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**GOLDEN GROVE  
DEVELOPMENT AGREEMENT  
BY AND BETWEEN  
GOLDEN-GROVE, LLC  
AND  
THE TOWN OF RAVENEL, SOUTH CAROLINA**

**January 11, 2022**

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## EXHIBITS

- Exhibit A: Legal Description
- Exhibit B: Boundary Plat
- Exhibit C: Development Phasing Schedule
- Exhibit D: Golden Grove Development Agreement Ordinance
- Exhibit E: Town of Ravenel Zoning Ordinance
- Exhibit F: Reserved
- Exhibit G: Form of Partial Assignment and Assumption of Rights and Obligations under Development Agreement
- Exhibit H: Coordination Letter from Charleston Water Systems
- Exhibit I: Golden Grove Development Plan



**DEVELOPMENT AGREEMENT  
BY AND BETWEEN  
GOLDEN-GROVE, LLC  
AND  
TOWN OF RAVENEL, SOUTH CAROLINA**

This DEVELOPMENT AGREEMENT (together with the Exhibits attached hereto and incorporated by reference herein, the "Agreement") is entered into effective as of the 11<sup>th</sup> day of December, 2022 (the "Effective Date"), by and between Golden-Grove, LLC, a South Carolina limited liability company ("Property Owner"), and the Town of Ravenel, a political subdivision of the State of South Carolina (the "Town").

**RECITALS**

This Agreement is predicated upon the following:

1. The Code of Laws of South Carolina, 1976, as amended (the "S.C. Code"), Sections 6-31-10 through 6-31-160, as it exists on the Effective Date of this Agreement (the "Act"), enables political subdivisions of the State of South Carolina to enter into binding development agreements with entities intending to develop real property under certain conditions set forth in the Act.

2. The Town annexed approximately five hundred ninety-eight (598) acres comprising the Real Property (hereinafter defined) identified as TMS Numbers 175-00-00-049, 175-00-052, 168-00-00-035, 186-00-00-062, 168-00-00-023, and 168-00-00-001 located in Charleston County, South Carolina, and classified the Real Property as Planned Development District on July 27, 2021, pursuant to Ordinance No. 12-21.

4. Pursuant to the Act, the Town conducted public hearings regarding its consideration of this Agreement on July 6, 2021, and July 27, 2021, after publishing and announcing notice, in accordance with the Act.

5. The Town Council adopted Ordinance Number 13-21 on July 27, 2021, (a) determining that this Agreement is consistent with the Town's Comprehensive Plan, the Act, and the Current Regulations of the Town, and (b) approving this Agreement.

NOW THEREFORE, in consideration of the premises of this Agreement and the mutual benefits to the parties, the parties agree as follows:

1. The Real Property. The property subject to this Agreement currently consists of five hundred ninety-seven and sixty-four hundredths (597.64) acres, of which five hundred eighty-three and nine-tenths acres are highland. A legal description of the property is set forth in Exhibit A, attached hereto and incorporated by reference herein, and the boundary lines of the property are shown on the compiled plat attached hereto as Exhibit B, and incorporated by reference herein.

2. Definitions. In this Agreement, unless the word or phrase is non-capitalized:

(a) "Agreement" means this Development Agreement, including the recitals and exhibits attached hereto.

(b) "CWS" means Charleston Water Systems.

(c) "Comprehensive Plan" means the Town of Ravenel Comprehensive Plan, adopted on May 26, 2020, pursuant to S.C. Code § 6-29-510, et seq., as amended through the Effective Date.

(d) “Current Regulations” mean the Comprehensive Plan; the Development Plan, attached hereto as Exhibit I; the Town of Ravenel Zoning Ordinance, adopted on January 20, 2000, as amended through the Effective Date, attached hereto as Exhibit E and incorporated herein by reference; and all other applicable Town ordinances, all as amended through the Effective Date hereof,.

(e) “Development” means the planning for or carrying out of a building activity, the making of a material change in the use or appearance of any structure or property, or the dividing of land into three or more parcels, and is intended by the parties to include all uses of, activities upon or changes to the Real Property as are authorized by the Agreement.

“Development,” as designated in a land or development permit, includes the planning for, and all other activity customarily associated with it, unless otherwise specified. When appropriate to the context, “Development” refers to the planning for, or the act of developing, or to the result of development. Reference to a specific operation is not intended to mean that the operation or activity, when part of other operations or activities, is not development. Reference to particular operations is not intended to limit the generality of this item.

(f) “Development Parcel” means any tract of land on which Development may occur, including platted lots and unplatted parcels, but excluding street rights-of-way.

(g) “Development Permit” includes a building permit, zoning permit, subdivision approval, rezoning certification, special exception, variance, certificate of occupancy and any other official action of the Town having the effect of permitting the Development or use of property.

(h) “Development Plan” means the Golden Grove Planned Development District Guidelines and Statement of Intent, including appendices, approved by Town Council on July 27, 2021, attached hereto as Exhibit I and incorporated herein by reference.

(i) “Development Phasing Schedule” means the schedule of proposed Development of the Real Property as shown on Exhibit C, attached hereto and incorporated by reference herein.

(j) “Development Rights” means all rights to the use and Development of the Real Property derived from this Agreement and Development Plan.

(k) “Facilities” means major capital or community improvements including, but not limited to, transportation, sanitary sewer, solid waste, drainage, and potable water.

(l) “Land Development Regulations” means ordinances and regulations enacted by the Town for the regulation of any aspect of Development and includes, but is not limited to, Town zoning, rezoning, subdivision, building construction, or sign regulations or any other regulations controlling the Development or use of property.

(m) “Law” means all statutes, ordinances, resolutions, regulations, comprehensive plans, land development regulations, policies and rules, custom and usage (formal and informal) adopted by the State and/or the County affecting the Development of property, and includes laws governing permitted uses of the property, governing density, and governing design, improvement, and construction standards and specifications.

(n) “Material Breach” means a failure to meet the obligations set forth in Section 11.B. and Paragraphs 18(d) and 18(f) hereof.

(o) “Official Zoning Map” means the Town’s Official Zoning map.

(p) “Project” is the Development that will occur within and upon the Real Property described in Exhibit A and Exhibit B.

(q) “Property Owner” means Golden-Grove, LLC, a South Carolina limited liability company existing under the laws of South Carolina together with all subsidiaries thereof and other entities, which have a legal interest, on the date of execution hereof in any of the Real Property described in Paragraph 5 and includes their successors in interest, successors in title (as to any portion of the Real Property) and/or assigns by virtue of assignment or other instrument compliant with this Agreement. When used herein with reference to a specific property within the Property or other portion of the Property, Property Owner shall mean and refer to that specific person or entity that has legal title to such portion of the Property. This definition of Property Owner shall not be understood to impose obligations, burdens, or liabilities on any of the particular persons or entities who qualify as the Property Owner for portions of the Property not legally tied to them. Property Owner warrants that there are no other legal or equitable owners of the Real Property.

(r) “Real Property” is the real property referred to in Section 5 and includes any improvements or structures customarily regarded as part of real property.

(s) “Golden Grove Development Agreement Ordinance” or “Development Agreement Ordinance” means the Town of Ravenel Ordinance No. 13-21, adopted on the 27<sup>th</sup> day of July, 2021, approving this Agreement and attached hereto as Exhibit D and incorporated herein by reference.

(d) “Term” shall have the meaning set forth in Section 15 of this Agreement.

3. Parties. Parties to this Agreement are the Property Owner and the Town.

4. Relationship of the Parties. This Agreement creates a contractual relationship between the parties. This Agreement is not intended to create, and does not create, the relationship of master/servant, principal/agent, independent contractor/employer, partnership, joint venture, or any other relationship where one party may be held responsible for acts of the other party. Further, this Agreement is not intended to create, nor does it create, a relationship whereby the conduct of the Property Owner constitutes “state action” for any purposes.

5. Legal Description of the Real Property. The Real Property which is the subject of this Agreement is described as follows:

- (a) A legal description of the Real Property is set forth in Exhibit A.
- (b) A compiled plat of the Real Property is set forth in Exhibit B.

The Real Property currently consists of approximately five hundred eighty-three and nine tenths (583.90) acres of highland and approximately thirteen and seventy-four hundredths (13.74) acres of wetlands, with a total gross acreage of approximately five hundred ninety-seven and sixty-four hundredth (597.64) acres.

6. Intent of the Parties. The Town and the Property Owner agree that the burdens of this Agreement bind, and the benefits of this Agreement shall inure, to each of them and to their successors in interest and, in the case of the Property Owner, its successors in title and/or assigns. The Town and the Property Owner are entering into this Agreement in order to secure benefits and burdens referenced in the Code of Laws of South Carolina, §§ 6-31-10, et seq. To that end, the parties agree to work cooperatively to accomplish the purposes of this Agreement during the Term of this Agreement.

7. Consistency with the Town's Comprehensive Plan and Land Development Regulations.

This Agreement is consistent with the Town's Comprehensive Plan and Current Regulations.

Whenever expressed or implied substantive provisions of this Agreement are inconsistent with the applicable standards set forth in the Current Regulations, the standards set forth in the Current Regulations and the standards set forth in this Agreement shall, to the extent possible, be considered in *pari material* to give effect to both the Current Regulations and this Agreement; provided, however, that in the event of a conflict, and subject to the provisions of S.C. Code § 6-31-80, the standards set forth in the Current Regulations shall govern.

8. Legislative Act. Any change in the standards established by this Agreement or to Laws pertaining to the same shall require the approval of Town Council, subject to compliance with applicable statutory procedures and consistent with Section 9(a). This Agreement constitutes a legislative act of Town Council. Town Council adopted this Agreement only after following procedures required by S.C. Code §§ 6-31-10, et seq. This Agreement shall not be construed to create a debt of the Town as referenced in S.C. Code § 6-31-145.

9. Applicable Land Use Regulations.

(a) Applicable Laws and Land Development Regulations. Except as otherwise provided by this Agreement or by S.C. Code Section 6-31-10, et seq., the Laws applicable to Development of the Real Property, subject to this Agreement, are those in force at the time of execution of this Agreement, defined as the Current Regulations.

(b) Subsequent Regulations. The Town may enact subsequent regulations pursuant to S.C. Code § 6-31-80.

(c) Vested Rights. The benefits that inure to the Property Owner under this Agreement shall, commencing on the Effective Date of this Agreement and during the Term of this Agreement, constitute vested Development Rights for the Development of the Real Property, and the Property Owner shall have the vested right to undertake Development of the Real Property, or any portion thereof, in accordance with the Development Rights and consistent with the terms of this Agreement and the Current Regulations, during the Term of this Agreement. The parties acknowledge and agree that as of the Effective Date of this Agreement, the Property Owner has a legal interest in the Real Property and is vested with all Development Rights arising out of this Agreement.

Paragraph 9(b) of this Agreement does not abrogate any rights either preserved by S.C. Code Section 6-31-140 or that may be available or may become available pursuant to common law and otherwise in the absence of a development agreement.

10. Building Codes and Laws Other Than Land Use Regulations. The Property Owner, notwithstanding any provision which may be construed to the contrary in this Agreement, must comply with any building, housing, electrical, mechanical, plumbing, gas and energy codes subsequently adopted by the Town or other governmental entity, as authorized by Chapter 9 of Title 6 of the South Carolina Code. This Agreement shall not be construed to supersede or contravene the requirements of any building, housing, electrical, mechanical, plumbing, gas and energy codes subsequently adopted by the Town or other governmental entity, as authorized by Chapter 9 of Title 6 of the South Carolina Code. The provisions of this Agreement are not intended, nor should they be construed in any way, to alter or amend in any way the rights, duties and privileges of the Town to exercise governmental powers and pass laws not applicable to



Development of the Real Property including, but not limited to, the power of eminent domain and the power to levy and collect taxes; provided, however, that Laws applicable to the Development of the Real Property shall be subject to Section 9(b).

11. Local Development Permits and Other Permits Needed. The parties anticipate that the following local Development Permits and other regulatory permits will be needed to complete the Development of the Project:

Zoning permits, plat approvals (preliminary, conditional or final), road and drainage construction plan approvals, building permits, certificates of occupancy, county water and/or sewer development contracts, and utility construction and operating permits, as well as permits from the South Carolina Department of Health and Environmental Control, South Carolina Department of Transportation, and the US Environmental Protection Agency.

The failure of this Agreement to address a particular permit, condition, term, or restriction does not relieve the Property Owner of the necessity of complying with the Law governing permit requirements, conditions, terms, or restrictions.

#### A. LAND USES AND INTENSITIES

(1) The Development Plan establish the zoning and land development regulations for the Real Property, as well as the Development uses permitted on the Real Property, population densities, and building intensities and heights.

(2) Any future amendment by the Town of the Comprehensive Plan shall not constitute or require an amendment of this Agreement. Any and all Development authorized by this Agreement pursuant to the Master Plan shall be deemed consistent with the Comprehensive Plan.

(3) The Development Plan shall survive the Term of this Agreement, and the provisions of the Development Plan, including without limitation those that pertain to the validity of any and all Development Permits issued pursuant to the Development Plan, shall remain effective

after the expiration of the Term of this Agreement unless and until amended by Town Council pursuant to the zoning process in effect at the time.

(4) The Current Regulations are not intended to contain inconsistent provisions; in the event there are inconsistent provisions, the Development Plan shall take precedence over any other Land Development Regulations.

#### B. RESTRICTIVE COVENANTS

The Property Owner may establish restrictive covenants on all or portions of the Real Property, which may, provide at the sole discretion of the Property Owner, for the dedication of portions or all of the Real Property to an association of owners or any association or sub-association of owners for maintenance and management obligations or other functions, including the payment of fees, subject to the provisions of this Agreement. The recording of a restrictive covenant, conservation easement or similar instrument against all or any portion of the Real Property shall not require or constitute an amendment of the Development Plan or this Agreement, unless it constitutes a material change under the Current Regulations, is less restrictive than this Agreement or the Current Regulations, or triggers a requirement for an amendment.

12. Facilities and Services. Although the nature of this long-term project prevents the Property Owner from providing exact completion dates, the general phases of Development are set forth in Section 14 and described in Exhibit C. The Property Owner certifies that the services and Facilities will be in place (or if not fully in place, the cost of construction fully bonded or letter of credit posted pursuant to the Current Regulations) at the times provided herein. The Property Owner shall comply with applicable Laws and all provisions of this Agreement, and

obtain prior approval of construction plans by the Town or County, as applicable, and other applicable governmental entities before installing the Facilities. Notwithstanding any provision herein to the contrary, the Property Owner hereby assures the Town that adequate Facilities shall be available concurrent with the phases of Development.

(a) Rights-of-Way/Easement. The Property Owner or a third party shall at its expense develop and provide roads, streets, and other transportation and drainage related facilities and infrastructure within the Project and pursuant to and at such time required by the development plans for the Project and/or the Current Regulations. Such facilities may be transferred by the Property Owner, in fee or by easement, subject to proper dedication and acceptance by the South Carolina Department of Transportation (“SCDOT”), Charleston County, the Town, or a property owners association, as governed by recorded covenants, conditions, and restrictions regarding the ownership and maintenance thereof. Rights-of-way and easements may also remain privately owned and maintained.

(b) Potable Water. Subject to approval by the South Carolina Department of Health and Environment Control (“DHEC”), the service and Facilities for water shall be provided by CWS insofar as its rights allow, as is evidenced by the coordination letter from CWS dated November 9, 2020, attached hereto as Exhibit H and incorporated herein by reference. The Property Owner, in its sole discretion and as permitted by DHEC, may utilize private water systems.

(c) Sanitary Sewer Facilities and Service. Subject to approval by the DHEC, the service and facilities for sanitary sewer for the Project shall be provided by the Town. The Town warrants that sewer capacity for the residential development and 33,000 gpd for commercial development is available, and shall be reserved for the Project. Property Owner agrees to extend

the sewer system into the public rights-of-way within the Project. The Town shall charge, and the Property Owner shall pay, sewer impact fees at the rate in effect as of the Effective Date. The impact sewer impact fees will be initially assessed and calculated based upon the equivalent residential units (“ERUs”) for which sewer capacity is reserved for both residential and commercial pursuant to this Agreement. Property Owner agrees to phase in the ERUs and pay impact fees for at least 50 ERUs per year, beginning on the second anniversary of the Effective Date.

In consideration of the extension of the sewer system as described above and the donation of the Municipal Services Site described below, the Town agrees to provide a sewer impact fee credit in the amount of Two Hundred and Fifty-Thousand (\$250,000) (the “Credit”). The proportion of the total Credit to be applied to each annual total sewer impact fee payment shall be no more than 25% of that year’s residential sewer impact fee payment. After the Credit is fully drawn down, all remaining sewer impact fees shall be paid without discount when due. The Town shall not charge any other sewer impact fees unless agreed to by the Property Owner.

The Property Owner, in its sole discretion and as permitted by DHEC, may utilize private sewer systems.

d) Municipal Services Site. In consideration of the sewer impact fee credit described above, the Property Owner shall convey to the Town not less than two acres of highland in a mutually agreeable location for municipal services as permitted in the Development Plan, said conveyance to occur within six months of the Effective Date. In the event the Town does not elect to provide municipal services on the parcel, the Property Owner shall be offered the right of first refusal to purchase the site in an amount not to exceed the total sewer impact fee credit described above.

e) Public Services. The Project is eligible to receive services at a level and in a manner that is consistent with other similarly situated developed areas of the Town within the vicinity of Golden Grove.

13. Transportation.

(a) Primary access and main entry to the Project shall be from Us Highway 17 (Savannah Highway).

(b) Infrastructure. The Property Owner shall pay for and construct all road, street, thoroughfare, and other transportation and drainage related infrastructure and improvements within the Real Property. Any roads whose standards are dictated by federal, state or county standards shall be constructed according to the respective standards and pursuant to the applicable federal, state or county processes.

(c) Acceptance of Facilities. The road improvements located with the Real Property described above may be made public upon proper dedication to and acceptance to the Town.

14. Schedule for Project Development.

(a) Commencement Date. The Project will be deemed to commence Development upon the Effective Date of this Agreement.

(b) Development Phasing Schedule. The parties acknowledge that the Property Owner intends to develop the Real Property in phases. In accordance with the Act, the Property Owner shall develop the Real Property in a manner consistent with the Development Phasing Schedule as is set forth in Exhibit C hereto. As the timing of the Development will be affected by the health of the national and local economics as well as demand for various housing types and commercial and industrial uses in the region, it is difficult to accurately project the timing and scope of the Project. As such and using the most reliable information as of the Effective

Date, the Property Owner and Town agree upon the Development Phasing Schedule, which shall be updated annually during the periodic review required by the Act.

(c) Completion Date. The Property Owner projects that by the year 2030 the Project should be substantially completed (i.e., essentially all structures erected and/or all necessary infrastructure in place to serve the intended uses).

15. Term of the Agreement. The term of this Agreement shall be ten (10) years, commencing on the Effective Date.

16. Amending or Canceling the Agreement. Subject to the provisions of S.C. Code Section 6-31-80 and Paragraph 18 below, this Agreement may be amended or canceled in whole or in part only by mutual consent of the parties in writing or by their successors in interest. Any amendment to this Agreement shall comply with the provisions of S.C. Code Section 6-31-10, et seq. A major modification of this Agreement shall occur only after public notice and a public hearing by the Town pursuant to S.C. Code Section 6-31-60(B).

17. Modifying or Suspending the Agreement. Pursuant to S.C. Code Ann. § 6-31-130, in the event state or federal laws or regulations prevent or preclude compliance with one or more provisions of this Agreement, the pertinent provisions of this Agreement shall be modified or suspended as may be necessary to comply with the state or federal laws or regulations.

18. Periodic Review. Pursuant to S.C. Code Ann. § 6-31-90, the Town shall review the Project and this Agreement at least once every twelve (12) months, at which time the Property Owner shall demonstrate good-faith compliance with the terms of this Agreement.

If, as a result of its periodic review or at any other time, the Town finds and determines that the Property Owner has committed a material breach of the terms or conditions of this Agreement, the Town shall serve notice in writing upon the Property Owner setting forth with

reasonable particularity the nature of the breach and the evidence supporting the finding and determination, and providing the Property Owner a reasonable time of not less than thirty (30) days in which to cure or initiate a process or plan to cure the material breach. If the Property Owner has initiated a process or plan to cure the breach within thirty (30) days of notice of the breach, is using good faith efforts to cure the breach, and requires additional time to cure, the Property Owner shall request an extension in writing, and Town shall not unreasonably deny the request.

If the Property Owner fails to cure any Material Breach, then the Town Council may unilaterally terminate or modify this entire Agreement. If a Property Owner fails to cure any non-Material Breach as to any portion of the Real Property within a commercially reasonable time, then the Town Council may unilaterally terminate or modify this Agreement with respect to only that portion of the Real Property for which the non-Material Breach occurred.

19. Severability. Subject to the provisions of S.C. Code Section 6-31-150, if any word, phrase, sentence, paragraph or provision of this Agreement shall be finally adjudicated to be invalid, void, or illegal, it shall be deleted and in no way affect, impair, or invalidate any other provision hereof.

20. Merger. This Agreement, coupled with its Exhibits which are incorporated herein by reference, shall state the final and complete expression of the parties' intentions. In return for the respective rights, benefits and burdens undertaken by the parties, the Property Owner shall be, and is hereby, relieved of obligations imposed by future land development laws, ordinances and regulations, except those which may be specifically provided for herein.

The parties hereto agree to cooperate with each other to effectuate the provisions of this Agreement and to act reasonably and expeditiously in all performances required under the Agreement.

21. Conflicts of Law. This Agreement shall be construed and enforced in accordance with the laws of the State of South Carolina, and the Ninth Judicial Circuit, Charleston Town, shall be the proper venue for any disputes.

22. Remedies. In addition to the remedies found in Paragraphs 16 and 18 above, each Party recognizes that the other Party would suffer irreparable harm from a Material Breach of this Agreement and that no adequate remedy at law exists to enforce this Agreement. Consequently, the parties agree that any non-breaching Party who seeks enforcement of the Agreement is entitled to all remedies available at law and equity, including, but not limited to, actual damages; however, the parties agree that neither party is entitled to punitive damages. The Town will look solely to the Property Owner as to any rights it may have against the Property Owners under this agreement, hereby waives any right to assert any claims against the shareholders, employees or agents of the Property Owner, and further agrees that no shareholder, employee, or agent of the Property Owner has any personal liability under this Agreement.

23. Recording. Within fourteen (14) days after execution of this Agreement by both parties, the Property Owner shall record the Agreement in the office of the Charleston County Register of Deeds. The burdens of this Agreement are binding upon, and the benefits of this Agreement shall inure to, all successors in interest and assigns of the parties to this Agreement.

24. Third Parties. Notwithstanding any provision herein to the contrary, this Agreement shall not be binding and shall have no force or effect as to persons or entities that are not parties or successors and assigns to this Agreement.



25. Town Approval of Agreement. The Town Council has approved the Project under the process set forth in S.C. Code § 6-31-50 of the Act on the terms and conditions set forth in this Agreement.

26. Successors and Assigns.

(a) Binding Effect. This Agreement shall be binding on the successors and assigns of the Property Owner in the ownership or Development of any portion of the Real Property or the Project. A purchaser, lessee or other successor in interest of any portion of the Real Property shall be solely responsible for performance of obligations hereunder as to the portion or portions of the Real Property so transferred. Assignees of development tracts shall be required to execute a written acknowledgment accepting and agreeing to perform the obligations in this Agreement, said document to be in recordable form and provided to the Town at the time of the recording of any deed transferring a development tract. Following delivery of such documents, the previous Property Owner shall be released of any further liability or obligation with respect to the obligations.

The Property Owner shall not be required to notify the Town or obtain the Town's consent with regard to the sale of lots in residential areas which have been platted and approved in accordance with the terms of this Agreement.

(b) Transfer of Project. The Property Owner shall be entitled to transfer any portion or all of the Real Property to a purchaser(s), subject to the following exceptions:

(i) Transfer of Facility and Service Obligations. Simultaneous with the Property Owner conveying any portion of the Real Property to a third party, the Property Owner shall be required to obtain a written agreement in substantially the same form as

Exhibit G, attached hereto and incorporated herein by reference, expressly assuming the obligations with regard to the parcel conveyed and the potential Development of same. The Property Owner shall notify the Town within thirty (30) days after the conveyance of the property, provide the Town the applicable documents assigning the development obligations to the transferee and record the same in the office of the Charleston County Register of Deeds.

(ii) Assignment of Development Rights. Any and all conveyances of any portion of the Real Property subject to the intensities/square footage set forth in Section 11A herein to third party developers shall, by written agreement in substantially the same form as Exhibit G, assign a precise number of residential units and/or commercial/office square footage along with the permitted land uses that may be constructed on the subject. The Property Owner shall notify the Town within thirty (30) days of the conveyance of the property, provide the Town with the applicable documents assigning the development rights to the transferee and record the same in the office of the Charleston County Register of Deeds.

(iii) Mortgage Lenders. Notwithstanding anything to the contrary contained herein, the exceptions to transfer contained in this Section shall not apply: (i) to any mortgage lender either as the result of foreclosure of any mortgage secured by any portion of the Real Property or any other transfer in lieu of foreclosure; (ii) to any third party purchaser at such a foreclosure; or (iii) to any third party purchaser of such mortgage lender's interest subsequent to the mortgage lender's acquiring ownership of any portion of the Real Property as set forth above. Furthermore, nothing contained

herein shall prevent, hinder or delay any transfer or any portion of the Real Property to any such mortgage lender or subsequent purchaser.

(c) Release of Property Owner. In the event of conveyance of all or a portion of the Real Property and compliance with the conditions set forth therein, Golden-Grove, LLC shall be released from all obligations as to the portion of Real Property so transferred, and the transferee shall be substituted as the Property Owner under the Agreement as to the portion of the Real Property so transferred.

(d) Estoppel Certificate. Upon request in writing from an assignee or the Property Owner to the Town sent by certified or registered mail or publicly licensed message carrier, return receipt requested, the Town will provide a certificate (the "Certificate") in recordable form stating that solely with respect to the portion of the Real Property described in the request, there are no violations or breaches of this Agreement of which the Town has actual knowledge, except as otherwise described in the Certificate. The Town will respond to such a request within thirty (30) days of the receipt of the request, and may employ such professional consultants, municipal, county and state agencies and staff as may be necessary to assure the truth and completeness of the statements in the certificate. If the Town is unable to confirm the statements in said certificate are truthful and complete, Town will notify the Property Owner in writing and will not be required to sign said certificate. The reasonable costs and disbursements of private consultants will be paid by the person making the request.

The Certificate issued by the Town will be binding on the Town in accordance with the facts and statements contained therein as of its date and may be relied upon by all persons having notice thereof.

If the Town does not respond to such request within thirty (30) days of the time of its receipt, the portion of the Real Property described in the request will be deemed in compliance with all of the covenants and terms of this Agreement. A certificate of such conclusion may be recorded by the Property Owner, including a copy of the request and the notice of receipt and it shall be binding on the Town as of its date. Such notice shall have the same effect as a Certificate issued by the Town under this Section.

27. General Terms and Conditions.

(a) Agreements to Run with the Land. This Agreement shall be recorded against the Real Property as described in Exhibit A and shown on Exhibit B attached hereto. The agreements contained herein shall be deemed to run with the land. The burdens of this Agreement are binding upon, and the benefits of the Agreement shall inure to, all successors in interest to the parties to the Agreement.

(b) Pre-Existing Allowed Uses. All uses existing as of the Effective Date of this Agreement, including but not limited to commercial forestry and timbering, agricultural, sand or soil mining, wildlife management, hunt clubs, and wetland mitigation bank operations, including all practices, land uses, and improvements customarily associated with such operations, shall continue to be allowed uses if not provided for in the Development Plan. Any subdivision of a portion of the Real Property used or planned to be used for any of the uses listed in the preceding sentence may be an exempt land development as provided by State law. Nothing herein shall be construed to abrogate any rights of the Property Owner that may have accrued or vested as of the Effective Date or at any time during the Term of this Agreement pursuant to the Act, the South Carolina Local Government Comprehensive Planning Enabling Act of 1994, codified in Chapter

29 of Title 6 of South Carolina Code of Laws, Section 48-23-205 of South Carolina Code of Laws, or pursuant to common law.

(c) Construction of Agreement. This Agreement should be construed so as to effectuate the public purpose of settlement of disputes, while protecting the public health, safety and welfare, including but not limited to ensuring the adequacy of Facilities and compatibility between Developed and undeveloped lands.

(d) Mutual Releases. At the time of, and subject to (i) the expiration of any applicable appeal period with respect to the approval of this Agreement without any appeal having been filed or (ii) the final determination of any court upholding this Agreement; whichever occurs later, and excepting the parties' respective rights and obligations under this Agreement, Property Owner, on behalf of itself and Property Owner's members, officers, directors, employees, agents, attorneys, and consultants, hereby releases the Town and the Town's council members, officials, employees, agents, attorneys and consultants, and the Town, on behalf of itself and the Town's council members, officials, employees, agents, attorneys and consultants, hereby releases Property Owner and Property Owner's members, officers, directors, employees, agents, attorneys and consultants, from and against any and all claims, demands, liabilities, costs, expenses of whatever nature, whether known or unknown, and whether liquidated or contingent, arising on or before the date of this Agreement in connection with the Real Property or the application, processing or approval of the Project; provided, however, that each party shall not be released from its continuing obligation to comply with the law, including the Current Regulations.

(e) State and Federal Law. The parties agree, intend and understand that the obligations imposed by this Agreement are only such as are consistent with state and federal law.

In the event state or federal laws or regulations prevent or preclude compliance with one or more provisions of the development agreement, the provisions of this Agreement shall be modified or suspended as may be necessary to comply with state or federal laws or regulations. The parties further agree that if any provision of this Agreement is declared invalid, this Agreement shall be deemed amended to the extent necessary to make it consistent with state or federal law, as the case may be, and the balance of the Agreement shall remain in full force and effect.

(f) No Waiver. Failure of a Party hereto to exercise any right hereunder shall not be deemed a waiver of any such right and shall not affect the right of such Party to exercise at some future time said right or any other right it may have hereunder. Unless this Agreement is amended by vote of the Town Council taken with the same formality as the vote approving this Agreement, no officer, official or agent of the Town has the power to amend, modify or alter this Agreement or waive any of its conditions so as to bind the Town by making any promise or representation contained herein. Any amendments are subject to the provisions of Section 16 herein.

(g) Entire Agreement. This Agreement constitutes the entire agreement between the parties and supersedes all prior agreements, whether oral or written, covering the same subject matter. This Agreement may not be modified or amended except in writing mutually agreed to and accepted by both parties to this Agreement.

(h) Attorneys Fees. Should any Party hereto employ an attorney for the purpose of enforcing this Agreement, or any judgment based on this Agreement, for any reason or in any legal proceeding whatsoever, including insolvency, bankruptcy, arbitration, declaratory relief or other litigation, including appeal or rehearings, the prevailing party shall be reimbursed for its

attorneys' fees and all costs and expenses. Should any judgment or final order be issued in that proceeding, said reimbursement shall be specified therein.

(i) Notices. All notices hereunder shall be given in writing by certified mail, postage prepaid, at the following addresses:

To the Town:

Mayor of Ravenel  
5962 Highway 165, Suite 100  
Ravenel, SC 29470  
Telephone Number: (843) 708-2003

With copies to:

Town of Ravenel Planning & Zoning Administrator  
5962 Highway 165, Suite 100  
Ravenel, SC 29470  
Telephone Number: (843) 889-8732

To the Property Owner:

Golden-Grove, LLC  
P.O. Box 63535  
Charleston, SC 29419

With copy to:

George Bullwinkel, III, Esquire  
Nexsen Pruet, LLC  
205 King Street, Suite 400  
Charleston, SC 29401

(j) Execution of Agreement. This Agreement may be executed in multiple parts as originals or by facsimile copies of executed originals; provided, however, if executed and

evidence of execution is made by facsimile copy, then an original shall be provided to the other party within seven (7) days of receipt of said facsimile copy.

[SEPARATE SIGNATURE PAGES ATTACHED]



IN WITNESS WHEREOF, this Agreement has been executed by the parties as of the day and  
year first above written.

Witness:

[Handwritten Signature]

Tiffany Mitchell

TOWN OF RAVENEL, SOUTH CAROLINA

By: [Handwritten Signature]

Its: MAYOR

Attest: [Handwritten Signature]  
Clerk of Council

STATE OF SOUTH CAROLINA )  
)  
COUNTY OF CHARLESTON )

ACKNOWLEDGMENT

I, Nicholas F. Smith, Notary of the Public of the State of South Carolina, do hereby certify that the Town of Ravenel, South Carolina, by Stephen Tomblinson, its Mayor and Tommy Wood, its Clerk of Council, personally appeared before me this 23 day of December, ~~2015~~, 2021, and acknowledged the execution of the foregoing instrument.

Nicholas F. Smith

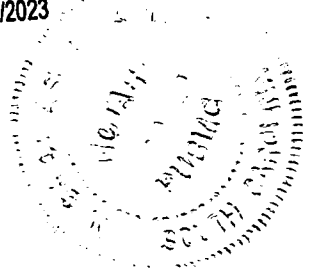
Notary Public for South Carolina

Nicholas F. Smith

Printed Name of Notary

My Commission Expires: 10-08-2023

**NICHOLAS F. SMITH**  
Notary Public, State of South Carolina  
My Commission Expires 10/8/2023



Witness:

Golden-Grove, LLC

Catherine J. McGhee  
\_\_\_\_\_

By: [Signature]

Its: Manager

STATE OF SOUTH CAROLINA )

)

ACKNOWLEDGMENT

COUNTY OF CHARLESTON )

I, Ginger Wright, the undersigned Notary of the Public of the State of South Carolina, do hereby certify that Don Thompson, Manager of Golden-Grove, LLC, personally appeared before me this 11<sup>th</sup> day of January, 2022, and acknowledged the execution of the foregoing instrument.

Ginger D. Wright  
\_\_\_\_\_

Notary Public for South Carolina

Ginger D. Wright  
\_\_\_\_\_

Printed Name of Notary

My Commission Expires: 12/11/2025

## EXHIBITS

- Exhibit A: Legal Description
- Exhibit B: Boundary Plat
- Exhibit C: Development Phasing Schedule
- Exhibit D: Golden Grove Development Agreement Ordinance
- Exhibit E: Town of Ravenel Zoning Ordinance
- Exhibit F: Reserved
- Exhibit G: Form of Partial Assignment and Assumption of Rights and Obligations under Development Agreement
- Exhibit H: Coordination Letter from Charleston Water Systems
- Exhibit I: Golden Grove Development Plan

## EXHIBIT A

### LEGAL DESCRIPTION

ALL those lots, pieces, or parcels of land, with improvements thereon, situate, lying and being in St. Paul's Parish, Charleston County, South Carolina, measuring and containing 658.328 acres, more or less, and being more particularly shown and designated as "**TRACT DH-1 18,416,317.87 SQFT 422.780 ACRES**", "**TRACT DH-1A 159,147.97 SQFT 3.654 ACRES**", "**TRACT DH-3B 7,499,056.73 SQFT 172.155 ACRES**", and "**TRACT DH-3C 29,850.95 SQFT 0.685 ACRES**" on a plat entitled "PLAT SHOWING TRACT DH-1 (422.780 ACRES), TRACT DH-3A (0.200 ACRES) & TRACT DH-3B (172.155 ACRES), BEING A PORTION OF TMS 175-00-00-009, TMS 186-00-00-062 (TRACT DH-1A 3.654 ACRES) & TMS 168-00-00-023 (TRACT DH-3C 0.685 ACRES) PROPERTY OF MWV-EAST EDISTO SPRING GROVE, LLC TRACT DH-2 (58.854 ACRES) BEING A PORTION OF TMS 179-00-00-025, PROPERTY OF MWV-EAST EDISTO CHARLESTON, LLC LOCATED IN ST. PAULS PARISH CHARLESTON COUNTY, SOUTH CAROLINA" prepared under seal of Andrew C. Gillette, PLS #5933-B, of Parker Land Surveying, LLC, dated March 27, 2017, and recorded May 17, 2017, in Plat Book L17 at Page 0272, in the Office of the RMC for Charleston County, South Carolina ("Plat"), said Property is more fully described according to said Plat.

TMS#            175-00-00-049  
                  186-00-00-062  
                  175-00-00-052  
                  168-00-00-023

AND

All that certain piece, parcel or lot of land situate, lying and being in Charleston County, State of South Carolina and designated as "TMS NO. 168-00-00-001 MARY ELOISE DEMPSEY HALLEX PLAT BOOK BA PG. 19 DEED BOOK J124 PG. 249 (RESIDUAL AREA = 2.00 AC.) on a plat entitled "PLAT OF PUMP STATION SITE AND PERMANENT EASEMENT TO BE ACQUIRED FROM MARY ELOISE DEMPSEY HALLEX" prepared by B. P. Barber & Associates, Inc., dated February 28, 2007, last revised February 8, 2008, and recorded February 29, 2008, in Plat Book DF at page 910, in the ROD Office for Charleston County, and having the following metes and bounds, to-wit:

BEGINNING at an Iron Pin Set on the Northwest right-of-way intersection of U.S. Highway No. 17 – Savannah Highway and New Road (County Maintained –Dirt), thence running N87°58'32"E along the northern right-of-way of U.S. Highway No. 17 – Savannah Highway a distance of 368.05' to a calculated point, thence running N87°58'32"E along the northern right-of-way of U.S. Highway No. 17 – Savannah Highway for a distance of 25.00' to an iron pin found, thence turning and running N01°56'02"W along the property of TMS# 168-00-00-024 James Howell, Jr., for a distance of 129.84' to an iron pin set, thence running N88°03'58"E along the southern property line of PUMP STATION SITE for a distance of 25.00' to a calculated point, thence running N88°03'58"E along the southern property line of PUMP STATION SITE for a distance of 25.00' to an iron pin set, thence turning and running N01°56'02"W along the eastern property line of PUMP STATION

SITE for a distance of 53.71' to an iron pin set; thence turning and running N83°49'33"E along the property of TMS# 175-00-00-009 Meadwestvaco Forestry, LLC, for a distance of 449.12' to an iron pin found, thence turning and running S23°56'33"W along the western right-of-way of New Road (County Maintained-Dirt) for a distance of 240.23' to and iron pin set, said point being the POINT OF BEGINNING.

Said property being also described as follows:

All that certain piece, parcel or lot of land situate, lying and being in Charleston County, State of South Carolina designated as "Residual Area" containing Two (2.00) acres, more or less, as more fully shown on that certain plat entitled "PLAT OF PUMP STATION SITE AND PERMANENT EASEMENT TO BE ACQUIRED FROM MARY ELOISE DEMPSEY HALLEX" prepared by Robert A. Vannerson, S.C.P.L.S of BP Barber, dated February 28, 2007, and recorded in the RMC Office for Charleston County in Plat Book DF at page 910.

Said lot having such size, shape, dimensions, buttings and boundings, as will be more fully shown upon review of said plat.

TMS# 168-00-00-001

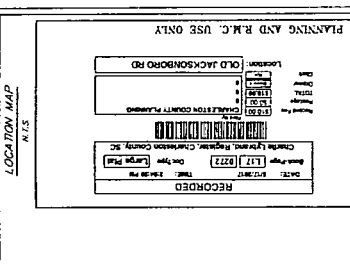
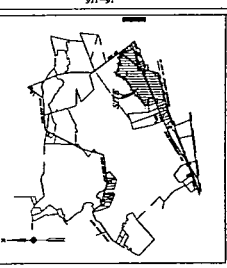
AND

All that certain piece, parcel or lot of land situate, lying and being in Charleston County, State of South Carolina designated as "Pump Station Site" containing Two (2.00) acres, more or less, as more fully shown on that certain plat entitled "PLAT OF PUMP STATION SITE AND PERMANENT EASEMENT TO BE ACQUIRED FROM MARY ELOISE DEMPSEY HALLEX" prepared by Robert A. Vannerson, S.C.P.L.S of BP Barber, dated February 28, 2007, and recorded in the RMC Office for Charleston County in Plat Book DF at page 910, and having the following metes and bounds, to wit:

Beginning at an iron pipe found (IPF) in the line of lands of MeadWestvaco Forestry, LLC (TMS #175-00-00-009), and being the northeastern corner of the lands of James Howell, Jr. (TMS #168-00-00-024); thence departing TMS #168-00-00-024 and running with TMS #175-00-00-009 the following course; N 83°49'33" e 50.14 feet to an iron pipe set (IPS) in the line of TMS #175-00-00-009, and being a corner to the lands of Mary Eloise Dempsey Hallex (TMS #168-00-00-001); thence departing TMS #175-00-00-009 and running with TMS #168-00-00-001 the following two (2) courses; S 01°56'02" E 53.71 feet to an IPS; thence S 88°03'58" W 50.00 feet to an IPS in the line of the aforementioned TMS #168-00-00-024 and being a corner to TMS #168-00-00-001; thence departing TMS #168-00-00-001 and running with TMS #168-00-00-024 the following course; N 01°56'02" W 50.00 feet to the point of beginning, containing 2,593 square feet or 0.06 acres of land more or less.

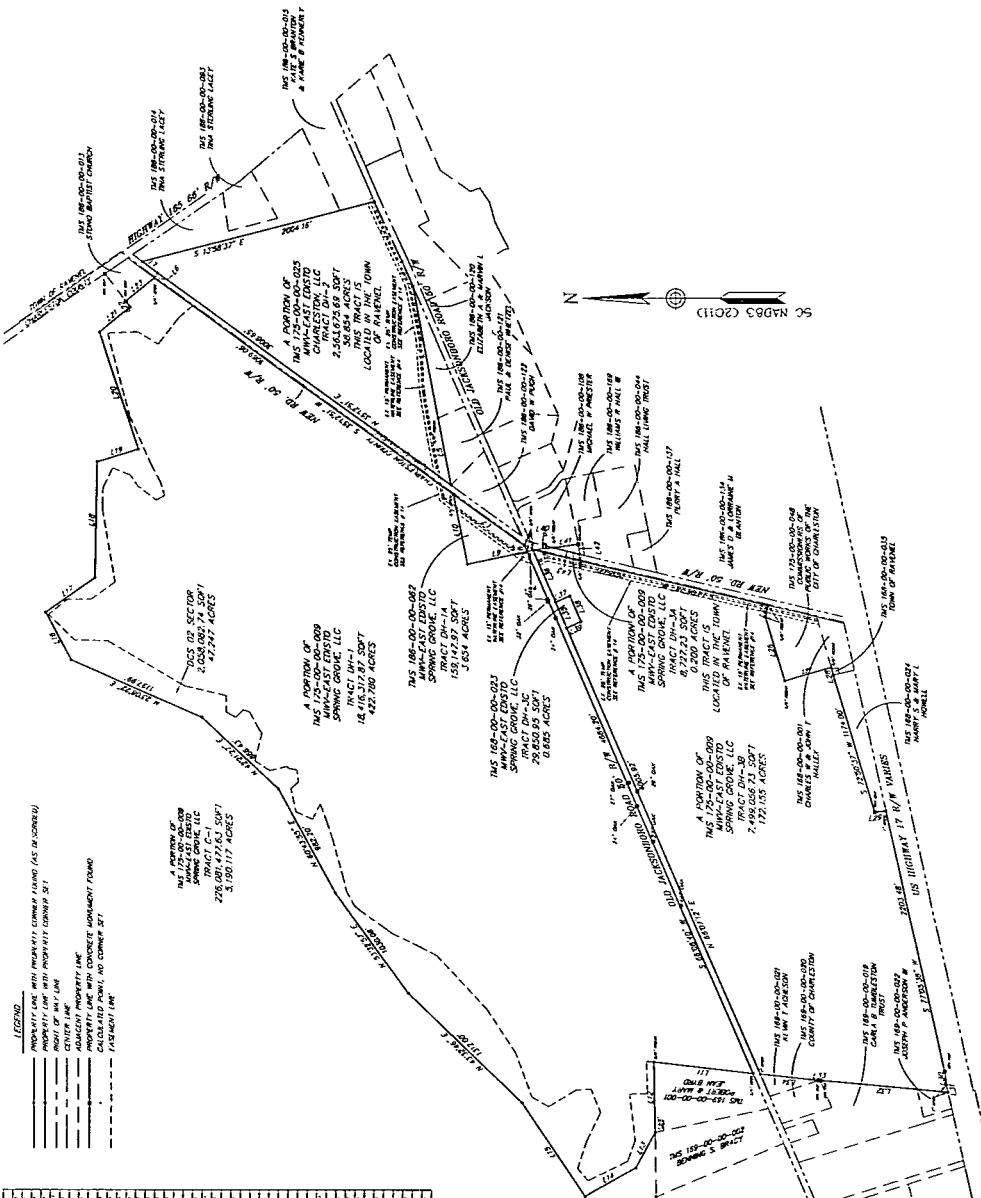
TMS# 168-00-00-035

**EXHIBIT B**  
**BOUNDARY PLAT**



APPROVED PLAT  
 Charleston County Planning Commission  
 SEPA - 2017-03-27  
 APPROVED BY  
 CHARLESTON COUNTY PLANNING COMMISSION  
 DATE: 03/27/2017  
 TIME: 10:30 AM  
 RECORDING OFFICE: CHARLESTON COUNTY REGISTER OF DEEDS

REFERENCES:  
 1. SUBDIVISION PLAT OF THE WESTERN PORTION OF TRACT 175-00-00-023, OWNED BY SOUTH CAROLINA STATE UNIVERSITY, LOCATED IN CHARLESTON COUNTY, SOUTH CAROLINA, RECORDED IN PLAT BOOK 175, PAGE 303.  
 2. SUBDIVISION PLAT OF THE WESTERN PORTION OF TRACT 175-00-00-023, OWNED BY SOUTH CAROLINA STATE UNIVERSITY, LOCATED IN CHARLESTON COUNTY, SOUTH CAROLINA, RECORDED IN PLAT BOOK 175, PAGE 303.  
 3. SUBDIVISION PLAT OF THE WESTERN PORTION OF TRACT 175-00-00-023, OWNED BY SOUTH CAROLINA STATE UNIVERSITY, LOCATED IN CHARLESTON COUNTY, SOUTH CAROLINA, RECORDED IN PLAT BOOK 175, PAGE 303.  
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 13. SUBDIVISION PLAT OF THE WESTERN PORTION OF TRACT 175-00-00-023, OWNED BY SOUTH CAROLINA STATE UNIVERSITY, LOCATED IN CHARLESTON COUNTY, SOUTH CAROLINA, RECORDED IN PLAT BOOK 175, PAGE 303.  
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 17. SUBDIVISION PLAT OF THE WESTERN PORTION OF TRACT 175-00-00-023, OWNED BY SOUTH CAROLINA STATE UNIVERSITY, LOCATED IN CHARLESTON COUNTY, SOUTH CAROLINA, RECORDED IN PLAT BOOK 175, PAGE 303.  
 18. SUBDIVISION PLAT OF THE WESTERN PORTION OF TRACT 175-00-00-023, OWNED BY SOUTH CAROLINA STATE UNIVERSITY, LOCATED IN CHARLESTON COUNTY, SOUTH CAROLINA, RECORDED IN PLAT BOOK 175, PAGE 303.  
 19. SUBDIVISION PLAT OF THE WESTERN PORTION OF TRACT 175-00-00-023, OWNED BY SOUTH CAROLINA STATE UNIVERSITY, LOCATED IN CHARLESTON COUNTY, SOUTH CAROLINA, RECORDED IN PLAT BOOK 175, PAGE 303.  
 20. SUBDIVISION PLAT OF THE WESTERN PORTION OF TRACT 175-00-00-023, OWNED BY SOUTH CAROLINA STATE UNIVERSITY, LOCATED IN CHARLESTON COUNTY, SOUTH CAROLINA, RECORDED IN PLAT BOOK 175, PAGE 303.



LOT	ACRES	OWNER
1	0.0000	STATE OF SOUTH CAROLINA
2	0.0000	STATE OF SOUTH CAROLINA
3	0.0000	STATE OF SOUTH CAROLINA
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99	0.0000	STATE OF SOUTH CAROLINA
100	0.0000	STATE OF SOUTH CAROLINA

PLAT SHOWING  
 TRACT DH-1 (422.780 ACRES), TRACT DH-3A (0.200 ACRES) &  
 TRACT DH-3B (172.155 ACRES), BEING PORTIONS OF TMS 175-00-00-009,  
 TMS 168-00-00-023 (TRACT DH-1A 3.654 ACRES) &  
 TMS 168-00-00-023 (TRACT DH-1B 3.654 ACRES) PROPERTY OF  
 MHW-EAST EDISTO SPRING GROVE, LLC  
 TRACT DH-2 (58.854 ACRES) BEING A PORTION OF TMS 175-00-00-025,  
 PROPERTY OF MHW-EAST EDISTO SPRING GROVE, LLC  
 LOCATED IN ST. PAULS PARISH, CHARLESTON COUNTY, SOUTH CAROLINA  
 DATE: MARCH 27, 2017  
 SCALE: 1" = 500'

NOTES:  
 1. THE PROPERTY SHOWN OUTSIDE THE BOUNDARIES OF THIS PLAT IS FOR IDENTIFICATION PURPOSES ONLY.  
 2. THE BOUNDARIES OF THIS PLAT ARE BASED ON THE RECORDS OF THE CHARLESTON COUNTY REGISTER OF DEEDS.  
 3. THE PROPERTY SHOWN WITHIN THE BOUNDARIES OF THIS PLAT IS SUBJECT TO ALL EASEMENTS, ENCUMBRANCES, AND OTHER INTERESTS OF RECORD.  
 4. THE PROPERTY SHOWN WITHIN THE BOUNDARIES OF THIS PLAT IS SUBJECT TO ALL EASEMENTS, ENCUMBRANCES, AND OTHER INTERESTS OF RECORD.  
 5. THE PROPERTY SHOWN WITHIN THE BOUNDARIES OF THIS PLAT IS SUBJECT TO ALL EASEMENTS, ENCUMBRANCES, AND OTHER INTERESTS OF RECORD.  
 6. THE PROPERTY SHOWN WITHIN THE BOUNDARIES OF THIS PLAT IS SUBJECT TO ALL EASEMENTS, ENCUMBRANCES, AND OTHER INTERESTS OF RECORD.  
 7. THE PROPERTY SHOWN WITHIN THE BOUNDARIES OF THIS PLAT IS SUBJECT TO ALL EASEMENTS, ENCUMBRANCES, AND OTHER INTERESTS OF RECORD.  
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 9. THE PROPERTY SHOWN WITHIN THE BOUNDARIES OF THIS PLAT IS SUBJECT TO ALL EASEMENTS, ENCUMBRANCES, AND OTHER INTERESTS OF RECORD.  
 10. THE PROPERTY SHOWN WITHIN THE BOUNDARIES OF THIS PLAT IS SUBJECT TO ALL EASEMENTS, ENCUMBRANCES, AND OTHER INTERESTS OF RECORD.

PLS. 5833-B  
 Parker Land Surveying, LLC  
 710 9th Street  
 Charleston, SC 29401  
 Phone: (803) 581-1777  
 Fax: (803) 581-1779

## EXHIBIT C

### DEVELOPMENT PHASING SCHEDULE

#### Land Use Bays Development and Phasing

The GGPDD is anticipated to be constructed as a phased development. A Conceptual Phasing Plan that outlines the anticipated phasing sequence for the overall GGPDD is provided in the Master Development Plan (see Sheet C900). The phasing boundaries, as depicted in the Conceptual Phasing Plan, are intended for planning purposes and are subject to change based on variable market conditions and demand.

The GGPDD is comprised of three (3) principal land uses (land bays) for which development is proposed along separate timelines. These timelines will be dependent upon both current general economic conditions and associated trajectories, as well as the more local economic needs and demands of the Town of Ravenel and the Greater Charleston Area. Since the timing of development for the GGPDD is based on anticipation of these conditions, needs, and demands; it is necessarily subject to significant changes based on actual current conditions as the project develops. In consideration of the information and projections that we believe to be current and accurate at this time, we project the following schedule below.

#### 2021-2025 Initial Construction

This phase will include the start of infrastructure permitting and development for the Residential Land Bay in 2021. It will also include a continuation in the Resource Extraction Land Bay of an existing borrow pit operation from a neighboring parcel in 2021. By the end of this phase, it is anticipated that development of the infrastructure and associated single-family homes in the Residential Land Bay will be nearing completion.

#### 2025-2030

The Commercial Land Bay should begin construction during this period based on market demand and adjacent residential development. A wide variety of potential uses are possible based on the then-current needs of the area and future potential. Borrow pit operation in the Resource Extraction Land Bay should be ongoing.

#### 2030-2035

The Commercial Land Bay is expected to be fully built out during this period and the borrow pit operation should also be at or near completion.



**EXHIBIT D**

**GOLDEN DEVELOPMENT AGREEMENT ORDINANCE**

# TOWN OF RAVENEL

1<sup>st</sup> Reading: 7/6/2021  
2<sup>nd</sup> Reading: 7/27/2021

Introduced by: Robert L. Cochran  
Date: 7/6/2021

## ORDINANCE 13-21

### AN ORDINANCE AUTHORIZING THE MAYOR TO EXECUTE THE GOLDEN GROVE DEVELOPMENT AGREEMENT BETWEEN THE TOWN OF RAVENEL AND GOLDEN GROVE, LLC

**WHEREAS**, the South Carolina Development Agreement Act provides that local governments and property owners may, under specified circumstances, enter into agreements regarding the development of property; and

**WHEREAS**, such agreements provide some assurance as to continued zoning so as to support long-range planning and investment rather than short-term focused development; and

**WHEREAS**, such agreements can also make sense in matching long-term benefits with long-lasting commitments; and

**WHEREAS**, Council has previously given careful consideration to the related PDD zoning and believes it appropriate to give adequate time for it to be realized; and

**WHEREAS**, all statutory requirements are satisfied, and Council believes the attached agreement to be mutually beneficial and in the best interest of the Town's citizens and the surrounding community.

***NOW THEREFORE, BE IT ORDAINED*** by the Town Council of the Town of Ravenel, South Carolina, in Council duly assembled, and by authority of the same, that Mayor is authorized to execute the Golden Grove Development Agreement as set forth on the attached Exhibit A, which is incorporated herein. The Mayor is further authorized to make corrections and revisions as he deems necessary.

THIS ORDINANCE SHALL BECOME EFFECTIVE IMMEDIATELY UPON ADOPTION.

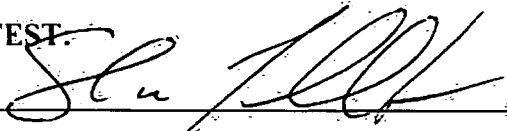
ADOPTED this 27<sup>th</sup> day of July, 2021 at Ravenel, South Carolina.

Ayes: 1


Nays: 0

Abstains: \_\_\_\_\_

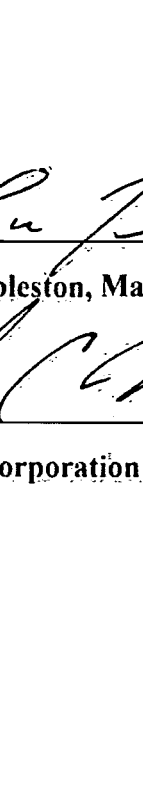
ATTEST.



Stephen Tumbleston, Mayor



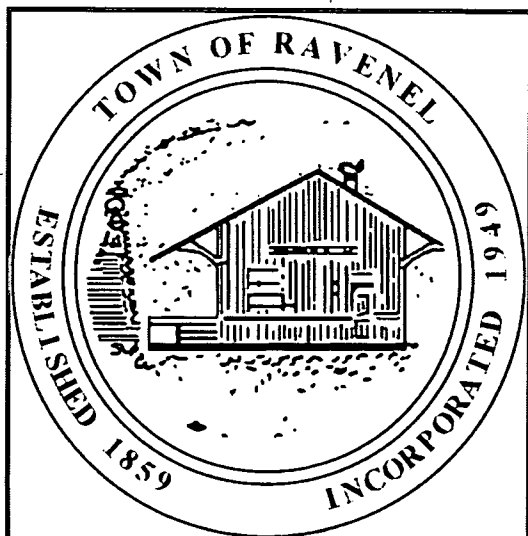
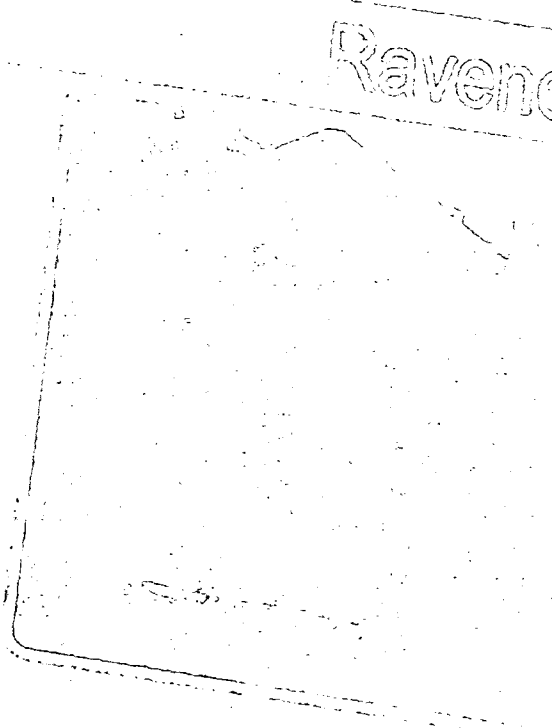
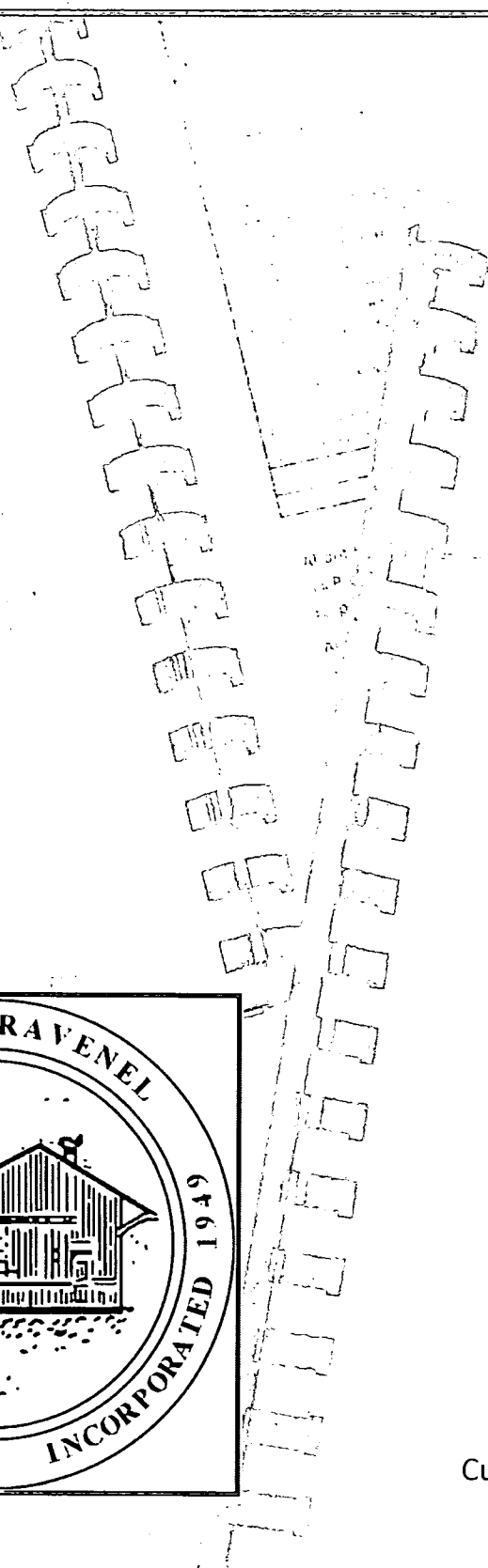
Clerk-Treasurer

  
Approved—Corporation Counsel

**EXHIBIT E**  
**ZONING ORDINANCE**

Town of Ravenel, South Carolina

# ZONING CODE



Current Zoning Code through August 2021

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**01/01/2020 Zoning Map**

*(prior to amendments by Ordinances 1-20, 2-20, 4-20, 5-20, 9-20, 13-20, 1-21, 6-21, 8-21, and 11-21)*

## **CHAPTER I. GENERAL PROVISIONS AND PROCEDURES**

### **Section 1.1 Authority.**

This chapter is adopted pursuant to the authority conferred by Chapter 29 of Title 6 of the Code of Laws of South Carolina, as amended, and drafted in accordance with the Town of Ravenel Land Use Ordinance, adopted May 10, 1999.

### **Section 1.2 Title.**

This ordinance, and amendments hereto, shall officially be known as the Ravenel Zoning Ordinance or Zoning Ordinance.

### **Section 1.3 Effective Date.**

This Ordinance was adopted by majority vote of Ravenel Town Council on January 20, 2000 and, together with subsequent and future amendments, shall remain in effect from that date.

### **Section 1.4 Intent and Purpose.**

This Ordinance is intended for the purposes, among others, of providing for the safe, orderly and efficient development of land within the Town of Ravenel, by

- A. Protecting the development of both urban and rural areas, and
- B. Securing protection from fire, flood, erosion and other dangers, and
- C. Encouraging such land use patterns that facilitate economic growth and provide sufficiently for transportation, communications, roads, airports, water supply, drainage, sanitation, education, recreation or other public requirements, and
- D. Conserving and developing the natural resources, and
- E. Fostering the community's agricultural industry, preserving rural character, and
- F. Protecting the food supply, and
- G. Guiding the development of the town in accordance with existing and future needs, and
- H. Preventing the overcrowding of land and undue concentration of population, and
- I. Protecting scenic areas and preserving historic sites and buildings, and
- J. Promoting desirable living conditions and the stability of neighborhoods, and
- K. Protecting property against blight and depreciation, and
- L. Conserving the value of land and buildings, and
- M. Encouraging the most appropriate use of land and structures.



**Section 1.5 Territorial Jurisdiction.**

The jurisdiction of this chapter shall include all land and improvements within the incorporated portions of the town. (Ord., passed 8-17-87, amended 01-20-00)

**Section 1.6 Repeal of Existing.**

All existing land use regulations adopted previously by the Town of Ravenel and contrary to this ordinance are hereby repealed. The adoption of this ordinance, however, shall not affect nor prevent any pending or future prosecution of or action to abate any existing violation of said regulations, as amended, if the violation is also a violation of the provisions of this ordinance.

**Section 1.7 Conflict with Other Provisions.**

Whenever there is, or appears to be, a conflict between any provision of this Zoning Ordinance, with any other provisions of this Zoning Ordinance, any section of the Town Code or any other applicable State or Federal Law, the more restrictive shall apply. (Ord., passed 8-17-87, amended 01-20-00)

**Section 1.8 Interpretation.**

For the purpose of this ordinance, the following rules of interpretation shall apply:

- A. Words used in the present tense include the future tense.
- B. The singular number includes the plural and the plural number includes the singular.
- C. The word "person" includes an individual or a corporation, firm, company, partnership, association, organization, or public or private authority.
- D. The term "shall" is always mandatory.
- E. The word "used" or "occupied" as applied to any land or building shall be considered to include the words "intended", "arranged", or "designed to be used or occupied".
- F. The word "building" includes the word "structure" and the word "structure" includes the word "building."
- G. The word "lot" includes the words "plot" or "parcel."

**Section 1.9 Application.**

- A. It is the intent of this Ordinance that all future development and redevelopment shall comply with the regulations of this Ordinance.
- B. Upon adoption of this Ordinance, specific zoning designations are assigned to each parcel of land situated within the corporate limits of the town. Zoning districts are assigned based upon minimum compliance with a particular district. No parcel, structure, business, or use will be designated a more intensive or permissive category than what it needs. The intent of this chapter is to zone correspondingly, and in a restrictive manner, not to create intensive zoning districts unnecessarily. All structures built on any lot hereafter shall comply with the regulations of this chapter. Any structure hereafter moved from one site to another site, including movement within a zoning lot, shall be considered to be a structure built hereafter. Any structure rebuilt or restored after damage or destruction by fire or other casualty shall

be considered to be a structure built hereafter, unless permitted to be rebuilt or restored. First floor elevation of all structures shall be in compliance with the current minimum height requirements of the Federal Flood Insurance program flood boundaries, adopted by the Town of Ravenel on April 1987 and as amended.

## **Section 1.10 Nonconformity.**

Any nonconformity that legally existed at the time of adoption of this Ordinance or that becomes nonconforming upon the adoption of any amendment to this Ordinance may continue to exist in accordance with the provisions of this Ordinance.

### **Section 1.10.1 Nonconformity General Rules.**

Nonconforming Lots, Structures and Uses. If certain lots, structures or uses do not comply with requirements for any one zoning designation, those lots, structures or uses will be authorized to remain in occupancy and use subject to the regulations and limits contained herein. These nonconformities are to be avoided or eliminated where now existing, whenever possible. General rules governing all nonconformities include:

- A. **Loss of Legal Nonconforming Status Due to Nonuse.** If a nonconforming structure or use is vacated, abandoned, or discontinued for a period of at least twelve (12) consecutive months or by adoption of a conforming use for any period of time, any future use of said land or structure shall be in conformity with the provisions of this Ordinance. This section does not apply to any lots, structures or uses established in violation of the Zoning Ordinance in effect at the time of the establishment, and such lots are illegal, nonconforming, and cannot be continued in accordance with this Section.
- B. **Change of Use.** A nonconforming lot, structure or use shall not be changed to another nonconforming use nor shall a nonconforming use be enlarged or expanded unless such expansion eliminates or reduces the nonconforming aspects of the situation.
- C. **Determination of Nonconformity status.** In all cases, the burden of establishing that a nonconformity lawfully exists shall be on the owner of the land on which the purported nonconformity is located.
- D. **Nonconformities Created by Condemnation.** When lot area or setbacks are reduced as a result of conveyance to a federal, state or local government for a public purpose and the remaining area is at least fifty percent (50%) of the applicable minimum standard, then the lot shall be considered a legally nonconforming lot or use subject to this Section.
- E. **Change of tenancy or ownership.** The status of nonconformity is not affected by a change in tenancy or ownership.
- F. **Change of Zoning Classification.** A nonconforming status shall no longer apply if a landowner requests, and is subsequently granted, a change of zoning classification according to the provisions of this Ordinance. The landowner must then comply with the requirements of the zoning district classification in which the property is now situated.
- G. **Mixed Use Parcels.** In cases of mixed land use on one parcel of land, the parcel may either be zoned to accommodate the most restrictive use, and all remaining

uses would be nonconforming in status, or the property owner may subdivide, in order to zone that portion of land which is more intensely used. If the property owner chooses the latter, the subdivision of that portion of land must comply with all zoning requirements set forth by the district regulations of this chapter, such as setbacks, minimum lot size, height, etc.

**Section 1.10.2 Nonconforming Lots.**

- A. Nonconforming Lots. A nonconforming lot is a tract of land, duly recorded that complied with lot requirements at the time of its creation but which no longer complies with minimum lot requirements of the zoning district in which it is now located.
- B. Combination of lots. If two or more lots of record or combination of lots of record and portions of contiguous lots of record are in single ownership, and if one or more of these lots do not comply with the lot area standards in this Ordinance, the lots involved shall be considered to be an individual lot for the purposes of this Ordinance, and no portion of these lots shall be used or sold which do not comply with the lot area standards of this Ordinance, nor shall any division of the lots be made that leaves any remaining lot that fails to comply with the lot area standards. If the owner of two or more contiguous nonconforming lots elects to build on or sell off these lots, the owner must combine them to comply with minimal dimensional requirements of this ordinance.

**Section 1.10.3 Nonconforming Structures.**

- A. Continuance of nonconforming structures. Nonconforming structures or buildings legally constructed in compliance with this Ordinance at the time of construction but which no longer conform to the provisions of this ordinance and the underlying district in which it is located may be continued only as hereinafter specified.
  - 1. Repairs, alterations and maintenance. Ordinary nonstructural repairs or maintenance made be made to a nonconforming structure as required to keep it in safe, sound condition, provided that the repair or maintenance does not extend, expand, intensify, or enlarge the nonconforming use or structure.
  - 2. Loss of legal nonconforming status, damage or destruction. In the event a nonconforming structure is damaged or destroyed by any means to the extent that fifty percent (50%) of the structure's market value prior to such destruction, such structure shall lose its legal nonconforming status and shall not be restored unless in conformance with the standards of this Ordinance. A nonconforming structure that is damaged or destroyed by any means to an extent of less than fifty percent (50%) of the structure's market value prior to such damage or destruction may be restored to its pre-damaged state provided reconstruction is initiated within twelve (12) months and provided the reconstruction complies with all other Town ordinances, as well as state and federal laws.
  - 4. A nonconforming structure may only contain a conforming use. Nonconforming structures housing nonconforming uses may only continue in accordance with the standards in Section 1.10.4, Nonconforming Uses.
  - 5. Demolition and Rebuilding. A nonconforming structure shall not be re-

established as a nonconforming structure after demolition, damage, or destruction, except pursuant to Section 1.10.3(2) above.

6. Relocation. A nonconforming structure shall not be moved, in whole or in part, to another location on or off the parcel of land on which it is located, unless upon relocation it shall conform to the standards and requirements of this Zoning Ordinance.

#### **Section 1.10.4 Nonconforming Uses.**

- A. Nonconforming Uses. A nonconforming use is a use that was legally established but which is no longer allowed by the use regulations of the district in which it is now located.
- B. Continuation of Nonconforming Uses. Uses legally established but no longer allowed by the use regulations of the zoning district in which it is located may be continued but not enlarged or changed to any other nonconforming use. The one exception to this shall be authorization by the Board of Zoning Appeals upon a finding that the new use will be less detrimental to adjacent property and the general area than the existing use.
- C. Abandonment. If a nonconforming use is replaced with a conforming use, it immediately loses its legal nonconforming status. If a nonconforming use is discontinued for any reason for a period of more than twelve (12) consecutive months, it loses its legal nonconforming status.
- D. Accessory Uses. Once a nonconforming principal use is discontinued, all associated accessory uses shall cease operations within thirty (30) days.
- E. Loss of Nonconforming Use. A legally nonconforming use will lose its legal status pursuant to the destruction, substantial improvement, demolition and relocation rules set forth above in Section 1.10.3, Nonconforming Structures.

#### **Section 1.11 Amendments.**

For the purpose of maintaining sound, stable and desirable growth within the town limits, this ordinance text or the official map, as adopted, may be amended. The purposes for such amendment could include: to correct a manifest error in the ordinance, because of changed or changing conditions in an area or in the town generally, to rezone an area, to extend the boundary of an existing zoning district or to change the regulations and restrictions thereof as reasonably necessary to the promotion of the public health, safety or general welfare.

- A. An Amendment to this Ordinance may be initiated by:
  - Town Council on its own motion; or
  - The Planning Commission, an appointed board charged with the administration of these regulations as set forth herein; or
  - Any individual or organization having an interest in the property to be rezoned.
- B. Amendment Application Procedures:
  1. A request for a change in zoning or an ordinance text amendment shall be made on a form supplied by the Planning and Zoning Administrator at Town Hall.

2. All application requests to amend this ordinance shall be accompanied with a filing fee as determined by Town Council and said application shall contain:
  - a. The applicant's name, address and information of every person having a legal or equitable interest in the land covered by the request.
  - b. The property owner's name, address, and contact information and the relationship of the applicant to the property owner.
  - c. The nature and effect of the proposed amendment.
  - d. For a rezoning request, a valid DHEC permit or statement of availability of public sewer.
  - e. A legal description of the land and a plat map indicating the land affected by the petition, the present zoning classification of the land and of all abutting zoning districts, all public and private rights-of-way and easements bounding and intersecting the land under consideration, and the names and addresses of the owners of all adjacent lands.
  - f. In the case of alleged errors in the ordinance text, the location of the error in the code, a detailed explanation making the case that this is an error, and a proposal to correct the ordinance is required.
  - g. The application must be signed by the applicant and the owner.

Upon receipt of the application and required information, the Planning and Zoning Administrator shall determine if the application request is in harmony with the intent of the Comprehensive Plan and/or if the action will avoid any significant adverse impacts to travel and traffic patterns in nearby areas.

3. Upon a determination that a complete request has been submitted, the Planning and Zoning Administrator shall schedule and advertise a Public Hearing before the Planning and Zoning Commission as required in South Carolina Code 6-29-760 with specifics to include:
  - a. Notice of the Public Hearing shall be advertised in a newspaper of general circulation at least fifteen (15) days prior to the hearing; and,
  - b. For the adoption of a Comprehensive Plan in its entirety or any element thereof, the Notice of the Public Hearing shall be advertised in a newspaper of general circulation at least thirty (30) days prior to the hearing); and,
  - c. For a rezoning request, the property will be posted with a sign indicating the Public Hearing date, time, and location; and,
  - d. For a rezoning request, the Notice of the Public Hearing will be mailed by general mail to all property owners of record within three hundred (300) feet of any portion of the property proposed to be rezoned. The Town of Ravenel is not responsible for the accuracy of County property records used for this mailing; and,
  - e. The Public Hearing notice will be provided to parties of interest including the applicant, property owner(s), and any individual or group that has submitted a written statement of interest.

Minor defects in a Public Hearing notice shall not invalidate the notice or proceedings pursuant to the notice if an attempt has been made to comply with applicable notice requirements.

4. The Planning and Zoning Administrator shall forward the application, along with any report, to the Planning and Zoning Commission for review and recommendation.

5. At a Regularly Planning and Zoning Commission meeting following the Public Hearing, the Commission shall act upon the petition by:
  - Recommend approval or denial to the Town Council of the request on the determination of the request meeting current and future land use patterns; or,
  - Cause further and complete study of the request; and,
  - After such additional study and consideration, recommending to Town Council, such action as the Commission deems proper.
6. The Planning and Zoning Commission shall have sixty (60) days following the Public Hearing to submit any such recommendation regarding the request to the Town Council. If the Commission fails to submit a recommendation within sixty (60) days, it is deemed to have met with approval and the Town Council shall proceed.
7. Those requests which are recommended for approval by the Planning and Zoning Commission receive first reading of the required ordinance at the next regularly scheduled Town Council meeting.
8. Those requests which are recommended for denial by the Planning and Zoning Commission will be placed on the agenda of the next regularly scheduled Town Council meeting for consideration.
9. The Town Council may advance, adopt, or reject any ordinance relating to the request that has been introduced or is under consideration.
10. Those applications for which an ordinance is introduced and approved must then receive a second (final) reading at a Town Council meeting at least six (6) days apart from the first reading of the ordinance. The zoning change is effective following the second reading as adopted and applicants will be notified when the request is approved.
11. Those requests which the Town Council rejects are notified of Council's action by mail. Re-application shall be subject to a one-year waiting period.

Any person with a substantial interest in a decision of the Planning Commission, Town Council, or Town Administrator or any board or bureau of the Town may appeal a final decision to the Circuit Court of Charleston County in a timeframe as allowed by law.

### **Section 1.12 Variances.**

A Variance to the dimensional requirements of the zoning ordinance may be granted by the Board of Zoning Appeals if the Board of Zoning Appeals agrees that strict application of the requirements would result in an unnecessary hardship. A variance allows the Board of Zoning Appeals to modify an otherwise legitimate zoning restriction when, due to unusual conditions, the restriction may be more burdensome than was intended. The variance must not impair the public purpose.

- A. A variance request is initiated by the owner, or legal representative of the owner, of the property. The owner is attempting to obtain a variance on the grounds of unnecessary hardship and must demonstrate adequate evidence that a particular property suffers a singular disadvantage over nearby properties due to the zoning regulation. Additionally, an owner is not entitled to relief from a self-created or self-inflicted hardship. The Zoning

Board of Appeals must apply the standards found in this ordinance based on the South Carolina Comprehensive Act of 1994 to grant or deny a variance request.

B. Variance Application Procedures:

1. A request for a variance shall be made on an application form supplied by the Planning and Zoning Administrator at Town Hall.
2. Requests for Board of Zoning Appeals hearings other than variances, such as a Special Exception Request or an appeal of a decision of the Planning and Zoning Administrator, may be included on a similar or different form to be submitted to Town Hall.
3. All application requests for a variance from the requirements in the zoning ordinance shall be accompanied with a filing fee as determined by Town Council and said application shall contain:
  - a. The applicant's name, address and information of every person having a legal or equitable interest in the land covered by the request.
  - b. The property owner's name, address, and contact information and the relationship of the applicant to the property owner.
  - c. The section of the Zoning Code from which the applicant is requesting a variance.
  - d. A specific description of the variance amount (i.e. in distance, square feet, height, etc.).
  - e. A description of the hardship faced by the property owner without the variance.
  - f. The nature and effect of the proposed variance.
  - g. A legal description of the land and a plat map indicating the land affected by the variance request, buildings affected by the request, the present zoning classification of the land and of all abutting zoning districts, all public and private rights-of-way and easements bounding and intersecting the land under consideration, and the names and addresses of the owners of all adjacent lands.
  - h. The application must be signed by the applicant and the owner.
4. Upon receipt of the variance request and required information, the Planning and Zoning Administrator shall determine if the request contains adequate information for the Board of Zoning Appeals to make a determination regarding the indicated approval criteria.
5. Upon a determination that a complete request has been submitted, the Planning and Zoning Administrator shall schedule and advertise a Public Hearing before the Zoning Board of Appeals as required in South Carolina Code 6-29-800 with specifics to include:
  - a. Notice of the Public Hearing shall be advertised in a newspaper of general circulation at least fifteen (15) days prior to the hearing; and,
  - b. The property will be posted with a sign indicating the Public Hearing date, time, and location; and,
  - c. The Notice of the Public Hearing will be mailed by general mail to all property owners of record within three hundred (300) feet of any portion of the property for which a variance is proposed. The Town of Ravenel is not responsible for the accuracy of County property records used for

- this mailing; and,
- d. The Public Hearing notice will be provided to parties of interest including the applicant, property owner(s), and any individual or group that has submitted a written statement of interest.

Minor defects in a Public Hearing notice shall not invalidate the notice or proceedings pursuant to the notice if an attempt has been made to comply with applicable notice requirements.

6. The Planning and Zoning Administrator shall forward the variance application, along with any report, to the Board of Zoning Appeals.
7. The Board of Zoning Appeals will hold at least one public hearing on the requested zoning variance and, based on the approval criteria and factors not to be considered as found in this Section in items (C) and (D) and the public testimony presented at the public hearing, act to:
  - Remand the request back to the Planning and Zoning Administrator to obtain additional information to be presented at a new Public Hearing to be held within sixty (60) days; or,
  - Approve the variance request; or,
  - Approve the variance request, with conditions that may affect location, character, or other features to protect established property values in the surrounding area or promote public health, safety, or general welfare; or,
  - Deny the variance request.

A zoning variance request may only be granted if the Board of Zoning Appeals agrees that the strict application and enforcement of the zoning ordinance will result in unnecessary hardship to the applicant and that, by granting the variance request, the spirit of the zoning ordinance will be observed and the welfare and safety of the public will not be diminished.

8. The decision of the Board of Zoning Appeals is to be accompanied by a specific Finding of Fact clearly stating the reason or reasons for the decision, noting the Approval Criteria. This Finding of Fact will be delivered to the applicant and parties of interest within ten (10) days after the decision is filed at Town Hall.

Any person with a substantial interest in a decision of the Board of Zoning Appeals may appeal the decision to the Circuit Court of Charleston County in a timeframe as allowed by law.

- C. Approval Criteria. When deciding a request for a zoning variance, the Board of Zoning Appeals shall consider the request documentation, other research, and the public testimony presented at the Public Hearing as it may relate to evidence or proof for the applicability of the following specific criteria:

1. There are extraordinary and exceptional conditions pertaining to the subject property, such as size, shape, topography, or other conditions that make it difficult or impossible to make an economically feasible use of the property;
2. The same extraordinary and exceptional conditions do not generally apply to other properties in the vicinity;
3. Because of the extraordinary and exceptional conditions, the application of the zoning ordinance to the property will effectively prohibit or unreasonably restrict



the use of the property;

4. The hardship need for the variance is not a result of the applicant's, or previous owner's, own actions; and,
5. The authorization of the variance will not be of substantial detriment to adjacent property or to the public good, and that the character of the district will not be harmed by granting the variance.

D. Factors NOT to be considered.

1. The Board of Zoning Appeals is not to consider the fact that a property may be more profitably utilized as grounds for granting a zoning variance, nor as evidence of a hardship.

E. Effects of Variance. A zoning variance request may be granted to any dimensional, design, or performance standard set forth in this ordinance, provided that the Approval Criteria considered in Section 1.12 (C) are met and that such variance does not:

1. Permit a use, activity, business, or operation that is not otherwise allowed by the Use Regulations of the underlying zoning district; or,
2. Change the zoning district boundaries as shown on the Official Zoning Map; or,
3. Allow the physical extension of a non-conforming use or structure; or,
4. Increase the density of a residential use above that permitted by the underlying district.

F. Lapse of Approval. An approved zoning variance shall lapse and be of no further effect twelve (12) months after the date of approval unless a complete application for a Zoning Permit is submitted and approved in accordance with this ordinance.

### **Section 1.13 Conditional Uses.**

Certain uses are allowed as Conditional Uses in various zoning districts as indicated in the Zoning Ordinance Use Matrix found in Appendix B and are subject to the specific conditions for each use as indicated in Appendix B and found in Chapter 3.

Unless indicated otherwise in Chapter 3 for a specific Conditional Use, the Planning and Zoning Administrator will review the Conditional Use request, compare the plans to the indicated criteria, and make the determination to grant the use by issuing a Conditional Use Zoning Permit.

A Conditional Use Zoning Permit is granted for the activity requested and does not stay with the property after a use has ceased. After a period of twelve (12) consecutive months of a lapse in use, a new Conditional Use Zoning Permit must be requested for the same property and use and the specific plans for the renewed use must again be reviewed and compared to the conditional criteria before approval.

An approved Conditional Use Zoning Permit shall lapse and be of no further effect twenty-four (24) months after the date of issuance unless the use has been established on the subject property.

- A. A Conditional Use request is initiated by an individual having an interest in the property

such as the owner, agent, or tenant or purchaser; either current or prospective. Both the applicant and the owner of the property are required to sign the request.

B. Application Procedures:

1. A request for a Conditional Use shall be made on an application form supplied by the Planning and Zoning Administrator at Town Hall.
2. All application requests for a Conditional Use shall be accompanied with a filing fee as determined by Town Council and said application shall contain:
  - a. The applicant's name, address and information of every person having a legal or equitable interest in the land covered by the request.
  - b. The property owner's name, address, and contact information and the relationship of the applicant to the property owner.
  - c. A full description of the proposed use, including NAIS or SIC codes and equipment to be used.
  - d. A legal description of the land and a plat map indicating the land and buildings affected by the use, total acreage, acreage of highland, all easements, rights-of-way, zoning, and setbacks and buffer yards.
  - e. A description of how the use meets the Conditional Use criteria as noted for the specific use.
  - f. A statement that the property and buildings where the Conditional Use is to operate will meet all other requirements of the Town Code and Zoning Ordinance, including, but not limited to setbacks, screening, buffer yards and landscaping, signage and other requirements.
  - g. Evidence that the proposed use will not materially endanger the public health, safety, or general welfare.
  - h. Evidence that the proposed use will meet all air and water quality standards and provide for adequate emergency response and vehicular parking and access.
  - i. Evidence that the use will not unduly impact adjacent residential areas.
  - j. The application must be signed by both the applicant and the owner of record of the property.
3. Upon receipt of the Conditional Use application and required information, the Planning and Zoning Administrator shall determine if the request contains adequate information for review.
4. Unless indicated otherwise in Chapter 3 for a specific Conditional Use, upon a determination that a complete request has been submitted, the Planning and Zoning Administrator shall issue a Zoning Permit for an approved Conditional Use or a written notice of denial of the Conditional Use request within thirty (30) days of submittal of a complete application.

An appeal of a denied Conditional Use decision made by the Planning and Zoning Administrator may be made as found in Section 1.15. Such appeal will be heard at a Public Hearing before the Board of Zoning Appeals as indicated in Section 1.12 B. 5.

Any person with a substantial interest in a decision of the Board of Zoning Appeals may appeal the decision to the Circuit Court of Charleston County in a timeframe as allowed by law.

## **Section 1.14 Special Exception Uses.**

Certain uses are allowed as Special Exception Uses in various zoning districts as indicated in the Zoning Ordinance Use Matrix found in Appendix B and are subject to the specific conditions for each use as found in Chapter 3.

The Board of Zoning Appeals has the exclusive power to permit uses that are indicated as Special Exception Uses in the Zoning Ordinance Use Matrix found in Appendix B and subject to the standards and conditions as found in Chapter 3. The Board of Zoning Appeals must follow the indicated regulations in Chapter 3 when hearing a Special Exception Use case.

A Special Exception Use is granted for the activity requested and does not stay with the property after a use has ceased. After a period of twelve (12) consecutive months of a lapse in use, a new Special Exception Use must be requested for the same property and use and the specific plans for the renewed use must again be reviewed and compared to the conditional criteria before approval.

- A. A Special Exception Use request is initiated by an individual having an interest in the property such as the owner, agent, or tenant or purchaser; either current or prospective. Both the applicant and the owner of the property are required to sign the request.
- B. Application Procedures:
  1. A request for a Special Exception Use shall be made on an application form supplied by the Planning and Zoning Administrator at Town Hall.
  2. All application requests for a Special Exception Use shall be accompanied with a filing fee as determined by Town Council and said application shall contain:
    - a. The applicant's name, address and information of every person having a legal or equitable interest in the land covered by the request.
    - b. The property owner's name, address, and contact information and the relationship of the applicant to the property owner.
    - c. A full description of the proposed use, including NAIS or SIC codes and equipment to be used.
    - d. A legal description of the land and a plat map indicating the land and buildings affected by the use, total acreage, acreage of highland, all easements, rights-of-way, zoning, and setbacks and buffer yards.
    - e. A description of how the use meets the Special Exception Use criteria as noted for the specific use.
    - f. A statement that the property and buildings where the Special Exception Use is to operate will meet all other requirements of the Town Code and Zoning Ordinance, including, but not limited to setbacks, screening, buffer yards and landscaping, signage and other requirements.
    - g. Evidence that the proposed use will not materially endanger the public health, safety, or general welfare.
    - h. Evidence that the proposed use will meet all air and water quality standards and provide for adequate emergency response and vehicular parking and access.
    - i. Evidence that the use will not unduly impact adjacent residential areas.
    - j. The application must be signed by both the applicant and the owner of record of the property.

3. Upon receipt of the Special Exception Use request and required information, the Planning and Zoning Administrator shall determine if the request contains adequate information for the Board of Zoning Appeals to make a determination regarding the approval or denial of the use.
4. Upon a determination that a complete request has been submitted, the Planning and Zoning Administrator shall schedule and advertise a Public Hearing before the Zoning Board of Appeals as required in South Carolina Code 6-29-800 with specifics to include:
  - a. Notice of the Public Hearing shall be advertised in a newspaper of general circulation at least fifteen (15) days prior to the hearing; and,
  - b. The property will be posted with a sign indicating the Public Hearing date, time, and location; and,
  - c. The Notice of the Public Hearing will be mailed by general mail to all property owners of record within three hundred (300) feet of any portion of the property for which a Special Exception is proposed. The Town of Ravenel is not responsible for the accuracy of County property records used for this mailing; and,
  - d. The Public Hearing notice will be provided to parties of interest including the applicant, property owner(s), and any individual or group that has submitted a written statement of interest.

Minor defects in a Public Hearing notice shall not invalidate the notice or proceedings pursuant to the notice if an attempt has been made to comply with applicable notice requirements.

5. The Planning and Zoning Administrator shall forward the Special Exception Use application, along with any report, to the Board of Zoning Appeals.
6. The Board of Zoning Appeals will hold at least one public hearing on the requested Special Exception Use and, based on the conditions specific for the use and the public testimony presented at the public hearing, act to:
  - Approve the Special Exception Use; or,
  - Deny the Special Exception Use.

A Special Exception Use request may only be granted if the Board of Zoning Appeals agrees that the conditions specified for the use will be met and that the welfare and safety of the public will not be diminished.

7. The decision of the Board of Zoning Appeals is to be accompanied by a specific Finding of Fact clearly stating the reason or reasons for the decision, noting the conditions required for the Special Use. This Finding of Fact will be delivered to the applicant and parties of interest within ten (10) days after the decision is made and filed at Town Hall.

Any person with a substantial interest in a decision of the Board of Zoning Appeals may appeal the decision to the Circuit Court of Charleston County in a timeframe as allowed by law.

- C. Lapse of Approval. An approved Special Exception Use shall lapse and be of no further effect twelve (12) months after the date of approval unless the use has been established on the subject property.

**Section 1.15 Appeals to Decision of the Planning and Zoning Administrator.**

Any decision of the Planning and Zoning Administrator, and/or their designated representative regarding the interpretation or errant application of any element of the Zoning Ordinance, including, but not limited to, determination of non-conforming status, classification of uses, regulation applicability, measurements, and approvals or denials of permits, can be appealed in writing within fourteen (14) days of the letter of record of the decision. Such appeal will be heard at a Public Hearing before the Board of Zoning Appeals as indicated in Section 1.12 B. 5.

The submittal of an appeal to the Board of Zoning Appeals must include the specific grounds for the appeal and the sought modification of the decision.

The Board of Zoning Appeals will determine the nature of the remedy, if any, regarding the appeal and determine the action, if any, required by the Planning and Zoning Administrator.

Any person with a substantial interest in a decision of the Board of Zoning Appeals may appeal the decision to the Circuit Court of Charleston County in a timeframe as allowed by law.

## **CHAPTER 2. ZONING DISTRICTS AND ZONING MAP**

### **Section 2.1 Establishment of Districts.**

In order to accomplish the purposes set forth by growth control regulations, the municipality is divided into zoning classifications, known as districts described hereafter. The districts and their boundaries shall be as shown on the official zoning map (county tax assessment maps), identified by the signature of the Mayor, attested by the Zoning Administrator and bearing the seal of the town. The official zoning map, which shall be located in town hall, shall be the final authority as to the current zoning status of land, buildings, and other structures in the town. (Ord., passed 8-17-87, amended 01-20-02)

### **Section 2.2 Official Zoning Map.**

For the purpose of regulating and restricting the location of uses of land, the Town is hereby divided into zones or districts, as more fully described in Section 2.6 of this Ordinance and as shown on a map or maps entitled Official Zoning Map, which, together with all explanatory matter thereon, is hereby adopted by reference and declared to be a part of this Ordinance. The Official Zoning Map shall be identified by the signature of the Mayor, attested by the Zoning Administrator and bearing the seal of the Town under the following words: AThis is to certify that this is the Official Zoning Map of the Town of Ravenel, S. C., adopted on May 26, 2020.

- A. If, in accordance with the provisions of this Chapter, changes are made in district boundaries or other matter portrayed on the Official Zoning Map, such changes shall be made on the Official Zoning Map promptly after the amendment has been approved by Town Council, with an entry on the Official Map as follows: Map Amended by Action of Action of Council on \_\_\_\_\_ for the following purpose \_\_\_\_\_, which entry shall be signed by the Mayor and shall be attested by the Zoning Administrator. No such change shall become effective until such entry has been made on the Official Zoning Map, and signed and attested.
- B. The Official Zoning Map shall remain in the custody of Town Hall and shall be the final authority as to the current zoning status of lands, buildings or other structures in the Town regardless of the existence of purported copies of the map. In the event that the Official Zoning Map becomes damaged, destroyed, lost, difficult to interpret, the Town Council may by resolution adopt a new Official Zoning Map which shall supersede the prior Official Zoning Map. The new Official Zoning Map may correct drafting and other errors or omissions, but no such correction shall have the effect of amending the original Official Zoning Map as amended. No building or parcel shall be erected or used except in conformity with the regulations prescribed in this Ordinance for the zoning district in which it is located as shown on the Official Zoning Map.

**Section 2.3 Removed**

**Section 2.4 Removed**

### **Section 2.5 Rules of Determining Zoning**

Where uncertainty exists with respect to the boundary of any zoning district shown on the zoning map, the following criteria shall apply:

- A. The district boundaries shall follow lot lines; center lines of streets, highways, alleys, or railroads; center lines of rivers, streams, or other bodies of water. District locations shall be determined by the use of the scale shown on the zoning map.

- B. Where any district boundary is indicated on the zoning map as following approximately the town boundary line, that boundary line shall be construed to be the district boundary.
- C. With the exception of lands within the ownership of national forests, swampland, wildlife refuge, and any other publicly designated conservation area, the Coastal Council critical line shall be the district boundary between marsh and other low lands abutting, surrounding, or surrounded by all waterways including ocean, rivers, lakes, canals, tidal streams or creeks.  
(Ord., passed 8-17-87, amended 01-20-02)

**Section 2.6 Zoning Districts**

In order to provide for the development of specific uses and to carry out the goals of the Comprehensive Land Use Plan, the following use districts are hereby established:

<b>DISTRICT NAME</b>	
Agricultural Residential . . . . .	AR
Residential One. . . . .	R-1
Residential One Restrictive. . . . .	R-1R
Residential Two. . . . .	R-2
Residential Two Restrictive. . . . .	R-2R
Residential Three. . . . .	R-3
Residential Three Restrictive. . . . .	R-3R
Residential 4 . . . . .	R-4
Mobile Home Planned Development. . . . .	M-PD
Neighborhood Commercial. . . . .	NC
General Business. . . . .	GB
Light Industrial. . . . .	LI
General Industrial. . . . .	GI
Planned Development . . . . .	PD
Historic Conservation Overlay District . . . . .	HC
Commercial Corridor Overlay District. . . . .	CCO

**Section 2.6.1 Agricultural Residential District (AR)**

The Agricultural Residential District is primarily designed to accommodate agriculturally-used properties and single-family residences which are situated on large parcels of land on, or in close proximity to, properties which are farmed or used for other agricultural purposes. This district is also intended to establish and protect large, undeveloped tracts and low-density uses on large sites for forestry management and to encourage preservation of natural resources.

- A. Permitted uses: See Appendix B, Table of Permitted Uses.
- B. Lot, yard, height, and coverage requirements.

1.	<u>Minimum Lot Requirements</u>	<u>Measurement</u>
	Lot area per dwelling unit	43,560 square feet - one acre
	Lot width	150 feet (measured at building line)
2.	<u>Minimum Yard Requirements</u>	
	Front yard	30 feet
	Side yard	10 feet
	Rear yard	30 feet
3.	<u>Maximum Height Permitted</u>	
	Vertical Measure	35 feet/2.5 stories



- 4. Building coverage: No more than 35% of the lot may be covered by principal residence and accessory buildings.
- C. Development in the AR district shall comply with all other applicable regulations of this ordinance.

**Section 2.6.2 Residential One District (R-1)**

The purpose of the R-1 district is to provide for quiet, livable low-density residential neighborhoods, to encourage the formation and continuation of a stable, residential environment on lots having an area of one acre (43,560) or more, to discourage unwarranted and blighting encroachments by prohibiting commercial and industrial uses and to prohibit any other use which would subsequently interfere with the development or continuation of a single-family usage.

The intent of the district is to discourage any use which would generate traffic on minor streets other than that required to serve residences on those streets.

- A. Permitted uses: See Appendix B. Table of Permitted Uses.
- B. Lot, yard, height and coverage requirements:
  - 1. 

<u>Minimum Lot Requirements</u>	<u>Measurement</u>
Lot area per dwelling unit	43,560 square feetC one acre
Lot width-measured at building line	150 feet
  - 2. 

<u>Minimum Yard Requirements</u>	<u>Measurement</u>
Front yard	30 feet
Side yard (width on one side)	10 feet
Rear yard	30 feet
  - 3. 

<u>Maximum Height Permitted</u>	<u>Measurement</u>
Vertical measure	35 feet (2.5 stories)
  - 4. Building coverage: No more than 35% of the lot may be covered by principal residence and accessory buildings.
- C. Development in the R-1 district shall comply with all other applicable regulations of this ordinance.

**Section 2.6.3 Residential One Restrictive District (R-1R)**

The intent of the R-1R district is to establish and preserve low density residential neighborhoods and to restrict the residential uses to constructed-on-site homes. The R-1R district provides for the creation of a stable, healthy, residential area on lots of one acre (43,560 square feet) or more and to discourage unwarranted and blighted encroachments of commercial, industrial or any other uses which would interfere with the development of single-family usage.

- A. Permitted uses. See Appendix B. Table of Permitted Uses.
- B. Lot, yard, height and coverage requirements: See requirements for Section 2.6.2.
- C. Development in the R-1R district shall comply with all other applicable regulations of this ordinance.

**Section 2.6.4 Residential Two District (R-2)**

The purpose of the Residential Two District (R-2) is to provide for quiet, livable, low-density residential neighborhoods, and to encourage the formation and continuance of a stable, residential environment on lots having an area of 30,000 square feet or more and to discourage unwarranted and blighting encroachments by prohibiting commercial and industrial uses and disallowing any other use which would substantially interfere with the development or continuation of single-family usage.

- A. Permitted uses: See Appendix B. Table of Permitted Uses.
- B. Lot, yard, height and coverage requirements:
  - 1. 

<u>Minimum Lot Requirements</u>	<u>Measurement</u>
Lot area per dwelling unit	30,000 square feet
Lot width (measured at building line)	70 feet
  - 2. 

<u>Minimum Yard Requirements</u>	<u>Measurement</u>
Front yard	30 feet
Side yard (width on one side)	10 feet
Rear yard	30 feet
  - 3. 

<u>Maximum Height Permitted</u>	<u>Measurement</u>
Vertical measure	35 feet (2.5 stories)
  - 4. Building coverage: No more than 40% of the lot may be covered by principal residence and accessory buildings.
- C. Development in the R-2 district shall comply with all other applicable regulations of this ordinance.

**Section 2.6.5 Residential Two Restricted District (R-2R)**

The intent of the R-2R district is to establish and preserve lower density residential neighborhoods and to restrict the residential uses to constructed-on-site homes. The R-2R district provides for the creation of a stable residential area with lots of 30,000 square feet or more and to discourage unwarranted and blighted encroachments or commercial, industrial or any other uses which would interfere with the development of single-family usage.

- A. Permitted uses. See Appendix B. Table of Permitted Uses.
- B. Lot, yard, height, and coverage requirements: See requirements for Section 2.6.4
- C. Development in the R-2R district shall comply with all other applicable regulations of this ordinance.

**Section 2.6.6 Residential Three District (R-3)**

The purpose of the R-3 Residential District is to provide medium density residential development in quiet, livable neighborhoods and to encourage the formation and continuation of a stable, residential environment for medium-density single-family and two-family dwellings situated on lots having an area of 12,500 square feet or more, to discourage unwarranted and blighting encroachments by prohibiting the commercial and industrial use of land and to disallow any other use which would subsequently interfere with the development or continuation of single-family and two-family dwelling usage and to discourage any use which would generate traffic on minor streets other than that required to serve residents on those

streets.

A. Permitted uses: See Appendix B. Table of Permitted Uses.

B. Lot, yard, height and coverage requirements:

- |    |   |                                     |                   |
|----|---|-------------------------------------|-------------------|
| 1. | <u>Minimum Lot Requirements</u>   | <u>Measurement</u>                  |                   |
|    | Lot area per dwelling unit  | 12,500 square feet per unit         |                   |
|    | Lot width   | 70 feet (measured at building line) |                   |
| 2. | <u>Minimum Yard Requirements</u>  |                                     |                   |
|    | Front yard  | 25 feet                             |                   |
|    | Side yard   | 10 feet                             |                   |
|    | Rear yard   | 25 feet                             |                   |
| 3. | <u>Maximum Height</u>   | <u>Single-Family</u>                | <u>Duplex</u>     |
|    | Vertical measure  | 35' (2.5 stories)                   | 35' (2.5 stories) |
| 4. | Building coverage: No more than 50% of the lot may be covered by the principal residence and accessory buildings. |                                     |                   |

C. Development in the R-3 district shall comply with all other applicable regulations of this ordinance.

#### **Section 2.6.7 Residential Three Restricted District (R-3R)**

The intent of the R-3R Residential district is to establish medium density residential neighborhoods and to restrict the residential uses to constructed-on-site homes. The R-3R district provides for the creation of stable, healthy, residential areas of lots of 12,500 square feet or larger and to discourage unwarranted and blighted encroachments of commercial, industrial or any other uses which would interfere with the development of single-family and two-family usage.

A. Permitted uses. See Appendix B. Table of Permitted Uses

B. Lot, yard, height and coverage requirements. See requirements in Section 2.6.6.

C. Development in the R-3R district shall comply with all other applicable regulations of this ordinance.

#### **Section 2.6.8 RESIDENTIAL FOUR DISTRICT (R-4)**

The purpose of the Residential Four District (R-4) is to provide for quiet, livable, low-density Residential neighborhoods and to encourage the formation of a stable, healthy, residential environment on

Lots having an area of 22,000 square feet or more and to discourage unwarranted and blighted encroachments. This district prohibits commercial and industrial uses and any other use which would substantially interfere with the development and continuation of single family residential uses.

A. Permitted uses: See Appendix B. Table of Permitted Uses

B. Lot, yard, height and coverage requirements

- |    |                                 |                    |  |
|----|---------------------------------|--------------------|--|
| 1. | <u>Minimum Lot Requirements</u> | <u>Measurement</u> |  |
|    | Lot area per dwelling unit      | 22,000 square feet |  |

- |    |   |                       |
|----|---|-----------------------|
|    | Lot width (measured at building line)   | 80 feet               |
| 2. | <u>Minimum Yard Requirements</u>  | <u>Measurement</u>    |
|    | Front yard  | 30 feet               |
|    | Side yard (width on one side)   | 10 feet               |
|    | Rear yard   | 25 feet               |
| 3. | <u>Maximum Height Permitted</u>   | <u>Measurement</u>    |
|    | Vertical measure  | 35 feet (2.5 stories) |
| 4. | Building coverage: No more than 40% of the lot may be covered by principal residence and accessory buildings. |                       |
- C. Development in the R-4 district shall comply with all other applicable regulations of this ordinance.

**Section 2.6.9 Mobile Home Planned Development (MH-PD)**

The purpose of the MH-PD district is to promote desirable living environments for a grouping of mobile homes with mobile home spaces for rental or leasing as well as mobile homes placed on single lots for rental or sale and to provide for accessory uses needed to serve the residents of the planned development. These developments shall comply with all applicable state and local regulations and are subject to the following standards:

- A. Town Council Approval Criteria: Conditional Uses for MH-PD district:
1. Uses allowed in MH-PD district: Mobile home, modular home or trailer constructed for permanent living.
  2. Accessory structure and use customarily incidental to mobile homes, and which services only the residents of the mobile home park, specifically including self-service laundry, restrooms, park, leasing or managerial office, and similar service facility.
  3. Signage as permitted under Sign regulations for Residential Subdivisions, which allows for one free-standing sign per entrance not to exceed six feet in height and twenty-four (24) square feet in sign face, identifying the name of the development.
  4. Site design and development criteria: All mobile home developments shall be planned, designed and developed to meet conditions and factors conducive to the creation and maintenance of a healthful and safe residential environment. Compliance with the conditional use authorization regulating the following criteria shall be observed:
    - a. Tract size and density: Mobile home parks shall have a minimum tract size of five acres. The overall or average density of the mobile home development district shall not exceed three mobile homes or non-accessory structures per acre and shall be permitted only with Charleston County Department of Health approval.
    - b. Grading: Mobile home sites shall be graded to create desirable and attractive site features, provide for adequate drainage of each lot

and the entire park, and to provide safe and convenient access, circulation, recreation and ease of maintenance.

5. Foundation (mobile home stand).
  - a. All mobile homes shall be situated upon a foundation (mobile home stand) of material which is of sufficient strength and durability to retain the size and weight of structure that will be placed upon it, in a stable and safe condition. The stand should be adequately crowned or graded to permit drainage. The foundation shall include tie-down fixtures and should not heave, shift or settle unevenly as a result of frost action, poor drainage, vibration or other forces. Mobile home stands shall not exceed a longitudinal grade of 5%.
  - b. In addition, the stand shall be situated and designed in elevation, distance and angle in relation to the access street and lot access-way, so that placement, retention and removal of the mobile home shall be practicable and without hindrance or lack of safety. The size of the stand shall be equal in length and width to the size of the mobile home located upon it.
  - c. Manufactured skirting or other material suitable for exterior use is required within six (6) months of placement.
6. Setbacks
  - a. Front setbacks and distances between mobile homes: All mobile homes shall be a minimum of 50 feet from any road or highway right-of-way, property boundaries or other mobile home in the mobile home district. This does not include the distance of open space between a mobile home and the accessory structures which serve that mobile home.
  - b. There shall also be a minimum distance of 20 feet between any mobile home and any fence, wall or planting serving as a wall or buffer for the site and any common parking, walkway, recreation area or other common space.
7. Open space and recreation. Mobile home parks shall have a minimum of 10% of the total site area reserved and improved as common recreation space and shall be easily accessible by all lots.
8. Parking. There shall be two parking spaces required for each mobile home unit.
9. Buffer yards, as prescribed in Section 4.2 shall be provided by the property owner along the periphery of a mobile home park.
10. A screened and maintained refuse area shall be located convenient to all trailer sites.
11. Streets and infrastructure. All mobile home districts shall provide streets and utilities conforming to the following requirements:
  - a. Streets and access. All mobile home districts having three or more mobile home lots shall have dedicated and paved public rights-of-

way as per Charleston County Road Standards, unless otherwise granted by Town Council. If concrete is used, it should be a minimum of five inches thick and have expansion joints where it meets driveways, walkways or curbs.

- b. All mobile home parks shall have direct access to a public road, maintained by the state or county.
- c. Circulation for vehicles shall be provided by an integrated system of minor streets and collector streets linked to major entrance roads. Dead-end streets should not be longer than 1,000 feet and shall terminate in a 50-foot radius cull-de-sac, or other paved turnaround space adequate for a fire truck.
- d. All street intersections within the district shall be at right angles and a minimum of 150 feet apart and a maximum of 1,000 feet apart.
- e. Mobile home parks shall provide a common walkway system conveniently linked to all lots, common areas and facilities. The walkway shall be asphalt or concrete or material approved by Town Council, safe in all seasons, durable and convenient to maintain and shall be a minimum of 3 2 feet wide.
- f. Sewage disposal and treatment. Mobile home parks shall provide individual septic systems to each site as approved by the Health Department or public sewer whenever available.
- g. Water supply. All mobile home districts shall connect to the public water supply system or shall have individual wells.
- h. Electrical supply. All electrical connections, equipment, materials and installations in a mobile home park project, and each mobile home lot shall comply with Southern/Standard Building Codes and the National Electrical Code, specifically as practiced by the South Carolina Electric and Gas Company and Berkeley Electric Co-op and as described in Electrical Underground Distribution for Mobile Homes, by the South Carolina Electric and Gas CompanyC Distribution Engineering Department. Whereas the developer shall enter into service agreements with the South Carolina Electric and Gas Company or Berkeley Electric Co-op for provision of electrical service, the above referenced document shall be considered the minimum standards required by this chapter.
- i. Fuel supply and storage. All mobile home districts that provide fuel supply or storage shall use equipment, materials and installations per the County Code and all applicable federal safety codes.
- j. Telephone lines. The distribution of telephone lines to all mobile home stands within mobile home districts shall be underground.

#### **Section 2.6.10 Neighborhood Commercial.**

It is the intent of this section that the NC District be developed and reserved for certain service type businesses, offices and specified public purposes. The regulations which apply within this district are designed to encourage the formation and continuance of a quiet, compatible and un-congested

environment for office and limited retail business; and to discourage any encroachment by unrestricted retail or wholesale business establishments, industrial concerns or other uses capable of adversely affecting the specialized commercial and housing character of the district.

- A. Permitted uses: See Appendix B. Table of Permitted Uses.
- B. Lot, yard, height and coverage requirements.
  - 1. Minimum lot requirements. 12,500 square feet.  
Minimum lot width measured at building line: 100 feet
  - 2. Minimum setback requirements. There shall be a 50-foot building setback from the edge of any street.
    - Front setback 50 feet
    - Side setback 25 feet\*
    - Rear setback 25 feet\*\*
  - 3. Maximum height. Maximum height shall be 35 feet (2.5 stories)
  - 4. Building coverage: No more than 35% of the lot area may be covered by principle use.
- C. Buffer yard requirements. Minimum buffer yard requirements for and between permitted uses in this district and residential uses as provided in Section 4.2.
- D. Development in NC district shall comply with all applicable regulations of this ordinance.

\* Minimum side yard setbacks for existing lots of record of two acres or less and that abut other commercial lots shall be 10 feet.

\*\* Minimum rear yard setback for existing lots of record of two acres or less and that abut other commercial lots shall be 15 feet.

#### **Section 2.6.11 General Business (GB)**

The General Business District is intended for a broad range of commercial uses and activities which need a location adjacent to arterial roads. The regulations herein are designed to encourage an economically healthy environment, particularly for those businesses which have a market area beyond just one or a few neighborhoods. They are also designed to discourage the encroachment of other uses capable of adversely affecting the basic commercial character of the district.

- A. Permitted uses. See Appendix B. Table of Permitted Uses.
- B. Minimum lot area principal use: 12,500 square feet.  
Minimum lot width at building line: 100 feet
- C. Minimum setback requirements:
  - Front setback 50 feet
  - Side setback 25 feet\*
  - Rear setback 25 feet\*\*
- D. Height. Maximum building height shall not exceed 35 feet (2.5 stories).  
Lot Coverage?

- A. Buffer yard requirements. Screening and buffering requirements must be provided between commercial and residential or agricultural zoning district as per Section 4.2.
- E. Development in the GB district shall comply with all other applicable regulations of this ordinance

\* Minimum side yard setbacks for existing lots of record of two acres or less and that abut other commercial lots shall be 10 feet.

\*\* Minimum rear yard setbacks for existing lots of record of two acres or less and that abut other commercial lots shall be 15 feet.

**Section 2.6.12 Light Industrial (LI)**

It is the intent of the LI Zoning District to develop and reserve large parcels for a broad range of industrial uses including extensive manufacturing, processing or assembly operations or which serve as large employment centers. The regulations which apply within this district are designed to (1) Encourage the formation and continuance of a compatible environment for industries; and (2) Protect and reserve undeveloped areas in the town which are suitable for such industries.

- A. Permitted uses. See Appendix B. Table of Permitted Uses.
- B. Minimum lot area: 10 acres  
Minimum lot width at building line: 200 feet
- C. Minimum building setback:
 

<u>Yards</u>	<u>Measurement</u>
Front	50 feet
Side (corner lot)	50 feet
Side and rear	50 feet
- E. Screening/buffer yard requirements. Minimum buffer yard requirements must be provided between permitted uses in this district and rural agriculture districts or residential districts as per Section 4.2.
- F. Development in the LI district shall comply with all other applicable regulations of this ordinance

**Section 2.6.13 General Industrial (GI)**

It is the intent of the General Industrial (GI) district to provide for low impact general industrial uses which do not create excessive noise, odor, and dust, generate heavy truck or automobile traffic and are compatible with surrounding uses. These uses include business park and office warehousing activities.

- A. Permitted uses: See Section B. Table of Permitted Uses.
- B. Minimum lot area: 2 acres  
Minimum lot width at building line: 100 feet
- C. Building setbacks
 

Front setback	50 feet
---------------	---------



- |  |              |         |
|--|--------------|---------|
|  | Side setback | 25 feet |
|  | Rear setback | 35 feet |
- D. Maximum height permitted: 35 feet (2.5 stories).
- E. Screening/buffer yard requirements. Minimum buffer yard requirements must be implemented for and between permitted uses in this district and rural agriculture districts or residential districts as per Section 4.2.
- F. Development in the GI district shall comply with all other applicable regulations of this ordinance.

**Section 2.6.14 Historic Conservation Overlay District (HC).**

The Historic Conservation Overlay District regulations apply in addition to the underlying zoning district. By establishing the Historic Conservation Overlay District, the Town intends to protect and preserve the historic character of the area so designated, including:

- To safeguard the heritage of the town by preserving the Historic District=s element of cultural, social, economic, political or architectural history;
  - To ensure the preservation of significant historic sites against undesirable development;
  - To stabilize and improve property values in the Historic Districts thereby ensuring its continued existence; and
  - To promote the use and preservation of the Historic Districts for the education, welfare and pleasure of residents of the town, and of the state as a whole.
- A. Lot, yard, height and coverage requirements. The minimum requirements described in the use regulations for the underlying district shall apply generally.
- B. Additional development requirements.
1. Exterior architectural features. Within the HC District, no exterior portion of any building or other structure (including stone walls, fences, light fixtures, steps and pavement or other appurtenant features) nor above ground utility structure nor any type of outdoor sign shall be erected, altered, restored or moved, and no building permit shall be issued within the Historic District until after an application for a Certificate of Appropriateness as to exterior architectural features of the structure has been submitted to and approved by Town Council.
  2. Construction on public property. The Town Council shall not approve any porches, steps, posts, fences, walks or other appurtenances extending over, on or within a public sidewalk, alleyway or street right-of-way unless the particular item is necessary for the authentic restoration or maintenance of the particular project, and unless such proposed items will not impede pedestrian or vehicular traffic or constitute a public safety hazard. Any of the aforesaid items restored or maintained on, over or within a public sidewalk or public alley area under the authority hereof shall be the responsibility of the owner, and the owner=s restoration, reconstruction, or maintenance of any such item within such area shall constitute the owner=s agreement to protect and hold the town

harmless against any and all liability, cost, damage or expense suffered or sustained by the town as a result of or maintenance thereof.

3. Maintenance and repair. Nothing in this section shall be construed to prevent the ordinary maintenance or repair of any exterior architectural feature in the Historic District which does not involve a change in design, material, color or outer appearance thereof, nor to prevent the construction, reconstruction, alteration, restoration or demolition of any such feature which the Codes Inspector or similar official shall certify is required by the public safety because of an unsafe or dangerous condition.
4. Demolition.
  - a. No building or structure in the Historic Districts shall be demolished or otherwise removed until the owner thereof shall have given the Town Council ninety (90) days written notice of his proposed action. During such ninety (90) day period, the Town Council may negotiate with the owner and with any other parties in an effort to find a means of preserving the building involved. If it is determined the building has no particular historic significance or value toward maintaining the character of the district, it may waive all or part of such ninety (90) day period and authorize earlier demolition or removal.
  - b. The Town Council shall also have authority to take such action as may be necessary or appropriate under the provisions of this section relating to delay in demolition of historic buildings. Further, the Town Council may, in its discretion, request the Zoning or Planning Board to take such action as may be appropriate to prevent the construction, reconstruction, alteration, restoration, or removal of buildings, structures, appurtenant fixtures, or outdoor signs in the Historic Districts in violation of the provisions of this section.

#### **Section 2.6.15 Planned Development District (PD)**

The purpose of the Planned Development District is to allow for flexibility in order to improve the design, character, and/or quality of new multiple-density or mixed-use developments, promote the orderly and efficient expansion and use of public utilities and infrastructure, and to preserve the natural and scenic features of open and undeveloped spaces.

An area may be accepted as a Planned Development District upon request by the property owner or organization having an interest in the subject property or properties required for the proposed project, the successful negotiation of a Planned Development Project Concept and Plan with Town Staff and the Planning and Zoning Commission, and approval by ordinance by the Town Council.

A Planned Development District is an amendment to the zoning ordinance and the initial approval shall follow all zoning amendment, administrative procedures, and public notice and input as required for an amendment to the zoning ordinance.

- A. Required conditions that must be presented in the application request for the advancement of a Planned Development District project and request are:
  1. A statement of intent from the developer regarding the maximum number and

types of units to be developed, all property to be included, public services that will be required, and development phases and timelines, and;

2. A statement from the developer that exceptions or variations to the design or dimensional requirements of the zoning ordinance are essential to the project, and;
3. The site must contain not less than five acres, and;
4. The minimum width between any two opposite boundary lines is 200 feet, and;
5. The parcel is not a flag lot and no flag lots will be created in the Planned Development, and;
6. The site must adjoin and have direct access to a publicly maintained roadway having a right-of-way width of 50 feet, and;
7. More than one principal land use is proposed for the project or land uses are proposed which would not otherwise be permitted to located within the same zoning district.

B. Additional Procedures and Information:

1. The request for a Planned Development District must be submitted in a format as specified by the Planning and Zoning Administrator, and;
2. A pre-application conference with the Planning and Zoning Administrator is required. A Planned Development Concept will be presented and reviewed at the pre-application conference. Information required in the Concept plan will include, but not be limited to:
  - a. Proposed lot sizes and setbacks;
  - b. Proposed peak housing density;
  - c. Gross average housing density (incl. wetlands and unbuildable area);
  - d. Net average housing density (only buildable area);
  - e. Proposed land uses and general locations of land uses;
  - f. Proposed infrastructure improvements including service connection locations and routes, impact mitigation efforts, roadways, and facilities;
  - g. Proposed green and open space;
  - h. Proposed development phasing and completion dates;
  - i. Proposed Stormwater Pollution Prevention Plan (SWPPP);
  - j. Other requirements of the zoning ordinance from which the proposed project may require some measure of flexibility.
3. The Planning and Zoning Administrator will review the Concept Plan application for completeness and note any incompatibility with the Town's Comprehensive Plan or other Town planning efforts regarding public services or infrastructure.
4. As the project Concept Plan and Planned Development Amendment begins the zoning amendment process, the text of the Plan shall shift from conceptual to specific information regarding uses, densities, setbacks, and other requirements.
5. The Plan presented at the required Public Hearing before the Planning and

Zoning Commission shall be the Plan considered for approval by ordinance by the Town Council and shall include the results of a Traffic Impact Study. This Plan will also include a schedule for the payment of any currently imposed Traffic Impact Fees required to assist with the mitigation of traffic issues as determined by the Town of Ravenel.

6. The Planning and Zoning Commission will consider the Planned Development District request and either recommend approval or denial of the project to the Town Council, based on the following standards:
  - a. The project will be compatible with the Town's Comprehensive Plan and with adjacent land uses and existing development.
  - b. The impact of the development placed upon infrastructure and public services will be manageable and efficient.
  - c. Overall site design shall be harmonious in terms of landscaping, enclosure of principal and accessory uses, sizes of structures, street patterns, and use relationships. Variety and compatibility in building types, heights, facades, setbacks and size of open spaces shall be encouraged.
  - d. Consideration of the impact of the traffic generated by the project (as indicated in the required Traffic Impact Study) on the surrounding and nearby roadways and the road standards and improvements proposed to be undertaken by the developer (if any) to mitigate and manage the increased traffic.
  - e. Consideration of housing densities. Generally, the gross average housing density for the project will be compared to the existing densities allowed in the Town's residential zoning classifications. This comparison will weigh the amount of variance from the existing classifications against the innovative, unique, and attractive design elements proposed in the project.

Additionally, designs and programs that reduce storm, fire, and other natural hazard risk or increase residential resiliency to hazards can allow for consideration of greater housing densities.

The final negotiated Planned Development may result in areas of higher residential density than would otherwise be allowed in the traditional zoning classifications.
  - f. Consideration of the amount and dedication of open space, preserved wetlands and other areas, and common green space.
  - g. Innovative design. Developments that demonstrate harmonious, attractive, and innovative design, both within the project and with the relationship to adjacent areas, are desired and these elements are required for full consideration of greater housing density and increased flexibility and variance from existing zoning code standards.
  - h. Inclusion of adequate signage, parking and loading spaces, streets and street lighting, and drive ways. Generally, sidewalks or paved trails are

required in all residential areas. Decorative and interesting design elements are encouraged.

- i. Consideration of street standards being requested. Generally, all uses shall maintain safe distances from streets to maintain acceptable sight triangles and promote safe ingress/egress points.
  - j. Screening and landscaping shall be required along the periphery of a Planned Development Project in an amount no less than that required of a General Business District abutting a residential district as found in the zoning ordinance.
  - k. Generally, utilities, parking and loading spaces, and dumpsters shall be screened from view of any public right-of-way.
  - l. Commercial, industrial, and multi-family uses shall have adequate, but not excessive, access points to a public street.
  - m. A drainage plan must be prepared by a registered/professional engineer in order to ensure proper drainage flow that will not have a negative impact on neighboring properties.
- C. Upon approval by the Town Council by ordinance, any specific use proposed by the developer in the Planned Development Plan is permitted in the project. A listing of these specific uses will be adopted along with the plan text and other zoning requirements to become the regulations of the Planned Development project area. These are the only uses permitted in the Planned Development District.
- D. **Minor Modifications.** The Planning and Zoning Administrator may approve minor modifications to the Planned Development Plan. Minor modifications may not result in a greater housing density calculation of any kind, different uses than were specified in the Plan, or other changes that materially affect the concept of the Plan that was approved by Council. Minor modifications may include aspects such as a decrease in housing density, changes to the locations of uses, driveways, or streets, revised floorplans, and/or design modifications for landscaping, site amenities, common areas, and parks.

If the Planning and Zoning Administrator determines that a change is not a minor modification, the Planned Development District Concept will need to be reconsidered fully as an amendment to the zoning ordinance.

#### **Section 2.6.16. Commercial Corridor Overlay District (CCOZ)**

- A. *Purpose of zone.* The purpose of the Commercial Corridor Overlay Zone is to address conditions unique to US Highway 17. The standards of this zone shall manage vehicular access to mitigate traffic congestion and improve driver safety, encourage pedestrian accessibility to and within the development site, improve the appearance of development from the perspective of the highway, protect property values along US-17, and generally improve the functionality and aesthetics of land and development throughout the highway corridor, as explained in the Comprehensive Plan US-17 Corridor Study. The CCO zoning district shall "overlay" existing and future zoning districts specified on the Ravenel Official Zoning Map. The standards set forth by this zone shall supersede those standards set forth by the underlying zoning district. Where the CCOZ is mute, the standards of the underlying zoning district shall prevail. (Ord. amended 12-14-04)

- B. *Scope of Authority.* The CCOZ shall apply to the right-of-way of US Highway 17 through the Town limits of Ravenel and all properties which have a property line fronting on US Highway 17.
1. All new non-residential developments having more than 3,000 square feet of floor area and new multi-family residential development shall follow standards of development set forth herein. Development having less than 3,000 square feet of floor area shall require approval by the Zoning Administrator.
  2. All exterior alterations and/or additions to structures in existing non-residential developments in which the cost of the alteration and/or addition exceeds fifty percent (50%) of the value of the existing improvements shall fall under the requirements of this Section. For purposes hereof, the "value of existing improvements" shall be the fair market value of the improvements as shown on the most recent assessment records, and in the absence thereof, as verified by a real estate appraiser.
  3. These regulations shall not apply to:
    - a. Temporary uses,
    - b. Ordinary maintenance or repair which does not require a building permit,
    - c. Demolition of any structure for which a demolition permit has been issued by Charleston County Building Services
    - d. Public and private utility structures and telecommunication towers permitted by district regulations
    - e. Structures on public streets or public property approved by the town council.
- C. *Allowed uses.* The CCOZ is mute regarding land use. The standards of the underlying zoning district shall prevail.
- D. *Minimum lot area.* The CCOZ is mute regarding minimum lot area. The standards of the underlying district shall prevail.
- E. *Minimum side and rear setback and buffer yard requirements.* The CCOZ is mute regarding minimum side and rear setbacks. The standards of the underlying district shall prevail.
- F. *Minimum front setbacks and front buffer yards.* For commercial, institutional, industrial, mobile home park, and multi-family residential development, the front yard requirements of the underlying zoning district are superseded by the standards below. The standards of the underlying zoning district shall remain for agriculture, resource extraction, single- and two-family homes, and a single manufactured home on a parcel.
1. *Primary building setback.* Any front yard provided (whether required or not) between the highway right-of-way and the primary building shall consist of a front buffer yard of a depth equal to at least twenty percent (20%) of the front setback of 50 feet, required or provided, of the primary building. The minimum size of this front yard buffer shall be at least ten feet (10'). (Ord. amended 09-30-08)
    - a. if developer chooses to locate parking spaces in front of the building, the required minimum front setback shall be fifty feet (50').

- b. if developer elects to locate the required parking to the side or rear of the building, the minimum front setback shall be twenty-five feet (25').
  - 2. *Street trees.* The developer shall retain or install canopy trees at a rate no less than one per forty feet (40') of highway frontage. (Location may deviate five feet {5'} from specification, provided the average spacing is maintained.) Street trees shall be located within ten feet (10') of the right-of-way; however, where pole-mounted utility lines are present, the trees should be planted twenty to thirty feet (20'-30') from such lines. Generally, one should avoid planting trees that generate large or messy debris (e.g., magnolia, pecan, gum) within thirty feet (30') of paved surfaces. Street trees shall be a minimum of two inches (2") in diameter.
  - 3. *Parking areas and driveways.* To prevent vehicles on private property from errantly interfering with US-17 traffic and vice versa, a landscaped berm or garden wall can be an option between the front property boundary and any parking or driving surfaces (other than access driveways perpendicular to US-17) less than thirty-five feet (35') from the front property boundary.
  - 4. *Front buffer yard planting requirements.* One (1) tree per two thousand square feet (2,000 SF) of required buffer yard shall be retained or installed.
- G. *Maximum building height.* The CCOZ is mute regarding maximum building height. The standards of the underlying district shall prevail.
- H. *Building design standards.*
- 1. *Intent of design standards.* The intent of the design standards is to promote attractive well designed development, to protect the appearance, character and economic value of new development and existing development, to encourage quality and creativity in new development and to foster attractive streetscapes and pedestrian environments while accommodating safe vehicular movement.
    - a. Single large building masses shall be avoided. Structures with exterior walls of more than fifteen hundred square feet should incorporate fascia, canopies, arcades, or other multidimensional design features to break up large wall surfaces on the street facing elevations. No overhead garage doors shall be in the front facade.
    - b. The side and rear elevations of buildings shall be as visually attractive as the front elevation, especially where viewed by the public.
    - c. All structures within a proposed development, including gasoline canopies, shall utilize a uniform architectural theme and be designed to create a harmonious whole through considerations of scale, proportion, detail, materials, color, site planning and landscaping.
    - d. The scale of buildings and accessory structures shall be appropriate to the scale of structures in the surrounding area and cognizant of the rural character of the area.
  - 2. *Color schemes.* The use of bold, garish or day glow colors is prohibited. Color combinations of the following colors shall be allowed:
    - a. Natural materials. The natural colors of brick and stone shall be

considered preferred. The natural colors of finished wood (not lumber) shall be considered preferred. Hued wood finishing stains are preferred. Exposed metal and concrete are NOT preferred for color.

- b. Shades. All shades and tints of brown, including warmer and cooler variations thereof, are preferred (e.g., sand, tan, beige, cream, umber, and sienna). Shades of primary colors are also considered preferred (e.g., crimson, hunter green, navy blue, dark burnt orange).
  - c. The use of bold primary colors (red, blue, yellow), secondary colors (orange, green, violet), and tertiary colors (e.g., turquoise, purple) and tints thereof are permitted for accent colors only, up to maximum twenty percent (20%) of the total exterior colors.
  - d. Black, gray, and white shall count neither toward nor against color scheme requirements.
3. *Building Materials.* Materials should reflect the rural character of the area.
- a. Concrete finishes or precast concrete panels (tilt wall) that are not exposed aggregate, hammered, sandblasted or covered with a cement based acrylic coating shall be prohibited as an exterior building material along any building elevation visible from public right-of-way.
  - b. Unpainted or bare metal panels, corrugated or sheet metal, except stainless steel, copper or galvanized metal shall be prohibited as an exterior building material.
  - c. Mirrored glass with a reflectance greater than forty percent (40%) shall be prohibited from covering more than forty percent (40%) of the exterior walls of any building.
  - d. Shingles, metal standing seam, tile or other appropriate roofing material shall be utilized. Flat roofs will not be discouraged where they are appropriate to the design theme of a structure.
- I. *Foundation plantings.* A planting area shall be provided for a minimum of fifty percent (50%) of the length of the facade, which may be interrupted by entrances, archways, porches, porticos, and piazzas. The planting area shall be adjacent to the facade and shall extend one foot from the facade per two feet (2') of cornice height or eave height.
- 1. *Minimum landscaping.* At least ten (10) shrubs and ornamental grasses, maturing to at least two feet (2') in height and diameter, shall be installed per one hundred square feet (100') of planting area. The landscaper is encouraged to install plants in groupings for a more pleasing aesthetic. Remaining exposed ground shall be covered with pine straw, mulch, wood chips, gravel, or similar to inhibit weed growth and erosion.
  - 2. *Exemptions and modifications.* The following conditions are exempt from foundation planting requirements:
    - a. All industrial buildings, warehouses, utility buildings, and garages at least three hundred feet (300') from the edge of the highway;
    - b. Agriculture, resource extraction, a single-family detached residence, or an individually sited mobile home;



- c. Wall planes in a piazza or elevated floor, such as that in a deck or porch; and
  - d. A parallel sidewalk in a public right-of-way or crossing-driveway easement may pass through the required foundation planting area.
- J. *Site design standards.*
1. *Parking lot trees.* One (1) tree per twelve (12) parking stalls shall be planted or retained within the parking lot or within twenty feet (20') of it. A parking island of a width to sustain the long-term growth of the tree shall separate the spaces.
  2. *CCOZ trees.* At least forty percent (40%) of all required trees shall be canopy trees. All required canopy trees shall be at least two inches (2") in caliper and ten feet (10') tall upon installation. Other required trees shall be at least one inch (1") in caliper and five feet (5') tall upon installation (e.g., redbud, dogwood, crabapple, Bradford pear, crape myrtle).
  3. *Tree counting.* Tree requirements may overlap. A tree planted to meet a buffer yard requirement may be counted toward parking lot tree-planting requirements as well.
  4. *Buffer-yard design.* No building or parking stall shall be allowed in a buffer yard. Walkways are allowed in the buffer yard. Driveways are allowed only when roughly perpendicular to the orientation of the buffer yard and providing direct ingress to the parcel from an adjacent parcel or road right-of-way. Structures allowed in the buffer yard are limited to signage, necessary utility boxes and poles, site lighting, and park furniture. Storm water may be managed (filtered, detained, et al) in the buffer yard. Remaining exposed ground shall be covered with turf grass or other natural ground cover (e.g., pine straw, mulch, wood chips) to inhibit weed growth and erosion.
  5. *Garden wall.* For the purposes of the CCOZ, a garden wall shall be an opaque wall or fence of brick, textured concrete, or finished wood adjacent to a ten-foot-deep (10') garden of shrubs and ornamental grasses. At least twenty (20) such plants shall be installed per ten linear feet (10') of garden wall. The landscaper is encouraged to install plants in groupings for a more pleasing aesthetic. Remaining exposed ground shall be covered with pine straw, mulch, wood chips, or similar product to inhibit weed growth and erosion.
  6. *Landscaped berm.* For the purposes of the CCOZ, a landscaped berm shall be at least three feet (3') tall with slopes no steeper than four and twelve (4" rise per 12" run). Landscaping shall consist, at a minimum, of shrubs and ornamental grasses maturing to at least two feet (2') in height and diameter. At least twenty (20) such plants shall be installed per ten linear feet (10') of berm. The landscaper is encouraged to install plants in groupings for a more pleasing aesthetic. Remaining exposed ground shall be covered with pine straw, mulch, wood chips, or similar to inhibit weed growth and erosion.
  7. *Fencing.* Chain-link fencing shall not be erected in the front setback.
- K. *Optional monument sign.* A freestanding monument sign achieving the following design standards is recommended over the freestanding sign allowed per Section 4.3 and can have fifteen percent (15%) more sign surface. Free standing signs shall follow sub-sections 1 and 2 below.

1. *Color scheme.* The sign and all supporting structure shall achieve the preferred color scheme of Ravenel. Graphics and text shall comply, but the name and logo of the business or institution are exempt and may be of corporate colors.
2. *Illumination.* Only lettering and logos may be internally illuminated. Signage background shall be opaque. Spotlighting, up-lighting, or similar illumination is encouraged.
3. *Height.* The sign and all supporting structure shall be less than eight feet (8') tall.
4. *Support.* The sign shall not be supported by poles but by a base or foundation that appears solid and opaque.

L. *Access to US 17.* The Town of Ravenel requires the following access standards to development preserve the capacity of US Highway 17 and the safety of motorists thereon by enabling of interconnected business districts that encourage multiple destination shopping in Ravenel. Access to development of interconnected business districts that encourage multiple destination shopping in Ravenel. Access to US 17 is therefore more limited along that section of the highway with greater design speeds but allowed more regularly nearer to the center of Ravenel where more townsfolk reside, the road is narrower and more services are expected to locate.

1. *Maximum access.* A maximum of one curb cut shall be allowed for parcels with two hundred and fifty feet (250') or less of road frontage. One pair of one-way curb cuts shall count as one curb cut.
2. *Maximum driveway width.* No driveway shall be wider than twenty-five feet (25'), except to provide for turning radii of twenty-five feet (25'), maximum.
  - a. *Exception.* A three-lane driveway not wider than forty feet (40') shall be allowed to access parking areas totaling more than one hundred (100) stalls. Turning radii shall be no more than twenty-five feet (25').
  - b. *Exception.* A two-lane driveway not wider than forty feet (40') shall be allowed for wholesale commercial, warehousing, or industrial operations with more than one loading dock or truck bay intended to accommodate vehicles longer than forty feet (40'). Turning radii shall be no more than forty feet (40').
  - c. *Existing conditions.* A driveway existing upon adoption of the CCOZ by ordinance shall not preclude the construction of a driveway based on spacing of points of access if no other means of accessing adjacent lots exists.
  - d. *Home site.* A single-family residence or a single manufactured home shall be exempt from spacing of points of access in light of low traffic volume. Driveways within egress easements to the same are not exempt.
3. *Sidewalks.* Sidewalks alongside the crossing driveway are encouraged where appropriate. The developer shall qualify for an additional five-percent (5%) reduction in required parking stalls if a curb-mounted, hard-surfaced sidewalk five feet (5') wide is provided within the easement and from the easement to the main public entrance of the primary building.

M. *Administration of CCOZ requirements.* To facilitate the administration of the Commercial Corridor Overlay zoning district by the Town of Ravenel, the following documentation shall be required for commercial, institutional, industrial, mobile home park, and multi-family residential development, to be submitted to the Zoning Administrator, in addition to that regularly required for a zoning permit.

1. *Traffic study.* The developer of a building structure of twenty-five thousand (25,000) square feet or greater or of five or more contiguous acres (5 acres) of land shall report the number of trips expected to be generated to and from the project at each point of access to the parcel. This information will be forwarded to SC Department of Transportation, which will determine if the projected traffic load would necessitate improvements to US 17 (e.g., turn lanes and traffic signals). Any improvements required by SCDOT shall be installed by the developer prior to receipt of a certificate of occupancy.
2. *Site development plan.* Graphic illustration of intent and ability to meet the requirements of the CCOZ shall be required prior to approval for a zoning permit. A site development plan, submitted to the Zoning Administrator for review and approval, shall be drawn at a scale no smaller than one to fifty (1' = 50') shall contain the following information:
  - a. Names, seals, and signatures of professionals involved in the preparation of the site development plan (e.g., registered surveyor, professional engineer, registered architect, registered landscape architect);
  - b. Title block, to include project name, drawing preparation and revision dates, scale, and space for the signature of approval of the Zoning Administrator;
  - c. North arrow and graphic scale;
  - d. Existing features for purposes of orientation and project location; including US 17 and other existing roads; bridges; railroads; and water courses;
  - e. Town boundaries, if adjacent;
  - f. Parcel boundaries, described in metes and bounds, parcel area in square feet or acres, Charleston County parcel identification number(s), and parcel owner(s);
  - g. Owners and parcel identification numbers of adjoining parcels;
  - h. Rights-of-way and easements, existing and proposed, with widths and purposes stated;
  - i. Proposed temporary construction access;
  - j. Pedestrian and vehicular circulation, including width of facilities, number and width of lanes, surface materials, and traffic signage and signals;
  - k. All parking areas with number of spaces;
  - l. Footprints and overall dimensions of structures;

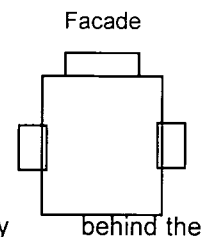
- m. Existing and proposed street address numbers;
  - n. Required setbacks, buffer yards, and planting areas; and
  - o. Any other information deemed necessary by the Zoning Administrator for review and approval.
3. *Facade elevation.* The developer shall include with the required submittal for a building permit an elevation drawing of the facade(s) of the building(s). The elevation, drawn no smaller than sixteenth scale (1/16" = 1'-0"), shall depict the following information:
- a. Names, seals, and signatures of professionals who prepared the elevation (e.g., registered architect);
  - b. Title block, to include project name, drawing preparation and revision dates, scale, and space for the signature of approval of the Zoning Administrator;
  - c. Building profile, doors, windows, faux windows, archways, eaves, cornices, and other structural and ornamental facade features;
  - d. Dimensions or call-outs of building height, eave and cornice height(s), finish floor elevations above grade, window and door sizes, pier/post/column widths and on-center spacing; and
  - e. Any other information deemed necessary for review and approval by the Zoning Administrator.
4. *Parking plan.* Prior to receipt of a building permit, the developer shall submit to the Zoning Administrator for review and approval a parking plan (which may occur on the same drawing) drawn at a scale no smaller than one to fifty feet (1" = 50'), depicting the following information:
- a. Names, seals, and signatures of professionals who prepared the drawing (e.g., registered landscape architect, professional engineer);
  - b. Title block, to include project name, drawing preparation and revision dates, scale, and space for the signature of approval of the Zoning Administrator;
  - c. North arrow and graphic scale;
  - d. Existing features for purposes of orientation and project location; including US 17 and other existing roads; bridges; railroads; and water courses;
  - e. Town boundaries, if adjacent, and parcel boundaries;
  - f. Rights-of-way and easements, with widths and purposes stated;
  - g. Pedestrian and vehicular circulation, including width of facilities, number and width of lanes, surface materials, and traffic signage and signals;
  - h. All parking areas with delineated stalls, including loading and handicapped stalls, and number of spaces;

- i. Footprints of structures with indication of vehicular and pedestrian entrances;
  - j. Required setbacks, buffer yards, and planting areas; and
  - k. Any other information deemed necessary for review and approval by the Zoning Administrator.
5. *Color palette.* Prior to receipt of a certificate of occupancy, the developer shall provide to the Zoning Administrator a color palette displaying samples of each of the colors and materials proposed for exterior use where subject to the standards of this ordinance. The developer shall submit the color palette for review and approval before construction.
6. *Landscape plan.* Prior to receipt of a building permit, the developer shall submit to the Zoning Administrator for review and approval a landscape plan (which may occur on the same drawing as the parking plan) drawn at a scale no smaller than one to fifty feet (1' = 50'), depicting the following information:
- a. Names, seals, and signatures of professionals who prepared the drawing (e.g., registered landscape architect);
  - b. Title block, to include project name, drawing preparation and revision dates, scale, and space for the signature of approval of the Zoning Administrator;
  - c. North arrow and graphic scale;
  - d. Existing features for purposes of orientation and project location; including US 17 and other existing roads; bridges; railroads; and water courses;
  - e. Town boundaries, if adjacent, and parcel boundaries;
  - f. Rights-of-way and easements, with widths and purposes stated;
  - g. Pedestrian and vehicular circulation and parking areas
  - h. Exterior walls in plan view, with doors and windows, and exposed vertical elements of buildings (columns, posts, piers, pilasters, etc.) defining façade voids, and footprints of other structures
  - i. Required setbacks, buffer yards, and planting areas;
  - j. Required landscape elements, including trees, shrubs, grasses, and ground cover;
    - i. Location and size of trees proposed (in caliper) and trees retained (in caliper or diameter at breast height);
    - ii. Ground cover, delineated and called out by type;
    - iii. A planting schedule specifying the species and size of each proposed plant; and
  - k. Any other information deemed necessary for review and approval by the

Zoning Administrator.

N. *Terms and measurements.* The following words and phrases shall be interpreted as specified below in the administration of the CCOZ.

1. *Access driveway.* For the purposes of this ordinance, a driveway that accommodates direct ingress from US 17 to private property and vice versa.
2. *Buffer yard.* A buffer yard contains trees, shrubs, grasses, and natural ground covers installed throughout an area, as prescribed herein. A buffer yard is located adjacent to a property boundary and spans the width (front or rear buffer yard) or the depth (side buffer yard) of the parcel. Existing forested area that exhibits twenty years of undisturbed growth may be retained in lieu of installation of new landscaping materials in a required buffer yard.
3. *Canopy tree.* A large, long-lived (minimum sixty-year life expectancy), upright-growing, hardwood tree, maturing to at least forty feet (40') in height and thirty inches (30") in breadth (e.g., oak, maple, elm, hickory, sycamore).
4. *Color shades and tints.* One shades a color by adding black and tints a color by adding white. (e.g., mint green is a tint and hunter green a shade.) A shade is at least one part black per four parts basic color.
5. *Colors, warm and cool.* One warms a color by adding red, and cools a color by adding blue. Turquoise is cooler than green, while olive green is warmer.
6. *Crossing driveway.* For the purpose of this ordinance, a driveway within a dedicated easement running generally parallel to US 17 that accommodates vehicular access between two or more contiguous parcels.
7. *Driveway spacing.* All specified distances from driveways shall be measured from the centerlines of such driveways.
8. *Driveway width.* All specified widths of driveways shall be measured from edge of pavement to edge of pavement, shall not include gutters installed as part of curb-and-gutter drainage systems, and shall not include turning radii.
9. *Facade.* The public face of a building, comprised of all forward facing wall planes in the forward quadrant of the building, as depicted at right. The facade may also include the forward face of the roof.
10. *Faux window.* A framed opening with glazing in the veneer but not the structure of the wall. To accomplish the desired effect, the window is heavily tinted or shuttered or the wall cavity behind the window is blacked out so as not to visually expose wall components (sheathing, studs, insulation, et al). Functional glazing, by contrast, allows natural light directly into occupiable enclosed space.
11. *Parking stall.* An area designated or reserved for parking a vehicle, including temporary parking, such as a point of service for refueling or drive-through window.
12. *Piazza.* An arcaded, roofed gallery or promenade at grade. (An elevated roofed gallery is a loggia, which is sometimes incorrectly called a piazza.)



13. *Shrubs and grasses.* A shrub is a multi-stemmed woody plant. A large shrub is at least three feet (3') in height and diameter at planting and matures to at least seven feet (7') in height and diameter (e.g., wax myrtle, crape myrtle, yaupon holly, oleander, azalea Formosa, tea olive, camellia). A small shrub is at least eight inches (8") in height and diameter at planting and matures to at least two feet (2') in height and diameter (e.g., dwarf yaupon holly, gumpo azalea). Ornamental grasses are commercially sold potted, grow in small clumps, and may flower (e.g., sweetgrass, mondo grass, monkey grass). Turf grass may be potted but is typically installed by seed or sod and spreads along the ground (e.g., Bermuda grass, St. Augustine grass, Kentucky bluegrass, centipede grass).
14. *Traffic island.* A feature within a road or parking area intended to define travel lanes and guide traffic. For the purposes of this ordinance, a traffic island shall be at least six feet (6') in perpendicular dimensions. Moreover, a traffic island shall be a non-traversable, permeable, vegetated surface preferably bound by curbs. In the absence of curbing, vegetation shall be trees and/or shrubbery to deter motor vehicles from encroaching the island. (Ord., passed 12-14-04)

## **CHAPTER 3. CONDITIONS AND EXCEPTIONS TO BASE DISTRICT USES**

### **Section 3.1 Use Conditions.**

Certain uses shall be allowed as a Conditional Use if they meet the specified conditions or standards of this Chapter and if the use proposed will not materially endanger the public health, safety or general welfare, if located where proposed and developed and operated according to the project specifications as submitted and approved.

- A. The proposed use conforms in general with the approved Land Use Ordinance as adopted by the Town of Ravenel on May 6, 1999.
- B. Application for a Conditional Use shall be submitted to the Town as follows:
  - 1. Two (2) copies of proposal package to include:
    - a. Completed application form and description of the proposed use and equipment to be used.
    - b. Recorded plat and detailed site plan and, if required, to be prepared by a registered land surveyor, engineer or landscape architect.
    - c. Application fee as determined by Town Council.

#### **Section 3.1.1 Consideration for evaluation**

- A. In evaluating an application for a Conditional Use permit, the following criteria shall be considered:
  - 1. The proposed project will not materially endanger the public health, safety, or general welfare, meets air and water quality standards established by the government authority having jurisdiction nor will unduly impact adjacent residential areas through an increase in illumination, noise levels or adverse traffic.
  - 2. The proposed project meets the criteria listed for the specific use.
  - 3. The proposed project provides adequate fire and emergency access.
  - 4. The project provides for adequate vehicular traffic circulation and for required parking.
  - 5. Buffering and landscaping as required by Section 4.2 must be provided.
  - 6. Signage requirements and other considerations deemed appropriate and important for the performance of the Conditional Use.

#### **Section 3.1.2 Issuance of Zoning Permit for Conditional Use.**

- A. The application for a conditional use permit shall be considered and written notice of approval or denial shall be issued within thirty (30) days of application.
- B. Except as expressly referenced in the Conditional Use criteria, the Town Council shall have the authority to determine if the proposed use meets the requirements as listed and upon such determination, a zoning permit shall be issued.



**Section 3.1.3 Appeals to decision of Town Council or Zoning Administrator**

- c. Filing of appeals: Appeal of a conditional use permit shall be filed with the Zoning Administrator as a written notice specifying the grounds for appeal and what modification of the decision is sought. The written appeal shall be filed within seven calendar days following action on the conditional use permit.
- d. Hearing on appeal:
  - 1. In scheduling a public hearing for an appeal of a conditional use permit, the Town Council shall give public notice at least 15 days prior to the meeting date in a daily newspaper in the county. Date, place and time of the hearing shall be included in the public notice.
  - 2. Public notice shall also include posting on the subject lot a sign whose dimensions, design, content and location shall conform to specifications adopted by Town Council. A written notice shall be delivered to all property owners within a 300-foot radius of the property.
  - 3. Permits: No permits shall be issued on a conditional use permit which has been appealed until such time as Town Council has rendered its decision on the appeal.

**Section 3.1.4 Adult and Sexually Oriented Businesses**

It is the purpose of this Section to regulate Adult Businesses, also known as Sexually Oriented Businesses in order to protect and promote the health, safety and general welfare of the citizens of the Town, and to establish reasonable and uniform regulations to prevent the continued deleterious location and concentration of Sexually Oriented Businesses within the Town. The provisions of this Section have neither the purpose nor effect of imposing a limitation or restriction on the content of any communicative materials including sexually oriented materials. Similarly, it is not the intent or effect of this Section to restrict or deny access by adults to sexually oriented materials protected by the First Amendment, or to deny access by the distributors and exhibitors of sexually oriented entertainment to their intended market. Neither is it the intent or effect of this Section to condone or legitimize any use of act which is otherwise prohibited or punishable by law.

**A. Findings of Fact**

- 1. Sexually oriented businesses generate secondary effects which are detrimental to the public health, safety and welfare. Additionally, sexually oriented businesses are frequently used for unlawful sexual activities, including public sexual indecency, prostitution and sexual encounters of a casual nature. Such businesses are of particular concern to the community when they are located in close proximity to each other, or close to schools, churches or parks and playgrounds.
- 2. The concern over sexually transmitted diseases is a legitimate health concern of the Town which demands reasonable regulation of sexually oriented businesses in order to protect the health and well-being of our citizens.
- 3. Live entertainment presented by some sexually oriented businesses involves a considerable amount of bodily contact between patrons and semi-nude and nude employees and dancers, including physical contact, such as hugging, kissing and sexual fondling of employees and patrons. Many sexually oriented businesses have "couch" or "straddle" dancing, and in these "dances," employees sometimes do such things as sit in a patron's lap, place their breasts against the patron's face

while physical contact is maintained, and gyrate in such a manner as to simulate sexual intercourse. Such behavior can lead to prostitution. Town Council recognizes that preventing prostitution and the spread of sexually-transmitted diseases are clearly within its police powers: *Southeastern Promotions, Inc. versus Conrad*, 341 F. Supp. 465, 477 (E.D. Tenn. 1972), reversed on other grounds, 420 U.S. 546 (1975). Town Council believes that prohibiting physical contact between performers and patrons at a sexually oriented business establishment is a reasonable and effective means of addressing these legitimate governmental interests.

4. Licensing is a legitimate and reasonable means of accountability to ensure that operators of sexually oriented businesses comply with reasonable regulations, to facilitate the enforcement of legitimate location and distancing requirements, and to ensure that operators do not knowingly allow their establishments to be used as places of illegal sexual activity or solicitation.
5. The location of sexually oriented businesses close to residential areas diminishes property values and leads to conditions that give rise to crime in residential neighborhoods. Many studies performed in other communities indicate conclusively that property crimes and sexual crimes increase significantly in neighborhoods in which a sexually oriented business is located.
6. It is not the intent of this Chapter to suppress any speech activities protected by the First Amendment or to place any impermissible burden on any constitutionally-protected expression or expressive conduct by the enactment or enforcement of this Ordinance. Rather, it is the intent of Town Council to enact a "content neutral regulation" which addresses the secondary effects of sexually oriented businesses.

B. Terms, as they are used in this Section have the following meanings:

1. "Adult arcade" means any place to which the public is permitted or invited wherein coin-operated, slug-operated or electronically, electrically, or mechanically-controlled still or motion picture machines, projectors or other image-producing devices are maintained to show images to one or more persons per machine at any one time, and where the images so displayed are distinguished or characterized by the depicting or describing of "specified sexual activities" or "specified anatomical areas."
2. "Adult bookstore," "Adult retail store" or "Adult video store" means a commercial establishment which excludes any person by virtue of age from all or part of the premises generally held opened to the public where products or equipment distinguished or characterized by a predominant emphasis or simulation of "specified sexual activities" or "specified anatomical areas" are sold, rented or displayed therein, (unless the business complies with the requirements of 2C herein) or which has, as one of its principal business purposes, the sale or rental for consideration, one or more of the following:
  - a. Books, magazines, periodicals or other printed matter, or photographs, films, motion picture, video cassettes or video reproductions, slides, or other visual representations which depict or describe "specified sexual activities" or "specified anatomical areas."
  - b. Instruments, devices, paraphernalia or clothing which are designed for use in connection with "specified sexual activities," excluding condoms

and other birth control and disease prevention products. A commercial establishment may have other principal business purposes that do not involve the offering for sale or rental of material depicting or describing "specified sexual activities" or "specified anatomical areas" and still be categorized as an adult bookstore or adult video store. Such other business purposes will not serve to exempt such commercial establishment from being categorized as an adult bookstore or adult video store so long as one of its principal business purposes is the offering for sale or rental, the specified materials which depict or describe "specified sexual activities" or "specified anatomical areas."

- c. "Adult bookstore," "Adult retail store" or "Adult video store" does not mean any establishment which displays, rents or sells sexually-explicit materials in an enclosed room equal to less than 10% of the business's total square footage, and which prohibits anyone under 18 years of age from entering the room.
  - d. "Principle business purpose," as used in this section, means that more than 25% of the "stock in trade" of the business is devoted to the display, rent or sale of items, products or equipment distinguished or characterized by a predominant emphasis on, or simulation of, "specified sexual activities" or "specified anatomical areas."
  - e. "Stock in trade" for purposes of this sub-section shall mean the greater of: (1) the retail dollar value of all items, products or equipment readily available for purchase, rental, viewing or use by patrons of the establishment, excluding material located in any storeroom or other portion of the premises not regularly open to patrons; or (2) the total volume of shelf space and display area.
3. "Adult cabaret" means a nightclub, bar, restaurant or similar commercial eating or drinking establishment, which regularly features:
- a. Persons who appear in a state of nudity.
  - b. Live performances which are characterized by the exposure of "specified anatomical areas" or by "specified sexual activities."
  - c. Films, motion pictures, video cassettes, slides or other photographic reproductions which are characterized by the depiction or description of "specified sexual activities" or "specified anatomical areas."
4. "Adult car wash" means a car wash where some or all of the employees are semi-nude or nude and/or where "specified sexual activities" occur or "specified anatomical areas" are exhibited.
5. "Adult motel" means a hotel, motel or similar commercial establishment which:
- a. Offers accommodations to the public for any form of consideration; provides patrons with closed-circuit television transmissions, films, motion pictures, video cassettes, slides or other photographic reproductions which are characterized by the depiction or description of "specified sexual activities" or "specified anatomical areas;" and which may have a sign visible from the public right-of-way which advertises the availability of this type of photographic reproductions, or

- b. Routinely offers a sleeping room for rent for a period of time that is less than eight hours, or
  - c. Routinely allows a tenant or occupant of a sleeping room to sub-rent the room for a period of time that is less than eight hours, or
  - d. Evidence that a sleeping room in a hotel, motel, or a similar commercial establishment has been rented and vacated two or more times in a period of time that is less than eight hours creates a rebuttable presumption that the establishment is an adult motel as that term is defined in this section.
6. "Adult motion picture theater" means a commercial motion picture theater, one of whose primary business purpose is, for any form of consideration, to regularly show films, motion pictures, video cassettes, slides or similar photographic reproductions which are characterized by the depiction or description of "specified sexual activities" or "specified anatomical areas."
  7. "Adult theater" means a commercial theater, concert hall, auditorium, or similar commercial establishment, one of whose primary business purpose is to regularly feature persons who appear in a state of nudity, or which features live performances which are characterized by the exposure of "specified anatomical areas" or by "specified sexual activities."
  8. "Certificate of Nonconformity" means a certificate issued by the Town of Ravenel to any sexually oriented business which is operating at the time of the enactment of this Chapter, and is not in compliance with one or more of its provisions.
  9. Dancer means an employee of a sexually oriented business who entertains patrons through expressive forms of dance and/or movement.
  10. "Employee" means an individual working and performing services for any sexually oriented business, including any independent contractor who provides services on behalf of any sexually oriented business to the patrons of such business.
  11. "Established" or "establishment," as used in this Chapter, means and includes any of the following:
    - a. The opening or commencement of any sexually oriented business as a new business.
    - b. The conversion of an existing business, whether or not a sexually oriented business, to a sexually oriented business.
    - c. The addition of any sexually oriented business to any other existing sexually oriented business.
    - d. The relocation of any sexually oriented business.
  12. "Health club," as used in this chapter, means a health club where some or all of the employees are nude or semi-nude, or in which "specified sexual activities" occur or "specified anatomical areas" are exhibited.
  13. "Licensee" means a person in whose name a Sexually Oriented Business Regulatory License to operate a sexually oriented business has been issued, as

well as the individual listed as an applicant on the application for a Sexually Oriented Business Regulatory License.

14. "Live Entertainment," for purposes of this Chapter, means a person who appears nude, semi-nude, or a performance which is characterized by the exposure of "specified anatomical areas" or "specified sexual activities."
15. "Nude model studio" means any place where a person appears in a state of nudity or displays "specified anatomical areas" and is observed, sketched, drawn, painted, sculptured, photographed, or similarly depicted by other persons who pay money or any other form of consideration, and such place is not subject to an exemption pursuant to Section 3.1.4.S. herein.
16. "Nude," "Nudity" or "state of nudity" means:
  - a. The appearance of a bare human buttock, anus, male genitals, or the areola or nipple of the female breast; or
  - b. A state of dress which fails to completely cover a human buttocks, anus, male or female genitals, pubic region or areola or nipple of the female breast.
17. "Operate" or "causes to be operated," as used in this Chapter, means to cause to function or to put or keep in operation.
18. "Operator" means any person on the premises of a sexually oriented business who is authorized to exercise overall operational control of the business, or who causes to function or who puts or keeps in operation the business. A person may be found to be operating or causing to be operated a sexually oriented business whether or not the person is an owner, part owner, or licensee of the business.
19. "Patron" means any person who pays a sexually oriented business any form of consideration for services provided to him or her by a sexually oriented business.
20. "Person" means an individual, proprietorship, partnership, corporation, association, or other legal entity.
21. "Semi-nude" or "semi-nudity" means a state of dress in which clothing covers no more than the genitals of a man, or the pubic region and areolae of the breasts of a woman.
22. "Sexually oriented business" includes an adult arcade, adult bookstore, adult retail store or adult video store, adult cabaret, adult motel, adult motion picture theater, adult theater, nude motel studio, or any other business, such as a car wash or a health club, which offers, for consideration, materials or services characterized as depicting "specified sexual activities" or "specified anatomical areas," or whose employees perform services in a state of nudity or semi-nudity.
23. "Sexually Oriented Business Regulatory License" means a special annual operating license necessary for a sexually oriented business to do business in the Town of Ravenel. Such license is in addition to a Town of Ravenel Business License, and is issued by the Town of Ravenel.
24. "Specified anatomical areas" means the male genitals in a state of sexual arousal and/or the vulva or more intimate parts of the female genitals.

25. "Specified sexual activities" means and includes any of the following:
    - a. The fondling or other erotic touching of human genitals, pubic region, buttocks, anus or female breasts.
    - b. Sex acts, normal or perverted, actual or simulated, including intercourse, oral copulation, or sodomy.
    - c. Masturbation, actual or simulated.
    - d. Excretory functions as part of or in connection with any of the activities set forth above.
  26. "Substantial enlargement" of a sexually oriented business means the increase in floor areas occupied by the business by more than 25%, as the floor areas exist on the date the original Town of Ravenel Zoning Permit was obtained.
  27. "Transfer of ownership" or control of a sexually oriented business means and includes any of the following:
    - a. The sale, lease or sublease of the business.
    - b. The transfer of securities which constitute a controlling interest in the business, whether by sale, exchange or similar means.
    - c. The establishment of a trust, gift or other similar legal device which transfers the ownership or control of the business, except for transfer by bequest or other operation of law upon the death of the person possessing the ownership or control.
  28. "Viewing Room" means the room, booth, or area where a patron of a sexually oriented business would ordinarily be positioned while watching a film, video cassette, video reproduction, or live production.
  29. "Zoning Permit" means a Town of Ravenel Zoning Permit.
- C. Zoning Permit requirement for Town of Ravenel Business License and Sexually-Oriented Business Regulatory License:
1. Every person engaged or intending to engage in a sexually oriented business is required to obtain a Sexually Oriented Business Regulatory License.
  2. A person commits a misdemeanor if he operates a sexually oriented business without a valid Zoning Permit and Business License and Sexually Oriented Business Regulatory License issued by the Town of Ravenel.
  3. An application for a Zoning Permit must be made on a form provided by the Town of Ravenel. The application must be accompanied by a site plan, sketch or diagram showing the configuration of the premises, including a statement of total floor space occupied by the business. The sketch or diagram need not be professionally prepared but must be drawn to a designated scale or drawn with marked dimensions of the interior of the premises to an accuracy of plus or minus six inches.
  4. The applicant must be qualified according to the provisions of Section 3.1.4.D. and

the premises must be inspected and found to be in compliance with applicable State laws by the Health Department (DHEC) and the Charleston County Building Official.

5. If an entity wishing to operate a sexually oriented business is an individual, he must sign the application for a Sexually Oriented Business Regulatory License as applicant. If an entity wishing to operate a sexually oriented business is other than an individual, each individual who has a 10% or greater interest in the business must sign the application for a Sexually Oriented Business Regulatory License as an applicant. If a corporation is listed as owner of a sexually oriented business or as the entity wishing to operate such a business, each individual having a 10% or greater interest in the corporation must sign the application for a Sexually Oriented Business Regulatory License as applicant.
6. The fact that a person possesses other types of state or town permits and/or licenses does not exempt him from the requirement to obtain a Sexually Oriented Business Regulatory License.

D. Sexually-Oriented Business/Adult Business Regulatory License.

The Town of Ravenel shall approve the issuance of a Sexually Oriented Business Regulatory License to an applicant within 30 days after receipt of an application unless it finds one or more of the following to be true:

1. The applicant is under 18 years of age.
2. The applicant has failed to provide information reasonably necessary for issuance of Sexually Oriented Business Regulatory License or has falsely answered a question or request for information on the applicant form.
3. The premises to be used for the sexually oriented business have not been approved by the Health Department (DHEC) and the Charleston County Building Official as being in compliance with applicable laws and ordinances.
4. The applicant of the sexually oriented business is in violation of, or is not in compliance with, any one or more of the provisions of this Section of the Town of Ravenel Zoning Ordinance.
5. The Sexually Oriented Business Regulatory License, if granted, shall state on its face the name(s) of the person(s) to whom it is granted, the expiration date, and the address of the sexually oriented business. The Sexually Oriented Business Regulatory License shall be posted in a conspicuous place at or near the entrance to the sexually oriented business so that it may be easily read at any time.

E. Inspection. An applicant or licensee shall permit representatives of the Town of Ravenel, Charleston County Building Inspection, Charleston County Sheriff's Department, Health Department (DHEC), LOCAL Fire Department, and/or Town of Ravenel Legal Department to inspect the premises of a sexually oriented business for the purpose of ensuring compliance with the law, at any time it is occupied or open for business.

1. The licensee (or his agent or employee) of a sexually oriented business commits a misdemeanor if he refuses such lawful inspection of the premises at any time it is occupied or open for business. Such refusal is also grounds for suspension or revocation of a Sexually Oriented Business Regulatory License.

F. Expiration. A regulatory license for a sexually oriented business shall expire at the end of

each fiscal year.

1. A Sexually Oriented Business Regulatory License must be renewed each year two weeks prior to the expiration date.
  2. If, after denying the issuance or renewal of a Sexually Oriented Business Regulatory License, the Town of Ravenel finds that the basis for denial of the License has been corrected or abated, the applicant may then be granted a Sexually Oriented Business Regulatory License.
- G. Suspension. The Town of Ravenel shall suspend a Sexually Oriented Business Regulatory License for a period not to exceed 30 days if it is determined that a licensee or an employee of a licensee:
1. Has violated or is not in compliance with any requirements of this Section.
  2. Has refused to allow an inspection of the sexually oriented business premises as authorized by this Section.
  3. Has knowingly permitted gambling by any person on the sexually oriented business premises.
- H. Revocation. The Town of Ravenel shall revoke a Sexually Oriented Business Regulatory License if it determines that:
1. A cause of suspension as found in Section 3.1.4.G. occurs and the Sexually Oriented Business Regulatory License has previously been suspended within the preceding 12 months.
  2. The licensee gave false or misleading information in the material submitted to the Town of Ravenel during the application process.
  3. The licensee or an employee knowingly operated the sexually oriented business during a period of time when the licensee's Sexually Oriented Business Regulatory License was suspended.
  4. A licensee or an employee has knowingly allowed any act of sexual intercourse, sodomy, oral copulation or masturbation to occur in or on the permitted and/or licensed premises.
  5. If subsequent to revocation, the Town of Ravenel finds that the basis for the revocation of the Sexually Oriented Business Regulatory License has been corrected or abated, the applicant may be granted a Sexually Oriented Business Regulatory License.
- I. Appeal of designation, suspension or revocation. A sexually oriented business or a Licensee may appeal, in writing, the Town of Ravenel's designation of a business as a sexually oriented business, or the suspension or revocation of a Sexually Oriented Business Regulatory License to the Town of Ravenel Board of Zoning Appeals. Such appeal must be made within 10 days after the sexually oriented business or the Licensee receives written notice from the Town of Ravenel of a designation, suspension or revocation decision.
1. A Hearing will be scheduled and heard within three weeks of receipt of a written appeal.



2. The proceedings shall be recorded and transcribed at the expense of the party so requesting. The rules of evidence and procedure prescribed by the Board of Zoning Appeals shall comply. The Board of Zoning Appeals shall, by majority vote of the members present, render a written decision based upon findings of fact and the application of the provisions of this Chapter within three days of the Hearing. The decision of the Board of Zoning Appeals shall be final unless appealed to Circuit Court within ten days of receipt of the written Order.
- J. Transfer of license. A Licensee shall not transfer a Sexually Oriented Business Regulatory License to another sexually oriented business, nor shall a Licensee operate a sexually oriented business under the authority of a Sexually Oriented Business Regulatory License at any place other than the address designated in the application.
- K. Restrictions of location. A person commits a misdemeanor if he or she operated or causes to be operated a sexually oriented business outside of the zoning districts where the use is permitted.
1. A person commits a misdemeanor if he or she operates or causes to be operated a sexually oriented business within five-hundred (500) feet of:
    - a. A church.
    - b. A public or private school.
    - c. A residential structure existing at the time of application.
    - d. A public park.
  2. A person commits a misdemeanor if he causes or allows the operation, establishment, substantial enlargement, or transfer of ownership or control of a sexually oriented business within 1,000 feet of another sexually oriented business.
  3. A person commits a misdemeanor if he causes or allows the operation, establishment, or maintenance of more than one sexually oriented business in the same building, structure or portion thereof, or the substantial enlargement of floor areas of any sexually oriented business in any building, structure or portion thereof containing another sexually oriented business.
  4. For the purpose of this Subsection, measurement shall be made in a straight line, without regard to intervening structures or objects, from the nearest portion of the building or structure used as a part of the premises where a sexually oriented business is conducted, to the nearest property line of the premises of a church or public or private school, or to the nearest boundary of any neighboring public park, residential district or residential lot.
  5. For purposes of Subsection 2. above, the distance between any two sexually oriented business shall be measured in a straight line, without regard to intervening structures or objects, from the closest exterior wall of the structure in which each business is located.
- L. Adult Car Wash. Nude or semi-nude employees of adult car washes must not be able to be seen from any public right-of-way or adjoining parcels. Necessary fencing and/or buffers, as deemed appropriate by the Town of Ravenel, must be placed around the establishment in order to ensure that patrons can only view the employees once the patrons are inside the establishment.

- M. No fondling or caressing. It is a misdemeanor for any nude or semi-nude employee or dancer to fondle or caress any patron, and no patron shall fondle or caress any nude or semi-nude employee or dancer.
- N. The six-foot distance rule requires that:
1. No nude or semi-nude employee or nude or semi-nude dancer shall perform live entertainment within six feet of any patron, nor shall any patron experience live entertainment within six feet of any nude or semi-nude employee or nude or semi-nude dancer in a sexually oriented business. In the case of adult car washes, the six-foot distance rule necessitates that patrons get out of their vehicles, and stand at least six feet away from the nude or semi-nude employees.
  2. Sexually oriented businesses with live entertainment shall post in a conspicuous place a sign advising patrons that they must be at least six feet away from nude or semi-nude dancers at all times.
- O. Giving or accepting gratuities.
1. No patron shall personally pay or personally give a gratuity to any nude or semi-nude employee or any nude or semi-nude dancer in a sexually oriented business establishment. Gratuities can be placed in containers at a location away from the nude or semi-nude dancers or handed to clothed employees. As an alternative, employers could charge a cover charge and prohibit all gratuities.
  2. No nude or semi-nude dancer or nude or semi-nude employee of a sexually oriented business shall solicit or accept any pay or gratuity from a patron.
  3. Sexually oriented businesses with nude or semi-nude dancers or nude or semi-nude employees shall conspicuously post a sign that advises patrons that paying gratuities personally to nude or semi-nude dancers and nude or semi-nude employees is prohibited.
- P. Nonconformity of location of sexually oriented businesses.
1. Any sexually oriented business operating on the date this Section is adopted that is found to be in violation of any of the location provisions of Subsection K. above, shall be deemed a nonconforming use, and, upon written notification by the Town of Ravenel, must obtain a Certificate of Nonconformity from the Town of Ravenel. A certified nonconforming use will be permitted to continue to operate for a period not to exceed one year before being licensed.
  2. If the sexually oriented business does not, within six months of notification by the Town, obtain a Certificate of Nonconformity, then the business will be deemed in violation of this Ordinance, and will not be permitted to continue to operate six months past the date of enactment of this Section.
  3. No nonconforming use shall be increased, enlarged, extended or altered except that the use may be changed to a conforming use.
  4. If two or more sexually oriented businesses are within 1,000 feet of one another and otherwise in a permissible location, the sexually oriented business which was first established and continually operating at that particular location is the conforming use, and the later-established business is nonconforming.

5. Any sexually oriented business lawfully operating as a conforming use is not rendered a nonconforming use due to the subsequent location of a church, public or private elementary or secondary school, public park, residential structure, or a park within 500 feet of the sexually oriented business. This provision applies only to the renewal of a valid Sexually Oriented Business Regulatory License, and does not apply when an application for a Sexually Oriented Business Regulatory License is submitted after a Sexually Oriented Business Regulatory License has expired or has been revoked.
- Q. Adult motels prohibited. A person in control of a sleeping room in a hotel, motel, or similar commercial establishment, commits a misdemeanor if he or she rents or sub-rents a sleeping room to a person, and then, within eight hours from the time the room is rented, rents or sub-rents the same sleeping room again, as such creates a rebuttable presumption that the establishment is an adult motel as that term is defined in this Section. For purposes of this Subsection, "rent" or "sub-rent" means the act of permitting a room to be occupied or any form of consideration.
- R. Additional regulations pertaining to the exhibition of sexually explicit films and videos, adult arcades and health clubs:
  1. A person who operates or causes to be operated a sexually oriented business, as defined in this Section, which exhibits on the premises in a viewing room of less than 150 square feet of floor space, a film, video cassette or other video reproduction which depicts "specified sexual activities" or "specified anatomical areas," or which allows "specified sexual activities" to occur in a separate room in the establishment shall comply with the following requirements:
    - a. Upon application for a Sexually Oriented Business Regulatory License, the application shall be accompanied by a diagram of the premises showing a plan thereof specifying the location of one or more manager's stations and the location of all overhead lighting fixtures, and designating any portion of the premises in which patrons will not be permitted. A manager's station may not exceed 32 square feet of floor area. The diagram shall also designate the place at which the permit will be conspicuously posted, if granted. A professionally prepared diagram in the nature of an engineer's or architect's blueprint shall not be required; however, each diagram should be oriented to the north or to some designated street or object, and should be drawn to a designated scale or with marked dimensions sufficient to show the various internal dimensions of all areas of the interior of the premises to an accuracy of plus or minus six inches. The Town of Ravenel may waive the foregoing diagram for renewal applications if the applicant adopts a diagram that was previously submitted and certifies that the configuration of the premises has not been altered since it was prepared.
    - b. The application shall be sworn to be true and correct by the applicant.
    - c. No alteration in the configuration or location of a manager's station may be made without the prior approval of the Town of Ravenel or its designee.
    - d. It is the duty of the owners and operator of the premises to ensure that at least one employee is on duty and situated in each manager's station at all times that any patron is present inside the premises.
    - e. The interior of the premises shall be configured in such a manner that

there is an unobstructed view from a manager's station of every area of the premises to which any patron is permitted access for any purpose, excluding restrooms. Restrooms may not contain video reproduction equipment. If the premises has two or more manager's stations designated, then the interior of the premises shall be configured in such a manner that there is an unobstructed view of each area of the premises to which any patron is permitted access for any purpose from at least one of the manager's stations. The view required in this subsection must be by direct line of sight from the manager's station.

- f. It shall be the duty of the owners and operator, and also the duty of any agents and employees present in the premises, to ensure that the view area specified in Subsection e. remains unobstructed by any doors, walls, merchandise, display racks or other materials at all times and to ensure that no patron is permitted access to any area of the premises which has been designated as an area in which patrons will not be permitted in the application filed pursuant to Subsection a. above.
- g. No viewing room, nor any room or enclosed area in a health club that cannot be viewed from the manager's station, may be occupied by more than one person at any time.
- h. The premises shall be equipped with overhead lighting fixtures of sufficient intensity to illuminate every place to which patrons are permitted access at an illumination of not less than one candle foot as measured at the floor level.
- i. It shall be the duty of the owners and operator, and also the duty of any agents and employees present in the premises, to ensure that the illumination described above, is maintained at all times that any patron is present in the premises.
- j. A person having a duty under this section commits a misdemeanor if he knowingly fails to fulfill that duty.

S. Exemptions. It is a defense to prosecution under this Section that a person appearing in a state of nudity did so in a modeling class operated:

- 1. By a proprietary school, licensed by the state of South Carolina; a college, junior college, or university supported entirely or partly by taxation.
- 2. By a private college or university which maintains and operates educational programs in which credits are transferable to a college, junior college, or university supported entirely or partly by taxation.
- 3. In a structure:
  - a. Which has no sign visible from the exterior of the structure and no other advertising that indicates a nude person is available for viewing.
  - b. Where, in order to participate in a class, a student must enroll at least three days in advance of the class.
  - c. Where no more than one nude model is on the premises at any one time.

- T. Injunction. A person who operates or causes to be operated a sexually oriented business without a valid Sexually Oriented Business Regulatory License or in violation of this Ordinance is subject to a suit for injunctive relief as well as prosecution for criminal violations. Such violations shall be punishable by a fine of \$500.00 or thirty (30) days imprisonment.
- U. Severability. A determination that any portion of this Ordinance is invalid or unenforceable shall not affect the remaining portions.

**Section 3.1.5 Bed and Breakfast/Tourist Homes**

- A. Council Approval Criteria: The Bed and Breakfast shall be operated by the record owner of the subject property who is also a resident or shall have a manager/innkeeper permanently residing on the premises and shall meet the following criteria:
  1. No more than five (5) bed and breakfast units may be operated at the subject property for the provision of sleeping accommodations for transient occupancy.
  2. At least one (1) parking space must be provided on the property for each unit in the bed and breakfast use, in addition to at least two parking spaces required for the property owner. The parking area for the Bed and Breakfast uses located in an agricultural or residential zoning district shall be screened from view by evergreen planted material that will provide opaque screening at the time of maturity.
  3. The use must contain no signage advertising the bed and breakfast units other than one two-square foot (per side) sign allowed, set, at a minimum, ten (10) feet from the road rights-of-way.
  4. The use must be located on a property which is in compliance with the required minimum lot area and required setbacks for existing uses.
  5. The use must be subordinate and incidental to the principal residential use of the property and not create the need for extensive exterior alterations to any buildings that would alter the single family residential nature of the primary use.
  6. Completion of application form.
  7. All related requirements in this ordinance including parking, signage, buffering, etc. must be met.

**Section 3.1.6 Container Storage Facilities**

- A. Council Approval Criteria: Facilities for or including container storage (whether temporary or permanent) shall be subject to the following standards:
  1. Container storage facilities can be approved only for Light-Industrial zoned property of ten (10) acres or more and must be part of a trucking terminal operation.
  2. The facility's location and the proposed use, permitted uses and actual uses of the property will not substantially injure the actual or permitted uses of neighboring or nearby properties;
  3. Uses are separated from any adjoining uses or public or private rights-of-way,

excluding points of ingress or egress, by way of either:

- a. A suitably landscaped earthen berm sufficient in height to screen the facility from nearby properties and in no event less than eight (8) feet in height above finished grade; or
  - b. A solid, concrete brick or masonry wall of not less than ten (10) feet in height above finished grade which will be completely screened from view from public rights-of-way by means of a vegetative buffer.
4. Container stacking shall be limited to a maximum of two containers high and may be approved, where appropriate, pursuant to an approved container stacking plan. Such plan shall, at a minimum, contain a site plan showing location of all abutting streets and sidewalks, adjoining properties and uses, and the proposed stacking schedule. The plan shall include a perimeter buffer of not less than fifty (50) feet from the nearest property lines and rights-of-way.
- a. Developer must provide an engineer's report that the proposed storage and stacking of containers will meet OCRM approved land management practices and FEMA hurricane wind zone requirements and verify structural stability in high winds.
  - b. Developer must provide verification from the St. Paul's Fire Department that adequate protection is available at the proposed configuration of stacking.

**Section 3.1.7 Contractor, Construction Office.**

- A. Staff Approval Criteria: Contractor and construction offices may be established in a Neighborhood Commercial District upon application and providing that the use meets the following criteria:
1. There can be no outside storage of materials and equipment.
  2. Nearby residential uses shall not be impacted by noise, fumes, and dust of heavy truck traffic.
  1. All related requirements of this ordinance including signage, parking, buffering, etc. must be met.

**Section 3.1.8 Day Care Center.**

- A. Council Approval Criteria: Family day care facilities may be established in residential and commercial districts upon application and provision of the following requirements:
1. Proof of application for the facility's registration with the Department of Social Services is submitted.
  2. Adequate play areas are provided and hours of outdoor play are limited to between the hours of 8 a.m. and 6 p.m.
  3. The day care is an accessory use of a residence occupied by the owner of the facility unless in a commercial district whereas it may be the principal use.
  4. The proposed outdoor lighting of the facility does not unduly impact nearby residential properties.

5. There are no signs identifying the day care except for one (1) two (2) square foot (per side) identification sign.
6. A notice of the proposed use is posted on the property for a ten-day notification period and no objection is expressed. If, however, prior to the expiration of the ten day posting period, a petition opposing the use is filed with the Town and signed by a majority of the property owners within 200 feet of any lot line of the property then the matter shall be referred to the Board of Zoning Appeals.
7. All related requirements in this ordinance including parking, signage, buffering, etc. must be met.

**Section 3.1.9 Detached Single Family Dwellings in a Non-Residential District.**

- A. An exclusively Owner Occupied detached single-family dwelling in a non-residentially zoned district may be approved as a Conditional Use as indicated in the Zoning Ordinance Use Matrix found in Appendix B, subject to the following conditions:
  1. The lot must be at least 1 acre in size.
  2. Separate water and septic or sewer service, approved by DHEC, is required for the residential use and the non-residential use or uses. Separate electrical service may be required.
  3. The residential use shall meet the lot density and setbacks as required for property zoned as Residential Two (R-2). Additionally, the residential use must:
    - a. Meet all other requirements of the Zoning Ordinance and Town Code; and
    - b. Not be expanded or increased in use, area, or intensification of either the primary structure nor any accessory buildings.
  4. The non-residential use shall meet all requirements of the underlying zoning district. Additionally, the non-residential use must:
    - a. Provide a 15' planted buffer area between the residential and non-residential uses; and
    - b. Provide an opaque fence of at least 6' in height to screen the non-residential activities from view of any right-of-way; and
    - c. Meet all other requirements of the Zoning Ordinance and Town Code; and
    - d. Not be expanded or increased in use, area, or intensification unless the residential use is removed from the property.
- B. A detached single-family dwelling to be occupied only by an owner or property caretaker in a non-residentially zoned district may be approved as a Conditional Use as indicated in the Zoning Ordinance Use Matrix found in Appendix B, subject to the following conditions:
  1. The lot must be at least 5 acres in size.
  2. Separate water and septic or sewer service, approved by DHEC, is required for the residential use and the non-residential use or uses. Separate electrical service may be required.
  3. The residential use shall meet the lot density as required for property zoned as Residential One (R-1). Additionally, the residential use must:
    - a. Be set back a minimum of 100' from all rights-or-way and 50' from all property lines; and
    - b. Meet all other requirements of the Zoning Ordinance and Town Code; and
    - c. Not be expanded or increased in use, area, or intensification of either the primary structure, nor any accessory buildings.

4. The non-residential use shall meet all requirements of the underlying zoning district. Additionally, the non-residential use must:
  - a. Provide a 15' planted buffer area between the residential and non-residential uses; and
  - b. Meet all other requirements of the Zoning Ordinance and Town Code; and
  - c. Not be expanded or increased in use, area, or intensification unless the residential use is removed from the property.

**Section 3.1.10 Drinking (of Alcoholic Beverages) Places, including bar or lounge, taverns, cocktail lounges, members exclusive clubs, whether public or private**

A. Council Approval Criteria: Establishments licensed for the selling and on-site consumption of alcoholic beverages are permitted to be located in Light Industrial (LI) and General Industrial (GI) districts as a Conditional Use, provided the following conditions are met:

1. All of the provisions and requirements of the general law of the State in regard to alcoholic beverages, beer and wine as contained in S.C. Code 1976, Title 61, et seq and amendments thereto insofar as such provisions have application within the town are adopted and made part of this chapter and a valid State Alcohol Beverage Commission license authorizing the applicant to sell beer, wine or other alcoholic beverages must be obtained.
2. The place of business shall not be within one thousand (1000) feet of any church, school or playground or within five hundred (500) feet of an existing bar as measured from the nearest property line of any existing church, school, playground or bar, to the nearest property line of the proposed bar.
3. The operation of such establishments shall not disturb the tranquility of residential areas or other areas within close proximity or otherwise interfere with the reasonable use and enjoyment of neighboring property by reason of violence, excessive noise, traffic and litter. Noise shall not be audible from outside the building in which such establishment is located.
4. Operators of such establishments shall not allow loitering or congregations of individuals outside the building or in the parking lot and shall keep all entrance and exit doors closed at all times excepts when patrons, employees or other persons are entering or exiting the establishment.
5. All related requirements in this ordinance including landscaping, parking, signage, buffering, etc. must be met.

**Section 3.1.11 Eating places**

A. Council Approval Criteria: Restaurants and eating places are allowed within a Neighborhood Commercial district provided the following conditions are met:

1. The sale of alcoholic beverages is incidental to the food service only.
2. Parking shall be provided so access to property is not on a residential street so as not to interfere with neighboring residential traffic.
3. Hours of operation are restricted to between the hours of 7 a.m. and 11 p.m.



4. All related requirements in this ordinance including parking, signage, buffering, etc. must be met.

**Section 3.1.12 Farm Labor Housing.**

- A. Residential accommodations for farm laborers may be located in agriculturally zoned districts pending Council's review and the following criteria are met:
  1. The minimum lot area for farm labor housing shall be five acres.
  2. Such use shall be setback a minimum of 100 feet from road rights-of-way and all property lines.
  3. A minimum 50-foot planted buffer shall be maintained along the sides and rear property lines.
  4. Farm labor housing shall be used on a seasonal basis only and not serve as year-round housing.
  5. All related requirements in this ordinances including parking, signage, buffering, etc. must be met.

**Section 3.1.13 Food, Grocery Stores.**

- A. Council approval criteria: Food or grocery stores are allowed within a Neighborhood Commercial district providing the following requirements are met:
  1. The place of business shall be no larger than five thousand (5,000) square feet.
  2. Adequate parking and loading spaces must be provided on site.
  3. Lighting from the parking lot shall be directed onto the site and away from adjoining residential property.
  4. Hours of operation shall be limited to between the hours of 7:00 a.m. and 10:00 p.m.
  5. All related requirements in this ordinance including signage, parking, buffering, etc. must be met.

**Section 3.1.14 Gasoline service stations.**

- A. Council approval criteria: Gasoline service stations are allowed as a Conditional Use in a Neighborhood Commercial district if the following requirements are met:
  1. Buildings or equipment shall not be within 50 feet of any residential zone district or within one hundred (100) feet of any existing school or church.
  2. Entrances and/or exits shall be onto public roadway and will not be in excess of forty (40) feet wide.
  3. Lighting from the parking lot shall be directed onto the site and away from adjoining residential property.
  4. Hours of operation shall be limited to between hours of 7:00 a.m. and 11:00 p.m.

5. All related requirements in this ordinance including parking, signage, buffering, etc. must be met.

**Section 3.1.16 Manufacturing, Light. Computers or electronic products and equipment, fabric and materials production, food processing and production of glass goods.**

- A. Council approval criteria: Allowed in zoning district subject to conditions (C);
- B. No more than five employees on any one shift of operations;
- C. Hours of operation shall be restricted to the hours between 7:00 a.m. to 11:00 p.m.
- D. In GB zoning district, maximum floor area of facility shall be limited to no more than 5,000 (five thousand) square feet.
- E. All other applicable requirements of the Zoning Ordinance shall be met.

**Section 3.1.17 Mobile Home Park. See Section 2.6.7.**

**Section 3.1.18 Recreation Vehicle Park.**

- A. A Recreational Vehicle Park may be located as a Conditional Use provided a site plan is submitted for Town Council's review showing the layout and planned improvements and the following requirements are met:
  1. The site must have direct access to an approved public road.
  2. The motor home vehicles located at the site shall be fully licensed and ready for highway use or be anchored as per mobile home elevation and anchoring regulations.
  3. The motor home vehicles shall be limited to a maximum stay of six months on site.
  4. Appropriate waste system provided as approved by DHEC.
  5. All related requirements in this ordinance including parking, signage, solid waste removal, buffering, etc. must be met.

**Section 3.1.19 Resource Extraction**

- A. All requests for resource extraction shall complete the Site Plan review process before Council after consideration for a Special Exception is granted by the Board of Zoning Appeals. Application shall include:
  1. A written statement of intent.
  2. Proof of application to the South Carolina Department of Health and Environmental Control made within six months of application to the town.
  3. Plat and proof of ownership of property to be used for mining.
- B. Along with criteria for Special Exception approval, the Board of Zoning Appeal shall consider:

1. Safe property access that does not impact nearby residential areas.
2. Screening of excavation area and protection of nearby residential uses from dust, noises, etc.
3. Drainage plan for property before and after resource extraction.
4. Plan for restoration and/or use of property after excavation is completed.

**Section 3.1.20 Salvage or Junk Services or Yards.**

- A. Council approval criteria. Properties proposed for salvage or junk services require review and approval in accordance with the Special Exceptions as specified under Section 3.2 and shall meet the following criteria:
1. Yards used for the sale, rental and/or storage of new, used or salvaged materials shall be enclosed with a minimum six (6) foot high opaque fence or masonry wall.
  2. No burning of materials or products shall be conducted on the premises except by means of approval by the St. Paul's Fire Chief.
  3. All related requirements in this ordinance including parking, signage, buffering, etc. must be met.

**Section 3.1.21 Telecommunication Towers.**

- A. Definitions.
1. Communications tower as used in this ordinance shall mean a tower, pole, or similar structure which supports a telecommunications antenna operated for commercial purposes above ground in a fixed location, freestanding, guyed or on a building.
  2. Telecommunications as defined in the federal Telecommunications Act of 1996, means the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.
  3. Antenna means a device, dish or array used to transmit or receive telecommunication signals.
  4. Height (of a communication tower) is the distance from the base of the tower to the top of the structure.
- B. Communications tower and antenna permitted as conditional use. A communications tower and/or antenna may be permitted by Ravenel Mayor/Town Council without further review upon determination that all of the applicable conditions in this ordinance are met.
- C. District in which Communication Towers/Antenna are permitted; Light Industrial (LI) Communication towers shall be approved within the LI district subject to a finding that a tower satisfies the staff approval or by the Zoning Board of Appeals as an exception subject to a finding that the tower satisfies the special exception criteria listed below.

Towers which are no longer used for communication purposes must be dismantled and removed within 120 days of the date the tower is taken out of service.

1. Staff Approval Criteria. Staff may approve the construction of a communication tower upon a finding that each of the following criteria are met:
  - a. The height of the proposed tower must not exceed 200 feet; and
  - b. The tower must be located no closer to residential or conservation zoned property than a distance equal to one-half the heights of the proposed tower, if said property is intended to remain zoned as residential or conservation under the adopted land use plan for that area; and
  - c. The proposed tower must be located such that adequate setbacks are provided on all sides to prevent the tower's fall zone from encroaching into adjoining properties (the fall zone shall be determined by an engineer certified in the State of South Carolina in a letter which includes the engineers signature and seal); and
  - d. The proposed tower must not be visible from property listed in the National Register of Historic Places, or from a road or river which has been officially designated as a scenic road or river. The line of site to determine whether a proposed tower will be visible from a certain location, will be from approximately six feet above grade, or the river level at high tide, at that location; and
  - e. The proposed tower and associated improvements meet applicable zoning district and setback requirements, and applicable landscaping and tree protection measures requirements; and
  - f. The applicant has attempted to collocate on existing communication towers, building, or other structures and the applicant is willing to allow other users to collocate on the proposed tower in the future subject to engineering capabilities of the structure, frequency considerations, and proper compensation from the additional user; and
  - g. The proposed tower is only illuminated as required by the Federal Communications Commission, Federal Aviation Administration or other regulatory agencies. Night time strobe lighting shall not be incorporated unless required by the Federal Communications Commission, Federal Aviation Administration or other regulatory agency; and
  - h. The color of the proposed tower is appropriate to blend in with its surroundings; and
  - i. The proposed tower and associated structures are appropriately secured by means of walls, fences or other devices; and
  - j. The proposed tower does not include signage of any nature on any portion of the tower.
2. Zoning Board of Appeals approval criteria. The Zoning Board of Appeals may approve construction of a communication tower as exception upon a finding that each of the following criteria are met:

- a. The height of the proposed tower must not exceed 250 feet; and
  - b. In addition to satisfying staff approval criteria used above as c, e, f, g, h, i, j, the Board must find that the design, location and height of the proposed tower will not substantially impact (1) the aesthetic and residential character of adjoining areas zoned residential or conservation and intended to remain as such under adopted land use plans; and (2) the character of property listed in the National Register of Historic Places, or roads and rivers which have been officially designated as scenic roads or rivers.
3. Application for staff or Board approval shall include the following information: The applicant for a conditional use permit for construction of a communications tower or placement of a commercial telecommunications antenna on an existing structure other than a tower previously permitted must file with the Clerk Administrator as application accompanied by a fee of \$275.00 and the following documents, if applicable:
- a. A scaled site plan showing the location of the tower(s), guy anchors (if any), building and other structures or improvements, parking, driveways and fences, proposed screening and all protected and grand trees affected by the proposed improvements. Adjacent land use shall also be noted on the site plan.
  - b. The height and typical design of the tower, typical materials to be used, color, and lighting shall be shown on the elevation drawing.
4. Documentation indicating that collocation on existing towers or buildings in the vicinity of the proposed tower was attempted by the applicant but found to be unfeasible, with reasons noted.
6. Other information as requested by staff or the Board to allow adequate review of approval criteria, including photographs with the tower superimposed to assess visual impact.
7. All related requirements in this ordinance including parking, signage, buffering, etc. must be met.

**Section 3.1.22 Towing Services, No Vehicle Storage.**

- A. Council approval criteria: Allowed in zoning district subject to conditions (C);
- B. No more than two (2) towing vehicles on premises at any given time.
- B. Temporary overnight holding of vehicles;
- C. All other applicable requirements of Zoning Ordinance must be met.

**Section 3.1.23 Towing Services, Vehicle Storage Allowed.**

- A. Council approval criteria: Allowed in zoning district subject to conditions (C);
- B. Use shall be separated from any adjoining uses or rights-of-way excluding points of ingress and egress by way of a solid concrete, brick or masonry wall or wooden fence of not less than six (6) feet in height above finished grade or by a berm of no less than six (6) feet in

- height and landscaped subject to requirements under Section 4.2.3. Planting Standards;
- C. Vehicle storage area shall be set back from road rights-of-way a minimum distance of 100';
  - D. Lighting shall be so directed upon the property so as not to reflect onto adjacent properties.
  - E. All other applicable requirements of the Zoning Ordinance must be met.

**Section 3.1.24 Turkey Shoots.**

- A. Council approval criteria: Turkey shoots are allowed to be conducted by a non-profit, charitable organization within Agricultural Residential, General Business, General Industrial, and Light Industrial Districts provided the following conditions are met:
  - 1. Minimum lot size for conducting a turkey shoot business shall be 10 acres with adequate buffering from nearby uses.
  - 2. Total time of operation shall be limited to 60 days during a one-year period; this time period shall begin the first date that such use is established and ready to operate.
  - 3. Adequate off-street parking shall be provided. Sharing of parking with existing businesses shall be allowed if hours of operation do not overlap.
  - 4. No sale of food or beverages nor consumption of alcoholic beverages shall be allowed.
  - 5. Other conditions as specified by Council.

**Section 3.1.25 Veterinary Services or Pet Care Clinic**

- A. Staff approval criteria: Veterinary service offices or pet care clinic are allowed as a Conditional Use provided the clinic meets the following criteria:
  - 1. The clinic will provide for animals no larger than a dog with medical care on premises and overnight lodging only for animals under treatment.
  - 2. Structures or equipment will not be located within 100 feet of any residential zone district or existing residence, school, church or health care facility.
  - 3. Animal will be contained within the principal building which shall be so constructed with appropriate soundproofing and ventilation to prevent objectionable odors and sound from being emitted.
  - 4. No cremation of animals will occur on the property.
  - 5. All related requirements in this ordinance including parking, signage, buffering, etc. must be met.

**Section 3.2 Special Exceptions**

- A. Applications for Special Exceptions shall be filed with the Town on a Board of Appeals Application form and all information submitted as required.

1. Public Hearing Notice. The application for a Special Exception shall be presented to the Board of Zoning Appeals at a scheduled Public Hearing. Notice of the Public Hearing shall be provided in a local newspaper 15 days prior to the meeting date. The subject property shall be posted and notices of the meeting date shall be mailed to property owners within 300 feet of the subject property.
- B. The Board of Zoning Appeals shall hold a Public Hearing on the proposed Special Exception and shall act to approve, approve with conditions or deny the proposed Special Exception based on the following approval criteria:
1. The use will not endanger the public health, safety, and general welfare or be hazardous to surrounding uses due to noise, dust, glare, odor, fumes, smoke, traffic congestion or water pollution, if allowed to locate where proposed; and
  2. Adequate provision is made for compliance with all applicable standards of this Ordinance, including setbacks, fences, parking, landscaping, buffering to protect adjacent properties and use conditions of the district in which it is to be located, and with the Town of Ravenel Comprehensive Land Use Plan, as approved; and
  3. The proposed use is consistent with the character of the underlying district to the extent that such use will not adversely affect the property values or general character or the nearby area and will contribute to the convenience of the immediate community and public; and
  4. The proposed use will have adequate water and waste water supply, stormwater facilities, waste disposal and other public services; and
  5. The proposed use will be developed in a way that will preserve and incorporate any important natural features that are part of the site.
  6. In approving a Special Exception, the Board may attach such reasonable conditions as it may consider necessary to meet the intent of the Ordinance.
- C. Notice of Findings
1. The decision of the Board of Zoning Appeal shall be accompanied by specific findings of fact, clearly stating the reasons for the decision.
  2. Within ten days of the final decision by the Board of Zoning Appeals, copies of the decision shall be sent to the applicant and shall be filed at Town Hall where it shall be available for public inspection during regular office hours.
  3. Appeals
    - a. Appeals to the decision of the Board of Zoning Appeals may be made by any person with a substantial interest in the decision to the Circuit Court of Charleston County. Appellants shall file with the Court Clerk a written petition fully setting forth how such decision is contrary to law. Such appeals shall be filed in accordance with Appendix E.
  4. Lapse of Approval. An approved Special Exception shall lapse one (1) year from the date of approval by the Board unless a zoning permit is obtained.

**Section 3.3 Accessory Uses and Structures**

- A. Permitted accessory uses and structures are uses and structures that are customarily considered as being appropriate and in connection with the allowed principal use of the lot, but they are subordinate or incidental to the allowed principal use. Permitted accessory uses and structures may require a Zoning Permit.
- B. The Planning and Zoning Administrator will determine if an accessory use and/or structure is “necessarily and customarily associated with, appropriate to, and incidental and subordinate” to the allowed principal use. The Planning and Zoning Administrator will consider ALL accessory buildings upon a zoning lot and will review other elements such as visibility and the scale of the property in relation to the accessory use or structure. This decision may be appealed to the Board of Zoning Appeals.
- C. Accessory uses and structures shall be allowed in zoning districts as indicated in Appendix B and must comply with all applicable requirements of the Ravenel Zoning Ordinance.
- D. An accessory use or structure cannot exist without a principal use or structure unless as indicated below.
- E. Examples of accessory uses and structures and additional criteria are indicated in the following sections.

**Section 3.3.1 Allowed Accessories to Residential Property**

- A. An accessory structure can be used without a principal building on a residential property provided that:
  - i. The accessory structure is being used to aid in the construction of a principal structure that is fully permitted with a Zoning Permit and a Building Permit.
  - ii. If the Zoning Permit for the principal building expires, the accessory structure being used to aid in the construction of the principal structure must be removed.
  - iii. An accessory structure cannot be used as a temporary dwelling unit, but may be used to secure tools, materials, and equipment.
  - iv. OR, the accessory structure is demonstrated to be used as a barn or other farm-related structure, where permitted by Appendix B and shown to comply with all applicable requirements of the Ravenel Zoning Ordinance.
- B. Vehicle storage buildings, sheds, home workshops, or residential building or maintenance equipment storage units;
- C. Private swimming pools, bath houses, sport courts, playhouses, and other private recreational facilities for residents of the principal dwelling;
- D. Accessory garage apartments, where permitted by Appendix B;
- E. Accessory dwelling units for guests, owners, employees, or caretakers, where permitted by Appendix B, in compliance with all applicable Ravenel Zoning Code requirements, and on lots of 5 acres or more and with separate septic/water facilities;
- F. Shipping containers and tractor trailers are prohibited as permanent storage buildings in all residential districts. They may be approved as temporary storage with an approved Zoning Permit.
- G. Gate houses and guard houses for private roads;



- H. Satellite dishes, radio and television receiving antennas, and solar collectors;
- I. Accessory home occupations. A home occupation may be established in a dwelling unit, as an accessory to the principal residential use provided the proposed use meets the criteria listed for the home occupation. A home occupation shall be defined as any commercial use conducted within a dwelling by the resident of record. The method or amount of compensation for the commercial activity is irrelevant. This may include a hobby or seasonal activity.

A home occupation may not constitute a nuisance or adversely affect the use and development of adjoining properties and must comply with all requirements of the Ravenel Town and Zoning codes and other state and local laws.

Home occupations may include: lawn care service, accounting, business administration services, data or computer processing, cleaning service, mail order processing, newspaper delivery, painting, interior design or personal services such as music instruction, dancing, or crafts.

A home occupation does not include such occupations as building contractor, landscape services, motor vehicle repair, beauty parlor, boarding homes, animal kennels, veterinarian or other medical offices. A home occupation does not include any business activity that requires employees or contractors to meet to travel to jobs, storage of additional vehicles or equipment, sales rooms or customer traffic, or additional storage for products outside of the home.

If a business that is not considered a home occupation has elements of its business, such as accounting or administration, those elements may be allowed as a home occupation provided there are no employees, vehicles, customers, or equipment visible from outside the home and all other requirements of this section are met.

- 1. Applications for a Home Occupation Use shall be made on a form available at Town Hall and will be approved by Town Staff if the following conditions are met:
  - a. The home occupation must be incidental to the principal residential use of the property and shall not change the residential character.
  - b. The home occupation use shall not occupy more than twenty-five (25) percent of the existing principal building.
  - c. No accessory building or outside storage shall be used in connection with the home occupation.
  - d. No article, product or service sold in connection with such activity shall be other than those produced on the premises.
  - e. No electrical or mechanical equipment, including vehicles or trailers, that is not normally part of usual and customary the household equipment or residential vehicles, shall be permitted, nor can the proposed use create disturbing or offensive noise, vibration, smoke, dust, or hazardous fumes or generate traffic.
  - f. There shall be no visible evidence of the home occupation from outside the dwelling unit except for a sign with a maximum two (2) square foot per sign face shall be permitted.

- g. Such occupation shall be carried on by a resident of the household, with no other employees, except for members of the family living on the premises.
  - 2. Upon review and approval of the home occupation, an applicant may apply for a Zoning Permit and Business License with the Town of Ravenel. Any conditions for the home occupation will be noted on the Permit and License.
  - 3. Home Occupation approval shall be revoked upon a finding that any home occupation established under this section fails at any time to meet the requirements prescribed herein or the conditions noted on the Permit or License.
  - 4. Decisions to revoke a Home Occupation approval and related permits are made by the Planning and Zoning Administrator and may be appealed to the Board of Zoning Appeals as indicated in Section 1.15 of this Zoning Ordinance.
- J. Electric meters in residential districts. A second and separate electric meter may be permitted under the following conditions:
- a. A separate electrical meter shall be allowed for a permitted and detached accessory dwelling unit. A separate electrical meter is not allowed for attached dwelling units.
  - h. In residential zoning districts, a separate electric meter of up to 60 amperes shall be allowed for accessory nonresidential structures if such structure is located more than 100 feet from the electric meter used by the principal structure.
  - c. In Agriculture Residential (AR) district, a separate electric meter of up to 100 amperes shall be allowed for accessory nonresidential structures if such structures are located more than 100 feet from the electric meter used by the principal structure. The Zoning Administrator shall be authorized to approve electric meters of up to 200 amperes when deemed necessary to accommodate agriculture-related equipment that requires more than 100 amperes.

**Section 3.3.2 Allowed Accessories to Commercial or Industrial Facilities**

- A. Dwelling units for owners or property caretaker personnel as provided under Section 3.1.9;
- B. Off-street parking, loading or storage area for customer, client or employee-owned vehicle;
- C. Accessory uses and structures, completely enclosed buildings for storage of supplies, stock or merchandise, as approved during commercial site plan review;
- D. Shipping containers and tractor trailers may be used as storage structures in non-residential districts with approved site plan review and zoning approval;
- E. Gates and Guardhouses;
- F. Radio and television antenna, satellite dishes and solar collectors;
- G. Gasoline or fuel oil pump and storage tank, provided not more than 500 gallons of gasoline be stored above ground, nor storage of petroleum products in excess of 40,000 gallons per site.

**Section 3.3.3 Allowed Accessories to Church Buildings**

- A. Religious education buildings;
- B. Parsonage, parsonium or parish house, together with any use accessory to a dwelling as listed in Section 3.3.1;
- C. Off-street parking area for the use of church members and visitors;
- D. Completely enclosed building for storage of supplies, stock or merchandise.

**Section 3.3.4 Accessory Placement and Other Regulations**

- A. Accessory buildings shall be erected on the rear two-thirds of the lot or behind the principal structure, except in the case of carports which can be erected in the required front yard setback;
- B. Accessory buildings may occupy the required rear yard provided they are not placed within 6 feet of the rear or side property lines;
- C. Accessory buildings can be placed no closer than 15 feet to the principal dwelling unit on the lot or the adjoining lot;
- D. Accessory buildings shall have a building footprint no greater than one-thousand, two hundred (1,200) square feet and shall be no taller than twenty-four (24) feet in height;
- E. A barn or farm-related building must be used for farm equipment, animals, supplies, or feed only and may exceed the size and height limitation indicated in Section 3.3.4 D. if located on agriculturally-zoned property;
- F. An accessory structure attached to the principal structure shall share a common wall therewith and shall comply with all requirements of the principal dwelling.

**Section 3.4 Temporary Uses**

Temporary Uses are allowed on a provisional, short-term basis and must be discontinued within a set limit of time. Consideration for extension of time shall be through appeal to Council.

- A. Temporary Sales. The Zoning Administrator shall be authorized to issue temporary permits for the sale of Christmas trees, fireworks, and other items that are seasonal and temporary in nature. The permit time frame shall not exceed a time period of 60 days.
- B. Temporary public assembly uses and parking for special events as approved by Council. Temporary permits shall be issued only if adequate parking and sanitary facilities are provided to serve the proposed use or activity and if the proposed public assembly meets the requirements of Chapter 72 of the Town Code.
- C. Yard sales. No more than four yard sales shall be permitted per lot, per year. No business license is required for a yard sale.
- D. Road side vegetable stands, seasonal farm produce stands selling sweet grass baskets, indigenous produce and related products shall be allowed. A peddler's license must be purchased.

## CHAPTER 4. LAND DEVELOPMENT REGULATIONS

### **Section 4.1 Lot and Building Development Criteria**

Development within the Town of Ravenel shall comply with all applicable provisions of this Ordinance. The following specific criteria shall apply:

#### **Section 4.1.1 Compliance.**

The lot, setback and height requirements shall comply with district regulations (as found in Chapter Two), unless modified by special provisions, variances, exceptions and conditions contained elsewhere in this chapter.  
(Ord., passed 8-17-87, amended 01-20-00)

#### **Section 4.1.2 Lot Width.**

Lot width is measured between side lot lines along a line parallel to the front line and located the minimum front setback distance from the front lot lines.

#### **Section 4.1.3 Absence of Public Sewer or Water.**

In the absence of public water or public sewer, no building permit shall be issued until the lot meets all the requirements of this Ordinance and the South Carolina Department of Health and Environmental Control.

#### **Section 4.1.4 Reduction of Lot Area Prohibited.**

No lot shall be so reduced in size as to result in the violation of any requirement of Chapter Two, Minimum Lot Size requirements for each Zoning District or of the Subdivision Regulations in Chapter Five.

#### **Section 4.1.5 Lots for Certain Utility Facilities.**

The Town Council or the Town Board of Zoning Appeals may reduce the required minimum lot area and width for a pumping, pressure regulating, or similar utility substation.  
(Ord., passed 8-17-87)

#### **Section 4.1.6 Substandard Approved Lots of Record.**

Substandard approved lots of record, pre-existing lots (lots subdivided and approved before 1994) and those which do not meet minimum lot size requirements shall not be subject to the minimum lot area and width requirements provided they comply with setback and other building lot requirements and do not abut a lot in the same ownership at the adoption of this chapter.

#### **Section 4.1.7 Subdivision.**

A lot may be subdivided provided that all resulting lots and structures comply with the provisions of Minimum Lot requirements in Chapter Two and the Subdivision Regulations in Chapter Five. If a lot is occupied by a nonconforming structure, it may be subdivided provided that subdividing does not create a new nonconformity or increase the degree of nonconformance of the structure.

**Section 4.1.8            Lots to Have Access.**

No lots shall be created within the town limits which do not have access to publicly-maintained or private street of record, except as provided below. Such access shall consist of frontage on a public or private street of a width of not less than 20 feet and a minimum right-of-way width of 50 feet.

- A. In the subdivision of a single lot of record into two lots, a 20 foot minimum ingress/egress easement may be approved as access to the subdivided lot, provided that each newly created lot conforms to the underlying minimum zoning district standards. The location of the easement shall be clearly depicted and labeled on submitted plats.  
(Ord. passed 11-28-06)

**Section 4.1.9            Limitation of One Residential Building per Lot.**

- A. Except as provided elsewhere in this Ordinance, no principal detached residential structure shall be located on the same zoning lot with any other principal structure.
- B. Where garage apartments are permitted, only one such apartment shall be permitted on any zoning lot.        (Ord., passed 8-17-87)

**Section 4.1.10         Special Setbacks Established.**

Where special setback lines have been established on any street by the Town Council by approval of a subdivision plat or otherwise, such setback lines shall prevail over the front setbacks established herein.    (Ord., passed 8-17-87)

- A. Front setbacks of adjacent structures. Notwithstanding the front setback requirements of this Ordinance, the front building line of any structure or addition to a structure may be as close to the street as the front building line of the immediately adjacent structure on a separate lot on the same block, either to the right or to the left, whichever of the two is farther from the street.    (Ord., passed 8-17-87)
- B. Differing setback requirements at district boundaries for front setbacks.
  - 1. Where a zoning district boundary lies along a portion of a street and the front setback requirements in the two districts are not the same, the greater requirement shall apply on both sides of such portion of the street. This requirement shall not apply if the right-of-way exceeds 50 feet.
  - 2. Where a district boundary intersects a street line and the front setback requirements in the districts on either side of the boundary are not the same, the greater setback requirement shall continue along such street for 100 feet into the district having the lesser requirement.
- C. Differing setback requirements as district boundaries for interior setbacks:
  - 1. Where the interior setback requirement of a district on one side of a district boundary differs from the requirement on the other side thereof, the greater requirement shall prevail.
- D. Reduction of one front setback on narrow corner lot.
  - 1. Where the front and interior setbacks required by this chapter reduce to less than 40 feet the buildable width of any corner lot which was of record as of the effective date of this chapter, the front setback on the longer street side may be reduced as much

as shall be necessary to increase such buildable width to 40 feet but shall not be reduced to less than 15 feet.

- a. In the event the street sides of such lot are of equal length, the reduction shall be made on the side which lies on the shorter side of the block. (Ord., passed 8-17-87)
- E. Front setbacks on narrow streets. Where a lot abuts a publicly dedicated street that has been accepted for street maintenance and has a right-of-way of less than 50 feet wide, the required front setback shall be measured from a line measured 25 feet from the center of such right-of-way. (Ord., passed 8-17-87)
- F. Rear setbacks from wetlands. Rear yard setbacks for lots abutting wetlands shall be a minimum of 35 feet from the critical line as determined by the state or federal regulating agency.

**Section 4.1.11 Exceptions to Setbacks.**

All areas between the property lines and setback lines must remain open, unoccupied and unobstructed except as follows:

- A. Eaves, cornices, chimney and flues, window sills and other architectural features may project into any required setback not more than 24 inches.
- B. Open, uncovered porches, open fire escapes, uncovered decks and balconies may project into a front or rear setback not more than five (5) feet.
- C. Fences, walls and hedges may be erected in any required setback or along the edge of lot, provided that in any residential zone, NC or GB District, no fence, wall or hedge located in a front setback or street side setback shall exceed four (4) feet in height, or shall exceed eight (8) feet along any interior or rear setback.
- D. Trees, shrubbery and other landscaping may be located within any required setback.
- E. Driveways, sidewalks, utility lines, wires and associated structures may be located within any required setback.
- F. Satellite dish antennas may be placed in required rear setbacks.

**Section 4.1.12 Vision Clearance Standards.**

- A. On a corner lot, no structure, planting, sign, fence, wall or other obstruction shall obscure travel vision from 3 feet to 15 feet above ground level in a triangular area formed by measuring from the point of intersection of the front and side lot lines a distance of 40 feet along the lot lines and connecting the points to form a triangle.
- B. A similar line-of-sight shall be maintained at private driveways of commercial or industrial activities except that the connecting points establishing the clear area shall be measured a distance of 15 feet from the intersecting lines of the street lines and driveway lines. (Ord., passed 8-17-87) Penalty, see Chapter Six. Section 6.3.2.

**Section 4.1.12 Zero Lot Line Development.**

In districts where multi-family and attached dwellings are permitted, zero lot line construction is also permitted with the provision that structures shall otherwise meet the minimum setback requirements

of the district in which they are located. This applies to condominiums, cooperatives or any other units created in accordance with the Horizontal Property Act (SC Code 57-494 through 57-523) or agreements wherein common walls of units are shared.  
(Ord., passed 8-17-87)

**Section 4.1.14            Height**

Height shall be measured by the vertical distance between the base flood elevation and the average height level between the eaves and ridge line of a cable, hip, or gambrel roof or the highest point of a mansard roof or the coping of a flat roof.

- A.     Where any lot in a zoning district abuts an interior lot line of another zoning district with more restrictive height requirements, the more restrictive height requirements shall apply to structures on such lot.  
(Ord., passed 8-17-87)
  
- B.     Fences or walls shall be measured from the ground level on the higher side of the fence or wall.

**Section 4.1.15            Exceptions to Height.**

The height limitations of this chapter shall not apply to accessory farm structures, antennas, belfries, chimneys, church spires, conveyors, cupolas, domes not intended for human occupancy, flag poles, masts, monuments, radio or television towers, transmission towers, utility poles, water towers or necessary mechanical appurtenance extending above the roof of any building.  
(Ord., passed 8-17-87)

**Section 4.2 Screening, Bufferyards and Landscape Requirements**

The primary purpose for implementing screening and buffering requirements is to visually and environmentally protect residential areas and uses from non-residential development. It shall be the responsibility of the developers of new non-residential properties to design, install and maintain the approved planting materials. Any commercial, governmental or other non-residential use shall be separated from abutting properties through the placement of plantings and structures.

**Section 4.2.1 Screening Required Between Districts**

Business, commercial and industrial (NC, GB, LI, GI) districts must be separated from adjacent residentially or agriculturally zoned districts as follows:

- A. Development adjacent to residential property
  - 1. Fifteen (15) foot landscaped bufferyard; and/or
  - 2. Opaque fence, not to exceed 6 feet in height; and
  - 3. Two canopy trees and six understory trees per one-hundred feet of contiguous property line.
- B. Development adjacent to other commercial property or adjacent to street with residentially-zoned property on one side
  - 1. Five foot landscaped bufferyard; and
  - 2. Two canopy trees and two understory trees per one-hundred feet of frontage.

**Section 4.2.2 Landscaping Along Front Property Line**

All commercial properties shall be required to provide a landscaped buffer along the front property line, consisting of:

- A. Two canopy trees and three understory trees per one hundred feet of frontage.
- B. Ten to twenty large shrubs.

**Section 4.2.3 Planting Standards**

- A. At time of planting, canopy trees shall be a minimum of two and one-half (2 ½) inches in caliper, measured six inches above grade. Understory trees shall be a minimum of five feet in height.
  - 1. When planting or replacement of trees, plant material or other landscape features is required, such replacement shall be accomplished within a one-year growing season or as approved during the site plan approval process.
- B. Existing natural plant materials which satisfy the size and type criteria of this section may be counted towards meeting the requirements of this section.
- C. Opaque fencing, not to exceed six feet in height, may be substituted for the plantings with approval of the Planning and Zoning Commission and/or Town Council.
- D. Landscaping shall be required on all new commercial developments and any renovation or



remodeling, which equates to twenty-five (25) percent of the building's value, of existing commercial structures.

- E. Buffers shall be located along the perimeter of a parcel and shall extend to the parcel boundary but not on any portion of the right-of-way.
- F. Where drainage or other utility easements run along the property boundary, required landscape buffers shall be planted along but not within the easements.
- G. No development shall be allowed within the required planted buffer areas. On-premise signs, fences, walls, berms, mailboxes, driveway, sidewalks and other improvements may be permitted.
- H. All required landscaping shall be installed prior to the issuance of a Certificate of Occupancy.

**Section 4.2.4                      Landscaping Requirements for Parking and Loading Areas**

Landscaping along the abutting public street right-of-way, adjacent uses and within required parking areas shall be provided for all non-residential and multi-family residential off-street, surface parking, loading and vehicular use areas. Any off-street parking or loading or other vehicular use areas that will be entirely screened from view by an intervening building or structure or by a buffer provided to meet the buffer requirements of Section 4.2.2 shall be exempt from the street front landscaping requirements for parking areas. Such landscaping shall be provided as follows:

- A. A landscaping area at least ten feet in depth shall be located between the abutting right-of-way and any off-street surface parking, loading or other vehicular use area, and between off-street parking areas and adjacent uses, except where permitted curb cuts are to be provided.
  - 1. Such planted areas shall consist of at least four canopy trees every one-hundred feet, and ten to twenty understory bushes, shrubs or other approved material every one-hundred feet.
- B. Interior parking areas shall be required to provide one landscaped planter island for every twelve parking spaces in a row. The planter island shall have at least one tree of two and one-half (2 ½) inches in caliper and other planted material as approved.
- C. Existing plant material. Wherever possible, the developer is encouraged to preserve the natural landscaping.

### **Section 4.3      Sign Regulations.**

The purpose of this section is to provide minimum requirements for signage allowed within the Town and to:

- A. Provide minimum standards to safeguard life, property values and general public welfare and promote safety by controlling the design, size, location, construction, illumination, and maintenance of signs.
- B. Encourage signs that are of quality design and pleasing appearance.
- C. Enhance property value and the visual environment in the Town by discouraging signs which impede traffic safety, obstruct vision and interfere with ingress and egress and contribute to visual clutter.

#### **Section 4.3.1              Definitions**

**Abandoned Sign.** A sign which was erected on property in conjunction with a particular use which has been discontinued for a period of 30 days or more, or a sign the content of which pertains to a time, event or purpose which no longer applies or permitted temporary sign for which the permit has expired.

**Awning Sign.** A sign on a metal or similar material frame that is supported entirely from the exterior of the building.

**Animated Sign.** Any sign which uses movement, the appearance of movement or change of lighting to depict motion or action or to create a special effect.

**Banner.** Any sign of lightweight fabric or similar material that is mounted on a pole or a building.

**Billboard.** An on-premise or off-premise freestanding sign that exceeds the size limitation of a free-standing sign.

**Canopy Sign** A sign on or attached to a permanent overhanging shelter which projects from the face of a building and is supported only partially by the building.

**Combination Wall/Roof Sign.** A double-faced projecting wall sign which projects above the roof line of a building and which is wholly or partially supported by the building.

**Commercial Sign.** A sign which refers to the name or type of business.

**Community Sign.** A sign listing only the names and/or use, or location of more than one business, activity or professional office conducted within a building, group of buildings or commercial center.

**Dilapidated Sign.** Any sign which is insecure or otherwise structurally unsound, has damaged or defective parts, is unsightly in appearance due to lack of maintenance or which is unable to withstand the wind pressure for which it was originally designed.

**Facade/Wall Sign.** A sign which advertises a business, product or service and is in any manner painted or affixed to any exterior wall of a building.

**Flashing Sign.** Any lighted or electrical sign that emits light in sudden transitory bursts of light.

**Free-standing Sign.** A sign, not including sandwich boards, which is permanently supported by one or more columns, uprights or braces in the ground.

Illuminated Sign. A sign designed to give forth artificial light or to reflect artificial light.

Monument Sign. A free-standing sign that is designed as one architectural structure incorporating the sign face and the sign support structure and is solid from the base of the sign to the top of the sign.

Non-commercial Sign. A sign which conveys a message not intended to promote a business.

Off-premise Sign. A sign that advertises activities, goods, products, and the like, that are available elsewhere than within the building or on the lot where the sign is located. (Billboards are generally off-premise signs.)

On-premise Sign. A sign that advertises activities, goods, products, and the like, that are available within the building or on the lot where the sign is located.

Permanent Sign. A sign which is permanently attached to a building, the grounds, or other structures and which meets the structural and installation standards of the International Building Code and electrical standards of the National Electrical Code. All permanent signs must be constructed to withstand a pressure of 24 pounds per square foot, which is equivalent to a 110 miles per hour wind.

Portable Sign. A sign not permanently attached to the ground or a building which rests on wheels or metal legs and is designed to be transported, and may be temporarily anchored by weights or cables attached to stakes driven into the ground.

Projecting Wall Sign. A double-faced sign, mounted to the exterior wall of a building, which projects perpendicular to the wall/building.

Readerboard Sign. A sign on which copy is changed manually or electronically and on which message applies to the business or property wherein the sign is located.

Real Estate Sign. A temporary sign advertising the real property upon which the sign is located for rent, for lease, or for sale and providing the name and location of the owner or his agent.

Roof Sign. A sign which is erected upon or above the roof-line or roof-eave of a building and which is wholly or partially supported by the building.

Snipe Sign. A non-permitted sign which is tacked, nailed, posted, pasted, glued, or otherwise attached to trees, poles, stakes or fences, or to other objects.

Temporary Sign. A sign or information-conveying structure intended to be erected or displayed for a limited period, and is not permanently attached to the ground, building and/or any other structure.

Window sign. Any sign which is painted on, applied to, attached to or projected upon or within the exterior or interior of a building glass area, including doors.

#### **Section 4.3.2 Sign Permit Required.**

- A. No signs, except signs exempted in Section 4.3.5, may be erected, altered, moved, or repaired within the Town until a sign permit has been granted by the Zoning Administrator. The Town of Ravenel may order the removal of any sign which, after a permit has been obtained, is not constructed in accordance with this ordinance or which does not meet electrical or building code requirements.
- B. Application for sign permit. An application for a permit may be secured through the Town staff. It shall be accompanied by a plan, showing the following information:

1. The dimensions and height of the sign and, where applicable, the dimensions of the wall surface of the building to which it is to be attached.
  2. The dimensions and design of the sign's supporting parts.
  3. A site plan and proposed location of the sign in relation to the boundaries of the lot upon which it is to be situated and distance from the right-of-way.
  4. The building frontage as it exists (or will be built) on the lot, and the setback of the building to which the sign is to be attached.
- C. Sign permit issuance, refusal. If Staff reviews an application for a sign permit and finds it meets the standards of this ordinance, a permit shall be issued authorizing the erection of or alteration of a sign. If Staff finds the application does not meet the requirements of the ordinance then the erection or alteration of the sign shall not be authorized and a letter shall be written to the applicant, advising that the request was refused.
- D. Inspection. All signs are subject to inspection by the Town Inspector. The Town Inspector is authorized to enter at all reasonable times any property to determine if the code provisions are being obeyed. The sign owner will be notified by letter if any maintenance is necessary. The sign owner will have 30 days to complete the required maintenance. Town Council may grant an extension beyond 30 days if necessary. Lot owners may appeal by letter to Town Council, who must act by letter within 14 calendar days.

**Section 4.3.3 Sign Standards, Applicable to all Signs**

- A. Height of sign. The height of the sign shall be determined by measuring the vertical distance from the ground level at the base of the sign structure to the highest point.
- B. Area of Sign. The area of a sign shall be that entire area within a continuous perimeter, enclosing the extreme limits of sign display, including any border that is part of the sign but not the frame. Both sides of the sign shall be used to calculate the maximum allowed sign area as provided in this section.
- C. Sign face. The sign face shall be that part of the sign that is or can be used to identify, advertise, communicate information or for visual representation which attracts the attention of the public for any purpose. It shall include any material, panel, trim or color forming an integral part of the display upon which or against which it is placed. The sign structure shall not be included as a portion of the sign face provided that no message, symbol or any of the aforementioned sign face criteria are displayed on or designed as part of the sign structure.
- D. Sign maintenance. Every sign, all its parts, portions, units, and materials, together with the frame, background, supports, or anchorage thereof shall be maintained in proper repair and a proper state of preservation. The display surface of all signs shall be kept neatly painted.
- E. Setback from right-of-way. All free-standing signs shall be set back at least ten feet from the public right-of-way and shall be not be located as to block travel vision near entrance of a driveway. Signs shall not be located so as to obscure the travel vision as required in Section 4.1.12 within the vision clearance triangle at street intersections.
- F. Sign illumination. In non-residential districts, signs shall be illuminated by:
1. By a steady, stationary light of reasonable intensity shielded and directed solely at the sign or by interior light.

2. Light sources to illuminate signs shall be shielded from all adjacent residential structures and streets and shall not be of such brightness so as to cause glare hazardous to pedestrians or automobile drivers or so as to create a nuisance to adjacent residential districts.
3. Signs shall not have light reflecting background, but may use light reflecting lettering.
4. Signs allowed in a residential area shall not be illuminated except for one spotlight directed on the subdivision identification sign.

**Section 4.3.4            Prohibited Signs.**

- A. "Snipe" signs;
- B. Off-premise signs including billboards, except the re-establishment of billboards as allowed under Section 4.3.9.;
- C. Signs which contain any flashing, animated or intermittent lights, or give the appearance of animation or movement, except for time and temperature signs and electronic message boards;
- D. Signs which emit a sound, odor, or visible matter;
- E. Signs which obstruct free ingress/egress from a required door, window, fire escape, or other required way; signs located in a manner or place so as to constitute a hazard to pedestrians or traffic;
- F. Signs and/or sign structures; copying or imitating official government signs;
- G. Signs located in the public rights-of-way except for signs placed there by government agency;
- H. Signs using the words "stop", "danger" or any other word, phrase, symbol or character in a manner that might reasonably mislead, confuse or distract a vehicle driver;
- I. Signs painted on or attached to trees, rocks or other natural features, telephone or utility poles or attached to existing signs as advertisements for special events;
- J. No sign of any kind shall be erected or displayed in any salt marsh areas or on any land subject to periodic inundation by tidal salt water;
- K. Abandoned or dilapidated signs;
- L. Portable signs, except as provided in Section 4.3.6;
- M. Sandwich board signs;
- N. Projecting or roof signs;
- O. Commercial banners, pennants, streamers, balloons, and other gas-filled signs except as a temporary sign;
- P. Signs placed or painted on parked motor vehicles with the primary purpose of an on or off premise sign.

**Section 4.3.5**                    **Exempt Signs (do not require a permit).**

- A. Political campaign signs, with the following conditions:
  - 1. All political signs must be located on private property and shall be positioned so as not to conflict with travel vision.
  - 2. No political sign shall be affixed to any tree or utility pole.
  - 3. All political signs must be removed within seven days following the close of the primary or general election.
- B. Official notices posted by any court, public agency or officer;
- C. Historic plaques, markers, monuments;
- D. Traffic, directional, warning or informational signs authorized by any public agency or denoting the location of underground utilities;
- E. A building contractor's or developer's sign, not exceeding 15 square feet per face and temporarily displayed during construction of a structure or development of an approved project.
- F. Signs or plates on residential and commercial structures or premises bearing the street number associated with the address of the residence or commercial structure. Numbers shall be a minimum of four (4) inches in height and conspicuously located to be visible from the street.
- G. Real Estate and project signs shall be allowed without a permit provided they are removed within 30 days of the rent, sale, or lease of a property

**Section 4.3.6**                    **Temporary Signs.**

- A. The following signs shall require the issuance of a Temporary Sign Permit by Staff prior to their installation. The permit shall cite the length of time any such sign may be displayed.
  - 1. Temporary and seasonal produce stands. The total area of all such signs shall not exceed ten square feet, nor shall any sign exceed ten feet in height and must be removed within five days of the closing of the stand.
  - 2. Temporary signs announcing a business, charitable, civic, educational, non-commercial or religious event. Such signs shall not exceed 32 square feet per sign face or ten feet in height. Such signs shall not be erected more than 30 days prior to the event, may remain in place a maximum of 30 days and shall be removed within five days after the event. A minimum of 30 days from the date of removal of a temporary sign shall lapse before a temporary sign permit may be issued for the same property.
  - 3. Temporary signs shall conform to all other general regulations regarding illumination, setback, etc., included in this section.

**Section 4.3.7**                    **Freestanding Signs**

- A. On- premise freestanding signs shall conform to the following table, Table 4.3.7T:

**TABLE 4.3.7T**

ZONING DISTRICT	MAXIMUM AREA/SIZE	MAXIMUM HEIGHT
Residential and Agricultural	<u>Single-Family</u> : 1 freestanding sign, maximum of 4 square feet in total sign area (home occupation) <u>Subdivisions/Multi-Family</u> : 1 sign per entrance, maximum 24 square feet per sign face	6 feet  8 feet
Neighborhood Commercial	1 freestanding sign per entrance, if entrances are 300 feet or more apart, the development may have 2 but not more than 2, maximum 100 square feet in total sign area, divided among not more than 4 sign faces, 50 square feet per sign face per side.	For 1 sign: 20 feet For 2 signs: 12 feet each
General Business	1 freestanding sign per entrance, if entrances are 300 feet or more apart, the development may have 2 but not more than 2, maximum 200 square feet in total sign area, divided among not more than 4 sign faces, 100 square feet per sign face per side.	For 1 sign: 20 feet For 2 signs: 12 feet each
Light Industrial	1 freestanding sign per entrance, if entrances are 300 feet or more apart, the development may have 2, but not more than 2, maximum 200 square feet in total sign area, divided among not more than 4 sign faces, 100 square feet per sign face per side. Additional signage may be allowed for each separate building not to exceed a total of 20 square feet in sign area for each additional business up to and not exceeding a total of 300 square feet.	For 1 sign: 30 feet For 2 signs: 12 feet If sign is set back 100 feet, then the sign may exceed maximum height by 1 foot for every 1 foot setback beyond 100 feet or more.
Planned Development	Depending on composition of development, may select one single sign category above that is most appropriate.	
Historic District	NA	NA

B. Special Provisions for freestanding signs.

1. In addition to the signage allowed in Table 4.3.7T., every Neighborhood Commercial and General Business development, may increase the total sign face area of its allowed freestanding sign(s) five square feet for each separate business entity located therein, provided such additional square footage shall not exceed 100 square feet per development.
2. Readerboards must be incorporated into the overall design of the sign and size must be included in the total sign square footage.
3. Readerboards which are constructed as a part of a drive-thru service are not deemed to be freestanding signs.

**Section 4.3.8**                    **Wall/Facade Signs**

- A.     Wall or facade sign faces shall not occupy more than fifteen percent per facade of the building.
- B.     Where more than one business or use occupies a single building, each separate business occupying a space which includes an exterior facade may erect signage which shall not occupy more than fifteen percent per facade of the separate business entity; provided, however, that the total signage per facade of the separate business entity shall not exceed the fifteen percent coverage requirement.
- C.     Where a business occupies an interior space, said business or use may erect signage on an exterior facade provided the total signage per building facade or per facade of a separate business entity, where applicable, shall not exceed the fifteen percent coverage requirement.
- D.     Projecting wall signs shall not project more than five feet from an exterior wall of a building and shall be limited to one sign per wall.

**Section 4.3.9**                    **Existing, Nonconforming Signs**

The existence of a permanent sign, with the exception of existing signs or billboards located along Federal Aid Primary (FAP) roads, Interstate Highways, and National Highway System roads (hereinafter referred to collectively as "FAP Signs"), at the time of passage of this section which does not conform to the standards of this section or other ordinances of the Town of Ravenel shall be considered a nonconforming use, subject to the provisions of the regulations of this and other ordinances of the Town of Ravenel.

- A.     FAP Signs - Reconstruction.     Notwithstanding any other provision in the Zoning Ordinance of the Town to the contrary, all existing FAP Signs shall be permitted to remain in existence, and may be altered, repaired, replaced, or relocated, provided the necessary permits have been secured from the Town, which permits shall be issued upon a showing that the following requirements will be met:
  - 1.     That there shall be no increase in the size or number of sign faces (except that the practice of using cutouts, embellishments, or add-ons, which increase the size of a sign face by up to 150 square feet, shall continue to be permitted) and that there shall be no change in the orientation of sign faces in relation to the road or highway on which they are located which would make them visible from another road or highway.
  - 2.     That the existing height of a billboard above the roadbed, excluding ramps, shall not be increased when relocated.     A billboard, in its new location, shall not exceed 40 feet in height, except when placed adjacent to an elevated highway, in which case the sign shall not exceed 25 feet in height above the roadbed.     Notwithstanding the previous sentence, however, a billboard which exceeds a height of forty (40) feet at the time this ordinance is enacted may be relocated to the same height above the roadbed at its new location.
  - 3.     That no billboards that are not illuminated on February 4, 1997, shall thereafter be illuminated.
  - 4.     That the billboard shall be relocated along the same FAP Road within 300 feet of its location on February 4, 1997.
  - 5.     That the billboard shall not be relocated within 500 feet of another billboard.



6. That the billboard shall not be relocated within the Historic District (HC), any single-family (R1, R2, R3, RD, or MHP) zone district or within any critical area as defined by the South Carolina Office of Coastal Resource Management critical area definition in effect on February 4, 1997.
  7. That the relocation of a billboard shall not increase the impact of that billboard structure upon marsh vistas or historical resources.
  8. That the billboard shall be relocated along the same road, which shall be a federal aid interstate highway, federal aid primary road, or a road which will be included in the new National Highway System (as provided for under the Intermodal Surface Transportation Efficiency Act of 1991). No change in the official nomenclature of roads classified as federal aid primary roads or National Highway System roads on February 4, 1997 shall impair the provisions of this Article.
  9. Billboards that are not in use for a period of six months shall not be permitted for re-establishment.
- B. Existing on-premise signs advertising a legal non-conforming use shall be considered a legal, non-conforming sign during such non-conforming use of the premises and until such time as the non-conforming use has been abandoned or become conforming, whichever shall occur first; and provided further that conforming signs which may be hereafter erected on the premises of such non-conforming use shall not, in terms of sign faces, height or number, exceed that of the non-conforming signs being replaced.  
(Ord. approved Feb. 4, 1997)

**Section 4.4 Off-Street Parking.**

**Section 4.4.1 Purpose.**

All new development and changes, alterations or expansion to existing development shall be required at the time of development or redevelopment to provide adequate, off-street parking spaces and shall be developed in accordance with this ordinance.

**Section 4.4.2 Application of Parking Requirements.**

- A. Location of parking spaces. All parking spaces required in this ordinance shall be located on the same lot as the principal building or use served or on a separate lot as approved during site plan review. Adjacent uses with different operating hours may share off-street parking spaces is approved during site plan review.
- B. Mixed uses. Where more than one principal or accessory use occupy the same building or premises, the parking spaces required shall equal the sum of the requirements of the various uses computed separately.
- C. Requirements for uses not specifically listed. The parking space requirements for a use not specifically listed in this section shall be the same as for a listed use of similar characteristics or parking demand generation, as determined by the Zoning Administrator.
- D. Compilation of total employment. Except as otherwise provided, the number of employees shall be compiled on the basis of the number of persons employed on the premises at one time on an average day or average night, whichever is greater. Seasonal variations in employment may be recognized in determining an average day.
- E. Fractional computations. Where fractional spaces result, the parking spaces required shall be construed to be the next highest whole number.

**Section 4.4.3 Area and paving required for parking spaces.**

- A. Excluding aisles, maneuvering space, turnaround space, and drives, each required off-street parking space shall be no less than nine feet in width and 18 feet in length. No parking or maneuvering area shall be located in any public right-of-way. A scaled drawing or layout of all required parking areas showing the location, size, and arrangement of the individual parking spaces, loading spaces, and landscaped areas as provided under Section 4.2 shall be submitted to the Town for approval. (Ord., passed 8-17-87) Penalty, see Section 6.3.
- B. In paved parking areas, each parking space must be clearly delineated by surface markings at least 4 inches in width. Markings shall be visible at all times. Spaces shall be so laid out to provide for the safe and orderly maneuvering of vehicles into and out of the parking space and lot.
- C. Unpaved parking lots must have a curb stop to delineate the location of each space. Unpaved parking areas must have an all weather surface such as gravel, slag or other pervious surface, not including asphalt shingles.

**Section 4.4.4 Design Regulations.**

- A. Parking lots and vehicular use areas may be lighted; however, such shall not illuminate, nor cast glare into neighboring properties. Lighting fixtures shall be part of the overall project design and contribute to the landscaping effect.

- B. Screening: All parking lots and vehicular use areas shall be screened from abutting properties or rights-of-ways by the minimum requirements of Section 4.2.

**Section 4.4.5 Parking Space Schedule.**

**TABLE 4.4.5T**

<b>Type of Use</b>	<b># of Spaces Required</b>	<b>Additional Requirements</b>
<b>Residential Uses</b>		
One-family dwelling	One space	
Two-family dwelling	Three spaces	
Multi-family dwelling townhouse/Condominium	Two spaces per dwelling unit	
Mobile home in a mobile home development on individual lots	Two spaces/unit	Plus one space per each employee living on premises
Rooming and boarding house/group dwelling	One space per each sleeping room	Plus one space per each employee
<b>Public and Semi-Public Uses</b>		
Nursing home, sanitarium, in-patient clinic, home for the aged, and similar institutions	One space per each five patient beds	Plus one space per each regular employee in single shift
Medical and dental office and outpatient clinic	One space per each 200 square feet of gross floor space (Minimum of four spaces)	
Church and other places of worship, recreation and places of public assembly	One space per five fixed seats in main assembly hall	Or five spaces per classroom, whichever is greater
Places of public assembly or recreation not containing fixed seats in the main assembly room	One space per each 100 square feet of gross floor area in the main assembly room	
Nursery, elementary or junior high	One space per each ten seats in the main assembly room	Or one space per classroom, whichever is greater, plus one space per each employee
High school, trade or business school	One space per each four seats in the main assembly room	Or five spaces per classroom, whichever is greater, plus one space per each two employees
Country club or golf club	One space per each five members	Plus one space per each five-hundred square feet of floor area
Library, museum, art gallery or similar building	Ten spaces	Plus one space per each five-hundred square feet of floor

		area
Club, fraternity, sorority or lodge	One space per sleeping room or suite	Or one space per five active members whichever is greater, plus one space per each three employees
<b>Commercial Uses</b>		
Public or private office buildings	One space per 300 square feet of gross floor area (four space minimum)	
Bank, savings and loan association, and similar lending institutions	One space per each 200 square feet of gross floor space	
Service or repair establishment, not otherwise mentioned specifically	One space per each 250 square feet of gross floor area not used for storage	
Retail business not otherwise specifically mentioned	One space per each 200 square feet of gross retail floor space not used for storage (three spaces minimum)	Plus one space per each employee
Theater, night club and similar places of assembly	One space per each four seating accommodations	Plus one space per each three employees on shift of greatest employment
Automobile service stations	One space per employee but in all cases, a minimum of five spaces	Plus one space per each grease rack or wash rack
Motel, hotel and tourist court	One space per sleeping room or suite	Plus one space per each three employees
Furniture, home furnishings, appliances, machinery, equipment, automotive, farm and boat sales and service	One space per 300 square feet of retail floor area, three spaces minimum	Except that automobile sales and service must have ten spaces minimum
Bowling alley	Five spaces per lane	
Funeral home or mortuary	One space per 50 square feet of gross floor area exclusive of storage and work areas	
Planned shopping center	Four spaces per 1000 square feet of gross leasable area	
Sit-down restaurant	One space per each four seats	Plus one space per each three employees on shift of greatest employment
Drive-in restaurant	One space per each 35 square feet of gross building area	Plus one space per each three employees on shift of greatest

		employment
Take-out restaurant	One space per each 100 square feet of gross building area	Plus one space per each three employees on shift of greatest employment
Printing, publishing, plumbing, heating or broadcasting station	One space per each three employees	Or one space per 1500 square feet, whichever is greater
<b>Wholesale and Industrial Uses</b>		
Manufacturing, processing, research testing laboratories, bottling, wholesaling storage, warehousing, junk and supply yard, brick or coal, or lumber yard and similar establishments	One space per each two employees at maximum employment	Plus one space for each company vehicle operating from the premises
Transportation terminal facility including bus depot, truck terminal	One space per 100 feet of public waiting room	Plus one space for each two employees, plus all commercial motor vehicles incident to the facility

(Ord., passed 8-17-87)

**Section 4.5 Off-Street Loading**

**Section 4.5.1 Off-street loading required.**

- A. Areas suitable for loading and unloading motor vehicles in off-street locations and specifically designated for this purpose, shall hereafter be required at the time of the initial construction or alteration or conversion of any building or structure used or arranged to be used for commercial, industrial, governmental, or multi-family residential purposes. Such off-street loading areas shall have access to a public alley or street and shall be provided and maintained in accordance with the following requirements of this sub-chapter, the computation of which shall not be included in the off-street parking requirements. (Ord., passed 8-17-87) Penalty, see Section 6.3.

**Section 4.5.2 Number of Spaces required.**

- A. The number of off-street loading spaces shall be calculated on the basis of the use of the land or principal building on a lot, according to the requirements indicated in the following table:

Type of Use	Square Feet in Floor Area: Spaces	Required Spaces
Retail and personal service establishment	0— 1,999.....	NONE
	2,000— 24,999.....	ONE
	For each additional 25,000.....	ONE
Wholesale, manufacturing; governmental and institutional (including places of public assembly; educational institution; recreation; business services, terminals and similar business uses)	0— 24,999.....	NONE
	25,000— 49,999.....	ONE
	50,000—99,999.....	TWO
	100,000— 249,000.....	THREE
	250,000— 999,999.....	FOUR
Funeral home or mortuary	0—2,499.....	NONE
	2,500—3,999.....	ONE
	4,000— 5,999.....	TWO
	For each additional 10,000.....	ONE
Offices or office building	0— 4,999.....	NONE
	5,000— 9,999.....	ONE
	10,000— 20,000.....	TWO
	For each additional 50,000.....	ONE
Multi-family dwelling project, mobile home, development, hotel, motel, tourist home or similar establishment	0—9 units.....	NONE
	10— 20 units.....	ONE
	For each additional 10 units.....	ONE

(Ord., passed 8-17-87)

**Section 4.5.3**            **Amount of area required for each loading space.**

Each off-street loading and unloading space required by the provisions of this sub-chapter shall be at least 12 feet wide, 40 feet long and 14 feet high. Such space shall be free and clear of obstruction at all times.

(Ord., passed 8-17-87) Penalty, see Section 6.3.

**Section 4.5.4**            **Location of off-street loading areas.**

Required off-street loading and unloading areas shall in all cases be located on the same lot or parcel of land as the structure they are intended to serve. In no case shall the required off-street loading space be considered as part of the area provided to satisfy off-street parking requirements as listed in this sub-chapter. (Ord., passed 8-17-87) Penalty, see Section 6.3

**Section 4.5.5**            **Adequacy of loading area.**

All uses, whether specified in this chapter or not, shall provide off-street loading areas sufficient for their requirements. Such space shall be adequate so that no vehicle being loaded or unloaded in connection with normal operations shall stand in or project into a public street, walk, alley or way. (Ord., passed 8-17-87)

**Section 4.6      Site Plan Review.**

It is the intent of this section to establish a site plan review process for proposed development to encourage the orderly placement of buildings, structures, parking, signage, open spaces, landscaping, ingress and egress, and site preparation as well as provisions for traffic circulation and stormwater drainage.

**Section 4.6.1              Review and Action.**

Site plan review shall be before the Town Council to ensure the proposed construction will be developed in a manner that promotes the public health, safety and welfare and meets the development criteria as set forth in this ordinance. Town Council shall review the site plan at the next regularly scheduled Council meeting or call a special meeting for review. Input from other public agencies that may have jurisdiction over the approval criteria of the Ordinance shall be presented at this meeting. (Part of this section removed September 30, 2008.)

**Section 4.6.2              Commencement of work**

It shall be unlawful to commence the clearing, excavation, or filling of any lot or parcel for the construction of any building or to commence construction of any building or to commence the moving or alteration of any building until a site plan has been approved for such work.

**Section 4.6.3              Exemptions.**

The following shall be exempt from site plan review:

- A. Single and two-family dwellings and residential accessory buildings.
- B. Small storage structures or garages that do not exceed five hundred (500) square feet.
- C. Construction or renovations, routine repairs and maintenance that do not result in the addition of over two thousand (2,000) square feet of space to an existing structure or do not increase the use to a more intensive use as determined by the Zoning Administrator.

**Section 4.6.4              Preliminary site plan requirements**

The preliminary site plan shall show:

- A. The proposed title of the project and the name of the engineer, architect, designer or landscape architect and the developer.
- B. A north arrow, scale of the drawing and date.
- C. Existing zoning of property and of surrounding properties and proposed changes in zoning, if any.
- D. Boundaries of the development property and general location of all existing easements, property lines, streets, buildings and other existing physical features on or adjoining the project. Show the location of all trees 24" DBH and over.
- E. On a topographic map, identify the approximate location and sizes of existing and proposed storm drain easements, culverts, and underground utilities in or near the project.
- F. Identify the general location and dimensions of:



1. proposed streets, driveways, curb cuts, entrances, parking and loading areas,
  2. proposed lots, easements, setbacks, open spaces, and a generalized land use plan,
  3. proposed main and accessory buildings,
  4. proposed location, height, width and material of all fences, walls, screens, buffers, plantings, and landscaping,
- G. Show general location, size, height and orientation of proposed signs.
- H. Method and location of providing water and sanitary sewage disposal.

**Section 4.6.5            Approval Criteria.**

Final site plan approval may be given when the Planning Administrator finds the proposed project meets all applicable provisions of this ordinance and recommendations of Town Council.

**Section 4.6.6            Appeals**

Zoning related appeals shall be made before the Board of Zoning Appeals as specified in Section 6.7

**Section 4.6.7            Expiration and Lapse of Approval.**

Property owners shall have twelve (12) months from the date of approval of a Site Plan to secure a Zoning Permit to carry out the proposed improvements, otherwise the approval shall lapse and be of no further effect.

**Section 4.7    Traffic Impact Study.**

The developer of a building structure of 25,000 square feet or greater or of ten or more contiguous acres (10 acres) of land or that is projected to generate more than 100 peak hour vehicle trips, based on trip generation rates from the latest edition of the Institute of Transportation Engineers (ITE) trip Generation Manual or that is likely to have significant impact on transportation capacity, levels of service or on traffic safety shall prepare a report on the number of trips expected to be generated to and from the project at each access point on the parcel.

- A.    The following information shall be included:
  - 1.       Existing conditions, including adjacent land uses and roadway conditions.
  - 2.       Proposed site(s) usage, including number of lots, buildings, parking, internal circulation patterns and other factors that affect traffic on and adjacent to the site.
  - 3.       Current ADT and design hourly traffic volumes, site-generated ADT with development at fully built status. Existing and projected (at 10 years after opening) traffic volumes on the adjacent roadway system.
  - 4.       Capacity analysis and traffic improvement recommendations.
  
- B.    Traffic impact information will be forwarded on to the SC Department of Transportation or to Charleston County Public Works, depending on which body of government has jurisdiction over the primary access road. The State or County will determine if road conditions will not be significantly impacted, if the projected increase will necessitate road improvements and what improvements will be required.
  - 1.       Any required improvements shall be installed by the developer prior to receipt of final Certificate of Occupancy.
  
- C.    The Town may grant exceptions to the requirements of this Section where an agreement between the developer and the Town can reasonably improve, maintain or rehabilitate conditions of the roadway affected by the amount of traffic being generated by the site. (Ord., amended 10-25-2005.)

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## **CHAPTER 5. SUBDIVISION AND TREE REGULATIONS**

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### **Section 5.1 Intent**

It is the intent of this chapter to regulate the subdivision of land and provide for the review and approval by the Planning and Zoning Commission of the plans and specifications of the development of land and open spaces, the opening or extension of any street or road, the width, character and location of such streets, alleyways and roads, the manner of laying out of infrastructure in such subdivisions and other utility proposals and provide for the coordinated and harmonious development of the Town of Ravenel in accordance with the provisions of Title 6, Chapter 29, as amended, Code of Laws of South Carolina and in accordance with the Town of Ravenel Comprehensive Land Use Plan.

These regulations, as herein set forth, are designed to protect and secure the public health, safety, order, appearance, convenience and general welfare through the orderly and progressive development of land, for the following purposes, among others:

- A. To encourage economically sound and stable development;
- B. To ensure the timely and coordinated street and road layout with adequate provisions for traffic circulation and access, both vehicular and pedestrian;
- C. To assure adequate and clean water supply, light, air, drainage and sanitary sewer facilities;
- D. To provide adequate provisions for recreational areas, open space, school sites and other public services and facilities; and
- E. To provide for adequate identification and permanent location of real estate boundaries and ensure the recording of necessary survey data.

### **Section 5.2 Repeal of Existing Subdivision Regulations**

All existing subdivision regulations adopted previously by the Town of Ravenel, and contrary to this Ordinance, are hereby repealed. The adoption of this chapter, however, shall not affect nor prevent any pending or future prosecution of, or action to abate, any existing violation of said regulations, as amended, if the violation is also a violation of the provisions of this Ordinance.

- A. Grandfathered Clause. Parcels that were created and recorded by deed or plat prior to the adoption of these subdivision regulations, will receive automatic approval under a Grandfather's Clause, providing the parcel involved is still in the same size and shape as when recorded previously and has the approval of the South Carolina Department of Health and Environmental Control.

### **Section 5.3 Applicability**

Unless expressly exempted, no subdivision shall be made, platted or recorded for any purpose nor shall any parcels resulting from such subdivisions be sold or offered for sale, unless such subdivision meets all applicable standards of this Ordinance and has been approved and recorded.

- A. To facilitate the subdivision process, Charleston County shall be given the authority to review and approve plats as presented under the subdivision standards of Chapter 5. The Town of Ravenel will work with Charleston County to assure the proposed subdivision of property is consistent with long-range policies of the Town.

(Ord. passed 11-28-06)

**Section 5.4**    **Definitions**

For the purpose of this Ordinance, the following definitions shall apply:

- A.    **Land Development**: a change in land characteristics through redevelopment, construction, subdivision into parcels, multi-family complexes, commercial or industrial parks, shopping centers, mobile home parks and similar developments for sale, lease, or any combination of owner or rental characteristics.
  
- B.    **Subdivision**: a division of a tract or parcel of land into two or more lots, building sites or other division, including all land divisions involving new streets or a change in existing streets or the alteration of any street previously recorded, and the combination of lots or relocation of lot lines.
  
- C.    Types of Subdivisions:
  - 1.    **Minor Subdivision**:    A subdivision of any tract of land in one ownership into four (4) or fewer lots, provided that:
    - a.        No public street right-of-way dedications are involved;
    - b.        No utility or drainage easements are necessary;
    - c.        The lots meet Health Department requirements for the installation of a conventional or modified individual sewage disposal system; and
    - d.        No new or residual parcels will be created that do not comply with all applicable requirements of this Ordinance.
  
  - 2.    **Major Subdivision**:    Any division of land that will result in five (5) or more new lots. Major subdivision application is a three-step process:
    - a.        Schedule with Charleston County and confirm with Ravenel Zoning Administrator, a pre-application conference to determine lot and street requirements and other standards;
    - b.        Preliminary plat review (by the Ravenel Planning and Zoning Commission);
    - c.        Final plat review and approval.

**Section 5.5**    **Exemptions.**

The following shall be exempt from the Subdivision Plat Procedures for review by the Planning and Zoning Commission and shall be approved upon a finding by Charleston County and the Zoning Administrator that all other applicable requirements are met. The Planning and Zoning Commission shall be notified of such approval.

- A.    The combination or re-combination of portions of previously platted and recorded lots where the total number of lots is not increased and all lots or residual parcels thus created comply with all applicable requirements of this Ordinance.
  
- B.    The public acquisition of land for rights-of-way or easements.

- C. When contiguous properties are to be divided for the purpose of exchange or to trade parcels of land.
- D. When a parcel of land is proposed to be used as a site for a utility substation, electricity regulating station or similar facility. Lot design standards found in Chapter 2 of this Ordinance may be waived and a statement included on final plat that describes the proposed action and certifies the parcel is not created as an individual building lot.
- E. The division of any tract of land that is in one ownership into four (4) or fewer lots, provided that no new street right-of-way dedications are involved; no utility or drainage easements are necessary, the lots meet the Department of Health requirements and all new lots created conform to the requirements of this Ordinance.
- F. The combination or re-combination of lots of record where no new street or change in existing street is involved.

**Section 5.6 Pre-application Conference**

- A. Occurring prior to filing an application for plat approval, a pre-application conference is intended to save time and money as the applicant can be familiarized with the appropriate zoning requirements for the particular parcel, plat submittal process and other applicable procedures before finalizing the development proposal.
  - 1. For smaller, minor subdivisions as listed under "Minor Subdivisions" or "Exemptions" to be approved by the Zoning Administrator, a pre-application conference will assist the subdivider in filing but is not mandatory.
  - 2. For major subdivisions that involve five (5) or more lots, require dedication of new streets or do not meet the "Exemptions" criteria, a pre-application conference is required. The applicant must submit a plat of the subject property or a tax map showing the property and a sketch plan showing the proposed means of access to a public road, adjacent land uses and roads, and a conceptual layout of the proposed subdivision to Charleston County and to the Zoning Administrator. Where review from other agencies is required, i.e. Charleston County, Council of Governments, DHEC, U. S. Army Corps of Engineers, etc., representative staff from these organizations may be present at the time of presentation.

**Section 5.7 Preliminary Plat**

- A. A subdivider or property owner shall complete an application form with the Town and submit a copy of the proposed plat. An application will also be submitted to Charleston County along with the required fees and four (4) copies of minor subdivision preliminary plat or six (6) copies of the major subdivision preliminary plat, drawn to an engineer's scale no smaller than 1" = 200'. Where large areas are being platted, they may be drawn on one or more sheets, not to exceed twenty-two (22) inches by thirty-four (34) inches in size. Lettering on plats must be a minimum of 1/8 inch or Leroy size 80.
- B. Even though a subdivider may intend to subdivide only a small portion of a parcel or tract of land initially, the preliminary plat shall show a proposed street and lot layout, drainage plan and other requirements for the entire parcel or tract of land in which said portion is contained, except that the Zoning Administrator may waive this requirement on a finding that such a complete layout is not necessary to satisfy the intent of these requirements.
- A. The following information shall be required on each plat:

1. Title, date of survey, graphic and numeric scale, North arrow, and a location map showing the proposed subdivision and surrounding area and any residual tract, if applicable.
2. Courses and distances of the perimeter of the tract being subdivided with distances to nearest street intersection and total acreage, and the acreage above the Office of Coastal Resource Critical Line. Date of critical line certification shall be indicated. Wetland areas under the jurisdiction of the U.S. Army Corps of Engineers shall be verified.
3. Zoning district information, tax map number of tract(s), references to previous plats and/or deeds and owner(s) of the tract shall be noted.
4. All intersecting boundaries or property lines with the full names of owners districts and tax map numbers of adjoining properties shall be noted.
5. Flood Zone designation(s) in which the tract is located, including the community panel number and date of map, location and names of water courses within or adjoining the tract shall be shown.
6. For major subdivisions, the plat shall indicate all existing physical features of the land, including contours and drainage patterns must be shown. All existing structures, streets, rights-of-ways, drainage ditches, easements along with proposed divisions with courses and distances, proposed easements, right-of-way widths with proposed street widths and names and street type or surfacing material. Contours are not required on proposed private subdivisions, and only within rights-of-way of proposed public streets. The plat must note proposed street names and whether the streets are to be public or private, and sites proposed for public uses with the ownership and maintenance responsibilities noted. A draft of private restrictive covenants and/or Homeowner Association structure and responsibilities shall be included. (Ord., amended 09-30-08)
7. The size of each lot with the total number of lots shall be noted.
8. Proposed water sources (public or well) and proposed sewage disposal shall be indicated. A statement of the location, availability of and distance from the nearest water supply and public sewer shall be included.
9. Proposed landscaping and buffers and location of protected trees.
10. R.L.S. certification of preparer of plat.

D. Zoning Administrator review and report.

1. Upon receipt of a complete application for Preliminary Plat approval, the Zoning Administrator shall have 30 days to review the proposal and submit plats to affected agencies for review. Applications containing the required information shall be placed on the next agenda of the Planning and Zoning Commission if review and approval by the Commission is required. Applications with missing information shall be returned to the applicant with an explanation of needed additional information.
2. As soon as the additional information is received, staff shall prepare a report on the proposed plat and the preliminary plat review shall be placed on the next agenda

of the Planning and Zoning Commission. The Commission shall be presented with a complete copy of the preliminary plat and all required information along with a copy of staff report and shall take action to approve, disapprove, or approve with specific conditions, the preliminary plat.

- E. Duration of Approval. An approved Preliminary Plat shall expire after two years from the date of approval if a Final Plat for the subdivision (or phase of the subdivision) has not been approved within two (2) years of the date of preliminary approval. If the subdivision is to be developed in phases, a phasing plan, including a timetable for development of the entire subdivision, shall be approved as part of the Preliminary Plat approval. No final plats shall be accepted and no construction shall be allowed for any phase not approved as part of the Preliminary Plat.
- F. Appeals. Any person with a substantial interest in a Preliminary Plat decision of the Planning and Zoning Commission may appeal the decision to the Circuit Court of Charleston County. Appellants shall file with the Court Clerk a written petition plainly and fully setting forth how such decision is contrary to law. Such appeal shall be filed within thirty (30) days of the date of the Commission's decision.

**Section 5.8 Construction Plans Requirements.**

- A. After approval of a Preliminary Plat and before commencing any work within the proposed subdivision (including land clearing and grading), road plans shall be submitted as following:
  - 1. Private Roads: Subdivider shall submit road plans and profiles and a drainage plan as approved by Planning and Zoning Commission, along with draft of planned maintenance agreement or agreement shall be so stated and signed on plat.
  - 2. Roads to be dedicated to the County for public maintenance: Subdivider shall submit road plans and profiles and a detailed drainage plan prepared by an engineer registered in the state of South Carolina which shall be submitted to the Charleston County Public Works Director for review and approval in accordance with the Road Standards as shown in the Charleston County Unified Development Ordinance.
- B. Inspections. Subdivisions shall be subject to field inspection by the Public Works staff to ensure compliance with any applicable Ordinance requirements and road and drainage standards. The South Carolina Department of Health and Environmental Control will inspect the site and test for minimum septic system requirements.

**Section 5.9 Final Plat Approval Process**

- A. Subdivisions which do not involve the platting, construction or opening of new streets, water or sewer facilities, or improvements to existing streets and meet the criteria under Section 5.5., Exemptions, shall be accepted by Charleston County in the form of a final plat and, if the plat meets conditions of this ordinance, shall be approved by staff. Plats that do not meet the criteria under Section 5.5., Exemptions, shall be reviewed and approved by Charleston County and Town staff, approved by the Planning and Zoning Commission, if necessary and after corrections are made, submitted for final approval.
- B. Conditional Plat Approval. Prior to approval of a Final Plat, the developer shall install all required public improvements and post an approved financial guarantee of performance and maintenance (surety bond) in accordance with the provisions of this ordinance. If such guarantees are posted, the Planning Commission shall be authorized to grant



conditional plat approval, with final approval contingent upon completion and acceptance of all required improvements. After conditional plat approval is granted, the sale of subdivision lots shall be permitted and zoning permits may be granted, but no Certificates of Occupancy shall be issued until all required improvements have been installed and accepted.

C. Final Plat Application process.

1. The subdivider shall submit one (1) final plat, drawn in ink on a material and size specified by the Register of Mesne Conveyance recording and seven (7) or more dark line prints to Charleston County final approval. Minimum plat size shall be 8 ½ inches by 11 inches and shall be drawn to a scale no smaller than 1" = 100' on sheets no larger than twenty-two (22) inches by thirty-four (34) inches in size. Where necessary, the plat may be on several sheets accompanied by an index or key insert.
2. The final plat shall show the following:
  - a. All information required on the preliminary plat, (minus the topographic data, tree survey, and location of water and sewer/septic lines, if applicable) title, scale north arrow, name of applicant and of engineer, date.
  - b. All property lines with distances and accurate bearings or deflection angles listed. For property lines which are curves or are part curves, the arc length, tangent distances, radius and points of tangency shall be noted.
  - c. Block and lot numbers suitably arranged by a simple system.
  - d. Description of all property markers and all known and discovered encroachments.
  - e. High land and low land acreage for each lot, OCRM Critical line, and OCRM and/or the U.S. Army Corps of Engineers statement if required.
  - f. A surveyor's certificate that the survey and plat are accurate, as follows:  
*"I, \_\_\_\_\_ (name of surveyor), a registered professional surveyor in the State of South Carolina, hereby state that to the best of my knowledge, information and belief, the survey shown hereon was made in accordance with the requirements of the Minimum Standards Manual for the Practice of Land Surveying in South Carolina, and meets or exceeds the requirements for a Class "A" survey as specified therein.*  
Surveyor's signature and seal of the registered land surveyor in accordance with the Minimum Standard Manual for the Practice of Land Surveying in South Carolina.
  - g. Drainage easements, names of all streets, locations of all utility rights-of-way and easements, areas or sites reserved or dedicated for public uses and a statement of dedication by the property owners of streets, rights-of-way, easements and any other sites for public use.
  - h. A statement of the Department of Health's findings of soil suitability for septic system.

- i. Plat must include a 3" x 8" block of space to be set aside for use by approving and recording authorities to place Approval Stamps and Recording Stamps.
- j. A copy of final private covenants to be recorded with plat.
- k. A certificate of title or a sworn affidavit establishing the ownership of the land, signed by the owner(s), heirs thereto or assigns.

**Section 5.10 Action on Final Plat.**

Charleston County and the Town shall approve or disapprove the final plat as soon as possible after it has been submitted for final approval. After final plat approval, the Zoning Administrator or Mayor shall sign and date the plat. If no action is taken within 45 days after submission, the plat shall be deemed to have been approved.

- A. The Planning and Zoning Commission reserves the right to require the final plat to be resubmitted to them for final review and to require additional statements or information to be placed upon the plat if the proposed roads and drainage have not been constructed in conformance with standards and specifications or if subdivision does not meet all requirements of the Subdivision Regulations.
- B. If the final plat is disapproved, the grounds of such action shall be stated in writing, referring specifically to the part of the ordinance or regulations with which the plat does not conform. One (1) copy of the notice of disapproval shall be kept on file and another given to the subdivider for correction and resubmission if he so desires.
- C. In instances involving Town acceptance of lands, the final plat shall be submitted to Town Council for approval and acceptance of rights-of-way, utilities, easements, and other lands dedicated to public use. Town Council shall not be obligated to accept any land proposed for public dedication.

**Section 5.11 Recording.**

- A. After final approval, Charleston County shall file the original approved final plat, with certificates, with the County Register of Mesne Conveyance within 30 days of approval and return one stamped approved copy to the Town for record.
- B. The final plat shall constitute only that portion of the approved plat which the subdivider proposes to record and develop at the time.

**Section 5.12 Appeals.**

- A. Appeals of Planning and Zoning Commission Decision.  
  
Any person with a substantial interest in a Final Plat decision of the Planning and Zoning Commission may appeal the decision to the Town Council by filing an appeal with the Zoning Administrator within 30 days of the date of the decision. In exercising the appeal power, the Council may reverse or affirm wholly or partly or may modify the decision being appealed. If Council determines additional information is needed, it may remand the matter to the Planning and Zoning Commission with directions to obtain further evidence and to reconsider the decision in light of such evidence.
- B. The Town Council shall consider only the same application, plans and related project

materials that were the subject of the original decision and only the issues raised by the appeal. In acting on the appeal, the Town Council shall grant to the Planning and Zoning Commission's decision a presumption of correctness, placing the burden of persuasion of error on the appellant. An appeal shall be sustained only if Council finds that the Planning and Zoning Commission erred.

- C. Appeals of Town Council's Decision. Any person with a substantial interest in the appeal decision may appeal the final decision to the Circuit Court of Charleston County. Appellants shall file with the Court Clerk, a written petition plainly and fully setting forth how such decision is contrary to law. Such appeal shall be filed within thirty (30) days of Council's decision.

**Section 5.13 Subdivision Design Standards.**

- A. Lot Size. The lot size, width, depth, and the minimum building setback lines shall comply with the underlying zoning district and all other applicable standards of this Ordinance and, in all cases, must conform to South Carolina Department of Health and Environmental Control (DHEC) water and wastewater supply/treatment regulations. Lot depth shall not exceed four times the width (1:4 ratio) except in the case of attached dwellings or in case where the additional depth is necessary to provide separation from major streets or railroads, non-access reservations, easements or marshes. The depth-width ratio shall not apply in cases where the width of a lot exceeds 300 feet for its entire depth or in subdivisions of three (3) or fewer lots.
- B. Lot frontage. The minimum lot frontage width for single-family residential lots shall be 50 feet on a public right-of-way, except for cul-de-sacs which shall be a minimum 30-foot or a flag lot. Double frontage lots shall be avoided except where essential to provide separation of residential development from major roadways or to overcome specific disadvantages of topography. An easement of at least ten feet in width may be required to restrict access from the major street or other area.
- C. Flag Lots. The Planning and Zoning staff shall be authorized to allow the use of flag lots only when it is determined that such lot configurations are necessary to address site development constraints.
  - 1. Flag lots may be permitted to facilitate subdivision of a long narrow parcel that has sufficient area but insufficient width to be otherwise subdivided or subdivision is restricted due to the presence of a natural resource or the irregular shape of a parcel.
  - 2. A flag lot may be utilized to eliminate multiple access points to collector or arterial roads.
  - 3. Flag lots shall not be used to avoid the development of streets otherwise required by this Ordinance when the effect of such flag lots would be to increase the number of access points (driveways) on a publicly dedicated road right-of-way.
  - 4. Approval standards for flag lots.
    - a. Flag lots shall have direct access to a street that complies with the standards of this Ordinance.
    - b. The connecting portion (flagpole) of a flag lot shall have a minimum width of 20 feet for its entire length and shall not exceed 300 feet in length.

- c. The area within the flagpole shall not be counted as lot area for the purpose of meeting minimum lot requirements.

D. Blocks

The lengths, widths and shapes of blocks shall be determined by the area and spacing requirements for lot sizes and dimensions, needs for convenient access, circulation, control and safety of traffic, and utility easement requirements.

1. Length of any block shall not exceed fourteen hundred (1,400) feet nor be less than six hundred (600) feet, unless a particular hardship is shown.
2. Width of any block used for residential purposes shall be of sufficient width to allow for two (2) tiers of lots of appropriate depth. Blocks intended for commercial or industrial uses shall be of a suitable width for the intended use, with allowances for off-street parking and loading.

E. Tree Preservation

Lots within subdivisions shall be so designed to provide a buildable area on each lot that does not require the removal of grand trees. Removal of grand trees is permitted only through the Town's tree removal process.

F. Streets

1. The layout of streets shall be designed to promote safe and efficient movement of vehicular and pedestrian traffic; and shall take into consideration cost effectiveness, future maintenance costs, sight distance visibility, considerations for the environment, space for utilities and drainage, natural contours and natural features.
2. Streets shall be defined according to function and right-of-way widths:
  - a. **Access street:** designed to conduct traffic in small residential areas includes short street lengths, cul-de-sacs and courts.
  - b. **Sub-collector street:** provides passage between access streets and collectors.
  - c. **Collector street:** designed as the principal arteries within residential and commercial areas, carrying higher volume of traffic.
  - d. **Arterial street:** facility designed mainly for higher volume, higher speed through traffic, between communities and larger activity areas, and to connect to major state and interstate highways.
  - e. **Parkways:** divided arterial streets with full or limited access.
3. Dead-end streets. Dead end streets, designed to remain so permanently shall be no longer than 800 feet except where land cannot be otherwise subdivided and shall be provided with a cul-de-sac of at least 50 feet in radius.
4. Street names. No street names shall be duplicated or be confused with names of existing streets. Proposed street names shall be checked with the Charleston County 911 Coordinator for confirmation. Street names shall receive final approval

from the Planning and Zoning Commission. Street name signs shall be installed by the development in accordance with the South Carolina Uniform Manual on Traffic Control Devices.

5. Street design. Except as provided under Section 4.1.8, all lots shall be provided access by means of streets which have been constructed in conformance with the following standards or to SCDOT requirements as appropriate, and dedicated in accordance with these regulations, with access to an existing street which has been accepted for continual maintenance by the State or County.
  6. Private streets must be constructed in accordance with an approved street plan. The landowner/developer is responsible for submitting road plans that are designed to adequately support traffic, allow for emergency service vehicles, buses and utility vehicles and have provisions for proper drainage. The landowner/developer is also responsible for ensuring the road is constructed as approved. Maintenance of private streets shall be the responsibility of the developer or property owners as indicated in the approved covenants.
  7. Alternative surface materials. Rock or earth roads may be allowed for rural roads, if adequate drainage is provided and a maintenance agreement or bond is provided to ensure continuing maintenance of the road.
  8. The Town's standard non-industrial asphalt pavement section is minimum 1½ inches hot plant mix asphaltic concrete with prime coat on minimum 6-inch compacted stabilized aggregate base course on prepared subgrade, in accordance with Charleston Transportation Commission standards. A prime coat is recommended where FABC will not be paved within 2 weeks. Geotechnical data shall be submitted to substantiate the design of all new arterial roads and collector roads.
  9. Roadway drainage. Roadside ditching or curb and gutter piped systems as detailed in the Charleston County *Standard Specification for Design and Construction of Roads and Drainage Systems* shall be required for roads dedicated for public maintenance. Private roadways shall provide for adequate slope for proper drainage.
- G. A storm drainage system designed to protect proposed development from flooding shall be provided for every major subdivision. The system shall be adequate to carry off all storm water in its drainage area, shall not increase the hazard of flooding down grade from the proposed development to the specifications of the S. C. Storm Water Management and Sediment Reduction Act.

**ROAD STANDARDS**

STANDARD	Collector	Subcollector	Access	Earth Roads <sup>1</sup>
Minimum Lane Width	10'	10'	10'	10'
Minimum Right-of-Way width <sup>2</sup>	60'	50'	50'	50'
Construction Material	paved	rock or paved	rock, paved or approved alternative	earth
Maximum Cul-de-Sac Length	1,500'	1,500'	1,500'	800'
Minimum Cul-de-Sac Pavement Radius	35'	35'	35'	30'
Minimum Cul-de-Sac Right-of-Way Radius	50'	50'	45'	40'
Minimum Finish Grade Street Centerline Elevation (MSL)	6.5'	6.5'	6.5'	6.5'
Minimum Centerline Grade	0.4%	0.4%	0.4%	0.4%
Maximum Centerline Grade	8%	8%	8%	
Minimum Design Speed	35 mph	30 mph	25 mph	20 mph
Minimum Sight Distance	250'	250'	200'	200'
Minimum Vertical Clearance (feet at pavement edge)	15'	15'	15'	15'
Minimum Intersection Radius (back edge of road)	25'	25'	20'	20'
Minimum Intersection Offset	125'	125'	125'	125'
Minimum Intersection Angle	90°	90°	90°	90°

1. Earth roads in new subdivisions are currently not accepted by Charleston County for public maintenance. Rock road may be accepted for public maintenance if constructed to County standards.
2. The minimum road right-of-way shall be the required width of 50' for travel way (lane width), plus safety space (shoulders), plus drainage and utility areas.

**Section 5.14 Required Improvements.**

- A. All subdivision grading shall be done in such a manner as to preserve natural vegetation and topographic features. Where extensive grading is required for road and other improvements, the topsoil shall be removed and piled near the site until rough grading is complete, after which the topsoil shall be returned over the portions of the site which are not to be paved.
- B. Markers required. Markers shall be installed prior to final plat approval and placed at all control corners and at other locations where needed and where required by the Charleston

County Public Works Engineer. The location and type of markers shall be indicated on the final plat.

- C. The developer shall install public water lines and connect to public water service if available within three hundred (300) feet of the property as measured along adjacent rights-of-way for developments over five (5) lots.
- D. The subdivider of any subdivision shall lay out, grade, install necessary drainage facilities, build roads of acceptable material and design, install curb and gutter or ditches and otherwise improve all streets that are designed and approved on the preliminary plat, installing all utilities or leaving adequate easements for future installation in accordance with the specifications on the preliminary plat approval.
  - 1. It is the desire of the Town of Ravenel that all utilities will be located underground to the extent feasible. Toward that end, the Planning and Zoning Commission will, as a condition of the preliminary plat review make a decision as to the feasibility of installing electrical, telephone and other utilities underground.
- E. The subdivider of a major development shall submit a street lighting plan and subdivision identification sign design as part of final plat approval.

**Section 5.15 Tree Regulations**

**Section 5.15.1**            **Purpose:** The town recognizes the value of trees for:

- A. Purification of air and water;
- B. Improvement of stormwater drainage through filtration,
- C. Improvement of sediment control, preventing loss due to runoff and wind,
- D. Reduction of energy costs by shading of buildings,
- E. Lessening noise, glare and other nuisances by buffering buildings from rights-of-way and incompatible land uses,
- F. Increasing residential and commercial property values, and
- G. Promoting tourism, commerce, and the local quality of life through beautification of the landscape. (Ord., passed 06-02-92)

**Section 5.15.2**            **Authority**

The standards as set forth in this chapter are established pursuant to that authority and are intended to supplement that document and guide the mandated preservation of trees during the development process on affected properties (see Sections 5.15.10 through 5-15-23). (Ord., passed 6-2-92)

**Section 5.15.3**            **Definitions**

For the purpose of this chapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

**Border Area**            All land within 25 feet of a public or private right-of-way and land within ten feet of any other property line (not a required building setback).

**Commercial Nursery Operations**            A wholesale or retail horticultural business engaged in the production of plants for the purpose of selling those plants for transplanting to another location.

**Commercial Timber Operations**            Tracts of five acres or more devoted to the production of marketable forest products through generally accepted silvicultural practices including, but not limited to, harvesting, site preparation and regeneration.

**Diameter Breast Height (Dbh)**            The total diameter, in inches, of a tree trunk or trunks measured 4 ½ feet above existing grade.

**Grand Tree**            All preferred specimen trees that are 50 years of age or older.

**Interior Area**            For purposes of the tree protection requirements of Section 154.17, the interior portion of a lot is that property which lies within the border area of a lot as defined elsewhere in this chapter.

**Protected Tree**            Any tree with a diameter breast height (DBH) of at least 24 inches.

**Required Trees**            Term used to refer, either collectively or separately, to all trees required to be retained or replaced by Sections 154.30 through 154.43, including: All significant trees, all



protected trees in the border area and all protected trees necessary to meet diameter requirements on the remaining interior portion of a lot.

Significant Tree Any tree with a diameter breast height (DBH) of 24 inches or greater, with the exception of any species of pine or gum.

Tree Any self-supporting woody perennial plant having a single trunk or trunks of two inches DBH or greater and usually having branches.

#### **Section 5.15.4 Tree Removal Permit Required**

Removal of trees in excess of 24 inches in diameter, excluding pine and gum, is prohibited prior to the issuance of a tree removal permit by the town. Tree removal permits will be issued only after a tree plan is approved by the Mayor, as outlined in Section 5.15.15. Failure to obtain a tree removal permit prior to removal, in violation of this chapter, constitutes a misdemeanor. (Ord., passed 6-2-92) Penalty, see Section 6.3

#### **Section 5.15.5 Administrative Processes for Preservation of Trees**

With regard to the preservation of trees, site development will be subject to the following process:

- A. Commercial sites and commercial subdivisions must submit approved recorded plat, development site plan and tree plan (see Section 5.15.15) for Mayor's review.
- B. Approval of tree plan.
- C. Compliance with all zoning, subdivision, drainage, road and Health Department requirements.
- D. Tree removal permit granted for tree removal. (No fee required.)
- E. Zoning and Building permits granted.
- F. Tree protective barrier placed around all required trees and other trees developer desires to save. (See Section 5.15.16., Tree Protective Standards.)
- G. Site subject to random inspections during construction to verify protection of trees.
- H. Completion of construction and paving around trees subject to guidelines. (See Section 5.15.9., Separation of Trees and Pavement.)
- I. Planting of replacement trees per approved tree plan.
- J. Mayor contacted by owner, developer or contractor to schedule a tree preservation compliance inspection prior to issuance of the certificate of occupancy by the Department of Building Services.
- K. Certificate of Occupancy issued; establishment opens.
- L. The Mayor visits site to verify continued health of replaced or replanted trees during random inspections.
- M. Three years after the granting of the certificate of occupancy is issued, the Mayor shall perform a follow-up site inspection to verify continued health of all required trees. (Ord., passed 6-2-92)

**Section 5.15.6**

**Tree Plan Guidelines**

- A. Tree plan(s) of the same scale as, or superimposed on a development site plan (see Section 4.6) or preliminary plat shall include:
1. Where tree plan is included on a preliminary plat, in accordance with Chapter 5, Subdivision Regulations, the name, address, signature and seal of the licensed surveyor and civil engineer, registered in the state, shall be provided.
  2. In cases where a landscape architect, civil engineer or surveyor utilizes previously approved recorded plats prepared by surveyors, for the purpose of showing a tree plan, the name, address, signature and seal of the licenses landscape architect, civil engineer or surveyor, registered in the state, who shall be responsible for the accuracy of information provided. (Assistance in tree identification and condition may be provided by a forester or arborist.)
  3. Location, number, size (DBH) and species of all trees of 24 inches or greater diameter breast height (DBH). (Trees within five feet of each other may be designated in groups, with the predominant species, established number and average diameter indicated.)
  4. Location, number, size (DBH) and species of all trees to be preserved, and those scheduled to be removed (including dead and diseased trees) and replaced.
  5. A plan outlining the manner in which trees are to be protected during development.
  6. For developments of ten acres or greater requiring larger open space areas, including, but not limited to, parks, playgrounds and golf courses, a scaled high resolution black and white aerial photograph or print of equal quality may be substituted in cases where the Mayor determines that it would provide the same information as a tree plan. (Refer to Administrative Guidelines for Tree Preservation and Landscaping, Town of Ravenel, S.C.)
  7. In addition, tree plan(s) required for preliminary subdivision applications on partially exempted properties or nonexempt properties which include proposed road or easements or extensions of existing roads or easements shall indicate the location, size and species of all significant trees within rights-of-way or easements and in the areas adjacent to each side of the right-of-way easement, extending to a depth to be determined by the Mayor.
- N. Standards for measurement:
1. All trees shall be measured with a standard diameter tape or to diameter tape standards of dividing the circumference by 3.14.
  2. Trees shall be measured 4.5 feet above the highest ground level at the base of the tree.
  3. If the tree trunks split at ground level and do not share a common base, then each truck shall be measured as a separate tree.
  4. If a multi trunk tree splits below the 4.5 foot mark coming out of a common base, the trunks will be measured and combined as one DBH and will count as one tree.

5. If a multi trunk tree splits at or above the 4.5 foot mark, then it shall be considered one tree and have one DBH measurement.
- O. For survey notations and special information with regard to survey preparation, where necessary, the following procedures should be followed:
1. On all surveys, tree species may be indicated with abbreviations and DBH and use of an abbreviation key as shown in the examples below. The Mayor will not accept surveys using unlabeled symbols with a separate species/DBH key. Groups of individual trees located together should be indicated as clusters and multi-stem trees as "double-species name," "triple-species name" and the like. (See examples below.)
  2. Survey labeling examples:
    - 20" Oak Cluster
    - 24" L.O.
    - 8" DW
    - 30" P
    - 18" Triple Oak
  3. In cases where a large number of significant trees will be affected, the Mayor may request additional survey information where necessary to determine alternate alignments. In those cases, surveyors will be asked to survey adjacent areas up to 25 feet in depth on either side of the easement.
  4. Wetlands and other unusable features of a site which would prevent shifting of easements or right-of-way to adjacent areas must also be included in a tree survey. (Ord., passed 6-2-92)

**Section 5.15.7 Developments with Large Open Spaces**

- A. For developments of ten acres or greater requiring large open space areas, including but not limited to, parks, playgrounds and golf courses, a scaled high resolution black and white aerial photograph or print of equal quality may be substituted in cases where the Mayor determines that it would provide the same information as a tree plan.
- B. The suitability of these photographs as substitutes for tree plans will be determined on a case by case basis by the Mayor based on the scale and clarity of the photography. Developers wishing to use these are urged to first confer with the Mayor and to provide black and white aerials available from the County Assessors tax map office to provide an idea of the relative density of foliage in the area. (Ord., passed 6-2-92)

**Section 5.15.8 Tree Protective Standards**

- A. Tree protective zone: Tree protection zones will be designated by the Mayor and will generally consist of the area just outside of the tree's canopy. The protection zone for a significant tree will include no less than the total area beneath the tree's canopy, as defined by the farthest dripline of the tree.
- B. Placement of tree protective barriers:
  1. Prior to construction, tree protective barriers shall be placed around all required trees and any other trees located near construction activity which are to be saved. These barriers will be located just outside of the tree's canopy or other area as

determined by the Mayor.

2. Protective barriers shall remain in place until construction is completed.
  3. Areas within the protective barriers shall be free of all building materials, dirt, chemicals, construction debris, vehicles and development activities.
  4. No disturbance shall occur within the protective area of a required tree without prior approval by the Mayor.
- C. Specifications of tree protective barriers: All tree protective barriers will be approved by the Mayor. Highly recommended is fluorescent polyethylene laminar safety fencing, minimum four feet in height, which is flexible and reusable. Also acceptable is a securely installed post and rail wooden fence, minimum of four feet in height with a minimum of two-inch by four-inch rail. The fence shall be made highly visible with a fluorescent orange paint.
- D. Activities within tree protection zones: Any changes in grade and installation of impervious surfaces changes within the tree protection zone will be permitted subject to the following guidelines:
1. All tree protective fencing and erosion control barriers must be installed prior to and maintained throughout the land development process, including tree removal, site grading and building construction. The barriers will not be removed until landscaping is installed.
  2. Changes in grade should comply with the South Carolina Land Resource Conservation Commission, Section 2.10 of Erosion and Sediment Control Practices for Developing Areas and with the South Carolina Coastal Councils Stormwater Management Guidelines.
  3. Grade changes with an aeration system will allow moderate fill within a tree's critical root zone. Commercially available aeration systems are subject to approval by the Mayor. A decrease in grade is best accomplished with the use of retaining walls or terracing.
- E. Soil Compaction: Where soil compaction will occur due to traffic or material storage, the tree protection zone must first be mulched with a minimum of four-inch layer of processed pine bark or wood chips or a six-inch layer of pine straw.
- F. Root cutting: All roots to be removed in and around tree protection zones should be severed clean. Exposed roots will be covered with a two-inch layer of mulch.
- G. Remote disturbance areas. In areas remote from land disturbance, ropes or flagging may be used. Ropes and flagging must completely surround these areas (passive tree protection). Flagging must be heavy mill, minimum four inches wide. These barriers must be accompanied by "KEEP OUT" or "SAVE TREE" signage.
- H. Tree pruning: Pruning of all trees must be done according to the National Arborists Association, Pruning Standards for Shade Trees. (Ord., passed 6-2-92) Penalty, see Section 6.3.

**Section 5.15.9      Separation of Trees and pavements**

Pavement distance from a tree will vary due to the tree, size, age, species, condition and location of

the majority of the root system. This will be determined on a case by case basis. As a general rule paving would be allowed within 30% to 50% of the tree's canopy area. During construction, approved barriers should be placed outside of the dripline area. When paving is to take place the barriers can be adjusted to the approved location around the tree. All trees in parking areas shall have permanent barriers (such as curbs and gutters or secured railroad ties) around them in the agreed distance from that tree. (Ord., passed 6-2-92) Penalty, see Section 6.3.

**Section 5.15.10 Tree Preservation, Removal and Replacement**

- A. Trees are an essential natural resource, an invaluable economic resource and a priceless aesthetic resource. Trees play a critical role in purifying air and water, providing wildlife habitat and enhancing natural drainage of stormwater and sediment control. They also help conserve energy by providing shade, and shielding against noise and glare. Trees promote commerce and tourism by buffering different land uses and beautifying the landscape.
- B. Trees enhance the low country quality of life as a sacred and inseparable part of its historical legacy. Consequently, the town intends to exercise its state-mandated powers to enhance the health, safety and welfare of its citizens with this section of comprehensive regulations designed to preserve trees. (Ord., passed 6-2-92)

**Section 5.15.11 Application of Regulations**

The provision set forth herein in their entirety shall apply to all real property in town which:

- A. Is presently zoned or where an application is pending for rezoning to multi-family residential, mobile home residential, Planned Development, office, parking or commercial districts, or
- B. Is designed as appropriate for rezoning to multi-family residential, mobile home residential, Planned Development, office, parking or commercial, or districts under a Council-approved land use plan.

(Ord., passed 6-2-92)

**Section 5.15.12 Exemptions**

The following categories of properties or activities shall be exempt from all or some of the provisions of this section as set forth:

- A. Partial exemptions:
  - 1. Properties or activities listed below shall be exempt from the provisions of this section except with regard to the removal of significant trees.
    - a. Single-family residential or agricultural zoned properties for which preliminary subdivision application has been made proposing new roads or easements will be subject only to the following provisions of this chapter: 1). Administration and enforcement., 2). Tree survey(s) 3). Tree preservation. 4). Tree removal. 5). Tree replacement
    - b. Other single-family residential or agricultural zoned properties will be subject only to the following provisions of this Chapter: 1). Tree preservation, 2) Tree removal, 3). Tree replacement

2. Properties zoned as industrial (LI) districts shall be exempt from tree preservation requirements for the interior portion of a lot, but shall be subject to all other provisions of this section. (Tree surveys to be provided for border areas and for rights-of-way is applicable.) See also full exemptions.
- B. Full exemptions: Activities listed below shall be exempt from all provisions of this subchapter excluding Grand trees which must be protected at all times:
1. Electric suppliers and public utilities and Charleston County Public Works.
    - a. This subchapter shall not restrict the ability of public utilities, electric suppliers and Charleston County Public Works from maintaining safe clearance around existing utility lines, drainage ditches and existing easements in accordance with existing maintenance agreements and practices. Siting and construction of future water, sewer, gas, telephone, drainage, communications, electrical lines or other easements shall be exempt from the provisions of this subchapter.
    - b. Utility easements for which the town granted conditional use approval prior to adoption of this Section shall be fully exempt.
  2. Commercial timber operations: Commercial timber operations shall be exempt from the provisions of this Section.
  3. Commercial nursery operations: Commercial nursery operations shall be exempt from the provisions of this Section.
  4. Agricultural uses: Removal of trees for the purpose of establishing agricultural uses, shall be exempt from the provisions of this Section.
  5. Charleston County Aviation Authority: Removal of trees for the purposes of maintaining safe clearance for aircraft as required by federal law or the establishment of facilities exclusively dedicated to aviation operations on property owned or leased and in use by the Charleston County Aviation Authority will be exempt from the provisions of this section. (Ord., passed 6-2-92)

**Section 5.15.13      Tree Removal Permit Required:**

Removal of required trees is prohibited prior to the issuance of a tree removal permit by the town. Tree removal permits will be issued only after a tree plan is approved by the Mayor, as outlined in this Section. Failure to obtain a tree removal permit prior to removal, in violation of this chapter, shall be considered a misdemeanor. (Ord., passed 6-2-92) Penalty, see Section 6.3.

**Section 5.1.14      Application Required**

Tree plan(s) by a licensed registered surveyor, civil engineer or landscape architect, shall be required for:

- A. Preliminary subdivision applications which include proposed roads or easements, or extensions of existing roads or easements.
- B. Planned development rezoning requests and/or

- C. Applications for tree removal permits to remove trees for site development (an approved, recorded plat and development site plan must accompany tree survey (s)). (Ord., passed 6-2-92)

**Section 5.15.15      Tree Plans**

Tree plan(s) of the same scale as, or superimposed on a development site plan or preliminary plat shall include:

- A. Where a tree plan is included on a preliminary plat in accordance with the town subdivision regulations, the name, address, signature and seal of licensed surveyor and civil engineer, registered in the state, shall be provided.
- B. In cases where a landscape architect, civil engineer, forester or surveyor utilizes previously approved recorded plats prepared by surveyors, for the purpose of showing a tree plan, the name, address, signature and seal of licensed surveyor and civil engineer, registered in the state, shall be provided.
- C. In cases where a landscape architect, civil engineer, forester or surveyor utilizes previously approved recorded plats prepared by surveyors, for the purpose of showing a tree plan, the name, address, signature and seal of the licensed landscape architect, civil engineer, forester or surveyor, registered in the state, who shall be responsible for the accuracy of information provided. (Assistance in tree identification and condition may be provided by a forester or arborist);
- D. Location, number, size (DBH) and species of all trees of 24 inches or greater diameter breast height (DBH). (Trees within five feet of each other may be designated in groups, with the predominant species, estimated number and average diameter indicated);
- E. Location, number, size (DBH) and species of all trees to be preserved, and those scheduled to be removed (including dead and diseased trees) and replaced;
- F. A plan outlining the manner in which trees are to be protected during development;
- G. For developments of ten acres or greater requiring large open space areas, including but not limited to, parks, playgrounds and golf courses, a scaled high resolution black and white aerial photograph or print of equal quality may be submitted in cases where the Mayor determines that it would provide the same information as a tree plan. (Refer to Administrative Guidelines for Tree Preservation and Landscaping, Town of Ravenel, SC)
- H. In addition to division (A) above, tree plan(s) required for preliminary subdivision applications on partially exempted properties (Section 5.15.12) or full exempt properties (Section 5.15.12) which include proposed roads or easements or extensions of existing roads or easements shall indicate the location, size and species of all significant trees within rights-of-way or easements and in the areas adjacent to each side of the right-of-way easement, extending to a depth to be determined by the Mayor. (Ord., passed 6-2-92)

**Section 5.15.16      Tree Protection During Development**

Protective barricades shall be placed around all required trees in or near development areas, as determined by the Mayor, prior to the start of development activities. These barricades, fluorescent polyethylene laminar safety fencing shall be erected in accordance with standards provided by the Mayor and shall remain in place until development activities are complete. The area within the protective barricade shall remain free of all building materials, dirt, fill or other construction debris, vehicles and development activities.

(Ord., passed 602-92)

**Section 5.15.17      Separation of Trees and Pavement**

Paved areas shall be separated from trees by a minimum distance deemed necessary to protect the tree's root system, as determined by the Mayor.

(Ord., passed 6-2-92) Penalty, See Section 6.3

**Section 5.15.18      Inspections and Final Approval**

- A. The Mayor shall periodically visit development sites prior to completion to monitor compliance with the tree plan approved for a project.
- B. Prior to issuance of a Certificate of Occupancy for a completed structure by the Department of Building Services, the Mayor shall issue a statement of approval attesting to the developers' compliance with the tree plan approved for their project. The Department of Building Services shall withhold certificates of occupancy pending verification of compliance. It is the responsibility of the owner or agent to contact the Mayor regarding the compliance inspection. These inspections will occur within five working-days of contact.
- C. Three years after issuance of the Certificate of Occupancy, the Mayor shall again perform a site inspection to verify the health of trees which were retained to meet the requirements of this section and which may have suffered damage due to insufficient protective measures during development.
- D. Each required tree that is determined by the Mayor to be diseased or injured to the extent it is irreparably damaged shall be approved for removal. The burden of proof of the extent of the disease or injury shall rest with the applicant, who must provide documentation from a tree service.
- E. The owner(s) of a nonexempt property or properties shall be responsible for the maintenance of all required trees. No department or agent of the town is in any way responsible for the maintenance of required trees.

(Ord., passed 6-2-92)

**Section 5.15.19      Emergency Provisions**

In the event that a tree poses a serious and imminent threat to public safety due to death, disease or damage resulting from emergencies including, but not limited to fires, flooding, storms, natural disasters or negligence, the Mayor may waive requirements of this section. Written findings must later be issued, outlining the threat to public safety which initiated the removal. The Mayor may require replacement of required trees which are removed where it is determined that death or disease were caused from negligence. (Ord., passed 6-2-92)

**Section 5.15.20      Variances**

Requests for Variances from the requirements of this Section may be filed with the Mayor and Council as outlined in Administrative guidelines for Tree Preservation and Landscaping, Town of Ravenel, SC.

**Section 5.15.21      Tree Preservation Specifications**

- A. Significant Trees: On the entirety of any zoning lot, the removal of significant trees is prohibited.



- B. Other Required Trees:
1. Upon the issuance of a tree removal permit, tree removal must comply with division (B) (2) below.
  2. Border Area: Within the border area all trees of 24 inches or greater DBH are to be preserved, with the exception of areas to be developed with necessary driveways, roads, easements and drainage structures permitted by and constructed in accordance with applicable town subdivision, road code and other Public Works Department requirements, and the requirements of this chapter.
- C. Preferred Specimen Trees: The preservation of preferred specimen trees is highly encouraged. Healthy trees of a sufficient diameter, height and shape, as identified (site-specifically) by the Mayor, may be retained in fulfillment of the preceding requirements where it is determined that they are equivalent assets, by comparison with existing protected trees, in providing shade, improving drainage or contributing aesthetically to a site. (See Administrative Guideline for Tree Preservation and Landscaping, Town of Ravenel.)
- D. Undevelopable Areas:
1. Required drainage improvements such as detention and retention ponds located within the interior portion of a tract will be subtracted from the area used to calculate interior tree preservation requirements.
  2. Where trees are retained within wetland areas, they may be used to fulfill the requirements for border areas, they may be used to fulfill the requirements for border areas as listed in division (B) (2) of this section. Wetlands will be subtracted from the area used to calculate interior tree preservation requirements. (Ord., passed 6-2-92) Penalty, see Section 6.3.

**Section 5.15.22 Tree Removal Specifications**

- A. Generally:
1. Where difficulties are encountered in compliance with tree preservation requirements, private site design professionals are encouraged to consult with the Mayor. Permits for tree removal may be approved where one or more of the following conditions are deemed to exist by the Mayor.
    - a. Trees are not required to be retained by the provisions of this subchapter;
    - b. Trees are diseased, dead or dying;
    - c. Trees pose a safety hazard to nearby buildings, or pedestrian or vehicular traffic;
    - d. Trees prevent essential grade changes or all reasonable utility installations;
    - e. Trees prevent all reasonable site configurations;

- f. Removal of trees is the only reasonable means by which building, zoning, subdivision, health, public safety or other town requirements can be met.
  - g. Replacement of required trees for which removal has been authorized shall follow the requirements listed below.
- B. Significant Trees: Significant trees may be removed only where approved by the Mayor and Council and shall be replaced according to a schedule determined by the Council. The Mayor will make recommendations to the Council concerning the number, species, DBH and placement of those trees.
  - C. Emergency Provisions: Trees may be removed under emergency conditions as Section 5.15.19. (Ord., passed 6-2-92) Penalty, see Section 6.3

**Section 5.15.23      Tree Replacement Specifications**

Tree replacement shall be required accompanying development on all nonexempt properties in the manner described below and under the following circumstances:

- A. Wooded site with interior of 160 inches or greater DBH. Where tree(s) have been removed from a lot illegally, replacement tree(s) shall be planted in the same general area according to a replacement schedule approved by the Mayor.
- B. Site with interior of less than 160 inches combined DBH. Where lots lack a sufficient number of trees to meet the interior lot requirement for DBH/number of trees per acre, all trees of 24 inches or greater shall be preserved and must equal no less than 40 inches per acre combined DBH. On lots with less than 40 inches per acre combined DBH, additional tree(s) shall be planted on the interior of the lot equaling or exceeding 40 inches per acre combined DBH. Planting schedules shall be approved by the Mayor.
- C. Tree removed without permits:
  - 1. Generally.
    - a. Where sites were completely cleared of trees prior to development, in violation of this subchapter, trees shall be replaced in accordance with a replacement schedule approved by the Mayor and Council.
    - b. The Mayor shall recommend the number, species, DBH and location of replacement trees, according to the following criteria:
      - 1). Combined DBH of which equals or exceeds 80 inches per acre, and
      - 2). One-half of individual replacement trees are four inches or greater DBH.
- D. Significant Trees
  - 1. Where significant trees have been removed in violation of this chapter or where removal is necessitated at any time due to acts of negligence, trees shall be replaced in accordance with a replacement schedule approved by the Mayor and Council. The Mayor shall recommend the number, species, DBH and location of replacement trees, according to the following criteria:

- a. Combined DBH of replacement trees is equal to or greater than three times the DBH of the tree removed; or
  - b. Individual replacement trees are of the largest transplantable DBH available.
2. Where significant tree removal is necessitated by emergencies (See Section 5.15.19) or death and disease of trees due to natural causes, as determined by the Mayor, replacement will not be required. (Ord., passed 6-2-92) Penalty, see Section 6.3.

**Section 5.15.24**      **Remedies**

- A. Should violations be noted during the course of a project or at final inspection, the Mayor shall take appropriate actions, including, but not limited to, requiring: Replacement of required trees which are damaged, diseased, dying or dead; remedial actions to protect trees during construction; revocation of zoning permits; and denial of Certificates of Occupancy.
- B. Violations of this chapter, unless remedied by actions and within the time frame prescribed by the Mayor will be prosecuted as provided under Section 6.3. (Ord., passed 6-2-92)

**Section 5.15.25**      **Penalty**

Any person, firm, organization, society, association or corporation, or any agent or representative thereof who commits, participates or assists in removal of trees in violation of this chapter may each be found guilty of a separate offense and suffer the penalties provided in Section 6.3 (Ord., passed 6-2-92, amended 01-20-00)

## **CHAPTER 6. ADMINISTRATION AND ENFORCEMENT**

### **Section 6.1 Planning and Zoning Administrator**

The Planning and Zoning Administrator (or Zoning Administrator) shall have the duty to administer and enforce the provisions of this ordinance, grant required permits, act as staff for Council, Boards and Commissions, and make or direct inspections of buildings or premises necessary to carry out the duties in the enforcement of this ordinance. Appeals to a decision of the Planning and Zoning Administrator made be filed as indicated in Section 1.15 of this Zoning Ordinance.

The Planning and Zoning Administrator, or his or her appointed designee, shall have the powers and duties as indicated in the Town of Ravenel Town Code and whose primary responsibility is to enforce the Ravenel Zoning Ordinance by activities including, but not limited to:

- A. Interpreting all zoning ordinance provisions
- B. Reviewing site plans and building applications pursuant to the issuance of a Ravenel Zoning Permit and collection of Zoning Permit fees
- C. Process applications for all Planning & Zoning Commission and Board of Zoning Appeals actions, including, but not limited to rezoning, subdivisions, site plan reviews, variances, conditional uses, special exception uses, planned developments, and appeals to the Board of Zoning Appeals
- D. Suggest and process Zoning Ordinance amendments and assist the Planning and Zoning Commission regarding recommendations for Council
- E. Set meeting dates for Commissions and Boards and process, or cause to be processed, mailings, property postings, and public notices as required
- F. Assist Commission and Board leadership in conducting regular meeting and public hearings
- G. Review and maintain the current and official version of the Ravenel Zoning Ordinance and Zoning Map
- H. Maintain public records whose contents shall be open to public inspection during business hours
- I. Other general duties as may be necessary to administer the Ravenel Zoning Ordinance

### **Section 6.2 Town Code Inspector**

The Town Code Inspector is hereby conferred with the duties as indicated in the Town of Ravenel Town Code, including the sole authority and duty to inspect any property within the Town of Ravenel and whose primary responsibility is to enforce the Codes and Ordinances for the Town of Ravenel by activities including, but not limited to:

- A. Investigate Zoning Code violations and assist the Planning and Zoning Administrator as needed with the administration of the Ravenel Zoning Code

- B. Investigate Town Code violations and issue contact letters, warnings, notices, or uniform ordinance summons according to adopted policies where violations exist
- C. Follow-up on all violations as needed or directed until the situation is resolved
- D. Attend court hearings and testify on behalf of the Town of Ravenel concerning Town Code or Zoning Code violations
- E. Post properties for public notice, as required by Ordinance
- F. Other general duties as may be necessary to administer and enforce all Town of Ravenel Codes and Ordinances.

**Section 6.3 Penalties for Ordinance Violations**

Whenever any building or structure is demolished, erected, constructed, reconstructed, altered, repaired or maintained, or any building, structure or land is used in violation of this Ordinance, the Town or any appropriate authority shall take appropriate action to prevent the continued violation in the case of such building, structure or land use.

**Section 6.3.1 Stop / Violation Investigation Orders**

It shall be unlawful for work to be initiated on any property within the town limits without a proper zoning permit, building permit, and/or business license, when required or for work that constitutes a violation to this Ordinance. In such a case, a Stop Order and / or Notice of Violation Investigation may be issued and posted on the property. The Order and / or Notice will be posted by the Town Inspector or the Planning and Zoning Administrator.

**Section 6.3.2 Penalty**

Any person violating any of the provisions of the Town of Ravenel Town Code or Zoning Code or any Town ordinance shall be subject to punishment according to Chapter 10, General Provisions of the Town Code of Ordinances.

Any person who, having been served with a Stop Order or Violation Investigation Order that fails to remove any violation to the satisfaction of the Planning and Zoning Administrator or the Town Code Inspector in a timeframe as agreed upon and set by Town policy, shall be issued a Uniform Ordinance Summons and be subject to the remedies and requirements of corrective actions as determined by the Charleston County Magistrate's Court. Penalties and fines may vary by offense and the discretion of the Court.

**Section 6.4 Interpretation of Ordinance**

In interpreting and applying the provisions of the Zoning Ordinance, the application shall be held to be the minimum requirements for the promotion of the health, safety, morals or general welfare. Where the Town of Ravenel Zoning Ordinance imposes greater restrictions upon the use of a building or land than are imposed or required by other ordinances, rules, restrictions, permits or agreements, the provisions of the Town of Ravenel Zoning Ordinance shall govern. Where any other ordinances, rules, regulations or permits or other agreements imposed greater restrictions upon the use of a building or land than are required by the Town of Ravenel Zoning Ordinance, such provisions shall govern.

## **Section 6.5 Zoning Permit Required**

Development proposals are reviewed by the Planning and Zoning Administrator for compliance with zoning regulations. If applicable requirements are met, a zoning permit may be issued prior to obtaining any building and other permits. A zoning permit issued by the Planning and Zoning Administrator is required in advance of:

- A. Any action that will require the issuing of a building permit by the Town of Ravenel, the County of Charleston, or any other issuing agency
- B. Any excavation or clearing that is preparatory to the construction of a structure for which a building permit is required
- C. Any grading, filling or surfacing, or other site improvements in preparation for a new or changed use of the lot
- D. Changing the use of any part of a structure or zoning lot, including any increase in the number of families or dwelling units occupying a building or zoning lot
- E. The placement and hookup, or moving of, a mobile or manufactured home within the Town limits
- F. Installation of any sign that requires a permit as indicated in Section 4.3 of the Ravenel Zoning Code

### **Section 6.5.1 Application for Zoning Permit**

- A. A Zoning Permit Application, in a format approved by the Planning and Zoning Administrator, shall be submitted prior to the commencement of any construction or work for which a Zoning Permit is required.
- B. Each Zoning Permit Application submitted will be accompanied by the appropriate zoning permit fee as established by a fee schedule approved by the Town Council.
- C. Each Zoning Permit Application for accessory structures, new construction, additions, mobile homes, or commercial activity require a site plan showing the location of all structures, setbacks, wetlands, significant trees, and property lines. The location of other site features may also be requested. This information may be submitted on an approved recorded plat or to-scale diagram.
- D. If applicable, each Zoning Permit Application is to be accompanied by a permit from Charleston County Department of Health and Environmental Control for the proposed sanitary waste disposal system, including the location of the system.
- E. The Zoning Permit Application shall be signed by all owners of the property or by the authorized agent/s of the property owners. When the proposed construction, including accessory uses, utilizes more than one abutting lot of record, and crosses lot lines of those abutting lots, the application shall be based upon a new, approved, recorded survey, combining the lots into one zoning lot. (Ord., passed 8-17-87)
- F. Upon the submittal of all information and fees required, and the successful inspection or investigation of any aspect of the proposed activity indicated on the Zoning Permit Application, the Planning and Zoning Administrator will issue a Zoning Permit for the proposed work indicated.

- G. Work that was not indicated on the Zoning Permit Application, is NOT PERMITTED.
- H. A Zoning Permit will be active for a period of one (1) year from the date of issuance. A Zoning Permit may be granted one (1), six (6) month extension by the Planning and Zoning Administrator.
- I. The Planning and Zoning Administrator may grant additional extensions as necessary due to permitting or inspection delays by other agencies that are not found to be the fault of the Applicant.
- J. Any work not completed by the expiration date of a Zoning Permit is considered unpermitted. A new Zoning Permit Application, including updated information, review, and repayment of fees, is required to be submitted if work is to continue.

**Section 6.5.2 Exemptions**

- A. A zoning permit shall not be required with respect to any parcel of land in an Agriculture District, used for agricultural purposes as the principal use including farming, dairying, pasturage, agriculture, aqua-culture, horticulture, animal and poultry husbandry, forestry, and other uses or enterprises customarily carried on in the field of general agriculture including the necessary accessory uses for packing, treating, or storing produce. The operation of any accessory use shall be secondary to that of the normal agricultural activity. Any accessory building, structure, or installation to be placed on agricultural lands that is not of an agricultural nature, shall require a permit.
- B. A zoning permit shall not be required in connection with the establishment of electric distribution of transmission lines, water lines, sewer, gas, or other pipelines; provided, however, that such facilities meet all pertinent conditions established in this chapter.
- C. A zoning permit shall not be required for grading, drainage, or the construction of roads or utilities in a subdivision, provided the preliminary or conditional plat has received tentative approval in accordance with the town Subdivision Regulations in Chapter 5. (Ord., passed 8-17-87)

**Section 6.6 Planning and Zoning Commission**

There is hereby established and created a Town of Ravenel Planning and Zoning Commission, also to be known as the Planning Commission, pursuant to and which shall have the powers and duties as set forth in South Carolina Code 6-29-310, et seq.

**Section 6.6.1 Powers and Duties**

- A. The Planning and Zoning Commission shall prepare and revise periodically a Comprehensive Plan and process for the development and redevelopment of Ravenel.
- B. In its purpose to promote public health, safety, morals, convenience, prosperity and the general welfare and as a means to implement the Comprehensive Plan and program, the Planning Commission has the power and duty to:
  - 1. Prepare, revise, recommend for adoption, and enforce plans and programs for the development and redevelopment of the land area within Ravenel;

2. Prepare, revise, recommend for adoption, and enforce the Zoning Ordinance, maps and district boundaries;
3. Prepare, revise, recommend for adoption, and enforce regulations for the subdivision and development of land, management of environmentally sensitive areas including but not limited to floodplains and to oversee the administration of the regulations that may be adopted as provided herein;
4. Prepare, revise, recommend for adoption, and enforce a landscaping ordinance setting forth required planting, tree preservation, and other aesthetic consideration for land and structures;
5. Prepare and recommend for adoption an official map showing the location of existing and proposed public streets and utility rights-of-way, and public building sites or open spaces within the political jurisdiction or specified portions thereof;
6. Recommend a capital improvements program setting forth projects required to implement the Comprehensive Plan and such plans adopted as part thereof. This said capital improvements program shall include an annual budget based on estimates of cost of proposed projects and the means of financing them to be submitted to the Town Council for authorization.
7. Establish principals, policies or procedures to facilitate implementation of all planning elements within the Comprehensive Plan and for guiding development within the area.

The Planning Commission shall keep the Town Council informed and advised as to all planning activities, issues, or topics of importance to the Town of Ravenel.

**Section 6.6.2 Composition, Terms, and Compensation**

- A. The Planning Commission Membership shall consist of five (5) members, residents of the Town of Ravenel, to be appointed by the Ravenel Town Council. In the appointment of the Planning Commission Members, Town Council shall consider professional expertise, knowledge of the community, and concern for the Town and its citizens. Planning Commission members shall represent a broad cross-section of the interests within the Town. No member shall be the holder of an elected public office.
- B. The terms of office of Planning Commission Members shall be staggered, three (3) year terms and Members shall serve until their successors are appointed and qualified. Any vacancy in membership shall be filled for the unexpired term. For the staggering of terms only, of the initial five members appointed, one (1) member shall be appointed for one (1) year, two (2) members shall be appointed for two (2) years, and two (2) members shall be appointed for three (3) years.
- C. Members of the Planning and Zoning Commission shall serve without compensation. Reimbursement for actual expenses incurred in the performance of official duties of the Planning Commission may be reimbursed from budgeted funds pursuant to current Town of Ravenel reimbursement policies and procedures.

**Section 6.6.3 Vacancy and Removal of Members**

A vacancy in a term of office of the Planning Commission Membership shall occur whenever a member has resigned, is unable or unwilling to serve for any reason, or is removed for cause by a vote of the Mayor and Town Council. The decree of the Mayor and Town Council for removal for cause shall include a finding of inefficiency, neglect of duty, three unexcused absences in a twelve (12) month time



period, loss of town residency, or malfeasance or misconduct in office. Any fact which, in the discretion of the Town Council, is deemed to adversely impact the public interest, is considered cause for removal from the Planning and Zoning Commission.

#### **Section 6.6.4 Election and Duties of Officers**

The Officers of the Planning and Zoning Commission shall be a Chairman and Vice-Chairman elected by the Membership to serve one (1) year terms. The election of Officers shall occur at the first meeting of the Commission of each calendar year and shall be by majority vote of the members of the Commission in a public meeting. The Commission shall also appoint a Secretary, who may be another Commission member or an employee of the Town.

- A. Chairman. The Chairman shall be a voting member of the Commission and shall:
  - 1. Call the meetings of the Commission;
  - 2. Preside at meetings and hearings;
  - 3. Act as spokesperson for the Commission;
  - 4. Sign documents for the Commission;
  - 5. Transmit reports and recommendations to Council; and
  - 6. Perform other duties approved by the Commission.
- B. Vice-Chairman. The Vice-Chairman shall exercise the duties of the Chairman in the absence, disability, or disqualification of the Chairman. In the absence of the Chairman and Vice-Chairman, an acting Chairman shall be elected by the members present.
- C. Secretary. The Secretary shall provide notice of meetings, assist the Chairman in the preparation of the agenda, keep minutes of meetings and hearings, maintain Commission records as public records, and attend to Commission correspondence.

#### **Section 6.6.5 Meeting Procedures**

- A. The Planning Commission shall adopt rules for the transaction of business and shall keep a record of its recommendations, transactions and determinations and shall meet at the call of the Chairman and at such times as the Chairman or Commission may determine. Special meetings may be called by the Chairman upon 24-hour notice, posted and delivered to all members and local news media. Meetings shall be held at the place stated in the notice and shall be open to the public.
- B. A written agenda shall be furnished by the secretary to each member of the Commission and the news media and shall be posted at least five (5) days prior to each regular meeting and at least twenty-four (24) hours prior to a special meeting. Items may be added to the agenda at a meeting by majority vote.
- C. A majority of the members of the Commission shall constitute a quorum. A quorum shall be present before any business is conducted other than rescheduling the meeting.
- D. Except when under a Federal, State or local emergency declaration, a member must be present to vote.
- E. Each member shall vote on every question unless disqualified by law or recused due to a conflict of interest; either real or perceived. The question of disqualification or recusal shall be decided by the member affected, who shall announce the reason for disqualification or recusal. Recusal forms are to be signed, provided to the Chairman and Secretary, and included in the meeting minutes.

- F. Robert's Rules of Order shall govern the conduct of meetings except as otherwise provided by these rules of procedure.
- G. Except for a Public Hearing, no person shall speak at a regular Commission meeting unless invited to do so by the Commission. Members of the public desiring to address the Commission shall give written notice to the Secretary prior to commencement of the meeting.
- H. For a Public Hearing which has been initiated by an applicant, staff will make the presentation of the application along with the recommendation; the applicant, his agent or attorney shall be heard second, and members of the public next. The Commission may ask questions of staff, the applicant or representative and the public as necessary for information. The applicant shall have the right to reply last. No person may speak for more than five (5) minutes without consent of the Commission. No person speaking at a Public Hearing shall be subject to cross-examination. In matters not initiated by an applicant, members of the public shall speak in the order in which requests were received or in such order as the Commission shall determine. All attendees speaking at a Public Hearing are required to provide their name, address, and interest in the matter at hand.

**Section 6.6.6 Records, Minutes, and Reports**

- A. Meeting and hearing records of the Commission shall be maintained as required by law and in all cases retained until final action is taken on matters presented. Meeting minutes and copies of all notices, correspondence, reports, and forms shall be maintained as public records.
- B. The Secretary shall assist in the preparation of the minutes of each meeting and presented to the Commission for approval at the next regular meeting. The Secretary shall assist in the preparation and forwarding of all reports and recommendations of the Commission to the appropriate individuals.
- C. Proposed zoning text and district amendments shall be considered and recommendations shall be forwarded to Council within 30 days after receipt of proposed amendments, unless additional time is given by the governing body. The Planning Commission shall keep the Town Council informed and advised as to all other planning activities of importance to the Town of Ravenel

**Section 6.7 Board of Zoning Appeals**

There is hereby established a Town of Ravenel Board of Zoning Appeals, also to be known herein as the "Board", which shall have the powers and duties to hear and decide appeals to the provisions of this ordinance as provided in South Carolina Code 6-29-310 – 6-29-1200, et seq.

**Section 6.7.1 Powers, Duties, and Appeals**

The Board of Zoning Appeals shall have the power, duty, and responsibility:

- A. To hear and decide appeals where it is alleged there is an error in any order, requirement, decision or determination made by a Town employee or official in the enforcement of the Zoning Ordinance, and
- B. To hear and decide Variances from the requirements of the Zoning Ordinance when strict application of the provisions of the ordinance would result in unnecessary hardship, and
- C. To hear and decide Special Exception Uses as noted in the requirements of the Zoning

## Ordinance for the Town of Ravenel.

All matters for appeals and applications to come before the Board shall be filed on forms available from the Planning and Zoning Administrator's Office at Town Hall and will specify the grounds of the appeal, evidence of the need for a variance, or conditions relating to the Special Exception Use being requested.

The Board may require any additional information to be produced and presented at a Public Hearing as is deemed necessary to assist in making a decision regarding an appeal or request.

Failure to submit a complete application or to provide inadequate information may be grounds for dismissal of a case or request. An application filed by an agent or representative must be accompanied by written designation of the agent signed by the applicant or party in interest.

An appeal:

- Must be filed within thirty (30) days from the date of the decision being appealed. The Town staff shall transmit to the Board all the papers constituting the official record upon which the action being appealed was taken.
- Stays all legal proceedings in furtherance of the action appealed from, unless the officer from whom the appeal is taken certifies to the Board, after the notice of appeal has been filed, that by reason of facts stated in the certificate a stay would cause imminent peril to life and property. In that case, proceedings may not be stayed otherwise than by a restraining order which may be granted by a court of record on application, and on due cause shown.
- Will be heard by the Board at a date and time that allows for proper publishing, posting, mailing, and noticing requirements. At the case hearing any party may appear in person or by agent or by attorney.
- May require witnesses to be present at a case hearing. The Board may subpoena such witnesses and, in the case of contempt, may certify this fact to the Magistrate's Court.

The Board of Zoning Appeals may, in conformity with the provisions of the Zoning Code, reverse or affirm, wholly or in part, or modify the request, appeal decision, order, requirements, or determination that has been heard before them. To that end, the Board shall have all the powers of the officer from whom the appeal is taken and may issue or direct the issuance of a permit or make a final decision that is effective immediately.

All final decisions and orders of the Board must be permanently filed in the records of the Town as a public record. All findings of fact and conclusions of law must be separately stated in final decisions or orders of the Board which may be delivered to parties of interest by certified mail.

### **Section 6.7.2 Composition, Terms, and Compensation**

- A. The Board of Zoning Appeals Membership shall consist of five (5) members, residents of the Town of Ravenel, to be appointed by the Ravenel Town Council. In the appointment of the Board Members, Town Council shall consider professional expertise, knowledge of the community, and concern for the Town and its citizens. Board members shall represent a broad cross-section of the interests within the Town. No member shall be the holder of an elected public office.
- B. The terms of office of Board Members shall be staggered, four (4) year terms and Members shall serve until their successors are appointed and qualified. Any vacancy in

membership shall be filled for the unexpired term. For the staggering of terms only, of the initial five members appointed, one (1) member shall be appointed for two (2) years, two (2) members shall be appointed for three (3) years, and two (2) members shall be appointed for four (4) years.

- C. Board of Zoning Appeals Members may be appointed to succeed themselves for a maximum of two (2) successive full terms.
- D. Members of the Board shall serve without compensation. Reimbursement for actual expenses incurred in the performance of official duties of the Board may be reimbursed from budgeted funds pursuant to current Town of Ravenel reimbursement policies and procedures.

### **Section 6.7.3 Vacancy and Removal of Members**

A vacancy in a term of office of the Board of Zoning Appeals Membership shall occur whenever a member has resigned, is unable or unwilling to serve for any reason, or is removed for cause by a vote of the Mayor and Town Council. The decree of the Mayor and Town Council for removal for cause shall include a finding of inefficiency, neglect of duty, three unexcused absences in a twelve (12) month time period, loss of town residency, or malfeasance or misconduct in office. Any fact which, in the discretion of the Town Council, is deemed to adversely impact the public interest, is considered cause for removal from the Board of Zoning Appeals.

### **Section 6.7.4 Election and Duties of Officers**

The Officers of the Board of Zoning Appeals shall be a Chair and Vice-Chair elected by the Membership to serve one (1) year terms. The election of Officers shall occur at the first meeting of the Board of each calendar year and shall be by majority vote of the members of the Board in a public meeting. The Board shall also appoint a Secretary who will be a Town employee.

- A. Chairman. The Chairman shall be a voting member of the Board and shall:
  - 1. Call the meetings of the Board;
  - 2. Preside at meetings and hearings and swear-in witnesses;
  - 3. Act as spokesperson for the Board;
  - 4. Sign documents for the Board;
  - 5. Have orders of the Board served on parties as needed;
  - 6. Transmit reports and recommendations to Council; and
  - 7. Perform other duties approved by the Board.
- B. Vice-Chairman. The Vice-Chairman shall exercise the duties of the Chairman in the absence, disability, or disqualification of the Chairman. In the absence of the Chairman and Vice-Chairman, an acting Chairman shall be elected by the members present.
- C. Secretary. The Secretary shall provide and publish notice of appeal and meetings, assist the Chairman in the preparation of the agenda, ensure property in question is properly posted, keep minutes of meetings and hearings, maintain Board records as public records, serve Board decisions, and attend to Board correspondence.

### **Section 6.7.5 Meeting Procedures**

- A. The Board of Zoning Appeals shall adopt rules for the transaction of business and shall keep a record of its Public Hearings, decisions, determinations, and attendees and shall meet at the call of the Chairman and at such times as the Chairman or Board may determine. All meetings of the Board are Public Hearings to hear cases and will be

appropriately advertised, posted, mailed, and noticed. All Public Hearings shall be held at the place stated in the notice and shall be open to the public.

- B. The Chairman cannot call a Special Meeting that includes a Public Hearing. However, the Chairman may call a Special Meeting for other Board business upon 24-hour notice, posted, and delivered to all members and news media.
- C. A written agenda shall be furnished by the secretary to each member of the Board and news media and shall be posted at least five (5) days prior to a regular meeting date and at least 24 hours prior to a Special Meeting.
- D. A majority of the members of the Board shall constitute a quorum. A quorum shall be present before any business is conducted other than rescheduling a meeting.
- E. Robert's Rules of Order shall govern the conduct of meetings except as otherwise provided by these Rules of Procedure.

**Section 6.7.6 Violation, Appropriate Action, Contempt Penalty, Further Appeal**

- A. Any violation of this chapter shall be punished as prescribed by the General Provisions Section as found in the Ravenel Town Code of Ordinances. Orders will be served to remove violations to Town Codes and continued violations will incur penalties and fines as determined by Ravenel Town Codes. The Magistrates Court, in its discretion, may reduce violations or fines imposed by the Town.
- B. In case any building or structure is proposed to be erected, constructed, reconstructed, altered, maintained, or used in violation of this chapter or any regulation or amendment thereof, enacted or adopted by the governing body of the Town of Ravenel (the "Town"), under the authority granted by this chapter, the Town, Town Attorney, or any owner of real estate within the district in which such buildings, structures, or land is situated may, in addition to other remedies provided by law, institute an injunction, abatement, or any appropriate action or proceeding to prevent, enjoin, abate, or remove such unlawful erection, construction, reconstruction, alteration, maintenance, or use.
- C. In case of contempt by a party, witness, or other person before the Board of Zoning Appeals, the Board may certify this fact to the Magistrates Court of Charleston County or other courts that may hear the case and the judges of said courts, in open court or in chambers, after hearing, may impose a penalty as authorized by law.
- D. Appeals to Board decisions. A person who may have a substantial interest in any decision of the Board of Zoning Appeals or an officer or agent of the appropriate governing authority may appeal from a decision of the Board to the Magistrates Court of Charleston County or other courts through methods and within timeframes as provided by law.

# Appendices

Appendix A—Definitions

Appendix B—Use Matrix

Appendix C—Dimensional Requirements

## APPENDIX A DEFINITIONS

**Accessory** A structure detached from a principal building or part of a structure customarily incidental and subordinate to the principal use of a zoning lot or of a structure. In addition to accessory uses, structures set forth in the permitted tables, accessories shall include the following:

1. Barn, shed, tool room or other similar subordinate building or structure for domestic or agricultural storage;
2. Home tennis court; swimming pool;
3. Incinerators incidental to the use of a lot or tract of land for residential or other purposes;
4. Private recreation areas in connection with the principal use;

**Accessory Use** Subordinate or incidental uses customarily considered as being appropriate in connection with the principal use of the lot. An accessory use is located on the same zoning lot as the principal use, except in the cases of off-street parking, temporary manufactured housing parks, temporary real estate sales office and temporary construction facilities.

**Acre** A measure of land containing 43,560 square feet.

**Administrative and Business Office** The use of a building or a portion of a building for the provision of executive, management, or administrative services. Typical uses include administrative offices and services including real estate, insurance, property management, investment, personnel, travel, secretarial services, telephone answering, photocopy and reproduction, and business offices of public utilities, organizations and associations, or other use classifications when the service rendered is that customarily associated with administrative office services.

**Adult Entertainment Uses** See definitions in Section 3.1.4.B

**Agricultural Processing** The preliminary processing of agricultural products, to include processing and packaging, such as a packing shed.

**Agricultural Sales and Service** An establishment engaged in sale from the premises of feed, grain, fertilizers, pesticides and similar goods or in the provision of agriculturally related services with incidental storage on lots other than where the service is rendered.

**Ambient Air Quality Standard** An acceptable concentration of an air pollutant in a community.

**Amortization** A method of eliminating nonconforming uses by requiring the termination of the nonconforming use after a specified period of time.

**Amusement and Recreation Services** Establishments engaged in providing entertainment for a fee and including such activities as dance halls; studios; theatrical productions; bands,

orchestras, and other musical entertainment; bowling alleys and billiard and pool establishments; commercial facilities, such as arenas, rings, rinks and racetracks; public golf courses; coin-operated devices; amusement parks; membership sports and health clubs; amusement and bathing beaches; swimming pools; riding academies; carnival operations; expositions; game parlors; and horse shows.

**Animal Service** Retail sales, veterinary service, grooming, and boarding (located totally within a building), of dogs, cats, birds, fish or similar small animals customarily used as household pets. Typical uses include pet stores, small animal clinics, dog bathing and clipping salons, and pet grooming shops, but exclude uses for livestock and large animals.

**Application, Complete** An application for development review and approval that: (1) has been submitted in the required format; (2) includes all information required to be submitted for the subject application type; and (3) is accompanied by the required fee.

**Arborist, Certified** Means a person or firm, possessing a current city business license, who has been trained in the business of diagnosing, treating, pruning and removing trees.

**Aviation and Surface Transportation** Airports, landing fields, aircraft parking and service facilities for operation, service, fueling, repair, storage, charter, sales and rental of aircraft, including activities directly associated with the operation and maintenance of airport facilities and the provision of safety and security. Aviation and Surface Transportation also includes facilities for loading, unloading and interchange of passengers, baggage and incidental freight or package express between modes of transportation, including bus terminals, railroad stations, and public transit facilities.

**Banner** A strip of cloth containing a message or advertisement.

**Bar or Lounge** Premises used primarily for the sale or dispensing of liquor by the drink for on-site consumption and where food may be available for consumption on the premises as accessory to the principal use.

**Base Flood Elevation** The highest height, expressed in feet above sea level, of the level of flood-waters occurring in the regulatory base flood.

**Bed and Breakfast** A portion of an owner-occupied dwelling unit, or detached accessory structure, offering transient lodging accommodations with or without breakfast to paying guests.

**Berm** A man-made landscape feature generally consisting of a linear mound of soil. Temporary soil stockpiles and retaining walls are not berms.

**Buffer** Open spaces, landscaped areas, fences, walls, berms, or any combination thereof used to physically separate or screen one use or property from another so as to visually shield or block noise, lights, or other nuisances.



**Building** Any structure having a roof supported by columns or walls and intended for the shelter, housing, or enclosure of any individual, animal, process, equipment, goods, or materials of any kind.

**Building Code** The International Building Code as regulated by Charleston County.

**Building Height** The vertical distance between the base flood elevation and: (1) the average height level between the eaves and ridge line of a gable, hip or gambrel roof; (2) the highest point of a mansard roof; or (3) the highest point of the coping of a flat roof.

**Building, Principal** A building in which is conducted the principal use of the zoning lot on which it is situated. In a Residential District, any dwelling shall be deemed to be a principal building on which the lot is situated.

**Canopy Tree** A tree, with a diameter of at least 2 ½ inches (as measured 6 inches above grade) at the time of planting.

**Caretaker** An individual or family who resides on premises as an accessory use for the purpose of maintaining, protecting, or operating a permitted principal use on the premises and for which financial remuneration is received for such services.

**Cemetery** Land used or intended to be used for the burial of the dead and dedicated for cemetery purposes, including columbariums, crematoriums, mausoleums, and mortuaries when operated in conjunction with and within the boundaries of such cemetery.

**Certificate of Occupancy** A document issued by a governmental authority allowing the occupancy or use of a building and certifying that the structure or use has been constructed and will be used in compliance with all the applicable municipal codes and ordinances.

**Club or Lodge** An establishment providing meeting, recreational, or social facilities for a private or nonprofit association, primarily for use by members and guests. Typical uses include private social clubs and fraternal organizations.

**Cluster Development** A development design technique that concentrates buildings on a part of the site to allow the remaining land to be used for recreation, common open space, and preservation of environmentally sensitive features.

**Commercial Timber Operations** Tracts of 5 acres or more devoted to the production of marketable forest products through generally accepted silvicultural practices including, but not limited to, harvesting, site preparation and regeneration.

**Communications Tower** A tower of any size that supports communication equipment, transmission or reception, and is utilized by commercial, governmental, or other public or quasi-public users. This does not include communication towers for amateur radio operators

licensed by the Federal Communications Commission which are exempt from local zoning restrictions or communications towers under 100 feet in height used solely for educational communications purposes.

**Construction Sales and Service** An establishment primarily engaged in construction activities and incidental storage on lots other than construction sites as well as the retail or wholesale sale, from the premises, of materials used in the construction of buildings or other structures other than retail sale of paint, fixtures and hardware. Typical uses include building materials stores, tool and equipment rental or sales, or building contractors.

**Cul-de-sac** The radial turnaround area at the end of a dead-end street; or an egress.

**Cultural Service** A library, museum, or similar registered non-profit organizational use displaying, preserving, and exhibiting objects of community and cultural interest in 1 or more of the arts and sciences.

**Curb** A stone, concrete or other improved boundary marking the edge of a road or other paved area.

**Curb Cut** The opening along the curb line at which point vehicles may enter or leave the roadway.

**Day Care Center** The care, supervision or guidance of a person or persons, unaccompanied by the parent, guardian or custodian, on a regular basis, for periods of less than twenty-four hours per day in a place other than the person or persons' own home or homes.

**Dedication** The transfer of property by the owner to another party.

**Density** The number of families, individuals, dwelling units, households, or housing structures per unit of land.

**Detention Basin (Pond)** A facility for the temporary storage of stormwater runoff.

**Developer** The legal or beneficial owner of a lot land proposed for development; or the holder of an option or contract to purchase, or any other person having an enforceable contractual interest in such land.

**Diameter Breast Height (DBH)** The total diameter, in inches, of a tree trunk or trunks measured at a point four and one-half (4 ½) feet above existing grade (at the base of the tree). In measuring DBH, the circumference of the tree shall be measured with a standard diameter tape, and the circumference shall be divided by 3.14.

**Drip Line** An imaginary vertical line extending from the outermost circumference of the branches of a tree to the ground.

**Dwelling (Dwelling Unit)** A building or portion of it designed and used for residential occupancy by a single household and that includes exclusive sleeping, cooking, eating and sanitation facilities.

**Dwelling, Multi-Family** A building containing three or more dwelling units.

**Easement** A grant of one or more of the property rights by the property owner to and/or for use by the public, a corporation, or another person or entity.

**Easement, Drainage** Land required for the installation of stormwater sewers drainage ditches and/or required for the preservation or maintenance of a natural stream or watercourse or other drainage facility.

**Elderly Residential Care Facility** A facility which offers room and board for up to ten elderly persons who are unrelated to the operator and require personal assistance.

**Excavation** Removal or recovery by any means whatsoever of soil, rock, minerals, mineral substances, or organic substances, other than vegetation, from water or land, on or beneath the surface thereof, or beneath the land surface, whether exposed or submerged.

**Façade** The entire building wall, fascia, windows, doors, canopy and on any complete elevation.

**Family** An individual, or two or more persons related by blood or marriage living together; or a group of not more than six individuals not related by blood or marriage but living together as a single housekeeping unit. In each instance the family shall be construed to include necessary live-in servants. Residents of state-licenses group homes for nine or fewer individuals shall be considered a family, for the purpose of Farm Labor Housing only, a family will be defined as up to and including ten unrelated persons living together as a single housekeeping unit.

**Farm Labor Housing** A building or structure which is designed or constructed as a place of residence for farm workers.

**Fence or Wall** A structural device erected to serve as an architectural element, landscape element, visual screen or physical barrier.

**Financial Service** An establishment primarily engaged in the provision of financial and banking services. Typical uses include banks, savings and loan institutions, stock and bond brokers, loan and lending activities, and similar services.

**Floor Area** The sum of the gross horizontal areas of the several floors of the building, measured from the exterior faces of the exterior wall or from the center lines of walls separating two buildings, computed as follows: (1) floor space devoted to the principal use of the premises, including accessory storage areas located within selling or working space, such as counters, racks, or closets; (2) any basement floor area devoted to the production or processing of goods or to

business or professional offices. Floor area shall not include space devoted primarily to storage purposes (except ramps, and maneuvering space, or basement floor area, other than area devoted to retailing activities, the production of processing of goods, or business or professional offices, stairwells, elevator shafts, equipment rooms (generally minus about 15 percent).

**Florist** A commercial activity offering for sale cut flowers, ornamental plants, floral arrangements, real or artificial, and related accessories including cards, figurines, and indoor ornamental fixtures.

**Food Sales** An establishment primarily engaged in the retail sale of food or household products for home consumption. Typical uses include grocery stores (including the sale of beer and wine in unopened containers for off-premise consumption) where revenue from the sale of groceries other than beer and wine comprises at least 51 percent of the gross sales of products of the establishment, and at least 51 percent of the total display or shelf space is devoted to groceries (other than beer and wine), delicatessens, meat markets, retail bakeries, and candy shops.

**Forestry** Establishments primarily engaged in the operation of timber tracts, tree farms, forest nurseries, the gathering of forest products, or in performing forest services.

**Frontage Road** A service road, usually parallel to a highway, designed to reduce the number of driveways that intersect the highway.

**Funeral Service/Home** An establishment engaged in undertaking services such as preparing the human dead for burial and arranging and managing funerals.

**Garage, (Private)** An accessory structure or space on a lot with a dwelling unit devoted to or designed for the storage of automobiles and small (one-half ton capacity or less) trucks and not used for business purposes or occupancy.

**Garage Apartment** A single dwelling unit located over a private detached garage and containing square footage no greater than that of the garage.

**Garden Supply Center** A commercial activity offering for sale indoor or outdoor garden fixtures, packaged plant food, or pesticides, garden tools, manually or power operated with associated parts and accessories. Accessories may include plants. Not included is farm equipment elsewhere provided for in this ordinance.

**Gasoline Service Station** Any premises used for supplying gasoline and oil, tires, accessories and services for automobiles at retail direct to the motorist consumer, including the making of minor repairs, but not including such major repairs as (a) spray painting; (b) body, fender, clutch, transmission, differential, axle, spring, and frame repairs; (c) major overhauling of engines requiring removal therefrom of cylinder-head or crankcase pan; (d) repairs of radiator requiring removal thereof; and (e) complete recapping or retreading of tires. The term includes the sale of used tires, taken in trade on the premises. The term does not include automobile sales and/or

trailer rental.

**Government Office** Federal, state, county or city offices, administrative, clerical or public contact services, together with incidental storage and maintenance of necessary vehicles.

**Grade** The natural elevation of the ground or (1) the average elevation of the land around a building (2) the percent of rise or descent of a sloping surface.

**Grand Tree** Any tree with a diameter breast height of 24 inches or greater, with the exception of pine tree species.

**Ground Cover** Low-growing plant material less than 18 inches in height.

**Group Care Home** A residential care facility licensed by the State Department of Social Services or Department of Mental Retardation for care of more than nine developmentally disabled or physically handicapped residents

**Historic Area** A district or zone designated by a local authority or state or federal government within which the buildings, structures, appurtenances, and places are of basic and vital importance because of their association with history; or because of their unique architectural style and scale.

**Home Occupation** Any activity carried out for gain by a resident and conducted as a customary, incidental, and accessory use in the resident's dwelling unit.

**Homeowners Association** A community association, other than a condominium association, that is organized in a development in which individual owners share common interest and responsibilities for costs and upkeep of common open space or facilities.

**Horticulture Production** The growing of horticultural and floricultural specialties, such as flowers, shrubs, or trees intended for ornamental or landscaping purposes, but excluding retail sales. Typical uses include wholesale commercial nurseries and greenhouses.

**Hotel-Motel** A building or portion thereof, or a group of buildings, which provides sleeping accommodations for transients on a daily or weekly basis, whether such establishment is designated as a hotel, inn, automobile court, motel, motor inn, motor lodge, tourist court, or tourist home.

**Impervious Surface** Any material that prevents absorption of stormwater into the ground.

**Inoperable Vehicle** Any motor-driven vehicle, regardless of size, which is incapable of being self-propelled upon the public streets of the County or which does not meet the requirements for operation upon the public streets, including a current motor vehicle license.

**Junk Yard** Any area, lot, land, parcel, building, or structure, or part thereof, used for the

storage, collection, processing, purchase, sale, salvage, or disposal of junk.

**Kennel** Boarding and care services for dogs, cats and similar small animals. Typical uses include boarding kennels, pet motels, and dog training centers.

**Lot Occupancy** The proportion, expressed as a percentage, of the area of a zoning lot covered by all buildings located thereon, including the area covered by all overhanging roofs.

**Lot, Through** An interior lot which abuts on two or more streets.

**Lot Width** The horizontal distance between the side lines of a lot measured at right angles to its depth along a straight line parallel to the front lot line at the minimum required building setback line.

**Lots of Record, Approved** A portion or parcel of land laid out and approved by proper authorities and recorded as a single parcel in the R.M.C. office for Charleston County, which is devoted to a common use or occupied by a building or buildings.

**Maintenance Guarantee** Any security which may be required and accepted by the Town to ensure that necessary improvements are maintained and will function as required for a specific period of time.

**Manufactured Housing Park (Mobile Home Park)** A development which meets the requirements of Section 2.6.8, upon which two (2) or more mobile homes are placed for occupancy.

**Manufactured Housing Unit or Mobile Home** Any residential dwelling unit constructed to standards and codes set forth by the United States Department of Housing and Urban Development, including the federal Manufactured Housing Construction and Safety Standards Act of 1974 (42 U.S.C. Sec. 5401). The term does not include recreational vehicles, travel trailers or motorized homes licenses for travel on highways nor manufactured housing units designed and built to meet applicable requirements of South Carolina Modular Buildings Construction Act.

**Manufacturing and Production** An establishment engaged in the manufacturing, processing, fabrication, packaging, or assembly of goods. Natural, man-made, raw, secondary, or partially completed materials may be used. Products may be finished or semi-finished and are generally made for the wholesale market, for transfer to other plants, or to order for firms or consumers. Goods are generally not displayed or sold on site, but if so, they can include processing of food and related products; slaughter houses and meat packing; weaving or production of textiles or apparel; lumber mills, pulp and paper mills and other wood products manufacturing; woodworking, including cabinet makers; production of chemical, rubber, leather, clay, bone, plastic, stone, or glass materials or products; printing, publishing and lithography; movie production facilities; concrete batching and asphalt mixing; production or fabrication of metals or metal products including enameling and galvanizing; manufacture or assembly of machinery, equipment, instruments, including musical instruments, vehicles, appliances, precision items and other

electrical items; production of artwork and toys; sign making; and production of prefabricated structures, including manufactured housing units.

**Marina** The wet or dry storage and docking of seaworthy watercraft, including ramps and hoists for boats, for commercial purposes.

**Marshlands** Low-lying tracts of land characterized by high water tables, soils, and extensive vegetation peculiar to and characteristic of wet places.

**Mean High Waterline** The line formed by the intersection of the tidal plane of mean high tide with the shore.

**Medical Office** A use providing consultation, diagnosis, therapeutic, preventative, or corrective personal treatment services by doctors, dentists, medical and dental laboratories, or similar practitioners of medical and healing arts for humans, licensed for such practice by the state.

**Mile** A linear measure equal to 5,280 feet, 1,760 yards, or 1.6 kilometers.

**Mini-Warehouse** See “Self-Service Storage”

**Mixed-Use Structure** A structure containing both residential and nonresidential uses.

**Modular Building Unit** A building including the necessary electrical, plumbing, heating, ventilating, and other service systems, manufactured off-site and transported to the point of use for installation or erection, with or without other specified components, as a finished building and not designed for ready removal to another site. This term is not to be limited to residential dwellings.

**Moratorium** The legally authorized delay of new construction or development.

**Motel/Hotel** An establishment providing sleeping accommodations with a majority of all rooms having direct access to the outside without the necessity of passing through the main lobby of the building.

**Multi-Family** A building containing three or more dwelling units, including condominium residential structures.

**Nonconforming Lot** A lot, the area, dimensions, or location of which was lawful prior to the adoption, revision, or amendment of the zoning ordinance but that fails by reason of such adoption, revision, or amendment to conform to the present requirements of the zoning district.

**Nonconforming Structure** A structure or building, the size, dimensions, or location of which was lawful prior to the adoption, revision, or amendment to the zoning ordinance but that fails by reason of such adoption, revision, or amendment to conform to the present requirements of the zoning district.

**Nonconforming Use** A use which was lawfully established and maintained, but which does not comply with the use regulations applicable to new uses in the zoning district in which it is located.

**Nonpoint Runoff** Surface water entering a channel from no definable discharge source.

**Nursery** Land or greenhouses used to raise flowers, shrubs, and plants for sale.

**Office** A room or group of rooms used for conducting the affairs of a business, profession, service, industry, or government and generally furnished with desks, tables, files, and communication equipment.

**Office of Coastal Resource Management Critical Area Line** This line is defined by Office of Coastal Resource Management at the date of application and determines their jurisdiction.

**Office/Warehouse Complex** A structure or group of structures offering compartments of varying size for rental to different tenants for the storage of commercial goods or wares, conducting of certain retail trade activities, or provision of those personal or business services permitted by zoning.

**Off-Site Improvement** Improvements required to be made off-site as a result of an application for development and including, but not limited to, road widening and upgrading, stormwater facilities, and traffic improvements.

**Open Space** Any parcel or area of land or water essentially unimproved and set aside, dedicated, designated or reserved for public or private use or enjoyment, or for the use and enjoyment of owners and occupants of land adjoining or neighboring such open space. Open space shall not include streets, drives, off-street parking and loading areas, area so located or of such size of shape to have no substantial aesthetic or recreational value and any area within residential lots.

**Open (or field) Storage** The location of bulk items, assemblies or sub-assemblies in areas exposed to weather, in whole or in part, for the end use of further manufacturing process, sale or transportation. This shall include, but not be limited to, open display of transportation vehicles, marine craft, aircraft, manufactured housing units, modules, recreation vehicles, junk yards, or "piggy-back" containers. It does not include uses that are totally enclosed.

**Overlay Zone** A zoning district that encompasses one or more underlying zones and that imposes additional requirements above that required by the underlying zone.

**Parapet** The extension of the main walls of a building above the roof level.

**Parcel** A contiguous lot or tract of land owned and recorded as the property of the same person or persons or controlled by a single entity.

**Parks and Recreation** Parks, playgrounds, swimming pools, recreation facilities, and open



spaces available to the general public and under the management or control of a public agency. The term also includes golf courses, whether public or private.

**Pavement** (1) A created surface, such as brick, stone, concrete, or asphalt, placed on the land to facilitate passage; (2) that part of a street having an improved surface.

**Pawn Shop** A use engaged in the loaning of money on the security of property pledged in the keeping of the pawnbroker, and the incidental sale of such property.

**Person** A corporation, company, association, society, firm, partnership, or joint stock company, as well as an individual, a state, and all political subdivisions of a state or any agency or instrumentality thereof.

**Personal Improvement Service** An establishment primarily engaged in the provision of informational, instructional, personal improvements and similar services of a nonprofessional nature. Typical uses include photography studios, driving schools, health or physical fitness studios, reducing salons, dance studios, and handicraft or hobby instruction.

**Permitted Uses** Any use allowed in a zoning district and subject to the restrictions applicable to that zoning district.

**Pervious Surface** Any material that permits full or partial absorption of stormwater into previously unimproved land.

**Planned Development** An area of a minimum contiguous size, as specified by ordinance, to be planned, developed, operated, and maintained according to plan as a single entity and containing one or more structures with appurtenant common areas.

**Plat** A diagram drawn to an engineering scale showing all essential data pertaining to the boundaries and subdivision of a tract of land as determined by a professional land surveyor.

**Point Source** A stationary source of a large individual emission, generally of an industrial nature.

**Prescription of Land** The acquisition of land by right of continuous use without protest from the owner.

**Principal Use** The primary or predominant use to which a property is or may be devoted and to which all other uses on the premises are accessory.

**Private Club** A building and related facilities owned or operated by a corporation, association, or group of individuals established for the fraternal, social, educational, recreational, or cultural enrichment of its members and not primarily for profit and whose members pay dues and meet certain prescribed qualifications for membership.

**Professional Office** A use providing professional or consulting services in the fields of law, architecture, design, engineering, accounting, and similar professions.

**Professional Services** The office of a doctor, dentist, architect, landscape architect, engineer, surveyor, lawyer or other similar recognized professions.

**Recreation Vehicle Park** A zoning lot on which two or more recreational vehicles are parked or any zoning lot on which space for the parking of recreational vehicles is rented or offered. The term does not include premises on which unoccupied recreational vehicles, whether new or used, are parked for the purposes of inspection, sale, storage, or repair.

**Recreational Vehicle** A highway vehicular, portable structure designed as a temporary dwelling for travel, recreational, and vacation uses. The term includes camping trailer, motor home, travel trailer, and truck campers; the term does not include manufactured housing units.

**Recycling Center** An establishment engaged in the processing, collection and transfer of recyclable materials. Typical recyclable materials include glass, paper, plastic, cans, or other source-separated, non putrescible materials.

**Religious Assembly** A use located in a permanent or temporary building and providing regular organized religious worship and religious education incidental thereto, but excluding private primary or secondary educational facilities, community recreational facilities, day care facilities, and parking facilities. A property tax exemption obtained pursuant to state law shall constitute prima facie evidence of religious assembly use.

**Repair, Minor** A repair affecting 25 percent or less of the gross floor area of a structure.

**Residential Building or Use** A term including dwellings, rooming and boarding houses, group quarters, and manufactured housing units. A residential building is a building containing only residential uses and uses accessory thereto.

**Residential Treatment Facility** A facility providing 24 hour supervision, counseling, and treatment for more than 15 residents not needing regular medical attention. This classification includes alcohol and chemical dependence rehabilitation facilities, including facilities to which persons convicted of alcohol or drug-related offenses are ordered to remain under custodial supervision as a condition of probation or parole, and residential care facilities and halfway houses for the emotionally ill.

**Resource Extraction** The on-site extraction of surface or sub-surface mineral products or natural resources. Typical extractive uses are quarries, borrow pits, sand and gravel operations, oil and gas extraction, and mining operations.

**Restaurant, Fast Food/Take Out** An establishment engaged in the preparation and retail sale of food and beverages in a ready-to-consume state, with one or more of the following characteristics:

1. It serves ready-to-eat foods, frozen desserts, or beverages in paper, plastic or disposable containers;
2. It serves foods that customers carry to the restaurant's seating facilities, to motor vehicles, or off-premises; and/or
3. It serves foods through a pass-through window, (which includes any and all drive-in restaurants)

**Restaurant, General** An establishment engaged in the preparation and retail sale of food and beverages for on-premises consumption. Typical uses include diners, cafeterias, dinner-houses and restaurants, but not including fast food restaurants.

**Restriction** A limitation on property that may be created in a property deed, lease, mortgage, through certain zoning or subdivision regulations, or as a condition of approval of an application for development.

**Restrictive Covenant** A restriction on the use of land usually set forth in the deed.

**Retail Sales and Service, Convenience** An establishment primarily engaged in the provision of frequently or recurrently needed services of a personal nature. Typical uses include seamstresses, tailors, shoe repair shops, and dry cleaning pick-up station services.

**Retail Sales and Service, General** An establishment primarily engaged in the sale, lease or rent of new or used products to the general public, including those providing personal services, entertainment, catering services, product repair or sales of consumer goods, but excluding those establishments more specifically defined in this ordinance.

**Retention Basin** A pond, pool, or basin used for the permanent storage of water runoff.

**Retirement Housing** The use of a site for dwelling units designed and marketed specifically for the elderly, persons with physical disabilities or both.

**Review Body** The entity that is authorized to recommend approval or denial of an application or permit required under this Ordinance.

**Right-of-Way** A strip of land acquired by reservation, dedication, forced dedication, prescription, or condemnation and intended to be occupied by a road, crosswalk, railroad, electric transmission lines, oil or gas pipeline, water line, sanitary storm sewer, and other similar uses, also, generally, the right of one to pass over the property of another.

**Roadway** The word "roadway" shall mean that portion of an approved street or that is designed for ordinary use of vehicular travel.

**Rooming House** A residential building other than a hotel where for compensation and by pre-arrangement for definite periods of time, lodging is provided for three or more persons on a

weekly or monthly basis.

**Rural Area** A sparsely developed area, with a population density of less than one hundred persons per square mile and where the land is undeveloped or primarily used for agricultural purposes.

**Salvage Yard or Junk Yard** Establishments engaged in storing, assembling, disassembling, breaking up, sorting, or distributing scrap equipment, mechanical components, and waste materials, including auto wrecking, parts salvage, and junk establishments.

**Screening (Elements)** Various combinations of walls, fences, earthen berms, trees, shrubbery, and landscape materials which comprise a screening plan approved by the Town to fulfill the requirements and serve the purposes of buffering requirements.

**Screening (Opaque)** A combination of screening elements, approved by the Planning Director, designed to substantially or completely obscure horizontal views between abutting or adjacent properties. When plant materials are used for screening, the screening shall be opaque at the time of plant maturity.

**Setback** A required minimum distance from a lot line or street right-of-way that establishes an area within which a structure shall not be erected.

**Silviculture** The cultivation of a forest for the purpose of harvesting timber.

**Single-Family, Attached** The use of a site for 2 or more dwelling units, constructed with common or abutting walls and each located on a separate lot. Also known as townhouses or rowhouses.

**Site Plan** A plan delineating the overall design of a development on a tract of land, including but not limited to grading, engineering design, construction details and survey data for existing and proposed improvements, the size, height, shape and location of buildings, location and design of parking areas, landscaping, refuse areas, and pedestrian and vehicular circulation on site.

**Special Exception** A departure from a general provision of this chapter, by the expressed terms of such provision, may be permitted by the Board of Zoning Appeals upon application only after the Board finds the use meets the conditions specified in Section 3.2

**Stable** An establishment for boarding, breeding or raising of horses not owned by the occupant of the premises, or the rental of horses for riding by other than the occupants of the premises or their nonpaying guests. Typical uses include boarding stables, public stables and private, noncommercial, (non-accessory use) stables.

**Street** The word "street" shall mean the entire width between boundary lines of every way publicly maintained when any part thereof is open to the use of the public for purposes of vehicular

traffic and shall be taken to include any public way, road, highway, street, avenue, boulevard, parkway, alley, lane, viaduct, bridge and approaches thereto within the city. The word “street” shall also mean a private street within a subdivision.

**Street, Arterial** A federal or state highway designed primarily for the movement of large volumes of traffic from one area to another.

**Street, Collector** A street that collects traffic from local streets and connects with minor and major arterials.

**Street, Local** A public street used primarily for providing direct access to abutting property.

**Street, Paper** A street that has never been built but is shown on an approved plan, subdivision plat, tax maps, or official map.

**Structure** Anything constructed or erected, the use of which requires more or less permanent location on the ground, or which is attached to something having a more or less permanent location on the ground.

**Subdivision** The division of a tract, parcel, or lot into two or more lots or any division of land involving the dedication of a street or other public right-of-way or any division of land involving a change in existing streets.

**Tax Map** The recorded map of delineated lots or tracts in a municipality showing boundaries, bearings, sizes, and dimensions, including the block and lot numbers.

**Traffic Count** A tabulation of the number of vehicles or pedestrians passing a certain point during a specified period of time.

**Traffic Impact Study** A report analyzing anticipated roadway conditions with and without an applicant’s proposed development.

**Use Permitted by Right** A principal use permitted without the requirement of a Special Exception.

**Variance** Relief from the literal enforcement of this chapter, permitting the use of property in a manner otherwise forbidden, granted by the Board of Zoning Appeals upon a finding that the enforcement of this chapter as written would inflict practical difficulty or unnecessary hardship as hereinafter described; provided, however, that the Board of Zoning Appeals may not, by variance, permit to be established or carried on in any use district an activity, business or operation which is not otherwise allowed in such district by a specific provision of this chapter.

**Vehicle Repair, General** An establishment that provides service to passenger vehicles, light and medium trucks and other consumer motor vehicles such as motorcycles, boats and recreational

vehicles. Generally, the customer does not wait at the site while the service or repair is being performed. Typical uses include muffler shops, auto repair garages, tire sales and installation, wheel and brake shops, body and fender shops, and similar repair and service activities, but excluding dismantling of salvage.

**Vehicle Sales/Rental** The sale or rental of automobiles, noncommercial trucks, motorcycles, recreational vehicles, or boats, including incidental storage, maintenance, and servicing. Typical uses include new and used car dealerships, motorcycle dealerships, and boat, trailer, or recreational vehicle dealerships.

**Vehicle Service, Limited** An establishment that provides direct services to motor vehicles where the driver or passengers generally wait in the car or nearby while the service is performed. Typical uses include full-service, mini-service and self-service gas stations; car washes; and quick lubrication services.

**Veterinary Service** An establishment offering veterinary services and hospitals for animals. Typical uses include pet clinics, dog and cat hospitals, and veterinary hospitals for livestock and large animals.

**Wall or Fence** A structural device erected to serve as an architectural element, landscape element, visual screen or physical barrier.

**Warehouse and Distribution/Freight Movement** An establishment engaged in the storage, or movement of goods for themselves or other firms. Typical use include separate warehouses used by retail stores such as furniture and appliance stores; household moving and general freight storage; cold storage plants, including frozen food lockers; storage of weapons and ammunition; major wholesale distribution centers; truck, or air freight terminals; bus barns; parcel services; major post offices; grain terminals; and the stockpiling of sand, gravel, or other aggregate materials. Goods are generally delivered to other firms or the final consumer, except for some will-call pickups. There is little on-site sales activity with the customer present.

**Wetlands** Those areas of land that are inundated or saturated by fresh or saltwater surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions.

**Wholesale Sales** An establishment engaged in the sale, lease, or rent of products primarily intended for industrial, institutional, or commercial businesses. The uses emphasize on-site sales or order taking and often include display areas. Businesses may or may not be open to the general public, but sales to the general public are limited. Products may be picked up on-site or delivered to the customer. Typical use include sale or rental of machinery, equipment, heavy trucks, building materials, special trade tools, welding supplies, machine parts, electrical supplies, janitorial supplies, restaurant equipment and store fixtures; mail order houses; and wholesalers of food, clothing, auto parts, building hardware.

# APPENDIX B

## TOWN OF RAVENEL ZONING CODE USE MATRIX

PRINCIPAL USES	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
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### AGRICULTURAL AND RELATED USES

Agricultural Production, Hydroponics, Horticulture, Nursery or Greenhouse Operations	A							A	A	
Agricultural Sales or Services	A						A	A	A	
Animal aquaculture, Commercial fishing, Fish and Shellfish Farming	S							A	A	
Forestry, Commercial Timber Operations	A							A	A	
Horse Production Operations, Breeding Stables	A									
Kennels with inside/outside boarding	S							A	A	
Landscape and horticulture services	S						A	A	A	
Livestock and/or Dairy Farms	S						S	S	S	
Lumber mills, Planing, Sawmills, including chipping or mulching	S						S	A	A	
Stable, Boarding and Riding	A							A	A	
Veterinary Services	C						C	A	A	

### RESIDENTIAL USES

Single-Family Dwellings, Detached	A	A	A	A	A	C	C	C	C	A
Duplex/Two-Family Dwellings	A		A	A						A
Farm Labor Homes	C									
Group Care Homes	S	S	S	S						
Group Residential, Fraternity or Sorority House	S			S						
Manufactured or Mobile Home on Individual Lot	A	A	A	A	A					
Manufactured or Mobile Home Park					C					
Multi-Family Dwellings				S						
Retirement Homes	S	S	S							

## TOWN OF RAVENEL ZONING CODE USE MATRIX

### PRINCIPAL USES

A-R   R-1   R-2   R-3   MHP   NC   GB   LI   GI   HC

### CIVIC, PUBLIC ADMINISTRATION, SOCIAL AND MEDICAL OFFICES

PRINCIPAL USES	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
Arboreta, Botanical Gardens and Zoological Exhibits	S						A	A	A	S
Cemetery, Crematorium	S	S	S	S						
Civic/Fraternal/Social Associations, including Youth Organizations, Sororities, Fraternities, Social Club or Lodge	S					A	A	A	A	
Colleges, Universities, Professional Schools, Vocational Schools	S					S	S	S	S	
Convention/Meeting Center, Visitors Bureau	S					S	S	S	S	
Community Recreation Center	S	S				S	S	S	S	
Convalescent Center	S	S				S	S			
Correctional Institutions								S	S	
Courts, Judicial						A	A	A	A	
Cultural Center						A	A	A	A	S
Day Care Center, Adult, Family	A	S				A	A			
Day Care Center, Educational, Pre-school	C	C	C	C		C	C			
Elementary, Secondary Schools	S	S	S	S		S	S	S	S	
Funeral Services including Funeral Homes or Mortuaries						S	A		A	
Government Offices,/Facilities						A	A	A	A	
Hospitals							A	A	A	
Individual and Family Social Service							A	A	A	
Libraries, Archives	A					A	A	A	A	
Medical and Dental Offices, Laboratories, Outpatient Clinics						S	A	A	A	
Museum, Art Galleries, Nature Exhibits	S					A	A	A	A	S
Personal Improvement Schools, i.e. Driving Schools, Dance School						A	A		A	
Public Order and Safety, Police and Fire Protection Stations	A	A	A	A		A	A	A	A	A
Religious Assembly	S	S	S	S		A	A	S	A	S
Residential Treatment Facility						S	S	S	S	
U. S. Post Office	A	A	A	A		A	A	A	A	A



# TOWN OF RAVENEL ZONING CODE USE MATRIX

## PRINCIPAL USES

A-R   R-1   R-2   R-3   MHP   NC   GB   LI   GI   HC

### COMMUNICATION USES

Cable/Other Pay Television Services										A	A	A		
Communication Services, including Radio or Television Broadcasting Studios, Film or Sound Recording Studios, Telecommunication Service Center or Telegraph Service Office									S	A	A	A		
Communication Transmitting Station										A	A	A		
Telecommunication Towers											C			
Telephone Facilities										A	A	A		

### UTILITIES

Electric or Gas Substation	S	S	S	S	S	S	S	S	A	A	A	A	A	S
Fuel Bottling and Distribution											A			
Maintenance Facilities for Utilities											A	A		
Recycling/Solid Waste Disposal											S			
Right-of-Way, Pipeline, Pressure Control Station											A	A		
Sewage Collection Service Line	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sewerage Disposal Facilities	S	S	S	S	S	S	S	S	S	S	A	S		
Telephone Switching Facility	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Waste Transfer/Collection Services												S		
Water Service Line	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Water Storage Tank	S										A	A	A	
Water Treatment Plant											A			

# TOWN OF RAVENEL ZONING CODE USE MATRIX

## PRINCIPAL USES

A-R    R-1    R-2    R-3    MHP    NC    GB    LI    GI    HC

## TRANSPORTATION RELATED SERVICES

	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
Airports, Airstrips								A		
Courier Services							A	A	A	
Dry Stack Boat Storage								A	A	
Household Moving Company						A	A	A	A	
Marine Terminals, Boat Rental Services							A	A	A	
Motor Freight Terminals							S	A	A	
Parking Lots/Areas, Garages							A	A	A	
Railroad Stations, Switching Yards								A		
Taxi, Limo Service, Vehicle Rental or Leasing						A	A			
Towing Services, No Vehicle Storage							C	A	A	
Towing Services, with Vehicle Storage								C		
Transit Terminals with Garaging and/or Maintenance								A	A	

## TOWN OF RAVENEL ZONING CODE USE MATRIX

### PRINCIPAL USES

#### INDUSTRIAL SERVICES

	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
Concrete Products Manufacturing, Cement Processing								A	A	A
Fabricated Metal Products								A	A	A
Food and Related Products Packing							A	A	A	A
Freight Container Storage Yards, excluding Fuel Storage Facilities							C			
Furniture, Cabinets, Fixtures or Related Products Manufacturing							S	A	A	A
Industrial and Commercial Machinery and Transportation Equipment								A	A	A
Iron Works Industries								A	A	A
Manufacturing, Heavy, including Aircraft, Beverage, Cement, Concrete, Chemical, or Clay Products, Machinery, Tools, Toy or Construction Equipment								A	S	S
Manufacturing, Light, including Computers or Electronic Products and Equipment, Fabric and Material Industry, Food Processing, Glass and Related Goods Production							C	A	A	A
Meat Packing	S							A	A	A
Motor Vehicles, Watercraft or Trailer Manufacturing, including Related Parts								A	A	A
Paper and Allied Products								A	A	A
Petroleum Refining and Related industries								A		
Printing and Publishing Industries, including Newspaper, Periodical, Book, Database, or Software Publishers, Printing Press							A	A	A	A
Professional or Commercial Equipment or Supplies, Manufacturing, including Office, Medical, Restaurant Equipment, or Specialty Items								A		
Pulp or Paper Mills								S		
Research and Development Laboratories	S							A	A	A
Resource Extraction, Mining and Quarry	S							S	S	S
Salvage and Junk Yards, including Auto Wrecking Yards, Parts or Paper Salvage, Wholesale Scrap, Waste Materials or Material Recovery Yards								C		
Sign Manufacturing							S	A	A	A
Stone, Clay, Glass and Concrete Products								A	A	A
Textile Mill Products								A	A	A
Yard Art, Wood Products and Decoration Manufacturing								A	A	A

# TOWN OF RAVENEL ZONING CODE USE MATRIX

## PRINCIPAL USES

A-R   R-1   R-2   R-3   MHP   NC   GB   LI   GI   HC

## WAREHOUSE AND FREIGHT MOVEMENT

	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
Cold Storage Plants								A	A	
Freight Container Storage Yards, excluding Fuel Storage Facilities								C		
Freight Forwarding Facilities, including Truck Terminals, Marine Terminals or Packing and Crating Facilities								S	S	
Fuel Storage Facilities								A		
Household Moving and Storage								A	A	
Grain Terminals and Elevators	S							A	A	
Parcel Services							A	A	A	
Retail Store Warehouse								A	A	
Self-storage, Mini-warehousing							S	A	A	
Stockpiling of Sand, Gravel, etc.							S	A	A	
Vehicle Storage, including Bus Barns, RV Storage or Impound Yards								C	C	
Warehouse and Distribution Facilities								A	A	
Warehousing: Industrial								A	A	
Warehousing: Office							S	A	A	
Miscellaneous manufacturing-type industries that are not elsewhere classified								S	S	

# TOWN OF RAVENEL ZONING CODE USE MATRIX

## PRINCIPAL USES

A-R    R-1    R-2    R-3    MHP    NC    GB    LI    GI    HC

### Wholesale Trade

	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
Aircraft Wholesalers								A	A	
Apparel or Fabric Wholesalers								A	A	
Chemical and Allied Products Wholesalers								A		
Electrical Equipment, Appliances or Components Wholesalers							S	A	A	
Flowers, Nursery Stock Wholesalers	A						A	A	A	
Food or Related Products, Wholesalers							A	A	A	
Furniture, Cabinets or Related Products							C	A	A	
Petroleum Bulk Station and Terminals								A		
Professional or Commercial Equipment or Supplies Wholesalers								A	A	
Toy or Artwork Wholesalers									A	
Watercraft and Related Parts Wholesalers								A	A	
Wholesalers, including Construction Materials, Farm Supplies and Equipment, Leather Products, Metal, Mineral or Printed Materials							S	A	A	
Wholesalers, including Motor Vehicles - Commercial or Passenger, Trailers Wholesalers including Related Parts								A	A	
Other Miscellaneous Wholesale Sales								S	S	

# TOWN OF RAVENEL ZONING CODE USE MATRIX

## PRINCIPAL USES

A-R   R-1   R-2   R-3   MHP   NC   GB   LI   GI   HC

### RETAIL TRADE

PRINCIPAL USES	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
Adult and Sexually Oriented Businesses								C		
Art, Hobby, Musical Instrument, Toy, Sporting Goods, or Related Products Store						A	A	A	A	
Auto and home supply store						A	A	A	A	
Building Materials/Lumber Yards						A	A	A	A	
Catering Services						A	A	A	A	
Convenience Stores						A	A	A	A	
Department Stores, including Clothing, Piece Goods, Shoes, Jewelry, Leather Goods, or Related Products						A	A	A	A	
Drinking (alcoholic beverage) Places, including Bars, Lounges, Taverns, Cocktail Lounges, Members Exclusive Clubs, Whether Public or Private								C		C
Eating Places, including Cafeterias, Diners or Full Service Restaurants						C	A	A	A	
Eating Places, including Fast Food, Drive-In, Snack or non-Alcoholic Beverage Bars						A	A	A	A	
Electronics, Appliances, or Related Products Store						S	A	A	A	
Farm Equipment							A	A	A	
Florist						A	A	A	A	
Food, Grocery Stores, Meat Markets, Retail Bakeries, Candy Shops						C	A	A	A	
Fuel Dealers, (except Liquefied Petroleum Gas) including Heating Oil Dealers								A	A	
Furniture Stores, Home Furnishings						A	A	A	A	
Garden Supply Center						A	A	A	A	
Gasoline Service Stations						C	A	A	A	
Hardware Stores, Home Improvement Stores						A	A	A	A	
Heating and Plumbing Supplies						A	A	A	A	
Heavy Duty Truck or Commercial Vehicle Dealer						S	A	A	A	
Liquefied Petroleum Gas (bottled) Dealers							A	A	A	
Liquor Stores, Beer or Wine Sales						S	S	A	A	S

## TOWN OF RAVENEL ZONING CODE USE MATRIX

### PRINCIPAL USES

	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
Marine Craft and Accessories							A	A	A	
Manufactured Home Sales, Mobile Home Dealers							A	A	A	
Motor vehicle dealers, new or used							A	A	A	
News Dealers, Newsstands						A	A	A	A	
Non-store Retailers, Direct Selling Merchandise, Mail-order Houses						S	A	A	A	
Optical Goods						A	A	A	A	
Paint, Glass and Wallpaper Stores						A	A	A	A	
Pawn Shop							A		A	
Pet Stores or Grooming Salons						A	A	A	A	
Pharmacy, Drug Store						A	A	A	A	
Private Postal, Mailing Service						A	A	A	A	
Recreational Motor Homes							A	A	A	
Recreational and Utility Trailer Dealer							A	A	A	
Retail Nurseries, Lawn and Garden Supply S							A	A	A	
Tobacco Stores and Stands							A	A	A	
Used Merchandise Stores						A	A	A	A	
Variety Stores						A	A	A	A	
Vending Machine Operators						A	A	A	A	
Warehouse Clubs or Superstores							A	A	A	
Miscellaneous General Merchandise Store, not elsewhere listed						S	S	S	S	

# TOWN OF RAVENEL ZONING CODE USE MATRIX

## PRINCIPAL USES

A-R   R-1   R-2   R-3   MHP   NC   GB   LI   GI   HC

## BUSINESS SERVICES

Accounting, Auditing, and Book Keeping Services, Couriers, Insurance Offices, Tax Preparation Offices									A	A	A	A		
Advertising Agencies									A	A	A	A		
Business/Professional Organizations									A	A	A	A		
Computer and Data Processing									A	A	A	A		
Contractor, Construction Company, including Carpentry, Concrete, Electrical, Excavation, Painting, Roofing, Siding, Sheet Metal and Flooring including Tile and Terrazzo Offices									C	A	A	A		
Engineering, Architectural and Surveying Services									A	A	A	A		
Finance Services, including Savings Banks, Loan or Lending Services, Stock or Bond Brokers, Credit Unions									A	A	A	A		
Insurance Carriers and Services									A	A	A	A		
Legal Services									A	A	A	A		
Management and consultant service									A	A	A	A		
Print Shop, Duplicating Services									A	A	A	A		
Real Estate Brokers and Travel Services									A	A	A	A		
Security, Commodity Brokers									A	A	A	A		



# TOWN OF RAVENEL ZONING CODE USE MATRIX

## PRINCIPAL USES

A-R   R-1   R-2   R-3   MHP   NC   GB   LI   GI   HC

## PERSONAL SERVICES

	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
Barber/Beauty Shops, Skin Care Services	S	S				A	A	A	A	
Cleaning and Maintenance Services, Carpet Cleaning, Janitorial Services						A	A	A	A	
Consumer Goods, Rental Services						A	A	A	A	
Day Care Centers, Family Day Care, Overnight Care Centers	C	C	C	C		C	C			
Dry Cleaning/Laundry with Plant Operations							A	A	A	
Exterminating services						A	A	A	A	
Florists						A	A		A	
Funeral Services, Mortuaries						A	A		A	
Landscaping Services						A	A	A	A	
Locksmith						A	A	A	A	
Medical and Dental Services, Clinics						A	A	A	A	
Pet Grooming, No Boarding	A					A	A	A	A	
Pet Grooming, Boarding Facilities							A	A	A	
Photographic/Portrait Studios						A	A	A	A	
Shoe Repair Shops						A	A	A	A	
Small Engine, Electronics Repair						A	A	A	A	
Tailors or Seamstresses						A	A	A	A	

## MISCELLANEOUS SERVICES

Contract Construction							A	A	A	
Equipment Rental and Leasing							A	A	A	
Hotels, Motels and Inns							A		A	
Lodges, Fishing, Fishing Guide Services, Hunting	S					S	S			
Photofinishing Labs						A	A	A	A	
Recreational Vehicle Park	C					C	C		C	
Research and Development Labs							A	A	A	
Rooming and Boarding Homes	S					S	A			
Tourist Homes/Bed and Breakfast	C	C	C	C						C
Miscellaneous Services not Classified Elsewhere						S	S	S	S	

## TOWN OF RAVENEL ZONING CODE USE MATRIX

### PRINCIPAL USES

A-R    R-1    R-2    R-3    MHP    NC    GB    LI    GI    HC

### REPAIR SERVICES

	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
Automotive Vehicle Body Repair, Motor Repair, Muffler Repair, Tire and Brake Shop							A	A	A	
Automotive Vehicle Limited Services, including Oil Change or Lubrication, Car Wash						S	A	A	A	
Boat Yard, Boat Repair, Boat Maintenance							A	A	A	
Repair Shops, including Appliances, Electrical, Small Engine, Tool Repair, and Professional Instrument Repair							A	A	A	
Repair Shop, including Upholstery and Furniture, Jewelry and Shoes						S	A	A	A	
Welding, Iron Work Shops								A	A	
Repair shops, not elsewhere listed							S	S	S	

### AMUSEMENT AND RECREATION SERVICES, EXCEPT MOTION PICTURE

	A-R	R-1	R-2	R-3	MHP	NC	GB	LI	GI	HC
Amusement Parks, Fairgrounds, Go Cart Tracks							S	S	S	
Bowling Alley, Billiard and Pool Hall Establishments							A	A	A	
Camping, Picnicking Areas		S					A	A	A	
Coin-operated Amusement Devices							A	A	A	
Dance Studios and Schools						A	A	A	A	
Gun Ranges, Indoor/Outdoor								A	S	
Membership Health, Sports and Recreation Clubs						A	A	A	A	
Miniature Golf, Putt-putt Courses							A	A	A	
Parks, Public Playgrounds		A	A				A	A	A	
Professional Sports Clubs and Promoters, Arenas, Stadiums							C	A	A	
Public Golf Courses, Driving Ranges		S					S	A	A	
Recreation or Vacation Camps						A	A			
Skating Rinks, Ice and Roller							A	A	A	

# TOWN OF RAVENEL ZONING CODE USE MATRIX

## PRINCIPAL USES

A-R   R-1   R-2   R-3   MHP   NC   GB   LI   GI   HC

### Motion Picture and Theaters

Motion Picture Production								A	A	A	A	
Theaters, including Motion Picture										A	A	
Video Tape Rental												A

### ACCESSORY USES - Residential

*Residential - Accessory Uses must meet Special Accessory Uses Conditions as per Section 3.3*

Accessory Garage Apartment	A	A							A	A		
Accessory Guest Accommodations or Living Quarters for Owners, Employees or Caretakers	A							C	C	C		
Accessory Vehicle/Storage Building	A	A	A	A	A			A	A	A	A	A
Private Docks - 5 or less Slips	A	A	A	A	A			A	A	A	A	A

### ACCESSORY USES - Commercial

Accessory Off-Street Loading										A	A	A
Accessory Roadside Stand	A	A						A	A			

### TEMPORARY USES - Residential

Temporary Dwelling Unit as allowed under Section 3.3	A	A	A	A	A							A
--	---	---	---	---	---	--	--	--	--	--	--	---

### TEMPORARY USES - Commercial

Roadside Produce Stands, other Seasonal Uses as Allowed under Section 3.3	A	A						A	A			A
Temporary Sales or Construction Office as allowed under Section 3.3	A	A	A	A	A			A	A	A	A	A
Turkey Shoots	C									C	C	C

**APPENDIX C**  
**HEIGHT, AREA, AND SETBACK REQUIREMENTS**

DISTRICT	MINIMUM LOT AREA (square feet)	MINIMUM LOT WIDTH (feet)	MINIMUM SETBACKS FROM A LOT LINE OR STREET RIGHT-OF-WAY <sup>1</sup>			MAXIMUM % OF LOT COVERAGE	MAXIMUM BUILDING HEIGHT	ACCESSORY STRUCTURE setback from front street <sup>2</sup>
			FRONT	SIDE	REAR			
AR	43,560 (one acre)	150'	30'	10'	30'	35%	35' (2.5 stories)	60'
R-1	43,560 (one acre)	150'	30'	10'	30'	35%	35' (2.5 stories)	60'
R-1R	43,560 (one acre)	150'	30'	10'	30'	35%	35' (2.5 stories)	60'
R-2	30,000 (.69 acre)	70'	30'	10'	30'	40%	35' (2.5 stories)	60'
R-2R	30,000 (.69 acre)	70'	30'	10'	30'	40%	35' (2.5 stories)	60'
R-3	12,500 (.29 acre)	70'	25'	10'	25'	50%	35' (2.5 stories)	60'
R-3R	12,500 (.29 acre)	70'	25'	10'	25'	50%	35' (2.5 stories)	60'
R-4	22,000 (.51)	80'	30'	10'	25'	40%	35' (2.5 stories)	60'
MHP	Five (5) acres	150'	50'	50'	50'	40%	35' (2.5 stories)	60'
NC	12,500 (.29 acres)	100'	50'	25 <sup>*</sup>	25 <sup>**</sup>	35%	35' (2.5 stories)	60'
GB	12,500 (.29 acres)	100'	50'	25 <sup>*</sup>	25 <sup>**</sup>	40%	35' (2.5 stories)	60'
LI	10.0 acres	200'	50'	50'	50'	40%	35' (2.5 stories)	60'
GI	2.0 acres	100'	50'	25'	35'	40%	35' (2.5 stories)	60'

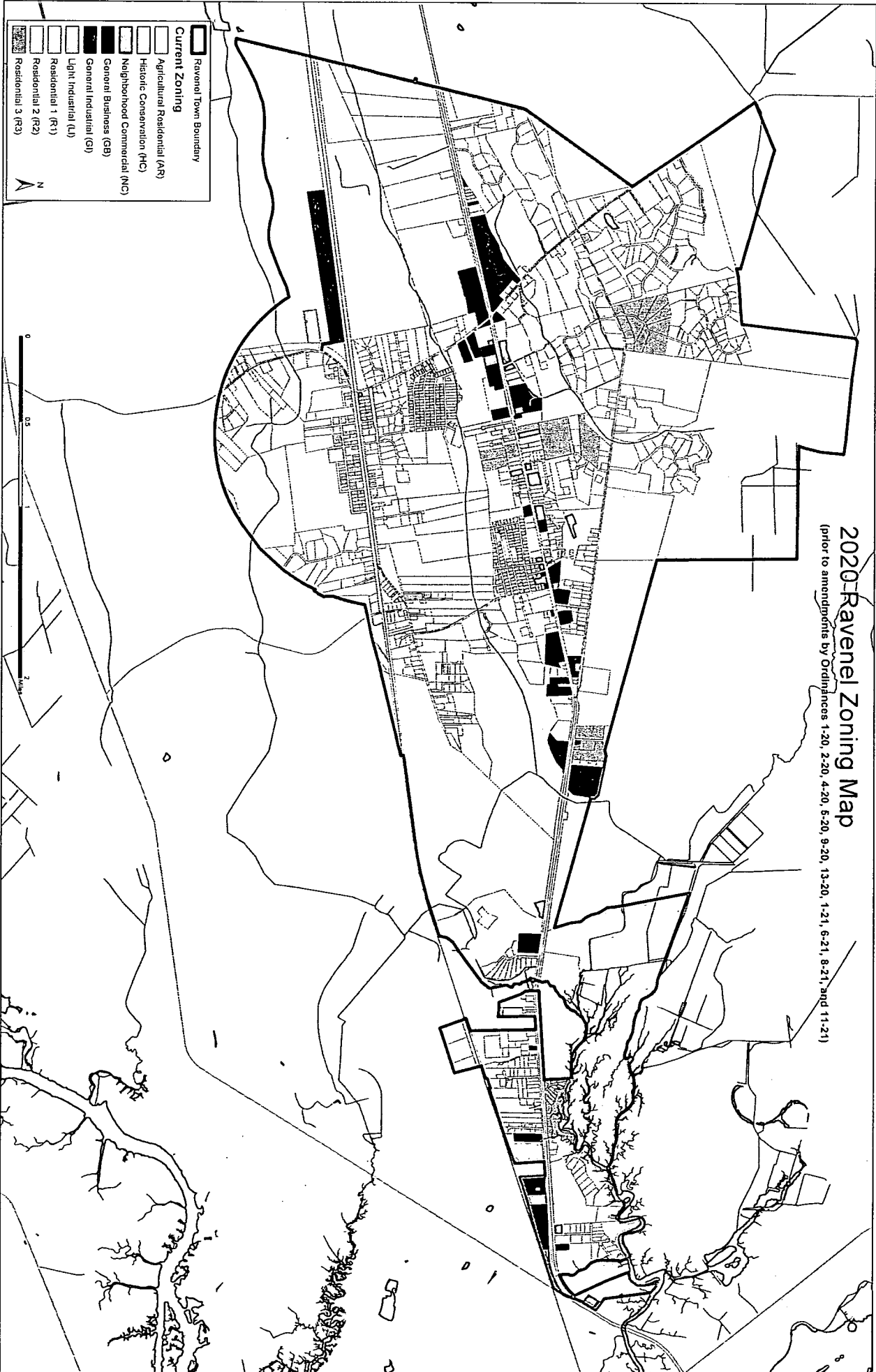
<sup>\*</sup>Minimum side yard setbacks for existing lots of two-acres or less and that abut other commercial lots shall be 10 feet.

<sup>\*\*</sup>Minimum rear yard setback for existing lots of two acres or less and that abut other commercial lots shall be 15 feet

<sup>1</sup>35' minimum setback from freshwater or saltwater wetlands or in flood prone areas as determined by FIRM maps, setback from critical line shall be a minimum of 35'.

<sup>2</sup>Shall not apply to carport: setback from side or rear yard shall be no less than 6' for any detached residential accessory AND 15' from any principal structure on the subject lot or adjoining lot.

**2020 Raveneil Zoning Map**  
(prior to amendments by Ordinances 1-20, 2-20, 4-20, 5-20, 9-20, 13-20, 1-21, 6-21, 8-21, and 11-21)



**EXHIBIT F**

**TRAFFIC IMPACT STUDY STANDARDS**



**Golden Grove Development  
Traffic Impact Analysis**

Charleston County, South Carolina

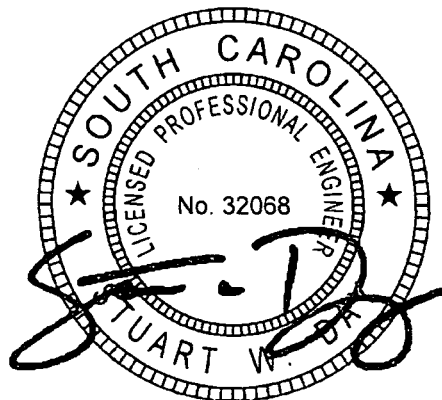
Prepared for:

Bowman Consulting Group, Ltd.

Prepared by:

Stantec Consulting Services Inc.

February 2021



2-11-21



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

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# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

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# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Executive Summary

A traffic impact analysis was conducted for the Golden Grove development following SCDOT and Charleston County guidelines. The proposed Golden Grove development is located on the north side of US 17 between New Road and Old Jacksonboro Road in Charleston County, South Carolina. The Golden Grove development is a residential development with a final buildout year of 2026 and will consist of 382 single-family homes.

The extent of the existing road network to be studied consists of two intersections - US 17 & SC 165 and US 17 & New Road. Access to the development will be provided through two driveways, a new proposed right-in, right-out driveway to the west along US 17 (Golden Grove Driveway 1), as well as a new proposed full access driveway to the east along US 17 (Golden Grove Driveway 2).

Based on the *Roadway Design Manual* guidelines, a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) along US 17 is recommended at the proposed intersection with Golden Grove Driveway 1.

An eastbound exclusive left-turn lane 400 feet in length (200 feet of storage with a 200-foot taper) and a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) along US 17 are recommended at the proposed intersection with Golden Grove Driveway 2. An exclusive left-turn lane 350 feet in total length (200 feet of storage and a 150-foot taper) is recommended on the southbound approach of Golden Grove Driveway 2.

The results of the analysis indicate that the proposed intersection of US 17 & Golden Grove Driveway 1 is anticipated to operate at LOS B in both peak hours with a stop-controlled approach for the Golden Grove minor street approach. Therefore, no additional improvements are recommended, beyond the proposed exclusive westbound right-turn lane along US 17 into the site.

The intersection of US 17 & Golden Grove Driveway 2 is anticipated to operate at LOS C in the AM peak hour and LOS E in the PM peak hour with a stop-controlled approach for the Golden Grove minor street approach. The delay in the PM peak hour is anticipated to be experienced only by patrons of the Golden Grove site (and not by mainline traffic along US 17). Therefore, no additional improvements are recommended, beyond the proposed exclusive right- and left-turn lanes along US 17 into the site and proposed southbound left-turn lane exiting the site.



## **GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS**

The intersection of US 17 & New Road is anticipated to experience an undesirable level of service in the PM peak hour in 2026 without the Golden Grove development. However, since this intersection operates at LOS D in the 2026 Build scenario, no improvements are recommended. The increased number of right-turns at this intersection brings the average delay for the minor street approaches down in the Build scenario. The signalized intersection of US 17 & SC 165 is projected to operate at an acceptable LOS with or without the Golden Grove development.

In addition to the residential land use analyzed in this traffic impact analysis study, the Golden Grove development master plan also includes commercial land use to be built in the future. It is recommended that an additional traffic impact analysis study be performed in the future before building this commercial land-use portion of the development.



## 1.0 INTRODUCTION

The purpose of this report is to document a traffic impact analysis for the Golden Grove development located in Charleston County, South Carolina following the South Carolina Department of Transportation (SCDOT) and Charleston County guidelines. This report summarizes the procedures and findings of the traffic impact analysis.

### 1.1 PROJECT BACKGROUND

The proposed Golden Grove development is located on the north side of US 17 between New Road and Old Jacksonboro Road in Charleston County, South Carolina. The final buildout will consist of 382 single-family homes. Access to the development will be provided through a new proposed right-in, right out (RIRO) driveway (Golden Grove Driveway 1), and a new proposed full access driveway (Golden Grove Driveway 2). Both of these driveways are located along US 17.

The traffic impact analysis considers the weekday AM peak hour (between 7:00 AM and 9:00 AM) and the weekday PM peak hour (between 4:00 PM and 6:00 PM) as the study time frames. The extent of the existing road network to be studied consists of the two (2) intersections of:

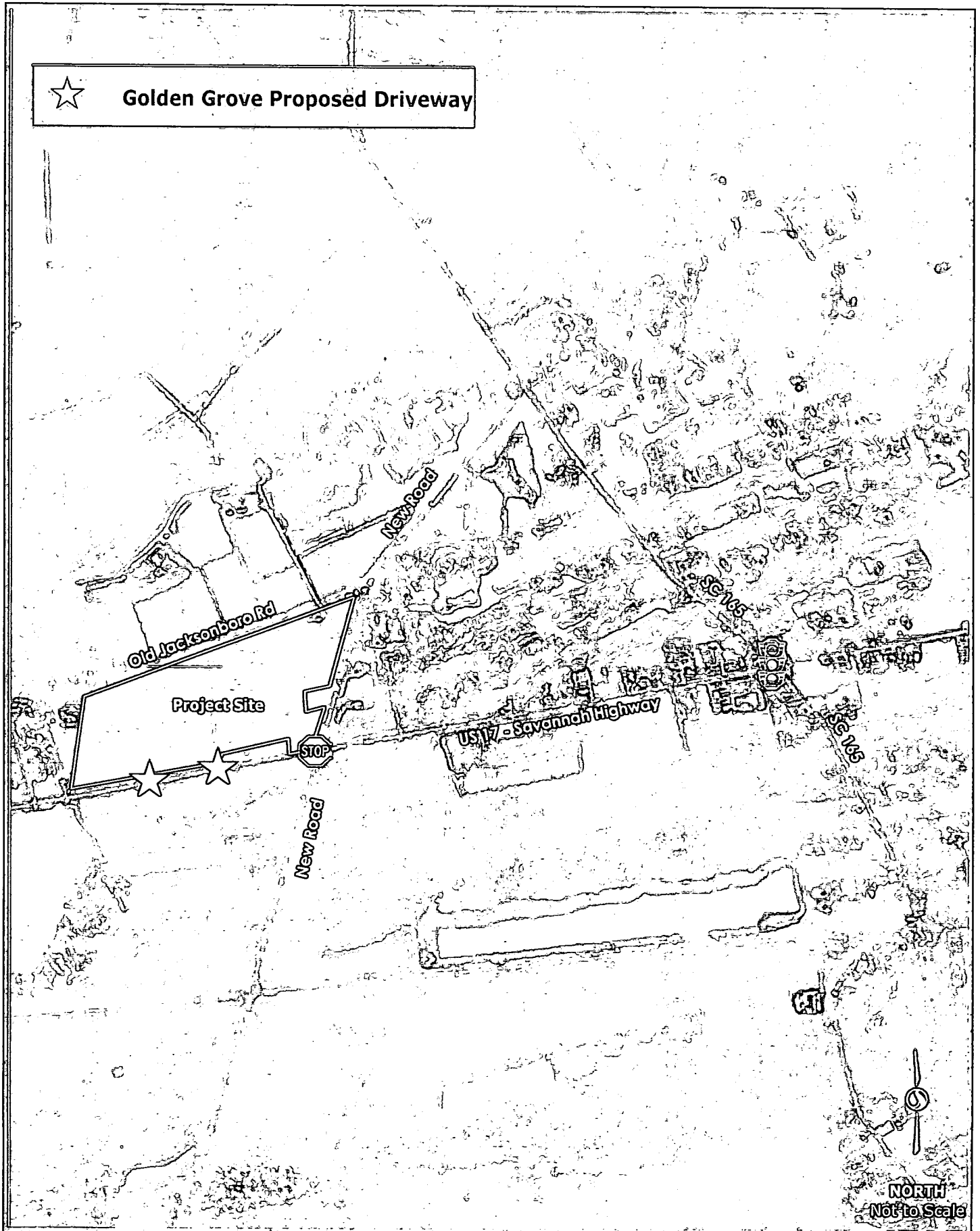
1. US 17 & SC 165
2. US 17 & New Road

The proposed development is anticipated to be completed by 2026. **Exhibit 1.1** illustrates the location of the project site, including the adjacent public roadway network. **Exhibit 1.2** illustrates the site plan of the proposed development.





Golden Grove Proposed Driveway



Golden Development Traffic Impact Analysis



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

Introduction

## 1.2 EXISTING ROADWAY CONDITIONS

US 17 is a four-lane divided principal arterial roadway that serves primarily commercial land uses. The posted speed limit is 55 mph and the 2019 AADT was 21,100 vpd. Based on existing turning movement counts, the percentage of heavy vehicles along US 17 is 7%.

SC 165 is a two-lane minor arterial roadway that serves commercial and residential land uses. The posted speed limit is 35 mph and the 2019 AADT was 4,600 vpd. Based on existing turning movement counts, the percentage of heavy vehicles along SC 165 is 4%.

New Road is a two-lane local roadway that serves residential land uses. Based on existing turning movement counts, the percentage of heavy vehicles along New Road is less than 1%.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Driveway Spacing Review

## 2.0 DRIVEWAY SPACING REVIEW

Access to the development will be provided through one full access driveway and one RIRO driveway along US 17. A review of the driveway spacing of the proposed driveways along US 17 was undertaken based upon the information contained in SCDOT's *Access & Roadside Management Standards (ARMS)* manual.

Based upon the 55-mph posted speed limit and the driveway spacing criteria of ARMS, a minimum driveway spacing of 400 feet is required for full access driveways along US 17. The proposed full movement Golden Grove Driveway 2 on US 17 is located approximately 1,600 feet west of the nearest access road/driveway, New Road. The proposed RIRO Golden Grove Driveway 1 on US 17 is located approximately 600 feet west of the Golden Grove full access driveway. Both of these driveways fulfill the SCDOT driveway spacing criteria.





# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Project Traffic

### 3.0 PROJECT TRAFFIC

Project traffic in this analysis is defined as the vehicle trips expected to be generated by the Golden Grove development. These trips were distributed and assigned throughout the study roadway network.

#### 3.1 PROPOSED LAND USES

The Golden Grove development will consist of 382 single-family homes. The project site is currently vacant.

#### 3.2 TRIP GENERATION ESTIMATES

The trip generation for the development was estimated using the information contained in ITE's Trip Generation Manual, 10<sup>th</sup> Edition (2017) reference. The estimates utilized the following land use codes (LUC):

- ❖ 210 – Single-Family Detached Housing;

Estimates were developed for the weekday daily, the weekday AM peak hour of the adjacent street, and the weekday PM peak hour of the adjacent street. The trip generation estimates for the development are shown in **Table 3.1** and documented in **Appendix A**.



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Project Traffic

Table 3.1 – Trip Generation Estimates

Land Use	ITE LUC	Scale	Daily	Weekday AM Peak Hour		Weekday PM Peak Hour	
				Enter	Exit	Enter	Exit
Single-Family Detached Housing	210	382 Homes	3,568	69	207	232	136
<b>New External Trips:</b>			<b>3,560</b>	<b>69</b>	<b>207</b>	<b>232</b>	<b>136</b>



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Project Traffic

### 3.3 TRIP DISTRIBUTION & ASSIGNMENT

New external traffic expected to be generated by the Golden Grove development was distributed and assigned to the roadway network based upon existing travel patterns in the area. The general distribution of new project trips was assumed to be:

- ❖ 5% to/from the north via New Road;
- ❖ 10% to/from the north via SC 165;
- ❖ 10% to/from the south via SC 165;
- ❖ 50% to/from the east via US 17; and
- ❖ 25% to/from the west via US 17.

The assignment of project traffic is illustrated in **Exhibit 3.1** for the AM and PM peak hours.

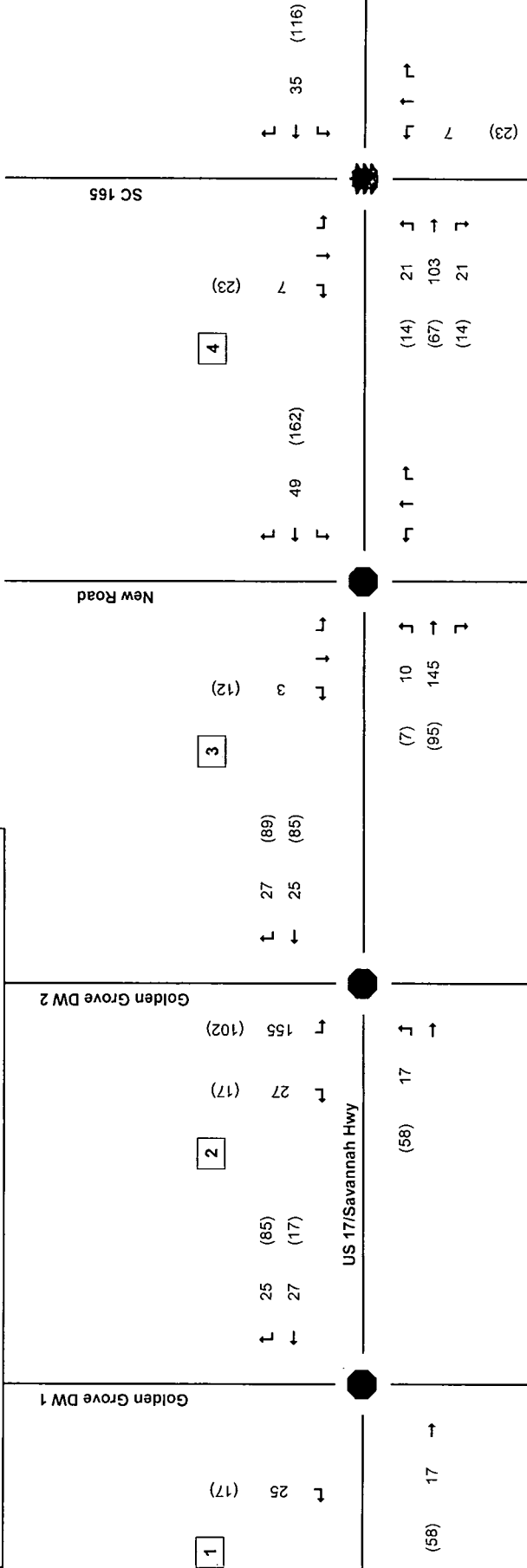




2026 PROJECT TRAFFIC VOLUMES LEGEND

- 000' - AM Peak Hour Volumes
- (000) - PM Peak Hour Volumes
- TWSC
- ▲ Yield
- ◊ Roundabout
- ◻ Signal

**GOLDEN GROVE  
PROJECT SITE**



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Traffic Volume Development

### 4.0 TRAFFIC VOLUME DEVELOPMENT

Existing traffic volumes were collected in October 2020 for use in the project intersection analyses and future-year traffic volume development. The future-year traffic 2026 volumes consisted of existing traffic volumes adjusted by an annual growth rate and projected traffic volumes of the Golden Grove development.

#### 4.1 EXISTING TRAFFIC VOLUMES

The traffic impact analysis considers the weekday AM peak hour (between 7:00 AM and 9:00 AM) and the weekday PM peak hour (between 4:00 PM and 6:00 PM) at the existing intersections of US 17 & New Road and US 17 & SC 165.

To incorporate the reduced traffic volumes due to the COVID-19 pandemic, seasonal factors assigned by SCDOT were applied to the collected traffic volume numbers. As a result, the AM and PM traffic volumes were increased by 19% and 13% respectively. The SCDOT guidelines for calculating the volume reduction due to the COVID-19 pandemic are documented in **Appendix B**.

The raw traffic volume counts are provided in **Appendix C**. The factored existing traffic volumes are illustrated in **Exhibit 4.1** and documented in **Appendix D**.

#### 4.2 FUTURE TRAFFIC VOLUME PROJECTIONS

##### 4.2.1 Historical Growth Rates

To develop an annual background growth rate for use in the analysis, historical count data along US 17 (SCDOT count station #103) was reviewed over the past 10 years. It was determined that the roadway has experienced annual growth of approximately 2.24%. To be conservative, a 2.5% annual growth rate was used to develop the 2026 No Build traffic volumes, which are illustrated in **Exhibit 4.2**.

The Golden Grove development project traffic volumes were then combined with the 2026 No Build volumes to develop the 2026 Build traffic volumes, which are illustrated in **Exhibit 4.3**. Intersection traffic volume development is documented in **Appendix D**.



2020 EXISTING PEAK HOUR TRAFFIC VOLUMES LEGEND

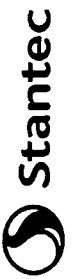
- 000 - AM Peak Hour Volumes
- (000) - PM Peak Hour Volumes
- TWSC
- ▲ Yield
- Signal
- ◇ Roundabout



**GOLDEN GROVE  
PROJECT SITE**

Location	Direction	AM Peak Hour Volume	PM Peak Hour Volume	Notes
Golden Grove DW 1	→	0	0	
	←	0	0	
Golden Grove DW 2	→	0	0	
	←	0	0	
New Road	→	0	0	
	←	0	0	
SC 165	→	0	0	
	←	0	0	

**Golden Grove Development - Traffic Impact Analysis**  
Exhibit 4.1 - 2020 Existing Peak Hour Traffic Volumes

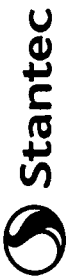
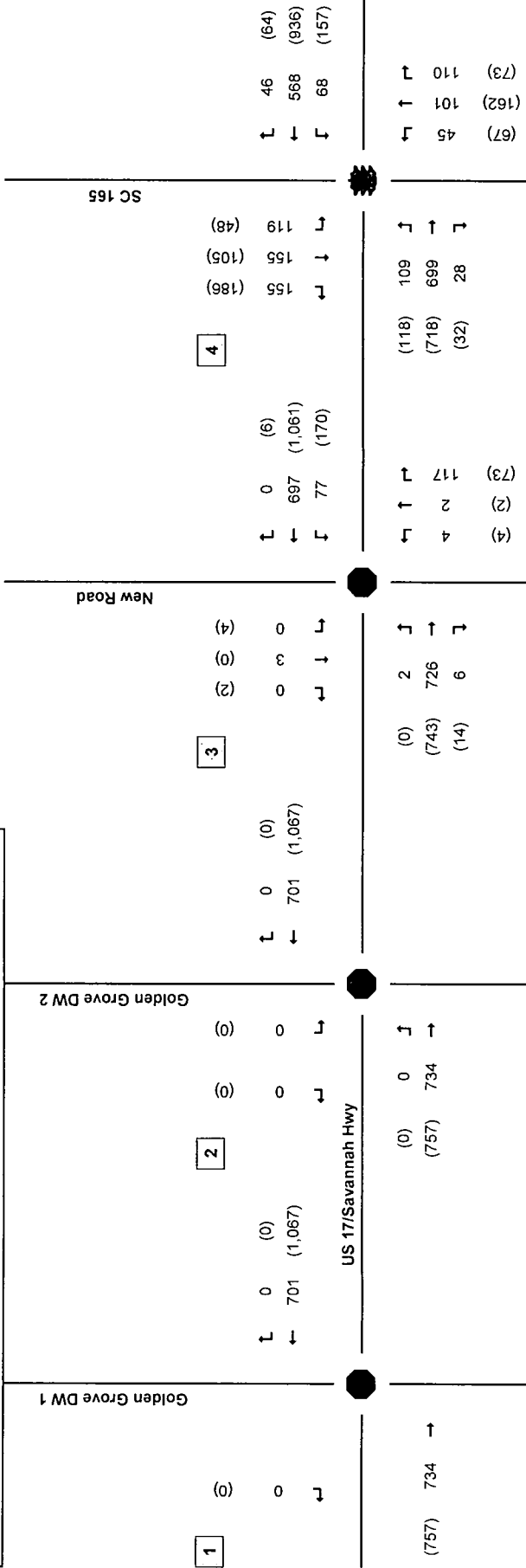




2026 NO. BUILD PEAK HOUR TRAFFIC VOLUMES LEGEND

- 000 - AM Peak Hour Volumes
- (000) - PM Peak Hour Volumes
- TWSC
- Signal
- Yield
- Roundabout

**GOLDEN GROVE  
PROJECT SITE**

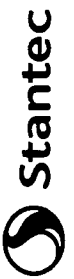
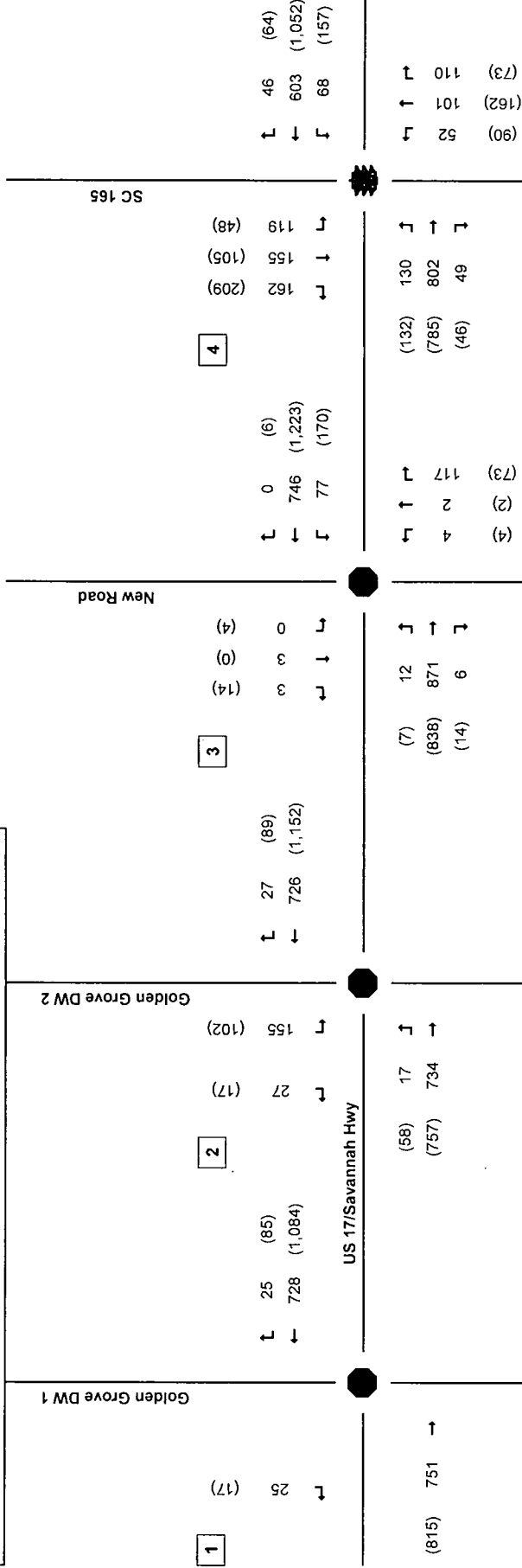


2026-BUILD PEAK HOUR TRAFFIC VOLUMES LEGEND

- 000 - AM Peak Hour Volumes
- (000) - PM Peak Hour Volumes
- TWSC
- Signal
- Yield
- Roundabout



**GOLDEN GROVE  
PROJECT SITE**





# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Traffic Impact Analysis

### 5.0 TRAFFIC IMPACT ANALYSIS

Using the existing and projected traffic volumes previously discussed, intersection analyses were conducted for the study and project driveway intersections considering 2020 Existing conditions, 2026 No-Build conditions, and 2026 Build conditions. This analysis was conducted using the Transportation Research Board's *Highway Capacity Manual 2010 (HCM 2010)* methodologies of the *Synchro*, Version 10 software for intersection analysis.

Intersection level of service (LOS) grades range from LOS A to LOS F, which are directly related to the level of control delay at the intersection and characterize the operational conditions of the intersection traffic flow. LOS A operations typically represent ideal, free-flow conditions where vehicles experience little to no delays, and LOS F operations typically represent poor, forced-flow (bumper-to-bumper) conditions with high vehicular delays, and are generally considered undesirable. **Table 5.1** summarizes the *HCM 2010* control delay thresholds associated with each LOS grade for unsignalized and signalized intersections.

**Table 5.1 – HCM 2010 LOS Criteria for Unsignalized and Signalized Intersections**

Unsignalized Intersections		Signalized Intersections	
LOS	Control Delay (s/veh)	LOS	Control Delay (s/veh)
A	< 10	A	< 10
B	> 10 and < 15	B	> 10 and < 20
C	> 15 and < 25	C	> 20 and < 35
D	> 25 and < 35	D	> 35 and < 55
E	> 35 and < 50	E	> 55 and < 80
F	> 50	F	> 80

#### 5.1 INTERSECTION LOS ANALYSIS

As part of the intersection analysis, SCDOT's default *Synchro* parameters were utilized. The 2020 traffic counts peak hour factors (PHF) were utilized in the analysis of existing peak season and future conditions with a minimum PHF of 0.90 and maximum PHF of 0.95 being considered for the future-year conditions. Existing heavy vehicle percentages, as previously discussed, were utilized in the analysis, with a minimum percentage of 2% considered. The existing lane geometry was utilized for the analysis of existing conditions and the 2026 future-year scenarios.



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Traffic Impact Analysis

The 2026 Build future-year scenario utilized new lane geometries at the two Golden Grove driveways. The construction of the RIRO movement intersection at US 17 & Golden Grove Driveway 1 would involve the addition of an exclusive right turn lane along US 17 for ingress to the site. The construction of the full movement US 17 & Golden Grove Driveway 2 intersection would involve shifting an existing median break located approximately 400 feet east of the proposed site access point. Exclusive left and right turn lanes would be added along US 17 for ingress to the site in addition to an exclusive southbound left turn lane.

Using the Synchro Intersection software, intersection analyses were conducted for 2020 Existing conditions, 2026 No-Build conditions, and 2026 Build conditions for the weekday AM and PM peak-hour periods. The results of the intersection analyses for existing and future-year conditions for the weekday AM and PM peak-hour periods are summarized in **Table 5.2** for the intersections of US 17 & Golden Grove Driveway, US 17 & New Road, and US 17 & SC 165, respectively. For the unsignalized intersections, the LOS and delay results are shown for the worst-case minor-street approaches only, based upon the *HCM 2010* methodologies for two-way stop-controlled intersections.

**Table 5.2 – Intersection Analysis Results**

Intersection	Control	LOS/Delay (seconds/vehicle)					
		AM Peak Hour			PM Peak Hour		
		2020 Existing	2026 No Build	2026 Build <sup>1</sup>	2020 Existing	2026 No Build	2026 Build <sup>1</sup>
1 US 17 & Golden Grove Driveway 1	TWSC	--	--	B/11.3 (SB)	--	--	B/13.3 (SB)
2 US 17 & Golden Grove Driveway 2	TWSC	--	--	C/22.9 (SB)	--	--	E/44.8 (SB)
3 US 17 & New Road	TWSC	C/22.2 (SB)	D/25.6 (SB)	C/21.0 (SB)	D/28.2 (SB)	E/35.6 (SB)	D/25.6 (SB)
4 US 17 & SC 165	SIGNAL	B/13.0	B/13.3	B/12.5	B/11.2	B/11.8	B/11.9

<sup>1</sup> Includes proposed right- and left-turn lanes along US 17 for ingress into the site.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Traffic Impact Analysis

The results of the analysis indicate that the proposed intersection of US 17 & Golden Grove Driveway 1 is anticipated to operate at LOS B in both peak hours with a stop-controlled approach for the Golden Grove minor street approach. Therefore, no additional improvements are recommended, beyond the proposed exclusive westbound right-turn lane along US 17 into the site.

The intersection of US 17 & Golden Grove Driveway 2 is anticipated to operate at LOS C in the AM peak hour and LOS E in the PM peak hour with a stop-controlled approach for the Golden Grove minor street approach. The delay in the PM peak hour is anticipated to be experienced only by patrons of the Golden Grove site (and not by mainline traffic along US 17). Therefore, no additional improvements are recommended, beyond the proposed exclusive right- and left-turn lanes along US 17 into the site and proposed southbound left-turn lane exiting the site.

The intersection of US 17 & New Road is anticipated to experience an undesirable level of service in the PM peak hour in 2026 without the Golden Grove development. However, since this intersection operates at LOS D in the 2026 Build scenario, no improvements are recommended. The increased number of right-turns at this intersection brings the average delay for the minor street approaches down in the Build scenario. The signalized intersection of US 17 & SC 165 is projected to operate at an acceptable LOS with or without the Golden Grove development.

In addition to the residential land use analyzed in this traffic impact analysis study, the Golden Grove development master plan also includes commercial land use to be built in the future. It is recommended that an additional traffic impact analysis study be performed in the future before building this commercial land-use portion of the development.

Synchro reports documenting the intersection analysis are provided in **Appendix E** for 2020 Existing Conditions, **Appendix F** for 2026 No-Build Conditions, and **Appendix G** for 2026 Build Conditions.



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Traffic Impact Analysis

### 5.2 TURN LANE ANALYSIS

An analysis was conducted to determine the potential need for exclusive turn lanes for the proposed Golden Grove driveways. This analysis was conducted utilizing the criteria documented in SCDOT's *ARMS Manual* (2008) and *Roadway Design Manual* (2017). The need for exclusive right-turn lanes is based upon the criteria documented in Section 9.5.1.1 of the *Roadway Design Manual*, which consists of nine considerations. These considerations and applications are listed below for the US 17 intersections with Golden Grove Driveway 1 & 2.

- 1) *At a free-flowing leg of any unsignalized intersection on a two-lane urban or rural highway which satisfies the criteria in Figure 9.5-A;*

The criterion is not applicable as US 17 is a four-lane highway.

- 2) *At the free-flowing leg of any unsignalized intersection on a high-speed (50 miles per hour or greater), four-lane urban or rural highway which satisfies the criteria in Figure 9.5-B;*

The intersections of US 17 & Golden Grove Driveway 1 and US 17 & Golden Grove Driveway 2 were analyzed for an exclusive westbound right-turn lane according to the *Roadway Design Manual*. The analysis shows that the intersection does satisfy the criteria for an exclusive right-turn lane in the build-out year 2026. Worksheets including the turn-lane analysis are provided in **Appendix H**.

- 3) *At the free-flowing leg of any unsignalized intersection on a six-lane urban or rural highway;*

This criterion is not applicable as US 17 is not a six-lane highway.

- 4) *At any intersection where a capacity analysis determines a right-turn lane is necessary to meet the overall level-of-service criteria;*

The intersection analysis results indicate that all approaches operate at an acceptable overall delay, so this criterion is not applicable.

- 5) *As a general rule, at any signalized intersection where the projected right-turning volume is greater than 300 vehicles per hour and where there are greater than 300 vehicles per hour per lane on the mainline (A traffic analysis will be required if the turning volumes are greater than 300 vehicles per hour.);*

This criterion is not applicable as the intersections are not proposed to be signalized.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Traffic Impact Analysis

- 6) *For uniformity of intersection design along the highway if other intersections have right-turn lanes;*

Right turn lanes are provided at other intersections with driveways along US 17. Therefore, this criterion is applicable.

- 7) *At any intersection where the mainline is curved to the left and where the mainline curve requires superelevation;*

The mainline is not curved and does not look to have superelevation at the intersection; therefore, this criterion is not applicable.

- 8) *At railroad crossings where the railroad is paralleled to the facility and is located close to the intersection and where a right-turn lane would be desirable to store queued vehicles avoiding interference with the movement of through traffic; or*

The intersection is not located near railroad facilities; therefore, this criterion is not applicable.

- 9) *At any intersection where the crash experience, existing traffic operations, sight distance restrictions (e.g., intersection beyond a crest vertical curve), or engineering judgment indicates a significant conflict-related to right-turning vehicles.*

No issues with crashes, traffic operations, or sight distance are known; therefore, this criterion is not applicable.

Based on the *Roadway Design Manual* guidelines, a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) is recommended along US 17 at the proposed intersection with the Golden Grove Driveway 1, and a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) is recommended along US 17 at the proposed intersection with Golden Grove Driveway 2.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Traffic Impact Analysis

The need for exclusive left-turn lanes is based upon the criteria documented in Section 9.5.1.2 of the Roadway Design Manual which consists of nine considerations. These considerations and applications for the proposed intersection of US 17 & Golden Grove Driveway 2 are listed below.

- 1) *At any unsignalized intersection on principal, high-speed rural highways with other arterials or collectors:*

The proposed unsignalized intersection of US 17 & Golden Grove Driveway 2 is on a high-speed rural highway with other collectors. Therefore, this criterion is applicable.

- 2) *At any unsignalized intersection on a two-lane urban or rural highway that satisfies the criteria in Figures 9.5-C, 9.5-D, 9.5-E, 9.5-F, or 9.5-G;*

The criterion is not applicable as US 17 is a four-lane highway.

- 3) *At any intersection where capacity analysis determines a left lane is necessary to meet the level of service criteria;*

The intersection analysis results indicate that the proposed intersection of US 17 & Golden Grove Driveway 2 is projected to operate at an acceptable delay for the overall intersection. Therefore, this criterion is not applicable.

- 4) *At any signalized intersection where the left turn volume is 300 vehicles per hour or more, conduct a traffic review to determine if dual left-turn lanes are necessary;*

This criterion is not applicable as the intersection of US 17 & Golden Grove Driveway 2 is not proposed to be signalized.

- 5) *As a general rule, at an intersection where the left turn volume is 100 vehicles per hour (for a single turn lane) or 300 vehicles per hour (for a dual turn lane);*

The proposed Golden Grove Driveway 2 will have left-turn volumes above 100 vehicles in the AM and PM peak hours, therefore a single left-turn lane is justified by this criterion.

- 6) *At all entrances to major residential, commercial, and industrial developments;*

The proposed Golden Grove Driveway 2 will serve as the entrance to a major residential development; therefore, this criterion is applicable.

- 7) *At median crossovers;*

The proposed Golden Grove Driveway 2 will be located at a median crossover for US 17; therefore, this criterion is applicable.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Traffic Impact Analysis

- 8) *For uniformity of intersection design along the highway if other intersections have left-turn lanes (i.e. to satisfy driver expectancy);*

Left turn lanes are not provided at other intersections with driveways along US 17. Therefore, this criterion is not applicable.

- 9) *At any intersection where crash experience, traffic operations, sight distance restrictions (e.g., intersection beyond a vertical crest curve), or engineering judgments indicates a significant conflict-related to left-turning vehicles.*

No issues with crashes, traffic operations, or sight distance are known; therefore, this criterion is not applicable.

Based on the *Roadway Design Manual* guidelines, an exclusive eastbound left-turn lane of 400 feet in total length (200 feet of storage and a 200-foot taper) and an exclusive southbound left-turn of 350 feet in total length (200 feet of storage and a 150-foot taper) are recommended at the intersection of US 17 and Golden Grove Driveway 1.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Summary of Findings and Recommendations

## 6.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

A traffic impact analysis was conducted for the Golden Grove development following SCDOT and Charleston County guidelines. The proposed Golden Grove development is located on the north side of US 17 between New Road and Old Jacksonboro Road in Charleston County, South Carolina. The Golden Grove development is a residential development with a final buildout year of 2026 and will consist of 382 single-family homes.

The extent of the existing road network to be studied consists of two intersections - US 17 & SC 165 and US 17 & New Road. Access to the development will be provided through two driveways, a new proposed right-in, right-out driveway to the west along US 17 (Golden Grove Driveway 1), as well as a new proposed full access driveway to the east along US 17 (Golden Grove Driveway 2).

Based on the *Roadway Design Manual* guidelines, a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) along US 17 is recommended at the proposed intersection with Golden Grove Driveway 1.

An eastbound exclusive left-turn lane 400 feet in length (200 feet of storage with a 200-foot taper) and a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) along US 17 are recommended at the proposed intersection with Golden Grove Driveway 2. An exclusive left-turn lane 350 feet in total length (200 feet of storage and a 150-foot taper) is recommended on the southbound approach of Golden Grove Driveway 2.

The results of the analysis indicate that the proposed intersection of US 17 & Golden Grove Driveway 1 is anticipated to operate at LOS B in both peak hours with a stop-controlled approach for the Golden Grove minor street approach. Therefore, no additional improvements are recommended, beyond the proposed exclusive westbound right-turn lane along US 17 into the site.

The intersection of US 17 & Golden Grove Driveway 2 is anticipated to operate at LOS C in the AM peak hour and LOS E in the PM peak hour with a stop-controlled approach for the Golden Grove minor street approach. The delay in the PM peak hour is anticipated to be experienced only by patrons of the Golden Grove site (and not by mainline traffic along US 17). Therefore, no additional improvements are recommended, beyond the proposed exclusive right- and left-turn lanes along US 17 into the site and proposed southbound left-turn lane exiting the site.





## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

The intersection of US 17 & New Road is anticipated to experience an undesirable level of service in the PM peak hour in 2026 without the Golden Grove development. However, since this intersection operates at LOS D in the 2026 Build scenario, no improvements are recommended. The increased number of right-turns at this intersection brings the average delay for the minor street approaches down in the Build scenario. The signalized intersection of US 17 & SC 165 is projected to operate at an acceptable LOS with or without the Golden Grove development.

In addition to the residential land use analyzed in this traffic impact analysis study, the Golden Grove development master plan also includes commercial land use to be built in the future. It is recommended that an additional traffic impact analysis study be performed in the future before building this commercial land-use portion of the development.



## Appendix A Trip Generation Worksheets



**TRIP GENERATION ESTIMATES**  
**Golden Grove Development**

**Weekday Daily**

TRIP GENERATION CHARACTERISTICS						DIRECT. DISTRIB.		GROSS TRIPS			INTERNAL CAPTURE TRIPS				PASS-BY CAPTURE TRIPS				NEW EXTERNAL TRIPS		
Land Use	Ed.	LUC	Scale	Unit	Equation/Rate	In	Out	In	Out	Total	%	In	Out	Trips	%	In	Out	Trips	In	Out	Total
Single-Family Detached Housing	10m	210	382	DU	$\ln(f) = 0.92 \cdot \ln(x) + 2.71$	50%	50%	1,784	1,784	3,568	0%	0	0	0	0%	0	0	0	1,784	1,784	3,568
Total:								1,784	1,784	3,568	0%	0	0	0	0%	0	0	0	1,784	1,784	3,568

**Weekday AM Peak Hour**

TRIP GENERATION CHARACTERISTICS						DIRECT. DISTRIB.		GROSS TRIPS			INTERNAL CAPTURE TRIPS				PASS-BY CAPTURE TRIPS				NEW EXTERNAL TRIPS		
Land Use	Ed.	LUC	Scale	Unit	Equation/Rate	In	Out	In	Out	Total	%	In	Out	Trips	%	In	Out	Trips	In	Out	Total
Single-Family Detached Housing	10m	210	382	DU	$f = 0.71(x) + 4.60$	25%	75%	69	207	276	0%	0	0	0	0%	0	0	0	69	207	276
Total:								69	207	276	0%	0	0	0	0%	0	0	0	69	207	276

**Weekday PM Peak Hour**

TRIP GENERATION CHARACTERISTICS						DIRECT. DISTRIB.		GROSS TRIPS			INTERNAL CAPTURE TRIPS				PASS-BY CAPTURE TRIPS				NEW EXTERNAL TRIPS		
Land Use	Ed.	LUC	Scale	Unit	Equation/Rate	In	Out	In	Out	Total	%	In	Out	Trips	%	In	Out	Trips	In	Out	Total
Single-Family Detached Housing	10m	210	382	DU	$\ln(f) = 0.96 \cdot \ln(x) + 0.20$	63%	37%	232	136	368	0%	0	0	0	0%	0	0	0	232	136	368
Total:								232	136	368	0%	0	0	0	0%	0	0	0	232	136	368

**Appendix B SCDOT Volume Adjustment Guidelines for  
Covid-19 Impact**



**FROM:** Josh Johnson, PE, PTOE, District Six Traffic Engineer, -Y  
**DATE:** September 28, 2020  
**RE:** Traffic Impact Analyses during COVID-19 Pandemic (Update)

On April 23, 2020, I issued guidance regarding conducting a Traffic Impact Analysis (TIA) in SCOOT District Six during the COVID-19 pandemic. That guidance was extended through August 2020, at which time local school districts began to release plans for reopening. The return to in-person instruction for students was expected to increase traffic volumes closer to normal, but updated guidance is needed based on the varying traffic due to the combination of in-person and virtual student instruction. As such, the District Six traffic office has established updated options for conducting TIAs for SCOOT review in Beaufort, Berkeley, Charleston, Colleton, Dorchester, and Jasper counties, as outlined below.

1. Prepare the analysis using turning movement count data collected within the past five (5) years when school was in session with fully in-person instruction. The calculated historical growth rate will be applied to the traffic count to establish the current year traffic volumes.
2. Conduct traffic counts on a typical weekday and apply assigned seasonal factors to establish current year traffic volumes. The seasonal factors applied shall be 1.19 for the AM peak hour volumes and 1.13 for the PM peak hour volumes.
3. Prepare a trip generation memo for review and determination of possible mitigation required, and construct the mitigation determined by the District Traffic Engineer.

Admittedly, the seasonal factors to be applied in option two are higher than expected. Therefore, my office will conduct periodic data analysis throughout the fall semester as necessary to either validate or update the factors. The above values will apply until further notice.

File: D6/traffic/Correspondence

## Appendix C Traffic Count Data



# SHORT COUNTS, LLC

735 Maryland St  
Columbia, SC 29201

*We can't say we're the Best, but you Can!*

File Name : US 17 @ Hwy 165

Site Code :

Start Date : 10/29/2020

Page No : 1

## Groups Printed- Passenger Vehicles - Heavy Vehicles - Buses

Start Time	Hwy 165 Southbound				US 17 Westbound				Hwy 165 Northbound				US 17 Eastbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
07:00	21	24	27	0	7	81	4	0	4	17	22	0	27	132	3	0	369
07:15	26	32	31	0	10	92	13	0	4	19	19	0	21	135	6	0	408
07:30	25	29	20	0	9	104	7	0	7	17	20	0	18	127	8	0	391
07:45	17	31	34	0	16	116	3	0	13	19	14	0	20	138	4	0	425
Total	89	116	112	0	42	393	27	0	28	72	75	0	86	532	21	0	1593
08:00	20	23	30	0	15	109	11	0	9	19	28	0	21	117	3	0	405
08:15	18	15	24	0	12	99	17	0	4	14	16	0	16	145	4	0	384
08:30	16	13	33	0	9	102	10	0	7	14	21	0	10	113	2	0	350
08:45	15	15	27	0	7	101	15	0	6	13	11	0	18	133	5	0	366
Total	69	66	114	0	43	411	53	0	26	60	76	0	65	508	14	0	1505
16:00	7	16	34	0	30	185	9	0	10	35	15	0	25	149	6	0	521
16:15	14	20	38	0	33	163	15	0	12	29	10	0	22	155	1	0	512
16:30	6	27	40	0	30	160	16	0	15	35	19	0	21	124	8	0	501
16:45	10	18	32	0	29	217	9	0	15	26	12	0	23	128	9	0	528
Total	37	81	144	0	122	725	49	0	52	125	56	0	91	556	24	0	2062
17:00	11	17	28	1	34	202	16	0	11	30	25	0	24	116	5	0	520
17:15	8	19	32	0	22	157	18	0	20	16	15	0	30	133	6	0	476
17:30	9	24	26	0	31	187	11	0	18	27	12	0	33	127	4	0	509
17:45	4	17	25	0	29	146	7	0	8	16	13	0	27	131	4	0	427
Total	32	77	111	1	116	692	52	0	57	89	65	0	114	507	19	0	1932
Grand Total	227	340	481	1	323	2221	181	0	163	346	272	0	356	2103	78	0	7092
Apprch %	21.6	32.4	45.9	0.1	11.9	81.5	6.6	0	20.9	44.3	34.8	0	14	82.9	3.1	0	
Total %	3.2	4.8	6.8	0	4.6	31.3	2.6	0	2.3	4.9	3.8	0	5	29.7	1.1	0	
Passenger Vehicles	212	331	453	1	318	2060	165	0	157	339	258	0	325	1958	76	0	6653
% Passenger Vehicles	93.4	97.4	94.2	100	98.5	92.8	91.2	0	96.3	98	94.9	0	91.3	93.1	97.4	0	93.8
Heavy Vehicles	15	9	24	0	4	140	16	0	5	6	9	0	30	142	2	0	402
% Heavy Vehicles	6.6	2.6	5	0	1.2	6.3	8.8	0	3.1	1.7	3.3	0	8.4	6.8	2.6	0	5.7
Buses	0	0	4	0	1	21	0	0	1	1	5	0	1	3	0	0	37
% Buses	0	0	0.8	0	0.3	0.9	0	0	0.6	0.3	1.8	0	0.3	0.1	0	0	0.5

# SHORT COUNTS, LLC

735 Maryland St  
Columbia, SC 29201

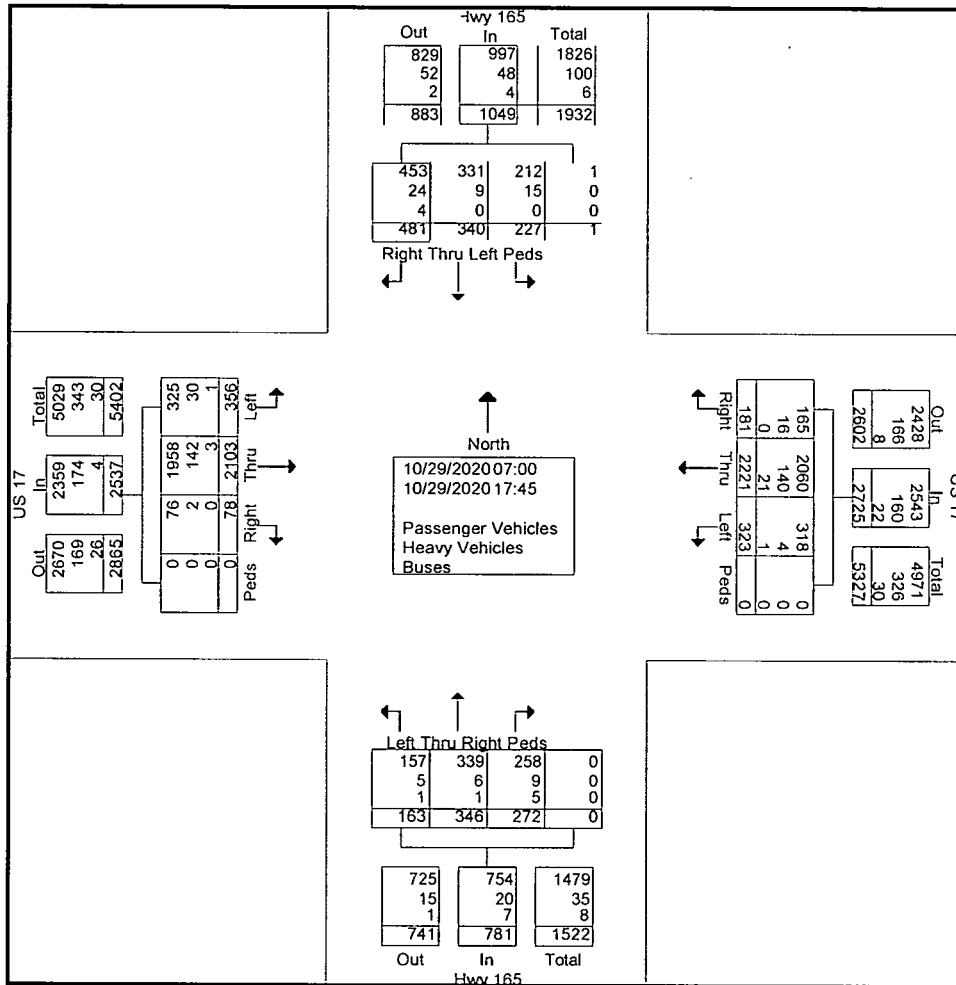
*We can't say we're the Best, but you Can!*

File Name : US 17 @ Hwy 165

Site Code :

Start Date : 10/29/2020

Page No : 2





# SHORT COUNTS, LLC

735 Maryland St  
Columbia, SC 29201

*We can't say we're the Best, but you Can!*

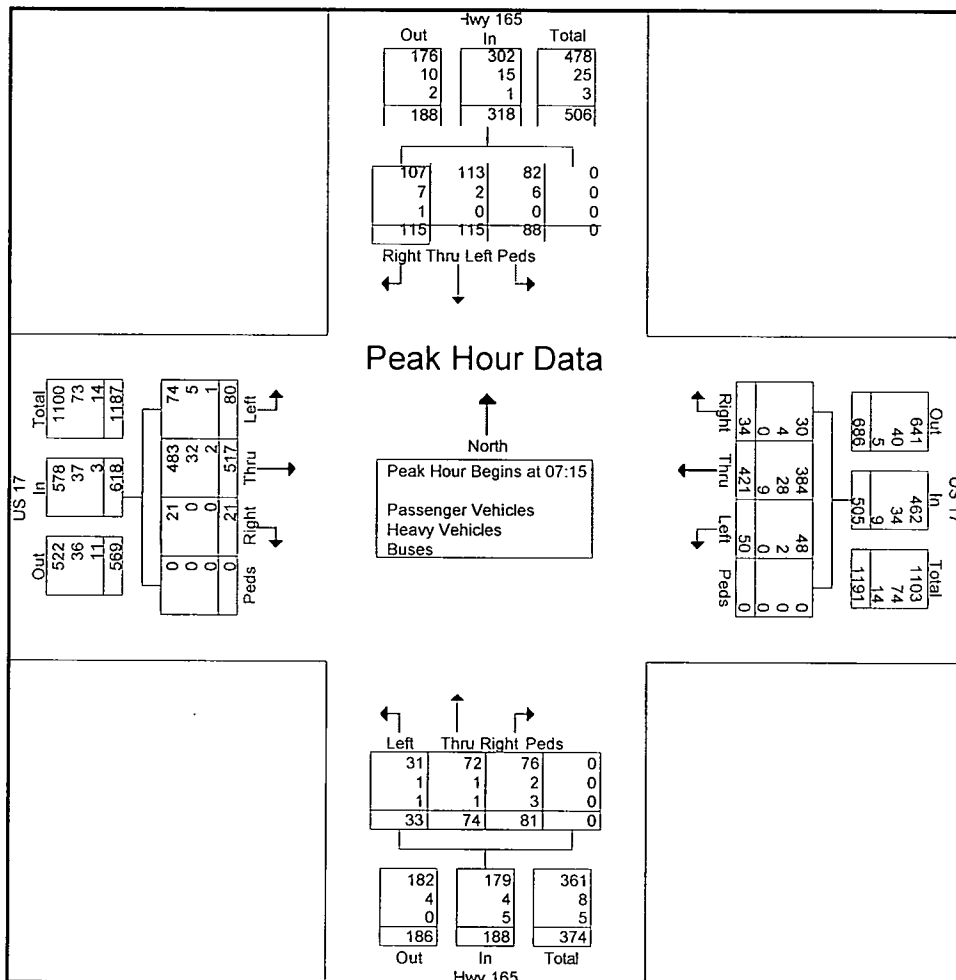
File Name : US 17 @ Hwy 165

Site Code :

Start Date : 10/29/2020

Page No : 3

Start Time	Hwy 165 Southbound					US 17 Westbound					Hwy 165 Northbound					US 17 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15																					
07:15	26	32	31	0	89	10	92	13	0	115	4	19	19	0	42	21	135	6	0	162	408
07:30	25	29	20	0	74	9	104	7	0	120	7	17	20	0	44	18	127	8	0	153	391
07:45	17	31	34	0	82	16	116	3	0	135	13	19	14	0	46	20	138	4	0	162	425
08:00	20	23	30	0	73	15	109	11	0	135	9	19	28	0	56	21	117	3	0	141	405
Total Volume	88	115	115	0	318	50	421	34	0	505	33	74	81	0	188	80	517	21	0	618	1629
% App. Total	27.7	36.2	36.2	0		9.9	83.4	6.7	0		17.6	39.4	43.1	0		12.9	83.7	3.4	0		
PHF	.846	.898	.846	.000	.893	.781	.907	.654	.000	.935	.635	.974	.723	.000	.839	.952	.937	.656	.000	.954	.958
Passenger Vehicles	82	113	107	0	302	48	384	30	0	462	31	72	76	0	179	74	483	21	0	578	1521
% Passenger Vehicles																					
Heavy Vehicles	6	2	7	0	15	2	28	4	0	34	1	1	2	0	4	5	32	0	0	37	90
% Heavy Vehicles	6.8	1.7	6.1	0	4.7	4.0	6.7	11.8	0	6.7	3.0	1.4	2.5	0	2.1	6.3	6.2	0	0	6.0	5.5
Buses	0	0	1	0	1	0	9	0	0	9	1	1	3	0	5	1	2	0	0	3	18
% Buses	0	0	0.9	0	0.3	0	2.1	0	0	1.8	3.0	1.4	3.7	0	2.7	1.3	0.4	0	0	0.5	1.1



# SHORT COUNTS, LLC

735 Maryland St  
Columbia, SC 29201

*We can't say we're the Best, but you Can!*

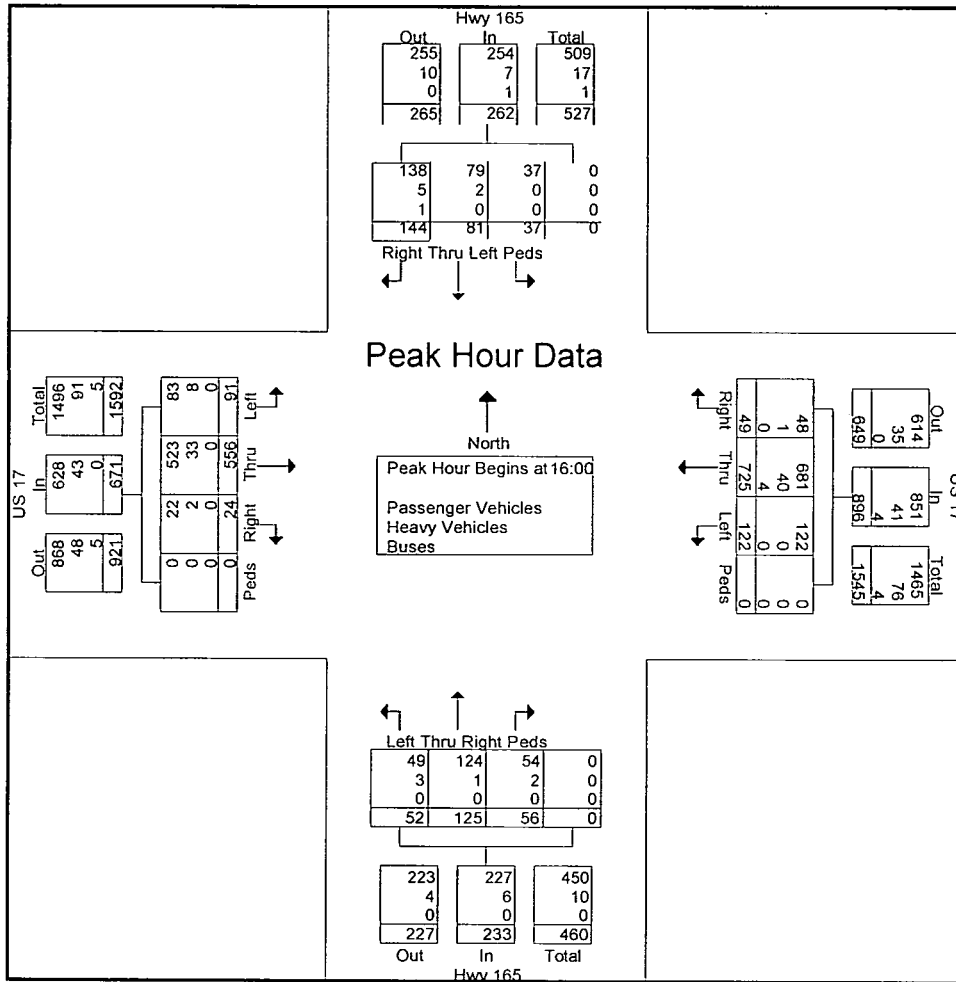
File Name : US 17 @ Hwy 165

Site Code :

Start Date : 10/29/2020

Page No : 4

Start Time	Hwy 165 Southbound					US 17 Westbound					Hwy 165 Northbound					US 17 Eastbound					Int. Total		
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																							
Peak Hour for Entire Intersection Begins at 16:00																							
16:00	7	16	34	0	57	30	185	9	0	224	10	35	15	0	60	25	149	6	0	180	521		
16:15	14	20	38	0	72	33	163	15	0	211	12	29	10	0	51	22	155	1	0	178	512		
16:30	6	27	40	0	73	30	160	16	0	206	15	35	19	0	69	21	124	8	0	153	501		
16:45	10	18	32	0	60	29	217	9	0	255	15	26	12	0	53	23	128	9	0	160	528		
Total Volume	37	81	144	0	262	122	725	49	0	896	52	125	56	0	233	91	556	24	0	671	2062		
% App. Total	14.1	30.9	55	0		13.6	80.9	5.5	0		22.3	53.6	24	0		13.6	82.9	3.6	0				
PHF	.661	.750	.900	.000		.897	.924	.835	.766	.000	.878	.867	.893	.737	.000	.844	.910	.897	.667	.000		.932	.976
Passenger Vehicles	37	79	138	0	254	122	681	48	0	851	49	124	54	0	227	83	523	22	0	628	1960		
% Passenger Vehicles																							
Heavy Vehicles	0	2	5	0	7	0	40	1	0	41	3	1	2	0	6	8	33	2	0	43	97		
% Heavy Vehicles	0	2.5	3.5	0	2.7	0	5.5	2.0	0	4.6	5.8	0.8	3.6	0	2.6	8.8	5.9	8.3	0	6.4	4.7		
Buses	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	5		
% Buses	0	0	0.7	0	0.4	0	0.6	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0.2		



# SHORT COUNTS, LLC

735 Maryland St  
Columbia, SC 29201

*We can't say we're the Best, but you Can!*

File Name : US 17 @ New Rd

Site Code :

Start Date : 10/29/2020

Page No : 1

## Groups Printed- Passenger Vehicles - Heavy Vehicles - Buses

Start Time	New Rd Southbound				US 17 Westbound				New Rd Northbound				US 17 Eastbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
07:00	1	0	0	0	9	102	0	0	2	0	21	0	0	135	0	0	270
07:15	3	0	0	0	7	104	1	0	1	0	16	0	0	167	2	0	301
07:30	0	0	0	0	16	106	2	0	1	0	21	0	0	122	3	0	271
07:45	0	0	0	0	10	130	0	0	0	1	26	0	0	132	2	0	301
Total	4	0	0	0	42	442	3	0	4	1	84	0	0	556	7	0	1143
08:00	0	0	0	0	19	136	0	0	2	0	27	0	0	136	1	0	321
08:15	0	0	0	0	13	126	0	0	1	0	13	0	1	150	0	0	304
08:30	0	2	0	0	15	124	0	0	0	0	20	0	0	119	1	0	281
08:45	0	0	0	0	10	108	0	0	1	1	23	0	0	136	1	0	280
Total	0	2	0	0	57	494	0	0	4	1	83	0	1	541	3	0	1186
16:00	1	1	1	0	20	188	2	0	3	0	12	0	1	158	0	0	387
16:15	0	0	0	0	14	204	1	0	4	0	12	0	0	154	2	0	391
16:30	1	0	1	0	19	175	1	0	1	0	11	0	0	142	0	0	351
16:45	1	0	0	0	31	214	1	0	0	1	14	0	0	151	2	0	415
Total	3	1	2	0	84	781	5	0	8	1	49	0	1	605	4	0	1544
17:00	0	0	0	0	39	223	2	0	0	0	13	0	0	127	2	0	406
17:15	1	0	0	0	35	191	1	0	2	0	17	0	0	157	4	0	408
17:30	1	0	1	0	26	195	0	0	1	0	12	0	0	141	2	0	379
17:45	0	0	0	0	23	160	1	0	3	0	11	0	0	126	2	0	326
Total	2	0	1	0	123	769	4	0	6	0	53	0	0	551	10	0	1519
Grand Total	9	3	3	0	306	2486	12	0	22	3	269	0	2	2253	24	0	5392
Apprch %	60	20	20	0	10.9	88.7	0.4	0	7.5	1	91.5	0	0.1	98.9	1.1	0	
Total %	0.2	0.1	0.1	0	5.7	46.1	0.2	0	0.4	0.1	5	0	0	41.8	0.4	0	
Passenger Vehicles	9	3	3	0	284	2307	12	0	19	2	260	0	2	2078	19	0	4998
% Passenger Vehicles	100	100	100	0	92.8	92.8	100	0	86.4	66.7	96.7	0	100	92.2	79.2	0	92.7
Heavy Vehicles	0	0	0	0	5	176	0	0	3	1	6	0	0	174	4	0	369
% Heavy Vehicles	0	0	0	0	1.6	7.1	0	0	13.6	33.3	2.2	0	0	7.7	16.7	0	6.8
Buses	0	0	0	0	17	3	0	0	0	0	3	0	0	1	1	0	25
% Buses	0	0	0	0	5.6	0.1	0	0	0	0	1.1	0	0	0	4.2	0	0.5

# SHORT COUNTS, LLC

735 Maryland St  
Columbia, SC 29201

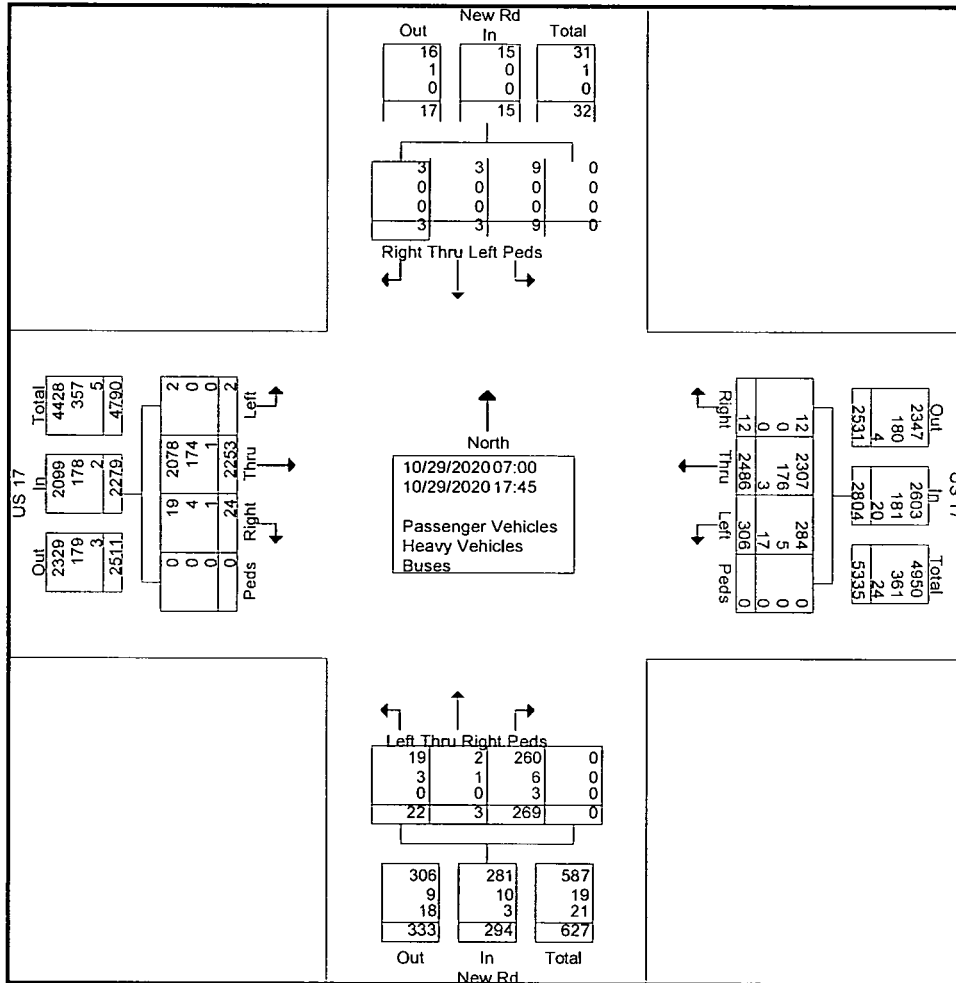
*We can't say we're the Best, but you Can!*

File Name : US 17 @ New Rd

Site Code :

Start Date : 10/29/2020

Page No : 2



# SHORT COUNTS, LLC

735 Maryland St  
Columbia, SC 29201

*We can't say we're the Best, but you Can!*

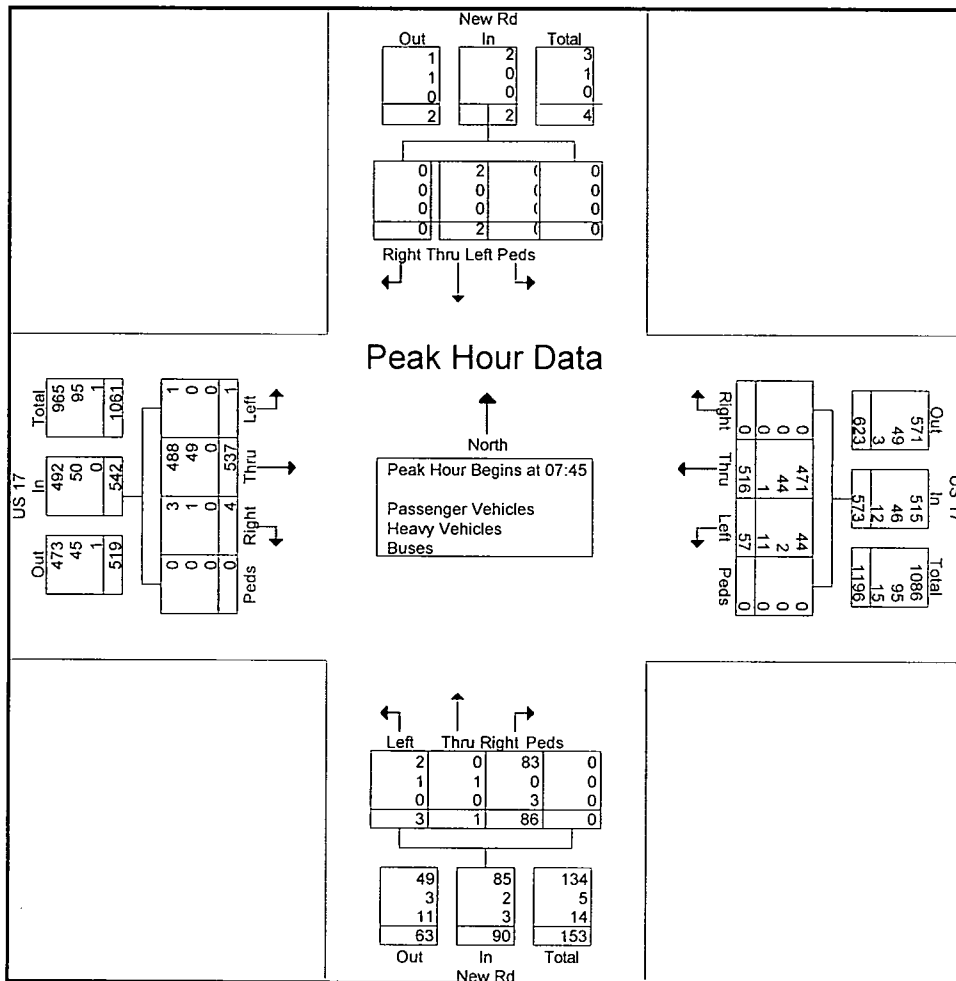
File Name : US 17 @ New Rd

Site Code :

Start Date : 10/29/2020

Page No : 3

Start Time	New Rd Southbound					US 17 Westbound					New Rd Northbound					US 17 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45																					
07:45	0	0	0	0	0	10	130	0	0	140	0	1	26	0	27	0	132	2	0	134	301
08:00	0	0	0	0	0	19	136	0	0	155	2	0	27	0	29	0	136	1	0	137	321
08:15	0	0	0	0	0	13	126	0	0	139	1	0	13	0	14	1	150	0	0	151	304
08:30	0	2	0	0	2	15	124	0	0	139	0	0	20	0	20	0	119	1	0	120	281
Total Volume	0	2	0	0	2	57	516	0	0	573	3	1	86	0	90	1	537	4	0	542	1207
% App. Total	0	100	0	0	0	9.9	90.1	0	0	0	3.3	1.1	95.6	0	0	0.2	99.1	0.7	0	0	
PHF	.000	.250	.000	.000	.250	.750	.949	.000	.000	.924	.375	.250	.796	.000	.776	.250	.895	.500	.000	.897	.940
Passenger Vehicles	0	2	0	0	2	44	471	0	0	515	2	0	83	0	85	1	488	3	0	492	1094
% Passenger Vehicles																					
Heavy Vehicles	0	0	0	0	0	2	44	0	0	46	1	1	0	0	2	0	49	1	0	50	98
% Heavy Vehicles	0	0	0	0	0	3.5	8.5	0	0	8.0	33.3	100	0	0	2.2	0	9.1	25.0	0	9.2	8.1
Buses	0	0	0	0	0	11	1	0	0	12	0	0	3	0	3	0	0	0	0	0	15
% Buses	0	0	0	0	0	19.3	0.2	0	0	2.1	0	0	3.5	0	3.3	0	0	0	0	0	1.2



# SHORT COUNTS, LLC

735 Maryland St  
Columbia, SC 29201

*We can't say we're the Best, but you Can!*

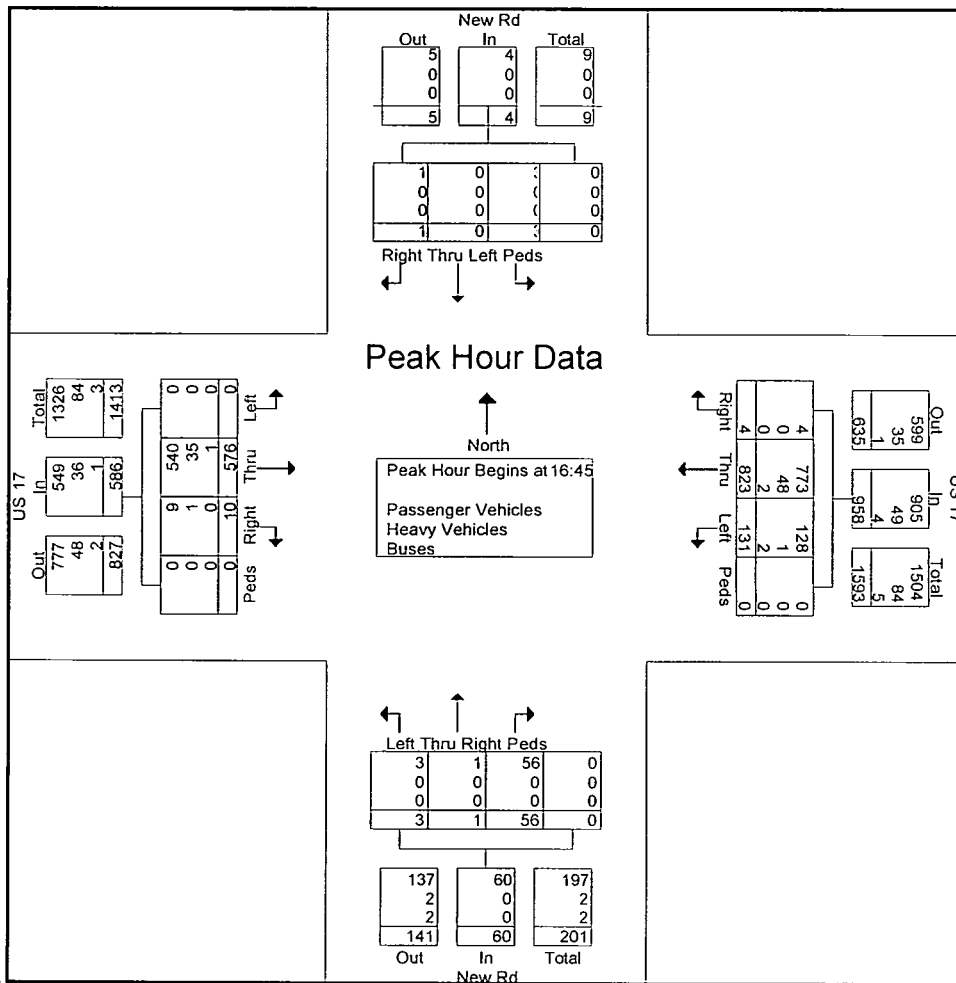
File Name : US 17 @ New Rd

Site Code :

Start Date : 10/29/2020

Page No : 4

Start Time	New Rd Southbound					US 17 Westbound					New Rd Northbound					US 17 Eastbound					Int. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 16:45																						
16:45	1	0	0	0	1	31	214	1	0	246	0	1	14	0	15	0	151	2	0	153	415	
17:00	0	0	0	0	0	39	223	2	0	264	0	0	13	0	13	0	127	2	0	129	406	
17:15	1	0	0	0	1	35	191	1	0	227	2	0	17	0	19	0	157	4	0	161	408	
17:30	1	0	1	0	2	26	195	0	0	221	1	0	12	0	13	0	141	2	0	143	379	
Total Volume	3	0	1	0	4	131	823	4	0	958	3	1	56	0	60	0	576	10	0	586	1608	
% App. Total	75	0	25	0		13.7	85.9	0.4	0		5	1.7	93.3	0		0	98.3	1.7	0			
PHF	.750	.000	.250	.000		.500	.840	.923	.500		.907	.375	.250	.824		.789	.000	.917	.625		.910	.969
Passenger Vehicles	3	0	1	0	4	128	773	4	0	905	3	1	56	0	60	0	540	9	0	549	1518	
% Passenger Vehicles																						
Heavy Vehicles	0	0	0	0	0	1	48	0	0	49	0	0	0	0	0	0	35	1	0	36	85	
% Heavy Vehicles	0	0	0	0	0	0.8	5.8	0	0	5.1	0	0	0	0	0	0	6.1	10.0	0	6.1	5.3	
Buses	0	0	0	0	0	2	2	0	0	4	0	0	0	0	0	0	1	0	0	1	5	
% Buses	0	0	0	0	0	1.5	0.2	0	0	0.4	0	0	0	0	0	0	0.2	0	0	0.2	0.3	



## Appendix D Traffic Volume Development Worksheets







# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## US 17 & Golden Grove Driveway 2

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: October 29, 2020

AM PEAK HOUR (7:15-8:15 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2020 TRAFFIC VOLUMES												
VOLUME ADJUSTMENT FACTOR	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
<b>2020 ADJUSTED TRAFFIC VOLUMES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	0	0	0	0	0	0	0	0	0	0	0	0
<b>VESTED TRAFFIC</b>												
<b>2026 NO-BUILD TRAFFIC VOLUMES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
New Project Traffic	17	0	0	0	25	27	0	0	0	155	0	27
Pass-By Traffic												
<b>2026 BUILD TRAFFIC VOLUMES</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>27</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>155</b>	<b>0</b>	<b>27</b>

PM PEAK HOUR (4:45-5:45 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2020 TRAFFIC VOLUMES												
VOLUME ADJUSTMENT FACTOR	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
<b>2020 ADJUSTED TRAFFIC VOLUMES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	0	0	0	0	0	0	0	0	0	0	0	0
<b>VESTED TRAFFIC</b>												
<b>2026 NO-BUILD TRAFFIC VOLUMES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
New Project Traffic	58	0	0	0	85	89	0	0	0	102	0	17
Pass-By Traffic												
<b>2026 BUILD TRAFFIC VOLUMES</b>	<b>58</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>85</b>	<b>89</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>102</b>	<b>0</b>	<b>17</b>

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## US 17 & New Road

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: October 29, 2020

AM PEAK HOUR (7:15-8:15 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2020 TRAFFIC VOLUMES	1	537	4	57	516	0	3	1	86	0	2	0
VOLUME ADJUSTMENT FACTOR	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
2020 ADJUSTED TRAFFIC VOLUMES	2	640	5	68	615	0	4	2	103	0	3	0
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	0	86	1	9	82	0	0	0	14	0	0	0
VESTED TRAFFIC												
2026 NO-BUILD TRAFFIC VOLUMES	2	726	6	77	697	0	4	2	117	0	3	0
New Project Traffic	10	145	0	0	49	0	0	0	0	0	0	3
Pass-By Traffic												
2026 BUILD TRAFFIC VOLUMES	12	871	6	77	746	0	4	2	117	0	3	3

PM PEAK HOUR (4:00-5:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2020 TRAFFIC VOLUMES	0	576	10	131	823	4	3	1	56	3	0	1
VOLUME ADJUSTMENT FACTOR	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
2020 ADJUSTED TRAFFIC VOLUMES	0	651	12	149	930	5	4	2	64	4	0	2
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	0	92	2	21	131	1	0	0	9	0	0	0
VESTED TRAFFIC												
2026 NO-BUILD TRAFFIC VOLUMES	0	743	14	170	1,061	6	4	2	73	4	0	2
New Project Traffic	7	95	0	0	162	0	0	0	0	0	0	12
Pass-By Traffic												
2026 BUILD TRAFFIC VOLUMES	7	838	14	170	1,223	6	4	2	73	4	0	14

## INTERSECTION TRAFFIC VOLUME DEVELOPMENT

### US 17 & SC 165

TRAFFIC CONTROL: Signalized

DATE COUNTED: October 29, 2020

AM PEAK HOUR (7:15-8:15 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
<b>2020 TRAFFIC VOLUMES</b>	80	517	21	50	421	34	33	74	81	88	115	115
VOLUME ADJUSTMENT FACTOR	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
<b>2020 ADJUSTED TRAFFIC VOLUMES</b>	96	616	25	60	501	41	40	89	97	105	137	137
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	13	83	3	8	67	5	5	12	13	14	18	18
<b>VESTED TRAFFIC</b>												
<b>2026 NO-BUILD TRAFFIC VOLUMES</b>	109	699	28	68	568	46	45	101	110	119	155	155
New Project Traffic	21	103	21	0	35	0	7	0	0	0	0	7
Pass-By Traffic												
<b>2026 BUILD TRAFFIC VOLUMES</b>	130	802	49	68	603	46	52	101	110	119	155	162

PM PEAK HOUR (4:30-5:30 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
<b>2020 TRAFFIC VOLUMES</b>	91	556	24	122	725	49	52	125	56	37	81	144
VOLUME ADJUSTMENT FACTOR	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13		1.13
<b>2020 ADJUSTED TRAFFIC VOLUMES</b>	103	629	28	138	820	56	59	142	64	42	92	163
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	15	89	4	19	116	8	8	20	9	6	13	23
<b>VESTED TRAFFIC</b>												
<b>2026 NO-BUILD TRAFFIC VOLUMES</b>	118	718	32	157	936	64	67	162	73	48	105	186
New Project Traffic	14	67	14	0	116	0	23	0	0	0	0	23
Pass-By Traffic												
<b>2026 BUILD TRAFFIC VOLUMES</b>	132	785	46	157	1,052	64	90	162	73	48	105	209

## Appendix E 2020 Existing Conditions



Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↕			↕	
Traffic Vol, veh/h	2	640	5	68	615	0	4	2	103	0	3	0
Future Vol, veh/h	2	640	5	68	615	0	4	2	103	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	9	25	4	9	2	33	100	2	2	2	2
Mvmt Flow	2	696	5	74	668	0	4	2	112	0	3	0























Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	668	0	0	701	0	0	1184	1516	348	1169	1521	334
Stage 1	-	-	-	-	-	-	700	700	-	816	816	-
Stage 2	-	-	-	-	-	-	484	816	-	353	705	-
Critical Hdwy	4.14	-	-	4.18	-	-	8.16	8.5	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.24	-	-	3.83	5	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	918	-	-	879	-	-	113	48	648	148	117	662
Stage 1	-	-	-	-	-	-	331	262	-	337	389	-
Stage 2	-	-	-	-	-	-	459	220	-	637	437	-
Platoon blocked, %												
Mov Cap-1 Maneuver	918	-	-	879	-	-	104	44	648	113	107	662
Mov Cap-2 Maneuver	-	-	-	-	-	-	214	123	-	225	213	-
Stage 1	-	-	-	-	-	-	330	261	-	336	356	-
Stage 2	-	-	-	-	-	-	417	202	-	521	436	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.9	13.1	22.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	562	918	-	-	879	-	-	213
HCM Lane V/C Ratio	0.211	0.002	-	-	0.084	-	-	0.015
HCM Control Delay (s)	13.1	8.9	-	-	9.5	-	-	22.2
HCM Lane LOS		B	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.8	0	-	-	0.3	-	-	0

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2020 Existing Conditions  
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	616	25	60	501	41	40	89	97	105	137	137
Future Volume (veh/h)	96	616	25	60	501	41	40	89	97	105	137	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1795	1900	1827	1769	1900	1845	1863	1845	1792	1818	1900
Adj Flow Rate, veh/h	104	670	27	65	545	45	43	97	105	114	149	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	2	4	7	12	3	2	3	6	2	7
Cap, veh/h	315	1197	48	282	1126	93	654	875	736	636	854	0
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.47	0.47	0.47	0.47	0.47	0.00
Sat Flow, veh/h	792	3342	135	731	3145	259	1222	1863	1568	1131	1818	0
Grp Volume(v), veh/h	104	342	355	65	291	299	43	97	105	114	149	0
Grp Sat Flow(s),veh/h/ln	792	1705	1771	731	1681	1724	1222	1863	1568	1131	1818	0
Q Serve(g_s), s	6.1	8.4	8.4	4.1	7.0	7.0	1.1	1.5	2.0	3.3	2.5	0.0
Cycle Q Clear(g_c), s	13.2	8.4	8.4	12.5	7.0	7.0	3.6	1.5	2.0	4.8	2.5	0.0
Prop In Lane	1.00		0.08	1.00		0.15	1.00		1.00			0.00
Lane Grp Cap(c), veh/h	315	611	634	282	602	617	654	875	736	636	854	0
V/C Ratio(X)	0.33	0.56	0.56	0.23	0.48	0.48	0.07	0.11	0.14	0.18	0.17	0.00
Avail Cap(c_a), veh/h	433	866	899	391	854	875	654	875	736	636	854	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.1	13.4	13.5	18.5	13.0	13.0	9.0	7.7	7.9	9.1	8.0	0.0
Incr Delay (d2), s/veh	0.6	0.8	0.8	0.4	0.6	0.6	0.2	0.3	0.4	0.6	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	4.0	4.2	0.9	3.3	3.4	0.4	0.8	0.9	1.1	1.3	0.0
LnGrp Delay(d),s/veh	18.7	14.3	14.2	18.9	13.6	13.6	9.2	8.0	8.3	9.7	8.4	0.0
LnGrp LOS	B	B	B	B	B	B	A	A	A	A	A	
Approach Vol, veh/h		801			655			245				263
Approach Delay, s/veh		14.8			14.1			8.3				9.0
Approach LOS		B			B			A				A
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.0		23.2		29.0		23.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		24.5		26.5		24.5		26.5				
Max Q Clear Time (g_c+I1), s		5.6		15.2		6.8		14.5				
Green Ext Time (p_c), s		0.9		3.5		1.1		2.9				
Intersection Summary												
HCM 2010 Ctrl Delay				13.0								
HCM 2010 LOS				B								

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↔			↔	
Traffic Vol, veh/h	0	651	12	149	930	5	4	2	64	4	0	2
Future Vol, veh/h	0	651	12	149	930	5	4	2	64	4	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	6	10	2	6	2	2	2	2	2	2	2
Mvmt Flow	0	708	13	162	1011	5	4	2	70	4	0	2

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1016	0	0	721	0	0	1538	2048	354	1693	2059	508
Stage 1	-	-	-	-	-	-	708	708	-	1338	1338	-
Stage 2	-	-	-	-	-	-	830	1340	-	355	721	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	678	-	-	877	-	-	79	55	642	60	54	510
Stage 1	-	-	-	-	-	-	392	436	-	161	220	-
Stage 2	-	-	-	-	-	-	331	220	-	635	430	-
Platoon blocked, %												
Mov Cap-1 Maneuver	678	-	-	877	-	-	67	45	642	45	44	510
Mov Cap-2 Maneuver	-	-	-	-	-	-	175	132	-	121	117	-
Stage 1	-	-	-	-	-	-	392	436	-	161	179	-
Stage 2	-	-	-	-	-	-	269	179	-	563	430	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.4	13.3	28.2
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	508	678	-	-	877	-	-	162
HCM Lane V/C Ratio	0.15	-	-	-	0.185	-	-	0.04
HCM Control Delay (s)	13.3	0	-	-	10	-	-	28.2
HCM Lane LOS		B	A	-	B	-	-	D
HCM 95th %tile Q(veh)	0.5	0	-	-	0.7	-	-	0.1

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2020 Existing Conditions  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	629	28	138	820	56	59	142	64	42	92	163
Future Volume (veh/h)	103	629	28	138	820	56	59	142	64	42	92	163
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1743	1791	1900	1863	1797	1900	1792	1863	1827	1863	1833	1900
Adj Flow Rate, veh/h	112	684	30	150	891	61	64	154	70	46	100	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	6	8	2	6	2	6	2	4	2	3	4
Cap, veh/h	294	1610	71	392	1572	108	518	645	538	466	635	0
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.35	0.35	0.35	0.35	0.35	0.00
Sat Flow, veh/h	549	3321	146	733	3243	222	1241	1863	1553	1152	1833	0
Grp Volume(v), veh/h	112	350	364	150	469	483	64	154	70	46	100	0
Grp Sat Flow(s), veh/h/ln	549	1701	1765	733	1707	1758	1241	1863	1553	1152	1833	0
Q Serve(g_s), s	9.7	7.1	7.1	8.9	10.4	10.4	2.0	3.1	1.6	1.6	2.0	0.0
Cycle Q Clear(g_c), s	20.1	7.1	7.1	16.0	10.4	10.4	4.0	3.1	1.6	4.7	2.0	0.0
Prop In Lane	1.00		0.08	1.00		0.13	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	294	825	856	392	828	852	518	645	538	466	635	0
V/C Ratio(X)	0.38	0.42	0.42	0.38	0.57	0.57	0.12	0.24	0.13	0.10	0.16	0.00
Avail Cap(c_a), veh/h	362	1036	1075	483	1039	1070	518	645	538	466	635	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.9	8.9	8.9	14.1	9.8	9.8	13.4	12.4	11.9	14.1	12.1	0.0
Incr Delay (d2), s/veh	0.8	0.3	0.3	0.6	0.6	0.6	0.5	0.9	0.5	0.4	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.5	3.4	3.5	1.9	5.0	5.1	0.7	1.7	0.8	0.6	1.1	0.0
LnGrp Delay(d), s/veh	17.7	9.3	9.3	14.7	10.4	10.4	13.9	13.3	12.4	14.5	12.6	0.0
LnGrp LOS	B	A	A	B	B	B	B	B	B	B	B	
Approach Vol, veh/h		826			1102			288			146	
Approach Delay, s/veh		10.4			11.0			13.2			13.2	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		30.4		23.0		30.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.5		32.5		18.5		32.5				
Max Q Clear Time (g_c+1), s		6.0		22.1		6.7		18.0				
Green Ext Time (p_c), s		1.0		3.8		0.5		5.8				
Intersection Summary												
HCM 2010 Ctrl Delay	11.2											
HCM 2010 LOS	B											



**Appendix F 2026 No-Build Conditions**



Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↔			↔	
Traffic Vol, veh/h	2	726	6	77	697	0	4	2	117	0	3	0
Future Vol, veh/h	2	726	6	77	697	0	4	2	117	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	9	25	4	9	2	33	100	2	2	2	2
Mvmt Flow	2	789	7	84	758	0	4	2	127	0	3	0























Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	758	0	0	796	0	0	1342	1719	395	1326	1726	379
Stage 1	-	-	-	-	-	-	793	793	-	926	926	-
Stage 2	-	-	-	-	-	-	549	926	-	400	800	-
Critical Hdwy	4.14	-	-	4.18	-	-	8.16	8.5	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.24	-	-	3.83	5	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	849	-	-	809	-	-	84	33	604	114	88	619
Stage 1	-	-	-	-	-	-	287	228	-	289	346	-
Stage 2	-	-	-	-	-	-	416	186	-	597	395	-
Platoon blocked, %												
Mov Cap-1 Maneuver	849	-	-	809	-	-	76	30	604	81	79	619
Mov Cap-2 Maneuver	-	-	-	-	-	-	181	101	-	186	178	-
Stage 1	-	-	-	-	-	-	286	228	-	288	310	-
Stage 2	-	-	-	-	-	-	369	167	-	466	394	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0		1		14.3		25.6
HCM LOS					B		D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	522	849	-	-	809	-	-	178
HCM Lane V/C Ratio	0.256	0.003	-	-	0.103	-	-	0.018
HCM Control Delay (s)	14.3	9.3	-	-	10	-	-	25.6
HCM Lane LOS		B	A	-	A	-	-	D
HCM 95th %tile Q(veh)		1	0	-	0.3	-	-	0.1

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2026 No Build Conditions  
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	699	28	68	568	46	45	101	110	119	155	155
Future Volume (veh/h)	109	699	28	68	568	46	45	101	110	119	155	155
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1795	1900	1827	1770	1900	1845	1863	1845	1792	1818	1900
Adj Flow Rate, veh/h	118	760	30	74	617	50	49	110	120	129	168	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	2	4	7	12	3	2	3	6	2	7
Cap, veh/h	310	1308	52	273	1232	100	598	830	698	584	810	0
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.45	0.45	0.45	0.45	0.45	0.00
Sat Flow, veh/h	737	3345	132	670	3151	255	1201	1863	1568	1103	1818	0
Grp Volume(v), veh/h	118	387	403	74	329	338	49	110	120	129	168	0
Grp Sat Flow(s), veh/h/ln	737	1705	1772	670	1681	1725	1201	1863	1568	1103	1818	0
Q Serve(g_s), s	7.9	9.8	9.9	5.4	8.1	8.2	1.4	1.9	2.5	4.3	3.1	0.0
Cycle Q Clear(g_c), s	16.1	9.8	9.9	15.2	8.1	8.2	4.5	1.9	2.5	6.2	3.1	0.0
Prop In Lane	1.00		0.07	1.00		0.15	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	310	667	693	273	657	674	598	830	698	584	810	0
V/C Ratio(X)	0.38	0.58	0.58	0.27	0.50	0.50	0.08	0.13	0.17	0.22	0.21	0.00
Avail Cap(c_a), veh/h	377	822	854	334	810	831	598	830	698	584	810	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.8	13.2	13.2	19.2	12.7	12.7	10.7	9.0	9.2	10.8	9.3	0.0
Incr Delay (d2), s/veh	0.8	0.8	0.8	0.5	0.6	0.6	0.3	0.3	0.5	0.9	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	4.8	5.0	1.0	3.9	4.0	0.5	1.1	1.2	1.4	1.7	0.0
LnGrp Delay(d),s/veh	19.6	14.0	14.0	19.7	13.3	13.3	11.0	9.3	9.7	11.7	9.9	0.0
LnGrp LOS	B	B	B	B	B	B	B	A	A	B	A	
Approach Vol, veh/h		908			741			279			297	
Approach Delay, s/veh		14.7			13.9			9.8			10.7	
Approach LOS		B			B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.0		26.0		29.0		26.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		24.5		26.5		24.5		26.5				
Max Q Clear Time (g_c+I1), s		6.5		18.1		8.2		17.2				
Green Ext Time (p_c), s		1.1		3.4		1.3		3.0				
Intersection Summary												
HCM 2010 Ctrl Delay				13.3								
HCM 2010 LOS				B								

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↔			↔	
Traffic Vol, veh/h	0	743	14	170	1061	6	4	2	73	4	0	2
Future Vol, veh/h	0	743	14	170	1061	6	4	2	73	4	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	6	10	2	6	2	2	2	2	2	2	2
Mvmt Flow	0	808	15	185	1153	7	4	2	79	4	0	2























Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1160	0	0	823	0	0	1755	2338	404	1932	2350	580
Stage 1	-	-	-	-	-	-	808	808	-	1527	1527	-
Stage 2	-	-	-	-	-	-	947	1530	-	405	823	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	598	-	-	803	-	-	54	36	596	40	35	458
Stage 1	-	-	-	-	-	-	341	392	-	123	178	-
Stage 2	-	-	-	-	-	-	281	177	-	593	386	-
Platoon blocked, %												
Mov Cap-1 Maneuver	598	-	-	803	-	-	44	28	596	28	27	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	139	102	-	91	86	-
Stage 1	-	-	-	-	-	-	341	392	-	123	137	-
Stage 2	-	-	-	-	-	-	215	136	-	511	386	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.5	14.6	35.6
HCM LOS			B	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	462	598	-	-	803	-	-	124
HCM Lane V/C Ratio	0.186	-	-	-	0.23	-	-	0.053
HCM Control Delay (s)	14.6	0	-	-	10.8	-	-	35.6
HCM Lane LOS	B	A	-	-	B	-	-	E
HCM 95th %tile Q(veh)	0.7	0	-	-	0.9	-	-	0.2

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2026 No Build Conditions  
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	718	32	157	936	64	67	162	73	48	105	186
Future Volume (veh/h)	118	718	32	157	936	64	67	162	73	48	105	186
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1743	1791	1900	1827	1770	1900	1792	1863	1827	1863	1833	1900
Adj Flow Rate, veh/h	128	780	35	171	1017	70	73	176	79	52	114	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	6	8	4	7	12	6	2	4	2	3	4
Cap, veh/h	274	1761	79	376	1695	117	454	588	490	396	579	0
Arrive On Green	0.53	0.53	0.53	0.53	0.53	0.53	0.32	0.32	0.32	0.32	0.32	0.00
Sat Flow, veh/h	484	3317	149	655	3194	220	1225	1863	1553	1120	1833	0
Grp Volume(v), veh/h	128	400	415	171	535	552	73	176	79	52	114	0
Grp Sat Flow(s),veh/h/ln	484	1701	1765	655	1682	1732	1225	1863	1553	1120	1833	0
Q Serve(g_s), s	14.5	8.5	8.5	12.7	12.8	12.9	2.7	4.2	2.2	2.2	2.7	0.0
Cycle Q Clear(g_c), s	27.4	8.5	8.5	21.2	12.8	12.9	5.4	4.2	2.2	6.3	2.7	0.0
Prop In Lane	1.00		0.08	1.00		0.13	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	274	903	937	376	893	919	454	588	490	396	579	0
V/C Ratio(X)	0.47	0.44	0.44	0.45	0.60	0.60	0.16	0.30	0.16	0.13	0.20	0.00
Avail Cap(c_a), veh/h	285	943	978	391	932	960	454	588	490	396	579	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.9	8.4	8.4	14.9	9.5	9.5	16.6	15.2	14.5	17.6	14.6	0.0
Incr Delay (d2), s/veh	1.2	0.3	0.3	0.9	1.0	1.0	0.8	1.3	0.7	0.7	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.0	4.1	2.4	6.0	6.2	1.0	2.4	1.0	0.7	1.5	0.0
LnGrp Delay(d),s/veh	20.1	8.8	8.8	15.8	10.5	10.4	17.4	16.5	15.2	18.2	15.4	0.0
LnGrp LOS	C	A	A	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		943			1258			328			166	
Approach Delay, s/veh		10.3			11.2			16.4			16.3	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		35.6		23.0		35.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.5		32.5		18.5		32.5				
Max Q Clear Time (g_c+11), s		7.4		29.4		8.3		23.2				
Green Ext Time (p_c), s		1.1		1.7		0.5		5.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				11.8								
HCM 2010 LOS				B								

## Appendix G 2026 Build Conditions



Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	751	728	25	0	25
Future Vol, veh/h	0	751	728	25	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	7	2	2	2
Mvmt Flow	0	816	791	27	0	27

Major/Minor	Major1	Major2	Minor2	
Conflicting Flow All	-	0	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0
Stage 1	0	-	-	0
Stage 2	0	-	-	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	603
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	603
HCM Lane V/C Ratio	-	-	-	0.045
HCM Control Delay (s)	-	-	-	11.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	17	734	726	27	155	27
Future Vol, veh/h	17	734	726	27	155	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	100	200	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	7	2	2	2
Mvmt Flow	18	798	789	29	168	29

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	818	0	-	0	1224 395
Stage 1	-	-	-	-	789 -
Stage 2	-	-	-	-	435 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	806	-	-	-	171 604
Stage 1	-	-	-	-	408 -
Stage 2	-	-	-	-	620 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	806	-	-	-	167 604
Mov Cap-2 Maneuver	-	-	-	-	346 -
Stage 1	-	-	-	-	399 -
Stage 2	-	-	-	-	620 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	22.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	806	-	-	-	346	604
HCM Lane V/C Ratio	0.023	-	-	-	0.487	0.049
HCM Control Delay (s)	9.6	-	-	-	24.9	11.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	2.6	0.2

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon



Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↔			↔	
Traffic Vol, veh/h	12	871	6	77	746	0	4	2	117	0	3	3
Future Vol, veh/h	12	871	6	77	746	0	4	2	117	0	3	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	9	25	4	9	2	33	100	2	2	2	2
Mvmt Flow	13	947	7	84	811	0	4	2	127	0	3	3























Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	811	0	0	954	0	0	1548	1952	474	1480	1959	406
Stage 1	-	-	-	-	-	-	973	973	-	979	979	-
Stage 2	-	-	-	-	-	-	575	979	-	501	980	-
Critical Hdwy	4.14	-	-	4.18	-	-	8.16	8.5	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.24	-	-	3.83	5	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	811	-	-	704	-	-	57	21	537	87	63	594
Stage 1	-	-	-	-	-	-	218	173	-	268	326	-
Stage 2	-	-	-	-	-	-	400	171	-	521	326	-
Platoon blocked, %												
Mov Cap-1 Maneuver	811	-	-	704	-	-	50	18	537	58	55	594
Mov Cap-2 Maneuver	-	-	-	-	-	-	141	78	-	155	143	-
Stage 1	-	-	-	-	-	-	215	170	-	264	287	-
Stage 2	-	-	-	-	-	-	346	151	-	386	321	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0.1		1		16.3		21
HCM LOS					C		C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	452	811	-	-	704	-	-	231
HCM Lane V/C Ratio	0.296	0.016	-	-	0.119	-	-	0.028
HCM Control Delay (s)	16.3	9.5	-	-	10.8	-	-	21
HCM Lane LOS		C	A	-	B	-	-	C
HCM 95th %tile Q(veh)	1.2	0	-	-	0.4	-	-	0.1

HCM 2010 Signalized Intersection Summary  
4: SC 165 & US 17/ Savannah Hwy

2026 Build Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	802	49	68	603	46	52	101	110	119	155	162
Future Volume (veh/h)	130	802	49	68	603	46	52	101	110	119	155	162
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1796	1900	1827	1770	1900	1845	1863	1845	1776	1826	1900
Adj Flow Rate, veh/h	141	872	53	74	655	50	57	110	120	129	168	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	2	4	7	12	3	2	3	7	2	6
Cap, veh/h	342	1440	87	272	1395	106	532	735	619	521	720	0
Arrive On Green	0.44	0.44	0.44	0.44	0.44	0.44	0.39	0.39	0.39	0.39	0.39	0.00
Sat Flow, veh/h	712	3269	199	591	3167	242	1201	1863	1568	1092	1826	0
Grp Volume(v), veh/h	141	455	470	74	347	358	57	110	120	129	168	0
Grp Sat Flow(s),veh/h/ln	712	1707	1761	591	1681	1727	1201	1863	1568	1092	1826	0
Q Serve(g_s), s	9.5	11.1	11.1	6.0	7.9	8.0	1.8	2.1	2.7	4.7	3.3	0.0
Cycle Q Clear(g_c), s	17.5	11.1	11.1	17.1	7.9	8.0	5.2	2.1	2.7	6.8	3.3	0.0
Prop In Lane	1.00		0.11	1.00		0.14	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	342	752	776	272	740	761	532	735	619	521	720	0
V/C Ratio(X)	0.41	0.61	0.61	0.27	0.47	0.47	0.11	0.15	0.19	0.25	0.23	0.00
Avail Cap(c_a), veh/h	413	924	953	332	910	935	532	735	619	521	720	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.9	11.6	11.6	18.1	10.8	10.8	12.7	10.6	10.8	12.8	11.0	0.0
Incr Delay (d2), s/veh	0.8	0.8	0.8	0.5	0.5	0.5	0.4	0.4	0.7	1.1	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	5.3	5.5	1.0	3.8	3.9	0.7	1.2	1.3	1.6	1.8	0.0
LnGrp Delay(d),s/veh	17.7	12.4	12.4	18.7	11.2	11.2	13.1	11.0	11.5	13.9	11.8	0.0
LnGrp LOS	B	B	B	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		1066			779			287			297	
Approach Delay, s/veh		13.1			11.9			11.7			12.7	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		26.0		28.5		26.0		28.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		21.5		29.5		21.5		29.5				
Max Q Clear Time (g_c+I1), s		7.2		19.5		8.8		19.1				
Green Ext Time (p_c), s		1.0		4.5		1.2		3.4				
Intersection Summary												
HCM 2010 Ctrl Delay				12.5								
HCM 2010 LOS				B								

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	815	1084	85	0	17
Future Vol, veh/h	0	815	1084	85	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	7	2	2	2
Mvmt Flow	0	886	1178	92	0	18

Major/Minor	Major1	Major2	Minor2	
Conflicting Flow All	-	0	-	0 589
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0 452
Stage 1	0	-	-	0 -
Stage 2	0	-	-	0 -
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	- 452
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	452
HCM Lane V/C Ratio	-	-	-	0.041
HCM Control Delay (s)	-	-	-	13.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	58	757	1152	89	102	17
Future Vol, veh/h	58	757	1152	89	102	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	100	200	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	7	2	2	2
Mvmt Flow	63	823	1252	97	111	18

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1349	0	-	0	1790 626
Stage 1	-	-	-	-	1252 -
Stage 2	-	-	-	-	538 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	506	-	-	-	~72 427
Stage 1	-	-	-	-	233 -
Stage 2	-	-	-	-	549 -
Platoon blocked, %					
Mov Cap-1 Maneuver	506	-	-	-	~63 427
Mov Cap-2 Maneuver	-	-	-	-	185 -
Stage 1	-	-	-	-	204 -
Stage 2	-	-	-	-	549 -

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	44.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	506	-	-	-	185	427
HCM Lane V/C Ratio	0.125	-	-	-	0.599	0.043
HCM Control Delay (s)	13.1	-	-	-	50	13.8
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	0.4	-	-	-	3.3	0.1

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↕			↕	
Traffic Vol, veh/h	7	838	14	170	1223	6	4	2	73	4	0	14
Future Vol, veh/h	7	838	14	170	1223	6	4	2	73	4	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	6	10	2	6	2	33	100	2	2	2	2
Mvmt Flow	8	911	15	185	1329	7	4	2	79	4	0	15























Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1336	0	0	926	0	0	1962	2633	456	2176	2645	668
Stage 1	-	-	-	-	-	-	927	927	-	1703	1703	-
Stage 2	-	-	-	-	-	-	1035	1706	-	473	942	-
Critical Hdwy	4.14	-	-	4.14	-	-	8.16	8.5	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.83	5	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	512	-	-	734	-	-	26	5	551	26	23	401
Stage 1	-	-	-	-	-	-	234	186	-	95	146	-
Stage 2	-	-	-	-	-	-	198	54	-	541	340	-
Platoon blocked, %												
Mov Cap-1 Maneuver	512	-	-	734	-	-	20	4	551	17	17	401
Mov Cap-2 Maneuver	-	-	-	-	-	-	86	26	-	69	65	-
Stage 1	-	-	-	-	-	-	230	183	-	93	109	-
Stage 2	-	-	-	-	-	-	142	40	-	450	335	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0.1		1.4		21.1		25.6
HCM LOS					C		D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	309	512	-	-	734	-	-	194
HCM Lane V/C Ratio	0.278	0.015	-	-	0.252	-	-	0.101
HCM Control Delay (s)	21.1	12.1	-	-	11.5	-	-	25.6
HCM Lane LOS		C	B	-	B	-	-	D
HCM 95th %tile Q(veh)	1.1	0	-	-	1	-	-	0.3

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2026 Build Conditions  
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	785	46	157	1052	64	90	162	73	48	105	209
Future Volume (veh/h)	132	785	46	157	1052	64	90	162	73	48	105	209
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1743	1791	1900	1863	1796	1900	1792	1863	1827	1863	1833	1900
Adj Flow Rate, veh/h	143	853	50	171	1143	70	98	176	79	52	114	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	6	8	2	6	2	6	2	4	2	3	4
Cap, veh/h	268	1948	114	385	1949	119	379	506	422	325	498	0
Arrive On Green	0.60	0.60	0.60	0.60	0.60	0.60	0.27	0.27	0.27	0.27	0.27	0.00
Sat Flow, veh/h	429	3266	191	615	3268	200	1225	1863	1553	1120	1833	0
Grp Volume(v), veh/h	143	444	459	171	597	616	98	176	79	52	114	0
Grp Sat Flow(s),veh/h/ln	429	1701	1757	615	1707	1761	1225	1863	1553	1120	1833	0
Q Serve(g_s), s	21.1	9.7	9.7	14.3	14.8	14.8	4.6	5.2	2.7	2.7	3.3	0.0
Cycle Q Clear(g_c), s	36.0	9.7	9.7	24.1	14.8	14.8	7.9	5.2	2.7	7.9	3.3	0.0
Prop In Lane	1.00		0.11	1.00		0.11	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	268	1015	1048	385	1018	1050	379	506	422	325	498	0
V/C Ratio(X)	0.53	0.44	0.44	0.44	0.59	0.59	0.26	0.35	0.19	0.16	0.23	0.00
Avail Cap(c_a), veh/h	280	1061	1096	401	1064	1098	379	506	422	325	498	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.7	7.5	7.5	14.1	8.5	8.5	22.4	20.0	19.1	23.1	19.3	0.0
Incr Delay (d2), s/veh	1.8	0.3	0.3	0.8	0.8	0.8	1.6	1.9	1.0	1.1	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.5	4.7	2.5	7.0	7.2	1.7	2.9	1.3	0.9	1.8	0.0
LnGrp Delay(d),s/veh	21.5	7.8	7.8	14.9	9.3	9.3	24.0	21.9	20.0	24.2	20.4	0.0
LnGrp LOS	C	A	A	B	A	A	C	C	C	C	C	C
Approach Vol, veh/h		1046			1384			353			166	
Approach Delay, s/veh		9.7			10.0			22.0			21.6	
Approach LOS		A			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		45.2		23.0		45.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.5		42.5		18.5		42.5				
Max Q Clear Time (g_c+I1), s		9.9		38.0		9.9		26.1				
Green Ext Time (p_c), s		1.0		2.7		0.4		8.3				
Intersection Summary												
HCM 2010 Ctrl Delay				12.0								
HCM 2010 LOS				B								

**Appendix H Turn Lane Analysis Worksheet**



## RIGHT-TURN LANE WARRANT REVIEW

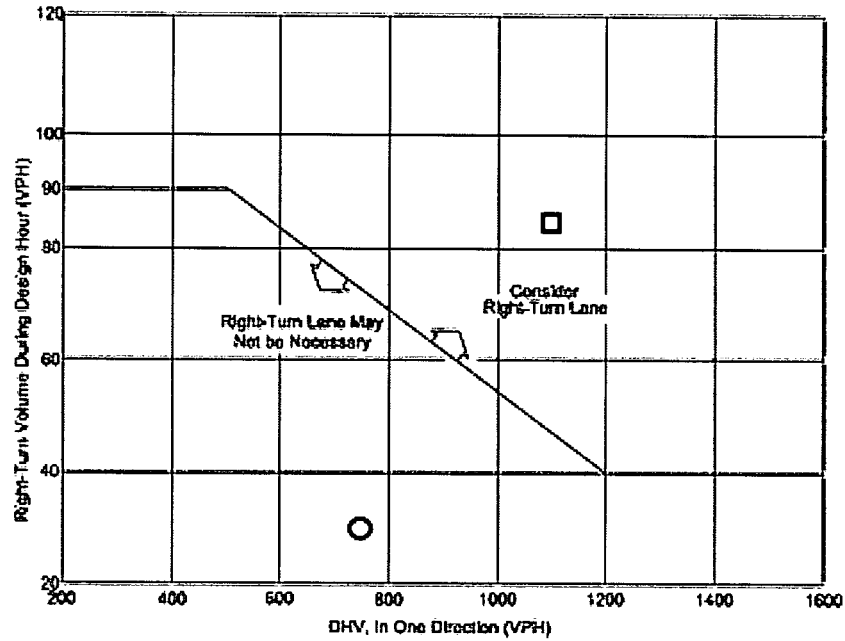
**INTERSECTION:** US 17 & Golden Grove Driveway 1 (2026)

**MOVEMENT:** Westbound Right-Turn Lane

March 2017

INTERSECTIONS

9.5-3



*Note: Figure is only applicable on highways with a design speed of 50 miles per hour or greater.*

**GUIDELINES FOR RIGHT-TURN LANES AT UNSIGNALIZED INTERSECTIONS  
ON FOUR-LANE HIGHWAYS**  
Figure 9.5-8

2030 Build Conditions	Major Road Volume (Direction of Right Turn Ingress)	Right Turn Volume	Speed along Right Turn Ingress	Symbol
AM Peak Hour	753	25	25	○
PM Peak Hour	1169	85	25	□



## RIGHT-TURN LANE WARRANT REVIEW

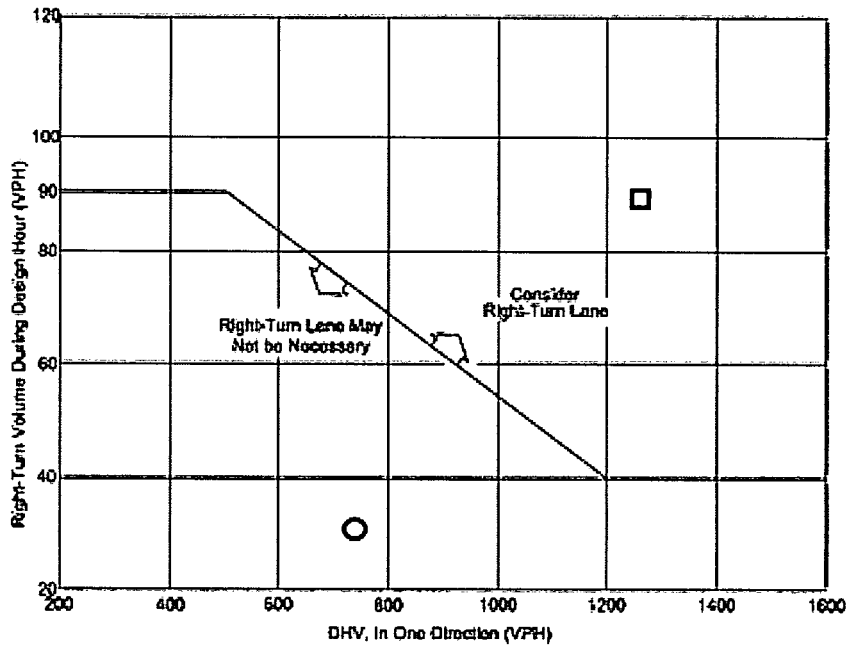
**INTERSECTION:** US 17 & Golden Grove Driveway 2 (2026)

**MOVEMENT:** Westbound Right-Turn Lane

March 2017

INTERSECTIONS

9.5-3



Note: Figure is only applicable on highways with a design speed of 50 miles per hour or greater.

**GUIDELINES FOR RIGHT-TURN LANES AT UNSIGNALIZED INTERSECTIONS  
ON FOUR-LANE HIGHWAYS**  
Figure 9.5-8

2030 Build Conditions	Major Road Volume (Direction of Right Turn Ingress)	Right Turn Volume	Speed along Right Turn Ingress	Symbol
AM Peak Hour	753	27	25	○
PM Peak Hour	1,241	89	25	□

**EXHIBIT G**

**FORM OF PARTIAL ASSIGNMENT AND ASSUMPTION OF RIGHTS AND  
OBLIGATIONS UNDER DEVELOPMENT AGREEMENT**

STATE OF SOUTH CAROLINA                    )  
   )  
   )  
 COUNTY OF CHARLESTON                    )                    **PARTIAL ASSIGNMENT AND  
 ASSUMPTION OF RIGHTS AND  
 OBLIGATIONS UNDER  
 DEVELOPMENT AGREEMENT**

This **PARTIAL ASSIGNMENT AND ASSUMPTION OF RIGHTS AND OBLIGATIONS UNDER DEVELOPMENT AGREEMENT** ("Partial Assignment and Assumption") is dated as of this \_\_\_\_ day of \_\_\_\_\_, 2013, by and between Golden-Grove, LLC, a South Carolina limited liability company                    ("Assignor")                    and                    the                    \_\_\_\_\_,  
 \_\_\_\_\_ ("Assignee").

RECITALS:

**WHEREAS**, on or about \_\_\_\_\_, 2021, Assignor entered into that certain Golden Grove Development Agreement ("Agreement") with the Town of Ravenel, South Carolina (the "County"), incident to the future development of approximately five hundred ninety-eight (598) acres of real property, as further described on Exhibit "A" attached hereto (the "Property"), which Agreement was recorded in the Office of the Register of Deeds of Charleston County, South Carolina (the "ROD") in Volume \_\_\_\_ at Page \_\_\_\_\_; and

**WHEREAS**, on \_\_\_\_\_, \_\_\_\_\_, Assignor conveyed \_\_\_\_\_ (\_\_\_\_) acres of Real Property to Assignee, as is more fully described on Exhibit "B" attached hereto (the "Transferred Property"), by that certain \_\_\_\_\_ deed recorded on \_\_\_\_\_, \_\_\_\_\_ in the ROD in Volume \_\_\_\_ at Page \_\_\_\_\_; and

**WHEREAS**, as an integral part of the conveyance of the Transferred Property from Assignor to Assignee, it is the desire and intention of Assignor to assign to Assignee, and it is the desire and intention of Assignee to assume certain rights, privileges and obligation under the terms of the Development Agreement applicable to the Transferred Property, thus necessitating the preparation and execution of the within Partial Assignment and Assumption.

**NOW, THEREFORE**, for good and valuable consideration, the receipt and adequacy whereof is herewith acknowledged, the parties hereby agree as follows, to wit:

1. Partial Assignment and Assumption of Rights Privileges and Obligations Applicable to the Transferred Property Pursuant to the Development Agreement. Assignor does hereby transfer, assign, convey and deliver unto Assignee, its successors and assigns, all of Assignor's rights, privileges and obligations as described in the Development Agreement with respect to \_\_\_\_\_ (\_\_\_\_) acres with an \_\_\_\_\_ density not to exceed \_\_\_\_\_ (\_\_\_\_\_) square feet (as further described in Section 11.A. of the Development Agreement) (the "Allocated Rights"). Assignee hereby assumes and agrees to perform all of Assignor's rights, privileges and obligations as described in the Development Agreement, applicable to the Transferred Property, including without limitation, the Assumed Obligations (as defined below). Assignee acknowledges receipt of the Development Agreement and all Exhibits thereto and agrees to be bound by the terms thereof and to develop the Transferred Property in accordance with such terms. The rights and obligations hereby assigned and assumed shall be covenants running with the land, binding upon the parties hereto and their successors and assigns. Notwithstanding anything herein to the contrary, Assignee shall not convert (and shall have no right to convert) any of the \_\_\_\_\_ (\_\_\_\_) acres designated \_\_\_\_\_ density (not to exceed \_\_\_\_\_ (\_\_\_\_\_) square feet) to use for single family detached or multi-family residential dwellings units, as is permitted under the Development Agreement.

2. Assumed Obligations. In connection with this Partial Assignment and Assumption, Assignee agrees to assume, and release Assignor from any liability for, the following obligations (the "Assumed Obligations") arising under the Development Agreement:

- (i) \_\_\_\_\_
- (ii) \_\_\_\_\_
- (iii) \_\_\_\_\_

3. Default and Enforcement of Provisions. As provided in Section 23 of the Development Agreement and as herein provided, upon the failure of Assignor or Assignee to comply with the terms of the Development Agreement and this Partial Assignment and Assumption incident to the Property, the non-defaulting party may pursue the remedies of injunction and specific performance, but not to any other legal or equitable remedies, including, but not limited to, damages.

4. Indemnification. Assignee agrees to indemnify, defend and hold harmless Assignor, its agents, principals, successors and assigns, and their affiliates from and against all losses, costs, damages, and reasonable attorney fees arising out of any breach by Assignee of the Development Agreement from and after the Closing Date, including without limitation the Assumed Obligations set forth in Section 2 hereof.

5. Notices. Any notice, demand, request, consent, approval or communication among any of the parties hereto shall be in writing and shall be delivered or addressed as provided under section 28(h) of the Development Agreement and shall also be addressed as follows:

As to Assignee:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Attn: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Facsimile Number: \_\_\_\_\_  
e-mail: \_\_\_\_\_

With a required copy to:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Attn: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Facsimile Number: \_\_\_\_\_  
e-mail: \_\_\_\_\_

To Assignor:

Golden-Grove, LLC

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Attn: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Facsimile Number: \_\_\_\_\_  
E-mail: \_\_\_\_\_

With a required copy to:

Nexsen Pruet, LLC  
205 King Street, Suite 400  
Charleston, SC 29401  
Attention: George Bullwinkel, Esq.  
Phone: (843) 720-1716

6. Binding Effect. This Partial Assignment and Assumption shall inure to the benefit of and be binding upon the respective parties hereto, their successors and assigns.

7. Governing Law. The within Partial Assignment and Assumption shall be interpreted and construed and conform to the laws of the State of South Carolina.

8. Reaffirmation of Terms. All other terms, conditions, rights and privileges contained in the Development Agreement not specifically referenced herein shall remain in full force and effect and binding upon the parties hereto and their successors and assigns.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, the parties have caused this Partial Assignment and Assumption to be duly executed as of the date set forth above.

Signed, sealed and delivered  
in the presence of:

ASSIGNEE:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
Witness

By: \_\_\_\_\_

Its: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_  
Witness

STATE OF SOUTH CAROLINA )

)

ACKNOWLEDGMENT

COUNTY OF \_\_\_\_\_ )

I, the undersigned Notary Public, do hereby certify that \_\_\_\_\_, as  
\_\_\_\_\_ of \_\_\_\_\_, personally  
appeared before me this day and, in the presence of the two witnesses above named, acknowledged the  
due execution of the foregoing instrument.

Witness my hand and seal this \_\_\_\_ day of \_\_\_\_\_, 2013.

\_\_\_\_\_  
Notary Public for South Carolina  
My Commission expires:



**Exhibit A**  
**Property**



**Exhibit B**  
**Transferred Property**

**EXHIBIT H**

**COORDINATION LETTER FROM CHARLESTON WATER SYSTEMS**



# Charleston Water System

PO Box B  
Charleston, SC 29402  
103 St. Philip Street (29403)

(843) 727-6800  
www.charlestonwater.com

## Board of Commissioners

Thomas B. Pritchard, Chairman  
David E. Rivers, Vice Chairman  
William E. Koopman, Jr., Commissioner  
Mayor John J. Tecklenburg (Ex-Officio)  
Councilmember Perry K. Waring (Ex-Officio)

## Officers

Kin Hill, P.E., Chief Executive Officer  
Mark Cline, P.E., Assistant Chief Executive Officer  
Dorothy Harrison, Chief Administrative Officer  
Wesley Ropp, CMA, Chief Financial Officer  
Russell Huggins, P.E., Capital Projects Officer

November 9, 2020

Megan Baum  
Bowman Consulting  
[mbaum@bowmanconsulting.com](mailto:mbaum@bowmanconsulting.com)

Water Availability to TMS: 175-00-00-052  
Single Family Residential

This letter is to certify our willingness and ability to provide water service to the above referenced site in Charleston County, South Carolina. CWS currently owns a 16" Ductile Iron water main within an easement on the west side of New Road which may serve the site.

It will of course be a developer responsibility to ensure there are adequate pressures and quantities on the existing mains to serve this site with domestic water/fire flow and not negatively impact the existing developments. Please be advised any extensions or modifications to the infrastructure as well as any additional fire protection will be a developer's expense. All fees and cost associated with providing service to this site will be a developer expense and will be due prior to connection of any Charleston Water System's water systems. This letter does not reserve capacity in the Charleston Water System infrastructure and it is incumbent upon the developer or his agent to confirm the availability herein granted past 12 months of this correspondence.

The Charleston Water System certifies the availability of service only insofar as its rights allow. Should access to our existing main/mains be denied by appropriate governing authorities, the Charleston Water System will have no other option than to deny service.

This letter is not to be construed as a letter of acceptance for operation and maintenance from the Department of Health and Environmental Control.

If there are any questions pertaining to this letter, please do not hesitate to call on me at (843) 727-6869.

Sincerely,

Lydia Owens  
Charleston Water System

**EXHIBIT I**

**GOLDEN GROVE DEVELOPMENT PLAN**

# Golden Grove

Planned Development District

Guidelines & Statement of Intent

Presented to:

**The Town of Ravenel**

January 19, 2021

*Revised May 11, 2021*

*Revised June 10, 2021*

*Revised July 27, 2021*

Prepared for:

Golden Grove, LLC

Prepared by:

**Bowman**

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## I. PLANNED DEVELOPMENT DISTRICT REQUIREMENTS

### A. General Conditions Compliance & Subject Properties

This document is presented in support of the Applicant's request for consideration and approval for an assemblage of properties to be rezoned under the Planned Development District (PD) guidelines for the Town of Ravenel and as an amendment to the zoning ordinance. The proposed Planned Development District is to be named *Golden Grove*.

The subject properties offered for consideration with this rezoning application may be considered for rezoning to a Planned Development District because the Applicant seeks variations to the site, dimensional standards, and other requirements of the Town's zoning ordinance and more than one principal land use is proposed for the properties.

The following is a comprehensive list of properties (the 'Properties') to be considered with this rezoning application for inclusion in the proposed *Golden Grove Planned Development District*:

<b><u>Subject Tax Map Parcels</u></b>	
<b>Tax Map Parcel ID:</b>	<b>175-00-00-049</b>
Owner:	Golden Grove, LLC
Parcel Address:	Old Jacksonboro Rd
Existing Land Use:	Vacant
Existing Zoning:	FBZD-1 (Charleston County)
<b>Tax Map Parcel ID:</b>	<b>186-00-00-062</b>
Owner:	Golden Grove, LLC
Parcel Address:	Old Jacksonboro Rd
Existing Land Use:	Vacant
Existing Zoning:	FBZD-1 (Charleston County)
<b>Tax Map Parcel ID:</b>	<b>175-00-00-052</b>
Owner:	Golden Grove, LLC
Parcel Address:	Old Jacksonboro Rd
Existing Land Use:	Vacant
Existing Zoning:	FBZD-1 (Charleston County)
<b>Tax Map Parcel ID:</b>	<b>168-00-00-023</b>
Owner:	Golden Grove, LLC
Parcel Address:	Old Jacksonboro Rd
Existing Land Use:	Vacant
Existing Zoning:	FBZD-1 (Charleston County)
<b>Tax Map Parcel ID:</b>	<b>168-00-00-001</b>
Owner:	Golden Grove, LLC
Parcel Address:	US Hwy 17
Existing Land Use:	Vacant
Existing Zoning:	AGR (Charleston County)

<b>Tax Map Parcel ID:</b>	<b>168-00-00-035</b>
Owner:	Town of Ravenel
Parcel Address:	US Hwy 17
Existing Land Use:	Vacant
Existing Zoning:	AGR (Charleston County)

## B. Minimum Requirements Compliance

### *Minimum Requirements for Consideration & Required Conditions*

#### (1) Statement of Intent

The proposed Golden Grove Planned Development District (GGPDD) is intended to incorporate three (3) principal land uses:

##### 1. Residential Land Bay

This section of the GGPDD incorporates the following TMS numbers of the previously referenced Properties:

(Owner) Golden Grove LLC: portions of 168-00-00-023 and 175-00-00-052

The maximum number and type of units proposed for the Residential Land Bay is 381 single-family detached dwelling units.

The Residential Land Bay of the GGPDD is intended to provide an attainable housing option, presenting a unique product offering and community lifestyle for current and future Town of Ravenel home buyers. It is anticipated to be constructed in phasing sequences that will allow for a sufficient inventory of lots to keep pace with lot sales. Only single-family detached dwelling units are intended for the Residential Land Bay, including open spaces, and utility areas designed to support the development of a functional single-family neighborhood. The developer may opt to add ponds for stormwater detention or community open space enhancement.

Site development of the first phases is anticipated to begin in 2021 with first homes available January 2022. This will be followed by an approximate 5-year estimated buildout period projected for 2026.

Please also reference the proposed Table of Permitted Uses included in the Appendix (see Appendix Item 1).



<b><u>Residential Land Bay Summary</u></b>	
Proposed Land Use:	Residential
Tax Map Parcels:	Portions of 175-00-00-052 and 168-00-00-023
Proposed Zoning:	PD, Planned Development
Total Wetlands:	2.92 acres
Total Disturbed Wetlands:	0.00 acres
Total Land Bay Area:	120.48 acres
Total Proposed Units:	381 units
Proposed Density:	3 DU / Acre (381 units / 120.48 acres)
Proposed Peak Housing Density:	10 DU / Acre (50 units / 5 acres)
<b><u>Minimum Setbacks</u></b>	
Front	20'
Side	5'
Rear	20'
<b><u>Proposed Lot Sizes</u></b>	
	<b><u>Lot Count</u></b>
4,500 SF (45' x 100')	50
5,500 SF (55' x 100')	35
6,000 SF (50' x 120')	184
7,500 SF (60' x 125')	112

2. Commercial Land Bay

This section of the GGPDD incorporates the following TMS numbers of the previously referenced Properties:

(Owner) Golden Grove LLC: 168-00-00-001 and portion of 175-00-00-052

(Owner) Town of Ravenel: 168-00-00-035

The Commercial Land Bay of the GGPDD is intended to provide an example conceptual plan for a potential commercial center for the proposed GGPDD as well as the surrounding community. The conceptual layout allocates an overall estimated 336,810 +/- SF of proposed commercial space. While intended for illustrative purposes only, the layout provides scale context for the extent of developable area available for future commercial

development. The Commercial Land Bay is not currently intended for development until there is sufficient market demand established to support feasibility.

Please also reference the proposed Table of Permitted Uses included in the Appendix (see Appendix Item 1).

<b><u>Example: Conceptual Commercial Land Bay Summary</u></b>	
Proposed Land Use:	Commercial
Tax Map Parcels:	168-00-00-001, 168-00-00-035, portion of 175-00-00-052
Proposed Zoning:	PD, Planned Development
Total Wetlands:	10.82 acres
Total Disturbed Wetlands:	9.08 acres
Total Land Bay Area:	50.69 acres
<b>Example Bay A</b>	
Day Care	12,025 SF
Medical Office/Office	<u>36,540 SF</u>
	Total: 48,565 SF
<b>Example Bay B</b>	
C-Store	6,000 SF
Tire	9,000 SF
Retail	15,000 SF
Bank	<u>4,800 SF</u>
	Total: 34,800 SF
<b>Example Bay C</b>	
Inline Retail	48,209 SF
Pharmacy	17,732 SF
Grocery	<u>46,950 SF</u>
	Total: 112,891 SF
<b>Example Bay D</b>	
Restaurants	26,642 SF
Inline Retail	<u>29,400 SF</u>
	Total: 56,042 SF
<b>Example Bay E</b>	
Retail	Total: 84,512 SF
<b>Total Commercial SF</b>	<b>±336,810 SF</b>

### 3. Resource Extraction Land Bay

This section of the GGPDD incorporates the following TMS numbers of the previously referenced Properties:

(Owner) Golden Grove LLC: 175-00-00-049, 186-00-00-062 and portion of 168-00-00-023

The Resource Extraction Land Bay of the GGPDD is permitted under SCDHEC Mine Operating Permit (Permit No. I-002257), effective as of May 12, 2020. The Mine Operating Permit grants coverage for a total of 249 acres of property. The operation is used for

mining topsoil and fill dirt for the region's building/construction needs. The Golden Grove Mine operational boundary is intended to provide for any additional planned mine site expansions and to serve as the project limits for the life of the mine operation. The surrounding land adjacent to the mine's operational boundary is currently managed for silviculture and wildlife. A copy of the SCDHEC Mine Operating Permit (Permit No. I-002257) has been included in the Appendix (see Appendix Item 2).

In the future, upon completion of the mining operation, the excavated areas that result from resource extraction will be reclaimed for lakes and/or future stormwater management needs for low-density residential development. The land surrounding the future lakes and ponds that comprise the remainder of the Resource Extraction Land Bay will be converted for residential development. The intended single-family detached residential design is planned to accommodate relatively low density lots for residents seeking a more rural community setting. While the current plan is to transition from resource extraction operations to residential development, the developer retains the option for the lands to be used for commercial purposes in accordance with the approved Table of Permitted Uses as included in the Appendix (see Appendix Item 1).

The number of units allowed for future residential development within the Resource Extraction Land Bay shall be defined by a unit calculation based on net developable acreage (gross acreage less ponds and public right-of-way) with a minimum lot size of 0.5 acres.

Areas within this land bay will be set aside for existing hunting, fishing, and target shooting rights, which shall be preserved for the foreseeable future. The lake resulting from resource extraction operations is intended to enhance the value of the land and serve as an aesthetic and recreational asset for the residential community and for the benefit of all future residents. Additionally, spaces to accommodate wedding and event venues shall be allocated within the Resource Extraction Land Bay once that section of the lake is complete and has been released by SCDHEC.

Please also reference the proposed Table of Permitted Uses included in the Appendix (see Appendix Item 1).

<b>Resource Extraction Land Bay Summary</b>	
Proposed Land Use:	Resource Extraction
Tax Map Parcels:	175-00-00-049, 186-00-00-062, portion of 168-00-00-023
Proposed Zoning:	PD, Planned Development
Mine Segment 1 Affected Area:	17 acres (Permitted)
Future Mine Segments 2 – 8:	232 acres (Permitted)
Total Mine Permitted Area:	± 249 acres
Total Land Bay Area:	426.47 acres

(2) Statement on Exceptions/Variations to the Town of Ravenel Zoning Ordinance

The current base district zoning standards provided within the Town of Ravenel Zoning Code do not support the proposed planned development given the uniqueness and adjacency of the three intended principal land uses that comprise the GGPDD. Therefore, the Applicant is requesting variations to design and dimensional requirements to ensure the feasibility of the planned development district.

It is the intent of the Developer (for both the Residential and Resource Extraction Land Bays) to integrate the nature of small-lot residential clustering to minimize the development footprint and to maximize the preservation of the inherent natural features of the Properties, thus also capitalizing on increased opportunities for open space. Since small-lot residential clustering is not currently addressed within the GGPDD for the Resource Extraction Land Bay, the Developer will apply to the Town to modify the GGPDD if/when it is deemed appropriate.

(3) Minimum District Size

The GGPDD incorporates a total of approximately 600 acres and, therefore, meets the minimum required condition that the site must contain not less than five acres per Section 2.6.15 of the Town of Ravenel Zoning Code.

(4) Minimum Boundary Width

The Properties associated with the GGPDD meet the required condition that the minimum width between any two opposite boundary lines is 200 feet as per Section 2.6.15 of the Town of Ravenel Zoning Code.

(5) No Flag Lots Created

The Properties associated with the GGPDD are not flag lots, and no flag lots will be created in the GGPDD.

(6) Site Access

The GGPDD adjoins and has direct access to publicly maintained roadways having a right-of-way of [at least] 50 feet.

(7) Principal Land Uses

There are three principal land uses that comprise the proposed GGPDD: residential, commercial, and resource extraction. The minimum required condition that more than one principal land use is proposed for the project has been met as per the Town of Ravenel Zoning Code (Section 2.6.15).

## II. PUBLIC INFRASTRUCTURE & UTILITIES

The GGPDD has access to public infrastructure systems, including roads, potable water, and stormwater drainage. Confirmation of preliminary review and coordination for public services is detailed in the following section.

### A. Access

Primary access and main entry to the GGPDD is intended along US Highway 17 (Savannah Highway), which is maintained by SCDOT. The new proposed entrance is approximately 0.3 miles

(1,650 LF) west of the intersection at New Road. A potential secondary entrance along US Highway 17 is also currently shown within the Residential Land Bay. Perimeter access roads include New Road and Old Jacksonboro Road (S-10-1332), which are both locally maintained. Entrances along New Road and Old Jacksonboro Road are not proposed at this time; however, both roads could serve to provide additional points of access in the future.

Confirmation of preliminary coordination with SCDOT has been provided by JuLeigh Fleming, SCDOT District Permit Engineer (dated October 23, 2020), indicating no objections to the proposed project. A copy of this confirmation of preliminary coordination with SCDOT has been included in the Appendix (see Appendix Item 3). A formal traffic study was completed by Stantec for the GGPDD. A copy of the completed Traffic Impact Analysis (TIA) was submitted to SCDOT for review on December 21, 2020, and Josh Johnson, SCDOT Traffic Engineer, provided acceptance of the TIA on February 8, 2021. A copy of the final, stamped TIA along with documentation of coordination for SCDOT acceptance has been provided in the Appendix (see Appendix Items 4 and 5) for Town of Ravenel review.

A proposed Pedestrian and Bicycle Circulation Plan has been included in the Master Development Plan (Sheet C103). The proposed internal trail system is planned to connect to the intended Spring Grove trail system as shown in Map Number 1.1.5 ("75% Acreage & Trails Map") from the *Spring Grove Form District Master Plan*, dated November 19, 2015.

A detailed Thoroughfare Plan has also been included in the Master Development Plan (Sheet C200). This plan shows a design layout for three (3) proposed roadway sections planned within the GGPDD:

1. A 45' right-of-way intended for residential access only
2. A 60' right-of-way intended for general community access
3. A 70' right-of-way intended for use as a primary spine road and main community access

#### B. Water

Potable water is available to the GGPDD and will be provided by Charleston Water System (CWS) since the Properties are located within the CWS Water Service Area. A 16" ductile iron water main exists along New Road adjacent to the GGPDD that can be used to provide water service. A letter confirming willingness and ability to provide water service has been provided by CWS, dated November 9, 2020. Copies of this letter and a map of the CWS water utility infrastructure surrounding the GGPDD have been included in the Appendix (see Appendix Items 6 and 7). Please refer also to the Utility Plan included in the Master Development Plan (Sheet C300).

#### C. Sewer

Sewer service is not currently available to the GGPDD. The Town of Ravenel, through the Golden Grove Development Agreement by and between Golden Grove, LLC, and the Town of Ravenel, has committed to providing sewer service to the GGPDD simultaneous with annexation. The proposed design includes an offsite sewer main extension intended to connect to the existing Town of Ravenel commercial sewer system. The proposed offsite sewer main extension is approximately 812 LF. Please refer also to the Utility Plan included in the Master Development Plan (Sheet C300).

Sewer requirements have been estimated for the Residential Land Bay. Per SCDHEC's §61-67, Appendix A, Unit Contributory Loadings to All Domestic Wastewater Treatment Facilities, the residential sewer requirements are calculated at 300 Gallons Per Day (GPD) per residential lot/unit. A total of 381 lots/units are proposed, resulting in a total of 114,300 GPD, or 381 ERU, for the residential portion. The residential calculations are provided in the GPD calculation sheet in the Appendix (see Appendix Item 8).

#### D. Stormwater

Stormwater runoff generated by the proposed project will be treated onsite for both quantity and quality through a series of stormwater management ponds and other onsite BMP's. Post-development peak discharge rates will be less than or equal to pre-development rates per the standards required by Charleston County in the *Stormwater Program Permitting Standards and Procedures Manual*. In order to better mimic the natural hydrology and improve stormwater flows, the proposed Stormwater Management Plan (please reference Master Development Plan, Sheet C400) presents residential lots smaller than traditional *Residential Three District (R-3)* standards. Stormwater ponds are proposed to be located adjacent to the existing wetlands to capture a majority of runoff generated within the Properties. The series of stormwater ponds will have multiple outfalls, which will help diffuse stormwater throughout the adjacent wetlands to emulate the pre-development drainage patterns. Stormwater culverts will be installed to allow offsite drainage to flow through existing streams, maintaining existing drainage patterns, to prevent adverse impacts to neighboring properties.

A Preliminary Drainage Study has been completed for the Residential and Commercial Land Bays. Please reference the Preliminary Drainage Study report and associated Stormwater Management Plan included in the Appendix (see Appendix Item 9).

#### E. Electric and Natural Gas

Berkeley Electric Cooperative will supply the electrical distribution requirements for the GGPDD. A copy of the willingness to serve letter has been included in the Appendix (see Appendix Item 10).

Natural gas service is available to the GGPDD, and Dominion Energy has confirmed availability and willingness to serve. A copy of the Gas Availability Letter has been included in the Appendix (see Appendix Item 11).

### III. EXISTING SITE CONDITIONS

#### A. Project Site Location & Area Summary

The GGPDD is generally situated west of Highway 165 and north of US Highway 17 at the intersection of New Road. The Properties are immediately adjacent to the Town of Ravenel jurisdictional boundary and comprise a total of approximately 600 +/- acres of land. The adjacent Town of Ravenel properties to the east are currently zoned *Agricultural Residential (AR)*. Please refer also to the Location Aerial and Regional Context Map included in the Master Development Plan (Sheet C003). Additional existing site information is included in the Master Development

Plan, including an Existing Conditions site inventory (Sheet C004) and the FEMA Flood Insurance Rate Map (FIRM) (Sheet C005).

## B. Wetlands

Terracon Consultants, Inc., (wetlands consultant) performed two wetland delineation surveys for the Properties within the GGPDD. The U.S. Army Corps of Engineers (USACE) has issued the following *Approved Jurisdictional Determination* (AJD) letters that cover the developable areas of the GGPDD:

### SAC-2018-01765

Date of Issue: July 15, 2019

USACE Assessment: The site does not contain any aquatic resources that are subject to regulatory jurisdiction under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act. (See Appendix Item 12)

### SAC-2020-00455

Date of Issue: October 21, 2020

USACE Assessment: The site does not contain any aquatic resources that are subject to regulatory jurisdiction under Section 404 of the Clean Water Act or Sections 9 and 10 of the Rivers and Harbors Act.

(See Appendix Item 13)

Based on the final assessments provided by the USACE, there are no jurisdictional wetlands located within the GGPDD; however, there are non-jurisdictional wetlands located within the site. Any impacts to non-jurisdictional wetlands will require permits from applicable agencies. Copies of both wetland delineation surveys have been included in the Appendix (see Appendix Items 14 and 15).

## C. Development Agreement

These Properties are also governed by that certain Golden Grove Development Agreement by and between Golden Grove, LLC, and the Town of Ravenel.

## D. Known Historical and Architecturally Significant Sites

In 2017, Terracon Consultants, Inc., conducted an initial cultural resources reconnaissance survey for portions of the GGPDD. This study entitled, *Phase 1 Cultural Resources Survey of Approximately 59 Acres at the Proposed Golden Grove Mine*, is included in the Appendix (see Appendix Item 16). This study is referenced as State Historic Preservation Office (SHPO) Project No. 17-EJ0094. The State Historic Preservation Office (SHPO) evaluated the report for eligibility for inclusion in the National Register of Historic Places (NRHP). Three sites (38CH2526, 38CH2527, 28CH2528) and three isolated finds (IF-1-IF-3) were identified. SHPO concurred with the recommendation of a Phase 1 archaeological survey for 72 acres (Areas B, C, D, F, I) and additional work at sites 38CH2527 and 38CHS2528; the other areas were deemed not eligible for NRHP.

In 2020, an intensive archaeological survey was completed in Area B by Brockington and Associates, Inc., entitled, *Archaeological Survey of Section B Golden Grove II Mining Tract*. A copy of the study is included in the Appendix (see Appendix Item 17). This study is also referenced

under SHPO Project No. 17-EJ0094. SHPO determined Area B (Segment 2) was unlikely to contain significant cultural resources and further assessment was not necessary.

In the SHPO response to the Area B survey (dated March 17, 2020), SHPO notes the presence of two historical settlements and a cemetery within the project areas (Areas C, D, F, I). The operator will assess these areas prior to future mine activity in segments 3 – 7. The assessment shall be forwarded to SHPO for evaluation and approval. Based on SHPO review, the mine maps for segments 3 – 7 shall note the location of any cultural resources and protective buffers. A copy of the SHPO response letter is included in the Appendix (see Appendix Item 18).

## IV. REGULATORY PROVISIONS

### A. Comparable Town of Ravenel Zoning Districts

The Properties that comprise the proposed GGPDD are intended for annexation into the Town of Ravenel. Upon annexation approval, the Applicant seeks rezoning of these Properties through the modified regulatory provisions proposed in this planned development district document. These proposed modifications to the existing Town of Ravenel Zoning Code are intended to serve as supplemental zoning provisions and development guidelines for the GGPDD.

As such, the following are the comparable existing Town of Ravenel zoning districts by which each of the three (3) intended principal land uses will be assessed:

1. Residential Land Bay  
Town of Ravenel *Residential Three District (R-3)*
2. Commercial Land Bay  
Town of Ravenel *General Business District (GB)*
3. Resource Extraction Land Bay  
Town of Ravenel *Agricultural Residential (AR)*

### B. Overall Development

#### **Overall Development Maximums**

Residential	A maximum of 3 DU / Acre of residential density will be allowed. 381 units / 120.48 acres
Commercial	A maximum of 50.69 acres of commercial property will be allowed.
Resource Extraction	A maximum of 249 acres are permitted for resource extraction operations per SCDHEC Mine Operating Permit No. I-002257.  The number of units allowed for future residential development within the Resource Extraction Land Bay shall be defined by a unit calculation based on net developable acreage (gross acreage less ponds and public right-of-way) with a minimum lot size of 0.5 acres.



## Phasing

The GGPDD is anticipated to be constructed as a phased development. A Conceptual Phasing Plan that outlines the anticipated phasing sequence for the overall GGPDD is provided in the Master Development Plan (see Sheet C800). The phasing boundaries, as depicted in the Conceptual Phasing Plan, are intended for planning purposes and are subject to change based on variable market conditions and demand.

The GGPDD is comprised of three (3) principal land uses (land bays) for which development is proposed along separate timelines. These timelines will be dependent upon both current general economic conditions and associated trajectories, as well as the more local economic needs and demands of the Town of Ravenel and the Greater Charleston Area. Since the timing of development for the GGPDD is based on anticipation of these conditions, needs, and demands; it is necessarily subject to significant changes based on actual current conditions as the project develops. In consideration of the information and projections that we believe to be current and accurate at this time, we project the following schedule below:

### **2021-2025 Initial Construction**

This phase will include the start of infrastructure permitting and development for the Residential Land Bay in 2021. It will also include a continuation in the Resource Extraction Land Bay of an existing borrow pit operation from a neighboring parcel in 2021. By the end of this phase, it is anticipated that development of the infrastructure and associated single-family homes in the Residential Land Bay will be nearing completion.

### **2025-2030**

The Commercial Land Bay should begin construction during this period based on market demand and adjacent residential development. A wide variety of potential uses are possible based on the then-current needs of the area and future potential. Borrow pit operation in the Resource Extraction Land Bay should be ongoing.

### **2030-2035**

The Commercial Land Bay is expected to be fully built out during this period and the borrow pit operation should also be at or near completion.

## Building Heights

Building height will be 45' maximum throughout all land bays within the GGPDD. Building height shall be measured in feet above the average grade elevation within 20' feet of the structure or the base flood elevation, whichever is higher.

## Accessory Dwelling Units

Standards or development regulations not described or defined here within shall default to the requirements as set forth by the Town of Ravenel Zoning Code as per Section 3.3 Accessories Uses and Structures.

Accessory Dwelling Units (ADUs) shall be defined as accessory structures, attached or detached, that meet the definition of a dwelling unit.

1. ADUs are not allowed in either the Residential or Commercial Land Bays.

2. ADUs are allowed within the Resource Extraction Land Bay and do not count toward the allocated residential dwelling units.
3. ADUs shall be allowed within the Resource Extraction Land Bay on any single-family detached lots that are a minimum of one (1) acre or greater as long as defined setbacks are maintained. ADUs shall not count toward the overall maximum unit count for the Resource Extraction Land Bay.
4. Accessory Non-Dwelling Units, such as detached garages and pool houses, shall be allowed water and septic connections on any single-family detached lots within the Resource Extraction Land Bay. These units must meet defined setback requirements and shall not count toward the overall maximum unit count for the Resource Extraction Land Bay.

**Land Bay Chart**

<b>LAND BAY</b>	<b>TOTAL ACREAGE</b>	<b>% LAND USAGE</b>
Residential	120.48	20.16%
Commercial	50.69	8.48%
Resource Extraction	426.47	71.36%
<b>TOTAL</b>	<b>597.64 ac</b>	<b>100%</b>
AREAS LISTED ARE APPROXIMATE AND MAY VARY WITH UPDATED SURVEY INFORMATION		

C. Residential Land Bay

**GPPDD Residential Development Standards**

Standards or development regulations not described or defined here within shall default to the Town of Ravenel *Residential Three District (R-3)* zoning designation and other requirements as set forth by the Town of Ravenel Zoning Code.

**Density**

Up to 381 principal residential units may occur within the Residential Land Bay.

**Allowable Uses**

Please reference the proposed Table of Permitted Uses included in the Appendix (see Appendix Item 1).

**Lot Size**

1. Minimum lot sizes shall be 4,500 square feet for single-family detached lots
2. Minimum lot width for single-family detached lots shall be 45'
3. Minimum lot width shall be measured at the building face

4. Minimum lot depths for all lot types shall be 100'
5. There shall be no maximum lot sizes

### **Building Coverage**

The maximum amount of building coverage shall be 70%, including detached garages.

### **Setbacks**

Side: 5'  
Front: 20'  
Rear: 20'

Accessory structures may extend up to 2' in the side setback and 10' into the rear setback.

Open, uncovered porches, open fire escapes, uncovered decks and balconies may project into a front or rear setback not more than 10'. Garages will be placed a minimum of 20' from a sidewalk.

Eaves and overhangs are allowed to penetrate side setbacks.

See Section 4.1.11 of the Town of Ravenel Zoning Code for additional exceptions to setbacks.

### **Block Size**

The maximum block size will be 1,400'. Block size shall be defined as the length of a segment along a street right-of-way measured between perpendicular street intersections. In place of an intersection, Cul-de-sacs or other legal turn arounds may be used to measure block size when site constraints make a perpendicular street connection impractical.

### **Parking**

Required parking for single-family residential shall be 2 spaces per unit. Parking spaces meeting dimensional requirements that are within garages and on-lot driveways shall count toward the requirement.

On-street parking is not allowed within the Residential Land Bay; however, on-street parking will be allowed during the construction phase.

### **Lighting**

Lighting shall be 18' fixture height cut-off fixtures with no spill over at property line. There shall be no minimum light levels and dark sky standards will be encouraged.

### **Signs**

1. All signage shall adhere to Town of Ravenel zoning regulations unless otherwise specified below.

2. Master Development signs shall be a maximum of 10' tall and 20' wide with a maximum of 150 SF sign face for each side of the sign.
3. No internally illuminated signs shall be allowed.
4. Along internal rights-of-way only, four internal residential signs may occur per phase but may not exceed 4 internal residential signs per 100 lots. Internal residential signs shall be a "gateway style sign pair" in the form of columns. Signs shall be limited to 8' tall and 3' wide maximum per column. Sign face shall be limited to 10 SF per column.
5. Temporary signs such as lot signs, construction signs, builder signs, safety signs, and sales signs shall be allowed. Signs shall be limited to 30 SF of sign face per sign. Temporary signs internal to the GGPDD shall not require a sign permit.
6. If signs are proposed within a public right-of-way, they shall be subject to approval of an encroachment permit.

### **Landscaping**

Landscaping shall be per the requirements set forth by the Town of Ravenel Zoning Code.

### **Building Materials**

The exterior facades of all single-family dwellings shall be constructed of cementitious siding material (e.g., "HardiPlank" siding). No vinyl siding will be allowed.

## **D. Commercial Land Bay**

### **GGPDD Commercial Development Standards**

Standards or development regulations not described or defined here within shall default to the Town of Ravenel *General Business District* (GB) zoning designation and other requirements as set forth by the Town of Ravenel Zoning Code.

### **Density**

The Commercial Land Bay is intended solely for commercial use. No residential dwelling units may be constructed in the Commercial Land Bay. Additionally, no ADUs are permitted within this district.

### **Allowable Uses**

Please reference the proposed Table of Permitted Uses included in the Appendix (see Appendix Item 1).

### **Lot Coverage**

Impervious surfaces shall be limited to 80% of each lot.

**Setbacks**

- Side: 15'
- Front: 25' (may be reduced to 15' if the building is oriented to a frontage road OR is located between the frontage road and associated parking)
- Rear: 25'

A 50' setback shall be maintained along the U.S. Highway 17 frontage.

**Minimum Lot Width**

The minimum lot width at building line shall be 50'.

**Parking**

Parking requirements shall be per the Town of Ravenel Zoning Code unless otherwise defined herein.

Parking space dimensions shall be a minimum of 9'x18'.

Compact parking space dimensions shall be a minimum of 8'x15' and may be up to 25% of the total required parking.

Two-way drive aisles shall be a minimum 22' (11' lanes).

On-street parking is allowed, but it is not required. On-street parking spaces may count towards parking requirements for buildings with entrances within 500' of the spaces, but spaces may not count toward satisfying more than one building's parking requirement.

**Lighting**

Lighting shall be 24' maximum fixture height cut-off fixtures designed to prevent spill over at property line. There shall be no minimum light levels, and dark sky standards will be promoted for use within commercial development areas.

**Signs**

Signage requirements shall be per the Town of Ravenel Zoning Code.

**Landscaping**

Landscaping shall be per the requirements set forth by the Town of Ravenel Zoning Code.

**Building Materials**

No building elevation constructed of unadorned concrete masonry units or corrugated and/or sheet metal shall front upon any existing public or private rights-of-way. Mechanical equipment, whether ground level, raised, or rooftop shall be shielded and screened from public view.

**Quick Service Restaurants**

Drive-thru lanes shall be permitted for any Quick Service Restaurants (QSRs). Drive-thru lanes should be placed adjacent to 50' or greater buffers or oriented inward to the site to reduce visibility from adjacent rights-of-way.

E. Resource Extraction Land Bay

**GGPDD Resource Extraction Development Standards**

Standards or development regulations not described or defined here within shall default to the Town of Ravenel Agricultural Residential (AR) zoning designation and other requirements as set forth by the Town of Ravenel Zoning Code.

**Phase 1: Resource Extraction Operations**

**Density**

While in use for resource extraction operations, there shall be no density requirement within the Resource Extraction Land Bay.

**Allowable Uses**

Please reference the proposed Table of Permitted Uses included in the Appendix (see Appendix Item 1).

**Lot Size**

There shall be no minimum lot size requirement.

**Building Coverage**

There shall be no building coverage requirement.

**Setbacks & Buffers**

A minimum of 50 feet will be maintained from the operational mine segment boundary and the overall Resource Extraction Land Bay boundary. A 200-foot buffer will be maintained along Old Jacksonboro Road.

**Block Size**

There shall be no block size requirement.

### **Parking**

Required parking shall be 2 spaces plus 1 space per employee per shift. Private gravel drives and gravel parking areas for resource extraction uses shall be allowed.

### **Lighting**

Lighting shall be 30' maximum height cut-off fixtures with no spill over at property line. There shall be no minimum light levels and lighting design shall be per Dark Sky standards.

### **Signs**

Internal wayfinding signs shall be allowed and are exempt from obtaining sign permits. All other signage shall be per Town of Ravenel Zoning Code. If signs are proposed within a public right-of-way, these signs shall require an encroachment permit.

### **Landscaping**

While in use for resource extraction operations, there shall be no landscaping requirements within the Resource Extraction Land Bay.

### **Building Materials**

There shall be no regulations on architectural materials for utilitarian buildings needed to support resource extraction operations.

## **Phase 2: Low-Density Residential**

### **Density**

The number of units allowed for future residential development within the Resource Extraction Land Bay shall be defined by a unit calculation based on net developable acreage (gross acreage less ponds and public right-of-way) with a minimum lot size of 0.5 acres.

### **Allowable Uses**

Please reference the proposed Table of Permitted Uses included in the Appendix (see Appendix Item 1).

### **Lot Size**

1. Minimum lot size shall be 0.5 acres for single-family detached lots
2. There shall be no maximum lot sizes

### **Building Coverage**

The maximum amount of building coverage shall be 70%, including detached garages.

### **Setbacks**

Side: 5'  
Front: 20'  
Rear: 20'

Accessory structures may extend up to 2' in the side setback and 10' into the rear setback.

Open, uncovered porches, open fire escapes, uncovered decks and balconies may project into a front or rear setback not more than 10'.

Eaves and overhangs are allowed to penetrate side setbacks.

See Section 4.1.11 of the Town of Ravenel Zoning Code for additional exceptions to setbacks.

### **Block Size**

There shall be no block size requirement.

### **Parking**

Required parking for single-family residential shall be 2 spaces per residence. Private gravel drives and gravel parking areas shall be allowed. An additional parking space shall be required for each ADU.

### **Lighting**

Along residential rights-of-way, light fixtures, if provided, shall be 18' fixture height cut-off fixtures with no spill over at property line. There shall be no minimum light levels and dark sky standards will be encouraged.

### **Signs**

All signage shall adhere to Town of Ravenel zoning regulations unless otherwise specified below.

1. Master Development signs shall be a maximum of 10' tall and 20' wide with a maximum of 150 SF sign face for each side of the sign.
2. No internally illuminated signs shall be allowed.
3. Along internal rights-of-way, only four internal residential signs may occur per phase but may not exceed 4 internal residential signs per 100 lots. Internal residential signs shall be a "gateway style sign pair" in the form of columns. Signs shall be limited to 8' tall and 3' wide maximum per column. Sign face shall be limited to 10 SF per column.
4. Temporary signs such as lot signs, construction signs, builder signs, safety signs, and sales signs shall be allowed. Signs shall be limited to 30 SF of sign face per sign. Temporary signs internal to the GGPDD shall not require a sign permit.



5. If signs are proposed within a public right-of-way, they shall be subject to approval of an encroachment permit.

### **Landscaping**

Landscaping shall be per the requirements set forth by the Town of Ravenel Zoning Code.

### **Building Materials**

Exterior facades shall be composed of materials other than vinyl siding. No vinyl siding will be allowed.

## **F. Street Standards**

Streets shall be designed per the Town of Ravenel Zoning Code except as defined herein.

1. Reverse curves, where practical, shall contain a tangent between curves.
2. Horizontal Curves: The minimum horizontal curve shall adhere to Public Road Standards per Charleston County; however, they may be reduced to 50 feet in a 45' one-way thoroughfare or an alley at the discretion of the Town Engineer, on a case-by-case basis. When connecting street centerlines deflect from each other at any one point by more than 10 degrees, they shall be connected by a curve with a radius of not less than 150 feet for minor streets, and 300 feet for collector streets, and 500 feet for arterial streets. However, the minimum curb radii can be reduced to 100 feet for minor streets and 250' for collector streets by the Town Engineer on a case-by-case basis due to physical constraints (wetlands, grand trees, etc.).
3. Minimum rights-of-way for public streets shall be 45'. Sidewalks shall be required on only one side of the street. Pavement width for curb and gutter street sections shall be a minimum of 24 feet exclusive of the curb and gutter. For minor streets, reductions in pavement width to 22 feet exclusive of the curb and gutter can be approved by the Town Engineer on a case-by-case basis. Pavement width for 45' one-way thoroughfares shall be a minimum of 13', exclusive of the curb and gutter.
4. Minimum rights-of-way for alleys shall be 20'. Sidewalks and street trees shall not be required on alleys.
5. Alleys shall be privately maintained and may utilize inverted crown road sections for drainage.
6. Minimum rights-of-way for public roads within the Resource Extraction Land Bay shall be 50'. Unpaved roads may be allowed within the Resource Extraction Land Bay, such that the streets have an all-weather surface and are privately maintained. In no case shall an unpaved road be a public right-of-way. The design of the street section shall be subject to review and approval by the Town of Ravenel. Sidewalks shall not be required along unpaved roads.

## G. Open Space Requirements

Definitions for open space are as follows:

### **Common Open Space**

Common open space is land and / or water bodies used for recreation, amenity, or buffer, which shall be freely accessible to all residents and property owners of a development. Common open space shall not be buildings or structures other than those in conjunction with the use of the open space, roads, or parking nor shall it include the yards or lots of residential dwelling units required to meet the minimum lot area or parking area requirements.

### **Active Open Space**

Active open space areas consist of high ground developed to provide for active recreational uses. Examples of possible types of active open spaces could include ball fields, playgrounds, community gardens, walking or multi-use trails, picnic areas, ponds with water interaction areas, and other similar program features.

The Residential and Commercial Land Bays shall require 15% open space, 10% of which must be active. This requirement shall apply to each upland area of each land use. Open space shall be owned and maintained by the POA.

The Resource Extraction Land Bay contains ample common open space and is exempt from open space requirements.

A trail system will connect throughout the Residential and Commercial Land Bays where practical. Trails may vary in width from 4' to 12' and may be pervious or impervious, including plantation mix or shell-sand mix, and shall be ADA compliant in some areas. Trail connections may occur in the form of boardwalks within wetland areas, as approved by the Army Corps of Engineers. A conceptual trail exhibit has been provided within the Master Development Plan (see Sheet C103) to illustrate the intent.

## H. Tree Survey and Mitigation Requirements

### **Definitions**

1. Significant Tree: a canopy tree, excluding pines, sweetgums, and exotic invasive species, that is between 8" to 23" DBH.
2. Grand Tree: a canopy tree, excluding pines, sweetgums, and exotic invasive species, that is 24" DBH or larger.
3. Exotic Invasive species: trees listed as exotic invasive by the Southeast Exotic Pest Plant Council's "Invasive Plant Species of South Carolina" to include Chinaberry, Tallowtree, Princesstree, Tree of Heaven, Chinese Privet, Callery Pear, Chinese Parasol Tree, Mimosa, Paper Mulberry, White Mulberry, White Poplar, and Japanese Privette.

### **Pine Trees**

Given the property's current use in timber production, the removal of pines is not subject to any mitigation requirements. Except for areas designated as undisturbed buffers, forestry / silvicultural practices may continue to occur in all areas.

### **Significant Trees**

1. Significant trees and larger shall be preserved in buffers except where clearing is required for road crossings, utility crossings, swales, drainage pipes, sight distance triangles, or clearing for signage view windows.
2. Unapproved removal of Significant trees in wetlands and buffer areas shall require inch-per-inch replacement.

### **Grand Trees**

1. Shall be preserved to the greatest extent possible in areas within all land bays.
2. Timber operations may continue to occur without surveying grand trees.
3. Grand trees in wetland areas shall only be surveyed for in areas proposed for wetland crossings or wetland impacts.
4. Grand Trees approved for removal shall require inch-per-inch mitigation.
5. Unapproved removal of Grand Trees shall require replacement of tree inches at a 3:1 ratio.
6. No mitigation will be due for the removal of Grand Trees of poor health or that are hazardous per an arborist's report.

### **Replacement/Mitigation Trees**

1. Shall be chosen from the Town's approved tree and shrub list.
2. Must be 2.5" minimum caliper size.
3. In cases where the site is constrained due to property size or configuration, existing tree canopy, building conflicts, or easement locations, upon review and approval by the Zoning Administrator, understory or palmetto trees may be utilized. Two 12' minimum height palmettos or two 1.5" caliper understory trees shall count as 1-2.5" caliper canopy tree.
4. Mitigation may be satisfied by Street Trees (as follows), through On-Lot Trees (as follows), or through trees planted in HOA areas.

### **Street Trees**

1. Shall be required along public rights-of-way in the Residential and Commercial Land Bays
2. Will not be required in the Resource Extraction Land Bay
3. Shall be chosen from the Town's approved tree and shrub list
4. Must be 2.5" minimum caliper size
5. Shall be placed along both sides of public ROWs at a spacing between 35' and 55' on center; Street trees shall not be required along alleys.
6. Should occur in minimum 5' wide tree lawns (verges) between the sidewalk and the curb where practical. Tree selections and location shall be subject to Town approval.
7. Flexibility in street tree spacing shall be given to avoid conflicts with existing trees and site features, including driveways and utilities.
8. Depending on the locations of proposed trees and timing of construction, portions of street tree installations may be deferred until after Certificate of Occupancy to optimize tree survivability, subject to a bond agreement with the Town of Ravenel.

### **On-lot Trees**

1. Shall be chosen from the Town's approved tree and shrub list
2. Must be 2.5" minimum caliper size
3. One 2.5" canopy tree shall be planted on each single-family detached residential lot
4. Where practical, on-lot canopy trees should be placed in the front yard of the lot
5. On-lot trees shall be installed prior to issuance of Certificate of Occupancy

#### **I. Buffers**

Applicable to all buffers:

In all required buffers, perpendicular buffer penetrations shall be allowed for curb cuts, roadways, connecting sidewalks, infrastructure, utilities, and drainage lines for outfall purposes.

All buffers designated within the GGPDD are to be owned and maintained by the POA and are to be undisturbed buffers except for specific allowable disturbances as described here within.

Areas that are illegally disturbed shall be subject to replanting at a rate of 12 two- and one-half-inch caliper canopy trees, 12 one-and-a-half-inch caliper understory trees, and 50 three-gallon shrubs per 1000 square feet of disturbed buffer.

Trails, including sidewalks and boardwalks, not more than 10' in width may be allowed in buffers. Wetland buffers should utilize pervious trails.

Under-brushing of undesirable plant material, removal of fallen trees, cleaning of vines, removal of invasive vegetation, and other practices necessary for the maintenance of a healthy buffer shall be allowed once per year. Should the opacity of the buffer be noticeably compromised, revegetation may be required at the discretion of the Town of Ravenel.

A 50' buffer shall be required along U.S. Highway 17 and New Road. The buffer shall be 50' measured from the current right-of-way line inward.

- Utility easements shall be allowed within this buffer.
- Signs shall be allowed in this buffer.
- This buffer is subject to reduction in depth due to right-of-way acquisitions or utility improvements that are not the direct result of development within the GGPDD.

#### Wetland Buffers:

- The GGPDD will abide by and allocate for wetland buffers as required by the Authority Having Jurisdiction.
- Drainage lines shall be allowed to penetrate wetland buffers for outfall purposes.
- Disturbed areas shall be replanted with native species complementary to those in the adjacent undisturbed buffer.
- All wetland buffer design and allowances shall be subject to U.S. Army Corps of Engineers approval.

No buffers shall be required between different land uses internal to the GGPDD except as described in this section.

#### J. Stormwater Requirements

A Preliminary Drainage Study report and associated Stormwater Management Plan have been provided in the Appendix (see Appendix Item 9).

Stormwater requirements will be per Town of Ravenel.

#### K. Water and Sewer Requirements

Water requirements will be per Charleston Water System and sewer requirements will be per Town of Ravenel.

Private water and sewer treatment systems shall be allowed as permitted by SCDHEC. The Resource Extraction Land Bay may utilize well water and septic sewer systems.

L. Utilities

Utilities shall be as required by and in conformance with the standards and specifications of the Town of Ravenel Zoning Code.

M. Cultural Resources

Cultural resource study reference has been provided in the Appendix (see Appendix Items 16, 17, and 18). All archeological buffers recommended in the study shall be provided per recommendations.

N. Subdivision

Subdivisions within the GGPDD boundary will be per standards specified within this document and the Town of Ravenel subdivision regulations.

O. Traffic Study

A formal traffic study was completed by Stantec for the GGPDD. A copy of the completed Traffic Impact Analysis has been provided in the Appendix (see Appendix Item 4).

P. Additional Development Requirements

**Sales Trailer**

One sales trailer per development phase shall be allowed within the Residential and Commercial Land Bays.

**Phasing**

A Conceptual Phasing Plan (see Sheet C800) has been provided in the Master Development Plan and is intended to illustrate the general phasing approach. The plan is conceptual in nature and subject to change.

Each Land Bay may be subject to its own phasing plan.

Water, sewer and utilities will be provided to the site with the Initial Construction phase. The anticipated date for commencement of the Initial Construction phase is the second half of the year 2021. Right-of-way dedications to the Town of Ravenel for roads completed within the GGPDD would also be anticipated to begin in 2021.

Q. Property Owner's Association(s)

Prior to the sale of any property, one or more Property Owners Associations (POAs) will be established, and such property shall be submitted to the jurisdiction of a POA by recorded covenants. Membership in a POA will be mandatory for each property owner. Each POA will be funded by assessments to be established pursuant to its recorded covenants. Each POA shall be responsible for administering its recorded documents and for the maintenance and operation of those common areas, if any, which are designed to benefit the properties subject to its jurisdiction. Common areas for the benefit of residential properties will include both common park space as well as areas for pools, playgrounds, and other active amenities. There may be additional Property Owner's Associations (POAs) established for individual development tracts which have their own

common areas. The recorded covenants of each applicable POA shall also establish architectural controls requiring review and approval of plans for new construction and any additions or improvements such as fences, pools, etc., prior to commencement of construction. This review will be for aesthetic purposes only and does not replace the required reviews by the Town of Ravenel.

# APPENDIX



## APPENDICES

1. Table of Permitted Uses
2. SCDHEC Mine Operating Permit (I-002257)
3. SCDOT Preliminary Coordination Email
4. Traffic Impact Analysis
5. SCDOT TIA Acceptance
6. Charleston Water System Water Availability Letter
7. Charleston Water System Water Utility Infrastructure Map
8. Residential Sewer Calculations
9. Preliminary Drainage Study
10. Berkeley Electric Cooperative Electric Availability Letter
11. Dominion Energy Natural Gas Availability Letter
12. USACE AJD Letter SAC-2018-01765
13. USACE AJD Letter SAC-2020-00455
14. USACE AJD Exhibit SAC-2018-01765
15. USACE AJD Exhibit SAC-2020-00455
16. Phase 1 Cultural Resources Survey of Approximately 59 Acres at Proposed Golden Grove Mine
17. Archaeological Survey of Section B Golden Grove II Mining Tract
18. Archaeological Survey of Section B Golden Grove II Mining Tract – SHPO Letter

## MASTER DEVELOPMENT PLAN

- C001 Cover Sheet
- C002 General Notes
- C003 Location Aerial & Regional Context Map
- C004 Existing Conditions
- C005 FEMA Flood Insurance Rate Map (FIRM)
- C100 Site Plan (1 of 3)
- C101 Site Plan (2 of 3)
- C102 Site Plan (3 of 3)
- C103 Pedestrian and Bicycle Circulation Plan
- C200 Thoroughfare Plan
- C300 Utility Plan
- C400 Stormwater Management Plan
- C401 Stormwater Pollution Prevention Plan (SWPPP)
- C500 Fire Protection Plan
- C600 Land Use Plan
- C700 Proposed Community Renderings
- C800 Conceptual Phasing Plan

# APPENDIX 1

## Table of Permitted Uses

### Town of Ravenel - Table of Permitted Uses

"A" = Allowed Use  
 A blank cell indicates that the use is NOT ALLOWED in the respective zoning district

PRINCIPAL USES	RESIDENTIAL		COMMERCIAL		RESOURCE EXTRACTION	
	Ravenel/R-3	GGPDD	Ravenel/GB	GGPDD	Ravenel/A-R	GGPDD
<b>AGRICULTURAL AND RELATED USES</b>						
Agricultural Production, Hydroponics, Horticulture, Nursery or Greenhouse Operations					A	A
Agricultural Sales or Services			A	A	A	A
Animal aquaculture, Commercial fishing, Fish and Shellfish Farming					S	A
Forestry, Commercial Timber Operations					A	A
Horse Production Operations, Breeding Stables					A	
Kennels with inside/outside boarding					S	A
Landscape and horticulture services			A	A	S	A
Livestock and/or Dairy Farms			S		A	A
Lumber mills, Planing, Sawmills, including chipping or mulching			S		S	A
Stable, Boarding and Riding					A	A
Veterinary Services			C	A	C	A
<b>RESIDENTIAL USES</b>						
Single-Family Dwellings, Detached	A	A	C	A	A	A
Duplex/Two-Family Dwellings	A				A	A
Farm Labor Homes					C	
Group Care Homes	S				S	A
Group Residential, Fraternity or Sorority House	S				S	A
Manufactured Home on Individual Lot	A				A	A
Manufactured Home Park						
Multi-Family Dwellings	S					A
Retirement Homes						
Age Restricted, Independent/Assisted Living, & Memory Care Facilities				A	S	A
				A	A	A

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PRINCIPAL USES	RESIDENTIAL		COMMERCIAL		RESOURCE EXTRACTION	
	Ravenel/R-3	GGPDD	Ravenel/GB	GGPDD	Ravenel/A-R	GGPDD
<b>Civic, Public Administration, Social and Medical Offices</b>						
Arboreta, Botanical Gardens and Zoological Exhibits			A	A	S	A
Cemetery, Crematorium	S			A	S	
Civic/Fraternal/Social Associations, including Youth Organizations, Sororities, Colleges, Universities, Professional Schools, Vocational Schools			A	A	S	A
Convention/Meeting Center, Visitors Bureau - Including Wedding Venues			S	A	S	A
Community Recreation Center			S	A	S	A
Convalescent Center			S	A	S	
Correctional Institutions				A		
Courts, Judicial			A	A		A
Cultural Center			A	A		A
Day Care Center, Adult, Family			A	A	A	
Day Care Center, Educational, Pre-school	C		C	A	C	
Elementary, Secondary Schools	S		S	A	S	A
Funeral Services including Funeral Homes or Mortuaries			A	A		
Government Offices,/Facilities			A	A	A	A
Hospitals			A	A	A	A
Individual and Family Social Service			A	A	A	A
Libraries, Archives			A	A	A	A
Medical and Dental Offices, Laboratories, Outpatient Clinics			A	A	A	A
Museum, Art Galleries, Nature Exhibits			A	A	S	A
Personal Improvement Schools, i.e. Driving Schools, Dance School			A	A		
Public Order and Safety, Police and Fire Protection Stations	A	A	A	A	A	A
Religious Assembly	S		A	A	S	A
Residential Treatment Facility			S	A	A	A
U. S. Post Office	A		A	A	A	A

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	Ravenel/R-3	GGPDD	Ravenel/GB	GGPDD	Ravenel/A-R	GGPDD
<b>COMMUNICATION USES</b>						
Cable/Other Pay Television Services			A	A		A
Communication Services, including Radio or Television Broadcasting Studios, Film or Sound Recording Studios, Telecommunication Service Center or Telegraph Service Office			A	A		A
Communication Transmitting Station			A	A		A
Telecommunication Towers						A
Telephone Facilities			A	A		A
<b>Utilities</b>						
Electric or Gas Substation	S	A	A	A	S	A
Fuel Bottling and Distribution						A
Maintenance Facilities for Utilities						A
Recycling/Solid Waste Disposal						A
Right-of-Way, Pipeline, Pressure Control Station						A
Sewage Collection Service Line	A	A	A	A	A	A
Sewerage Disposal Facilities	S		S	A	S	A
Telephone Switching Facility	A	A	A	A	A	A
Waste Transfer/Collection Services						A
Water Service Line	A	A	A	A	A	A
Water Storage Tank				A	S	A
Water Treatment Plant						A
<b>TRANSPORTATION RELATED SERVICES</b>						
Airports, Airstrips						A
Courier Services			A	A		A
Dry Stack Boat Storage						A
Household Moving Company			A	A		A
Marine Terminals						A
Boat Sales, Rentals and Service			A	A		A
Motor Freight Terminals			S			A
Parking Lots/Areas, Garages			A	A		A
Railroad Stations, Switching Yards						A
Taxi, Limo Service, Vehicle Rental or Leasing			A	A		A
Towing Services, No Vehicle Storage			C			A
Towing Services, with Vehicle Storage						A
Transit Terminals with Garaging and/or Maintenance						A

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	Ravenel/R-3	GGPDD	Ravenel/GB	GGPDD	Ravenel/A-R	GGPDD
<b>PRINCIPAL USES</b>						
<b>INDUSTRIAL SERVICES</b>						
Concrete Products Manufacturing, Cement Processing						A
Fabricated Metal Products						A
Food and Related Products Packing			A	A		A
Freight Container Storage Yards, excluding Fuel Storage Facilities						A
Furniture, Cabinets, Fixtures or Related Products Manufacturing			S			A
Industrial and Commercial Machinery and Transportation Equipment						A
Iron Works Industries						A
Manufacturing, Heavy, including Aircraft, Beverage, Cement, Concrete, Chemical, or Clay Products, Machinery, Tools, Toy or Construction Equipment						A
Manufacturing, Light, including Computers or Electronic Products and Equipment, Fabric and Material Industry, Food Processing, Glass and Related Goods Production			C	A		A
Meat Packing					S	A
Motor Vehicles, Watercraft or Trailer						
Manufacturing, including Related Parts						A
Paper and Allied Products						A
Petroleum Refining and Related Industries						
Printing and Publishing Industries, including Newspaper, Periodical, Book, Database, or Software Publishers, Printing Press			A	A		A
Professional or Commercial Equipment or Supplies, Manufacturing, including Office, Medical, Restaurant Equipment, or Specialty Items						A
Pulp or Paper Mills						A
Research and Development Laboratories					S	A
Resource Extraction, Mining and Quarry					S	A
Salvage and Junk Yards, including Auto Wrecking Yards, Parts or Paper Salvage, Wholesale Scrap, Waste Materials or Material Recovery Yards						A
Sign Manufacturing			S	A		A
Stone, Clay, Glass and Concrete Products						A
Textile Mill Products						A
Yard Art, Wood Products and Decoration Manufacturing						A

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	Ravenel/R-3	GGPDD	Ravenel/GB	GGPDD	Ravenel/A-R	GGPDD
<b>PRINCIPAL USES</b>						
<b>WAREHOUSE AND FREIGHT MOVEMENT</b>						
Cold Storage Plants						A
Freight Container Storage Yards, excluding Fuel Storage Facilities						A
Freight Forwarding Facilities, including Truck Terminals, Marine Terminals or Packing and Crating Facilities						A
Fuel Storage Facilities						A
Household Moving and Storage						A
Grain Terminals and Elevators					S	A
Retail Parcel Services			A	A		A
Retail Store Warehouse						A
Self-storage, Mini-warehousing			S	A		A
Stockpiling of Sand, Gravel, etc.			S	A		A
Vehicle Storage, including Bus Barns, RV Storage or Impound Yards						A
Warehouse and Distribution Facilities						A
Warehousing: Industrial						A
Warehousing: Office			S	A		A
Miscellaneous manufacturing-type industries that are not elsewhere classified						A
<b>WHOLESALE TRADE</b>						
Aircraft Wholesalers						A
Apparel or Fabric Wholesalers						A
Chemical and Allied Products Wholesalers						A
Electrical Equipment, Appliances or Components Wholesalers			S	A		A
Flowers, Nursery Stock Wholesalers			A	A	A	A
Food or Related Products, Wholesalers			A	A		A
Furniture, Cabinets or Related Products			C	A		A
Petroleum Bulk Station and Terminals						
Professional or Commercial Equipment or Supplies Wholesalers						A
Toy or Artwork Wholesalers						
Watercraft and Related Parts Wholesalers						A
Wholesalers, including Construction Materials, Farm Supplies and Equipment, Leather Products, Metal, Mineral or Printed Materials			S	A		A
Wholesalers, including Motor Vehicles - Commercial or Passenger, Trailers						
Wholesalers including Related Parts						A
Other Miscellaneous Wholesale Sales						A

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	Ravenel/R-3	GGPDD	Ravenel/GB	GGPDD	Ravenel/A-R	GGPDD
<b>RETAIL TRADE</b>						
Adult and Sexually Oriented Businesses						
Art, Hobby, Musical Instrument, Toy, Sporting Goods, or Related Products Store			A	A		A
Auto and home supply store			A	A		A
Building Materials/Lumber Yards			A	A		A
Catering Services			A	A		A
Convenience Stores			A	A		A
Department Stores, including Clothing, Piece Goods, Shoes, Jewelry, Leather Goods, or Related Products			A	A		A
Drinking (alcoholic beverage) Places, including Bars, Lounges, Taverns, Cocktail Lounges, Members Exclusive Clubs, Whether Public or Private				A		A
Eating Places, including Cafeterias, Diners or Full Service Restaurants			A	A		A
Eating Places, including Fast Food, Drive-In, Snack or Non-Alcoholic Beverage Bars			A	A		A
Electronics, Appliances, or Related Products Store			A	A		A
Farm Equipment			A	A		A
Florist			A	A		A
Food, Grocery Stores, Meat Markets, Retail Bakeries, Candy Shops			A	A		A
Fuel Dealers, (except Liquefied Petroleum Gas) including Heating Oil Dealers			A	A		A
Furniture Stores, Home Furnishings			A	A		A
Garden Supply Center			A	A		A
Gasoline Service Stations			A	A		A
Hardware Stores, Home Improvement Stores			A	A		A
Heating and Plumbing Supplies			A	A		A
Heavy Duty Truck or Commercial Vehicle Dealer			A	A		A
Liquefied Petroleum Gas (bottled) Dealers			A	A		A
Liquor Stores, Beer or Wine Sales			S	A		A
Marine Craft and Accessories			A	A		A
Manufactured Home Sales, Mobile Home Dealers			A	A		A
Motor vehicle dealers, new or used			A	A		A
News Dealers, Newsstands			A	A		A
Non-store Retailers, Direct Selling Merchandise, Mail-order Houses			A	A		A
Optical Goods			A	A		A
Paint, Glass and Wallpaper Stores			A	A		A
Pawn Shop			A	A		A
Pet Stores or Grooming Salons			A	A		A



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	Ravenel/R-3	GGPDD	Ravenel/GB	GGPDD	Ravenel/A-R	GGPDD
Pharmacy, Drug Store			A	A		A
Private Postal, Mailing Service			A	A		A
Recreational Motor Homes			A	A		A
Recreational and Utility Trailer Dealer			A	A		A
Retail Nurseries, Lawn and Garden Supply			A	A		A
Tobacco Stores and Stands			A	A		A
Used Merchandise Stores			A	A		A
Variety Stores			A	A		A
Vending Machine Operators			A	A		A
Warehouse Clubs or Superstores			A	A		A
Miscellaneous General Merchandise Store, not elsewhere listed			S	A		A
<b>BUSINESS SERVICES</b>						
Accounting, Auditing, and Book Keeping Services, Couriers, Insurance Offices, Tax Preparation Offices			A	A		A
Advertising Agencies			A	A		A
Business/Professional Organizations			A	A		A
Computer and Data Processing			A	A		A
Contractor, Construction Company, including Carpentry, Concrete, Electrical, Excavation, Painting, Roofing, Siding, Sheet Metal and Flooring including Tile and Terrazzo Offices			A	A		A
Engineering, Architectural and Surveying Services			A	A		A
Finance Services, including Savings Banks, Loan or Lending Services, Stock or Bond Brokers, Credit Unions			A	A		A
Insurance Carriers and Services			A	A		A
Legal Services			A	A		A
Management and consultant service			A	A		A
Print Shop, Duplicating Services			A	A		A
Real Estate Brokers and Travel Services			A	A		A
Security, Commodity Brokers			A	A		A
<b>PERSONAL SERVICES</b>						
Barber/Beauty Shops, Skin Care Services			A	A	S	A
Cleaning and Maintenance Services, Carpet Cleaning, Janitorial Services			A	A		A
Consumer Goods, Rental Services			A	A		A
Day Care Centers, Family Day Care, Overnight Care Centers	C	A	C	A	C	A
Dry Cleaning/Laundry with Plant Operations			A	A		A
Exterminating services			A	A		A
Florists			A	A		A
Funeral Services, Mortuaries			A	A		A

### Town of Ravenel - Table of Permitted Uses

"A" = Allowed Use  
 A blank cell indicates that the use is NOT ALLOWED in the respective zoning district

PRINCIPAL USES	RESIDENTIAL		COMMERCIAL		RESOURCE EXTRACTION	
	Ravenel/R-3	GGPDD	Ravenel/GB	GGPDD	Ravenel/A-R	GGPDD
Landscaping Services			A	A		A
Locksmith			A	A		A
Medical and Dental Services, Clinics			A	A		A
Pet Grooming, No Boarding			A	A		A
Pet Grooming, Boarding Facilities			A	A		A
Photographic/Portrait Studios			A	A		A
Shoe Repair Shops			A	A		A
Small Engine, Electronics Repair			A	A		A
Tailors or Seamstresses			A	A		A
<b>MISCELLANEOUS SERVICES</b>						
Contract Construction			A	A		A
Equipment Rental and Leasing			A	A		A
Hotels, Motels and Inns			A	A		A
Lodges, Fishing, Fishing Guide Services, Hunting			S	A	S	A
Photofinishing Labs			A	A		A
Recreational Vehicle Park			C		C	A
Research and Development Labs			A	A		A
Rooming and Boarding Homes			A		S	
Tourist Homes/Bed and Breakfast	C				C	
Miscellaneous Services not Classified Elsewhere			S	A		A
<b>REPAIR SERVICES</b>						
Automotive Vehicle Body Repair, Motor Repair, Muffler Repair, Tire and Brake Shop			A	A		A
Automotive Vehicle Limited Services, including Oil Change or Lubrication, Car Wash			A	A		A
Boat Yard, Boat Repair, Boat Maintenance			A	A		A
Repair Shops, including Appliances, Electrical, Small Engine, Tool Repair, and Professional Instrument Repair			A	A		A
Repair Shop, including Upholstery and Furniture, Jewelry and Shoes			A	A		A
Welding, Iron Work Shops						A
Repair shops, not elsewhere listed			S	A		A
<b>AMUSEMENT AND RECREATION SERVICES, EXCEPT MOTION PICTURE</b>						
Amusement Parks, Fairgrounds, Go Cart Tracks			S			A
Bowling Alley, Billiard and Pool Hall Establishments			A	A		A
Camping, Picnicking Areas			A		S	A
Coin-operated Amusement Devices			A	A		A
Dance Studios and Schools			A	A		A
Gun Ranges, Indoor/Outdoor			A	A		A

### Town of Ravenel - Table of Permitted Uses

"A" = Allowed Use  
 A blank cell indicates that the use is NOT ALLOWED in the respective zoning district

PRINCIPAL USES	RESIDENTIAL		COMMERCIAL		RESOURCE EXTRACTION	
	Ravene/R-3	GGPDD	Ravene/GB	GGPDD	Ravene/A-R	GGPDD
Membership Health, Sports and Recreation Clubs			A	A		A
Miniature Golf, Putt-putt Courses			A	A		A
Parks, Public Playgrounds			A	A	A	A
Professional Sports Clubs and Promoters, Arenas, Stadiums			C	A		A
Public Golf Courses, Driving Ranges			S		S	A
Recreation or Vacation Camps			A			
Skating Rinks, Ice and Roller			A	A		A
<b>Motion Picture and Theaters</b>						
Motion Picture Production			A	A		A
Theaters, including Motion Picture			A	A		A
Video Tape Rental			A	A		A
<b>ACCESSORY USES</b>						
Accessory Garage Apartment			A	A	A	A
Accessory Guest Accommodations or Living Quarters for Owners, Employees or Caretakers			C	A	A	A
Accessory Vehicle/Storage Building	A		A	A	A	A
Private Docks - 5 or less Slips	A		A	A	A	A
<b>ACCESSORY USES</b>						
Accessory Off-Street Loading			A	A		A
Accessory Roadside Stand			A		A	
<b>TEMPORARY USES</b>						
Temporary Dwelling Unit as allowed under Section 3:3	A				A	
<b>TEMPORARY USES COMMERCIAL</b>						
Roadside Produce Stands, other Seasonal Uses as Allowed under Section 3.3			A	A	A	A
Temporary Sales or Construction Office as allowed under Section 3.3	A	A	A	A	A	A
Turkey Shoots			C	A	C	A

"A" = Allowed Use  
 A blank cell indicates that the use is NOT ALLOWED in the respective zoning district

# APPENDIX 2

SCDHEC Mine Operating Permit (I-002257)



Bureau of Land and Waste Management

May 12, 2020

Mr. J. David Hand  
O.L. Thompson Construction Company, Inc.  
PO Box 63535  
Charleston, SC 29415-3535

RE: Approval of Application and Reclamation Plan for a Mine Operating Permit  
Issuance of Mine Operating Permit I-002257  
Golden Grove Mine, O.L. Thompson Construction Company, Inc.  
Charleston County, TMS#s 175-00-00-049, 175-00-00-052

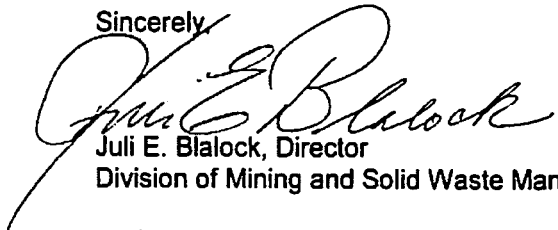
Dear Mr. Hand:

The S.C. Department of Health and Environmental Control (SCDHEC) has approved the application and reclamation plan for the Golden Grove Mine as of May 12, 2020. SCDHEC has approved the reclamation bond submitted in the amount of \$25,000.00.

With the receipt of the reclamation bond and the approval of the application and reclamation plan, this letter serves as official notification that the Mine Operating Permit for the Golden Grove Mine is being issued as of May 12, 2020. Enclosed are the permit document with Coastal Zone Consistency Determination, approved Reclamation Plan, mine and reclamation maps.

If you have any questions concerning this permit decision, please contact Wendy Hamilton at 803-898-1368 ([hamiltws@dhec.sc.gov](mailto:hamiltws@dhec.sc.gov)). Nicholas Green is the mine inspector assigned to Charleston County. Mr. Green can be contacted at 843-953-0494 ([greenr@dhec.sc.gov](mailto:greenr@dhec.sc.gov)) to assist with any questions.

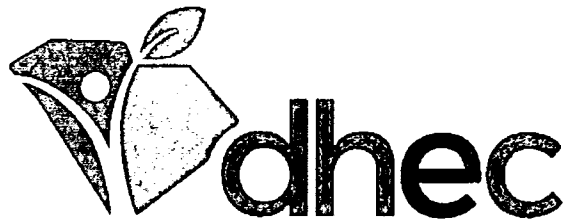
Sincerely,



Juli E. Blalock, Director  
Division of Mining and Solid Waste Management

enclosures

cc: Charleston County: Jennfier Miller; Gary McCellan; Jennifer Werking  
MSHA: Jeff Phillips  
SCDHEC: Joe Koon, DMSWM; Lillian McFadden; C&E; Crystal Rippy, BOW; Nicholas Green,  
Jon Summa, Low Country Region



S.C. Department of Health and  
Environmental Control

## MINE OPERATING PERMIT

### PART I:

### Golden Grove Mine O.L. Thompson Construction Company, Inc.

O.L. Thompson Construction Company, Inc., a corporation, has been granted a Mine Operating Permit, Mine Permit Number I-002257, to operate the Golden Grove Mine in accordance with the S.C. Mining Act (S.C. Code Sections 48-20-10 *et seq.*, 1976) and Regulations 89-10 *et seq.* The operator shall conduct this operation as represented in documents submitted to support the issuance of this permit.

JOE KOON, MANAGER  
MINING AND RECLAMATION SECTION  
DIVISION OF MINING AND SOLID WASTE MANAGEMENT

**PERMIT NUMBER:** I-002257  
**ORIGINALLY ISSUED:** May 12, 2020  
**MODIFIED:** Not Applicable

In accordance with Section 48-20-60 of the South Carolina Mining Act, this Mine Operating Permit will remain valid unless it terminates as set forth in R.89-270 or is revoked in accordance with Section 48-20-160 and R.89-280. The anticipated mining completion date is shown on the *Schedule for Conservation and Reclamation Practices* in the *Reclamation Plan*.

The approved *Permit Application*, *Reclamation Plan*, and all supplemental information referenced herein, are an integral part of this permit. *Land Entry Agreements and Mine Maps* as identified in Part II and Part IV, respectively, are also a part of this permit.

I-002257

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**O.L. Thompson Construction Company, Inc.**

**Home Office Address:** O.L. Thompson Construction Company, Inc.  
PO Box 63535  
Charleston, SC 29415-3535  
3691 Paramount Drive  
North Charleston, SC 29419

**Local Office Address:** None

**Address for Official Mail:** O.L. Thompson Construction Company, Inc.  
PO Box 63535  
Charleston, SC 29415-3535

**Company personnel and title to be the contact for official business and correspondence [South Carolina Department of Health and Environmental Control (DHEC) should be notified in writing immediately of any change in contact, address, telephone or fax numbers]:**

J. David Hand  
President

Telephone: 843-572-0088  
Fax: 843-553-1390

**LOCATION:** The mine is located on the Osburn, SC U.S.G.S. 7.5' Topographic Map. The approximate geographic coordinates for the site are:

Latitude: 32.782457

Longitude: -80.272323

The operation is located in Charleston County approximately 1.7 miles northwest of Ravenel, S.C. Specifically the site is located northwest and adjacent to the intersection of SC Secondary Highway S-10-1332 (Old Jackson Road) and New Road.

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## Part II: MINE OPERATIONS

O.L. Thompson Construction Company, Inc. also referred to as the operator, is permitted to mine sand/clay and topsoil at the Golden Grove Mine. The estimated maximum depth to the pit floor will be 50 feet (approximately -16' MSL) below ground original surface. Mining will take place on a tract of land leased by the referenced operator. The tract of land is identified in the submitted *Land Entry Agreement* (LEA).

**MINE/PIT CHARACTERIZATION:** The sand/ clay and topsoil will be excavated with hydraulic excavators. Material will be loaded directly onto trucks and transported offsite.

Adequate amounts of topsoil shall be stockpiled for reclamation of the affected area; excess topsoil not needed for reclamation may be sold.

**PROCESSING PLANT LOCATED ON MINE SITE:** No processing will be done on site.

**MINE DEWATERING:** The water table at mine site is relatively shallow and dewatering is necessary to facilitate mining. Any accumulation of groundwater seepage and stormwater will be pumped into a sediment basin. Water discharged from the mine to a receiving stream must be discharged through an outfall regulated by NPDES permits.

Where feasible, stormwater runoff will be diverted into the pit, collected into the sump and discharged in the same manner as groundwater.

**BLASTING:** Blasting operations are not permitted at this mine site.

**SIGNIFICANT CULTURAL OR HISTORICAL SITES:** An initial reconnaissance survey was conducted on the tract by Terracon (*Phase 1 Cultural Resources Survey of Approximately 595 Acres at the Proposed Golden Grove II Mine, Charleston County, South Carolina*, Terracon Project No. 73177129, SHPO Project No. 17-EJ0094, 2017). The State Historic Preservation Office (SHPO) evaluated the report for eligibility for inclusion in the National Register of Historic Places (NRHP). Three sites (38CH2526, 38CH2527, 38CH2528) and three isolated finds (IF-1 – IF-3) were identified. SHPO concurred with the recommendation of a Phase 1 archaeological survey for 72 acres (Areas B, C, D, F, I) and additional work at sites 38CH2527 and 38CH2528; the other areas were deemed not eligible for NRHP.

In 2020, an intensive archaeological survey was completed in Area B (*Archaeological Survey of Section B Golden Grove II Mining Tract, Charleston County, South Carolina*, Brockington and Associates, SHPO Project No.17-EJ0094). SHPO determined Area B (Segment 2) was unlikely to contain significant cultural resources and further assessment was not necessary.

In the March 17, 2020 SHPO response to the Area B survey, SHPO notes the presence of two historical settlements and a cemetery within the project area (Areas C, D, F, I). The operator will assess these areas prior to future mine activity in segments 3 - 7. The assessment shall be forwarded to SHPO for evaluation and approval. Based on SHPO review, the mine maps for segments 3 - 7 shall note the location of any cultural resources and protective buffers.

Note Part X: *Additional Term and Conditions* of this Mine Operating Permit.

**VISUAL SCREEN:** To appropriately screen the operation from view, the operator shall maintain a minimum undisturbed buffer from all property lines as depicted on approved maps. The operator has agreed to maintain a 200' undisturbed buffer along Old Jacksonboro Road and mine operations. If vegetative buffers are inadequate as a visual screen, DHEC may require construction of an earthen berm.

**NOISE MONITORING AND CONTROL:** The operator shall use **Best Management Practices (BMPs)** to minimize noise from the mine site. This noise BMP should include, at a minimum, proper maintenance of mufflers on equipment (trucks, trackhoes, pumps, etc.) and consideration of special buffering measures if planning to operate equipment during nighttime hours.



Part II: MINE OPERATIONS

**OTHER STATE OR FEDERAL PERMITS:** The operator must obtain, maintain, and update, as appropriate, all necessary State and Federal permits in order to construct and operate the mine.

**LAND ENTRY AGREEMENTS:** The operator is required to furnish and maintain up-to-date *Land Entry Agreements* on all lands covered under this permit. Any change in ownership on any portion of land covered by this permit, the operator is responsible for furnishing the appropriate and completed *Land Entry Agreements* (Forms MR-600 or MR-700) to the DHEC within 30 days of the change of ownership.

Land Owner(s) as Listed on *Land Entry Agreement(s)*:

Golden Grove, LLC/ Thompson Golden, LLC

TMS#s: 175-00-00-049, 175-00-00-052

Total acres of the contiguous tract(s) of land for which the permit is granted:

OWNED 0.0 LEASED 249.0 TOTAL 249.0

Part III: PERMITTED LAND

This permit allows the operator to conduct mining operations within the permitted land as defined through the *Land Entry Agreement* submitted as part of the application. Permitted land as defined by Section 48-20-40(18) is "the affected land in addition to (a) lands identified for future mining to become affected land; (b) and undisturbed or buffer area that is or may become adjacent to the affected land." Therefore, this permit grants the operator the right to conduct active mining operations within the specified affected land, delineate land for future mine areas as future reserves and to establish undisturbed buffer zones to mitigate any adverse affects to the surrounding environment.

**AFFECTED LAND:** 17.0 acres of land are to be affected by O.L. Thompson Construction Company, Inc. under the current mine plan. The affected acres are derived from the operator's response in the *Application for a Mine Operating Permit* and are shown on the approved mine map.

The operator is permitted to affect up to 17.0 bonded acres of land at any point in time in accordance with the *Schedule for Conservation and Reclamation Practices* in the approved *Reclamation Plan*. Once affected land is released as reclaimed by the Department in accordance with R.89-330, that land is no longer considered affected and the mine operator carries no further reclamation liability. The affected acres are derived from the operator's response in the *Application for a Mine Operating Permit* (Form MR-400), page 3, line 2H.

**FUTURE RESERVES:** 232.0 acres are identified as future mine reserves and are specified on the mine site map. Prior to the initiation of activity in future reserves, the operator shall submit detailed mine and reclamation plans. Failure to submit such plans to the SCDHEC and obtain approval prior to commencement of mining activities would be a violation of this permit.

**BUFFER AREAS:** 0.0\* acres are identified as buffer area, setbacks or areas that will not be disturbed beyond the pre-mine natural state. These buffer areas are identified on the mine site map. Acres designated as buffer areas are not bonded under the reclamation bond. Any disturbance of the buffer areas (i.e. removal of timber) requires this *Mine Operating Permit* to be modified prior to any such disturbance.

\*the permit area is located within larger tracts and well buffered from adjacent properties. The operator will maintain a 200' undisturbed buffer along Old Jacksonboro Road and any mine operation activities.

**TOTAL PERMITTED AREA:** 249.0 acres as submitted on the *Land Entry Agreement(s)*.

## Part IV: MAPS

The permitted maps are listed herein. The maps are dated and further identified with DHEC assigned map number as listed and are part of the operating permit.

### Mine Maps:

SM-2257-1V1	Permit Area Map	December 20, 2018/ revised April 6, 2020
SM-2257-2V1	Segment 1 Map	December 20, 2018/ revised October 22, 2019

### Reclamation Maps:

RM-2257-2V1	Segment 1 Reclamation Map	December 20, 2018/ revised October 22, 2019
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## Part V: RECLAMATION BOND

The Reclamation Bond is calculated based on the acreage to be affected per segment. Pursuant to Section 48-20-70 and R.89-200, the reclamation bond for this mining permit is set at \$25,000.00. The reclamation bond shall remain in force and continuous throughout the life of the mining operation and shall only be released, partially or in full, back to the operator after the operator has completed reclamation in accordance with the approved *Reclamation Plan* and the minimum standards in R.89-330.

The amount of the reclamation bond shall be assessed prior to initiating ground clearing activities in each segment. Any increase in the bond amount shall be submitted and approved before any mining can begin.

## Part VI: PROTECTION OF NATURAL RESOURCES

### 1. Describe the area of and around the mine site. Specify topography, surface water systems, wildlife habitats, residential houses, commercial properties, recreational areas and/ or public roads.

The site is located within two large parcels adjacent to the intersection of Old Jacksonboro Road and New Road in rural Charleston County. Historically the tracts have been managed as a pine plantation with the associated irrigation ponds. The permit area is bordered by forested areas with sparse commercial and residential properties in the vicinity; a permitted mine operation is located south of New Road.

The tracts have a slight variation in topography; no federally jurisdictional waters are located in the permit area. Chipley loamy fine sand, Lakeland sand, and St. Johns fine sand are the predominant soils.

### 2. Methods used to prevent physical hazards to persons and to any neighboring dwelling, house, school, church, hospital, commercial or industrial building or public road.

A gate are installed at the entrance to the mine site; gates will be locked during inactive periods. *Warning* and/ or *Danger* signs shall be posted around the perimeter of the property. Areas to be excavated are set back from Old Jacksonboro Road, New Road, and adjacent properties; this distance will lessen potential impacts to these unimproved dirt roads and adjacent properties.

The operator shall grade side slopes as excavations progress. Minimizing highwalls during active mining will reduce potential of accidental falls.

### 3. Methods used to prevent an adverse effect on the purposes of a publicly owned park, forest or recreation area.

There are no publicly owned parks, forest or recreational areas near this mine site.

### 4. Measures taken to insure against substantial deposits of sediment in stream beds or lakes.

The operator shall comply with the NPDES discharge permit and *Stormwater Pollution Prevention Plan* developed for the mine. Active pumping and discharge of water from the active pit through the sediment basin shall cease if the dewatering discharge causes flooding conditions to property downstream of the mine site.

## Part VI: PROTECTION OF NATURAL RESOURCES

### 5. Measures taken to insure against landslides or unstable mine walls.

To minimize potential for landslides or unstable mine walls, the operator shall grade side slopes as excavation progresses and maintain slopes no steeper than 3H:1V. The operator is responsible for maintaining stable mine walls and appropriate setbacks to prevent significant slumping that may encroach into non-permitted lands.

### 6. Measures taken to insure against acid water generation at the mine site that may result in pollution on adjacent property.

Acid water is not anticipated to be generated from the oxidation of existing minerals currently found on this site.

### 7. Measures taken to minimize or eliminate fugitive dust emissions from the permitted area.

The mine operator will use appropriate measures (i.e. water truck, dust suppressants, etc.) to control fugitive dust created by moving equipment along haul roads. The operator, where feasible, shall establish vegetation in non-active mine areas barren of vegetation to stabilize the soil and reduce potential for wind erosion and blowing dust.

## Part VII: STANDARD CONDITIONS OF MINE OPERATING PERMIT

1) SURVEY MONUMENTS: In accordance to R.89-130, the operator shall install and maintain the two required permanent survey monuments or control points within the permitted area as shown on the mine site map. At the discretion of DHEC the operator may be required to mark the area to be affected with flagging or other appropriate measures.

2) RIGHT OF ENTRY: Pursuant to Section 48-20-130 and R.89-240, the operator shall grant DHEC and/or duly appointed representatives access to the permitted area for inspection to determine whether the operator has complied with the reclamation plan, the requirements of this chapter, rules and regulations promulgated hereunder, and any terms and conditions of this permit.

3) RECORDS RETENTION: All records are to maintained through additional terms and conditions of this permit or by regulations, shall be kept on site or at the office identified for receipt of official mail and open for inspection during normal business hours. The records shall be maintained for a minimum of three (3) years or as specified by DHEC. The operator shall furnish copies of the records upon request to DHEC.

4) PERMIT MODIFICATIONS: Pursuant to Section 48-20-80, the operator may modify the permit and/or *Reclamation Plan* upon approval by DHEC. Requests for permit and/or *Reclamation Plan* modifications may be made to DHEC on Form MR-1300. The operator shall submit any requested supporting data for consideration during DHEC's evaluation of the modification request. If a modification request is determined to be substantial by DHEC, the modification request will be public noticed pursuant to R.89-100 and a modification fee will be required as specified in R.89-340. If DHEC determines activities proposed under the *Reclamation Plan* and other terms and conditions of the permit are failing to achieve the purpose and requirements of the S.C. Mining Act and Regulations, DHEC shall notify the operator of its intentions to modify the permit and/or *Reclamation Plan* pursuant to Section 48-20-150.

5) TRANSFER OF PERMIT: Pursuant to Section 48-20-70, this permit may be transferred to another responsible party. The transfer of the permit must be conducted in accordance with R.89-230. The transferor of the permit will remain liable for all reclamation obligations until all required documents; plans and the replacement reclamation bond have been submitted and approved by DHEC. The transfer will be considered complete when all parties have received notification by certified letters of the approval of the transfer by DHEC.

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## Part VII: STANDARD CONDITIONS OF MINE OPERATING PERMIT

**6) DURATION OF MINE OPERATING PERMIT:** In accordance with Section 48-20-60 this Mine Operating Permit will remain valid unless this permit terminates as set forth in R.89-270 or is revoked in accordance with Section 48-20-160 and R.89-280. The proposed anticipated mining completion date is shown on the *Schedule for Conservation and Reclamation Practices* in the *Reclamation Plan*.

Pursuant to R.89-80 (B), the operator shall conduct reclamation simultaneously with mining whenever feasible. Reclamation shall be initiated at the earliest practicable time, but no later than within 180 days following termination of mining of any segment of the mine and shall be completed within two years after completion or termination of mining on any segment of the mine.

## Part VIII: ENFORCEMENT ACTIONS

Pursuant to Section 48-20-30 of the S.C. Mining Act, "DHEC has ultimate authority, subject to the appeal provisions of this chapter, over all mining, as defined in this chapter, and the provisions of the chapter regulating and controlling such activity." This allows DHEC to assist, cooperate with or supersede other State agencies in taking enforcement action on violations of the State Regulations or violations of the S.C. Mining Act to ensure the purposes of this Act are enforced.

**COMPLIANCE:** The operator shall comply at all times with all conditions of this mine operating permit. Non-compliance with this mining permit, statute, or regulations could lead to permit revocation and bond forfeiture pursuant to Sections 48-20-160 and 48-20-170 or other enforcement action allowed by law.

Compliance with the Mine Operating Permit requires the operator to conduct the mining operation as described in the approved *Application for a Mine Operating Permit*. Variance from the *Application for a Mine Operating Permit*, this permit, statute or regulation, without first receiving DHEC approval, shall be deemed non-compliance with the permit.

An operator or official representative of the mine operator who willfully violates the provisions of the S.C. Mining Act, rules and regulations or willfully misrepresents any fact in any action taken pursuant to this chapter or willfully gives false information in any application or report required by this chapter shall be deemed guilty of a misdemeanor and, upon conviction, shall be fined not less than one hundred dollars nor more than one thousand dollars for each offense. Each day of continued violation after written notification shall be considered a separate offense.

The operator is responsible for all mining activity on the permitted mine site.

## Part IX: REPORTS

**1) ANNUAL RECLAMATION REPORTS:** The operator shall comply with Section 48-20-120 and Regulation 89-210 and submit an *Annual Reclamation Report* on Form MR-1100 as supplied by DHEC. The form for the report will be sent by regular mail to the operator to the mailing address shown on the previous year's *Annual Reclamation Report*. The operator should receive the report form from DHEC by July 1 of each year; however, the operator is ultimately responsible for obtaining the *Annual Reclamation Report* form and is not excused from penalty fees for failure to submit the report on time.

The Annual Operating Fee is a part of the *Annual Reclamation Report*. Failure to submit a complete *Annual Reclamation Report* (i.e. information and fee) in accordance with Section 48-20-120 and R.89-340 will result in a late penalty payment. The *Annual Reclamation Report* and Annual Operating Fee is required if there is any permitted land not fully reclaimed and released by DHEC by June 30 of *each* year.

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## Part IX: REPORTS

**2) SPECIAL REPORTS:** DHEC may at any time request information, data, or explanations from the operation as to conditions relating to the permitted mine site. Such request from DHEC shall be made in writing to the operator with appropriate time frame stated for the submittal of the requested information to DHEC. The operator must produce the information requested within the timeframe specified by DHEC.

## Part X: ADDITIONAL TERMS AND CONDITIONS

1. Prior to mine activity in Segments 3 - 7 the operator will assess areas noted in the SHPO response to the Area B survey (correspondence, March 17, 2020). The cultural resource assessment shall be forwarded to SHPO for evaluation and determination of necessary protective buffers; cultural sites and requested buffers shall be indicated on maps provided to DHEC for the expansion.

If archaeological materials are encountered prior to or during the construction of mine facilities or during mining, the SC Department of Archives and History, the SC Institute of Archaeology and Anthropology, and the SC Department of Health and Environmental Control should be notified immediately. Historic or cultural resources consist of those sites listed in the National Register of Historic Places and those sites that are eligible for the National Register. Archaeological materials consist of any items, fifty years or older, which were made or used by humans. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, oyster shell, worked wood, bone and stone, metal and glass objects, human skeletal remains, and concentrations of charcoal and stones below the ground surface. These materials may be present on the ground surface and/or under the surface of the ground.

2. In the future, if determined to be necessary by SCDHEC, an appropriate fence will be installed around the affected area.

3. Temporary or permanent placement of refuse and debris from off-site locations is prohibited. Topsoil, free of debris and contaminants and as defined in Regulation 89-10D, may be brought in from off-site sources, but only for the purposes of mine land reclamation.

4. Prior to initiating activity in Segments 2 - 7, the operator must submit revised mine plan, maps, and reclamation schedule. All requests must receive CZC certification and be approved by SCDHEC before proceeding in the segment. The amount of the reclamation bond shall be assessed with each segment expansion; any increase in the bond amount shall be submitted and approved before any mining can begin.

5. Active pumping and discharge of water from the pit through the sediment pond shall cease if the dewatering discharge causes flooding conditions to property downstream of the mine site.

7. If a complaint is received concerning adverse impacts to neighboring wells, the operator is to notify DHEC's Manager of the Mining and Reclamation Section, Columbia, SC, within 48 hours. After investigation, if DHEC determines dewatering activities at the mine are affecting a drinking water well or water supply well, the operator shall be responsible for repairing, deepening, or re-drilling such wells. Until that permanent water supply is re-established, the operator shall supply the owner with a temporary water supply (e.g., bottled water for drinking, provisions for laundry).

8. The operator shall comply with the approved Coastal Zone Consistency Determination issued under the SC Coastal Zone Management Program by SCDHEC's Office of Ocean and Coastal Resource Management (OCRM). See Appendix B.

**APPENDIX A**

**MODIFICATIONS TO MINE PERMIT I-002257**

<b>NUMBER</b>	<b>APPROVAL DATE</b>	<b>DESCRIPTION OF MODIFICATION</b> (PA= Permitted Acreage; AA= Affected Acreage; FR= Reserves Acreage, B= Buffer Acreage)
Issued	5/12/20	Permit issued; PA = 249.0 ac., AA = 17.0 ac., FR= 232.0 (Segs 2-8), B = 0.0 ac

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## APPENDIX B

Coastal Zone Consistency Determination  
SC Department of Health and Environmental Control  
Office of Ocean and Coastal Resource Management

HNP-A952-M0N8K

Segment 1

March 27, 2020

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### Coastal Zone Consistency Determination

To: Wendy Hamilton, BLWM Mining and Reclamation Section

From: Christopher M Stout, OCRM Coastal Zone Consistency Section

Applicant: David Hand, O L Thompson Construction Company

Project Name: Golden Grove Mine

Finding: Conditionally Consistent with the SC Coastal Zone Management Program

Site Location: New Road, Ravenel, Charleston County, South Carolina (TMS#: 1750000049)

Reference #: HNP-A952-M0N8K, I-002257

Date: March 27, 2020

Handwritten initials "CMS" in a circle, likely representing Christopher M Stout.

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The staff of the Office of Ocean and Coastal Resource Management (OCRM) reviewed the above referenced Coastal Zone Consistency project request for a permit to mine topsoil/dirt at a site located at New Road in Charleston County, approximately 1.52 miles west of Ravenel, South Carolina. The proposed mining operation would excavate material utilizing hydraulic excavators from a 15 acre pit to a depth of 50'. The proposed reclamation plan for the site would be to restore the site to ponds and grassland/fields. The proposed mining operation will not impact any onsite wetlands.

We hereby certify that the above referenced project is **Conditionally Consistent** with the **Guidelines for Evaluation of All Projects** as well as the Coastal Industries (*Mining*), Wildlife and Fisheries Management, and Stormwater Management (*Runoff and Mines*) policies contained in the S.C. Coastal Zone Management Program provided the following conditions are included in the permits and adhered to by the applicant.

1. In the event that any historic or cultural resources and/or archaeological materials are found during the course of work, the applicant must notify the State Historic Preservation Office and the South Carolina Institute of Archaeology and Anthropology. Historic or cultural resources consist of those sites listed in the National Register of Historic Places and those sites that are eligible for the National Register. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal and glass objects, and human skeletal materials.



- 
2. All construction BMPs must be installed, inspected and maintained to hold sediment onsite and to protect any adjacent or downstream critical area, wetlands and waters through the life of the project. Upon completion of construction activities, all disturbed (includes undeveloped) areas, including those impacted for access, must be immediately stabilized.
  3. The project must be fully consistent with local zoning and comprehensive plans prior to work being conducted.
  4. The pumping of groundwater from sediment basins must be done with floating intakes only. Pumping of the basin must cease whenever the water levels come to within 2 feet of the pond bottom.
  5. The applicant is not authorized to impact any wetlands. In the event any impacts to wetlands occur, the US Army Corps of Engineers and DHEC-OCRM must be notified and all work must cease to minimize additional impacts until the applicant receives authorization.

This determination shall serve as the SCDHEC OCRM Coastal Zone Consistency Determination for the work described above. However, this determination **does not** serve as a Department permitting decision and **does not** alleviate the applicant's responsibility to obtain any applicable State or Federal permit(s) for the work. Local government authorizations **may also** be required.



Mining  
Form  
MR-500

S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL  
BUREAU OF LAND AND WASTE MANAGEMENT  
DIVISION OF MINING AND SOLID WASTE PERMITTING  
2600 Bull Street, Columbia, SC 29201  
Telephone Number: (803) 896-4261 Fax Number: (803) 896-4001

**RECLAMATION PLAN**  
**DHEC FORM 500 DATE VERSION ADOPTED 7/1/94**

As required in Section 48-20-90 of the South Carolina Mining Act, "An operator shall submit with his application for an operating permit a proposed reclamation plan. The reclamation plan for an operating permit only must be furnished to the local soil and water conservation district in which the mining operation is to be conducted. The plan must include as a minimum each of the elements specified in the definition of 'reclamation plan' in Section 48-20-40 and information required by the department. The reclamation plan must provide that reclamation activities, particularly those relating to control of erosion, to the extent feasible, must be conducted simultaneously with mining operations and be initiated at the earliest practicable time after completion or termination of mining on a segment of the permitted land. The plan must provide that reclamation activities must be completed within two years after completion or termination of mining on each segment of the area for which an operation permit is requested unless a longer period specifically is permitted by the department."

**I. APPLICANT INFORMATION**

1. Name of Company: O.L. Thompson Construction Co., Inc.
2. Name of Proposed Mine: Golden Grove Mine County: Charleston
3. Home Office Address: PO Box 63535 (843) 572-0088  
(Street and P.O. Box) (Telephone No.)  
Charleston SC 29415-3535 SC  
(City) (State) (Zip Code) (Fax No.)
4. Local Office Address: 3691 Paramount Drive (843) 572-0088  
(Street and P.O. Box) (Telephone No.)  
N. Charleston, SC 29419 SC  
(City) (State) (Zip Code) (Fax No.)
5. Name of company personnel and their title to be the contact for official business and correspondence: David Hand, President
6. Location of Mine: New Road Ravenel SC  
State or County Hwy No. Nearest Town or City

**II. ENVIRONMENTAL PROTECTION**

1. Describe practices to protect adjacent resources such as roads, wildlife areas, woodland, cropland and others during mining and reclamation.  
 Mining to occur within the confines of a managed pine plantation and agricultural tract, exterior vegetative perimeter to remain as buffer until reclamation is complete.
2. Describe proposed methods to limit significant adverse effects on adjacent surface water and groundwater resources.  
 Management of surface and dewatering waters within the mining area. Detention per NPDES General Permit For Discharges Associated W/ Non-Metallic Mineral Mining. No shallow wells/deeper groundwater uses are within a conservative drawdown radius of the mine site minimizing potential well failure or groundwater contamination. operator to maintain contact with adjacent landowners to monitor/correct impacts.
3. Describe proposed methods to limit significant adverse effects on known significant cultural or historic sites within the proposed permitted area.  
 CR research has identified potential areas for future Phase 1 studies, buffers will be maintained at these areas until completion of additional studies are complete.

4. Describe method to prevent or eliminate conditions that could be hazardous to animal or fish life in or adjacent to the permitted area.

The mine is located within a managed forest and agricultural fields. We will continue with BMP's relative to wildlife to minimize animal impacts. There should be no interaction with aquatic species during mining or related activities.

5. Describe how applicant will comply with State air quality and water quality standards as established by the S.C. Department of Health and Environmental Control.

No Air Quality standards are required from this method of operation, but we will utilize dust control measures (sweepers, water trucks, etc.) to control nuisance dust. Water Quality (specifically Ph and TSS) will be in accordance with NPDES requirements.

### III. RECLAMATION OF AFFECTED AREA

6. State useful purpose(s) the affected land is being proposed for reclamation. More than one purpose may be checked, but information should be submitted to support the feasibility for each proposed purpose.

- |   |   |
|---|---|
| a. Lake or pond <input checked="" type="checkbox"/> | f. Grassland <input type="checkbox"/>             |
| b. Agriculture <input type="checkbox"/>             | g. Recreation <input checked="" type="checkbox"/> |
| c. Woodlands <input checked="" type="checkbox"/>    | h. Wetlands <input type="checkbox"/>              |
| d. Residential <input checked="" type="checkbox"/>  | i. Park <input type="checkbox"/>                  |
| e. Commercial <input checked="" type="checkbox"/>   | j. Other <input type="checkbox"/>                 |

7. State the final maximum surface gradient(s) (slope) in soil, sand, or other unconsolidated materials on reclaimed land. Surface gradients steeper than 3H:1V (18 degrees or 33 percent) may be required to submit geotechnical data and studies to demonstrate that the steeper slopes will remain stable following final reclamation.

Surface grades to be constructed at a minimum of 3:1, with permanent vegetative cover consistent with the current indigenous groundcover.

8. How will the final slopes in unconsolidated material be accomplished? If the slope will be by backfilling, demonstrate that there is adequate material to accomplish the stated final gradient. If gradient is to be achieved by bringing in material from outside the permitted area, state the nature of the material and approximate quantities. If the gradient is to be achieved by grading, show that there is adequate area for grading to achieve gradient (i.e., adequate distance between the property line and edge of highwall). Operator should show calculations or other appropriate information to demonstrate that there is adequate materials in backfilling and grading to meet the requirements for final slope.

Mine is located within a managed plantation / agricultural field tract with the perimeter of the mine areas located away (+/- 100 LF) from any public access. There is sufficient area to grade slopes into an aesthetically pleasing pond like feature. Slopes will be left un-excavated or backfilled with topsoil like material to provide a stable growth surface.

9. Describe the plan for revegetation or other surface treatment of affected area(s). The revegetation plan shall include but not be limited to the following: (a) planned soil test; (b) site preparation and fertilization; (c) seed or plant selection; (d) rate of seeding or amount of planting per acre; (e) maintenance.

Revegetation will occur using BMP for establishing permanent ground cover consistent with native vegetation and to prevent soil erosion. Soil testing, amendment application, seed selection and application to be consistent with growing and maintaining cover. Evaluation, inspection and maintenance will be performed within the normal plantation management schedules.

10. Provide, as a separate document, a closure plan of the mine and permitted facilities to prevent a release of contaminants from being harmful to the environment. A closure plan is not necessary for all mines, but is required where the possibility exists for (a) acid rock drainage; (b) where the National Pollutant Discharge Elimination Systems (NPDES) Permit has discharge limitation parameters other than pH and Total Suspended Solids (TSS); (c) chemically treated tailings or stockpiles (excludes fertilizer or lime for revegetation purposes).

Mineral acidity is not present in this mining operation, Ph and TSS will be monitored and managed per NPDES requirements, No chemical treatments will be performed at the mine site.

11. Method of control of contaminants and disposal of mine waste soil, rock, mineral, scrap, tailings, slimes, and other material directly connected with the mining, cleaning, and preparation of mineral substances mined and includes all waste materials deposited on or in the permit area from any source.

Not applicable to this operation

12. Method of reclaiming settling and/or sediment ponds.

Settling, detention, and / or retention ponds will be incorporated into the shape and aesthetic configuration of the final mine site. Sediments or deposits would be naturally occurring and should be fully reincorporated into the mineral / soil profile of the finished mine site.

13. Describe method of restoration or establishment of stream channels, stream banks and site drainage to a condition minimizing erosion, siltation and other pollution.

Not applicable to this operation.

14. What are the maintenance plans to insure that the reclamation practices established on the affected land will not deteriorate before released by the Department?

Periodic inspection by mine operator to ensure final shape, grade, integrity and ground cover are maintained.

15. For final reclamation, submit information about practices to provide for safety to persons and to adjoining property in all excavations. Identify areas of potential danger (vertical walls, unstable slopes, unstable surface on clay slimes, etc.) and provide appropriate safety provisions. These provisions can include but are not limited to setbacks, fencing,

Mine site is located approximately 100 LF from any public R/W and within an access controlled management area. Localized safety measures such as berms, ramps, warning signs will be used as safety measures within the access areas and working boundaries of the pit. Company Safety officers will perform regular evaluations of the work area.

16. What provisions will be taken to prevent noxious, odious, or foul pools of water from collecting and remaining on the mined area? For mines to be reclaimed as lakes or ponds, provide supporting information that a minimum water depth of four (4) feet on at least fifty percent (50%) of the pond surface area can be maintained.

Pond depth will exceed minimum depths to prevent noxious weeds, odors, and pooling from occurring.

17. Identify any structures (e.g. buildings, roads) that are proposed to remain as part of final reclamation. Provide justification for leaving any structures.

Not applicable, no current structures onsite and final area to be returned to a native state.

18. Attach two (2) copies of a map of the area (referred to as the RECLAMATION MAP) that shows the reclamation practices and conservation practices to be implemented. The following should be shown:

- A. The outline of the proposed final limits of the excavation during the number of years for which the permit is requested.
- B. The approximate final surface gradient(s) and contour(s) of the area to be reclaimed. This would include the sides and bottoms of mines reclaimed ponds and lakes.
- C. The outline of the tailings disposal area.
- D. The outline of disposal areas for spoil and refuse (exclusive of tailings ponds).
- E. The approximate location of the mean shore line of any impoundment or water body and inlet and/or outlet structures which will remain upon final reclamation.
- F. The approximate locations of access roads, haul roads, ramps or buildings which will remain upon final reclamation.
- G. The approximate locations of various vegetative treatments.
- H. The proposed locations of re-established streams, ditches or drainage channels to provide for site drainage.
- I. The proposed locations of diversions, terraces, silt fences, brush barriers or other Best Management Practices to be used for preventing or controlling erosion and off-site siltation.
- J. Proposed locations of the measures to provide safety to persons and adjoining property.
- K. Segments of the mine that can be mined and reclaimed as an ongoing basis.
- L. The boundaries of the permitted area.
- M. The boundaries of the affected area for the anticipated life of the mine.
- N. The boundaries of the 100-year floodplain, where appropriate.
- O. Identify sections of mine where the final surface gradient will be achieved by grading and/or backfilling.
- P. A legend showing the name of the applicant, the name of the proposed mine, the north arrow, the county, the scale, the date of preparation and the name and title of the person who prepared the map.

THE REQUIRED RECLAMATION MAP SHALL HAVE A NEAT, LEGIBLE APPEARANCE AND BE OF SUFFICIENT SCALE TO CLEARLY SHOW THE REQUIRED INFORMATION LISTED ABOVE. THE BASE FOR THE MAP SHALL BE EITHER A SPECIALLY PREPARED LINE DRAWING, AERIAL PHOTOGRAPH, ENLARGED USGS TOPOGRAPHIC MAP OR A RECENTLY PREPARED PLAT. RECLAMATION MAP SHOULD BE THE SAME SCALE USED FOR THE SITE MAP.

#### IV. SCHEDULE FOR IMPLEMENTATION OF CONSERVATION AND RECLAMATION PRACTICES

19. As stated in Section 48-20-90 of the S.C. Mining Act, reclamation activities, to the extent feasible, must be conducted simultaneously with mining operations. Identify which areas or segments of the mine are not feasible to reclaim simultaneously with mining. Provide reasons why reclamation can not proceed simultaneously with mining in these areas.

Mining shall progress in increments of approximately 3 acres annually (based on anticipated annual sales volumes) utilizing continual slope maintenance, final reclamation occurring upon mining completion of Affected Area.

OL Thompson Construction Co., Inc.

Golden Grove Mine

I-002257

20. Section 48-20-40(16)(f) of the S.C. Mining Act requires a "time schedule, including the anticipated years for completion of reclamation by segments." This time schedule should meet the requirements of Section 48-20-90 of the Mining Act.

**SCHEDULE FOR IMPLEMENTING CONSERVATION AND RECLAMATION PRACTICES**

Conservation and Reclamation Practices	Segment # or Area	Planned		* Applied		Notes
		Amount	Year	Amount	Year	
<b>SCHEDULE FOR IMPLEMENTING CONSERVATION AND RECLAMATION PRACTICES</b>	PA	1	2020			See Note A
Post signs, notifications needed for mine area	1	17	2020			
Mark buffers and delineate adjacent areas	1	17	2020			See Note B, maintain LOM
Install/ upgrade access, gates, haul roads	AA	17	2020			
Install Storm Water BMP's, sediment basin	1	17	2020			See Notes C, D; maintain LOM
Clearing , strip topsoil	1	17	2020			See Notes E, F
Excavate; required reporting, monitoring	1	17	2020			See Notes E, F, G, I
<b>Finalize bounds of segment, buffer, submit to DHEC</b>	2	13	2021			<b>See Notes H, J, K</b>
Grade, topsoil, fertilize, seed banks; inspect and repair	1	17	2021			until released by DHEC
Post signs, notifications needed for mine area	2	13	2021			
Mark buffers and delineate adjacent areas	2	13	2021			See Note B, maintain LOM
Install/ upgrade access, gates, haul roads	2	13	2021			
Install Storm Water BMP's, sediment basin	2	13	2021			See Notes C, D; maintain LOM
Clearing , strip topsoil	2	13	2021			See Notes E, F
Complete Cultural resources for Segs 3-8 including 38CH2527, 38CH2528, Areas C, D, F, I	3-8	219	2021			Complete study; submit to A&H, DHEC for review
Determine final area of Segs 3-8, buffer from CR, update mining documents to DHEC	3-8	219	2021			Determine area of Segs 3-8, report to DHEC for approval
Excavate; required reporting, monitoring	2	13	2021-2023			See Notes E, F, G, I
<b>Finalize bounds of segment, buffer, submit to DHEC</b>	3	51	2023			<b>See Notes H, J, K</b>
Grade, topsoil, fertilize, seed banks; inspect and repair	2	13	2021-2023			until released by DHEC
Post signs, notifications needed for mine area	3	51	2023			
Mark buffers and delineate adjacent areas	3	51	2023			See Note B, maintain LOM
Install/ upgrade access, gates, haul roads	3	51	2023			
Install Storm Water BMP's, sediment basin	3	51	2023			See Notes C, D; maintain LOM
Clearing , strip topsoil	3	51	2023			See Notes E, F

Excavate; required reporting, monitoring	3	51	2023-2028		See Notes E, F, G, I
<b>Stake 200 ft Buffer along Old Jacksonboro Rd.</b>	4-8		2028		Prior to mine activity, Maintain LOM
<b>Finalize bounds of segment, buffer, submit to DHEC</b>	4	30	2028		See Notes H, J, K
Grade, topsoil, fertilize, seed banks; inspect and repair	3	51	2023-2028		until released by DHEC
Post signs, notifications needed for mine area	4	30	2028		
Mark buffers and delineate adjacent areas	4	30	2028		See Note B, maintain LOM
Install/ upgrade access, gates, haul roads	4	30	2028		
Install Storm Water BMP's, sediment basin	4	30	2028		See Notes C, D; maintain LOM
Clearing , strip topsoil	4	30	2028		See Notes E, F
Excavate; required reporting, monitoring	4	30	2028-2031		See Notes E, F, G, I
<b>Finalize bounds of segment, buffer, submit to DHEC</b>	5	45	2031		See Notes H, J, K
Grade, topsoil, fertilize, seed banks; inspect and repair	4	30	2028-2031		until released by DHEC
Post signs, notifications needed for mine area	5	45	2031		
Mark buffers and delineate adjacent areas	5	45	2031		See Note B, maintain LOM
Install/ upgrade access, gates, haul roads	5	45	2031		
Install Storm Water BMP's, sediment basin	5	45	2031		See Notes C, D; maintain LOM
Clearing , strip topsoil	5	45	2031		See Notes E, F
Excavate; required reporting, monitoring	5	45	2031-2035		See Notes E, F, G, I
<b>Finalize bounds of segment, buffer, submit to DHEC</b>	6	20	2035		See Notes H, J, K
Grade, topsoil, fertilize, seed banks; inspect and repair	5	45	2031-2035		until released by DHEC
Post signs, notifications needed for mine area	6	20	2035		
Mark buffers and delineate adjacent areas	6	20	2035		See Note B, maintain LOM
Install/ upgrade access, gates, haul roads	6	20	2035		
Install Storm Water BMP's, sediment basin	6	20	2035		See Notes C, D; maintain LOM
Clearing , strip topsoil	6	20	2035		See Notes E, F
Excavate; required reporting, monitoring	6	20	2035-2037		See Notes E, F, G, I
<b>Finalize bounds of segment, buffer, submit to DHEC</b>	7	22	2037		See Notes H, J, K
Grade, topsoil, fertilize, seed banks; inspect and repair	6	20	2035-2037		until released by DHEC
Post signs, notifications needed for mine area	7	22	2037		

Mark buffers and delineate adjacent areas	7	22	2037	See Note B, maintain LOM
Install/ upgrade access, gates, haul roads	7	22	2037	
Install Storm Water BMP's, sediment basin	7	22	2037	See Notes C, D; maintain LOM
Clearing , strip topsoil	7	22	2037	See Notes E, F
Excavate; required reporting, monitoring	7	22	2037-2039	See Notes E, F, G, I
<b>Finalize bounds of segment, buffer, submit to DHEC</b>	<b>8</b>	<b>51</b>	<b>2039</b>	<b>See Notes H, J, K</b>
Grade, topsoil, fertilize, seed banks; inspect and repair	7	22	2037-2039	until released by DHEC
Post signs, notifications needed for mine area	8	51	2039	
Mark buffers and delineate adjacent areas	8	51	2039	See Note B, maintain LOM
Install/ upgrade access, gates, haul roads	8	51	2039	
Install Storm Water BMP's, sediment basin	8	51	2039	See Notes C, D; maintain LOM
Clearing , strip topsoil	8	51	2039	See Notes E, F
Excavate; required reporting, monitoring	8	51	2039-2044	See Notes E, F, G, I
Grade, topsoil, fertilize, seed banks; inspect and repair	8	51	2039-2044	until released by DHEC
Inspect, repair, maintain	ALL	249	2045	until released by DHEC

**NOTES:**

- A) Two permanent survey markers will be located onsite at least 100 ft. apart per R89-130
- B) All markers, buffers, and designated wetland, Cultural resources, property lines and roads to be permanently marked in the field prior to mining
- C) Best Management Practices to be installed and maintained as necessary to ensure stormwater and sediment is retained onsite
- D) Sediment Basins to be cleaned of sediment as needed to ensure proper function
- E) Sufficient topsoil shall be stockpiled onsite for use in reclamation
- F) Minimize the amount of disturbed areas to minimize erosion and sediment concerns
- G) Rough grade slopes as mining progresses, final restoration at segment completion
- H) Prior to activity in Segs 2 - 8 operator shall submit revised maps, reclamation schedules and additional information regarding buffers, Cultural Resources, wetlands, and roadways for DHEC approval/bond review
- I) Reclamation should be initiated within 180 days of termination of mining in any specific areas. Temporary grading and grassing should be utilized in the event mining is delayed or suspended for a period of time longer than 180 days
- J) Segs 2- 8 are anticipated to progress in order, but may be rearranged as future conditions dictate
- K) Time frames are estimated and may progress at different rates per year depending on market conditions

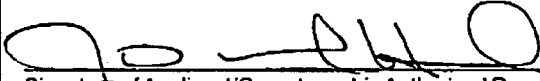
PA = Permit Area AA = Affected Area LOM = Life of Mine

\*completed by Department



YOU ARE NOTIFIED THAT:

- 1) You, the operator, must file an application to modify the reclamation plan in the event actual reclamation varies from the set forth hereinabove; and
- 2) If at any time it appears to the Department that the activities under the reclamation plan are failing to achieve the purposes and requirements of the S.C. Mining Act, the Department may modify the RECLAMATION PLAN in accordance to Section 48-20-150.



Signature of Applicant/Operator or his Authorized Representative

J. David Hand

Printed Name of Applicant/Operator or his Authorized Representative

President

Title

2/11/19

Date

Department Use Only

Permit No.: I-002257 Date Application Approved: 5/12/20 Date Bond Rec'd: 5/1/20

Bond Amount: \$25,000.00 Blanket or Single Bond: Single Permit Issuance Date: 5/12/20

ACTION TAKEN ON THIS RECLAMATION PLAN

Approved  Denied  Approved with Additional Terms and Conditions

By:  Section Manager

DIVISION DIRECTOR

Date: May 12, 2020

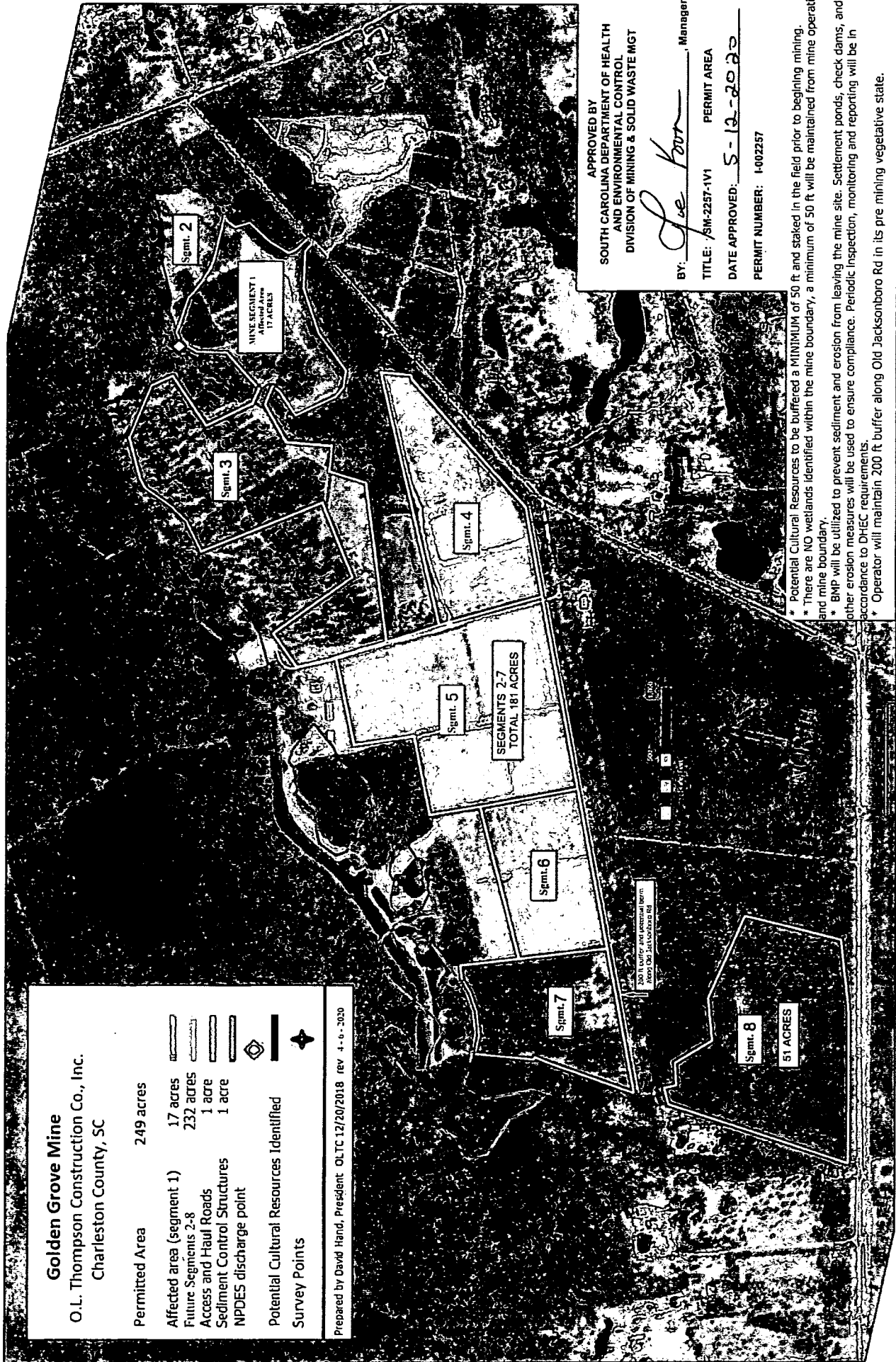
### Golden Grove Mine

O.L. Thompson Construction Co., Inc.  
Charleston County, SC

Permitted Area 249 acres  
 Affected area (segment 1) 17 acres  
 Future Segments 2-8 232 acres  
 Access and Haul Roads 1 acre  
 Sediment Control Structures 1 acre  
 NPDES discharge point

Potential Cultural Resources Identified  
 Survey Points

Prepared by David Hand, President. OLTG12/20/2018 rev 4-e-3030



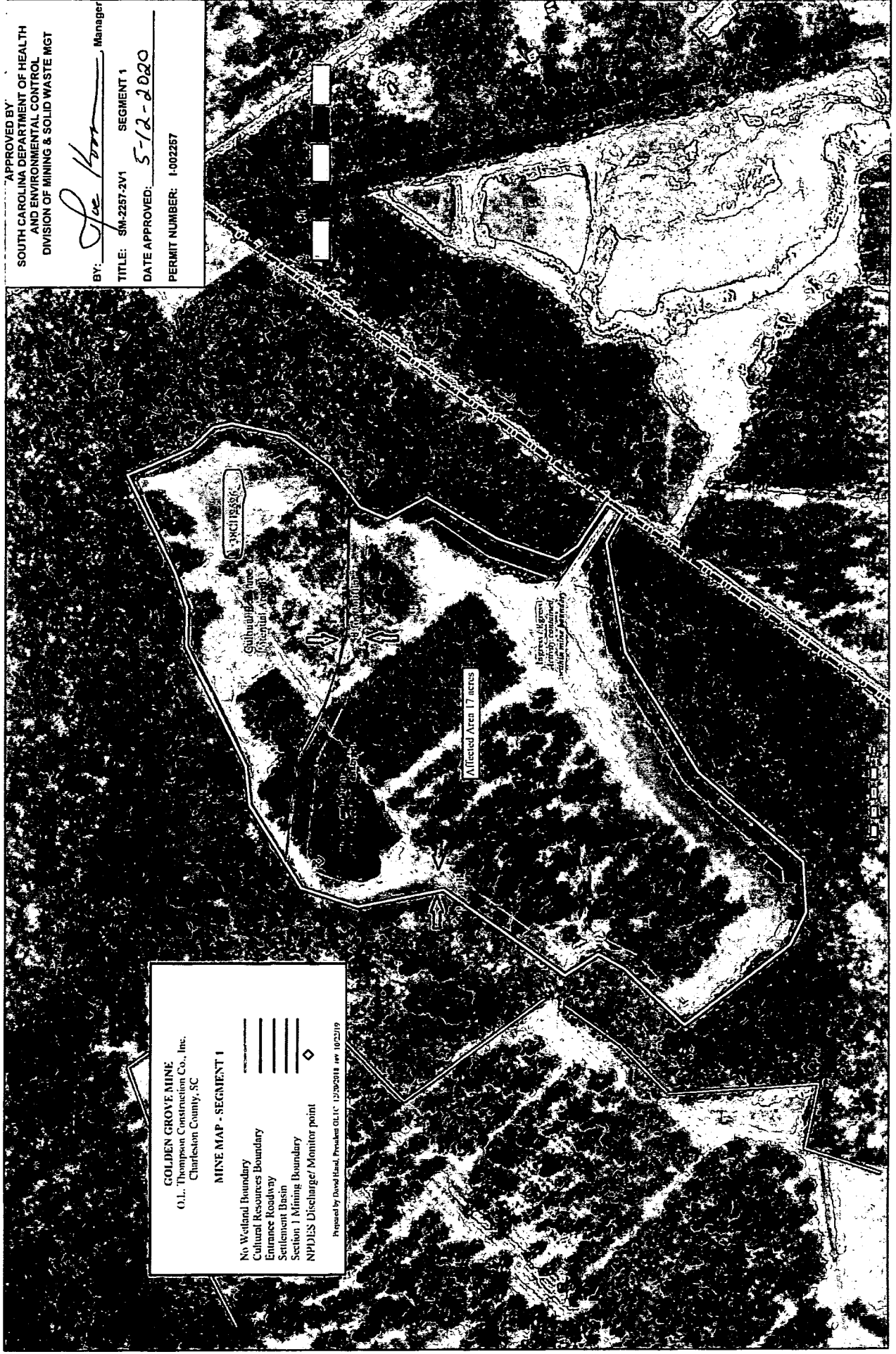
APPROVED BY  
 SOUTH CAROLINA DEPARTMENT OF HEALTH  
 AND ENVIRONMENTAL CONTROL  
 DIVISION OF MINING & SOLID WASTE MGT

BY: *[Signature]*, Manager  
 TITLE: SIM-2257-1V1 PERMIT AREA  
 DATE APPROVED: 5-12-2020  
 PERMIT NUMBER: 1-002257

- \* Potential Cultural Resources to be buffered a MINIMUM of 50 ft and staked in the field prior to beginning mining.
- \* There are NO wetlands identified within the mine boundary, a minimum of 50 ft will be maintained from mine operation and mine boundary.
- \* BNP will be utilized to prevent sediment and erosion from leaving the mine site. Settlement ponds, check dams, and other erosion measures will be used to ensure compliance. Periodic inspection, monitoring and reporting will be in accordance to DHEC requirements.
- \* Operator will maintain 200 ft buffer along Old Jacksonboro Rd in its pre mining vegetative state.

APPROVED BY: *[Signature]* Manager  
 SOUTH CAROLINA DEPARTMENT OF HEALTH  
 AND ENVIRONMENTAL CONTROL  
 DIVISION OF MINING & SOLID WASTE MGT

TITLE: SM-2257-2V1 SEGMENT 1  
 DATE APPROVED: 5-12-2020  
 PERMIT NUMBER: I-002257



**GOLDEN GROVE MINE**  
 O.L. Thompson Construction Co., Inc.  
 Charleston County, SC

**MINE MAP - SEGMENT 1**

No Wetland Boundary  
 Cultural Resources Boundary  
 Entrance Roadway  
 Settlement Basin  
 Section 1 Mining Boundary  
 NPDES Discharge/ Monitor point

Prepared by David Hissel, President O.L.T.C. 12/20/2018 rev 10/23/19

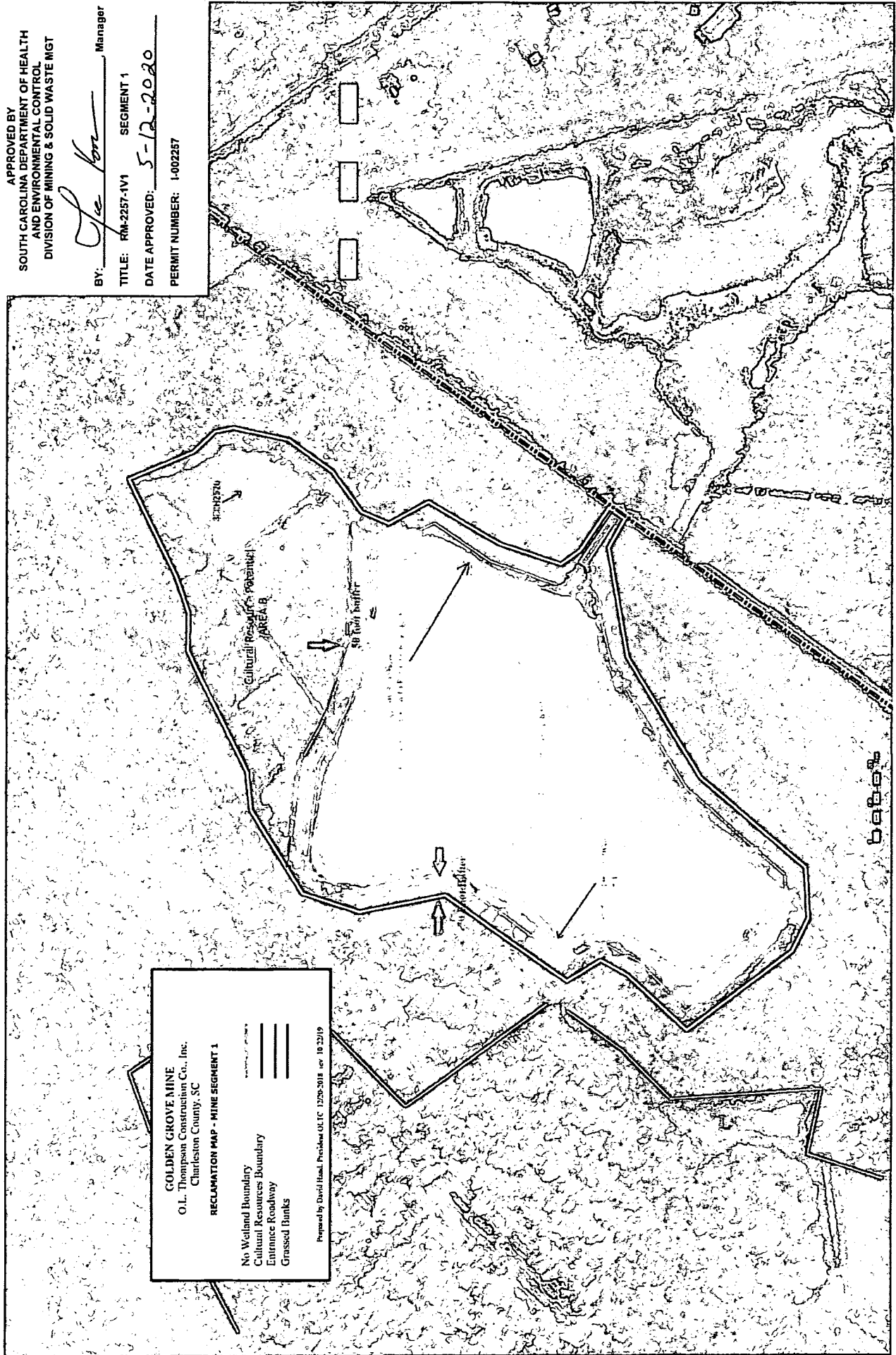
APPROVED BY  
SOUTH CAROLINA DEPARTMENT OF HEALTH  
AND ENVIRONMENTAL CONTROL  
DIVISION OF MINING & SOLID WASTE MGT

BY: *[Signature]* Manager

TITLE: RM-2257-1V1 SEGMENT 1

DATE APPROVED: 5-12-2020

PERMIT NUMBER: 1-002257



# APPENDIX 3

SCDOT Preliminary Coordination Email

**From:** [Fleming, Juleigh B.](#)  
**To:** [Jenna Nelson](#)  
**Cc:** [Ricky Waters](#); [Bret Jarotski](#); [Megan Baum](#); [Kei Cheng](#); [Grooms, Robert W.](#)  
**Subject:** RE: Golden Grove Preliminary SCDOT Review  
**Date:** Friday, October 23, 2020 1:53:54 PM  
**Attachments:** [image007.png](#)  
[image008.png](#)  
[image009.png](#)  
[image010.png](#)  
[image011.png](#)  
[Golden Grove Concept Plan.pdf](#)

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Good afternoon;

Thank you for the early coordination concerning the proposed Golden Grove project on US-17 in Charleston County.

After reviewing the attached concept plan for access locations, our office has no objection to the proposed project. The driveway locations are generally acceptable. Please note that the proposed driveway on US-17 does not include the approval for a median break. Any new median breaks along US-17 will have to meet ARMS manual median spacing standards for rural locations. There is an existing median break east of the property. You will need to meet minimum median break spacing from this median. The other option is that you could relocate this existing median to your proposed driveway location. This would require that you obtain permission from all property owners who have access to this median break.

This development will require a traffic impact analysis that must be provided to our traffic engineer for review and approval **prior to submitting your permit application**. Please note that all ARMS manual requirements (to include roadway and hydraulic design) for commercial development shall be met for permit approval.

This email does not constitute encroachment approval. Final approval is issued through our online EPPS system. This preliminary review is valid for six months. Any submissions after six months are subject to re-evaluation.

Please let me know if you have any questions.

Thank you!

*JuLeigh B Fleming, P.E.*  
District Permit Engineer



6355 Fain Street  
North Charleston, SC 29406

**From:** Jenna Nelson <jnelson@bowmanconsulting.com>  
**Sent:** Tuesday, October 20, 2020 8:37 AM  
**To:** Fleming, Juleigh B. <FlemingJB@scdot.org>

Cc: Ricky Waters <rwaters@bowmanconsulting.com>; Bret Jarotski <bjarotski@bowmanconsulting.com>; Megan Baum <mbaum@bowmanconsulting.com>; Kei Cheng <kcheng@bowmanconsulting.com>  
**Subject:** Golden Grove Preliminary SCDOT Review

**\*\*\* This is an EXTERNAL email. Please do not click on a link or open any attachments unless you are confident it is from a trusted source. \*\*\***

Good Morning Juleigh,

We'd like to request a preliminary review of the attached concept plan for a project (Golden Grove) intended to be annexed into the Town of Ravenel, Charleston County. We are currently preparing a Planned Development District (PD) package for the Town's review.

The proposed primary entrance fronts along US Highway 17. The other accessible (perimeter) roads are locally maintained.

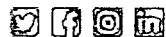
We would like to provide documentation of preliminary review and coordination with SCDOT as part of our PD package to indicate project awareness and to include any items pertaining to feasibility. If I need to direct this request to another SCDOT contact, please advise.

We are happy to provide any additional information that you need to support your review, and we appreciate your help with this request.

Very respectfully,  
Jenna



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# APPENDIX 4

## Final Traffic Impact Analysis





**Golden Grove Development  
Traffic Impact Analysis**

Charleston County, South Carolina

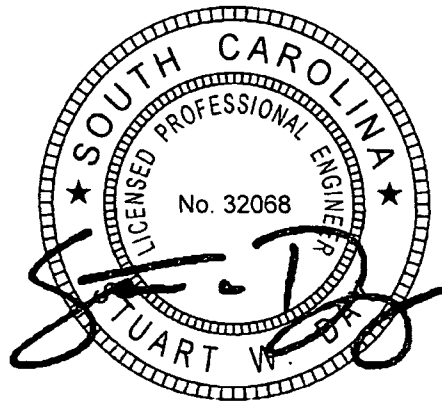
Prepared for:

Bowman Consulting Group, Ltd.

Prepared by:

Stantec Consulting Services Inc.

February 2021



2-11-21



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

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# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

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# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Executive Summary

A traffic impact analysis was conducted for the Golden Grove development following SCDOT and Charleston County guidelines. The proposed Golden Grove development is located on the north side of US 17 between New Road and Old Jacksonboro Road in Charleston County, South Carolina. The Golden Grove development is a residential development with a final buildout year of 2026 and will consist of 382 single-family homes.

The extent of the existing road network to be studied consists of two intersections - US 17 & SC 165 and US 17 & New Road. Access to the development will be provided through two driveways, a new proposed right-in, right-out driveway to the west along US 17 (Golden Grove Driveway 1), as well as a new proposed full access driveway to the east along US 17 (Golden Grove Driveway 2).

Based on the *Roadway Design Manual* guidelines, a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) along US 17 is recommended at the proposed intersection with Golden Grove Driveway 1.

An eastbound exclusive left-turn lane 400 feet in length (200 feet of storage with a 200-foot taper) and a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) along US 17 are recommended at the proposed intersection with Golden Grove Driveway 2. An exclusive left-turn lane 350 feet in total length (200 feet of storage and a 150-foot taper) is recommended on the southbound approach of Golden Grove Driveway 2.

The results of the analysis indicate that the proposed intersection of US 17 & Golden Grove Driveway 1 is anticipated to operate at LOS B in both peak hours with a stop-controlled approach for the Golden Grove minor street approach. Therefore, no additional improvements are recommended, beyond the proposed exclusive westbound right-turn lane along US 17 into the site.

The intersection of US 17 & Golden Grove Driveway 2 is anticipated to operate at LOS C in the AM peak hour and LOS E in the PM peak hour with a stop-controlled approach for the Golden Grove minor street approach. The delay in the PM peak hour is anticipated to be experienced only by patrons of the Golden Grove site (and not by mainline traffic along US 17). Therefore, no additional improvements are recommended, beyond the proposed exclusive right- and left-turn lanes along US 17 into the site and proposed southbound left-turn lane exiting the site.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

The intersection of US 17 & New Road is anticipated to experience an undesirable level of service in the PM peak hour in 2026 without the Golden Grove development. However, since this intersection operates at LOS D in the 2026 Build scenario, no improvements are recommended. The increased number of right-turns at this intersection brings the average delay for the minor street approaches down in the Build scenario. The signalized intersection of US 17 & SC 165 is projected to operate at an acceptable LOS with or without the Golden Grove development.

In addition to the residential land use analyzed in this traffic impact analysis study, the Golden Grove development master plan also includes commercial land use to be built in the future. It is recommended that an additional traffic impact analysis study be performed in the future before building this commercial land-use portion of the development.



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## 1.0 INTRODUCTION

The purpose of this report is to document a traffic impact analysis for the Golden Grove development located in Charleston County, South Carolina following the South Carolina Department of Transportation (SCDOT) and Charleston County guidelines. This report summarizes the procedures and findings of the traffic impact analysis.

### 1.1 PROJECT BACKGROUND

The proposed Golden Grove development is located on the north side of US 17 between New Road and Old Jacksonboro Road in Charleston County, South Carolina. The final buildout will consist of 382 single-family homes. Access to the development will be provided through a new proposed right-in, right out (RIRO) driveway (Golden Grove Driveway 1), and a new proposed full access driveway (Golden Grove Driveway 2). Both of these driveways are located along US 17.

The traffic impact analysis considers the weekday AM peak hour (between 7:00 AM and 9:00 AM) and the weekday PM peak hour (between 4:00 PM and 6:00 PM) as the study time frames. The extent of the existing road network to be studied consists of the two (2) intersections of:

1. US 17 & SC 165
2. US 17 & New Road

The proposed development is anticipated to be completed by 2026. **Exhibit 1.1** illustrates the location of the project site, including the adjacent public roadway network. **Exhibit 1.2** illustrates the site plan of the proposed development.





Golden Grove Proposed Driveway







# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

Introduction

## 1.2 EXISTING ROADWAY CONDITIONS

US 17 is a four-lane divided principal arterial roadway that serves primarily commercial land uses. The posted speed limit is 55 mph and the 2019 AADT was 21,100 vpd. Based on existing turning movement counts, the percentage of heavy vehicles along US 17 is 7%.

SC 165 is a two-lane minor arterial roadway that serves commercial and residential land uses. The posted speed limit is 35 mph and the 2019 AADT was 4,600 vpd. Based on existing turning movement counts, the percentage of heavy vehicles along SC 165 is 4%.

New Road is a two-lane local roadway that serves residential land uses. Based on existing turning movement counts, the percentage of heavy vehicles along New Road is less than 1%.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Driveway Spacing Review

## 2.0 DRIVEWAY SPACING REVIEW

Access to the development will be provided through one full access driveway and one RIRO driveway along US 17. A review of the driveway spacing of the proposed driveways along US 17 was undertaken based upon the information contained in SCDOT's *Access & Roadside Management Standards (ARMS)* manual.

Based upon the 55-mph posted speed limit and the driveway spacing criteria of ARMS, a minimum driveway spacing of 400 feet is required for full access driveways along US 17. The proposed full movement Golden Grove Driveway 2 on US 17 is located approximately 1,600 feet west of the nearest access road/driveway, New Road. The proposed RIRO Golden Grove Driveway 1 on US 17 is located approximately 600 feet west of the Golden Grove full access driveway. Both of these driveways fulfill the SCDOT driveway spacing criteria.



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Project Traffic

### 3.0 PROJECT TRAFFIC

Project traffic in this analysis is defined as the vehicle trips expected to be generated by the Golden Grove development. These trips were distributed and assigned throughout the study roadway network.

#### 3.1 PROPOSED LAND USES

The Golden Grove development will consist of 382 single-family homes. The project site is currently vacant.

#### 3.2 TRIP GENERATION ESTIMATES

The trip generation for the development was estimated using the information contained in ITE's Trip Generation Manual, 10<sup>th</sup> Edition (2017) reference. The estimates utilized the following land use codes (LUC):

- ❖ 210 – Single-Family Detached Housing;

Estimates were developed for the weekday daily, the weekday AM peak hour of the adjacent street, and the weekday PM peak hour of the adjacent street. The trip generation estimates for the development are shown in **Table 3.1** and documented in **Appendix A**.



GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

Project Traffic

Table 3.1 – Trip Generation Estimates

Land Use	ITE LUC	Scale	Daily	Weekday AM Peak Hour		Weekday PM Peak Hour	
				Enter	Exit	Enter	Exit
Single-Family Detached Housing	210	382 Homes	3,568	69	207	232	136
<b>New External Trips:</b>			<b>3,560</b>	<b>69</b>	<b>207</b>	<b>232</b>	<b>136</b>



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Project Traffic

### 3.3 TRIP DISTRIBUTION & ASSIGNMENT

New external traffic expected to be generated by the Golden Grove development was distributed and assigned to the roadway network based upon existing travel patterns in the area. The general distribution of new project trips was assumed to be:

- ❖ 5% to/from the north via New Road;
- ❖ 10% to/from the north via SC 165;
- ❖ 10% to/from the south via SC 165;
- ❖ 50% to/from the east via US 17; and
- ❖ 25% to/from the west via US 17.

The assignment of project traffic is illustrated in **Exhibit 3.1** for the AM and PM peak hours.

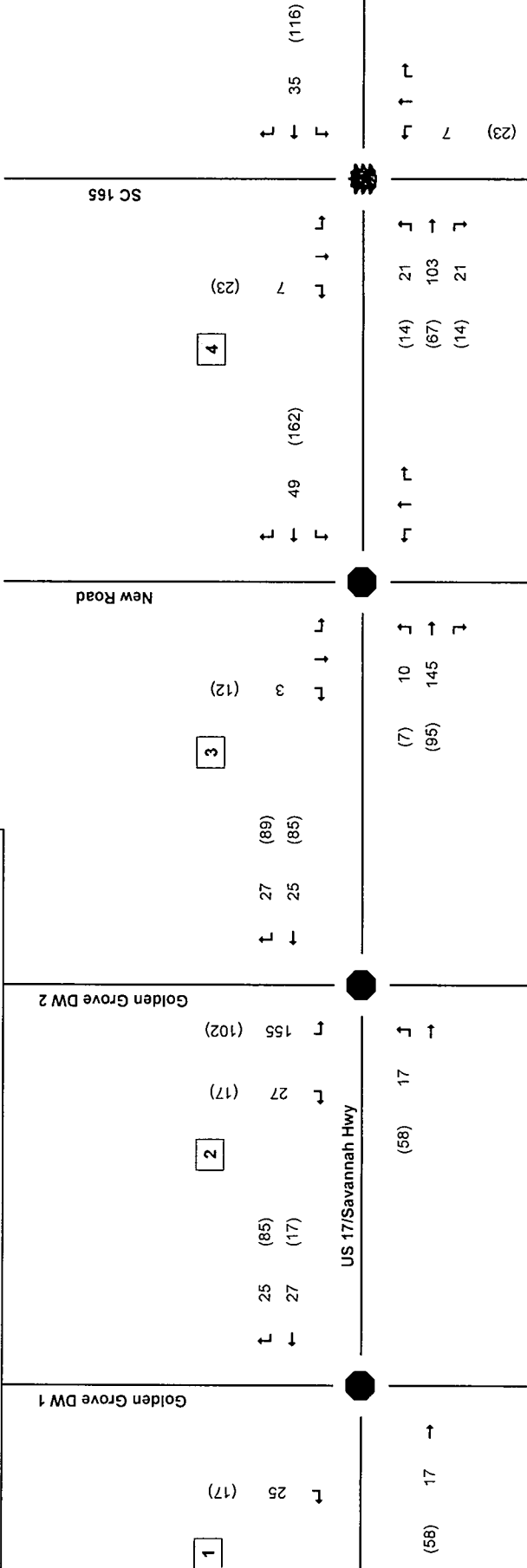




2026 PROJECT TRAFFIC VOLUMES LEGEND

- .000 - AM Peak Hour Volumes
- (000) - PM Peak Hour Volumes
- TWSC
- ◀ Yield
- ◻ Signal
- ◊ Roundabout

**GOLDEN GROVE  
PROJECT SITE**



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Traffic Volume Development

### 4.0 TRAFFIC VOLUME DEVELOPMENT

Existing traffic volumes were collected in October 2020 for use in the project intersection analyses and future-year traffic volume development. The future-year traffic 2026 volumes consisted of existing traffic volumes adjusted by an annual growth rate and projected traffic volumes of the Golden Grove development.

#### 4.1 EXISTING TRAFFIC VOLUMES

The traffic impact analysis considers the weekday AM peak hour (between 7:00 AM and 9:00 AM) and the weekday PM peak hour (between 4:00 PM and 6:00 PM) at the existing intersections of US 17 & New Road and US 17 & SC 165.

To incorporate the reduced traffic volumes due to the COVID-19 pandemic, seasonal factors assigned by SCDOT were applied to the collected traffic volume numbers. As a result, the AM and PM traffic volumes were increased by 19% and 13% respectively. The SCDOT guidelines for calculating the volume reduction due to the COVID-19 pandemic are documented in **Appendix B**.

The raw traffic volume counts are provided in **Appendix C**. The factored existing traffic volumes are illustrated in **Exhibit 4.1** and documented in **Appendix D**.

#### 4.2 FUTURE TRAFFIC VOLUME PROJECTIONS

##### 4.2.1 Historical Growth Rates

To develop an annual background growth rate for use in the analysis, historical count data along US 17 (SCDOT count station #103) was reviewed over the past 10 years. It was determined that the roadway has experienced annual growth of approximately 2.24%. To be conservative, a 2.5% annual growth rate was used to develop the 2026 No Build traffic volumes, which are illustrated in **Exhibit 4.2**.

The Golden Grove development project traffic volumes were then combined with the 2026 No Build volumes to develop the 2026 Build traffic volumes, which are illustrated in **Exhibit 4.3**. Intersection traffic volume development is documented in **Appendix D**.

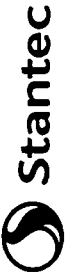
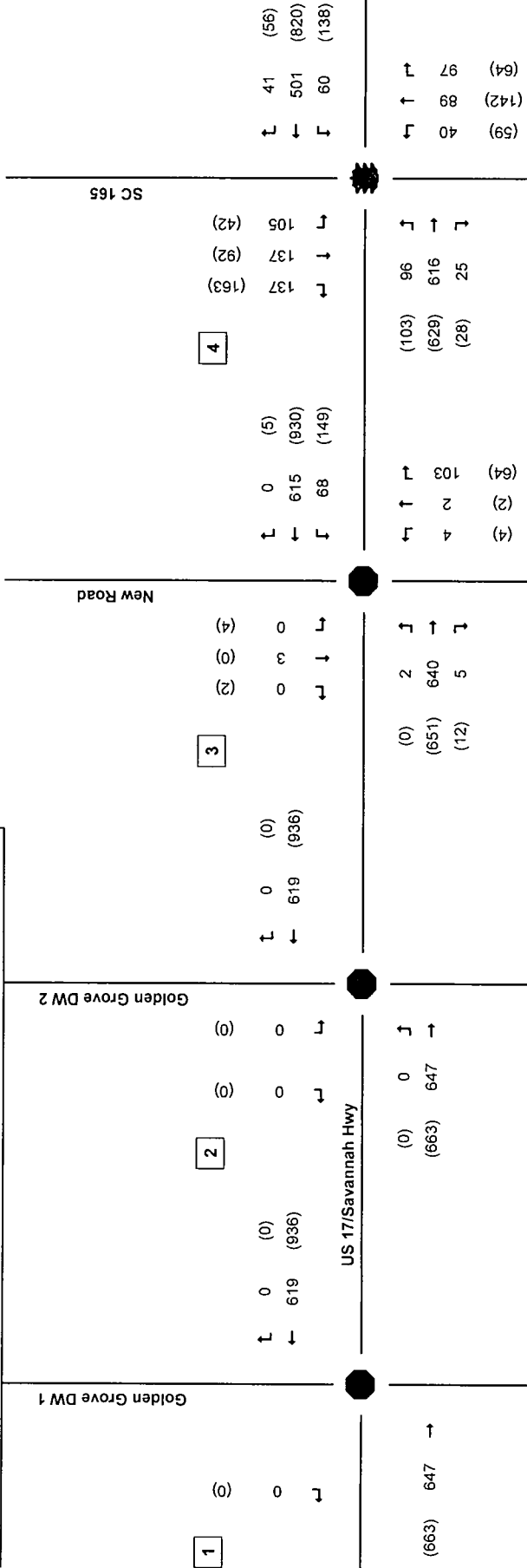


2020 EXISTING PEAK HOUR TRAFFIC VOLUMES LEGEND

- 000 - AM Peak Hour Volumes
- (000) - PM Peak Hour Volumes
- TWSC
- Signal
- Yield
- Roundabout



**GOLDEN GROVE  
PROJECT SITE**



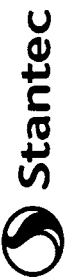
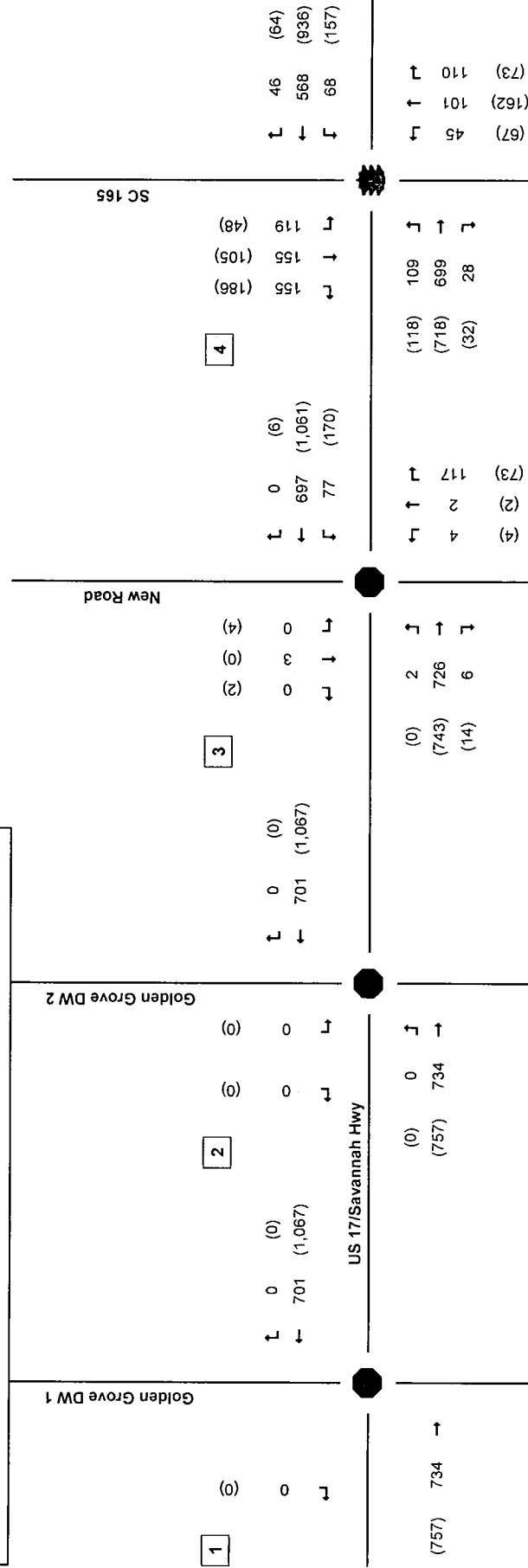


2026 NO BUILD PEAK HOUR TRAFFIC VOLUMES LEGEND

- 000 - AM Peak Hour Volumes
- (000) - PM Peak Hour Volumes
- TWSC
- Signal
- Yield
- Roundabout



**GOLDEN GROVE  
PROJECT SITE**

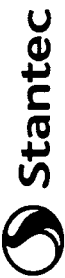
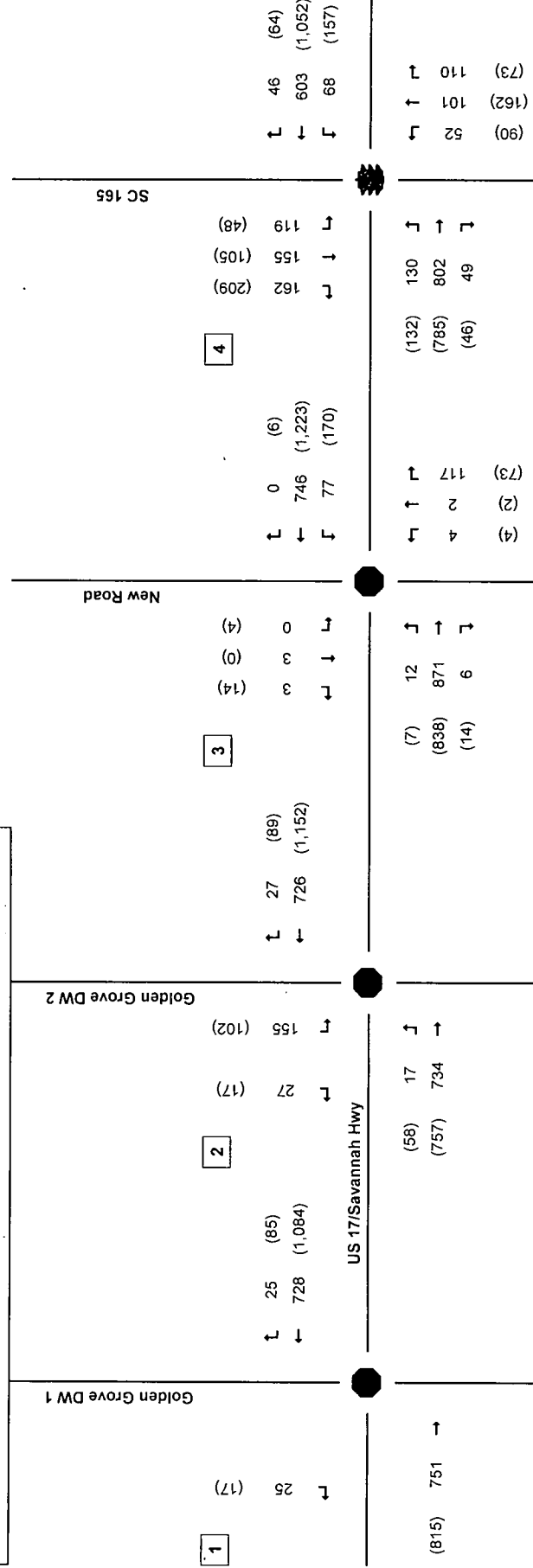


2026 BUILD PEAK HOUR TRAFFIC VOLUMES LEGEND

- 000 - AM Peak Hour Volumes
- (000) - PM Peak Hour Volumes
- TWSC
- Signal
- Yield
- Roundabout



**GOLDEN GROVE  
PROJECT SITE**



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Traffic Impact Analysis

### 5.0 TRAFFIC IMPACT ANALYSIS

Using the existing and projected traffic volumes previously discussed, intersection analyses were conducted for the study and project driveway intersections considering 2020 Existing conditions, 2026 No-Build conditions, and 2026 Build conditions. This analysis was conducted using the Transportation Research Board's *Highway Capacity Manual 2010 (HCM 2010)* methodologies of the *Synchro*, Version 10 software for intersection analysis.

Intersection level of service (LOS) grades range from LOS A to LOS F, which are directly related to the level of control delay at the intersection and characterize the operational conditions of the intersection traffic flow. LOS A operations typically represent ideal, free-flow conditions where vehicles experience little to no delays, and LOS F operations typically represent poor, forced-flow (bumper-to-bumper) conditions with high vehicular delays, and are generally considered undesirable. **Table 5.1** summarizes the *HCM 2010* control delay thresholds associated with each LOS grade for unsignalized and signalized intersections.

**Table 5.1 – HCM 2010 LOS Criteria for Unsignalized and Signalized Intersections**

Unsignalized Intersections	
LOS	Control Delay (s/veh)
A	< 10
B	> 10 and < 15
C	> 15 and < 25
D	> 25 and < 35
E	> 35 and < 50
F	> 50

Signalized Intersections	
LOS	Control Delay (s/veh)
A	< 10
B	> 10 and < 20
C	> 20 and < 35
D	> 35 and < 55
E	> 55 and < 80
F	> 80

### 5.1 INTERSECTION LOS ANALYSIS

As part of the intersection analysis, SCDOT's default *Synchro* parameters were utilized. The 2020 traffic counts peak hour factors (PHF) were utilized in the analysis of existing peak season and future conditions with a minimum PHF of 0.90 and maximum PHF of 0.95 being considered for the future-year conditions. Existing heavy vehicle percentages, as previously discussed, were utilized in the analysis, with a minimum percentage of 2% considered. The existing lane geometry was utilized for the analysis of existing conditions and the 2026 future-year scenarios.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Traffic Impact Analysis

The 2026 Build future-year scenario utilized new lane geometries at the two Golden Grove driveways. The construction of the RIRO movement intersection at US 17 & Golden Grove Driveway 1 would involve the addition of an exclusive right turn lane along US 17 for ingress to the site. The construction of the full movement US 17 & Golden Grove Driveway 2 intersection would involve shifting an existing median break located approximately 400 feet east of the proposed site access point. Exclusive left and right turn lanes would be added along US 17 for ingress to the site in addition to an exclusive southbound left turn lane.

Using the Synchro Intersection software, intersection analyses were conducted for 2020 Existing conditions, 2026 No-Build conditions, and 2026 Build conditions for the weekday AM and PM peak-hour periods. The results of the intersection analyses for existing and future-year conditions for the weekday AM and PM peak-hour periods are summarized in **Table 5.2** for the intersections of US 17 & Golden Grove Driveway, US 17 & New Road, and US 17 & SC 165, respectively. For the unsignalized intersections, the LOS and delay results are shown for the worst-case minor-street approaches only, based upon the *HCM 2010* methodologies for two-way stop-controlled intersections.

**Table 5.2 – Intersection Analysis Results**

Intersection	Control	LOS/Delay (seconds/vehicle)					
		AM Peak Hour			PM Peak Hour		
		2020 Existing	2026 No Build	2026 Build <sup>1</sup>	2020 Existing	2026 No Build	2026 Build <sup>1</sup>
1 US 17 & Golden Grove Driveway 1	TWSC	--	--	B/11.3 (SB)	--	--	B/13.3 (SB)
2 US 17 & Golden Grove Driveway 2	TWSC	--	--	C/22.9 (SB)	--	--	E/44.8 (SB)
3 US 17 & New Road	TWSC	C/22.2 (SB)	D/25.6 (SB)	C/21.0 (SB)	D/28.2 (SB)	E/35.6 (SB)	D/25.6 (SB)
4 US 17 & SC 165	SIGNAL	B/13.0	B/13.3	B/12.5	B/11.2	B/11.8	B/11.9

<sup>1</sup> Includes proposed right- and left-turn lanes along US 17 for ingress into the site.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Traffic Impact Analysis

The results of the analysis indicate that the proposed intersection of US 17 & Golden Grove Driveway 1 is anticipated to operate at LOS B in both peak hours with a stop-controlled approach for the Golden Grove minor street approach. Therefore, no additional improvements are recommended, beyond the proposed exclusive westbound right-turn lane along US 17 into the site.

The intersection of US 17 & Golden Grove Driveway 2 is anticipated to operate at LOS C in the AM peak hour and LOS E in the PM peak hour with a stop-controlled approach for the Golden Grove minor street approach. The delay in the PM peak hour is anticipated to be experienced only by patrons of the Golden Grove site (and not by mainline traffic along US 17). Therefore, no additional improvements are recommended, beyond the proposed exclusive right- and left-turn lanes along US 17 into the site and proposed southbound left-turn lane exiting the site.

The intersection of US 17 & New Road is anticipated to experience an undesirable level of service in the PM peak hour in 2026 without the Golden Grove development. However, since this intersection operates at LOS D in the 2026 Build scenario, no improvements are recommended. The increased number of right-turns at this intersection brings the average delay for the minor street approaches down in the Build scenario. The signalized intersection of US 17 & SC 165 is projected to operate at an acceptable LOS with or without the Golden Grove development.

In addition to the residential land use analyzed in this traffic impact analysis study, the Golden Grove development master plan also includes commercial land use to be built in the future. It is recommended that an additional traffic impact analysis study be performed in the future before building this commercial land-use portion of the development.

Synchro reports documenting the intersection analysis are provided in **Appendix E** for 2020 Existing Conditions, **Appendix F** for 2026 No-Build Conditions, and **Appendix G** for 2026 Build Conditions.



# GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

## Traffic Impact Analysis

### 5.2 TURN LANE ANALYSIS

An analysis was conducted to determine the potential need for exclusive turn lanes for the proposed Golden Grove driveways. This analysis was conducted utilizing the criteria documented in SCDOT's *ARMS Manual* (2008) and *Roadway Design Manual* (2017). The need for exclusive right-turn lanes is based upon the criteria documented in Section 9.5.1.1 of the *Roadway Design Manual*, which consists of nine considerations. These considerations and applications are listed below for the US 17 intersections with Golden Grove Driveway 1 & 2.

- 1) *At a free-flowing leg of any unsignalized intersection on a two-lane urban or rural highway which satisfies the criteria in Figure 9.5-A;*

The criterion is not applicable as US 17 is a four-lane highway.

- 2) *At the free-flowing leg of any unsignalized intersection on a high-speed (50 miles per hour or greater), four-lane urban or rural highway which satisfies the criteria in Figure 9.5-B;*

The intersections of US 17 & Golden Grove Driveway 1 and US 17 & Golden Grove Driveway 2 were analyzed for an exclusive westbound right-turn lane according to the *Roadway Design Manual*. The analysis shows that the intersection does satisfy the criteria for an exclusive right-turn lane in the build-out year 2026. Worksheets including the turn-lane analysis are provided in **Appendix H**.

- 3) *At the free-flowing leg of any unsignalized intersection on a six-lane urban or rural highway;*

This criterion is not applicable as US 17 is not a six-lane highway.

- 4) *At any intersection where a capacity analysis determines a right-turn lane is necessary to meet the overall level-of-service criteria;*

The intersection analysis results indicate that all approaches operate at an acceptable overall delay, so this criterion is not applicable.

- 5) *As a general rule, at any signalized intersection where the projected right-turning volume is greater than 300 vehicles per hour and where there are greater than 300 vehicles per hour per lane on the mainline (A traffic analysis will be required if the turning volumes are greater than 300 vehicles per hour.);*

This criterion is not applicable as the intersections are not proposed to be signalized.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Traffic Impact Analysis

- 6) *For uniformity of intersection design along the highway if other intersections have right-turn lanes;*

Right turn lanes are provided at other intersections with driveways along US 17. Therefore, this criterion is applicable.

- 7) *At any intersection where the mainline is curved to the left and where the mainline curve requires superelevation;*

The mainline is not curved and does not look to have superelevation at the intersection; therefore, this criterion is not applicable.

- 8) *At railroad crossings where the railroad is paralleled to the facility and is located close to the intersection and where a right-turn lane would be desirable to store queued vehicles avoiding interference with the movement of through traffic; or*

The intersection is not located near railroad facilities; therefore, this criterion is not applicable.

- 9) *At any intersection where the crash experience, existing traffic operations, sight distance restrictions (e.g., intersection beyond a crest vertical curve), or engineering judgment indicates a significant conflict-related to right-turning vehicles.*

No issues with crashes, traffic operations, or sight distance are known; therefore, this criterion is not applicable.

Based on the *Roadway Design Manual* guidelines, a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) is recommended along US 17 at the proposed intersection with the Golden Grove Driveway 1, and a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) is recommended along US 17 at the proposed intersection with Golden Grove Driveway 2.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Traffic Impact Analysis

The need for exclusive left-turn lanes is based upon the criteria documented in Section 9.5.1.2 of the Roadway Design Manual which consists of nine considerations. These considerations and applications for the proposed intersection of US 17 & Golden Grove Driveway 2 are listed below.

- 1) *At any unsignalized intersection on principal, high-speed rural highways with other arterials or collectors:*

The proposed unsignalized intersection of US 17 & Golden Grove Driveway 2 is on a high-speed rural highway with other collectors. Therefore, this criterion is applicable.

- 2) *At any unsignalized intersection on a two-lane urban or rural highway that satisfies the criteria in Figures 9.5-C, 9.5-D, 9.5-E, 9.5-F, or 9.5-G;*

The criterion is not applicable as US 17 is a four-lane highway.

- 3) *At any intersection where capacity analysis determines a left lane is necessary to meet the level of service criteria;*

The intersection analysis results indicate that the proposed intersection of US 17 & Golden Grove Driveway 2 is projected to operate at an acceptable delay for the overall intersection. Therefore, this criterion is not applicable.

- 4) *At any signalized intersection where the left turn volume is 300 vehicles per hour or more, conduct a traffic review to determine if dual left-turn lanes are necessary;*

This criterion is not applicable as the intersection of US 17 & Golden Grove Driveway 2 is not proposed to be signalized.

- 5) *As a general rule, at an intersection where the left turn volume is 100 vehicles per hour (for a single turn lane) or 300 vehicles per hour (for a dual turn lane);*

The proposed Golden Grove Driveway 2 will have left-turn volumes above 100 vehicles in the AM and PM peak hours, therefore a single left-turn lane is justified by this criterion.

- 6) *At all entrances to major residential, commercial, and industrial developments;*

The proposed Golden Grove Driveway 2 will serve as the entrance to a major residential development; therefore, this criterion is applicable.

- 7) *At median crossovers;*

The proposed Golden Grove Driveway 2 will be located at a median crossover for US 17; therefore, this criterion is applicable.





## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Traffic Impact Analysis

- 8) *For uniformity of intersection design along the highway if other intersections have left-turn lanes (i.e. to satisfy driver expectancy);*

Left turn lanes are not provided at other intersections with driveways along US 17. Therefore, this criterion is not applicable.

- 9) *At any intersection where crash experience, traffic operations, sight distance restrictions (e.g., intersection beyond a vertical crest curve), or engineering judgments indicates a significant conflict-related to left-turning vehicles.*

No issues with crashes, traffic operations, or sight distance are known; therefore, this criterion is not applicable.

Based on the *Roadway Design Manual* guidelines, an exclusive eastbound left-turn lane of 400 feet in total length (200 feet of storage and a 200-foot taper) and an exclusive southbound left-turn of 350 feet in total length (200 feet of storage and a 150-foot taper) are recommended at the intersection of US 17 and Golden Grove Driveway 1.



## GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS

### Summary of Findings and Recommendations

## 6.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

A traffic impact analysis was conducted for the Golden Grove development following SCDOT and Charleston County guidelines. The proposed Golden Grove development is located on the north side of US 17 between New Road and Old Jacksonboro Road in Charleston County, South Carolina. The Golden Grove development is a residential development with a final buildout year of 2026 and will consist of 382 single-family homes.

The extent of the existing road network to be studied consists of two intersections - US 17 & SC 165 and US 17 & New Road. Access to the development will be provided through two driveways, a new proposed right-in, right-out driveway to the west along US 17 (Golden Grove Driveway 1), as well as a new proposed full access driveway to the east along US 17 (Golden Grove Driveway 2).

Based on the *Roadway Design Manual* guidelines, a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) along US 17 is recommended at the proposed intersection with Golden Grove Driveway 1.

An eastbound exclusive left-turn lane 400 feet in length (200 feet of storage with a 200-foot taper) and a westbound exclusive right-turn lane 300 feet in length (100 feet of storage with a 200-foot taper) along US 17 are recommended at the proposed intersection with Golden Grove Driveway 2. An exclusive left-turn lane 350 feet in total length (200 feet of storage and a 150-foot taper) is recommended on the southbound approach of Golden Grove Driveway 2.

The results of the analysis indicate that the proposed intersection of US 17 & Golden Grove Driveway 1 is anticipated to operate at LOS B in both peak hours with a stop-controlled approach for the Golden Grove minor street approach. Therefore, no additional improvements are recommended, beyond the proposed exclusive westbound right-turn lane along US 17 into the site.

The intersection of US 17 & Golden Grove Driveway 2 is anticipated to operate at LOS C in the AM peak hour and LOS E in the PM peak hour with a stop-controlled approach for the Golden Grove minor street approach. The delay in the PM peak hour is anticipated to be experienced only by patrons of the Golden Grove site (and not by mainline traffic along US 17). Therefore, no additional improvements are recommended, beyond the proposed exclusive right- and left-turn lanes along US 17 into the site and proposed southbound left-turn lane exiting the site.



## **GOLDEN GROVE DEVELOPMENT TRAFFIC IMPACT ANALYSIS**

The intersection of US 17 & New Road is anticipated to experience an undesirable level of service in the PM peak hour in 2026 without the Golden Grove development. However, since this intersection operates at LOS D in the 2026 Build scenario, no improvements are recommended. The increased number of right-turns at this intersection brings the average delay for the minor street approaches down in the Build scenario. The signalized intersection of US 17 & SC 165 is projected to operate at an acceptable LOS with or without the Golden Grove development.

In addition to the residential land use analyzed in this traffic impact analysis study, the Golden Grove development master plan also includes commercial land use to be built in the future. It is recommended that an additional traffic impact analysis study be performed in the future before building this commercial land-use portion of the development.



## Appendix A Trip Generation Worksheets



**TRIP GENERATION ESTIMATES**  
**Golden Grove Development**

**Weekday Daily**

TRIP GENERATION CHARACTERISTICS						DIRECT. DISTRIB.		GROSS TRIPS			INTERNAL CAPTURE TRIPS				PASS-BY CAPTURE TRIPS				NEW EXTERNAL TRIPS		
Land Use	Ed.	LUC	Scale	Unit	Equation/Rate	In	Out	In	Out	Total	%	In	Out	Trips	%	In	Out	Trips	In	Out	Total
Single-Family Detached Housing	10m	210	382	DU	$\ln(f) = 0.92 \cdot \ln(x) + 2.71$	50%	50%	1,784	1,784	3,568	0%	0	0	0	0%	0	0	0	1,784	1,784	3,568
Total:								1,784	1,784	3,568	0%	0	0	0	0%	0	0	0	1,784	1,784	3,568

**Weekday AM Peak Hour**

TRIP GENERATION CHARACTERISTICS						DIRECT. DISTRIB.		GROSS TRIPS			INTERNAL CAPTURE TRIPS				PASS-BY CAPTURE TRIPS				NEW EXTERNAL TRIPS		
Land Use	Ed.	LUC	Scale	Unit	Equation/Rate	In	Out	In	Out	Total	%	In	Out	Trips	%	In	Out	Trips	In	Out	Total
Single-Family Detached Housing	10m	210	382	DU	$f = 0.71(x) + 4.80$	25%	75%	69	207	276	0%	0	0	0	0%	0	0	0	69	207	276
Total:								69	207	276	0%	0	0	0	0%	0	0	0	69	207	276

**Weekday PM Peak Hour**

TRIP GENERATION CHARACTERISTICS						DIRECT. DISTRIB.		GROSS TRIPS			INTERNAL CAPTURE TRIPS				PASS-BY CAPTURE TRIPS				NEW EXTERNAL TRIPS		
Land Use	Ed.	LUC	Scale	Unit	Equation/Rate	In	Out	In	Out	Total	%	In	Out	Trips	%	In	Out	Trips	In	Out	Total
Single-Family Detached Housing	10m	210	382	DU	$\ln(f) = 0.96 \ln(x) + 0.20$	63%	37%	232	136	368	0%	0	0	0	0%	0	0	0	232	136	368
Total:								232	136	368	0%	0	0	0	0%	0	0	0	232	136	368

**Appendix B SCDOT Volume Adjustment Guidelines for  
Covid-19 Impact**



**FROM:** Josh Johnson, PE, PTOE, District Six Traffic Engineerf,-Y  
**DATE:** September 28, 2020  
**RE:** Traffic Impact Analyses during COVID-19 Pandemic (Update)

On April 23, 2020, I issued guidance regarding conducting a Traffic Impact Analysis (TIA) in SCOOT District Six during the COVID-19 pandemic. That guidance was extended through August 2020, at which time local school districts began to release plans for reopening. The return to in-person instruction for students was expected to increase traffic volumes closer to normal, but updated guidance is needed based on the varying traffic due to the combination of in-person and virtual student instruction. As such, the District Six traffic office has established updated options for conducting TIAs for SCOOT review in Beaufort, Berkeley, Charleston, Colleton, Dorchester, and Jasper counties, as outlined below.

1. Prepare the analysis using turning movement count data collected within the past five (5) years when school was in session with fully in-person instruction. The calculated historical growth rate will be applied to the traffic count to establish the current year traffic volumes.
2. Conduct traffic counts on a typical weekday and apply assigned seasonal factors to establish current year traffic volumes. The seasonal factors applied shall be 1.19 for the AM peak hour volumes and 1.13 for the PM peak hour volumes.
3. Prepare a trip generation memo for review and determination of possible mitigation required, and construct the mitigation determined by the District Traffic Engineer.

Admittedly, the seasonal factors to be applied in option two are higher than expected. Therefore, my office will conduct periodic data analysis throughout the fall semester as necessary to either validate or update the factors. The above values will apply until further notice.

File: D6/traffic/Correspondence

## Appendix C Traffic Count Data





# SHORT COUNTS, LLC

735 Maryland St  
Columbia, SC 29201

*We can't say we're the Best, but you Can!*

File Name : US 17 @ Hwy 165

Site Code :

Start Date : 10/29/2020

Page No : 1

## Groups Printed- Passenger Vehicles - Heavy Vehicles - Buses

Start Time	Hwy 165 Southbound				US 17 Westbound				Hwy 165 Northbound				US 17 Eastbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
07:00	21	24	27	0	7	81	4	0	4	17	22	0	27	132	3	0	369
07:15	26	32	31	0	10	92	13	0	4	19	19	0	21	135	6	0	408
07:30	25	29	20	0	9	104	7	0	7	17	20	0	18	127	8	0	391
07:45	17	31	34	0	16	116	3	0	13	19	14	0	20	138	4	0	425
Total	89	116	112	0	42	393	27	0	28	72	75	0	86	532	21	0	1593
08:00	20	23	30	0	15	109	11	0	9	19	28	0	21	117	3	0	405
08:15	18	15	24	0	12	99	17	0	4	14	16	0	16	145	4	0	384
08:30	16	13	33	0	9	102	10	0	7	14	21	0	10	113	2	0	350
08:45	15	15	27	0	7	101	15	0	6	13	11	0	18	133	5	0	366
Total	69	66	114	0	43	411	53	0	26	60	76	0	65	508	14	0	1505
16:00	7	16	34	0	30	185	9	0	10	35	15	0	25	149	6	0	521
16:15	14	20	38	0	33	163	15	0	12	29	10	0	22	155	1	0	512
16:30	6	27	40	0	30	160	16	0	15	35	19	0	21	124	8	0	501
16:45	10	18	32	0	29	217	9	0	15	26	12	0	23	128	9	0	528
Total	37	81	144	0	122	725	49	0	52	125	56	0	91	556	24	0	2062
17:00	11	17	28	1	34	202	16	0	11	30	25	0	24	116	5	0	520
17:15	8	19	32	0	22	157	18	0	20	16	15	0	30	133	6	0	476
17:30	9	24	26	0	31	187	11	0	18	27	12	0	33	127	4	0	509
17:45	4	17	25	0	29	146	7	0	8	16	13	0	27	131	4	0	427
Total	32	77	111	1	116	692	52	0	57	89	65	0	114	507	19	0	1932
Grand Total	227	340	481	1	323	2221	181	0	163	346	272	0	356	2103	78	0	7092
Apprch %	21.6	32.4	45.9	0.1	11.9	81.5	6.6	0	20.9	44.3	34.8	0	14	82.9	3.1	0	
Total %	3.2	4.8	6.8	0	4.6	31.3	2.6	0	2.3	4.9	3.8	0	5	29.7	1.1	0	
Passenger Vehicles	212	331	453	1	318	2060	165	0	157	339	258	0	325	1958	76	0	6653
% Passenger Vehicles	93.4	97.4	94.2	100	98.5	92.8	91.2	0	96.3	98	94.9	0	91.3	93.1	97.4	0	93.8
Heavy Vehicles	15	9	24	0	4	140	16	0	5	6	9	0	30	142	2	0	402
% Heavy Vehicles	6.6	2.6	5	0	1.2	6.3	8.8	0	3.1	1.7	3.3	0	8.4	6.8	2.6	0	5.7
Buses	0	0	4	0	1	21	0	0	1	1	5	0	1	3	0	0	37
% Buses	0	0	0.8	0	0.3	0.9	0	0	0.6	0.3	1.8	0	0.3	0.1	0	0	0.5

# SHORT COUNTS, LLC

735 Maryland St  
Columbia, SC 29201

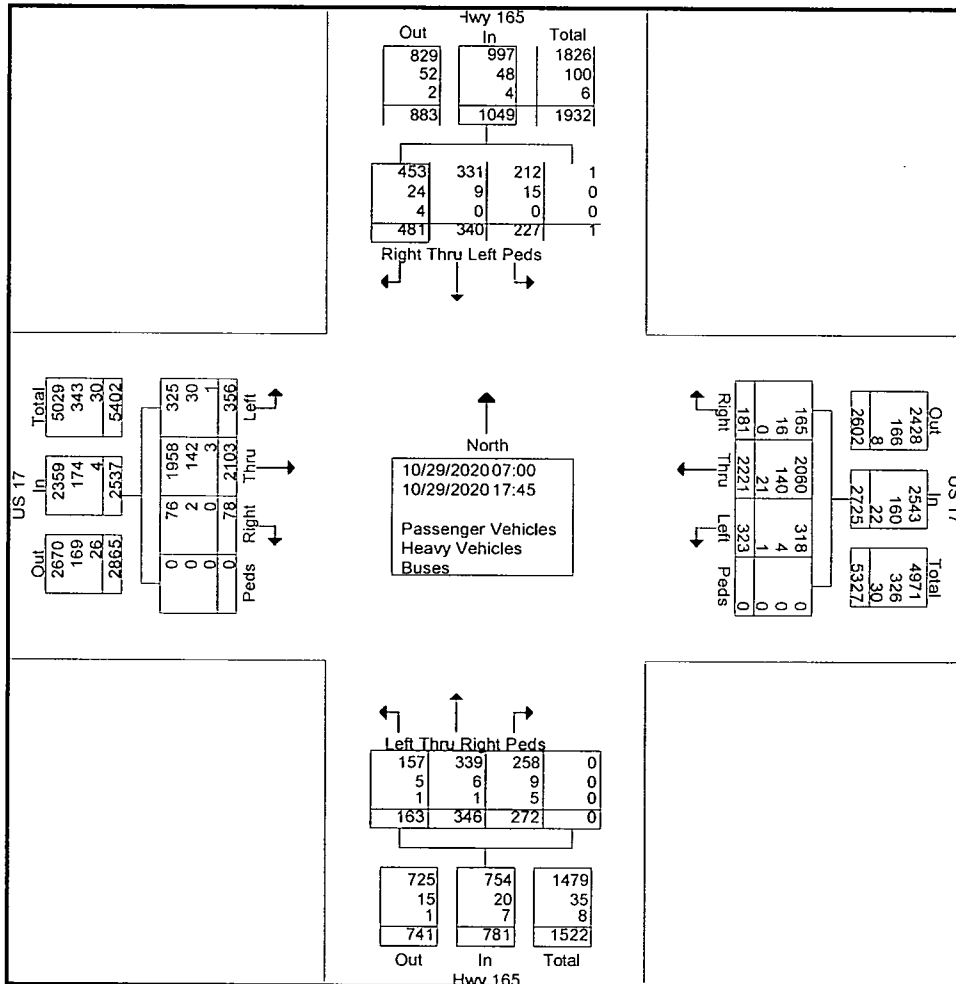
*We can't say we're the Best, but you Can!*

File Name : US 17 @ Hwy 165

Site Code :

Start Date : 10/29/2020

Page No : 2



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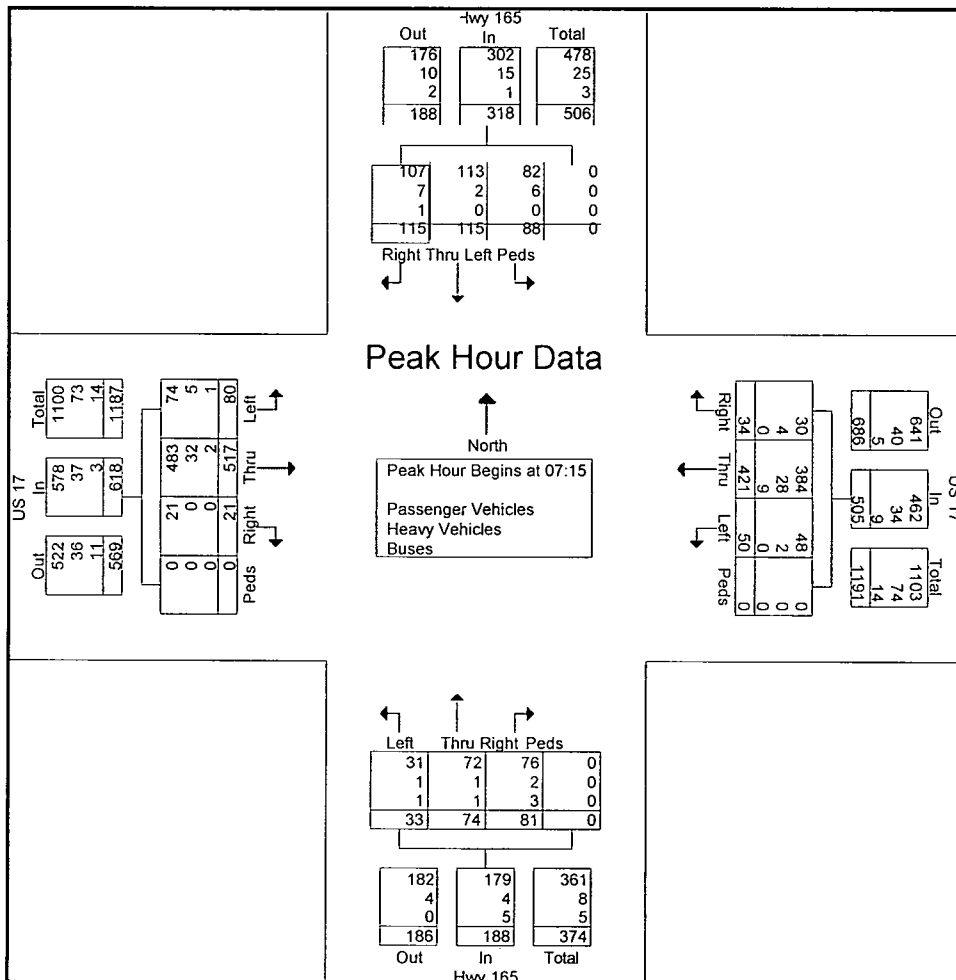
File Name : US 17 @ Hwy 165

Site Code :

Start Date : 10/29/2020

Page No : 3

Start Time	Hwy 165 Southbound					US 17 Westbound					Hwy 165 Northbound					US 17 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15																					
07:15	26	32	31	0	89	10	92	13	0	115	4	19	19	0	42	21	135	6	0	162	408
07:30	25	29	20	0	74	9	104	7	0	120	7	17	20	0	44	18	127	8	0	153	391
07:45	17	31	34	0	82	16	116	3	0	135	13	19	14	0	46	20	138	4	0	162	425
08:00	20	23	30	0	73	15	109	11	0	135	9	19	28	0	56	21	117	3	0	141	405
Total Volume	88	115	115	0	318	50	421	34	0	505	33	74	81	0	188	80	517	21	0	618	1629
% App. Total	27.7	36.2	36.2	0		9.9	83.4	6.7	0		17.6	39.4	43.1	0		12.9	83.7	3.4	0		
PHF	.846	.898	.846	.000	.893	.781	.907	.654	.000	.935	.635	.974	.723	.000	.839	.952	.937	.656	.000	.954	.958
Passenger Vehicles	82	113	107	0	302	48	384	30	0	462	31	72	76	0	179	74	483	21	0	578	1521
% Passenger Vehicles																					
Heavy Vehicles	6	2	7	0	15	2	28	4	0	34	1	1	2	0	4	5	32	0	0	37	90
% Heavy Vehicles	6.8	1.7	6.1	0	4.7	4.0	6.7	11.8	0	6.7	3.0	1.4	2.5	0	2.1	6.3	6.2	0	0	6.0	5.5
Buses	0	0	1	0	1	0	9	0	0	9	1	1	3	0	5	1	2	0	0	3	18
% Buses	0	0	0.9	0	0.3	0	2.1	0	0	1.8	3.0	1.4	3.7	0	2.7	1.3	0.4	0	0	0.5	1.1



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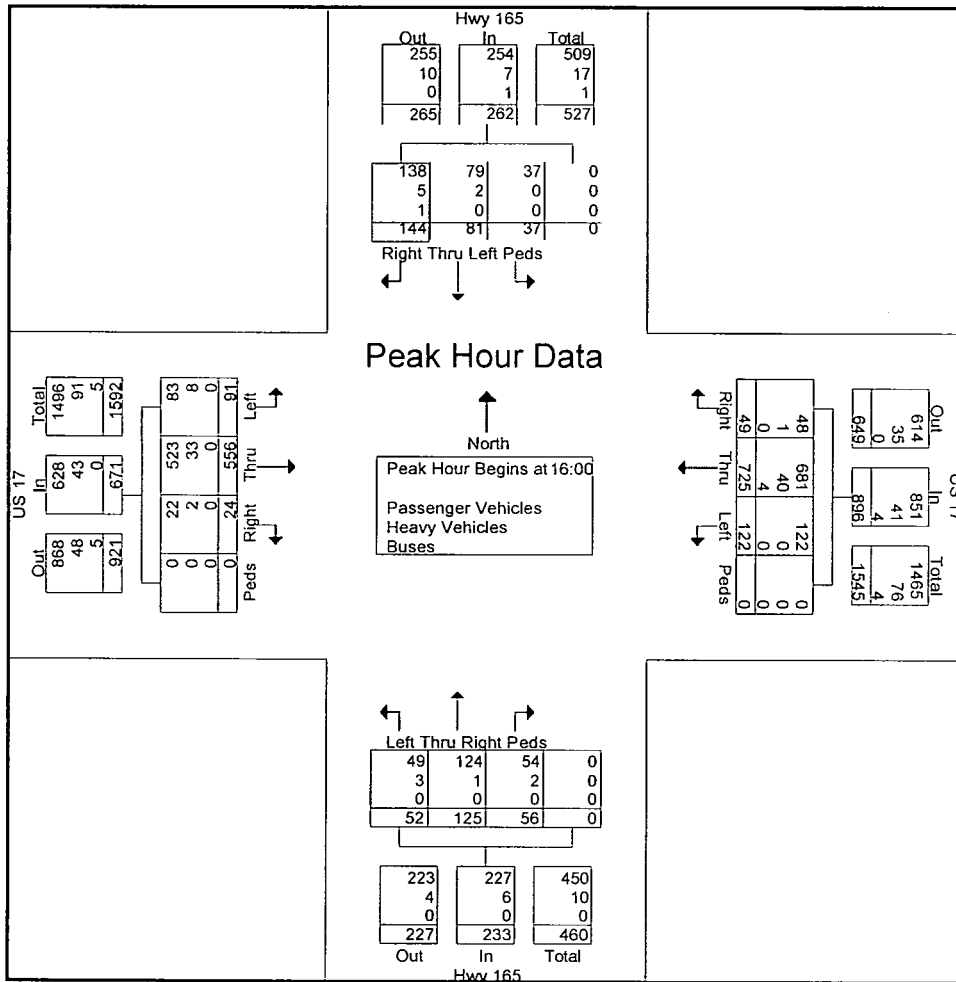
File Name : US 17 @ Hwy 165

Site Code :

Start Date : 10/29/2020

Page No : 4

Start Time	Hwy 165 Southbound					US 17 Westbound					Hwy 165 Northbound					US 17 Eastbound					Int. Total		
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total			
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																							
Peak Hour for Entire Intersection Begins at 16:00																							
16:00	7	16	34	0	57	30	185	9	0	224	10	35	15	0	60	25	149	6	0	180	521		
16:15	14	20	38	0	72	33	163	15	0	211	12	29	10	0	51	22	155	1	0	178	512		
16:30	6	27	40	0	73	30	160	16	0	206	15	35	19	0	69	21	124	8	0	153	501		
16:45	10	18	32	0	60	29	217	9	0	255	15	26	12	0	53	23	128	9	0	160	528		
Total Volume	37	81	144	0	262	122	725	49	0	896	52	125	56	0	233	91	556	24	0	671	2062		
% App. Total	14.1	30.9	55	0		13.6	80.9	5.5	0		22.3	53.6	24	0		13.6	82.9	3.6	0				
PHF	.661	.750	.900	.000		.897	.924	.835	.766	.000	.878	.867	.893	.737	.000	.844	.910	.897	.667	.000		.932	.976
Passenger Vehicles	37	79	138	0	254	122	681	48	0	851	49	124	54	0	227	83	523	22	0	628	1960		
% Passenger Vehicles																							
Heavy Vehicles	0	2	5	0	7	0	40	1	0	41	3	1	2	0	6	8	33	2	0	43	97		
% Heavy Vehicles	0	2.5	3.5	0	2.7	0	5.5	2.0	0	4.6	5.8	0.8	3.6	0	2.6	8.8	5.9	8.3	0	6.4	4.7		
Buses	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	5		
% Buses	0	0	0.7	0	0.4	0	0.6	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0.2		



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735 Maryland St  
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File Name : US 17 @ New Rd

Site Code :

Start Date : 10/29/2020

Page No : 1

## Groups Printed- Passenger Vehicles - Heavy Vehicles - Buses

Start Time	New Rd Southbound				US 17 Westbound				New Rd Northbound				US 17 Eastbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
07:00	1	0	0	0	9	102	0	0	2	0	21	0	0	135	0	0	270
07:15	3	0	0	0	7	104	1	0	1	0	16	0	0	167	2	0	301
07:30	0	0	0	0	16	106	2	0	1	0	21	0	0	122	3	0	271
07:45	0	0	0	0	10	130	0	0	0	1	26	0	0	132	2	0	301
Total	4	0	0	0	42	442	3	0	4	1	84	0	0	556	7	0	1143
08:00	0	0	0	0	19	136	0	0	2	0	27	0	0	136	1	0	321
08:15	0	0	0	0	13	126	0	0	1	0	13	0	1	150	0	0	304
08:30	0	2	0	0	15	124	0	0	0	0	20	0	0	119	1	0	281
08:45	0	0	0	0	10	108	0	0	1	1	23	0	0	136	1	0	280
Total	0	2	0	0	57	494	0	0	4	1	83	0	1	541	3	0	1186
16:00	1	1	1	0	20	188	2	0	3	0	12	0	1	158	0	0	387
16:15	0	0	0	0	14	204	1	0	4	0	12	0	0	154	2	0	391
16:30	1	0	1	0	19	175	1	0	1	0	11	0	0	142	0	0	351
16:45	1	0	0	0	31	214	1	0	0	1	14	0	0	151	2	0	415
Total	3	1	2	0	84	781	5	0	8	1	49	0	1	605	4	0	1544
17:00	0	0	0	0	39	223	2	0	0	0	13	0	0	127	2	0	406
17:15	1	0	0	0	35	191	1	0	2	0	17	0	0	157	4	0	408
17:30	1	0	1	0	26	195	0	0	1	0	12	0	0	141	2	0	379
17:45	0	0	0	0	23	160	1	0	3	0	11	0	0	126	2	0	326
Total	2	0	1	0	123	769	4	0	6	0	53	0	0	551	10	0	1519
Grand Total	9	3	3	0	306	2486	12	0	22	3	269	0	2	2253	24	0	5392
Apprch %	60	20	20	0	10.9	88.7	0.4	0	7.5	1	91.5	0	0.1	98.9	1.1	0	
Total %	0.2	0.1	0.1	0	5.7	46.1	0.2	0	0.4	0.1	5	0	0	41.8	0.4	0	
Passenger Vehicles	9	3	3	0	284	2307	12	0	19	2	260	0	2	2078	19	0	4998
% Passenger Vehicles	100	100	100	0	92.8	92.8	100	0	86.4	66.7	96.7	0	100	92.2	79.2	0	92.7
Heavy Vehicles	0	0	0	0	5	176	0	0	3	1	6	0	0	174	4	0	369
% Heavy Vehicles	0	0	0	0	1.6	7.1	0	0	13.6	33.3	2.2	0	0	7.7	16.7	0	6.8
Buses	0	0	0	0	17	3	0	0	0	0	3	0	0	1	1	0	25
% Buses	0	0	0	0	5.6	0.1	0	0	0	0	1.1	0	0	0	4.2	0	0.5

# SHORT COUNTS, LLC

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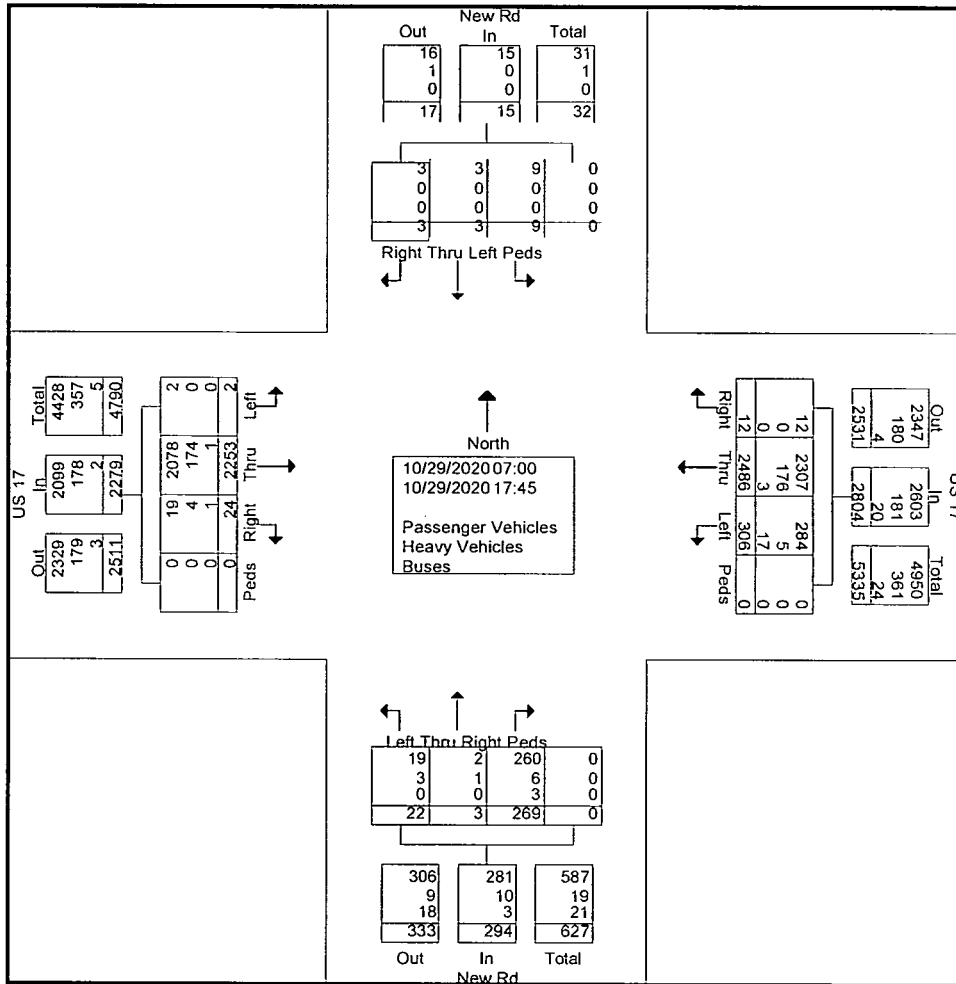
*We can't say we're the Best, but you Can!*

File Name : US 17 @ New Rd

Site Code :

Start Date : 10/29/2020

Page No : 2



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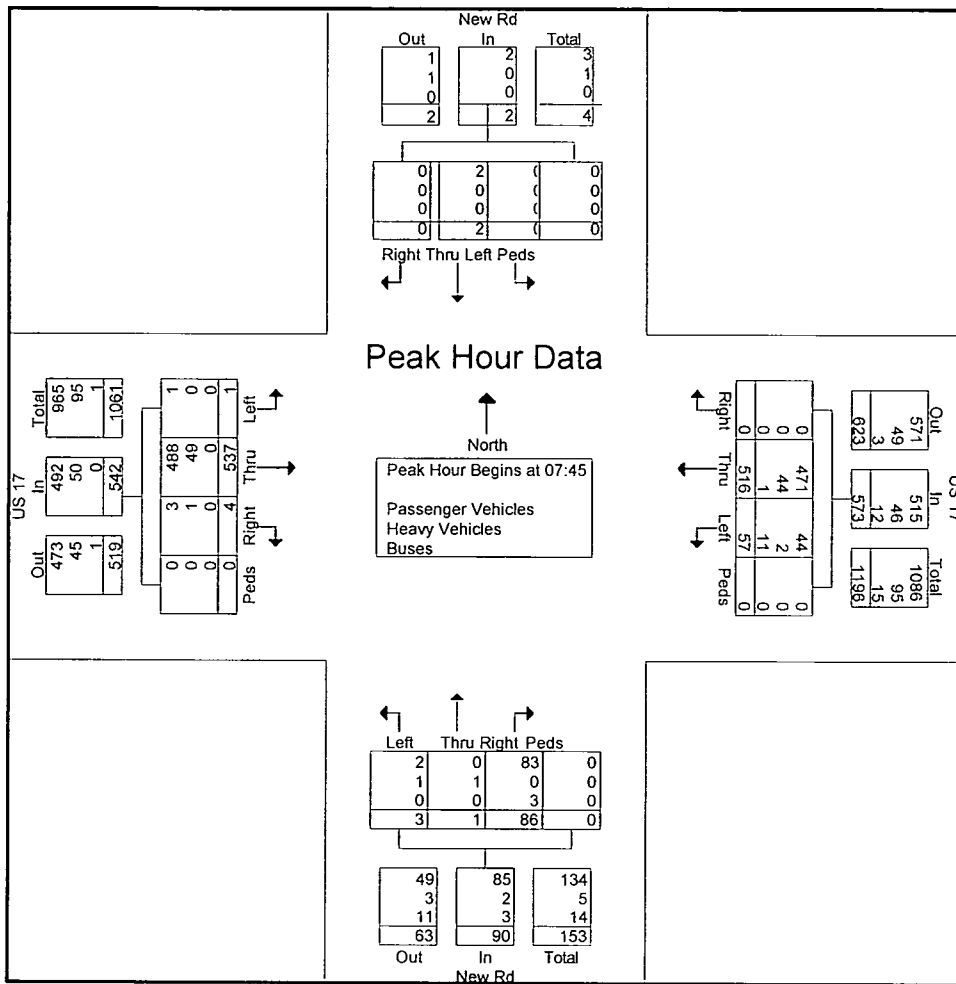
File Name : US 17 @ New Rd

Site Code :

Start Date : 10/29/2020

Page No : 3

Start Time	New Rd Southbound					US 17 Westbound					New Rd Northbound					US 17 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45																					
07:45	0	0	0	0	0	10	130	0	0	140	0	1	26	0	27	0	132	2	0	134	301
08:00	0	0	0	0	0	19	136	0	0	155	2	0	27	0	29	0	136	1	0	137	321
08:15	0	0	0	0	0	13	126	0	0	139	1	0	13	0	14	1	150	0	0	151	304
08:30	0	2	0	0	2	15	124	0	0	139	0	0	20	0	20	0	119	1	0	120	281
Total Volume	0	2	0	0	2	57	516	0	0	573	3	1	86	0	90	1	537	4	0	542	1207
% App. Total	0	100	0	0	0	9.9	90.1	0	0	0	3.3	1.1	95.6	0	0	0.2	99.1	0.7	0	0	0
PHF	.000	.250	.000	.000	.250	.750	.949	.000	.000	.924	.375	.250	.796	.000	.776	.250	.895	.500	.000	.897	.940
Passenger Vehicles	0	2	0	0	2	44	471	0	0	515	2	0	83	0	85	1	488	3	0	492	1094
% Passenger Vehicles																					
Heavy Vehicles	0	0	0	0	0	2	44	0	0	46	1	1	0	0	2	0	49	1	0	50	98
% Heavy Vehicles	0	0	0	0	0	3.5	8.5	0	0	8.0	33.3	100	0	0	2.2	0	9.1	25.0	0	9.2	8.1
Buses	0	0	0	0	0	11	1	0	0	12	0	0	3	0	3	0	0	0	0	0	15
% Buses	0	0	0	0	0	19.3	0.2	0	0	2.1	0	0	3.5	0	3.3	0	0	0	0	0	1.2



# SHORT COUNTS, LLC

735 Maryland St  
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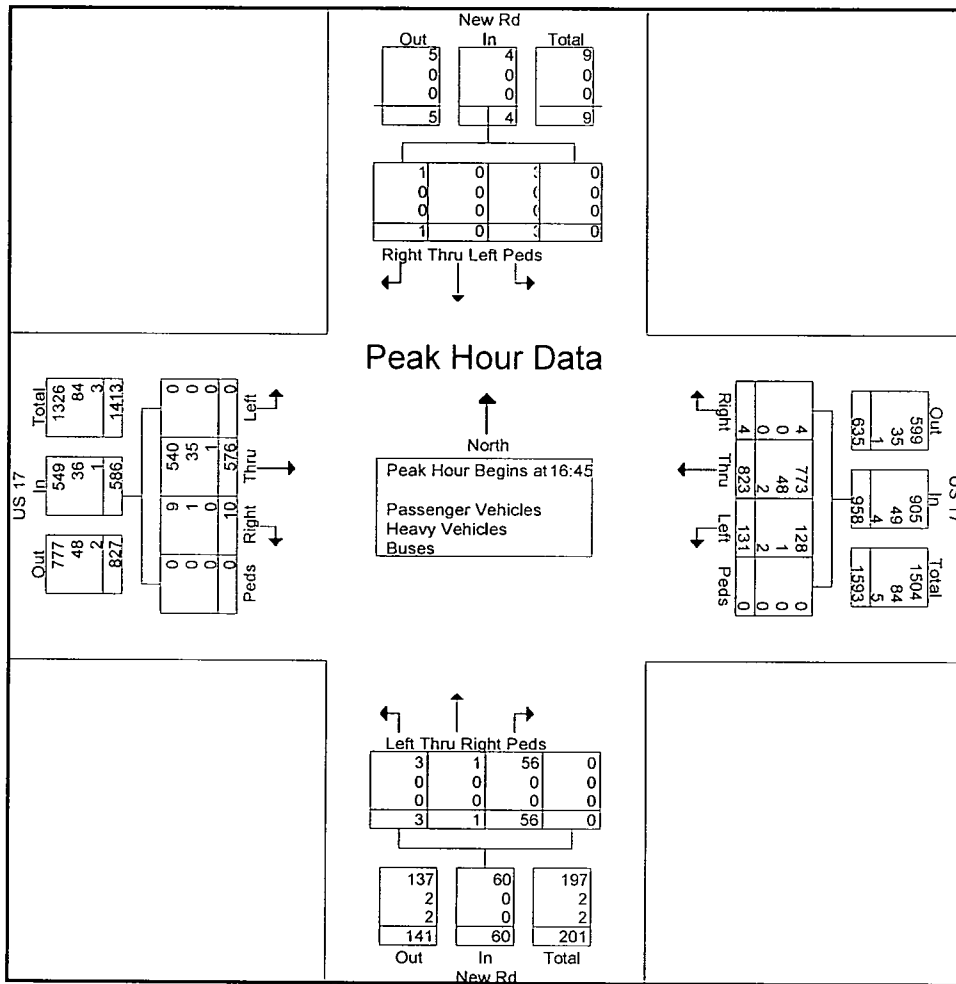
File Name : US 17 @ New Rd

Site Code :

Start Date : 10/29/2020

Page No : 4

Start Time	New Rd Southbound					US 17 Westbound					New Rd Northbound					US 17 Eastbound					Int. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 16:45																						
16:45	1	0	0	0	1	31	214	1	0	246	0	1	14	0	15	0	151	2	0	153	415	
17:00	0	0	0	0	0	39	223	2	0	264	0	0	13	0	13	0	127	2	0	129	406	
17:15	1	0	0	0	1	35	191	1	0	227	2	0	17	0	19	0	157	4	0	161	408	
17:30	1	0	1	0	2	26	195	0	0	221	1	0	12	0	13	0	141	2	0	143	379	
Total Volume	3	0	1	0	4	131	823	4	0	958	3	1	56	0	60	0	576	10	0	586	1608	
% App. Total	75	0	25	0		13.7	85.9	0.4	0		5	1.7	93.3	0		0	98.3	1.7	0			
PHF	.750	.000	.250	.000		.500	.840	.923	.500		.907	.375	.250	.824		.789	.000	.917	.625		.910	.969
Passenger Vehicles	3	0	1	0	4	128	773	4	0	905	3	1	56	0	60	0	540	9	0	549	1518	
% Passenger Vehicles																						
Heavy Vehicles	0	0	0	0	0	1	48	0	0	49	0	0	0	0	0	0	35	1	0	36	85	
% Heavy Vehicles	0	0	0	0	0	0.8	5.8	0	0	5.1	0	0	0	0	0	0	6.1	10.0	0	6.1	5.3	
Buses	0	0	0	0	0	2	2	0	0	4	0	0	0	0	0	0	1	0	0	1	5	
% Buses	0	0	0	0	0	1.5	0.2	0	0	0.4	0	0	0	0	0	0	0.2	0	0	0.2	0.3	





## Appendix D Traffic Volume Development Worksheets





## INTERSECTION TRAFFIC VOLUME DEVELOPMENT

### US 17 & Golden Grove Driveway 2

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: October 29, 2020

AM PEAK HOUR (7:15-8:15 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2020 TRAFFIC VOLUMES												
VOLUME ADJUSTMENT FACTOR	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
<b>2020 ADJUSTED TRAFFIC VOLUMES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	0	0	0	0	0	0	0	0	0	0	0	0
<b>VESTED TRAFFIC</b>												
<b>2026 NO-BUILD TRAFFIC VOLUMES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
New Project Traffic	17	0	0	0	25	27	0	0	0	155	0	27
Pass-By Traffic												
<b>2026 BUILD TRAFFIC VOLUMES</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>27</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>155</b>	<b>0</b>	<b>27</b>

PM PEAK HOUR (4:45-5:45 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2020 TRAFFIC VOLUMES												
VOLUME ADJUSTMENT FACTOR	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
<b>2020 ADJUSTED TRAFFIC VOLUMES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	0	0	0	0	0	0	0	0	0	0	0	0
<b>VESTED TRAFFIC</b>												
<b>2026 NO-BUILD TRAFFIC VOLUMES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
New Project Traffic	58	0	0	0	85	89	0	0	0	102	0	17
Pass-By Traffic												
<b>2026 BUILD TRAFFIC VOLUMES</b>	<b>58</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>85</b>	<b>89</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>102</b>	<b>0</b>	<b>17</b>

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## US 17 & New Road

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: October 29, 2020

AM PEAK HOUR (7:15-8:15 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2020 TRAFFIC VOLUMES	1	537	4	57	516	0	3	1	86	0	2	0
VOLUME ADJUSTMENT FACTOR	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
<b>2020 ADJUSTED TRAFFIC VOLUMES</b>	<b>2</b>	<b>640</b>	<b>5</b>	<b>68</b>	<b>615</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>103</b>	<b>0</b>	<b>3</b>	<b>0</b>
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	0	86	1	9	82	0	0	0	14	0	0	0
<b>VESTED TRAFFIC</b>												
<b>2026 NO-BUILD TRAFFIC VOLUMES</b>	<b>2</b>	<b>726</b>	<b>6</b>	<b>77</b>	<b>697</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>117</b>	<b>0</b>	<b>3</b>	<b>0</b>
New Project Traffic	10	145	0	0	49	0	0	0	0	0	0	3
Pass-By Traffic												
<b>2026 BUILD TRAFFIC VOLUMES</b>	<b>12</b>	<b>871</b>	<b>6</b>	<b>77</b>	<b>746</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>117</b>	<b>0</b>	<b>3</b>	<b>3</b>

PM PEAK HOUR (4:00-5:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2020 TRAFFIC VOLUMES	0	576	10	131	823	4	3	1	56	3	0	1
VOLUME ADJUSTMENT FACTOR	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
<b>2020 ADJUSTED TRAFFIC VOLUMES</b>	<b>0</b>	<b>651</b>	<b>12</b>	<b>149</b>	<b>930</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>64</b>	<b>4</b>	<b>0</b>	<b>2</b>
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	0	92	2	21	131	1	0	0	9	0	0	0
<b>VESTED TRAFFIC</b>												
<b>2026 NO-BUILD TRAFFIC VOLUMES</b>	<b>0</b>	<b>743</b>	<b>14</b>	<b>170</b>	<b>1,061</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>73</b>	<b>4</b>	<b>0</b>	<b>2</b>
New Project Traffic	7	95	0	0	162	0	0	0	0	0	0	12
Pass-By Traffic												
<b>2026 BUILD TRAFFIC VOLUMES</b>	<b>7</b>	<b>838</b>	<b>14</b>	<b>170</b>	<b>1,223</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>73</b>	<b>4</b>	<b>0</b>	<b>14</b>

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## US 17 & SC 165

TRAFFIC CONTROL: Signalized

DATE COUNTED: October 29, 2020

AM PEAK HOUR (7:15-8:15 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
<b>2020 TRAFFIC VOLUMES</b>	80	517	21	50	421	34	33	74	81	88	115	115
VOLUME ADJUSTMENT FACTOR	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
<b>2020 ADJUSTED TRAFFIC VOLUMES</b>	96	616	25	60	501	41	40	89	97	105	137	137
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	13	83	3	8	67	5	5	12	13	14	18	18
<b>VESTED TRAFFIC</b>												
<b>2026 NO-BUILD TRAFFIC VOLUMES</b>	109	699	28	68	568	46	45	101	110	119	155	155
New Project Traffic	21	103	21	0	35	0	7	0	0	0	0	7
Pass-By Traffic												
<b>2026 BUILD TRAFFIC VOLUMES</b>	130	802	49	68	603	46	52	101	110	119	155	162

PM PEAK HOUR (4:30-5:30 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
<b>2020 TRAFFIC VOLUMES</b>	91	556	24	122	725	49	52	125	56	37	81	144
VOLUME ADJUSTMENT FACTOR	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13		1.13
<b>2020 ADJUSTED TRAFFIC VOLUMES</b>	103	629	28	138	820	56	59	142	64	42	92	163
Years To Buildout (2026)	6	6	6	6	6	6	6	6	6	6	6	6
Yearly Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic Growth	15	89	4	19	116	8	8	20	9	6	13	23
<b>VESTED TRAFFIC</b>												
<b>2026 NO-BUILD TRAFFIC VOLUMES</b>	118	718	32	157	936	64	67	162	73	48	105	186
New Project Traffic	14	67	14	0	116	0	23	0	0	0	0	23
Pass-By Traffic												
<b>2026 BUILD TRAFFIC VOLUMES</b>	132	785	46	157	1,052	64	90	162	73	48	105	209

**Appendix E 2020 Existing Conditions**



HCM 2010 TWSC  
3: New Road & US 17/ Savannah Hwy

2020 Existing Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↔			↔	
Traffic Vol, veh/h	2	640	5	68	615	0	4	2	103	0	3	0
Future Vol, veh/h	2	640	5	68	615	0	4	2	103	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	9	25	4	9	2	33	100	2	2	2	2
Mvmt Flow	2	696	5	74	668	0	4	2	112	0	3	0

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	668	0	0	701	0	0	1184	1516	348	1169	1521	334
Stage 1	-	-	-	-	-	-	700	700	-	816	816	-
Stage 2	-	-	-	-	-	-	484	816	-	353	705	-
Critical Hdwy	4.14	-	-	4.18	-	-	8.16	8.5	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.24	-	-	3.83	5	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	918	-	-	879	-	-	113	48	648	148	117	662
Stage 1	-	-	-	-	-	-	331	262	-	337	389	-
Stage 2	-	-	-	-	-	-	459	220	-	637	437	-
Platoon blocked, %												
Mov Cap-1 Maneuver	918	-	-	879	-	-	104	44	648	113	107	662
Mov Cap-2 Maneuver	-	-	-	-	-	-	214	123	-	225	213	-
Stage 1	-	-	-	-	-	-	330	261	-	336	356	-
Stage 2	-	-	-	-	-	-	417	202	-	521	436	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0		0.9		13.1		22.2
HCM LOS					B		C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	562	918	-	-	879	-	-	213
HCM Lane V/C Ratio	0.211	0.002	-	-	0.084	-	-	0.015
HCM Control Delay (s)	13.1	8.9	-	-	9.5	-	-	22.2
HCM Lane LOS		B	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.8	0	-	-	0.3	-	-	0

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2020 Existing Conditions  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	616	25	60	501	41	40	89	97	105	137	137
Future Volume (veh/h)	96	616	25	60	501	41	40	89	97	105	137	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1795	1900	1827	1769	1900	1845	1863	1845	1792	1818	1900
Adj Flow Rate, veh/h	104	670	27	65	545	45	43	97	105	114	149	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	2	4	7	12	3	2	3	6	2	7
Cap, veh/h	315	1197	48	282	1126	93	654	875	736	636	854	0
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.47	0.47	0.47	0.47	0.47	0.00
Sat Flow, veh/h	792	3342	135	731	3145	259	1222	1863	1568	1131	1818	0
Grp Volume(v), veh/h	104	342	355	65	291	299	43	97	105	114	149	0
Grp Sat Flow(s),veh/h/ln	792	1705	1771	731	1681	1724	1222	1863	1568	1131	1818	0
Q Serve(g_s), s	6.1	8.4	8.4	4.1	7.0	7.0	1.1	1.5	2.0	3.3	2.5	0.0
Cycle Q Clear(g_c), s	13.2	8.4	8.4	12.5	7.0	7.0	3.6	1.5	2.0	4.8	2.5	0.0
Prop In Lane	1.00		0.08	1.00		0.15	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	315	611	634	282	602	617	654	875	736	636	854	0
V/C Ratio(X)	0.33	0.56	0.56	0.23	0.48	0.48	0.07	0.11	0.14	0.18	0.17	0.00
Avail Cap(c_a), veh/h	433	866	899	391	854	875	654	875	736	636	854	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.1	13.4	13.5	18.5	13.0	13.0	9.0	7.7	7.9	9.1	8.0	0.0
Incr Delay (d2), s/veh	0.6	0.8	0.8	0.4	0.6	0.6	0.2	0.3	0.4	0.6	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	4.0	4.2	0.9	3.3	3.4	0.4	0.8	0.9	1.1	1.3	0.0
LnGrp Delay(d),s/veh	18.7	14.3	14.2	18.9	13.6	13.6	9.2	8.0	8.3	9.7	8.4	0.0
LnGrp LOS	B	B	B	B	B	B	A	A	A	A	A	
Approach Vol, veh/h	801			655			245			263		
Approach Delay, s/veh	14.8			14.1			8.3			9.0		
Approach LOS	B			B			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	29.0		23.2		29.0		23.2					
Change Period (Y+Rc), s	4.5		4.5		4.5		4.5					
Max Green Setting (Gmax), s	24.5		26.5		24.5		26.5					
Max Q Clear Time (g_c+I1), s	5.6		15.2		6.8		14.5					
Green Ext Time (p_c), s	0.9		3.5		1.1		2.9					
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay	13.0											
HCM 2010 LOS	B											



Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↔			↔	
Traffic Vol, veh/h	0	651	12	149	930	5	4	2	64	4	0	2
Future Vol, veh/h	0	651	12	149	930	5	4	2	64	4	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	6	10	2	6	2	2	2	2	2	2	2
Mvmt Flow	0	708	13	162	1011	5	4	2	70	4	0	2

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1016	0	0	721	0	0	1538	2048	354	1693	2059	508
Stage 1	-	-	-	-	-	-	708	708	-	1338	1338	-
Stage 2	-	-	-	-	-	-	830	1340	-	355	721	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	678	-	-	877	-	-	79	55	642	60	54	510
Stage 1	-	-	-	-	-	-	392	436	-	161	220	-
Stage 2	-	-	-	-	-	-	331	220	-	635	430	-
Platoon blocked, %												
Mov Cap-1 Maneuver	678	-	-	877	-	-	67	45	642	45	44	510
Mov Cap-2 Maneuver	-	-	-	-	-	-	175	132	-	121	117	-
Stage 1	-	-	-	-	-	-	392	436	-	161	179	-
Stage 2	-	-	-	-	-	-	269	179	-	563	430	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.4	13.3	28.2
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	508	678	-	-	877	-	-	162
HCM Lane V/C Ratio	0.15	-	-	-	0.185	-	-	0.04
HCM Control Delay (s)	13.3	0	-	-	10	-	-	28.2
HCM Lane LOS	B	A	-	-	B	-	-	D
HCM 95th %tile Q(veh)	0.5	0	-	-	0.7	-	-	0.1

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2020 Existing Conditions  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	629	28	138	820	56	59	142	64	42	92	163
Future Volume (veh/h)	103	629	28	138	820	56	59	142	64	42	92	163
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1743	1791	1900	1863	1797	1900	1792	1863	1827	1863	1833	1900
Adj Flow Rate, veh/h	112	684	30	150	891	61	64	154	70	46	100	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	6	8	2	6	2	6	2	4	2	3	4
Cap, veh/h	294	1610	71	392	1572	108	518	645	538	466	635	0
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.35	0.35	0.35	0.35	0.35	0.00
Sat Flow, veh/h	549	3321	146	733	3243	222	1241	1863	1553	1152	1833	0
Grp Volume(v), veh/h	112	350	364	150	469	483	64	154	70	46	100	0
Grp Sat Flow(s),veh/h/ln	549	1701	1765	733	1707	1758	1241	1863	1553	1152	1833	0
Q Serve(g_s), s	9.7	7.1	7.1	8.9	10.4	10.4	2.0	3.1	1.6	1.6	2.0	0.0
Cycle Q Clear(g_c), s	20.1	7.1	7.1	16.0	10.4	10.4	4.0	3.1	1.6	4.7	2.0	0.0
Prop In Lane	1.00		0.08	1.00		0.13	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	294	825	856	392	828	852	518	645	538	466	635	0
V/C Ratio(X)	0.38	0.42	0.42	0.38	0.57	0.57	0.12	0.24	0.13	0.10	0.16	0.00
Avail Cap(c_a), veh/h	362	1036	1075	483	1039	1070	518	645	538	466	635	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.9	8.9	8.9	14.1	9.8	9.8	13.4	12.4	11.9	14.1	12.1	0.0
Incr Delay (d2), s/veh	0.8	0.3	0.3	0.6	0.6	0.6	0.5	0.9	0.5	0.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.4	3.5	1.9	5.0	5.1	0.7	1.7	0.8	0.6	1.1	0.0
LnGrp Delay(d),s/veh	17.7	9.3	9.3	14.7	10.4	10.4	13.9	13.3	12.4	14.5	12.6	0.0
LnGrp LOS	B	A	A	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		826			1102			288				146
Approach Delay, s/veh		10.4			11.0			13.2				13.2
Approach LOS		B			B			B				B
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		30.4		23.0		30.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.5		32.5		18.5		32.5				
Max Q Clear Time (g_c+1), s		6.0		22.1		6.7		18.0				
Green Ext Time (p_c), s		1.0		3.8		0.5		5.8				
Intersection Summary												
HCM 2010 Ctrl Delay				11.2								
HCM 2010 LOS				B								

**Appendix F 2026 No-Build Conditions**



Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↔			↔	
Traffic Vol, veh/h	2	726	6	77	697	0	4	2	117	0	3	0
Future Vol, veh/h	2	726	6	77	697	0	4	2	117	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	9	25	4	9	2	33	100	2	2	2	2
Mvmt Flow	2	789	7	84	758	0	4	2	127	0	3	0























Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	758	0	0	796	0	0	1342	1719	395	1326	1726	379
Stage 1	-	-	-	-	-	-	793	793	-	926	926	-
Stage 2	-	-	-	-	-	-	549	926	-	400	800	-
Critical Hdwy	4.14	-	-	4.18	-	-	8.16	8.5	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.24	-	-	3.83	5	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	849	-	-	809	-	-	84	33	604	114	88	619
Stage 1	-	-	-	-	-	-	287	228	-	289	346	-
Stage 2	-	-	-	-	-	-	416	186	-	597	395	-
Platoon blocked, %												
Mov Cap-1 Maneuver	849	-	-	809	-	-	76	30	604	81	79	619
Mov Cap-2 Maneuver	-	-	-	-	-	-	181	101	-	186	178	-
Stage 1	-	-	-	-	-	-	286	228	-	288	310	-
Stage 2	-	-	-	-	-	-	369	167	-	466	394	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1	14.3	25.6
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	522	849	-	-	809	-	-	178
HCM Lane V/C Ratio	0.256	0.003	-	-	0.103	-	-	0.018
HCM Control Delay (s)	14.3	9.3	-	-	10	-	-	25.6
HCM Lane LOS	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1	0	-	-	0.3	-	-	0.1

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2026 No Build Conditions  
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	699	28	68	568	46	45	101	110	119	155	155
Future Volume (veh/h)	109	699	28	68	568	46	45	101	110	119	155	155
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1795	1900	1827	1770	1900	1845	1863	1845	1792	1818	1900
Adj Flow Rate, veh/h	118	760	30	74	617	50	49	110	120	129	168	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	2	4	7	12	3	2	3	6	2	7
Cap, veh/h	310	1308	52	273	1232	100	598	830	698	584	810	0
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.45	0.45	0.45	0.45	0.45	0.00
Sat Flow, veh/h	737	3345	132	670	3151	255	1201	1863	1568	1103	1818	0
Grp Volume(v), veh/h	118	387	403	74	329	338	49	110	120	129	168	0
Grp Sat Flow(s),veh/h/ln	737	1705	1772	670	1681	1725	1201	1863	1568	1103	1818	0
Q Serve(g_s), s	7.9	9.8	9.9	5.4	8.1	8.2	1.4	1.9	2.5	4.3	3.1	0.0
Cycle Q Clear(g_c), s	16.1	9.8	9.9	15.2	8.1	8.2	4.5	1.9	2.5	6.2	3.1	0.0
Prop In Lane	1.00		0.07	1.00		0.15	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	310	667	693	273	657	674	598	830	698	584	810	0
V/C Ratio(X)	0.38	0.58	0.58	0.27	0.50	0.50	0.08	0.13	0.17	0.22	0.21	0.00
Avail Cap(c_a), veh/h	377	822	854	334	810	831	598	830	698	584	810	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.8	13.2	13.2	19.2	12.7	12.7	10.7	9.0	9.2	10.8	9.3	0.0
Incr Delay (d2), s/veh	0.8	0.8	0.8	0.5	0.6	0.6	0.3	0.3	0.5	0.9	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	4.8	5.0	1.0	3.9	4.0	0.5	1.1	1.2	1.4	1.7	0.0
LnGrp Delay(d),s/veh	19.6	14.0	14.0	19.7	13.3	13.3	11.0	9.3	9.7	11.7	9.9	0.0
LnGrp LOS	B	B	B	B	B	B	B	A	A	B	A	
Approach Vol, veh/h		908			741			279			297	
Approach Delay, s/veh		14.7			13.9			9.8			10.7	
Approach LOS		B			B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.0		26.0		29.0		26.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		24.5		26.5		24.5		26.5				
Max Q Clear Time (g_c+I1), s		6.5		18.1		8.2		17.2				
Green Ext Time (p_c), s		1.1		3.4		1.3		3.0				
Intersection Summary												
HCM 2010 Ctrl Delay				13.3								
HCM 2010 LOS				B								

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↕			↕	
Traffic Vol, veh/h	0	743	14	170	1061	6	4	2	73	4	0	2
Future Vol, veh/h	0	743	14	170	1061	6	4	2	73	4	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	6	10	2	6	2	2	2	2	2	2	2
Mvmt Flow	0	808	15	185	1153	7	4	2	79	4	0	2























Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1160	0	0	823	0	0	1755	2338	404	1932	2350	580
Stage 1	-	-	-	-	-	-	808	808	-	1527	1527	-
Stage 2	-	-	-	-	-	-	947	1530	-	405	823	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	598	-	-	803	-	-	54	36	596	40	35	458
Stage 1	-	-	-	-	-	-	341	392	-	123	178	-
Stage 2	-	-	-	-	-	-	281	177	-	593	386	-
Platoon blocked, %												
Mov Cap-1 Maneuver	598	-	-	803	-	-	44	28	596	28	27	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	139	102	-	91	86	-
Stage 1	-	-	-	-	-	-	341	392	-	123	137	-
Stage 2	-	-	-	-	-	-	215	136	-	511	386	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0		1.5		14.6		35.6
HCM LOS					B		E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	462	598	-	-	803	-	-	124
HCM Lane V/C Ratio	0.186	-	-	-	0.23	-	-	0.053
HCM Control Delay (s)	14.6	0	-	-	10.8	-	-	35.6
HCM Lane LOS	B	A	-	-	B	-	-	E
HCM 95th %tile Q(veh)	0.7	0	-	-	0.9	-	-	0.2

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2026 No Build Conditions  
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	718	32	157	936	64	67	162	73	48	105	186
Future Volume (veh/h)	118	718	32	157	936	64	67	162	73	48	105	186
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1743	1791	1900	1827	1770	1900	1792	1863	1827	1863	1833	1900
Adj Flow Rate, veh/h	128	780	35	171	1017	70	73	176	79	52	114	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	6	8	4	7	12	6	2	4	2	3	4
Cap, veh/h	274	1761	79	376	1695	117	454	588	490	396	579	0
Arrive On Green	0.53	0.53	0.53	0.53	0.53	0.53	0.32	0.32	0.32	0.32	0.32	0.00
Sat Flow, veh/h	484	3317	149	655	3194	220	1225	1863	1553	1120	1833	0
Grp Volume(v), veh/h	128	400	415	171	535	552	73	176	79	52	114	0
Grp Sat Flow(s), veh/h/ln	484	1701	1765	655	1682	1732	1225	1863	1553	1120	1833	0
Q Serve(g_s), s	14.5	8.5	8.5	12.7	12.8	12.9	2.7	4.2	2.2	2.2	2.7	0.0
Cycle Q Clear(g_c), s	27.4	8.5	8.5	21.2	12.8	12.9	5.4	4.2	2.2	6.3	2.7	0.0
Prop In Lane	1.00		0.08	1.00		0.13	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	274	903	937	376	893	919	454	588	490	396	579	0
V/C Ratio(X)	0.47	0.44	0.44	0.45	0.60	0.60	0.16	0.30	0.16	0.13	0.20	0.00
Avail Cap(c_a), veh/h	285	943	978	391	932	960	454	588	490	396	579	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.9	8.4	8.4	14.9	9.5	9.5	16.6	15.2	14.5	17.6	14.6	0.0
Incr Delay (d2), s/veh	1.2	0.3	0.3	0.9	1.0	1.0	0.8	1.3	0.7	0.7	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.0	4.1	2.4	6.0	6.2	1.0	2.4	1.0	0.7	1.5	0.0
LnGrp Delay(d),s/veh	20.1	8.8	8.8	15.8	10.5	10.4	17.4	16.5	15.2	18.2	15.4	0.0
LnGrp LOS	C	A	A	B	B	B	B	B	B	B	B	B
Approach Vol, veh/h		943			1258			328			166	
Approach Delay, s/veh		10.3			11.2			16.4			16.3	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		35.6		23.0		35.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.5		32.5		18.5		32.5				
Max Q Clear Time (g_c+I1), s		7.4		29.4		8.3		23.2				
Green Ext Time (p_c), s		1.1		1.7		0.5		5.2				
Intersection Summary												
HCM 2010 Ctrl Delay				11.8								
HCM 2010 LOS				B								

## Appendix G 2026 Build Conditions





Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	751	728	25	0	25
Future Vol, veh/h	0	751	728	25	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	7	2	2	2
Mvmt Flow	0	816	791	27	0	27

Major/Minor	Major1	Major2	Minor2	
Conflicting Flow All	-	0	-	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0
Stage 1	0	-	-	0
Stage 2	0	-	-	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	603
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	603
HCM Lane V/C Ratio	-	-	-	0.045
HCM Control Delay (s)	-	-	-	11.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	17	734	726	27	155	27
Future Vol, veh/h	17	734	726	27	155	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	100	200	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	7	2	2	2
Mvmt Flow	18	798	789	29	168	29

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	818	0	-	0	1224 395
Stage 1	-	-	-	-	789 -
Stage 2	-	-	-	-	435 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	806	-	-	-	171 604
Stage 1	-	-	-	-	408 -
Stage 2	-	-	-	-	620 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	806	-	-	-	167 604
Mov Cap-2 Maneuver	-	-	-	-	346 -
Stage 1	-	-	-	-	399 -
Stage 2	-	-	-	-	620 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	22.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	806	-	-	-	346	604
HCM Lane V/C Ratio	0.023	-	-	-	0.487	0.049
HCM Control Delay (s)	9.6	-	-	-	24.9	11.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	2.6	0.2

Notes  
 ~: Volume exceeds capacity    S: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↔			↔	
Traffic Vol, veh/h	12	871	6	77	746	0	4	2	117	0	3	3
Future Vol, veh/h	12	871	6	77	746	0	4	2	117	0	3	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	9	25	4	9	2	33	100	2	2	2	2
Mvmt Flow	13	947	7	84	811	0	4	2	127	0	3	3

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	811	0	0	954	0	0	1548	1952	474	1480	1959	406
Stage 1	-	-	-	-	-	-	973	973	-	979	979	-
Stage 2	-	-	-	-	-	-	575	979	-	501	980	-
Critical Hdwy	4.14	-	-	4.18	-	-	8.16	8.5	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.24	-	-	3.83	5	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	811	-	-	704	-	-	57	21	537	87	63	594
Stage 1	-	-	-	-	-	-	218	173	-	268	326	-
Stage 2	-	-	-	-	-	-	400	171	-	521	326	-
Platoon blocked, %												
Mov Cap-1 Maneuver	811	-	-	704	-	-	50	18	537	58	55	594
Mov Cap-2 Maneuver	-	-	-	-	-	-	141	78	-	155	143	-
Stage 1	-	-	-	-	-	-	215	170	-	264	287	-
Stage 2	-	-	-	-	-	-	346	151	-	386	321	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0.1		1		16.3		21
HCM LOS					C		C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	452	811	-	-	704	-	-	231
HCM Lane V/C Ratio	0.296	0.016	-	-	0.119	-	-	0.028
HCM Control Delay (s)	16.3	9.5	-	-	10.8	-	-	21
HCM Lane LOS	C	A	-	-	B	-	-	C
HCM 95th %tile Q(veh)	1.2	0	-	-	0.4	-	-	0.1

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2026 Build Conditions  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	802	49	68	603	46	52	101	110	119	155	162
Future Volume (veh/h)	130	802	49	68	603	46	52	101	110	119	155	162
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1796	1900	1827	1770	1900	1845	1863	1845	1776	1826	1900
Adj Flow Rate, veh/h	141	872	53	74	655	50	57	110	120	129	168	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	2	4	7	12	3	2	3	7	2	6
Cap, veh/h	342	1440	87	272	1395	106	532	735	619	521	720	0
Arrive On Green	0.44	0.44	0.44	0.44	0.44	0.44	0.39	0.39	0.39	0.39	0.39	0.00
Sat Flow, veh/h	712	3269	199	591	3167	242	1201	1863	1568	1092	1826	0
Grp Volume(v), veh/h	141	455	470	74	347	358	57	110	120	129	168	0
Grp Sat Flow(s),veh/h/ln	712	1707	1761	591	1681	1727	1201	1863	1568	1092	1826	0
Q Serve(g_s), s	9.5	11.1	11.1	6.0	7.9	8.0	1.8	2.1	2.7	4.7	3.3	0.0
Cycle Q Clear(g_c), s	17.5	11.1	11.1	17.1	7.9	8.0	5.2	2.1	2.7	6.8	3.3	0.0
Prop In Lane	1.00		0.11	1.00		0.14	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	342	752	776	272	740	761	532	735	619	521	720	0
V/C Ratio(X)	0.41	0.61	0.61	0.27	0.47	0.47	0.11	0.15	0.19	0.25	0.23	0.00
Avail Cap(c_a), veh/h	413	924	953	332	910	935	532	735	619	521	720	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.9	11.6	11.6	18.1	10.8	10.8	12.7	10.6	10.8	12.8	11.0	0.0
Incr Delay (d2), s/veh	0.8	0.8	0.8	0.5	0.5	0.5	0.4	0.4	0.7	1.1	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	5.3	5.5	1.0	3.8	3.9	0.7	1.2	1.3	1.6	1.8	0.0
LnGrp Delay(d),s/veh	17.7	12.4	12.4	18.7	11.2	11.2	13.1	11.0	11.5	13.9	11.8	0.0
LnGrp LOS	B	B	B	B	B	B	B	B	B	B	B	
Approach Vol, veh/h		1066			779			287			297	
Approach Delay, s/veh		13.1			11.9			11.7			12.7	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		26.0		28.5		26.0		28.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		21.5		29.5		21.5		29.5				
Max Q Clear Time (g_c+I1), s		7.2		19.5		8.8		19.1				
Green Ext Time (p_c), s		1.0		4.5		1.2		3.4				
Intersection Summary												
HCM 2010 Ctrl Delay				12.5								
HCM 2010 LOS				B								

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	815	1084	85	0	17
Future Vol, veh/h	0	815	1084	85	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	7	2	2	2
Mvmt Flow	0	886	1178	92	0	18

Major/Minor	Major1	Major2	Minor2	
Conflicting Flow All	-	0	-	0 589
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	0 452
Stage 1	0	-	-	0 -
Stage 2	0	-	-	0 -
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	- 452
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	452
HCM Lane V/C Ratio	-	-	-	0.041
HCM Control Delay (s)	-	-	-	13.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	58	757	1152	89	102	17
Future Vol, veh/h	58	757	1152	89	102	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	100	200	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	7	2	2	2
Mvmt Flow	63	823	1252	97	111	18

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1349	0	-	0	1790 626
Stage 1	-	-	-	-	1252 -
Stage 2	-	-	-	-	538 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	506	-	-	-	~72 427
Stage 1	-	-	-	-	233 -
Stage 2	-	-	-	-	549 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	506	-	-	-	~63 427
Mov Cap-2 Maneuver	-	-	-	-	185 -
Stage 1	-	-	-	-	204 -
Stage 2	-	-	-	-	549 -

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	44.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	506	-	-	-	185	427
HCM Lane V/C Ratio	0.125	-	-	-	0.599	0.043
HCM Control Delay (s)	13.1	-	-	-	50	13.8
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	0.4	-	-	-	3.3	0.1

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↕			↕	
Traffic Vol, veh/h	7	838	14	170	1223	6	4	2	73	4	0	14
Future Vol, veh/h	7	838	14	170	1223	6	4	2	73	4	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	330	-	330	325	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	6	10	2	6	2	33	100	2	2	2	2
Mvmt Flow	8	911	15	185	1329	7	4	2	79	4	0	15

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1336	0	0	926	0	0	1962	2633	456	2176	2645	668
Stage 1	-	-	-	-	-	-	927	927	-	1703	1703	-
Stage 2	-	-	-	-	-	-	1035	1706	-	473	942	-
Critical Hdwy	4.14	-	-	4.14	-	-	8.16	8.5	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.16	7.5	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.83	5	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	512	-	-	734	-	-	26	5	551	26	23	401
Stage 1	-	-	-	-	-	-	234	186	-	95	146	-
Stage 2	-	-	-	-	-	-	198	54	-	541	340	-
Platoon blocked, %												
Mov Cap-1 Maneuver	512	-	-	734	-	-	20	4	551	17	17	401
Mov Cap-2 Maneuver	-	-	-	-	-	-	86	26	-	69	65	-
Stage 1	-	-	-	-	-	-	230	183	-	93	109	-
Stage 2	-	-	-	-	-	-	142	40	-	450	335	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.4	21.1	25.6
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	309	512	-	-	734	-	-	194
HCM Lane V/C Ratio	0.278	0.015	-	-	0.252	-	-	0.101
HCM Control Delay (s)	21.1	12.1	-	-	11.5	-	-	25.6
HCM Lane LOS	C	B	-	-	B	-	-	D
HCM 95th %tile Q(veh)	1.1	0	-	-	1	-	-	0.3

HCM 2010 Signalized Intersection Summary  
 4: SC 165 & US 17/ Savannah Hwy

2026 Build Conditions  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	785	46	157	1052	64	90	162	73	48	105	209
Future Volume (veh/h)	132	785	46	157	1052	64	90	162	73	48	105	209
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1743	1791	1900	1863	1796	1900	1792	1863	1827	1863	1833	1900
Adj Flow Rate, veh/h	143	853	50	171	1143	70	98	176	79	52	114	0
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	6	8	2	6	2	6	2	4	2	3	4
Cap, veh/h	268	1948	114	385	1949	119	379	506	422	325	498	0
Arrive On Green	0.60	0.60	0.60	0.60	0.60	0.60	0.27	0.27	0.27	0.27	0.27	0.00
Sat Flow, veh/h	429	3266	191	615	3268	200	1225	1863	1553	1120	1833	0
Grp Volume(v), veh/h	143	444	459	171	597	616	98	176	79	52	114	0
Grp Sat Flow(s),veh/h/ln	429	1701	1757	615	1707	1761	1225	1863	1553	1120	1833	0
Q Serve(g_s), s	21.1	9.7	9.7	14.3	14.8	14.8	4.6	5.2	2.7	2.7	3.3	0.0
Cycle Q Clear(g_c), s	36.0	9.7	9.7	24.1	14.8	14.8	7.9	5.2	2.7	7.9	3.3	0.0
Prop In Lane	1.00		0.11	1.00		0.11	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	268	1015	1048	385	1018	1050	379	506	422	325	498	0
V/C Ratio(X)	0.53	0.44	0.44	0.44	0.59	0.59	0.26	0.35	0.19	0.16	0.23	0.00
Avail Cap(c_a), veh/h	280	1061	1096	401	1064	1098	379	506	422	325	498	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.7	7.5	7.5	14.1	8.5	8.5	22.4	20.0	19.1	23.1	19.3	0.0
Incr Delay (d2), s/veh	1.8	0.3	0.3	0.8	0.8	0.8	1.6	1.9	1.0	1.1	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.5	4.7	2.5	7.0	7.2	1.7	2.9	1.3	0.9	1.8	0.0
LnGrp Delay(d),s/veh	21.5	7.8	7.8	14.9	9.3	9.3	24.0	21.9	20.0	24.2	20.4	0.0
LnGrp LOS	C	A	A	B	A	A	C	C	C	C	C	
Approach Vol, veh/h		1046			1384			353			166	
Approach Delay, s/veh		9.7			10.0			22.0			21.6	
Approach LOS		A			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		45.2		23.0		45.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.5		42.5		18.5		42.5				
Max Q Clear Time (g_c+I1), s		9.9		38.0		9.9		26.1				
Green Ext Time (p_c), s		1.0		2.7		0.4		8.3				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				12.0								
HCM 2010 LOS				B								



## Appendix H Turn Lane Analysis Worksheet



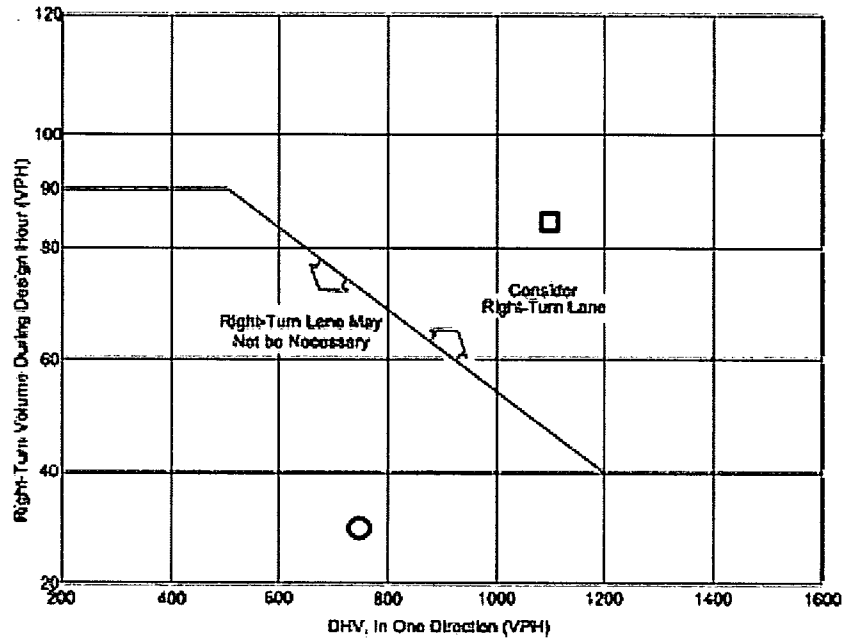
## RIGHT-TURN LANE WARRANT REVIEW

**INTERSECTION:** US 17 & Golden Grove Driveway 1 (2026)  
**MOVEMENT:** Westbound Right-Turn Lane

March 2017

INTERSECTIONS

9.5-3



*Note: Figure is only applicable on highways with a design speed of 50 miles per hour or greater.*

**GUIDELINES FOR RIGHT-TURN LANES AT UNSIGNALIZED INTERSECTIONS  
 ON FOUR-LANE HIGHWAYS**  
 Figure 9.5-B

2030 Build Conditions	Major Road Volume (Direction of Right Turn Ingress)	Right Turn Volume	Speed along Right Turn Ingress	Symbol
AM Peak Hour	753	25	25	○
PM Peak Hour	1169	85	25	◻

## RIGHT-TURN LANE WARRANT REVIEW

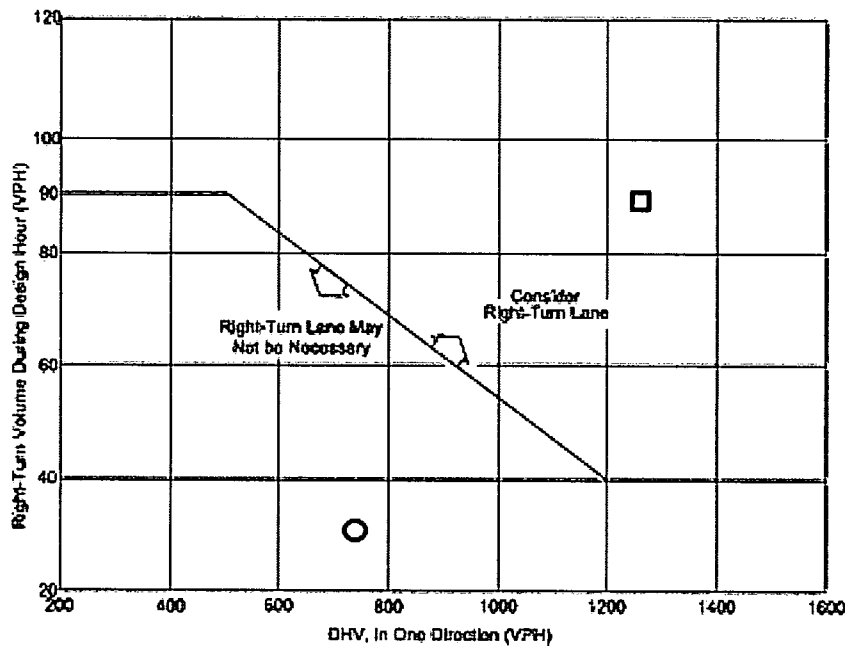
**INTERSECTION:** US 17 & Golden Grove Driveway 2 (2026)

**MOVEMENT:** Westbound Right-Turn Lane

March 2017

INTERSECTIONS

9.5-3



*Note: Figure is only applicable on highways with a design speed of 50 miles per hour or greater.*

**GUIDELINES FOR RIGHT-TURN LANES AT UNSIGNALIZED INTERSECTIONS  
ON FOUR-LANE HIGHWAYS**  
Figure 9.5-B

2030 Build Conditions	Major Road Volume (Direction of Right Turn Ingress)	Right Turn Volume	Speed along Right Turn Ingress	Symbol
AM Peak Hour	753	27	25	○
PM Peak Hour	1,241	89	25	□

# APPENDIX 5

SCDOT TIA Acceptance

**From:** [Johnson, Joshua A.](#)  
**To:** [Megan Baum](#)  
**Cc:** [Fleming, Juleigh B.](#); [Grooms, Robert W.](#); [Ricky Waters](#); [Jenna Nelson](#); [Payne, Adam C.](#); [Anastopoulos, Angelo A.](#)  
**Subject:** [EXTERNAL] RE: Golden Grove TIA Review  
**Date:** Monday, February 8, 2021 11:37:43 AM  
**Attachments:** [Golden Grove TIA Stantec 01-18-21.pdf](#)  
[Comment Response Letter.pdf](#)

---

Megan,

The Golden Grove TIA is accepted with proposed mitigation of right-turn lanes at both access points, a left-turn lane at the full access driveway, and a new/updated TIA when further development occurs beyond the proposed 382 single family units. It was noted that discussion of signalization was omitted based on the updated development plan, and that the proposed full access location would not be guaranteed a traffic signal even if warranted based on its proximity to New Rd. Please upload this approval email and the final stamped TIA with the encroachment application in EPPS. Also provide documentation from the Town of Ravenel that the development will be restricted to 382 single family residential units until further study as provided and approved.

Thanks,

**Josh Johnson, PE, PTOE**  
District Traffic Engineer | SCDOT District 6

---

**From:** Megan Baum <[mbaum@bowmanconsulting.com](mailto:mbaum@bowmanconsulting.com)>  
**Sent:** Thursday, February 4, 2021 9:57 AM  
**To:** Johnson, Joshua A. <[JohnsonJA@scdot.org](mailto:JohnsonJA@scdot.org)>  
**Cc:** Fleming, Juleigh B. <[FlemingJB@scdot.org](mailto:FlemingJB@scdot.org)>; Grooms, Robert W. <[GroomsRW@scdot.org](mailto:GroomsRW@scdot.org)>; Ricky Waters <[rwaters@bowmanconsulting.com](mailto:rwaters@bowmanconsulting.com)>; Jenna Nelson <[jnelson@bowmanconsulting.com](mailto:jnelson@bowmanconsulting.com)>; Payne, Adam C. <[PayneAC@scdot.org](mailto:PayneAC@scdot.org)>  
**Subject:** RE: Golden Grove TIA Review

**\*\*\* This is an EXTERNAL email. Please do not click on a link or open any attachments unless you are confident it is from a trusted source. \*\*\***

Good morning, Josh,

Please see the attached response letter and revised TIA for Golden Grove that address your comments below. Please let us know if you have any questions or need anything else!

Respectfully,  
Megan

**Megan Baum**  
Project Coordinator | **Bowman**  
O: (843) 501-0333 | D: (843) 501-0328  
[mbaum@bowmanconsulting.com](mailto:mbaum@bowmanconsulting.com)

# APPENDIX 6

Charleston Water System Water Availability Letter



PO Box B  
Charleston, SC 29402  
103 St. Philip Street (29403)

(843) 727-6800  
www.charlestonwater.com

**Board of Commissioners**

Thomas B. Pritchard, Chairman  
David E. Rivers, Vice Chairman  
William E. Koopman, Jr., Commissioner  
Mayor John J. Tecklenburg (Ex-Officio)  
Councilmember Perry K. Waring (Ex-Officio)

**Officers**

Kin Hill, P.E., Chief Executive Officer  
Mark Cline, P.E., Assistant Chief Executive Officer  
Dorothy Harrison, Chief Administrative Officer  
Wesley Ropp, CMA, Chief Financial Officer  
Russell Huggins, P.E., Capital Projects Officer

November 9, 2020

Megan Baum  
Bowman Consulting  
[mbaum@bowmanconsulting.com](mailto:mbaum@bowmanconsulting.com)

Water Availability to TMS: 175-00-00-052  
Single Family Residential

This letter is to certify our willingness and ability to provide water service to the above referenced site in Charleston County, South Carolina. CWS currently owns a 16" Ductile Iron water main within an easement on the west side of New Road which may serve the site.

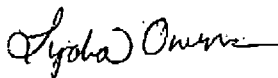
It will of course be a developer responsibility to ensure there are adequate pressures and quantities on the existing mains to serve this site with domestic water/fire flow and not negatively impact the existing developments. Please be advised any extensions or modifications to the infrastructure as well as any additional fire protection will be a developer's expense. All fees and cost associated with providing service to this site will be a developer expense and will be due prior to connection of any Charleston Water System's water systems. This letter does not reserve capacity in the Charleston Water System infrastructure and it is incumbent upon the developer or his agent to confirm the availability herein granted past 12 months of this correspondence.

The Charleston Water System certifies the availability of service only insofar as its rights allow. Should access to our existing main/mains be denied by appropriate governing authorities, the Charleston Water System will have no other option than to deny service.

This letter is not to be construed as a letter of acceptance for operation and maintenance from the Department of Health and Environmental Control.

If there are any questions pertaining to this letter, please do not hesitate to call on me at (843) 727-6869.

Sincerely,



Lydia Owens  
Charleston Water System

# APPENDIX 7

Charleston Water System Water Infrastructure Map





**Legend**

1 inch equals 856 feet

- |  |  |                |  |                   |
|--|--|----------------|--|-------------------|
|  |  | ThreeWay       |  | Transmission Main |
|  |  | HydrantControl |  | AirRelease        |
|  |  | Gate           |  | Butterfly         |
|  |  | Water Main     |  |                   |
|  |  |                |  |                   |

# APPENDIX 8

## Residential Sewer Calculations



Sanitary Sewer Calculations:  
8 IN MAIN (Residential)

Project: Golden Grove  
Project No.: 150001-02-002  
Municipality: Town of Ravenel

Date: 12/15/2020  
Designed: BH  
Checked: BJ

**Sanitary Sewer Design Flow**

Type	Unit Flow (gpd)		Quantity		Flow (gpd)	Remarks
Residences	300	Residence	381	Units	114,300	61-67.App A.CC. Residences (Per House, Unit)

\*Flows based on Standards for Charleston Water Systems Standards (Per CWS).

Flow per Day: 

114,300
---------

 gpd  
ERU 

381
-----

# APPENDIX 9

## Preliminary Drainage Study

# Golden Grove Town of Ravenel

## Preliminary Drainage Study

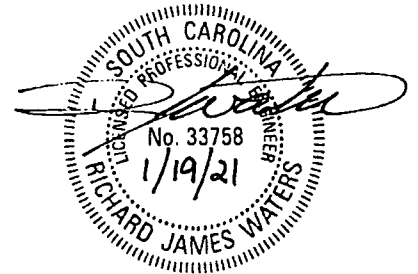
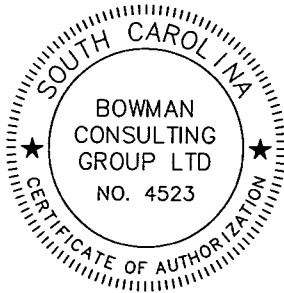
Golden Grove – Town of Ravenel, SC  
BCG Project No.: 150002-02-002

PREPARED FOR  
BRD Land and Investment 1, LP  
725 Cherry Road, Suite 3234  
Rock Hill, SC 29732

January 19, 2021

PREPARED BY

# Bowman



Bowman Consulting Group, Ltd.  
880 Island Park Drive, Suite 400 • Charleston, SC 29492  
Phone: 843.501.0333 • bowmanconsulting.com

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INTRODUCTION..... 3

Project Description..... 4

Pre-Development Conditions..... 5

Post-Development Conditions..... 5

Stormwater Management Summary..... 6

Methodology & References..... 6

Water Quality Volume Summary..... 7

Conclusion..... 8

APPENDIX A..... 9

APPENDIX B..... 17

APPENDIX C..... 19

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## INTRODUCTION

This Preliminary Drainage Study for the proposed residential single-family detached development, commercial development, and mine sites development at Golden Grove in the Town of Ravenel (Charleston County) has been prepared by Bowman Consulting for BRD Land and Investment 1, LP. Bowman Consulting performed a preliminary hydrological assessment for the properties defined as TMS# 175-00-00-049, -052, 168-00-00-001, -023, and 186-00-00-062.

### Purpose of this Document

This preliminary drainage study assesses the hydrologic aspects and stormwater drainage conditions as a result of the development of residential single-family detached units and commercial development, including right-of-way, landscaping areas, stormwater management facilities, associated utilities and related site improvements.

The focus of the preliminary study is the identification of the existing drainage characteristics in comparison to post-development conditions. Preliminary calculations documenting the design of the stormwater management system are illustrated on the Stormwater Management Plan drawing documents, prepared by Bowman Consulting.

---

## PROJECT DESCRIPTION

The project known as Golden Grove is located along the north, northwest side of U.S. Highway 17 and is bisected by Old Jacksonboro Road within the Town of Ravenel (Charleston County), South Carolina that encompasses 597.64 acres of land. Pre-development conditions consist of vacant land, specifically vegetation, woods, and wetlands. The overall project site predominantly drains from south to north. The parcel(s) fronting Highway 17 is relatively flat, and the parcel(s) that is fronting (north) Old Jacksonboro Road has a significant grade change from south to north as there are existing wetlands and center features to the north. Improvements include residential single-family detached units, commercial development, rights-of-way, landscape, and stormwater facilities and infrastructure.

### Project Information

- Disturbed Area:  $\pm 597.64$  ac
- Drainage Analysis Area:  $\pm 171.17$ ac
- Location: Town of Ravenel, SC
- TMS#: 175-00-00-049, -052, 168-00-00-001, -023, 186-00-00-062
- Latitude/Longitude: N 32-46-28 W -80-16-37
- FEMA Map: 45019C0445K (Effective January 29, 2021)
  - Flood Zone: AE & X
- Quad Map: Osborn, SC-Charleston County
- Wetland Delineation:  $\pm 13.74$  ac
  - Wetland Impacts:  $\pm 0.00$  ac.
- Downstream WQMS:
  - Waterbody: Swimton Creek
  - 303d List: N/A
  - TMDL Established: N/A

Due to the anticipated increase in the stormwater runoff, aboveground detention pond strategies are proposed to decrease the post-development runoff rates of pre-development rates for the 2-year, 10-year, 25-year, 50-year, and 100-year storm events. See the HydroCAD output figures in Appendix C for preliminary pre- and post-development peak runoff flow rates.



---

## **PRE-DEVELOPMENT CONDITIONS**

### Residential Single-Family and Commercial Development Portion

The parcel(s) fronting Highway 17 to the south and Old Jacksonboro Road to the north consists of vegetation, woods, and wetlands. The preliminary analysis area considers the site as one (1) drainage undeveloped area analysis point and one (1) drainage area based on preliminary topography analysis. The site is currently undeveloped and contains vegetation.

### Resource Extraction Portion

The parcel(s) fronting Old Jacksonboro Road to the south consists of vegetation, woods, wetlands, and other water features. The preliminary analysis considers the site as one (1) drainage analysis point based on preliminary topography analysis. The site drains to the north to the existing water features onsite.

## **POST-DEVELOPMENT CONDITIONS**

### Residential Single-Family and Commercial Development Portion

The post-development conditions for the parcel(s) fronting the south and Old Jacksonboro Road consist of residential single-family units and commercial development, as well as right of ways, landscape, stormwater pond areas, etc. The preliminary analysis considers the site as one (1) drainage analysis point and seven (7) drainage areas. The proposed drainage areas are provided on the stormwater Management Plan in Appendix B of this report.

### Resource Extraction Portion

The parcel(s) fronting Old Jacksonboro Road to the south consists of resource extraction area that does not include any proposed development. The resource extraction land bay has been permitted under the SCDHEC mine operating permit (permit No. I 002257), effective as of May 12, 2020, which grants coverage for a total of 249 acres. The site naturally discharges from south to north to the existing water features onsite.

## STORMWATER MANAGEMENT SUMMARY

Table 1: Pre vs Post Development Rainfall Rate Summary

Onsite Predeveloped Runoff Rates	Storm Event				
	2-Yr	10-Yr	25-Yr	50-Yr	100-Yr
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
Pre-Development Design Point 1	95.4	253.2	365.9	462.3	567.9
Post- Development Design Point 2	67.7	165.7	243.1	320.4	403.3

## METHODOLOGY & REFERENCES

### Stormwater Routing Model

The preliminary hydrologic analysis of the site was performed using the SCS Method (TR-55) to calculate time of concentrations, curve numbers, peak flows, and storage volumes required for stormwater management BMPs. The software program HydroCAD was utilized to create hydrographs for the two (2), ten (10), twenty-five (25), fifty (50) and one hundred (100) year storms. In addition to the detention system, weir outlet control structures are designed to manage the design storms and decrease the post-developed peak runoff rates of the pre-development levels for the two (2), ten (10), twenty-five (25), fifty (50), and one hundred (100) year storms.

Table 2: Rainfall Intensity

Design Storm Precipitation Data (inches) for Charleston County, SC					
Area	2-yr	10-yr	25-yr	50-yr	100-yr
Charleston, SC	4.2	6.5	7.9	9.1	10.3

Source: *City of Charleston Stormwater Design Standards Manual*

- Rainfalls for 24-hr storm durations from the table above are used in analysis.
- SCS Rainfall Distribution Method: NOAA 24-hr
- Unit Hydrograph Timestep: 0.1 hr
- Minimum time of concentration: 10 minutes
- Composite curve numbers calculated for the basin based on NRCS Wet Soil Survey information. Soils with dual classifications have been classified as type "A" and "A/D" for in-situ conditions.

## WATER QUALITY VOLUME SUMMARY

The stormwater management detention systems have been designed to treat a volume equal to the first inch (1") over the required treatment area with a release rate over a 24-hour period. Requirements were computed for the site based on the procedures outlined in the SCDHEC design manual, using the following equation:

$$WQv = ( Q * DA-2 ) / 12$$

WQv = water quality volume (cubic feet)

Example Calculation for Area A:

$$Q = \text{runoff depth (inches)} = (0.90)*(0.14) + (0.50)*(0.52) + (0.20)*(0.34) = 0.46$$

- Runoff Coefficient for Impervious Cover = 0.90
- Percent of Site in Impervious Cover = 0.14
- Runoff Coefficient for Impervious Residential Cover = 0.50
- Percent of Site in Impervious Residential Cover = 0.52
- Runoff Coefficient for Lawn (HSGB) = 0.20
- Percent of Site in Lawn (HSGB) = 0.34

DA-2 = Drainage area to water quality BMP (sf)

Total Area = 1,538,366 sf

Impervious Coverage = 358,415 sf

Impervious Residential Coverage = 657,548 sf

Pervious Coverage = 522,403 sf

$$WQv = \frac{(0.46) * (1,538,366 \text{ sf})}{12} = 58,971 \text{ cf}$$

The water quality volumes for all drainage areas are less than the proposed detention storage volumes and a released rate of a 24-hour period for all proposed ponds; therefore, the water quality volumes for all proposed ponds comply with the required water quality. See Table 3 below for the water quality volume for all ponds.

Table 3: Water Quality Volume summary

<b>Design Storm Precipitation Data (inches) for Charleston County, SC</b>		
<b>Pond BMP</b>	<b>WQv Required (cf)</b>	<b>WQv Provided (cf)</b>
A	58,971	83,740
B	29,969	35,063
C	16,774	20,260
D	33,998	121,527
E	27,498	32,889
F	24,994	25,270
G	141,684	247,586

---

## CONCLUSION

Based on the results of the preliminary drainage study for the Golden Grove improvements, typical water quality and water quality volume and standards are anticipated to be adequately provided for this project. We anticipate no anticipated negative impacts to the hydrology of the site or sites downstream.

## APPENDIX A

AERIAL EXHIBIT

VICINITY EXHIBIT

QUAD MAP

FEMA EXHIBIT

SOILS EXHIBIT

WETLANDS EXHIBIT

TMDL EXHIBIT



SITE LOCATION  
 LAT: 32° 46' 28"  
 LONG: 80° 16' 37"

HIGHWAY 17

NEW ROAD

NEW ROAD

HIGHWAY 165

<b>Bowman</b> CONSULTING	
880 Island Park Drive Suite 400 Charleston, SC 29492	Phone: (843) 501-0333  <a href="http://www.bowmanconsulting.com">www.bowmanconsulting.com</a>
© Bowman Consulting Group, Ltd.	

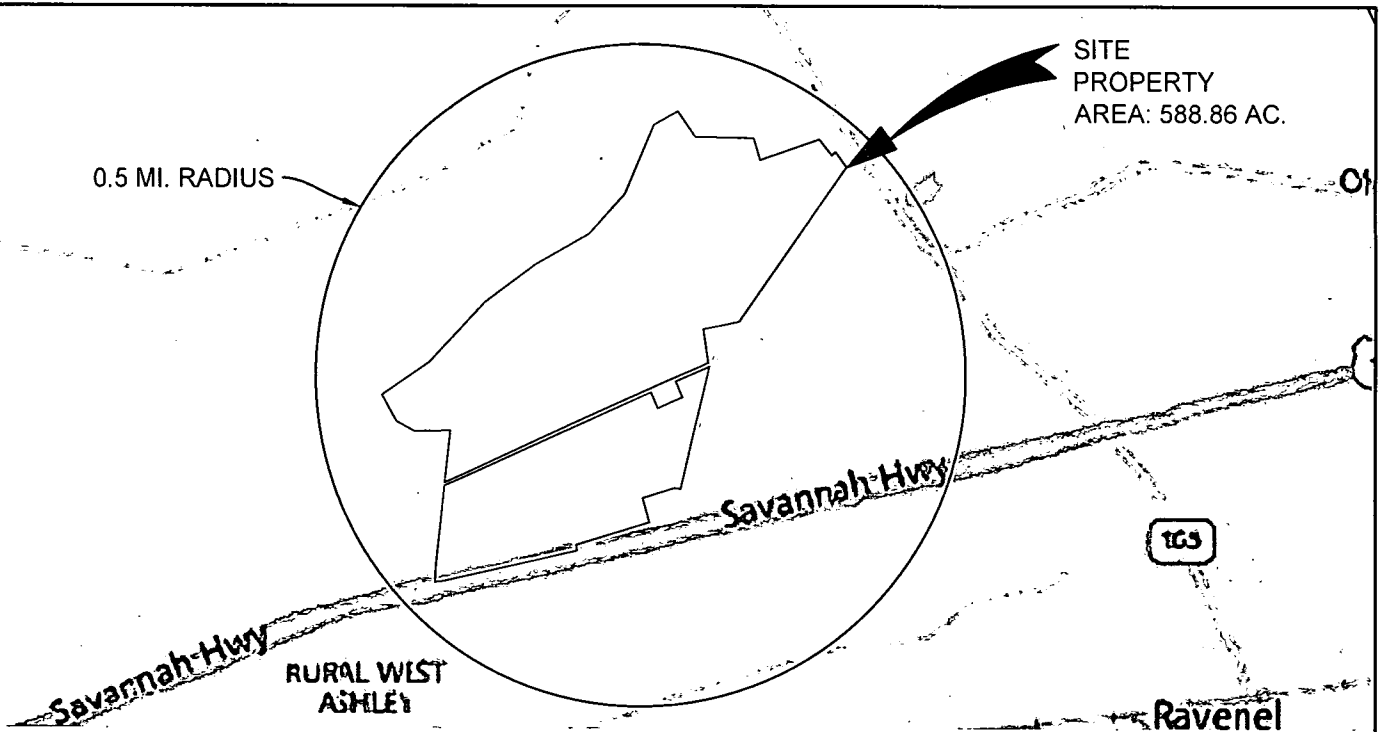
**AERIAL EXHIBIT**  
**GOLDEN GROVE**  
 Charleston County, SC



SCALE: 1" = 2000'

SITE  
PROPERTY  
AREA: 588.86 AC.

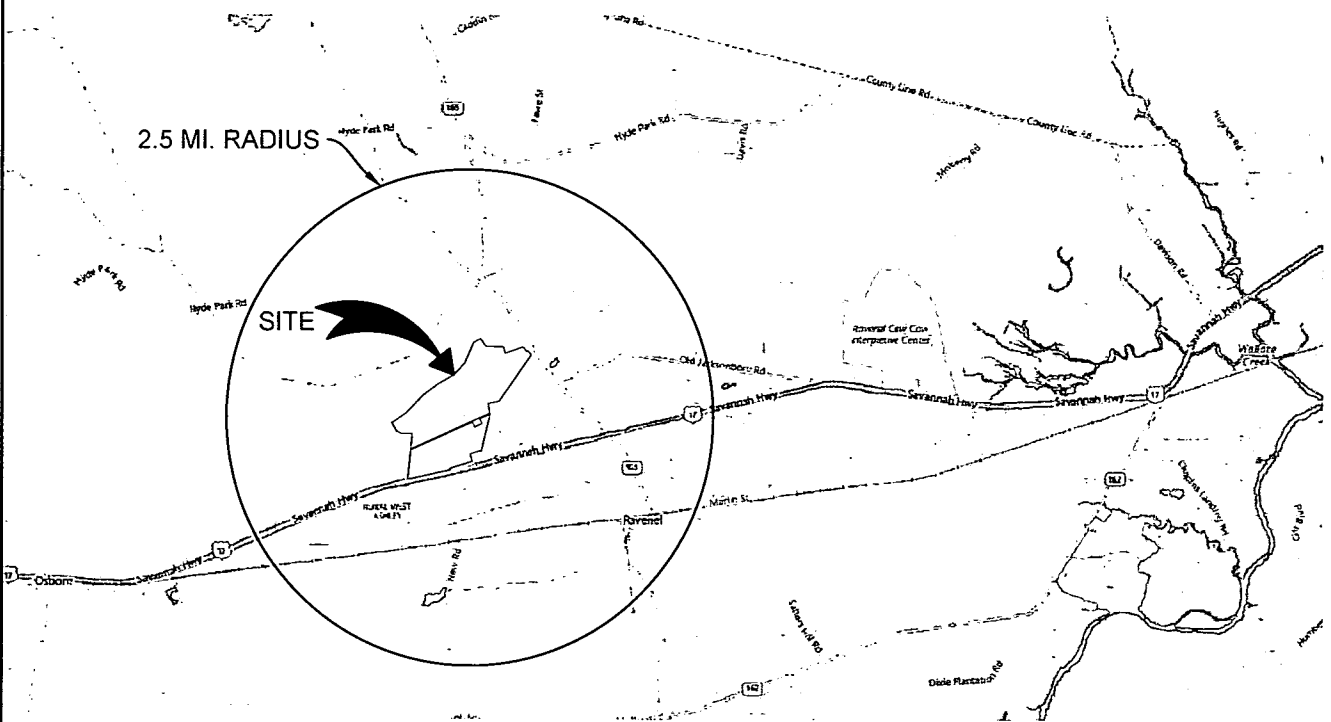
0.5 MI. RADIUS



### VICINITY MAP

1" = 3,000'

2.5 MI. RADIUS



### VICINITY MAP - OVERALL

1" = 10,000'

**Bowman**  
CONSULTING

880 Island Park Drive  
Suite 400

Charleston, SC 29492

Phone: (843) 501-0333

www.bowmanconsulting.com

© Bowman Consulting Group, Ltd.

## VICINITY EXHIBIT GOLDEN GROVE Charleston County, SC





MAP DATE: 2020  
 CONTOUR INTERVAL: 10 FT  
 NORTH AMERICAN DATUM OF 1983 (NAD83)

**Bowman**  
 CONSULTING

880 Island Park Drive Phone: (843) 501-0333  
 Suite 400  
 Charleston, SC 29492 www.bowmanconsulting.com

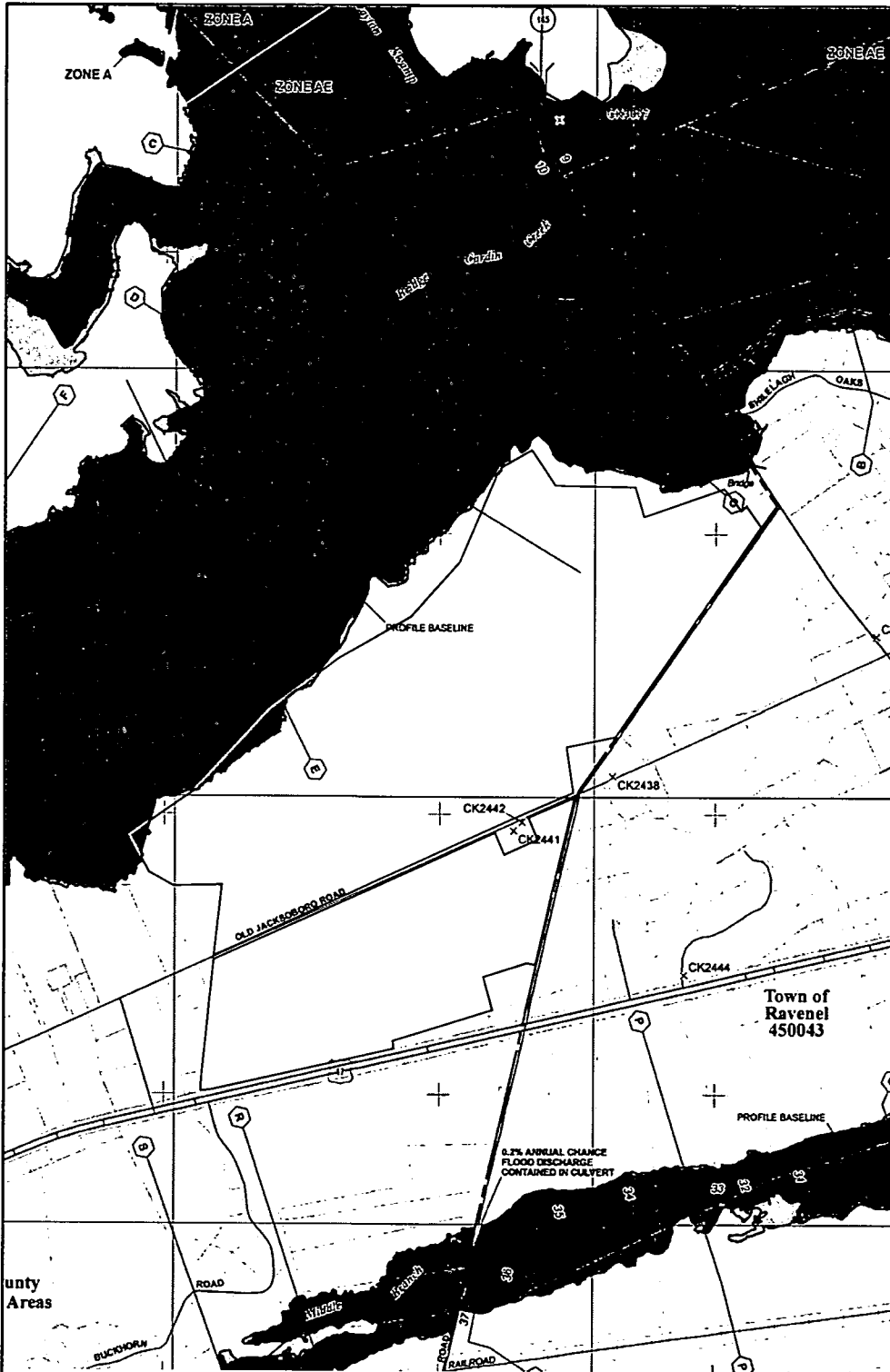
© Bowman Consulting Group, Ltd.

**QUAD MAP**  
**GOLDEN GROVE**  
 Charleston County, SC



SCALE: 1" = 5000'





SITE LOCATED IN FLOOD ZONE AE AND X

**Bowman**  
CONSULTING

880 Island Park Drive Phone: (843) 501-0333  
Suite 400  
Charleston, SC 29492 www.bowmanconsulting.com

© Bowman Consulting Group, Ltd.

FEMA EXHIBIT  
**GOLDEN GROVE**  
Charleston County, SC

SCALE: 1" = 2000'

**LEGEND**

- SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO FUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual chance flood (100-year flood) and waves on the lower flood is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, AV, X, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A**  
No Base Flood Elevation determined.
- ZONE AE**  
Base Flood Elevation determined.
- ZONE AH**  
Flood depths of 1 to 3 feet (usually areas of parking); Base Flood Elevation determined.
- ZONE AO**  
Flood depths of 1 to 3 feet (usually street flow cut; stopping tanks); average depths determined. For areas of altered low flooding, velocity also determined.
- ZONE AR**  
Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently abandoned. Zone AE indicates that the former flood control system is being restored to provide protection from the 1% annual chance of greater flood.
- ZONE AV**  
Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevation determined.
- ZONE VE**  
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevation determined.
- FLOODWAY AREAS IN ZONE AE**
- The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X**  
Areas of 0.2% annual chance flood, areas of 1% annual chance flood with average depths of less than 1 foot or with average wave heights of 1 square wave, and areas protected by waves from 1% annual chance flood.
- OTHER AREAS**
- ZONE D**  
Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood heights are undetermined, but possible.
- Floodplain boundary  
— Floodway boundary  
— Zone D boundary  
— Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths and flood velocities.
- Limit of Moderate Wave Action
- Base Flood Elevation line and wave, elevation in feet  
— Base Flood Elevation line where surface water and ocean, elevation in feet
- Referenced to the North American Vertical Datum of 1988
- Closed section line  
— Transit line  
— Culvert, Flume, Pipeline, or Aqueduct  
— Bridge  
— Footbridge
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Modern Hemisphere  
17° 12' 30", 32° 22' 30"  
79 19 W  
400000 FT  
5000-foot grid values: South Carolina State Plane coordinate system (GCS:SC83), Lambert Conformal Conic projection  
North-south false equatorion in feet to Lines section of the FIRM (DREF)  
+ NAD 83  
Near File

MAP REPOSITORY  
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP  
November 17, 2004

EFFECTIVE DATES OF REVISIONS TO THIS PANEL  
January 29, 2021 - to add Base Flood Elevation and Special Flood Hazard Areas, to change Base Flood Elevation and Special Flood Hazard Areas, to incorporate previously issued Letters of Map Revision, to reflect the effects of coastal erosion, revised shoreline, and updated topographic information, and to update corporate title, the effects of wave action, and road and road name.

PANEL 0445K

**FIRM**  
FLOOD INSURANCE RATE MAP

CHARLESTON COUNTY,  
SOUTH CAROLINA  
AND INCORPORATED AREAS

PANEL 445 OF 855  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CHARLESTON COUNTY	455413	D445	K
HOLLYWOOD TOWN OF	450037	D445	K
RAVENEL TOWN OF	450043	D445	K

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.





Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Bc	Bayboro	C/D	4.6	0.8%
Cm	Chipley loamy fine sand	A	297.9	49.4%
LaB	Lakeland sand, 0 to 6 percent slopes	A	73.2	12.1%
Le	Leon fine sand, 0 to 2 percent slopes	A/D	85.1	14.1%
Rg	Rutlege loamy fine sand	A/D	63.9	10.6%
Sa	St. Johns fine sand	A/D	74.4	12.3%
Yo	Yonges loamy fine sand	A/D	3.4	0.6%
<b>Totals for Area of Interest</b>			<b>602.6</b>	<b>100.0%</b>

**Bowman**  
CONSULTING

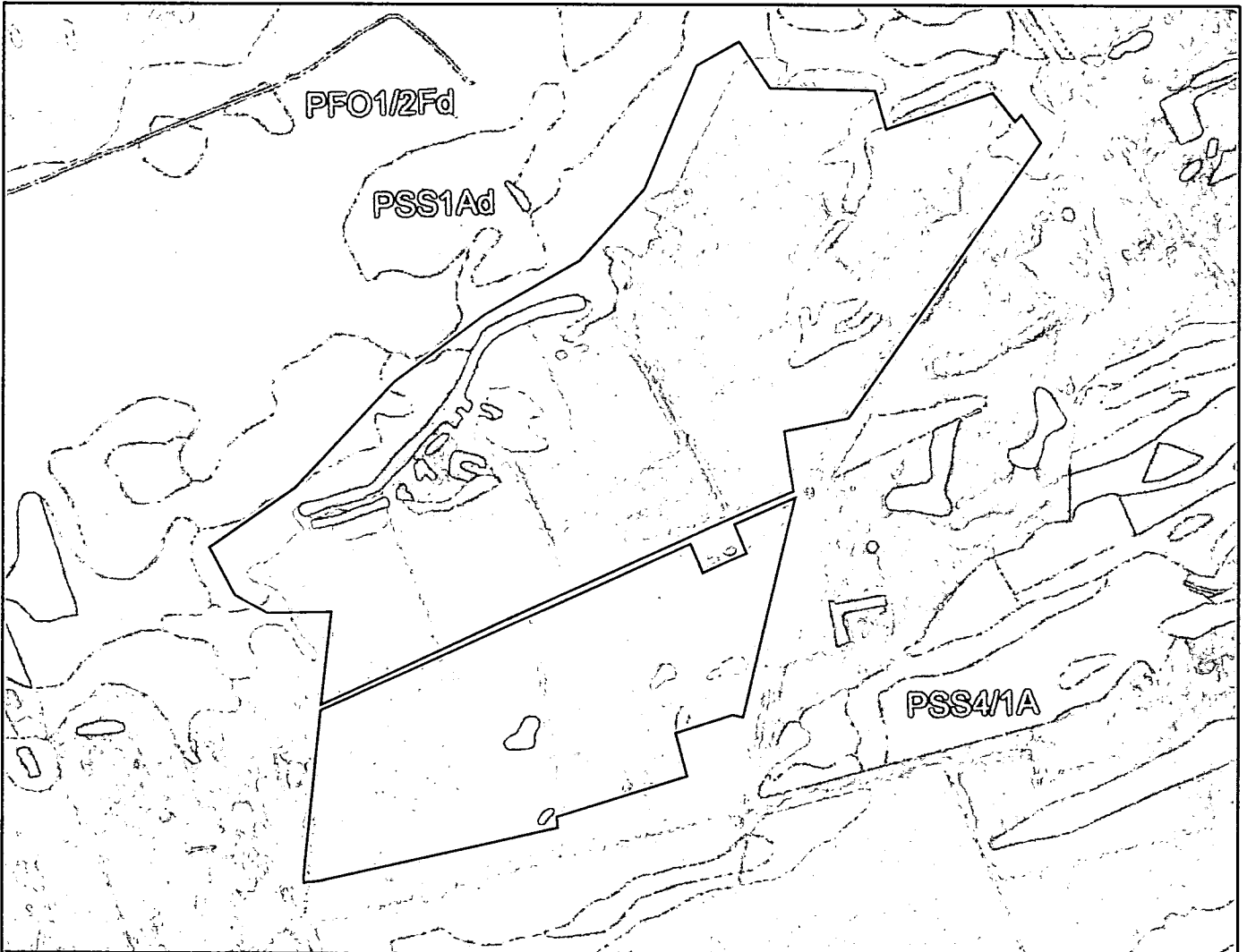
880 Island Park Drive      Phone: (843) 501-0333  
Suite 400  
Charleston, SC 29492      www.bowmanconsulting.com

© Bowman Consulting Group, Ltd.

**USGS SOILS EXHIBIT  
GOLDEN GROVE**  
Charleston County, SC



SCALE: 1" = 1500'



October 23, 2020

**Wetlands**

- |   |  |                                   |
|---|--|-----------------------------------|
| <input type="checkbox"/> Estuarine and Marine Deepwater | <input type="checkbox"/> Freshwater Emergent Wetland       | <input type="checkbox"/> Lake     |
| <input type="checkbox"/> Estuarine and Marine Wetland   | <input type="checkbox"/> Freshwater Forested/Shrub Wetland | <input type="checkbox"/> Other    |
|   | <input type="checkbox"/> Freshwater Pond                   | <input type="checkbox"/> Riverine |

MAP SHOWN IS PER NATIONAL WETLANDS INVENTORY

PRODUCED BY BOWMAN CONSULTING GROUP

November 6, 2020

**Bowman**  
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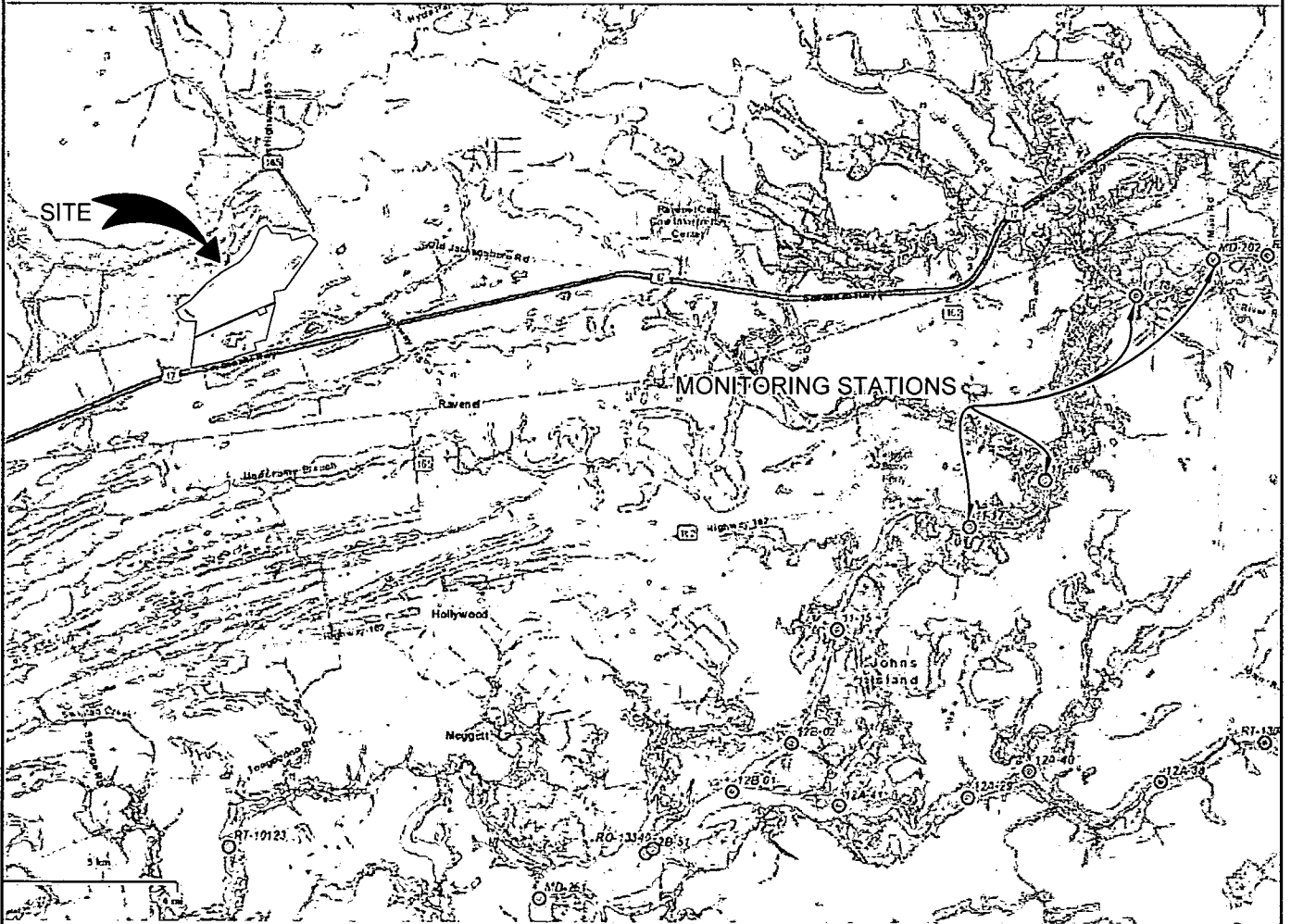
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**WETLANDS EXHIBIT**  
**GOLDEN GROVE**  
Charleston County, SC



SCALE: 1" = 1500'



NOTE: SEE WATER QUALITY REPORT FOR COMPLETE ASSESSMENT INFORMATION.

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**TMDL EXHIBIT**  
**GOLDEN GROVE**  
Charleston County, SC



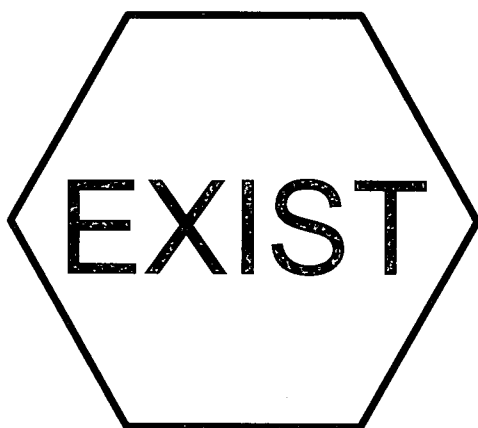
## APPENDIX B

### STORMWATER MANAGEMENT PLAN

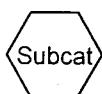


## APPENDIX C

### HydroCAD REPORTS



# EXISTING DA



**Routing Diagram for Golden Grove Preliminary Study (WQv)**  
Prepared by Bowman Consulting, Printed 12/21/2020  
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# Golden Grove Preliminary Study (WQv)

Prepared by Bowman Consulting

HydroCAD® 10.10-3a s/n 10232 © 2020 HydroCAD Software Solutions LLC

NOAA 24-hr B 2-Year Rainfall=4.24"

Printed 12/21/2020

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## Summary for Subcatchment EXIST: EXISTING DA

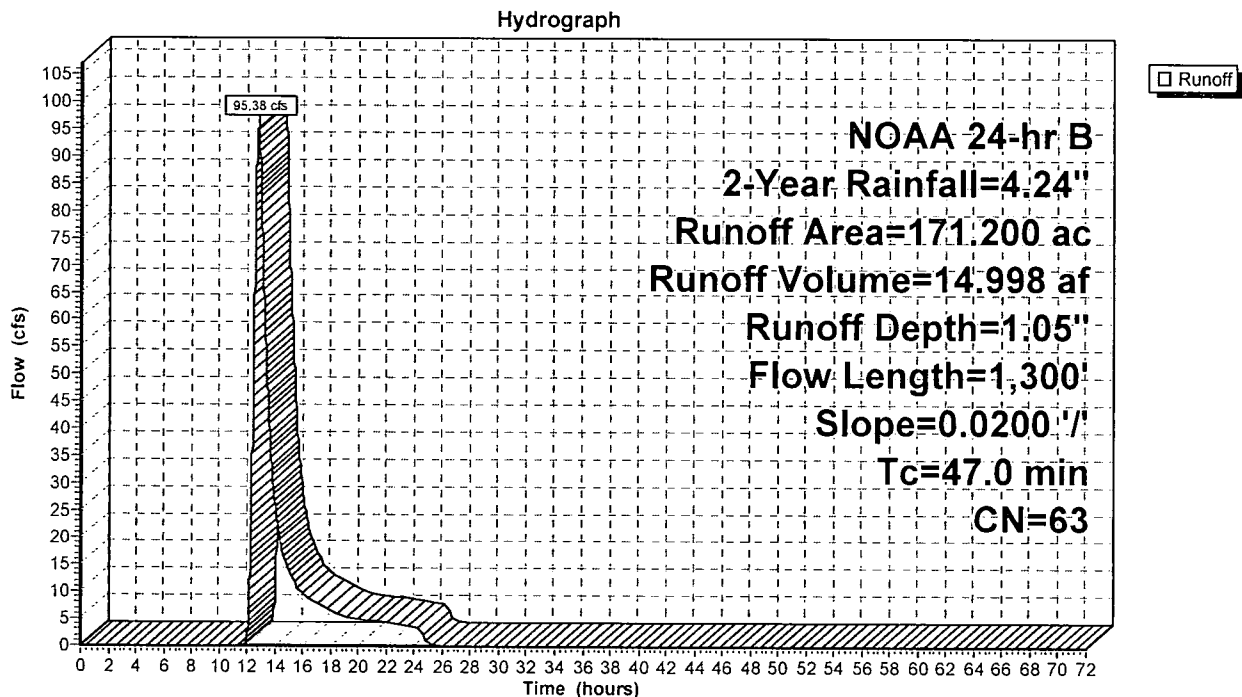
Runoff = 95.38 cfs @ 12.74 hrs, Volume= 14.998 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
NOAA 24-hr B 2-Year Rainfall=4.24"

Area (ac)	CN	Description
57.500	30	Woods, Good, HSG A
* 13.700	98	Wetland
100.000	77	Woods, Good, HSG D
171.200	63	Weighted Average
157.500		92.00% Pervious Area
13.700		8.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	100	0.0200	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 4.24"
28.3	1,200	0.0200	0.71		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
47.0	1,300	Total			

## Subcatchment EXIST: EXISTING DA



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 10-Year Rainfall=6.49"

Prepared by Bowman Consulting

Printed 12/21/2020

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Page 4

**Summary for Subcatchment EXIST: EXISTING DA**

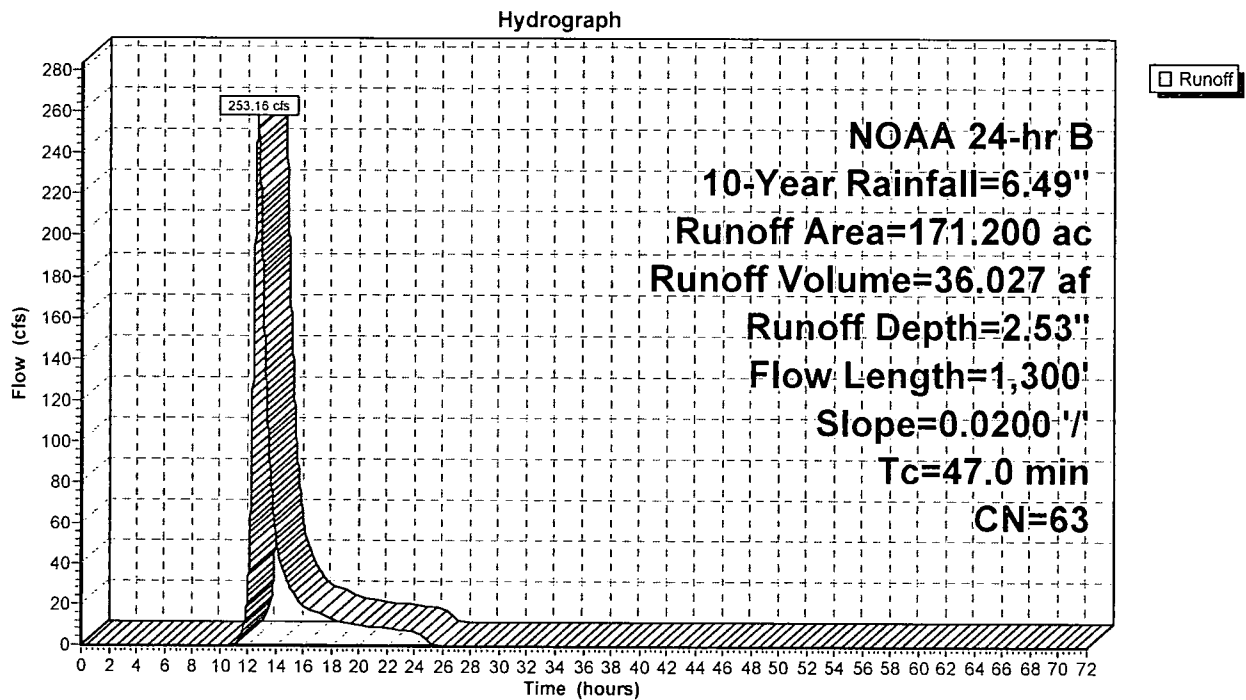
Runoff = 253.16 cfs @ 12.69 hrs, Volume= 36.027 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 10-Year Rainfall=6.49"

Area (ac)	CN	Description
57.500	30	Woods, Good, HSG A
* 13.700	98	Wetland
100.000	77	Woods, Good, HSG D
171.200	63	Weighted Average
157.500		92.00% Pervious Area
13.700		8.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	100	0.0200	0.09		<b>Sheet Flow, Sheet Flow</b> Woods: Light underbrush n= 0.400 P2= 4.24"
28.3	1,200	0.0200	0.71		<b>Shallow Concentrated Flow, Shallow Concentrated</b> Woodland Kv= 5.0 fps
47.0	1,300	Total			

**Subcatchment EXIST: EXISTING DA**



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 25-Year Rainfall=7.90"

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Page 5

**Summary for Subcatchment EXIST: EXISTING DA**

Runoff = 365.94 cfs @ 12.69 hrs, Volume= 51.220 af, Depth= 3.59"

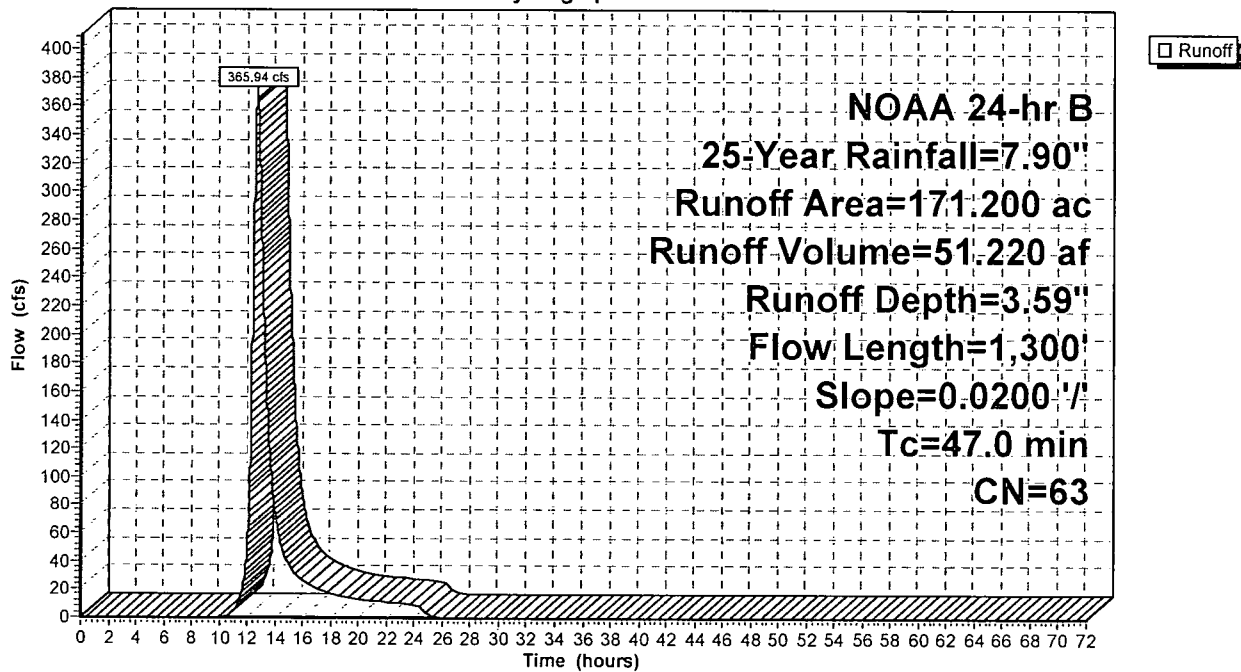
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 25-Year Rainfall=7.90"

Area (ac)	CN	Description
57.500	30	Woods, Good, HSG A
* 13.700	98	Wetland
100.000	77	Woods, Good, HSG D
171.200	63	Weighted Average
157.500		92.00% Pervious Area
13.700		8.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	100	0.0200	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 4.24"
28.3	1,200	0.0200	0.71		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
47.0	1,300	Total			

**Subcatchment EXIST: EXISTING DA**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 50-Year Rainfall=9.05"

Prepared by Bowman Consulting

Printed 12/21/2020

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**Summary for Subcatchment EXIST: EXISTING DA**

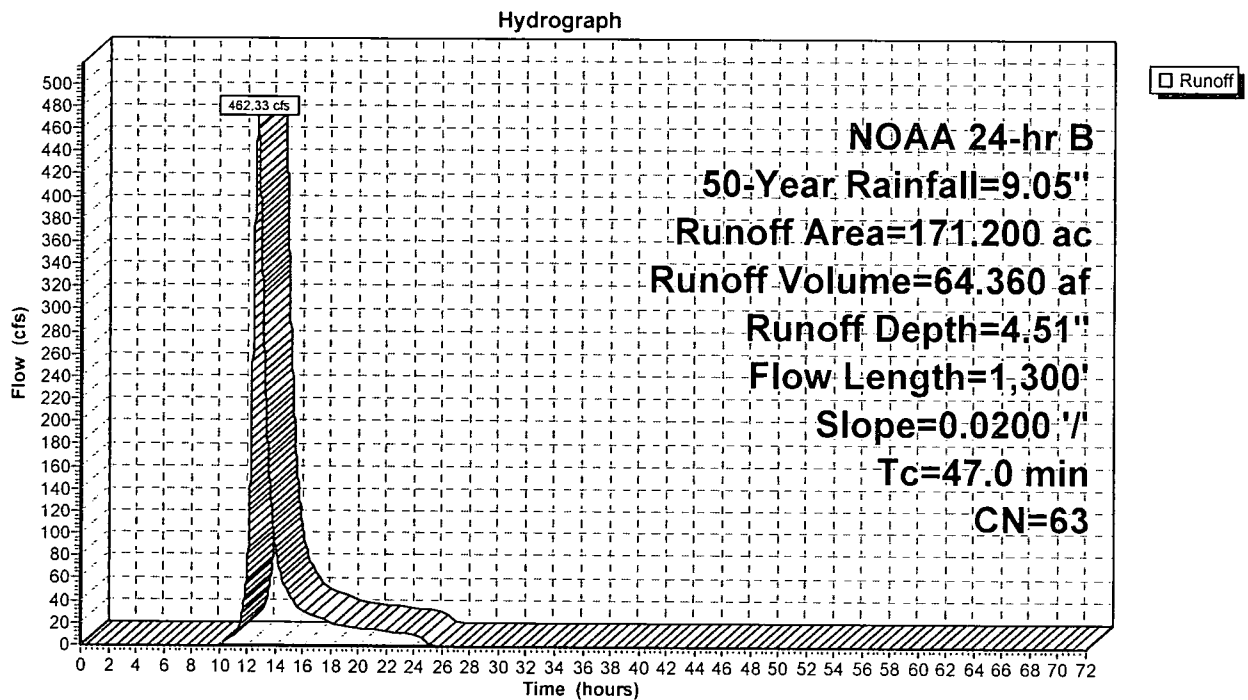
Runoff = 462.33 cfs @ 12.68 hrs, Volume= 64.360 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 50-Year Rainfall=9.05"

Area (ac)	CN	Description
57.500	30	Woods, Good, HSG A
* 13.700	98	Wetland
100.000	77	Woods, Good, HSG D
171.200	63	Weighted Average
157.500		92.00% Pervious Area
13.700		8.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	100	0.0200	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 4.24"
28.3	1,200	0.0200	0.71		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
47.0	1,300	Total			

**Subcatchment EXIST: EXISTING DA**



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

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**Summary for Subcatchment EXIST: EXISTING DA**

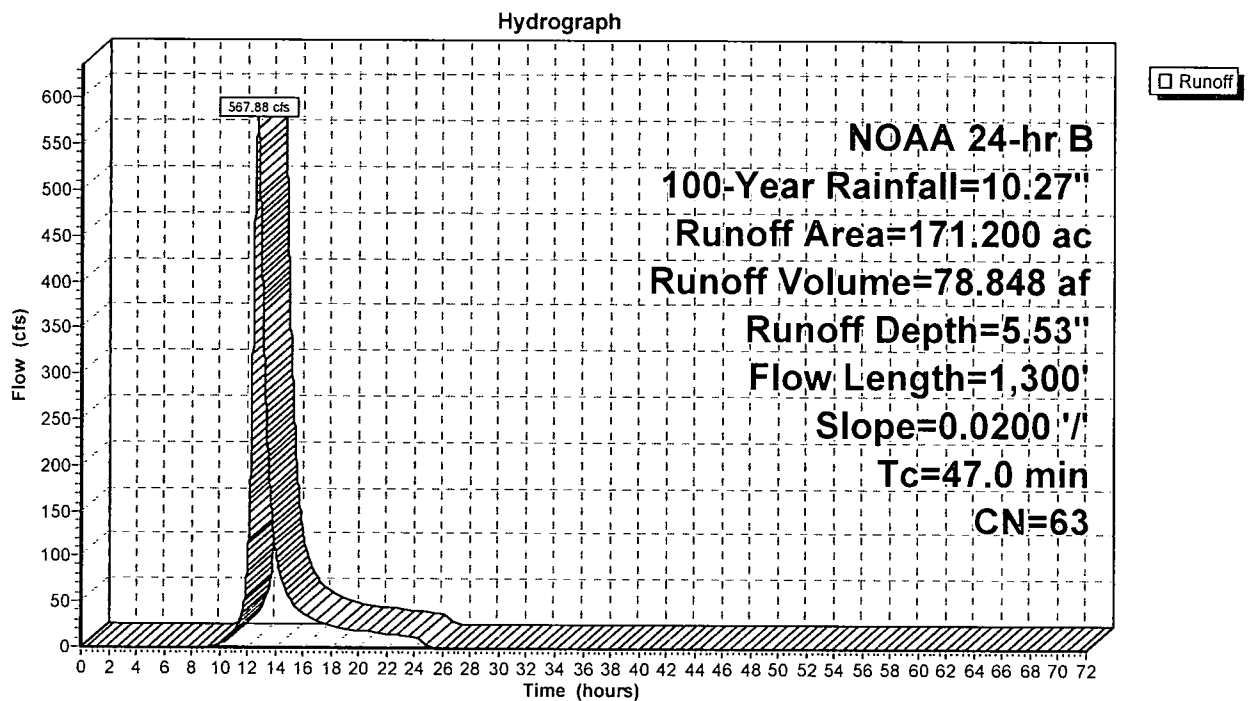
Runoff = 567.88 cfs @ 12.68 hrs, Volume= 78.848 af, Depth= 5.53"

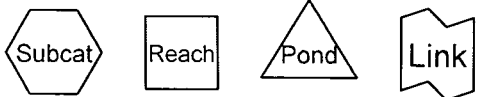
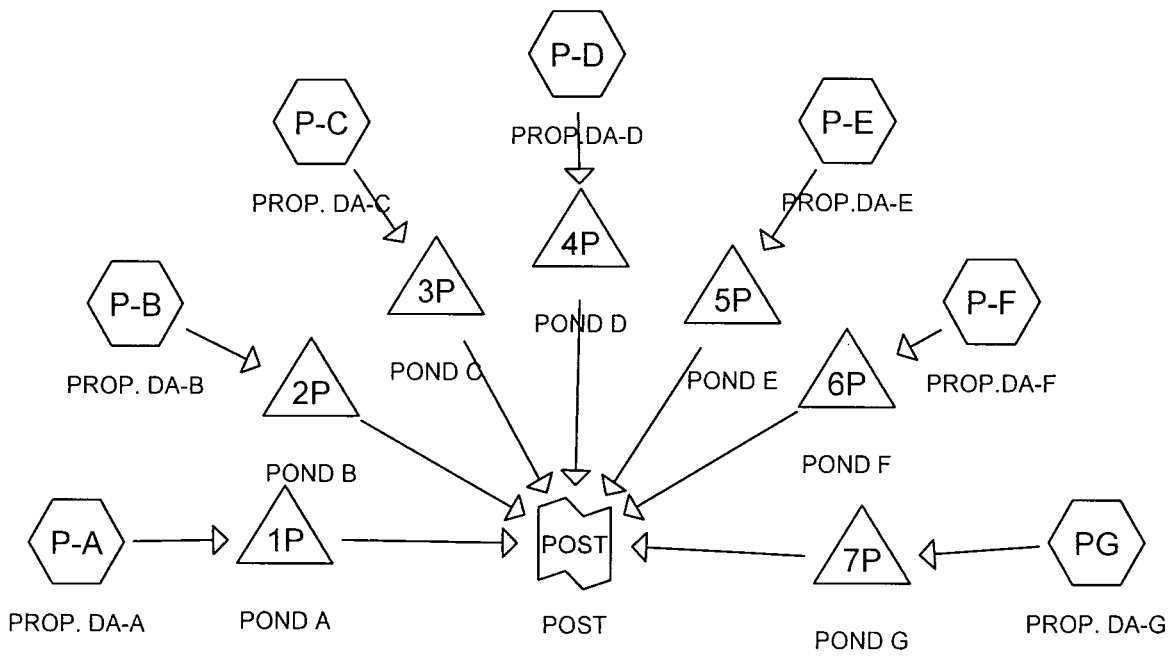
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 100-Year Rainfall=10.27"

Area (ac)	CN	Description
57.500	30	Woods, Good, HSG A
* 13.700	98	Wetland
100.000	77	Woods, Good, HSG D
171.200	63	Weighted Average
157.500		92.00% Pervious Area
13.700		8.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	100	0.0200	0.09		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 4.24"
28.3	1,200	0.0200	0.71		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
47.0	1,300	Total			

**Subcatchment EXIST: EXISTING DA**





**Routing Diagram for Golden Grove Preliminary Study (WQv)**  
 Prepared by Bowman Consulting, Printed 12/21/2020  
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**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 2-Year Rainfall=4.24"

Prepared by Bowman Consulting

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Page 2

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>SubcatchmentP-A: PROP. DA-A</b>	Runoff Area=1,538,366 sf 78.95% Impervious Runoff Depth=2.67" Flow Length=1,300' Tc=34.0 min CN=85 Runoff=67.75 cfs 7.868 af
<b>SubcatchmentP-B: PROP. DA-B</b>	Runoff Area=856,244 sf 70.85% Impervious Runoff Depth=2.32" Flow Length=1,300' Slope=0.0100 '/ Tc=64.6 min CN=81 Runoff=22.57 cfs 3.808 af
<b>SubcatchmentP-C: PROP. DA-C</b>	Runoff Area=447,304 sf 74.80% Impervious Runoff Depth=2.50" Flow Length=600' Slope=0.0050 '/ Tc=28.9 min CN=83 Runoff=20.14 cfs 2.136 af
<b>SubcatchmentP-D: PROP. DA-D</b>	Runoff Area=832,612 sf 71.43% Impervious Runoff Depth=2.32" Flow Length=1,300' Slope=0.0050 '/ Tc=39.2 min CN=81 Runoff=29.56 cfs 3.703 af
<b>SubcatchmentP-E: PROP. DA-E</b>	Runoff Area=804,829 sf 74.60% Impervious Runoff Depth=2.50" Flow Length=1,300' Slope=0.0050 '/ Tc=39.2 min CN=83 Runoff=30.70 cfs 3.843 af
<b>SubcatchmentP-F: PROP. DA-F</b>	Runoff Area=769,055 sf 68.32% Impervious Runoff Depth=2.16" Flow Length=1,100' Slope=0.0050 '/ Tc=36.2 min CN=79 Runoff=26.54 cfs 3.178 af
<b>SubcatchmentPG: PROP. DA-G</b>	Runoff Area=2,208,063 sf 81.83% Impervious Runoff Depth=2.86" Flow Length=1,300' Slope=0.0100 '/ Tc=23.6 min CN=87 Runoff=125.33 cfs 12.071 af
<b>Pond 1P: POND A</b>	Peak Elev=10.13' Storage=190,887 cf Inflow=67.75 cfs 7.868 af Outflow=15.39 cfs 7.770 af
<b>Pond 2P: POND B</b>	Peak Elev=7.07' Storage=71,902 cf Inflow=22.57 cfs 3.808 af Outflow=10.73 cfs 3.762 af
<b>Pond 3P: POND C</b>	Peak Elev=11.57' Storage=42,437 cf Inflow=20.14 cfs 2.136 af Outflow=6.29 cfs 2.136 af
<b>Pond 4P: POND D</b>	Peak Elev=8.63' Storage=125,969 cf Inflow=29.56 cfs 3.703 af Outflow=1.41 cfs 1.700 af
<b>Pond 5P: POND E</b>	Peak Elev=9.05' Storage=59,992 cf Inflow=30.70 cfs 3.843 af Outflow=18.40 cfs 3.811 af
<b>Pond 6P: POND F</b>	Peak Elev=9.84' Storage=47,130 cf Inflow=26.54 cfs 3.178 af Outflow=15.06 cfs 3.173 af
<b>Pond 7P: POND G</b>	Peak Elev=8.89' Storage=358,049 cf Inflow=125.33 cfs 12.071 af Outflow=8.22 cfs 10.236 af
<b>Link POST: POST</b>	Inflow=67.71 cfs 32.587 af Primary=67.71 cfs 32.587 af

**Golden Grove Preliminary Study (WQv)**

Prepared by Bowman Consulting

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NOAA 24-hr B 2-Year Rainfall=4.24"

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Page 3

**Summary for Subcatchment P-A: PROP. DA-A**

Runoff = 67.75 cfs @ 12.47 hrs, Volume= 7.868 af, Depth= 2.67"

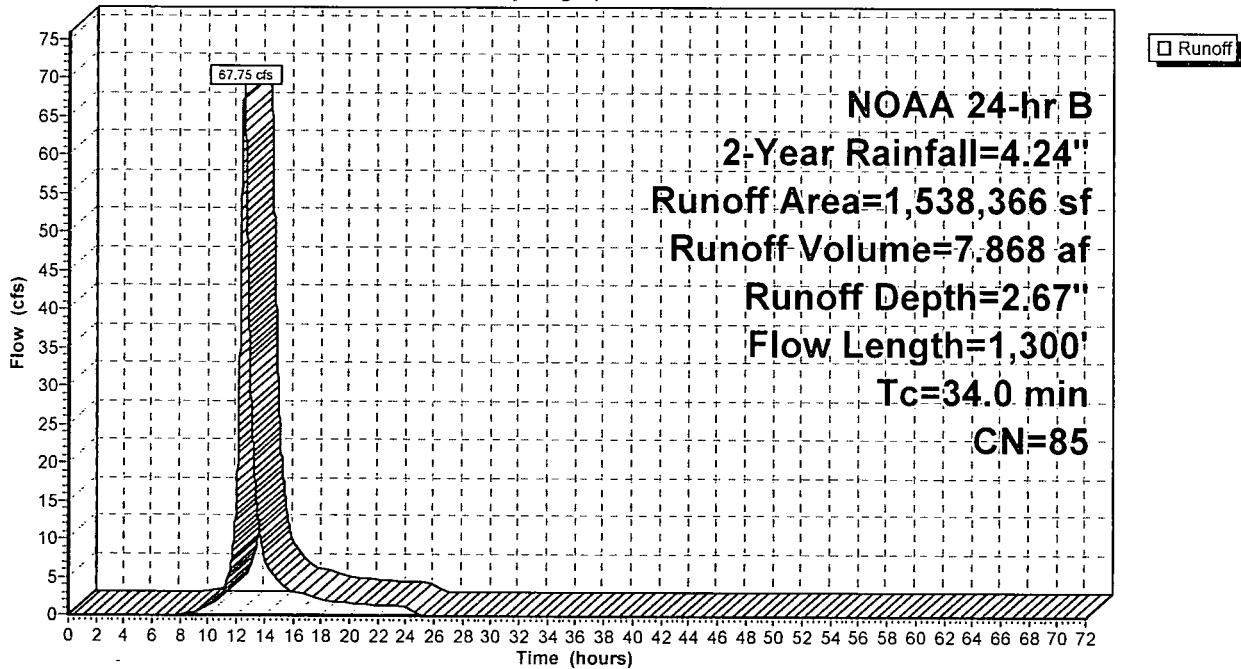
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 2-Year Rainfall=4.24"

Area (sf)	CN	Description
522,403	61	1/4 acre lots, 38% imp, HSG A
* 876,934	98	IMPERVIOUS
* 139,029	98	PONDS
1,538,366	85	Weighted Average
323,890		21.05% Pervious Area
1,214,476		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0100	0.10		<b>Sheet Flow, Sheet Flow</b> Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		<b>Shallow Concentrated Flow, Shallow concentrated flow</b> Unpaved Kv= 16.1 fps
34.0	1,300	Total			

**Subcatchment P-A: PROP. DA-A**

Hydrograph





**Golden Grove Preliminary Study (WQv)**

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NOAA 24-hr B 2-Year Rainfall=4.24"

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**Summary for Subcatchment P-B: PROP. DA-B**

Runoff = 22.57 cfs @ 12.85 hrs, Volume= 3.808 af, Depth= 2.32"

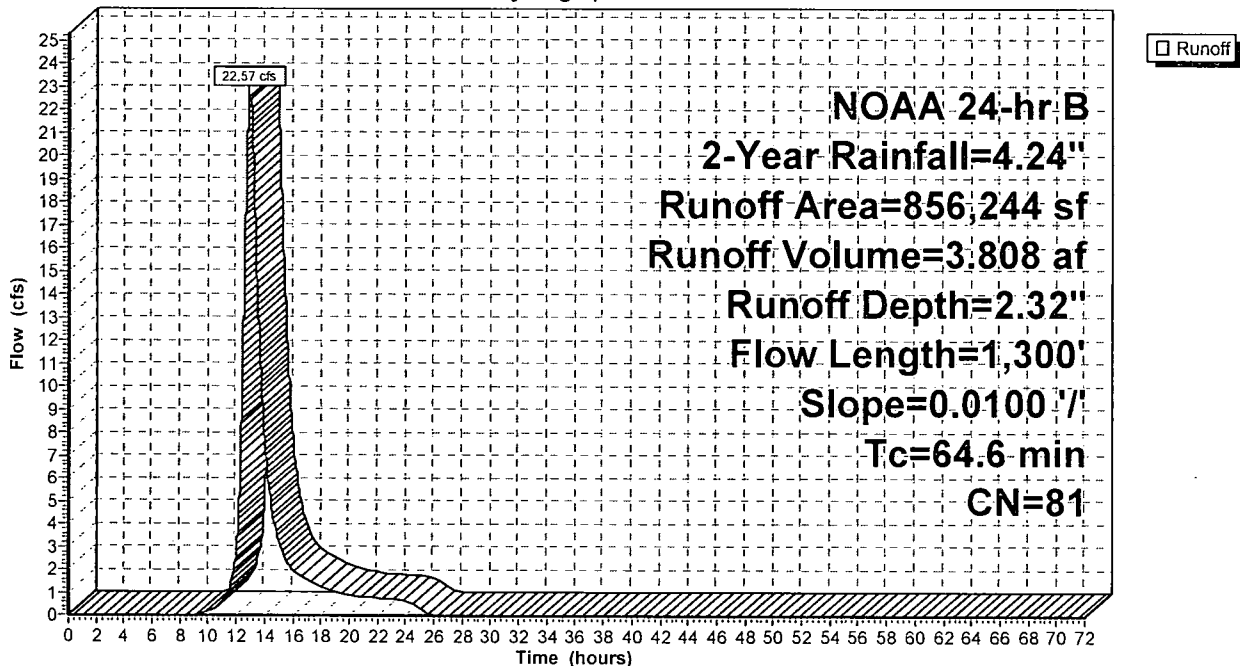
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 2-Year Rainfall=4.24"

Area (sf)	CN	Description
402,533	61	1/4 acre lots, 38% imp, HSG A
371,484	98	Paved parking, HSG D
* 51,398	98	POND
* 30,829	98	WETLAND
856,244	81	Weighted Average
249,570		29.15% Pervious Area
606,674		70.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.6	100	0.0100	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 4.24"
40.0	1,200	0.0100	0.50		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
64.6	1,300	Total			

**Subcatchment P-B: PROP. DA-B**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

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NOAA 24-hr B 2-Year Rainfall=4.24"

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**Summary for Subcatchment P-C: PROP. DA-C**

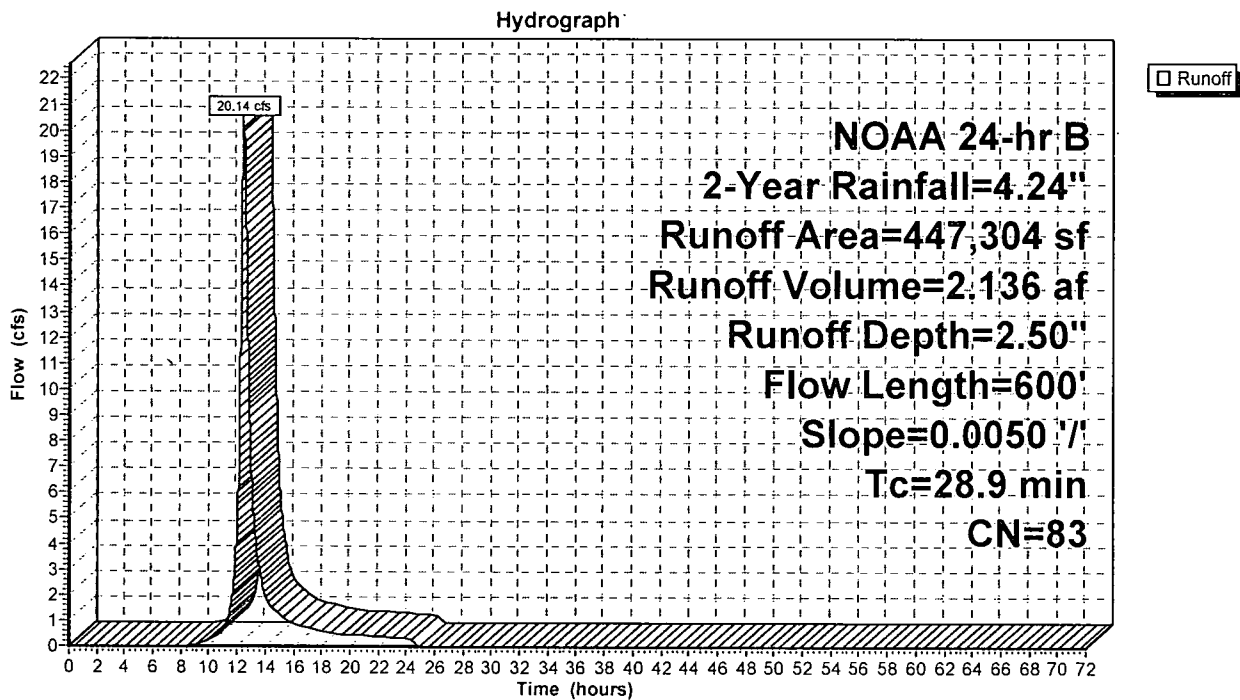
Runoff = 20.14 cfs @ 12.42 hrs, Volume= 2.136 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 2-Year Rainfall=4.24"

Area (sf)	CN	Description
181,773	61	1/4 acre lots, 38% imp, HSG A
235,430	98	Paved parking, HSG D
* 30,101	98	pond
447,304	83	Weighted Average
112,699		25.20% Pervious Area
334,605		74.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		<b>Sheet Flow, Sheet Flow</b> Grass: Dense n= 0.240 P2= 4.24"
7.3	500	0.0050	1.14		<b>Shallow Concentrated Flow, Shallow Concentrated Flow</b> Unpaved Kv= 16.1 fps
28.9	600	Total			

**Subcatchment P-C: PROP. DA-C**



**Golden Grove Preliminary Study (WQv)**

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NOAA 24-hr B 2-Year Rainfall=4.24"

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**Summary for Subcatchment P-D: PROP.DA-D**

Runoff = 29.56 cfs @ 12.55 hrs, Volume= 3.703 af, Depth= 2.32"

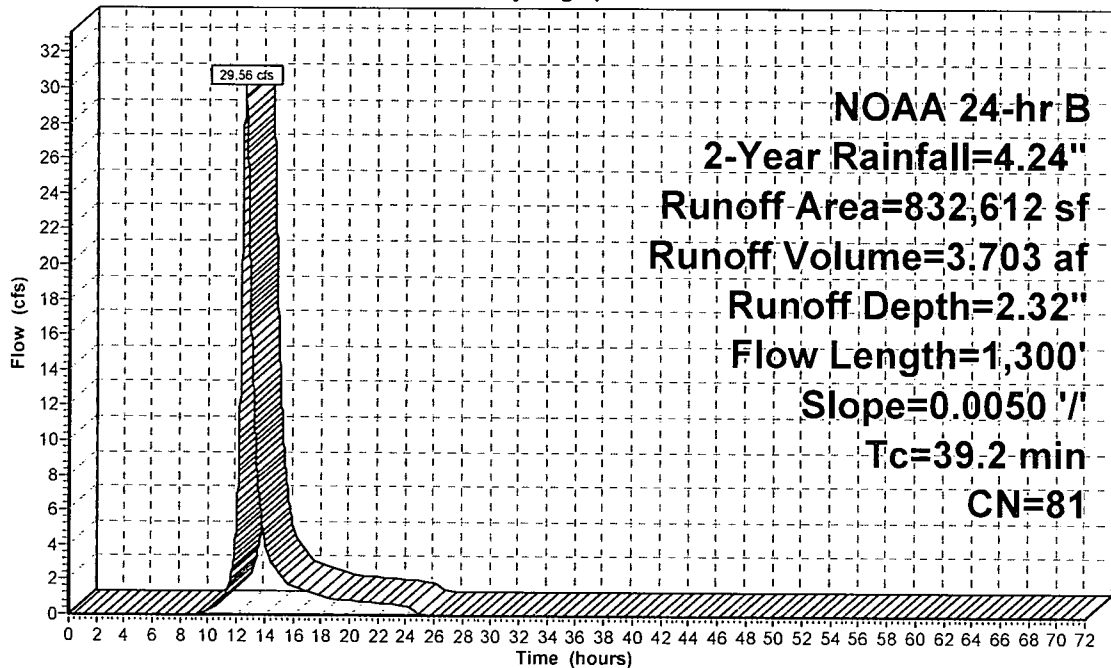
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 2-Year Rainfall=4.24"

Area (sf)	CN	Description
383,716	61	1/4 acre lots, 38% imp, HSG A
299,467	98	Paved parking, HSG D
* 88,466	98	WETLAND
* 60,963	98	POND
832,612	81	Weighted Average
237,904		28.57% Pervious Area
594,708		71.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
39.2	1,300	Total			

**Subcatchment P-D: PROP.DA-D**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

Prepared by Bowman Consulting

HydroCAD® 10.10-3a s/n 10232 © 2020 HydroCAD Software Solutions LLC

NOAA 24-hr B 2-Year Rainfall=4.24"

Printed 12/21/2020

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**Summary for Subcatchment P-E: PROP.DA-E**

Runoff = 30.70 cfs @ 12.54 hrs, Volume= 3.843 af, Depth= 2.50"

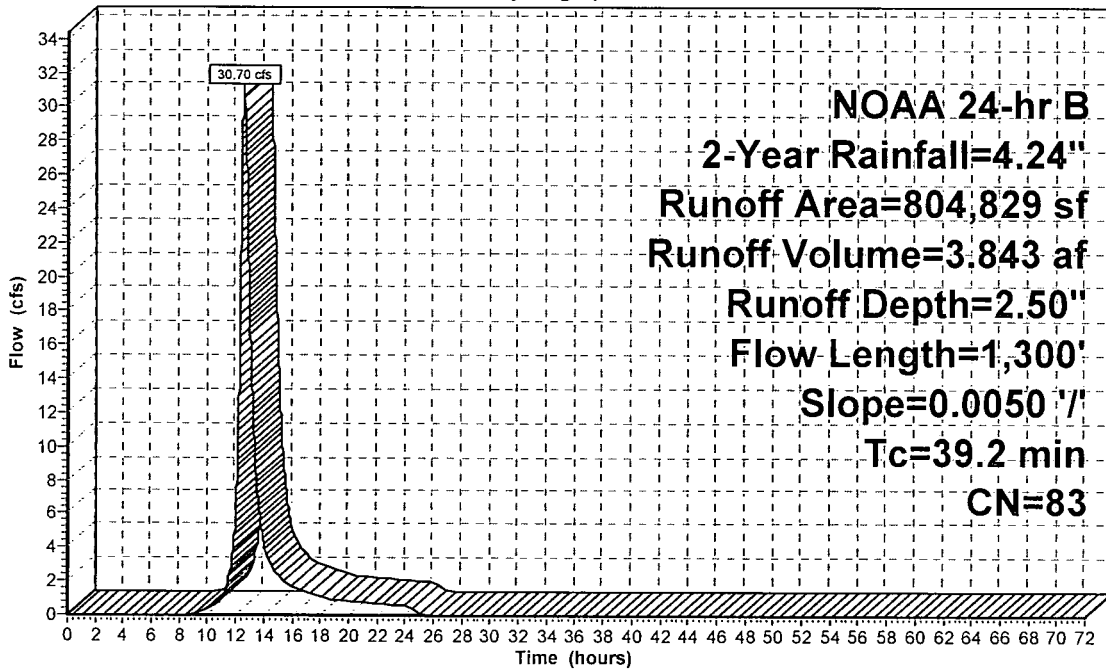
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 2-Year Rainfall=4.24"

Area (sf)	CN	Description
416,071	98	Paved parking, HSG A
329,718	61	1/4 acre lots, 38% imp, HSG A
* 59,040	98	POND
804,829	83	Weighted Average
204,425		25.40% Pervious Area
600,404		74.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
39.2	1,300	Total			

**Subcatchment P-E: PROP.DA-E**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

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NOAA 24-hr B 2-Year Rainfall=4.24"

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**Summary for Subcatchment P-F: PROP.DA-F**

Runoff = 26.54 cfs @ 12.51 hrs, Volume= 3.178 af, Depth= 2.16"

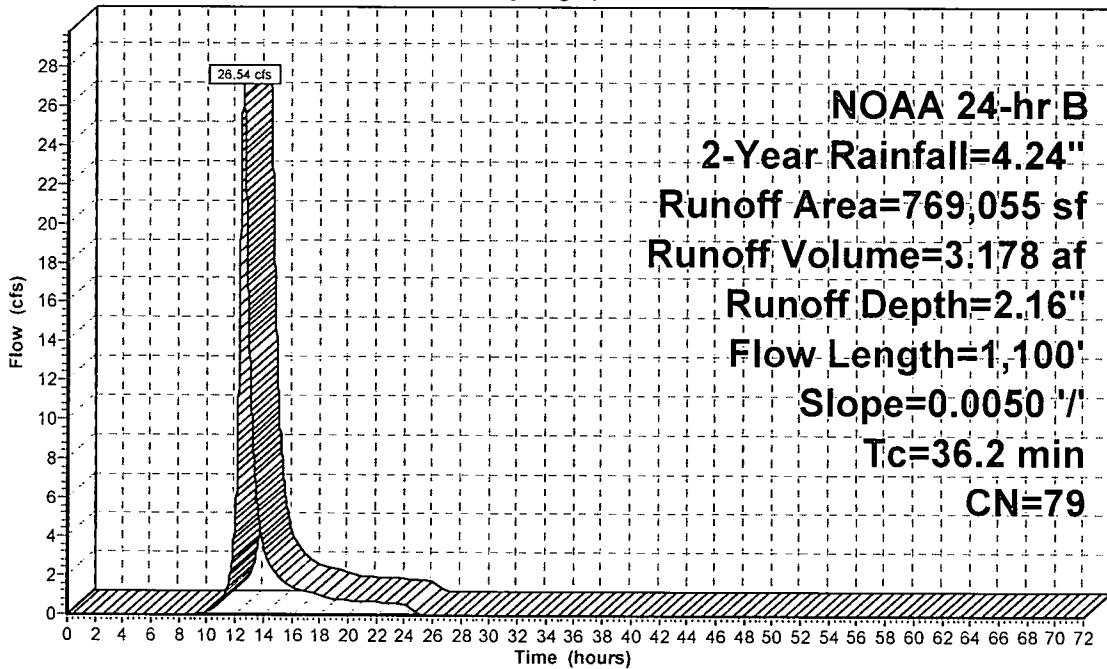
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 2-Year Rainfall=4.24"

Area (sf)	CN	Description
392,960	61	1/4 acre lots, 38% imp, HSG A
334,179	98	Paved parking, HSG D
* 41,916	98	pond
769,055	79	Weighted Average
243,635		31.68% Pervious Area
525,420		68.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		<b>Sheet Flow, Sheet Flow</b> Grass: Dense n= 0.240 P2= 4.24"
14.6	1,000	0.0050	1.14		<b>Shallow Concentrated Flow, Shallow Concentrated Flow</b> Unpaved Kv= 16.1 fps
36.2	1,100	Total			

**Subcatchment P-F: PROP.DA-F**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

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**Summary for Subcatchment PG: PROP. DA-G**

Runoff = 125.33 cfs @ 12.34 hrs, Volume= 12.071 af, Depth= 2.86"

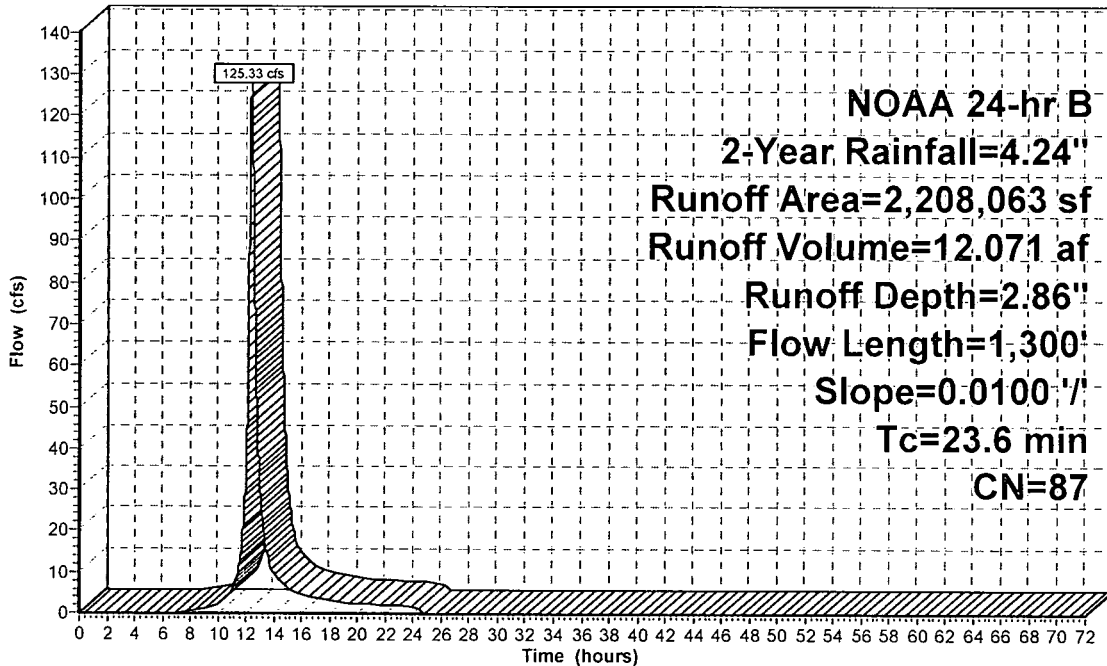
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 2-Year Rainfall=4.24"

Area (sf)	CN	Description
401,286	39	>75% Grass cover, Good, HSG A
1,605,144	98	Paved parking, HSG A
* 75,778	98	wetland
* 125,855	98	pond
2,208,063	87	Weighted Average
401,286		18.17% Pervious Area
1,806,777		81.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.20		<b>Sheet Flow, Sheet Flow</b> Smooth surfaces n= 0.011 P2= 4.24"
22.2	1,200	0.0100	0.90		<b>Shallow Concentrated Flow, Shallow Concentrated Flow</b> Cultivated Straight Rows Kv= 9.0 fps
23.6	1,300	Total			

**Subcatchment PG: PROP. DA-G**

Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 2-Year Rainfall=4.24"

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## Summary for Pond 1P: POND A

Inflow Area = 35.316 ac, 78.95% Impervious, Inflow Depth = 2.67" for 2-Year event  
 Inflow = 67.75 cfs @ 12.47 hrs, Volume= 7.868 af  
 Outflow = 15.39 cfs @ 13.38 hrs, Volume= 7.770 af, Atten= 77%, Lag= 54.4 min  
 Primary = 15.39 cfs @ 13.38 hrs, Volume= 7.770 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 10.13' @ 13.38 hrs Surf.Area= 106,492 sf Storage= 190,887 cf

Plug-Flow detention time= 475.0 min calculated for 7.769 af (99% of inflow)  
 Center-of-Mass det. time= 467.7 min ( 1,300.6 - 832.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	478,682 cf	<b>POND A (Irregular)</b> Listed below (Recalc) 1,196,706 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	80,000	1,700.0	0	0	80,000
6.00	84,842	1,702.0	82,409	82,409	81,785
7.00	89,983	1,725.0	87,400	169,809	88,287
8.00	95,190	1,746.0	92,574	262,383	94,342
9.00	100,460	1,767.0	97,813	360,197	100,470
10.00	105,793	1,788.0	103,115	463,312	106,671
11.00	111,187	1,808.0	108,479	571,790	112,670
12.00	116,640	1,828.0	113,903	685,693	118,735
13.00	122,152	1,847.0	119,385	805,078	124,588
14.00	127,721	1,866.0	124,926	930,005	130,501
15.00	133,346	1,885.0	130,523	1,060,528	136,474
16.00	139,029	1,904.0	136,178	1,196,706	142,508

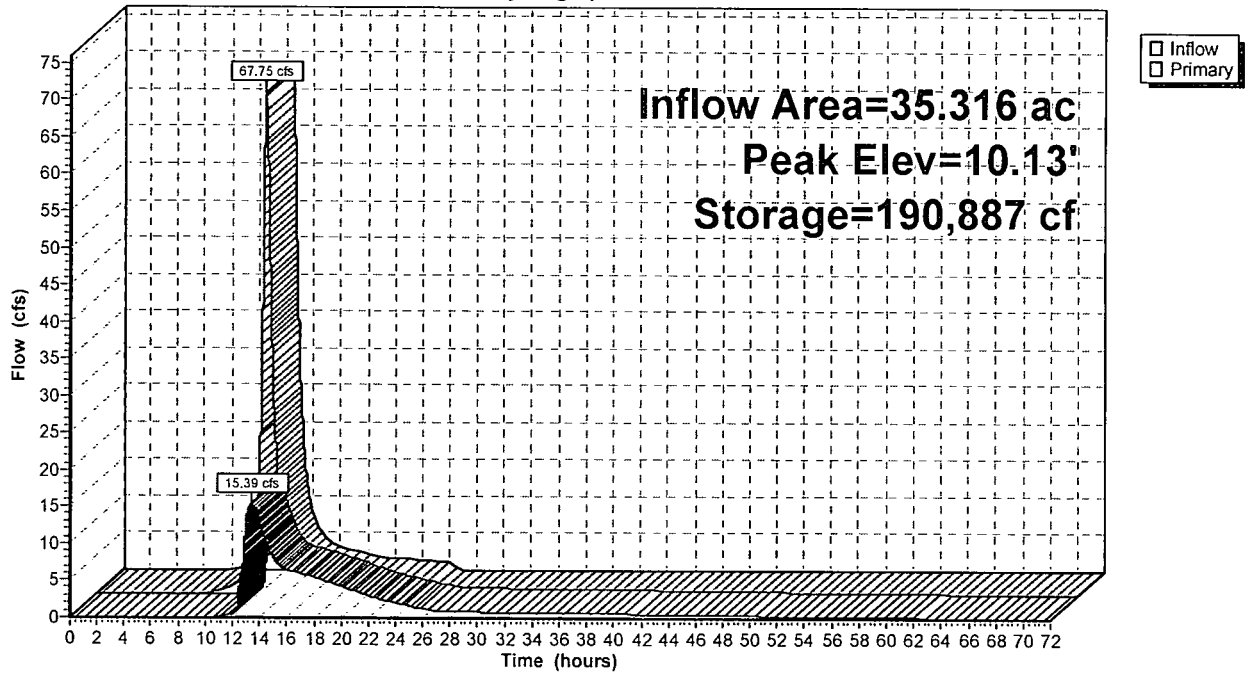
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round Culvert</b> L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.88'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.31'	<b>42.0" W x 8.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	12.85'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=15.41 cfs @ 13.38 hrs HW=10.13' (Free Discharge)

- 1=Culvert (Passes 15.41 cfs of 74.43 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.46 cfs @ 10.68 fps)
- 3=Orifice/Grate (Orifice Controls 6.27 cfs @ 7.99 fps)
- 4=Orifice/Grate (Orifice Controls 7.68 cfs @ 3.29 fps)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

Pond 1P: POND A

Hydrograph





**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 2-Year Rainfall=4.24"

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**Summary for Pond 2P: POND B**

Inflow Area = 19.657 ac, 70.85% Impervious, Inflow Depth = 2.32" for 2-Year event  
 Inflow = 22.57 cfs @ 12.85 hrs, Volume= 3.808 af  
 Outflow = 10.73 cfs @ 13.69 hrs, Volume= 3.762 af, Atten= 52%, Lag= 49.9 min  
 Primary = 10.73 cfs @ 13.69 hrs, Volume= 3.762 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 7.07' @ 13.69 hrs Surf.Area= 39,026 sf Storage= 71,902 cf

Plug-Flow detention time= 317.2 min calculated for 3.762 af (99% of inflow)  
 Center-of-Mass det. time= 309.8 min ( 1,181.5 - 871.8 )

Volume	Invert	Avail.Storage	Storage Description			
#1	5.00'	204,373 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
5.00	30,624	1,334.0	0	0	30,624	
6.00	34,658	1,355.0	32,620	32,620	35,314	
7.00	38,755	1,376.0	36,687	69,308	40,078	
8.00	42,912	1,395.0	40,816	110,123	44,491	
9.00	47,126	1,414.0	45,003	155,126	48,964	
10.00	51,398	1,433.0	49,247	204,373	53,498	

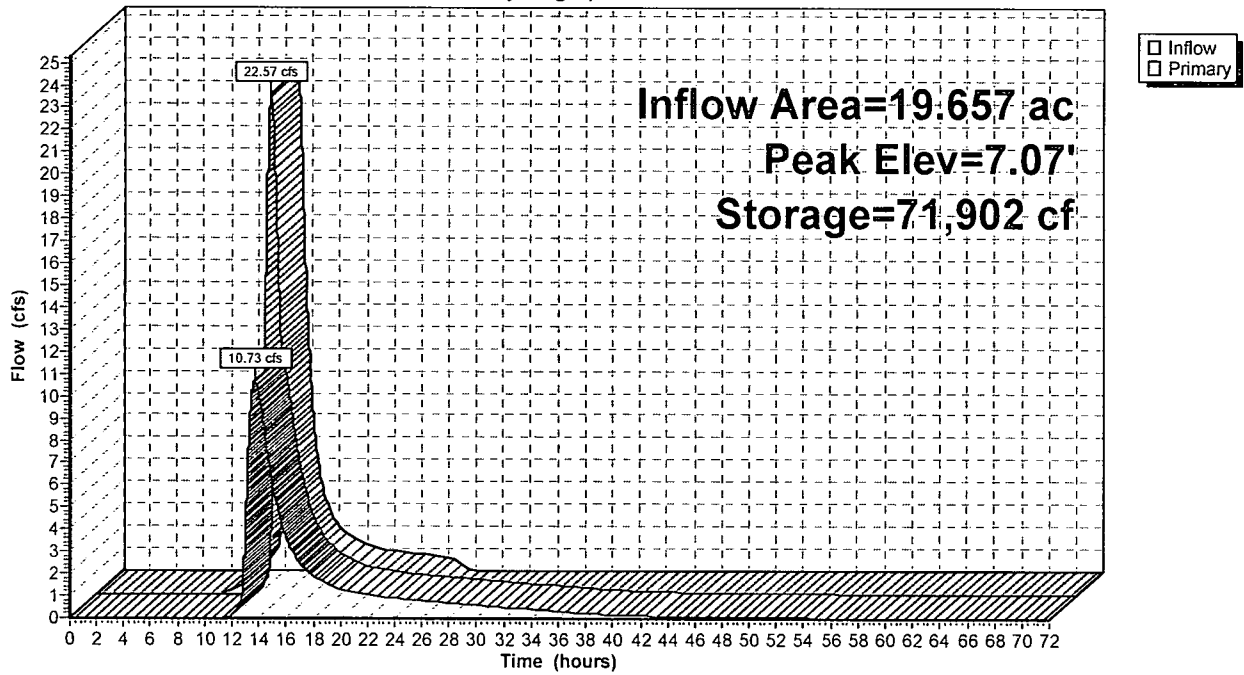
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.00'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	7.87'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	8.65'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=10.73 cfs @ 13.69 hrs HW=7.07' (Free Discharge)

- 1=RCP\_Round 36" (Passes 10.73 cfs of 25.12 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.27 cfs @ 6.49 fps)
- 3=Orifice/Grate (Orifice Controls 9.45 cfs @ 3.52 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

### Pond 2P: POND B

#### Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 2-Year Rainfall=4.24"

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## Summary for Pond 3P: POND C

Inflow Area = 10.269 ac, 74.80% Impervious, Inflow Depth = 2.50" for 2-Year event  
 Inflow = 20.14 cfs @ 12.42 hrs, Volume= 2.136 af  
 Outflow = 6.29 cfs @ 13.03 hrs, Volume= 2.136 af, Atten= 69%, Lag= 36.7 min  
 Primary = 6.29 cfs @ 13.03 hrs, Volume= 2.136 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 11.57' @ 13.03 hrs Surf.Area= 22,568 sf Storage= 42,437 cf

Plug-Flow detention time= 305.8 min calculated for 2.135 af (100% of inflow)  
 Center-of-Mass det. time= 306.1 min ( 1,139.6 - 833.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	122,983 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 307,457 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	10,253	541.0	0	0	10,253
6.00	11,920	570.0	11,076	11,076	12,876
7.00	13,671	597.0	12,786	23,862	15,451
8.00	15,499	622.0	14,575	38,437	17,951
9.00	17,399	645.0	16,440	54,877	20,355
10.00	19,366	666.0	18,374	73,251	22,642
11.00	21,395	687.0	20,372	93,623	25,002
12.00	23,484	706.0	22,431	116,054	27,221
13.00	25,632	726.0	24,550	140,604	29,609
14.00	27,838	745.0	26,727	167,332	31,952
15.00	301,001	764.0	140,126	307,457	34,355

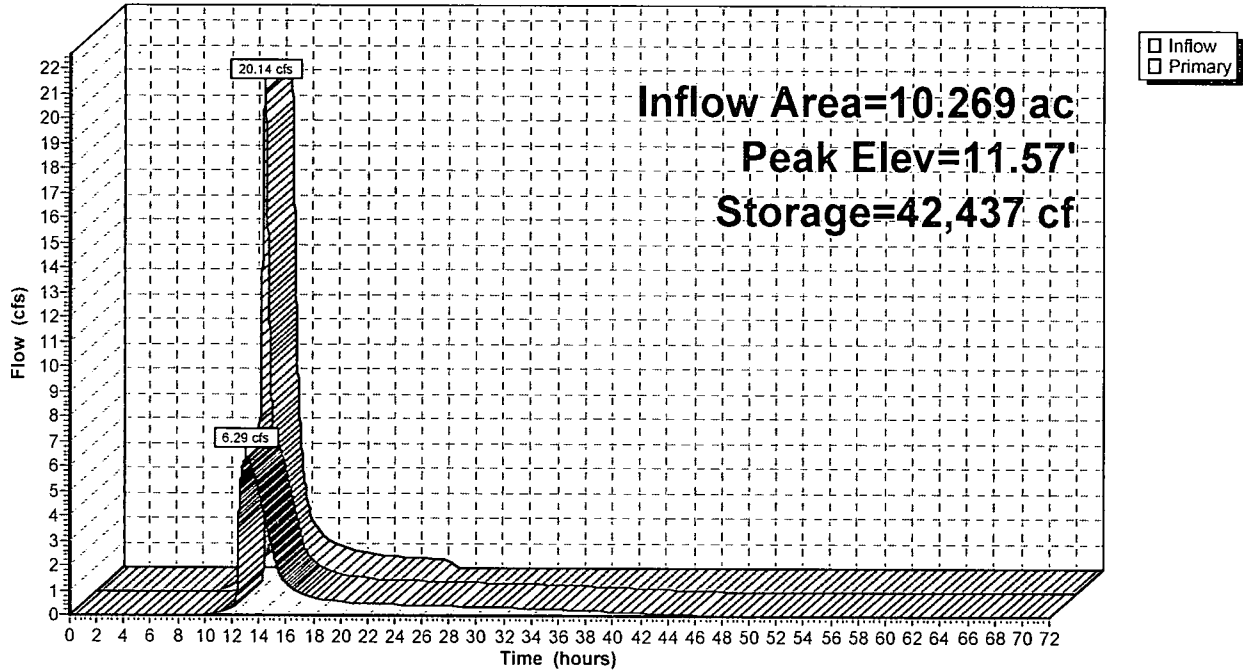
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>30.0" Round RCP_Round 30"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	8.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	12.01'	<b>36.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	14.04'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=6.29 cfs @ 13.03 hrs HW=11.57' (Free Discharge)

- 1=RCP\_Round 30" (Passes 6.29 cfs of 54.50 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.60 cfs @ 12.22 fps)
- 3=Orifice/Grate (Orifice Controls 5.69 cfs @ 7.25 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

Pond 3P: POND C

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 2-Year Rainfall=4.24"

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**Summary for Pond 4P: POND D**

Inflow Area = 19.114 ac, 71.43% Impervious, Inflow Depth = 2.32" for 2-Year event  
 Inflow = 29.56 cfs @ 12.55 hrs, Volume= 3.703 af  
 Outflow = 1.41 cfs @ 16.87 hrs, Volume= 1.700 af, Atten= 95%, Lag= 259.2 min  
 Primary = 1.41 cfs @ 16.87 hrs, Volume= 1.700 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 8.63' @ 16.87 hrs Surf.Area= 96,752 sf Storage= 125,969 cf

Plug-Flow detention time= 1,129.2 min calculated for 1.700 af (46% of inflow)  
 Center-of-Mass det. time= 1,021.2 min ( 1,869.4 - 848.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	418,976 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 1,047,440 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	76,922	1,776.0	0	0	76,922
6.00	82,288	1,802.0	79,590	79,590	84,538
7.00	87,732	1,827.0	84,995	164,585	91,982
8.00	93,250	1,851.0	90,477	255,062	99,243
9.00	98,838	1,874.0	96,030	351,093	106,311
10.00	104,491	1,895.0	101,651	452,744	112,885
11.00	110,206	1,079.0	107,336	560,080	306,008
12.00	115,979	1,934.0	113,080	673,160	511,015
13.00	121,809	1,953.0	118,882	792,042	517,205
14.00	127,696	1,972.0	124,741	916,783	523,455
15.00	133,639	1,991.0	130,656	1,047,440	529,766

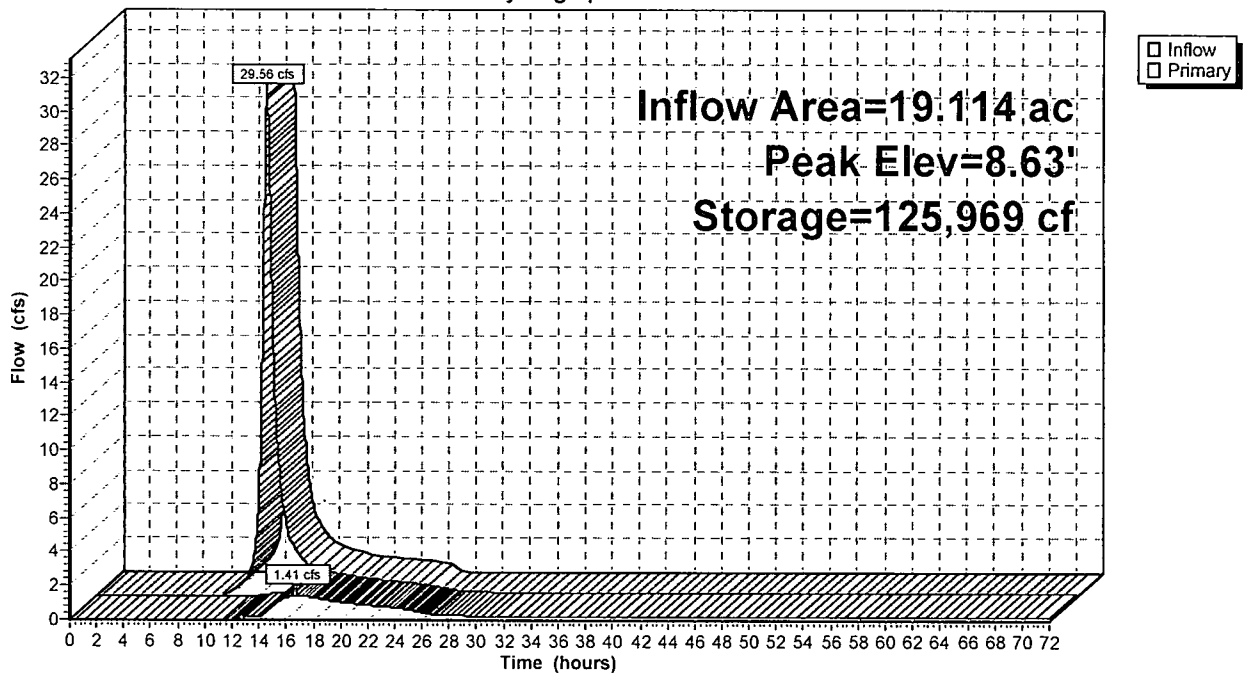
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	8.29'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	10.17'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	12.14'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.39 cfs @ 16.87 hrs HW=8.63' (Free Discharge)

- 1=RCP\_Round 36" (Passes 1.39 cfs of 49.67 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.20 cfs @ 9.07 fps)
- 3=Orifice/Grate (Orifice Controls 1.20 cfs @ 1.99 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

Pond 4P: POND D

Hydrograph



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## Summary for Pond 5P: POND E

Inflow Area = 18.476 ac, 74.60% Impervious, Inflow Depth = 2.50" for 2-Year event  
 Inflow = 30.70 cfs @ 12.54 hrs, Volume= 3.843 af  
 Outflow = 18.40 cfs @ 12.94 hrs, Volume= 3.811 af, Atten= 40%, Lag= 23.6 min  
 Primary = 18.40 cfs @ 12.94 hrs, Volume= 3.811 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 9.05' @ 12.94 hrs Surf.Area= 42,182 sf Storage= 59,992 cf

Plug-Flow detention time= 350.9 min calculated for 3.810 af (99% of inflow)  
 Center-of-Mass det. time= 346.0 min ( 1,189.1 - 843.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	179,993 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 449,982 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	32,069	780.0	0	0	32,069
6.00	34,448	806.0	33,251	33,251	35,445
7.00	36,906	832.0	35,670	68,921	38,932
8.00	39,440	857.0	38,166	107,087	42,396
9.00	42,047	880.0	40,737	147,824	45,692
10.00	44,723	903.0	43,378	191,202	49,075
11.00	47,465	925.0	46,087	237,289	52,403
12.00	50,271	945.0	48,861	286,150	55,523
13.00	53,136	965.0	51,697	337,847	58,709
14.00	56,060	984.0	54,591	392,439	61,813
15.00	59,040	1,003.0	57,544	449,982	64,977

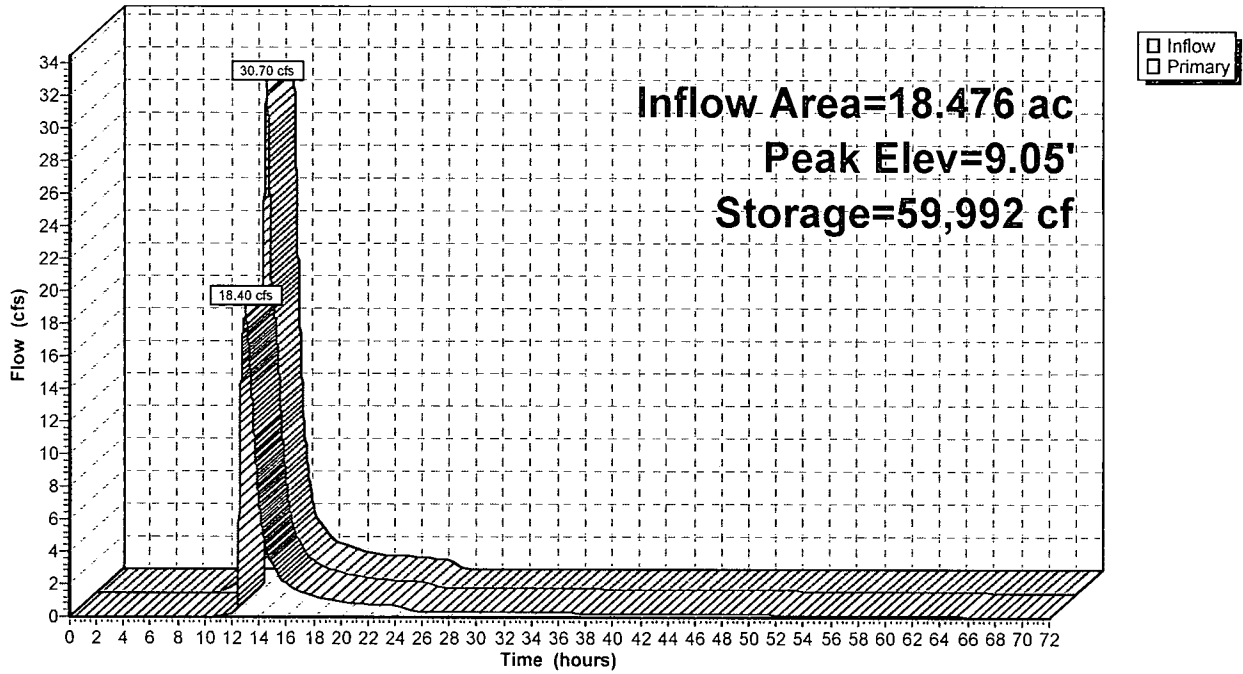
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>24.0" Round RCP_Round 24"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.50' S= 0.0050 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.19'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.35'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	11.26'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=18.41 cfs @ 12.94 hrs HW=9.05' (Free Discharge)

- 1=RCP\_Round 24" (Passes 18.41 cfs of 25.16 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.47 cfs @ 9.54 fps)
- 3=Orifice/Grate (Orifice Controls 17.94 cfs @ 5.08 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

Pond 5P: POND E

Hydrograph





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## Summary for Pond 6P: POND F

Inflow Area = 17.655 ac, 68.32% Impervious, Inflow Depth = 2.16" for 2-Year event  
 Inflow = 26.54 cfs @ 12.51 hrs, Volume= 3.178 af  
 Outflow = 15.06 cfs @ 12.92 hrs, Volume= 3.173 af, Atten= 43%, Lag= 24.5 min  
 Primary = 15.06 cfs @ 12.92 hrs, Volume= 3.173 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 9.84' @ 12.92 hrs Surf.Area= 29,434 sf Storage= 47,130 cf

Plug-Flow detention time= 284.2 min calculated for 3.173 af (100% of inflow)  
 Center-of-Mass det. time= 283.1 min ( 1,133.5 - 850.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	120,437 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 301,092 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	19,563	615.0	0	0	19,563
6.00	21,448	642.0	20,498	20,498	22,336
7.00	23,413	669.0	22,423	42,922	25,228
8.00	25,459	695.0	24,429	67,350	28,131
9.00	27,586	722.0	26,515	93,866	31,257
10.00	29,792	748.0	28,682	122,548	34,386
11.00	32,075	774.0	30,926	153,474	37,626
12.00	34,432	798.0	33,247	186,721	40,729
13.00	36,861	821.0	35,640	222,360	43,801
14.00	39,357	843.0	38,102	260,463	46,831
15.00	41,916	863.0	40,630	301,092	49,677

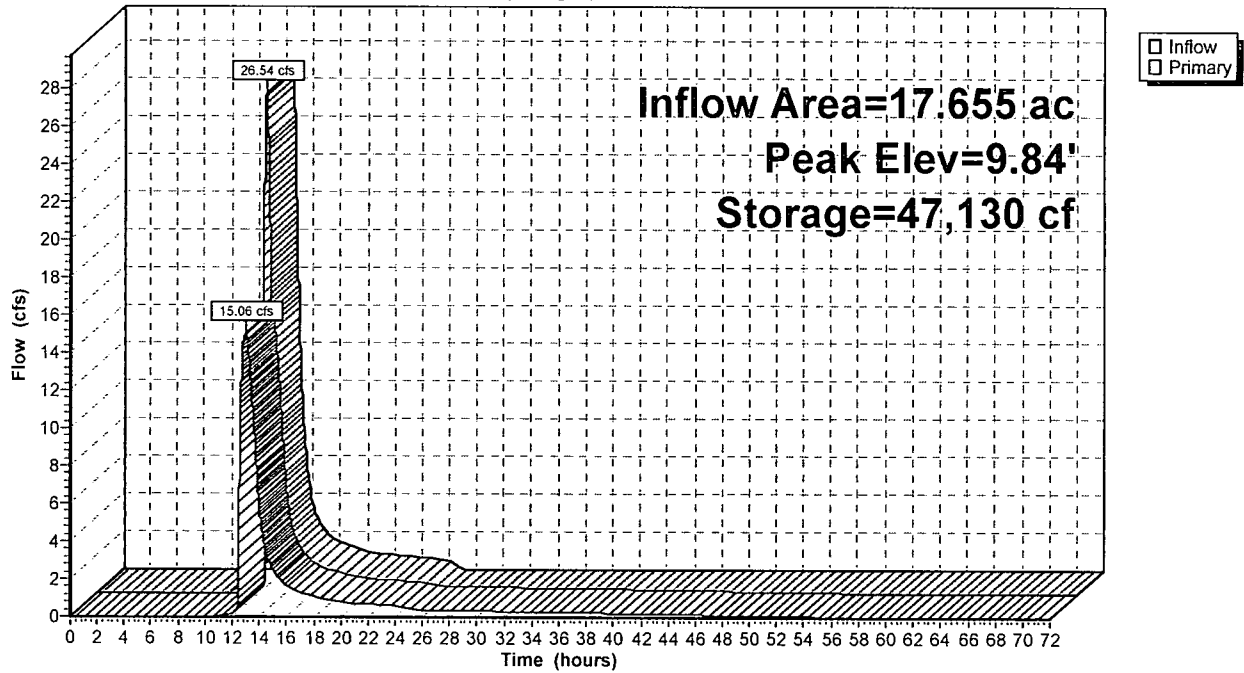
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.70'	<b>15.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.13'	<b>36.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	13.26'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=15.06 cfs @ 12.92 hrs HW=9.84' (Free Discharge)

- 1=RCP\_Round 36" (Passes 15.06 cfs of 62.21 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.51 cfs @ 10.46 fps)
- 3=Orifice/Grate (Orifice Controls 14.55 cfs @ 5.93 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

### Pond 6P: POND F

#### Hydrograph



# Golden Grove Preliminary Study (WQv)

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NOAA 24-hr B 2-Year Rainfall=4.24"

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## Summary for Pond 7P: POND G

Inflow Area = 50.690 ac, 81.83% Impervious, Inflow Depth = 2.86" for 2-Year event  
 Inflow = 125.33 cfs @ 12.34 hrs, Volume= 12.071 af  
 Outflow = 8.22 cfs @ 14.35 hrs, Volume= 10.236 af, Atten= 93%, Lag= 120.5 min  
 Primary = 8.22 cfs @ 14.35 hrs, Volume= 10.236 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 8.89' @ 14.35 hrs Surf.Area= 99,801 sf Storage= 358,049 cf

Plug-Flow detention time= 850.8 min calculated for 10.236 af (85% of inflow)  
 Center-of-Mass det. time= 788.2 min ( 1,605.7 - 817.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	1,046,078 cf	<b>POND A (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	84,335	1,283.0	0	0	84,335
6.00	88,218	1,305.0	86,269	86,269	89,047
7.00	92,165	1,326.0	90,184	176,454	93,636
8.00	96,174	1,346.0	94,162	270,616	98,094
9.00	100,243	1,366.0	98,201	368,817	102,618
10.00	104,370	1,385.0	102,300	471,117	106,999
11.00	108,553	1,404.0	106,455	577,572	111,441
12.00	112,794	1,423.0	110,667	688,238	115,943
13.00	117,091	1,442.0	114,936	803,174	120,505
14.00	121,444	1,461.0	119,261	922,435	125,128
15.00	125,855	1,479.5	123,643	1,046,078	129,700

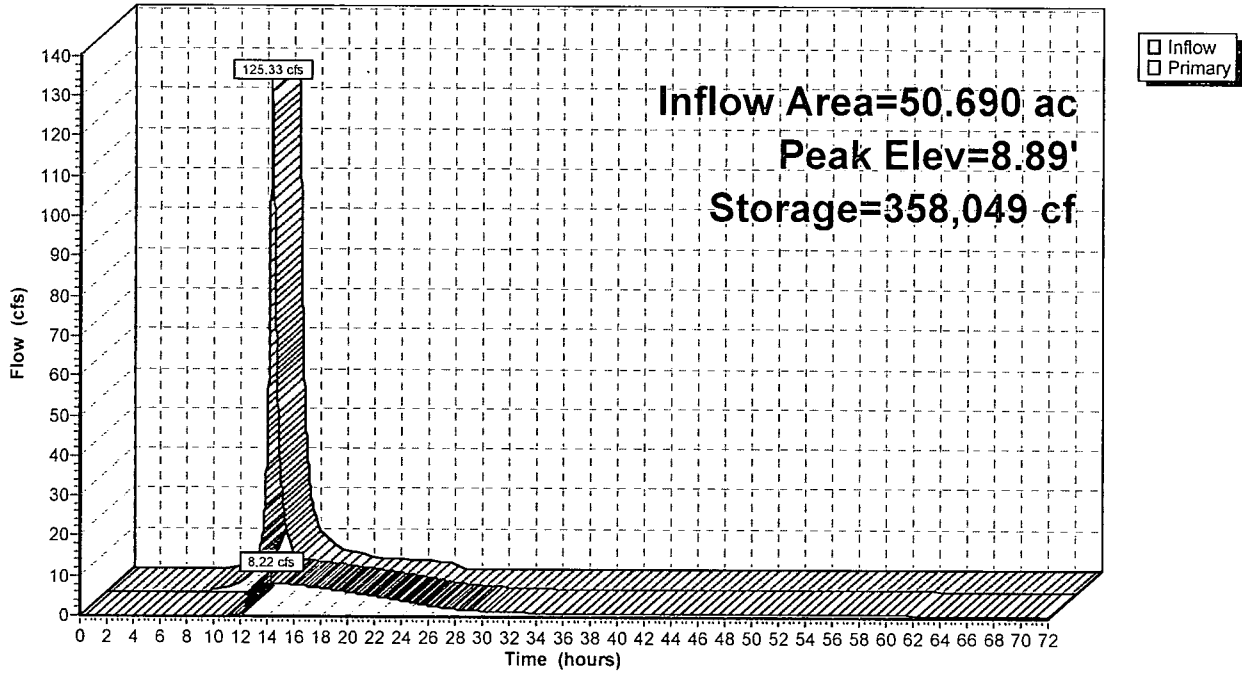
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round Culvert</b> L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.88'	<b>15.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.47'	<b>36.0" W x 8.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	11.78'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=8.22 cfs @ 14.35 hrs HW=8.89' (Free Discharge)

- 1=Culvert (Passes 8.22 cfs of 59.97 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.26 cfs @ 9.24 fps)
- 3=Orifice/Grate (Orifice Controls 6.96 cfs @ 5.67 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

Pond 7P: POND G

Hydrograph



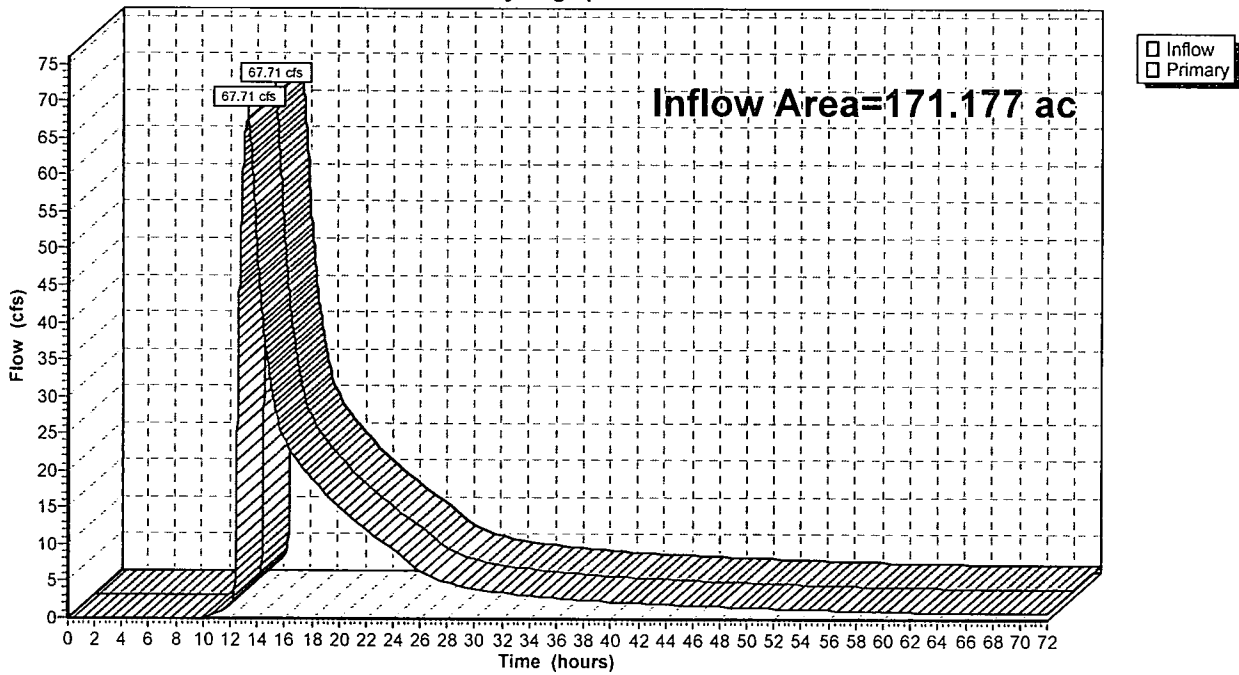
### Summary for Link POST: POST

Inflow Area = 171.177 ac, 76.22% Impervious, Inflow Depth > 2.28" for 2-Year event  
Inflow = 67.71 cfs @ 13.22 hrs, Volume= 32.587 af  
Primary = 67.71 cfs @ 13.22 hrs, Volume= 32.587 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

### Link POST: POST

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 10-Year Rainfall=6.49"

Prepared by Bowman Consulting

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>SubcatchmentP-A: PROP. DA-A</b>	Runoff Area=1,538,366 sf 78.95% Impervious Runoff Depth=4.77" Flow Length=1,300' Tc=34.0 min CN=85 Runoff=118.99 cfs 14.028 af
<b>SubcatchmentP-B: PROP. DA-B</b>	Runoff Area=856,244 sf 70.85% Impervious Runoff Depth=4.33" Flow Length=1,300' Slope=0.0100 '/ Tc=64.6 min CN=81 Runoff=42.10 cfs 7.097 af
<b>SubcatchmentP-C: PROP. DA-C</b>	Runoff Area=447,304 sf 74.80% Impervious Runoff Depth=4.55" Flow Length=600' Slope=0.0050 '/ Tc=28.9 min CN=83 Runoff=36.25 cfs 3.892 af
<b>SubcatchmentP-D: PROP. DA-D</b>	Runoff Area=832,612 sf 71.43% Impervious Runoff Depth=4.33" Flow Length=1,300' Slope=0.0050 '/ Tc=39.2 min CN=81 Runoff=54.85 cfs 6.902 af
<b>SubcatchmentP-E: PROP. DA-E</b>	Runoff Area=804,829 sf 74.60% Impervious Runoff Depth=4.55" Flow Length=1,300' Slope=0.0050 '/ Tc=39.2 min CN=83 Runoff=55.39 cfs 7.003 af
<b>SubcatchmentP-F: PROP. DA-F</b>	Runoff Area=769,055 sf 68.32% Impervious Runoff Depth=4.12" Flow Length=1,100' Slope=0.0050 '/ Tc=36.2 min CN=79 Runoff=50.65 cfs 6.062 af
<b>SubcatchmentPG: PROP. DA-G</b>	Runoff Area=2,208,063 sf 81.83% Impervious Runoff Depth=4.99" Flow Length=1,300' Slope=0.0100 '/ Tc=23.6 min CN=87 Runoff=214.10 cfs 21.068 af
<b>Pond 1P: POND A</b>	Peak Elev=12.93' Storage=318,758 cf Inflow=118.99 cfs 14.028 af Outflow=31.38 cfs 13.923 af
<b>Pond 2P: POND B</b>	Peak Elev=8.15' Storage=116,524 cf Inflow=42.10 cfs 7.097 af Outflow=23.54 cfs 7.050 af
<b>Pond 3P: POND C</b>	Peak Elev=13.91' Storage=65,960 cf Inflow=36.25 cfs 3.892 af Outflow=18.10 cfs 3.892 af
<b>Pond 4P: POND D</b>	Peak Elev=9.76' Storage=171,136 cf Inflow=54.85 cfs 6.902 af Outflow=14.70 cfs 4.886 af
<b>Pond 5P: POND E</b>	Peak Elev=11.04' Storage=95,656 cf Inflow=55.39 cfs 7.003 af Outflow=33.56 cfs 6.970 af
<b>Pond 6P: POND F</b>	Peak Elev=12.42' Storage=80,591 cf Inflow=50.65 cfs 6.062 af Outflow=31.91 cfs 6.056 af
<b>Pond 7P: POND G</b>	Peak Elev=11.12' Storage=590,777 cf Inflow=214.10 cfs 21.068 af Outflow=23.86 cfs 19.046 af
<b>Link POST: POST</b>	Inflow=165.66 cfs 61.824 af Primary=165.66 cfs 61.824 af

**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 10-Year Rainfall=6.49"

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**Summary for Subcatchment P-A: PROP. DA-A**

Runoff = 118.99 cfs @ 12.47 hrs, Volume= 14.028 af, Depth= 4.77"

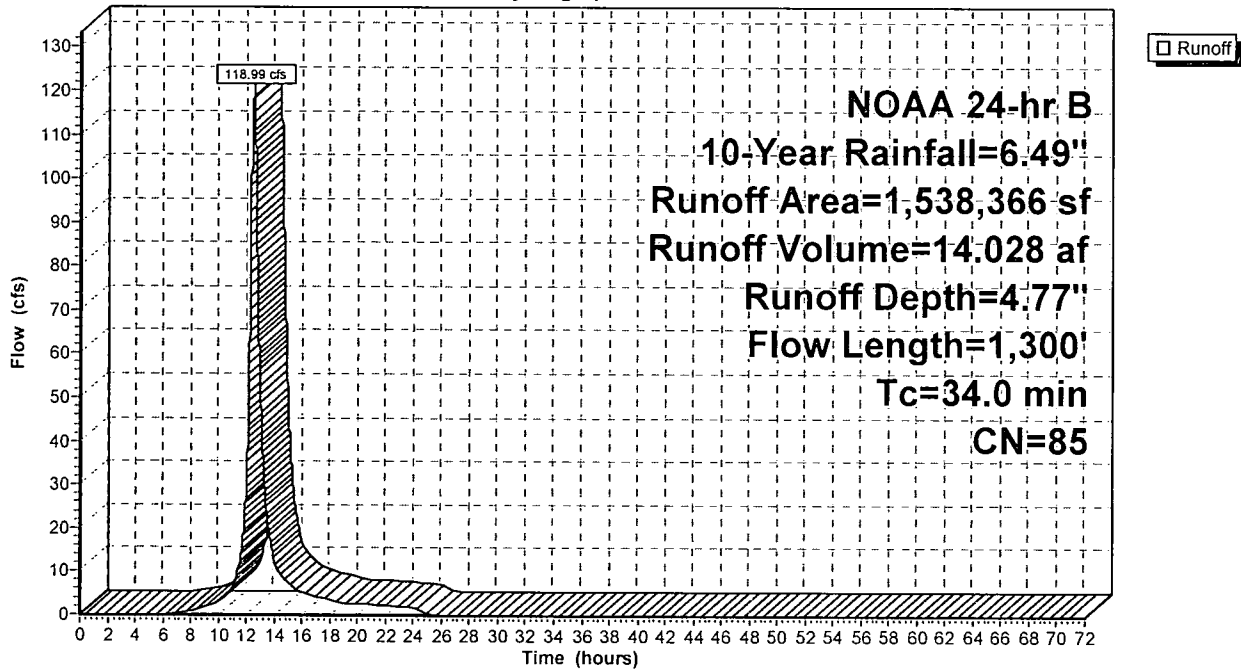
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 10-Year Rainfall=6.49"

Area (sf)	CN	Description
522,403	61	1/4 acre lots, 38% imp, HSG A
* 876,934	98	IMPERVIOUS
* 139,029	98	PONDS
1,538,366	85	Weighted Average
323,890		21.05% Pervious Area
1,214,476		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0100	0.10		<b>Sheet Flow, Sheet Flow</b> Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		<b>Shallow Concentrated Flow, Shallow concentrated flow</b> Unpaved Kv= 16.1 fps
34.0	1,300	Total			

**Subcatchment P-A: PROP. DA-A**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

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NOAA 24-hr B 10-Year Rainfall=6.49"

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**Summary for Subcatchment P-B: PROP. DA-B**

Runoff = 42.10 cfs @ 12.85 hrs, Volume= 7.097 af, Depth= 4.33"

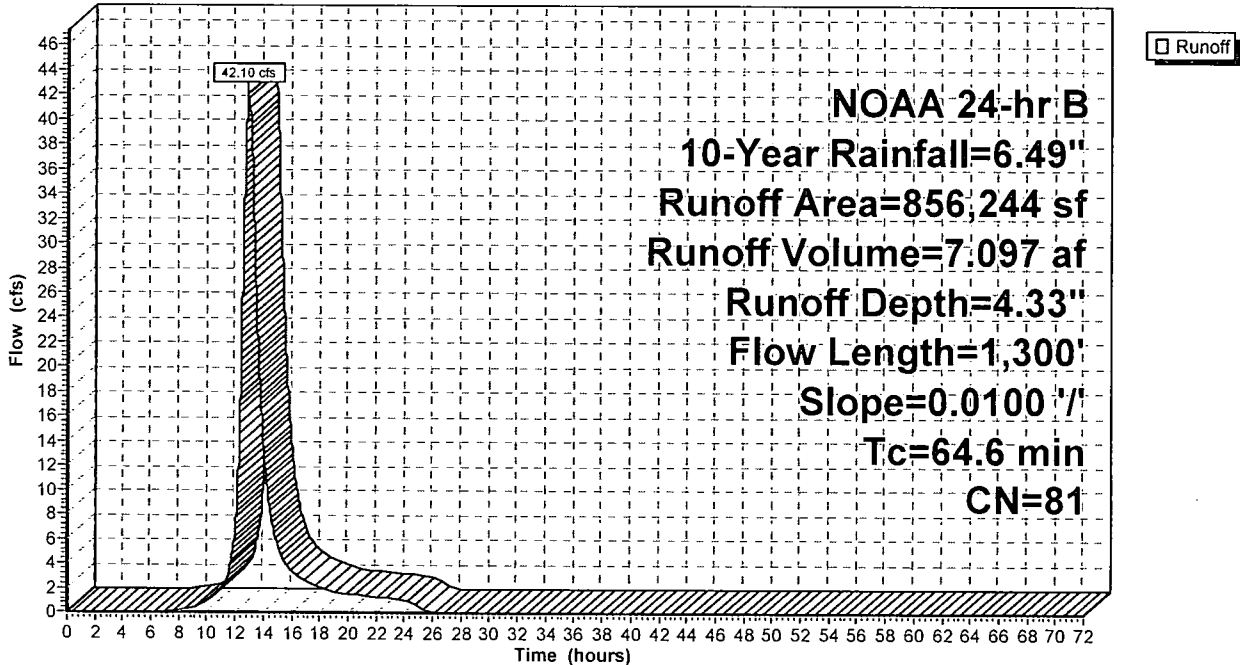
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 10-Year Rainfall=6.49"

Area (sf)	CN	Description
402,533	61	1/4 acre lots, 38% imp, HSG A
371,484	98	Paved parking, HSG D
* 51,398	98	POND
* 30,829	98	WETLAND
856,244	81	Weighted Average
249,570		29.15% Pervious Area
606,674		70.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.6	100	0.0100	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 4.24"
40.0	1,200	0.0100	0.50		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
64.6	1,300	Total			

**Subcatchment P-B: PROP. DA-B**

Hydrograph





**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 10-Year Rainfall=6.49"

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**Summary for Subcatchment P-C: PROP. DA-C**

Runoff = 36.25 cfs @ 12.40 hrs, Volume= 3.892 af, Depth= 4.55"

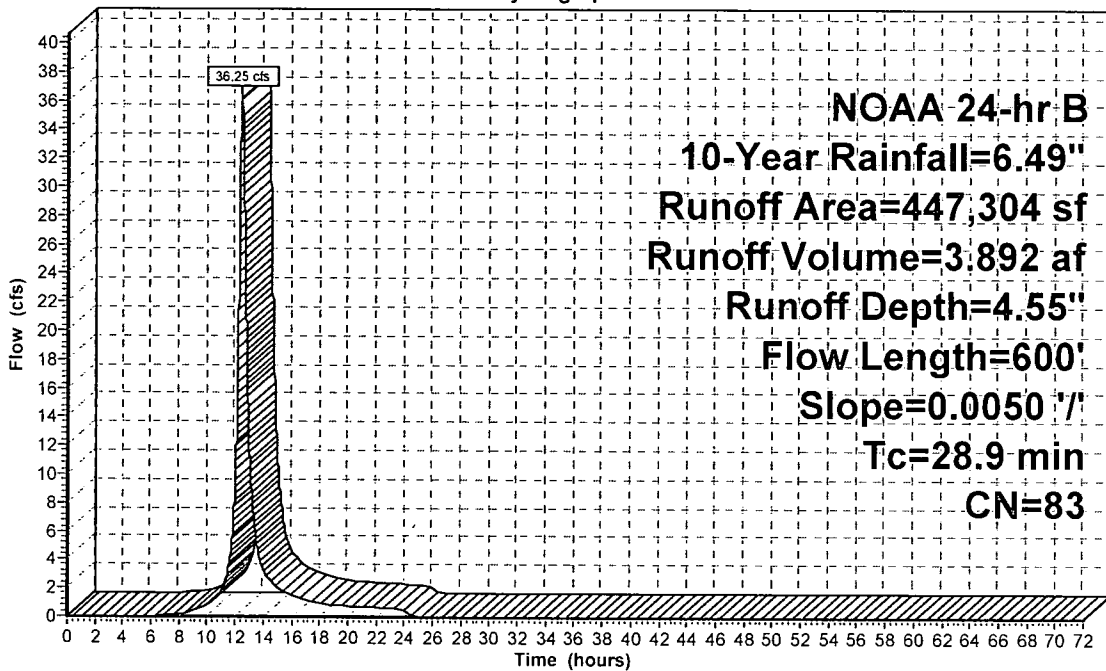
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 10-Year Rainfall=6.49"

Area (sf)	CN	Description
181,773	61	1/4 acre lots, 38% imp, HSG A
235,430	98	Paved parking, HSG D
* 30,101	98	pond
447,304	83	Weighted Average
112,699		25.20% Pervious Area
334,605		74.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
7.3	500	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
28.9	600	Total			

**Subcatchment P-C: PROP. DA-C**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 10-Year Rainfall=6.49"

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**Summary for Subcatchment P-D: PROP.DA-D**

Runoff = 54.85 cfs @ 12.54 hrs, Volume= 6.902 af, Depth= 4.33"

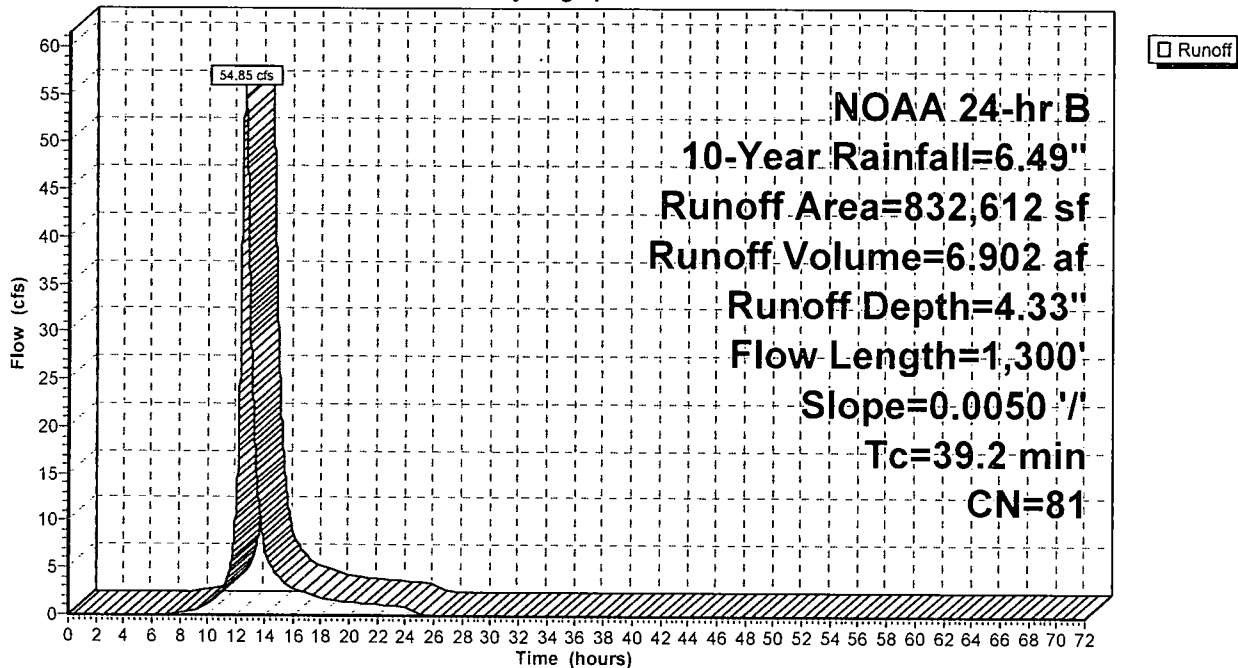
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 10-Year Rainfall=6.49"

Area (sf)	CN	Description
383,716	61	1/4 acre lots, 38% imp, HSG A
299,467	98	Paved parking, HSG D
* 88,466	98	WETLAND
* 60,963	98	POND
832,612	81	Weighted Average
237,904		28.57% Pervious Area
594,708		71.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
39.2	1,300	Total			

**Subcatchment P-D: PROP.DA-D**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 10-Year Rainfall=6.49"

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**Summary for Subcatchment P-E: PROP.DA-E**

Runoff = 55.39 cfs @ 12.54 hrs, Volume= 7.003 af, Depth= 4.55"

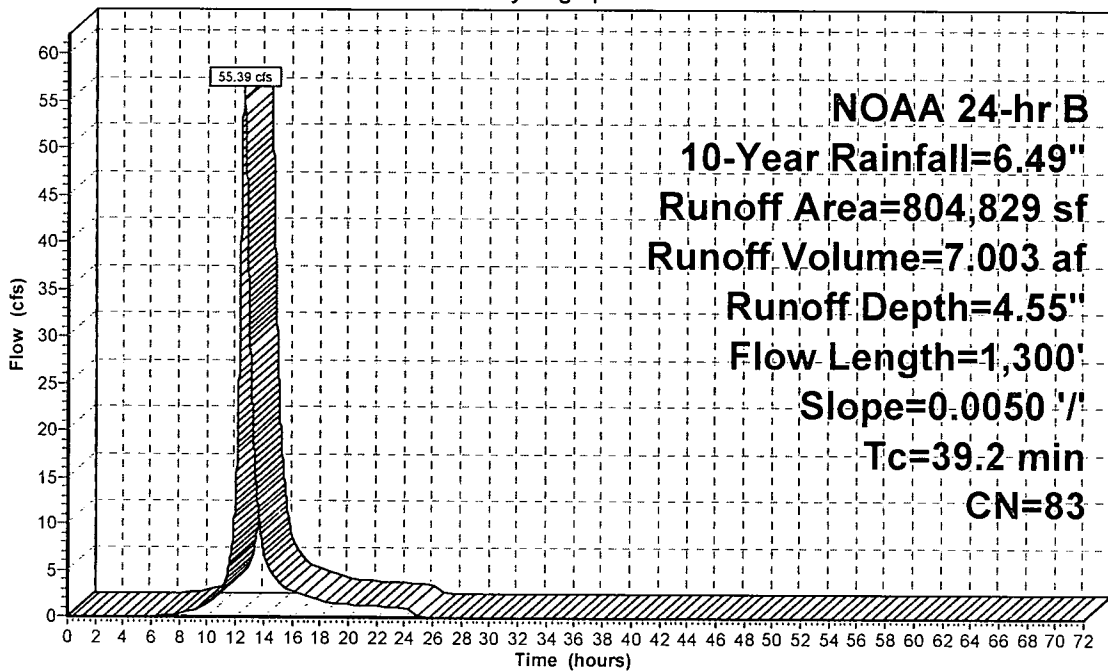
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 10-Year Rainfall=6.49"

Area (sf)	CN	Description
416,071	98	Paved parking, HSG A
329,718	61	1/4 acre lots, 38% imp, HSG A
* 59,040	98	POND
804,829	83	Weighted Average
204,425		25.40% Pervious Area
600,404		74.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		<b>Sheet Flow, Sheet Flow</b> Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		<b>Shallow Concentrated Flow, Shallow Concentrated Flow</b> Unpaved Kv= 16.1 fps
39.2	1,300	Total			

**Subcatchment P-E: PROP.DA-E**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 10-Year Rainfall=6.49"

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**Summary for Subcatchment P-F: PROP.DA-F**

Runoff = 50.65 cfs @ 12.51 hrs, Volume= 6.062 af, Depth= 4.12"

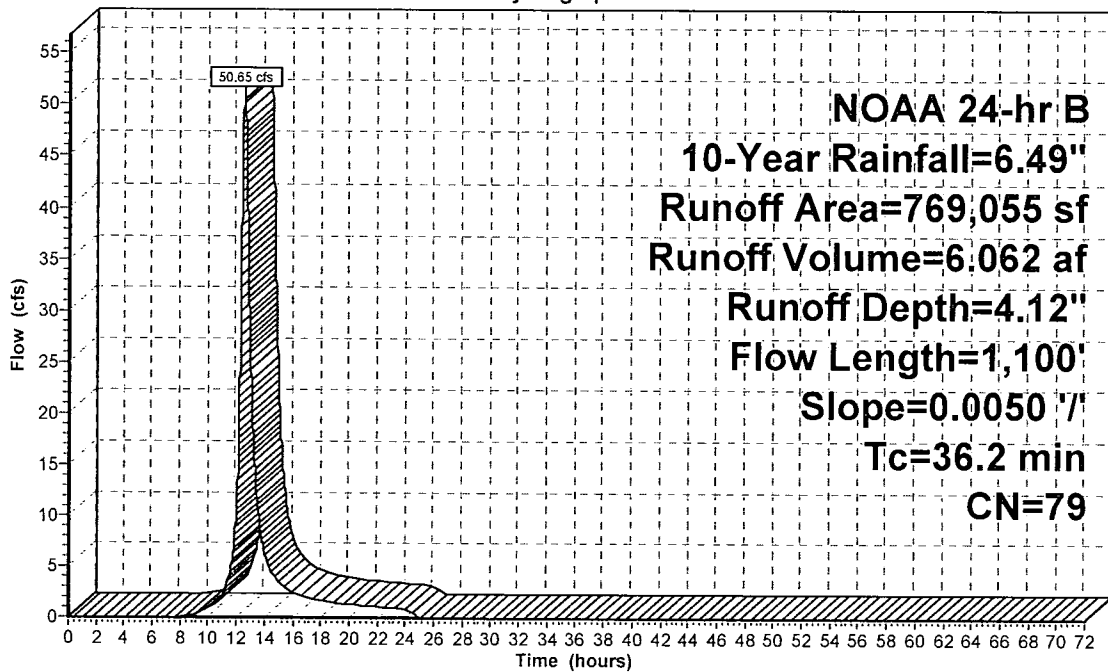
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 10-Year Rainfall=6.49"

Area (sf)	CN	Description
392,960	61	1/4 acre lots, 38% imp, HSG A
334,179	98	Paved parking, HSG D
* 41,916	98	pond
769,055	79	Weighted Average
243,635		31.68% Pervious Area
525,420		68.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
14.6	1,000	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
36.2	1,100	Total			

**Subcatchment P-F: PROP.DA-F**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 10-Year Rainfall=6.49"

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**Summary for Subcatchment PG: PROP. DA-G**

Runoff = 214.10 cfs @ 12.33 hrs, Volume= 21.068 af, Depth= 4.99"

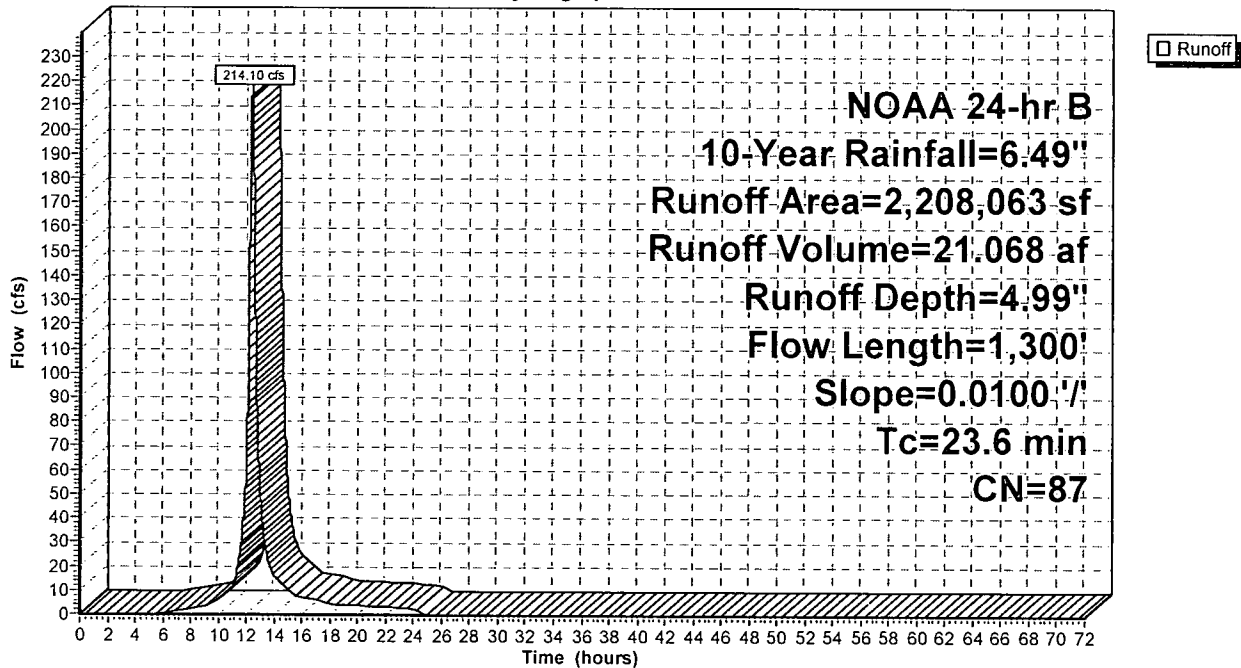
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 10-Year Rainfall=6.49"

Area (sf)	CN	Description
401,286	39	>75% Grass cover, Good, HSG A
1,605,144	98	Paved parking, HSG A
* 75,778	98	wetland
* 125,855	98	pond
2,208,063	87	Weighted Average
401,286		18.17% Pervious Area
1,806,777		81.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.20		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 4.24"
22.2	1,200	0.0100	0.90		Shallow Concentrated Flow, Shallow Concentrated Flow Cultivated Straight Rows Kv= 9.0 fps
23.6	1,300	Total			

**Subcatchment PG: PROP. DA-G**

Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 10-Year Rainfall=6.49"

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## Summary for Pond 1P: POND A

Inflow Area = 35.316 ac, 78.95% Impervious, Inflow Depth = 4.77" for 10-Year event  
 Inflow = 118.99 cfs @ 12.47 hrs, Volume= 14.028 af  
 Outflow = 31.38 cfs @ 13.24 hrs, Volume= 13.923 af, Atten= 74%, Lag= 46.7 min  
 Primary = 31.38 cfs @ 13.24 hrs, Volume= 13.923 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 12.93' @ 13.24 hrs Surf.Area= 121,778 sf Storage= 318,758 cf

Plug-Flow detention time= 335.8 min calculated for 13.922 af (99% of inflow)  
 Center-of-Mass det. time= 331.4 min ( 1,150.2 - 818.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	478,682 cf	<b>POND A (Irregular)</b> Listed below (Recalc) 1,196,706 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	80,000	1,700.0	0	0	80,000
6.00	84,842	1,702.0	82,409	82,409	81,785
7.00	89,983	1,725.0	87,400	169,809	88,287
8.00	95,190	1,746.0	92,574	262,383	94,342
9.00	100,460	1,767.0	97,813	360,197	100,470
10.00	105,793	1,788.0	103,115	463,312	106,671
11.00	111,187	1,808.0	108,479	571,790	112,670
12.00	116,640	1,828.0	113,903	685,693	118,735
13.00	122,152	1,847.0	119,385	805,078	124,588
14.00	127,721	1,866.0	124,926	930,005	130,501
15.00	133,346	1,885.0	130,523	1,060,528	136,474
16.00	139,029	1,904.0	136,178	1,196,706	142,508

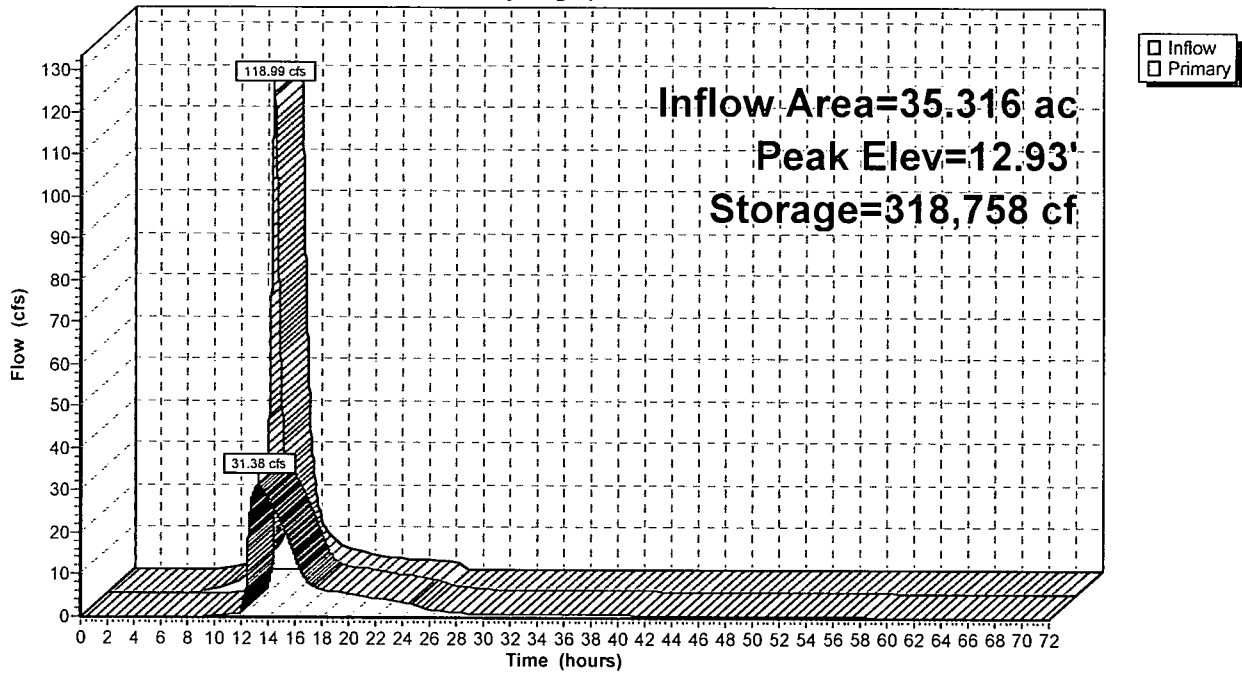
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round Culvert</b> L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.88'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.31'	<b>42.0" W x 8.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	12.85'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=31.37 cfs @ 13.24 hrs HW=12.93' (Free Discharge)

- 1=Culvert (Passes 31.37 cfs of 102.46 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.82 cfs @ 13.38 fps)
- 3=Orifice/Grate (Orifice Controls 8.91 cfs @ 11.35 fps)
- 4=Orifice/Grate (Orifice Controls 20.37 cfs @ 8.73 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 0.27 cfs @ 0.81 fps)

Pond 1P: POND A

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 10-Year Rainfall=6.49"

Prepared by Bowman Consulting

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**Summary for Pond 2P: POND B**

Inflow Area = 19.657 ac, 70.85% Impervious, Inflow Depth = 4.33" for 10-Year event  
 Inflow = 42.10 cfs @ 12.85 hrs, Volume= 7.097 af  
 Outflow = 23.54 cfs @ 13.51 hrs, Volume= 7.050 af, Atten= 44%, Lag= 39.4 min  
 Primary = 23.54 cfs @ 13.51 hrs, Volume= 7.050 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 8.15' @ 13.51 hrs Surf.Area= 43,524 sf Storage= 116,524 cf

Plug-Flow detention time= 210.7 min calculated for 7.050 af (99% of inflow)  
 Center-of-Mass det. time= 206.4 min ( 1,062.8 - 856.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	204,373 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	30,624	1,334.0	0	0	30,624
6.00	34,658	1,355.0	32,620	32,620	35,314
7.00	38,755	1,376.0	36,687	69,308	40,078
8.00	42,912	1,395.0	40,816	110,123	44,491
9.00	47,126	1,414.0	45,003	155,126	48,964
10.00	51,398	1,433.0	49,247	204,373	53,498

Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.00'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	7.87'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	8.65'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

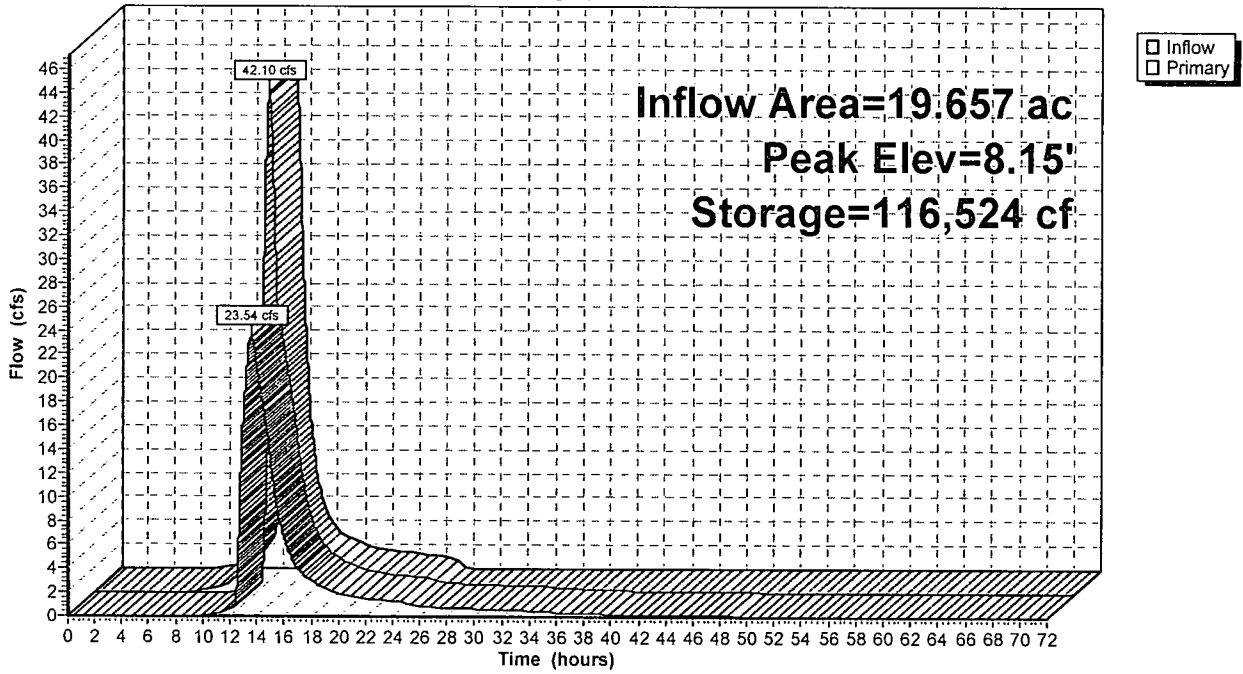
Primary OutFlow Max=23.54 cfs @ 13.51 hrs HW=8.15' (Free Discharge)

- 1=RCP\_Round 36" (Passes 23.54 cfs of 43.69 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.61 cfs @ 8.20 fps)
- 3=Orifice/Grate (Orifice Controls 20.12 cfs @ 5.69 fps)
- 4=Orifice/Grate (Orifice Controls 1.80 cfs @ 1.69 fps)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)



Pond 2P: POND B

Hydrograph



**Golden Grove Preliminary Study (WQv)**

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**Summary for Pond 3P: POND C**

Inflow Area = 10.269 ac, 74.80% Impervious, Inflow Depth = 4.55" for 10-Year event  
 Inflow = 36.25 cfs @ 12.40 hrs, Volume= 3.892 af  
 Outflow = 18.10 cfs @ 12.78 hrs, Volume= 3.892 af, Atten= 50%, Lag= 22.9 min  
 Primary = 18.10 cfs @ 12.78 hrs, Volume= 3.892 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 13.91' @ 12.78 hrs Surf.Area= 27,641 sf Storage= 65,960 cf

Plug-Flow detention time= 200.9 min calculated for 3.891 af (100% of inflow)  
 Center-of-Mass det. time= 201.2 min ( 1,020.0 - 818.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	122,983 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 307,457 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	10,253	541.0	0	0	10,253
6.00	11,920	570.0	11,076	11,076	12,876
7.00	13,671	597.0	12,786	23,862	15,451
8.00	15,499	622.0	14,575	38,437	17,951
9.00	17,399	645.0	16,440	54,877	20,355
10.00	19,366	666.0	18,374	73,251	22,642
11.00	21,395	687.0	20,372	93,623	25,002
12.00	23,484	706.0	22,431	116,054	27,221
13.00	25,632	726.0	24,550	140,604	29,609
14.00	27,838	745.0	26,727	167,332	31,952
15.00	301,001	764.0	140,126	307,457	34,355

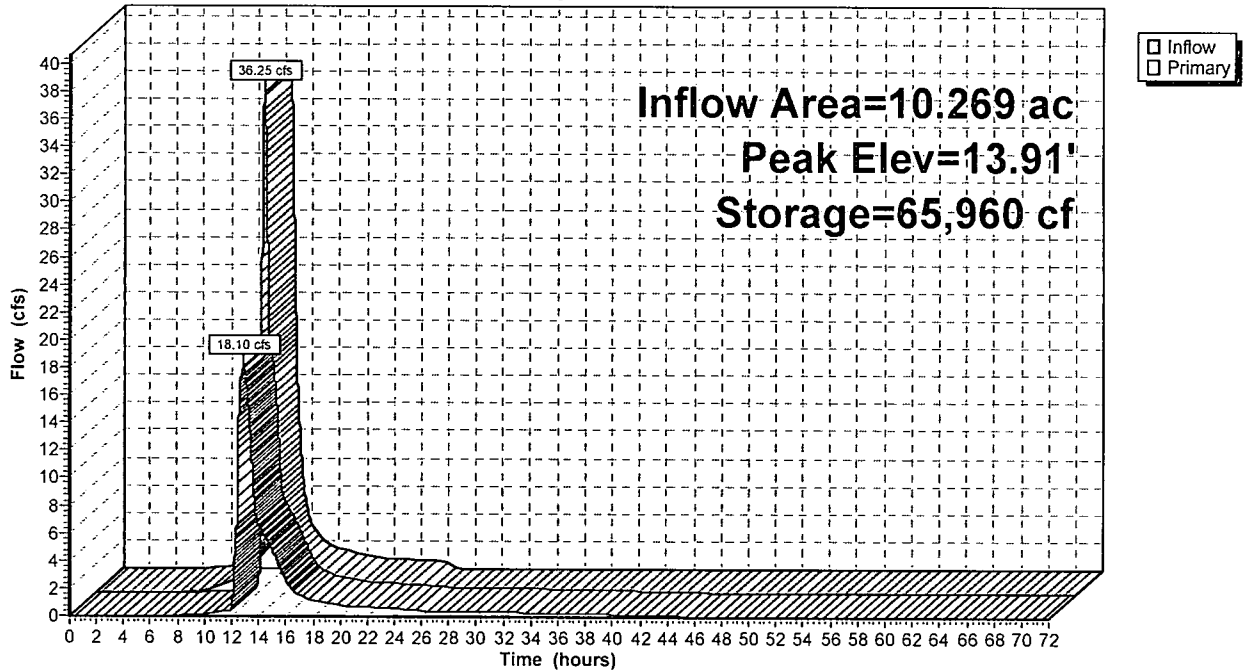
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>30.0" Round RCP_Round 30"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	8.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	12.01'	<b>36.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	14.04'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=18.10 cfs @ 12.78 hrs HW=13.91' (Free Discharge)

- 1=RCP\_Round 30" (Passes 18.10 cfs of 65.42 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.70 cfs @ 14.27 fps)
- 3=Orifice/Grate (Orifice Controls 8.12 cfs @ 10.34 fps)
- 4=Orifice/Grate (Orifice Controls 9.27 cfs @ 6.18 fps)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

Pond 3P: POND C

Hydrograph



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## Summary for Pond 4P: POND D

Inflow Area = 19.114 ac, 71.43% Impervious, Inflow Depth = 4.33" for 10-Year event  
 Inflow = 54.85 cfs @ 12.54 hrs, Volume= 6.902 af  
 Outflow = 14.70 cfs @ 13.41 hrs, Volume= 4.886 af, Atten= 73%, Lag= 52.1 min  
 Primary = 14.70 cfs @ 13.41 hrs, Volume= 4.886 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 9.76' @ 13.41 hrs Surf.Area= 103,120 sf Storage= 171,136 cf

Plug-Flow detention time= 500.2 min calculated for 4.886 af (71% of inflow)  
 Center-of-Mass det. time= 415.6 min ( 1,248.5 - 832.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	418,976 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 1,047,440 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	76,922	1,776.0	0	0	76,922
6.00	82,288	1,802.0	79,590	79,590	84,538
7.00	87,732	1,827.0	84,995	164,585	91,982
8.00	93,250	1,851.0	90,477	255,062	99,243
9.00	98,838	1,874.0	96,030	351,093	106,311
10.00	104,491	1,895.0	101,651	452,744	112,885
11.00	110,206	1,079.0	107,336	560,080	306,008
12.00	115,979	1,934.0	113,080	673,160	511,015
13.00	121,809	1,953.0	118,882	792,042	517,205
14.00	127,696	1,972.0	124,741	916,783	523,455
15.00	133,639	1,991.0	130,656	1,047,440	529,766

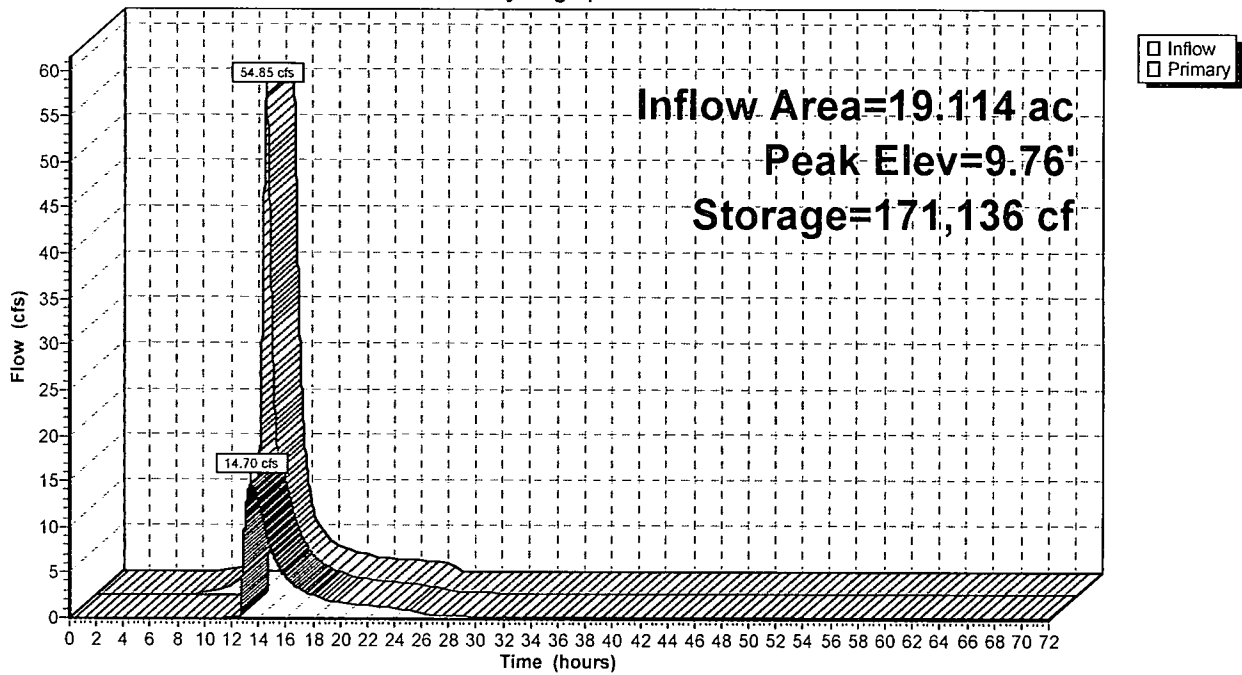
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	8.29'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	10.17'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	12.14'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=14.75 cfs @ 13.41 hrs HW=9.76' (Free Discharge)

- 1=RCP\_Round 36" (Passes 14.75 cfs of 61.45 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.23 cfs @ 10.41 fps)
- 3=Orifice/Grate (Orifice Controls 14.52 cfs @ 4.13 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

Pond 4P: POND D

Hydrograph



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**Summary for Pond 5P: POND E**

Inflow Area = 18.476 ac, 74.60% Impervious, Inflow Depth = 4.55" for 10-Year event  
 Inflow = 55.39 cfs @ 12.54 hrs, Volume= 7.003 af  
 Outflow = 33.56 cfs @ 12.91 hrs, Volume= 6.970 af, Atten= 39%, Lag= 22.3 min  
 Primary = 33.56 cfs @ 12.91 hrs, Volume= 6.970 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 11.04' @ 12.91 hrs Surf.Area= 47,573 sf Storage= 95,656 cf

Plug-Flow detention time= 214.4 min calculated for 6.970 af (100% of inflow)  
 Center-of-Mass det. time= 211.4 min ( 1,039.7 - 828.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	179,993 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 449,982 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	32,069	780.0	0	0	32,069
6.00	34,448	806.0	33,251	33,251	35,445
7.00	36,906	832.0	35,670	68,921	38,932
8.00	39,440	857.0	38,166	107,087	42,396
9.00	42,047	880.0	40,737	147,824	45,692
10.00	44,723	903.0	43,378	191,202	49,075
11.00	47,465	925.0	46,087	237,289	52,403
12.00	50,271	945.0	48,861	286,150	55,523
13.00	53,136	965.0	51,697	337,847	58,709
14.00	56,060	984.0	54,591	392,439	61,813
15.00	59,040	1,003.0	57,544	449,982	64,977

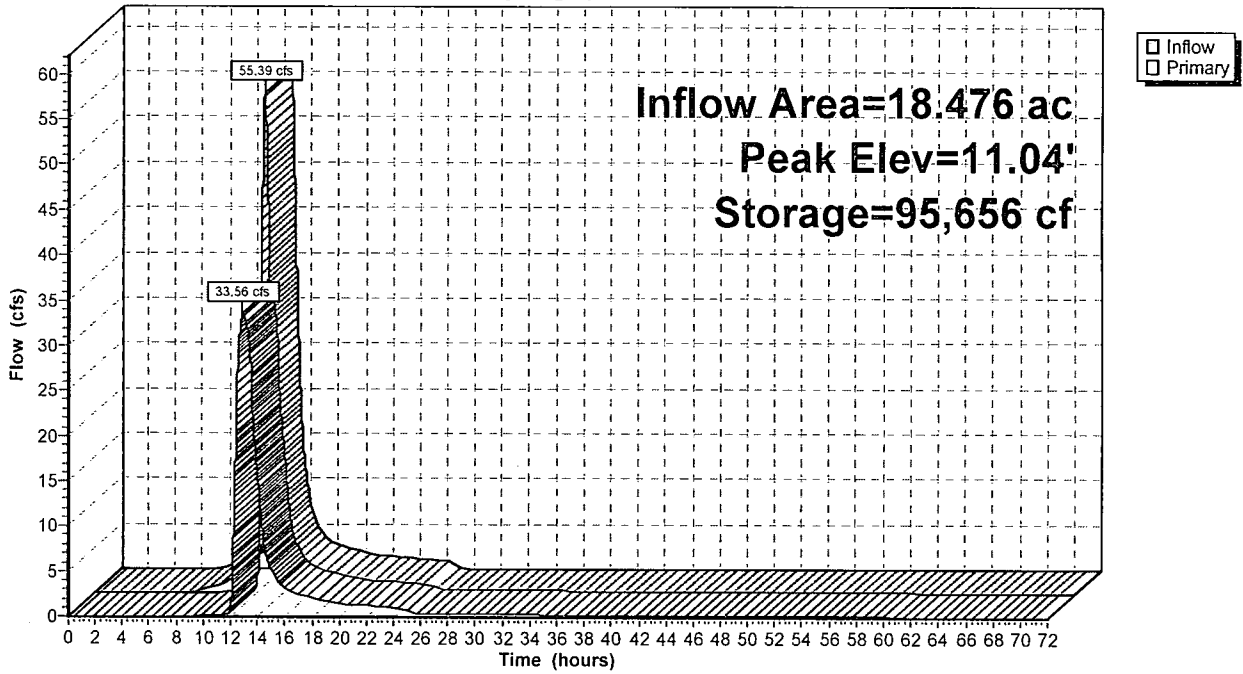
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>24.0" Round RCP_Round 24"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.50' S= 0.0050 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.19'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.35'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	11.26'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=33.56 cfs @ 12.91 hrs HW=11.04' (Free Discharge)

- 1=RCP\_Round 24" (Barrel Controls 33.56 cfs @ 10.68 fps)
- 2=Orifice/Grate (Passes < 0.57 cfs potential flow)
- 3=Orifice/Grate (Passes < 29.96 cfs potential flow)
- 4=Orifice/Grate (Passes < 11.06 cfs potential flow)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

Pond 5P: POND E

Hydrograph



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## Summary for Pond 6P: POND F

Inflow Area = 17.655 ac, 68.32% Impervious, Inflow Depth = 4.12" for 10-Year event  
 Inflow = 50.65 cfs @ 12.51 hrs, Volume= 6.062 af  
 Outflow = 31.91 cfs @ 12.84 hrs, Volume= 6.056 af, Atten= 37%, Lag= 20.0 min  
 Primary = 31.91 cfs @ 12.84 hrs, Volume= 6.056 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 12.42' @ 12.84 hrs Surf.Area= 35,448 sf Storage= 80,591 cf

Plug-Flow detention time= 169.8 min calculated for 6.055 af (100% of inflow)  
 Center-of-Mass det. time= 169.6 min ( 1,004.0 - 834.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	120,437 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 301,092 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	19,563	615.0	0	0	19,563
6.00	21,448	642.0	20,498	20,498	22,336
7.00	23,413	669.0	22,423	42,922	25,228
8.00	25,459	695.0	24,429	67,350	28,131
9.00	27,586	722.0	26,515	93,866	31,257
10.00	29,792	748.0	28,682	122,548	34,386
11.00	32,075	774.0	30,926	153,474	37,626
12.00	34,432	798.0	33,247	186,721	40,729
13.00	36,861	821.0	35,640	222,360	43,801
14.00	39,357	843.0	38,102	260,463	46,831
15.00	41,916	863.0	40,630	301,092	49,677

Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.70'	<b>15.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.13'	<b>36.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	13.26'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

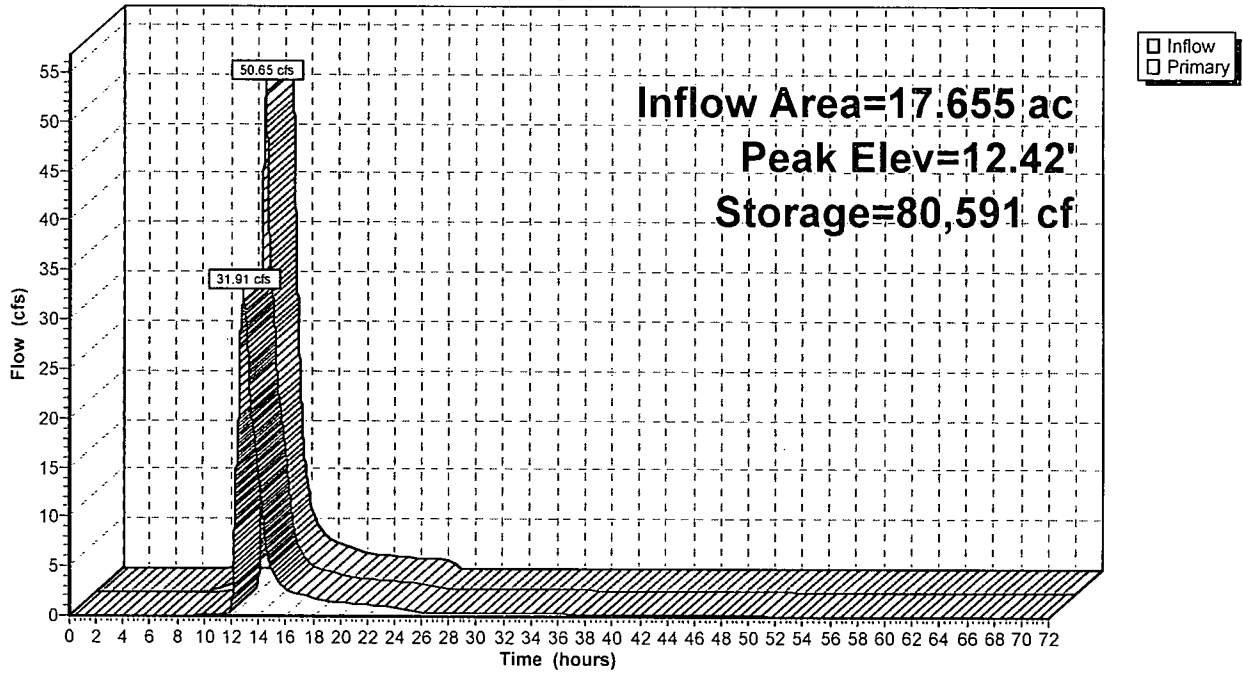
Primary OutFlow Max=31.92 cfs @ 12.84 hrs HW=12.42' (Free Discharge)

- 1=RCP\_Round 36" (Passes 31.92 cfs of 82.83 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.64 cfs @ 13.01 fps)
- 3=Orifice/Grate (Orifice Controls 23.92 cfs @ 9.75 fps)
- 4=Orifice/Grate (Orifice Controls 7.36 cfs @ 4.90 fps)
- 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)



Pond 6P: POND F

Hydrograph



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## Summary for Pond 7P: POND G

Inflow Area = 50.690 ac, 81.83% Impervious, Inflow Depth = 4.99" for 10-Year event  
 Inflow = 214.10 cfs @ 12.33 hrs, Volume= 21.068 af  
 Outflow = 23.86 cfs @ 13.51 hrs, Volume= 19.046 af, Atten= 89%, Lag= 70.7 min  
 Primary = 23.86 cfs @ 13.51 hrs, Volume= 19.046 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 11.12' @ 13.51 hrs Surf.Area= 109,063 sf Storage= 590,777 cf

Plug-Flow detention time= 625.0 min calculated for 19.046 af (90% of inflow)  
 Center-of-Mass det. time= 578.7 min ( 1,382.7 - 804.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	1,046,078 cf	<b>POND A (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	84,335	1,283.0	0	0	84,335
6.00	88,218	1,305.0	86,269	86,269	89,047
7.00	92,165	1,326.0	90,184	176,454	93,636
8.00	96,174	1,346.0	94,162	270,616	98,094
9.00	100,243	1,366.0	98,201	368,817	102,618
10.00	104,370	1,385.0	102,300	471,117	106,999
11.00	108,553	1,404.0	106,455	577,572	111,441
12.00	112,794	1,423.0	110,667	688,238	115,943
13.00	117,091	1,442.0	114,936	803,174	120,505
14.00	121,444	1,461.0	119,261	922,435	125,128
15.00	125,855	1,479.5	123,643	1,046,078	129,700

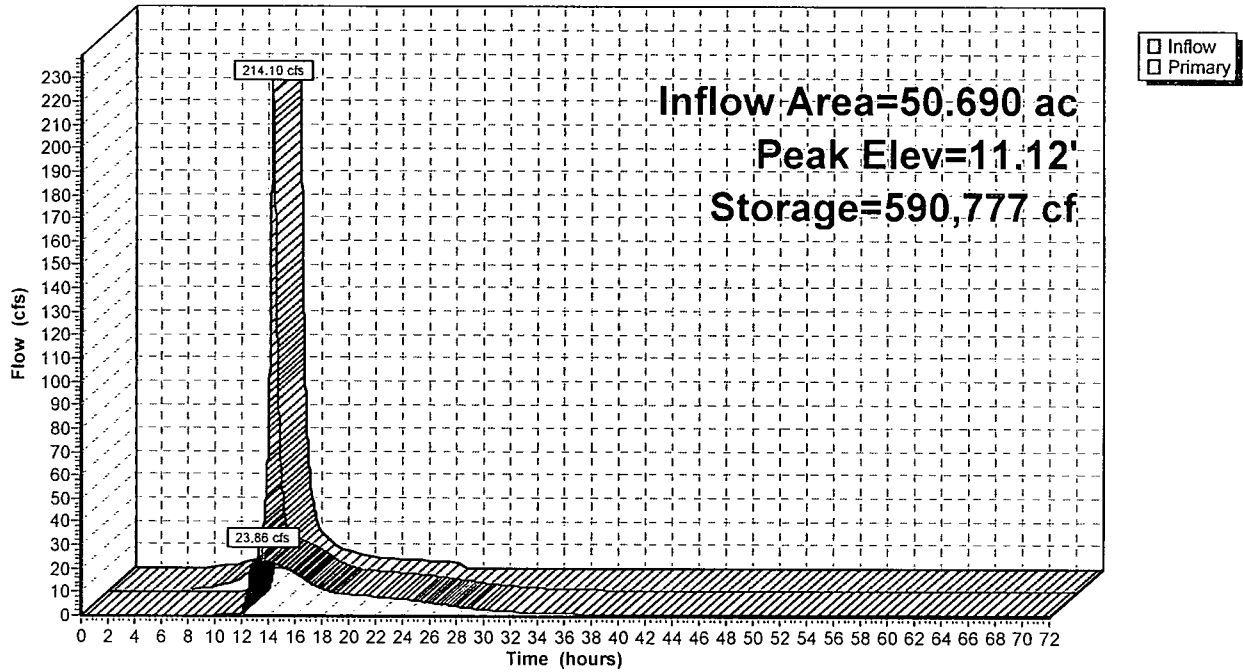
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round Culvert</b> L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.88'	<b>15.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.47'	<b>36.0" W x 8.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	11.78'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=23.86 cfs @ 13.51 hrs HW=11.12' (Free Discharge)

- 1=Culvert (Passes 23.86 cfs of 85.40 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.60 cfs @ 11.71 fps)
- 3=Orifice/Grate (Orifice Controls 11.24 cfs @ 9.16 fps)
- 4=Orifice/Grate (Orifice Controls 11.03 cfs @ 5.51 fps)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

### Pond 7P: POND G

#### Hydrograph



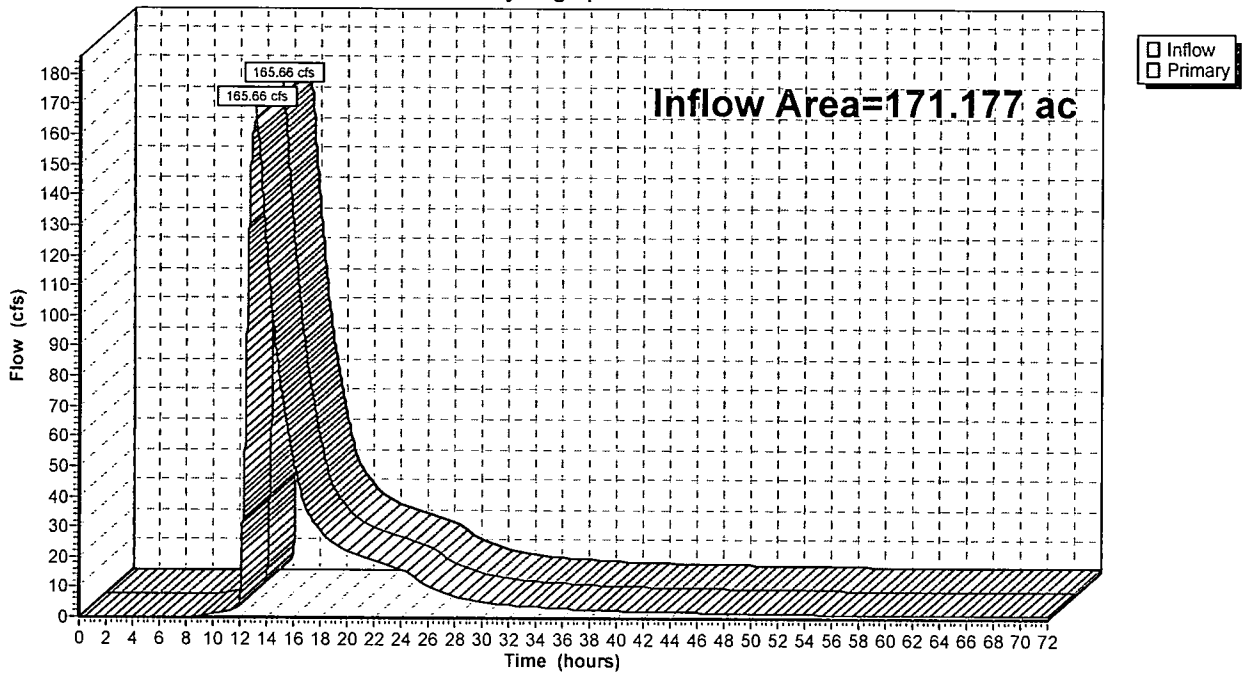
### Summary for Link POST: POST

Inflow Area = 171.177 ac, 76.22% Impervious, Inflow Depth > 4.33" for 10-Year event  
Inflow = 165.66 cfs @ 13.09 hrs, Volume= 61.824 af  
Primary = 165.66 cfs @ 13.09 hrs, Volume= 61.824 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs .

### Link POST: POST

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 25-Year Rainfall=7.90"

Prepared by Bowman Consulting

Printed 12/21/2020

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>SubcatchmentP-A: PROP. DA-A</b>	Runoff Area=1,538,366 sf 78.95% Impervious Runoff Depth=6.12" Flow Length=1,300' Tc=34.0 min CN=85 Runoff=151.14 cfs 18.002 af
<b>SubcatchmentP-B: PROP. DA-B</b>	Runoff Area=856,244 sf 70.85% Impervious Runoff Depth=5.65" Flow Length=1,300' Slope=0.0100 '/ Tc=64.6 min CN=81 Runoff=54.60 cfs 9.252 af
<b>SubcatchmentP-C: PROP. DA-C</b>	Runoff Area=447,304 sf 74.80% Impervious Runoff Depth=5.88" Flow Length=600' Slope=0.0050 '/ Tc=28.9 min CN=83 Runoff=46.44 cfs 5.033 af
<b>SubcatchmentP-D: PROP. DA-D</b>	Runoff Area=832,612 sf 71.43% Impervious Runoff Depth=5.65" Flow Length=1,300' Slope=0.0050 '/ Tc=39.2 min CN=81 Runoff=70.99 cfs 8.996 af
<b>SubcatchmentP-E: PROP. DA-E</b>	Runoff Area=804,829 sf 74.60% Impervious Runoff Depth=5.88" Flow Length=1,300' Slope=0.0050 '/ Tc=39.2 min CN=83 Runoff=71.07 cfs 9.056 af
<b>SubcatchmentP-F: PROP. DA-F</b>	Runoff Area=769,055 sf 68.32% Impervious Runoff Depth=5.41" Flow Length=1,100' Slope=0.0050 '/ Tc=36.2 min CN=79 Runoff=66.16 cfs 7.967 af
<b>SubcatchmentPG: PROP. DA-G</b>	Runoff Area=2,208,063 sf 81.83% Impervious Runoff Depth=6.35" Flow Length=1,300' Slope=0.0100 '/ Tc=23.6 min CN=87 Runoff=269.46 cfs 26.834 af
<b>Pond 1P: POND A</b>	Peak Elev=14.21' Storage=382,982 cf Inflow=151.14 cfs 18.002 af Outflow=57.03 cfs 17.894 af
<b>Pond 2P: POND B</b>	Peak Elev=8.73' Storage=142,395 cf Inflow=54.60 cfs 9.252 af Outflow=33.07 cfs 9.204 af
<b>Pond 3P: POND C</b>	Peak Elev=14.50' Storage=81,308 cf Inflow=46.44 cfs 5.033 af Outflow=23.86 cfs 5.033 af
<b>Pond 4P: POND D</b>	Peak Elev=10.59' Storage=206,080 cf Inflow=70.99 cfs 8.996 af Outflow=24.76 cfs 6.976 af
<b>Pond 5P: POND E</b>	Peak Elev=12.51' Storage=124,821 cf Inflow=71.07 cfs 9.056 af Outflow=38.59 cfs 9.023 af
<b>Pond 6P: POND F</b>	Peak Elev=13.76' Storage=100,451 cf Inflow=66.16 cfs 7.967 af Outflow=43.67 cfs 7.961 af
<b>Pond 7P: POND G</b>	Peak Elev=12.43' Storage=736,689 cf Inflow=269.46 cfs 26.834 af Outflow=36.98 cfs 24.752 af
<b>Link POST: POST</b>	Inflow=243.10 cfs 80.843 af Primary=243.10 cfs 80.843 af

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**Summary for Subcatchment P-A: PROP. DA-A**

Runoff = 151.14 cfs @ 12.46 hrs, Volume= 18.002 af, Depth= 6.12"

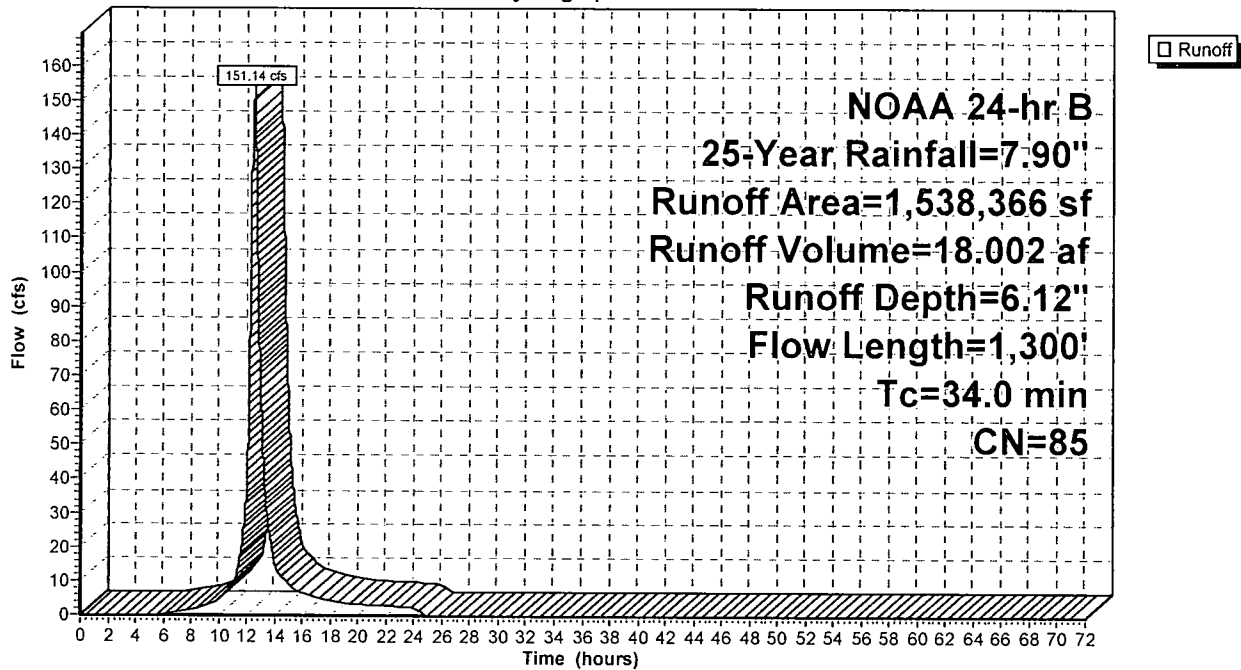
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 25-Year Rainfall=7.90"

Area (sf)	CN	Description
522,403	61	1/4 acre lots, 38% imp, HSG A
* 876,934	98	IMPERVIOUS
* 139,029	98	PONDS
1,538,366	85	Weighted Average
323,890		21.05% Pervious Area
1,214,476		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0100	0.10		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow concentrated flow Unpaved Kv= 16.1 fps
34.0	1,300	Total			

**Subcatchment P-A: PROP. DA-A**

Hydrograph



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**Summary for Subcatchment P-B: PROP. DA-B**

Runoff = 54.60 cfs @ 12.85 hrs, Volume= 9.252 af, Depth= 5.65"

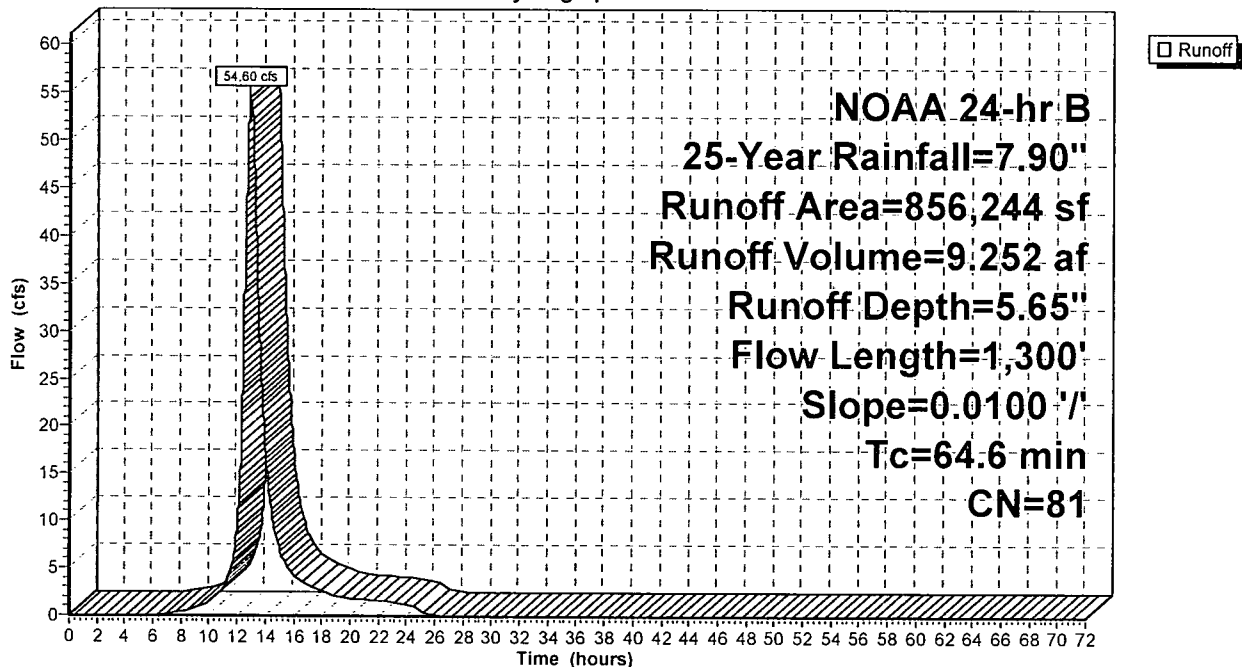
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 25-Year Rainfall=7.90"

Area (sf)	CN	Description
402,533	61	1/4 acre lots, 38% imp, HSG A
371,484	98	Paved parking, HSG D
* 51,398	98	POND
* 30,829	98	WETLAND
856,244	81	Weighted Average
249,570		29.15% Pervious Area
606,674		70.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.6	100	0.0100	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 4.24"
40.0	1,200	0.0100	0.50		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
64.6	1,300	Total			

**Subcatchment P-B: PROP. DA-B**

Hydrograph



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**Summary for Subcatchment P-C: PROP. DA-C**

Runoff = 46.44 cfs @ 12.40 hrs, Volume= 5.033 af, Depth= 5.88"

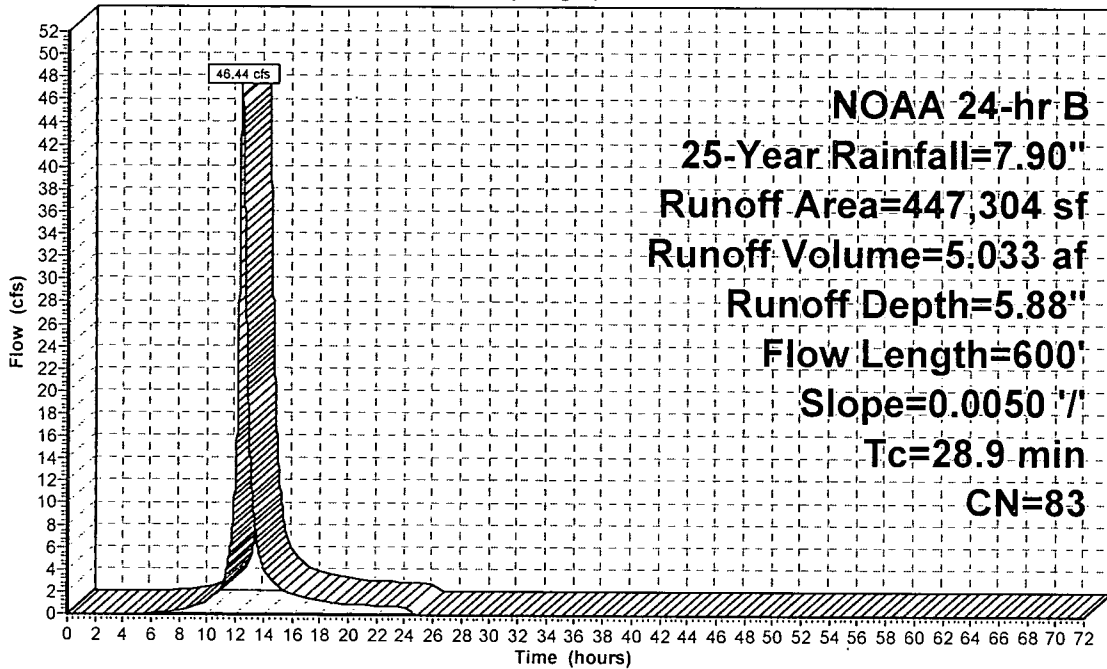
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 25-Year Rainfall=7.90"

Area (sf)	CN	Description
181,773	61	1/4 acre lots, 38% imp, HSG A
235,430	98	Paved parking, HSG D
* 30,101	98	pond
447,304	83	Weighted Average
112,699		25.20% Pervious Area
334,605		74.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
7.3	500	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
28.9	600	Total			

**Subcatchment P-C: PROP. DA-C**

Hydrograph





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**Summary for Subcatchment P-D: PROP.DA-D**

Runoff = 70.99 cfs @ 12.51 hrs, Volume= 8.996 af, Depth= 5.65"

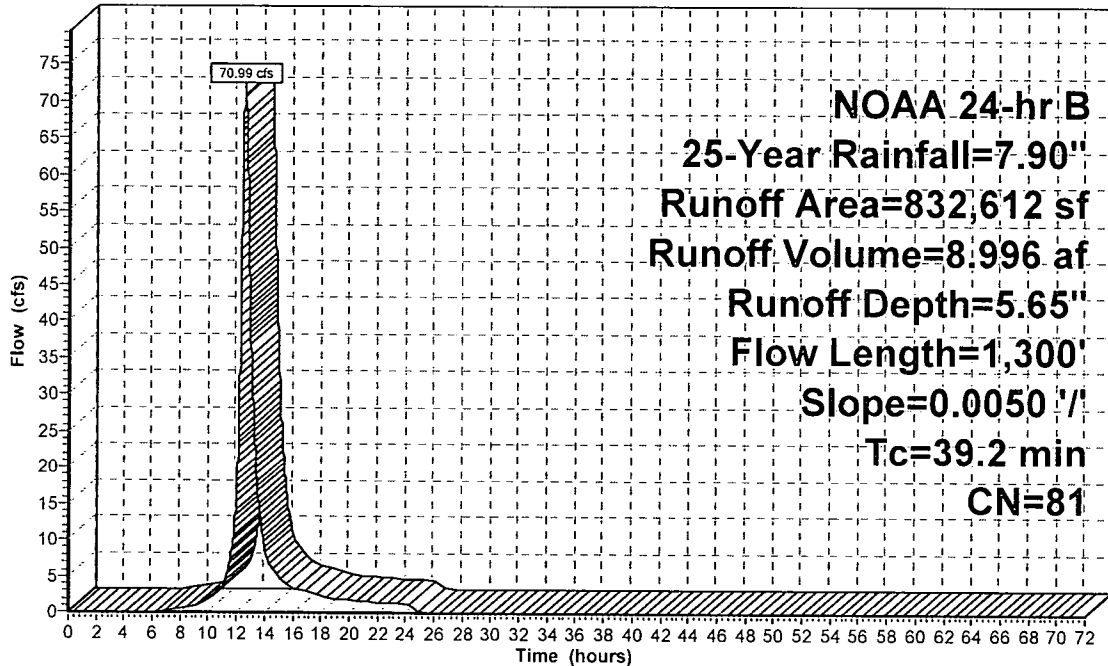
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 25-Year Rainfall=7.90"

Area (sf)	CN	Description
383,716	61	1/4 acre lots, 38% imp, HSG A
299,467	98	Paved parking, HSG D
* 88,466	98	WETLAND
* 60,963	98	POND
832,612	81	Weighted Average
237,904		28.57% Pervious Area
594,708		71.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		<b>Sheet Flow, Sheet Flow</b> Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		<b>Shallow Concentrated Flow, Shallow Concentrated Flow</b> Unpaved Kv= 16.1 fps
39.2	1,300	Total			

**Subcatchment P-D: PROP.DA-D**

Hydrograph



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**Summary for Subcatchment P-E: PROP.DA-E**

Runoff = 71.07 cfs @ 12.51 hrs, Volume= 9.056 af, Depth= 5.88"

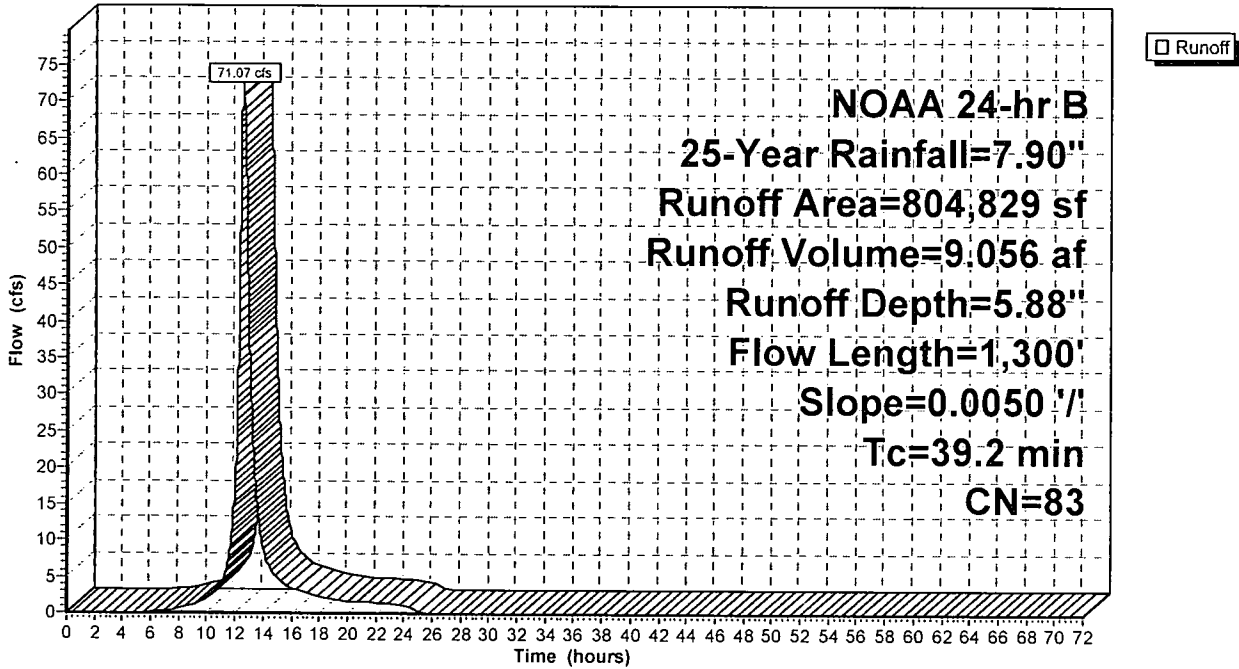
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 25-Year Rainfall=7.90"

Area (sf)	CN	Description
416,071	98	Paved parking, HSG A
329,718	61	1/4 acre lots, 38% imp, HSG A
* 59,040	98	POND
804,829	83	Weighted Average
204,425		25.40% Pervious Area
600,404		74.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
39.2	1,300	Total			

**Subcatchment P-E: PROP.DA-E**

Hydrograph



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**Summary for Subcatchment P-F: PROP.DA-F**

Runoff = 66.16 cfs @ 12.51 hrs, Volume= 7.967 af, Depth= 5.41"

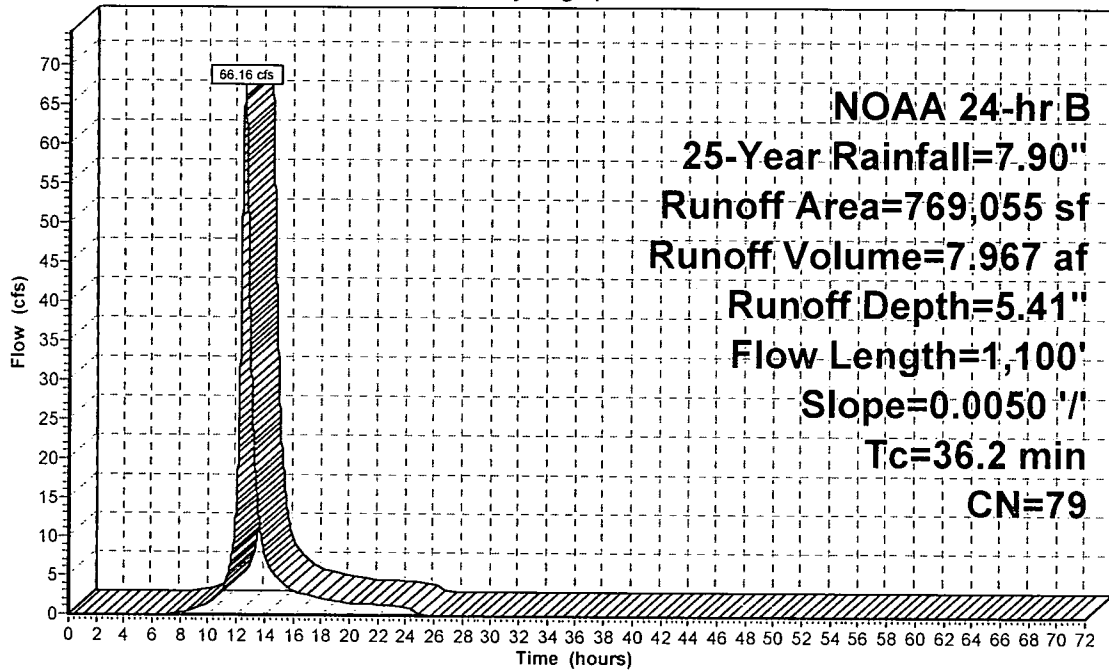
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 25-Year Rainfall=7.90"

Area (sf)	CN	Description
392,960	61	1/4 acre lots, 38% imp, HSG A
334,179	98	Paved parking, HSG D
* 41,916	98	pond
769,055	79	Weighted Average
243,635		31.68% Pervious Area
525,420		68.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
14.6	1,000	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
36.2	1,100	Total			

**Subcatchment P-F: PROP.DA-F**

Hydrograph



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**Summary for Subcatchment PG: PROP. DA-G**

Runoff = 269.46 cfs @ 12.33 hrs, Volume= 26.834 af, Depth= 6.35"

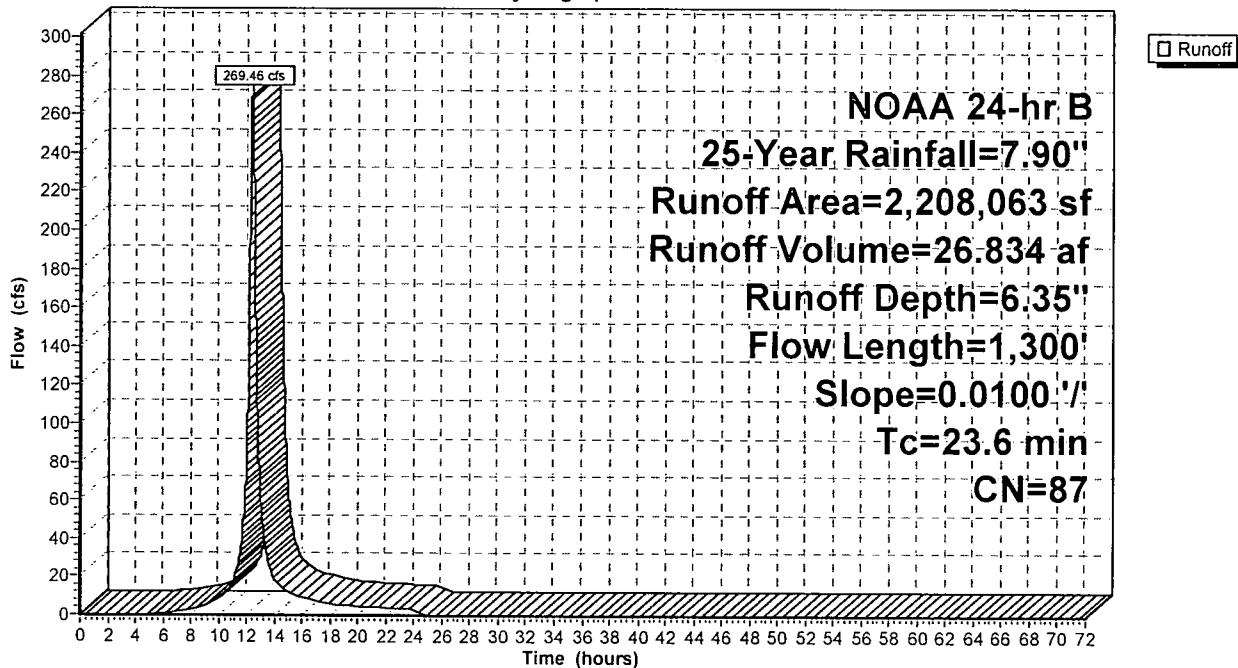
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 25-Year Rainfall=7.90"

Area (sf)	CN	Description
401,286	39	>75% Grass cover, Good, HSG A
1,605,144	98	Paved parking, HSG A
* 75,778	98	wetland
* 125,855	98	pond
2,208,063	87	Weighted Average
401,286		18.17% Pervious Area
1,806,777		81.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.20		<b>Sheet Flow, Sheet Flow</b> Smooth surfaces n= 0.011 P2= 4.24"
22.2	1,200	0.0100	0.90		<b>Shallow Concentrated Flow, Shallow Concentrated Flow</b> Cultivated Straight Rows Kv= 9.0 fps
23.6	1,300	Total			

**Subcatchment PG: PROP. DA-G**

Hydrograph



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## Summary for Pond 1P: POND A

Inflow Area = 35.316 ac, 78.95% Impervious, Inflow Depth = 6.12" for 25-Year event  
 Inflow = 151.14 cfs @ 12.46 hrs, Volume= 18.002 af  
 Outflow = 57.03 cfs @ 13.03 hrs, Volume= 17.894 af, Atten= 62%, Lag= 34.1 min  
 Primary = 57.03 cfs @ 13.03 hrs, Volume= 17.894 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 14.21' @ 13.03 hrs Surf.Area= 128,914 sf Storage= 382,982 cf

Plug-Flow detention time= 290.3 min calculated for 17.894 af (99% of inflow)  
 Center-of-Mass det. time= 286.4 min ( 1,099.1 - 812.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	478,682 cf	<b>POND A (Irregular)</b> Listed below (Recalc) 1,196,706 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	80,000	1,700.0	0	0	80,000
6.00	84,842	1,702.0	82,409	82,409	81,785
7.00	89,983	1,725.0	87,400	169,809	88,287
8.00	95,190	1,746.0	92,574	262,383	94,342
9.00	100,460	1,767.0	97,813	360,197	100,470
10.00	105,793	1,788.0	103,115	463,312	106,671
11.00	111,187	1,808.0	108,479	571,790	112,670
12.00	116,640	1,828.0	113,903	685,693	118,735
13.00	122,152	1,847.0	119,385	805,078	124,588
14.00	127,721	1,866.0	124,926	930,005	130,501
15.00	133,346	1,885.0	130,523	1,060,528	136,474
16.00	139,029	1,904.0	136,178	1,196,706	142,508

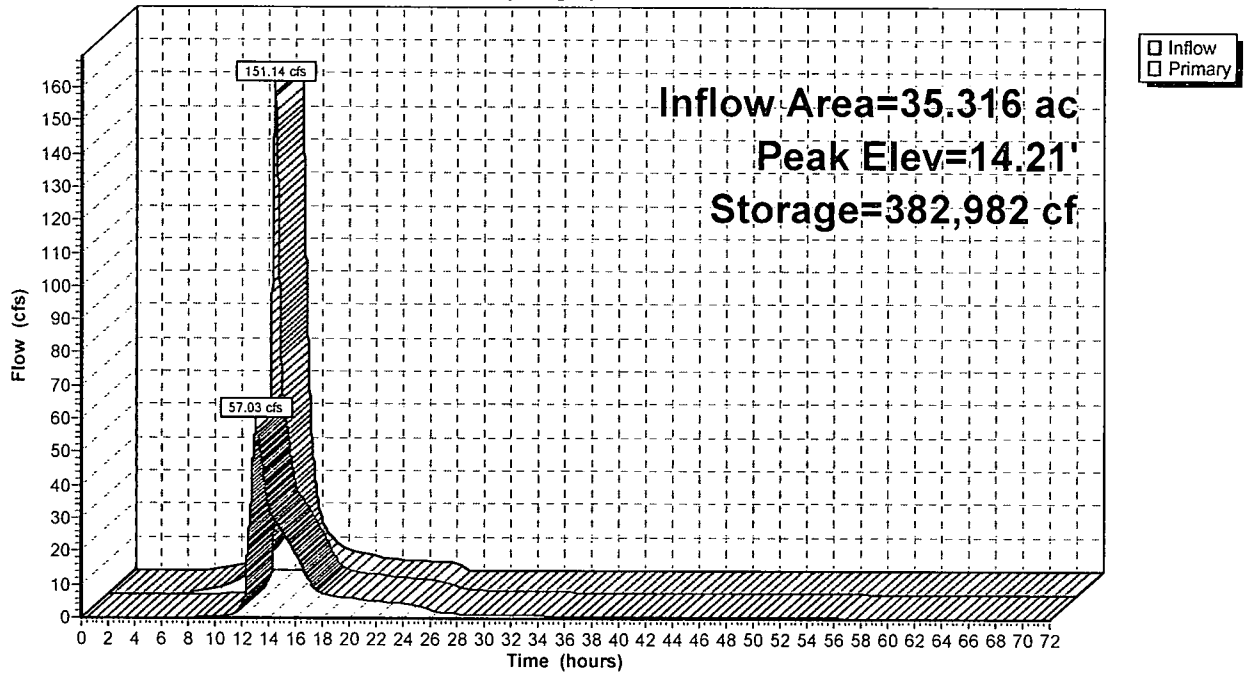
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round Culvert</b> L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.88'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.31'	<b>42.0" W x 8.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	12.85'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=57.02 cfs @ 13.03 hrs HW=14.21' (Free Discharge)

- 1=Culvert (Passes 57.02 cfs of 112.98 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.97 cfs @ 14.45 fps)
- 3=Orifice/Grate (Orifice Controls 9.89 cfs @ 12.59 fps)
- 4=Orifice/Grate (Orifice Controls 24.01 cfs @ 10.29 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 21.15 cfs @ 3.88 fps)

Pond 1P: POND A

Hydrograph



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**Summary for Pond 2P: POND B**

Inflow Area = 19.657 ac, 70.85% Impervious, Inflow Depth = 5.65" for 25-Year event  
 Inflow = 54.60 cfs @ 12.85 hrs, Volume= 9.252 af  
 Outflow = 33.07 cfs @ 13.43 hrs, Volume= 9.204 af, Atten= 39%, Lag= 34.9 min  
 Primary = 33.07 cfs @ 13.43 hrs, Volume= 9.204 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 8.73' @ 13.43 hrs Surf.Area= 45,954 sf Storage= 142,395 cf

Plug-Flow detention time= 179.1 min calculated for 9.204 af (99% of inflow)  
 Center-of-Mass det. time= 175.7 min ( 1,025.6 - 849.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	204,373 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	30,624	1,334.0	0	0	30,624
6.00	34,658	1,355.0	32,620	32,620	35,314
7.00	38,755	1,376.0	36,687	69,308	40,078
8.00	42,912	1,395.0	40,816	110,123	44,491
9.00	47,126	1,414.0	45,003	155,126	48,964
10.00	51,398	1,433.0	49,247	204,373	53,498

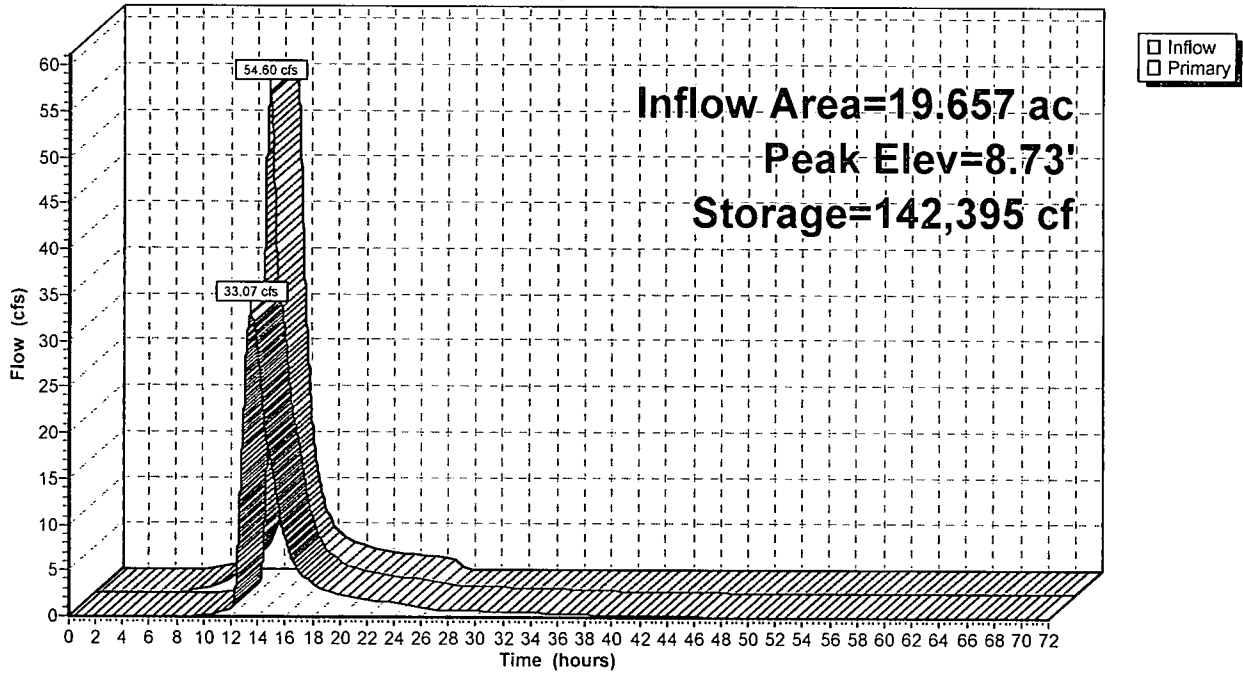
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.00'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	7.87'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	8.65'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=33.06 cfs @ 13.43 hrs HW=8.73' (Free Discharge)

- 1=RCP\_Round 36" (Passes 33.06 cfs of 50.78 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.76 cfs @ 8.98 fps)
- 3=Orifice/Grate (Orifice Controls 23.92 cfs @ 6.77 fps)
- 4=Orifice/Grate (Orifice Controls 7.13 cfs @ 3.72 fps)
- 5=Broad-Crested Rectangular Weir(Weir Controls 0.24 cfs @ 0.77 fps)

Pond 2P: POND B

Hydrograph





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## Summary for Pond 3P: POND C

Inflow Area = 10.269 ac, 74.80% Impervious, Inflow Depth = 5.88" for 25-Year event  
 Inflow = 46.44 cfs @ 12.40 hrs, Volume= 5.033 af  
 Outflow = 23.86 cfs @ 12.77 hrs, Volume= 5.033 af, Atten= 49%, Lag= 22.0 min  
 Primary = 23.86 cfs @ 12.77 hrs, Volume= 5.033 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 14.50' @ 12.77 hrs Surf.Area= 128,024 sf Storage= 81,308 cf

Plug-Flow detention time= 169.4 min calculated for 5.032 af (100% of inflow)  
 Center-of-Mass det. time= 169.7 min ( 982.2 - 812.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	122,983 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 307,457 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	10,253	541.0	0	0	10,253
6.00	11,920	570.0	11,076	11,076	12,876
7.00	13,671	597.0	12,786	23,862	15,451
8.00	15,499	622.0	14,575	38,437	17,951
9.00	17,399	645.0	16,440	54,877	20,355
10.00	19,366	666.0	18,374	73,251	22,642
11.00	21,395	687.0	20,372	93,623	25,002
12.00	23,484	706.0	22,431	116,054	27,221
13.00	25,632	726.0	24,550	140,604	29,609
14.00	27,838	745.0	26,727	167,332	31,952
15.00	301,001	764.0	140,126	307,457	34,355

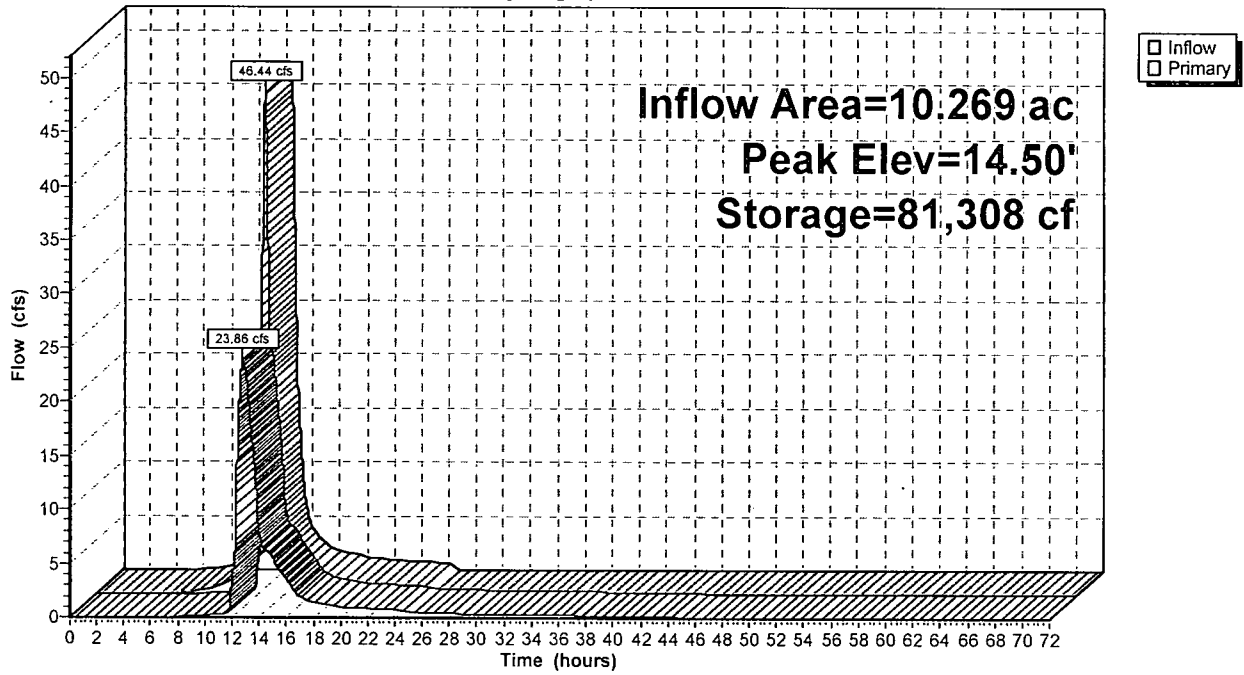
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>30.0" Round RCP_Round 30"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	8.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	12.01'	<b>36.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	14.04'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=23.86 cfs @ 12.77 hrs HW=14.50' (Free Discharge)

- 1=RCP\_Round 30" (Passes 23.86 cfs of 67.89 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.72 cfs @ 14.74 fps)
- 3=Orifice/Grate (Orifice Controls 8.62 cfs @ 10.98 fps)
- 4=Orifice/Grate (Orifice Controls 10.80 cfs @ 7.20 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 3.71 cfs @ 2.01 fps)

Pond 3P: POND C

Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 25-Year Rainfall=7.90"

Prepared by Bowman Consulting

Printed 12/21/2020

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## Summary for Pond 4P: POND D

Inflow Area = 19.114 ac, 71.43% Impervious, Inflow Depth = 5.65" for 25-Year event  
 Inflow = 70.99 cfs @ 12.51 hrs, Volume= 8.996 af  
 Outflow = 24.76 cfs @ 13.22 hrs, Volume= 6.976 af, Atten= 65%, Lag= 42.8 min  
 Primary = 24.76 cfs @ 13.22 hrs, Volume= 6.976 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 10.59' @ 13.22 hrs Surf.Area= 107,835 sf Storage= 206,080 cf

Plug-Flow detention time= 389.7 min calculated for 6.975 af (78% of inflow)  
 Center-of-Mass det. time= 314.8 min ( 1,141.1 - 826.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	418,976 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 1,047,440 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	76,922	1,776.0	0	0	76,922
6.00	82,288	1,802.0	79,590	79,590	84,538
7.00	87,732	1,827.0	84,995	164,585	91,982
8.00	93,250	1,851.0	90,477	255,062	99,243
9.00	98,838	1,874.0	96,030	351,093	106,311
10.00	104,491	1,895.0	101,651	452,744	112,885
11.00	110,206	1,079.0	107,336	560,080	306,008
12.00	115,979	1,934.0	113,080	673,160	511,015
13.00	121,809	1,953.0	118,882	792,042	517,205
14.00	127,696	1,972.0	124,741	916,783	523,455
15.00	133,639	1,991.0	130,656	1,047,440	529,766

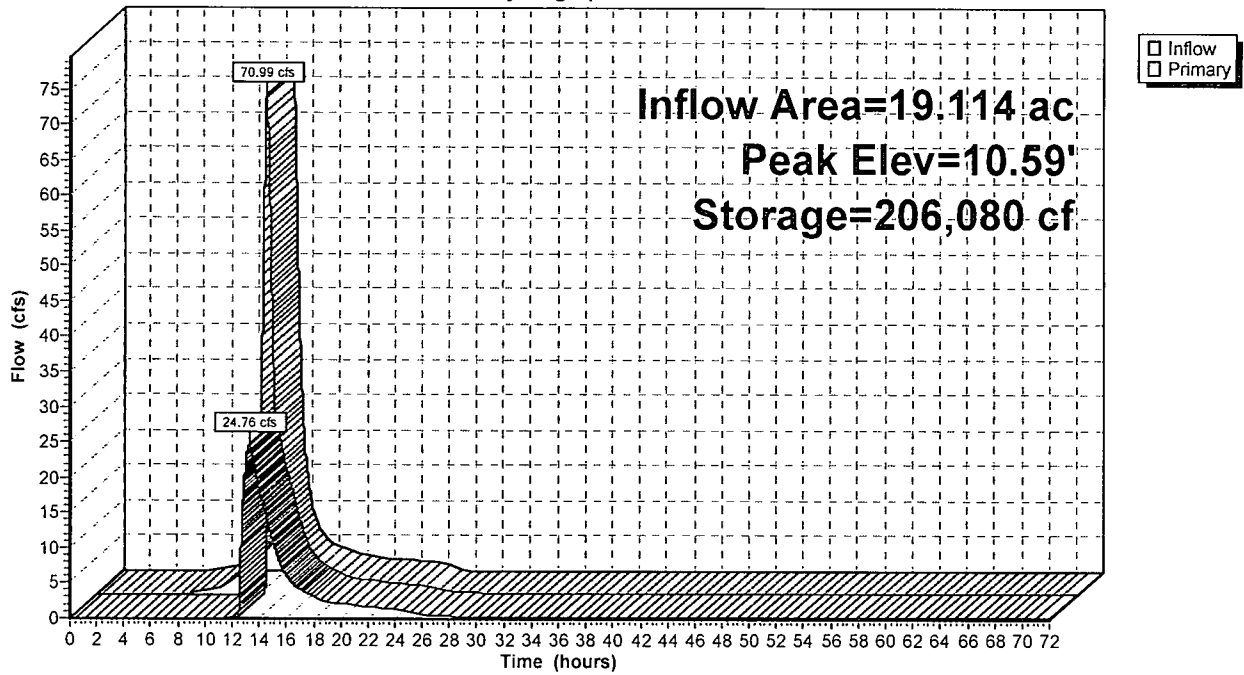
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	8.29'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	10.17'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	12.14'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=24.75 cfs @ 13.22 hrs HW=10.59' (Free Discharge)

- 1=RCP\_Round 36" (Passes 24.75 cfs of 68.82 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.25 cfs @ 11.30 fps)
- 3=Orifice/Grate (Orifice Controls 21.17 cfs @ 5.99 fps)
- 4=Orifice/Grate (Orifice Controls 3.33 cfs @ 2.08 fps)
- 5=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

Pond 4P: POND D

Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 25-Year Rainfall=7.90"

Prepared by Bowman Consulting

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## Summary for Pond 5P: POND E

Inflow Area = 18.476 ac, 74.60% Impervious, Inflow Depth = 5.88" for 25-Year event  
 Inflow = 71.07 cfs @ 12.51 hrs, Volume= 9.056 af  
 Outflow = 38.59 cfs @ 12.96 hrs, Volume= 9.023 af, Atten= 46%, Lag= 27.2 min  
 Primary = 38.59 cfs @ 12.96 hrs, Volume= 9.023 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 12.51' @ 12.96 hrs Surf.Area= 51,716 sf Storage= 124,821 cf

Plug-Flow detention time= 178.6 min calculated for 9.022 af (100% of inflow)  
 Center-of-Mass det. time= 176.6 min ( 998.6 - 822.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	179,993 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 449,982 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	32,069	780.0	0	0	32,069
6.00	34,448	806.0	33,251	33,251	35,445
7.00	36,906	832.0	35,670	68,921	38,932
8.00	39,440	857.0	38,166	107,087	42,396
9.00	42,047	880.0	40,737	147,824	45,692
10.00	44,723	903.0	43,378	191,202	49,075
11.00	47,465	925.0	46,087	237,289	52,403
12.00	50,271	945.0	48,861	286,150	55,523
13.00	53,136	965.0	51,697	337,847	58,709
14.00	56,060	984.0	54,591	392,439	61,813
15.00	59,040	1,003.0	57,544	449,982	64,977

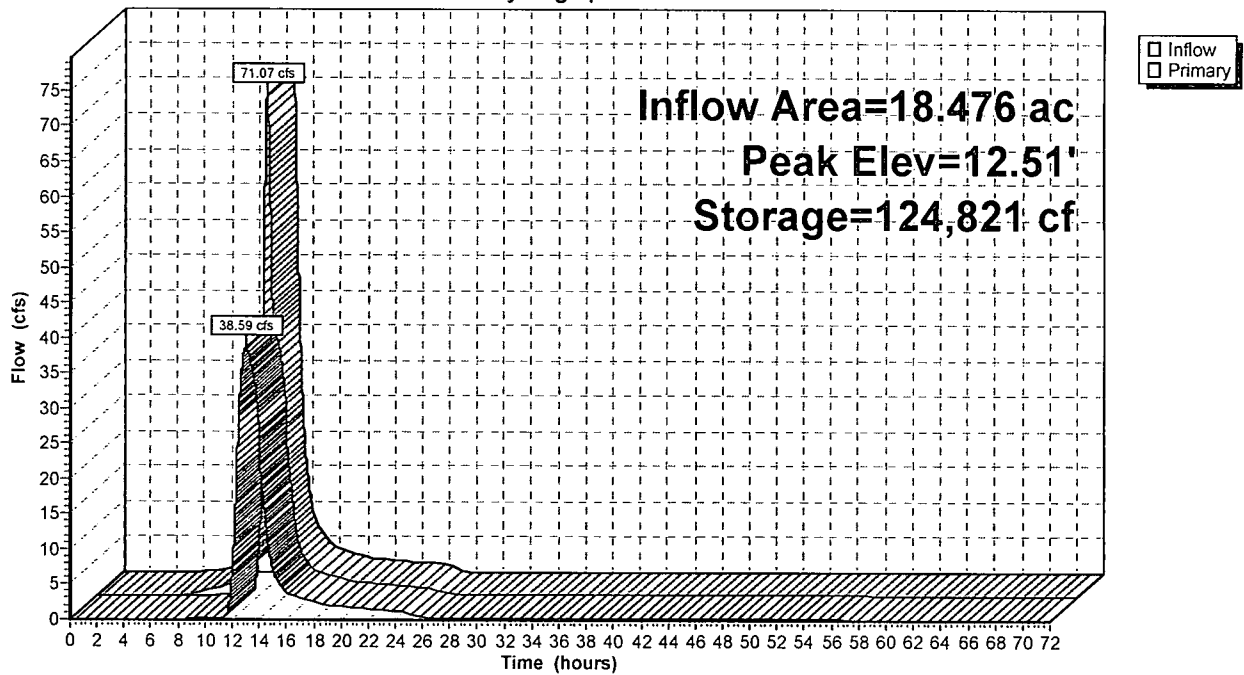
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>24.0" Round RCP_Round 24"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.50' S= 0.0050 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.19'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.35'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	11.26'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=38.59 cfs @ 12.96 hrs HW=12.51' (Free Discharge)

- 1=RCP\_Round 24" (Inlet Controls 38.59 cfs @ 12.28 fps)
- 2=Orifice/Grate (Passes < 0.64 cfs potential flow)
- 3=Orifice/Grate (Passes < 36.37 cfs potential flow)
- 4=Orifice/Grate (Passes < 15.73 cfs potential flow)
- 5=Broad-Crested Rectangular Weir (Passes < 18.51 cfs potential flow)

### Pond 5P: POND E

#### Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 25-Year Rainfall=7.90"

Prepared by Bowman Consulting

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## Summary for Pond 6P: POND F

Inflow Area = 17.655 ac, 68.32% Impervious, Inflow Depth = 5.41" for 25-Year event  
 Inflow = 66.16 cfs @ 12.51 hrs, Volume= 7.967 af  
 Outflow = 43.67 cfs @ 12.81 hrs, Volume= 7.961 af, Atten= 34%, Lag= 18.2 min  
 Primary = 43.67 cfs @ 12.81 hrs, Volume= 7.961 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 13.76' @ 12.81 hrs Surf.Area= 38,753 sf Storage= 100,451 cf

Plug-Flow detention time= 139.5 min calculated for 7.961 af (100% of inflow)  
 Center-of-Mass det. time= 139.0 min ( 966.7 - 827.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	120,437 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 301,092 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	19,563	615.0	0	0	19,563
6.00	21,448	642.0	20,498	20,498	22,336
7.00	23,413	669.0	22,423	42,922	25,228
8.00	25,459	695.0	24,429	67,350	28,131
9.00	27,586	722.0	26,515	93,866	31,257
10.00	29,792	748.0	28,682	122,548	34,386
11.00	32,075	774.0	30,926	153,474	37,626
12.00	34,432	798.0	33,247	186,721	40,729
13.00	36,861	821.0	35,640	222,360	43,801
14.00	39,357	843.0	38,102	260,463	46,831
15.00	41,916	863.0	40,630	301,092	49,677

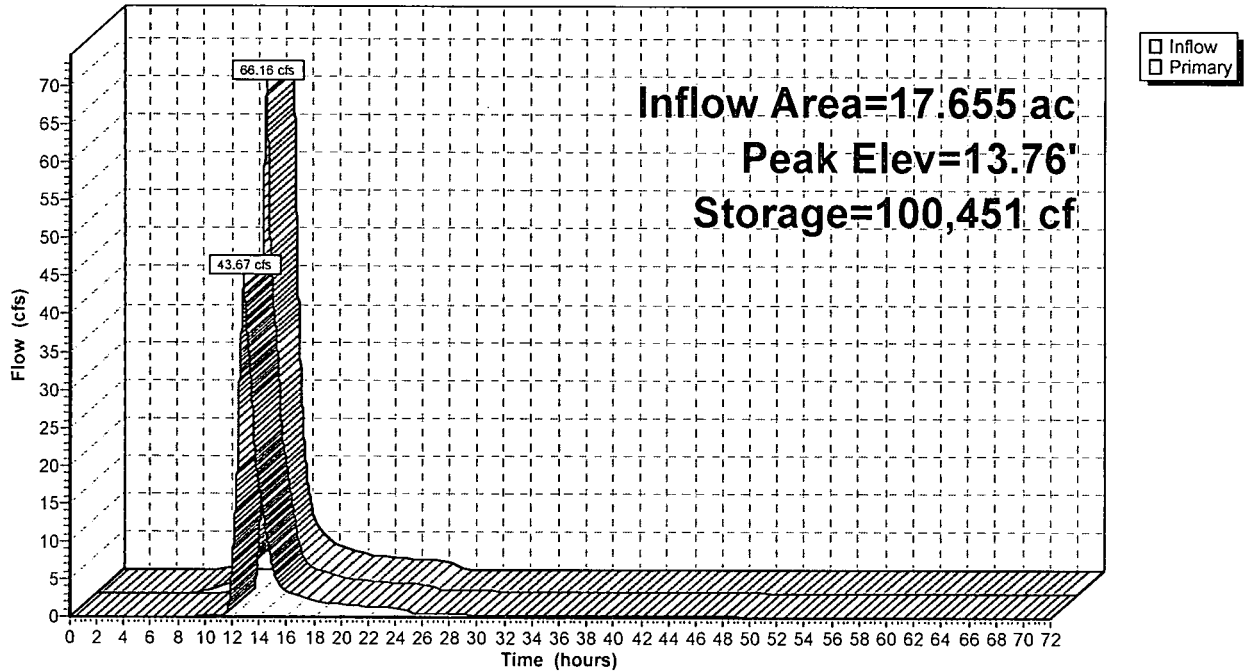
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.70'	<b>15.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.13'	<b>36.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	13.26'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=43.64 cfs @ 12.81 hrs HW=13.76' (Free Discharge)

- 1=RCP\_Round 36" (Passes 43.64 cfs of 91.71 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.69 cfs @ 14.15 fps)
- 3=Orifice/Grate (Orifice Controls 27.55 cfs @ 11.23 fps)
- 4=Orifice/Grate (Orifice Controls 11.14 cfs @ 7.43 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 4.26 cfs @ 2.12 fps)

Pond 6P: POND F

Hydrograph





# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 25-Year Rainfall=7.90"

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## Summary for Pond 7P: POND G

Inflow Area = 50.690 ac, 81.83% Impervious, Inflow Depth = 6.35" for 25-Year event  
 Inflow = 269.46 cfs @ 12.33 hrs, Volume= 26.834 af  
 Outflow = 36.98 cfs @ 13.32 hrs, Volume= 24.752 af, Atten= 86%, Lag= 59.1 min  
 Primary = 36.98 cfs @ 13.32 hrs, Volume= 24.752 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 12.43' @ 13.32 hrs Surf.Area= 114,615 sf Storage= 736,689 cf

Plug-Flow detention time= 548.8 min calculated for 24.749 af (92% of inflow)  
 Center-of-Mass det. time= 509.4 min ( 1,307.6 - 798.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	1,046,078 cf	<b>POND A (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	84,335	1,283.0	0	0	84,335
6.00	88,218	1,305.0	86,269	86,269	89,047
7.00	92,165	1,326.0	90,184	176,454	93,636
8.00	96,174	1,346.0	94,162	270,616	98,094
9.00	100,243	1,366.0	98,201	368,817	102,618
10.00	104,370	1,385.0	102,300	471,117	106,999
11.00	108,553	1,404.0	106,455	577,572	111,441
12.00	112,794	1,423.0	110,667	688,238	115,943
13.00	117,091	1,442.0	114,936	803,174	120,505
14.00	121,444	1,461.0	119,261	922,435	125,128
15.00	125,855	1,479.5	123,643	1,046,078	129,700

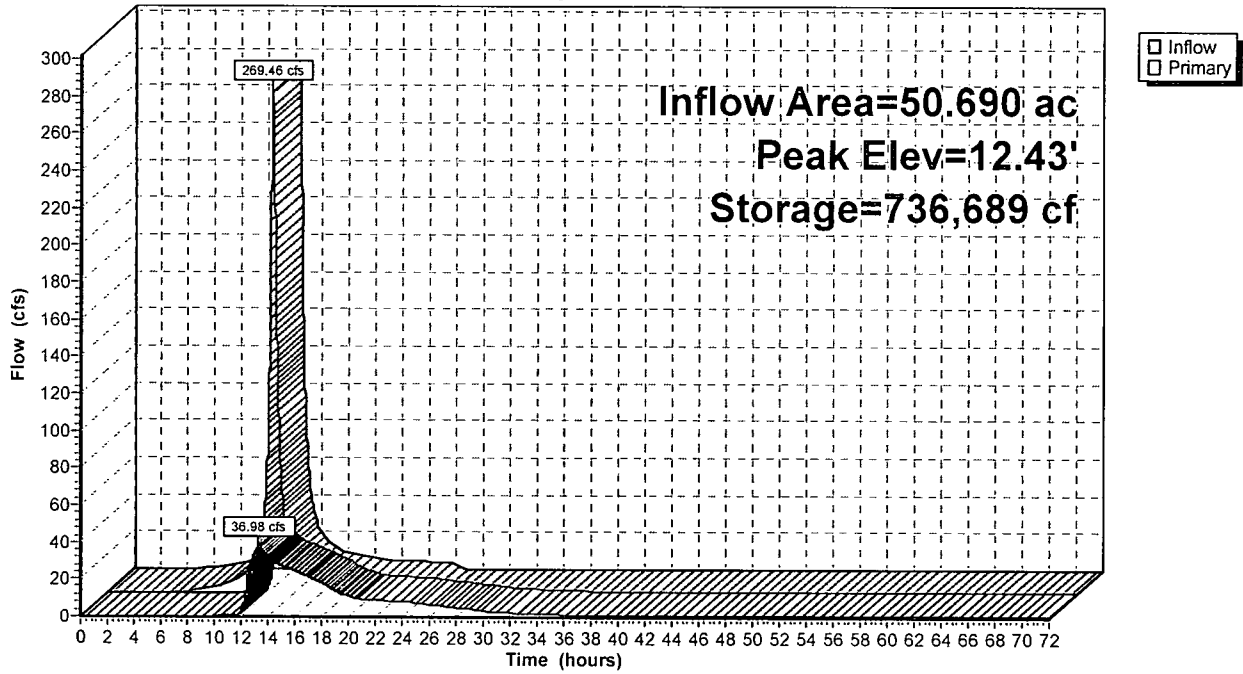
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round Culvert</b> L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.88'	<b>15.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.47'	<b>36.0" W x 8.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	11.78'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=36.96 cfs @ 13.32 hrs HW=12.43' (Free Discharge)

- 1=Culvert (Passes 36.96 cfs of 97.98 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.76 cfs @ 12.94 fps)
- 3=Orifice/Grate (Orifice Controls 13.11 cfs @ 10.68 fps)
- 4=Orifice/Grate (Orifice Controls 15.59 cfs @ 7.79 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 6.50 cfs @ 2.52 fps)

Pond 7P: POND G

Hydrograph



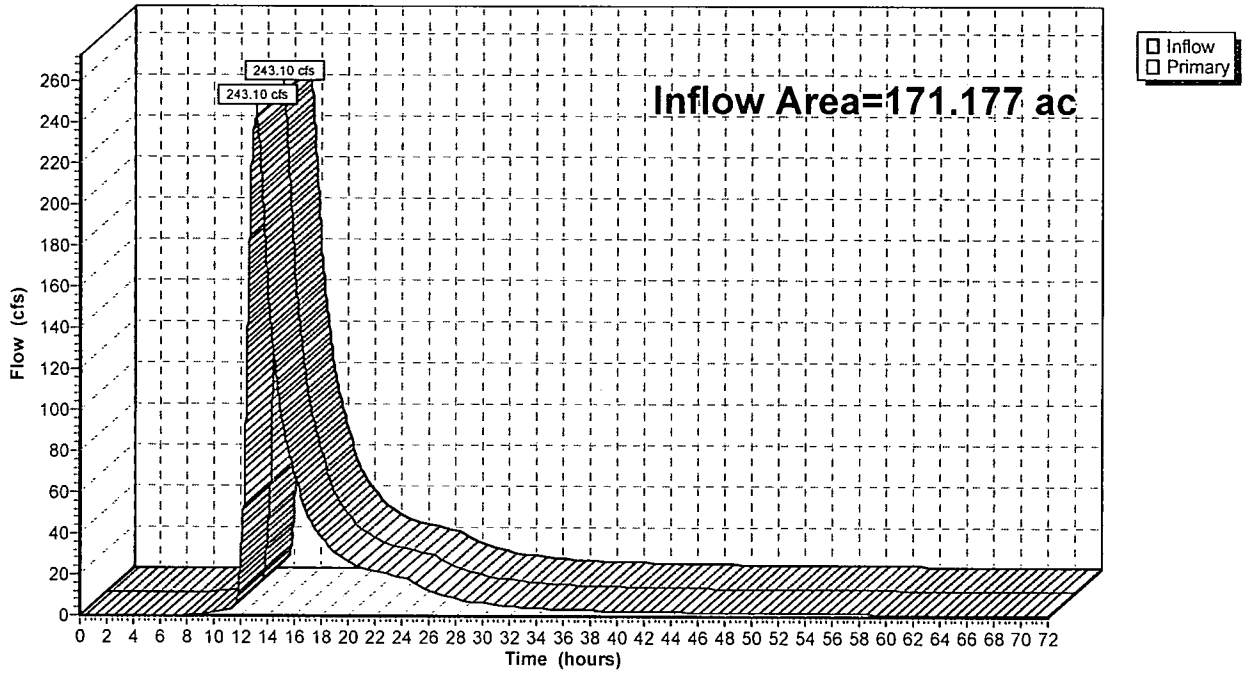
Summary for Link POST: POST

Inflow Area = 171.177 ac, 76.22% Impervious, Inflow Depth > 5.67" for 25-Year event  
Inflow = 243.10 cfs @ 13.07 hrs, Volume= 80.843 af  
Primary = 243.10 cfs @ 13.07 hrs, Volume= 80.843 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link POST: POST

Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 50-Year Rainfall=9.05"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>SubcatchmentP-A: PROP. DA-A</b>	Runoff Area=1,538,366 sf 78.95% Impervious Runoff Depth=7.23" Flow Length=1,300' Tc=34.0 min CN=85 Runoff=177.28 cfs 21.278 af
<b>SubcatchmentP-B: PROP. DA-B</b>	Runoff Area=856,244 sf 70.85% Impervious Runoff Depth=6.74" Flow Length=1,300' Slope=0.0100 '/' Tc=64.6 min CN=81 Runoff=64.82 cfs 11.038 af
<b>SubcatchmentP-C: PROP. DA-C</b>	Runoff Area=447,304 sf 74.80% Impervious Runoff Depth=6.98" Flow Length=600' Slope=0.0050 '/' Tc=28.9 min CN=83 Runoff=54.74 cfs 5.977 af
<b>SubcatchmentP-D: PROP. DA-D</b>	Runoff Area=832,612 sf 71.43% Impervious Runoff Depth=6.74" Flow Length=1,300' Slope=0.0050 '/' Tc=39.2 min CN=81 Runoff=84.23 cfs 10.734 af
<b>SubcatchmentP-E: PROP. DA-E</b>	Runoff Area=804,829 sf 74.60% Impervious Runoff Depth=6.98" Flow Length=1,300' Slope=0.0050 '/' Tc=39.2 min CN=83 Runoff=83.86 cfs 10.754 af
<b>SubcatchmentP-F: PROP. DA-F</b>	Runoff Area=769,055 sf 68.32% Impervious Runoff Depth=6.49" Flow Length=1,100' Slope=0.0050 '/' Tc=36.2 min CN=79 Runoff=78.87 cfs 9.552 af
<b>SubcatchmentPG: PROP. DA-G</b>	Runoff Area=2,208,063 sf 81.83% Impervious Runoff Depth=7.47" Flow Length=1,300' Slope=0.0100 '/' Tc=23.6 min CN=87 Runoff=314.38 cfs 31.575 af
<b>Pond 1P: POND A</b>	Peak Elev=15.01' Storage=424,881 cf Inflow=177.28 cfs 21.278 af Outflow=80.77 cfs 21.168 af
<b>Pond 2P: POND B</b>	Peak Elev=9.15' Storage=162,181 cf Inflow=64.82 cfs 11.038 af Outflow=41.79 cfs 10.990 af
<b>Pond 3P: POND C</b>	Peak Elev=14.71' Storage=94,321 cf Inflow=54.74 cfs 5.977 af Outflow=27.67 cfs 5.977 af
<b>Pond 4P: POND D</b>	Peak Elev=11.20' Storage=232,811 cf Inflow=84.23 cfs 10.734 af Outflow=33.36 cfs 8.710 af
<b>Pond 5P: POND E</b>	Peak Elev=13.70' Storage=150,404 cf Inflow=83.86 cfs 10.754 af Outflow=41.99 cfs 10.721 af
<b>Pond 6P: POND F</b>	Peak Elev=14.41' Storage=110,737 cf Inflow=78.87 cfs 9.552 af Outflow=58.84 cfs 9.546 af
<b>Pond 7P: POND G</b>	Peak Elev=13.25' Storage=832,916 cf Inflow=314.38 cfs 31.575 af Outflow=57.65 cfs 29.465 af
<b>Link POST: POST</b>	Inflow=320.44 cfs 96.577 af Primary=320.44 cfs 96.577 af

**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 50-Year Rainfall=9.05"

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**Summary for Subcatchment P-A: PROP. DA-A**

Runoff = 177.28 cfs @ 12.46 hrs, Volume= 21.278 af, Depth= 7.23"

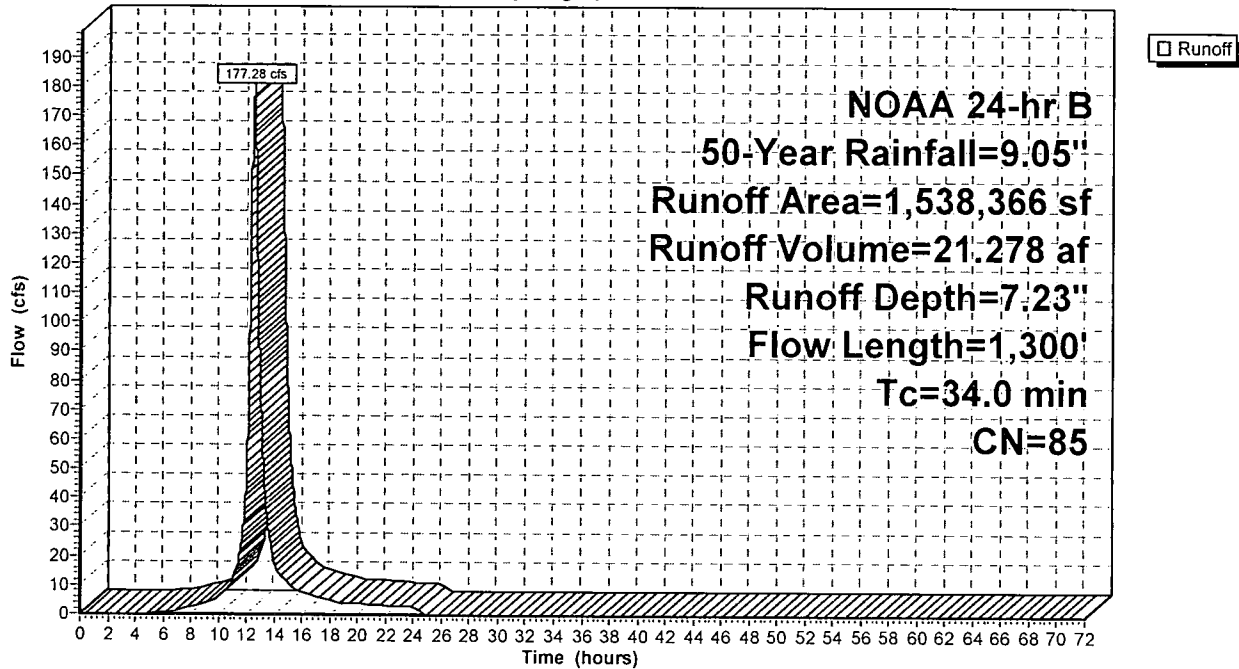
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 50-Year Rainfall=9.05"

Area (sf)	CN	Description
522,403	61	1/4 acre lots, 38% imp, HSG A
* 876,934	98	IMPERVIOUS
* 139,029	98	PONDS
1,538,366	85	Weighted Average
323,890		21.05% Pervious Area
1,214,476		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0100	0.10		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow concentrated flow Unpaved Kv= 16.1 fps
34.0	1,300	Total			

**Subcatchment P-A: PROP. DA-A**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 50-Year Rainfall=9.05"

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**Summary for Subcatchment P-B: PROP. DA-B**

Runoff = 64.82 cfs @ 12.85 hrs, Volume= 11.038 af, Depth= 6.74"

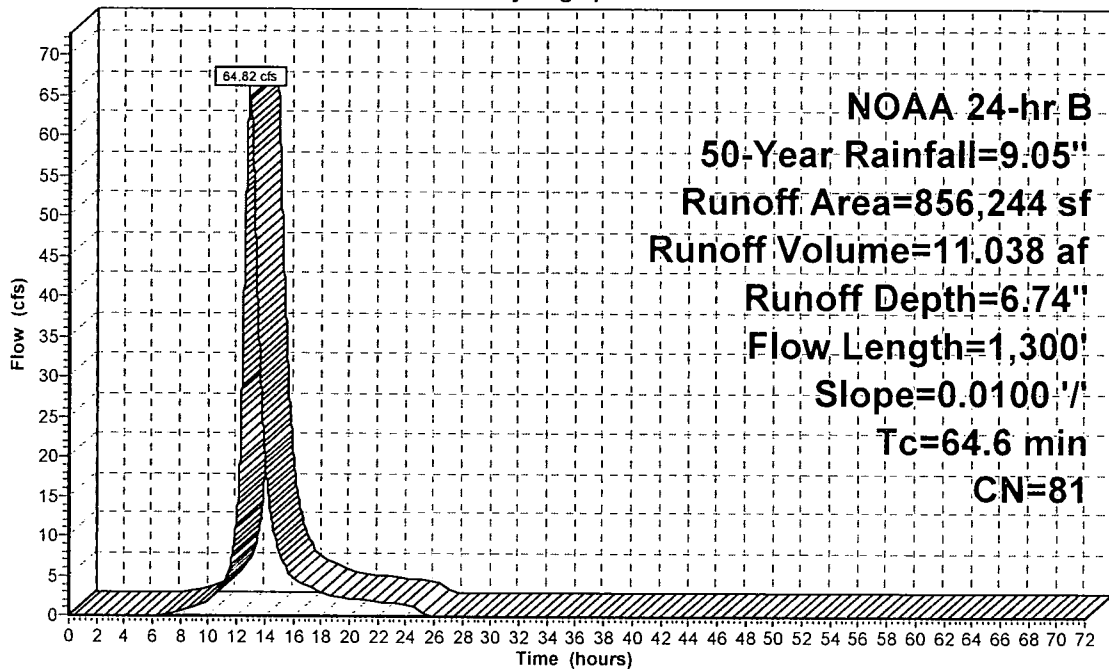
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 50-Year Rainfall=9.05"

Area (sf)	CN	Description
402,533	61	1/4 acre lots, 38% imp, HSG A
371,484	98	Paved parking, HSG D
* 51,398	98	POND
* 30,829	98	WETLAND
856,244	81	Weighted Average
249,570		29.15% Pervious Area
606,674		70.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.6	100	0.0100	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 4.24"
40.0	1,200	0.0100	0.50		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
64.6	1,300	Total			

**Subcatchment P-B: PROP. DA-B**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 50-Year Rainfall=9.05"

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**Summary for Subcatchment P-C: PROP. DA-C**

Runoff = 54.74 cfs @ 12.40 hrs, Volume= 5.977 af, Depth= 6.98"

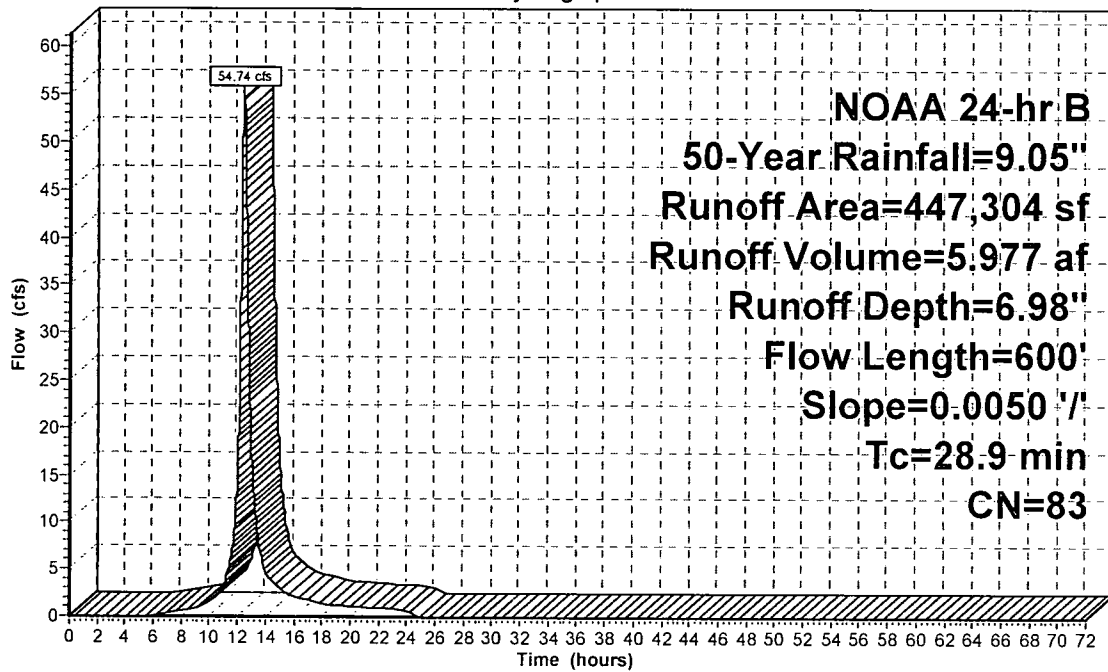
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 50-Year Rainfall=9.05"

Area (sf)	CN	Description
181,773	61	1/4 acre lots, 38% imp, HSG A
235,430	98	Paved parking, HSG D
* 30,101	98	pond
447,304	83	Weighted Average
112,699		25.20% Pervious Area
334,605		74.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
7.3	500	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
28.9	600	Total			

**Subcatchment P-C: PROP. DA-C**

Hydrograph



# Golden Grove Preliminary Study (WQv)

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NOAA 24-hr B 50-Year Rainfall=9.05"

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## Summary for Subcatchment P-D: PROP.DA-D

Runoff = 84.23 cfs @ 12.51 hrs, Volume= 10.734 af, Depth= 6.74"

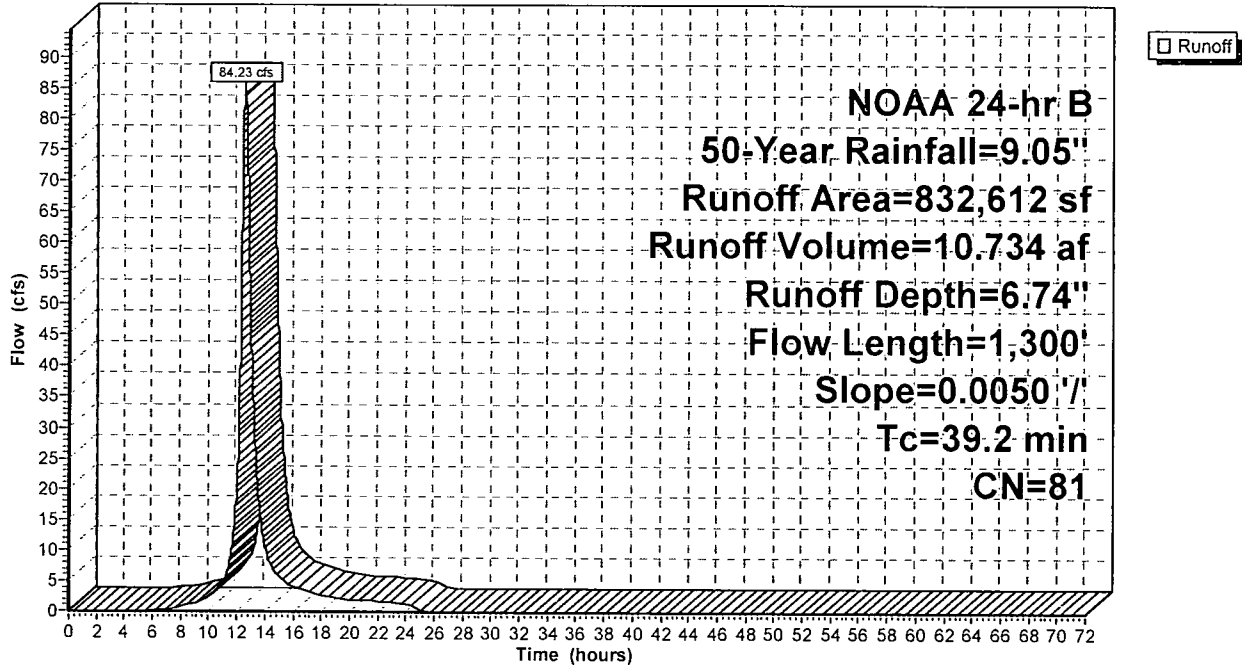
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 50-Year Rainfall=9.05"

Area (sf)	CN	Description
383,716	61	1/4 acre lots, 38% imp, HSG A
299,467	98	Paved parking, HSG D
* 88,466	98	WETLAND
* 60,963	98	POND
832,612	81	Weighted Average
237,904		28.57% Pervious Area
594,708		71.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
39.2	1,300	Total			

## Subcatchment P-D: PROP.DA-D

Hydrograph





**Golden Grove Preliminary Study (WQv)**

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NOAA 24-hr B 50-Year Rainfall=9.05"

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**Summary for Subcatchment P-E: PROP.DA-E**

Runoff = 83.86 cfs @ 12.51 hrs, Volume= 10.754 af, Depth= 6.98"

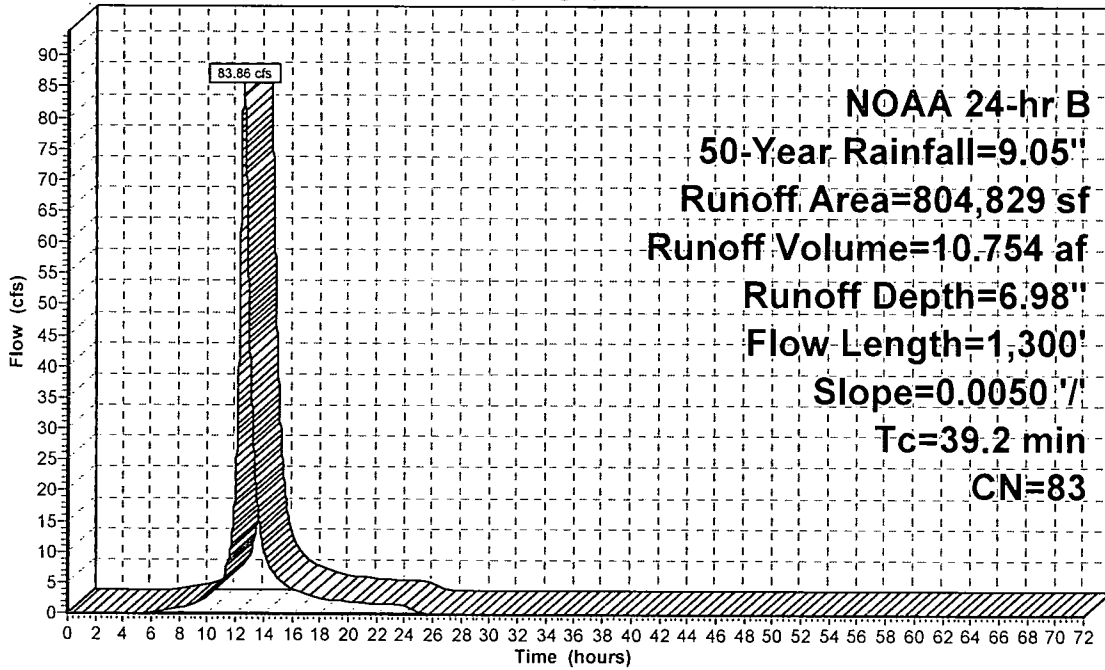
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 50-Year Rainfall=9.05"

Area (sf)	CN	Description
416,071	98	Paved parking, HSG A
329,718	61	1/4 acre lots, 38% imp, HSG A
* 59,040	98	POND
804,829	83	Weighted Average
204,425		25.40% Pervious Area
600,404		74.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
39.2	1,300	Total			

**Subcatchment P-E: PROP.DA-E**

Hydrograph



Runoff

**Golden Grove Preliminary Study (WQv)**

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NOAA 24-hr B 50-Year Rainfall=9.05"

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**Summary for Subcatchment P-F: PROP.DA-F**

Runoff = 78.87 cfs @ 12.51 hrs, Volume= 9.552 af, Depth= 6.49"

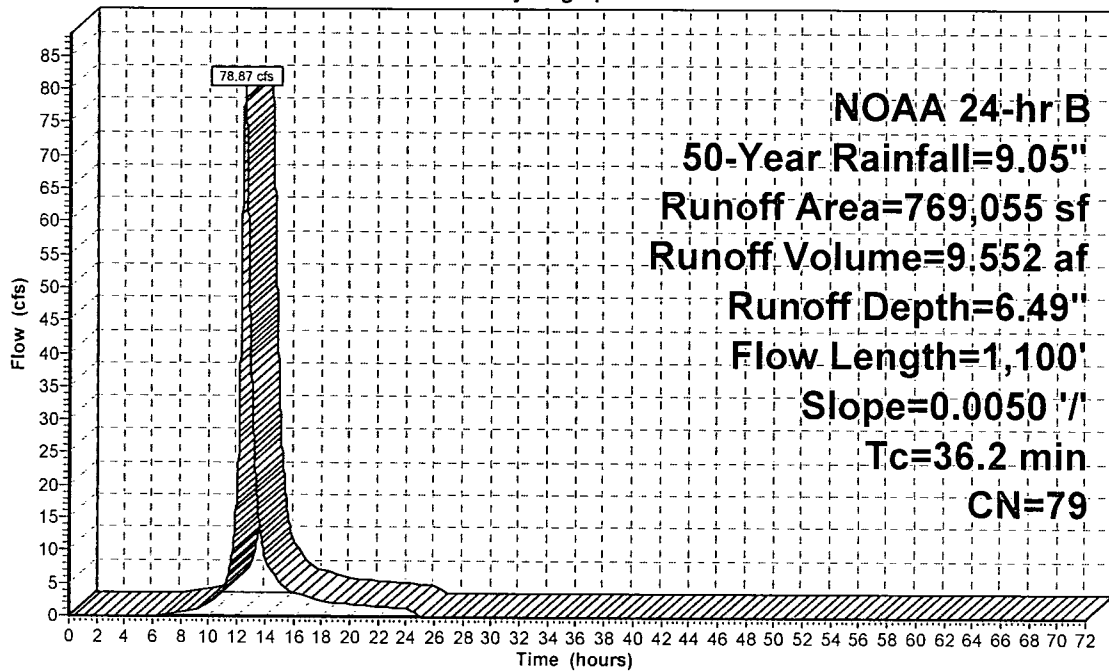
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 50-Year Rainfall=9.05"

Area (sf)	CN	Description
392,960	61	1/4 acre lots, 38% imp, HSG A
334,179	98	Paved parking, HSG D
* 41,916	98	pond
769,055	79	Weighted Average
243,635		31.68% Pervious Area
525,420		68.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
14.6	1,000	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
36.2	1,100	Total			

**Subcatchment P-F: PROP.DA-F**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 50-Year Rainfall=9.05"

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**Summary for Subcatchment PG: PROP. DA-G**

Runoff = 314.38 cfs @ 12.33 hrs, Volume= 31.575 af, Depth= 7.47"

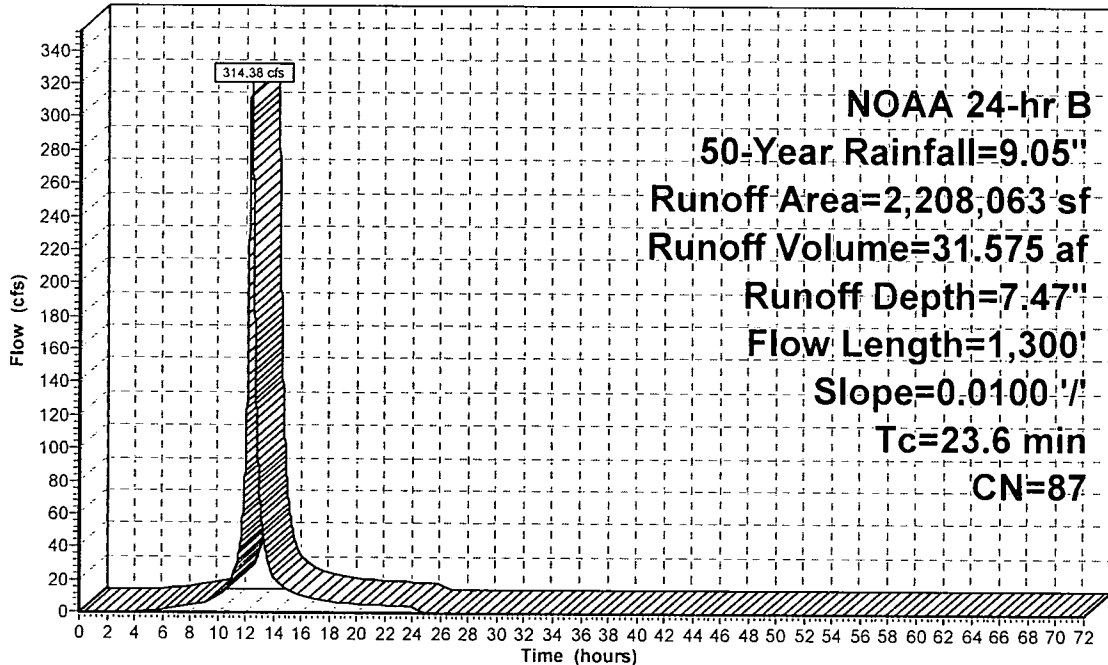
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 50-Year Rainfall=9.05"

Area (sf)	CN	Description
401,286	39	>75% Grass cover, Good, HSG A
1,605,144	98	Paved parking, HSG A
* 75,778	98	wetland
* 125,855	98	pond
2,208,063	87	Weighted Average
401,286		18.17% Pervious Area
1,806,777		81.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.20		<b>Sheet Flow, Sheet Flow</b> Smooth surfaces n= 0.011 P2= 4.24"
22.2	1,200	0.0100	0.90		<b>Shallow Concentrated Flow, Shallow Concentrated Flow</b> Cultivated Straight Rows Kv= 9.0 fps
23.6	1,300	Total			

**Subcatchment PG: PROP. DA-G**

Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 50-Year Rainfall=9.05"

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## Summary for Pond 1P: POND A

Inflow Area = 35.316 ac, 78.95% Impervious, Inflow Depth = 7.23" for 50-Year event  
 Inflow = 177.28 cfs @ 12.46 hrs, Volume= 21.278 af  
 Outflow = 80.77 cfs @ 12.93 hrs, Volume= 21.168 af, Atten= 54%, Lag= 28.3 min  
 Primary = 80.77 cfs @ 12.93 hrs, Volume= 21.168 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 15.01' @ 12.93 hrs Surf.Area= 133,417 sf Storage= 424,881 cf

Plug-Flow detention time= 261.5 min calculated for 21.168 af (99% of inflow)  
 Center-of-Mass det. time= 258.1 min ( 1,066.8 - 808.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	478,682 cf	<b>POND A (Irregular)</b> Listed below (Recalc) 1,196,706 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	80,000	1,700.0	0	0	80,000
6.00	84,842	1,702.0	82,409	82,409	81,785
7.00	89,983	1,725.0	87,400	169,809	88,287
8.00	95,190	1,746.0	92,574	262,383	94,342
9.00	100,460	1,767.0	97,813	360,197	100,470
10.00	105,793	1,788.0	103,115	463,312	106,671
11.00	111,187	1,808.0	108,479	571,790	112,670
12.00	116,640	1,828.0	113,903	685,693	118,735
13.00	122,152	1,847.0	119,385	805,078	124,588
14.00	127,721	1,866.0	124,926	930,005	130,501
15.00	133,346	1,885.0	130,523	1,060,528	136,474
16.00	139,029	1,904.0	136,178	1,196,706	142,508

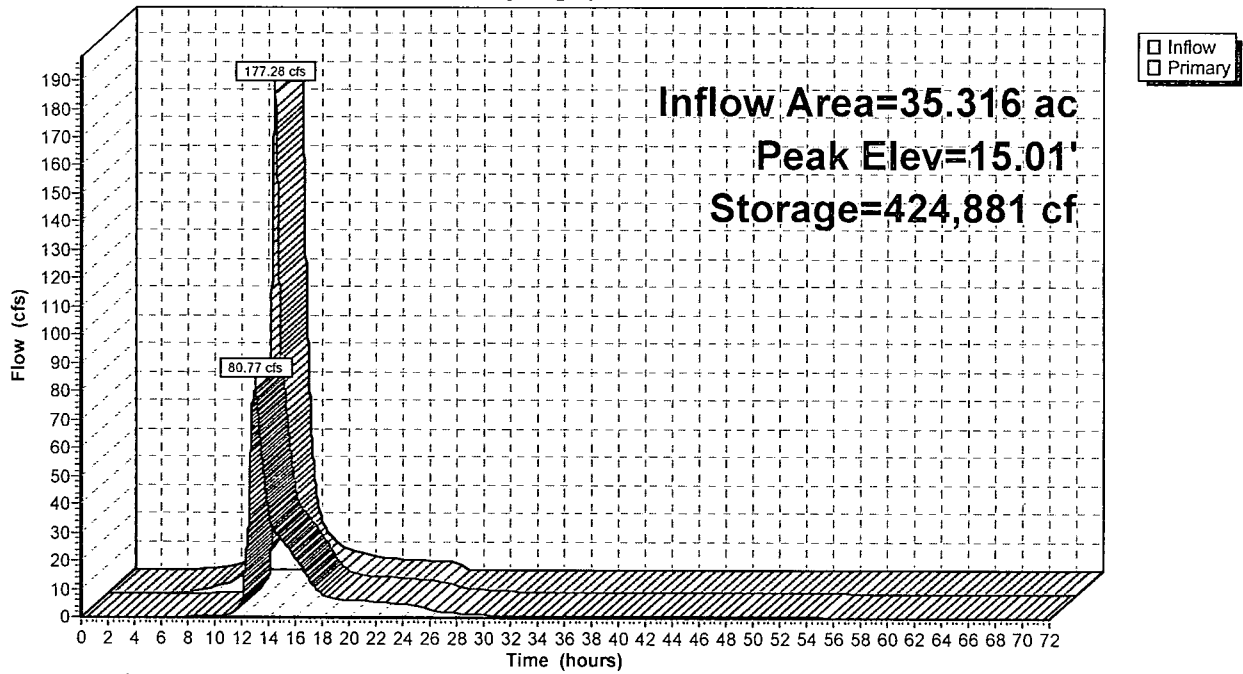
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round Culvert</b> L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.88'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.31'	<b>42.0" W x 8.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	12.85'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=80.76 cfs @ 12.93 hrs HW=15.01' (Free Discharge)

- 1=Culvert (Passes 80.76 cfs of 119.07 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 2.06 cfs @ 15.08 fps)
- 3=Orifice/Grate (Orifice Controls 10.45 cfs @ 13.30 fps)
- 4=Orifice/Grate (Orifice Controls 26.03 cfs @ 11.16 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 42.23 cfs @ 4.88 fps)

Pond 1P: POND A

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 50-Year Rainfall=9.05"

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**Summary for Pond 2P: POND B**

Inflow Area = 19.657 ac, 70.85% Impervious, Inflow Depth = 6.74" for 50-Year event  
 Inflow = 64.82 cfs @ 12.85 hrs, Volume= 11.038 af  
 Outflow = 41.79 cfs @ 13.38 hrs, Volume= 10.990 af, Atten= 36%, Lag= 31.6 min  
 Primary = 41.79 cfs @ 13.38 hrs, Volume= 10.990 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 9.15' @ 13.38 hrs Surf.Area= 47,750 sf Storage= 162,181 cf

Plug-Flow detention time= 161.0 min calculated for 10.989 af (100% of inflow)  
 Center-of-Mass det. time= 158.5 min ( 1,004.1 - 845.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	204,373 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	30,624	1,334.0	0	0	30,624
6.00	34,658	1,355.0	32,620	32,620	35,314
7.00	38,755	1,376.0	36,687	69,308	40,078
8.00	42,912	1,395.0	40,816	110,123	44,491
9.00	47,126	1,414.0	45,003	155,126	48,964
10.00	51,398	1,433.0	49,247	204,373	53,498

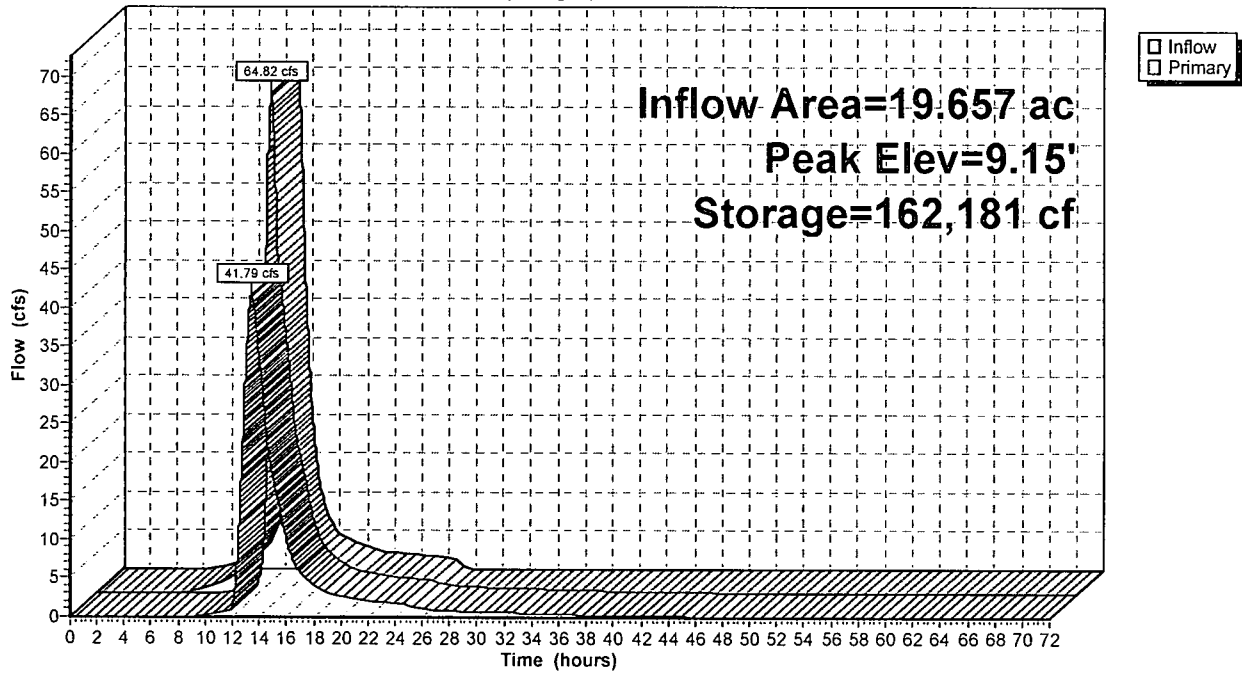
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.00'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	7.87'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	8.65'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=41.78 cfs @ 13.38 hrs HW=9.15' (Free Discharge)

- 1=RCP\_Round 36" (Passes 41.78 cfs of 55.39 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.87 cfs @ 9.51 fps)
- 3=Orifice/Grate (Orifice Controls 26.36 cfs @ 7.46 fps)
- 4=Orifice/Grate (Orifice Controls 9.34 cfs @ 4.87 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 4.22 cfs @ 2.12 fps)

Pond 2P: POND B

Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 50-Year Rainfall=9.05"

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## Summary for Pond 3P: POND C

Inflow Area = 10.269 ac, 74.80% Impervious, Inflow Depth = 6.98" for 50-Year event  
 Inflow = 54.74 cfs @ 12.40 hrs, Volume= 5.977 af  
 Outflow = 27.67 cfs @ 12.77 hrs, Volume= 5.977 af, Atten= 49%, Lag= 22.3 min  
 Primary = 27.67 cfs @ 12.77 hrs, Volume= 5.977 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 14.71' @ 12.77 hrs Surf.Area= 190,380 sf Storage= 94,321 cf

Plug-Flow detention time= 152.9 min calculated for 5.977 af (100% of inflow)  
 Center-of-Mass det. time= 152.9 min ( 961.2 - 808.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	122,983 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 307,457 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	10,253	541.0	0	0	10,253
6.00	11,920	570.0	11,076	11,076	12,876
7.00	13,671	597.0	12,786	23,862	15,451
8.00	15,499	622.0	14,575	38,437	17,951
9.00	17,399	645.0	16,440	54,877	20,355
10.00	19,366	666.0	18,374	73,251	22,642
11.00	21,395	687.0	20,372	93,623	25,002
12.00	23,484	706.0	22,431	116,054	27,221
13.00	25,632	726.0	24,550	140,604	29,609
14.00	27,838	745.0	26,727	167,332	31,952
15.00	301,001	764.0	140,126	307,457	34,355

Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>30.0" Round RCP_Round 30"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	8.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	12.01'	<b>36.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	14.04'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

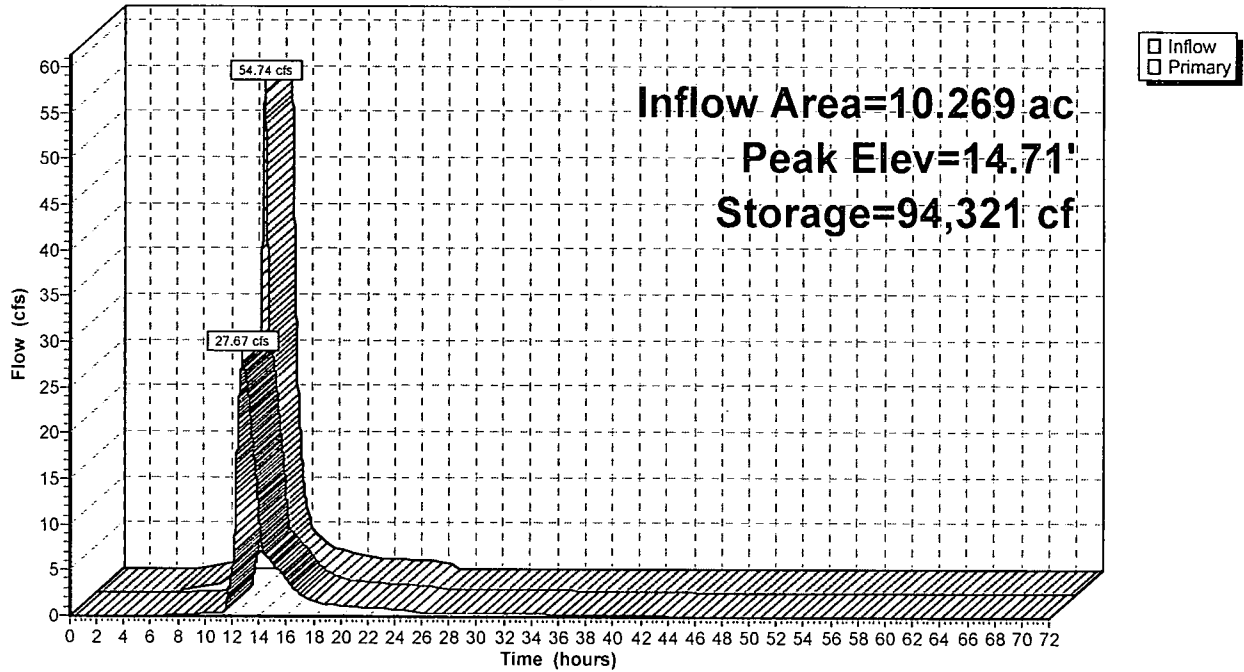
Primary OutFlow Max=27.67 cfs @ 12.77 hrs HW=14.71' (Free Discharge)

- 1=RCP\_Round 30" (Passes 27.67 cfs of 68.73 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.73 cfs @ 14.90 fps)
- 3=Orifice/Grate (Orifice Controls 8.79 cfs @ 11.20 fps)
- 4=Orifice/Grate (Orifice Controls 11.29 cfs @ 7.53 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 6.85 cfs @ 2.57 fps)



Pond 3P: POND C

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 50-Year Rainfall=9.05"

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**Summary for Pond 4P: POND D**

Inflow Area = 19.114 ac, 71.43% Impervious, Inflow Depth = 6.74" for 50-Year event  
 Inflow = 84.23 cfs @ 12.51 hrs, Volume= 10.734 af  
 Outflow = 33.36 cfs @ 13.14 hrs, Volume= 8.710 af, Atten= 60%, Lag= 37.8 min  
 Primary = 33.36 cfs @ 13.14 hrs, Volume= 8.710 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 11.20' @ 13.14 hrs Surf.Area= 111,338 sf Storage= 232,811 cf

Plug-Flow detention time= 335.6 min calculated for 8.709 af (81% of inflow)  
 Center-of-Mass det. time= 266.8 min ( 1,088.9 - 822.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	418,976 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 1,047,440 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	76,922	1,776.0	0	0	76,922
6.00	82,288	1,802.0	79,590	79,590	84,538
7.00	87,732	1,827.0	84,995	164,585	91,982
8.00	93,250	1,851.0	90,477	255,062	99,243
9.00	98,838	1,874.0	96,030	351,093	106,311
10.00	104,491	1,895.0	101,651	452,744	112,885
11.00	110,206	1,079.0	107,336	560,080	306,008
12.00	115,979	1,934.0	113,080	673,160	511,015
13.00	121,809	1,953.0	118,882	792,042	517,205
14.00	127,696	1,972.0	124,741	916,783	523,455
15.00	133,639	1,991.0	130,656	1,047,440	529,766

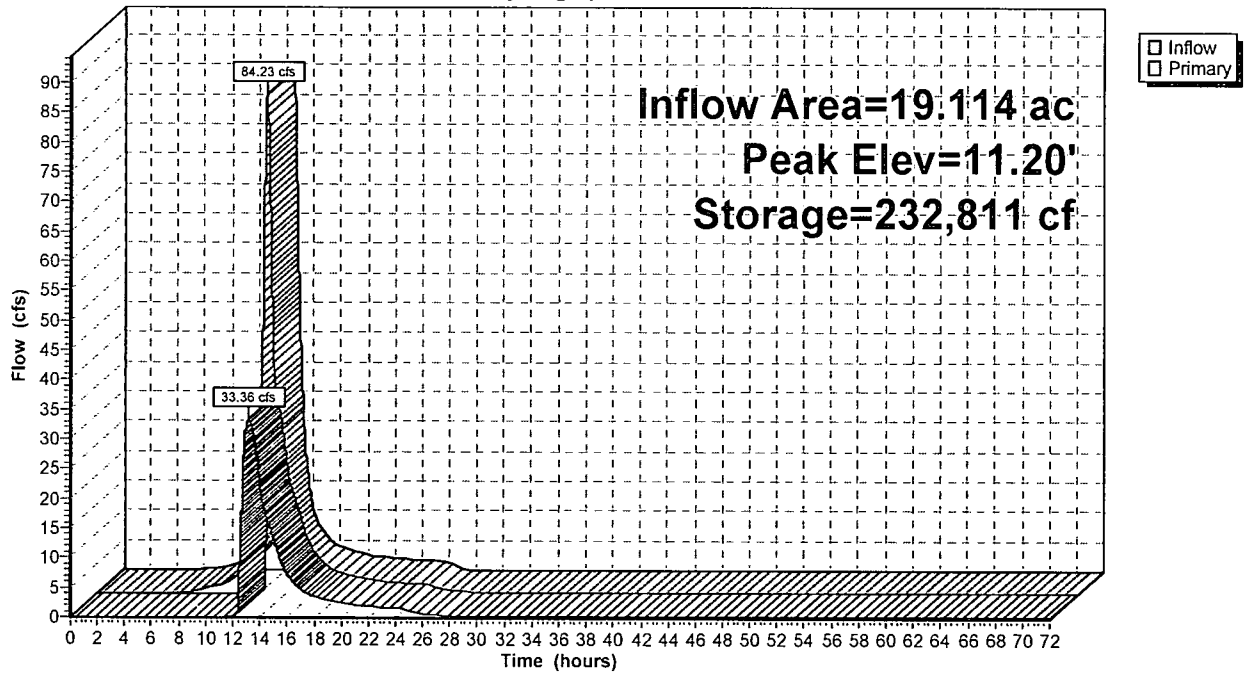
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	8.29'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	10.17'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	12.14'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=33.36 cfs @ 13.14 hrs HW=11.20' (Free Discharge)

- 1=RCP\_Round 36" (Passes 33.36 cfs of 73.77 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.26 cfs @ 11.91 fps)
- 3=Orifice/Grate (Orifice Controls 25.00 cfs @ 7.07 fps)
- 4=Orifice/Grate (Orifice Controls 8.10 cfs @ 4.23 fps)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

Pond 4P: POND D

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 50-Year Rainfall=9.05"

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**Summary for Pond 5P: POND E**

Inflow Area = 18.476 ac, 74.60% Impervious, Inflow Depth = 6.98" for 50-Year event  
 Inflow = 83.86 cfs @ 12.51 hrs, Volume= 10.754 af  
 Outflow = 41.99 cfs @ 13.01 hrs, Volume= 10.721 af, Atten= 50%, Lag= 29.8 min  
 Primary = 41.99 cfs @ 13.01 hrs, Volume= 10.721 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 13.70' @ 13.01 hrs Surf.Area= 55,188 sf Storage= 150,404 cf

Plug-Flow detention time= 160.8 min calculated for 10.721 af (100% of inflow)  
 Center-of-Mass det. time= 158.8 min ( 976.6 - 817.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	179,993 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 449,982 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	32,069	780.0	0	0	32,069
6.00	34,448	806.0	33,251	33,251	35,445
7.00	36,906	832.0	35,670	68,921	38,932
8.00	39,440	857.0	38,166	107,087	42,396
9.00	42,047	880.0	40,737	147,824	45,692
10.00	44,723	903.0	43,378	191,202	49,075
11.00	47,465	925.0	46,087	237,289	52,403
12.00	50,271	945.0	48,861	286,150	55,523
13.00	53,136	965.0	51,697	337,847	58,709
14.00	56,060	984.0	54,591	392,439	61,813
15.00	59,040	1,003.0	57,544	449,982	64,977

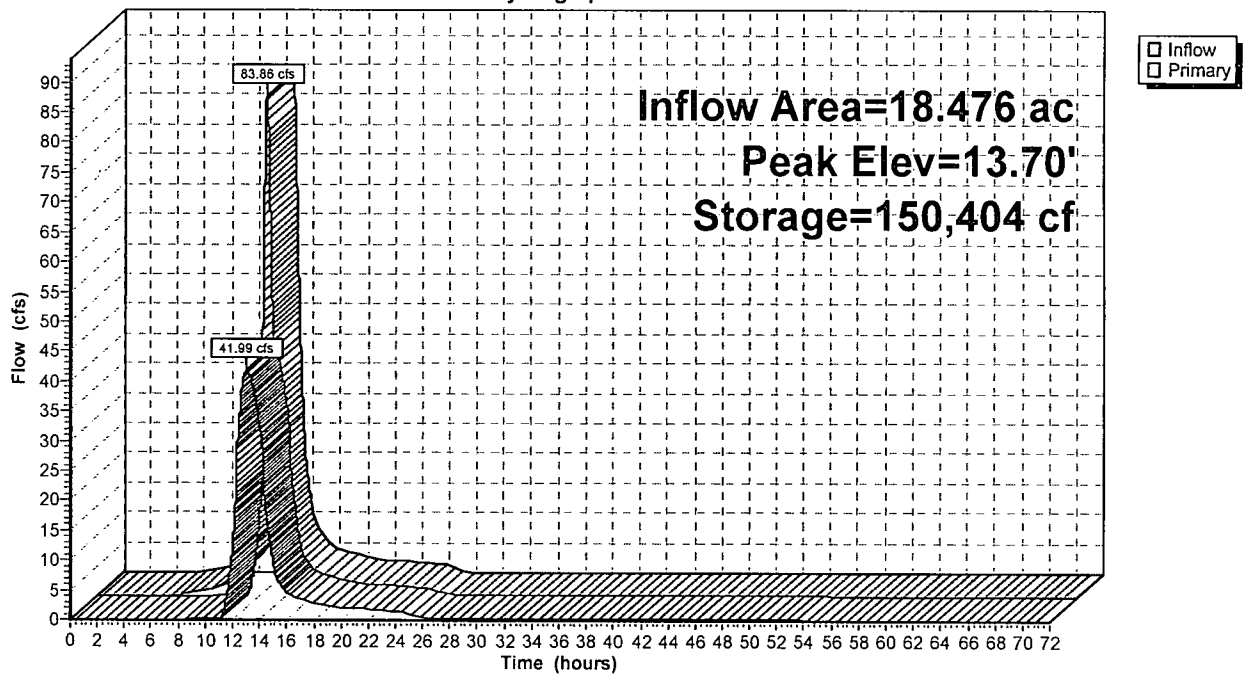
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>24.0" Round RCP_Round 24"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.50' S= 0.0050 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.19'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.35'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	11.26'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=41.99 cfs @ 13.01 hrs HW=13.70' (Free Discharge)

- 1=RCP\_Round 24" (Inlet Controls 41.99 cfs @ 13.36 fps)
- 2=Orifice/Grate (Passes < 0.69 cfs potential flow)
- 3=Orifice/Grate (Passes < 40.86 cfs potential flow)
- 4=Orifice/Grate (Passes < 18.69 cfs potential flow)
- 5=Broad-Crested Rectangular Weir(Passes < 50.76 cfs potential flow)

### Pond 5P: POND E

#### Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 50-Year Rainfall=9.05"

Prepared by Bowman Consulting

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## Summary for Pond 6P: POND F

Inflow Area = 17.655 ac, 68.32% Impervious, Inflow Depth = 6.49" for 50-Year event  
 Inflow = 78.87 cfs @ 12.51 hrs, Volume= 9.552 af  
 Outflow = 58.84 cfs @ 12.74 hrs, Volume= 9.546 af, Atten= 25%, Lag= 14.3 min  
 Primary = 58.84 cfs @ 12.74 hrs, Volume= 9.546 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 14.41' @ 12.74 hrs Surf.Area= 40,398 sf Storage= 110,737 cf

Plug-Flow detention time= 121.8 min calculated for 9.545 af (100% of inflow)  
 Center-of-Mass det. time= 121.7 min ( 945.0 - 823.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	120,437 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 301,092 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	19,563	615.0	0	0	19,563
6.00	21,448	642.0	20,498	20,498	22,336
7.00	23,413	669.0	22,423	42,922	25,228
8.00	25,459	695.0	24,429	67,350	28,131
9.00	27,586	722.0	26,515	93,866	31,257
10.00	29,792	748.0	28,682	122,548	34,386
11.00	32,075	774.0	30,926	153,474	37,626
12.00	34,432	798.0	33,247	186,721	40,729
13.00	36,861	821.0	35,640	222,360	43,801
14.00	39,357	843.0	38,102	260,463	46,831
15.00	41,916	863.0	40,630	301,092	49,677

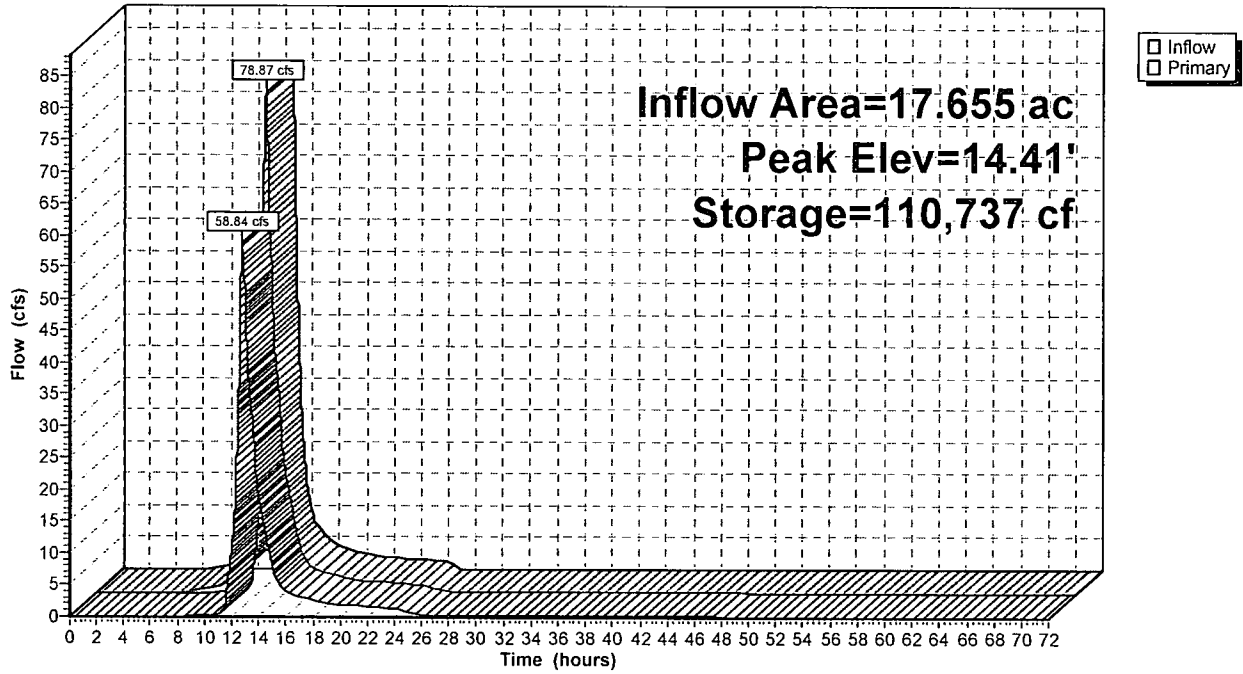
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.70'	<b>15.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.13'	<b>36.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	13.26'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=58.83 cfs @ 12.74 hrs HW=14.41' (Free Discharge)

- 1=RCP\_Round 36" (Passes 58.83 cfs of 95.73 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.72 cfs @ 14.67 fps)
- 3=Orifice/Grate (Orifice Controls 29.15 cfs @ 11.88 fps)
- 4=Orifice/Grate (Orifice Controls 12.57 cfs @ 8.38 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 16.39 cfs @ 3.56 fps)

Pond 6P: POND F

Hydrograph



# Golden Grove Preliminary Study (WQv)

NOAA 24-hr B 50-Year Rainfall=9.05"

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## Summary for Pond 7P: POND G

Inflow Area = 50.690 ac, 81.83% Impervious, Inflow Depth = 7.47" for 50-Year event  
 Inflow = 314.38 cfs @ 12.33 hrs, Volume= 31.575 af  
 Outflow = 57.65 cfs @ 13.11 hrs, Volume= 29.465 af, Atten= 82%, Lag= 46.8 min  
 Primary = 57.65 cfs @ 13.11 hrs, Volume= 29.465 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 13.25' @ 13.11 hrs Surf.Area= 118,184 sf Storage= 832,916 cf

Plug-Flow detention time= 493.2 min calculated for 29.461 af (93% of inflow)  
 Center-of-Mass det. time= 458.0 min ( 1,252.4 - 794.3 )

Volume #1	Invert 5.00'	Avail.Storage 1,046,078 cf	Storage Description POND A (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
5.00	84,335	1,283.0	0	0	84,335	
6.00	88,218	1,305.0	86,269	86,269	89,047	
7.00	92,165	1,326.0	90,184	176,454	93,636	
8.00	96,174	1,346.0	94,162	270,616	98,094	
9.00	100,243	1,366.0	98,201	368,817	102,618	
10.00	104,370	1,385.0	102,300	471,117	106,999	
11.00	108,553	1,404.0	106,455	577,572	111,441	
12.00	112,794	1,423.0	110,667	688,238	115,943	
13.00	117,091	1,442.0	114,936	803,174	120,505	
14.00	121,444	1,461.0	119,261	922,435	125,128	
15.00	125,855	1,479.5	123,643	1,046,078	129,700	

Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round Culvert</b> L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.88'	<b>15.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.47'	<b>36.0" W x 8.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	11.78'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

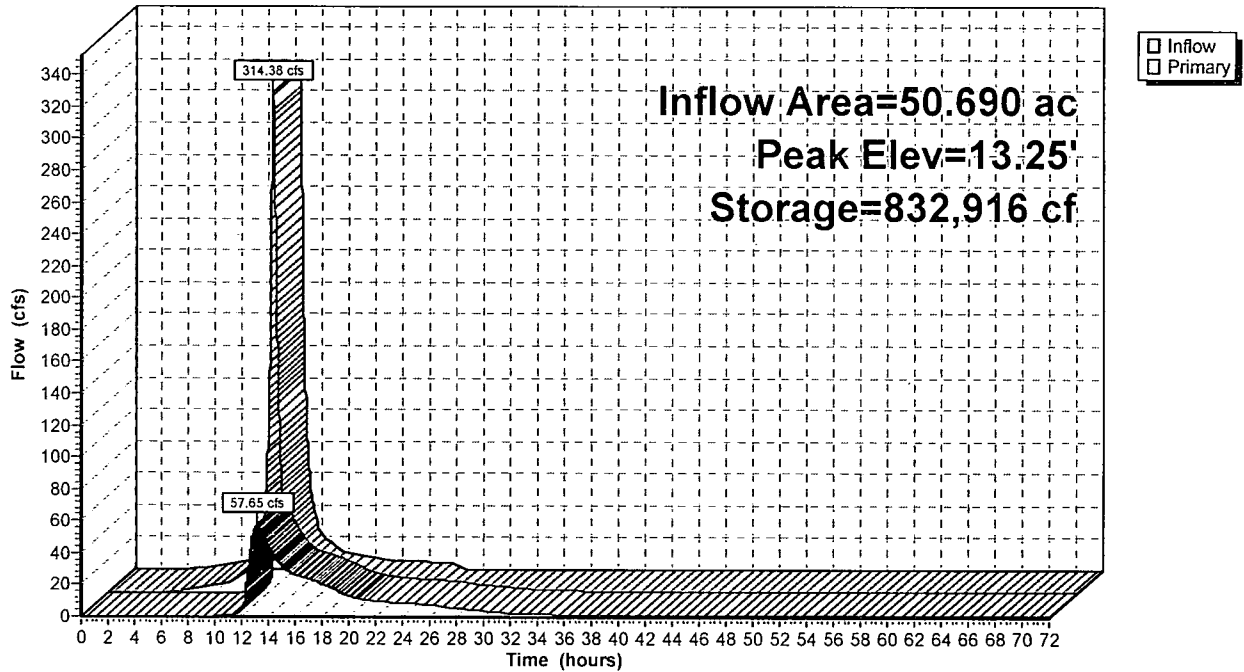
Primary OutFlow Max=57.64 cfs @ 13.11 hrs HW=13.25' (Free Discharge)

- 1=Culvert (Passes 57.64 cfs of 105.18 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.86 cfs @ 13.66 fps)
- 3=Orifice/Grate (Orifice Controls 14.17 cfs @ 11.54 fps)
- 4=Orifice/Grate (Orifice Controls 17.88 cfs @ 8.94 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 23.74 cfs @ 4.03 fps)



Pond 7P: POND G

Hydrograph



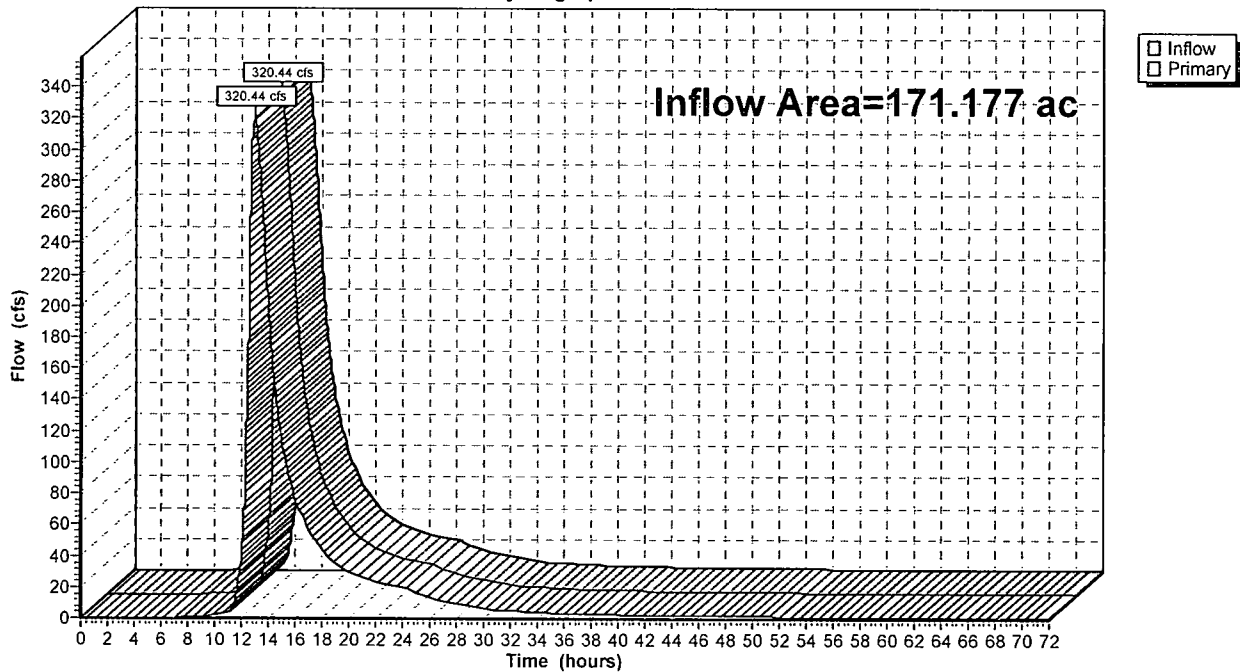
### Summary for Link POST: POST

Inflow Area = 171.177 ac, 76.22% Impervious, Inflow Depth > 6.77" for 50-Year event  
Inflow = 320.44 cfs @ 12.94 hrs, Volume= 96.577 af  
Primary = 320.44 cfs @ 12.94 hrs, Volume= 96.577 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

### Link POST: POST

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>SubcatchmentP-A: PROP. DA-A</b>	Runoff Area=1,538,366 sf 78.95% Impervious Runoff Depth=8.42" Flow Length=1,300' Tc=34.0 min CN=85 Runoff=204.91 cfs 24.777 af
<b>SubcatchmentP-B: PROP. DA-B</b>	Runoff Area=856,244 sf 70.85% Impervious Runoff Depth=7.91" Flow Length=1,300' Slope=0.0100 '/ Tc=64.6 min CN=81 Runoff=75.66 cfs 12.954 af
<b>SubcatchmentP-C: PROP. DA-C</b>	Runoff Area=447,304 sf 74.80% Impervious Runoff Depth=8.16" Flow Length=600' Slope=0.0050 '/ Tc=28.9 min CN=83 Runoff=63.51 cfs 6.987 af
<b>SubcatchmentP-D: PROP. DA-D</b>	Runoff Area=832,612 sf 71.43% Impervious Runoff Depth=7.91" Flow Length=1,300' Slope=0.0050 '/ Tc=39.2 min CN=81 Runoff=98.27 cfs 12.596 af
<b>SubcatchmentP-E: PROP. DA-E</b>	Runoff Area=804,829 sf 74.60% Impervious Runoff Depth=8.16" Flow Length=1,300' Slope=0.0050 '/ Tc=39.2 min CN=83 Runoff=97.39 cfs 12.571 af
<b>SubcatchmentP-F: PROP. DA-F</b>	Runoff Area=769,055 sf 68.32% Impervious Runoff Depth=7.65" Flow Length=1,100' Slope=0.0050 '/ Tc=36.2 min CN=79 Runoff=92.36 cfs 11.255 af
<b>SubcatchmentPG: PROP. DA-G</b>	Runoff Area=2,208,063 sf 81.83% Impervious Runoff Depth=8.67" Flow Length=1,300' Slope=0.0100 '/ Tc=23.6 min CN=87 Runoff=361.81 cfs 36.631 af
<b>Pond 1P: POND A</b>	Peak Elev=15.75' Storage=465,011 cf Inflow=204.91 cfs 24.777 af Outflow=106.53 cfs 24.665 af
<b>Pond 2P: POND B</b>	Peak Elev=9.52' Storage=180,310 cf Inflow=75.66 cfs 12.954 af Outflow=51.98 cfs 12.905 af
<b>Pond 3P: POND C</b>	Peak Elev=14.87' Storage=108,426 cf Inflow=63.51 cfs 6.987 af Outflow=31.24 cfs 6.986 af
<b>Pond 4P: POND D</b>	Peak Elev=11.90' Storage=264,534 cf Inflow=98.27 cfs 12.596 af Outflow=40.25 cfs 10.570 af
<b>Pond 5P: POND E</b>	Peak Elev=14.96' Storage=178,952 cf Inflow=97.39 cfs 12.571 af Outflow=45.27 cfs 12.537 af
<b>Pond 6P: POND F</b>	Peak Elev=14.95' Storage=119,640 cf Inflow=92.36 cfs 11.255 af Outflow=74.06 cfs 11.250 af
<b>Pond 7P: POND G</b>	Peak Elev=14.05' Storage=928,778 cf Inflow=361.81 cfs 36.631 af Outflow=82.41 cfs 34.497 af
<b>Link POST: POST</b>	Inflow=403.26 cfs 113.410 af Primary=403.26 cfs 113.410 af

**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

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**Summary for Subcatchment P-A: PROP. DA-A**

Runoff = 204.91 cfs @ 12.46 hrs, Volume= 24.777 af, Depth= 8.42"

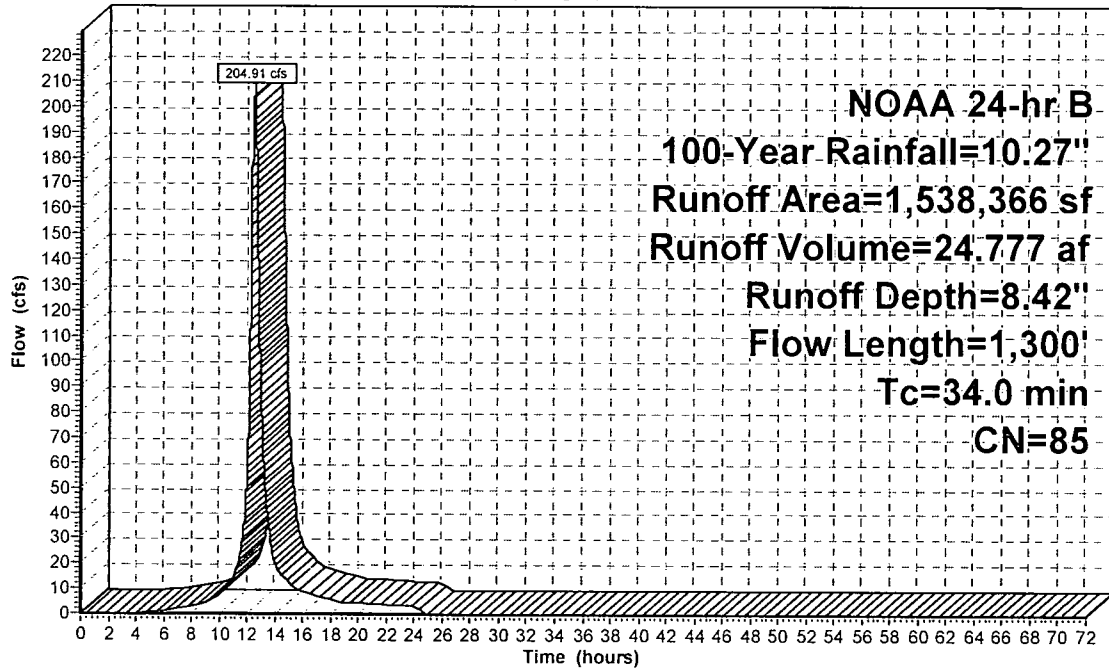
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 100-Year Rainfall=10.27"

Area (sf)	CN	Description
522,403	61	1/4 acre lots, 38% imp, HSG A
* 876,934	98	IMPERVIOUS
* 139,029	98	PONDS
1,538,366	85	Weighted Average
323,890		21.05% Pervious Area
1,214,476		78.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0100	0.10		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow concentrated flow Unpaved Kv= 16.1 fps
34.0	1,300	Total			

**Subcatchment P-A: PROP. DA-A**

Hydrograph



Runoff

**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

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**Summary for Subcatchment P-B: PROP. DA-B**

Runoff = 75.66 cfs @ 12.85 hrs, Volume= 12.954 af, Depth= 7.91"

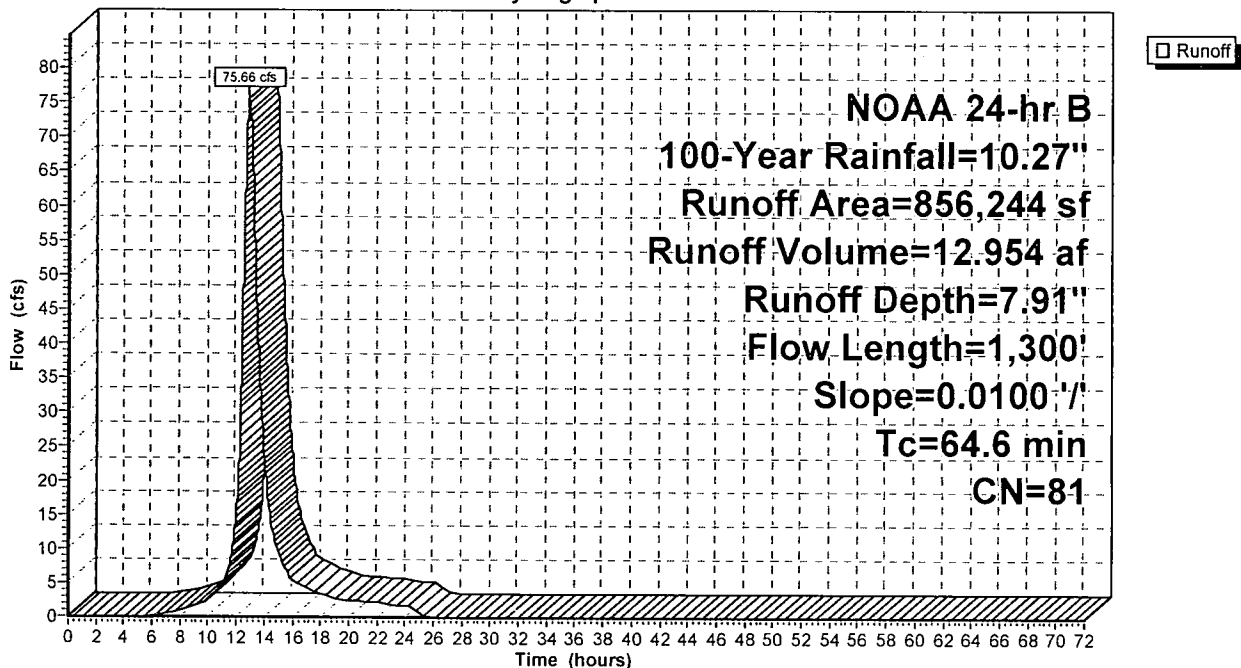
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 100-Year Rainfall=10.27"

Area (sf)	CN	Description
402,533	61	1/4 acre lots, 38% imp, HSG A
371,484	98	Paved parking, HSG D
* 51,398	98	POND
* 30,829	98	WETLAND
856,244	81	Weighted Average
249,570		29.15% Pervious Area
606,674		70.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.6	100	0.0100	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 4.24"
40.0	1,200	0.0100	0.50		Shallow Concentrated Flow, Shallow Concentrated Woodland Kv= 5.0 fps
64.6	1,300	Total			

**Subcatchment P-B: PROP. DA-B**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

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**Summary for Subcatchment P-C: PROP. DA-C**

Runoff = 63.51 cfs @ 12.40 hrs, Volume= 6.987 af, Depth= 8.16"

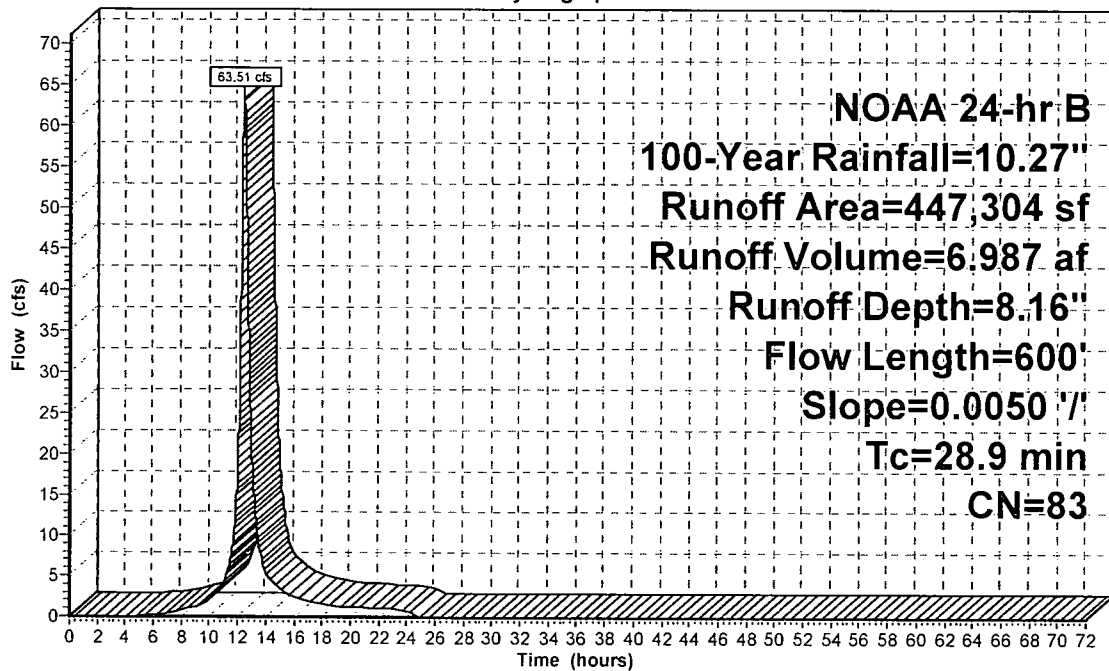
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 100-Year Rainfall=10.27"

Area (sf)	CN	Description
181,773	61	1/4 acre lots, 38% imp, HSG A
235,430	98	Paved parking, HSG D
* 30,101	98	pond
447,304	83	Weighted Average
112,699		25.20% Pervious Area
334,605		74.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		<b>Sheet Flow, Sheet Flow</b> Grass: Dense n= 0.240 P2= 4.24"
7.3	500	0.0050	1.14		<b>Shallow Concentrated Flow, Shallow Concentrated Flow</b> Unpaved Kv= 16.1 fps
28.9	600	Total			

**Subcatchment P-C: PROP. DA-C**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

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**Summary for Subcatchment P-D: PROP.DA-D**

Runoff = 98.27 cfs @ 12.51 hrs, Volume= 12.596 af, Depth= 7.91"

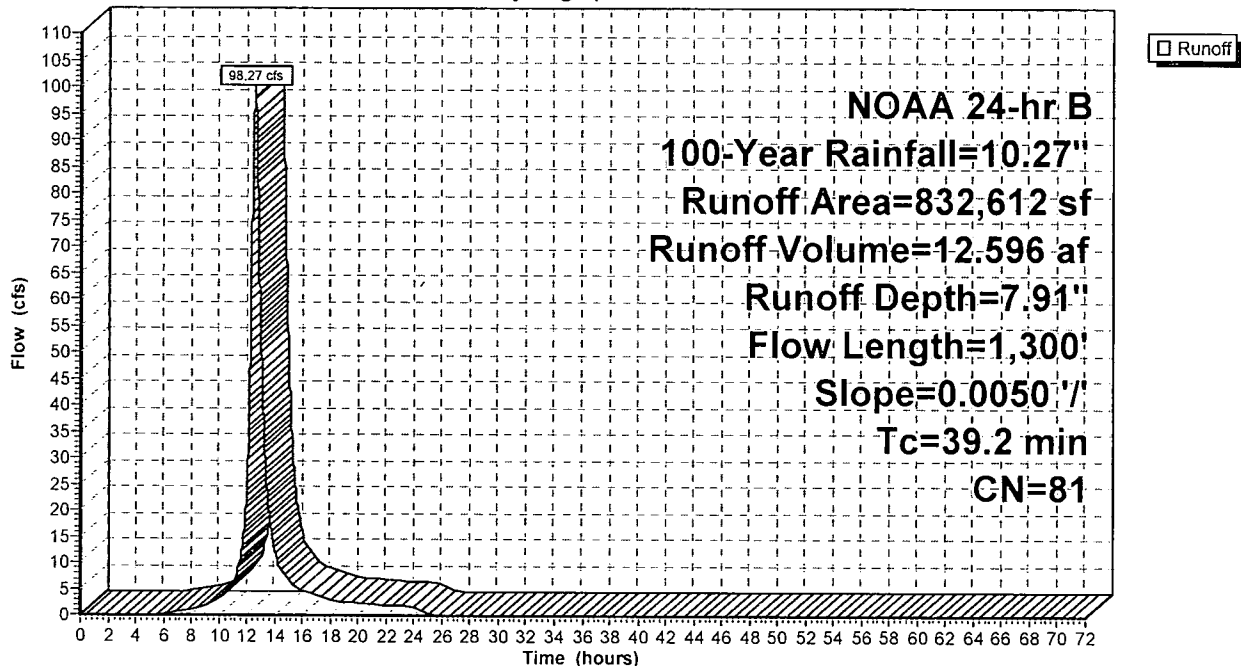
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 100-Year Rainfall=10.27"

Area (sf)	CN	Description
383,716	61	1/4 acre lots, 38% imp, HSG A
299,467	98	Paved parking, HSG D
* 88,466	98	WETLAND
* 60,963	98	POND
832,612	81	Weighted Average
237,904		28.57% Pervious Area
594,708		71.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
39.2	1,300	Total			

**Subcatchment P-D: PROP.DA-D**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

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**Summary for Subcatchment P-E: PROP.DA-E**

Runoff = 97.39 cfs @ 12.51 hrs, Volume= 12.571 af, Depth= 8.16"

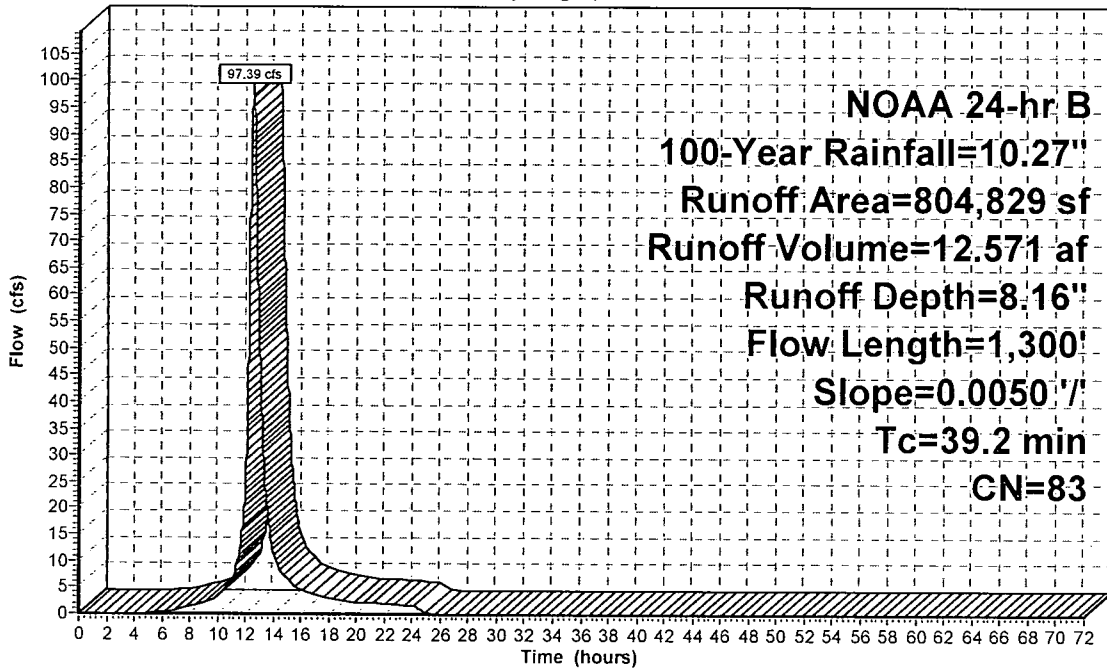
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 100-Year Rainfall=10.27"

Area (sf)	CN	Description
416,071	98	Paved parking, HSG A
329,718	61	1/4 acre lots, 38% imp, HSG A
* 59,040	98	POND
804,829	83	Weighted Average
204,425		25.40% Pervious Area
600,404		74.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
17.6	1,200	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
39.2	1,300	Total			

**Subcatchment P-E: PROP.DA-E**

Hydrograph





**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

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**Summary for Subcatchment P-F: PROP.DA-F**

Runoff = 92.36 cfs @ 12.51 hrs, Volume= 11.255 af, Depth= 7.65"

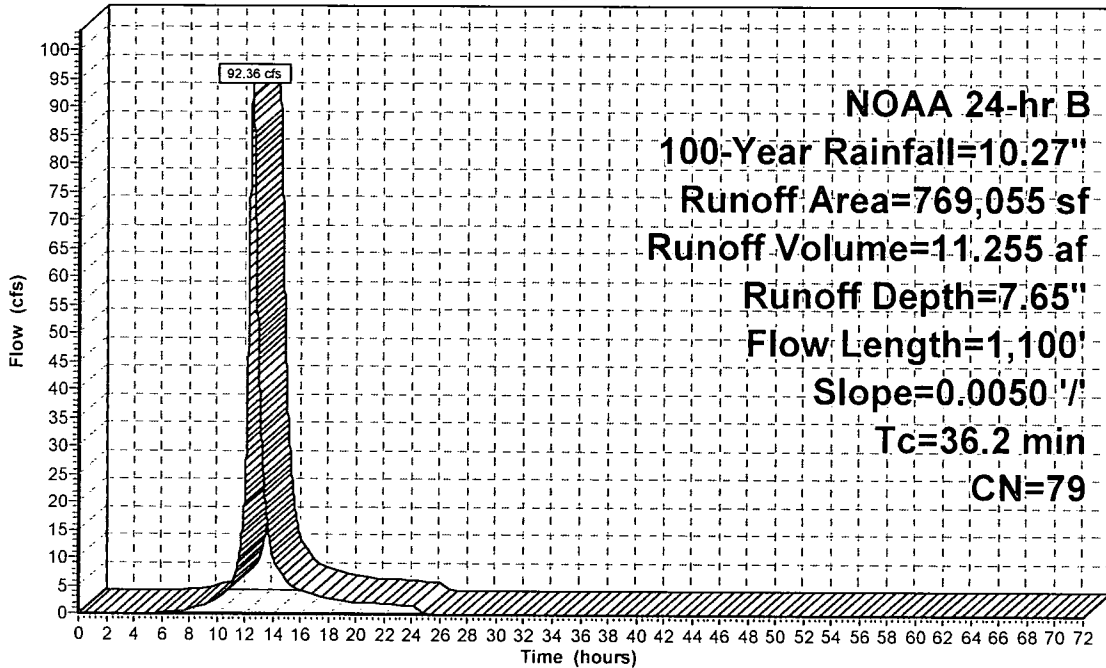
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 100-Year Rainfall=10.27"

Area (sf)	CN	Description
392,960	61	1/4 acre lots, 38% imp, HSG A
334,179	98	Paved parking, HSG D
* 41,916	98	pond
769,055	79	Weighted Average
243,635		31.68% Pervious Area
525,420		68.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	100	0.0050	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 4.24"
14.6	1,000	0.0050	1.14		Shallow Concentrated Flow, Shallow Concentrated Flow Unpaved Kv= 16.1 fps
36.2	1,100	Total			

**Subcatchment P-F: PROP.DA-F**

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

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**Summary for Subcatchment PG: PROP. DA-G**

Runoff = 361.81 cfs @ 12.33 hrs, Volume= 36.631 af, Depth= 8.67"

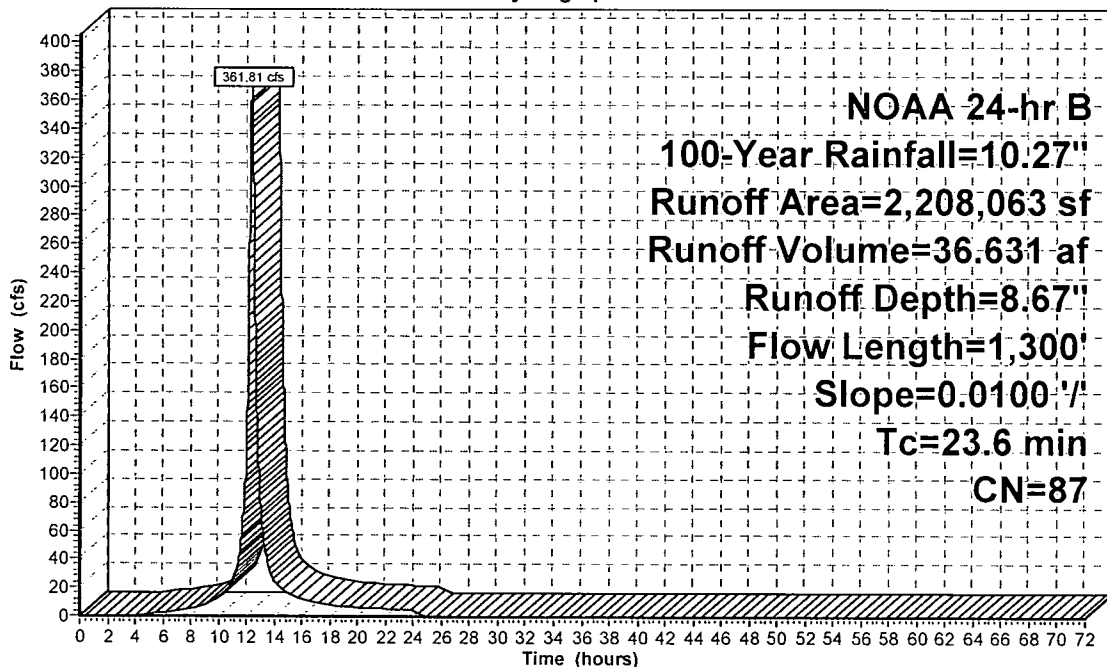
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 NOAA 24-hr B 100-Year Rainfall=10.27"

Area (sf)	CN	Description
401,286	39	>75% Grass cover, Good, HSG A
1,605,144	98	Paved parking, HSG A
* 75,778	98	wetland
* 125,855	98	pond
2,208,063	87	Weighted Average
401,286		18.17% Pervious Area
1,806,777		81.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0100	1.20		Sheet Flow, Sheet Flow Smooth surfaces n= 0.011 P2= 4.24"
22.2	1,200	0.0100	0.90		Shallow Concentrated Flow, Shallow Concentrated Flow Cultivated Straight Rows Kv= 9.0 fps
23.6	1,300	Total			

**Subcatchment PG: PROP. DA-G**

Hydrograph



Summary for Pond 1P: POND A

Inflow Area = 35.316 ac, 78.95% Impervious, Inflow Depth = 8.42" for 100-Year event  
 Inflow = 204.91 cfs @ 12.46 hrs, Volume= 24.777 af  
 Outflow = 106.53 cfs @ 12.87 hrs, Volume= 24.665 af, Atten= 48%, Lag= 24.4 min  
 Primary = 106.53 cfs @ 12.87 hrs, Volume= 24.665 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 15.75' @ 12.87 hrs Surf.Area= 137,614 sf Storage= 465,011 cf

Plug-Flow detention time= 238.0 min calculated for 24.665 af (100% of inflow)  
 Center-of-Mass det. time= 235.0 min ( 1,040.1 - 805.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	478,682 cf	<b>POND A (Irregular)</b> Listed below (Recalc) 1,196,706 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	80,000	1,700.0	0	0	80,000
6.00	84,842	1,702.0	82,409	82,409	81,785
7.00	89,983	1,725.0	87,400	169,809	88,287
8.00	95,190	1,746.0	92,574	262,383	94,342
9.00	100,460	1,767.0	97,813	360,197	100,470
10.00	105,793	1,788.0	103,115	463,312	106,671
11.00	111,187	1,808.0	108,479	571,790	112,670
12.00	116,640	1,828.0	113,903	685,693	118,735
13.00	122,152	1,847.0	119,385	805,078	124,588
14.00	127,721	1,866.0	124,926	930,005	130,501
15.00	133,346	1,885.0	130,523	1,060,528	136,474
16.00	139,029	1,904.0	136,178	1,196,706	142,508

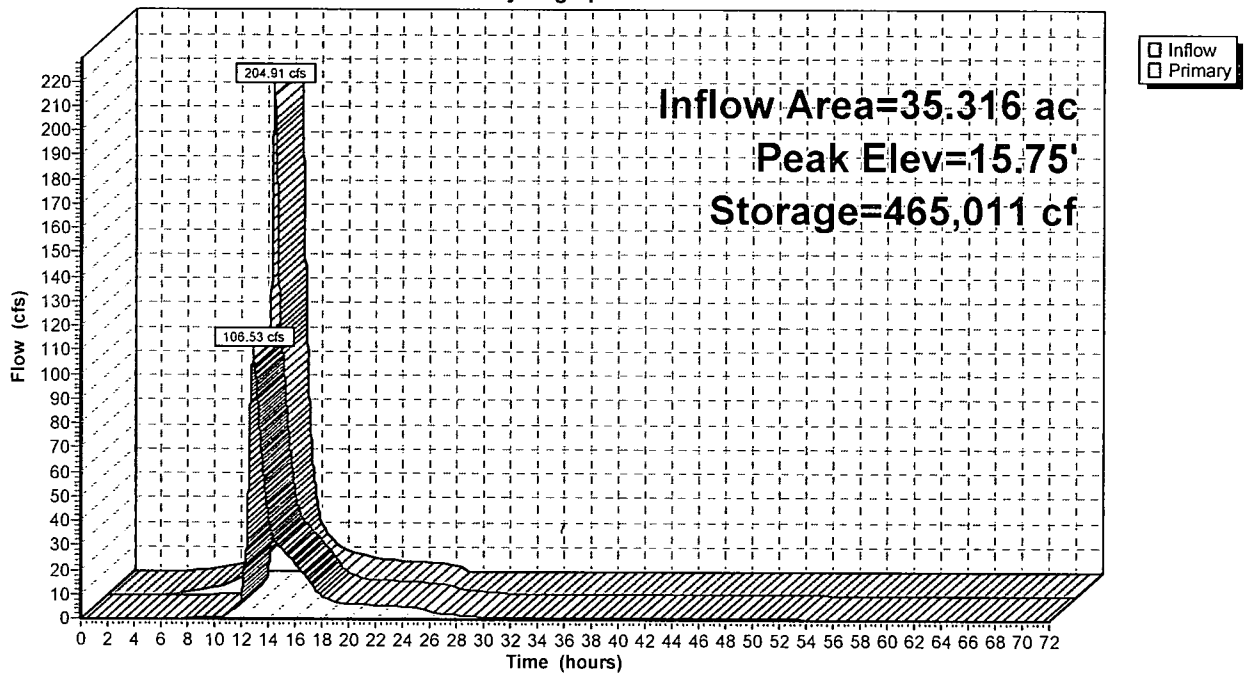
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round Culvert</b> L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.88'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.31'	<b>42.0" W x 8.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	12.85'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=106.52 cfs @ 12.87 hrs HW=15.75' (Free Discharge)

- 1=Culvert (Passes 106.52 cfs of 124.45 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 2.13 cfs @ 15.64 fps)
- 3=Orifice/Grate (Orifice Controls 10.94 cfs @ 13.93 fps)
- 4=Orifice/Grate (Orifice Controls 27.77 cfs @ 11.90 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 65.68 cfs @ 5.66 fps)

Pond 1P: POND A

Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

Prepared by Bowman Consulting

Printed 12/21/2020

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**Summary for Pond 2P: POND B**

Inflow Area = 19.657 ac, 70.85% Impervious, Inflow Depth = 7.91" for 100-Year event  
 Inflow = 75.66 cfs @ 12.85 hrs, Volume= 12.954 af  
 Outflow = 51.98 cfs @ 13.32 hrs, Volume= 12.905 af, Atten= 31%, Lag= 28.4 min  
 Primary = 51.98 cfs @ 13.32 hrs, Volume= 12.905 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 9.52' @ 13.32 hrs Surf.Area= 49,334 sf Storage= 180,310 cf

Plug-Flow detention time= 146.5 min calculated for 12.904 af (100% of inflow)  
 Center-of-Mass det. time= 144.4 min ( 986.1 - 841.7 )

Volume	Invert	Avail.Storage	Storage Description			
#1	5.00'	204,373 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
5.00	30,624	1,334.0	0	0	30,624	
6.00	34,658	1,355.0	32,620	32,620	35,314	
7.00	38,755	1,376.0	36,687	69,308	40,078	
8.00	42,912	1,395.0	40,816	110,123	44,491	
9.00	47,126	1,414.0	45,003	155,126	48,964	
10.00	51,398	1,433.0	49,247	204,373	53,498	

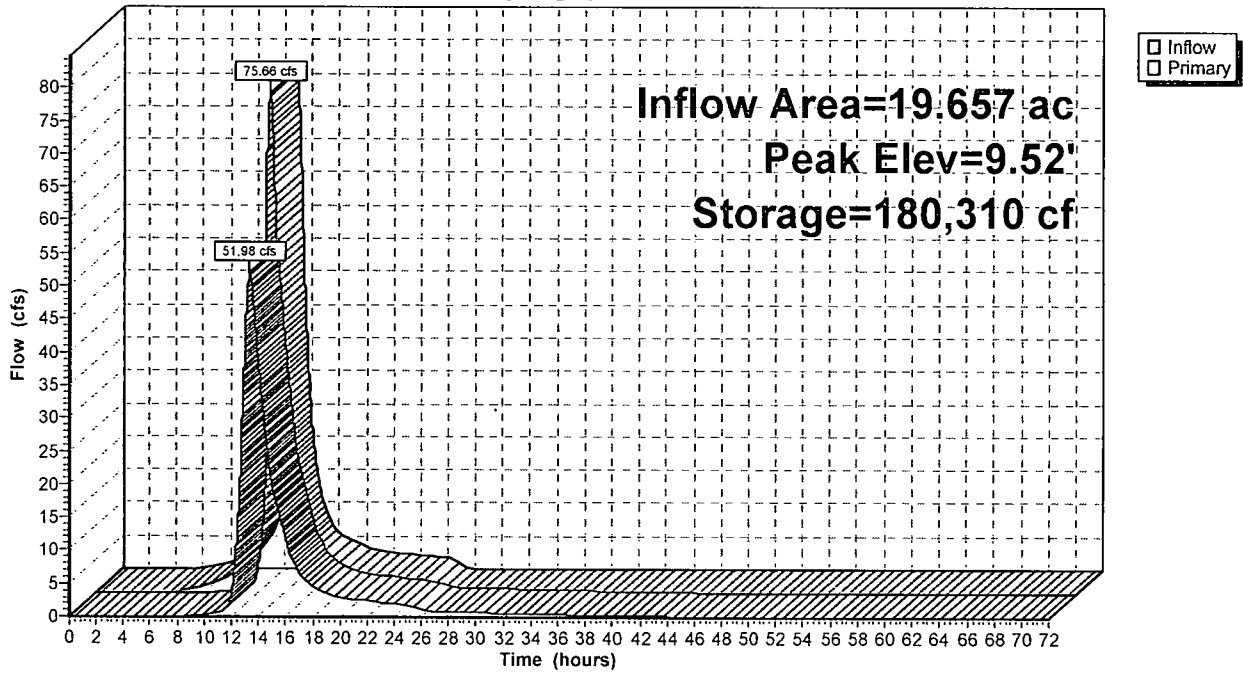
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>6.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.00'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	7.87'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	8.65'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=51.98 cfs @ 13.32 hrs HW=9.52' (Free Discharge)

- 1=RCP\_Round 36" (Passes 51.98 cfs of 59.17 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.95 cfs @ 9.95 fps)
- 3=Orifice/Grate (Orifice Controls 28.33 cfs @ 8.02 fps)
- 4=Orifice/Grate (Orifice Controls 10.91 cfs @ 5.69 fps)
- 5=Broad-Crested Rectangular Weir(Weir Controls 10.78 cfs @ 3.09 fps)

### Pond 2P: POND B

#### Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

Prepared by Bowman Consulting

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**Summary for Pond 3P: POND C**

Inflow Area = 10.269 ac, 74.80% Impervious, Inflow Depth = 8.16" for 100-Year event  
 Inflow = 63.51 cfs @ 12.40 hrs, Volume= 6.987 af  
 Outflow = 31.24 cfs @ 12.78 hrs, Volume= 6.986 af, Atten= 51%, Lag= 22.9 min  
 Primary = 31.24 cfs @ 12.78 hrs, Volume= 6.986 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 14.87' @ 12.78 hrs Surf.Area= 247,939 sf Storage= 108,426 cf

Plug-Flow detention time= 139.8 min calculated for 6.985 af (100% of inflow)  
 Center-of-Mass det. time= 140.1 min ( 944.7 - 804.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	122,983 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 307,457 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	10,253	541.0	0	0	10,253
6.00	11,920	570.0	11,076	11,076	12,876
7.00	13,671	597.0	12,786	23,862	15,451
8.00	15,499	622.0	14,575	38,437	17,951
9.00	17,399	645.0	16,440	54,877	20,355
10.00	19,366	666.0	18,374	73,251	22,642
11.00	21,395	687.0	20,372	93,623	25,002
12.00	23,484	706.0	22,431	116,054	27,221
13.00	25,632	726.0	24,550	140,604	29,609
14.00	27,838	745.0	26,727	167,332	31,952
15.00	301,001	764.0	140,126	307,457	34,355

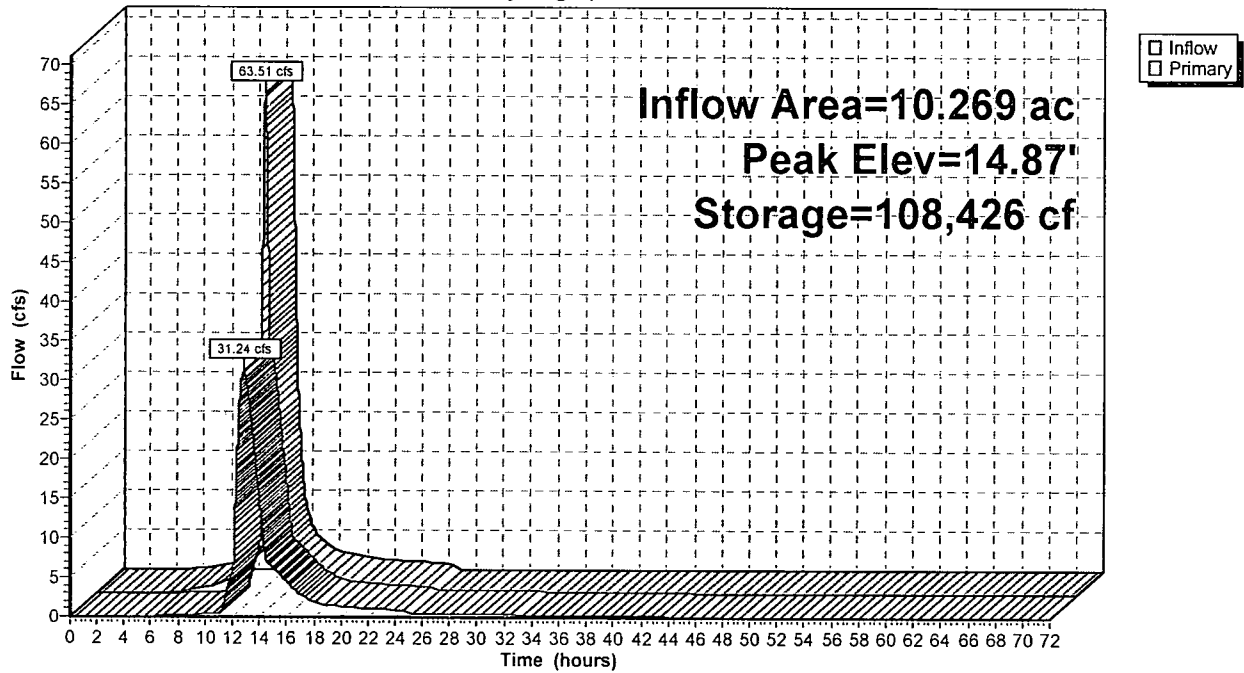
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>30.0" Round RCP_Round 30"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	8.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	12.01'	<b>36.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	14.04'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=31.26 cfs @ 12.78 hrs HW=14.87' (Free Discharge)

- 1=RCP\_Round 30" (Passes 31.26 cfs of 69.38 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.74 cfs @ 15.03 fps)
- 3=Orifice/Grate (Orifice Controls 8.92 cfs @ 11.36 fps)
- 4=Orifice/Grate (Orifice Controls 11.66 cfs @ 7.77 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 9.94 cfs @ 3.00 fps)

### Pond 3P: POND C

#### Hydrograph





**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

Prepared by Bowman Consulting

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**Summary for Pond 4P: POND D**

Inflow Area = 19.114 ac, 71.43% Impervious, Inflow Depth = 7.91" for 100-Year event  
 Inflow = 98.27 cfs @ 12.51 hrs, Volume= 12.596 af  
 Outflow = 40.25 cfs @ 13.12 hrs, Volume= 10.570 af, Atten= 59%, Lag= 36.5 min  
 Primary = 40.25 cfs @ 13.12 hrs, Volume= 10.570 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 11.90' @ 13.12 hrs Surf.Area= 115,382 sf Storage= 264,534 cf

Plug-Flow detention time= 297.8 min calculated for 10.570 af (84% of inflow)  
 Center-of-Mass det. time= 234.2 min ( 1,052.4 - 818.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	418,976 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 1,047,440 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	76,922	1,776.0	0	0	76,922
6.00	82,288	1,802.0	79,590	79,590	84,538
7.00	87,732	1,827.0	84,995	164,585	91,982
8.00	93,250	1,851.0	90,477	255,062	99,243
9.00	98,838	1,874.0	96,030	351,093	106,311
10.00	104,491	1,895.0	101,651	452,744	112,885
11.00	110,206	1,079.0	107,336	560,080	306,008
12.00	115,979	1,934.0	113,080	673,160	511,015
13.00	121,809	1,953.0	118,882	792,042	517,205
14.00	127,696	1,972.0	124,741	916,783	523,455
15.00	133,639	1,991.0	130,656	1,047,440	529,766

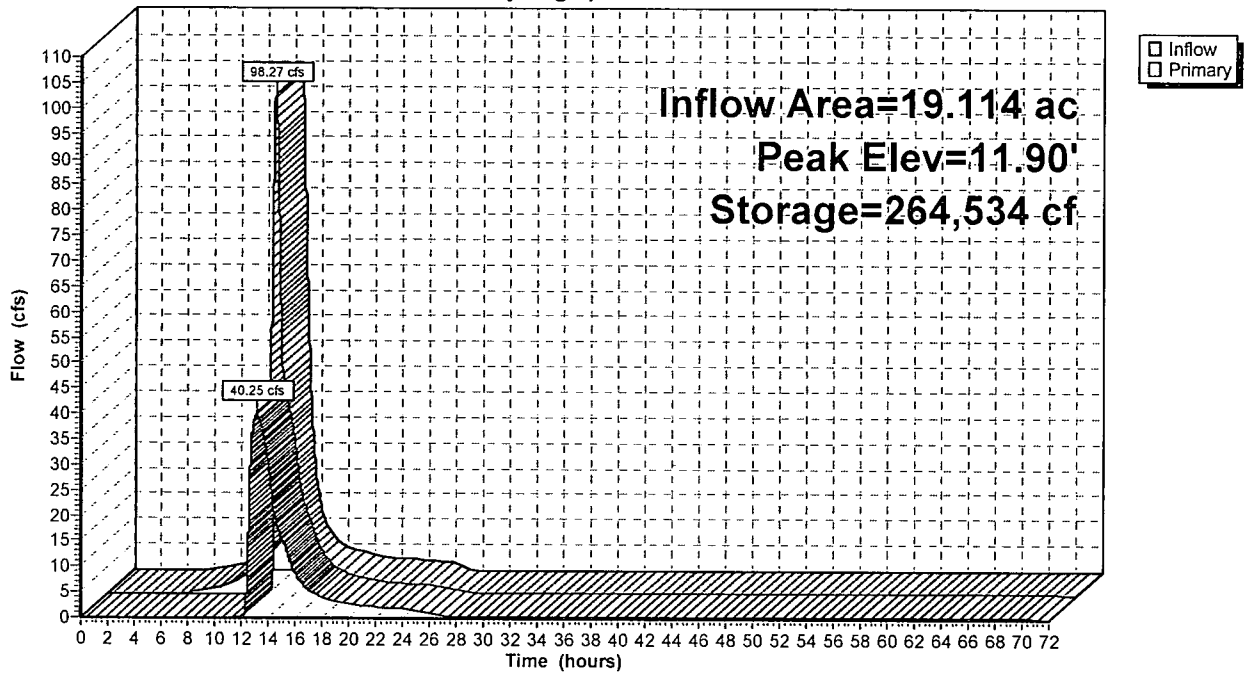
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	8.29'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	10.17'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	12.14'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

**Primary OutFlow Max=40.25 cfs @ 13.12 hrs HW=11.90' (Free Discharge)**

- 1=RCP\_Round 36" (Passes 40.25 cfs of 79.07 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.27 cfs @ 12.57 fps)
- 3=Orifice/Grate (Orifice Controls 28.77 cfs @ 8.14 fps)
- 4=Orifice/Grate (Orifice Controls 11.21 cfs @ 5.85 fps)
- 5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

### Pond 4P: POND D

Hydrograph



Summary for Pond 5P: POND E

Inflow Area = 18.476 ac, 74.60% Impervious, Inflow Depth = 8.16" for 100-Year event  
 Inflow = 97.39 cfs @ 12.51 hrs, Volume= 12.571 af  
 Outflow = 45.27 cfs @ 13.04 hrs, Volume= 12.537 af, Atten= 54%, Lag= 32.1 min  
 Primary = 45.27 cfs @ 13.04 hrs, Volume= 12.537 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 14.96' @ 13.04 hrs Surf.Area= 58,907 sf Storage= 178,952 cf

Plug-Flow detention time= 147.6 min calculated for 12.537 af (100% of inflow)  
 Center-of-Mass det. time= 145.8 min ( 959.9 - 814.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	179,993 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 449,982 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	32,069	780.0	0	0	32,069
6.00	34,448	806.0	33,251	33,251	35,445
7.00	36,906	832.0	35,670	68,921	38,932
8.00	39,440	857.0	38,166	107,087	42,396
9.00	42,047	880.0	40,737	147,824	45,692
10.00	44,723	903.0	43,378	191,202	49,075
11.00	47,465	925.0	46,087	237,289	52,403
12.00	50,271	945.0	48,861	286,150	55,523
13.00	53,136	965.0	51,697	337,847	58,709
14.00	56,060	984.0	54,591	392,439	61,813
15.00	59,040	1,003.0	57,544	449,982	64,977

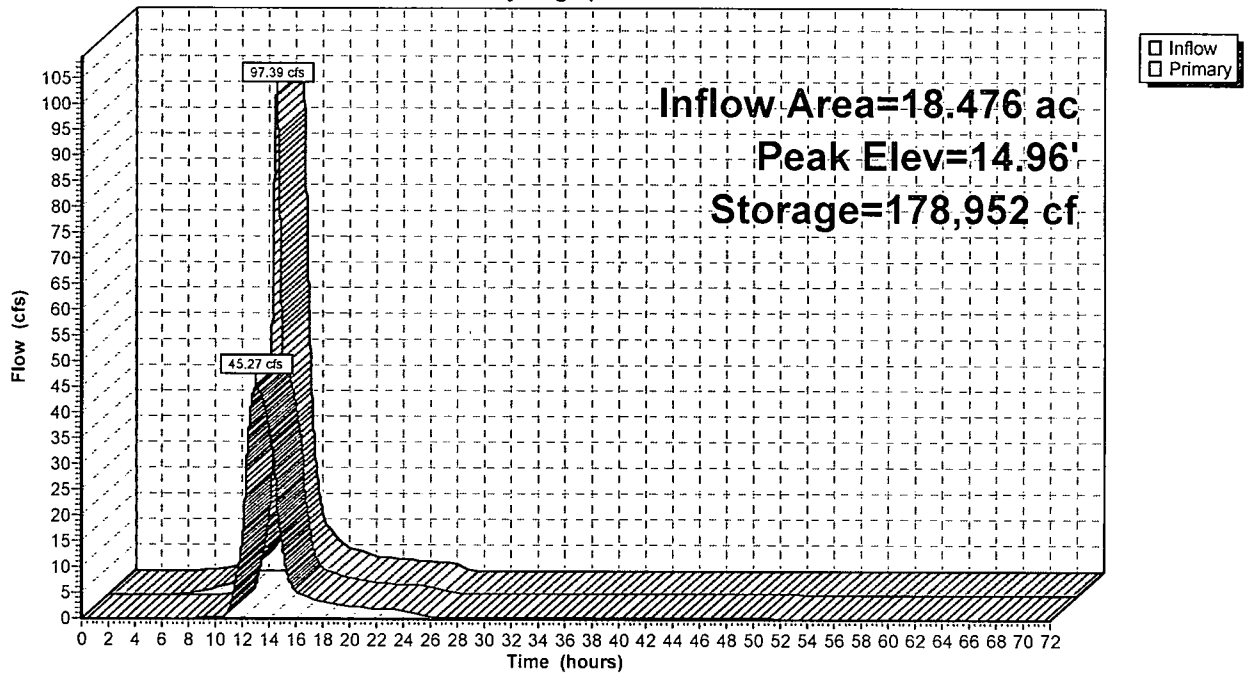
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>24.0" Round RCP_Round 24"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.50' S= 0.0050 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.19'	<b>18.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.35'	<b>46.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	11.26'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=45.27 cfs @ 13.04 hrs HW=14.96' (Free Discharge)

- 1=RCP\_Round 24" (Inlet Controls 45.27 cfs @ 14.41 fps)
- 2=Orifice/Grate (Passes < 0.74 cfs potential flow)
- 3=Orifice/Grate (Passes < 45.07 cfs potential flow)
- 4=Orifice/Grate (Passes < 21.36 cfs potential flow)
- 5=Broad-Crested Rectangular Weir (Passes < 94.35 cfs potential flow)

### Pond 5P: POND E

#### Hydrograph



**Golden Grove Preliminary Study (WQv)**

NOAA 24-hr B 100-Year Rainfall=10.27"

Prepared by Bowman Consulting

Printed 12/21/2020

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**Summary for Pond 6P: POND F**

Inflow Area = 17.655 ac, 68.32% Impervious, Inflow Depth = 7.65" for 100-Year event  
 Inflow = 92.36 cfs @ 12.51 hrs, Volume= 11.255 af  
 Outflow = 74.06 cfs @ 12.70 hrs, Volume= 11.250 af, Atten= 20%, Lag= 11.9 min  
 Primary = 74.06 cfs @ 12.70 hrs, Volume= 11.250 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 14.95' @ 12.70 hrs Surf.Area= 41,792 sf Storage= 119,640 cf

Plug-Flow detention time= 108.1 min calculated for 11.248 af (100% of inflow)  
 Center-of-Mass det. time= 108.1 min ( 927.4 - 819.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	120,437 cf	<b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 301,092 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	19,563	615.0	0	0	19,563
6.00	21,448	642.0	20,498	20,498	22,336
7.00	23,413	669.0	22,423	42,922	25,228
8.00	25,459	695.0	24,429	67,350	28,131
9.00	27,586	722.0	26,515	93,866	31,257
10.00	29,792	748.0	28,682	122,548	34,386
11.00	32,075	774.0	30,926	153,474	37,626
12.00	34,432	798.0	33,247	186,721	40,729
13.00	36,861	821.0	35,640	222,360	43,801
14.00	39,357	843.0	38,102	260,463	46,831
15.00	41,916	863.0	40,630	301,092	49,677

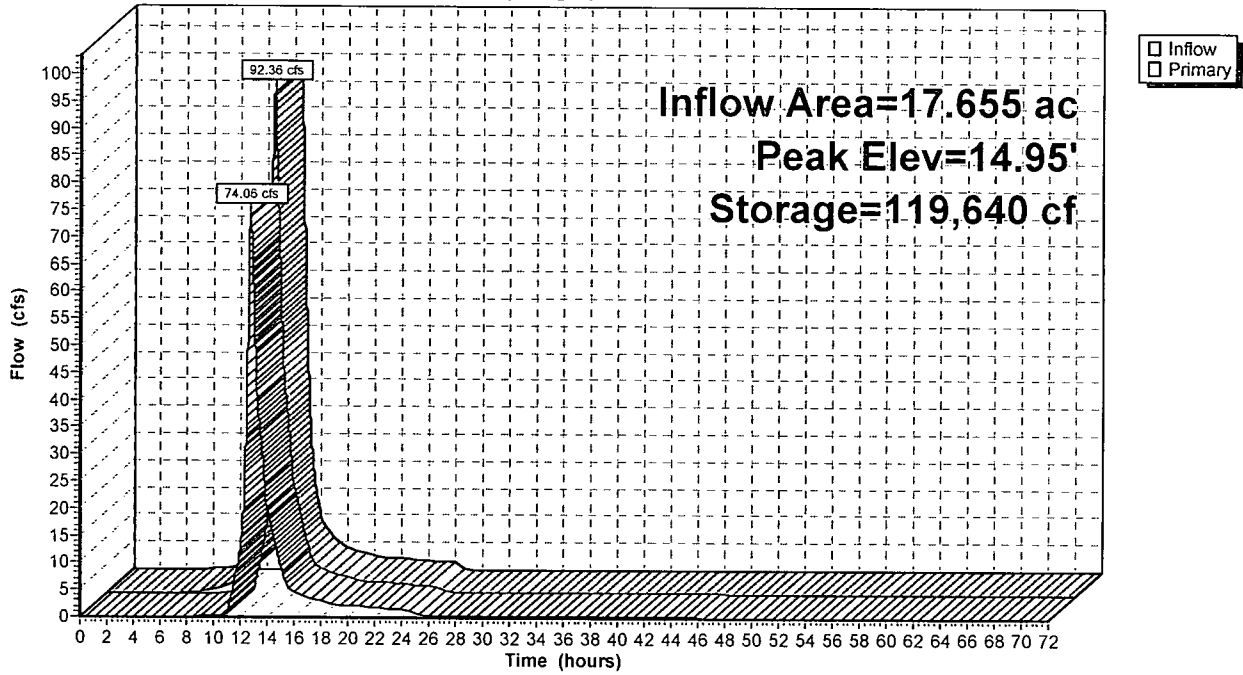
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round RCP_Round 36"</b> L= 100.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>3.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	7.70'	<b>15.0" Vert. Orifice/Grate X 2.00</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	11.13'	<b>36.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	13.26'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=74.04 cfs @ 12.70 hrs HW=14.95' (Free Discharge)

- 1=RCP\_Round 36" (Passes 74.04 cfs of 98.95 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.74 cfs @ 15.09 fps)
- 3=Orifice/Grate (Orifice Controls 30.42 cfs @ 12.40 fps)
- 4=Orifice/Grate (Orifice Controls 13.65 cfs @ 9.10 fps)
- 5=Broad-Crested Rectangular Weir (Weir Controls 29.23 cfs @ 4.32 fps)

### Pond 6P: POND F

#### Hydrograph



Summary for Pond 7P: POND G

Inflow Area = 50.690 ac, 81.83% Impervious, Inflow Depth = 8.67" for 100-Year event  
 Inflow = 361.81 cfs @ 12.33 hrs, Volume= 36.631 af  
 Outflow = 82.41 cfs @ 12.98 hrs, Volume= 34.497 af, Atten= 77%, Lag= 38.9 min  
 Primary = 82.41 cfs @ 12.98 hrs, Volume= 34.497 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs  
 Peak Elev= 14.05' @ 12.98 hrs Surf.Area= 121,672 sf Storage= 928,778 cf

Plug-Flow detention time= 446.1 min calculated for 34.497 af (94% of inflow)  
 Center-of-Mass det. time= 414.2 min ( 1,205.1 - 790.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	5.00'	1,046,078 cf	<b>POND A (Irregular)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
5.00	84,335	1,283.0	0	0	84,335
6.00	88,218	1,305.0	86,269	86,269	89,047
7.00	92,165	1,326.0	90,184	176,454	93,636
8.00	96,174	1,346.0	94,162	270,616	98,094
9.00	100,243	1,366.0	98,201	368,817	102,618
10.00	104,370	1,385.0	102,300	471,117	106,999
11.00	108,553	1,404.0	106,455	577,572	111,441
12.00	112,794	1,423.0	110,667	688,238	115,943
13.00	117,091	1,442.0	114,936	803,174	120,505
14.00	121,444	1,461.0	119,261	922,435	125,128
15.00	125,855	1,479.5	123,643	1,046,078	129,700

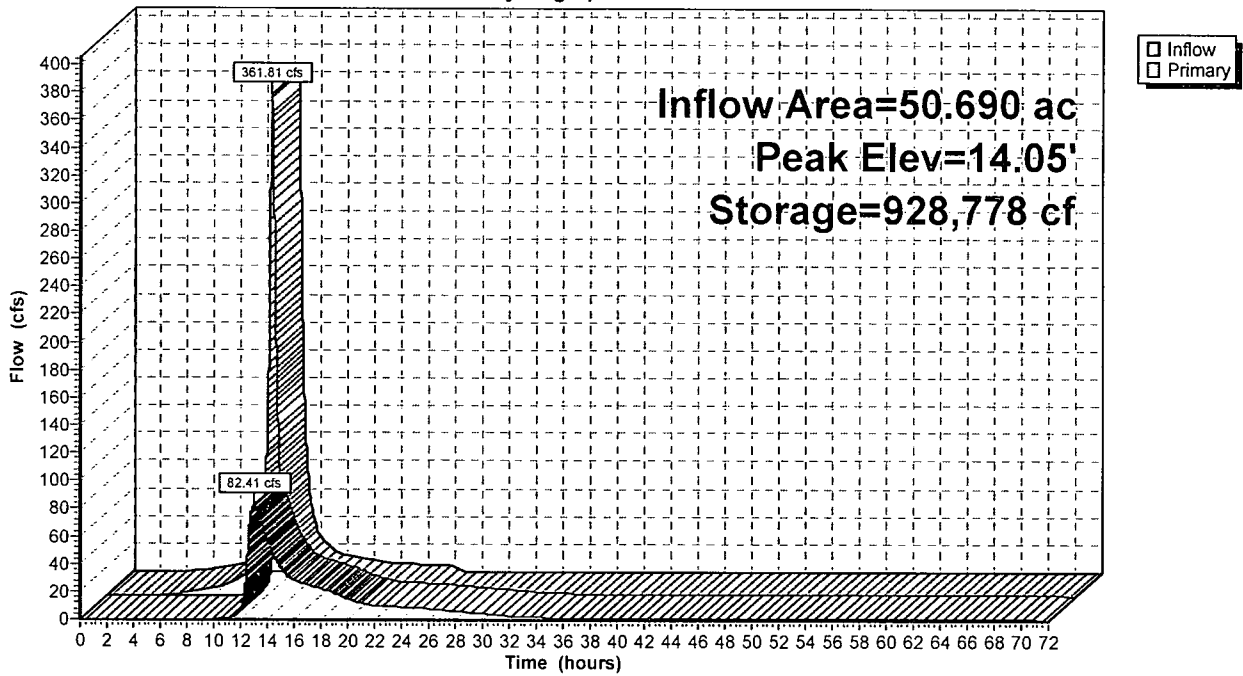
Device	Routing	Invert	Outlet Devices
#1	Primary	5.00'	<b>36.0" Round Culvert</b> L= 100.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 5.00' / 4.00' S= 0.0100 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf
#2	Device 1	5.00'	<b>5.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#3	Device 1	6.88'	<b>15.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#4	Device 1	9.47'	<b>36.0" W x 8.0" H Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads
#5	Device 1	11.78'	<b>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=82.40 cfs @ 12.98 hrs HW=14.05' (Free Discharge)

- 1=Culvert (Passes 82.40 cfs of 111.71 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.95 cfs @ 14.32 fps)
- 3=Orifice/Grate (Orifice Controls 15.12 cfs @ 12.32 fps)
- 4=Orifice/Grate (Orifice Controls 19.84 cfs @ 9.92 fps)
- 5=Broad-Crested Rectangular Weir(Weir Controls 45.48 cfs @ 5.00 fps)

### Pond 7P: POND G

Hydrograph





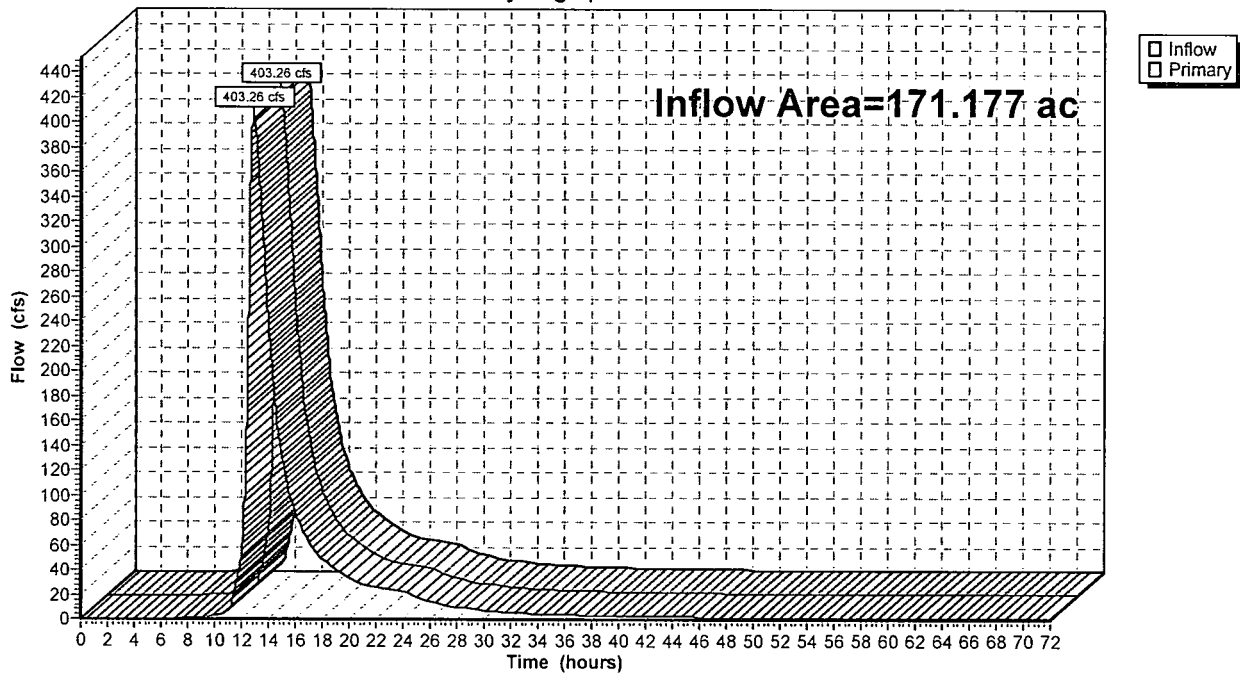
### Summary for Link POST: POST

Inflow Area = 171.177 ac, 76.22% Impervious, Inflow Depth > 7.95" for 100-Year event  
Inflow = 403.26 cfs @ 12.89 hrs, Volume= 113.410 af  
Primary = 403.26 cfs @ 12.89 hrs, Volume= 113.410 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

### Link POST: POST

Hydrograph




# APPENDIX 10

Berkeley Electric Cooperative Electric Availability Letter



# Berkeley Electric Cooperative, Inc.

Your Touchstone Energy® Cooperative 

www.berkeleyelectric.coop

Post Office Box 1234, Moncks Corner, SC 29461

October 22, 2020

Bowman Consulting  
C/o: Megan Baum  
880 Island Park Drive, Suite 400  
Charleston, SC 29492

**Re: Power Availability for Proposed 382 Single Family Residential Units in Golden Grove Development Located off Highway 17  
Charleston County, SC  
TMS 175-00-00-052**

Dear Megan:

Berkeley Electric Cooperative will supply the electrical distribution requirements for the above referenced location. We look forward to extending our facilities to meet the needs of this property.

All services that are rendered will be under our service rules and regulations at the time of service. If you have any questions, please don't hesitate to give me a call.

Sincerely,



Kevin Mims  
Supervisor of Distribution Design

KM/ts

Cc: Thomas Barnette, Manager of Construction and Maintenance  
Scott Bennett, Johns Island District Line Superintendent  
Charles Tyrrell, Johns Island District Planning Supervisor  
William Howe, Johns Island District Service Planner  
Megan Baum, Bowman Consulting (emailed copy)  
File

# APPENDIX 11

Dominion Energy Natural Gas Availability Letter



## Gas Availability Letter

October 22, 2020

Megan Baum | Project Coordinator  
Bowman Consulting  
880 Island Park Drive, Suite 400, Charleston, SC 29492

**Re: Golden Grove- TMS#175-00-00-052**

Dear Ms. Baum:

I am pleased to inform you that Dominion Energy will be able to provide natural gas service to the above referenced project. Services will be provided in accordance with Dominion Energy's General Terms and Conditions, other documents on file with the South Carolina Public Service Commission, and the company's standard operating policies and procedures.

Any cost associated with providing service will be determined when a finalized/approved plan is submitted to our office. In order to begin engineering work for the project, the following information will need to be provided:

- 1.) Detailed utility site plan (AutoCAD format preferred) showing water, sewer, and storm drainage. The finalized/approved plan must include lot numbers, street names, and 911 addresses for each lot.
- 2.) Additional drawings that indicate wetlands boundaries, tree survey with barricade plan and buffer zones (if required), as well as any existing or additional easements will also be needed.
- 3.) Copies of the Army Corp of Engineers official delineation and permits. If applicable, OCMR permits should also be included.
- 4.) Signed copy of this letter acknowledging its receipt and responsibility for its contents and authorization to begin engineering work with the understanding that Dominion Energy intends to serve the referenced project.

Dominion Energy's construction standards and specifications are available upon request. For more information or questions, contact me by phone at (843) 576-8923 or at [Barron.Gossett@dominionenergy.com](mailto:Barron.Gossett@dominionenergy.com)

Sincerely,

*Barron Gossett*

Barron Gossett  
Dominion Energy

# APPENDIX 12

USACE AJD Letter SAC-2018-01765



DEPARTMENT OF THE ARMY  
CHARLESTON DISTRICT, CORPS OF ENGINEERS  
69 A HAGOOD AVENUE  
CHARLESTON, SOUTH CAROLINA 29403-5107

JUL 15 2019

Regulatory Division

Mr. David Hand  
O. L. Thompson Company, LLC  
PO Box 63535  
Charleston, South Carolina 29419  
dhand@oltc.com

**COPY**

Dear Mr. Hand:

This is in response to your request for an Approved Jurisdictional Determination (AJD) (SAC-2018-01765) received in our office on March 4, 2019, for a 329-acre site located approximately 1 mile west of the intersection of Old Jacksonboro Road and State Route 165 in Ravenel, Charleston County, South Carolina (Latitude: 32.7816°, Longitude: -80.2730°). An AJD is used to indicate that this office has identified the presence or absence of wetlands and/or other aquatic resources on a site, including their accurate location(s) and boundaries, as well as their jurisdictional status pursuant to Section 404 of the Clean Water Act (CWA) (33 U.S.C. § 1344) and/or navigable waters of the United States pursuant to Section 10 of the Rivers and Harbors Act of 1899 (RHA) (33 U.S.C. § 403).

The site in question is shown on the attached map entitled "Approximate Depiction of Aquatic Resources Map" and dated February 25, 2019, prepared by Terracon Consultants, Inc. Based on an on-site inspection, a review of aerial photography, topographic maps, National Wetlands Inventory maps, soil survey information, and Wetland Determination Data Form(s), this office has determined that the referenced site, as shown on the referenced map, does not contain any aquatic resources that are subject to regulatory jurisdiction under Section 404 of the CWA or Section 10 of the RHA.

Attached is a form describing the basis of jurisdiction for the area(s) in question. Note that some or all of these areas may be regulated by other state or local government entities and you are encouraged to contact the South Carolina Department of Health and Environmental Control, Bureau of Water or the Department of Ocean and Coastal Resource Management, to determine the limits of their jurisdiction.

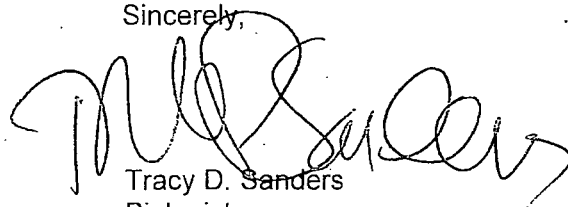
This AJD is valid for five (5) years from the date of this letter unless new information warrants revision before the expiration date. This AJD is an appealable action under the Corps of Engineers administrative appeal procedures defined at 33 CFR Part 331. The administrative appeal options, process and appeals request form is attached for your convenience and use.

This AJD was conducted pursuant to Corps of Engineers' regulatory authority to identify the limits of Corps of Engineers' jurisdiction for the particular site identified in this request. This AJD may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA

programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

In all future correspondence, please refer to file number SAC-2018-01765. A copy of this letter is being forwarded to State and/or Federal agencies for their information. If you have any questions, please contact Jeremy M. Kinney, Project Manager, at (843) 329-8033, or by email at [Jeremy.M.Kinney@usace.army.mil](mailto:Jeremy.M.Kinney@usace.army.mil).

Sincerely,



Tracy D. Sanders  
Biologist

Attachments:

Approved Jurisdictional Determination Form  
Notification of Appeal Options  
Approximate Depiction of Aquatic Resources Map

Copies Furnished:

Mr. Ted Melchers  
Terracon Consultants Inc.  
1450 Fifth Street West  
North Charleston, South Carolina 29405  
[ted.melchers@terracon.com](mailto:ted.melchers@terracon.com)

SCDHEC – Bureau of Water  
2600 Bull Street  
Columbia, South Carolina 29201  
[WQCWetlands@dhec.sc.gov](mailto:WQCWetlands@dhec.sc.gov)

SCDHEC - OCRM  
1362 McMillan Avenue, Suite 400  
North Charleston, South Carolina 29405  
[williabn@dhec.sc.gov](mailto:williabn@dhec.sc.gov)

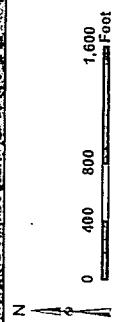


The Non-jurisdictional Features depicted on this drawing were estimated based on aerial photography and 2009 SDCNR LIDAR data. Terracon field verified the conditions depicted on the drawing on 10/23/2018. The Approximate Site Boundary was developed based on avoidance of waters of the US.

Approximate Total Non-jurisdictional Features: 11.07 Acres  
 Approximate Total Uplands: 317.38 Acres  
 Approximate Total Site Acreage: 328.05 Acres

- Non-jurisdictional Feature 1 (Pond) ~1.82 Acres
- Non-jurisdictional Feature 2 (Pond) ~1.14 Acres
- Non-jurisdictional Feature 3 (Pond) ~1.08 Acres
- Non-jurisdictional Feature 4 (Pond) ~1.59 Acres
- Non-jurisdictional Feature 5 (Pond) ~1.04 Acres
- Non-jurisdictional Feature 6 (Pond) ~1.40 Acres

- Legend**
- Boundary Corners
  - Approximate Site Boundary
  - ▲ Upland Data Point
  - ▨ Non-jurisdictional Feature



SAC-2018-01765  
 Golden Grove

Approximate Duplication of Aquatic Resources Map  
 Golden Grove  
 Old Jacksonboro Road  
 Ravenel, Charleston County, South Carolina

**Terracon**  
 1101 E. 8th Street  
 Greenville, SC 29615  
 Phone: 863.284.1234 Fax: 813.681.5324

Project No.	DATE
REV	JAN
Drawn BY:	WY
Check:	2/21/2019

Project No. \_\_\_\_\_ DATE \_\_\_\_\_  
 REV \_\_\_\_\_ JAN \_\_\_\_\_  
 Drawn BY: \_\_\_\_\_ WY \_\_\_\_\_  
 Check: \_\_\_\_\_ 2/21/2019 \_\_\_\_\_

# APPENDIX 13

USACE AJD Letter SAC-2020-00455



**DEPARTMENT OF THE ARMY**  
CHARLESTON DISTRICT, CORPS OF ENGINEERS  
69 A HAGOOD AVENUE  
CHARLESTON, SOUTH CAROLINA 29403-5107

October 21, 2020

Regulatory Division

Mr. Andy Ruocco  
Terracon Consultants, Inc.  
1450 Fifth Street West  
North Charleston, South Carolina 29405  
[andy.ruocco@terracon.com](mailto:andy.ruocco@terracon.com)

Dear Mr. Ruocco:

This is in response to your request for an Approved Jurisdictional Determination (AJD) (SAC-2020-00455) received in our office on September 29, 2020, for a 116.2-acre site located adjacent to the southwest of the intersection of Old Jacksonboro Road and New Road in Ravenel, Charleston County, South Carolina (Latitude: 32.7743°, Longitude: -80.2757°). An AJD is used to indicate that the U.S. Army Corps of Engineers (Corps) has identified the presence or absence of wetlands and/or other aquatic resources on a site, including their accurate location(s) and boundaries, as well as their jurisdictional status as waters of the United States pursuant to Section 404 of the Clean Water Act (CWA) (33 U.S.C. § 1344) and/or navigable waters of the United States pursuant to Sections 9 and 10 of the Rivers and Harbors Act of 1899 (RHA) (33 U.S.C. § 401 *et. seq.*). This AJD is issued in accordance with the definition of Waters of the United States in Corps regulations at 33 C.F.R. §328.3, as revised by the Navigable Waters Protection Rule: "Definition of Waters of the United States," 85 Fed. Reg. 22250 (April 21, 2020), which became effective on June 22, 2020.

The site is shown on the attached depiction entitled "Depiction of Aquatic Resources Map" and dated September 29, 2020 prepared by Terracon. Based on a review of aerial photography, topographic maps, National Wetlands Inventory maps, soil survey information, and Wetland Determination Data Form(s), we conclude the site, as shown on the referenced depiction, does not contain any aquatic resources subject to regulatory jurisdiction under Section 404 of the CWA or Sections 9 and 10 of the RHA.


Attached is a form describing the basis of jurisdiction for the delineated area(s). Note that some or all of these areas may be regulated by other state or local government entities and you should contact the South Carolina Department of Health and Environmental Control, Bureau of Water, or Department of Ocean and Coastal Resource Management, to determine the limits of their jurisdiction.

This AJD is valid for five (5) years from the date of this letter unless new information warrants revision before the expiration date. This AJD is an appealable action under the Corps administrative appeal procedures defined at 33 CFR Part 331. The administrative appeal options, process and appeals request form is attached for your convenience and use.

The delineation included herein has been conducted to identify the location and extent of the aquatic resource boundaries and/or the jurisdictional status of aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation and/or jurisdictional determination may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center, prior to starting work.

In all future correspondence, please refer to file number SAC-2020-00455. A copy of this letter is forwarded to State and/or Federal agencies for their information. If you have any questions, please contact Jeremy M. Kinney, Project Manager, at (843) 329-8033, or by email at [Jeremy.M.Kinney@usace.army.mil](mailto:Jeremy.M.Kinney@usace.army.mil).

Sincerely,

  
SANDERS.TRACY.D  
.1241947870  
2020.10.21  
09:26:11 -04'00'

Tracy D. Sanders  
Biologist

Attachments:

Approved Jurisdictional Determination Form  
Notification of Appeal Options  
Depiction of Aquatic Resources Map

Copies Furnished:

Mr. Dan Thompson  
O.L. Thompson Co., Inc.  
3691 Paramount Drive  
North Charleston, South Carolina 29405  
[dthompson@olt.com](mailto:dthompson@olt.com)

SCDHEC – Bureau of Water  
2600 Bull Street  
Columbia, South Carolina 29201  
[WQCWetlands@dhec.sc.gov](mailto:WQCWetlands@dhec.sc.gov)

SCDHEC - OCRM  
1362 McMillan Avenue, Suite 400  
North Charleston, South Carolina 29405  
[OCRMPermitting@dhec.sc.gov](mailto:OCRMPermitting@dhec.sc.gov)



U.S. ARMY CORPS OF ENGINEERS  
REGULATORY PROGRAM  
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)  
NAVIGABLE WATERS PROTECTION RULE

**I. ADMINISTRATIVE INFORMATION**

Completion Date of Approved Jurisdictional Determination (AJD): October 21, 2020  
ORM Number: SAC-2020-00455  
Associated JDs: N/A  
Review Area Location<sup>1</sup>:  
State: SC City: Ravenel County: Charleston County  
Center Coordinates of Review Area: Latitude 32.7743 Longitude -80.2757

**II. FINDINGS**

**A. Summary:** Check all that apply. At least one box from the following list **MUST** be selected. Complete the corresponding sections/tables and summarize data sources.

- The review area is comprised entirely of dry land (i.e., there are no waters or water features, including wetlands, of any kind in the entire review area). Rationale: N/A or describe rationale.
- There are "navigable waters of the United States" within Rivers and Harbors Act jurisdiction within the review area (complete table in section II.B).
- There are "waters of the United States" within Clean Water Act jurisdiction within the review area (complete appropriate tables in section II.C).
- There are waters or water features excluded from Clean Water Act jurisdiction within the review area (complete table in section II.D).

**B. Rivers and Harbors Act of 1899 Section 10 (§ 10)<sup>2</sup>**

§ 10 Name	§ 10 Size	§ 10 Criteria	Rationale for § 10 Determination
N/A	N/A	N/A	N/A

**C. Clean Water Act Section 404**

Territorial Seas and Traditional Navigable Waters ((a)(1) waters)<sup>3</sup>

(a)(1) Name	(a)(1) Size	(a)(1) Criteria	Rationale for (a)(1) Determination
N/A	N/A	N/A	N/A

Tributaries ((a)(2) waters):

(a)(2) Name	(a)(2) Size	(a)(2) Criteria	Rationale for (a)(2) Determination
N/A	N/A	N/A	N/A

Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters):

(a)(3) Name	(a)(3) Size	(a)(3) Criteria	Rationale for (a)(3) Determination
N/A	N/A	N/A	N/A

Adjacent wetlands ((a)(4) waters):

(a)(4) Name	(a)(4) Size	(a)(4) Criteria	Rationale for (a)(4) Determination
N/A	N/A	N/A	N/A

<sup>1</sup> Map(s)/Figure(s) are attached to the AJD provided to the requestor.

<sup>2</sup> If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.

<sup>3</sup> A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where independent upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD form.

<sup>4</sup> Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps Districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.

<sup>5</sup> Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.



U.S. ARMY CORPS OF ENGINEERS  
REGULATORY PROGRAM  
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)  
NAVIGABLE WATERS PROTECTION RULE

**D. Excluded Waters or Features**

Excluded waters ((b)(1) – (b)(12))<sup>4</sup>:

Exclusion Name	Exclusion Size	Exclusion <sup>5</sup>	Rationale for Exclusion Determination
Excluded Water 1 (Non-adjacent wetland)	0.13 acre	(b)(1) Non-adjacent wetland	This wetland is a closed polygon boundary that is not contiguous or directly abutting an (a)(1)-(a)(3) water. In addition, this wetland does not meet any of the other (a)(4) criteria for adjacency and thus is an excluded water pursuant to (b)(1).
Excluded Water 2 (Non-adjacent wetland)	1.88 acres	(b)(1) Non-adjacent wetland	This wetland is a closed polygon boundary that is not contiguous or directly abutting an (a)(1)-(a)(3) water. In addition, this wetland does not meet any of the other (a)(4) criteria for adjacency and thus is an excluded water pursuant to (b)(1).
Excluded Water 3 (Non-adjacent wetland)	1.5 acres	(b)(1) Non-adjacent wetland	This wetland is a closed polygon boundary that is not contiguous or directly abutting an (a)(1)-(a)(3) water. In addition, this wetland does not meet any of the other (a)(4) criteria for adjacency and thus is an excluded water pursuant to (b)(1).
Excluded Water 4 (Non-adjacent wetland)	1.74 acres	(b)(1) Non-adjacent wetland	This wetland is a closed polygon boundary that is not contiguous or directly abutting an (a)(1)-(a)(3) water. In addition, this wetland does not meet any of the other (a)(4) criteria for adjacency and thus is an excluded water pursuant to (b)(1).
Excluded Water 5 (Non-adjacent wetland)	5.57 acres	(b)(1) Non-adjacent wetland	This wetland is a closed polygon boundary that is not contiguous or directly abutting an (a)(1)-(a)(3) water. In addition, this wetland does not meet any of the other (a)(4) criteria for adjacency and thus is an excluded water pursuant to (b)(1).
Excluded Water 6 (Non-adjacent wetland)	2.21 acres	(b)(1) Non-adjacent wetland	This wetland is a closed polygon boundary that is not contiguous or directly abutting an (a)(1)-(a)(3) water. In addition, this wetland does not meet any of the other (a)(4) criteria for adjacency and thus is an excluded water pursuant to (b)(1).
Excluded Water 7 (Non-adjacent wetland)	0.71 acre	(b)(1) Non-adjacent wetland	This wetland is a closed polygon boundary that is not contiguous or directly abutting an (a)(1)-(a)(3) water. In addition, this wetland does not meet any of the other (a)(4) criteria for adjacency and thus is an excluded water pursuant to (b)(1).

**III. SUPPORTING INFORMATION**

**A. Select/enter all resources** that were used to aid in this determination and attach data/maps to this document and/or references/citations in the administrative record, as appropriate.

  X   Information submitted by, or on behalf of, the applicant/consultant: *Request for Corps Jurisdictional Determination (JD) / Delineation dated March 16, 2020.*

This information is sufficient for purposes of this AJD.

Rationale: *N/A*

       Data sheets prepared by the Corps: *N/A*

<sup>1</sup> Map(s)/Figure(s) are attached to the AJD provided to the requestor.

<sup>2</sup> If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.

<sup>3</sup> A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where independent upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD form.

<sup>4</sup> Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps Districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.

<sup>5</sup> Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.



U.S. ARMY CORPS OF ENGINEERS  
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NAVIGABLE WATERS PROTECTION RULE

- Photographs: *Site Photographs dated March 20, 2020, Exhibit No. 3: 1994 Infrared Aerial, Exhibit No. 4: 1999 Infrared Aerial and Exhibit No. 5: 2006 Infrared Aerial dated March 30, 2020.*
- Corps Site visit(s) conducted on: *N/A*
- Previous Jurisdictional Determinations (AJDs or PJDs): *N/A*
- Antecedent Precipitation Tool: *N/A*
- USDA NRCS Soil Survey: *Exhibit No. 7: 2006 Infrared Aerial / USDA NRCS Soils Data dated March 30, 2020*
- USFWS NWI maps: *Exhibit No. 6: 2006 Infrared Aerial / USGS NHD / USFWS NWI dated March 30, 2020.*
- USGS topographic maps: *Exhibit No. 2: 1979 Osborn, SC-USGS Topographic Map dated March 30, 2020.*

**Other data sources used to aid in this determination:**

Data Source (select)	Name and/or date and other relevant information
USGS Sources	N/A.
USDA Sources	N/A.
NOAA Sources	N/A.
USACE Sources	N/A.
State/Local/Tribal Sources	N/A.
Other Sources	N/A.

**B. Typical year assessment(s):** *N/A*

**C. Additional comments to support AJD:** The 116.2-acre review area for this AJD includes seven (b)(1) non-adjacent wetlands that this office has determined to be excluded waters and not subject to Section 404 of the Clean Water Act.

<sup>1</sup> Map(s)/Figure(s) are attached to the AJD provided to the requestor.

<sup>2</sup> If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.

<sup>3</sup> A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where independent upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD form.

<sup>4</sup> Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps Districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.

<sup>5</sup> Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

## NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Mr. Dan Thompson, O.L. Thompson Co., Inc.	File Number: SAC-2020-00455	Date: 10/21/2020
Attached is:		See Section below
<input type="checkbox"/>	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
<input type="checkbox"/>	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
<input type="checkbox"/>	PERMIT DENIAL	C
<input checked="" type="checkbox"/>	APPROVED JURISDICTIONAL DETERMINATION	D
<input type="checkbox"/>	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

**A: INITIAL PROFFERED PERMIT:** You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

**B: PROFFERED PERMIT:** You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**C: PERMIT DENIAL:** You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

**D: APPROVED JURISDICTIONAL DETERMINATION:** You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the Division Engineer, South Atlantic Division, 60 Forsyth St, SW, Atlanta, GA 30308-8801. This form must be received by the Division Engineer within 60 days of the date of this notice.

**E: PRELIMINARY JURISDICTIONAL DETERMINATION:** You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is **not appealable**. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.



**SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT**

**REASONS FOR APPEAL OR OBJECTIONS:** (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

**ADDITIONAL INFORMATION:** The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

**POINT OF CONTACT FOR QUESTIONS OR INFORMATION:**

If you have questions regarding this decision and/or the appeal process you may contact the Corps biologist who signed the letter to which this notification is attached. The name and telephone number of this person is given at the end of the letter.

If you only have questions regarding the appeal process you may also contact: Mr. Philip A. Shannin  
Administrative Appeal Review Officer  
CESAD-PDS-O  
60 Forsyth Street Southwest, Floor M9  
Atlanta, Georgia 30303-8803

**RIGHT OF ENTRY:** Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

\_\_\_\_\_  
Signature of appellant or agent.

Date: \_\_\_\_\_

Telephone number: \_\_\_\_\_

The Approximate Wetland Lines depicted on this drawing were flagged and surveyed with a Trimble Geo7X GPS with GNSS receiver in the field by Terracon Consultants on 12/05/17 and 3/20/20. Each survey point was at sub-meter accuracy.

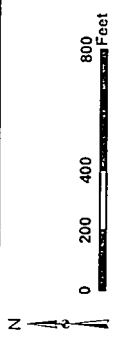
Approximate Total Excluded Wetlands: 13.74 Acres  
 Approximate Total Uplands: 102.28 Acres  
 Approximate Total Site Acreage: 116.12 Acres



Line Table		Boundary Corners	
FID	Latitude	Longitude	
0	32.779836	-80.281752	
1	32.779827	-80.281774	
2	32.774331	-80.282219	
3	32.774518	-80.281718	
4	32.774525	-80.281699	
5	32.776588	-80.276111	
6	32.776606	-80.276061	
7	32.778222	-80.271705	
8	32.777509	-80.271353	
9	32.777827	-80.270493	
10	32.777985	-80.270051	
11	32.778696	-80.270404	
12	32.779285	-80.268751	
13	32.779336	-80.268609	
14	32.779017	-80.268703	
15	32.776221	-80.269529	
16	32.779865	-80.27017	
17	32.77402	-80.270485	
18	32.773582	-80.27218	
19	32.772516	-80.271837	
20	32.772507	-80.271883	
21	32.772468	-80.27204	
22	32.771537	-80.275697	
23	32.77128	-80.275662	
24	32.771197	-80.276106	
25	32.771137	-80.276425	
26	32.773004	-80.27681	
27	32.773185	-80.277042	
28	32.773724	-80.278471	
29	32.77361	-80.279418	
30	32.774209	-80.280818	
31	32.774203	-80.280834	
32	32.779836	-80.281752	

**Legend**

- Boundary Corners
- Approximate Site Boundary
- ▲ Upland Data Point
- ⊙ Wetland Data Point
- ▨ Excluded Water



Source: Esri, Maxar, Swire, GeoEye, Earthstar, DigitalGlobe, GeoEye, IGN, USDA, USDA, AeroGRID, IGN, and the GIS User Community, Intel, iStock, GeoEye, © Terracon

**Terracon**  
 1100 Fifth Street West, Northampton, MA 01060  
 Phone: 413.264.1234 Fax: 413.264.0234

Project No.: 0320204  
 Date: JAR  
 Drawn By: JTM  
 Date: 03/20/20

Depiction of Aquatic Resources Map  
 Golden Grove Site  
 South Carolina  
 Charleston County

EXHIBIT NO: A

# APPENDIX 14

USACE AJD Exhibit SAC-2018-01765



**SAC-2018-01765  
Golden Grove**

Approximate Depiction of Aquatic Resources Map  
 Golden Grove  
 Old Jacksonboro Road  
 Ravenel, Charleston County, South Carolina

**Terracon**  
 1100 TERRY STREET, SUITE 200  
 CHARLOTTE, NORTH CAROLINA 28204  
 PHONE: 843.846.1234 FAX: 843.846.5254

Project No.	DATE
REV	JAN
DESIGNER	BY
DRAWN	DATE

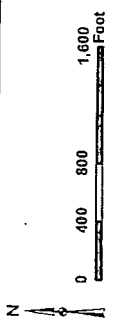
The Non-jurisdictional Features depicted on this drawing were estimated based on aerial photography and 2009 SCANS 1 LIDAR data. Terracon field verified the conditions depicted on the drawing on 10/23/2018. The Approximate Site Boundary was developed based on avoidance of waters of the US.

Approximate Total Non-jurisdictional Features: 11.67 Acres  
 Approximate Total Uplands: 317.38 Acres  
 Approximate Total Site Acreage: 329.05 Acres

- Non-jurisdictional Feature 1 (Pond) - 1.82 Acres
- Non-jurisdictional Feature 2 (Pond) - 1.34 Acres
- Non-jurisdictional Feature 3 (Pond) - 1.04 Acres
- Non-jurisdictional Feature 4 (Pond) - 1.04 Acres
- Non-jurisdictional Feature 5 (Pond) - 1.43 Acres

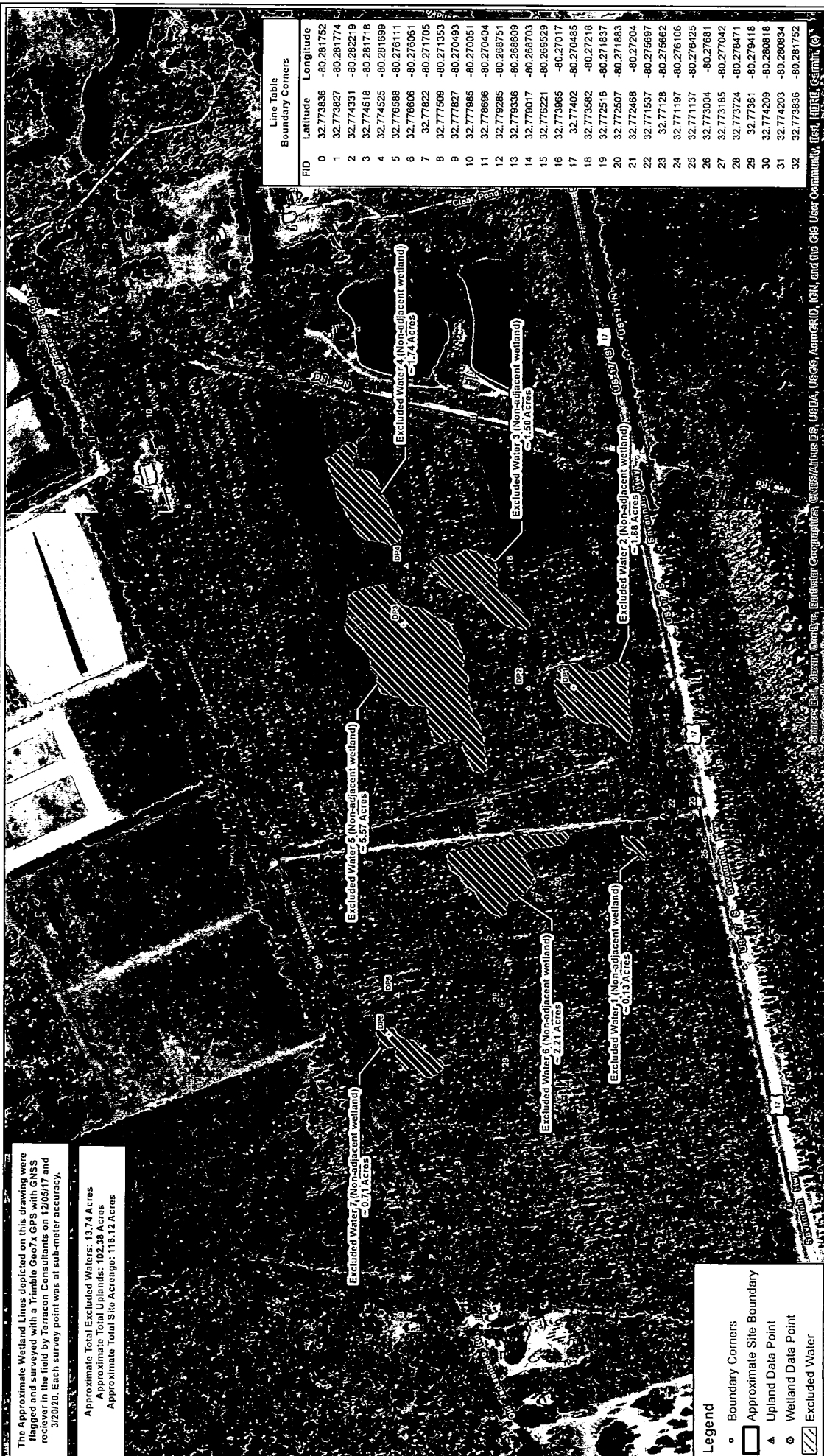
**Legend**

- Boundary Corners
- ▭ Approximate Site Boundary
- △ Upland Data Point
- ▨ Non-jurisdictional Feature



# APPENDIX 15

USACE AJD Exhibit SAC-2020-00455



The Approximate Wetland Lines, depicted on this drawing were litaged at a field with a Trimble Geo7X GPS/GNSS receiver in the field by Terracon Consultants on 12/05/17 and 3/20/20. Each survey point was at sub-meter accuracy.

Approximate Total Excluded Waters: 13.74 Acres  
 Approximate Total Uplands: 102.38 Acres  
 Approximate Total Site Acreage: 116.12 Acres

**Legend**

- Boundary Corners
- Approximate Site Boundary
- ▲ Upland Data Point
- Welland Data Point
- ▨ Excluded Water

Line Table		
Boundary Corners		
FID	Latitude	Longitude
0	32.773836	-80.281752
1	32.773827	-80.281774
2	32.774331	-80.282219
3	32.774518	-80.281718
4	32.774525	-80.281699
5	32.776888	-80.278111
6	32.776806	-80.276061
7	32.776822	-80.271705
8	32.777509	-80.271353
9	32.777827	-80.270493
10	32.777885	-80.270051
11	32.778896	-80.270404
12	32.779285	-80.268751
13	32.779336	-80.268609
14	32.779017	-80.268703
15	32.776221	-80.268529
16	32.773965	-80.27017
17	32.77402	-80.270485
18	32.773582	-80.27218
19	32.772516	-80.271837
20	32.772507	-80.271883
21	32.772468	-80.27204
22	32.771537	-80.275697
23	32.77128	-80.275662
24	32.771197	-80.276106
25	32.771137	-80.276425
26	32.773004	-80.27681
27	32.773185	-80.277042
28	32.773724	-80.278471
29	32.77361	-80.279418
30	32.774209	-80.280818
31	32.774203	-80.280834
32	32.773856	-80.281752

Project No.: E202004  
 Date: JAN  
 Drawn By: JIM  
 Date: #120200

Project Name: Golden Grove Site  
 Location: Charleston County, South Carolina

Project Description: Depiction of Aquatic Resources Map

Scale: 0 200 400 800 Feet

North Arrow

Terracon  
 1200 FFB Street West, N. Charleston, SC 29405  
 Phone: 843.884.1334 Fax: 843.884.8224

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Esri, Intel, Garmin, © OpenStreetMap contributors

# APPENDIX 16

Phase 1 Cultural Resources Survey of Approximately 59  
Acres at the Proposed Golden Grove Mine



June 7, 2017

Adrienne Daggett, Ph.D.  
Transportation Review Coordinator  
South Carolina Department of Archive and History  
8301 Parklane Rd.  
Columbia, South Carolina 29223

**Re: FINAL REPORT  
Phase I Cultural Resources Survey of Approximately 59 Acres  
at the Proposed Golden Grove Mine  
Charleston County, South Carolina  
Terracon Project No. 73177129  
SHPO Project No. 17-EJ0094**

Dear Adrienne:

On behalf of O.L. Thompson Co., Inc., Terracon Consultants, Inc. (Terracon), is pleased to submit one bound, one unbound, and one PDF copies on CD of the above-referenced final report. This project was done pursuant to the South Carolina Mining Act in anticipation of permitting through the Department of Health and Environmental Control.

In regard to your review letter dated June 5, 2017, we have addressed your comments in the final report. Specifically:

- Our methodology did not distinguish between well and poorly drained soils. All areas of the property were surveyed at 30-meter intervals. This is clarified on p. 3 of the report (Section 4.1).
- There will be no direct impacts to the Stono Baptist Church Cemetery and there is little potential for any unmarked graves to be located within the project area. This is clarified on p. 5 of the report (Sections 4.2.1 and 5.0).
- Intensive survey forms for the Stono Baptist Church and Cemetery will be submitted by Bruce Harvey under separate cover.

We appreciate your assistance with this project. If you have any questions or need additional

Terracon Consultants, Inc. 521 Clemson Road Columbia, South Carolina 29229  
P [803] 741 9000 F [803] 741-9900 terracon.com



**Phase I Cultural Resources Survey**

Golden Grove Mine ▣ Charleston County, South Carolina

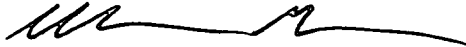
June 7, 2017 ▣ Terracon Project No. 73171129

**Terracon**

information, please don't hesitate to call me at 803-403-1256 or you can reach me via e-mail at [wggreen@terracon.com](mailto:wggreen@terracon.com). Thank you.

Sincerely,

**Terracon**



William Green, M.A., RPA

Group Manager, Natural and Cultural Resources

cc: Dan Thompson, O.L. Thompson Co., Inc.



June 7, 2017

Adrienne Daggett, Ph.D.  
Transportation Review Coordinator  
South Carolina Department of Archive and History  
8301 Parklane Rd.  
Columbia, South Carolina 29223

**Re: FINAL REPORT**  
**Phase I Cultural Resources Survey of Approximately 59 Acres**  
**at the Proposed Golden Grove Mine**  
**Charleston County, South Carolina**  
**Terracon Project No. 73177129**  
**SHPO Project No. 17-EJ0094**

**Authors: William Green, M.A., RPA, and Bruce Harvey, Ph.D.**

Dear Dr. Daggett:

Terracon Consultants, Inc. (Terracon), on behalf of O.L. Thompson Co., Inc., has completed a Phase I Cultural Resources Survey of approximately 59 acres at the proposed Golden Grove Mine located approximately 1.5 miles northwest of the Community of Ravenel in Charleston County, South Carolina (Figures 1 and 2). The purpose of the survey was to identify and evaluate archaeological and historic resources within and immediately adjacent to the project area that could be eligible for inclusion in the National Register of Historic Places (NRHP). The project is being conducted pursuant to the South Carolina Mining Act (South Carolina Code of Regulations Chapter 89-120(C)(4)). This work was done under contract to O.L. Thompson Co., Inc., in general accordance with Terracon Proposal No. PEN177179, dated May 12, 2017.

## **1.0 PROJECT DESCRIPTION**

The 59-acre project area is roughly triangular in shape and is located in the western portion of Charleston County, approximately 1.5 miles north of the Community of Ravenel and 6.3 miles west of the Town of Rantowles (Figures 1 and 2). The property is bounded by New Road to the northwest, Old Jacksonboro Road and private property to the south, and a private property line to the east. The area surrounding the project tract consists primarily of residential, agricultural, and small-scale commercial properties.

## **2.0 ENVIRONMENTAL CONTEXT**

The project area is situated in the Lower Coastal Plain physiographic province and falls within the Edisto River portion of the Ashley-Combahee-Edisto (ACE) drainage basin. The closest water



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**Geotechnical**



**Environmental**



**Construction Materials**



**Facilities**

source is Caw Caw Swamp, which, at its closest, is about 200 meters northwest of the northern tip of the project area. Topography is relatively level across most of the project area, ranging from about 30 ft. above mean sea level (AMSL) at the northern tip of the project area to approximately 45 ft. AMSL in the central and southern portions of the project area. Vegetation consists primarily of planted pines interspersed with young hardwoods and a moderate understory (Figures 3 and 4). Surface visibility was minimal across the entire project area.

Soils in the project area are composed of sandy alluvial and marine sediments that include moderately well drained Chipley loamy fine sand and Lakeland sand; poorly drained Leon fine sand and St. John's fine sand; and very poorly drained Rutlege loamy fine sand (Figure 5).

### **3.0 BACKGROUND RESEARCH**

#### **3.1 Prior Investigations and Previously Recorded Sites**

Background research was conducted on May 12, 2017, using ArchSite, a GIS program depicting previously recorded archaeological and historic resources in South Carolina. The area examined was a 0.5-mile radius around the project tract (Figure 1). If cultural resources were noted within or adjacent to the project area, then individual files and associated reports at SCIAA and the South Carolina Department of Archives and History were examined, if available.

Based on the results of the background research, the only previously recorded resources within a half mile of the project area are the Stono Baptist Church (Resource No. 378 0506.00) and Cemetery (378 0506.01). These mid-nineteenth century resources were recorded in 1991 during the *Charleston County Historical and Architectural Survey* and were recommended as being ineligible for inclusion in the NRHP (Fick 1992). The church and cemetery were revisited during the current survey and are discussed in more detail below.

#### **3.2 Historic Map Research**

In addition to checking ArchSite, eighteenth through twentieth century maps were examined to determine whether historic resources were likely to be present in the proposed project area. During the eighteenth through twentieth century the proposed project area was located in a moderately populated area near Caw Caw Swamp. Mouzon's 1777 map of North and South Carolina shows a number of settlements in the area, with the closest belonging to "Darwin" across what is now Old Jacksonboro Road (Figure 6). The 1825 Mills Atlas Map of the Colleton District shows the project area located at the intersection of Old Jacksonboro Road and New Road, just south of a structure labeled "Club House" (Figure 7). This structure is almost certainly in the same location as what later became Stono Baptist Church. The 1918 Cottageville USGS topographic quadrangle shows one structure located just south of the project area (Figure 8). Similarly, the 1943 Cottageville quadrangle (Figure 9) also shows this structure, but its location is off and the

map places it closer to New Road and within the project area. This appears to be a mapping error. By 1979, the structure is no longer extant (see Figure 1).

## 4.0 RESULTS OF FIELDWORK

### 4.1 Archaeological Survey

On May 17 and 18, 2017, Principal Investigator William Green, M.A., Archaeologist Doug Sain, Ph.D., and Crew Chief Sam Hunt conducted a Phase I cultural resources survey of the project area and immediate vicinity. The archaeological survey consisted of excavating shovel tests at 30-meter intervals along 19 east-west running transects across the entire project tract; no distinction was made between well and poorly drained soils in terms of the survey methods employed. Each shovel test pit (STP) was approximately 30 cm in diameter and excavated to either 80 cm below surface (cmbs) or to culturally sterile subsoil, whichever was encountered first.

During the survey, 171 shovel tests, ranging from 40–80 cm deep, were excavated. A typical soil profile in well drained areas consisted of 28 cm of very dark grayish brown (10YR 3/2) loamy fine sand (Ap horizon), followed by 40 cm (28–68 cmbs) of yellowish brown fine sand (E horizon), overlying 12+ cm (68–80+ cmbs) of strong brown (7.5YR 5/8) fine sand (Bt1 horizon). In poorly drained areas, soils consisted of either 40+ cm of black (10YR 2/1) sandy loam, or 18 cm of very dark gray (2.5Y 3/1) loamy fine sand (Ap horizon), followed by 28 cm (18–46 cmbs) of dark grayish brown fine sand, overlying 14+ cm of very dark brown (10YR 2/2) loamy fine sand. As a result of the survey, only one isolated find was identified.

Isolated Find 1 consists of a single Coastal Plain chert bifacial thinning flake (weight = 1.8 g; size grade = 2) found in a shovel test between 20 and 30 cmbs (the interface between the Ap and E horizons) in the northern portion of the project area at UTM coordinates E569150, N3627631 (UTM Zone 17S, NAD 27) (Figure 10). Eight additional shovel tests were excavated at 15-m intervals in cardinal directions around the initial positive shovel test; however, no other artifacts were found. This isolated find is unlikely to provide any significant information about the prehistory of the area and is recommended ineligible for inclusion in the NRHP.

### 4.2 Architectural Survey

In addition to the archaeological survey, an architectural survey was conducted to locate and record structures more than 50 years old within and immediately adjacent to the project area. During the architectural survey, the Stono Baptist Church and Cemetery were revisited.

#### 4.2.1 Stono Baptist Church (Resource No. 378 0506.00) and Cemetery (Resource No. 378 0506.01).

The Stono Baptist Church and Cemetery are located at the northwest corner of SC Route 165

and New Road, near the rural community of Ravenel in the western portion of Charleston County. The congregation was organized in June 1842, and built its first church building shortly thereafter. That first building burned in 1878; the current church was built in 1884. The church remained in active use until at least the 1940s, though it has been abandoned for many years. The associated cemetery, though, which is adjacent to the church, remains in use.

The current Stono Baptist Church is a one-story frame building with a gable roof (Figures 11 and 12). The building has two principal facades, one facing south and one facing east. In the absence of architectural details, it is impossible to determine which façade took precedence. The south façade, along the long side of the building, is symmetrical with five bays: a central single entrance opening flanked on each side by two single window openings. The east façade, beneath a gable end, is symmetrical with three bays: a central single entrance flanked on each side by a single window opening. The north façade originally the same configuration as the south, with a central entrance opening and two flanking windows, though the window openings have been covered in boards. The west façade features three evenly-spaced single windows, the center of which is raised above the level of the two flanking windows. A small square window opening is set within the gable of the north façade. None of the entrance openings has a door, while few of the window openings have even fragments of windows.

The building rests on brick piers, and is surmounted by a steeply-pitched gable roof. Each gable end features a pent roof. The building is clad in asbestos single siding, while the roof is covered by raised-seam metal. The interior is a single unarticulated space, with partially broken sheetrock on the walls and no ceiling; wooden beams span the shorter length which open directly to the roof. The wood floor remains largely intact, with a slightly raised dais at the western end of the interior. There is no chimney or flue.

The cemetery associated with the church is located immediately west and southwest of the building, and consists of several components (Figures 13 and 14). A small section enclosed by a chain link fence, approximately 30 feet square, contains four headstones, while another section of approximately the same size is enclosed only by a low stone border immediately to the south. One other apparently discreet section, though not enclosed by a fence, is located to the south of this enclosed area, while other headstones are scattered to the west of the fenced section. There are approximately 50 headstones in total, and two taller monuments.

The Stono Baptist Church and Cemetery were included in the 1992 Historical and Architectural Survey of Charleston County (Fick 1992). As a result of that survey, which included 693 individual resources, the South Carolina State Historic Preservation Office (SHPO) recommended 37 properties as individually eligible for the National Register of Historic Places (NRHP), together with eight complexes and extensions of seven previously listed complexes. The Stono Baptist Church and Cemetery were not among those that were recommended eligible for the NRHP.

Because the only previous survey was 25 years ago, the current survey re-evaluated the Stono

**Phase I Cultural Resources Survey**

Golden Grove Mine ■ Charleston County, South Carolina

June 7, 2017 ■ Terracon Project No. 73171129



Baptist Church and Cemetery for NRHP eligibility. No discussion of the building and its potential for NRHP eligibility was included in the Preservation Consultants' report (1992), and thus the reason for it being recommended ineligible is not known. An important consideration in the current re-evaluation, however, is the building's integrity. As noted earlier, the church currently has few architectural features remaining. In particular, there are no doors and only few partial remains of windows, while the window openings on the rear of the building have been replaced with boards. The original siding, meanwhile, has been replaced with asbestos shingles. While the building's footprint remains unchanged, its integrity has otherwise been substantially compromised. The current survey therefore recommends no change to the earlier determination that the Stono Baptist Church and Cemetery are not eligible for the NRHP.

The Stono Baptist Cemetery is protected under South Carolina State Law; however, the cemetery is located across New Road, outside of the area of direct effects. As such, it will not be physically impacted by the proposed undertaking. In addition, no evidence of marked or unmarked graves was found within the project area itself and it is highly unlikely there would be any graves as the church and cemetery property did not extend into project area.

**5.0 SUMMARY AND RECOMMENDATIONS**

As a result of the Phase I archaeological survey, only one isolated find was recorded. This artifact is recommended as being ineligible for inclusion in the NRHP. During the architectural survey, the Stono Baptist Church and Cemetery were reassessed and found to be ineligible for the NRHP due to the loss of integrity. In addition, the cemetery will not be physically impacted as it falls outside of the project area, across New Road, and there is no evidence that there are graves within the project area itself. Based on these results, it is the opinion of Terracon that no historic properties will be affected and that no additional cultural resource investigations are warranted for the project tract.

**6.0 CLOSING**

Terracon appreciates the opportunity to provide you with this report. If you have any questions, please do not hesitate to contact me at (803) 403-1256 or via e-mail at [wgreen@terracon.com](mailto:wgreen@terracon.com).

Sincerely,  
**Terracon Consultants, Inc.**

William Green, M.A., RPA  
Principal Investigator/Group Manager,  
Natural and Cultural Resources

Doug Sain, Ph.D.  
Archaeologist/Reviewer

cc: Dan Thompson, O.L. Thompson Co., Inc.

**Phase I Cultural Resources Survey**

Golden Grove Mine □ Charleston County, South Carolina

June 7, 2017 □ Terracon Project No. 73171129



**REFERENCES**

Fick, Sarah

1992 Charleston County Historical and Architectural Survey. Report prepared by Preservation Consultants, Inc., Charleston, South Carolina. Manuscript on file at the South Carolina Department of Archives and History, Columbia, South Carolina.

Mills, Robert

1825 *Atlas of the State of South Carolina*. Reprint 1980. Southern Historical Press, Greenville.

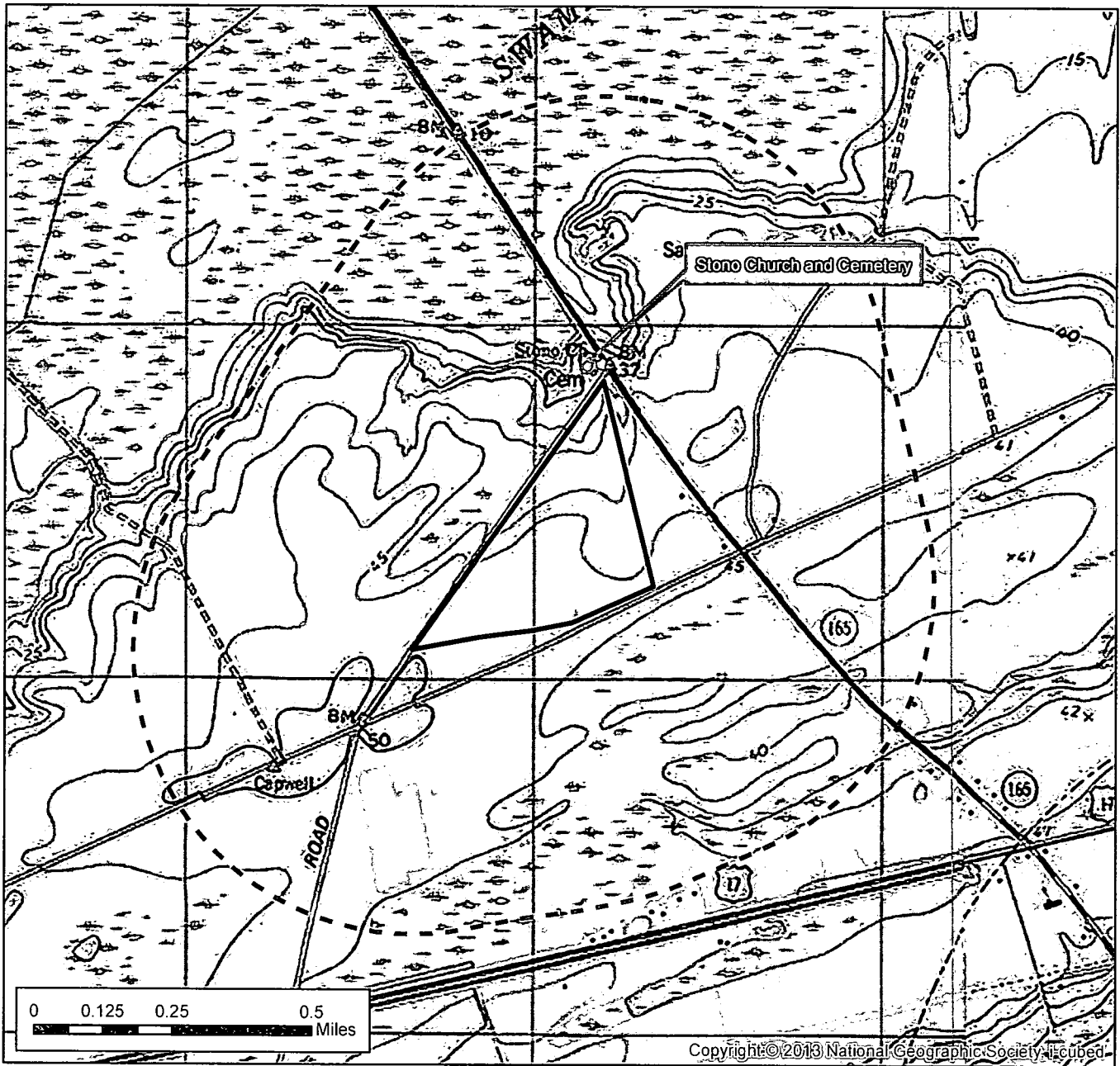
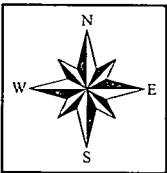
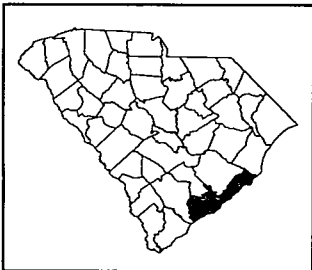
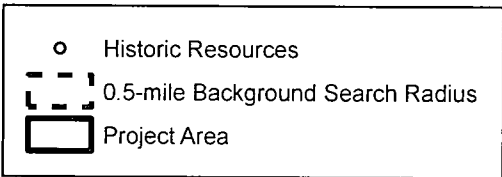


Figure 1. Project area and previously recorded cultural resources within a 0.5-mile search radius.  
 Base Map: Osborn (1979) 7.5' USGS topographic quadrangle.



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 Reviewed By: BGG

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USGS TOPOGRAPHIC MAP  
 GOLDEN GROVE MINE  
 CHARLESTON CO., SC

Figure  
 1



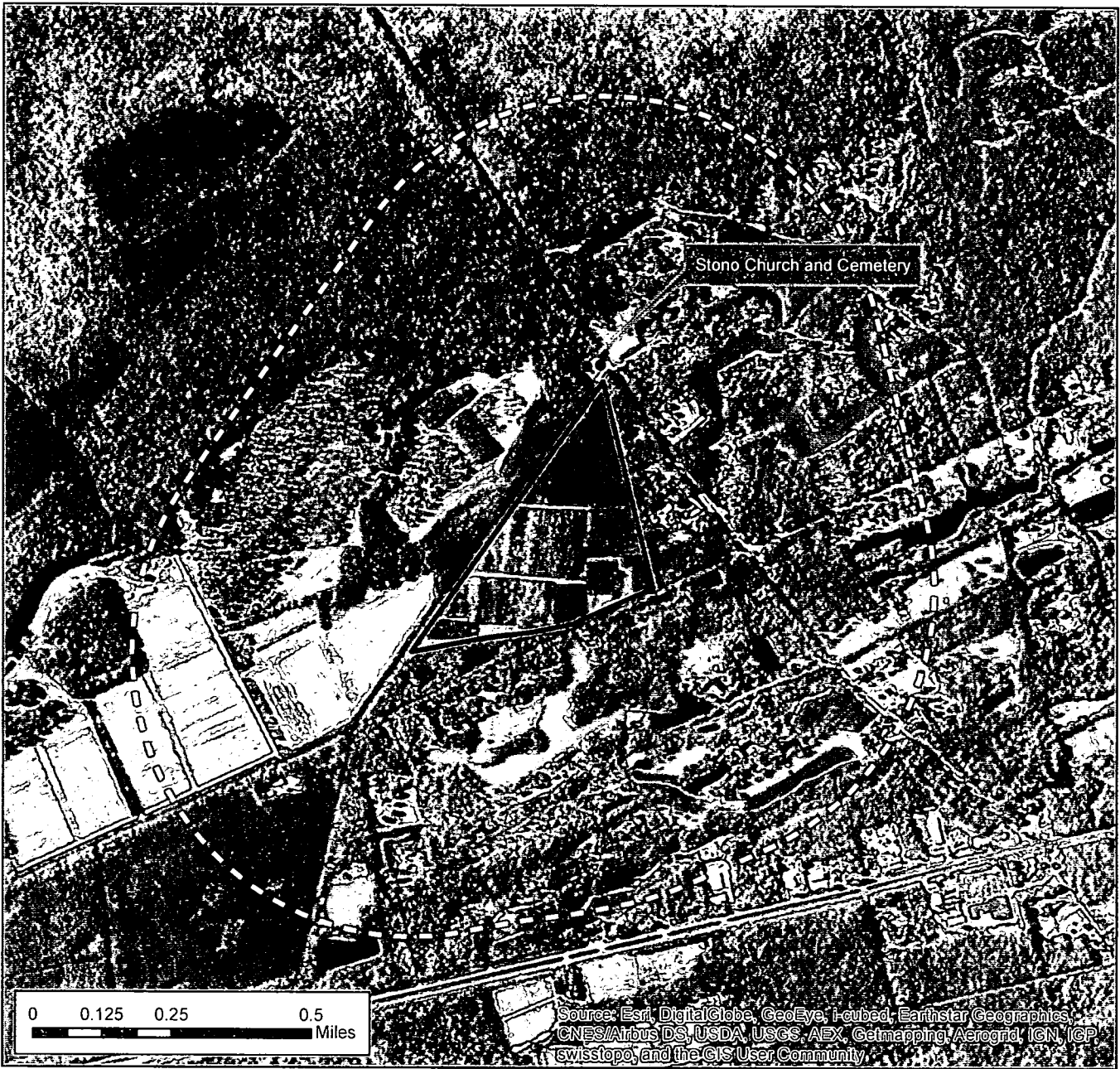
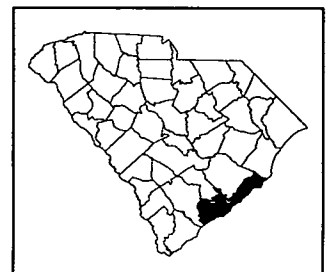
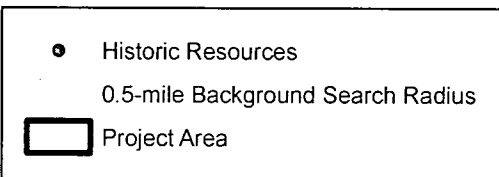


Figure 2. Aerial photograph of the project area and previously recorded cultural resources within a 0.5-mile search radius. Base Map: ESRI World Imagery.



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AERIAL IMAGERY
GOLDEN GROVE MINE CHARLESTON CO., SC

Figure
2



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Figure 3. Planted pines in the northern portion of the project area, facing north.



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Figure 4. Planted pines in the southern portion of the project area, facing northwest.

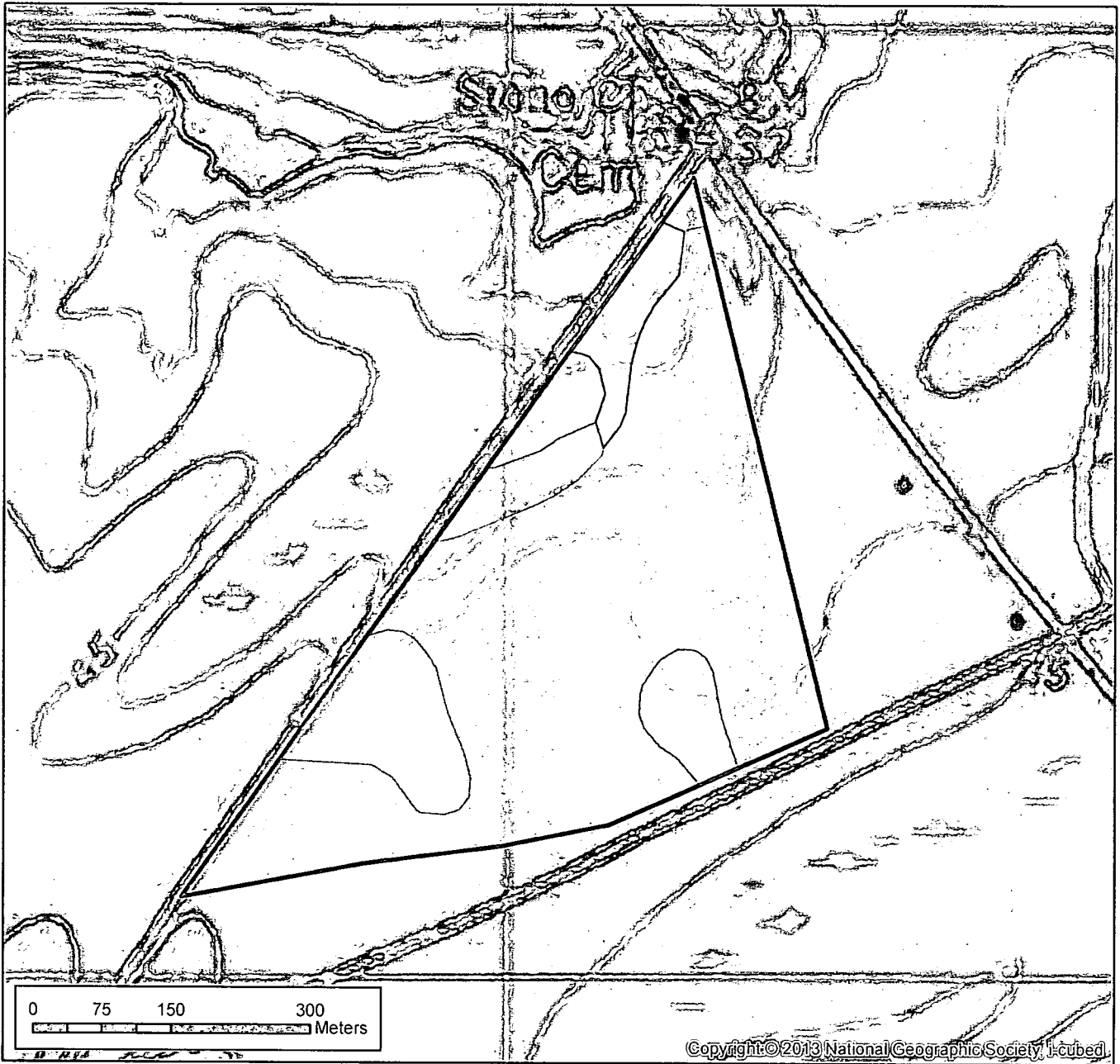
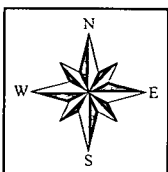
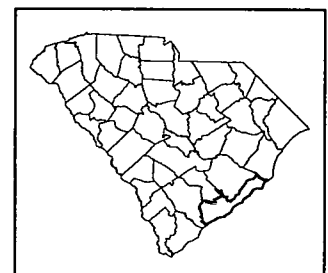
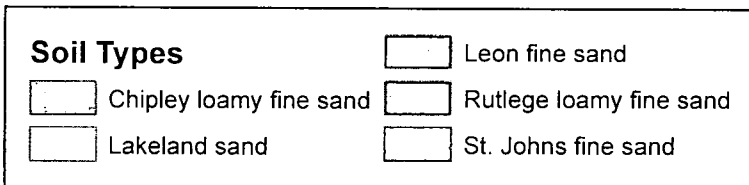


Figure 5. Soil types in the project area. Soils in yellow are well drained, while those in blue are poorly drained. Soil data obtained from NRCS Web Soil Survey. Base Map: Osborn (1979) 7.5' USGS topographic quadrangle.



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**SOIL TYPES**  
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Figure  
**5**

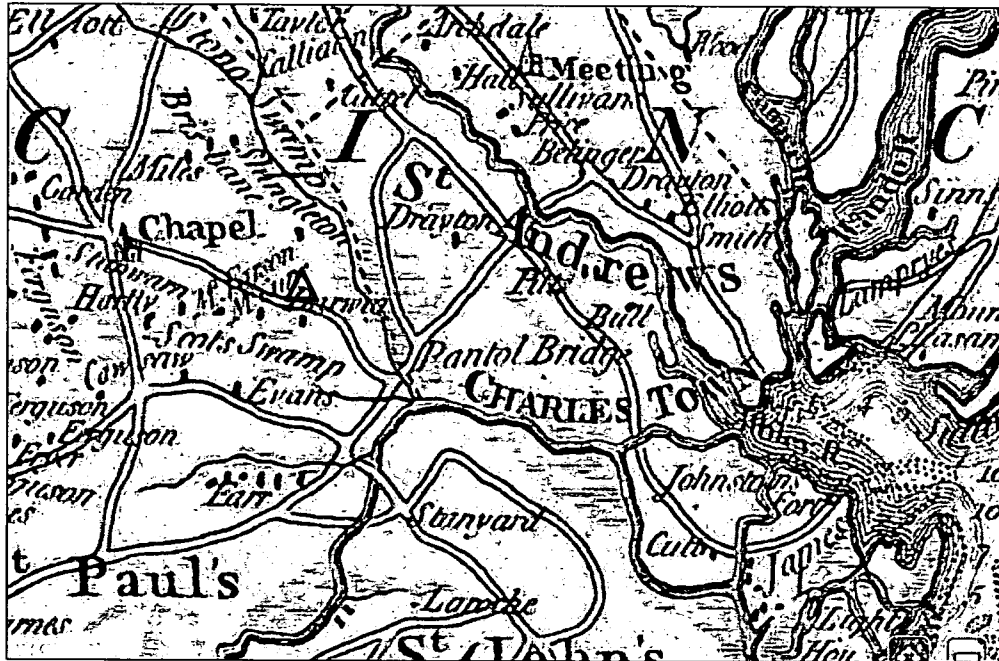


Figure 6. Henry Mouzon's Map of North and South Carolina (1777) showing the approximate location of the project area in red.

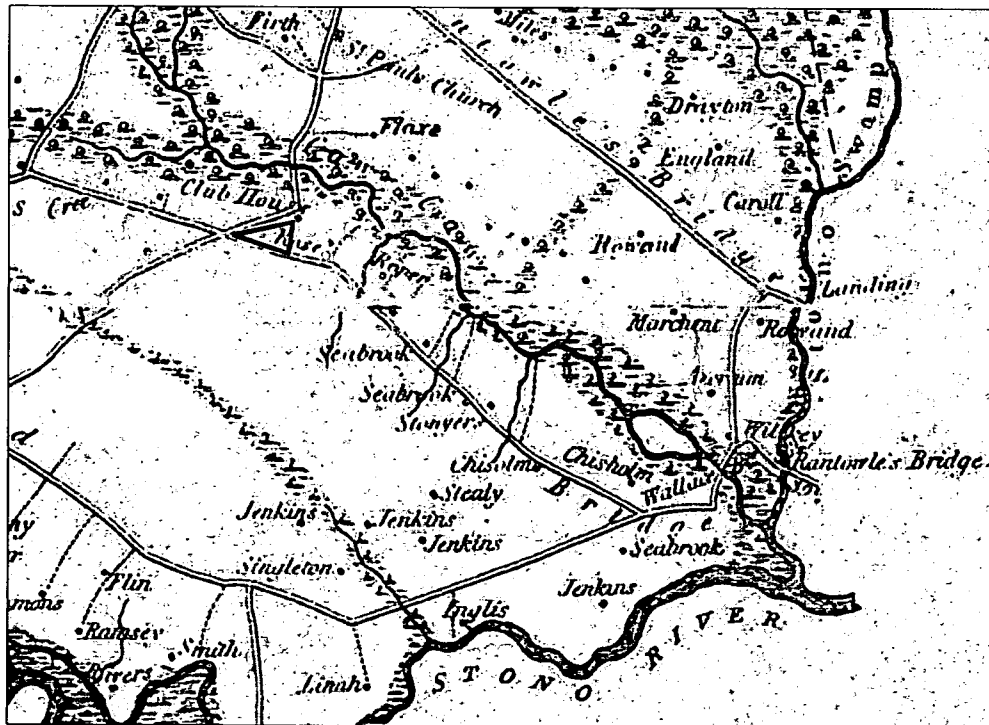


Figure 7. Mills Atlas Map of Colleton District (1825) showing the location of the project area in red.

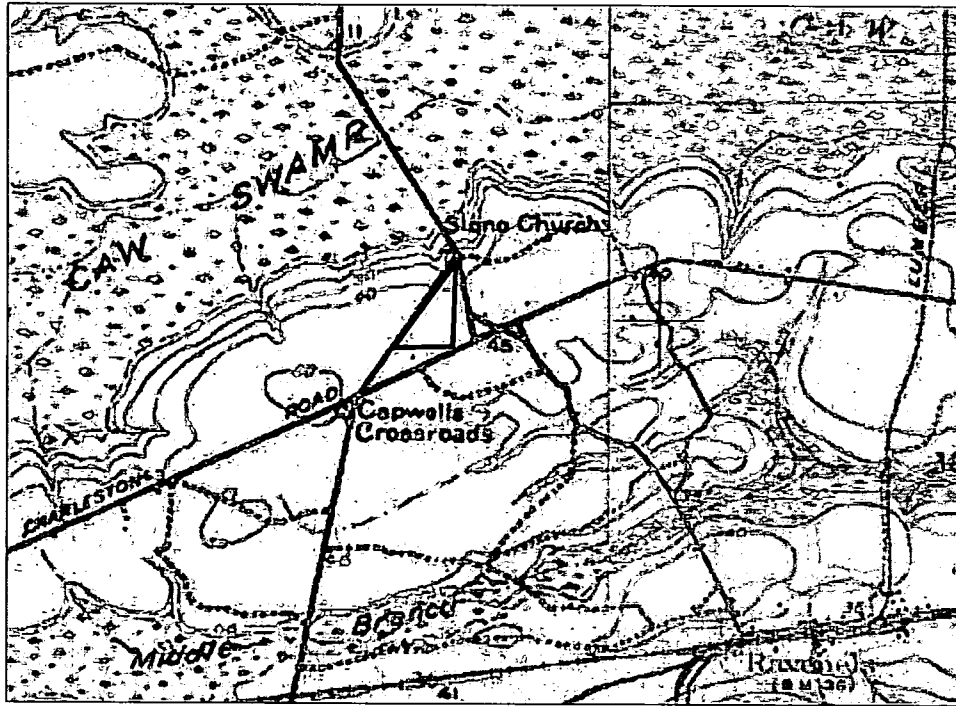


Figure 8. Cottageville (1918) USGS topographic quadrangle.

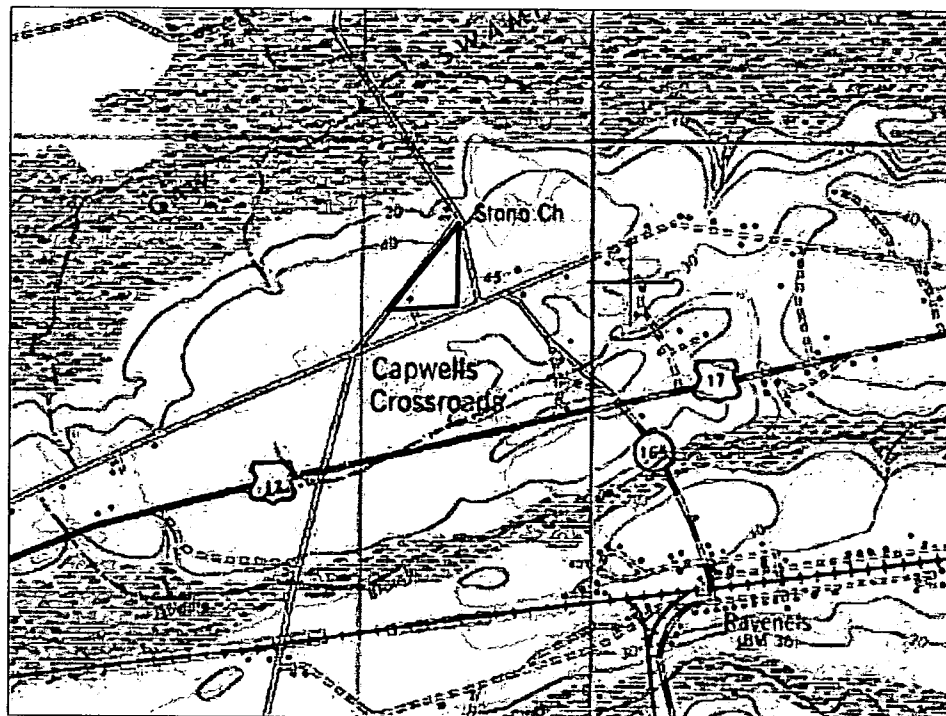


Figure 9. Cottageville (1943) USGS topographic quadrangle.

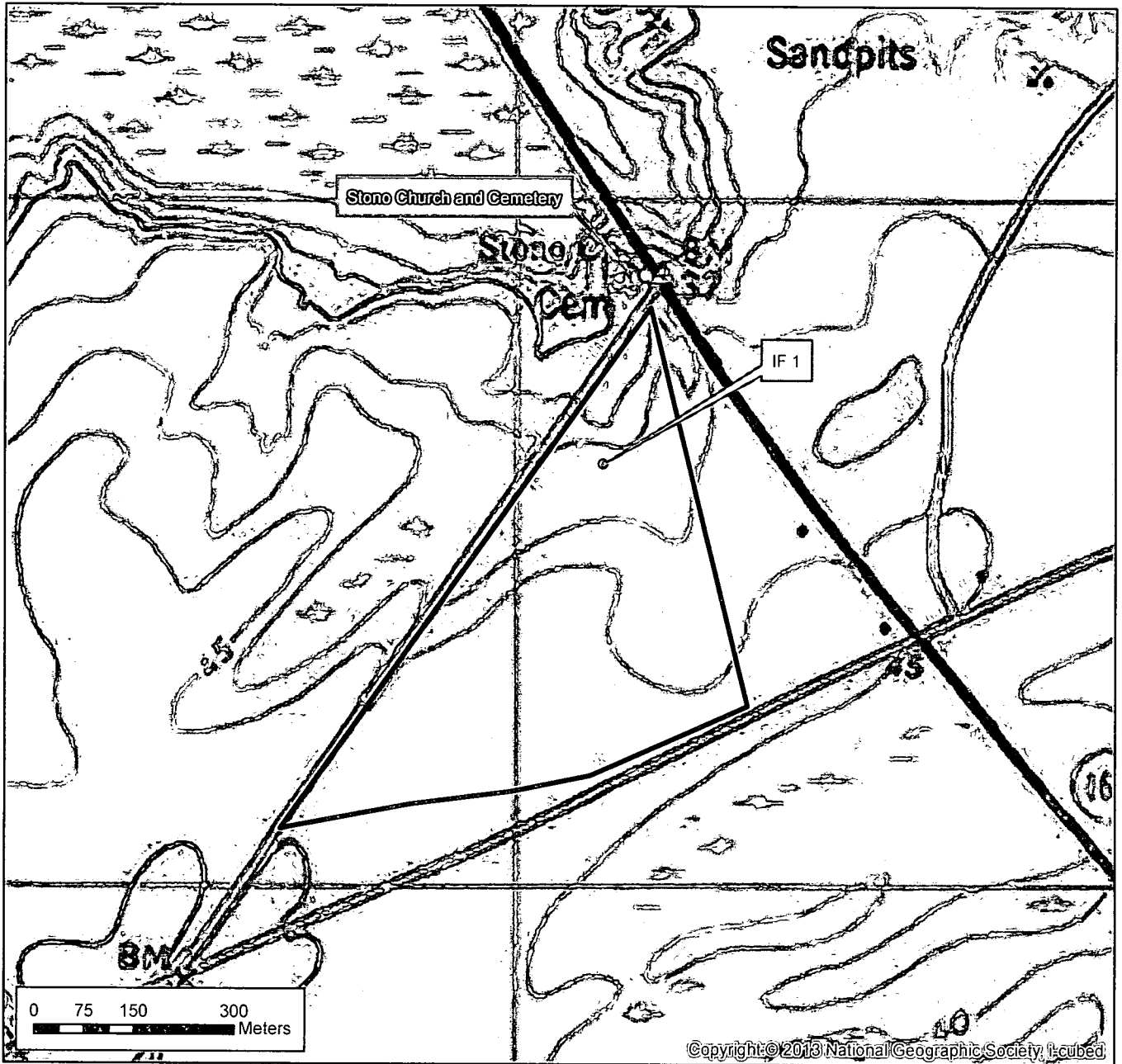
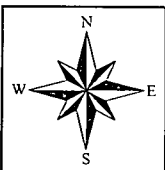
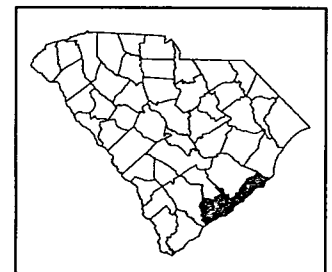


Figure 10. Cultural resources within and adjacent to the project area.  
 Base Map: Osborn (1979) 7.5' USGS topographic quadrangle.

○	Historic Resource
○	Isolated Find
▭	Project Areas



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CULTURAL RESOURCES

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Figure

10



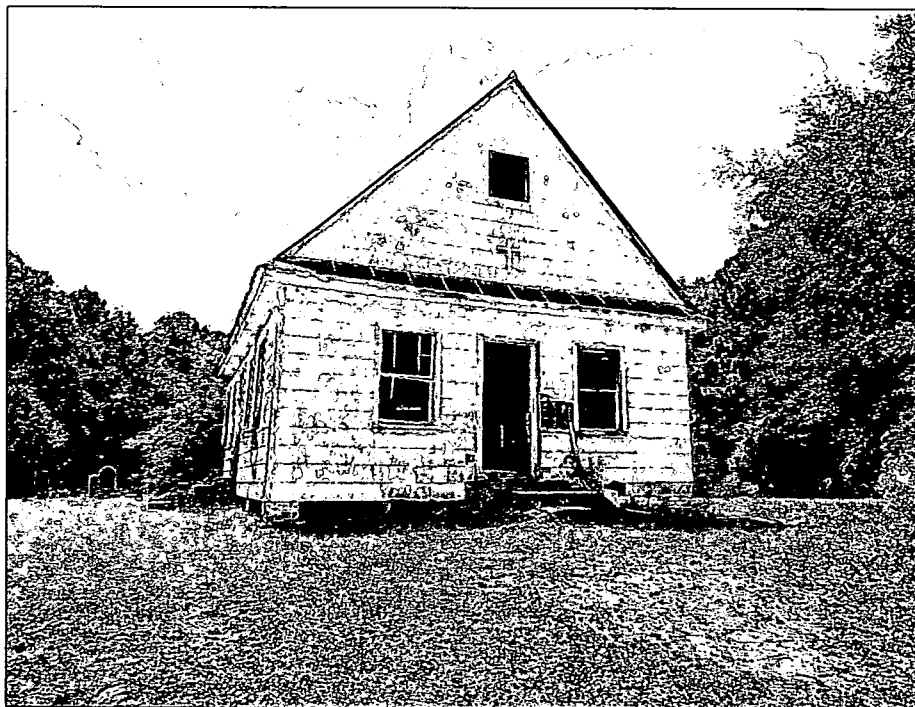


Figure 11. Stono Baptist Church, facing west.



Figure 12. Stono Baptist Church, facing south.



Figure 13. Stono Baptist Church Cemetery, facing south.

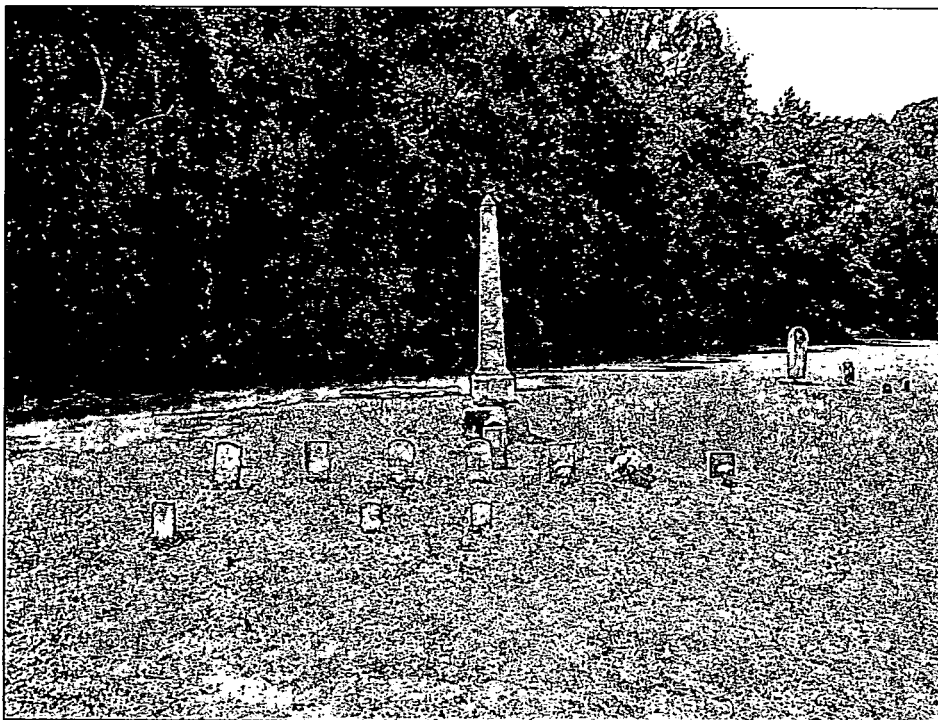


Figure 14. Stono Baptist Church Cemetery, facing west.



# APPENDIX 17

Archaeological Survey of Section B  
Golden Grove II Mining Tract

# Archaeological Survey of Section B Golden Grove II Mining Tract

Charleston County, South Carolina

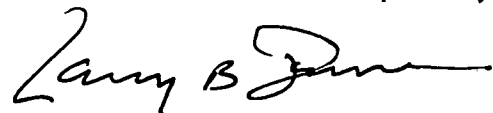
Draft Report

February 2020

**Prepared for:**

O.L. Thompson Construction, LLC  
3691 Paramount Dr.  
North Charleston, SC 29405

**Prepared by:**

A handwritten signature in black ink that reads "Larry B. James". The signature is written in a cursive style with a long horizontal line extending from the end.

Larry James, RPA  
Project Manager



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## 1.0 Introduction

In December 2020, Brockington and Associates, Inc. (Brockington) conducted an archaeological survey of a selected 15-acre portion of the 595-acre Golden Grove II Mining Tract located near the town of Ravenel in southern Charleston County, South Carolina. Brockington conducted the survey on behalf of O.L. Thompson Construction, LLC, (OL Thompson) as part of their due diligence process in advance of a permit application that extends their existing mining sand operation in the northeastern portion of the property. This study meets the South Carolina Department of Health and Environmental Control (SCDHEC) and the State Historic Preservation Office (SHPO) mining regulations concerning the management of historic properties (i.e., sites, buildings, structures, objects, and districts eligible for or listed on the National Register of Historic Places [NRHP]) affected through development activities compliant with the South Carolina Mining Act (SC Code Title 48, Chapter 20, Sections 10-310) and its implementing regulations found in Chapters 89-120(C)(4) of the SC Code of Regulations.

OL Thompson's management plan for the Golden Grove II Mining Tract includes conducting sand mining operations within the former agricultural fields located in the central and northeastern portions of the tract. In 2017, Terracon, Inc. (Terracon) conducted a reconnaissance survey of the entire tract and identified culturally sensitive areas along the elevated terrace of the tract, labeled as "Area B, C, D, F, and I" (Green and Linck 2017). Future mining operations require wetland access, and expansion of the mine into a 15-acre parcel of the upland terrace of the tract is unavoidable. This area corresponds with Area B and identified archaeological site 38CH2526. Site 38CH2526 is a small scatter of pre-contact artifacts associated with the Early Woodland period and is not eligible for the NRHP. This 15-acre portion is the Area of Potential Effect (APE). Figure 1.1 shows the location of the Golden Grove II Mine Tract, the project APE, and all recorded cultural resources within 0.5 mile (0.8 km) on the (1979) *Osborn, SC* US Geological Survey (USGS) quadrangle maps. Figure 1.2 presents the location of the Golden Grove II Mining Tract and the APE on a recent aerial image.

Brockington conducted an archaeological Phase I survey across the 15-acre APE. We revisited one site (38CH2526) and encountered two new archaeological sites (38CH2618 and 38CH2619) during our survey. Site 38CH2526 is a scatter of pre-contact ceramics and lithic artifacts diagnostic to the Early through Middle Woodland period (1000 BC to AD 700). Sites 38CH2618 and 38CH2619 are smaller scatters of undecorated ceramic and lithic artifacts also likely diagnostic to the Early through Middle Woodland period. We recommend 38CH2526, 38CH2618, and 38CH2619 not eligible for the NRHP. No further management consideration of these sites is warranted. Mining activities within the 15-acre APE will have **No Effect** on historic properties.

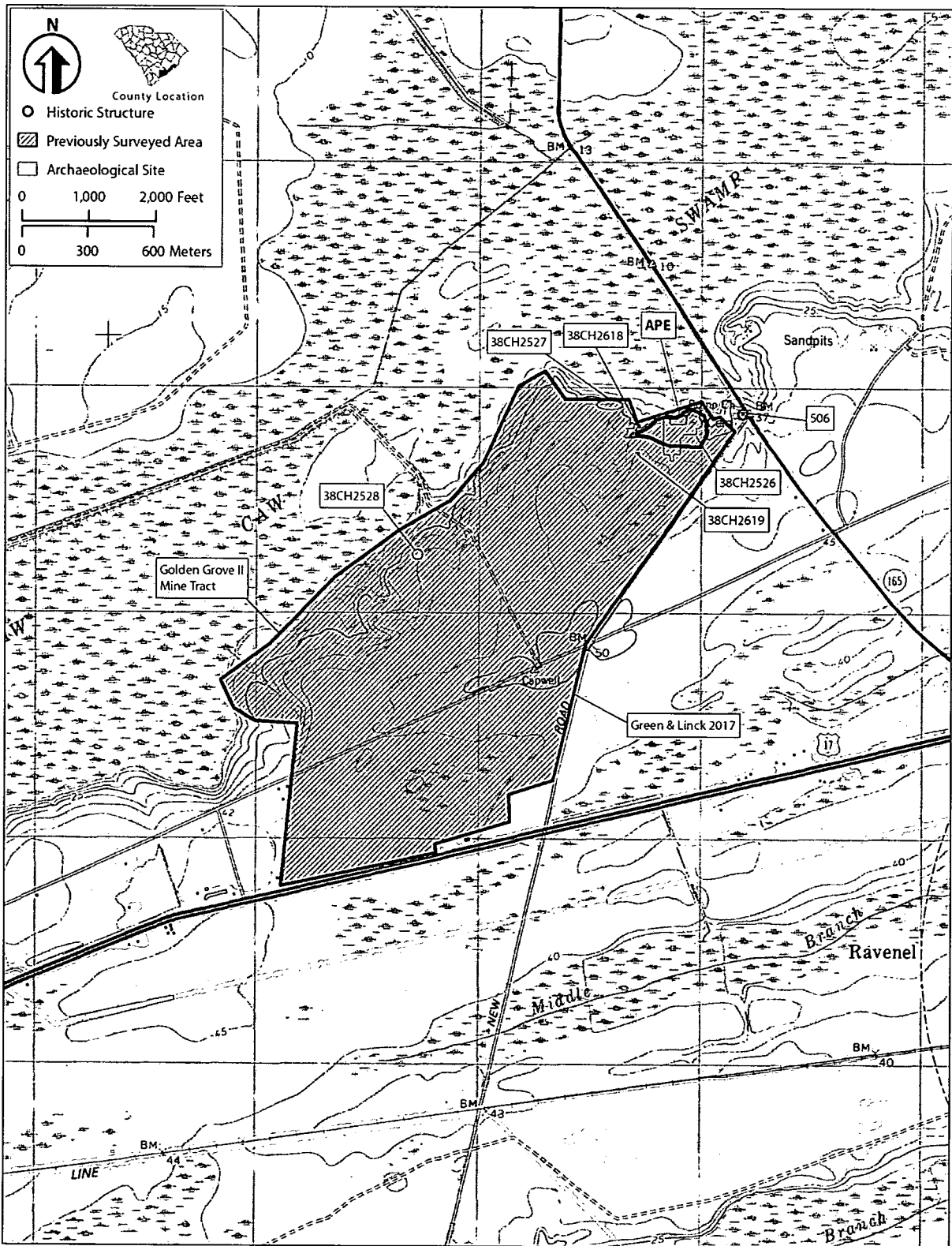


Figure 1.1 The location of the Golden Grove II Mining Tract, the project APE, and all recorded cultural resources within 0.5 mile (0.8 km) on the (1979) Osborn, SC US Geological Survey (USGS) quadrangle maps.



Figure 1.2 The location of the Golden Grove II Mining Tract and the APE on a recent aerial image.



## 2.0 Previous Investigations

In 2017, Terracon conducted a partial survey of the 595-acre tract titled: *Cultural Resources Reconnaissance Survey of Approximately 595 Acres at the Golden Grove II Mining Tract Charleston County, South Carolina* (Green and Linck 2017). Investigators documented three archaeological sites (38CH2526, 38CH2527, and 38CH2528) and three isolated finds (IF-1 through IF-3). In addition, they revisited one previously recorded structure, the Stono Baptist Church and Cemetery (506.00 and 506.01), and identified five newly recorded aboveground resources (7928 through 7932). All six aboveground resources, the Stono Baptist Church and Cemetery, and Resource numbers 7928 through 7932 are not eligible for the NRHP. Site 38CH2526 and the three isolated finds (IF-1 through IF-3) were also not eligible for listing in the NRHP. Sites 38CH2527 and 38CH2528 contain Native American (Woodland period) and post-contact (eighteenth-nineteenth century) artifacts and were unevaluated and in need of additional work to determine their NRHP eligibility.

Based on the results of the survey, a Phase I archaeological survey was recommended for 72 acres of the upland terrace that overlooked the Caw Caw Swamp where Sites 38CH2526, 38CH2527, and 38CH2528 are situated. According to Terracon, five portions of the broad terrace have a high potential to contain additional pre-contact archaeological sites. These include identified Areas B, C, D, F, and I that correspond with the upland portion along the northern terrace of the tract. Upon SHPO review, it was determined a Phase I archaeological survey is necessary for Areas B, C, D, F, and I in addition to additional work at Sites 38CH2527 and 38CH2528 prior to any future permitted land disturbance (SHPO Project No. 17-EJ0094) (see Appendix B: letter dated November 21, 2017, Keely Lewis [SHPO] to William Green [Terracon]). Figure 2.1 shows the areas recommended for a Phase I Archaeological survey on the 1979 *Osborn, SC* USGS quadrangle map (Green and Linck 2017:58).

In 2019, Brockington conducted an archaeological assessment of the historic land use of Golden Grove II Mining Tract (James 2019). This investigation was conducted in response to the discovery of potential historic resources within the tract. Our project objectives were focused on assessing the potential for significant historic archaeological sites, specifically a cemetery and two historic plantation sites that are shown on a 1790/91 plat of the Golden Grove and Sommers Hall Plantations (see Figure 2.2 below).

Our inspection of the Golden Grove II Mining Tract revealed faint traces of the Golden Grove, and Sommers Hall settlements proved that archaeological sites are present, but their significance is uncertain. We reviewed the projected areas of both settlements' slave dwellings, outbuildings, or main houses based upon the overlay of the 1791 plat. We did not see aboveground features such as chimneys, piers, or foundations or subtle rises that may indicate former structural locations. In addition, we did not see any historic vegetation associated with main houses gardens or the oak alleys illustrated on the 1791 plats. In contrast, we did see period-related artifacts on the surface and through metal detecting at the Sommers Hall and Golden Grove settlement areas. Figure 2.2 presents the projected locations of the former settlements and cemetery based on georeferencing the 1791 plats on the modern landscape. These areas are located 700 meters (m) and 1,000+ m southwest of the APE, respectively.

Our inspection of the cemetery area found no direct evidence of the burial grounds in the form of unmarked graves, headstones, or grave goods. However, we did discover a small 100-by-100 feet (ft). clearing surrounded by an earthen berm in the predicted location portrayed by the overlay of the 1791 plat. It is likely the cemetery is in this general area and is defined by the earthen berm. This area is located 800 m west of the APE. Thompson has adopted a preservation plan for the areas of both settlements and the cemetery, and their construction plans incorporate a 100-ft green-space buffer around each potential resource.

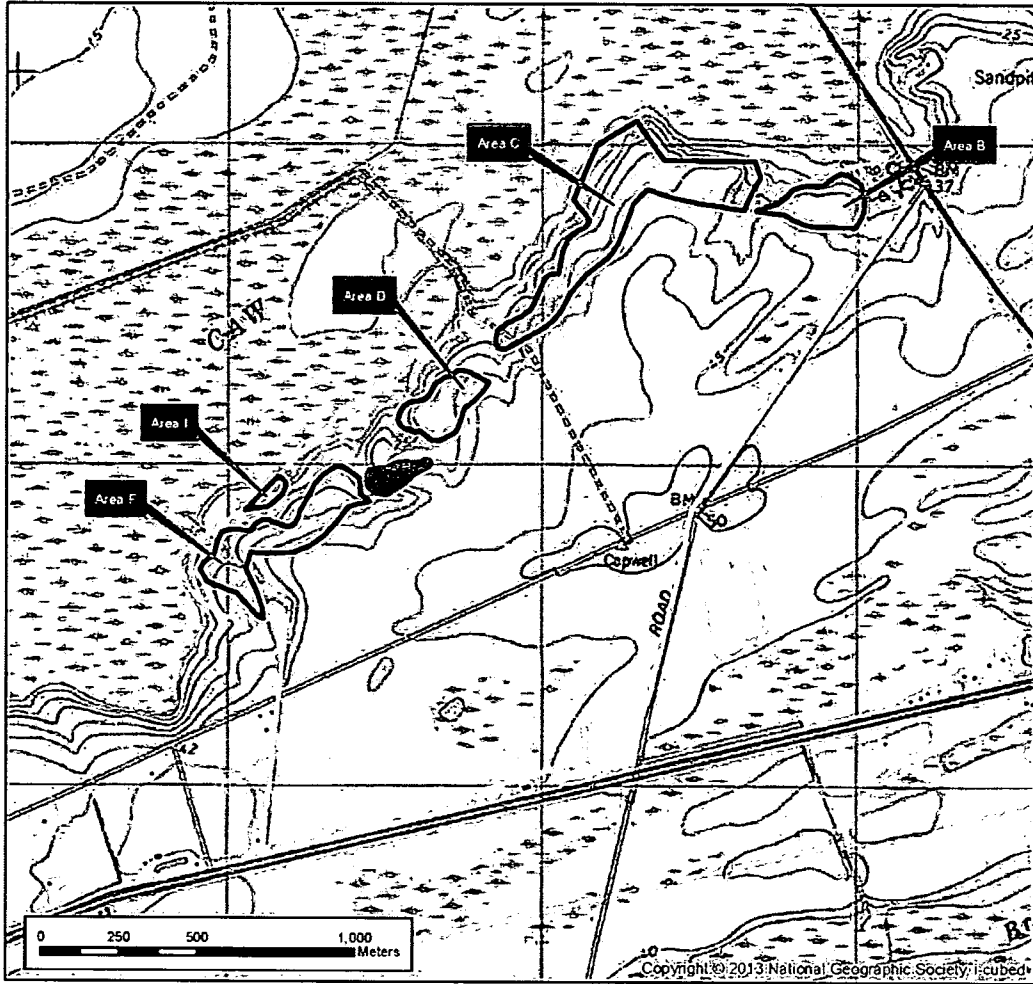
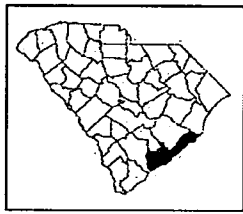
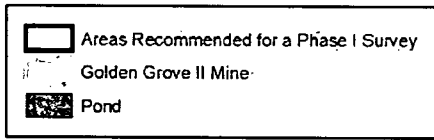


Figure 43. Areas recommended for a Phase I Archaeological Survey. Base Map: Osborn (1979) 7.5' USGS topographic quadrangle.



Project No:	73177142
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PROBABILITY AREAS
GOLDEN GROVE II MINE CHARLESTON CO., SC

Figure
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Figure 2.1 Terracon's areas recommended for a Phase I Archaeological survey on the 1979 Osborn, SC USGS quadrangle map (Green and Linck 2017:58).



Figure 2.2 The projected locations of the former settlements and cemetery based on georeferencing the 1791 plats on the modern landscape.

### **3.0 Methods of Investigation**

#### ***Project Objective***

The objective of this archaeological investigation is to assess the potential for historic properties within the Golden Grove II Mining Tract 15-acre APE. Tasks performed to accomplish this objective include background research, field investigations, laboratory analysis, and the assessment of the NRHP eligibility of identified resources. Methods employed for each of these tasks are described below.

#### ***Field Investigations***

Archaeological survey entailed the systematic examination of the project tract following the *South Carolina Standards and Guidelines for Archaeological Investigations* (South Carolina Department of Archives and History [SCDAH] 2013). Investigators systematically inspected the APE using pedestrian transects spaced at 30-m intervals. Investigators excavated shovel tests at 30-m intervals along each transect, except in areas that were wet and/or disturbed. Each shovel test measured approximately 30 centimeters (cm) diameter and was excavated into sterile subsoil (typically 80 cm below the surface [cmbs]). Investigators sifted the fill through 1/4-inch mesh hardware cloth. They recorded information relating to each shovel test in field notebooks. This information included the content (e.g., presence or absence of artifacts) and context (e.g., soil color, texture, stratification) of each test. Investigators flagged and labeled positive shovel tests (those where artifacts were present) for relocation and site delineation. Investigators excavated a total of 115 shovel tests across the project APE.

An archaeological site is a locale yielding three or more pre- or post-contact artifacts within a 30-m radius. Locales that produce less than three contemporaneous artifacts are isolated finds (SCDAH 2013). Redeposited artifacts (even if greater than three in number) are also an isolated find rather than a site unless there is a compelling reason for doing otherwise. Archaeologists defined the boundaries of 38CH2526, 38CH2618, and 38CH2619 by excavating additional shovel tests at reduced 15-m and 7.5-m (if necessary) intervals around the positive tests. Investigators recorded the location of the sites and isolated finds with a handheld GPS unit. The Universal Transverse Mercator (UTM) coordinates obtained from the GPS readings are recorded into the ArcView© software program. We plotted these coordinates on the digital USGS quadrangle for the tract (see Figure 1.1). Lastly, we recorded sufficient information for 38CH2526, 38CH2618, and 38CH2619 to complete South Carolina Institute of Archaeology and Anthropology (SCIAA) site forms, which were submitted to SCIAA at the completion of the fieldwork.

#### ***Laboratory Analysis and Curation***

All recovered artifacts were transported to Brockington's Mt. Pleasant laboratory facility where they were washed, cataloged, and analyzed. Laboratory personnel assigned distinct provenience numbers to artifacts from each shovel test. They separated artifacts from each provenience by class/type and assigned catalog numbers.

The basis for typological identification of post-contact and pre-contact artifacts is manifested by technological and stylistic attributes. Lab personnel classified all pre-contact ceramic sherds by surface decoration and aplastic content. Sherds smaller than 2-by-2 cm (0.5-by-0.5 inch) in diameter with no recognizable diagnostic attributes are classified as residual sherds and tabulated as a group. Sherds and other analyzable artifacts were compared to published type descriptions from available sources in order to facilitate identification and correct labeling of the collected samples from the field. All research materials associated with this project are located at Brockington's Mt. Pleasant office. Upon acceptance of the final report, Brockington will deliver the curation package to SCIAA.



## 4.0 Environmental and Cultural Setting

### *Environmental Setting*

The Golden Grove II Tract consists of 595-acres of undeveloped land located near the intersection of SC Hwy 165 and US Highway 17S outside of the community of Ravenel, SC in southeastern Charleston County. The tract consists of mostly agricultural and silviculture fields north of New Road and on both the north and south sides of Old Jacksonboro Road. The majority of the tract is made up of well-drained farmlands that include an estimated 100+-acres of terraced uplands which overlook the Caw Caw Swamp. Several man-made ponds are located along the northwest boundary while large forested wetlands lie in the eastern and northeastern sections of the tract. To the south of Old Jacksonboro Road, the tract contains mostly planted pine trees in poorly drained low-lying areas.

The environmental setting of Area B is consistent with much of the Golden Grove II Mining Tract. Area B includes open fields and stands of planted pine trees that gradually slope towards the low-lying wetlands of the Caw Caw Swamp. The terrain mimics a typical sloping upland marine terrace. The highest point of land is in the open fields and planted pines found in the southwestern edge of the site, and it slopes gently west to east in the northeast direction. Upland well-drained soils across the tract include Lakeland sand (85 percent); while Rutlege loamy fine sand constitute the poorly drained soils located in the surrounding lowlands (USDA 2020). Figure 4.1 presents views of tArea B located on the Golden Grove II Mining Tract, facing east and south, respectively.

### *Cultural Setting*

Generally, the cultural history of North America is divided into three eras: Pre-Contact, Contact, and Post-Contact. The Pre-Contact era refers primarily to the Native American groups and cultures that were present for at least 10,000 to 12,000 years prior to the arrival of Europeans. The Contact era refers to the time of exploration and initial European settlement on the continent. The Post-Contact era refers to the time after the establishment of European settlements, when Native American populations usually were in rapid decline.

### *The Pre-Contact through Contact Eras*

In South Carolina, the Pre-Contact era generally is divided into four stages (after Willey and Phillips 1958). These include the Lithic, Archaic, Woodland, and Mississippian. Specific technologies and strategies for procuring resources define each of these stages, with approximate temporal limits also in place. Within each stage, with the exception of the Lithic stage, there are temporal periods that are defined on technological bases as well. Readers are directed to Goodyear et al. (1989) for more detailed discussions of particular aspects of these stages and periods in South Carolina.

The Archaic period was a long period of adaptation to modern forest conditions in eastern North America. Caldwell (1958) characterizes the period as a movement toward Primary Forest Efficiency, meaning that during this period, human groups continually developed new and more effective subsistence strategies for exploiting the wild resources of the modern oak-hickory forest. Based on extensive work in the North Carolina Piedmont, Coe (1964) subdivides the Archaic period into a number of sequential phases recognizable by distinctive stone point/knife forms. This sequence has been confirmed over large parts of the Southeast and is applicable to the Lower Coastal Plain of South Carolina.

Archaic groups moved within a regular territory on a seasonal basis; exploitation of wild plant and animal resources was well planned and scheduled. Anderson and Hanson (1988) developed a settlement

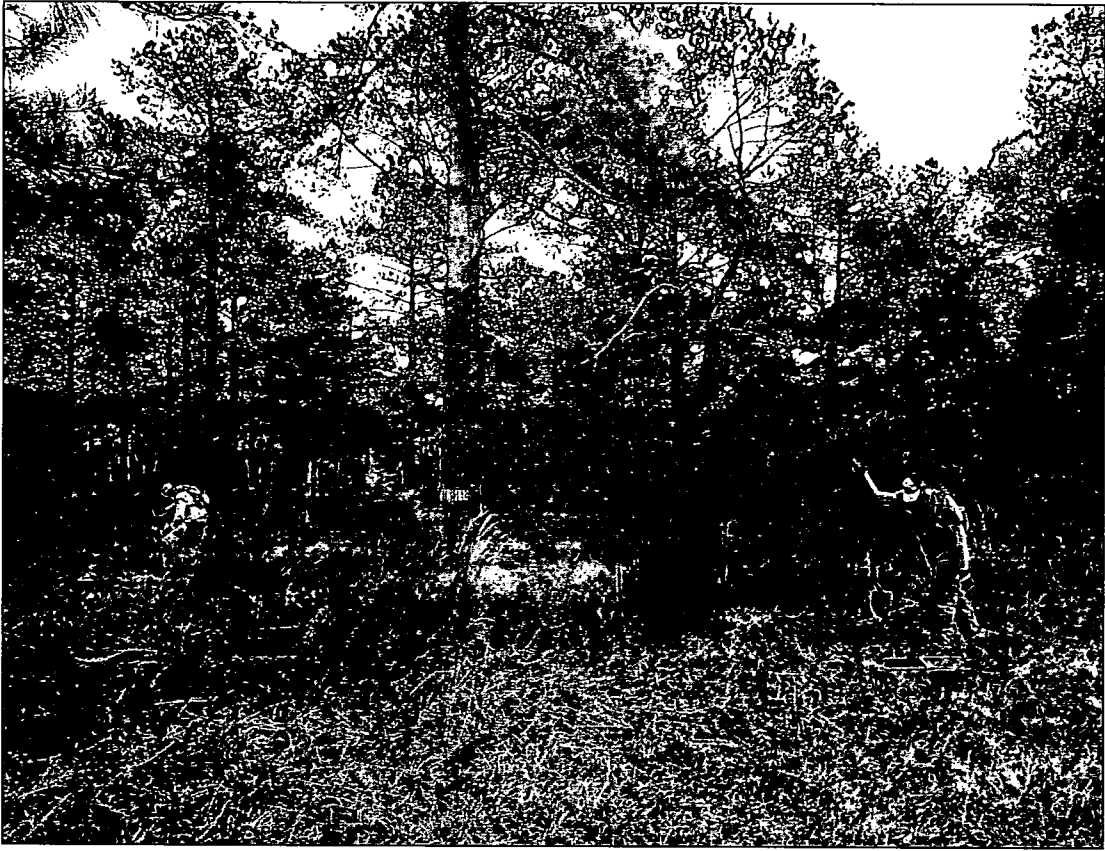


Figure 4.1 Typical views of Area B located on the Golden Grove II Mining Tract, facing east and north, respectively.

model for the Early Archaic (8000 to 6000 BC) in South Carolina involving movement of small groups (bands) on a seasonal basis within major river drainages. Anderson and Hanson (1988) hypothesize that Early Archaic use of the Lower Coastal Plain was limited to seasonal (spring) foraging camps and logistic camps. Aggregation camps and winter base camps are suggested to have been near the Fall Line. They also hypothesize that as population increased in the Middle Archaic (6000 to 2500 BC), band mobility decreased, and territoriality increased. Blanton and Sassaman (1989) recently reviewed the archaeological literature on the Middle Archaic. They document an increased simplification of lithic technology during this period, with increased use of expedient, situational tools. Furthermore, they argue that the use of local lithic raw materials is characteristic of the Middle and Late Archaic. Adaptation during the Late Archaic and into the Early Woodland periods saw an expansion of populations and increase in technology for local adaptations of the generalized hunting-gathering-fishing in coastal estuaries and interriverine uplands areas along major drainages found in upper portions of the Coastal Plain.

During the succeeding Woodland period, sedentism seems to have increased, although scheduled exploitation of wild food resources in a seasonal round continued. The Woodland period is significant for several technological and social developments: (1) the widespread manufacture and use of ceramics for cooking and storage; (2) the beginnings of agriculture; and (3) construction of burial mounds and other earthworks. While evidence of burial mounds and agriculture is not extensive at the few South Carolina Woodland period sites investigated in detail (Brooks and Canouts 1984; Trinkley 1990), ceramics are widespread, having been recovered at numerous small sites throughout the state. The varied manufacturing procedures and decorative styles of these ceramics allow for differentiation of site collections into several sub-periods as well as inferences of group movement and influence from adjacent geographic areas. Anderson et al. (1982), Espenshade and Brockington (1989), and Trinkley (1989) developed classificatory schemes for Early/Middle/Late Woodland period groups based on ceramics from several sites in the Coastal Plain.

A growing importance of horticulture and storable food stuffs develops during the Mississippian period. An increase in sedentism, technology, and trade shifted migrating bands of people into more organized towns along major rivers in the Coastal Plain. Anderson (1989) suggests that environmental unpredictability premised the organization of hierarchical chiefdoms in the Southeast beginning in the Early Mississippian period; the redistribution of stored goods (i.e., tribute) probably played an important role in the Mississippian social system.

Native groups encountered by the European explorers and settlers probably were living in a manner similar to the late pre-contact Mississippian groups identified in archaeological sites throughout the Southeast. The highly structured Native American society of Cofitachequi, formerly located in central South Carolina and visited by De Soto in 1540, represents an excellent example of the Mississippian social organizations present throughout southeastern North America during the late Pre-Contact era (Anderson 1985). However, initial European forays into the Southeast contributed to the disintegration and collapse of the aboriginal Mississippian social structures; disease, warfare, and European slave raids all contributed to the rapid decline of the regional Indian populations during the sixteenth century (Dobyns 1983; Ramenofsky 1982). By the late seventeenth century, Native American groups in coastal South Carolina apparently lived in small politically and socially autonomous semi-sedentary groups (Waddell 1980). By the mid-eighteenth century, very few Native Americans remained in the region; all had been displaced or annihilated by the ever-expanding English colonial settlement of the Carolinas (Bull 1770, cited in Anderson and Logan 1981:24-25).



### *History of the Golden Grove Tract*

Background research for this project consisted of a review of primary and secondary source materials at the South Carolina Room of the Charleston County Public Library, the Charleston County Register of Deeds Office, and the South Carolina Historical Society in Charleston. Brockington's historian also reviewed the online indexes for the South Carolina Department of Archives and History. They reviewed materials including deeds, plats, maps, published documents, and previous cultural resources management reports. Brockington archaeologists conducted background research for NRHP-listed or eligible resources using the ArchSite program maintained by SCIAA.

Our review of these archives uncovered an extensive history of landuse and ownership within the tract boundary and has identified two large plantation settlements (Sommers Hall and Golden Grove) originating with the Sommers Family ownership dating from the middle of the eighteenth century until the mid-nineteenth century. Sommers Hall is believed to be first owned by George Sommers (1700 to 1770) (Trinkley et al. 2010:15-16). Records show George Sommers was an active member of St. Michaels Church in Charleston and erected a house at 43 East Bay Street. George died in 1770, leaving his plantation holdings to his wife Henrietta and then to his brother James, who along with a third brother, Humphry, owned plantations surrounding Sommers Hall along the Caw Caw Swamp. James' son, John Sommers, was born in 1750 in Charleston and owned the neighboring Golden Grove, which he purchased or may have inherited through his father. James Sommers lived in Charleston and worked as a merchant and resided between South Carolina and England (Trinkley et al. 2010:12).

Based upon this research, we can only assume John Sommers, who was primarily a planter, owned and managed both estates since Golden Grove and Sommers Hall were adjacent properties. John's wife Martha Roper and later son, John W. Sommers, Jr., would acquire all of John Senior's landholdings. John, Jr. died in 1790 and two years later was followed by his father, James, who died in Bath, England and was buried on April 3, 1792 (Trinkley et al. 2010:12). The death of Humphry in 1788, John in 1790, and the absentee and ultimate demise of James in 1792, may have prompted the Sommers family heirs to conduct a survey of both plantations in 1790/1791. Figure 4.2 presents the 1791 plat of Golden Grove and Sommers Hall (Maps and Muniments Collection: 32-35-10). The plat highlights each tract's plantation settlement areas, detailing the main houses, slave dwelling rows, outbuildings, and a cemetery overlooking Caw Caw Swamp. In addition, large agricultural fields are labeled by crop and acreage along with plantation roads and large irrigation drains and ditches associated with the vast rice fields along Caw Caw Swamp. The 1791 depiction of these rice fields illustrates the complexity of these agricultural systems.

Figure 4.3 presents a second 1791 plat of Sommers Hall drawn and surveyed by the John Purcell plat that was recorded in the deed of the property in 1799 (Charleston County, South Carolina Deed Books [CCDB]: X6:380). This plat focuses solely upon the Sommers Hall tract and mirrors the larger 1791 plat, illustrating the settlement, agricultural fields, roads, and the cemetery. It is not clear if this cemetery was used for slave internments or for the Sommers Family.

By the nineteenth century, the estates of many landowners in St. Paul's Parish and around the Lowcountry were in decline as rice cultivation in inland swamps were abandoned for the more profitable and efficient tidal fields. Surviving deed records show that the first record of sale for Sommers Hall occurs in 1816 and Golden Grove in January 1838. The Sommers Hall Tract is sold through legal action, possibly a family dispute, to a Thomas Napier. John W. Sommers lists the Golden Grove tract in 1835. This sale mentions a two-story house and kitchen building standing on the Golden Grove tract, suggesting that the eighteenth-century house was well-kept and may have been occupied by John W. Sommers during this

time. An advertisement appeared in the *South Carolina Gazette* announcing the sale of the Golden Grove Plantation along with a neighboring tract (Trinkley et al. 2010:15-16):

Two valuable plantations, Golden Grove and Richmond Hill, on the Jacksonborough Road, one 17, the other 19 miles from Charleston, each contains about 1000 acres – 220 on each of as good rice land as need be planted – the remainder cotton, provision and pine land. When under cultivation, 300 barrels of rice have been made from 100 acres. Except a few acres about the buildings these places have not been cultivated for the last 30 years, so that the soil may be said to be in a virgin state. On Golden Grove, there is a two-story dwelling house and kitchen, on the other a one-story framed house. For stock of all kinds and grazing these lands are not surpassed any-where in the low country. They will be sold either separate or together. Refer to John W. Sommers, Esq. St. Paul's Parish, or to George Buist and the subscriber, William McDow, in Charleston.

The sales of Golden Grove and Sommers Hall began a series of ownership transfers that would continue through most of the nineteenth century. By 1890, both tracts were combined under the ownership of judge and historian Henry A. M. Smith whose interests led to the purchase of numerous tracts that were in the possession of well-known Charleston-region aristocratic families a century before. MeadWestvaco acquired many of H.A.M. Smith's land holdings in the mid-twentieth century. For much of the twentieth century and until the present day, the Golden Grove and Sommers Hall tracts were used for commercial timber production and experimental tree cultivation.

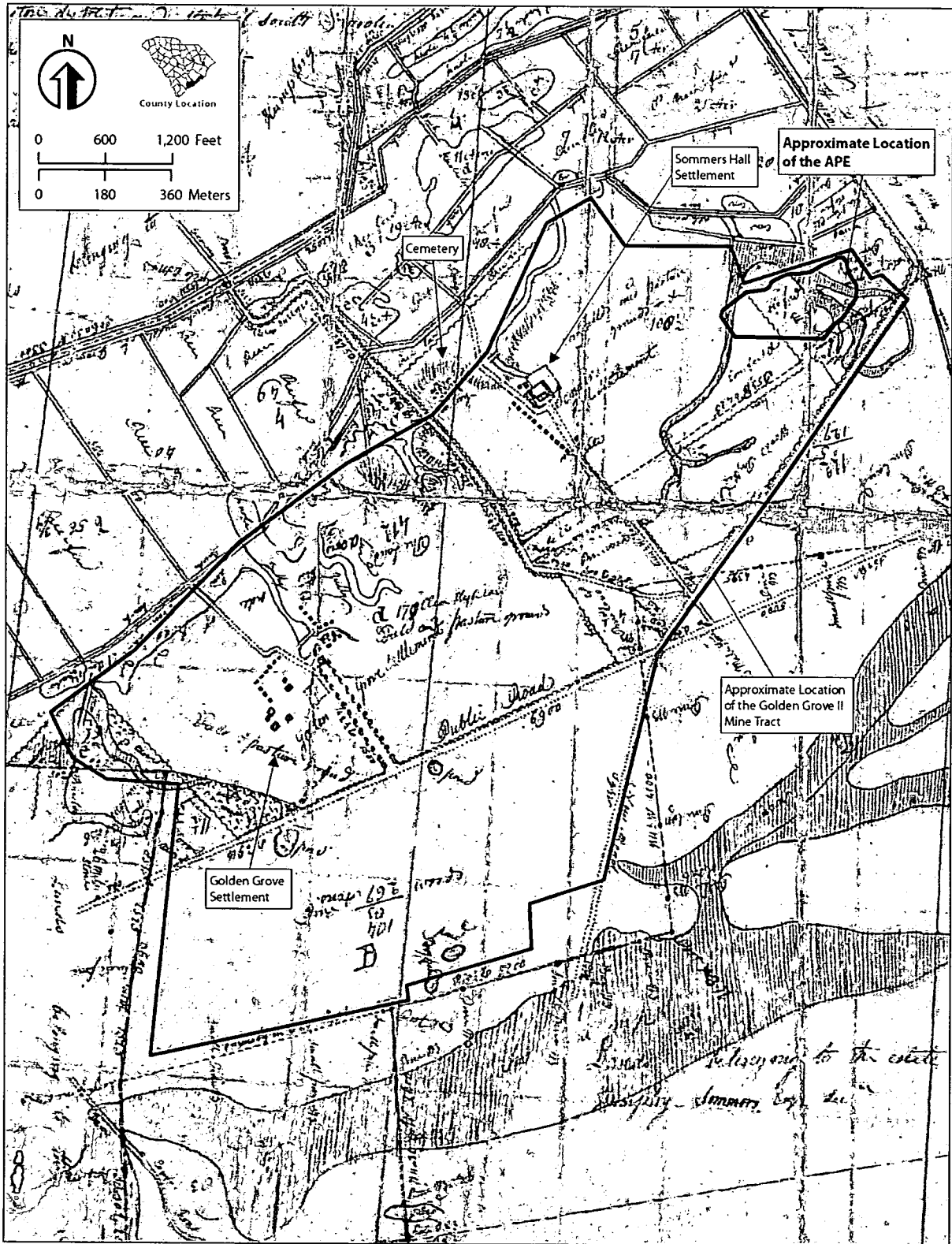


Figure 4.2 John Purcell's 1790/1791 plat of the Golden Grove and Sommers Hall plantation settlements, along with their respective main houses, slave dwelling rows, and outbuildings. The cemetery is located just northwest of the Sommers Hall settlement.

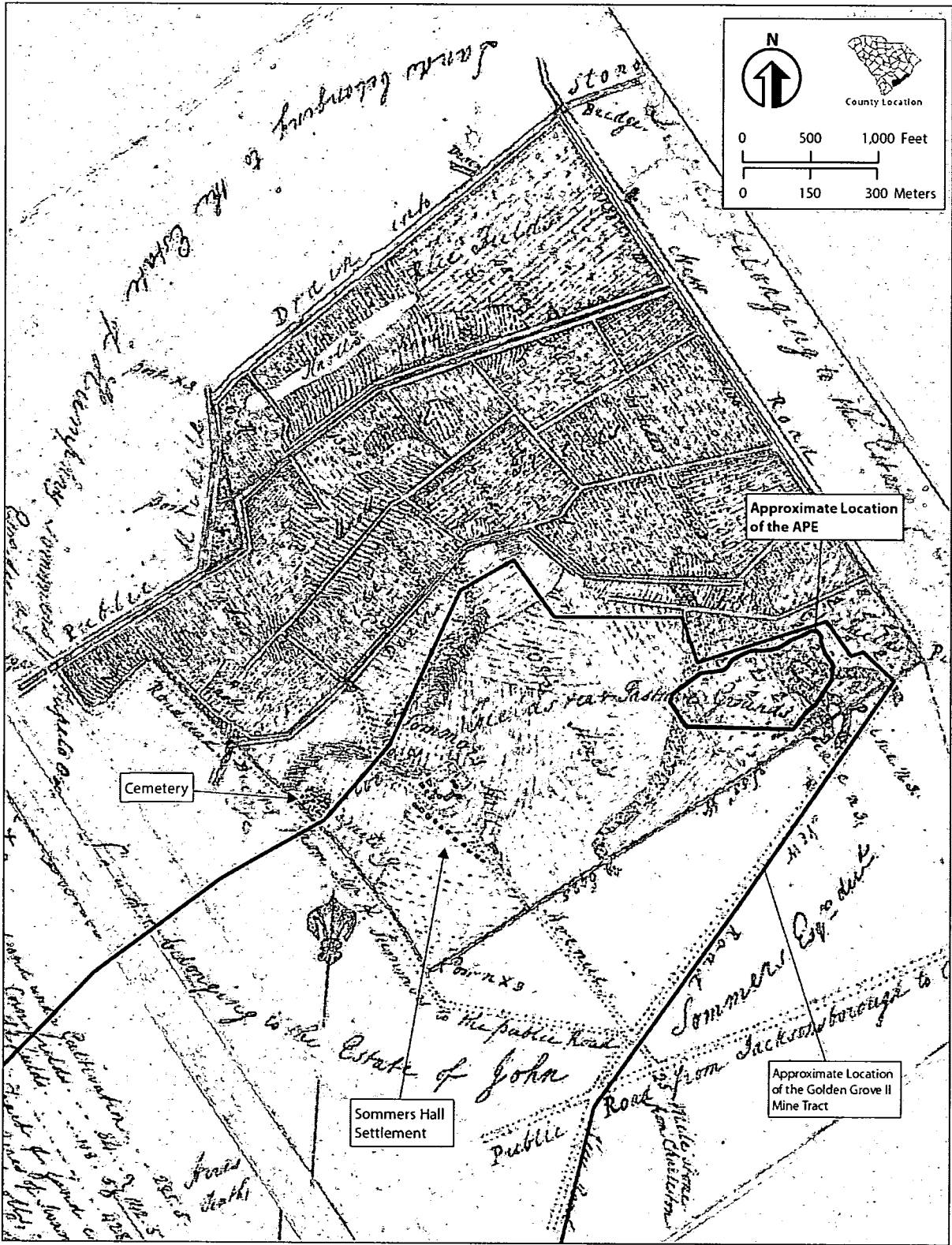


Figure 4.3 John Purcell's 1791 plat of the Sommers Hall Plantation with current tract boundary overlay.



## 5.0 Results of the Investigations

Brockington designed the intensive cultural resources survey to identify and assess all cultural resources within the 15-acre APE. During the survey, we revisited one site (38CH2526) and identified two new archaeological sites (38CH2618 and 38CH2619). A description of each of these cultural resources follows.

### **Site 38CH2526 (Revisited)**

*Cultural Affiliation – Early Woodland*

*Site Type – Artifact scatter*

*Site Dimensions – 165 m north-south by 225 m east-west*

*Elevation – 12 m (39 ft) above mean sea level (amsl)*

*Nearest Water Source – Caw Caw Swamp*

*Present Vegetation – Open field*

*NRHP Recommendation – Not Eligible*

*Management Recommendations – No further management*

Site 38CH2526 is a broad subsurface scatter of pre-contact artifacts located in the eastern portion of the APE (Figure 1.1). The site measures approximately 165-by-225 m. Vegetation at Site 38CH2526 consists of low-lying grasses within an open field. We defined the site's boundary by negative shovel tests in all cardinal directions.

Site 9CH2526 was recorded by Terracon in 2017 (Green and Linck 2017). Investigators described the site as a small Woodland or Mississippian period lithic and ceramic scatter from four positive shovel tests (Green and Linck 2017:32) Terracon excavated a total of 14 shovel tests in and around the site. A total of nine artifacts that include one plain sand-tempered sherd, two unidentified sherds, and three residual sherds. Lithic artifacts consisted of three pieces of coastal plain chert debitage. None of the artifacts are temporally diagnostic. Terracon evaluated Site 38CH2526 under Criteria D. According to Terracon, "Site 38CH2526 contains relatively few artifacts, no temporally diagnostic artifacts, and little artifact diversity. As such, the site is unlikely to yield significant information about the prehistory of Charleston County." (Green and Linck 2017:35). Site 38CH2526 was recommended as being not eligible for inclusion in the NRHP. In 2017, SHPO concurred with this recommendation (see Appendix B). Figure 5.1 presents Terracon's site plan of 38CH2526.

Investigators revisited the site and expanded its boundary in all directions. Investigators excavated a total of 115 shovel tests at 15-meter intervals in and around the site; 38 of these tests produced artifacts. Figure 5.2 presents the site plan for 38CH2526, 38CH2618, and 38CH2619. Shovel tests exposed a two-zone soil horizon that includes a 10YR 5/2 grayish-brown sand (0-45 cmbs) plow zone. Ap horizon is underlain by a 10YR 6/6 brownish-yellow sand subsoil E horizon (45-80 cmbs). Artifacts occurred within the upper 60 cm of most positive shovel tests.

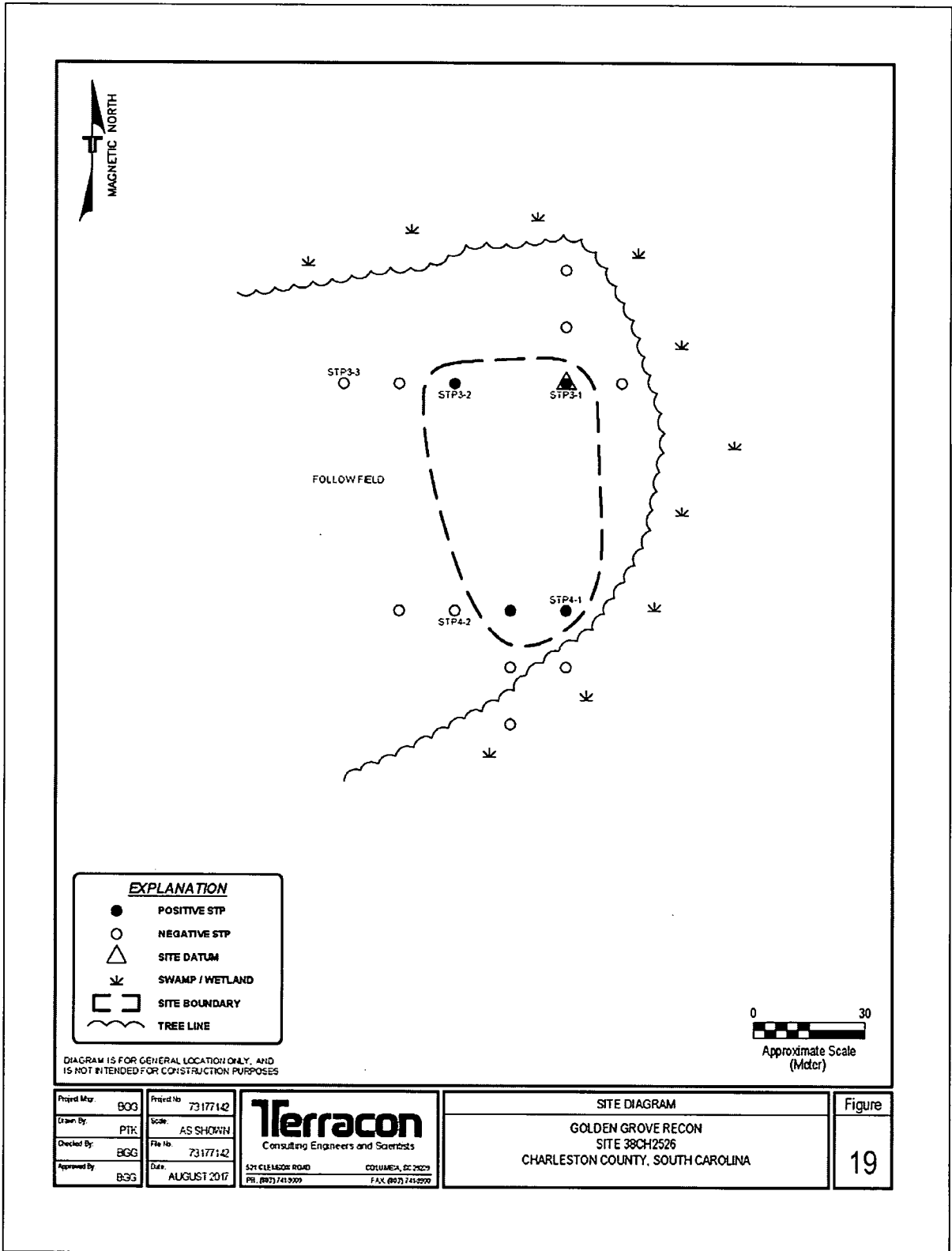


Figure 5.1 Terracon's site plan of 38CH2526.

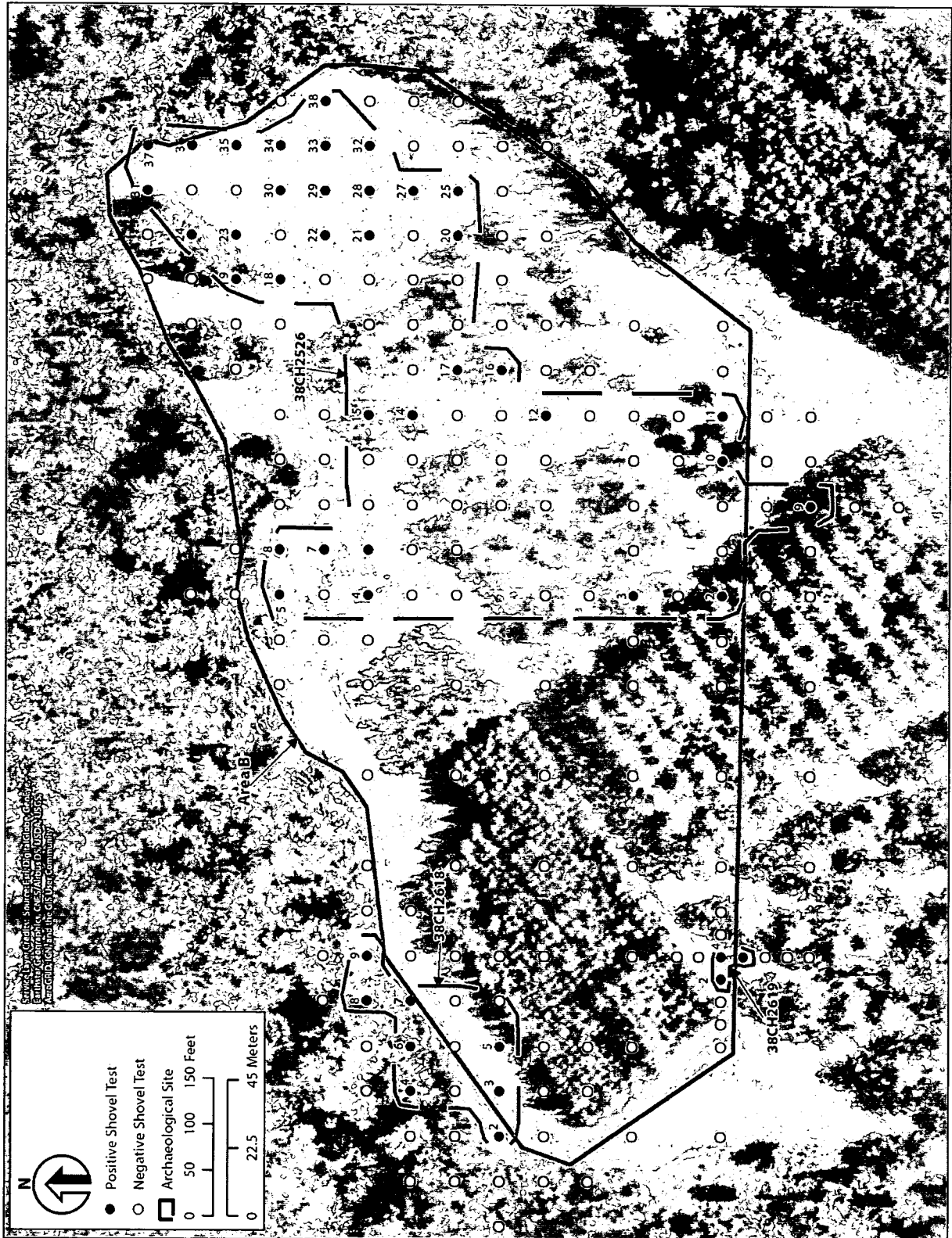


Figure 5.2 The site plan for 38CH2526, 38CH2618, and 38CH2619.



Investigators recovered a total of 94 pre-contact artifacts that include 74 ceramic sherds, 18 lithic flake fragments, and two small fired-clay fragments (11 grams). In addition, two small post-contact brick fragments (3 grams) were also found intermixed with the upper Ap horizon. Undiagnostic pre-contact pottery dominated the recovery with 37 residual/eroded sand-tempered sherds and 15 plain body sand-tempered sherds, representing 81 percent of the ceramic assemblage. Diagnostic pottery included one Stallings Plain sherd, 13 Refuge Dentate Stamped sand-tempered sherds, one Refuge Dentate Stamped grog-tempered sherd, two Refuge Punctated Stamped sherds, two Deptford Checked Stamped sherds, and three Deptford Cord Marked sand-tempered body sherds. Stallings Plain sherd is associated with the Late Archaic period and the Refuge sherds are associated with the Early Woodland period. The Deptford Series pottery is diagnostic to the Early/Middle Woodland period. Lithic artifacts included 14 Coastal Plain chert flake fragments, two utilized chert flake tools, and two Quartzite flake fragments.

***NRHP Eligibility and Management Recommendations.*** We re-evaluated 38CH2526 under NRHP Criterion D, which requires an archaeological site to yield, or be likely to yield, information important to history or prehistory (Savage and Pope 1998). We interpret 38CH2526 as an Early to Middle Woodland period seasonal resource extraction camp. Artifact recovery includes fragmented pottery and sparse lithic debitage from an Early to Middle Woodland period occupation (Refuge and Deptford). Artifact recovery shows that most of the pottery fragments (81 percent) are small eroded, plain, and residual sherds, and the lithic debitage is also small and fragmented. A small amount of diagnostic and decorative sherds (19 percent) are found in low concentrations in random shovel tests scattered throughout the middle and eastern sections of the site. The absence of features or dense concentrations of ceramics or lithic tools at 38CH2526 reveals that the encampment and the associated subsistence activities were short-lived and temporary. Our examination of 38CH2526 shows additional investigation of 38CH2526 is unlikely to generate information beyond the period of use (Early Woodland) and the presumed function (encampment). Therefore, we concur with the current NRHP status and recommend 38CH2526 as ***not eligible*** for the NRHP. Site 38CH2526 warrants no further management consideration.

#### **Site 38CH2618**

***Cultural Affiliation*** – Early Woodland

***Site Type*** – Artifact scatter

***Elevation*** – 11 m (32.7ft) amsl

***Nearest Water Source*** – Caw Caw Swamp

***Site Dimensions*** – 60 m n/s by 75 m e/w

***Present Vegetation*** – Open field

***NRHP/Management Recommendations*** – Not eligible/no further management

Site 38CH2618 is a 60-by-75-m subsurface scatter of pre-contact artifacts located in the northwest portion of the APE (see Figure 5.2). The site lies in an open field along the edge of the sloping terrace towards the hardwood forest of the Caw Caw Swamp.

Investigators excavated 32 shovel tests at 15-meter intervals within and around Site 38CH2618; eight of these shovel tests produced artifacts. Soils at the site generally consist of 10YR 5/2 grayish-brown sand (0-45 cmbs) underlain by a 10YR 6/6 brownish-yellow sand (45-60 cmbs). Artifacts were recovered from 0-40 cmbs. Investigators recovered a total of 13 pre-contact artifacts that included 12 ceramics, one Coastal Plain chert flake, and 0.9 grams of oyster shell. The ceramic assemblage included four sand-tempered plain sherds

and eight eroded/residual sand-tempered sherds. Only one sherd (Refuge) was found temporally diagnostic to the Early Woodland period.

We assessed the NRHP eligibility of Site 38CH2618 with respect to Criterion D. The artifact density is very low and is found as a displaced scatter. This site most likely represents an outlying artifact scatter associated with the neighboring short-term campsite epicenter (38CH2526). Additional investigation of 38CH2618 is unlikely to generate information beyond the period of use (Early Woodland) and its presumed function as an isolated displaced artifact scatter. The site cannot generate additional important information concerning past settlement patterns or land-use practices within the region. Therefore, we recommend 38CH2618 not eligible for the NRHP. Site 38CH2618 warrants no further management consideration.

#### **Site 38CH2619**

*Cultural Affiliation – Unknown Pre-Contact*

*Site Type – Artifact scatter*

*Elevation – 11 m (32.7ft) amsl*

*Nearest Water Source – Caw Caw Swamp*

*Site Dimensions – 15 m n/s by 15 m e/w*

*Present Vegetation – Open field*

*NRHP/Management Recommendations – Not eligible/no further management*

Site 38CH2619 is a 15-by-15-m subsurface scatter of pre-contact artifacts located in the southwestern portion of the APE (see Figure 5.2). The site lies in a small open field between stands of plant pine trees located on the ridge of the terrace that slopes northwest towards the Caw Caw Swamp.

Investigators excavated nine shovel tests at 7.5 and 15-meter intervals within and around 38CH2619; three of these shovel tests produced artifacts. Soils at the site generally consist of 10YR 5/2 grayish-brown sand (0-45 cmbs) underlain by a 10YR 6/6 brownish-yellow sand (45-60 cmbs). Artifacts were recovered from 0-40 cmbs. Investigators recovered a total of five pre-contact artifacts that include all eroded/residual sand-tempered sherds. No temporally diagnostic pottery was identified in the assemblage.

We assessed the NRHP eligibility of 38CH2619 with respect to Criterion D. Like 38CH2618, the artifact density is very low, and the assemblage contains no datable or recognizable characteristics. Additional investigation of 38CH2619 is unlikely to generate information beyond its presumed function as an isolated displaced artifact scatter. The site cannot generate additional important information concerning past settlement patterns or land-use practices within the region. Therefore, we recommend 38CH2619 not eligible for the NRHP. Site 38CH2619 warrants no further management consideration.

## 6.0 Summary and Recommendations

Brockington conducted an archaeological survey of a 15-acre portion of the Golden Grove II Mining Tract in Charleston County, South Carolina. Investigators revisited one site (38CH2526) and identified two archaeological sites (38CH2618 and 38CH2619) during the survey. These resources lack the potential to contribute meaningful information concerning the history or prehistory of the project tract or broader region. We recommend 38C2526, 38CH2618, and 38CH2619 *not eligible* for the NRHP. In addition, our review of outlying high potential areas of the Golden Grove II Mining Tract, identified as Areas C, D, F, and I and Golden Grove and Sommers Hall plantation settlements and cemetery, lie far outside of the proposed mining APE and will not be impacted. Lastly, the Stono Baptist Church Cemetery (Resource 506), is protected under South Carolina State Law and also lies well outside of the APE. The cemetery is screened by a dense vegetative buffer and will not be disturbed by the proposed undertaking. The surveyed portion of Area B on the Golden Grove II Mining Tract warrants no further consideration with respect to cultural resources.

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# **Appendix A**

## Artifact Catalog



# Golden Grove Survey Artifact Catalog

Brookington and Associates, Inc. uses the following proveniencing system. Provenience 1 designates general surface collections. Numbers after the decimal point designate subsequent surface collections, or trenches. Proveniences 2 to 200 designate shovel tests. Controlled surface collections and 50 by 50 cm units are also designated by this provenience range. For all provenience numbers except 1, the numbers after the decimal point designate levels. Provenience X.0 is a surface collection at a shovel test or unit. X.1 designates level one, and X.2 designates level two. Provenience 13.1 at 38CH2526 contained no cultural material.

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Site Number	Page Number
38CH2526	1-5
38CH2618	5
38CH2619	5

## Site Number: 38CH2526

Catalog #	Count	Weight (in g)	Artifact Description	Lithic Type	Ceramic Type	Temporal Range	Comments
<b>SITE NUMBER: 38CH2526</b>							
<i>Provenience Number:</i>							
1	1	4.9	2. 1 Shovel Test , N380, E440, 0-40 cmbs Plain Body Sherd, Fine/Medium Sand Tempered				
<i>Provenience Number:</i>							
1	1	0.1	3. 1 Shovel Test , N410, E440, 0-40 cmbs Conastal Plain Chert 1/4 inch Flake Fragment				
<i>Provenience Number:</i>							
1	1	1.8	4. 1 Shovel Test , N500, E440, 0-40 cmbs Residual Sherd				
<i>Provenience Number:</i>							
1	1	8.5	5. 1 Shovel Test , N530, E440, 0-35 cmbs Fired Clay Fragment,				
2	1	1.8	Conastal Plain Chert Utilized Flake Tool				
<i>Provenience Number:</i>							
1	1	2.4	6. 0 Shovel Test , N500, E455, Surface Residual Sherd				
<i>Provenience Number:</i>							
1	3	10.4	7. 0 Shovel Test , N515, E455, Surface Plain Body Sherd, Fine/Medium Sand Tempered				
2	1	2.9	Fired Clay Fragment,				
<i>Provenience Number:</i>							
1	2	2.2	8. 1 Shovel Test , N530, E455, 0-30 cmbs Residual Sherd				

**Site Number:** 38CH2526

<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Lithic Type</i>	<i>Ceramic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
2	3	1	Coastal Plain Chert 1/4 inch Flake Fragment				
3	0	1.5	Brick Fragment,				Discarded

*Provenience Number:*

9. 1	Shovel Test , N350, E470, 0-50 cmbs		
1	1	0.3	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake

*Provenience Number:*

10. 1	Shovel Test , N380, E485, 0-40 cmbs		
1	1	0.8	Residual Sherd

*Provenience Number:*

11. 1	Shovel Test , N380, E500, 0-30 cmbs		
1	1	3	Plain Body Sherd, Fine/Medium Sand Tempered
2	1	0.8	Residual Sherd

*Provenience Number:*

12. 1	Shovel Test , N440, E500, 0-30 cmbs		
1	1	1.1	Residual Sherd

*Provenience Number:*

14. 1	Shovel Test , N485, E500, 0-40 cmbs		
1	4	10	Dentate Body Sherd, Fine/Medium Sand Tempered

*Provenience Number:*

15. 1	Shovel Test , N500, E500, 0-30 cmbs		
1	1	3.2	Dentate Body Sherd, Fine/Medium Sand Tempered
2	1	3.7	Plain Base Sherd, Fine/Medium Sand Tempered

*Provenience Number:*

16. 1	Shovel Test , N455, E515, 0-40 cmbs		
1	1	0.2	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake

*Provenience Number:*

17. 1	Shovel Test , N470, E515, 0-30 cmbs		
1	1	2.4	Plain Body Sherd, Fine/Medium Sand Tempered

*Provenience Number:*

18. 1	Shovel Test , N530, E545, 0-40 cmbs		
1	1	5.3	Dentate Body Sherd, Fine/Medium Sand Tempered
2	2	9.7	Plain Base Sherd, Fine/Medium Sand Tempered

*Provenience Number:*

19. 1	Shovel Test , N545, E545, 0-40 cmbs		
1	1	1.7	Coastal Plain Chert Utilized Flake Tool

*Provenience Number:*

20. 1	Shovel Test , N470, E560, 0-50 cmbs		
1	1	0.5	Residual Sherd

**Site Number:** 38CH2526

<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Lithic Type</i>	<i>Ceramic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
<i>Provenience Number:</i> 21. 1 Shovel Test, N500, E560, 0-40 cmbs							
1	1	1.9	Residual Sherd				
<i>Provenience Number:</i> 22. 1 Shovel Test, N515, E560, 0-40 cmbs							
1	1	0.3	Quartzite 1/4 inch Flake Fragment				
<i>Provenience Number:</i> 23. 1 Shovel Test, N545, E560, 0-40 cmbs							
1	1	0.9	Residual Sherd				
<i>Provenience Number:</i> 24. 1 Shovel Test, N560, E560, 0-40 cmbs							
1	1	34.5	Dentate Base Sherd, Coarse Sand Tempered		Refuge	Early Woodland (1500 - 1000 BC)	
2	1	3.9	Dentate Body Sherd, Coarse Sand Tempered		Refuge	Early Woodland (1500 - 1000 BC)	
3	4	7.7	Residual Sherd				
<i>Provenience Number:</i> 25. 1 Shovel Test, N470, E575, 0-40 cmbs							
1	2	14.2	Dentate Body Sherd, Fine/Medium Sand Tempered		Refuge	Early Woodland (1500 - 1000 BC)	
2	1	3.1	Check Stamped Body Sherd, Fine/Medium Sand Tempered		Depitford	Early/Middle Woodland (1000 BC - AD 700)	
3	2	2.8	Residual Sherd				
4	1	0.5	Coastal Plain Chert 1/4 inch Flake Fragment				
5	0	1.4	Brick Fragment,				Discarded
<i>Provenience Number:</i> 26. 1 Shovel Test, N485, E575, 0-40 cmbs							
1	1	2.8	Residual Sherd				
<i>Provenience Number:</i> 27. 0 Shovel Test, N485, E575, Surface							
1	1	6.9	Punctated Body Sherd, Fine/Medium Sand Tempered		Refuge	Early Woodland (1500 - 1000 BC)	
<i>Provenience Number:</i> 28. 1 Shovel Test, N500, E575, 0-50 cmbs							
1	1	4	Plain Body Sherd, Small Grog Tempered		Refuge	Early Woodland (1500 - 1000 BC)	
2	2	2.5	Residual Sherd				
3	1	0.1	Chert Bifacial Reduction 1/4 inch Flake				Hydrated
4	2	0.9	Chert 1/4 inch Flake Fragment				Hydrated
<i>Provenience Number:</i> 29. 1 Shovel Test, N515, E575, 0-40 cmbs							
1	1	0.8	Residual Sherd				
<i>Provenience Number:</i> 30. 1 Shovel Test, N530, E575, 0-40 cmbs							
1	1	4.3	Punctated Body Sherd, Fine/Medium Sand Tempered		Refuge	Early Woodland (1500 - 1000 BC)	
2	4	3.1	Residual Sherd				

**Site Number:** 38CH2526

<i>Provenience Number:</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Lithic Type</i>	<i>Ceramic Type</i>	<i>Temporal Range</i>	<i>Comments</i>
31. 1	1	6.4	Shovel Test , N575, E575, 0-40 cmbs				
	1	6.4	Check Stamped Rim Sherd, Fine/Medium Sand Tempered				Refuge-like Paste
	1	2.5	Plain Body Sherd, Coarse Sand Tempered				
32. 1	1	5.1	Shovel Test , N500, E590, 0-40 cmbs				
	1	11.5	Dentate Finger Impressed Rim Sherd, Fine/Medium Sand Tempered				
	3	2.1	Dentate Body Sherd, Fine/Medium Sand Tempered		Refuge	Early Woodland (1500 - 1000 BC)	
	1	0.8	Residual Sherd				
	1	0.2	Coastal Plain Chert Non-Cortical Core Reduction 1/4 inch Flake				
	2	0.2	Coastal Plain Chert 1/4 inch Flake Fragment				
33. 0	1	3.7	Shovel Test , N515, E590, Surface				
	1	3.7	Plain Body Sherd, Fine/Medium Sand Tempered				
34. 0	1	3.5	Shovel Test , N530, E590, Surface				
	1	0.6	Dentate and Eroded Body Sherd, Fine/Medium Sand Tempered		Refuge	Early Woodland (1500 - 1000 BC)	
	1	0.6	Residual Sherd				
35. 1	1	0.1	Shovel Test , N545, E590, 0-40 cmbs				
	1	0.1	Coastal Plain Chert 1/4 inch Flake Fragment				
36. 1	1	1.4	Shovel Test , N560, E590, 0-40 cmbs				
	1	1.4	Residual Sherd				
	1	1.4	Quartzite 1/2 inch Flake Fragment				
37. 1	1	2.1	Shovel Test , N575, E590, 0-40 cmbs				
	1	2.1	Plain Bowl Rim Sherd, Fiber Tempered		Stallings	Late Archaic (2500 - 1500 BC)	
	1	2.1	Plain Body Sherd, Fine/Medium Sand Tempered				
	2	6.2	Plain Body Sherd, Coarse Sand Tempered				
	7	8.4	Residual Sherd				
38. 0	1	33.3	Shovel Test , N515, E605, Surface				
	3	33.3	Cord Marked Body Sherd, Fine/Medium Sand Tempered		Deptford	Early/Middle Woodland (1000 BC - AD 700)	
	1	3.7	Plain Body Sherd, Fine/Medium Sand Tempered				
	1	1.7	Residual Sherd				

**Site Number:** 38CH2618

Catalog #	Count	Weight (in g)	Artifact Description	Lithic Type	Ceramic Type	Temporal Range	Comments
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**SITE NUMBER:** 38CH2618**Provenience Number:** 2. 1 Shovel Test , N455, E260, 0-40 cmbs

1	1	3.7	Plain Jar Rim Sherd, Fine/Medium Sand Tempered				
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**Provenience Number:** 3. 1 Shovel Test , N455, E275, 0-30 cmbs

1	1	8.1	Plain Body Sherd, Fine/Medium Sand Tempered				
2	0	0.9	Oyster, Discarded				Discarded

**Provenience Number:** 4. 1 Shovel Test , N485, E275, 0-40 cmbs

1	2	4.6	Residual Sherd				
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**Provenience Number:** 5. 1 Shovel Test , N455, E290, 0-30 cmbs

1	1	1.1	Residual Sherd				
---	---	-----	----------------	--	--	--	--

**Provenience Number:** 6. 1 Shovel Test , N485, E290, 0-40 cmbs

1	1	5	Plain Body Sherd, Fine/Medium Sand Tempered		Refuge	Early Woodland (1500 - 1000 BC)	
2	1	3.5	Plain Body Sherd, Fine/Medium Sand Tempered				
3	1	1.5	Residual Sherd				

**Provenience Number:** 7. 1 Shovel Test , N485, E305, 0-40 cmbs

1	1	2	Residual Sherd				
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**Provenience Number:** 8. 1 Shovel Test , N500, E305, 0-30 cmbs

1	1	1.3	Residual Sherd				
2	1	0.6	Coastal Plain Chert Non-Cortical Bifacial Reduction 1/4 inch Flake				

**Provenience Number:** 9. 1 Shovel Test , N500, E320, 0-30 cmbs

1	2	1	Residual Sherd				
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**SITE NUMBER:** 38CH2619**Provenience Number:** 2. 1 Shovel Test , N380, E312.5, 0-40 cmbs

1	2	3.5	Residual Sherd				
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**Provenience Number:** 3. 1 Shovel Test , N372.5, E320, 0-30 cmbs

1	1	3.5	Eroded Body Sherd, Fine/Medium Sand Tempered				
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**Provenience Number:** 4. 1 Shovel Test , N380, E320, 0-30 cmbs

1	2	4	Residual Sherd				
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**Appendix B**  
Consultation and Correspondence



November 21, 2017

William Green, M.A., RPA  
Group Manager, Natural and Cultural Resources  
Terracon Consultants, Inc.  
521 Clemson Road  
Columbia, SC 29229

Re: Gold Grove II Mining Tract CRRS  
Charleston County, South Carolina  
SHPO Project No. 17-EJ0094

Dear William Green:

Thank you for your letter of August 24, 2017, which we received on October 25, 2017, regarding the above-referenced project. We also received the draft report, *Cultural Resources Reconnaissance Survey of Approximately 595 Acres at the Golden Grove II Mining Tract Charleston County, South Carolina* as supporting documentation for this undertaking. The State Historic Preservation Office (SHPO) is providing comments to the South Carolina Department of Health and Environmental Control (DHEC) pursuant to the South Carolina Mining Act (SC Code Title 48, Chapter 20, Sections 10-310) and its implementing regulations found at Chapter 89-120(C)(4) of the SC Code of Regulations. Consultation with the SHPO is not a substitution for consultation with Tribal Historic Preservation Offices, other Native American tribes, local governments, or the public.

The reconnaissance survey identified archaeological and historic resources within and immediately adjacent to the approximately 595 acre project area and evaluated their eligibility for inclusion in the National Register of Historic Places (NRHP). Three newly recorded archaeological sites (38CH2526, 38CH2527, and 38CH2528) were identified in addition to three isolated finds (IF-1 – IF-3). Site 38CH2526 and the three isolated finds (IF-1 – IF-3) were recommended as not eligible for listing in the NRHP. Sites 38CH2527 and 38CH2528 were unevaluated and recommend for additional work to determine their NRHP eligibility. One previously recorded above-ground resource (SHPO Site Number 0506.00-0506.001) was revisited and five newly recorded above-ground resources (SHPO Site Numbers 7928-7932) were identified. All five newly recorded resources (7928-7932) were recommended as not eligible for listing in the NRHP. Based on the results of the survey, a Phase I archaeological survey was recommended for 72 acres in Areas B, C, D, F, and I in addition to additional work at sites 38CH2527 and 38CH2528. Our office concurs with these recommendations.

Our office has additional technical comments on the report that we ask to see addressed (please see attached). We will accept the report as final once these comments are addressed; there is no need to send a revised draft for review. To complete the reporting process, please provide at least three (3) hard copies of

a final report: one (1) bound hard copy and a digital copy in ADOBE Acrobat PDF format for the SHPO; one (1) bound and one (1) unbound hard copies and a digital copy in ADOBE Acrobat PDF format for SCIAA. Investigators should send all copies directly to the SHPO. The SHPO will distribute the appropriate copies to SCIAA. Please ensure that a copy of our comments letter is included in the Appendices and Attachments of the final report. Please also provide electronic PDF copies of the architectural survey forms.

Please provide GIS shapefiles for the surveyed area (and architectural sites as applicable). Shapefiles for identified archaeological sites should be coordinated with SCIAA. Shapefiles should be compatible with ArcGIS (.shp file format) and should be sent as a bundle in .zip format. Please see our GIS Data Submission Requirements and shapefile templates that are available in the left side bar on the following webpage <http://shpo.sc.gov/research/Pages/ArchSite.aspx>. SHPO recommends e-mailing the shapefiles to the address link on the noted webpage or using a File Transfer Protocol website such as WeTransfer.com to send large files.

Please refer to SHPO Project Number 17-EJ0094 in any future correspondence regarding this project. If you have any questions, please contact me at (803) 896-6181 or [KLewis@scdah.sc.gov](mailto:KLewis@scdah.sc.gov).

Sincerely,



Keely Lewis  
Archaeologist  
State Historic Preservation Office



### **Technical Comments**

- Throughout the report, please refer to above-ground resources by the four digit SHPO Site Number (i.e. 378-7928 should be referred to as 7928).
- Please ensure that draft survey reports and survey forms are submitted at the same time.
- Please ensure that the SHPO National Register Determination of Eligibility field on the Survey Forms is left blank on draft submittals. The field can be completed and submitted with the final copies, after SHPO has provided our determinations.
- Pg. 18-TYPO: “after he [the] revocation”.
- Pg. 19-TYPO: “Profits off [of] indigo increased”.
- Pg. 20-TYPO: “South Carolinian’s [Carolina’s] agricultural economy”.
- Pg. 35-TYPO: “none of the artifacts is [are] temporally diagnostic”.
- Pg. 42, 45- Throughout site summary for 38CH2528, references to 38CH2527 should be corrected to 38CH2528.

# APPENDIX 18

Archaeological Survey of Section B  
Golden Grove II Mining Tract – SHPO Letter



March 17, 2020

Larry B. James  
Principal Investigator  
Brockington

Re: Golden Grove II Mining Tract Section B  
Archaeological Survey  
Charleston County, South Carolina  
SHPO Project No. 17-EJ0094

Dear Larry James:

Thank you for your letter of February 22, 2020, regarding the above-referenced project. We also received the draft letter report, *Archaeological Survey of Section B Golden Grove II Mining Tract, Charleston County, South Carolina* as supporting documentation for this undertaking. The State Historic Preservation Office (SHPO) is providing comments to the South Carolina Department of Health and Environmental Control (DHEC) pursuant to the South Carolina Mining Act (SC Code Title 48, Chapter 20, Sections 10-310) and its implementing regulations found at Chapter 89-120(C)(4) of the SC Code of Regulations. Consultation with the SHPO is not a substitution for consultation with Tribal Historic Preservation Offices, other Native American tribes, local governments, or the public.

An intensive archaeological survey was conducted of a selected 15-acre portion of the 595-acre Golden Grove II Mining Tract. The survey was conducted in advance of the extension of their existing sand mining operation in the northeastern portion of the property. The 15-acre portion of the tract corresponds with Area B which our office previously recommended for additional Phase I archaeological survey in correspondence dated November 21, 2017.

During the survey, one previously recorded archaeological site (38CH2526) was revisited with its boundaries expanded and two newly recorded archaeological sites (38CH2618 and 38CH2619) were identified. Sites 38CH2526, 38CH2618 and 38CH2619 are recommended as not eligible for listing in the National Register of Historic Places (NRHP). Our office concurs with these recommendations. SHPO recommends that additional cultural resources survey is **not necessary** in Area B of the Golden Grove II Mining Tract. Area B is not likely to contain significant cultural and/or historical sites.

The report notes that an archaeological assessment of the historic land use of the tract was previously conducted. The assessment identified two historic settlements and the location of a cemetery depicted on a 1790/91 plat within the tract. These sites were not delineated or evaluated during the current survey but surface artifacts and metal detecting confirmed the location the historic settlements. No above-ground evidence of the cemetery was identified during the assessment, but the reports notes that it is presumed to

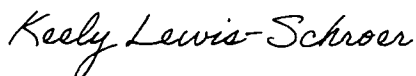
be in proximity to an extant earthen berm that corresponds with the overlay of the 1791 plat. The survey notes that Thompson has adopted a preservation plan for the historic settlement areas and the cemetery and their construction plans incorporate a 100-ft green-space buffer around each potential resource. Our office concurs that the area of the historic settlements, as depicted in Figure 2.2 of the report (attached), should be avoided by all-ground disturbance related to the mining activities with a 100-ft buffer or undergo intensive Phase I survey. The cemetery should be preserved and protected from ground disturbance in adherence with South Carolina laws governing cemeteries. We recommend that the location of the cemetery be recorded for future management of the tract. If the locations of the historic settlements are to be preserved in place, we recommend that the preservation area including the green space buffer be included on future mine maps.

Our office has additional technical comments on the report that we ask to see addressed (please see attached). We will accept the report as final once these comments are addressed; there is no need to send a revised draft for review. To complete the reporting process, please provide at least three (3) hard copies of a final report: one (1) bound hard copy and a digital copy in ADOBE Acrobat PDF format for the SHPO; one (1) bound and one (1) unbound hard copies and a digital copy in ADOBE Acrobat PDF format for SCIAA. Investigators should send all copies directly to the SHPO. The SHPO will distribute the appropriate copies to SCIAA. Please ensure that a copy of our comments letter is included in the Appendices and Attachments of the final report.

Please provide GIS shapefiles for the surveyed area. Shapefiles for identified archaeological sites should be coordinated with SCIAA. Shapefiles should be compatible with ArcGIS (.shp file format) and should be sent as a bundle in .zip format. For additional information, please see our [GIS Data Submission Requirements](#).

Please refer to SHPO Project Number 17-EJ0094 in any future correspondence regarding this project. If you have any questions, please contact me at (803) 896-6181 or [KLewis@scdah.sc.gov](mailto:KLewis@scdah.sc.gov).

Sincerely,



Keely Lewis  
Archaeologist  
State Historic Preservation Office

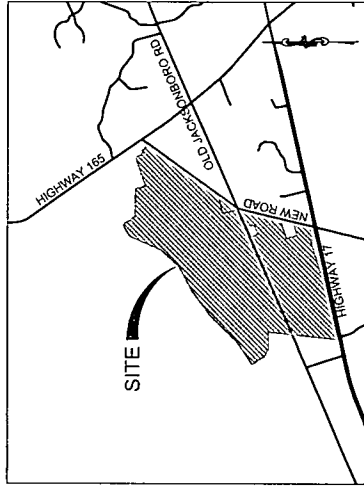
cc: Wendy Hamilton, DHEC-Mining

**Technical Comments**

p. 17, Site 38CH2526, para. 2- "9CH2526". Please correct.

p. 22, Summary- "38C[H]2526." Please correct.

# PROPOSED MASTER DEVELOPMENT PLAN FOR THE GOLDEN GROVE PLANNED DEVELOPMENT DISTRICT TOWN OF RAVENEL CHARLESTON COUNTY, SC



**SITE LOCATION MAP**



**OWNER:**

GOLDEN GROVE, LLC.  
3801 PARAMOUNT DRIVE  
NORTH CHARLESTON, SC 29405

**CIVIL ENGINEER:**

BOWMAN CONSULTING GROUP  
800 BROADWAY, SUITE 400  
CHARLESTON, SC 29401  
(843) 501-0333  
CONTACT: RICHARD WATERS, P.E.

**CONTACTS:**

CHARLES WATERS  
TOWN OF RAVENEL  
3801 PARAMOUNT DRIVE, SUITE 1100  
NORTH CHARLESTON, SC 29405  
CONTACT: CHARLES WATERS  
PHONE: (843) 777-4288

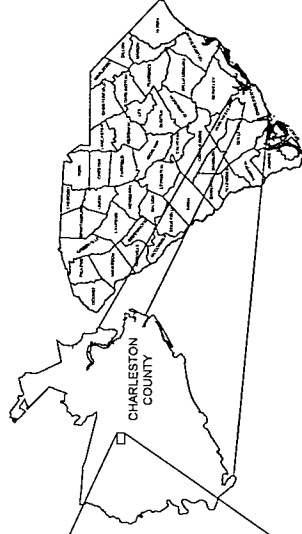
DOMINION ENERGY  
10000 WOODBRIDGE DRIVE  
MOUNT PLEASANT, SC 29465  
CONTACT: KEVIN WARD  
PHONE: (843) 670-0401

DOMINION ENERGY  
10000 WOODBRIDGE DRIVE  
MOUNT PLEASANT, SC 29465  
CONTACT: KEVIN WARD  
PHONE: (843) 670-0401

**UTILITY PROVIDERS:**

SEWER SERVICE PROVIDER  
TOWN OF RAVENEL  
WATER SERVICE PROVIDER  
CHARLESTON WATER SYSTEM  
ELECTRIC SERVICE PROVIDER  
DOMINION ENERGY  
GAS SERVICE PROVIDER  
DOMINION ENERGY

- PARCEL ID. NO.**
1. 182-000-0001
  2. 182-000-0002
  3. 182-000-0003
  4. 175-000-0048
  5. 175-000-0052
  6. 182-000-0062

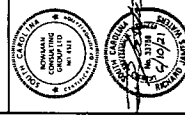


COVER SHEET

GOLDEN GROVE  
US Highway 17 & New Road  
Charleston County, South Carolina

**Bowman**

Bowman Consulting Group, LLC  
800 Broad Park Drive  
Suite 400  
Charleston, SC 29401  
Phone: (843) 501-0333  
Bowman Consulting Group, LLC



PLAN STATUS	DATE	DESCRIPTION
PRELIMINARY	10/10/2021	CONCEPTUAL THIRD-DRAW PLAN
FINAL	10/10/2021	CONCEPTUAL THIRD-DRAW PLAN

NO.	DESCRIPTION	DATE
1	TOWN OF RAVENEL	10/10/2021
2	TOWN OF RAVENEL	10/10/2021
3	TOWN OF RAVENEL	10/10/2021

**SUBMITTAL HISTORY**

NO.	DESCRIPTION	DATE
1	TOWN OF RAVENEL	10/10/2021
2	TOWN OF RAVENEL	10/10/2021
3	TOWN OF RAVENEL	10/10/2021

SHEET C001











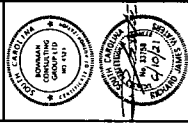






Bowman Consulting Group, Ltd.  
 880 Brent Park Drive  
 Suite 100  
 Charlotte, NC 28202  
 Phone: (410) 501-0233  
 Fax: (410) 501-0235  
 bowman@bcg.com

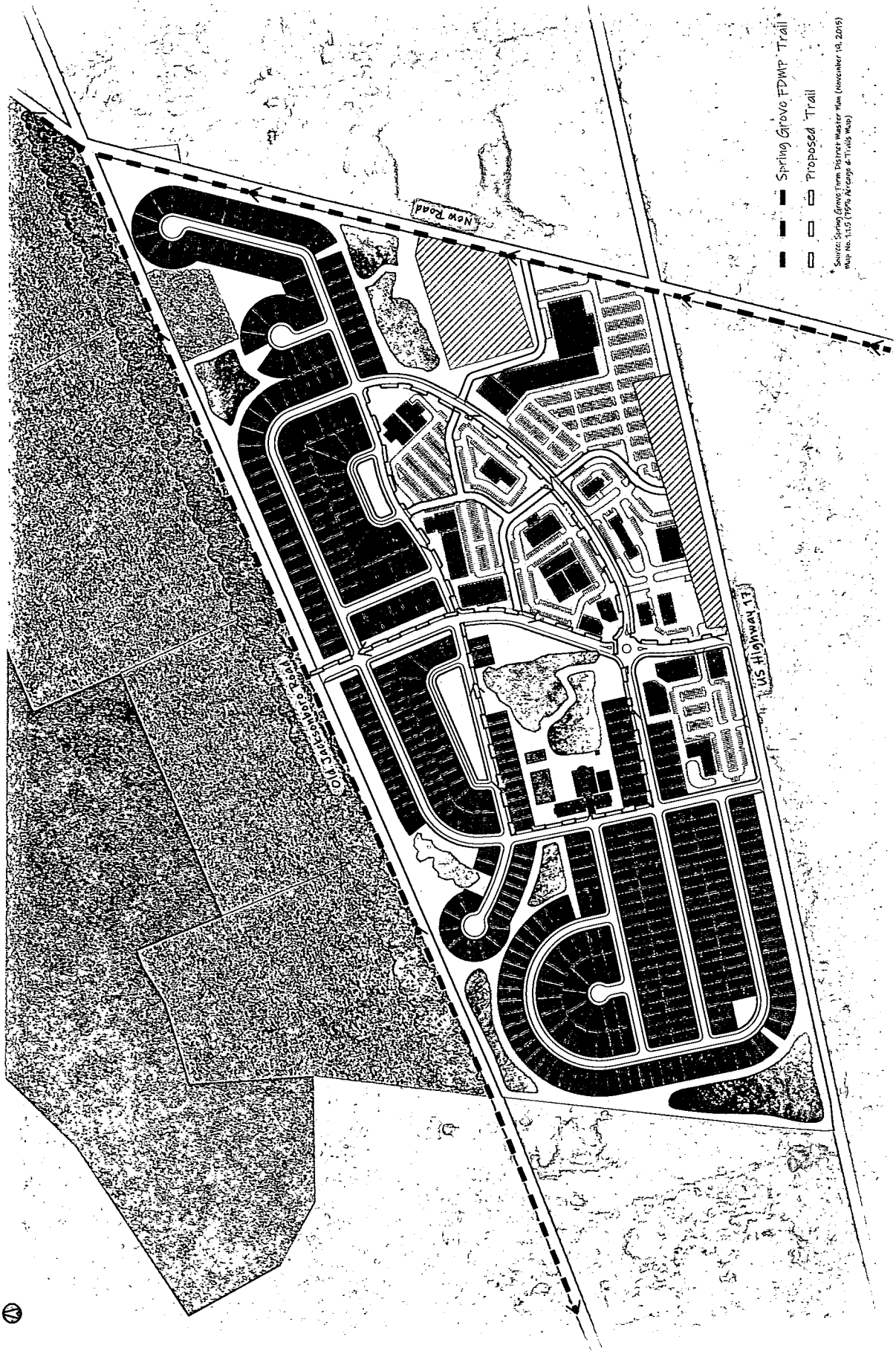
PEDESTRIAN AND BICYCLE CIRCULATION PLAN  
**GOLDEN GROVE**  
 US Highway 17 & New Road  
 Charleston County, South Carolina



PLAN STATUS	DATE	DESCRIPTION	BY	CHKD
DESIGN	06/10/2021	Spring Grove PDMP Trail	WVA	WVA
AS-BUILT		Proposed Trail		

Source: Spring Grove Tractor Master Plan (November 10, 2015)  
 Map No. 11.5 (15% Air Corps & Title Map)

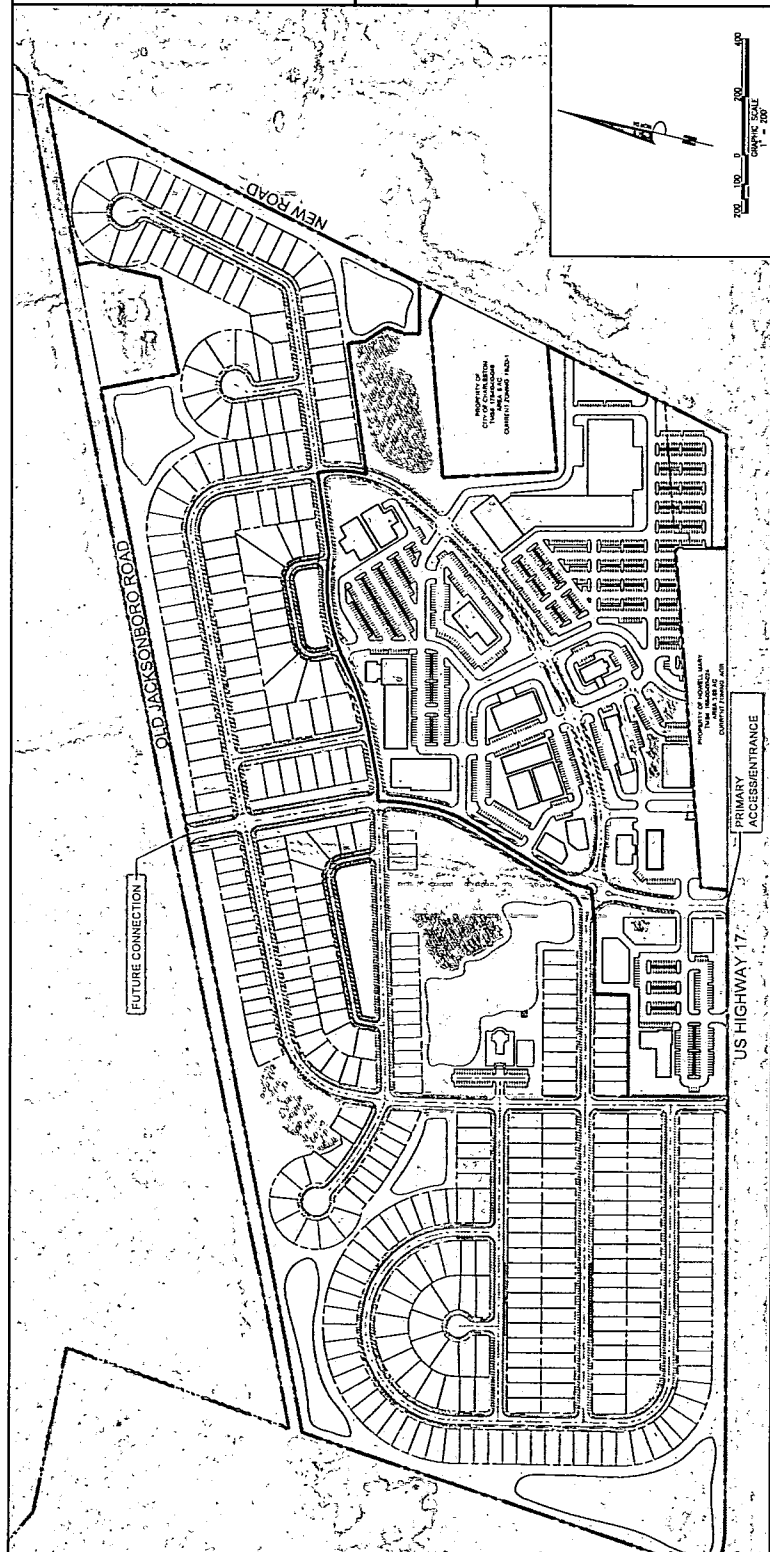
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 DATE: JUNE 10, 2021  
 SHEET C103



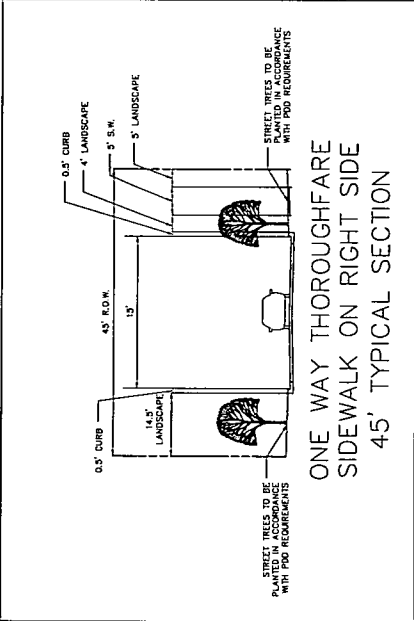


**LEGEND**

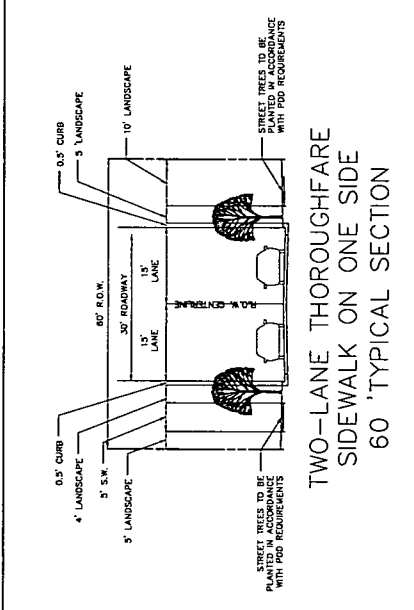
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Residential Land Bay	----
Commercial Land Bay	-----



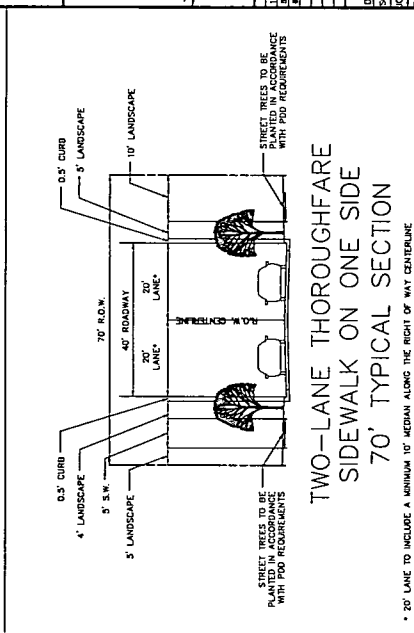
45' RIGHT OF WAY     
  60' RIGHT OF WAY     
  70' RIGHT OF WAY



SECTION 1



SECTION 2



SECTION 3







**GENERAL SWPPP NOTES:**

1. PROPOSED IMPROVEMENTS WITHIN THE PROJECT LIMITS SHALL BE CONSIDERED AS PART OF THE PHASES OF CONSTRUCTION, WHICH WILL BE DETERMINED AT THE TIME OF CONSTRUCTION. THESE PHASES OF CONSTRUCTION SHALL INCLUDE RESIDENTIAL, COMMERCIAL, INDUSTRIAL, AND AGRICULTURAL AREAS, AS WELL AS UTILITIES, TRANSPORTATION, AND PARKS.
2. THE PHASES OF CONSTRUCTION SHALL BE DETERMINED AT THE TIME OF CONSTRUCTION. CONSTRUCTION SHALL BE CONSIDERED TO BE THE GENERAL SEQUENCE OF CONSTRUCTION LISTED.
3. THE PROPOSED DEVELOPMENT WILL BE BUILT IN PHASES AND, AS THE PROJECT PROGRESSES, A STORMWATER POND SHALL BE CONSTRUCTED AND UTILIZED AS A STORMWATER POND. THE POND SHALL BE CONSTRUCTED AND UTILIZED AS A STORMWATER POND. THE POND SHALL BE CONSTRUCTED AND UTILIZED AS A STORMWATER POND.
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**SWPPP GENERAL SEQUENCE OF CONSTRUCTION:**

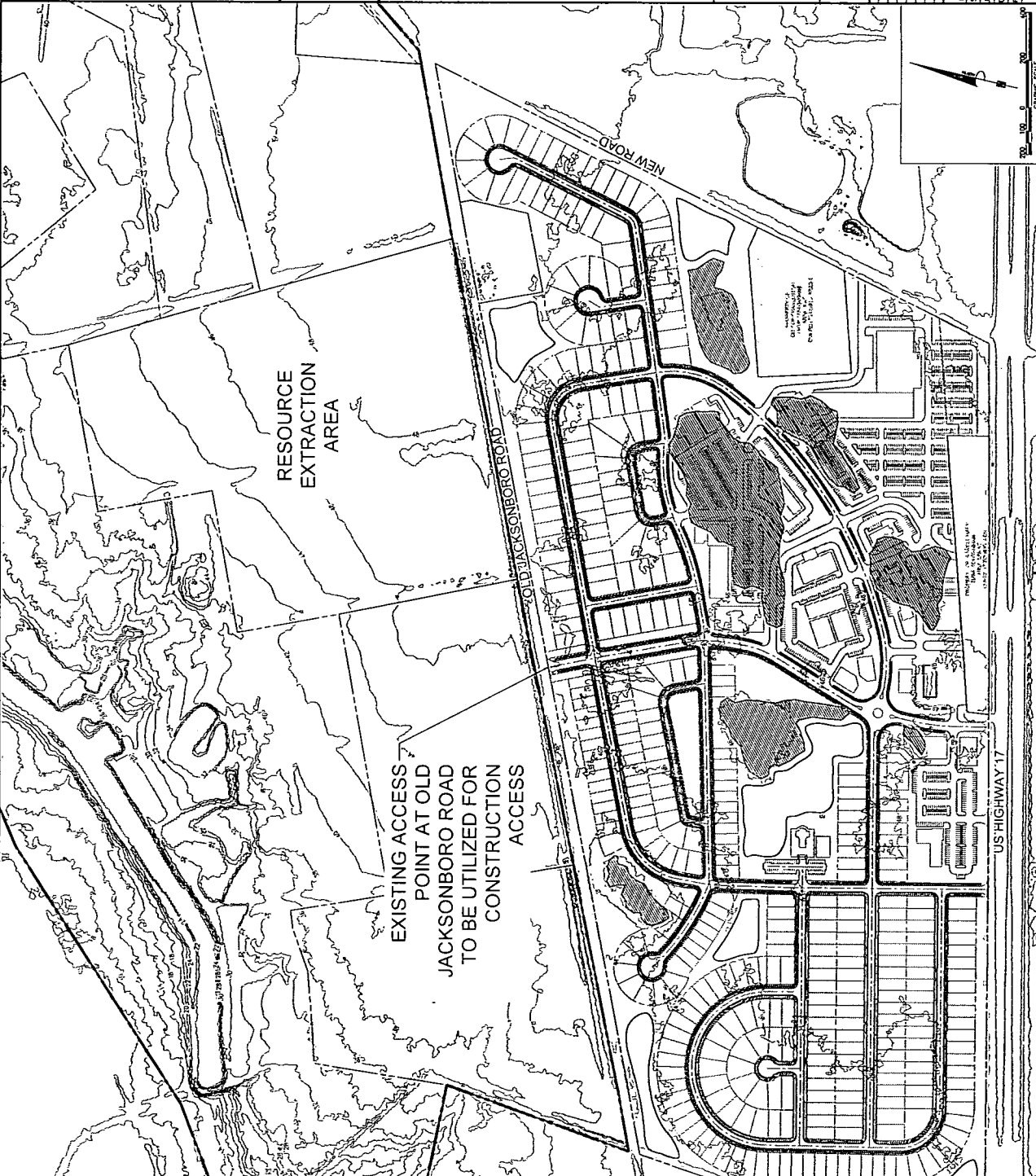
1. RECEIVE PERMITS FROM STATE AND LOCAL AGENCIES.
2. PRIOR TO ANY LAND DISTURBANCE ACTIVITY, CONTACT A SWPPP PRE-CONSTRUCTION CONSULTANT FOR LIMITED DEDICATION, CLEARING AND GRUBBING AS REQUIRED TO INSTALL CONSTRUCTION LIMIT AND PERMITTER BARRIERS.
3. MAINTAIN BARRIERS THROUGHOUT CONSTRUCTION.
4. COMPLETE DEDICATION, CLEARING AND GRUBBING ACTIVITIES FOR THE PORTION OF SITE IN ACCORDANCE WITH CLEARING AND DEMOLITION PLANS.
5. REMOVE TEMPORARY SEDIMENT TRAPS ONCE ALL LIPILL AREAS HAVE BEEN STABILIZED.
6. TEMPORARILY SEDIMENT TRAPS SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
7. GENERAL DRAINAGE.
8. PREPARE SITE FOR PAVING.
9. REMOVE TEMPORARY BARRIERS AND PERMITS AS NECESSARY.
10. REMOVE THE SEDIMENT TRAPS AND CONVERT TEMPORARY CONTROL DEVICES AND BARRIERS TO PERMANENT CONTROL DEVICES AND BARRIERS.
11. REMOVE ALL REMAINING TEMPORARY BARRIERS AND SEDIMENT CONTROL DEVICES AND BARRIERS.
12. CONTINUE WITH CONSTRUCTION UNTIL THE SITE IS FULLY STABILIZED AND THE PERMIT MAY BE TERMINATED.

**LEGEND**

- RESOURCE EXTRACTION LAND (RW)
- RESOURCE EXTRACTION LINE SEGMENT
- 1' USAR-DETERMINED CONTOUR
- WETLAND
- DISTURBED WETLAND
- STORMWATER POND

PROPOSED STORMWATER POND TO BE UTILIZED AS TEMPORARY SEDIMENTATION BASIN DURING CONSTRUCTION (TYP. OF ALL PROPOSED PONDS SHOWN)

\* THE SWPPP AND SEDIMENT CONTROL PLAN IS SUBJECT TO APPROVAL BY THE PERMITTING AGENCIES. \*\* CONTACT THE PERMITTING AGENCIES FOR THE LATEST REGULATORY REQUIREMENTS.



**Bowman**

Stormwater Consulting Group, LLC  
 880 Island Park Drive  
 Suite 100  
 Charleston, SC 29405  
 Phone: (843) 541-3333  
 bowman@bowmaneng.com

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)  
 GOLDEN GROVE  
 US Highway 17 & New Road  
 Charleston County, South Carolina

Professional Engineer Seal: JOHN W. BOWMAN, No. 11111, State of South Carolina  
 Professional Engineer Seal: JOHN W. BOWMAN, No. 11111, State of South Carolina

PLAN STATUS	DATE	DESCRIPTION
DATE	NO.	BY
DESIGN	1	JWB
DRAWN		
CHD		
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DATE	JUNE 10, 2021	
FILE NO.	160001-02-002	

SHEET C401





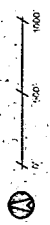
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2/17/21	TIME OF REVISION		
3/22/21	TIME OF REVISION		
DESIGN	DRAWN	CHD	
SCALE	1" = 1/4"		
JOB No.	130001-02-002		
DATE	JUNE 10, 2021		
FILE No.	130001-02-002-10		

**Land Bay Summary**

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130-88	130-88
130-89	130-89
130-90	130-90
130-91	130-91
130-92	130-92
130-93	130-93
130-94	130-94
130-95	130-95
130-96	130-96
130-97	130-97
130-98	130-98
130-99	130-99
130-100	130-100

**Land Use Summary**

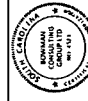
LAND USE	AREA (SQ FT)
Residential	60,371
Commercial	37,122
Public Use (Fire Station, Church, etc.)	386,181
Open Space	4,661
Other	19,078
Water	2,015
Unimproved	8,711
Highways	1,222
Other Public	21,873
Other	22,272
<b>TOTAL ACROSS:</b>	<b>911,644</b>



# Bowman

800 Hildreth Drive  
Charleston, SC 29322  
Phone (843) 541-0223  
Bowman Consulting Group, LLC  
Bowman Consulting Group, LLC

PROPOSED COMMUNITY RENDERINGS  
GOLDEN GROVE  
US Highway 17 & New Road  
Charleston County, South Carolina



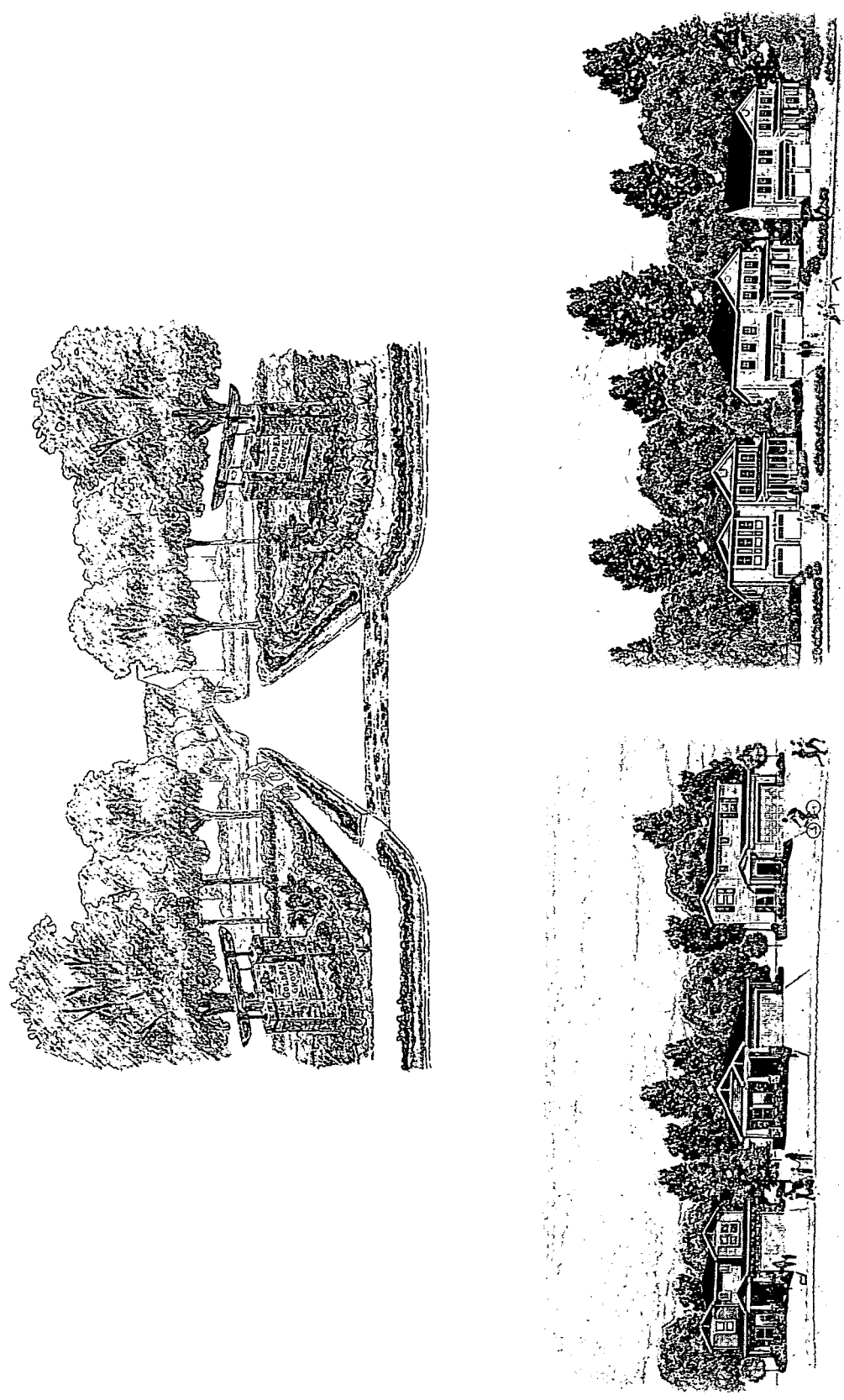
DATE: 6/10/2021  
DESIGN: RLB  
DRAWN: RLB  
SCALE: 1/4" = 1'-0"

PROJECT: GOLDEN GROVE  
SHEET: C700

DATE: JUNE 10, 2021  
FILE: No. 130001-02-002

DATE: JUNE 10, 2021  
FILE: No. 130001-02-002

SHEET C700



See the notes to the drawings for details. All drawings are the property of Bowman Consulting Group, LLC. No part of these drawings may be reproduced without the written consent of Bowman Consulting Group, LLC. 5/17/2021



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