PROJECT NARRATIVE, ENVIRONMENTAL PERMITS, GEOTECHNICAL REPORT AND PROJECT TECHNICAL SPECIFICATIONS

FOR

WILLOWBROOK LAKE DAM REPLACEMENT

MAY 2018
BID PACKAGE

PREPARED FOR:

BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA

PREPARED BY:

SIGMA CONSULTING GROUP, INC.
ENGINEERING CONSULTANTS

3298 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FL 32503
TELEPHONE: 850.332.7912

WILLOWBROOK LAKE DAM REPLCEMENT

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PROJECT NARRATIVE

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Project Narrative

Willowbrook Dam Replacement project consists of the replacement of the existing dam and spillway structure approximately 1.90 miles north of the intersection of Chemstrand Road and East – 9 Mile Road in Pensacola, Florida. The dam was damaged beyond repair during the April 2014 rain event and since that time the area upstream of the existing dam has been impounded by beaver dams. The scope of this project will consist of removing the existing embankment section and associated structures. The primary components of the replacement of the dam will consist of placing/installing a clay core, structural fill, a primary spillway/drop structure, sluice gate, trash rack, gangway, sand diaphragm, U-Type endwalls and slope armoring. Critical path items for the project will include following the project specific details associated with the environmental permits and the geotechnical report that are attached.

APPENDIX A

ENVIRONMENTAL PERMITS

Northwest Florida Water Management District

Carr Building, Suite 225, 3800 Commonwealth Blvd., MS LS225
Tallahassee, Florida 32399

Phone: (850) 921-2986 • Fax: (850) 921-3082

Brett J. Cyphers
Executive Director

August 31, 2016

Joy Jones
Escambia County
3363 W Park Pl
Pensacola, FL 32505-5250

RE: Notice of Final Agency Action - Approval
Individual Environmental Resource Permit
Project Number: IND-033-17510-1
Permit Name: Willowbrook Lake Dam Replacement

Dear Sir/Madam:

Enclosed is the approved individual Environmental Resource Permit for the above referenced project as authorized on August 31, 2016 by the Northwest Florida Water Management District.

Please be sure to read the enclosed permit and all exhibits in their entirety, paying close attention to the permit conditions in Exhibit A that require you to perform maintenance activities on your stormwater system and to have inspections performed by a Registered Professional at specified times throughout the life of the stormwater system.

Please be advised that you are required to fully execute and submit the following documents:

- "Construction Commencement Notice" [Form 62-330.350(1)] - Submitted to the District no later than 48 hours prior to commencement of any part of the activity authorized by the enclosed permit.

- "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)] Submitted to the District no later than 30 days after the activity has been completed.

Copies of these and other ERP forms are attached and are also available for download on the District website at http://www.nwfwmd.state.fl.us/permits/erp/erp_downloads.htm#erp_forms.

Please be advised that the District ***has not*** published a notice in the newspaper of local circulation advising the public that a permit has been issued for this activity. Publication, using the District form, notifies the public of their rights to challenge the issuance of this permit. If proper notice is given by publication, third parties have a 21-day time limit to file a petition opposing the issuance of the permit. If you do not publish, a party's right to challenge the issuance of the permit may extend indefinitely. If you wish to have certainty that the period for filing such a challenge is closed, then you may publish, at your expense, such a notice in a newspaper of general circulation. A sample notice form is attached for your information. If you choose to publish such a notice, please submit a copy to the District for our records.

The issuance of an Environmental Resource Permit for this activity does not eliminate the need to obtain all necessary permits or approvals from other agencies.

Should you have any questions regarding your permit or its conditions, please contact your permit reviewer, Ken Greenwood, at (850) 921-2986 or by e-mail: Ken.Greenwood@nwfwater.com and Ron Potts, at (850) 921-2986 or by e-mail: Ron.Potts@nwfwater.com

Sincerely,

Michael Bateman
P.E., Chief, Bureau of Environmental Resource Permitting

cc:

Consultant:
Rayne Mattson
Biome Consulting Group
1300 West Government Street
Pensacola, FL 32502

Paul M Heffernan
SigmaConsultingGroup
3298 Summit Blvd
Suite 32
Pensacola, FL 32503

Enc:

Environmental Resource Permit Number: IND-033-17510-1
Construction Commencement Notice [Form 62-330.350(1)]
As-Built Certification and Request for Conversion to Operational Phase [Form 62-330.310(1)]
Notice of Rights
Sample Newspaper Notice

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT

PERMIT NO: IND-033-17510-1 **DATE ISSUED:** August 31, 2016
PROJECT NAME: Willowbrook Lake Dam Replacement
CONSTRUCTION PHASE EXPIRATION DATE: August 31, 2021

A PERMIT AUTHORIZING:
Reconstruction of a failed dam for Willowbrook Lake Dam Replacement, a 2.15 acre project to be constructed per plans received by the District on August 25, 2016.

LOCATION:
Section(s): 22 Township(s): 1N Range(s): 30W

Escambia County

ISSUED TO:
Escambia County
3363 W Park Pl
Pensacola, FL 32505-5250

Permittee agrees to hold and save the Northwest Florida Water Management District and its successors harmless from any and all damages, claims, or liabilities which may arise from permit issuance. Said application, including all plans and specifications attached thereto, is by reference made a part hereof.

This permit does not convey to any permittee any property rights nor any rights or privileges other than those specified herein, nor relieve the permittee from complying with any law, regulation or requirement affecting the rights of other bodies or agencies. All structures and works installed by permittee hereunder shall remain the property of the permittee.

This permit is issued pursuant to Part IV of Chapter 373, Florida Statute (F.S.), and Chapter 62-330, Florida Administrative Code, (F.A.C.), and may be revoked, modified or transferred at any time pursuant to the appropriate provisions of Chapter 373, Florida Statutes.

This permit also constitutes certification compliance with water quality standards under Section 401 of the Clean Water Act, 33 U.S. Code 1341.

PERMIT IS CONDITIONED UPON:

See conditions on attached “Exhibit A”, dated August 31, 2016

AUTHORIZED BY: Northwest Florida Water Management District
Division of Resource Regulation

By: 

Michael Bateman, P.E.
Chief, Bureau of Environmental Resource Permitting

"EXHIBIT A"
CONDITIONS FOR ISSUANCE OF PERMIT NUMBER IND-033-17510-1
Willowbrook Lake Dam Replacement
DATED August 31, 2016

1. The repair of the facility authorized by this permit shall be completed, and the facility properly certified, as provided by Section 62-330.350(1)(f)2., F.A.C., within five years from the issuance date of the permit. However, the authorized work shall be completed within 180 days of its initiation. If the project cannot be completed within the required time frames, the permittee may request a one-time extension for a period not to exceed 90 days. The extension request must be submitted in writing at least 14 days prior to the expiration date of the deadline. The request must include information justifying the need for the extension and the planned completion date. The District, upon receipt and evaluation of the submitted request, shall grant the requested extension.

2. Construction activities shall be scheduled during a period of low flow and dry conditions in order to minimize the adverse impacts associated with increased runoff and erosion. The permittee shall institute necessary measures during the repair period to reduce erosion, turbidity, nutrient loading and sedimentation in the receiving waters.

3. The permittee is strongly encouraged to remove all trees, shrubs, and woody vegetation from both the front and back slopes of the embankment dam. Tree roots shall be grubbed for all trees located on the embankment that are greater than 6.0 inch DBH (diameter at breast height). The voids left shall be backfilled with a suitable soil, compacted, and stabilized.

4. The failed spillway shall be excavated and removed by utilizing cut-back slopes through the embankment and by following applicable safety regulations. This is to ensure safety and protection from cave-ins and to allow efficient bonding of the replaced material.

5. The Operation and Maintenance entity shall provide for water quality protection during the operation and maintenance of the completed facility by implementing the applicable recommended treatments and conservation best management practices (BMPs) identified in the permit application documents, and by implementing other BMPs as they become appropriate due to changing conditions or land uses.

6. The facility shall be maintained and operated in a safe and functional state. The Operation and Maintenance entity shall implement an operation and maintenance program, which includes inspection, testing, and maintenance of the approved facility. The operation and maintenance of the facility shall be conducted according to current engineering standards and criteria, and the following procedures:
    a. The facility's embankment, spillways, and other improvements shall be inspected at a minimum of semi-annually. Inspections shall assess the adequacy of present operation and maintenance activities, identify necessary maintenance work, identify unsafe conditions, and establish a time to relieve unsafe conditions and implement necessary maintenance work.
    b. The principal spillway's trashrack, inlets, pipes, and auxiliary spillways shall be inspected regularly for obstructions and deterioration. Obstructions shall be removed, and eroded areas repaired promptly. The protective coating of

materials shall be maintained as needed and according to manufacturers' recommendations.

c. Fences and structures shall not be installed on the emergency spillways or on the embankment.
d. The drain gate and valve of the facility shall be tested and operated periodically, at least one time per year.
e. The facility shall be mowed periodically to encourage a vigorous stand of grass groundcover and to prevent the establishment of non-desirable woody vegetation. Trees, shrubs, and other woody plants shall be removed from the embankment.
f. Eroded material shall be replaced and vegetation re-established. Revegetation of bare areas shall be undertaken promptly.

7. After completion and first filling, the facility shall be monitored for excessive seepage that might endanger the integrity of the structure. If seepage is identified as problematic, the facility will have to be dewatered and seepage control measures installed. If seepage control measures are necessary, the engineer shall submit a plan to the District for approval prior to its installation/implementation.

8. If the facility is not maintained in accordance with the terms and conditions of this permit, the facility shall be immediately dewatered. Failure to comply with stipulated terms and conditions of the permit may result in revocation of the permit.

9. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, F.A.C. Any deviations that are not so authorized may subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.

10. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

11. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the *State of Florida Erosion and Sediment Control Designer and Reviewer Manual (Florida Department of Environmental Protection and Florida Department of Transportation June 2007)*, and the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008)*, which are both incorporated by reference in subparagraph 62-330.050(9)(b)5., F.A.C., unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.

12. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice," [October 1, 2013], incorporated by reference herein

(http://www.flrules.org/Gateway/reference.asp?No=Ref-02505), indicating the expected start and completion dates.A copy of this form may be obtained from the Agency, as described in subsection 62-330.010(5), F.A.C. If available, an Agency website that fulfills this notification requirement may be used in lieu of the form.

13. Unless the permit is transferred under Rule 62-330.340, F.A.C., or transferred to an operating entity under Rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms and conditions of the permit for the life of the project or activity.

14. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:
    1. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex – "Construction Completion and Inspection Certification for Activities Associated With a Private Single-Family Dwelling Unit" [Form 62-330.310(3)]; or
    2. For all other activities – "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)].
    3. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.

15. If the final operation and maintenance entity is a third party:
    1. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as- built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.3 of Volume I) as filed with the Department of State, Division of Corporations and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
    2. Within 30 days of submittal of the as- built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.

16. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.

17. This permit does not:
    1. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;
    2. Convey to the permittee or create in the permittee any interest in real property;
    3. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
    4. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee

18. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under

Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.

19. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.

20. The permittee shall notify the Agency in writing:
    1. Immediately if any previously submitted information is discovered to be inaccurate; and
    2. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase

21. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.

22. If any prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, work involving subsurface disturbance in the immediate vicinity of such discoveries shall cease. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance and Review Section, at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Such subsurface work shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and notification shall be provided in accordance with Section 872.05, F.S.

23. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

24. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.

25. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.

26. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with subsection 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.

27. Once project construction has been deemed complete, including the re-stabilization of all side slopes, embankments, and other disturbed areas, and before the transfer to the Operation and Maintenance phase, all obsolete erosion control materials shall be removed.

28. **Record-keeping.** The permittee shall be responsible for keeping records documenting that relevant permit conditions are met. This documentation shall include, at a minimum, the date of each inspection, the name and qualifications of the inspector, any maintenance actions taken, and a determination by the inspector as to whether the system is operating as intended. Inspection documentation must be readily available and shall be provided at the District's request. Submittal of the inspection documentation to the District is not required.

NOTICE OF RIGHTS

Northwest Florida Water Management District
152 Water Management Drive, Havana, FL 32333-4712
(850) 539-5999 Fax (850) 539-2693
www.nwfwater.com

The following information addresses procedures to be followed if you desire an administrative hearing or other review of agency action.

PETITION FOR FORMAL ADMINISTRATIVE PROCEEDINGS

Any person whose substantial interests are or may be affected by the action described in the enclosed Notice of Agency Action, may petition for an administrative hearing in accordance with the requirements of section 28-106.201, Florida Administrative Code, or may choose to pursue mediation as an alternative remedy under section 120.573, Florida Statutes, before the deadline for filing a petition. Pursuit of mediation will not adversely affect the right to administrative proceedings in the event mediation does not result in a settlement. Petitions for an administrative hearing must be filed with the Agency Clerk of the Northwest Florida Water Management District, 81 Water Management Drive, Havana, Florida 32333-9700 by the deadline specified in the attached cover letter. Failure to file a petition within this time period shall constitute a waiver of any rights such person may have to request an administrative determination (hearing) under section 120.57, Florida Statutes, concerning the subject permit application. Petitions which are not filed in accordance with the above provisions are subject to dismissal.

DISTRICT COURT OF APPEAL

A party who is adversely affected by final agency action on the permit application and who has exhausted available administrative remedies is entitled to judicial review in the District Court of Appeal pursuant to section 120.68, Florida Statutes. Review under section 120.68, Florida Statutes, is initiated by filing a Notice of Appeal in the appropriate District Court of Appeal in accordance with Florida Rule of Appellate Procedure 9.110.

SECTION 28-106.201, FLORIDA ADMINISTRATIVE CODE, INITIATION OF PROCEEDINGS

(1) Unless otherwise provided by statute, and except for agency enforcement and disciplinary actions that shall be initiated under Rule 28-106.2015, F.A.C., initiation of proceedings shall be made by written petition to the agency responsible for rendering final agency action. The term "petition" includes any document that requests an evidentiary proceeding and asserts the existence of a disputed issue of material fact. Each petition shall be legible and on 8 1/2 by 11 inch white paper. Unless printed, the impression shall be on one side of the paper only and lines shall be double-spaced.

(2) All petitions filed under these rules shall contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, any e-mail address, any facsimile number, and telephone number of the petitioner, if the petitioner is not represented by an attorney or a qualified representative; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action;

(f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and

(g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

(3) Upon receipt of a petition involving disputed issues of material fact, the agency shall grant or deny the petition, and if granted shall, unless otherwise provided by law, refer the matter to the Division of Administrative Hearings with a request that an administrative law judge be assigned to conduct the hearing. The request shall be accompanied by a copy of the petition and a copy of the notice of agency action.

Rulemaking Authority 14.202, 120.54(3), (5) FS. Law Implemented 120.54(3) FS. History–New 4-1-97, Amended 9-17-98, 1-15-07, 2-5-13.

NOTICING PUBLICATION INFORMATION

The District's action regarding the issuance or denial of a permit, a petition or qualification for an exemption only becomes closed to future legal challenges from members of the public ("third parties"), if 1) "third parties" have been properly notified of the District's action regarding the permit or exemption, and 2) no "third party" objects to the District's action within a specific period of time following the notification.

Notification of "third parties" is provided through publication of certain information in a newspaper of general circulation in the county where the proposed activities are to occur. Publication of notice informs "third parties" of their right to have a 21-day time limit in which to file a petition opposing the District's action. However, if no notice to "third parties" is published, there is no time limit to a party's right to challenge the District's action. The District has not published a notice to "third parties" that it has taken final action on your application. If you want to ensure that the period of time in which a petition opposing the District's action regarding your application is limited to the time frame state above, you may publish, at your own expense, a notice in a newspaper of general circulation. A copy of the Notice of Agency Action the District uses for publication is attached. You may use this format or create your own, as long as the essential information is included.

If you do decide to publish a Notice of Final Agency Action, please provide the District a copy of the Proof of Publication when you receive it. That will provide us notice that action on this permit application is closed after the 21 days following publication.

Notice of Final Agency Action Taken by the
Northwest Florida Water Management District

Notice is given that Environmental Resource permit number IND-033-17510-1 was issued on August 31, 2016 to Joy Jones Escambia County for the construction of a new surface water management system Project is the repair of an existing failed dam for a recreational impoundment. The existing primary spillway will be removed and replaced by a concrete structure. An emergency overflow spillway will also be constructed at the primary spillway location. Portions of the dam will be replaced with suitable material placed to the design specifications. The project is located at North of Orby Street and South of Dye Street, Escambia County.

The file containing the application for this permit is available for inspection Monday through Friday (except for legal holidays), 8:00 a.m. to 5:00 p.m. at the Northwest Florida Water Management District's ERP Office, 180 E. Redstone Avenue, Crestview, FL 32539

A person whose substantial interests are affected by the District permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S., or may choose to pursue mediation as an alternative remedy under Section 120.573, Florida Statutes, and Rules 28-106.111 and 28-106.401-404, Florida Administrative Code. Petitions must comply with the requirements of Florida Administrative Code, Chapter 28-106 and be filed with (received by) the District Clerk located at District Headquarters, 81 Water Management Drive, Havana, FL 32333-4712. Petitions for administrative hearing on the above application must be filed within twenty-one (21) days of publication of this notice or within twenty-six (26) days of the District depositing notice of this intent in the mail for those persons to whom the District mails actual notice. Failure to file a petition within this time period shall constitute a waiver of any right(s) such person(s) may have to request an administrative determination (hearing) under Sections 120.569 and 129.57, F.S., concerning the subject permit. Petitions which are not filed in accordance with the above provisions are subject to dismissal.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the District's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the District on the application have the right to petition to become a party to the proceedings, the accordance with the requirements set forth above.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
41 NORTH JEFFERSON ST, SUITE 301
PENSACOLA, FLORIDA 32502

REPLY TO
ATTENTION OF

February 20, 2018

Regulatory Division
North Permits Branch
SAJ-2016-00603 (SP-HMM)

Escambia County Board of County Commissioners
Public Works Department
c/o Joy D. Blackmon, Director/County Engineer
3363 West Park Place
Pensacola, Florida 32505

Dear Ms. Blackmon:

The U.S. Army Corps of Engineers (Corps) is pleased to enclose the Department of the Army permit, which should be available at the construction site. Work may begin immediately but the Corps must be notified of:

a. The date of commencement of the work,

b. The dates of work suspensions and resumptions of work, if suspended over a week, and

c. The date of final completion.

This information should be mailed to the Special Projects and Enforcement Branch of the Regulatory Division of the Jacksonville District at 41 North Jefferson Street, Suite 301, Pensacola, FL 32502. The Special Projects and Enforcement Branch is also responsible for inspections to determine whether Permittees have strictly adhered to permit conditions.

IT IS NOT LAWFUL TO DEVIATE FROM THE APPROVED PLANS ENCLOSED.

Sincerely,

Shayne Hayes

for Donald W. Kinard
Chief, Regulatory Division

Enclosures
Copies Furnished:
Biome Consulting Group, Agent
Sigma Consulting Group, Engineer
USACE-CESAJ-RD-PE

DEPARTMENT OF THE ARMY PERMIT

Permittee: Escambia County Board of County Commissioners
Public Works Department
c/o Joy D. Blackmon, Director/County Engineer
3363 West Park Place
Pensacola, Florida 32505

Permit No: SAJ-2016-00603 (SP-HMM)

Issuing Office: U.S. Army Engineer District, Jacksonville

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: Fill 0.31 acre of wetlands to repair and replace a failed earthen dam structure that would re-impound waters of Clear Creek.

The work described above is to be completed in accordance with the 18 pages of drawings (Attachment 1) and 3 additional attachments affixed at the end of this permit instrument.

Project Location: The project is located on the west side of Chemstrand Road, north of Orby Street and south of Dye Street, in Section 22, Township 1 North, Range 30 West, in Pensacola, Escambia County, Florida.

Directions to site: From Pensacola, Interstate 110 north: take the 1-10 west exit to Mobile, then take exit 10B to merge onto US-29 north/Pensacola Blvd. towards Cantonment, then turn west on Detroit Boulevard/Johnson Avenue, then turn north on Chemstrand Road. The project will be located on the west side of Chemstrand Road, north of Orby Street and south of Dye Street.

Approximate Central Coordinates: *Latitude* 30° 33' 35.37" North
Longitude 87° 15' 42.49" West

PERMIT CONDITIONS

General Conditions:

1. The time limit for completing the work authorized ends on **January 29, 2023.** If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature and the mailing address of the new owner in the space provided, and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions. (Attachment 2)

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. **Reporting Address:** The Permittee shall submit all reports, notifications, documentation and correspondence required by the general and special conditions of this permit to the following address:

   a. For standard mail: U.S. Army Corps of Engineers, Regulatory Division, Special Projects and Enforcement Branch,41 North Jefferson St, Suite 301, Pensacola, FL 32502.

b. For electronic mail SAJ-RD-Enforcement@usace.army.mil (not to exceed 10 MB). The Permittee shall reference this permit number, SAJ-2016-00603 (SP-HMM), on all submittals.

2. **Commencement Notification:** Within 10 days from the date of initiating the authorized work, the Permittee shall provide to the Corps a written notification of the date of commencement of work authorized by this permit.

3. **Self-Certification:** Within 60 days of completion of the authorized work or at the expiration of the construction authorization of this permit, whichever occurs first, the Permittee shall complete the attached "Self-Certification Statement of Compliance" form (Attachment 3) and submit to the Corps. In the event that the completed work deviates, in any manner, from the authorized work, the Permittee shall describe, on the Self-Certification Form, the deviations between the work authorized by the permit and the work as constructed. Please note that the description of any deviations on the Self-Certification Form does not constitute approval of any deviations by the Corps.

4. **Erosion Control:** Prior to the initiation of any work authorized by this permit, the Permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the work area. Immediately after completion of the final grading of the land surface, all slopes, land surfaces, and filled areas shall be stabilized using sod, degradable mats, barriers, or a combination of similar stabilizing materials to prevent erosion. The erosion control measures shall remain in place and be maintained until all authorized work has been completed and the site has been stabilized.

5. **Turbidity Barriers:** Prior to the initiation of any of the work authorized by this permit, the Permittee shall install floating turbidity barriers with weighted skirts that extend to within 1 foot of the bottom around all work areas that are in, or adjacent to, surface waters. The turbidity barriers shall remain in place and be maintained until the authorized work has been completed and all suspended and erodible materials have been stabilized. Turbidity barriers shall be removed upon stabilization of the work area.

6. **Fill Material**: The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, debris, automotive parts, asphalt, construction materials, concrete block with exposed reinforcement bars, and soils contaminated with any toxic substance, in toxic amounts in accordance with Section 307 of the Clean Water Act.

7. **Eastern Indigo Snake Protection Measures and Inspection:** Permittee shall comply with U.S. Fish and Wildlife Service's "Standard Protection Measures for the Eastern Indigo Snake" dated August 12, 2013, which can be found at

https://www.fws.gov/northflorida/IndigoSnakes/20130812_Eastern_indigo_snake_Standard_Protection_Measures.htm. All gopher tortoise burrows, active or inactive, shall be evacuated prior to site manipulation in the vicinity of the burrow. If excavating potentially occupied burrows, active or inactive, individuals must first obtain state authorization via a Florida Fish and Wildlife Conservation Commission (FWC) Authorized Gopher Tortoise Agent permit. The excavation method selected shall minimize the potential for injury of an indigo snake. The Permittee shall follow the excavation guidance provided in the most current FWC Gopher Tortoise Permitting Guidelines found at http://myfwc.com/gophertortoise. If an indigo snake is encountered, the snake must be allowed to vacate the area prior to additional site manipulation in the vicinity. Holes, cavities, and snake refugia other than gopher tortoise burrows shall be inspected each morning before planned site manipulation of a particular area, and if occupied by an indigo snake, no work shall commence until the snake has vacated the vicinity of the proposed work.

8. **Mitigation Bank Credit Purchase:** Within 30 days from the date of initiating the work authorized by this permit, the Permittee shall provide verification to the Corps that 1.59 herbaceous federal mitigation bank credits have been purchased from the Pensacola Bay Mitigation Bank (SAJ-2007-04377). The required verification shall reference this project's permit number (SAJ-2016-00603).

9. **Regulatory Agency Changes**: Should any other regulatory agency require changes to the work authorized or obligated by this permit, the Permittee is advised that a modification to this permit instrument is required prior to initiation of those changes. It is the Permittee's responsibility to request a modification of this permit from the Pensacola Regulatory Office.

10. No building or fill materials, tools or other equipment shall be stockpiled in waters of the United States.

11. All contractors involved in this permitted activity shall be provided copies of this permit in its entirety. A copy shall remain on site at all times during construction.

12. **Cultural Resources/Historic Properties:**

    a. No structure or work shall adversely affect impact or disturb properties listed in the National Register of Historic Places (NRHP) or those eligible for inclusion in the NRHP.

    b. If during the ground disturbing activities and construction work within the permit area, there are archaeological/cultural materials encountered which were not the subject of a previous cultural resources assessment survey (and which shall include, but not be limited to: pottery, modified shell, flora, fauna, human remains, ceramics, stone tools or metal implements, dugout canoes, evidence of structures or any other physical remains that could be associated

with Native American cultures or early colonial or American settlement), the Permittee shall immediately stop all work and ground-disturbing activities within a 100-meter diameter of the discovery and notify the Corps within the same business day (8 hours). The Corps shall then notify the Florida State Historic Preservation Officer (SHPO) and the appropriate Tribal Historic Preservation Officer(s) (THPO(s)) to assess the significance of the discovery and devise appropriate actions.

c. Additional cultural resources assessments may be required of the permit area in the case of unanticipated discoveries as referenced in accordance with the above Special Condition; and if deemed necessary by the SHPO, THPO(s), or Corps, in accordance with 36 CFR 800 or 33 CFR 325, Appendix C (5). Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume on non-federal lands without written authorization from the SHPO for finds under his or her jurisdiction, and from the Corps.

d. In the unlikely event that unmarked human remains are identified on non-federal lands, they will be treated in accordance with Section 872.05 Florida Statutes. All work and ground disturbing activities within a 100-meter diameter of the unmarked human remains shall immediately cease and the Permittee shall immediately notify the medical examiner, Corps, and State Archeologist within the same business day (8-hours). The Corps shall then notify the appropriate SHPO and THPO(s). Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume without written authorization from the State Archeologist and from the Corps.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

   a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal projects.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision: This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be

required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions: General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE) (DATE) 2-14-18

Jay D. Blackmon
(PERMITTEE NAME-PRINTED)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Shayne Hayes 2-20-2018
(DISTRICT ENGINEER) (DATE)
for Jason A. Kirk,
Colonel, U.S. Army
District Commander

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. **To validate the *transfer* of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.**

_____ _____

(TRANSFEREE-SIGNATURE) (DATE)

_____

(NAME-PRINTED)

_____

(ADDRESS)

_____

(CITY, STATE, AND ZIP CODE)

Attachments to Department of the Army Permit Number SAJ-2016-00603

1. PERMIT DRAWINGS: Dated January 29, 2018 (18 pages)

2. WATER QUALITY CERTIFICATION: Specific Conditions of the water quality permit/certification in accordance with General Condition number 5 on page 2 of this DA permit. (4 pages)

3. SELF-CERTIFICATION FORM: (1 page)

BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

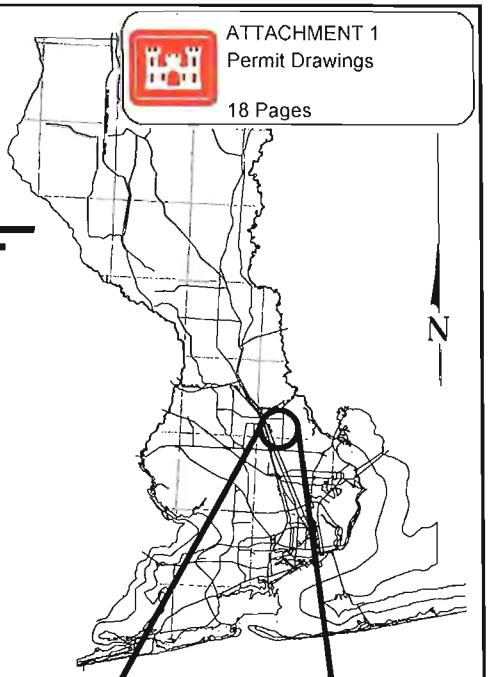
ATTACHMENT 1
Permit Drawings
18 Pages

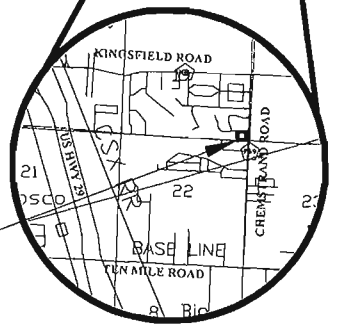
PLANS PROPOSED FOR

WILLOWBROOK LAKE DAM REPLACEMENT PROJECT

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION	
1	KEY SHEET	
2	GENERAL NOTES	
3	LEGEND	
4	SWPPP NOTES	
5	SWPPP DETAILS	
6	TYPICAL SECTION	
7	PROJECT LAYOUT & DEMO PLAN	
8	PLAN & PROFILE	
~~9 - 10~~	~~SPILLWAY DETAILS~~	NOT IN SET
11 - 20	CROSS SECTIONS	
~~21~~	~~DRAIN DIAPHRAGM DETAIL~~	NOT IN SET





PROJECT SITE

VICINITY MAP

PERMIT DRAWINGS - NOT FOR CONSTRUCTION
JULY 2016

SIGMA CONSULTING GROUP, INC.
3298 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7912
CERTIFICATE OF AUTHORIZATION #26889

PAUL M. HEFFERNAN
NAME
PRELIMINARY
SEE TITLE BLOCK
DATE
71379
LICENSE NO.

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

COMMISSIONERS

DISTRICT ONE	WILSON ROBERTSON
DISTRICT TWO	DOUG UNDERHILL
DISTRICT THREE	LUMON MAY
DISTRICT FOUR	GROVER C. ROBINSON, IV
DISTRICT FIVE	STEVEN BARRY

SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
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PROJECT MANAGER: Mrs. Liz Bush	
SECTION / TOWNSHIP / RANGE: 22 / T-1-N / R-30-W	DISTRICT: V
PROJECT ENGINEER: Paul M. Heffernan, P.E.	REG FLA ENG NO: 71379
SIGNATURE:	DATE:

GENERAL NOTES:

1. THE CONTRACTORS SHALL NOTIFY THE COUNTY DESIGN ENGINEER OR DESIGNEE 48 HOURS PRIOR TO CONSTRUCTION.
2. ALL CONDITIONS AND STIPULATIONS OF THE CONSTRUCTION PERMITS AND THE APPROVALS ISSUED BY THE ESCAMBIA COUNTY ENGINEER SHALL BE COMPLIED WITH IN EVERY DETAIL.
3. ALL ROADS DAMAGED BY CONSTRUCTION OPERATIONS ARE TO BE PATCHED OR RECONSTRUCTED AS DIRECTED BY THE COUNTY ENGINEER OR DESIGNEE.
4. THE CONTRACTOR SHALL TAKE STEPS NECESSARY TO PREVENT EROSION AND ANY OFF SITE SEDIMENT TRANSPORT RESULTING FROM INCREASED RUNOFF DURING CONSTRUCTION BY PROVIDING SILT FENCE AND/OR STAKED HAY BALES AS REQUIRED BY FDOT INDEX 102, THE FLORIDA STORMWATER, EROSION, AND SEDIMENT CONTROL INSPECTOR'S MANUAL, 2020 EDITION, OR AS INDICATED ON THE PLANS. ALL EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL ASSOCIATED DISTURBED AREAS ARE STABILIZED AS TO REDUCE SEDIMENT RUNOFF, UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR DESIGNEE.
5. ANY NECESSARY PERMITS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. ESCAMBIA COUNTY OR ITS DESIGNEE WILL ASSIST CONTRACTOR WITH REQUIRED PERMITS.
6. THE CONTRACTOR IS CAUTIONED TO VISIT THE SITE AND FAMILIARIZE HIMSELF WITH THE PROJECT PRIOR TO BIDDING AND/OR CONSTRUCTION.
7. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PRESERVE OR RELOCATE ALL BENCHMARKS (VERTICAL CONTROL) AS NEEDED DURING CONSTRUCTION. ALL PUBLIC OR PRIVATE CORNER MONUMENTATION SHALL BE PROTECTED. IF A PUBLIC OR PRIVATE CORNER MONUMENTATION IS IN DANGER OF BEING DESTROYED AND HAS NOT BEEN PROPERLY REFERENCED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR DESIGNEE IMMEDIATELY. ANY ESCAMBIA COUNTY HARN/GPS NETWORK MONUMENTS OR BUREAU OF SURVEY AND MAPPING GPS NETWORK MONUMENTS WITHIN THE LIMITS OF CONSTRUCTION SHALL BE PROTECTED. IF A HARN/GPS NETWORK MONUMENTS OR BUREAU OF SURVEY AND MAPPING GPS NETWORK MONUMENTS ARE DISTURBED OR DESTROYED THE CONTRACTOR SHALL BE RESPONSIBLE FOR RELACEMENT OF THE MONUMENTS AND HAVE THE MONUMENTS POSITION DETERMINED BY A FLORIDA LICENSED PROFESSIONAL SURVEYOR AND MAPPER USING GUIDELINES AS ESTABLISHED BY NATIONAL GEODETIC SURVEY FOR BLUE BOOKING AND APPROVAL.
8. EXISTING DRAINAGE FEATURES WITHIN CONSTRUCTION LIMITS SHALL REMAIN UNLESS OTHERWISE NOTED.
9. THE CONTRACTOR SHALL MATCH EXISTING CONDITIONS AT THE BEGINNING AND END OF CONSTRUCTION AS DIRECTED BY THE COUNTY ENGINEER OR DESIGNEE.
10. EXISTING STREETS AND DRIVES SHALL BE MAINTAINED TO LOCAL TRAFFIC AND PROPERTY OWNERS.
11. ALL ROADWAY CONSTRUCTION SHALL COMPLY WITH THE ESCAMBIA COUNTY TECHNICAL SPECIFICATIONS, LATEST EDITION.
12. ALL MATERIALS, TESTING AND CONSTRUCTION METHODS SHALL CONFORM TO THE ESCAMBIA COUNTY TECHNICAL SPECIFICATIONS, LATEST EDITION.
13. ANY REFERENCE TO FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, DIVISION 1, GENERAL REQUIREMENTS AND COVENANTS, SHALL BE EXCLUDED AND NOT APPLICABLE TO ANY SPECIFICATION REFERRED HEREIN OR OTHERWISE LISTED IN THESE PLANS OR RELATED DOCUMENTS OR THE ESCAMBIA COUNTY TECHNICAL SPECIFICATIONS.
14. EXISTING STREET AND ROAD NAME SIGNS ON THE PROJECT SHALL BE KEPT VISIBLE AT ALL TIMES FOR THE FACILITATION OF ACCESS BY EMERGENCY VEHICLES. ALL OTHER EXISTING SIGNS THAT CONFLICT WITH CONSTRUCTION OPERATIONS SHALL BE TAKEN DOWN AND STOCKPILED WITHIN THE R/W LIMITS BY THE CONTRACTOR AS DIRECTED BY THE COUNTY ENGINEER OR DESIGNEE. ANY EXISTING SIGNS THAT ARE TO BE RELOCATED AND ARE DAMAGED BEYOND USE BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
15. THE CONTRACTOR SHALL MAINTAIN AT LEAST ONE 10' OPEN LANE AT ALL TIMES. NO OPEN EXCAVATION SHALL REMAIN OVER NIGHT. CONTRACTOR SHALL RESTORE ROAD TO TWO LANES OF TRAFFIC AT THE END OF EACH WORK DAY.
16. CONTRACTOR SHALL COMPLY WITH ALL F.D.E.P. AND ARMY CORP. OF ENGINEERS REQUIREMENTS.
17. ONLY ACCESS TO THE ROAD R/W AS SHOWN IS GUARANTEED BY THE COUNTY. PRIVATE R/W REQUIRED BY THE CONTRACTOR TO FACILITATE CONSTRUCTION SHALL BE ACQUIRED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION OR ASSISTANCE FROM THE COUNTY.
18. IN THE EVENT THAT SURVEY MONUMENTATION OR REFERENCE POINTS ARE MISSING OR HAVE BEEN DESTROYED, PLEASE CONTACT:

DANNY SWAIN
ESCAMBIA COUNTY SURVEYOR
3363 WEST PARK PLACE
PENSACOLA, FLORIDA 32505 PH (850) 595-3427

DAVID GLAZE
PITTMAN GLAZE AND ASSOCIATES
5700 N DAVIS HWY #3
PENSACOLA, FL. 32303, (850) 434-6666

19. VEGETATION ON R/W AND EASEMENTS SHALL BE RESTORED TO ORIGINAL CONDITION UNLESS OTHERWISE NOTED ON THE PLAN SHEETS. COST OF SAID RESTORATION SHALL BE CONSIDERED INCIDENTAL TO OTHER PAY ITEMS.
20. GRADED AGGREGATE BASE SHALL BE REQUIRED WHERE THE SEASONAL HIGH GROUND WATER ENCROACHES WITHIN TWO (2) FEET OF THE BOTTOM OF BASE.
21. ALL TREES WITHIN LIMITS OF CONSTRUCTION SHALL BE REMOVED UNLESS OTHERWISE NOTED IN PLANS.
22. ALL COMPACTED FILL SHALL BE PLACED IN 4" LIFTS FOR HAND POWERED TAMPERS AND 8" LIFTS FOR HEAVY EQUIPMENT OPERATED TAMPERS.
23. MAINTENANCE OF TRAFFIC AS PER FDOT INDEX 600.
24. ALL SPEED BUMPS THAT ARE DISTURBED DURING CONSTRUCTION SHALL BE REPLACED TO THE LATEST ESCAMBIA COUNTY DESIGN SPECIFICATIONS. ALL COSTS FOR REPLACEMENT OF SAID SPEED BUMPS SHALL BE INCIDENTAL TO OTHER ITEMS AND NO ADDITIONAL COMPENSATION SHALL BE CONSIDERED.
25. ALL EXISTING MAILBOXES INTERFERING WITH NEW CONSTRUCTION SHALL BE RELOCATED OR REPLACED BY THE CONTRACTOR IN ACCORDANCE WITH POSTAL REQUIREMENTS AND IN ACCORDANCE WITH ESCAMBIA COUNTY TECHNICAL SPECIFICATION, FDOT DESIGN STANDARDS AND UNITED POSTAL REQUIREMENTS. ALL EXISTING BRICK MAILBOXES WITHIN LIMITS OF CONSTRUCTION OR COUNTY RIGHT OF WAY SHALL BE REMOVED AND PLACED ON THE PROPERTY LINE OF THE OWNER. CONTRACTOR SHALL REPLACE EXISTING BRICK MAILBOX WITH APPROVED PLASTIC BREAK AWAY MAILBOX.
26. THE CONTRACTOR SHALL, AT A MINIMUM, MATCH EXISTING SIGNING AND PAVEMENT MARKINGS. ALL SIGNING AND PAVEMENT MARKINGS SHALL BE PLACED IN ACCORDANCE WITH THE LATEST FDOT DESIGN STANDARDS. THE CONTRACTOR SHALL CONTACT THE COUNTY TRAFFIC DEPARTMENT PRIOR TO INSTALLATION OF ANY SIGNING AND PAVEMENT MARKINGS.
27. WHERE UNSUITABLE MATERIAL, AS DEFINED BY THE COUNTY SPECIFICATIONS SECTION 02300, 1.3(I), IS ENCOUNTERED IN THE AREAS PROPOSED FOR PAVING, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE COUNTY ENGINEER OR DESIGNEE PRIOR TO ANY EXCAVATION.
28. PIPE LENGTHS SHOWN IN THE PLANS DO NOT INCLUDE THE LENGTH OF PIPE THAT MUST BE INSTALLED WITH THE MITERED END SECTION. THEREFORE, ALL PIPES LENGTHS ASSOCIATED WITH MITERED END SECTIONS SHALL BE PAID FOR IN THE UNIT COST OF THE MITERED END SECTION.
29. IF ARCHAEOLOGICAL MATERIAL/PREHISTORIC ARTIFACTS SUCH AS POTTERY OR CERAMICS, STONE TOOLS OR METAL IMPLEMENTS, OR ANY OTHER PHYSICAL REMAINS THAT COULD BE ASSOCIATED WITH NATIVE AMERICAN CULTURES, OR EARLY COLONIAL OR AMERICAN SETTLEMENT ARE ENCOUNTERED AT ANY TIME, THE PROJECT SHOULD CEASE ALL ACTIVITIES INVOLVING SUBSURFACE DISTURBANCE IN THE IMMEDIATE VICINITY OF SUCH DISCOVERIES. THE APPLICANT/RECIPIENT, OR OTHER DESIGNEE, SHOULD CONTACT THE FLORIDA DEPARTMENT OF STATE, DIVISION OF HISTORICAL RESOURCES, THE STATE HISTORIC PRESERVATION OFFICER (SHPO) AND THE DSHP/EMA REGION IV ENVIRONMENTAL OFFICER AND FDEM'S STATE ENVIRONMENTAL LIAISON OFFICER FOR FURTHER GUIDANCE. PROJECT ACTIVITIES SHOULD NOT RESUME WITHOUT VERBAL AND/OR WRITTEN AUTHORIZATION FROM THE DIVISION OF HISTORICAL RESOURCES.
30. IN THE EVENT THAT UNMARKED HUMAN REMAINS ARE ENCOUNTERED DURING PERMITTED ACTIVITIES, ALL WORK MUST STOP IMMEDIATELY AND THE PROPER AUTHORITIES NOTIFIED IN ACCORDANCE WITH F.S. 872.05.

UTILITY NOTES:

1. THE LOCATION SHOWN FOR EXISTING UNDERGROUND UTILITIES IS APPROXIMATE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK IN EACH AREA. THE CONTRACTOR AGREES TO BE COMPLETELY RESPONSIBLE FOR ALL DAMAGES WHICH MIGHT OCCUR BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UTILITIES.
2. UTILITY OWNERS SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION SO THAT THE UTILITY OWNER CAN SPOT VERIFY AND/OR EXPOSE THEIR UTILITIES. KNOWN UTILITIES OWNERS INCLUDE:

SEWER/WATER - EMERALD COAST UTILITY AUTHORITY
MR. MIKE HAULIN
P.O. BOX 15311
PENSACOLA, FL. 32514 PH: (850) 969-3310

ELECTRIC - GULF POWER
MR. CHAD SWALLS
5120 DOGWOOD DRIVE
MILTON, FL. 32570 PH: (850) 479-2445

NATURAL GAS - ENERGY SERVICES OF PENSACOLA
MR. SHAWN HARRIS
1625 ATWOOD DRIVE
PENSACOLA, FL. 32514 PH: (850) 474-5310

CABLE - COX CABLE
MR. TROY YOUNG
2421 EXECUTIVE PLAZA
PENSACOLA, FL. 32504 PH: (850) 857-4564

TELEPHONE - AT&T FLORIDA
MR. HAL HINOTE
2221 INDUSTRIAL DRIVE
PANAMA CITY, FL. 32405 PH: (850) 913-3700

SUNSHINE STATE ONE-CALL
7200 LAKE ELLENOR DRIVE, SUITE 200
ORLANDO, FL. 32809 PH: (800) 432-4770

TRAFFIC DEPARTMENT - ESCAMBIA COUNTY PUBLIC WORKS
MRS. JOHNNY COX
3363 WEST PARK PLACE
PENSACOLA, FL. 32505 PH: (850) 595-3404

3. AT&T FLORIDA WILL COMPLETE ALL WORK DURING THE HOURS OF 7:30 AM - 4:30 PM, MONDAY THRU FRIDAY. NO NIGHT OR WEEKEND WORK/WORK.
4. ALL CABLE DAMAGE MUST BE REPORTED TO THE ATT FLORIDA REPAIR SERVICE DEPARTMENT AT 611 FROM A LAND LINE OR 877-737-2478 IF USING A CELL PHONE.
5. ALL LOOP DETECTOR INSTALLATION SHALL BE DONE AS PER FDOT INDEX 17781.
6. CONTRACTOR IS TO USE CAUTION WHEN WORKING IN OR AROUND AREAS OF OVERHEAD TRANSMISSION LINES AND UNDERGROUND UTILITIES.
7. UTILITIES TO REMAIN AND BE PROTECTED DURING CONSTRUCTION. NECESSARY REPAIRS SHALL BE CONSIDERED INCIDENTAL TO OTHER PAY ITEMS AND SHALL BE TO THE SATISFACTION OF UTILITY OWNERS.

DEWATERING NOTES:

1. DEWATERING IS EXPECTED FOR THE CONSTRUCTION OF THIS PROJECT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE DAM EMBANKMENT IS CONSTRUCTED IN DRY CONDITIONS. CONSTRUCTION AND DEMOLITION OF TEMPORARY DEWATERING SYSTEM INCLUDING ALL MATERIALS, LABOR, AND OTHER WORK EFFORT ANCILLARY TO THE SUCCESSFUL COMPLETION OF THIS CONSTRUCTION ACTIVITY SHALL BE EXCLUDED IN THE CONTRACT UNIT PRICE FOR DEWATERING, LUMP SUM. FOR ADDITIONAL SOILS INFORMATION AND SUBGRADE PREPARATION REFER TO PROJECT GEOTECHNICAL REPORT PREPARED BY: NOVA ENGINEERING AND ENVIRONMENTAL DATED JULY 12, 2016 (NOVA PROJECT NUMBER: 8016027).
2. DEWATERING MAY INCLUDE BUT NOT BE LIMITED TO COFFER DAM, WELL POINT SYSTEM, OR BYPASS METHODOLOGIES.
3. ALL DEWATERING COSTS ASSOCIATED WITH THE PERMITTING, INSTALLATION, MAINTENANCE AND CONSTRUCTION OF PROPOSED BYPASS PUMP SYSTEM SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR DEWATERING, LUMP SUM. THE CONTRACTOR SHALL SUBMIT FOR WATER USE PERMITS, IF REQUIRED FOR DEWATERING ACTIVITIES.
4. THE CONTRACTOR SHALL PROVIDE A DEWATERING DIVERSION PLAN FOR APPROVAL PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITIES.

GEOTECHNICAL NOTES:

1. FOR ADDITIONAL SOILS INFORMATION AND SUBGRADE PREPARATION REFER TO PROJECT GEOTECHNICAL REPORT PREPARED BY: NOVA ENGINEERING AND ENVIRONMENTAL DATED JULY 12, 2016 (NOVA PROJECT NUMBER: 8016027).

PAUL M. HOFFERNAN
NAME
PRELIMINARY
SEE TITLE BLOCK
DATE
71329
LICENSE NO.

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
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PERMIT DRAWING - NOT FOR CONSTRUCTION

SIGMA
CONSULTING GROUP, INC.
3208 SCENIC BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7512
CERTIFICATE OF AUTHORIZATION #30559

BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE
DAM REPLACEMENT

GENERAL NOTES

NO.	REVISION	DATE

Project Number: 16D101
Date: JULY 2016
Drawn By: C.W.H.
Designed By: P.M.H.
Checked By: J.L.L.
Sheet: 2

SURVEYOR'S NOTES:
1. The underground utilities shown have been located from field survey information and existing drawings. The surveyor has not physically located the underground utilities. The surveyor does not certify that the underground utilities shown comprise all such utilities or that they are the exact size, material, or location as indicated.
2. This survey does not reflect or determine ownership.
3. This survey is subject to any facts that may be disclosed by a full and accurate title search.
4. This survey is subject to setbacks, easements, and restrictions of record.
5. To assure the contractor is on the same vertical and horizontal datum as this survey, it is strongly recommended that vertical checks be made between two benchmarks and that horizontal checks be made between three control points or property corners.
6. Footings and foundations below natural ground not located.
7. Due to current safety regulations, we are unable to access any sewer manholes and/or structures in order to verify pipe size or material. Pipe size and material has been shown as per plans or by approximate measurements. It is strongly recommended that size and material are verified before any design work begins.
8. Coordinates shown are State Plane Coordinates referenced to N.A.D. 83 datum, 2011 adjustment, Florida North Zone and expressed in U.S. survey feet.
9. Coordinates and elevations based on Escambia County geodetic control points:

ESC 4083	ESC 4064	FLOPS 1
N 573012.68	N 572894.86	N 570874.67
E 1104904.78	E 1109260.70	E 1093228.20
Z 90.845	Z 22.60	Z 122.90

UTILITY COMPANIES:
Utility information shown as per field information and information furnished by utility companies involved.
TELEPHONE – AT & T, Inc., 605 West Garden Street, Pensacola, Florida 32501; (850) 436-1618
ELECTRIC – Gulf Power Company, 9220 Pine Forest Road, Pensacola, Florida 32534; (850) 484-5770
SANITARY SEWER/WATER – Emerald Coast Utility Authority, Elyson Industrial Park, Pensacola, Florida; (850) 476-5110
NATURAL GAS –Pensacola Energy, 16 South Pcolafax Street, Pensacola, Florida; (850) 474-5322

BENCHMARKS:
1034/72 –A PK nail in the south side of a light pole located in the north right of way of Dye Street, 20'+/– west of the west right of way of Chemstrand Road.
Elevation = 79.70'
1534/72A – A PK nail in the south side of a power pole located in the north right of way of Dye Street, 140'+/– west of the west right of way of Chemstrand Road.
Elevation = 76.58'
1534/72B – A PK nail in the north side of a power pole located in the south right of way of Orby Street, 230'+/– west of the west right of way of Chemstrand Road.
Elevation = 71.79
1534/72C – A PK nail in the north side of a power pole located in the south right of way of Orby Street and the west right of way of Chemstrand Road.
Elevation = 69.50'

LEGEND:
R/W Right of way
FFE Finished floor elevation
BM Benchmark
ELEV Elevation
CP Concrete pipe
INV Invert
T.O.P. Top of pipe elevation
Oak tree
Crepe myrtle
Pine tree
1/2"Capped iron rod set #7073
1/2" Capped iron rod found #noted
4"x4"Concrete monument found #noted
D.O.T. concrete monument found
Permanent control point found #noted
Nail and flag set
Brick column
Fire hydrant
Valve manhole
Water valve
Telephone equipment
Ground light
Soil boring
Light pole
Power pole
Guy wire
Water marker
Storm inlet
Road sign
Gas marker
Spot elevation
Contour line
Anchor line
Electric line
Cable line
Telephone line
Gas line
Water line
Sanitary sewer line
Buried telephone line
Force main
Chain link fence
Wood fence
Wire fence
Asphalt
Concrete
Concrete mesh
Rip rap

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Escambia Co/Willowbrook
January 29, 2018
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PAUL M. HEFFERNAN
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PERMIT DRAWING - NOT FOR CONSTRUCTION

SIGMA CONSULTING GROUP, INC.
7011 OLIVE BOULEVARD, SUITE 32
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PHONE (850) 332-7912
CERTIFICATE OF AUTHORIZATION #30665

BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE
DAM REPLACEMENT

LEGEND

NO.	REVISION	DATE

Project Number: 160101
Date: JULY 2016
Drawn By: C.W.H.
Designed By: P.M.H.
Checked By: J.L.I.
Sheet 3

THE FOLLOWING NARRATIVE OF THE STORMWATER POLLUTION PREVENTION PLAN CONTAINS REFERENCES TO THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, THE DESIGN STANDARDS, AND OTHER SHEETS OF THESE CONSTRUCTION PLANS. THE FIRST SHEET OF THE CONSTRUCTION PLANS (CALLED THE KEY SHEET) CONTAINS AN INDEX TO THE OTHER SHEETS. THE COMPLETE STORMWATER POLLUTION PREVENTION PLAN INCLUDES SEVERAL ITEMS: THIS NARRATIVE DESCRIPTION, THE DOCUMENTS REFERENCED IN THIS NARRATIVE, THE CONTRACTOR'S APPROVED EROSION CONTROL PLAN REQUIRED BY SPECIFICATION SECTION 104, AND REPORTS OF INSPECTIONS MADE DURING CONSTRUCTION.

1.0 SITE DESCRIPTION:

1.A. NATURE OF CONSTRUCTION ACTIVITY:

THE PROJECT CONSISTS OF REMOVAL OF EXISTING EMBANKMENT SECTION AND DAMAGED SPILLWAY, DEWATERING, CONSTRUCTION OF ROADSIDE GRADING, CONSTRUCTION OF DITCH AN STORM DRAIN SYSTEMS, CONSTRUCTION OF CULVERT HEADWALLS, AND CONSTRUCTION OF PROPOSED EMBANKMENT SECTION AND SPILLWAY.

1.B. SEQUENCE OF MAJOR SOIL DISTURBING ACTIVITIES:

IN THE SEDIMENT AND EROSION CONTROL PLAN, THE CONTRACTOR SHALL PROVIDE A DETAILED SEQUENCE OF CONSTRUCTION FOR ALL CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL FOLLOW THE SEQUENCE OF MAJOR ACTIVITIES DESCRIBED BELOW, UNLESS THE CONTRACTOR PROPOSES A DIFFERENT SEQUENCE THAT IS EQUAL OR BETTER AT CONTROLLING EROSION AND TRAPPING SEDIMENT AND IS APPROVED BY THE ENGINEER.

FOR EACH CONSTRUCTION PHASE, INSTALL PERIMETER CONTROLS AFTER CLEARING AND GRUBBING NECESSARY FOR INSTALLATION OF CONTROLS BUT BEFORE BEGINNING OTHER WORK FOR THE CONSTRUCTION PHASE. REMOVE PERIMETER CONTROLS ONLY AFTER ALL UPSTREAM AREAS ARE STABILIZED.

1. CLEARING AND GRUBBING, EARTHWORK FOR DEWATERING ACTIVITIES.
2. CLEARING AND GRUBBING, EARTHWORK FOR EMBANKMENT DEMOLITION.
3. CLEARING AND GRUBBING, EARTHWORK FOR EMBANKMENT CONSTRUCTION.

1.C. AREA ESTIMATES:

TOTAL SITE AREA: 1.40 ACRES.
TOTAL AREA TO BE DISTURBED: 1.40 ACRES.

1.D. RUNOFF DATA:

RUNOFF COEFFICIENTS:
BEFORE: 0.35
DURING: VARIES FROM 0.35 TO 0.40
AFTER: 0.35
SOILS DATA: SILT / LOAM / UNSUITABLE MATERIALS AND DEWATERING IS ANTICIPATED
FOR ADDITIONAL SOILS DATA AND CULVERT BASE PREPARATION SEE PROJECT GEOTECHNICAL REPORT PREPARED BY:
NOVA ENGINEERING AND ENVIRONMENTAL DATED JULY 12, 2018 (NOVA PROJECT NUMBER: 8218027).

OUTFALL INFORMATION:

THERE IS 1 EXISTING OUTFALL:

OUTFALL #1 DESCRIPTION: DAM REPLACEMENT LOCATION
CHOCTAWHATCHEE ROAD (CR 742) AT CLEAR CREEK
LOCATION: CHOKTAWHATCHEE ROAD APPROXIMATELY 3,300 FEET SOUTH OF KINGSFIELD ROAD (CR 186)
DRAINAGE AREA: 1,900 ACRES
RECEIVING WATER(S): CLEAR CREEK -> CONECUH RIVER -> ESCAMBIA RIVER -> ESCAMBIA BAY

1.E. SITE MAP:

THE CONSTRUCTION PLANS ARE BEING USED AS THE SITE MAPS. THE LOCATION OF THE REQUIRED INFORMATION IS DESCRIBED BELOW. THE SHEET NUMBERS FOR THE PLAN SHEETS REFERENCED ARE IDENTIFIED ON THE KEY SHEET OF THESE CONSTRUCTION PLANS.

- DRAINAGE PATTERNS: THE DRAINAGE BASIN DIVIDES AND FLOW DIRECTIONS ARE SHOWN ON THE DRAINAGE MAP.
- APPROXIMATE SLOPES: THE SLOPES OF THE SITE CAN BE SEEN IN PLAN/PROFILE.
- AREAS OF SOIL DISTURBANCE: THE AREAS TO BE DISTURBED ARE INDICATED ON THE PLAN/PROFILE SHEETS. ANY AREAS WHERE PERMANENT FEATURES ARE SHOWN TO BE CONSTRUCTED ABOVE OR BELOW GROUND WILL BE DISTURBED.
- AREAS NOT TO BE DISTURBED: ESSENTIALLY THE ENTIRE PROJECT SITE WILL BE DISTURBED.
- LOCATIONS OF TEMPORARY CONTROLS: TO BE SHOWN ON THE CONTRACTORS APPROVED EROSION CONTROL PLAN. SEDIMENTATION BASIN AND FLOATING / STAKED TURBIDITY BARRIER ARE SUGGESTED
- LOCATIONS OF PERMANENT CONTROLS: SOD ALL DISTURBED NON-PAVED AREAS (EXCLUDING DITCH BOTTOM)
- AREAS TO BE STABILIZED: ROADSIDE SWALES/DITCHES, LATERAL CULVERT DITCH SLOPES, AND AT FURTHEST DOWNSTREAM DITCH SECTION AT LOWER END OF CONSTRUCTION ACTIVITIES.

1.F. RECEIVING WATERS:
SEE ITEM 1.D FOR THE OUTFALL LOCATIONS AND RECEIVING WATER NAMES. THERE ARE JURISDICTIONAL WETLANDS ON THE PROJECT SITE.

2.0 CONTROLS:

2.A. EROSION AND SEDIMENT CONTROLS:

IN THE SEDIMENT AND EROSION CONTROL PLAN, THE CONTRACTOR SHALL DESCRIBE THE PROPOSED STABILIZATION AND STRUCTURAL PRACTICES. THE FOLLOWING RECOMMENDED GUIDELINES ARE BASED ON THE GRADING PLAN OUTLINED IN THE CONSTRUCTION PLANS. THE CONTRACTOR MAY CHOOSE TO ACCEPT THE FOLLOWING GUIDELINES OR MODIFY THEM IN THE SEDIMENT AND EROSION CONTROL PLAN, SUBJECT TO APPROVAL BY THE ENGINEER, AS WORK PROGRESSES. THE CONTRACTOR SHALL MODIFY THE PLAN TO ADAPT TO SEASONAL VARIATION, CHANGES IN CONSTRUCTION ACTIVITIES, AND THE NEED FOR BETTER PRACTICES.

FOR EACH CONSTRUCTION PHASE, INSTALL PERIMETER CONTROLS AFTER CLEARING AND GRUBBING NECESSARY FOR INSTALLATION OF CONTROLS BUT BEFORE BEGINNING OTHER WORK FOR THE CONSTRUCTION PHASE. REMOVE PERIMETER CONTROLS ONLY AFTER ALL UPSTREAM AREAS ARE STABILIZED.

2.A.1 STABILIZATION PRACTICES:

IN THE SEDIMENT AND EROSION CONTROL PLAN, THE CONTRACTOR SHALL DESCRIBE THE STABILIZATION PRACTICES PROPOSED TO CONTROL EROSION. THE CONTRACTOR SHALL INITIATE ALL STABILIZATION MEASURES AS SOON AS PRACTICAL, BUT IN NO CASE MORE THAN 7 DAYS, IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. THE STABILIZATION PRACTICES SHALL INCLUDE AT LEAST THE FOLLOWING, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

THE PARAGRAPH ABOVE REFERS TO A 7 DAY LIMIT BEFORE INITIATING STABILIZATION. THE DEP GENERIC PERMIT SPECIFIES 7 DAYS, BUT STRICTER REQUIREMENTS FROM OTHER PERMITTING AGENCIES WILL OFTEN APPLY AND SHOULD BE NOTED.

TEMPORARY:
- ARTIFICIAL COVERINGS IN ACCORDANCE WITH SPECIFICATION SECTION 104.
- TURF AND SOD IN ACCORDANCE WITH SPECIFICATION SECTION 104.

PERMANENT:
- SOD IN ACCORDANCE WITH SPECIFICATION SECTION 570.

2.A.2 STRUCTURAL PRACTICES:

IN THE SEDIMENT AND EROSION CONTROL PLAN, THE CONTRACTOR SHALL DESCRIBE THE PROPOSED STRUCTURAL PRACTICES TO CONTROL OR TRAP SEDIMENT AND OTHERWISE PREVENT THE DISCHARGE OF POLLUTANTS FROM EXPOSED AREAS OF THE SITE. SEDIMENT CONTROLS SHALL BE IN PLACE BEFORE DISTURBING SOIL UPSTREAM OF THE CONTROL. THE STRUCTURAL PRACTICES SHALL INCLUDE AT LEAST THE FOLLOWING, UNLESS OTHERWISE APPROVED BY THE ENGINEER:

TEMPORARY:
- SEDIMENT BARRIERS IN ACCORDANCE WITH DESIGN STANDARD 102 AND SPECIFICATION SECTION 104.
- INLET PROTECTION IN ACCORDANCE WITH DESIGN STANDARD 102 AND SPECIAL DETAILS SHOWN IN THE TTC PLAN.
- SEDIMENT CONTAINMENT SYSTEM: SILT FENCE, HAY BALES, AND FLOATING/STAKED TURBIDITY BARRIER WILL BE UTILIZED AS THE TEMPORARY SEDIMENT CONTAINMENT SYSTEM.

PERMANENT:
- SOD.

2.B STORMWATER MANAGEMENT:

ARMORED SWALE AND STORM DRAIN PIPE WILL BE CONSTRUCTED TO CONVEY RUNOFF TO THE STORMWATER SYSTEM.

2.0 OTHER CONTROLS:

2.C.1 WASTE DISPOSAL:

IN THE SEDIMENT AND EROSION CONTROL PLAN, THE CONTRACTOR SHALL DESCRIBE THE PROPOSED METHODS TO PREVENT THE DISCHARGE OF SOLID MATERIALS, INCLUDING BUILDING MATERIALS, TO WATERS OF THE UNITED STATES. THE PROPOSED METHODS SHALL INCLUDE AT LEAST THE FOLLOWING, UNLESS OTHERWISE APPROVED BY THE ENGINEER:
- PROVIDING LITTER CONTROL AND COLLECTION WITHIN THE PROJECT DURING CONSTRUCTION ACTIVITIES.
- DISPOSING OF ALL FERTILIZER OR OTHER CHEMICAL CONTAINERS ACCORDING TO EPA'S STANDARD PRACTICES AS DETAILED BY THE MANUFACTURER.
- DISPOSING OF SOLID MATERIALS INCLUDING BUILDING AND CONSTRUCTION MATERIALS OFF THE PROJECT SITE BUT NOT IN SURFACE WATERS, OR WETLANDS.

2.C.2 OFF-SITE VEHICLE TRACKING & DUST CONTROL:
IN THE SEDIMENT AND EROSION CONTROL PLAN, THE CONTRACTOR SHALL DESCRIBE THE PROPOSED METHODS FOR MINIMIZING OFFSITE VEHICLE TRACKING OF SEDIMENTS AND GENERATING DUST. THE PROPOSED METHODS SHALL INCLUDE AT LEAST THE FOLLOWING, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

- COVERING LOADED HAUL TRUCKS WITH TARPAULINS.
- REMOVE EXCESS DIRT FROM ROADS DAILY.
- STABILIZING CONSTRUCTION ENTRANCES ACCORDING TO FDOT DESIGN STANDARD 106.
- USING ROADWAY SWEEPERS DURING DUST GENERATING ACTIVITIES SUCH AS EXCAVATION AND HAULING OPERATIONS.

2.C.3 STATE AND LOCAL REGULATIONS FOR WASTE DISPOSAL, SANITARY SEWER, OR SEPTIC TANK REGULATIONS:

IN THE SECTION 104 EROSION CONTROL PLAN, THE CONTRACTOR SHALL DESCRIBE THE PROPOSED PROCEDURES TO COMPLY WITH APPLICABLE STATE AND LOCAL REGULATIONS FOR WASTE DISPOSAL, AND SANITARY SEWER OR SEPTIC SYSTEMS.

2.C.4 FERTILIZERS AND PESTICIDES:

IN THE SEDIMENT AND EROSION CONTROL PLAN, THE CONTRACTOR SHALL DESCRIBE THE PROCEDURES FOR APPLYING FERTILIZERS AND PESTICIDES. THE PROPOSED PROCEDURES SHALL COMPLY WITH APPLICABLE SUBSECTIONS OF SECTION 570 OF THE SPECIFICATIONS.

2.C.5 TOXIC SUBSTANCES:

IN THE SEDIMENT AND EROSION CONTROL PLAN, THE CONTRACTOR SHALL PROVIDE A LIST OF TOXIC SUBSTANCES THAT ARE LIKELY TO BE USED ON THE JOB AND PROVIDE A PLAN ADDRESSING THE GENERATION,
APPLICATION, MIGRATION, STORAGE, AND DISPOSAL OF THESE SUBSTANCES.

2.D.4 APPROVED STATE AND LOCAL PLANS AND PERMITS:

- N/A

3.0 MAINTENANCE:

IN THE SEDIMENT AND EROSION CONTROL PLAN, THE CONTRACTOR SHALL PROVIDE A PLAN FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROLS THROUGHOUT CONSTRUCTION. THE MAINTENANCE PLAN SHALL AT A MINIMUM, COMPLY WITH THE FOLLOWING:

- SILT FENCE: MAINTAIN PER SECTION 104. THE CONTRACTOR SHOULD ANTICIPATE REPLACING SILT FENCE ON 12 MONTH INTERVALS.
- SEDIMENT BARRIERS : REMOVE SEDIMENT AS PER MANUFACTURER'S RECOMMENDATIONS OR WHEN WATER PONDS IN UNACCEPTABLE AMOUNTS OR AREAS.

4.0 INSPECTIONS:

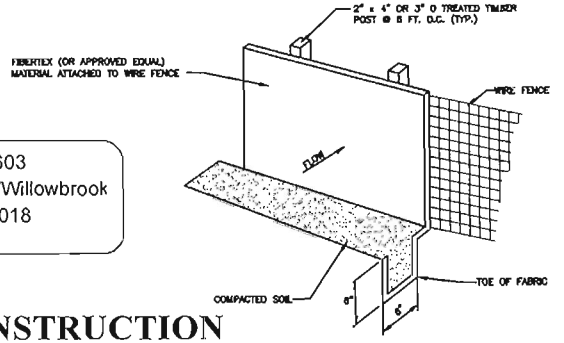
QUALIFIED PERSONNEL SHALL INSPECT THE FOLLOWING ITEMS AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM THAT IS 0.50 INCHES OR GREATER. TO COMPLY, THE CONTRACTOR SHALL INSTALL AND MAINTAIN RAIN GAUGES AND RECORD THE DAILY RAINFALL. WHERE SITES HAVE BEEN PERMANENTLY STABILIZED, INSPECTIONS SHALL BE CONDUCTED AT LEAST ONCE EVERY MONTH. THE CONTRACTOR SHALL ALSO INSPECT THAT CONTROLS INSTALLED IN THE FIELD AGREE WITH THE LATEST STORMWATER POLLUTION PREVENTION PLAN.

- POINTS OF DISCHARGE TO MUNICIPAL SEPARATE STORM DRAIN SYSTEMS.
- DISTURBED AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
- AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION.
- STRUCTURAL CONTROLS.
- STORMWATER MANAGEMENTS SYSTEMS.
- LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE.

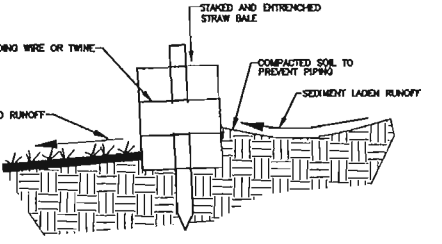
THE CONTRACTOR SHALL INITIATE REPAIRS WITHIN 24 HOURS OF INSPECTIONS THAT INDICATE ITEMS ARE NOT IN GOOD WORKING ORDER. IF INSPECTIONS INDICATE THAT THE INSTALLED STABILIZATION AND STRUCTURAL PRACTICES ARE NOT SUFFICIENT TO MINIMIZE EROSION, RETAIN SEDIMENT, AND PREVENT DISCHARGING POLLUTANTS, THE CONTRACTOR SHALL PROVIDE ADDITIONAL MEASURES, AS APPROVED BY THE ENGINEER.

6.0 NON-STORMWATER DISCHARGES:

IN THE SECTION 104 EROSION CONTROL PLAN, THE CONTRACTOR SHALL IDENTIFY ALL ANTICIPATED NON-STORMWATER DISCHARGES (EXCEPT FLOWS FROM FIRE FIGHTING ACTIVITIES). THE CONTRACTOR SHALL DESCRIBE THE PROPOSED MEASURES TO PREVENT POLLUTION OF THESE NON-STORMWATER DISCHARGES. IF THE CONTRACTOR ENCOUNTERS CONTAMINATED SOIL OR GROUNDWATER, CONTACT ESCAMBIA COUNTY ENGINEERING.



SILT FENCE DETAIL



DETAIL OF PROPERLY INSTALLED STRAW BALE

PAUL M. HEFFERNAN
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STGMA
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3336 SUMMIT BOULEVARD, SUITE 22
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CERTIFICATE OF AUTHORIZATION #3886

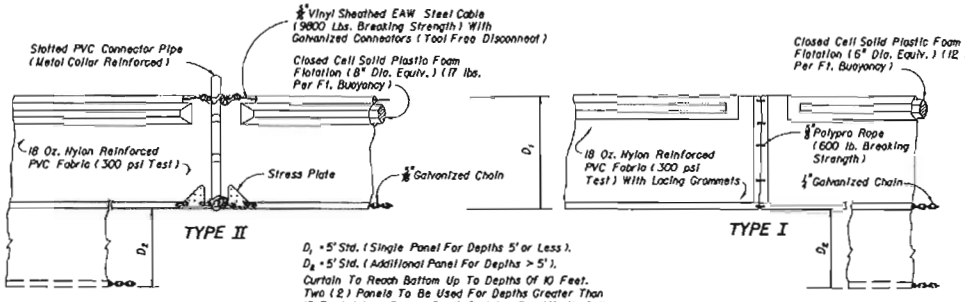
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT

SWPPP NOTES

NO.	REVISION	DATE

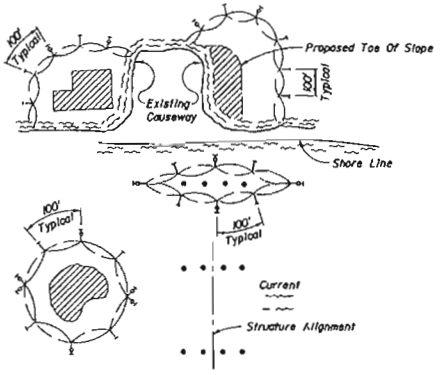
Project Number	160101
Date:	JULY 2018
Drawn By:	P.M.H.
Designed By:	P.M.H.
Checked By:	J.L.L.
Sheet	4



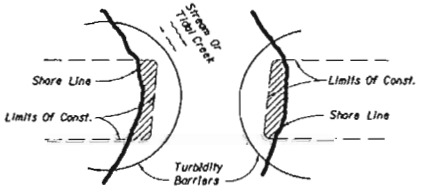
D_1 = 5' Std. (Single Panel For Depths 5' or Less).
D_2 = 5' Std. (Additional Panel For Depths > 5').
Curtain To Reach Bottom Up To Depths Of 10 Feet. Two (2) Panels To Be Used For Depths Greater Than 10 Feet Unless Special Depth Curtains Specifically Call For In The Plans Or As Determined By The Engineer.

NOTICE: COMPONENTS OF TYPES I AND II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.

FLOATING TURBIDITY BARRIERS



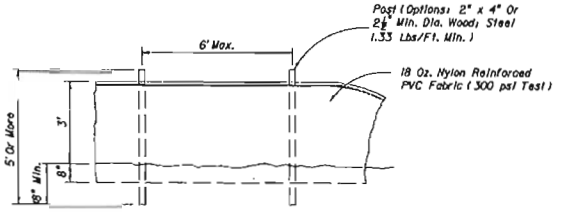
LEGEND
- Pile Locations
- Dredge Or Fill Area
- Mooring Buoy w/Anchor
- Anchor
- Barrier Movement Due To Current Action



NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of anchors dependent on current velocities.
3. Deployment of barrier around pile locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 104 of the Standard Specifications.

Note:
Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractors option unless otherwise specified in the plans, however payment will be under the pay item(s) established in the plans for Floating Turbidity Barrier and/or Staked Turbidity Barrier. Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

TURBIDITY BARRIER APPLICATIONS



STAKED TURBIDITY BARRIER

GENERAL NOTES

1. Floating turbidity barriers are to be paid for under the contract unit price for Floating Turbidity Barrier, LF.
2. Staked turbidity barriers are to be paid for under the contract unit price for Staked Turbidity Barrier, LF.

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CERTIFICATE OF AUTHORIZATION #28889

BOARD OF COUNTY COMMISSIONERS ESCAMBIA COUNTY, FLORIDA ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT

SWPPP DETAILS

NO	REVISION	DATE

Project Number: 160101
Date:
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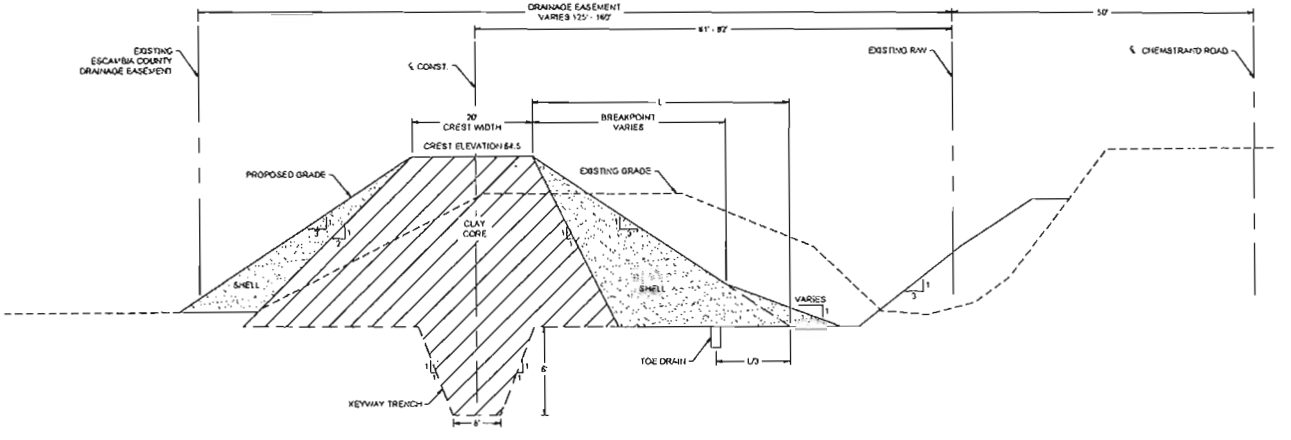
Sheet Number: 3



WILLOWBROOK DAM - TYPICAL SECTION
N.T.S.

FILL MATERIALS

CORE AND SHELL MATERIALS TO BE LIMITED TO SOILS WITH A STANDARD PROCTOR MAXIMUM DRY DENSITY OF 95PCF OR HIGHER.

CORE MATERIAL:

LOW PLASTICITY CLAY (USCS CLASSIFICATION, CL)
MINIMUM 70% FINES
PLASTICITY INDEX 15 - 30
TOTAL UNIT WEIGHT OF AT LEAST 115 PCF
IN-SITU PERMEABILITY OF $1x10^{-6}$ CM/SEC OR SLOWER

SHELL MATERIAL:

WELL TO POORLY GRADED SAND (USCS CLASSIFICATION, SW OR SP)
FREE OF NON-SOIL MATERIALS AND ROCK FRAGMENTS LARGER THAN 3 INCH DIAMETER
LESS THAN 3% FIBROUS ORGANIC MATERIALS BY WEIGHT

NOTES:

1) CONTRACTOR IS RESPONSIBLE FOR REMOVING THE EXISTING EMBANKMENT SECTION AS DESCRIBED IN THE PLANS. ADDITIONAL DEBRIS, BURIED OR EXPOSED, THAT HAS NOT BEEN QUANTIFIED FOR REMOVAL WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHOULD BE CONSIDERED IN THE CONTRACT UNIT PRICE FOR EXCAVATION.
2) INITIAL STRIPPING OPERATIONS FOR SUBGRADE PREPARATION MUST BE SUFFICIENT TO REMOVE ALL DELETERIOUS MATERIALS, INCLUDING TOPSOIL AND DEPOSITED SEDIMENT RESULTING FROM EXISTING DAM FAILURE.
3) PRIOR TO FILL PLACEMENT AGAINST EXISTING SLOPES, LOOSE SURFICIAL MATERIAL SHOULD BE REMOVED AND THE SLOPE BENCHED OR STEPPED TO PROVIDE HORIZONTAL BENCHES FOR COMPACTION, AND TO REDUCE THE POSSIBLE MOVEMENT OF SOIL ALONG THE SLOPE INTERFACE.
4) ALL SUBGRADE AREAS ARE TO BE APPROVED BY ESCAMBIA COUNTY ENGINEER OR DESIGNEE PRIOR TO FILL PLACEMENT.
5) THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING GROUND WATER LEVELS AT LEAST 3 FEET BELOW ALL POINTS OF THE EXCAVATION BOTTOM TO MINIMIZE SUBGRADE DEGRADATION.
6) ALL SURFACE FLOWS FROM THE DRAINAGE BASIN ABOVE THE DAM SITE SHOULD BE ROUTED AROUND THE IMMEDIATE CONSTRUCTION AREA(S).
7) STRUCTURAL FILL SHOULD BE PLACED IN LAYERS NOT EXCEEDING 8 INCHES IN THICKNESS WHEN LOOSE, AND SHOULD BE COMPACTED TO A MINIMUM SOIL DENSITY OF AT LEAST 95% STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698)
8) WHERE PORTABLE HAND EQUIPMENT IS REQUIRED, MAXIMUM LIFT THICKNESS SHOULD BE 4 INCHES LOOSE MEASURE.
9) SOIL MOISTURE CONTENT TO BE MAINTAINED WITHIN -2% TO +3% OF THE OPTIMUM MOISTURE CONTENT.
10) CONSTRUCTION PROCEDURES AND EQUIPMENT SHOULD BE SELECTED TO ASSURE THAT THE SURFACE OF EACH FILL LIFT IS LEFT IN A NON-SMOOTH CONDITION TO PROVIDE ADEQUATE BONDING WITH SUBSEQUENT FILLS LIFTS.
11) ALL FILL LIFTS SHOULD BE GRADED TO PREVENT SURFACE WATER PONDING.
12) THE SURFACE OF ALL FILL SHOULD BE SEALED AT THE END OF EACH WORK DAY WITH PROOFROLLING BY RUBBER TIRES.

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BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT PROJECT

TYPICAL SECTION

NO.	REVISION	DATE

Project Number: 160101
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Drawn by: C.W.H.
Designed by: P.M.H.
Checked By: J.C.L.
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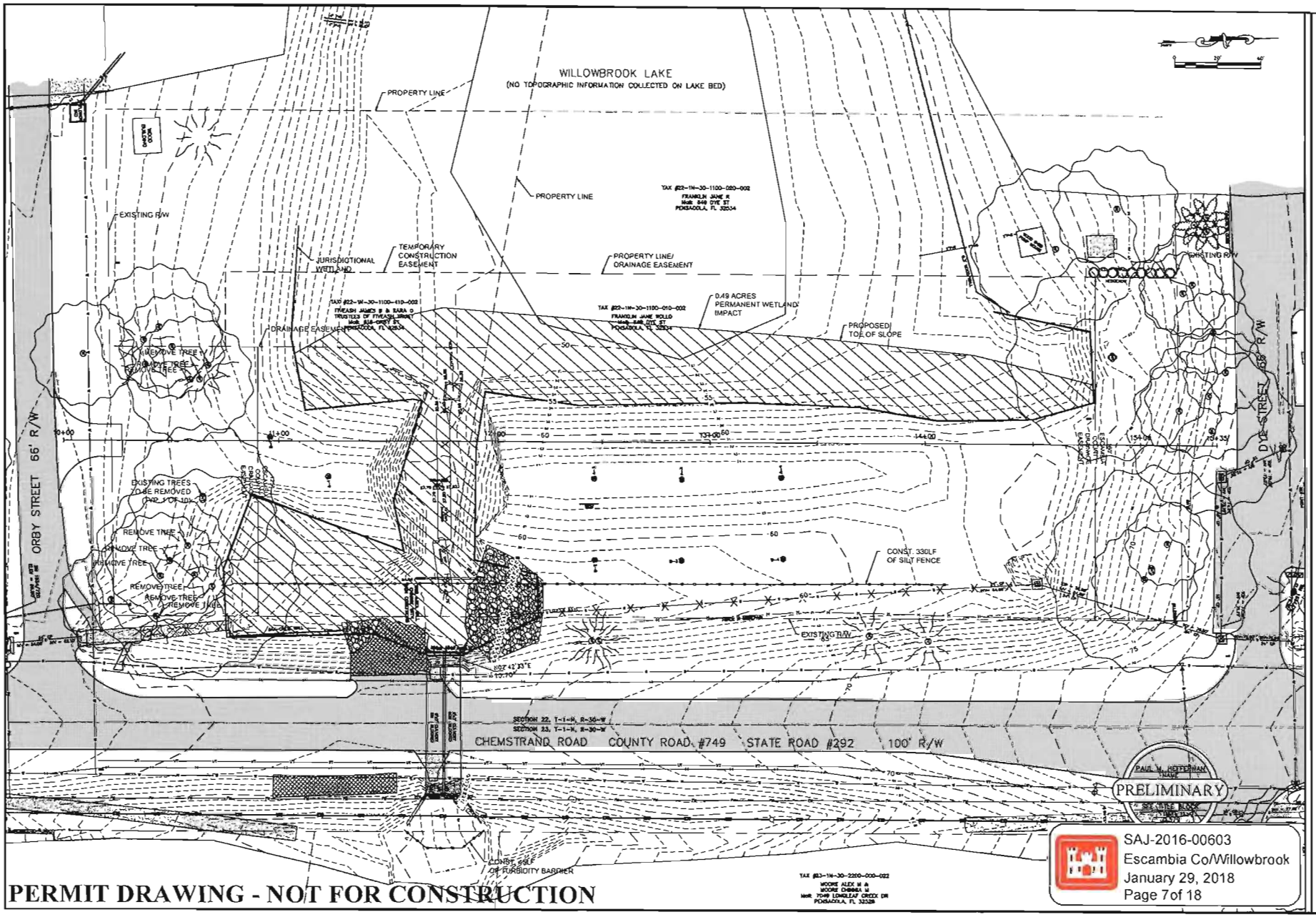

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PHONE: (850) 332-7112
CERTIFICATE OF AUTHORIZATION #28888

BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

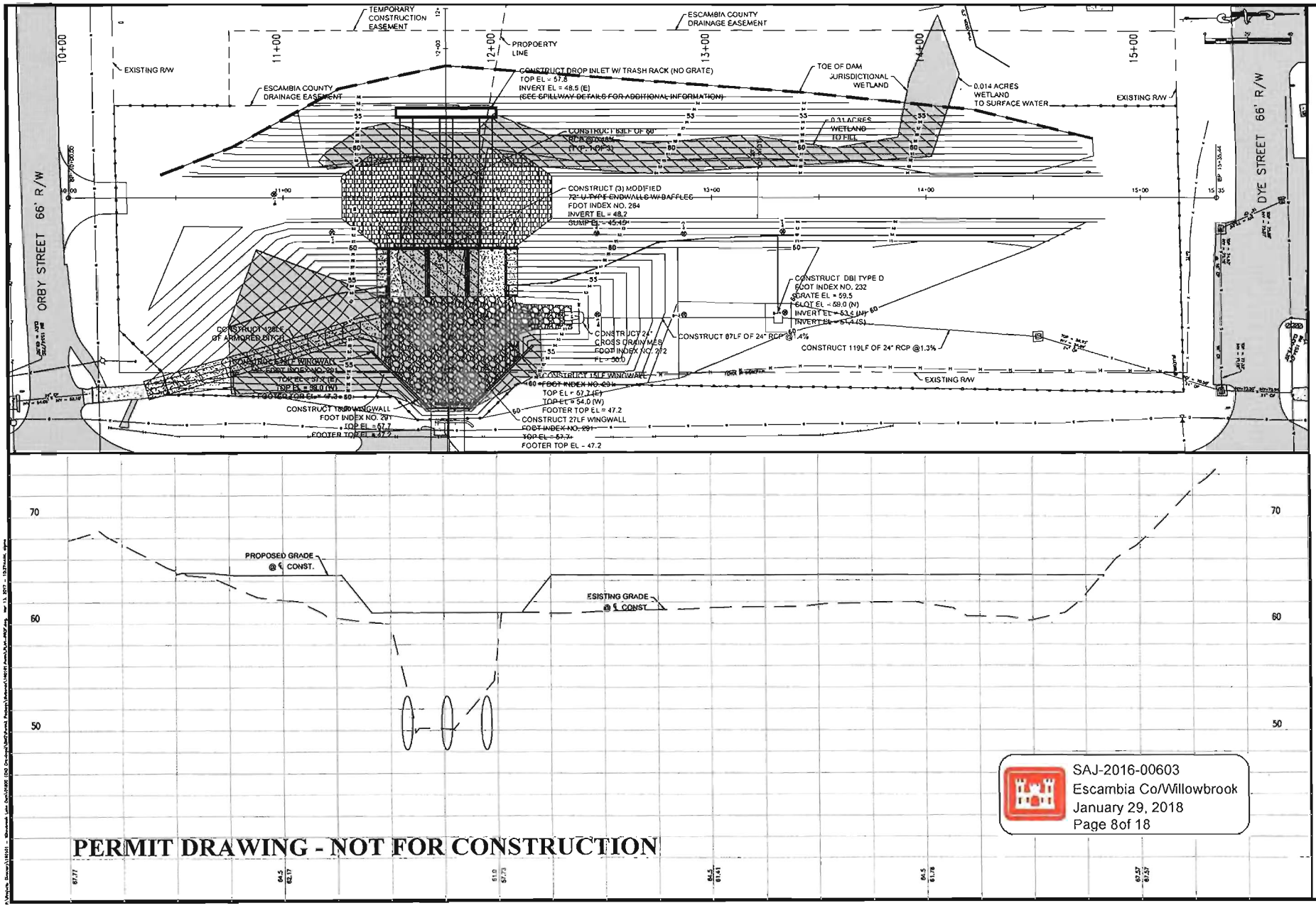
WILLOWBROOK LAKE
DAM REPLACEMENT

EXISTING CONDITIONS

NO.	REVISION	DATE

Project Number:	160101
Date:	JULY 2016
Drawn By:	G.W.H.
Designed By:	P.M.H.
Checked By:	V.L.L.
Sheet:	7

SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018



SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Page 8of 18

PERMIT DRAWING - NOT FOR CONSTRUCTION

SIGMA ENGINEERING CORP., INC.
1298 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7312
CERTIFICATE OF AUTHORIZATION #26685

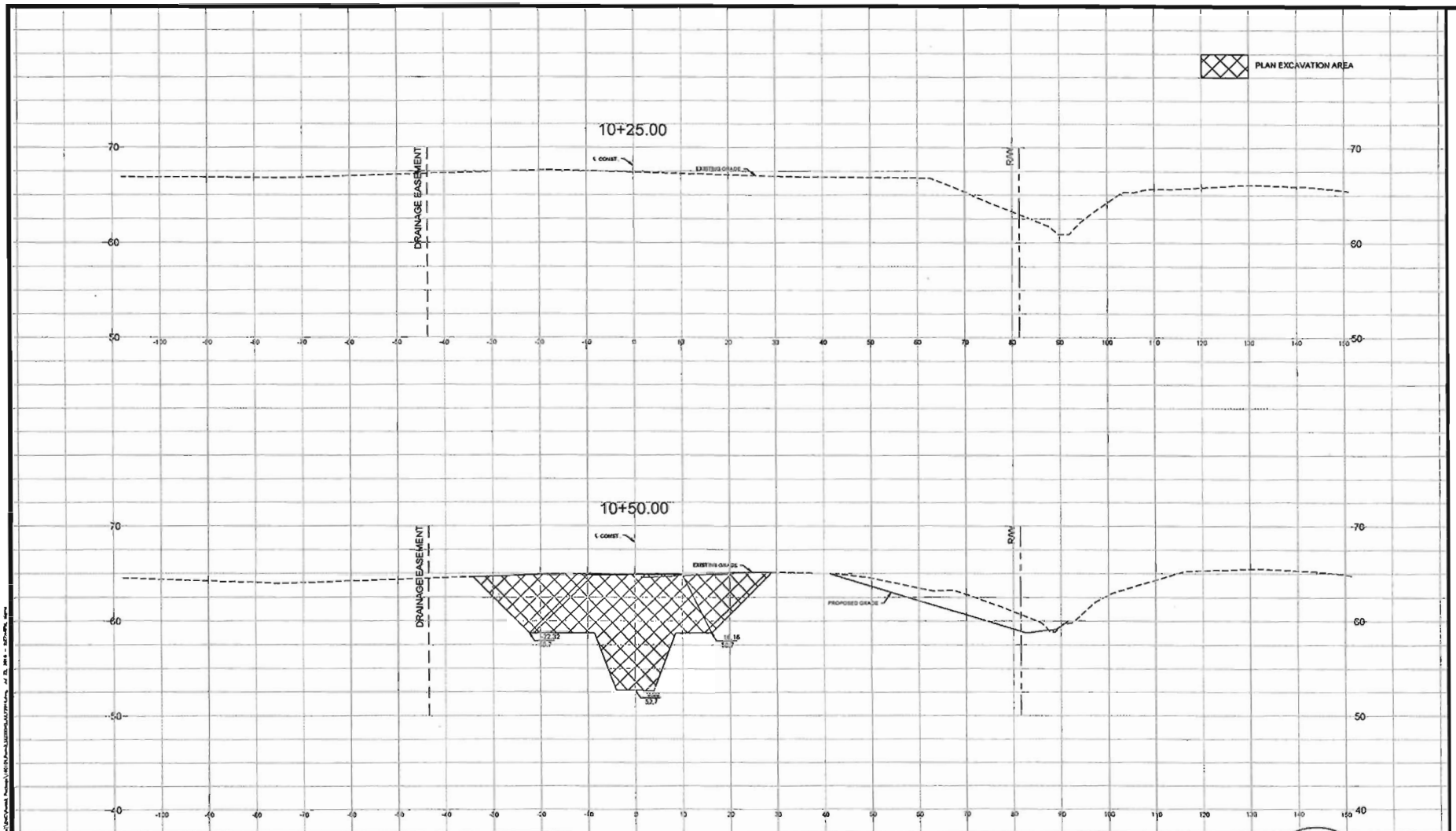
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT PROJECT

PROPOSED CONDITIONS

NO	REVISION	DATE

Project Number	121202
Date:	JULY 2016
Drawn By:	C.W.H
Designed By	P.M.H
Checked By	J.L.L
Sheet:	8



SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Page 9of 18

PAUL M. HEFFERNAN
NAME
PRELIMINARY
SEE TITLE BLOCK
DATE
71329
LICENSE NO.

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SIGMA
3298 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7912
CERTIFICATE OF AUTHORIZATION #26389

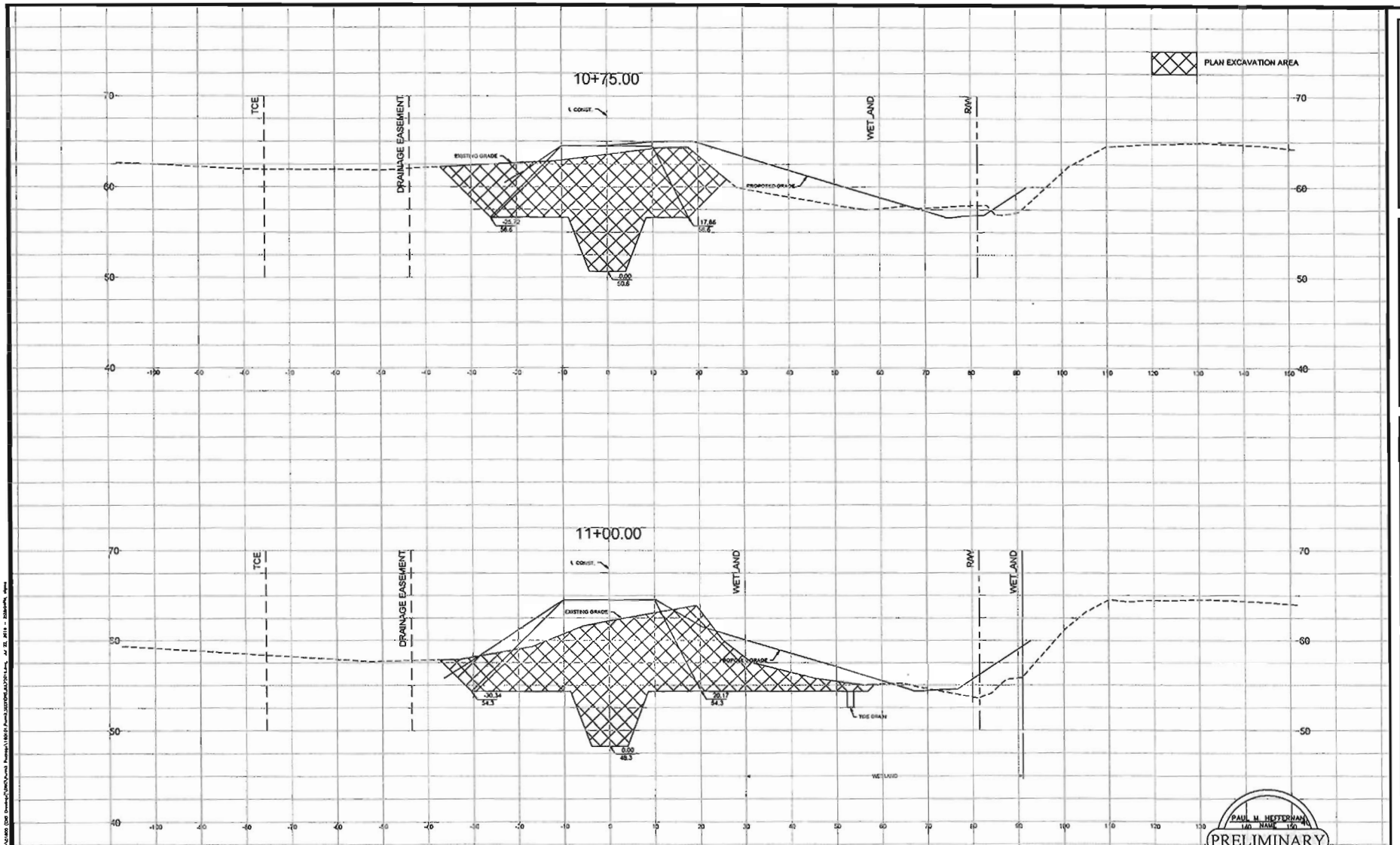
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT PROJECT

CROSS SECTION

NO	DESCRIPTION	DATE

Project Number	160101
Date	JULY 2016
Drawn By	C.W.H.
Designed By	P.M.H.
Checked By	J.L.L.
Sheet	11



SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Pg 10 of 18

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SIGNA
3288 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7812
CERTIFICATE OF AUTHORIZATION #25685

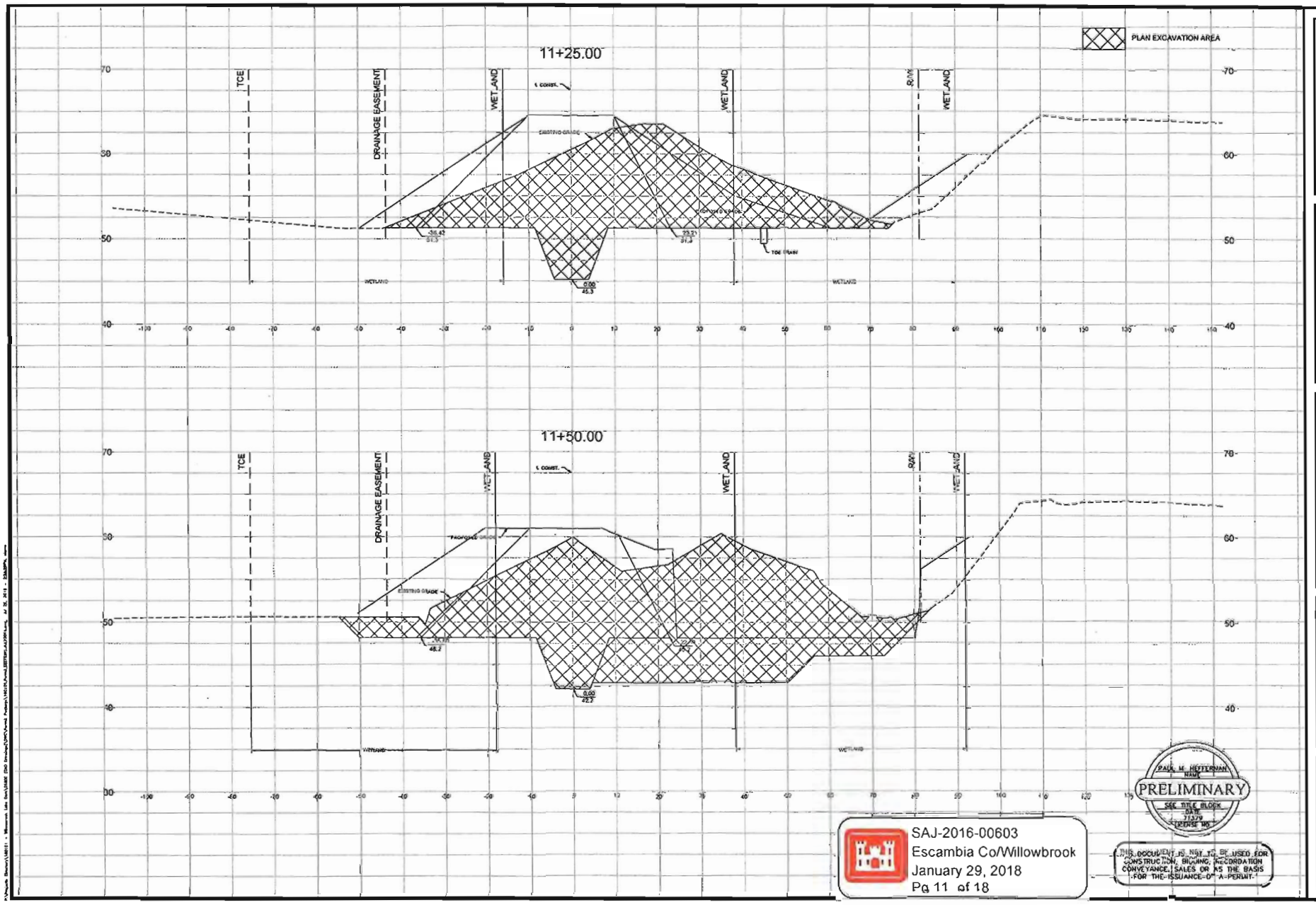
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM
REPLACEMENT PROJECT

CROSS SECTION

NO	REVISION	DATE

Project Number	160101
Date	JULY 2016
Drawn By	C.W.H
Designed By	P.M.H.
Checked By	J.L.L.
Sheet	12



SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Pg 11 of 18

PRELIMINARY
SEE TITLE BLOCK
DATE
11329
LICENSE NO.

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

SIGMA ENGINEERING, INC.
3295 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7912
CERTIFICATE OF AUTHORIZATION #26585

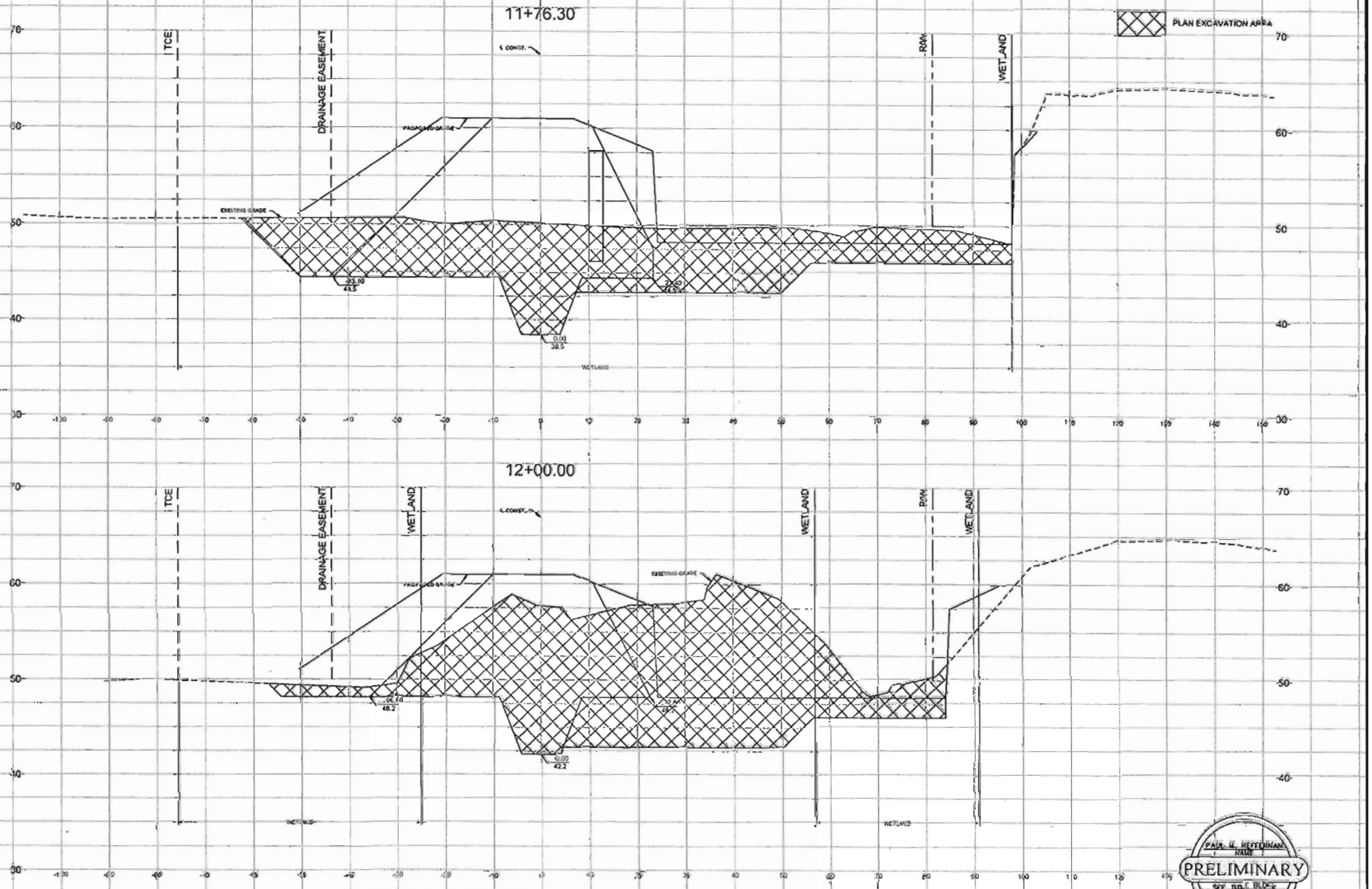
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM
REPLACEMENT PROJECT

CROSS SECTION

NO	REVISION	DATE

Project Number	160101
Date	JULY 2016
Drawn By	C.W.H
Designed By	P.M.H
Checked By	J.L.L
Sheet	13



SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Pg 12 of 18

PAUL H. HEFFERNAN
NAME
SOE NO. C BLOCK
DATE
71379
LICENSE NO.
PRELIMINARY

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SIGMA
CONSULTING, INC.
3258 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7912
CERTIFICATE OF AUTHORIZATION #26685

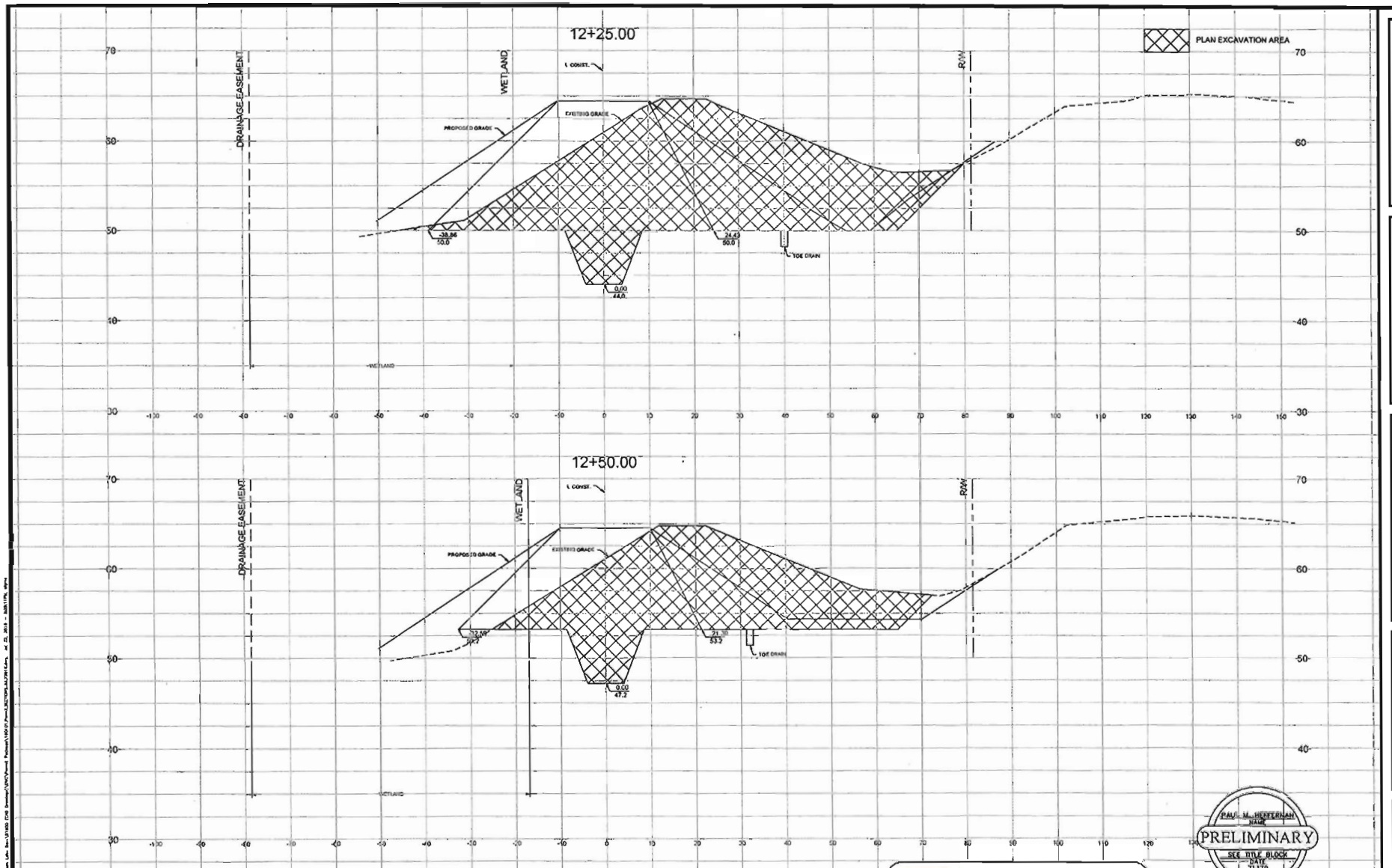
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM
REPLACEMENT PROJECT

CROSS SECTION

NO	DESCRIPTION	DATE

Project Number: 160101
Date: JULY 2016
Drawn By: CWH
Designed By: P.M.H
Checked By: J.E.L.
Sheet: 14



SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Pg 13 of 18

PRELIMINARY
SEE TITLE BLOCK FOR LICENSE NO.

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SIGMA ENGINEERING, INC.
3298 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7312
CERTIFICATE OF AUTHORIZATION #26889

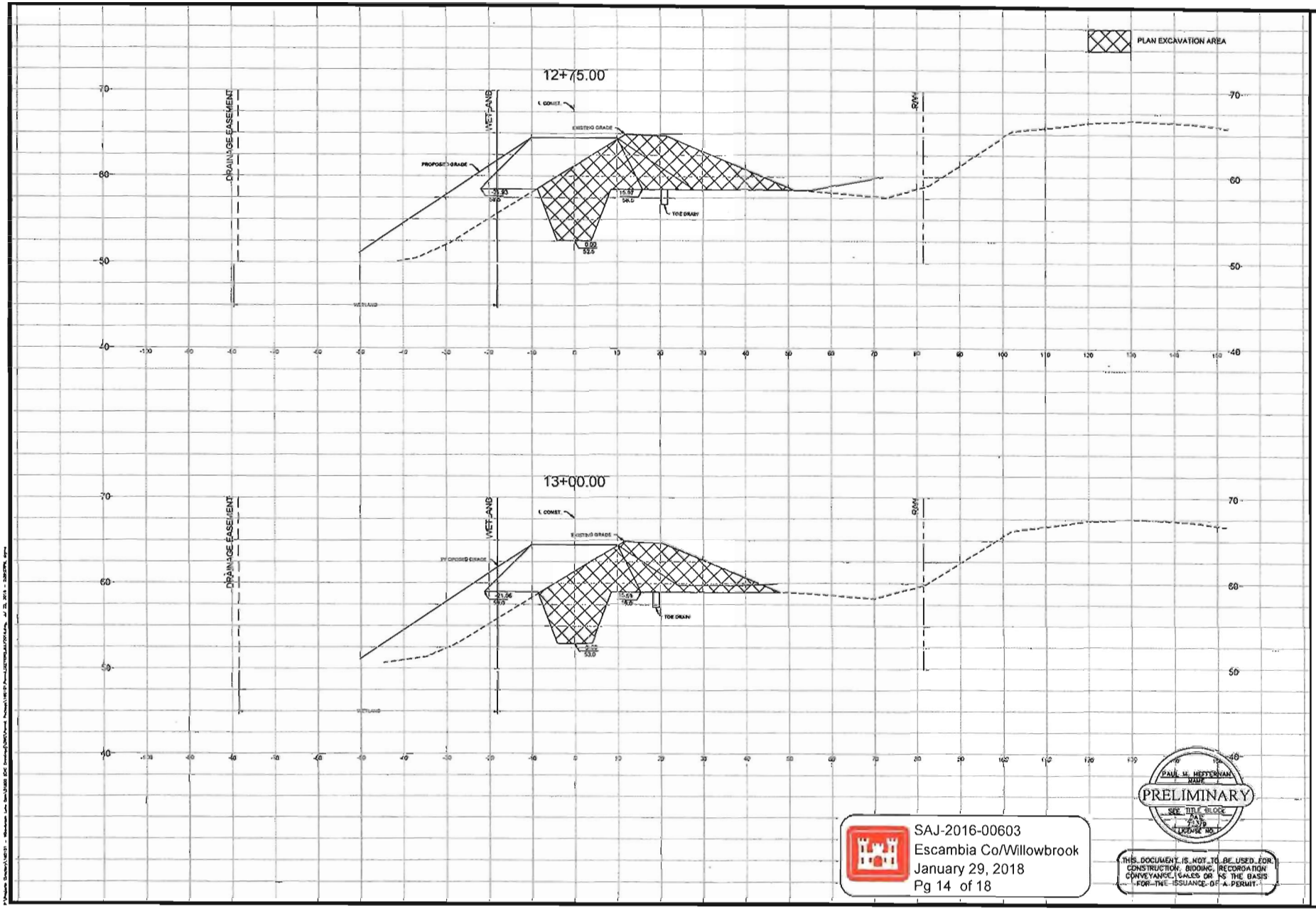
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT PROJECT

CROSS SECTION

NO	REVISION	DATE

Project Number	160101
Date	JULY 2016
Drawn By	C.W.H
Designed By	P.M.H
Checked By	J.L.L
Sheet	15



SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Pg 14 of 18

PAUL M. HEFFERNAN
NAME
PRELIMINARY
SEE TITLE BLOCK
FOR
LICENSE NO.

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

SIGMA ENGINEERING
3268 SUMMIT BOULEVARD, SUITE 12
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7912
CERTIFICATE OF AUTHORIZATION #26685

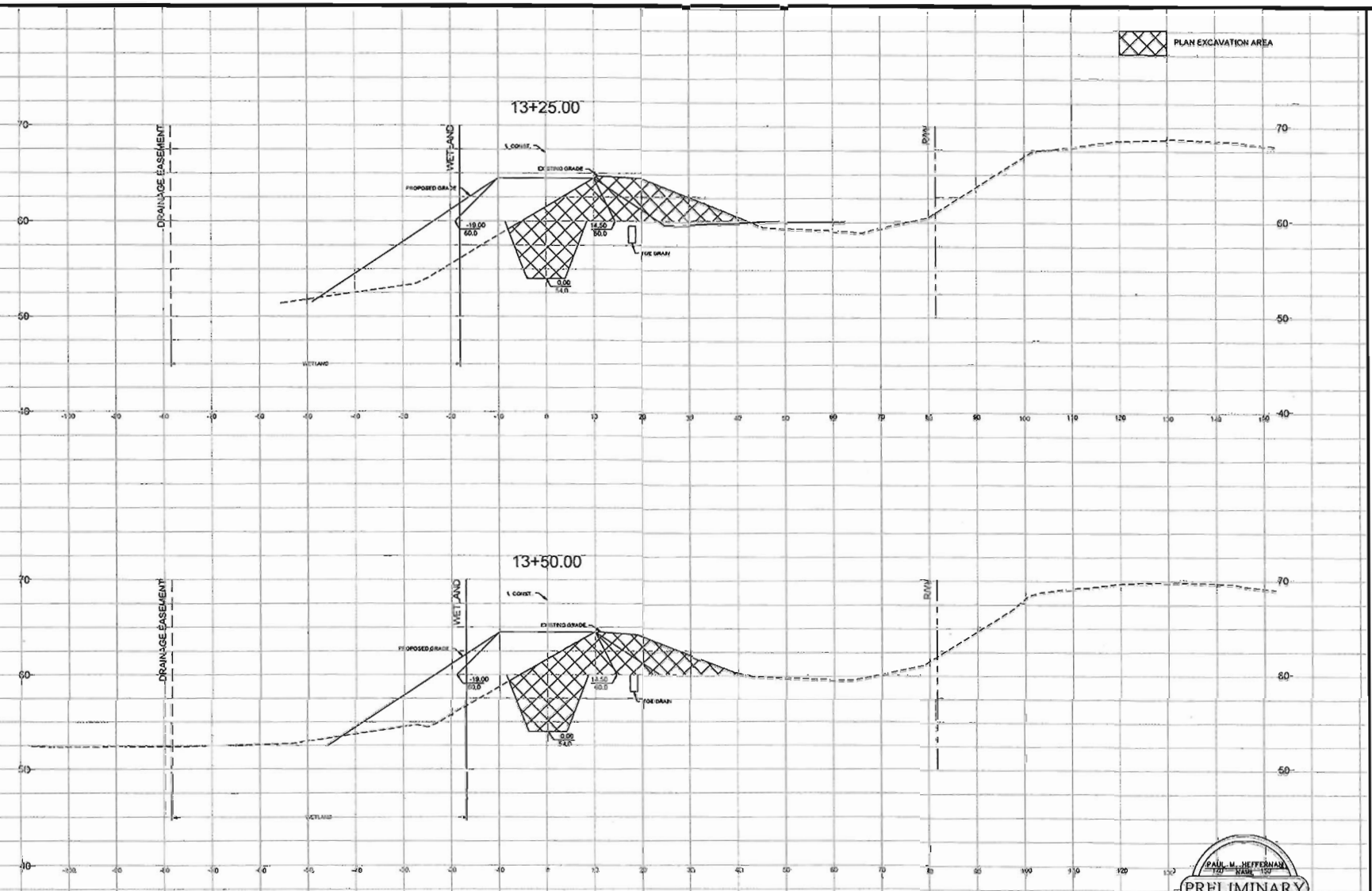
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM
REPLACEMENT PROJECT

CROSS SECTION

NO	REVISION	DATE

Project Number: 160101
Date: JULY 2016
Drawn By: C.W.H
Designed By: P.M.H.
Checked By: J.L.L.
Sheet: 16



PRELIMINARY

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Pg 15 of 18

SIVIA
1798 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7912
CERTIFICATE OF AUTHORIZATION #26869

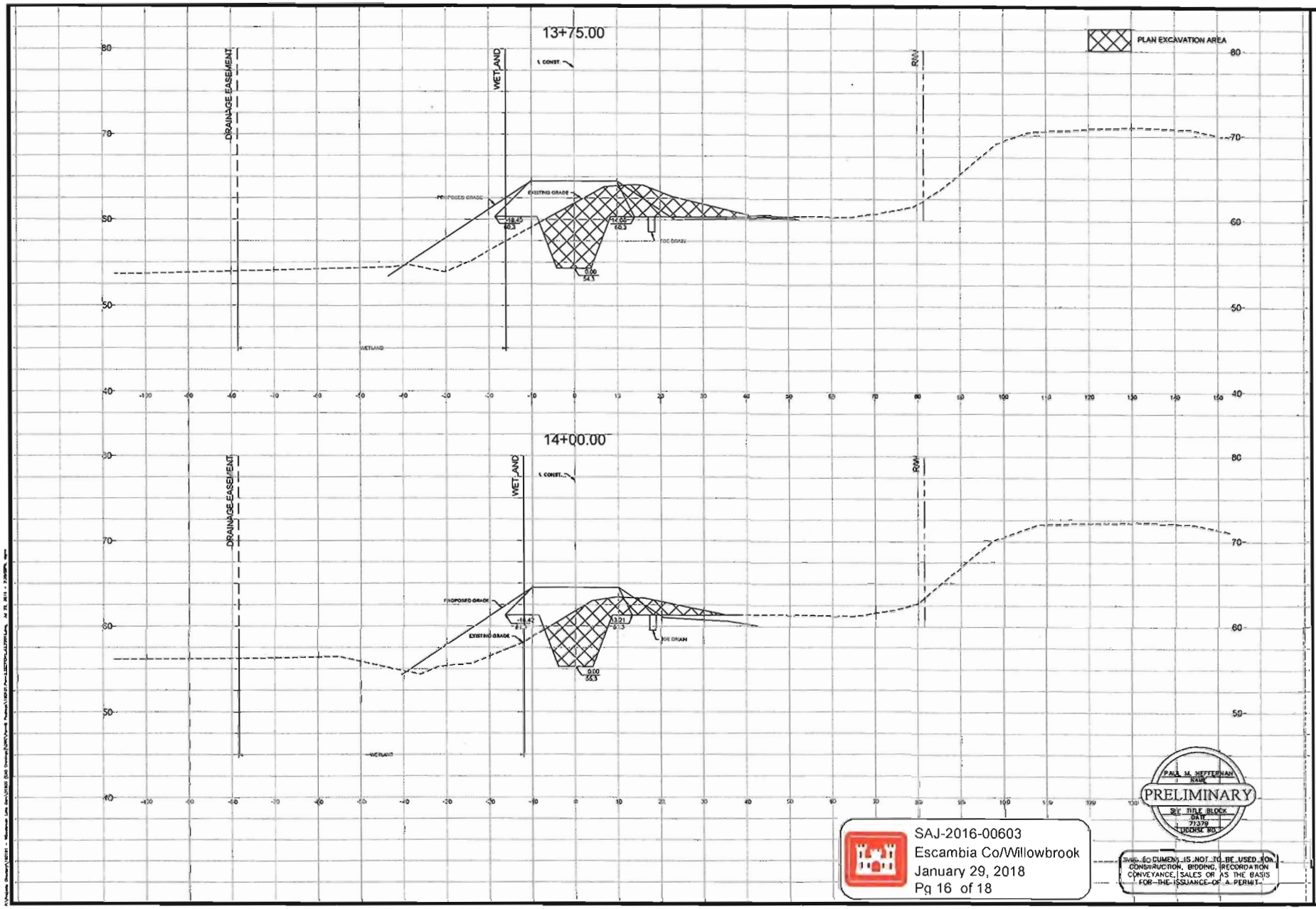
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM
REPLACEMENT PROJECT

CROSS SECTION

NO	REVISION	DATE

Project Number	160101
Date	JULY 2016
Drawn By	C.W.H
Designed By	P.M.H
Checked By	J.L.L
Sheet	17



SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Pg 16 of 18

PRELIMINARY

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

SIGMA ENGINEERING
3298 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7912
CERTIFICATE OF AUTHORIZATION #26869

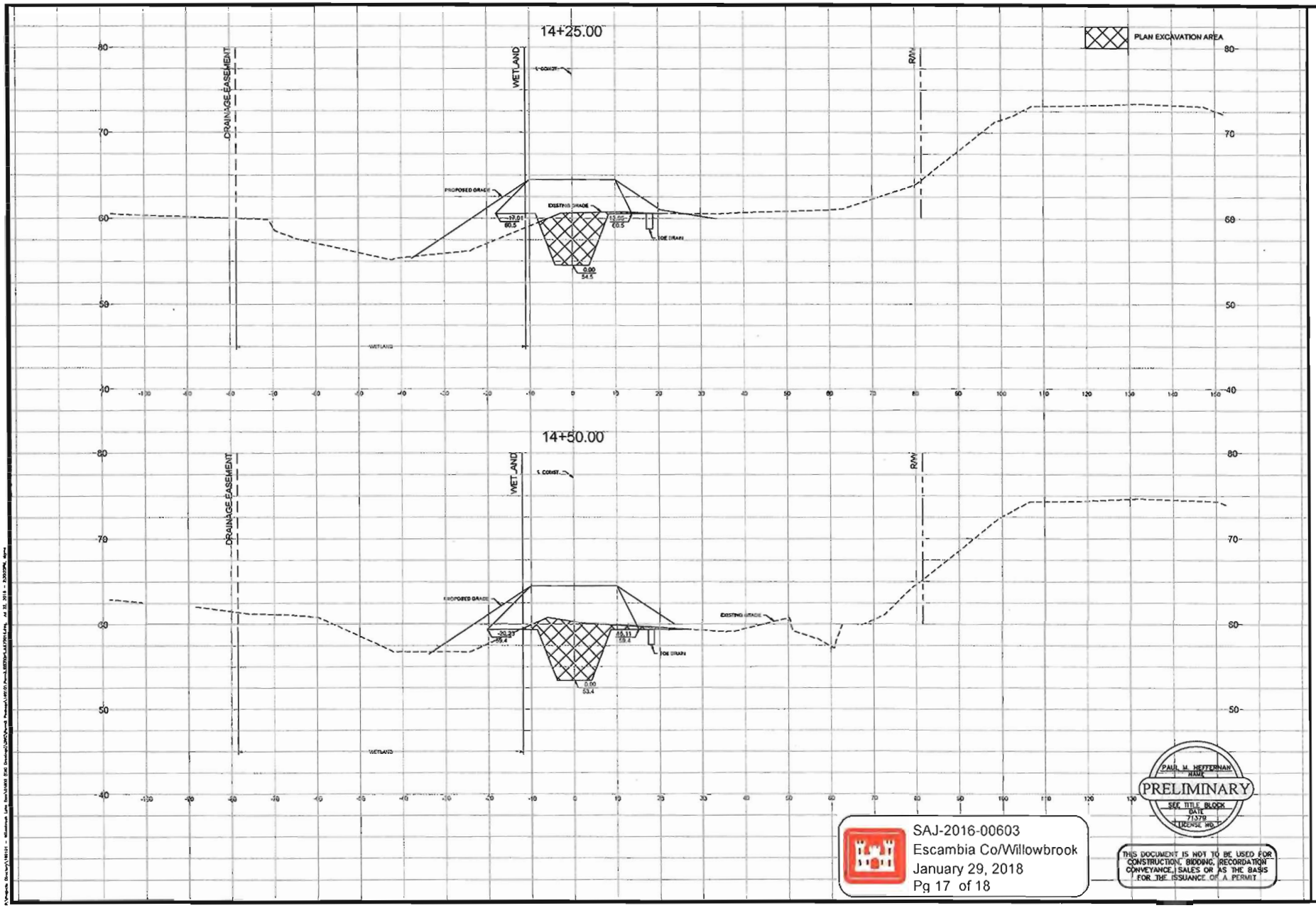
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT PROJECT

CROSS SECTION

NO	REVISION	DATE

Project Number: 160101
Date: JULY 2016
Drawn By: C.W.H.
Designed By: P.M.H.
Checked By: J.L.L.
Sheet: 18



3288 SUMMIT BOULEVARD SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7912
CERTIFICATE OF AUTHORIZATION #26889

BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT PROJECT

CROSS SECTION

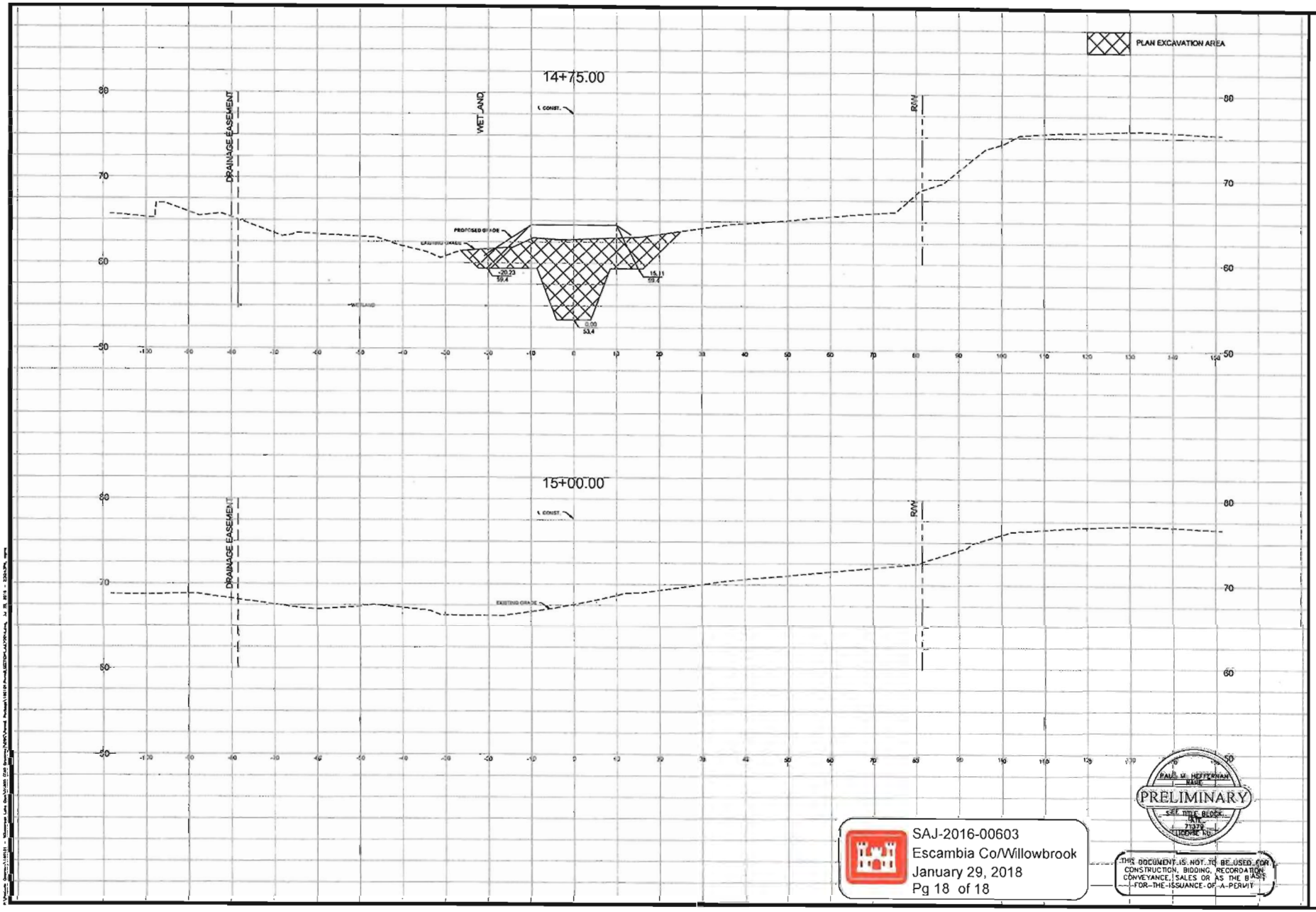
NO	REVISION	DATE

Project Number	160101
Date	JULY 2016
Drawn By	C.W.H
Designed By	P.M.H
Checked By	J.L.L.
Sheet	19

PAUL M. HEFFERNAN
NAME
PRELIMINARY
SEE TITLE BLOCK
DATE
71379
LICENSE NO.

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Pg 17 of 18



SAJ-2016-00603
Escambia Co/Willowbrook
January 29, 2018
Pg 18 of 18

PRELIMINARY

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SIGMA
3298 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7812
CERTIFICATE OF AUTHORIZATION #28585

BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT PROJECT

CROSS SECTION

NO.	DESCRIPTION	DATE

Project Number: 160101
Date: JULY 2016
Drawn By: G.W.H.
Designed By: G.W.H.
Checked By: J.L.L.
Sheet: 20

Authority for review – an agreement with the Corps entitled "Coordination Agreement Between the U.S. Army Corps of Engineers (Jacksonville District) and the Florida Department of Environmental Protection, or Duly Authorized Designee, State Programmatic General Permit," Section 10 of the Rivers and Harbor Act of 1899, and Section 404 of the Clean Water Act.

Coastal Zone Management
Issuance of this authorization also constitutes a finding of consistency with Florida's Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act.

Water Quality Certification
This permit also constitutes a: water quality certification under Section 401 of the Clean Water Act, 33 U.S.C. 1341

Other Authorizations
You are advised that authorizations or permits for this activity may be required by other federal, state, regional, or local entities including but not limited to local governments or municipalities. This permit does not relieve you from the requirements to obtain all other required permits or authorizations.

The activity described may be conducted only in accordance with the terms, conditions and attachments contained in this document. Issuance and granting of the permit and authorizations herein do not infer, nor guarantee, nor imply that future permits, authorizations, or modifications will be granted by the Department.

PERMIT CONDITIONS
The activities described must be conducted in accordance with:

- **The Specific Conditions**
- **The General Conditions**
- **The limits, conditions and locations of work shown in the attached drawings**
- **The term limits of this authorization**

You are advised to read and understand these conditions and drawings prior to beginning the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings herein. If you are using a contractor, the contractor also should read and understand these conditions and drawings prior to beginning any activity. Failure to comply with these conditions, including any mitigation requirements, shall be grounds for the Department to revoke the permit and authorization and to take appropriate enforcement action. Operation of the facility is not authorized except when determined to be in conformance with all applicable rules and this permit, as described.

SPECIFIC CONDITIONS – PRIOR TO ANY CONSTRUCTION
1. If the approved permit drawings conflict with the specific conditions, then the specific conditions shall prevail.

2. Prior to construction, the limits of the proposed fill areas shall be clearly flagged and staked by the agent and/or contractor. The sedimentation control devices must be placed entirely on the construction side of this boundary. All construction personnel shall be shown the location of all wetland areas outside of the construction area to prevent encroachment from heavy equipment into these areas.

3. Staked filter cloth shall be positioned at the edge of the permitted fill slopes adjacent to wetlands and surface waters to prevent turbid run-off and erosion. Erosion control devices shall remain in place until soils have stabilized by vegetative recruitment. Barriers shall be removed upon establishment of a substantial vegetative cover.

SPECIFIC CONDITIONS – CONSTRUCTION ACTIVITIES

4. Throughout the facility construction, the permittee shall provide quality control / quality assurance. Records of each inspection shall be available for inspection upon request by the Department. Erosion and sediment control BMPs shall be in place until the surface is stabilized.

5. No construction or fill is authorized in the remaining un-impacted wetlands as indicated on the plan-view drawings.

6. This permit does not authorize the construction of any additional structures not illustrated on the permit drawings.

7. All storage or stockpiling of tools or materials (i.e.) lumber, pilings, etc. shall be limited to uplands or within the impact areas authorized by this project. In addition, all equipment being utilized shall be limited to operation and storage in uplands or within the impact areas authorized by this permit.

8. All wetland areas or water bodies, which are adjacent to the specific limits of construction authorized by this permit, shall be protected from erosion, sedimentation, siltation, scouring, excess turbidity or dewatering.

9. Best management practices for erosion control shall be implemented and maintained at all times during construction to prevent siltation and turbid discharges in excess of State water quality standards pursuant to Rule 62-302, F.A.C. Methods shall include, but are not limited to the use of staked hay bales, staked filter cloth, sodding, seeding, and mulching; staged construction; and the installation of turbidity screens around the immediate project site.

10. The permittee shall be responsible for ensuring that erosion control devices/procedures are inspected and maintained daily during all phases of construction authorized by this permit until all areas that were disturbed during construction are sufficiently stabilized to prevent erosion, siltation, and turbid discharges.

11. All exposed and disturbed land surfaces shall be stabilized with sod, seed or mulch immediately following completion of final grades at the project site to prevent erosion. All side slopes shall be stabilized with sod within 48 hours following completion of the placement and compaction of the fill material.

12. The following measures shall be taken by the permittee whenever siltation, sedimentation, or erosion occurs within wetlands outside of the limits of the authorized activities:

a. Immediately cease all work contributing to the violation.
b. Stabilize all exposed soils contributing to the violation. Modify the work procedures that were responsible for the violation and install more erosion, sedimentation, and turbidity control devices.
c. Notify the Department within 24 hours of the time the violation occurred at (850) 595-8300.

13. All fill material shall be clean material and shall not be contaminated with vegetation, garbage, trash, tires, hazardous, toxic waste or other deleterious materials.

14. Ground which will become the foundation of the embankment shall be stripped of all vegetation and organic detritus or residue, including muck, mud, slimes, or other material which would flow or undergo excessive consolidation under heavy loading. All earth foundation surfaces on which fill is to be placed shall be scarified or moistened and compacted prior to spreading of first course of fill material, and the dike base shall be well drained during construction.

15. The basin interior and exterior slopes shall be sodded and/or seeded and stabilized both before use and after dewatering to prevent erosion.

16. For emergencies involving a serious threat to the public health, safety, welfare, or environment, the emergency telephone contact number is 800-320-0519 (State Warning Point). The Department telephone number for reporting nonthreatening problems or system malfunctions is (850) 595-0663, day or night

17. The construction phase expires at 11:59 p.m. on the date indicated on the cover page of this permit. If construction of the stormwater management system authorized by this ERP, individual stormwater permit has not been completed and continued use of the system formally transferred to the operating phase before the expiration date of this permit, or an authorized extension, then at least 60 days before such expiration date, the permittee shall apply for another individual stormwater permit, using the forms and accompanied by the fee required by rules in effect at that time.

18. If any construction de-watering is required, which results in an off-site discharge of ground water, the permittee and/or the contractor shall ensure that the requirements of pertinent portions of Chapter 62-621, F.A.C. are met. Please contact Bill Evans, P.E., at 850-595-0584, for more information.

19. The mailing address for submittal of forms for the "Construction Commencement Notice", "As-Built Certification", "Request for Conversion of Stormwater Management Permit Construction Phase to Operation and Maintenance Phase", or other correspondence is FDEP, SLERP, 160 W. Government Street, Pensacola, Florida, 32502.

SPECIFIC CONDITIONS – OPERATION AND MAINTENANCE ACTIVITIES

20. If deficiencies are found, the permittee will be responsible for correcting the deficiencies so that the facility is returned to the operational functions required in the permit. The corrections must be done in a timely manner to prevent compromises to flood protection and water quality. Records of all repairs performed must be maintained by the permittee.

21. If the operational maintenance and corrective measures are insufficient to enable the facility to meet the performance standards of this permit, the permittee must either replace the facility or construct an alternative design in a timely manner to prevent compromises to overtopping and breach.

GENERAL CONDITIONS FOR INDIVIDUAL PERMITS

The following general conditions are binding on all individual permits issued under Chapter 62-330, F.A.C., except where the conditions are not applicable to the authorized activity, or where the conditions must be modified to accommodate project-specific conditions.

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, F.A.C. Any deviations that are not so authorized may subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.

2. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the *State of Florida Erosion and Sediment Control Designer and Reviewer Manual* (Florida Department of Environmental Protection and Florida Department of Transportation, June 2007), and the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual* (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008), which are both incorporated by reference in subparagraph 62-330.050(9)(b)5., F.A.C., unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.

4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice" (October 1, 2013), which is incorporated by reference in paragraph 62-330.350(1)(d), F.A.C., indicating the expected start and completion dates. A copy of this form may be obtained from the Agency, as described in subsection 62-330.010(5), F.A.C. If available, an Agency website that fulfills this notification requirement may be used in lieu of the form.

SELF-CERTIFICATION STATEMENT OF COMPLIANCE

Permit Number: SAJ-2016-00603 (SP-HMM)

Permittee's Name & Address (please print or type):

_____

_____

Telephone Number:_____

Location of the Work: _____

_____

Date Work Started:_____ Date Work Completed:_____

PROPERTY IS INACCESSIBLE WITHOUT PRIOR NOTIFICATION: YES ____NO___
PLEASE CONTACT _____ AT _____
TO SCHEDULE AN INSPECTION

Description of the Work (e.g. bank stabilization, residential or commercial filling, docks, dredging, etc.):

_____

_____

Acreage or Square Feet of Impacts to Waters of the United States: _____

Describe Mitigation completed (if applicable):_____

_____

_____

Describe any Deviations from Permit (attach drawing(s) depicting the deviations):_____

_____

_____

****

I certify that all work, and mitigation (if applicable) was done in accordance with the limitations and conditions as described in the permit. Any deviations as described above are depicted on the attached drawing(s).

_____
Signature of Permittee

_____
Date

ATTACHMENT 3
Self-Certification Form

1 Page

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
41 NORTH JEFFERSON ST, SUITE 301
PENSACOLA, FLORIDA 32502

January 29, 2018

REPLY TO
ATTENTION OF

Regulatory Division
North Permits Branch
SAJ-2016-00603 (SP-HMM)

Escambia County Board of County Commissioners
Public Works Department
c/o Joy D. Blackmon, Director/County Engineer
3363 West Park Place
Pensacola, Florida 32505

Dear Ms. Blackmon:

The U.S. Army Corps of Engineers (Corps) has completed the review and evaluation of your Department of the Army permit application, number SAJ-2016-0603. Our regulations require that you have an opportunity to review the terms and conditions prior to final signature by the Department of the Army. Enclosed is an unsigned Department of the Army permit instrument (permit).

Please read carefully the Special Conditions beginning on page 3 of the permit. These were developed to apply specifically to your project. Water Quality Certification is also required prior to issuance of a permit. The Corps has received a copy of the State of Florida certification for your project. In accordance with General Condition 5 of the permit, any special conditions of the Water Quality Certification have been attached to the Department of the Army permit.

Instructions for Objecting to Permit Terms and Conditions: This letter contains an initial proffered permit for your proposed project. If you object to certain terms and conditions contained within the permit, you may request that the permit be modified. Enclosed you will find a Notification of Administrative Appeal Options and Process fact sheet and Request for Appeal (RFA) form. If you choose to object to certain terms and conditions of the permit, you must follow the directions provided in Section 1, Part A and submit the completed RFA form to the letterhead address.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria under 33 CFR Part 331.5, and that it has been received by the District office within 60 days of the date of the RFA. Should you decide to submit an RFA form, it must be received at the letterhead address by March 29, 2018.

Instructions for Accepting Terms and Conditions and Finalizing Your Permit: It is not necessary to submit an RFA form to the District office, if you do not object to the decision in this letter. In this case, the permit must be signed by the applicant in the space provided on the signature page of the permit. In the case of corporations, acceptance must be by an officer of that corporation authorized to sign on behalf of the corporation. The party responsible for assuring the work is done in accordance with the

permit terms and conditions must sign the permit. Please type or print the name and title of the person signing below the signature and the date signed.

SIGN AND RETURN THE **ENTIRE PERMIT** (ORIGINAL COPY, INCLUDING ALL ATTACHMENTS), TO THE LETTERHEAD ADDRESS.

The permit will be signed by the District Engineer and returned to you. It is important to note that the permit is not valid until the District Engineer signs it.

The Corps Jacksonville District Regulatory Division is committed to improving service to our customers. We strive to perform our duty in a friendly and timely manner while working to preserve our environment. We invite you to take a few minutes to visit http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey and complete our automated Customer Service Survey. Your input is appreciated – favorable or otherwise. Please be aware this web address is case sensitive and should be entered as it appears above.

If you have any questions concerning this application, you may contact Holly Millsap in writing at the letterhead address, by electronic mail at Holly.M.Millsap@usace.army.mil, or by telephone at 850-470-9823.

Sincerely,

Shayne Hayes

for Donald W. Kinard
Chief, Regulatory Division

Enclosures:
Appeal Form
Preliminary JD Form
Initially Proffered Permit (w/ attachments)

Copy Furnished:
Biome, Agent

29

Applicant: Escambia County BOCC/Willowbrook Dam	File Number: **SAJ-2016-00603**	Date: January 29, 2018
Attached is:		See Section below
X	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	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://www.usace.army.mil/CECW/Pages/reg_materials.aspx 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. This form must be received by the division engineer within 60 days of the date of this notice.

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: **Project Manager as noted in letter**	If you only have questions regarding the appeal process you may also contact: **for process:** **Jason Steele 404-562-5137**

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.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

Florida Department of Environmental Protection

160 W. Government Street, Suite 308
Pensacola, Florida 32502-5740

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Jonathan P. Steverson
Secretary

Permittee/Authorized Entity:
Escambia County Public Works
c/o Joy Blackmon
County Engineer
3363 West Park Place
Escambia County
JDBlackm@co.escambia.fl.us

Escambia County Public Works - Willowbrook Dam Replacement

Environmental Resource Permit

State-owned Submerged Lands Authorization – Not Applicable

U.S. Army Corps of Engineers Authorization – Separate Corps Authorization Required

Escambia County
Permit No.: 17-0342489-001-EI

Permit Issuance Date: April 26, 2016
Permit Construction Phase Expiration Date: April 26, 2021

Environmental Resource Permit

Permittee: Escambia County
Permit No: 17-0342489-001-EI

PROJECT LOCATION
The activities authorized by this permit are located at Parcel Numbers 221N301100010002 & 221N301100410002, at Chemstrand Road, Pensacola, Florida 32534, Section 22, Township 01 North, Range 30 West in Escambia County. Latitude 30° 33' 35.40" North / Longitude 87° 15' 42.32" West.

PROJECT DESCRIPTION
The permittee is authorized to fill 0.13-acres of wetlands, and temporarily impact 0.33-acres of wetlands, for the replacement of an earthen dam and the associated spillway structures in Clear Creek, a Class III Florida Waterbody. The proposed dam will be restored to the same elevation, and within the same footprint as the original failed dam. An armored auxiliary spillway is also proposed within the previous dam footprint.

Because the authorized activities will restore the pre-storm lake habitat, and because no new impacts are proposed, mitigation will not be required.

Authorized activities are depicted on the attached exhibits.

AUTHORIZATIONS
Escambia County Public Works - Willowbrook Dam Replacement
Environmental Resource Permit
The Department has determined that the activity qualifies for an Environmental Resource Permit. Therefore, the Environmental Resource Permit is hereby granted, pursuant to Part IV of Chapter 373, Florida Statutes (F.S.), and Chapter 62-330, Florida Administrative Code (F.A.C.).

Sovereignty Submerged Lands Authorization
As staff to the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees), the Department has determined the activity is not on submerged lands owned by the State of Florida. Therefore, your project is not subject to the requirements of Chapter 253, F.S., or Rule 18-21, F.A.C.

Federal Authorization
Your proposed activity as outlined on your application and attached drawings **does not qualify** for federal authorization pursuant to the State Programmatic General Permit and a **SEPARATE permit** or authorization **may be required** from the U.S. Army Corps of Engineers (Corps). A copy of your permit application has been forwarded to the Corps for their review. The Corps will issue their authorization directly to you or contact you if additional information is needed. If you have not heard from the Corps within 30 days from the date your application was received at the local FDEP Office, contact the Corps at (850) 433-8732 for status and further information. **Failure to obtain Corps authorization prior to construction could subject you to federal enforcement action by that agency.**

Authority for review – an agreement with the Corps entitled "Coordination Agreement Between the U.S. Army Corps of Engineers (Jacksonville District) and the Florida Department of Environmental Protection, or Duly Authorized Designee, State Programmatic General Permit," Section 10 of the Rivers and Harbor Act of 1899, and Section 404 of the Clean Water Act.

Coastal Zone Management
Issuance of this authorization also constitutes a finding of consistency with Florida's Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act.

Water Quality Certification
This permit also constitutes a: water quality certification under Section 401 of the Clean Water Act, 33 U.S.C. 1341

Other Authorizations
You are advised that authorizations or permits for this activity may be required by other federal, state, regional, or local entities including but not limited to local governments or municipalities. This permit does not relieve you from the requirements to obtain all other required permits or authorizations.

The activity described may be conducted only in accordance with the terms, conditions and attachments contained in this document. Issuance and granting of the permit and authorizations herein do not infer, nor guarantee, nor imply that future permits, authorizations, or modifications will be granted by the Department.

PERMIT CONDITIONS
The activities described must be conducted in accordance with:

- **The Specific Conditions**
- **The General Conditions**
- **The limits, conditions and locations of work shown in the attached drawings**
- **The term limits of this authorization**

You are advised to read and understand these conditions and drawings prior to beginning the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings herein. If you are using a contractor, the contractor also should read and understand these conditions and drawings prior to beginning any activity. Failure to comply with these conditions, including any mitigation requirements, shall be grounds for the Department to revoke the permit and authorization and to take appropriate enforcement action. Operation of the facility is not authorized except when determined to be in conformance with all applicable rules and this permit, as described.

SPECIFIC CONDITIONS – PRIOR TO ANY CONSTRUCTION
1. If the approved permit drawings conflict with the specific conditions, then the specific conditions shall prevail.

2. Prior to construction, the limits of the proposed fill areas shall be clearly flagged and staked by the agent and/or contractor. The sedimentation control devices must be placed entirely on the construction side of this boundary. All construction personnel shall be shown the location of all wetland areas outside of the construction area to prevent encroachment from heavy equipment into these areas.

3. Staked filter cloth shall be positioned at the edge of the permitted fill slopes adjacent to wetlands and surface waters to prevent turbid run-off and erosion. Erosion control devices shall remain in place until soils have stabilized by vegetative recruitment. Barriers shall be removed upon establishment of a substantial vegetative cover.

SPECIFIC CONDITIONS – CONSTRUCTION ACTIVITIES

4. Throughout the facility construction, the permittee shall provide quality control / quality assurance. Records of each inspection shall be available for inspection upon request by the Department. Erosion and sediment control BMPs shall be in place until the surface is stabilized.

5. No construction or fill is authorized in the remaining un-impacted wetlands as indicated on the plan-view drawings.

6. This permit does not authorize the construction of any additional structures not illustrated on the permit drawings.

7. All storage or stockpiling of tools or materials (i.e.) lumber, pilings, etc. shall be limited to uplands or within the impact areas authorized by this project. In addition, all equipment being utilized shall be limited to operation and storage in uplands or within the impact areas authorized by this permit.

8. All wetland areas or water bodies, which are adjacent to the specific limits of construction authorized by this permit, shall be protected from erosion, sedimentation, siltation, scouring, excess turbidity or dewatering.

9. Best management practices for erosion control shall be implemented and maintained at all times during construction to prevent siltation and turbid discharges in excess of State water quality standards pursuant to Rule 62-302, F.A.C. Methods shall include, but are not limited to the use of staked hay bales, staked filter cloth, sodding, seeding, and mulching; staged construction; and the installation of turbidity screens around the immediate project site.

10. The permittee shall be responsible for ensuring that erosion control devices/procedures are inspected and maintained daily during all phases of construction authorized by this permit until all areas that were disturbed during construction are sufficiently stabilized to prevent erosion, siltation, and turbid discharges.

11. All exposed and disturbed land surfaces shall be stabilized with sod, seed or mulch immediately following completion of final grades at the project site to prevent erosion. All side slopes shall be stabilized with sod within 48 hours following completion of the placement and compaction of the fill material.

12. The following measures shall be taken by the permittee whenever siltation, sedimentation, or erosion occurs within wetlands outside of the limits of the authorized activities:

a. Immediately cease all work contributing to the violation.
b. Stabilize all exposed soils contributing to the violation. Modify the work procedures that were responsible for the violation and install more erosion, sedimentation, and turbidity control devices.
c. Notify the Department within 24 hours of the time the violation occurred at (850) 595-8300.

13. All fill material shall be clean material and shall not be contaminated with vegetation, garbage, trash, tires, hazardous, toxic waste or other deleterious materials.

14. Ground which will become the foundation of the embankment shall be stripped of all vegetation and organic detritus or residue, including muck, mud, slimes, or other material which would flow or undergo excessive consolidation under heavy loading. All earth foundation surfaces on which fill is to be placed shall be scarified or moistened and compacted prior to spreading of first course of fill material, and the dike base shall be well drained during construction.

15. The basin interior and exterior slopes shall be sodded and/or seeded and stabilized both before use and after dewatering to prevent erosion.

16. For emergencies involving a serious threat to the public health, safety, welfare, or environment, the emergency telephone contact number is 800-320-0519 (State Warning Point). The Department telephone number for reporting nonthreatening problems or system malfunctions is (850) 595-0663, day or night

17. The construction phase expires at 11:59 p.m. on the date indicated on the cover page of this permit. If construction of the stormwater management system authorized by this ERP, individual stormwater permit has not been completed and continued use of the system formally transferred to the operating phase before the expiration date of this permit, or an authorized extension, then at least 60 days before such expiration date, the permittee shall apply for another individual stormwater permit, using the forms and accompanied by the fee required by rules in effect at that time.

18. If any construction de-watering is required, which results in an off-site discharge of ground water, the permittee and/or the contractor shall ensure that the requirements of pertinent portions of Chapter 62-621, F.A.C. are met. Please contact Bill Evans, P.E., at 850-595-0584, for more information.

19. The mailing address for submittal of forms for the "Construction Commencement Notice", "As-Built Certification", "Request for Conversion of Stormwater Management Permit Construction Phase to Operation and Maintenance Phase", or other correspondence is FDEP, SLERP, 160 W. Government Street, Pensacola, Florida, 32502.

SPECIFIC CONDITIONS – OPERATION AND MAINTENANCE ACTIVITIES

20. If deficiencies are found, the permittee will be responsible for correcting the deficiencies so that the facility is returned to the operational functions required in the permit. The corrections must be done in a timely manner to prevent compromises to flood protection and water quality. Records of all repairs performed must be maintained by the permittee.

21. If the operational maintenance and corrective measures are insufficient to enable the facility to meet the performance standards of this permit, the permittee must either replace the facility or construct an alternative design in a timely manner to prevent compromises to overtopping and breach.

GENERAL CONDITIONS FOR INDIVIDUAL PERMITS

The following general conditions are binding on all individual permits issued under Chapter 62-330, F.A.C., except where the conditions are not applicable to the authorized activity, or where the conditions must be modified to accommodate project-specific conditions.

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, F.A.C. Any deviations that are not so authorized may subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.

2. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the *State of Florida Erosion and Sediment Control Designer and Reviewer Manual* (Florida Department of Environmental Protection and Florida Department of Transportation, June 2007), and the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual* (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008), which are both incorporated by reference in subparagraph 62-330.050(9)(b)5., F.A.C., unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.

4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice" (October 1, 2013), which is incorporated by reference in paragraph 62-330.350(1)(d), F.A.C., indicating the expected start and completion dates. A copy of this form may be obtained from the Agency, as described in subsection 62-330.010(5), F.A.C. If available, an Agency website that fulfills this notification requirement may be used in lieu of the form.

5. Unless the permit is transferred under Rule 62-330.340, F.A.C., or transferred to an operating entity under Rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms and conditions of the permit for the life of the project or activity.

6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:

a. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex – "Construction Completion and Inspection Certification for Activities Associated With a Private Single-Family Dwelling Unit" [Form 62-330.310(3)]; or
b. For all other activities – "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)].
c. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.

7. If the final operation and maintenance entity is a third party:

a. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as- built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.3 of Volume I) as filed with the Department of State, Division of Corporations and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
b. Within 30 days of submittal of the as-built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.

8. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.

9. This permit does not:

a. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;
b. Convey to the permittee or create in the permittee any interest in real property;
c. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
d. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.

10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.

11. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.

12. The permittee shall notify the Agency in writing:
    a. Immediately if any previously submitted information is discovered to be inaccurate; and
    b. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.

13. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.

14. If any prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, work involving subsurface disturbance in the immediate vicinity of such discoveries shall cease. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance and Review Section, at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Such subsurface work shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and notification shall be provided in accordance with Section 872.05, F.S.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.

17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.

18. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with subsection 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.

NOTICE OF RIGHTS

This action is final and effective on the date filed with the Clerk of the Department unless a petition for an administrative hearing is timely filed under Sections 120.569 and 120.57, F.S., before the deadline for filing a petition. On the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. Because the administrative hearing process is designed to formulate final agency action, the hearing process may result in a modification of the agency action or even denial of the application.

Petition for Administrative Hearing

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57, Florida Statutes. Pursuant to rule 28-106.201, Florida Administrative Code, a petition for an administrative hearing must contain the following information:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, any email address, any facsimile number, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests are or will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;

(f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and

(g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000 or at Agency_Clerk@dep.state.fl.us. Also, a copy of the petition shall be mailed to the applicant at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with rule 62-110.106(3), Florida Administrative Code, petitions for an administrative hearing by the applicant must be filed within 21 days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under section 120.60(3), Florida Statutes, must be filed within 21 days of publication of the notice or within 21 days of receipt of the written notice, whichever occurs first. Under section 120.60(3), Florida Statutes, however, any person who has asked the Department for notice of agency action may file a petition within 21 days of receipt of such notice, regardless of the date of publication. The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing)

under sections 120.569 and 120.57, Florida Statutes, or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with rule 28-106.205, Florida Administrative Code.

Extension of Time

Under rule 62-110.106(4), Florida Administrative Code, a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, before the applicable deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

Mediation is not available in this proceeding.

FLAWAC Review

The applicant, or any party within the meaning of Section 373.114(1)(a) or 373.4275, F.S., may also seek appellate review of this order before the Land and Water Adjudicatory Commission under Section 373.114(1) or 373.4275, F.S. Requests for review before the Land and Water Adjudicatory Commission must be filed with the Secretary of the Commission and served on the Department within 20 days from the date when this order is filed with the Clerk of the Department.

Judicial Review

Once this decision becomes final, any party to this action has the right to seek judicial review pursuant to Section 120.68, F.S., by filing a Notice of Appeal pursuant to Rules 9.110 and 9.190, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, M.S. 35, Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this action is filed with the Clerk of the Department.

Thank you for applying to the Submerged Lands and Environmental Resource Permit Program. If you have any questions regarding this matter, please contact Leona Lewis at the letterhead address, at 850-595-0581, or at Leona.E.Lewis@dep.state.fl.us.

Executed in Escambia County, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

For Andrew Joslyn
Permitting Program Administrator

Attachments:
Exhibit 1, Project Drawings and Design Specs., 7 pages

Copies furnished to:
Clif Payne, U.S. Army Corps of Engineers, Lyal.C.Payne@usace.army.mil
Holly Millsap, U.S. Army Corps of Engineers, Holly.M.Millsap@usace.army.mil
Paul Heffernan, Sigma Consulting Group, Inc., pheffernan@sigmacg.com
Jason Lashley, Sigma Consulting Group, Inc., jlashley@sigmacg.com
Rayne Mattson, Biome Consulting Group, rayne@biome.co
File

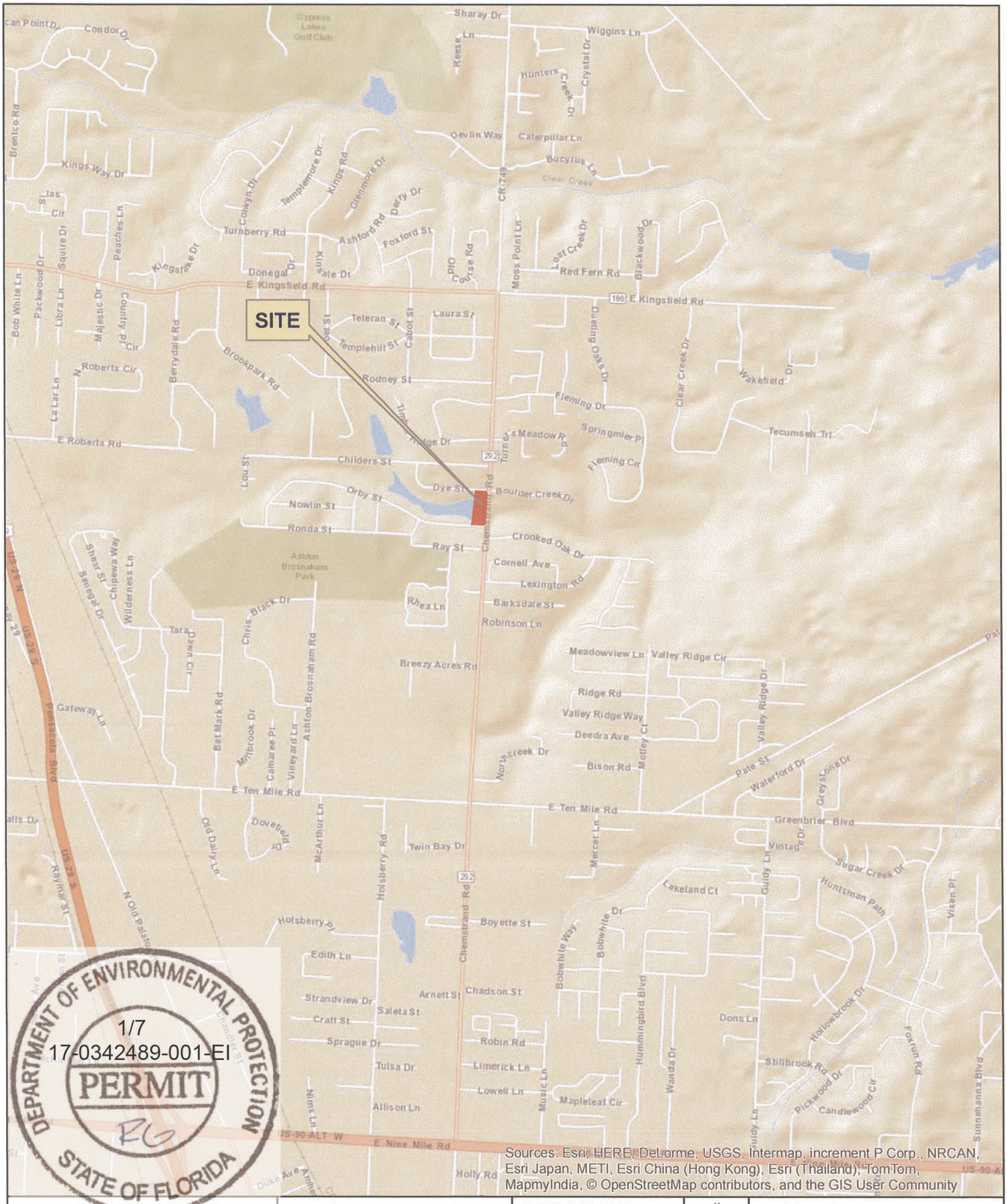
CERTIFICATE OF SERVICE

The undersigned hereby certifies that this permit, including all copies, was mailed before the close of business on April 26, 2016, to the above listed persons.

FILING AND ACKNOWLEDGMENT

FILED, on this date, under 120.52(7) of the Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

April 26, 2016
Clerk Date



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

EXHIBIT 1. LOCATION
WILLOWBROOK DAM
ESCAMBIA COUNTY
PREPARED FOR:
SIGMA CONSULTING GROUP, INC.

LEGEND

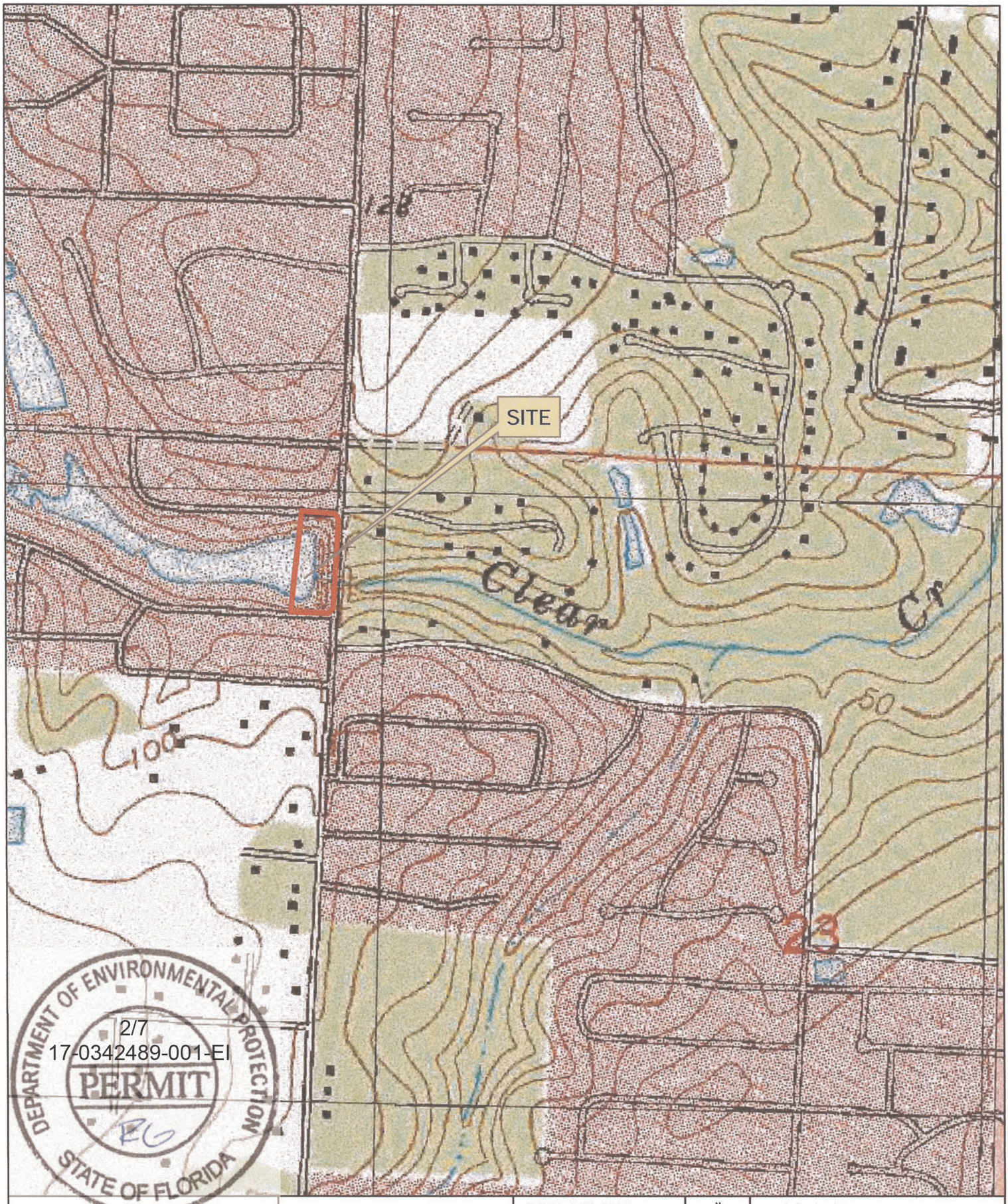
INSPECTION BOUNDARY

DATE: 2-29-2016
AUTHOR: WED
THIS IS NOT A SURVEY

N W E S

0 0.4 Miles

biome Consulting Group
1300 West Government St. Pensacola, Florida 32502
850.435.9367 www.biome.co



DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE OF FLORIDA
PERMIT
2/7
17-0342489-001-EI
RG

EXHIBIT 2. USGS QUAD
WILLOWBROOK DAM
ESCAMBIA COUNTY
PREPARED FOR:
SIGMA CONSULTING GROUP, INC.

LEGEND

INSPECTION BOUNDARY

DATE: 2-29-2016
AUTHOR: WED
THIS IS NOT A SURVEY

N W E S

0 800 Feet

biome Consulting Group
1300 West Government St. Pensacola, Florida 32502
850.435.9367 www.biome.co

DEPARTMENT OF ENVIRONMENTAL PROTECTION
3/7
17-0342489-001-EI
PERMIT
STATE OF FLORIDA

APPROXIMATE ACREAGES:
UPLAND: 1.79 AC.
WETLAND: 0.87 AC.

EXHIBIT 4. WETLAND
WILLOWBROOK DAM
ESCAMBIA COUNTY
PREPARED FOR:
SIGMA CONSULTING GROUP, INC.

LEGEND

INSPECTION BOUNDARY

WETLAND

DATE: 2-29-2016
AUTHOR: WED
THIS IS NOT A SURVEY

N
W E
S

0 100 Feet

biome
Consulting Group
1300 West Government St. Pensacola, Florida 32502
850.435.9367 www.biome.co

DEPARTMENT OF ENVIRONMENTAL PROTECTION
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17-0342489-001-EI
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EXHIBIT 7. 1974 AERIAL PHOTOGRAPH
WILLOWBROOK DAM
ESCAMBIA COUNTY
PREPARED FOR:
SIGMA CONSULTING GROUP, INC.

LEGEND

INSPECTION BOUNDARY

DATE: 2-29-2016
AUTHOR: WED
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N W E S

0 100 Feet

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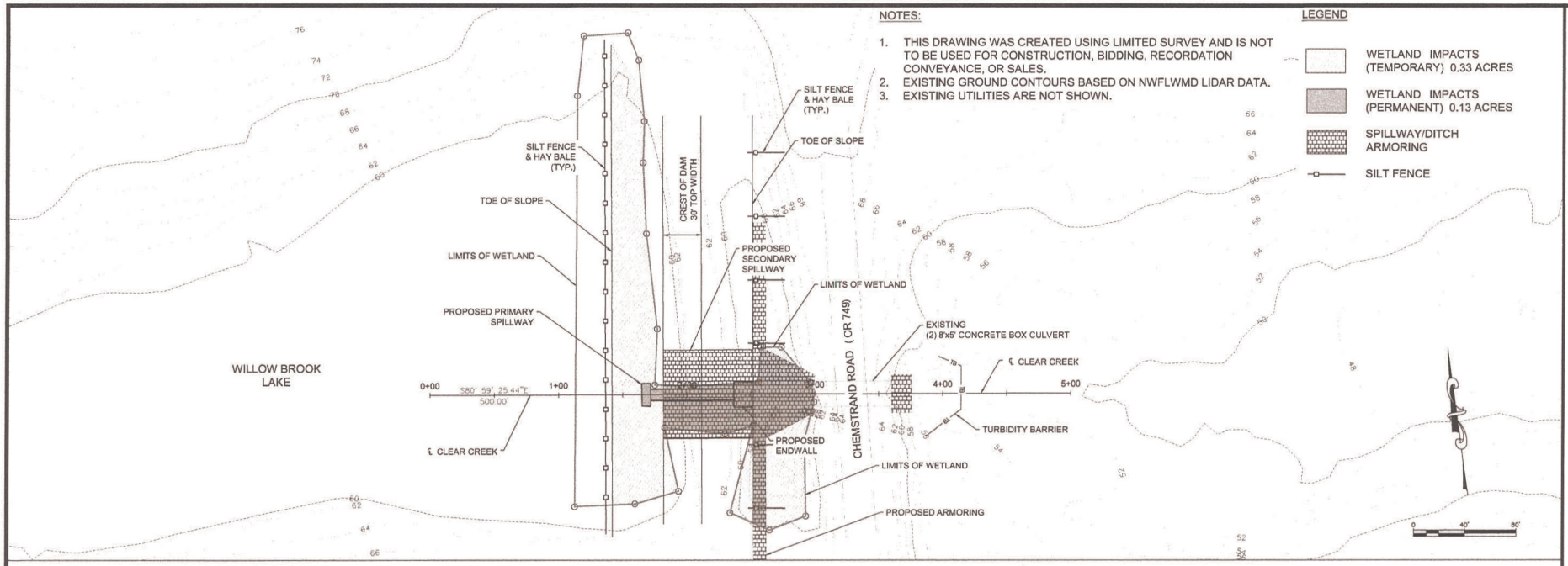
NOTES:

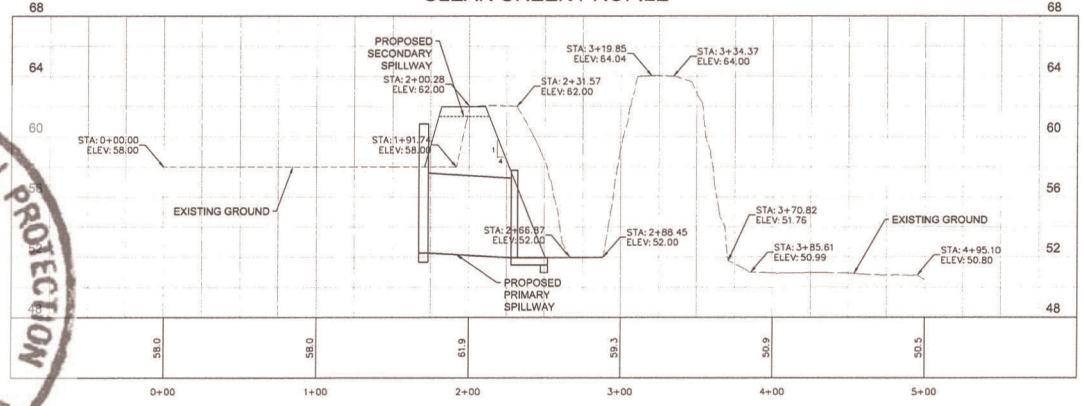
1. THIS DRAWING WAS CREATED USING LIMITED SURVEY AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION CONVEYANCE, OR SALES.
2. EXISTING GROUND CONTOURS BASED ON NWFLWMD LIDAR DATA.
3. EXISTING UTILITIES ARE NOT SHOWN.

LEGEND

- WETLAND IMPACTS (TEMPORARY) 0.33 ACRES
- WETLAND IMPACTS (PERMANENT) 0.13 ACRES
- SPILLWAY/DITCH ARMORING
- SILT FENCE



CLEAR CREEK PROFILE



0 40' 80'
SCALE HORIZ.
0 4' 8'
SCALE VERT.

PERMIT DRAWING - NOT FOR CONSTRUCTION

SIGMA CONSULTING GROUP, INC.
3298 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7312
CERTIFICATE OF AUTHORIZATION #28888

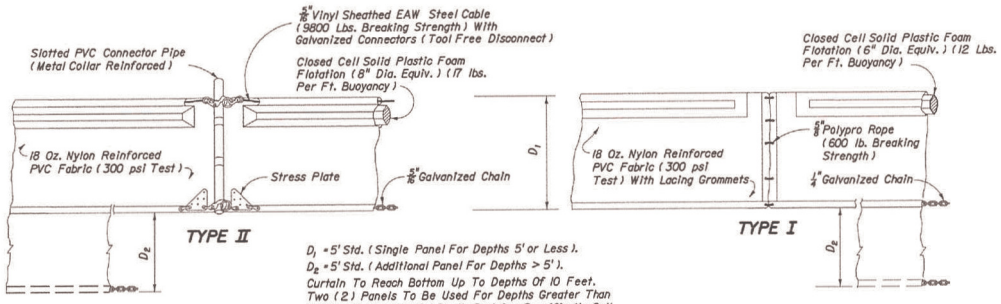
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT

PLAN AND PROFILE

NO.	REVISION	DATE

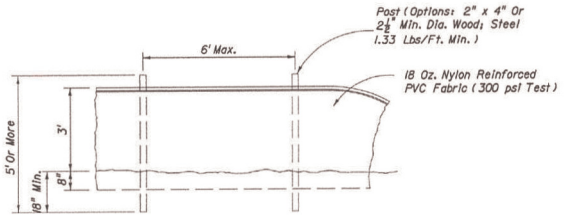
Project Number:	160101
Date:	03/03/2016
Drawn By:	P.M.H.
Designed By:	P.M.H.
Checked By:	J.L.L.
Sheet:	1



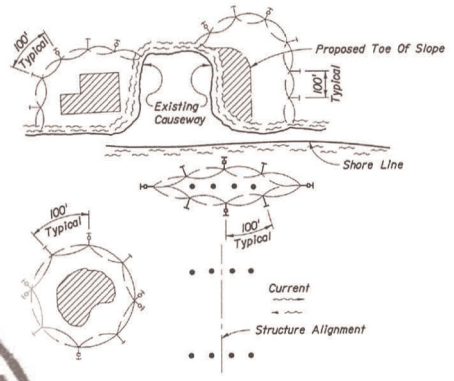
D_1 = 5' Std. (Single Panel For Depths 5' or Less).
D_2 = 5' Std. (Additional Panel For Depths > 5').
Curtain To Reach Bottom Up To Depths Of 10 Feet. Two (2) Panels To Be Used For Depths Greater Than 10 Feet Unless Special Depth Curtains Specifically Call For In The Plans Or As Determined By The Engineer.

NOTICE: COMPONENTS OF TYPES I AND II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.

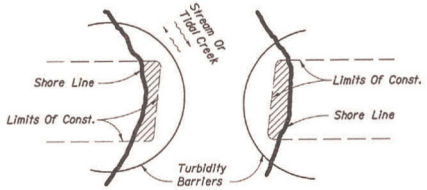
FLOATING TURBIDITY BARRIERS



STAKED TURBIDITY BARRIER



LEGEND
- Pile Locations
- Dredge Or Fill Area
- Mooring Buoy w/Anchor
- Anchor
- Barrier Movement Due To Current Action



NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of anchors dependent on current velocities.
3. Deployment of barrier around pile locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 104 of the Standard Specifications.

Note:
Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractors option unless otherwise specified in the plans, however payment will be under the pay item(s) established in the plans for Floating Turbidity Barrier and/or Staked Turbidity Barrier. Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

TURBIDITY BARRIER APPLICATIONS

GENERAL NOTES

1. Floating turbidity barriers are to be paid for under the contract unit price for Floating Turbidity Barrier, LF.
2. Staked turbidity barriers are to be paid for under the contract unit price for Staked Turbidity Barrier, LF.

SIGMA CONSULTING GROUP, INC.
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CERTIFICATE OF AUTHORIZATION #28889

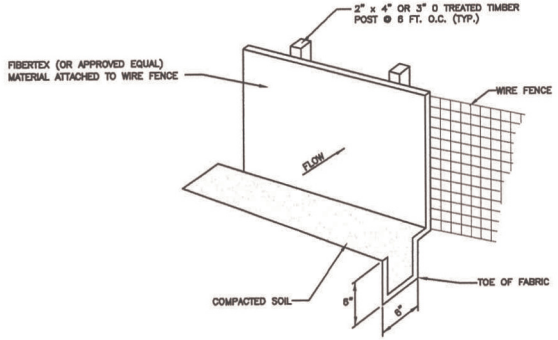
BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE DAM REPLACEMENT

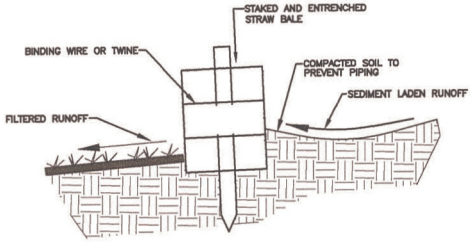
SWPPP DETAILS

NO.	REVISION	DATE

Project Number: 160101
Date: 03/03/2016
Drawn By: P.M.H.
Designed By: P.M.H.
Checked By: J.L.L.
Sheet: 2



SILT FENCE DETAIL
NTS



DETAIL OF PROPERLY INSTALLED STRAW BALE
NTS

DEPARTMENT OF ENVIRONMENTAL PROTECTION
7/7
17-0342489-001-EI
PERMIT
RG
STATE OF FLORIDA

SIGMA ENGINEERING GROUP, INC.
3239 SUMMIT BOULEVARD, SUITE 32
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PHONE: (850) 476-7972
CERTIFICATE OF AUTHORIZATION #28889

BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

WILLOWBROOK LAKE
DAM REPLACEMENT

SWPPP DETAILS

NO.	REVISION	DATE

Project Number:	160101
Date:	03/03/2016
Drawn By:	P.M.H.
Designed By:	P.M.H.
Checked By:	J.L.L.
Sheet:	3

APPENDIX B

GEOTECHNICAL REPORTS

REPORT OF GEOTECHNICAL EXPLORATION AND DAM RESTORATION RECOMMENDATIONS

Willowbrook Lake Dam Replacement

Escambia County, Florida

PREPARED FOR:

Sigma Consulting Group, Inc.
3298 Summit Boulevard, Suite 32
Pensacola, Florida 32503

NOVA Project Number: 8216027

July 12, 2016

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

July 12, 2016

SIGMA CONSULTING GROUP, INC.
3298 Summit Boulevard, Suite 32
Pensacola, Florida 32503

Attn: Mr. Paul Heffernan, P.E.

Subject: Report of Geotechnical Exploration and Dam Restoration Recommendations
WILLOWBROOK LAKE DAM REPLACEMENT
Escambia County, Florida
NOVA Project Number 8216027

Dear Mr. Heffernan:

NOVA Engineering and Environmental LLC (NOVA) has completed the authorized subsurface exploration and dam restoration recommendations for the proposed dam repair at Willowbrook Lake in Escambia County, Florida. The work was performed in general accordance with NOVA Proposal Number 016-20153142, dated December 9, 2015. This report briefly discusses our understanding of the project at the time of the subsurface exploration, describes the geotechnical consulting services provided by NOVA, and presents our findings, conclusions and recommendations.

We appreciate your selection of NOVA and the opportunity to be of service on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
NOVA Engineering and Environmental LLC

Wayne M. Shelburne, Ph.D.
Project Manager

William L. Lawrence, P.E.
Branch Manager
Florida Registration No. 60147

WILLIAM LEE LAWRENCE, JR ★ LICENSE ★ No. 60147 ★ STATE OF FLORIDA ★ PROFESSIONAL ENGINEER

Copies Submitted: via electronic mail service

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1.0 INTRODUCTION

1.1 PROJECT INFORMATION

Project information has been provided during recent telephone conversations and email exchanges with Mr. Paul Heffernan, P.E., of Sigma Consulting Group, Inc. We understand that the Willowbrook Lake Dam, an earthen berm totaling approximately 400 feet in length, was breached near its southern end for approximately 60 feet during a rain/flood event on the night of April 29-30, 2014. The dam will reportedly be completely removed and replaced for this project.

Willowbrook Lake is approximately 4 acres in size and has a design normal pool elevation of EL+57.80 feet (NAVD88) and a 100-year storm elevation of EL+62.00 feet (NAVD88). The new dam alignment will have a crest elevation of EL+64.60 feet (NAVD88), which results in a dam height on the order of 19 feet above surrounding natural grade elevations. Hydraulic and hydrology design are being performed by Sigma Consulting Group, Inc.

1.2 SCOPE OF WORK

Sigma Consulting Group, Inc. (Sigma), engaged NOVA to provide geotechnical engineering consulting and dam design recommendations for the proposed dam replacement at Willowbrook Lake in Escambia County, Florida. This report briefly discusses our understanding of the project, describes our exploratory procedures, and presents our findings, conclusions, and recommendations. The design for the replacement dam will be performed by Sigma.

The primary objective of this study was to perform a geotechnical exploration as close as practical to the alignment of the existing dam, to assess the findings as they relate to the planned construction, and to provide geotechnical design recommendations for reconstruction of the dam that was breached. The authorized geotechnical engineering services included a site reconnaissance, soil test borings with sampling, a slope stability analysis, and the preparation of this report. The services were performed substantially as outlined in our proposal number 016-20153142, dated December 9, 2015, and in general accordance with industry standards.

The assessment of the presence of the wetlands, floodplains or water classified as State Waters of Florida was beyond the scope of this study. Additionally, the assessment of site environmental conditions, including the detection of pollutants in the soil, rock or groundwater, at the site was also beyond the scope of this geotechnical study. If requested, NOVA can provide these services.

2.0 SITE DESCRIPTION

2.1 GENERAL

A Site Location Map is presented in Appendix A. Willowbrook Lake is located on the west side of Chemstrand Road beginning approximately 150 feet north of Orby Street in Escambia County, Florida. The lake is surrounded by single family residential neighborhoods, with surrounding elevations generally ranging from +65 to +80 feet NAVD88. With a functioning dam, the lake's surface is at approximately elevation +56 feet NAVD88. The existing dam is located at the eastern end of the lake, and the breach in the dam resulting from the April 29/30, 2014 rain/flood event occurred near the southern end of the dam alignment.

2.2 GEOLOGY/HYDROLOGY

Site and Area Geology

The site is located in the Escambia County, Florida area, and according to the United States Geological Survey (USGS), is situated within the greater Gulf Coastal Plain region. The site is generally covered with Alluvium sediments of the Pleistocene/Holocene periods underlain by the Citronelle formation of the Pliocene/Pleistocene periods. The alluvial sediments typically consist of siliciclastics that are fine to coarse quartz sand containing clay lenses and gravel in places. Sands consists primarily of very fine to very coarse poorly sorted quartz grains; gravel is composed of quartz, quartzite, and chert pebbles. In areas of the Valley and Ridge province gravels are generally composed of angular to sub-rounded chert, quartz, and quartzite pebbles. Coastal deposits in the Escambia County area include fine to medium quartz sand with shell fragments and accessory heavy minerals along Gulf beaches and fine to medium quartz sand, silt, clay, peat, mud and ooze in the Mississippi Sound, Little Lagoon, bays, lakes, streams, and estuaries. The Citronelle formation consists primarily of varicolored/mottled lenticular beds of poorly sorted sand, clayey sand, clay, and clayey gravel. Limonite pebbles and lenses of limonite cemented sand occur locally in weathered Miocene exposures.

Surficial soils in the region are primarily siliciclastic sediments deposited in response to the renewed uplift and erosion in the Appalachian highlands to the north and sea-level fluctuations. The extent and type of deposit is influenced by numerous factors, including mineral composition of the parent rock and meteorological events.

Groundwater

Groundwater in the Gulf Coastal Plain typically occurs as an unconfined aquifer condition. Recharge is provided by the infiltration of rainfall and surface water through the soil overburden. More permeable zones in the soil matrix can affect groundwater conditions. The groundwater table is expected to be a subdued replica of the original surface topography. Based on a review of topographic maps and our visual site observations, we anticipate the groundwater flow in the region to be towards the east.

3.0 FIELD AND LABORATORY PROCEDURES

3.1 FIELD EXPLORATION PROCEDURES

Soil test boring locations were established in the field by NOVA personnel using the provided site plan and taping distances from existing landmarks and site features. For increased accuracy, NOVA suggests that the boring locations and elevations be surveyed.

Our field exploration was conducted on March 3, 2016 and included:

- Four (4) soil test borings (B-1 through B-4) drilled to depths ranging from 25 to 35 feet below the existing ground surface as close as practical to the toe of the existing dam alignment.

- Four (4) hand auger borings (A-1 through A-4) drilled to a depth of 10 feet below the existing ground surface along the top of the existing dam alignment.

We note that it was not possible to perform borings within the breached zone.

The soil test borings were performed using the guidelines of ASTM Designation D-1586, "Penetration Test and Split-Barrel Sampling of Soils". A mud rotary drilling process was used to advance the borings. At regular intervals, soil samples were obtained with a standard 1.4-inch I.D., 2.0-inch O.D., split-tube sampler. The sampler was first seated six inches and then driven an additional foot with blows of a 140 pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is designated the "Penetration Resistance". The penetration resistance, when properly interpreted, is an index to the soil strength and density. Representative portions of the soil samples, obtained from the sampler, were placed in glass jars and transported to our laboratory for further evaluation and laboratory testing.

The Boring Logs in Appendix B show the standard penetration test (SPT) resistances, or “N-values”, and present the soil conditions encountered in the soil test and hand auger borings. These records represent our interpretation of the subsurface conditions based on the field exploration data, visual examination of the split-barrel samples, laboratory test data, and generally accepted geotechnical engineering practices. The stratification lines and depth designations represent approximate boundaries between various subsurface strata. Actual transitions between materials may be gradual.

3.2 LABORATORY TESTING

Laboratory soil tests are performed to aid in the classification of the soils encountered in the test borings, and to help in the evaluation of pertinent engineering characteristics of these soils. Samples obtained from the test borings were returned to our testing laboratory, where they were classified using visual/manual methods in accordance with the Unified Soil Classification System (USCS) and ASTM designations. All laboratory testing was performed in general accordance with current ASTM standards and included:

- Nine (9) Natural Moisture Content Tests – ASTM-D 2216
- Nine (9) Percent Passing #200 Sieve Tests – ASTM D-1140
- Two (2) Organic Content Tests – ASTM D-2974

The results of the laboratory tests noted above are provided in Appendix C of this report.

4.0 SUBSURFACE CONDITIONS

4.1 GEOLOGY

The site is located in the Escambia County, Florida area and according to the United States Geological Survey (USGS), is situated within the greater Gulf Coastal Plain region. The site is generally covered with Alluvium sediments of the Pleistocene/Holocene periods underlain by the Citronelle formation of the Pliocene/Pleistocene periods. The alluvial sediments typically consist of siliciclastics that are fine to coarse quartz sand containing clay lenses and gravel in places. Sands consists primarily of very fine to very coarse poorly sorted quartz grains; gravel is composed of quartz, quartzite, and chert pebbles. In areas of the Valley and Ridge province gravels are generally composed of angular to sub-rounded chert, quartz, and quartzite pebbles. Coastal deposits in the Escambia County area include fine to medium quartz sand with shell fragments and accessory heavy minerals along Gulf beaches and fine to medium quartz sand, silt, clay, peat, mud and ooze in the Mississippi Sound, Little Lagoon, bays, lakes, streams, and estuaries. The Citronelle formation consists primarily of varicolored/mottled lenticular beds of poorly sorted sand, clayey sand, clay, and clayey gravel. Limonite pebbles and lenses of limonite cemented sand occur locally in weathered Miocene exposures.

Surficial soils in the region are primarily siliciclastic sediments deposited in response to the renewed uplift and erosion in the Appalachian highlands to the north and sea-level fluctuations. The extent and type of deposit is influenced by numerous factors, including mineral composition of the parent rock and meteorological events.

4.2 SOIL CONDITIONS

The following paragraph provides a generalized description of the subsurface profiles and soil conditions encountered in the borings conducted during this study. The Boring Logs included in Appendix B should be reviewed to provide detailed descriptions of the conditions encountered at each boring location. Conditions may vary at other locations and times.

The test borings generally encountered mixed strata of very loose to medium dense fine-grained slightly silty to silty sands (USCS classifications of SP/SM and SM, respectively) from the existing ground surface elevation present at each boring location to the maximum depth explored of about 35 feet BEG.

Subsurface conditions are described in greater detail on the Log of Boring Records included in Appendix B.

4.3 GROUNDWATER CONDITIONS

4.1.1 General

Groundwater in the Gulf Coastal Plain typically occurs as an unconfined aquifer condition. Recharge is provided by the infiltration of rainfall and surface water through the soil overburden. More permeable zones in the soil matrix can affect groundwater conditions. The groundwater table is expected to be a subdued replica of the original surface topography. Based on a review of topographic maps and our visual site observations, we anticipate the groundwater flow at the site to be towards the east.

Groundwater levels vary with changes in season and rainfall, construction activity, surface water runoff and other site-specific factors. Groundwater levels in the greater Crestview area are typically lowest in the late fall to winter and highest in the early spring to mid-summer with annual groundwater fluctuations by seasonal rainfall; consequently, the water table may vary at times.

4.1.2 Soil Test Boring Groundwater Conditions

Stabilized groundwater level readings were obtained after 24 hours in the SPT borings at depths ranging from about 9 feet (in the lower elevation Borings B-2, B-3 and B-4) to 15 feet (in the higher elevation Boring B-1) below existing grade. Groundwater was not encountered in the 10-foot deep auger borings (A-1 through A-4) that were drilled along the top of the berm.

Groundwater levels vary with changes in season and rainfall, construction activity, surface water runoff and other site-specific factors. At this site, we anticipate the groundwater levels will also change with stream level fluctuations in and out of Willowbrook Lake.

Based on comparisons of current annual monthly rainfall data to historical rainfall data extending back 50+ years in time, we estimate that the normal permanent seasonal high groundwater (SHGW) table for this site will occur approximately at the apparent groundwater levels encountered in the test borings, during the wet season.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on our understanding of the proposed construction, our site observations, the data obtained during the field exploration, our experience with similar conditions at other sites, and generally accepted geotechnical engineering principles and practices.

Subsurface conditions in unexplored locations or at other times may vary from those encountered at specific boring locations. If such variations are noted during construction, or if project development plans are changed, we request the opportunity to review the changes and amend our recommendations. Additionally, NOVA requests the opportunity to review the finalized design for the project and amend our recommendations based on additional subsurface exploration, if necessary.

As previously noted, boring locations were established by estimating distances and angles from existing site landmarks. If increased accuracy is desired by the client, we recommend that the boring locations and elevations be surveyed.

5.1 PRELIMINARY DAM DESIGN

5.1.1 General Soils and Groundwater Information

Very loose to medium dense sandy materials were encountered in the SPT borings to the maximum depth explored of about 35 feet below existing grade. Therefore, we do not anticipate that difficult excavation conditions will be encountered during dam construction.

Stabilized groundwater level readings were obtained after 24 hours in the SPT borings at an approximate depth of about 9 feet below the ground surface elevations present along the toe of the slope of the existing dam. Excavations along and within the lake limits, if required to properly repair the dam, will likely not be feasible below groundwater depths without temporary dewatering and subsequent drying of excavated soils before re-use as fill within the dam.

5.1.2 Seepage

Based upon conversations with Mr. Jason Lashley, P.E., of Sigma, seepage through the dam has occurred in the past. In addition, we understand that the dam is architectural, and that some seepage is anticipated in the new dam. Without improvement of the existing soils both beneath and through the dam some seepage should be expected. Seepage itself is not uncommon and is anticipated in a homogenous earth dam, however, it must be controlled. We note that uncontrolled seepage is undesirable through an earth dam, since migration of fines and ultimately piping may result with time.

We recommend that a clay core be installed in the new dam. The top of the core should coincide with the top of the dam. The interior slope should be 2H:1V, and the exterior slope should be 1H:1V. The bottom of the core should coincide with the ground surface on the downstream side of the dam. A soil keyway trench should be extended a minimum depth of 6 feet into residual materials along the contact between the existing soil and the new dam section, assumed to be the ground surface on the downstream side of the dam. The bottom of the keyway should be 8 feet wide, and the sides should slope up to the bottom of the dam at 1H:1V. It is our understanding that Sigma is planning to include a clay core with the aforementioned requirements.

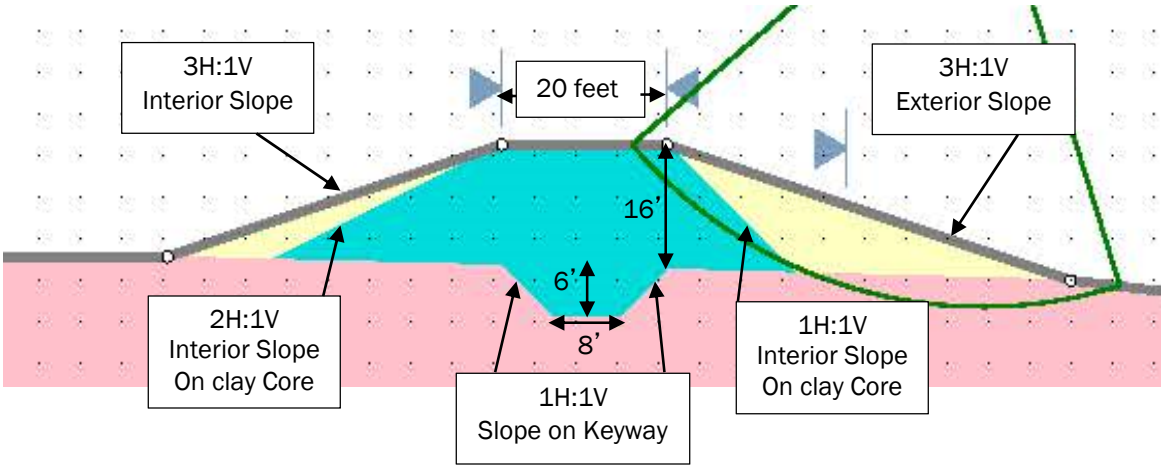
In order to control groundwater flow through the dam, NOVA recommends adding an anti-seep collar around the outflow pipe immediately before the chimney drain described in the following paragraph. The purpose of the anti-seep collar is to prevent the flow of fines into the chimney drain, thereby reducing the potential for piping. It is our understanding that Sigma is planning to include an anti-seep collar on the outflow pipe.

In order to control groundwater leakage through the front face of the dam which may carry soil with it, NOVA recommends a chimney drain set back approximately 15 feet from the toe of the dam. The drain should be parallel to the dam alignment and cross the full length of the dam. The drain should be perforated PVC pipe surrounded by a geosynthetic filter fabric and should have drain pipes perpendicular to it exiting out the front of the dam into a toe drain. It is our understanding that Sigma is planning to include such a system.

5.1.3 Dam Slope Stability

The results of the geotechnical exploration were used to perform a slope stability analysis on the upstream and downstream slopes using *Slide v6.0* from Rocscience, Inc. In evaluating the downstream slope for steady state seepage conditions, an effective stress analysis was used in conjunction with the Bishop Simplified Method of slices for circular arc failures. For the rapid draw-down analysis of the upstream slope, the Bishop Simplified Method was again used in the total stress mode.

Our analysis has considered the slope configurations provided by Sigma. The dimensions are summarized in the following schematic.



We note that the core height dimension of 16 feet shown in the above diagram is equal to the maximum dam height, which was used in the slope stability analysis. The height of the dam will vary, as the ground surface on the downstream side increases to the north. The core height will vary with the dam height along the alignment, with the dam height assumed to be the crest of dam elevation minus the ground surface elevation on the downstream side. The slopes of the core, as well as the keyway depth, will remain constant along the length of the dam, with the top of the keyway assumed to be equal to the ground surface on the downstream side.

Soil parameters and assumed water tables are shown on the results presented in Appendix D. These inputs result in a factor of safety of 1.5 or greater for both the upstream and downstream slopes. The results for the minimum factors of safety obtained from the analysis are shown in Appendix D.

We believe that safety factors of 1.1 (earthquake) and 1.5 (steady state seepage) are appropriate for the downstream section of an dam and that a safety factor of 1.3 is appropriate for rapid draw-down condition of the upstream section. Based on our experience with previous construction, and the results of the stability analysis, we believe that the proposed dam section should achieve these desired factors of safety.

New fill soils should meet the requirements for both quality/composition and compaction as recommended in the subsequent sections of this report. Additionally, a NOVA representative should be on-site during construction to document that contract documents and generally accepted construction practices are followed.

5.1.4 Settlement

Laboratory analysis to determine soil settlement parameters was beyond the scope of this study. However, based on approximate correlations between penetration resistances and elastic modulus values, it appears that settlement of the dam crest

could be on the order of several inches after final grading. We note that more total settlement could occur, however, the majority will take place during construction. Initial settlements are typically 60 to 90 percent of the total settlement in typical naturally occurring soils. The remaining consolidation generally takes place in a period of 3 to 6 months after load application. The estimates of settlement have been based on our previous experience with similar construction. We recommend that the crest be constructed above the design elevation at the maximum section (crowned) to allow for some settlement without reducing the design freeboard.

5.2 SITE GRADING

5.2.1 Site and Subgrade Preparation

Prior to proceeding with construction operations, the entire dam footprint should be stripped of surface and near surface debris. It is recommended that clearing and stripping operations extend beyond the downstream toe of the new dam section, if allowed by appropriate wetlands and/or land disturbance permits. This operation should consist of complete removal and wasting of trees, topsoil, root systems, loose sediment deposits, and other non-soil materials.

Beneath the new dam footprint, the initial stripping operations must be sufficient to remove all deleterious materials, including topsoil and deposited sediments resulting from the flood event noted previously, which may adversely affect the stability and seepage potential of the new dam section. Additional undercutting of water-softened soils may also be required in some areas.

We believe close coordination of the site and subgrade preparation by the geotechnical engineer is one of the most critical aspects of the proposed construction. The engineer will need to make field decisions as problems arise in specific areas concerning undercutting, groundwater control, subgrade stabilization and other remedial techniques. All subgrade areas should be approved by the geotechnical engineer prior to fill placement.

5.2.2 Dam Foundation Preparation

As previously mentioned, the complete and thorough removal of all deleterious materials along the new dam alignment is considered imperative to provide adequate stability and seepage protection performance. Weather conditions, water levels in the stream, and moisture contents of the near surface soils will influence the difficulty of the undercutting operations. In some areas, the residual subgrade exposed may be saturated and susceptible to damage from seepage and equipment traffic.

5.2.3 Ground Water and Surface Water Conditions

Depending on the time of construction conditions, problems with the control of ground water and surface water could potentially be an issue at this site during initial site and dam foundation preparation, and initial fill placement. All surface flows from the drainage basin above the dam site should be routed around the immediate construction area(s). We caution that the diversion of surface flows is considered a critical operation in dam construction; consequently, the diversion method and time schedule are very important design and construction elements.

We believe that the groundwater conditions within the dam construction site adjacent to the streambed can generally be handled with the use of drainage trenches and sumps. It will be necessary to maintain the ground water level at least 3 feet below all points of the excavation bottom in natural soils to minimize subgrade degradation.

It is our opinion that the most suitable approach for dealing with ground water problems may best be achieved during construction with on-the-spot field recommendations. If the ground water is not properly controlled, a "quick" condition may result in an unstable subgrade and pockets of unsuitable material being trapped beneath the dam. We again emphasize the need for close geotechnical engineering observation during the initial construction phases.

5.2.4 Structural Fill

Fill materials for the shell of the new berm should be a well- or poorly-graded sand (USCS classification of SW or SP), free of non-soil materials and rock fragments larger than 3 inches in diameter, and less than 3% fibrous organic materials by weight. The clay core material should consist of a low plasticity clay (USCS classification of CL), with a minimum 70% fines, PI less than 30, total unit weight of at least 115 pcf, and having an in-situ permeability of $1x10^{-6}$ cm/sec or slower. We recommend that dam fill and clay core materials be limited to soils with a Standard Proctor maximum dry density of 95 pcf or higher. Continuous monitoring by a qualified engineering technician will be required during construction to assure the proper selection of suitable borrow materials.

Prior to fill placement against existing slopes, loose surficial materials should be removed and the slope should be benched or stepped to provide horizontal benches for compaction, and to reduce the possible movement of soil along the slope interface.

After completion of subgrade preparation as described above, structural fill can be placed to bring the site to final grade. Structural fill should be placed in layers not exceeding 8 inches in thickness when loose, and should be compacted to a minimum soil density of at least 95 percent of the Standard Proctor maximum dry density (ASTM D-698). Where portable hand equipment is required, maximum lift thickness should be

4 inches loose measure. Soil moisture content should be maintained within –2 to +3 percent of the optimum moisture content. Scarification and benching of fill materials could be required to adequately bond the fill materials to the existing soils.

5.2.5 Fill Placement

We recommend that the grading contractor have equipment on site during earthwork for both drying and wetting fill soils. We do not anticipate significant problems in controlling moistures within the fill during dry weather. During winter months or extended periods of rain, moisture control problems will most likely occur. We suggest that the contractor be required to initially adjust moisture contents (if necessary) at the approved off-site borrow source prior to transporting fill to the dam site. However, we again note that tight control of the fill placement is considered critical. Substantial rains prior to or during construction may require additional remedial efforts to stabilize the working subgrade. The residual and fill soils are susceptible to degradation when wet; therefore, moisture control will be an important aspect of fill placement.

Any placed fill that becomes excessively wet or dry should be immediately corrected. Any unsuitable or damaged fill (rain, siltation, freeze, thaw, etc.) should not be covered with additional fill. Construction procedures and equipment should be selected to assure that the surface of each fill lift is left in a non-smooth condition to provide adequate bonding with subsequent fill lifts. All fill lifts should be graded to prevent surface water ponding. The surface of all fill should be sealed at the end of each work day with proofrolling by rubber tired rollers.

A NOVA soils technician, who can confirm suitability of the material used and the uniformity and appropriateness of compaction efforts, should observe all filling operations. He can also document compliance with the specifications by performing field density tests using nuclear density, thin-wall tube, or sand cone testing methods. At least one test per 5,000 square feet and each two foot lift of fill is recommended, with test locations well distributed throughout the fill mass. When filling in small areas, such as adjacent to the low-level discharge pipe, at least three tests per lift should be required. Any failing areas should be recompacted and retested.

5.2.6 Erosion Control

After final grading of the slopes and crest, suitable erosion protection should be provided as recommended by Sigma Consulting Group, Inc. Low maintenance grasses are employed most commonly on the downstream slope, crest, and exposed freeboard of the upstream slope. We recommend that the crest be sloped slightly toward the reservoir to prevent surface runoff from flowing onto the face of the downstream slope, and that the area of the upstream slope susceptible to wave action be protected to prevent erosion and beaching.

Shoreline riprap protection is typically based on estimated wave heights for a particular wind speed and direction. Calculation of wave exposure and riprap protection is normally performed during final design by the civil engineer after maximum pool and design storm criteria are established. For preliminary budget estimating purposes, we recommend that the riprap extend from the top of the embankment to at least 3 feet below the normal pool level. Riprap should consist of 36 inches (measured perpendicular to the slope) of reasonably well-graded rock fragments with a maximum particle size of 24 inches and a predominance of rock fragments in the 12-inch size range. The individual riprap rock fragments should be dense, sound, and resistant to abrasion and should be free from cracks, seams, and other defects that would tend to unduly increase their destruction by water action.

The riprap and bedding for the upstream dam slope should be keyed into the slope such that the surface of the completed riprap approximately coincides with that of the general dam slope surface.

Bedding for the riprap should consist of a layer of suitable geotextile (filter fabric) overlain by approximately 6 to 12 inches of bedding stone or sand to prevent punching of the fabric when the riprap is placed.

The riprap need not be compacted but should be placed to grade in a manner to insure that the larger rock fragments are uniformly distributed and the smaller rock fragments serve to fill the spaces between the larger rock fragments in such a manner as will result in well-keyed, densely placed, uniform layers of riprap of the specified thickness. Hand placing would be required only to the extent necessary to secure the results specified above, and adjacent to structures. The contractor's placement techniques should be subject to the approval of the engineer.

We also recommend that the abutment/dam contact be graded to prevent surface water flows, and subsequent erosion, along the interface. All surface water should be directed to flow along the residual soil face of the abutments. Consideration should be given to the need for possible positive protection in these areas.

Similarly, riprap protection will be required in the plunge pool of the principal spillway conduit, and may also be necessary in the emergency spillway. Actual extent of armoring will be dependent of flow velocities.

6.0 ADDITIONAL RECOMMENDED SERVICES

The following presents a summary of the recommended additional geotechnical engineering, testing, and consultation services for this project. We note that, since NOVA is familiar with the subsurface conditions at this site, the provided project information, and our interpretations of data and evaluations concerning anticipated performance of the completed structure, we should be retained to provide the detailed quality assurance inspections during construction. We feel that the analysis and design of an earth dam is not complete until the project is in operation. Since we are most familiar with the geotechnical aspects of this project, we feel we are best suited to assist in carrying out this final phase of design. In addition, it is our opinion that the recommended services below are critical to the overall success of this project.

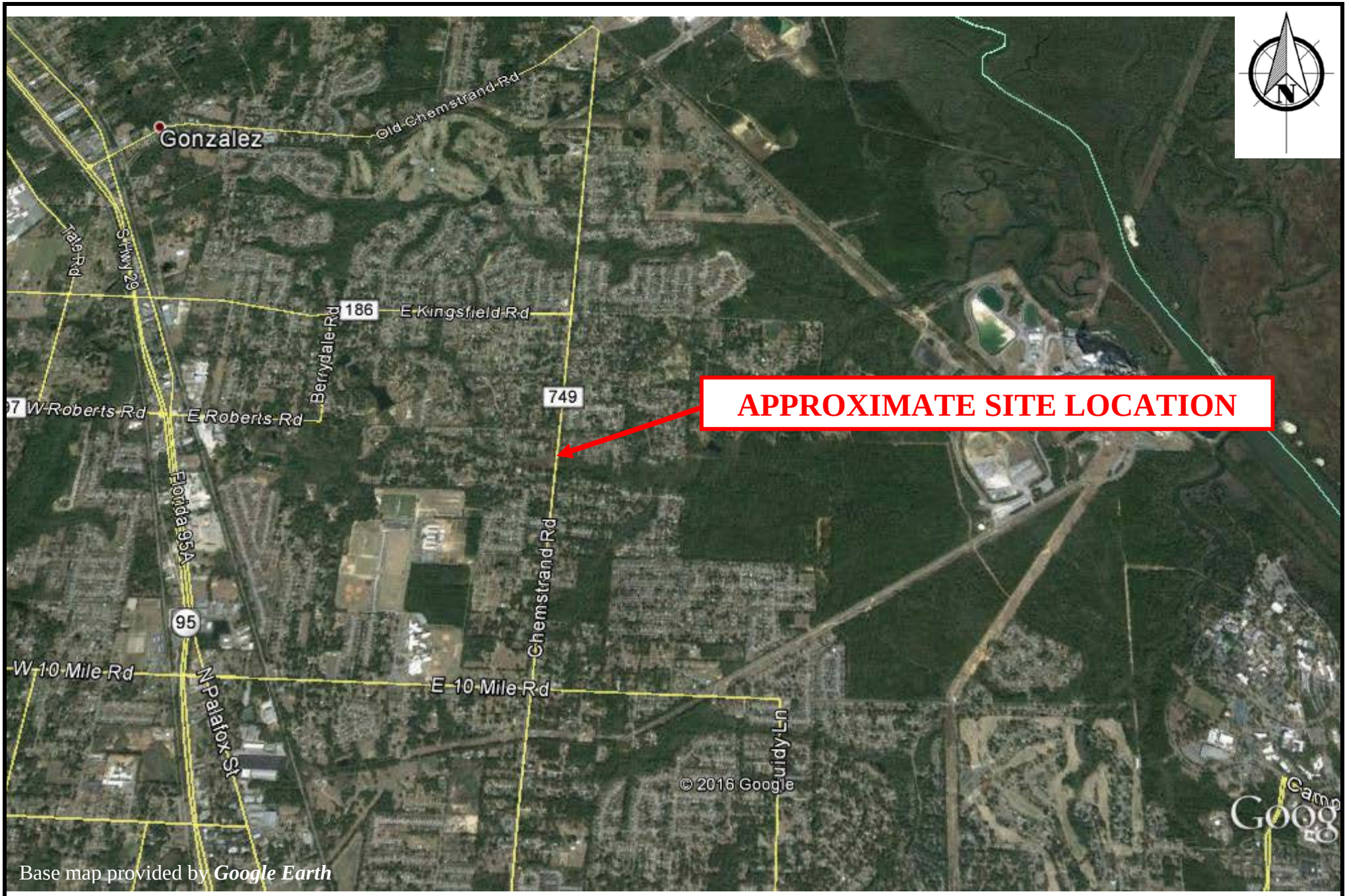
Additional Exploration and Laboratory Analysis: NOVA recommends that additional soil sampling be performed to evaluate the assumed soil parameters. Undisturbed samples should be obtained from the existing soils beneath the dam to evaluate hydraulic conductivity, strength, and settlement characteristics. Bulk samples should be obtained from borrow sources (both shell and core) to evaluate hydraulic conductivity and strength characteristics.

Site and Foundation Preparation: Following completion of the initial site stripping operations, an experienced geotechnical engineer should make an evaluation of the site. The engineer should determine if the general new dam repair foundation areas are suitably prepared for fill placement, and to observe undercutting operations of unsuitable materials (sediment deposits, etc.) along the existing stream bed. In addition, the engineer should observe construction of the recommended key trench excavations. This construction is critical to reduce seepage potential at the base of the dam repair zone. All areas of the dam foundation should be approved prior to backfilling.

Dewatering Requirements: Dewatering recommendations may be necessary in certain areas of the proposed construction depending on the time of construction ground water conditions. The details of such recommendations may best be made in the field at the time of construction.

Quality Control of Fill Placement: An experienced soils engineering technician should witness all required filling operations and take sufficient in-place density tests to confirm that the specified fill compaction is achieved. The engineer should observe and approve borrow materials being used and determine if their existing moisture contents are suitable for use to achieve the required degrees of compaction. The earthwork documentation should be reviewed by a qualified geotechnical engineer.

APPENDIX A
FIGURES & MAPS



Scale: Not To Scale **Date Drawn:** March 7, 2016 **Drawn By:** J. James **Checked By:** W. Lawrence	NOVA ENGINEERING AND ENVIRONMENTAL	140-A Lurton Street, Suite B Pensacola, Florida 32505 850.607.7782 ♦ 850.249.6683

PROJECT LOCATION MAP

Willowbrook Lake Dam Replacement

Cantonment, Escambia County, Florida

NOVA Project Number 8216027

Soil Map—Escambia County, Florida
(8216027 Willowbrook Lake Dam Replacement)

Map Scale: 1:1,470 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Escambia County, Florida
Survey Area Data: Version 13, Nov 18, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

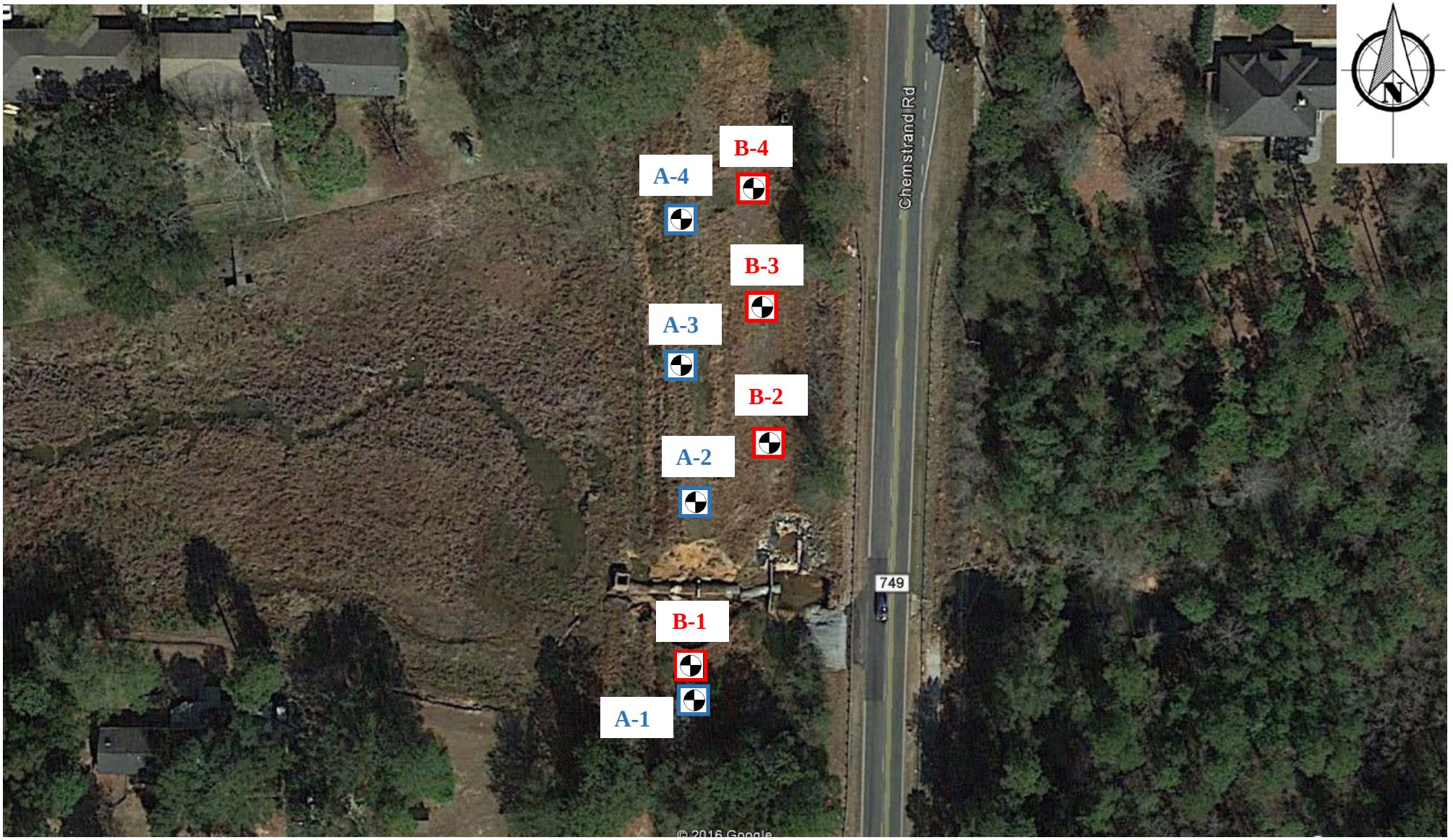
Date(s) aerial images were photographed: Jan 31, 2015—Mar 7, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Escambia County, Florida (FL033)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
49	Dorovan muck and Fluvaquents, frequently flooded	0.1	0.6%
54	Troup-Poarch complex, 8 to 12 percent slopes	6.9	67.1%
99	Water	3.3	32.3%
Totals for Area of Interest		**10.2**	**100.0%**

APPENDIX B
SUBSURFACE DATA



LEGEND

SPT Boring

Auger Boring

Scale: Not To Scale	
Date Drawn: February 28, 2016	
Drawn By: J.James	
Checked By: W. Lawrence	

NOVA ENGINEERING AND ENVIRONMENTAL

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Pensacola, Florida 32505
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BORING LOCATION PLAN

Willowbrook Lake Dam Replacement

Pensacola, Escambia County, Florida

NOVA Project Number 8216027

NOVA ENGINEERING AND ENVIRONMENTAL

KEY TO BORING LOGS

SYMBOLS AND ABBREVIATIONS

SYMBOL	DESCRIPTION
N-Value	No. of Blows of a 140-lb. Weight Falling 30 Inches Required to Drive a Standard Spoon 1 Foot
WOR	Weight of Drill Rods
WOH	Weight of Drill Rods and Hammer
	Sample from Auger Cuttings
	Standard Penetration Test Sample
	Thin-wall Shelby Tube Sample (Undisturbed Sampler Used)
% REC	Percent Core Recovery from Rock Core Drilling
RQD	Rock Quality Designation
	Stabilized Groundwater Level
	Seasonal High Groundwater Level (also referred to as the W.S.W.T.)
NE	Not Encountered
GNE	Groundwater Not Encountered
BT	Boring Terminated
-200 (%)	Fines Content or % Passing No. 200 Sieve
MC (%)	Moisture Content
LL	Liquid Limit (Atterberg Limits Test)
PI	Plasticity Index (Atterberg Limits Test)
K	Coefficient of Permeability
Org. Cont.	Organic Content
G.S. Elevation	Ground Surface Elevation

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS More than 50% retained on the No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES	GM	Silty gravels and gravel-sand-silt mixtures
			GC	Clayey gravels and gravel-sand-clay mixtures
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS 5% or less passing No. 200 sieve	SW**	Well-graded sands and gravelly sands, little or no fines
			SP**	Poorly graded sands and gravelly sands, little or no fines
		SANDS with 12% or more passing No. 200 sieve	SM**	Silty sands, sand-silt mixtures
			SC**	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS 50% or more passes the No. 200 sieve*	SILTS AND CLAYS Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diamicaceous fine sands or silts, elastic silts
			CH	Inorganic clays or clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
			PT	Peat, muck and other highly organic soils

*Based on the material passing the 3-inch (75 mm) sieve
** Use dual symbol (such as SP-SM and SP-SC) for soils with more than 5% but less than 12% passing the No. 200 sieve

RELATIVE DENSITY
(Sands and Gravels)
Very loose – Less than 4 Blow/Foot
Loose – 4 to 10 Blows/Foot
Medium Dense – 11 to 30 Blows/Foot
Dense – 31 to 50 Blows/Foot
Very Dense – More than 50 Blows/Foot

CONSISTENCY
(Silts and Clays)
Very Soft – Less than 2 Blows/Foot
Soft – 2 to 4 Blows/Foot
Medium Stiff – 5 to 8 Blows/Foot
Stiff – 9 to 15 Blows/Foot
Very Stiff – 16 to 30 Blows/Foot
Hard – More than 30 Blows/Foot

RELATIVE HARDNESS
(Limestone)
Soft – 100 Blows for more than 2 Inches
Hard – 100 Blows for less than 2 Inches

MODIFIERS

These modifiers Provide Our Estimate of the Amount of Minor Constituents (Silt or Clay Size Particles) in the Soil Sample
Trace – 5% or less
With Silt or With Clay – 6% to 11%
Silty or Clayey – 12% to 30%
Very Silty or Very Clayey – 31% to 50%

These Modifiers Provide Our Estimate of the Amount of Organic Components in the Soil Sample
Trace – Less than 3%
Few – 3% to 4%
Some – 5% to 8%
Many – Greater than 8%

These Modifiers Provide Our Estimate of the Amount of Other Components (Shell, Gravel, Etc.) in the Soil Sample
Trace – 5% or less
Few – 6% to 12%
Some – 13% to 30%
Many – 31% to 50%

Project: Willowbrook Lake Dam Replacement
Project Location: Pensacola, Escambia County, Florida
Project Number: 8216027

LOG OF BORING
B-1

Date(s) Drilled: **3/3/2016**	Drill Bit Size/Type: **2-inch Soil Bit**	Logged by: **J.James**
Drilled By: **J.Governale**	Sampling Method: **Split-Spoon**	Checked by: **W.Lawrence**
Drill Rig Type: **Track-Mounted BR-2500**	Total Depth of Boring: **35 ft BEG**	Approximate Surface Elevation: **Existing Grade**
Drilling Method: **SPT**	Boring Backfill: **Soil Cuttings**	Vertical Datum: **Existing Grade**
Hammer Data: Weight **140-lb** Drop **30-in**	Groundwater Level: **15 ft.**	Location: **Per Boring Location Plan**

Elevation, feet MSL	Depth, feet	Sample Type	Sample Number	Sampling Resistance Blows/foot (N-value)	Consistency/ Relative Density	USCS-AASHTO	Graphic Log	Material Description
	0		1	8	LOOSE	SM		Red/Orange Fine-Grained Silty SAND
			2	11	MEDIUM DENSE			
			3	3	VERY LOOSE			
	5		4	1	VERY LOOSE	SP-SM		Light-Brown Fine-Grained SAND with Silt
			5	3	VERY LOOSE	SM		Red/Orange Fine-Grained Silty SAND
	10							
			6	1	VERY LOOSE			
	15							
			7	1	VERY LOOSE	SP-SM		Light-Brown Fine-Grained SAND with Silt
	20							
			8	11	MEDIUM DENSE	SP-SM		Tan/Orange Fine-Grained SAND with Silt
	25							
			9	10	LOOSE	SM		Orange/Tan Fine-Grained Silty SAND
	30							

TEST RESULTS

N-VALUE ●
PLASTICITY INDEX ⊢⊣ LIQUID LIMIT
NATURAL MOISTURE % ■
% <200 ▲
ORGANIC % ◇

10 20 30 40 50 60

REMARKS AND OTHER TESTS:

NOVA ENGINEERING AND ENVIRONMENTAL

Project: Willowbrook Lake Dam Replacement
Project Location: Pensacola, Escambia County, Florida
Project Number: 8216027

LOG OF BORING
B-1

Date(s) Drilled: **3/3/2016**	Drill Bit Size/Type: **2-inch Soil Bit**	Logged by: **J.James**
Drilled By: **J.Governale**	Sampling Method: **Split-Spoon**	Checked by: **W.Lawrence**
Drill Rig Type: **Track-Mounted BR-2500**	Total Depth of Boring: **35 ft BEG**	Approximate Surface Elevation: **Existing Grade**
Drilling Method: **SPT**	Boring Backfill: **Soil Cuttings**	Vertical Datum: **Existing Grade**
Hammer Data: Weight **140-lb** Drop **30-in**	Groundwater Level: **15 ft.**	Location: **Per Boring Location Plan**

Elevation, feet MSL	Depth, feet	Sample Type	Sample Number	Sampling Resistance Blows/foot (N-value)	Consistency/ Relative Density	USCS-AASHTO	Graphic Log	Material Description	TEST RESULTS
			10	8	LOOSE				N-VALUE ● PLASTICITY INDEX ⊢⊣ LIQUID LIMIT NATURAL MOISTURE % ■ % <200 ▲ ORGANIC % ◇ 10 20 30 40 50 60
	35							Boring Terminated at 35 ft BEG	
	40								
	45								
	50								
	55								
	60								

REMARKS AND OTHER TESTS:

NOVA ENGINEERING AND ENVIRONMENTAL

Project: Willowbrook Lake Dam Replacement
Project Location: Pensacola, Escambia County, Florida
Project Number: 8216027

LOG OF BORING
B-2

Date(s) Drilled: **3/3/2016**	Drill Bit Size/Type: **2-inch Soil Bit**	Logged by: **J.James**
Drilled By: **J.Governale**	Sampling Method: **Split-Spoon**	Checked by: **W.Lawrence**
Drill Rig Type: **Track-Mounted BR-2500**	Total Depth of Boring: **30 ft BEG**	Approximate Surface Elevation: **Existing Grade**
Drilling Method: **SPT**	Boring Backfill: **Soil Cuttings**	Vertical Datum: **Existing Grade**
Hammer Data: Weight **140-lb** Drop **30-in**	Groundwater Level: **9 ft.**	Location: **Per Boring Location Plan**

Elevation, feet MSL	Depth, feet	Sample Type	Sample Number	Sampling Resistance Blows/foot (N-value)	Consistency/ Relative Density	USCS-AASHTO	Graphic Log	Material Description
	0		1	9	LOOSE	SM		Red/Orange Fine-Grained SIlty SAND
			2	12	MEDIUM DENSE	SP-SM		Light-Brown Fine-Grained SAND with Silt
	5		3	12	MEDIUM DENSE			
			4	7	LOOSE			
			5	9	LOOSE			
	10							
			6	5	LOOSE			
	15							
			7	6	LOOSE	SP-SM		Dark gray/black fine-grained slightly silty SAND with heavy organics and seams of PEAT
	20							
			8	12	MEDIUM DENSE	SM		Black/Brown Fine-Grained Silty SAND with PEAT
	25							
			9	12	MEDIUM DENSE	SM		Tan/Orange Fine-Grained Silty SAND
	30							Boring Terminated at 30 ft BEG

TEST RESULTS

N-VALUE ●
PLASTICITY INDEX ⊢⊣ LIQUID LIMIT
NATURAL MOISTURE % ■
% <200 ▲
ORGANIC % ◇

10 20 30 40 50 60

REMARKS AND OTHER TESTS:

NOVA ENGINEERING AND ENVIRONMENTAL

Project: Willowbrook Lake Dam Replacement
Project Location: Pensacola, Escambia County, Florida
Project Number: 8216027

LOG OF BORING
B-3

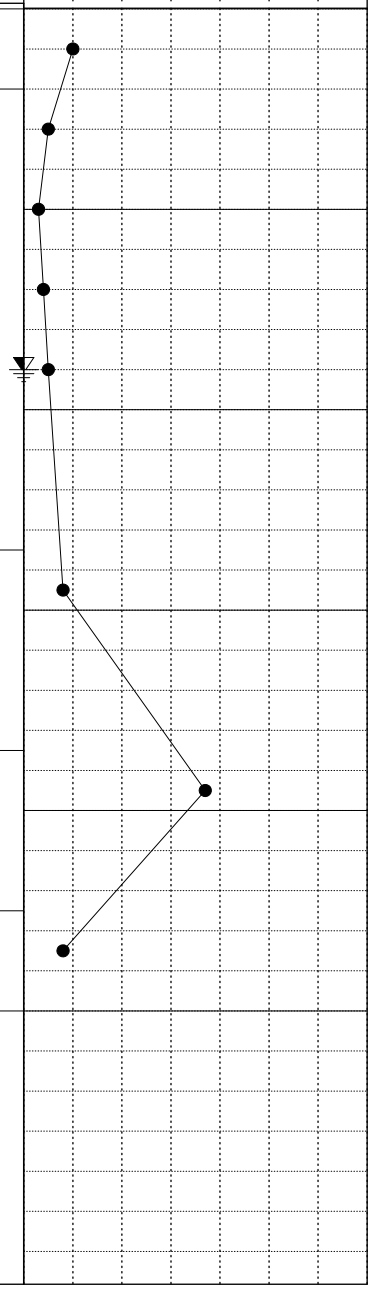
Date(s) Drilled: **3/3/2016**	Drill Bit Size/Type: **2-inch Soil Bit**	Logged by: **J.James**
Drilled By: **J.Governale**	Sampling Method: **Split-Spoon**	Checked by: **W.Lawrence**
Drill Rig Type: **Track-Mounted BR-2500**	Total Depth of Boring: **25 ft BEG**	Approximate Surface Elevation: **Existing Grade**
Drilling Method: **SPT**	Boring Backfill: **Soil Cuttings**	Vertical Datum: **Existing Grade**
Hammer Data: Weight **140-lb** Drop **30-in**	Groundwater Level: **9 ft.**	Location: **Per Boring Location Plan**

Elevation, feet MSL	Depth, feet	Sample Type	Sample Number	Sampling Resistance Blows/foot (N-value)	Consistency/ Relative Density	USCS-AASHTO	Graphic Log	Material Description
	0		1	10	LOOSE	SM		Red/Orange Fine-Grained Silty SAND
			2	5	LOOSE	SP-SM		Light-Brown Fine-Grained SAND with Silt
	5		3	3	VERY LOOSE			
			4	4	LOOSE			
			5	5	LOOSE			
	10							
			6	8	LOOSE	SM		Dark gray/black fine-grained silty SAND with heavy organics, traces of PEAT
	15							
			7	37	DENSE	SP-SM		Grey Fine-Grained SAND with Silt
	20							
			8	8	LOOSE	SM		Tan/Orange Fine-Grained Silty SAND with Trace Iron Rock
	25							Boring Terminated at 25 ft BEG
	30							

TEST RESULTS

N-VALUE ●
PLASTICITY INDEX ⊢⊣ LIQUID LIMIT
NATURAL MOISTURE % ■
% <200 ▲
ORGANIC % ◇

10 20 30 40 50 60



REMARKS AND OTHER TESTS:

NOVA ENGINEERING AND ENVIRONMENTAL

Project: Willowbrook Lake Dam Replacement
Project Location: Pensacola, Escambia County, Florida
Project Number: 8216027

LOG OF BORING
B-4

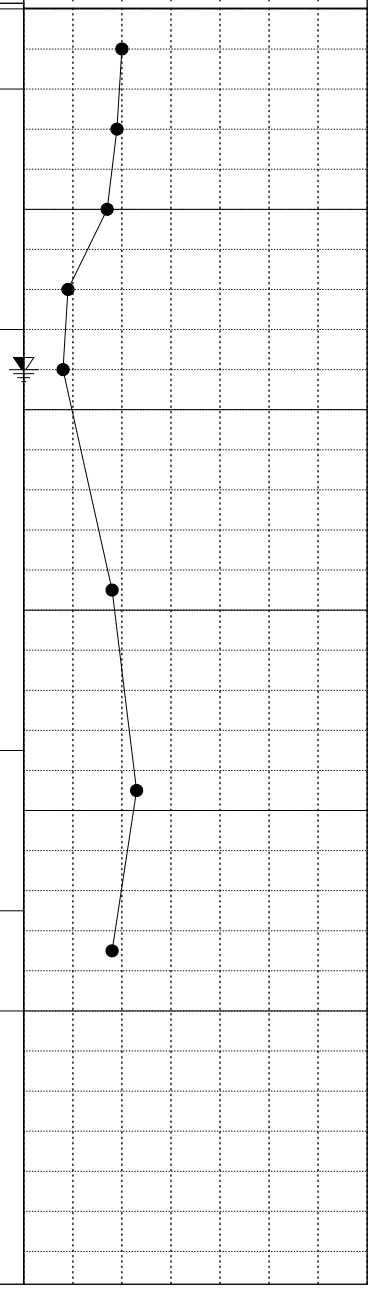
Date(s) Drilled: **3/3/2016**	Drill Bit Size/Type: **2-inch Soil Bit**	Logged by: **J.James**
Drilled By: **J.Governale**	Sampling Method: **Split-Spoon**	Checked by: **W.Lawrence**
Drill Rig Type: **Track-Mounted BR-2500**	Total Depth of Boring: **25 ft BEG**	Approximate Surface Elevation: **Existing Grade**
Drilling Method: **SPT**	Boring Backfill: **Soil Cuttings**	Vertical Datum: **Existing Grade**
Hammer Data: Weight **140-lb** Drop **30-in**	Groundwater Level: **9 ft.**	Location: **Per Boring Location Plan**

Elevation, feet MSL	Depth, feet	Sample Type	Sample Number	Sampling Resistance Blows/foot (N-value)	Consistency/ Relative Density	USCS-AASHTO	Graphic Log	Material Description
	0		1	20	MEDIUM DENSE	SM		Red/Orange Fine-Grained SIlty SAND
			2	19	MEDIUM DENSE	SP-SM		Light-Brown Fine-Grained SAND with Silt
			3	17	MEDIUM DENSE			
	5		4	9	LOOSE			
			5	8	LOOSE	SP-SM		Orange/Tan Fine-Grained SAND with Silt
	10							
			6	18	MEDIUM DENSE			
	15							
			7	23	MEDIUM DENSE	SP-SM		Light-Brown Fine-Grained SAND with Silt
	20							
			8	18	MEDIUM DENSE	SM		Grey Fine-Grained Silty SAND
	25							Boring Terminated at 25 ft BEG
	30							

TEST RESULTS

N-VALUE ●
PLASTICITY INDEX ⊢⊣ LIQUID LIMIT
NATURAL MOISTURE % ■
% <200 ▲
ORGANIC % ◇

10 20 30 40 50 60



REMARKS AND OTHER TESTS:

NOVA ENGINEERING AND ENVIRONMENTAL

Project: Willowbrook Lake Dam Replacement
Project Location: Pensacola, Escambia County, Florida
Project Number: 8216027

LOG OF BORING
A-1

Date(s) Drilled: **3/3/2016**	Drill Bit Size/Type: **3-inch Soil Sampler**	Logged by: **J.James**
Drilled By: **J.James**	Sampling Method: **Grab from Bucket**	Checked by: **W.Lawrence**
Drill Rig Type: **Hand Auger**	Total Depth of Boring: **10 ft.**	Approximate Surface Elevation: **Existing Grade**
Drilling Method: **Hand Auger**	Boring Backfill: **Soil Cuttings**	Vertical Datum: **Existing Grade**
Hammer Data: Weight **N/A** Drop **N/A**	Groundwater Level: **GNE**	Location: **Per Boring Location Plan**

Elevation, feet MSL	Depth, feet	Sample Type	Sample Number	Sampling Resistance Blows/foot (N-value)	Consistency/ Relative Density	USCS-AASHTO	Graphic Log	Material Description
	0		1			SP-SM		Light-Brown Fine-Grained SAND with Silt
			2			SC		Red/Orange Fine-Grained Clayey SAND
			3			SM		Brown Fine-Grained Silty SAND
	5							
			4			SC		Red/Orange Fine-Grained Clayey SAND
			5			SM		Brown Fine-Grained Silty SAND
	10							Boring Terminated at 10 ft.
	15							
	20							
	25							
	30							

TEST RESULTS

N-VALUE ●
PLASTICITY INDEX ⊢⊣ LIQUID LIMIT
NATURAL MOISTURE % ■
% <200 ▲
ORGANIC % ◇

10 20 30 40 50 60

REMARKS AND OTHER TESTS:

NOVA ENGINEERING AND ENVIRONMENTAL

Project: Willowbrook Lake Dam Replacement
Project Location: Pensacola, Escambia County, Florida
Project Number: 8216027

LOG OF BORING
A-2

Date(s) Drilled: **3/3/2016**	Drill Bit Size/Type: **3-inch Soil Sampler**	Logged by: **J.James**
Drilled By: **J.James**	Sampling Method: **Grab from Bucket**	Checked by: **W.Lawrence**
Drill Rig Type: **Hand Auger**	Total Depth of Boring: **10 ft.**	Approximate Surface Elevation: **Existing Grade**
Drilling Method: **Hand Auger**	Boring Backfill: **Soil Cuttings**	Vertical Datum: **Existing Grade**
Hammer Data: Weight **N/A** Drop **N/A**	Groundwater Level: **GNE**	Location: **Per Boring Location Plan**

Elevation, feet MSL	Depth, feet	Sample Type	Sample Number	Sampling Resistance Blows/foot (N-value)	Consistency/ Relative Density	USCS-AASHTO	Graphic Log	Material Description
	0		1			SP-SM		Light-Brown Fine-Grained SAND with Silt
			2			SC		Red/Orange Fine-Grained Clayey SAND
			3			SM		Brown Fine-Grained Silty SAND
	5							
	10							Boring Terminated at 10 ft.
	15							
	20							
	25							
	30							

TEST RESULTS

N-VALUE ●
PLASTICITY INDEX ⊢⊣ LIQUID LIMIT
NATURAL MOISTURE % ■
% <200 ▲
ORGANIC % ◇

10 20 30 40 50 60

REMARKS AND OTHER TESTS:

NOVA ENGINEERING AND ENVIRONMENTAL

Project: Willowbrook Lake Dam Replacement
Project Location: Pensacola, Escambia County, Florida
Project Number: 8216027

LOG OF BORING
A-3

Date(s) Drilled: **3/3/2016**	Drill Bit Size/Type: **3-inch Soil Sampler**	Logged by: **J.James**
Drilled By: **J.James**	Sampling Method: **Grab from Bucket**	Checked by: **W.Lawrence**
Drill Rig Type: **Hand Auger**	Total Depth of Boring: **10 ft.**	Approximate Surface Elevation: **Existing Grade**
Drilling Method: **Hand Auger**	Boring Backfill: **Soil Cuttings**	Vertical Datum: **Existing Grade**
Hammer Data: Weight **N/A** Drop **N/A**	Groundwater Level: **GNE**	Location: **Per Boring Location Plan**

Elevation, feet MSL	Depth, feet	Sample Type	Sample Number	Sampling Resistance Blows/foot (N-value)	Consistency/ Relative Density	USCS-AASHTO	Graphic Log	Material Description
	0		1			SP-SM		Light-Brown Fine-Grained SAND with Silt
			2			SC		Red/Orange Fine-Grained Clayey SAND
			3			SM		Brown Fine-Grained Silty SAND
	5							
	10							Boring Terminated at 10 ft.
	15							
	20							
	25							
	30							

TEST RESULTS

N-VALUE ●
PLASTICITY INDEX ⊢⊣ LIQUID LIMIT
NATURAL MOISTURE % ■
% <200 ▲
ORGANIC % ◇

10 20 30 40 50 60

REMARKS AND OTHER TESTS:

NOVA ENGINEERING AND ENVIRONMENTAL

Project: Willowbrook Lake Dam Replacement
Project Location: Pensacola, Escambia County, Florida
Project Number: 8216027

LOG OF BORING
A-4

Date(s) Drilled: **3/3/2016**	Drill Bit Size/Type: **3-inch Soil Sampler**	Logged by: **J.James**
Drilled By: **J.James**	Sampling Method: **Grab from Bucket**	Checked by: **W.Lawrence**
Drill Rig Type: **Hand Auger**	Total Depth of Boring: **10 ft.**	Approximate Surface Elevation: **Existing Grade**
Drilling Method: **Hand Auger**	Boring Backfill: **Soil Cuttings**	Vertical Datum: **Existing Grade**
Hammer Data: Weight **N/A** Drop **N/A**	Groundwater Level: **GNE**	Location: **Per Boring Location Plan**

Elevation, feet MSL	Depth, feet	Sample Type	Sample Number	Sampling Resistance Blows/foot (N-value)	Consistency/ Relative Density	USCS-AASHTO	Graphic Log	Material Description
	0		1			SP-SM		Light-Brown Fine-Grained SAND with Silt
			2			SC		Red/Orange Fine-Grained Clayey SAND
			3			SM		Brown Fine-Grained Silty SAND
	5							
			4			SC		Red/Orange Fine-Grained Clayey SAND
			5			SM		Brown Fine-Grained Silty SAND
	10							Boring Terminated at 10 ft.
	15							
	20							
	25							
	30							

TEST RESULTS

N-VALUE ●
PLASTICITY INDEX ⊢⊣ LIQUID LIMIT
NATURAL MOISTURE % ■
% <200 ▲
ORGANIC % ◇

10 20 30 40 50 60

REMARKS AND OTHER TESTS:

NOVA ENGINEERING AND ENVIRONMENTAL

APPENDIX C
LABORATORY DATA

SUMMARY OF CLASSIFICATION & INDEX TESTING

Willowbrook Lake Dam Replacement
Pensacola, Escambia County, Florida
NOVA Project No. 8216027

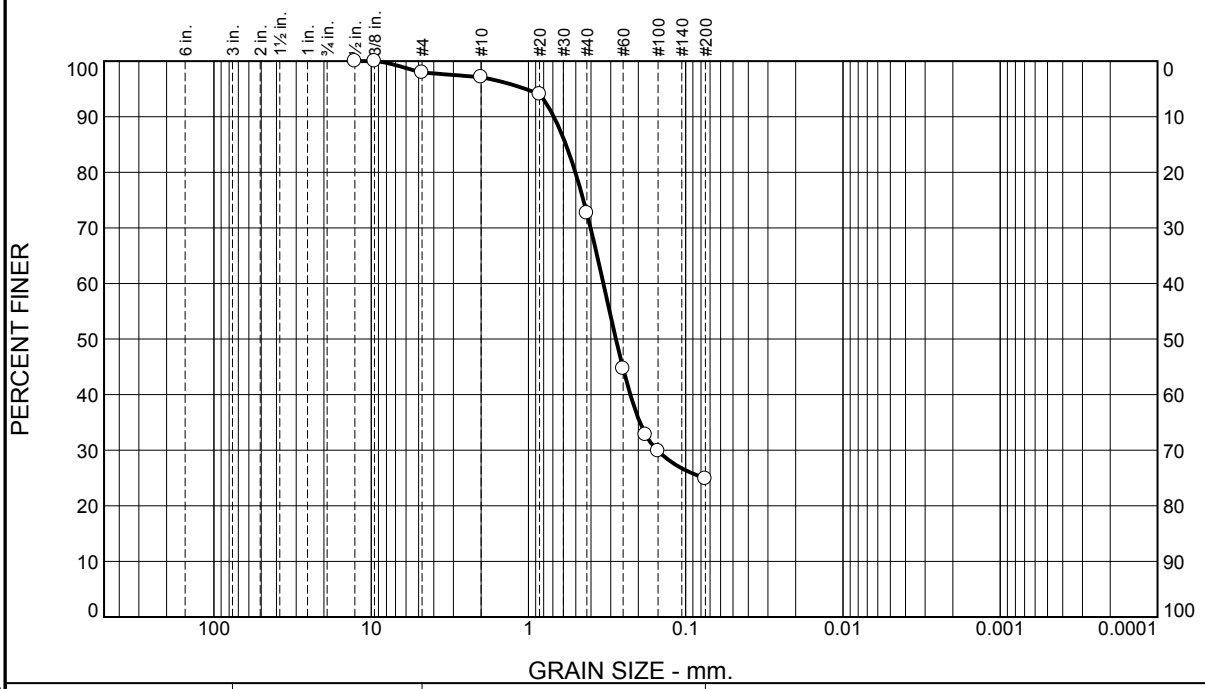
SUMMARY OF CLASSIFICATION AND INDEX TESTING					
Boring No.	**Sample Depth**	**Percent Fines (%<#200)**	**Natural Moisture (%)**	**Organic Content (%)**	**USCS Soil Classification**
B-1	0’-2’	25	14	---	SM
B-1	30’	13	26	---	SM
B-2	2’-4’	12	10	---	SP-SM
B-2	20’	9	78	64	SP-SM
B-3	15’	42	27	83	SM
B-3	25’	19	19	---	SM
B-4	25’	17	19	---	SM
A-1	0’-0.5’	12	15	---	SP-SM
A-4	2’-3’	25	12	---	SM

SUMMARY OF CLASSIFICATION & INDEX TESTING

Willowbrook Lake Dam Replacement
Pensacola, Escambia County, Florida
NOVA Project No. 8216027

SUMMARY OF CLASSIFICATION AND INDEX TESTING						
Boring No.	**Sample Depth**	**Natural Moisture (%)**	**Percent Fines (%<#200)**	**Atterberg Limits**		**USCS Soil Classification**
				Liquid Limit (LL)	**Plasticity Index (PI)**	
B-1	2'-8'	16%	25%	21	1.4	SM
B-2	2'-8'	10%	12%	17	NP	SP-SM
B-4	28.5'-30'	11%	21%	20	NP	SM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.1	0.8	24.4	47.8	24.9	

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.5"	100.0		
3/8"	100.0		
#4	97.9		
#10	97.1		
#20	94.1		
#40	72.7		
#60	44.7		
#80	32.8		
#100	29.9		
#200	24.9		

* (no specification provided)

Material Description

Red/Orange Fine-Grained Silty SAND (SM)

Atterberg Limits (ASTM D 4318)

PL= 19.7 **LL=** 21.1 **PI=** 1.4

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 0.6901 D_{85}= 0.5780 D_{60}= 0.3341
D_{50}= 0.2779 D_{30}= 0.1517 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: **Date Tested:**

Tested By: J.James

Checked By: W.Lawrence

Title:

Source of Sample: B-1 **Depth:** 2

Sample Number: 2

Date Sampled:

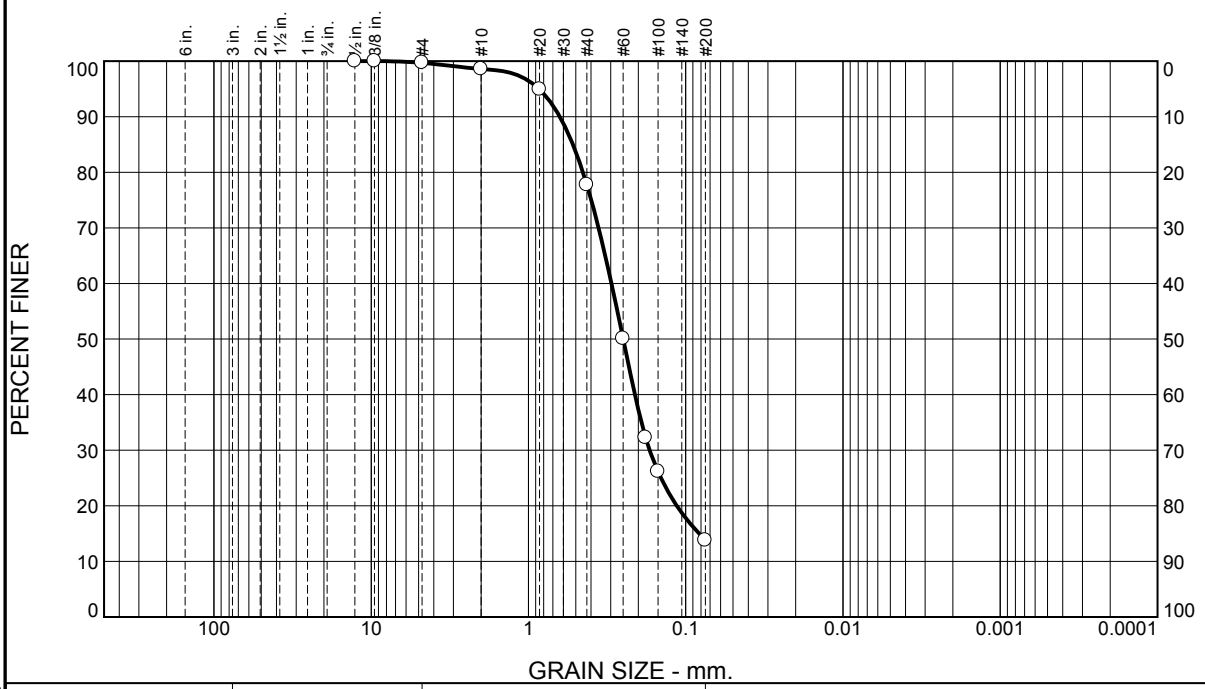
Nova Engineering & Environmental
Pensacola, FL

Client: Sigma Consulting Group

Project: Willowbrook Lake Dam Replacement

Project No: 8216027 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	1.1	20.9	63.9	13.8	

Test Results (ASTM C 136 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.5"	100.0		
3/8"	100.0		
#4	99.7		
#10	98.6		
#20	94.9		
#40	77.7		
#60	50.1		
#80	32.3		
#100	26.2		
#200	13.8		

* (no specification provided)

Material Description

Light-Brown Fine-Grained SAND with Silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** 16.7 **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 0.6323 D_{85}= 0.5214 D_{60}= 0.2967
D_{50}= 0.2496 D_{30}= 0.1697 D_{15}= 0.0821
D_{10}= C_u= C_c=

Remarks

Date Received: **Date Tested:**

Tested By: J.James

Checked By: W.Lawrence

Title:

Source of Sample: B-2 **Depth:** 2

Sample Number: 2

Date Sampled:

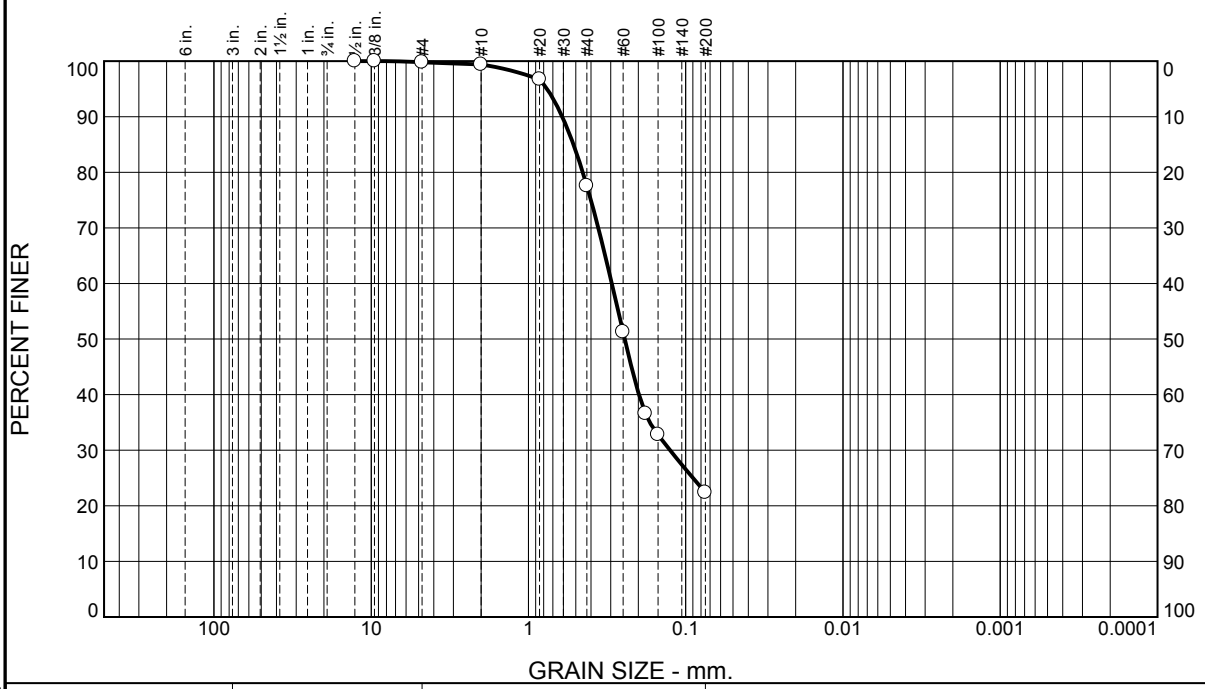
Nova Engineering & Environmental
Pensacola, FL

Client: Sigma Consulting Group

Project: Willowbrook Lake Dam Replacement

Project No: 8216027 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.4	21.9	55.1	22.4	

Test Results (ASTM C 136 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1/2"	100.0		
3/8"	100.0		
#4	99.8		
#10	99.4		
#20	96.7		
#40	77.5		
#60	51.3		
#80	36.6		
#100	32.8		
#200	22.4		

* (no specification provided)

Material Description

Orange/Tan Fine-Grained Silty SAND

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** 19.7 **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 0.6097 D_{85}= 0.5171 D_{60}= 0.2952
D_{50}= 0.2441 D_{30}= 0.1256 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: **Date Tested:**

Tested By: J.James

Checked By: W.Lawrence

Title:

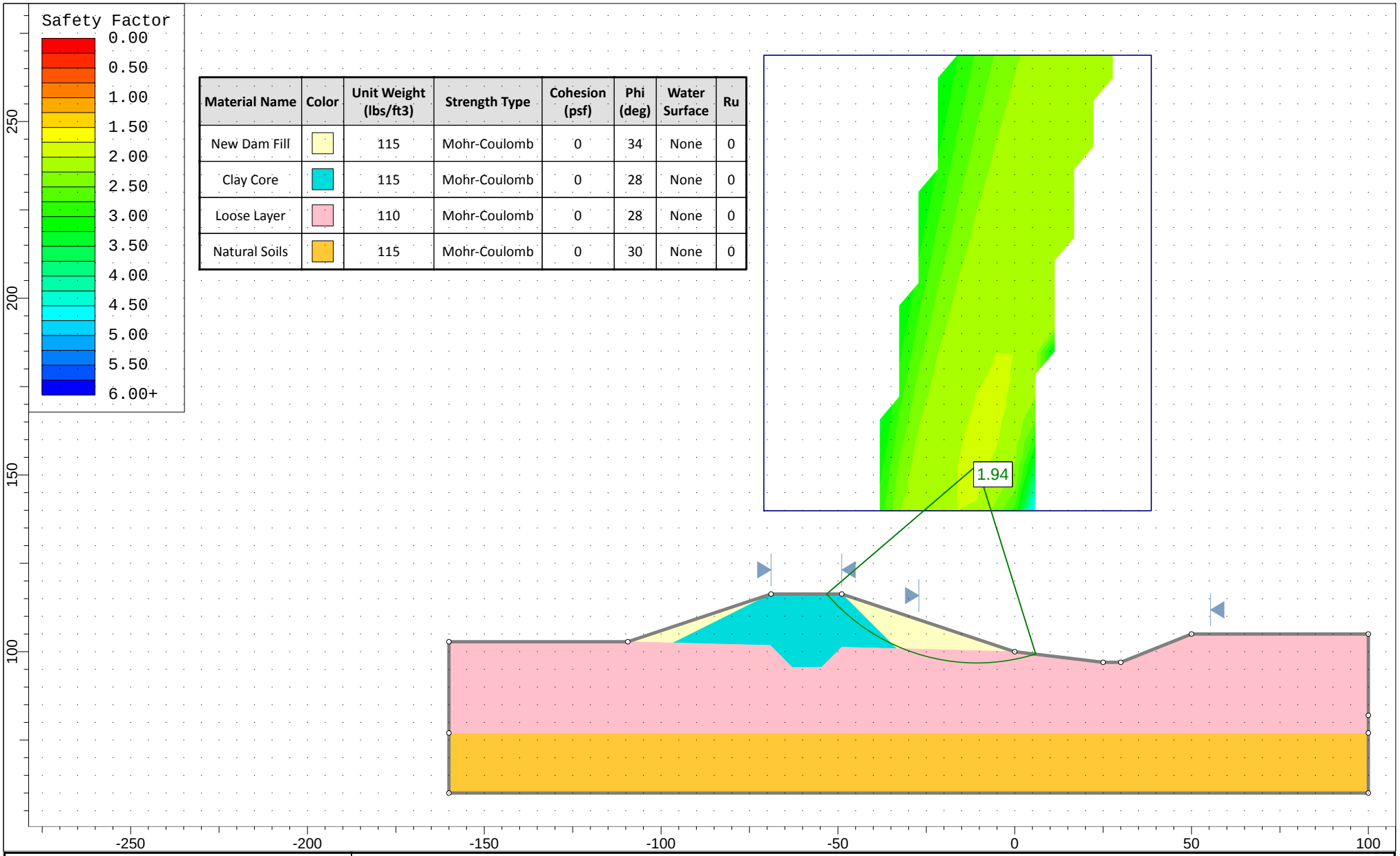
Source of Sample: B-1 **Depth:** 28.5
Sample Number: 9 **Date Sampled:**

Nova Engineering & Environmental
Pensacola, FL

Client: Sigma Consulting Group
Project: Willowbrook Lake Dam Replacement

Project No: 8216027 **Figure**

APPENDIX D
Slope Stability Analysis Reports

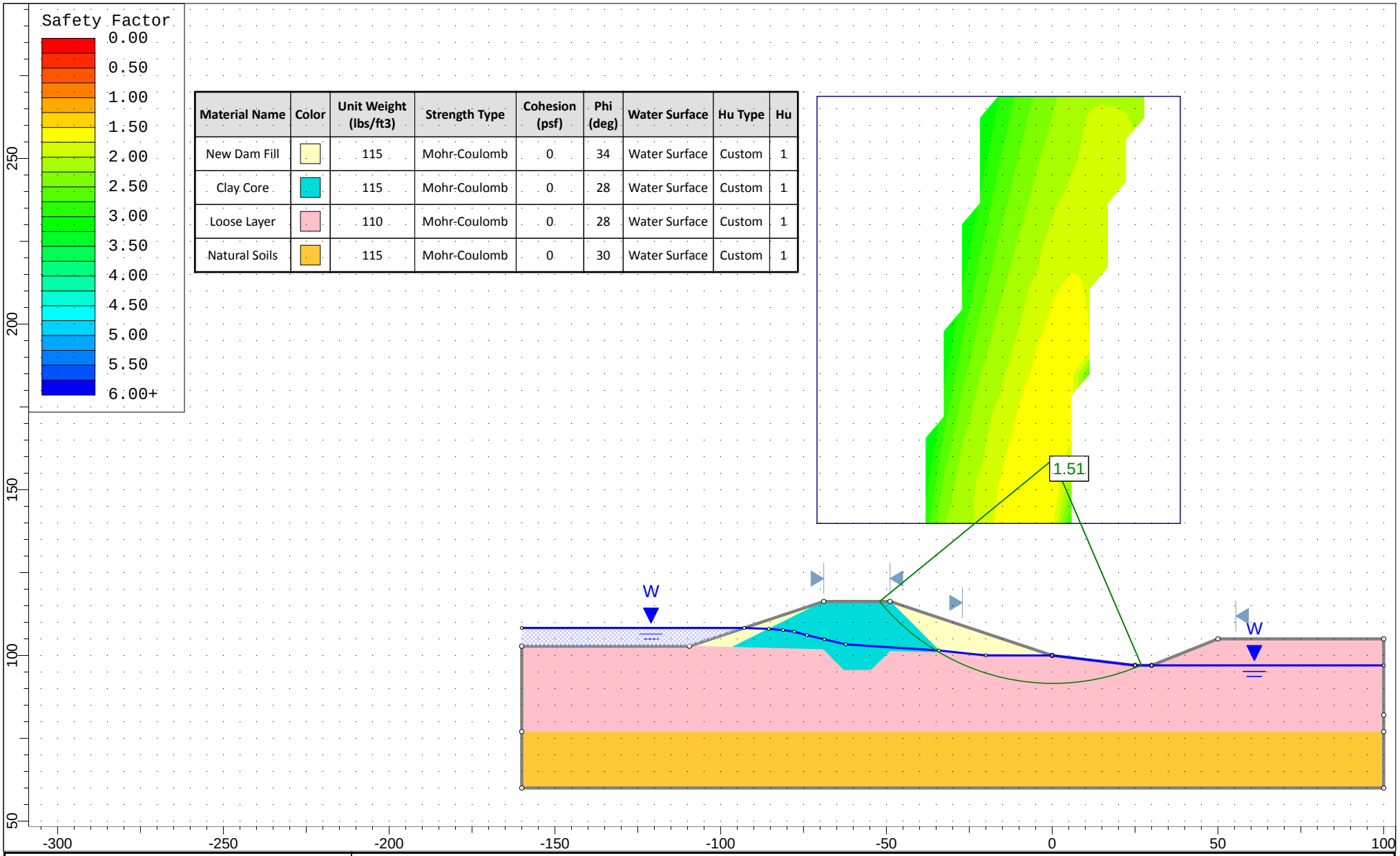


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
New Dam Fill		115	Mohr-Coulomb	0	34	None	0
Clay Core		115	Mohr-Coulomb	0	28	None	0
Loose Layer		110	Mohr-Coulomb	0	28	None	0
Natural Soils		115	Mohr-Coulomb	0	30	None	0

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

SLIDEINTERPRET 6.033

Project	Willowbrook Lake Dam		
Project Number	8216027		
Drawn by	Y. Chen	Scale 1:450	Client Sigma Consulting Group
Analysis Description	Bishop and Janbu Simplified Method		Date 7/11/2016

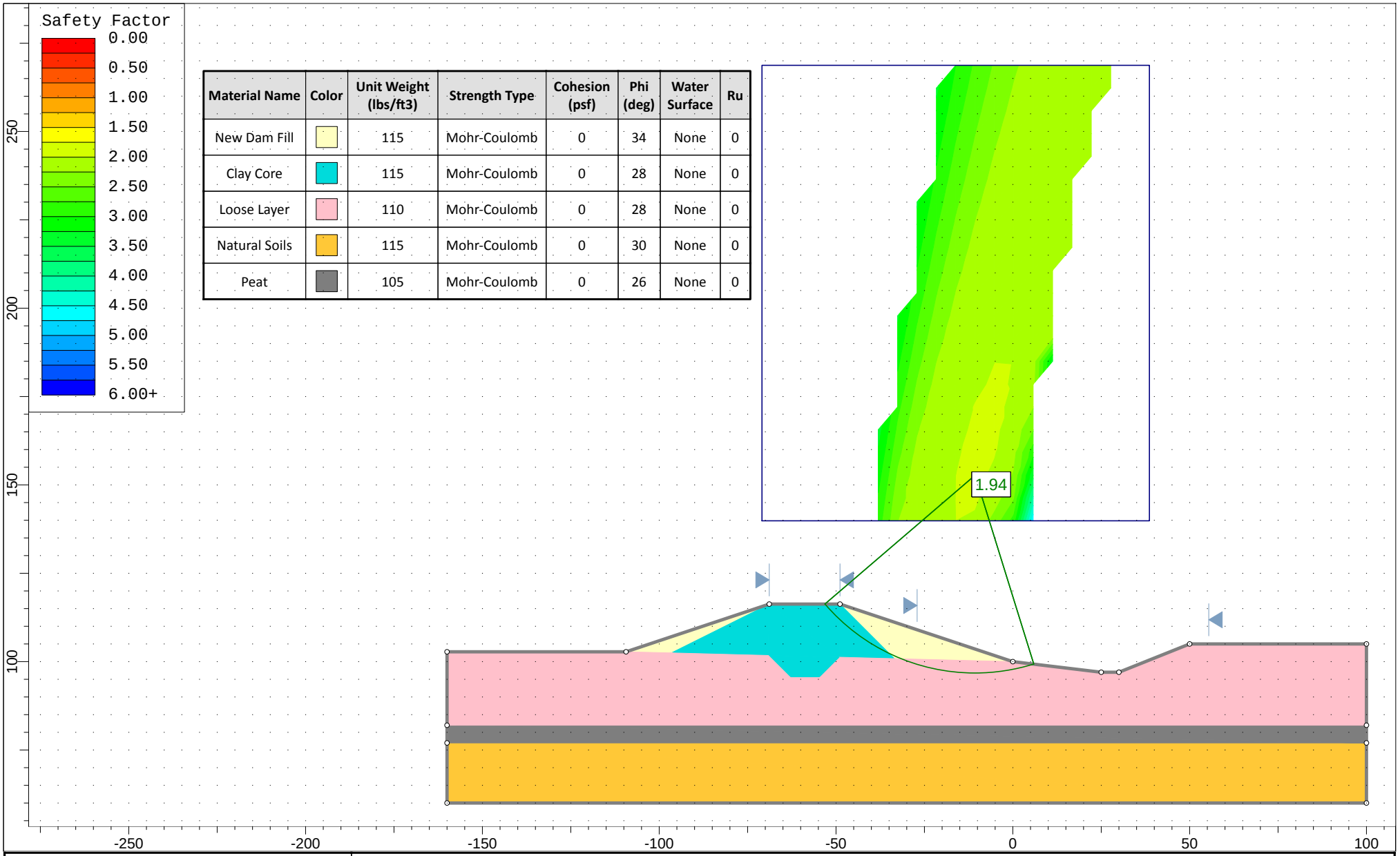


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
New Dam Fill		115	Mohr-Coulomb	0	34	Water Surface	Custom	1
Clay Core		115	Mohr-Coulomb	0	28	Water Surface	Custom	1
Loose Layer		110	Mohr-Coulomb	0	28	Water Surface	Custom	1
Natural Soils		115	Mohr-Coulomb	0	30	Water Surface	Custom	1

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

SLIDEINTERPRET 6.033

Project	Willbowbrook Lake Dam		
Project Number	8216027		
Drawn by	Y. Chen	Scale 1:480	Client Sigma Consulting Group
Analysis Description	Bishop and Janbu Simplified Method		Date 7/11/2016

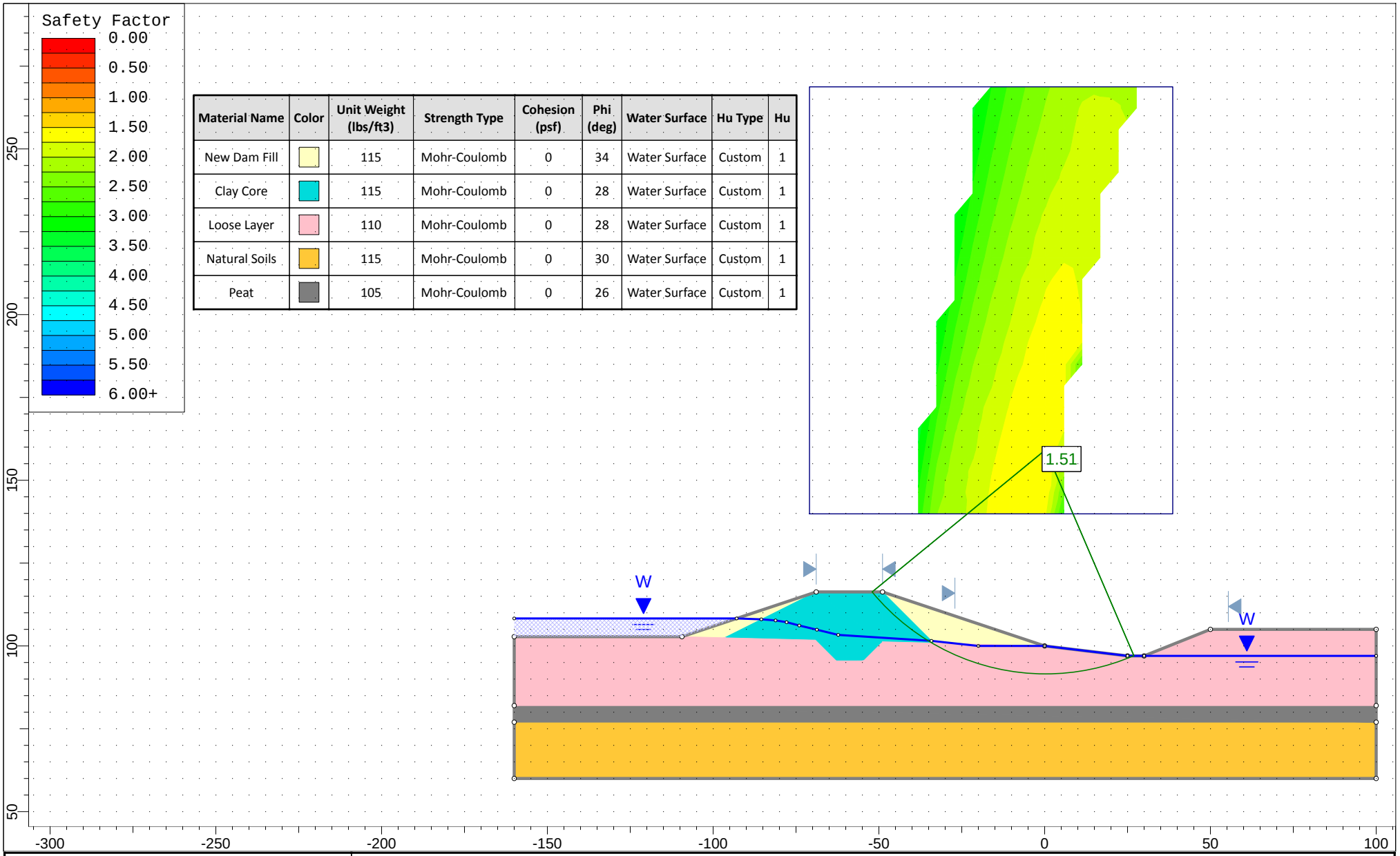


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
New Dam Fill		115	Mohr-Coulomb	0	34	None	0
Clay Core		115	Mohr-Coulomb	0	28	None	0
Loose Layer		110	Mohr-Coulomb	0	28	None	0
Natural Soils		115	Mohr-Coulomb	0	30	None	0
Peat		105	Mohr-Coulomb	0	26	None	0

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

SLIDEINTERPRET 6.033

Project	Willowbrook Lake Dam		
Project Number	8216027		
Drawn by	Y. Chen	Scale 1:450	Client Sigma Consulting Group
Analysis Description	Bishop and Janbu Simplified Method		Date 7/11/2016



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
New Dam Fill		115	Mohr-Coulomb	0	34	Water Surface	Custom	1
Clay Core		115	Mohr-Coulomb	0	28	Water Surface	Custom	1
Loose Layer		110	Mohr-Coulomb	0	28	Water Surface	Custom	1
Natural Soils		115	Mohr-Coulomb	0	30	Water Surface	Custom	1
Peat		105	Mohr-Coulomb	0	26	Water Surface	Custom	1

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

SLIDEINTERPRET 6.033

Project	Willowbrook Lake Dam		
Project Number	8216027		
Drawn by	Y. Chen	Scale 1:480	Client Sigma Consulting Group
Analysis Description	Bishop and Janbu Simplified Method		Date 7/11/2016

APPENDIX E
QUALIFICATIONS OF RECOMMENDATIONS
GBC DOCUMENT

QUALIFICATIONS OF RECOMMENDATIONS

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study, and our previous experience. If additional information becomes available which might impact our geotechnical opinions, it will be necessary for NOVA to review the information, re-assess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings may differ from those encountered at specific boring locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process has altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this report are not final. Field observations and foundation installation monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, NOVA should be retained by the owner to observe all earthwork and foundation construction to confirm that the conditions anticipated in this study actually exist, and to finalize or amend our conclusions and recommendations. NOVA is not responsible or liable for the conclusions and recommendations presented in this report if NOVA does not perform these observation and testing services.

This report is intended for the sole use of **SIGMA Consulting Group** only. The scope of work performed during this study was developed for purposes specifically intended **SIGMA Consulting Group** only, and may not satisfy other users' requirements. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. NOVA is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

Our professional services have been performed, our findings obtained, our conclusions derived and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the State of Florida. This warranty is in lieu of all other statements or warranties, either expressed or implied.

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX C

TECHNICAL SPECIFICATIONS

PUBLIC WORKS DEPARTMENT
Engineering Division

Escambia County
Technical Specifications

GENERAL EXCEPTIONS*: Any reference to FDOT *Standard Specifications for Road and Bridge Construction, Latest Edition, Division I General Requirements & Covenants* shall be excluded and not applicable to any specification referred herein or otherwise listed in this document.

Work shall comply with requirements of FDOT *Standard Specifications for Road and Bridge Construction*, latest edition, as modified herein.

**Note: The General Exception above does not apply when utilizing Federal Highway Administration (FHWA) funding.*

County Engineer
Joy D. Blackmon, P.E.

Effective Date: February 01, 2015
Revised : May 17, 2017

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SECTION 01000 – DEFINITIONS

PART 1 - GENERAL

The following terms, when used in the Contract Documents, have the meaning described

Advertisement
The public announcement, as required by law, inviting bids for work to be performed or materials to be furnished, usually issued as “Notice to Contractors,” or “Notice to Bidders.”

Bidder
An individual, firm, or corporation submitting a proposal for the proposed work.

Bridge
A structure, including supports, erected over a depression or over an obstruction such as water, highway or railway, or for elevated roadway, for carrying traffic or other moving loads, and having a length, measured along the center of the roadway, of more than 20 feet between the inside faces of end supports. A multiple-span box culvert is considered a bridge, where the length between the extreme ends of the openings exceeds 20 feet.

Calendar day
Every day shown on the calendar, ending and beginning at midnight.

Contract
The term “Contract” means the entire and integrated agreement between the parties there under and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract Documents form the Contract between the County and the Contractor setting forth the obligations of the parties thereunder, including, but not limited to, the performance of the Work and the basis of payment.

Contract Documents
The term “Contract Documents” includes: Advertisement for Proposal, Proposal, Certification as to Publication and Notice of Advertisement for Proposal, Appointment of Agent by Nonresident Contractors, Noncollusion Affidavit, Warranty Concerning Solicitation of the Contract by Others, Resolution of Award of Contract, Executed Form of Contract, Performance Bond and Payment Bond, Specifications, plans (including revisions thereto issued during construction), Addenda, or other information mailed or otherwise transmitted to the prospective bidders prior to the receipt of bids, work orders and supplemental agreements, all of which are to be treated as one instrument whether or not set forth at length in the form of contract.

Contract Bond
The security furnished by the Contractor and the surety as a guaranty that the Contractor shall fulfill the terms of the Contract and pay all legal debts pertaining to the construction of the project.

Contract Letting
The date that the County opened the bid proposals.

Contract Time
The number of calendar days allowed for completion of the Contract work, including authorized time extensions.

Contractor
The individual, firm, joint venture, or company contracting with the County to perform the work.

Contractor's Engineer of Record
A Professional Engineer registered in the State of Florida, other than the Engineer of Record or his subcontracted consultant, who undertakes the design and drawing of components of the permanent structure as part of a redesign or Cost Savings Initiative Proposal, or for repair designs and details of the permanent work. The Contractor's Engineer of Record may also serve as the Specialty Engineer. The Contractor's Engineer of Record must be an employee of a pre-qualified firm. Any Corporation or Partnership offering engineering services must hold a Certificate of Authorization from the Florida Department of Business and Professional Regulation.

As an alternate to being an employee of a pre-qualified firm, the Contractor's Engineer of Record may be a pre-qualified Specialty Engineer. For items of the permanent work declared by the State Construction Office to be "major" or "structural", the work performed by a prequalified Specialty Engineer must be checked by another pre-qualified Specialty Engineer. An individual Engineer may become pre-qualified in the work groups listed in the Rules of the Department of Transportation, Chapter 14-75, if the requirements for the Professional Engineer are met for the individual work groups. Pre-qualified Specialty Engineers are listed on the State Construction Website. Pre-qualified Specialty Engineers will not be authorized to perform redesigns or Cost Savings Initiative Proposal designs of items fully detailed in the plans.

Controlling Work Items
The activity or work item on the critical path having the least amount of total float. The controlling item of work will also be referred to as a Critical Activity.

County
Escambia County Public Works Department

Culverts
Any structure not classified as a bridge that provides an opening under the roadway.

Delay
Any unanticipated event, action, force or factor which extends the Contractor's time of performance of any controlling work item under the Contract. The term "delay" is intended to cover all such events, actions, forces or factors, whether styled "delay", "disruption", "interference", "impedance", "hindrance", or otherwise, which are beyond the control of and not caused by the Contractor, or the Contractor's subcontractors, materialmen, suppliers or other agents. This term does not include "extra work".

Department
Escambia County.

Developmental Specification See definition for Specifications.

Engineer
The Professional Engineer, registered in the State of Florida, other than the Engineer of Record or his subcontracted consultant, acting as the project's Construction Engineering Inspection Manager. The Engineer may be County in-house staff or a consultant retained by the County

Engineer of Record
The Professional Engineer or Engineering Firm registered in the State of Florida that develops the criteria and concept for the project, performs the analysis, and is responsible for the preparation of the Plans and Specifications. The Engineer of Record may be County in-house staff or a consultant retained by the County.

The Contractor shall not employ the Engineer of Record as the Contractor’s Engineer of Record or as a Specialty Engineer.

Equipment
The machinery and equipment, together with the necessary supplies for upkeep and maintenance thereof, and all other tools and apparatus necessary for the construction and acceptable completion of the work.

Extra Work
Any “work” which is required by the Engineer to be performed and which is not otherwise covered or included in the project by the existing Contract Documents, whether it be in the nature of additional work, altered work, deleted work, work due to differing site conditions, or otherwise. This term does not include a “delay”.

Highway, Street, or Road
A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

Holidays
Days designated by the Board of County Commissioners as holidays, which include, but are not limited to, New Year’s Day, Martin Luther King’s Birthday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the following Friday, and Christmas Day.

Inspector
An authorized representative of the County, assigned to make official inspections of the materials furnished and of the work performed by the Contractor.

Laboratory
The testing laboratory used by the Contractor.

Major Item of Work

Any item of work having an original Contract value in excess of 5% of the original Contract amount.

Materials
Any substances to be incorporated in the work under the Contract.

Median
The portion of a divided highway or street separating the traveled ways for traffic moving in opposite directions.

Plans
The approved plans, including reproductions thereof, showing the location, character, dimensions, and details of the work.

Proposal (Bid, Bid Proposal)
The offer of a bidder, on the prescribed form, to perform the work and to furnish the labor and materials at the prices quoted.

Proposal Form
The official form or the expedite program generated bid item sheets on which the County requires formal bids to be prepared and submitted for the work.

Proposal Guaranty
The security furnished by the bidder as guaranty that the bidder will enter into the Contract for the work if the County accepts the proposal.

Right-of-Way
The land that the County has title to, or right of use, for the road and its structures and appurtenances, and for material pits furnished by the County.

Roadbed
The portion of the roadway occupied by the subgrade and shoulders.

Roadway
The portion of a highway within the limits of construction.

Section
A numbered prime division of these Specifications.

Special Provisions
See definition for Specifications.

Specialty Engineer
A Professional Engineer registered in the State of Florida, other than the Engineer of Record or his subcontracted consultant, who undertakes the design and drawing preparation of components, systems, or installation methods and equipment for specific temporary portions of the project work or for special items of the permanent works not fully detailed in the plans and required to be furnished by the Contractor such as but not limited to pot bearing designs, nonstandard expansion joints, MSE wall designs and

other specialty items. The Specialty Engineer may also provide designs and details for items of the permanent work declared by the State Construction Office to be “minor” or “non-structural”. The Specialty Engineer may be an employee or officer of the Contractor or a fabricator, an employee or officer of an entity providing components to a fabricator, or an independent consultant. For items of work not specifically covered by the Rules of the Department of Transportation, a Specialty Engineer is qualified if he has the following qualifications:

Registration as a Professional Engineer in the State of Florida.
The education and experience necessary to perform the submitted design as required by the Florida Department of Business and Professional Regulation.

Specifications
The directions, provisions, and requirements contained herein, together with all stipulations contained in the Contract Documents, setting out or relating to the method and manner of performing the work, or to the quantities and qualities of materials and labor to be furnished under the Contract.

Standard Specifications: “Standard Specifications for Road and Bridge Construction” a bound book, applicable to all FDOT Contracts containing adopted requirements, setting out or relating to the method or manner of performing work, or to the quantities and qualities of materials and labor.

Supplemental Specifications: Approved additions and revisions to the Standard Specifications, applicable to all Department Contracts.

Special Provisions: Specific clauses adopted by the Department that add to or revise the Standard Specifications or supplemental specifications, setting forth conditions varying from or additional to the Standard Specifications applicable to a specific project.

Technical Special Provisions: Specifications, of a technical nature, prepared, signed, and sealed by an Engineer registered in the State of Florida other than the State Specifications Engineer or his designee, that are made part of the Contract as an attachment to the Contract Documents.

Developmental Specification: A specification developed around a new process, procedure, or material.

Standard Specifications
See definition for Specifications.

State
State of Florida.

Subarticle
A headed and numbered subdivision of an Article of a Section of these Specifications.

Subgrade
The portion of the roadbed immediately below the base course or pavement, including

below the curb and gutter, valley gutter, shoulder and driveway pavement. The subgrade limits ordinarily include those portions of the roadbed shown in the plans to be constructed to a design bearing value or to be otherwise specially treated. Where no limits are shown in the plans, the subgrade section extends to a depth of 12 inches below the bottom of the base or pavement and outward to 6 inches beyond the base, pavement, or curb and gutter.

Substructure
All of that part of a bridge structure below the bridge seats, including the parapets, backwalls, and wingwalls of abutments.

Superintendent
The Contractor's authorized representative in responsible charge of the work.

Superstructure
The entire bridge structure above the substructure, including anchorage and anchor bolts, but excluding the parapets, backwalls, and wingwalls of abutments.

Supplemental Agreement
A written agreement between the Contractor and theCounty, and signed by the surety, modifying the Contract within the limitations set forth in these Specifications.

Supplemental Specifications See definition for Specifications.

Surety
The corporate body that is bound by the Contract Bond with and for the Contractor and responsible for the performance of the Contract and for payment of all legal debts pertaining thereto.

Technical Special Provisions See definition for Specifications.

Traveled Way
The portion of the roadway providing for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

Unilateral Payment
A payment of money made to the Contractor by the Department pursuant to Section 337.11(12), Florida Statutes (2009), for sums the Department determines to be due to the Contractor for work performed on the project, and whereby the Contractor by acceptance of such payment does not waive any rights the Contractor may otherwise have against the Department for payment of any additional sums the Contractor claims are due for the work.

Work
All labor, materials and incidentals required to execute and complete the requirements of the Contract including superintendence, use of equipment and tools, and all services and responsibilities prescribed or implied.

Work Order
A written agreement between the Contractor and the County modifying the Contract within the limitations set forth in these Specifications. Funds for this agreement are drawn against the Initial Contingency Pay Item or a Contingency Supplemental Agreement.

Working Day
Any calendar day on which the Contractor works or is expected to work in accordance with the approved work progress schedule.

END OF SECTION 01000

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and General and Supplemental Provisions of the Contract, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including, but not limited to the following:

1. Submittal Procedures
2. Contractor's Construction Schedule
3. Daily Construction Reports
4. Shop Drawings
5. Product Data
6. Samples
7. Quality Assurance Submittals
8. Licenses
9. Pictures, Video of Pre-Construction Conditions

B. Administrative Submittals: Refer to other Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Permits
2. Applications for Payment
3. Performance and Payment Bonds
4. Insurance Certificates
5. List of Subcontractors
6. Licenses

1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, inspections, and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need

to review submittals concurrently for coordination. The County reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

3. Processing: To avoid the need to delay construction as a result of the time required to process submittals, allow sufficient time for submittal review, including time for re-submittals. Allow 2 weeks for initial review. Allow additional time if the County must delay processing to permit coordination with subsequent submittals.

    a. If an intermediate submittal is necessary, process the same as the initial submittal.
    b. Allow 2 weeks for reprocessing each submittal.
    c. No extension of Contract Time will be authorized because of failure to transmit submittals to the County sufficiently in advance of the Work to permit processing.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4 by 5 inches on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.

2. Include the following information on the label for processing and recording action taken.

    a. Project Name.
    b. Date.
    c. Name and Address of the Engineer.
    d. Name and Address of the Contractor.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Four copies of each submittal (three hard copy and one digital) shall be transmitted. Transmit each submittal from the Contractor to the County, (copy Engineer) using a transmittal form. The County will not accept submittals received from sources other than the Contractor. Submittals must be approved by Contractor prior to review by County. On the transmittal, record relevant information and requests for data. On the form or on a separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that the information complies with Contract Document requirements on each submittal.

1.4 CONSTRUCTION SCHEDULE/DOCUMENTATION

A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule. Submit within 10 days of the issuance of the Notice to Proceed. The contractor shall submit an updated schedule at least once per month, showing any schedule changes. This may be requested up to three times per month by the County. Include dates of shop drawing submittals.

B. Cost Correlation: At the head of the schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of Work performed as of the dates used for preparation of payment requests.

C. Pre-Construction Site Conditions Photos/Video: Contractor shall submit a DVD of photos and video of the site conditions prior to the performance of any work.

D. Licenses: All required licenses to perform work shall be submitted prior to the commencement of construction.

1.5 DAILY CONSTRUCTION REPORTS

Prepare a daily construction report recording the following information concerning events at the site, and submit duplicate copies to the County at weekly intervals including, but not limited to:

1. Work performed.
2. Approximate count of personnel at the site.
3. Count and type of major equipment at the site.
4. High and low temperatures, general weather conditions, including daily rainfall amount from gauge installed on site jointly recorded by contractor and county representative.
5. Accidents and unusual events.
6. Meetings and significant decisions.
7. Stoppages, delays, shortages, and losses.
8. Emergency procedures.
9. Orders and requests of governing authorities.
10. Change Orders received, implemented.
11. Material Expenditures.

1.6 SHOP DRAWINGS

A. Submit shop drawings for structures unless FDOT approved structures are used.

B. Shop Drawings – Including, but not limited to the following information:

1. Dimensions.
2. Identification of products and materials included by sheet and detail number.
3. Compliance with specified standards.

1.7 PRODUCT DATA

Product Data - Include the following information:

1. Manufacturer's printed recommendations.
2. Compliance with trade association standards.
3. Compliance with recognized testing agency standards.
4. Application of testing agency labels and seals.

1.8 SAMPLES

Submit samples as specified in the technical specifications.

1.9 QUALITY CONTROL (QC) / QUALITY ASSURANCE (QA) SUBMITTALS

A. Submit the QC Plan to the County for approval within 21 calendar days after the Notice to Proceed. The County will review the QC Plan and respond to the Contractor within 21 calendar days of receipt.

If at any time the Contractor is not in compliance with the approved QC Plan, or a part thereof, affected portions of the plan will be disapproved. The contractor shall cease work in the affected operation(s) and submit a revision to the County. If the QC Plan, or a part thereof, must be revised, submit the revision to the County. The County will review the revision and respond within seven calendar days of receipt.

Continue to work on operations that are still in compliance with the approved sections of the QC Plan.

B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit to the County a certification from the manufacturer certifying compliance with specified requirements.

C. Inspection and Test Reports: Requirements for specific testing are included in the technical specifications.

1. Submit to the County: Two (2) copies (one hard copy and one digital) of the inspection and test reports from a qualified, independent, geotechnical engineering testing agency, under the direction of a Professional Engineer, licensed in the State of Florida.

2. All testing required by the specifications or the County shall be at the contractors expense.

3. No additional work within/upon the tested area shall proceed until submitted test results confirm compliance with specification requirements.

4. Areas where submitted test results indicate non-compliance shall be removed, replaced, and retested. Extents of area out of compliance shall be determined by testing at 25’ increments, in each direction within the construction area, until passing results are achieved.

5. Variations from testing requirements and frequency of testing may be authorized by the County and will be documented in writing.

1.10 ENGINEER'S ACTION

Except for submittals for the record or information, where action and return is required, the County will review each submittal, mark to indicate action taken, return to contractor within the timeframe allotted herein. Compliance with specified characteristics is the Contractor's responsibility.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01300

SECTION 02230 - CLEARING & GRUBBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions shall apply to this Section.

B. Florida Department of Transportation*, Standard Specifications for Road and Bridge Construction, Section 110, Latest Edition.*

C. Emerald Coast Utility Authority (ECUA) *Engineering Manual*, *Latest Edition.*

1.2 SUMMARY

A. This Section includes, but is not limited to, the following:

1. Protection of existing trees indicated to remain.
2. Removal of trees and other vegetation.
3. Clearing and grubbing.
4. Removing above-grade improvements.
5. Removing below-grade improvements.

B. Extent of clearing & grubbing shall remain in County right-of-way, easements (temporary or permanent), or approved written work agreement areas, unless otherwise noted or instructed.

1.3 PROJECT CONDITIONS

Provide protection for all public land corners and monuments within the limits of construction. Any Monuments disturbed while performing the work will be replaced at the contractor's expense.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SITE CLEARING

A. General: Remove trees, shrubs, grass, and other vegetation, improvements, or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots.

Carefully and cleanly cut minor roots and branches of trees indicated to

remain in a manner where such roots and branches obstruct installation of new construction.

B. Clearing and Grubbing: Clear site of trees, shrubs, and other vegetation, except for those indicated to remain.

1. Completely remove all stumps within the roadway. Remove roots and other debris to a depth of 12” below the ground surface or finished grade, whichever is lower.

2. Use only hand methods for grubbing inside drip line of trees Indicated to remain.

3. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated in accordance with Section 2300.

C. Removal of Improvements: Remove existing above grade and below grade improvements as indicated and as necessary to facilitate new construction, and other work as indicated.

3.2 DISPOSAL OF WASTE MATERIALS

A. Burning: Burning is not permitted on County property. Requests to burn will be considered on a case by case basis. If approved, Contractor is to acquire permits and provide copies to the County.

B. Removal from County Property: Remove waste materials and unsuitable or excess topsoil from County property, and dispose of off site in a legal manner.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

A. Lump Sum Payment: When direct payment is provided in the Contract for the quantity to be paid for as the lump sum quantity cleared and grubbed, no additional measurements will be made.

B. Payment By The Acre/Square Yard: For areas of Clearing and Grubbing that are designated to be paid for separately by the acre or square yard, the quantity to be paid for will be determined by measurement of the areas shown on the plans or authorized by the County to be cleared and grubbed, and acceptably completed.

4.2 BASIS OF PAYMENT

A. General: Price and payment will be full compensation for all Clearing and Grubbing required for the roadway right-of-way and for lateral ditches, channel changes, or other outfall areas, and any other Clearing and Grubbing indicated, or required for the construction of the entire project, except for any areas designated to be paid for separately or to be specifically included in the costs of other work under the contract. Price and payment, either lump sum or by the acre/square yard will be full compensation for all the work specified in this Section, including all necessary hauling, furnishing equipment, equipment operation, furnishing any areas required for disposal of debris, leveling of terrain and the landscaping work of trimming, etc., as specified herein.

B. Lump Sum Payment: Payment shall be made at the lump sum contract price for Clearing and Grubbing, lump sum.

C. Payment: Payment shall be made at the per unit contract price for Clearing and Grubbing, per acre or square yard.

END OF SECTION 02230

SECTION 02300 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

B. Florida Department of Transportation*, Standard Specifications for Road and Bridge Construction, Latest Edition*.

1.2 SUMMARY

A. This Section includes preparing and grading for pavement, curb, subgrades, drainage features, and general site work.

B. Related Sections: The following Sections contain requirements that relate to this Section.

1. Section 2230 "Clearing & Grubbing" for clearing, grubbing, and tree protection.

2. Section 2600 “Stormwater System” for installation of stormwater systems.

1.3 DEFINITIONS

A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.

B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, base, drainage fill, or topsoil materials.

C. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from on-site excavations.

D. Subbase Course: The layer placed between the subgrade and base course in a paving system.

E. Base Course: The layer placed immediately beneath the surface pavement in a paving system.

F. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the County. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be at the Contractor's expense.

G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

H. Utilities include on-site above ground utilities, overhead utilities and underground utilities including: pipes, conduits, ducts, and cables, as well as related appurtenances and underground services within building lines.

I. Unsuitable Material: Any material such as muck, wood, rock, peat, garbage, non-compactable soils in dry condition, and any other material that is considered by the County Engineer to be unsuitable.

J. Topsoil: Topsoil is defined as the surface layer of soil found normally to a depth of at least 4 to 8 inches that typically contains organic materials. Satisfactory topsoil is reasonably free of roots, clay lumps, stones, other objects over 2 inches in diameter, and any other objectionable or deleterious material.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Section 1300, "Submittals."

B. Product Data and Samples of the following:

1. 1-lb representative samples of each proposed fill and backfill soil material from borrow sources as selected by the County.

2. 12-by-12-inch sample of filter fabric.

3. Representative samples of the proposed base and sub-base materials.

C. Test Reports: In addition to test reports required under field quality control, submit the original directly to the County from the testing services, with a copy to the Contractor:

1. Laboratory analysis as specified in 1.1 (Related Documents) of each soil material proposed for fill and backfill from borrow sources.

2. One optimum moisture-maximum density curve for each soil material.

3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.

1.5 QUALITY CONTROL / QUALITY ASSURANCE

A. Codes and Standards: Perform earthwork complying with all requirements of authorities having jurisdiction.

B. Testing and Inspection Service: A qualified independent geotechnical engineering testing agency, under the direction of a Professional Engineer, licensed in the State of Florida to classify, perform soil tests, and provide inspection services for quality control. All proposed borrow soils will require the testing agency to verify that soils comply with specified requirements and to perform required field and laboratory testing. Contractor shall replace materials removed for testing purposes. Should any work or materials fail to meet the requirements set forth in the plans and specifications, contractor shall reimburse for additional and re-testing.

1.6 PROJECT CONDITIONS

A. Site Information: Data in the subsurface investigation Report, if available, is used for the basis of the design and is available to the contractor for information only. Conditions are not intended as representations or warranties of accuracy or continuity between soil borings. The County will not be responsible for interpretations or conclusions drawn from this data by the Contractor.

B. Existing Utilities: After location of utilities by the appropriate utility company, it is the Contractor's responsibility to protect all such utility lines, including service lines and appurtenances, and to replace at his own expense any that may be damaged by the Contractor's equipment or forces during construction of the Project.

1. Provide a minimum of 48-hours notice to the County and receive written notice to proceed before interrupting any utility.

2. The contractor is responsible for contacting all utility companies to verify locations of all existing utilities, utility-related obstructions, or utility relocations that he may encounter during construction.

3. Adequate provision shall be made for the flow of existing sewers, drains, and water courses encountered during construction, and structures which may be disturbed shall be satisfactorily restored by the Contractor at his expense.

C. Should uncharted, or incorrectly charted, piping or other utilities be encountered during the course of the work, consult the County immediately for directions. Cooperate with the County and utility companies in keeping respective services and facilities in operation.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Soils used as fill shall be clean sands, similar to existing site soil, with less than 5% passing the number 200 sieve when existing subgrade conditions are considered wet as per the County. Soils as described above with less than 15% passing the number 200 sieve and meeting the requirements of Section 902-6 of the FDOT Specifications may be used when existing subgrade conditions are considered dry as per the County. The sand shall have a maximum dry density of at least 100 pounds per cubic foot, according to the Standard Proctor compaction test, AASHTO T-99, ASTM D698. Provide approved borrow soil materials from off-site when sufficient satisfactory soil materials are not available from on-site excavations.

If the Contractor elects to import any materials, then he will do so only with the approval of the County and at his own expense, unless separate payments for such items are called for in these specifications. Provide laboratory certification that soils meet requirements of specifications.

B. Sub-Base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, or sand. The material shall be stabilized in accordance with FDOT Standard Specification Section 160-5.4. ASTM D 2940, with at least 95 percent passing a 1-1/2-inch sieve, and not more than 8 percent passing a No. 200 sieve.

PART 3 - EXECUTION

3.1 DEWATERING

A. Prevent surface water and subsurface or groundwater from entering excavations, from ponding on sub-grades in work areas, and from flooding project site and surrounding area.

B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

C. The Contractor shall prevent the accumulation of water in excavated areas, and shall remove, by pumping or other means, any water that accumulates in the excavation. The Contractor shall prevent the accumulation of water in both structural and trench excavations and shall remove, by well point system or by other means, water which accumulates. The Contractor shall provide, install and operate a suitable and satisfactory dewatering system, when needed to dry sub-grades or other work areas. The Contractor shall comply with the latest testing requirements as set forth by the applicable regulatory agency. At a minimum, the contractor shall test once prior to dewatering, once within

the first week of dewatering, and once every thirty (30) days while dewatering.

D. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collection or runoff areas. Do not use trench excavations as temporary drainage ditches. Discharged water shall be clean, not silt or sediment laden, prior to discharge to untreated system and/or waters of the State.

3.2 EXCAVATION

A. Explosives: Not permitted.

B. Strip topsoil and significant root systems to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root systems.

3.3 STABILITY OF EXCAVATIONS

A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.

B. All excavation work shall conform to all applicable OSHA Publications, Latest Editions. The Contractor's method of providing protective support to prevent cave-ins shall conform to OSHA requirements. Slope excavations, shoring, and trench box usage in the field must be based on tabulated data and designed by the Contractor. The contractor is solely responsible for job site safety and shall not be compensated for required safety equipment/devices.

3.4 EXCAVATION FOR STRUCTURES

Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 foot. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, maintaining a safe slope, installing services and other construction, and for inspections.

A. Footings and Foundations: Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

B. Pile Foundations: After piles have been installed, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.

C. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Appurtenances: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades. Consider Dewatering and other sections as applicable.

3.6 EXCAVATION FOR STORMWATER SYSTEMS

Excavate and compact the backfill of trenches to the densities specified for embankment or subgrade, as applicable, and in accordance with the requirements of Section 2600. Consider Dewatering and other sections as applicable.

3.7 STORAGE OF SOIL MATERIALS

Stockpile excavated materials acceptable for backfill, fill soil, and topsoil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Stockpiles shall be placed, graded, and shaped to drain surface water and prevent erosion. Cover to prevent wind-blown dust and/or erosion. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.8 BACKFILL

A. Backfill excavations promptly, but not before completing the following:

1. Acceptance of construction below finish grade including, where applicable, filter fabric installation and gravel bedding.

2. Surveying locations of underground utilities for record documents.

3. Testing, inspecting, and approval of underground utilities.

4. Removal of trash and debris from excavation.

5. Removal of temporary shoring, bracing, and sheeting unless specified to remain.

B. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, backfill operations shall not be resumed until the moisture content of the fill is as previously specified to achieve proper compaction.

3.9 FILL

A. Preparation: Remove vegetation, topsoil, debris, wet and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface. In order to insure proper bond and prevent slipping between the original ground and fill, the surface of the original ground shall be scarified to a depth of at least three inches. Each layer of fill material shall be compacted until the required density is achieved, and the density achieved should be verified in accordance with specifications using in-place density testing.

B. When subgrade or existing ground surface is to receive fill and has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture condition or aerate soil and re-compact to required density.

C. Place fill material in layers to required elevations for each location listed below.

1. Under grass, subbase or base material, use satisfactory excavated or borrow soil material.

2. Under walks and pavements, curbs, steps, ramps, building slabs, footings and foundations use subbase and/or base material.

3.10 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

B. Do not place backfill or fill material on surfaces that contain excessive moisture.

C. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to specified density. Stockpile or spread and dry removed wet satisfactory soil material.

3.11 COMPACTION

A. Place backfill and fill materials in layers or lifts not more than 12 inches in loose depth for material compacted by heavy compaction equipment, and not more than 8 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.

C. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM Modified Proctor):

1. Under structures, building slabs, steps, and pavements, compact each layer of backfill or fill material at a minimum of 98% Modified Proctor of the material's maximum dry density.

2. Under lawn or unpaved areas, compact each layer of backfill or fill material at 95% Modified Proctor maximum dry density.

3.12 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between existing adjacent grades and new grades.

2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 0.10 foot.

2. Walks: Plus or minus 0.10 foot.

3. Pavements: Plus or minus ½ inch.

3.13 STABILIZED SUBGRADE

A. For stabilized subgrade the type of materials, commercial or local, is at the Contractor's option and no separate payment for stabilizing materials will be made (other than as may be paid for as borrow).

B. When stabilizing is designated as Type B, compliance with the bearing value requirements will be determined by the Limerock Bearing Ratio Method. Minimum LBR shall be 40.

C. It is the Contractor's responsibility that the finished roadbed section meets the bearing value requirements, regardless of the quantity of stabilizing materials necessary to be added. Also, full payment will be made for any areas where the existing subgrade materials meet the design bearing value requirements without the addition of stabilizing additives, as well as areas where the Contractor may elect to place select high-bearing

materials from other sources, within the limits of the stabilizing.

D. After the roadbed grading operations have been substantially completed, the Contractor shall make his own determination as to the quantity (if any) of stabilizing material, of the type selected by him, necessary for compliance with the bearing value requirements. The contractor shall notify the Engineer of the approximate quantity to be added, and the spreading and mixing-in of such quantity of materials shall meet the approval of the County as to uniformity and effectiveness.

3.14 FIELD QUALITY CONTROL

A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.

1. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), ASTM D 293 (drive cylinder method), or ASTM D 2922 (nuclear method), as applicable.

a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the speedy moisture meter according to ASTM D 3017.

b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and speedy moisture meter at beginning of work, on each different type of material encountered, and at intervals as directed by the Engineer.

2. Paved Areas: Make at least one field density test of subgrade, base, and each compacted fill layer for every 300 linear feet of roadway or equivalent area, but in no case less than two tests. Tests shall be staggered to ensure representative sampling.

3. Unpaved Areas: Make at least one field density test of each compacted fill layer or subgrade for every 1000 square yards of area, but in no case less than two tests.

4. Other tests may be required at County’s discretion.

B. If, in the opinion of the County, based on testing service reports and

inspection or the Engineer's observations, subgrades, fills, or backfills are below specified density, scarify and moisten or aerate as needed, or remove and replace soil to the depth required, re-compact, and re-test until required density is obtained at no additional expense.

3.15 REPAIR & CORRECTIONS

A. Protecting Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions. Scarify or remove and replace material to depth directed by the Engineer; reshape and re-compact at optimum moisture content to the required density.

B. Settling: Where settling occurs, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

C. When traffic must cross open trenches, the contractor shall provide suitable bridge of graded aggregate base or temporary asphalt paving as directed by County at no additional expense. (See Section 4060 for additional requirements.)

D. Erosion Control: The Contractor shall be responsible for the prevention of erosion from the site and for maintaining filled and graded surfaces for the duration of the project. This includes, but is not limited to, the erection of a silt fence and hay bale barricade as per Florida Stormwater Erosion and Sedimentation Control Inspector's Manual and/or as shown in the construction plans. The Contractor shall take whatever steps necessary to prevent erosion and sedimentation, and will be responsible for any damages which might occur to down-land properties as a result of run-off from the site during sitework construction at no additional cost. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.16 DISPOSAL OF SURPLUS AND WASTE MATERIALS

Surplus excavated material becomes the property of the Contractor unless otherwise noted. Waste materials, including unsatisfactory soils, trash and debris shall be removed and legally disposed of, off the Owner's property.

3.17 CLEAN-UP AND FINAL INSPECTION

Before final inspection and acceptance the Contractor shall clean ditches, shape

shoulders and restore all disturbed areas, including street crossings, grass plots, re-grassing if necessary, to as good a condition as existed before work started.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

A. Excavation: When payment for excavation is on a volumetric basis, the quantity to be paid for will be the volume, in cubic yards, calculated by the method of average end areas according to the survey and plans. If actual quantities vary in field, contractor shall communicate with Engineer and/or County to request additional payment. The measurement will include the net volume of material between the original ground surface and the surface of completed earthwork according to the survey and plans. If actual quantities vary in field, contractor shall communicate with the County to request additional payment. Excavation for swales and channels will be included in the total quantity for Excavation. Subsoil Excavation will be measured to the lines and grades indicated on the plans or as approved by the County. Backfill material shall either include normal excavation material from within project limits or borrow material supplied by the Contractor.

B. Embankment: Quantities for Embankment will be calculated by the method of average end or square yard areas, and will include material placed above the original ground line, within the lines and grades indicated on the plans or as directed by the County.

C. Calcium Chloride for Dust Control: The quantity to be paid for will be the weight, in tons, of calcium chloride authorized and acceptably spread on the road, within the limits specified by the County. The quantity will be determined from scales, certified freight bills, or other sources, the accuracy of which can be authenticated.

4.2 BASIS OF PAYMENT

A. General: Prices and payments for the various work items included in this section will be full compensation for all work described herein, including excavating, dewatering, dredging, hauling, placing, and compacting. Separate pay items will be provided for all devices required to maintain control of erosion according to plans and NPDES permit. Additional devices shall be no additional cost.

B. Excavation: Unit prices will be established for required cubic yard volumes of Regular Excavation, Subsoil Excavation, and Borrow Excavation as necessary. When subsoil excavation is required to a depth greater than plans and specifications require, and additional excavation is not due to unsuitable, a change order will be required to establish a new quantity utilizing the current unit price.

C. Embankment: Payment shall be made at the unit contract price for Embankment, cubic yard or square yard, in place, according to plans.

D. Calcium Chloride for Dust Control: Price and payment will be full compensation for all work and materials specified for this item, including specifically all required shaping and maintenance of the treated area and all water furnished and applied to the area.

E. Dewatering: The contractor shall include the cost of dewatering in the unit price bid for the stormwater pipe if there is not a specific line item used in the contract.

END OF SECTION 02300

SECTION 02320 - UNDERDRAIN AND EXFILTRATION TRENCH

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of Contract, including General and Supplementary Conditions and other Specification Sections, apply to work of this Section.

B. Florida Department of Transportation, *Standard Specifications for Road and Bridge Construction*, *Section 440, and Design Standards, Latest Edition*.

1.2 DESCRIPTION OF WORK

This section shall cover the work of furnishing pipe for underdrain and exfiltration trenches, the type and size shown on the plans or in the proposal in accordance with the requirements of these specifications, and installing such pipe at the locations shown on the plans or designed by the County in substantial conformity with the established lines, trench widths, filter media, and grades. The work shall include furnishing and construction of such joints and connections to other pipes as may be required to complete the work, as shown on the plans or directed, together with the specified trench, filter media, and filter fabric materials. Filter media may be sand, gravel, gravel pack, and/or a combination thereof.

PART 2 - PRODUCTS

A. Underdrain Pipe: Underdrain pipe shall conform to the requirements of Florida Department of Transportation Standard Specification 948-2, Latest Edition. The perforations shall meet the requirements for perforations as specified in AASHTO M294. Pipe shall be perforated polyethylene ADS N-12 or approved equal.

B. Filter Aggregate shall be clean, washed gravel free of organic material and fines with minimum 33% percent voids. Aggregate shall be at least FDOT stone or equivalent.

C. Filter Fabric shall be Terratex EP (Woven) or approved equal meeting the requirements of FDOT Specification Section 985.

D. Filter sand shall be clean sand, free of organic materials and fines, with an effective grains size of 0.20 to 0.55 mm, uniformity coefficient of 1.5 to 4.0, a K value (recommended design permeability) not to exceed 2.5 ft/hr, and the contractor shall provide a grain-size analysis to the County for the project.

PART 3 - EXECUTION

3.1 STANDARD INSTALLATION:

A. Trenches shall be excavated to the dimensions shown on the plans or as directed. A bedding layer of filter aggregate or filter sand of the size shown on the plans shall be placed in the bottom of the filter fabric lined trench for its full width and length and compacted as directed.

B. Subdrainage pipe of the type and size specified shall be embedded firmly in the bedding material. All pipe sections shall be securely joined with the appropriate coupling fittings or bands as per manufacturer's specifications.

C. After the pipe installation has been inspected and approved, the specified filter aggregate, gravel pack, and/or filter sand shall be placed as shown on the drawings and filter fabric wrapped around the filter media with a minimum overlap (as required) on top. Install wire mesh at opening/outfall. Care shall be taken not to displace the pipe.

D. The Contractor shall take every precaution to prevent the entrance of soil and sediments into the filter bed during construction, which would sacrifice the integrity of the filter fabric and aggregate installed. Stormwater runoff and sedimentation controls to be provided so as to protect the underdrain or exfiltration trench system.

E. Installation of the corrugated polyethylene pipe shall be in accordance with the ASTM D-2321 Latest Revision.

F. Gravel packs shall be installed around the filter-drain underdrain pipe an average thickness of at least six inches from the underdrain pipe for all underdrain systems located within pond bottoms and pond banks. The minimum separation between the gravel pack and the top of the filter bed shall be two feet. A permeable filter fabric shall be wrapped around the gravel pack.

G. Cleanouts or inspection boxes shall be installed, at minimum, every 400 feet or as specified by plan, at every directional change or bend, and at the beginning (upstream) and at the terminus (downstream) of the underdrain pipes or exfiltration trench systems.

H. Cleanouts shall have vertical portions non-perforated, include water-tight caps, and shall incorporate fittings (wye fittings or elbow bends) that have an angle no less than 45 degrees.

PART 4 – MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

The quantities to be paid for will be the length, in feet, of underdrain, which include trench filter fabric, measured in place, along the centerline and gradient of the underdrain, completed and accepted. The quantities to be paid for will be the length, in feet, of outlet pipe measured in place, along the centerline and gradient of the outlet pipe, completed and accepted. The quantity of underdrain inspection boxes and cleanouts to be paid for will be the number completed and accepted. When payment for gravel or sand filter media is on a volumetric basis, the quantity to be paid for will be the volume, in cubic yards, calculated based upon the length, width, and depth of the underdrain or exfiltration trench dimensions, minus the pipe volume, as shown on the plans, unless the filter media is specified as a bid item included in the costs of the underdrain or exfiltration system.

4.2 BASIS OF PAYMENT

Prices and payment for this item shall include all labor, equipment and materials necessary to complete the work in accordance with the plans and specifications. Materials covered under this pay item include but are not limited to: pipe including fittings, filter fabric, filter media, filter sand, filter aggregate, cleanout structures and inspections boxes. Payment shall be made for the underdrain or exfiltration pipe based upon the length of pipe. Unit prices will be established for the number of cleanouts structures and inspection boxes, unless otherwise specified as a bid item included in the under underdrain or exfiltration trench system. Unit prices will also be established for required cubic yard volume of gravel or sand filter media based upon the length, width, and depth of the underdrain or exfiltration trench, minus the pipe volume, as shown on the plans, unless otherwise specified as a lump sum bid item included in the costs of the underdrain or exfiltration trench system. No additional payment will be made for filter media overages larger than the specified plan volume. No additional payment will be made for excavation of the trench or lining the trench with filter fabric. No additional payment will be made for underdrain pipe with a sock filter fabric.

END OF SECTION 02320

SECTION 02340 - RIPRAP

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Specification Sections, apply to work of this Section.

B. Florida Department of Transportation, *Standard Specifications for Road and Bridge Construction*, *Section 530*, and *Design Standards 281*, *Latest Edition*.

1.2 DESCRIPTION OF WORK

This section shall cover the work of furnishing and constructing the Riprap which shall consist of a protective course of stone or other approved materials on embankment slopes, in channels, or other work as shown on the plans or directed, with or without a Filter Blanket, all in accordance with these Specifications and in conformity with the lines and grades noted in the plan details.

PART 2 - PRODUCTS

2.1 MATERIALS

Rubble\Stone Riprap shall comply with Florida Department of Transportation *Standard Specification 530-2.2*

A. Banks and shore protection shall comply with Florida Department of Transportation *Standard Specification 530-2.2.1*.

B. Ditch lining shall comply with Florida Department of Transportation *Standard Specification 530-2.2.2*.

C. Broken stone and broken concrete shall comply with Florida Department of Transportation *Standard Specification 530-2.2.3*.

D. Geotextile fabric shall comply with Florida Department of Transportation *Standard Specification 514* and Florida Department of Transportation *Design Standards 104* according to its application.

E. Bedding stone shall comply with Florida Department of Transportation *Standard Specification 530-2.3*.

F. Sand/Cement Riprap: Materials and placement shall comply with Florida Department of Transportation *Standard Specification 530-2.1*.

PART 3 - EXECUTION

3.1 EXECUTION

A. Construction Requirements:

General: All slopes to be treated with riprap shall be trimmed to the lines and grades indicated by the plans or directed, such that the plan grades are the top of the placed riprap, unless otherwise noted. Loose material shall be compacted by methods approved by the Engineer or removed.

Slopes which require a filter blanket under the riprap shall, in addition to the above, be prepared as noted below.

1. Placement of any riprap on a filter blanket shall be by such means that will not damage or destroy the blanket. Any damage to the blanket shall be repaired without additional compensation.

2. Unless directed otherwise by the Engineer or shown by plan details, all outer edges and the top of riprap where the riprap terminates shall be formed so that the surface of the riprap will be embedded and even with the surface of the ground and/or slope.

3. All riprap construction shall begin at the bottom of the slope and progress upward.

4. Filter Blanket: Unless otherwise specified by the plans or ordered in writing, a fabric blanket will not be allowed for soils with 85% by weight passing the No. 200 sieve (U.S. Std.)

5. The bedding stone shall be constructed in accordance with Florida Department of Transportation Specification 530-3.3.

6. Foundation Preparation: Areas on which filter fabrics are to be placed shall be uniformly trimmed and dressed to conform to cross-sections shown by the plans.

B. Plastic Filter Fabric (Geotextile):

Plastic filter fabric shall be placed in the manner and at the locations shown in the plans or as directed by the Engineer. At the time of installation, fabric shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacturer, transportation or storage. The fabric shall be placed with the long dimension parallel to the centerline of the channel or shoreline unless otherwise directed by the Engineer, and shall be laid smooth and free of tension, stress, folds, wrinkles or creases. The strips shall be placed to provide a minimum

width of 24 inches of overlap for each joint with the upstream strip of fabric overlapping the downstream strip. Overlap joints and seams shall be measured as a single layer of cloth. Securing pins with washers shall be inserted through both strips of overlapped cloth as recommended by the manufacturer, but no greater than the following intervals along a line through the midpoint of the overlap.

Pin Spacing	Slope
2 ft.	Steeper than 3:1
3 ft.	3:1 to 4:1
5 ft.	Flatter than 4:1

The fabric shall be turned down and buried two feet at all exterior limits except where a stone-filled key is provided below natural ground.

Additional pins regardless of location shall be installed as necessary to prevent any slippage of the filter fabric. Overlaps in the fabric shall be placed so that any upstream strip of fabric will overlap the downstream strip. Should the Engineer direct that the fabric be placed with the long dimension perpendicular to the centerline of the channel or shoreline, the lower strip of fabric shall underlap the next higher strip. Each securing pin shall be pushed through the fabric until the washer bears against the fabric and secures it firmly to the foundation. The fabric shall be protected at all times during construction from contamination by surface runoff and any fabric so contaminated shall be removed and replaced with uncontaminated fabric. Any damage to the fabric during its installation or during placement of riprap shall be replaced by the Contractor. The work shall be scheduled so that the manufacturer's recommendation for UV exposure is not exceeded or 5 days does not expire between placement of the fabric and the covering of the fabric with riprap, whichever is less.

3.2 STONE AND CONCRETE RUBBLE RIPRAP

General: Unless otherwise shown by plan details or directed, stone or concrete shall not be placed on slopes steeper than the natural angle of repose of the riprap material.

Placement of stone or concrete may, unless otherwise noted hereinafter, be placed by methods and equipment suitable for the purpose of placing the riprap in accordance with the requirements for the class riprap involved without damaging any existing facility or construction material.

The stone or concrete shall be placed in such a manner as to produce a reasonably well graded mass of rock with the minimum practical percentage of voids. Stone or concrete shall be laid with close broken joints and resting on the embankment slope. The top of the riprap shall be constructed to the lines, grades and thickness shown by the plans or as directed. Riprap shall be placed

to its full course thickness in one operation and in such a manner as to avoid displacing or damaging the filter blanket material. The larger stone or concrete shall be well distributed and the entire mass of stone or concrete, in their final position, shall conform to a reasonable uniform gradation. The finished riprap shall be free from objectionable pockets of small stone or concrete and clusters of larger stone or concrete. Open joints shall be filled with spalls, or small stone or concrete in such manner that all stone or concrete are tightly wedged or keyed. Placing riprap by dumping into chutes or by other methods likely to cause segregation of sizes will not be permitted. The desired distribution of the various sizes of stone or concrete throughout the mass shall be obtained by selective loading of the material at the source, by controlled dumping of successive loads during final placing, or by other methods of placement which will produce the specified results. The individual pieces of stone or concrete in each horizontal course shall be laid so that they will not break away from embankment. Rearranging of individual stone or concrete by mechanical equipment, or by hand, will be required to the extent necessary to obtain a reasonably well graded distribution of stone or concrete as specified above.

3.3 SAND/CEMENT RIPRAP

A. Placing: Immediately following mixing, the mixture shall be placed in the bags, tied (so that when laid in position, they will flatten out and give a thickness of not less than six inches) and placed flat on the area designed. Use only one type of bag per structure. Bags shall be layered and wedged against each other to form closed joints, with tied ends of sacks all laid in the same direction. Sacks ripped or torn in placing shall be removed and replaced with sound, unbroken sacks. When required to be placed under water, special care shall be taken to see that bags are closely jointed to give the same tight joints as required on dry slopes. After the riprap is placed, it shall be sprinkled with water as directed and kept damp for not less than three days. No sand/cement riprap shall be mixed in freezing weather.

B. Grouting: Immediately after watering, all openings between sacks shall be filled with dry grout composed of one part Portland cement and five parts sand.

C. Pinned/Staked Bags: Bags shall be pinned/staked when called for on drawings.

3.4 CLEAN UP

Before final inspection and acceptance, the Contractor shall remove all excess material from site and restore all disturbed areas to as good a condition as existed before work started.

3.5 MAINTENANCE

The Contractor shall maintain all riprap until the contract work is accepted, and shall replace, without additional compensation, any damaged or missing riprap.

PART 4 – MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

A. Sand-Cement: The quantity to be paid for will be the volume, in cubic yards, of sand actually used in the sand cement mixture and grout, satisfactorily placed and accepted. If sand is proportioned by volume, the sand will be measured loose in an approved measure prior to mixing with cement. If sand cement is proportioned by weight, approved scales will be used for this purpose and the volume will be calculated using a standard conversion factor for sand of 85lbs. /cubic feet. No adjustment of batch weights to allow for varying moisture content of the sand will be made.

B. Stone/Concrete Rubble and Bedding Stone: The quantities to be paid for will be, as per plans/bid schedule, and either by the weight in tons in surface dry natural state; by railroad scales, truck scales, or barge displacement, or by square yards (according to plan thickness.) The Contractor shall determine the weights as follows:

1. Railroad Weights: The Contractor shall weight railroad cars on railroad scales, before and after loading or before and after unloading. If weighed by other than the Engineer, a certified statement of weights will be required. Certificates of weight, furnished by the railroad company, will be accepted without further certification.

2. Truck Weights: The Contractor shall weigh trucks on certified scales, loaded and empty, as prescribed above for railroad weights. The Contractor shall weigh trucks in presence of the Engineer, or furnish certificates of weights.

3. Barge Displacement: The Engineer will measure each barge. The Contractor shall fit each barge with gauges graduated in tenths of a foot increment. The Contractor shall locate a gauge at each corner of the barge near the lower end of the rake. The Contractor shall furnish additional gauges amidships, if the Engineer deems necessary. The Engineer will review and check all computed weights. Weight certificates may be submitted.

4. In Place Measurement: The Contractor shall measure surface area (in square yards) of area riprap has been placed.

4.2 BASIS OF PAYMENT

A. Sand-Cement: Price and payment will be full compensation for all work specified in this Section, including all materials, labor, hauling, excavation, and backfill. The Contractor shall include the cost of dressing and shaping the existing fills (or subgrade) for placing riprap in the Contract unit price for Riprap (Sand-Cement.)

B. Stone/Rubble: Price and payment will be full compensation for all work specified in this Section, including all materials, hauling, excavation, and backfill. The Contractor shall include the cost of dressing and shaping the existing fill (or subgrade) for placing riprap in the Contract unit price for Riprap (Stone/Rubble). As an exception to the above, concrete that is shown to be removed from the project site and subsequently disposed of by being crushed and used in the embankment as riprap will not be paid for under this section. Include the cost of such work order under Removal of Existing Structures.

C. Bedding Stone: Price and payment will be full compensation for all work specified in this Section, including all materials and hauling. The Contractor shall include the cost of dressing and shaping the existing fills (or subgrade) for placing bedding stone in the Contract unit price for Riprap (Stone/Rubble).

END OF SECTION 02340

SECTION 02400 - GRADED AGGREGATE BASE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including General and Supplementary Conditions and other Specification Sections, apply to the work of this section.

1.2 DESCRIPTION OF WORK

This item shall consist of a base course of graded aggregate constructed on a subgrade prepared in accordance with the specifications and in conformity with the line, grades and typical cross-section as shown on the drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

Use graded aggregate material which yields a satisfactory mixture meeting all the requirements of these Specifications after it has been crushed and processed as a part of the mining operations.

The Contractor may furnish the material in two sizes of such gradation that, when combined in a central mix plant pugmill, the resultant mixture meets the required specifications.

Use graded aggregate base material of uniform quality throughout, substantially free f rom organic matter, shale, lumps and clay balls, and having a Limerock Bearing Ratio value of not less than 98. Use material retained on the No.10 sieve composed of aggregate meeting the following requirements:

Soundness Loss, Sodium, Sulfate: AASHTO T 104.....15%
Percent Wear: AASHTO T 96 (Grading A)
Group 1 Aggregates..... 45%
Group 2 Aggregates..... 65%
Group 1 : This group of aggregates is composed of limestone, marble, or dolomite.
Group 2: This group of aggregates is composed of granite, gneiss, or quartzite.
Use graded aggregate base material meeting the following gradation:

Sieve Size	Percent by Weight Passing
2 inch	100
1 1/2 inch	95 to 100
3/4 inch	65 to 90
3/8 inch	45 to 75
No. 4	35 to 60

No. 10	25 to 45
No. 50	5 to 25
No. 200	0 to 10

For Group 1 aggregates, ensure that the fraction passing the No. 40 sieve has a Plasticity I ndex (AASHTO T 90) of not more than 4.0 and a Liquid Limit (AASHTO T 89) of not more than 25, and contains not more than 67% of the weight passing the No. 200 sieve.

For Group 2 aggregates, ensure that the material passing the No. 10 sieve has a sand equivalent (AASHTO T 176) value of not less than 28.

The Contractor may use graded aggregate of either Group 1 or Group 2, but only use one group on any Contract. (Graded aggregate may be referred to hereinafter as “aggregate”.)

2.2 EQUIPMENT

The aggregate shall be spread by mechanical rock spreaders, equipped with a device which strikes off the aggregate uniformly to laying thickness, and capable of producing an even distribution of the aggregate. For crossovers, intersections and ramp areas; for roadway widths of 20 feet or less; for the main roadway area when forms are used and for any other areas where the use of a mechanical spreader is not practicable; spreading may be done by bulldozers or blade graders. All equipment for proper construction of this project shall be in first-class working condition.

PART 3 - EXECUTION

3.1 TRANSPORTING GRADED AGGREGATE

The graded aggregate shall be transported to the point where it is to be used, over aggregate previously placed if practical, and dumped on the end of the preceding spread. Hauling over the subgrade and dumping on the subgrade will be permitted when, in the County’s opinion, these operations will not be detrimental to the subgrade.

3.2 SPREADING GRADED AGGREGATE

A. Method of Spreading: The graded aggregate shall be spread uniformly. All segregated areas of fine or coarse aggregate shall be removed and replaced with properly graded aggregate.

B. Number of Courses: When the specified compacted thickness of the base is greater than six inches, the base shall be constructed in two courses. The thickness of the first course shall be a pproximately one-half the total thickness of the finished base, or enough addi tional material added to bear the weight of the construction equipment without disturbing the

subgrade. When compacted thickness is six inches or less, graded aggregate shall be placed in one lift.

3.3 COMPACTING AND FINISHING BASE

A. Single-Course Base: For single-course base, after the spreading is completed, the entire surface shall be scarified and then shaped so as to produce the required grade and cross-section, free of scabs and laminations, after compaction.

B. Multiple-Course Base: For multiple-course base, the first course shall be cleaned of foreign material and bladed and brought to a surface cross-section approximately parallel to that of the finished base. Prior to the spreading of any material for the upper course, the density tests for the lower course shall be made, and the County shall have proof that the required compaction has been obtained. After the spreading of the material for the second course is completed, its surface shall be finished and shaped so as to produce the required grade and cross-section after compaction, and free of scabs and laminations.

C. Moisture Content: When the material does not have the proper moisture content to ensure the required density, wetting or drying will be required. When water is added, it shall be uniformly mixed-in by disking to the full depth of the course which is being compacted. Water shall be added before beginning compaction operations. Wetting or drying operations shall involve manipulation, as a unit, of the entire width and depth of the course which is being compacted. This shall be performed utilizing the speedy moisture meter.

3.4 DENSITY REQUIREMENTS

As soon as proper conditions of moisture are attained, the material shall be compacted to a density of not less than 98% of the modified proctor maximum density as determined by AASHTO T-180 (Modified Proctor.)

3.5.1 TESTING SURFACE, PROTECTION, AND MAINTENANCE

A. Density Tests: A minimum of at least one field density test on each course of compacted base shall be performed for every 500 square yards, or every 300 linear feet of road pavement, or as directed by the Engineer. Additional tests may be made if deemed necessary by the Engineer and/or County/CEI.

B. During final compacting operations, if blading of any areas is necessary to obtain the true grade and cross-section, the compacting operations for such areas shall be completed prior to making the density tests on the finished base.

C. Correction of Defects: Contamination of Base Material: If, at any time, the subgrade material should become mixed with the base course materials, the Contractor shall, without additional compensation, dig out and remove the mixture, reshape and compact the subgrade and replace the materials removed with clean base material, which shall be shaped and compacted as specified above.

D. Cracks and Checks: If cracks or checks appear in the base, either before or after priming, which in the opinion of the County, would impair the structural efficiency of the base, the Contractor shall remove the cracks or checks by re-scarifying, reshaping, adding base material where necessary, and re-compacting, without additional compensation.

E. Compaction of Widening Strips: Where base construction consists of widening strips and the trench width is not sufficient to permit use of standard base compaction equipment, compaction shall be accomplished by use of vibratory compactors, trench rollers, mechanical plate tampers, or other special equipment which will achieve the density requirements specified herein. When multiple-course base construction is required by the plans or specifications, the required compaction shall be achieved in each course prior to spreading material for the overlaying course.

F. Testing Surface: The finished surface of the base course shall be checked from the required crown and ensure longitudinally a smooth, consistent surface for the placement of the asphalt course(s). All irregularities, greater than 1/4 inch per 15' straight edge test, shall be corrected, after which the entire area shall be re-compacted and tested as specified herein before. In the testing of the surface, the measurements will not be taken in small holes caused by individual pieces of rock having been pulled out by the grader.

G. Priming and Maintaining:

Priming: The prime coat shall be applied only when the base meets the specified density requirements and the moisture content in the top half of the base does not exceed 90% of the optimum moisture of the base material. At the time of priming, the base shall be firm, unyielding and in such condition that no undue distortion will occur. See FDOT Prime Coat Specification.

Maintaining: The Contractor will be responsible for assuring that the true crown and template are maintained, with no rutting or other distortions, and that the base meets all the requirements, at the time the surface course is applied.

H. Thickness Requirements:

Measurements: Thickness of the base shall be measured at intervals in

such a manner that each test represents 500 square yards, or every 300 linear feet of road pavement, or as otherwise directed by the County. Measurements shall be taken at various points on the cross-section, through holes not less than three inches in diameter.

Areas Requiring Correction: Where the compacted base is deficient by more than ½ inch from the thickness called for in the plans, the Contractor shall correct such areas. The affected areas shall then be brought to the required state of compaction and to the required thickness and cross-section.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT:

The quantity to be paid for will be the area, in square yards, completed and accepted.

4.2 BASIS OF PAYMENT:

Price and payment will be full compensation for all work specified in this section, including dust abatement, correcting all defective surfaces and deficient thickness, removing cracks and checks, the additional aggregate required for such crack elimination, and the prime coat.

END OF SECTION 02400

SECTION 02410 – RECYCLED CONCRETE AGGREGATE BASE
(CRUSHED CONCRETE)

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including General and Supplementary Conditions and other Specification Sections, apply to the work of this section.

1.2 The County recognizes the beneficial reuse of construction materials where said materials can be used in a manner that provides a construction product meeting specifications adopted by state and/or federal agencies. As such, the County shall allow, as noted below, the use of Recycled Concrete Aggregate (RCA) for the purpose of constructing an aggregate base course for the placement of an asphaltic concrete surface course in accordance with this section.

1.3 This section shall conform to section 2400 G.A.B. except as noted.

1.4 SPECIFIC CONSENT REQUIRED

Recycled Concrete Aggregate may only be used on projects with specific written consent of the County Engineer, or designee, subject to the conditions outlined herein. No such permission shall be given until the requirements of Items 2.1 through 3.1.A-D have been affirmatively addressed by the Engineer of Record for the project. Additionally, construction may not proceed until the requirements of Item 3.2.B have been addressed. Should construction commence more than six months after the date of the geotechnical report and/or roadway locations and/or elevations change, a geotechnical addendum shall be submitted confirming groundwater elevations. Should County staff observe differing construction or material conditions after approval; additional testing or re-evaluation of existing conditions for use may be required. RCA installations not in compliance with these specifications shall be subject to removal and replacement.

PART 2 - PRODUCTS

2.1 MATERIALS

The material requirements of Recycled Concrete Aggregate shall be in accordance with the Florida Department of Transportation Special Provisions Specification Section 204, “Graded Aggregate Base.”

A. Recycled Concrete Aggregate used shall not be required to comply with FDEP source approval requirements specified in FAC 62-701.730 or be qualified as a clean debris source under FDEP rules, as outlined in Florida Department of Transportation Special Provisions Specification Section 204-2.2, “ Graded Aggregate Base.” The aggregate supplied shall be

capable of meeting the requirements outlined in this item. NO material shall be used that has been obtained from potentially contaminated sources that may contain asbestos or other hazardous materials.

PART 3 - EXECUTION

3.1 SPECIFIC USE & LOCATION REQUIREMENTS

A. The use of Recycled Concrete Aggregate shall be in accordance with the Florida Department of Transportation *Special Provisions Specification Section 204, "Graded Aggregate Base."* It should be noted RCA may not be used on FHWA funded projects.

B. Unless the Engineer of Record can demonstrate that the grading plan provides a minimum vertical separation of 18 inches between the bottom of the base and the seasonal high water table provided in the geotechnical report, permanent groundwater control measures shall be incorporated in the roadway design (i.e. under drains with positive out falls, etc.). If the subsurface conditions encountered in the geotechnical study indicate the presence of, or the potential for, perched groundwater, the geotechnical engineer shall address the appropriate measures to remedy perched groundwater in the geotechnical report or addendum.

C. The Engineer of Record shall as part of the original construction plans approved by the County or by addendum approved by the County provide construction details and specifications for the road section(s) to be used with RCA. The section shall include material types, thickness requirements, and compaction requirements for all materials required for the flexible pavement section. The plan and profiles shall detail groundwater levels (apparent or perched) and the use of under drains with positive out falls, where applicable/appropriate. Where under drains are required, they shall be detailed in cross section relative to the road section. The Engineer of Record shall also provide calculations which detail the calculated capacity of all components of the underdrain section, transmission pipes and receiving system.

D. If, during the time period of construction, water is observed bleeding thru the pavement, new or additional permanent groundwater control measures to a positive, approved, out fall shall be installed. Such measures shall be submitted to the County for review and approval per Item C above.

3.2 TESTING & CERTIFICATION REQUIREMENTS

A. The installation of Recycled Concrete Aggregae shall be in accordance with the Florida Department of Transportation *Special Provisions Specification Section 204, "Graded Aggregate Base."*

B. Upon delivery of RCA to the project site, the contractor, NOT the supplier, shall provide to the County a report from an independent FDOT certified testing laboratory certifying that the material meets the gradation and Limerock Bearing Ratio requirements of Florida Department of Transportation *Special Provisions Specification Section 204, "Graded Aggregate Base."*

C. During the course of construction, quality control samples of RCA delivered to the project site shall be selected under the supervision of the County, or its representative, for gradation testing. Sampling shall be at a minimum frequency of one sample for every 3,600 square yards of in-place base material.

D. All testing shall be in accordance with Florida Department of Transportation *Special Provisions Specification Section 204, "Graded Aggregate Base,"* and/or the County requirements, whichever is more stringent.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT:

The quantity to be paid for will be the area, in square yards, completed and accepted.

4.2 BASIS OF PAYMENT:

Price and payment will be full compensation for all work specified in this section, including dust abatement, correcting all defective surfaces and deficient thickness, removing cracks and checks, the additional aggregate required for such crack elimination, and the prime coat.

END OF SECTION 02410

SECTION 02440 – SUPERPAVE ASPHALT BASE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Specifications sections, apply to work of this section.

1.2 SUBMITTALS

Submit certification of compliance with applicable specifications in accordance with *Section 01300, "Submittals".*

1.3 ENVIRONMENTAL CONDITIONS

Construct bituminous courses when underlying course is dry, and when atmospheric temperature is 40°F and rising for courses 1½" or greater, and 45°F and rising for courses less than 1½".

1.4 CONSTRUCTION EQUIPMENT

A. Spreading Equipment: Self-propelled electronically controlled type, unless other equipment is authorized. Spreading equipment shall be capable of spreading hot bituminous mixtures without tearing, shoving, or gouging and to produce a finished surface of specified grade and smoothness. The use of a spreader that leaves indented areas or other objectionable irregularities in the fresh laid mix during operations will not be permitted.

B. Rolling Equipment: Self-propelled pneumatic-tired rollers supplemented by three-wheel and tandem type steel wheel rollers. The number, type and weight of rollers shall be sufficient to compact the mixture to the required density without detrimentally affecting the compacted material. All rollers shall be suitable for rolling hot-mix bituminous pavements and capable of reversing without backlash. Pneumatic-tired rollers shall be capable of being operated both forward and backward without turning on the mat, and without loosening the surface being rolled. Equip rollers with suitable devices and apparatus to keep the rolling surfaces wet and prevent adherence of bituminous mixture.

At the Contractor's option, vibratory rollers especially designed for bituminous concrete compaction may be used, provided rollers do not impair stability of pavement structure and any underlying layers. Repair depressions in pavement surfaces resulting from use of vibratory rollers at no cost to the Owner. Rollers shall be self-propelled, single or dual vibrating drums, and steel drive wheels, as applicable; equipped with variable amplitude and separate controls for energy and propulsion.

C. Hand Tampers: Hand tampers shall weigh not less than 25 pounds and have a tamping face of not more than 50 square inches.

D. Mechanical Hand Tampers: Commercial type, operated by pneumatic pressure or by internal combustion.

PART 2 - PRODUCTS

2.1 MATERIALS

All materials shall conform to the requirements of these Specifications for the pavement sections as shown on the drawings.

PART 3 - EXECUTION

3.1 TRANSPORTATION OF BITUMINOUS MIXTURES

Deliver mixture to the area to be paved in such a manner that the temperature, at the time of dumping into the spreader, shall be not less than 285°F or greater than 34 5°F or that temperature required to obtain the specified compaction. Reject any load that has become wet prior to placing or falls outside of the above temperature ranges.

3.2 PLACING

Provide line and grade stakes as necessary for control. Place grade stakes in lanes parallel to centerline of area to be paved, and suitably space for string lines. Place and compact bituminous courses in such thicknesses as to achieve density and smoothness requirements. Maximum lift of bituminous base course shall not exceed 3 inches. Prior to laying the base course, clean underlying course of foreign and objectionable matter with power blowers, power brooms, or hand brooms in places inaccessible to power equipment, and inspect for compaction and smoothness requirements. The range of temperatures of the mixtures at the time of spreading shall be between 285°F and 345°F. Reject bituminous mixture having a temperature outside these limits when dumped into the hopper of the spreader. Adjust mechanical spreader and regulate speed so that the surface of the course is smooth, and when compacted conforms to depth, cross sections, grades and contours indicated. When irregularities of surface or deficiency in depth is more than specified tolerances, remove defective work and replace with new material. Whenever possible, place the mixture in strips not less than 10 feet wide. Overlap rolling to previously placed strip and extend to overlap first strip. Place mixture as continuously as possible. Shovelers and rakers shall follow spreading equipment, adding hot mixture and raking as required to produce a course that, when completed, shall conform to requirements specified. In areas where the use of machine spreading is impractical, mixture may be spread by hand. Distribute mixture into place from dump boards by means of hot shovels and spread with hot rakes in a uniformly

loose layer of such thickness that, when completed, it conforms to required grade and thickness. Do not dump loads any faster than they can be handled by shovelers and rakers. Paint contact surfaces of previously constructed curbs, manholes, and similar structures with a thin coat of emulsion or other approved bituminous material prior to placing the bituminous mixture.

3.3 COMPACTION OF MIXTURE

A. Affect compaction by rolling. Begin rolling as soon after placing as the mixture will bear the roller without undue displacement. Delays in rolling freshly spread mixture will not be tolerated. Start rolling longitudinally at extreme sides of lanes and proceed toward center of pavement, overlapping on successive strips by at least one-half the width of rear wheel of roller. Alternate trips of roller shall be slightly different lengths. Affect initial longitudinal rolling by the use of steel roller. Make tests for conformity with specified crown, grade and smoothness immediately after initial compression. Before continuing rolling, correct any variations by removing or adding materials, then roll course using pneumatic-tired rollers or tandem rollers, while mixture is hot and in condition suitable for proper compaction. Speed of rollers shall not exceed 3 miles per hour and at all times be slow enough to avoid displacement of hot mixture. Correct any displacement of mixture at once by use of rakes and apply fresh mixture or remove mixture as required. Continue rolling until all roller marks are eliminated. During rolling, moisten rollers to prevent adhesion of mixture to rolling surfaces, but do not permit an excess of water. Provide sufficient rollers for each spreading machine in operation on the job and to handle plant output. In places not accessible to rollers, compact mixture with hot pneumatic or manual hand tampers. Skin patching of an area that has been rolled is not permitted. Remove any mixture that becomes mixed with foreign material or is defective, replace with fresh mixture, and compact to density of surrounding area. Roller shall not pass over unprotected edge until asphalt has cooled to at least 120°F. Contractor shall provide workmen who are capable of performing work incidental to correction of pavement irregularities. After final rolling, permit no traffic of any kind on the pavement until the surface temperature has cooled to at least 120°F. Surface temperature shall be measured with surface thermometers or other satisfactory methods.

B. Testing Base Course:

1. Density: Within the entire limits of the width and depth of the base, obtain a minimum density in all areas of the roadway of 98% of modified Proctor maximum density as determined by AASHTO FM 1-T 180, Method D. Compact the base of any LOT of shoulder pavement to not less than 95% of the modified Proctor maximum density as determined by FM 1-T 180, Method D. Additional tests and cores may be required at the County's discretion.

2. Thickness: Measure thickness throughout the placement of any and all courses. In addition, perform periodic check on the yield during the placement of any and all courses. The maximum allowable deficiency at any point shall not be more than 1/4 inch less than the indicated thickness for the course. The average thickness of the course shall not be less than the indicated thickness. Where he deficiency is more than the specified tolerances, the contractor shall correct each such representative area or areas by removing the pavement in question and replacing with new pavement.

3. Smoothness: Straightedge the compacted surface of the course, utilizing a 15' rolling straightedge, as deemed necessary by the County. Apply a rolling straightedge parallel with the centerline of the road and a non-rolling straightedge at right angles to the centerline of the road after final rolling. Unevenness of the course shall not vary more than plus or minus 3/16 inch in 15 feet. Correct any portion of the pavement showing irregularities greater than that specified.

4. Thicknesses and Density Requirements: The thickness and density shall e checked at intervals not to exceed one per 300 linear feet of roadway, but in any case, should not be less than three tests. Tests shall be staggered to ensure representative sampling.

PART 4 – MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

ASPHALT BASE COURSE:
The uantity to be paid for will be the area, in square yards, of asphalt base course after adjustment to the equivalent area of specified thickness.

4.2 BASIS OF PAYMENT

ASPHALT BASE COURSE:
Prices and payments will be full compensation for all work specified in this Section.

END OF SECTION 02440

SECTION 02460 - SAND-CLAY BASE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

B. Florida Department of Transportation, *Standard Specifications for Road and Bridge Construction* (FDOT 2000 Specs), *Sections 240 and 912*, *Latest Edition.*

1.2 DESCRIPTION OF WORK

This item shall consist of a base course composed of sand-clay mixtures constructed on a subgrade prepared in accordance with the specifications and in conformity with the line and grades shown on the drawings.

1.3 USE

Sand-clay base may only be ued on projects with specific written consent from the County Engineer, or designee, subject to the conditions outlined herein.

Graded aggregate base shall be utilized in unsuitable soils, moisture sensitive areas, where g oundwater fluctuates to within two feet of average grade, adjacent to wetlands/surface waters where the subgrade soils have a low permeability, and for roadways that will be dedicated to the County for maintenance.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials shall be secured from sources approved by the County and shall be furnished by the Contractor.

B. Sand-Clay shall consist of natural or artificial mixtures of clay or soil binder and gravel, sand or other aggregates. The materials shall be free from organic matter and trash and shall not contain any aggregate particles that will not pass a one-inch (1") sieve. It shall be uniform and shall not contain lumps or aggregate in sufficient quantity to prevent securing a smooth surface free from pits or pockets.

C. The material passing the 10-mesh sieve shall meet the following requirements:

1. Clay (material smaller than 0.005mm) 8-21%

2. Silt (material from 0.05 to 0.005mm) 0-10%

3. Combined Clay and Silt 8-25%

D. It shall have a plasticity index of not more than 6 and have a liquid limit of not more than 25. The material shall have the minimum limerock bearing ratio (LBR) of 75.

PART 3 - EXECUTION

3.1 PLACING AND MIXING MATERIALS

A. Sand-Clay Base; minimum 6-inch compacted thickness. At least 98 percent of the modified proctor maximum dry density must be achieved throughout the full material thickness. The proposed sand-clay base material must be checked by a registered geotechnical engineer or by using hydrometer testing to determine clay content.

B. The material may be dumped directly on the subgrade, but shall be uniformly distributed. The loose thickness will be checked continuously by the Contractor to insure that the finished base course will have the thickness and shape required by the typical section.

3.2 COMPACTING AND FINISHING SAND-CLAY BASE

A. General: After spreading is completed, the base shall be compacted with water being added as required, until the required density has been obtained.

B. Density Requirements: As soon as the proper condition of moisture is attained, the material shall be compacted to a density not less than 98 percent of maximum density as determined by modified proctor test ASTM 1557.

C. Finishing: Upon completion of the initial compaction, the entire surface shall be scarified and then shaped to exact crown and cross-section. The base shall be re-watered, if needed, before final compaction. Final compaction shall be done with any type compacting equipment, in conjunction with traffic rollers, which will obtain the required density. Compaction shall continue until the required density has been obtained and until free water disappears from the surface.

D. Correction of Defects: If at any time, the sub-grade material should become mixed with the base course material, the Contractor shall, without additional compensation, dig out and remove the mixture, reshape and compact the sub-grade and replace the materials removed with base material, which shall be watered, if needed, and rolled until the

required density is obtained.

E. Priming: Allow base to cure until moisture does not exceed 90 percent of optimum moisture content for the base course material. Priming shall meet the requirements of Section 300 of FDOT *Standard Specifications, Latest Edition.*

3.3 TESTING SURFACE, PROTECTION AND MAINTENANCE

A. Testing Surfaces: The finished surface of the base course shall be true to the grades shown on drawings. All i regularities greater than 3/ 8-inch shall be corrected by scarifying and removing or adding base material as may be required, after which the entire area shall be re-compacted to meet the specified density requirements.

B. Thickness of Base: A three-eighths inch (3/8") under tolerance in the base will be allowed. All areas where the thickness of the completed base is less than the thickness required after such tolerance shall be corrected by scarifying, adding base material and re-compacting.

C. Protection, Priming and Maintaining: The base shall be kept well drained at all times. Wherever ruts or low spots are found, the areas affected shall be brought to grade and, if necessary, shall be kept moist until the prime coat is applied, so as to prevent dusting and raveling.

D. Thicknesses and Density Requirements: The thickness and density shall be checked at intervals not to exceed one per 300 linear feet of roadway. In no case shall less than three t sts be performed. Tests shall be staggered to ensure representative sampling.

E. Paved Areas: Make at least one field density test of each compacted fill layer (subgrade, base, etcetera) for every 300 l inear feet of roadway or equivalent area, but in no case less than three tests. Tests shall be staggered to ensure representative sampling.

PART 4 – MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

Sand-clay Base to be paid for will be the plan quantity, in square yards.

4.2 BASIS OF PAYMENT

Price and Payment will be full compensation for all work specified in this Section, including all materials; all clearing and grubbing of material pits; all stripping of overburden from the pits, if required; all hauling of material, application of prime and all incidentals necessary to complete the work.

END OF SECTION 02460

SECTION 02500 – SUPERPAVE ASPHALT CONCRETE

PART 1 - GENERAL

1.1 GENERAL

A. Construct a Type SP Asphalt pavement for local agencies using the type of mixture specified in the Contract, or when offered as alternates, as approved.

B. For this Section only, all references to the Department shall mean the County. All references to the Engineer shall mean the Engineer of Record, designated Engineer of Escambia County and/or CEI.

C. The County will accept the work based on one of the following methods as described in Part 5: 1) Certification, 2) Certification and process control testing by the Contractor, 3) acceptance testing by the County, or 4) other method(s) as determined by the Contract.

1.2 LAYER THICKNESSES

A. Use only fine graded Type SP asphalt mixes. Fine graded mixes are defined as having a gradation that passes above the restricted zone when plotted on an FHWA 0.45 Power Gradation Chart.

B. FINE MIXES: The allowable structural layer thicknesses for fine Type SP Asphalt Concrete mixtures are as follows:

Type SP 9.5	1-1 ½ inches
Type SP 12.5	1 ½ - 2 ½ inches
Type SP 19.0	2-3 inches

In addition to the minimum and maximum thickness requirements, the following restrictions are placed on fine mixes when used as a structural course:

Type SP 9.5 - Limited to the final (top) structural layer, one layer only

Type SP 12.5 - May not be used in the first layer of courses over 3 1/ 2 inches thick, nor in the first layer of courses over 2 3/4 inches thick on limited access facilities.

The thickness of the new pavement may be checked by core samples, as determined by the Engineer. The Contractor shall be required to correct any deficiency either by replacing the full thickness; or overlaying the area as directed by the Engineer. County inspection shall be performed and all base failures shall be corrected prior to asphalt installation.

Type SP 19.0 - May not be used in the final (top) structural layer.

C. ADDITIONAL REQUIREMENTS: The following requirements also apply to fine Type SP Asphalt Concrete mixtures:

1. A minimum 1 1/2 inch initial lift is required over an Asphalt Rubber Membrane Interlayer (ARMI).

2. When construction includes the paving of adjacent shoulders (5 feet wide or less), the layer thickness for the upper pavement layer and shoulder shall be the same and paved in a single pass, unless shown differently in the plans.

3. Use the minimum and maximum layer thicknesses as specified in 1.2 B above unless shown differently in the plans. On variable thickness overbuild layers, the minimum allowable thickness may be reduced by 1/2 inch, and the maximum allowable thickness may be increased 1/2 inch, unless shown differently in the plans.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

Meet the material requirements specified in F DOT Standard Specifications Division III. Specific references are as follows:

Superpave PG Asphalt Binder or Recycling Agent – Sections 916-1, 916-2
Coarse Aggregate, Stone, Slag or Crushed Gravel – Section 901
Fine Aggregate – Section 902

Aggregates utilized on Escambia County projects must be in accordance with FDOT Qualified Products List

2.2 GRADATION REQUIREMENTS

Combine the coarse and fine aggregate in proportions that will produce an asphalt mixture meeting all of the requirements defined in this Specification and conform to the gradation requirements at d sign as defined in Table 1 bel ow. Aggregates from various sources may be combined.

Table 1
Aggregate Gradation Control Points
(Gradation Design Ranges)

	Type SP Asphalt Mixture (Percent Passing)					
	SP 9.5		SP 12.5		SP 19.0	
Sieve Size	Min.	Max.	Min.	Max.	Min.	Max
1 inch	-	-	-	-	100	-

3/4 inch	-	-	100	-	90	100
1/2 inch	100	-	90	100	-	90
3/8 inch	90	100	-	90	-	-
No. 4	-	90	-	-	-	-
No. 8	32	67	28	58	23	49
No. 200	2	10	2	10	2	8
For additional information, refer to AASHTO M-323-04, Table 3						

2.3 RESTRICTED ZONE

The gradation ientified in 2.2 shall pass above the restricted zone specified in Table 2 below.

Table 2
Aggregate Gradation Restricted Zone (Design Only)

Sieve Size within Restricted Zone	Boundaries of Restricted Zone Type SP Asphalt Mixture (Percent Passing)					
	SP 9.5		SP 12.5		SP 19.0	
	Min.	Max.	Min.	Max.	Min.	Max
No. 4	-	-	-	-	-	-
No. 8	47.2	47.2	39.1	39.1	34.6	34.6
No. 16	31.6	37.6	25.6	31.6	22.3	28.3
No. 30	23.5	27.5	19.1	23.1	16.7	20.7
For additional information, refer to AASHTO M-323-04, Table 4						

2.4 AGGREGATE CONSENSUS PROPERTIES

A. Meet the following consensus properties at design for the aggregate blend:

1. Coarse A ggregate A ngularity: When tested in accordance with ASTM D 5821, meet the coarse aggregate angularity requirement defined in Table 3 below.

Table 3
Coarse Aggregate Angularity Criteria
(Minimum Percent Fractured Faces)

	Depth of Top of Pavement Layer From Surface			
	≤4 inches		>4 inches	
	1 or More Fractured Faces (%)	2 or More Fractured Faces (%)	1 or More Fractured Faces (%)	2 or More Fractured Faces (%)
	85	80	60	-
For additional information, refer to AASHTO M-323-04, Table 5				

2. Fine Aggregate Angularity: When tested in accordance with AASHTO T-304, meet the fine aggregate angularity requirement defined in Table 4 below.

Table 4 Fine Aggregate Angularity Criteria		
	Depth of Top of Pavement Layer From Surface	
	≤4 inches	>4 inches
	Minimum Uncompacted Void Content (%)	Minimum Uncompacted Void Content (%)
	45	40
For additional information, refer to AASHTO M-323-04, Table 5		

3. Flat and Elongated Particles: When tested in accordance with ASTM D 4791, use a ratio of maximum to minimum dimensions of 5:1 and do not exceed 10% as the maximum amount of flat and elongated particles.

2.5 USE OF RECLAIMED (MILLED) ASPHALT PAVEMENT

A. General Requirements: Reclaimed Asphalt Pavement (RAP) may be used as a component material of the asphalt mixture subject to the following:

1. The Contractor assumes responsibility for the design of asphalt mixes which incorporate RAP as a component material.

2. For design purposes, the Contractor assumes responsibility for establishing accurate specific gravity values for the RAP material. This may be accomplished by one of the following methods:

   a. Calculation of the bulk specific gravity value based upon the effective specific gravity of the RAP, determined on the basis of the asphalt binder content and maximum specific gravity. The Engineer and/or Engineer of Record will approve the estimated asphalt binder absorption value used in the calculation.

   b. Testing of the extracted aggregate obtained through a vacuum extraction or ignition oven extraction.

3. The amount of RAP material used in the mix is not to exceed 50% by weight of total aggregate.

4. Use a grizzly or grid over the RAP cold bin, in-line roller crusher, screen, or other suitable means to prevent oversized RAP material from showing up in the completed recycled mixture.

If oversized RAP material appears in the completed recycled mix, take the appropriate corrective action immediately. If the appropriate corrective actions are not taken immediately, plant operations should be stopped.

5. Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles that are soft or conglomerates of fines.

6. Provide RAP, having minimum average asphalt content of 4.0% by weight of total mix. The Engineer may sample the stockpile to verify that this requirement is met.

B. Binder for Mixes with RAP: Select the appropriate binder based on the table below. The Engineer and/or Engineer of Record reserves the right to change binder type and grade at design based on the characteristics of the RAP binder, and reserves the right to make changes during production. Maintain the viscosity of the recycled mixture within the range of 4,000 to 12,000 poises. Obtain a sample of the mixture for the Engineer within the first 1,000 tons and at a frequency of approximately one per 4,000 tons of mix.

Binder Grade for Mixes Containing RAP	
% RAP	Asphalt Binder Grade
<20	PG 67-22
20-29	PG 64-22
≥ 30	Recycling Agent
Note: When a PG 76-22 Asphalt Binder is called for in the Contract, limit the amount of RAP material used in the mix to a maximum of 15%.	

PART 3 - GENERAL COMPOSITION OF MIXTURE

3.1 GENERAL

Compose the asphalt mixture using a combination of aggregate (coarse, fine or mixtures thereof), mineral filler, if required, and asphalt binder material. Size, grade and combine the aggregate fractions to meet the grading and physical properties of the approved mix design. Aggregates from various sources may be combined.

3.2 MIX DESIGN

A. Design the Type SP asphalt mixture in accordance with AASHTO PP-28, except as noted herein, to meet the requirements of this Specification. Use only previously approved designs. Prior to the production of any Type SP asphalt mixture, submit the proposed mix design with supporting

test data indicating compliance with all Type SP asphalt mix design criteria.

The Engineer and/or Engineer of Record will consider any marked variations from original test data for a mix design or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and the Engineer and/or Engineer of Record will no longer allow the use of the mix design.

1. Grading Requirements: Meet Gradation Design Ranges in PART 2.

2. Gyratory Compaction: Compact the design mixture in accordance with AASHTO TP-4. Use the number of gyrations as defined in the table below.

Type SP Design Gyratory Compactive Effort			
	$N_{initial}$	N_{design}	$N_{maximum}$
SP Mixes	7	75	115

3. Volumetric Criteria: Use an air void content of the mixture at design of 4.0% at the design number of gyrations (N_{design}). Meet the requirements of the table below.

Mixture Densification Criteria			
	% G_{mm}		
	$N_{initial}$	N_{design}	$N_{maximum}$
SP Mixes	$\geq$ 89.0	96.0	$\leq$ 98.0

4. VMA Criteria: Meet the requirements of the table below for Voids in the Mineral Aggregate (VMA) of the mixture at the design number of gyrations.

VMA Criteria	
Type Mix	Minimum VMA (%)
SP 9.5	15.0
SP 12.5	14.0
SP 19.0	13.0

5. VFA Criteria: Meet the requirements of the table below for voids filled with asphalt (VFA) of the mixture at the design number of gyrations.

VFA Criteria	
	Design VFA (%)
SP Mixes	65 - 75

6. Dust Proportion: Use an effective dust-to-binder ratio as efined in FDOT Section 334-3.2.5.

7. Moisture Susceptibility: Provide a mixture (4 inch s pecimens) having a retained tensile strength ratio of at least 0. 80 and a minimum tensile strength (dry and unconditioned) of 100 psi.

8. Additional Information: In addition to the requirements listed above, provide t he following information with each proposed mix design submitted for use:

    a. The design number of gyrations (N_{design}).

    b. The source and description of the materials to be used.

    c. The FDOT source number product code of the aggregate components furnished from an FDOT approved source.

    d. The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation in handling and processing as necessary.

    e. A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly -No. 200 [-75 µm]) should be accounted for and identified for the applicable sieves.

    f. The bulk specific gravity value for each individual aggregate (and RAP) component as identified in the FDOT aggregate control program.

    g. A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1%.

    h. A target temperature at which the mixture is to be discharged from the plant and a target roadway temperature (per 30 -6.3). Do not exceed a target temperature of 340°F for modified asphalts and 315°F for unmodified asphalts.

    i. Evidence that the completed mixture conforms to all specified physical requirements.

    j. The name, seal, and/or certification of the Mix Designer.

3.3 REVISION OF MIX DESIGN

During production, the Contractor may request a t arget value revision to a mix design, subject to: (1) the target change falls within the limits defined in the table below, (2) ap propriate data exists demonstrating that the mix complies with production air voids specification criteria, and (3) the mixture gradation meets the basic gradation requirements defined in 2.2 and 2.3.

Limits for Potential Adjustments to Mix Design Target Values	
Characteristic	Limit from Original Mix Design
No. 8 sieve and Coarser	± 5.0%
No. 16 sieve	± 4.0%
No. 30 sieve	± 4.0%
No. 50 sieve	± 3.0%
No. 100 sieve	± 3.0%
No. 200 sieve	± 1.0%
Asphalt Binder Content (1)	± 0.3%
(1) R eductions to t he as phalt bi nder c ontent w ill not be permitted i f the VMA during production is lower than 1.0% below the design criteria.	

Submit all requests for revisions to mix designs, along with supporting documentation, to the Engineer. In order to expedite the revision process, the request for revision or discussions on the possibility of a revision may be made verbally, but must be followed up by a written request. The initial mix design will remain in effect until a change is authorized by the Engineer and/or Engineer of Record. In no case may the effective date of the revision be established earlier than the date of the first communication between the Contractor and the Engineer regarding the revision.

A new design mix will be required for any substitution of an aggregate product with a different aggregate code, unless approved by the Engineer and/or Engineer of Record.

3.4 PAVING EQUIPMENT

A. Mechanical Spreading and Screeding Equipment:

1. General: Provide mechanical spreading and screeding equipment of an approved type that is self-propelled and can be steered. Equip it with a receiving and distribution hopper and a mechanical screed. Use a mechanical screed capable of adjustment to regulate the depth of material spread and to produce the desired cross-section.

2. Automatic Screed Control: For all asphalt courses, placed with mechanical spreading and finishing equipment, equip the paving

machine with automatic longitudinal screed controls of either the skid type, traveling stringline type, or non-contact averaging ski type. Ensure that the length of the skid, traveling stringline, or non-contact averaging ski is at least 25 feet. On the final layer of base, overbuild, structural, and friction courses, use the joint matcher in lieu of the skid, traveling stringline, or non-contact averaging ski on all passes after the initial pass. Furnish a paving machine equipped with electronic transverse screed controls when required by the Contract Documents.

3. Inflation of Tires: When using paving machines equipped with pneumatic tires, the Engineer may require that the tires be ballasted.

4. Screed Width: Provide paving machines on full width lanes that have a screed width greater than 8 feet. Does not use extendable screed strike-off devices that do not provide preliminary compaction of the mat in place of fixed screed extensions. The Contractor may use a strike-off device on irregular areas that would normally be done by hand and on shoulders 4 feet or less in width. When using the strike-off device on shoulders in lieu of an adjustable screed extension, the Contractor must demonstrate the ability to obtain an acceptable texture, density, and thickness. When using an extendable screed device to extend the screed's width on the full width lane or shoulder by 24 inches or greater, an auger extension, paddle, or kicker device is required unless the Contractor provides written documentation from the manufacturer that these are not necessary.

5. Motor Graders: Provide two motor graders for spreading widening courses with prior approval from the Engineer only. Use motor graders that are rated at not less than 6 tons and are self-propelled and power-controlled. Mount them on smooth tread or rib-type tires (no lug types allowed) with a wheel base of at least 15 feet. Equip the front motor grader with a spreader box capable of spreading the mix at the required rate.

6. Rollers:

   a. Steel-Wheeled Rollers: Provide compaction equipment capable of meeting the density requirements described in these Specifications. Provide a tandem steel-wheeled roller weighing a minimum of 8 tons for seal rolling, and for the final rolling, use a separate roller with a minimum weight of 8 tons. Variations from these equirements shall be approved by the Engineer.

b. Traffic Rollers: Provide compaction equipment capable of meeting the density requirements described in these specifications. Provide a self-propelled, pneumatic-tired traffic roller equipped with at least seven smooth-tread, low pressure tires, equipped with pads or scrapers on each tire. Maintain the tire pressure between 50 and 55 psi or as specified by the manufacturer. Use rollers with a minimum weight of 6 tons. Do not use wobble-wheeled rollers. Variations from these requirements shall be approved by the Engineer.

c. Prevention of Adhesion: Do not allow the mixture to adhere to the wheels of any rollers. Do not use fuel oil or other petroleum distillates to prevent adhesion. Do not use any method which results in water being sprinkled directly onto the mixture.

7. Trucks: Transport the mix in trucks of tight construction, which prevents the loss of material and the excessive loss of heat. Provide each truck with a tarpaulin or other waterproof cover mounted in such a manner that it can cover the entire load when required. When in place, overlap the waterproof cover on all sides so that it can be tied down.

8. Coring Equipment: Furnish a suitable saw or drill for obtaining the required density cores.

9. Hand Tools: Provide the necessary hand tools such as rakes, shovels, etc., and a suitable means for keeping them clean.

PART 4 - CONTRACTOR'S PROCESS CONTROL

4.1 GENERAL

A. Personnel: Provide qualified personnel (certified technician) for sampling, testing (by certified lab), and/or sign-off by P.E., and inspection of materials and construction activities. Ensure that qualifications are maintained during the course of sampling, testing and inspection.

Construction operations that require a qualified technician must not begin until the Department verifies that the technician is on the CTQP (Construction Training Qualification Program) list of qualified technicians. The CTQP lists are subject to satisfactory results from periodic Independent Assurance evaluations.

B. Calibration of the Gyratory Compactor: Calibrate the Gyratory Compactor in accordance with the manufacturer's recommendations prior to

producing the mixture for any project. Check the height calibration, the speed of rotation; ram pressure and angle of gyration.

C. Plant Testing Requirements: During the initial production of a mix design, test mix to ensure proper performance and provide results to the department.

D. Roadway Testing Requirements: Areas that demonstrate concerns of the mix design quality or poor/improper compaction efforts may be subject to additional coring and testing as seen fit by the Engineer.

E. Extraction Gradation Analysis: Sample the asphalt mixture at the plant and perform extraction test prior to asphalt being delivered to project. The percent asphalt binder content of the mixture will be determined in accordance with FM 5-563 (ignition oven). The gradation of the extracted mixture will be determined in accordance with FM 1-T 030. All test results will be shown to the nearest 0.01. All calculations will be carried to the nearest 0.001 and rounded to the nearest 0.01. All results shall be provided to the department prior to placement of asphalt on any project.

Run an extraction gradation analysis on the mixture at a minimum frequency of once per 1,000 tons or a maximum of four consecutive days of paving, which ever comes first.

The target gradation and asphalt content will be as shown on the mix design. Any changes in target will require a change in the mix design.

If the percentage of asphalt binder deviates from the optimum asphalt binder content by more than 0.55%, or the percentage passing any sieve falls outside the limits in the table below, immediately resample the mix and test to validate the previous test result, and if needed, make the necessary correction. If the results for two consecutive tests deviate from the optimum asphalt binder content by more than 0.55%, or exceed the limits in the table for any sieve, notify the Engineer and take immediate steps to identify and correct the problem, then resample the mix. If the results from this test deviate from the optimum asphalt binder content by more than 0.55%, or exceed the limits in the table for any sieve, stop plant operations until the problem has been corrected.

Tolerances for Quality Control Tests (Extraction Gradation Analysis)	
Size	Percent Passing
1 inch	7.0
3/4 inch	7.0
1/2 inch	7.0
3/8 inch	7.0
No. 4	7.0
No. 8	5.5
No. 16	5.0
No. 30	4.5
No. 50	4.5
No. 100	3.0
No. 200	2.0

F. Volumetric Control: During poduction of the mix, monitor the volumetric properties of the Type SP asphalt mix with a Type SP Gyratory Compactor to determine the air voids, VMA, VFA, and dust-to-effective asphalt binder ratio (dust proportion) at N_{design}.

Take appropriate corrective actions in order to maintain an air void content at N_{design} between 3.0 and 5.0% during production. When the air void content at N_{design} drops below 2.5 or exceeds 5.5%, stop plant operations until the appropriate corrective actions are made and the problem is resolved to the satisfaction of the Engineer and/or Engineer of Record. Evaluate any failing material in accordance with Part 6.

Determine the volumetric properties of the mixture at a minimum frequency of once per production day when the daily production is less than 1,000 tons. If the daily production exceeds 1,000 tons, monitor the volumetric properties two times per production day.

During normal production, volumetric properties of the mixture will not be required on days when mix production is less than 100 tons. However, when mix production is less than 100 tons per day on successive days, run the test when the accumulative tonnage on such days exceeds 100 tons.

Testing required for volumetric property determination includes AASHTO TP-4, FM 1-T 209, FM 5-563 and FM 1-T 030. Prior to testing samples in accordance with AASHTO TP-4 and FM 1-T 209, condition the test-sized sample for one hour at the compaction temperature in a covered container.

G. Plant Calibration: At or before the start of mix production, perform an extraction gradation analysis of the mix to verify calibration of the plant.

The sample t sted at the start of any project may be utilized for this requirement.

H. Process Control of In-Place Compaction: Develop and implement a method to control the compaction of the pavement and ensure its compliance with the minimum specified density requirements. The department may require the use of a nuclear gauge to test areas suspected of not having proper compaction. Other density measuring devices may be used in lieu of the nuclear density gauge, provided that it is demonstrated to the satisfaction of the Engineer and/or Engineer of Record that the device can accurately measure the relative level of density in the pavement on a consistent basis.

PART 5 - ACCEPTANCE OF THE MIXTURE

5.1 GENERAL

The asphalt mixture will be ac cepted based on one of the following methods as determined by the Engineer and/or Contract Documents:

1. Certification by the Contractor
2. Certification and Process Control Testing by the Contractor
3. Acceptance testing by the Engineer
4. Other method(s) as determined by the Contract

5.2 CERTIFICATION BY THE CONTRACTOR

Submit a Notarized Certification of pecification Compliance letter on company letterhead to the Engineer that all material produced and placed on the project was in substantial compliance with these specifications.

5.3 CERTIFICATION AND PROCESS CONTROL TESTING BY THE CONTRACTOR

Submit a N tarized Certification of Specification Compliance letter on company letterhead to the ngineer that all material produced and placed on the project was in substantial compliance with these specifications, along with supporting test data documenting all process control testing. Utilize an Independent Laboratory as approved by the Engineer for the Process Control testing.

5.4 ACCEPTANCE TESTING BY THE ENGINEER

A. Acceptance at the Plant:

1. The asphalt mixture will be accepted, with respect to gradation and asphalt binder content, based on the results from the start up test. However, any load or loads of mixture which, in the opinion of the Engineer and/or Engineer of Record, are unacceptable for reasons of excessive segregation, aggregates improperly coated, or of excessively high or low temperature will be rejected for use in the work.

2. Acceptance Procedures: Control all operations in the handling, preparation, and production of the asphalt mix so that the percent asphalt binder content and the percents passing the No. 8 and No. 200 sieves will meet the targets from the mix design within the tolerances shown in the table below.

Tolerances for Acceptance Tests	
Characteristic	Tolerance*
Asphalt Binder Content	±0.55%
Passing No. 8 Sieve	±5.50%
Passing No. 200 Sieve	±2.00%
*Tolerances for sample size of n=1.	

Calculations for the acceptance test results for asphalt binder content and gradation (percentages passing the No. 8 and No. 200 sieves) will be shown to the nearest 0.01. Calculations for arithmetic averages will be carried to the 0.001 and rounded to the nearest 0.01.

Payment will be based on the acceptance of the project by the Engineer.

B. Acceptance of the Roadway:

1. Density Control: The in-place density of any questionable section of a course of asphalt mix will be ev aluated by the use of a nuclear gauge and/or by the testing of 6 inch diameter roadway cores.

The Engineer will not perform dnsity testing on leveling courses, open-graded friction courses, or any course which does not show signs of poor /improper compaction efforts. In addition, density testing will not be per formed on t he following areas when they are less than 1 ,000 feet in length: crossovers, intersections, turning lanes, acceleration lanes or deceleration lanes. Compact these courses (with the exception of open-graded friction courses) in accordance w ith t he appropriate rolling pr ocedure a s specified i n these specifications or as approved by the Engineer.

2. Acceptance**:** The completed pavement will be accepted with respect to overall ride, overall appearance, and overall yield as determined by the Engineer or Engineer of Record.

   Areas of question may be tested with a nuclear gauge or by the testing of the density of the cores, as determined by the engineer.

3. Additional Density Requirement: On shoulders with a width of 5 feet or less, compact the pavement in accordance with the rolling procedure (equipment and pattern) as specified herein or as approved by the Engineer. Stop the production of the mix if the rolling procedure deviates from the approved procedure.

4. Surface Tolerance: The asphalt mixture will be accepted on the roadway with respect to surface tolerance by the use of a 15 ft rolling straight edge. The department will determine if the use of a straight edge test is warranted. Unevenness of the course shall not vary more than plus or minus 3/16 inch in 15 feet.

5.5 ADDITIONAL TESTS

The Department reserves the right to run any test at any time for informational purposes and for determining the effectiveness of the Contractor's quality control.

PART 6 - DISPOSITION OF FAILING MATERIAL

Any material that is represented by failing test results will be evaluated to determine if removal and replacement is necessary. Remove and replace any material, if required, at no cost to the Department. The evaluation will be conducted by the Engineer and/or Engineer of Record. If so directed, obtain an engineering analysis, as directed by the Engineer, by the independent laboratory (as approved by the Engineer) to determine if the material can (a) remain in place, for this case the appropriate pay factor will be applied, or (b) be removed and replaced at no cost to the Department. The analysis will be a signed and sealed report by a Professional Engineer licensed in the State of Florida.

PART 7 – MEASUREMENT/PAYMENT

7.1 METHOD OF MEASUREMENT

For the work specified under this Section the quantity to be paid for will be the in-place measurement of the area in square yards unless otherwise stated in the project plan details.

The bid price for the asphalt mix will include the cost of the liquid asphalt or the asphalt recycling agent. There will be no separate payment or unit price adjustment for the asphalt binder material in the asphalt mix.

7.2 BASIS OF PAYMENT

Price and payment will be full compensation for all the work specified under this section.

END OF SECTION 02500

SECTION 02510 – ASPHALT RUBBER MEMBRANE INTERLAYER
(ARMI) CRACK RELIEF

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of Contract, including General and Supplementary Conditions and other Specification Sections, apply to work of this Section.

B. Florida Department of Transportation, *Standard Specifications for Road and Bridge Construction*, *Section 440, and Design Standards, Latest Edition*.

1.2 DESCRIPTION OF WORK

A. Construct an asphalt rubber membrane interlayer composed of a separate application of asphalt rubber binder covered with a single application of aggregate.

PART 2 - MATERIALS

A. Asphalt Rubber Binder: Use ARB-20, or approved equal, meeting the **r**equirements of FDOT *Standard Specification Section 336*.

B. Cover Material: Use Size No. 6 stone, slag, or gravel meeting the requirements of FDOT *Standard Specification Section 901*.

PART 3 - EQUIPMENT

A. Power Broom: Provide a power broom, for cleaning the existing pavement, capable of removing all loose material from the surface.

B. Spreading Equipment: Provide a self-propelled aggregate spreader that can be adjusted to accurately apply the cover material at the specified rate and that spreads the material uniformly.

C. Rollers: Provide self-propelled, pneumatic-tired traffic type rollers equipped with at least 7 smooth tread, low-pressure tires, and capable of carrying a gross load of at least 8 tons. Maintain a minimum tire inflation pressure of 90 psi, or as specified by the manufacturer, such that the air pressure in no two tires varies more than 5 psi. Load the traffic roller as directed by the Engineer.

D. Mixing Equipment: Use mixing equipment for asphalt rubber binder designed for that purpose and capable of producing and maintaining a

homogeneous mixture of rubber and asphalt cement at the specified temperature.

E. Pressure Distributor: Use a pressure type distributor to apply asphalt rubber binder capable of maintaining a homogeneous mixture of rubber and asphalt cement at the specified temperature and consistently apply the material in a uniform manner.

PART 4 - CONTRACTOR'S QUALITY CONTROL (QC) PLAN

Provide the necessary quality control of the asphalt rubber binder and construction in accordance with the Contract requirements. Provide in the QC Plan procedures for monitoring and controlling of rate of application. If the rate of application varies by more than 5% from the rate set by the County, in accordance with 4.6 herein, immediately make all corrections necessary to bring the spread rate into the acceptable range. The County may take additional measurements at any time. The County will randomly check the Contractor's measurement to verify the spread rate.

PART 5 - PREPARATION OF ASPHALT RUBBER BINDER

Combine the materials as rapidly as possible for such a time and at such a temperature that the consistency of the binder approaches that of a semi-fluid material. Use the time and temperature for blending of the asphalt rubber binder as specified in FDOT Standard Specifications Table 336-1. The manufacturer must ensure the material has reached application consistency. If not, the manufacturer will determine if an extender oil or diluents is needed. After reaching the proper consistency, proceed with application immediately. Never hold the mixture at temperatures over 350ºF for more than six hours after reaching that temperature.

PART 6 - CONSTRUCTION PROCEDURE

A. Preparation of Surface: Prior to application of the asphalt rubber binder, clean the existing pavement as specified in FDOT Standard Specifications 300-5.

B. Application of Asphalt Rubber Binder: Apply the asphalt rubber binder only under the following conditions:

1. The air temperature is above 50ºF and rising.

2. The pavement is absolutely dry.

3. The wind conditions are such that cooling of the asphalt rubber binder will not be so rapid as to prevent good bonding of the aggregate.

Uniformly apply the asphalt rubber binder, at the rate of 0.6 to 0.8 gal/yd^2 or as directed by the manufacturer. Use an application rate based on the unit weight as shown in FDOT Standard Specifications, Table 336-1. For conversions to standard 60ºF, refer to FDOT Standard Specifications 300-9. Determine the rate of application after each application operation.

C. Application of Cover Material: Immediately after application of the asphalt rubber binder, uniformly spread the cover material at a rate of 0.26 and 0.33 ft^3/yd^2 or as directed by the County. Determine the application rate at the beginning of each day's production, and as needed to control the operation, a minimum of twice per day. Maintain an application rate such that the pavement is covered uniformly with aggregate, and is one aggregate layer thick. For the cover material, use aggregate that is reasonably free of any adherent coatings and that does not contain excessive moisture. Immediately after the application of cover material, check the surface to ensure a uniform distribution of cover material and a smooth surface.

Do not separate the application of the asphalt rubber binder and the application of the cover material by more than 300 feet, unless approved by the County.

D. Rolling: In order to ensure maximum embedment of the aggregate, cover the entire width of the mat immediately by traffic rollers. For the first coverage, provide a minimum of three traffic rollers in order to accomplish simultaneous rolling in echelon of the entire width of the spread.

After initial rolling, immediately correct all portions of the completed surface that the County deem are defective (not properly covered by aggregates, fat spots, excessive free aggregate, etc.)

Following the first coverage, make additional coverages with traffic rollers as directed by the County.

E. Traffic Control: For the normal sequence of construction operations, place the first course of asphalt concrete overlay over the membrane prior to opening to traffic.

PART 7 - UNACCEPTABLE ASPHALT RUBBER MEMBRANE INTERLAYER

If the asphalt rubber membrane interlayer is unacceptable due to incorrect blending, application rate, or not meeting the requirements of this Section, or damaged prior to placement of the asphalt concrete layer, remove and replace it as directed by the County, at no additional cost to the County. Do not apply excessive amounts of asphalt rubber binder.

PART 8 - PLACEMENT OF ASPHALT CONCRETE OVERLAY

Ensure that the thickness and temperature of the initial layer of asphalt concrete placed on top of the asphalt rubber membrane interlayer are such that the overlay bonds to the interlayer and the underlying layer without voids or excessive binder. Core the asphalt overlay as directed by the County to evaluate the binder and aggregate spread rates, as well as the effectiveness of the asphalt concrete overlay in producing a well-bonded interlayer.

PART 9 – MEASUREMENT/PAYMENT

9.1 METHOD OF MEASUREMENT

A. Asphalt Rubber Membrane Interlayer: The quantity to be paid for will be plan quantity, in square yards, completed and accepted.

B. Bituminous Material (Asphalt Rubber Binder-Interlayer): The quantity will be the volume, in gallons, determined as provided in FDOT Standard Specifications 300-8.

9.2 BASIS OF PAYMENT

A. Asphalt Rubber Membrane Interlayer: Price and payment will be full compensation for all work specified in this Section, including furnishing cover materials, handling, spreading, rolling, bituminous material, and other incidental work necessary to complete this item.

B. Bituminous Material (Asphalt Rubber Binder-Interlayer): Payment will be included in the price of the asphalt rubber membrane interlayer and will be full compensation for furnishing asphalt cement, ground tire rubber, blending and handling.

C. Payment Items: Payment will be made determined by the square yards of in-place product accepted.

END OF SECTION 02510

SECTION 02580 – HOT IN-PLACE RECLAIMED ASPHALT AND RESURFACING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including general and supplementary conditions ad other specification sections, apply to work of this section.

B. Florida Department of Transportation, *Standard Specifications for Road and Bridge Construction Section 327*, *Latest Edition*.

1.2 DESCRIPTION OF WORK

This work consists of rehabilitating the surface layer of the existing asphalt roadway to a depth of one inch and placing a layer of new Hot Mix Asphalt Concrete (HMAC) material over the rehabilitated surface. This will be accomplished with a specially designed machine in a simultaneous process of heating, scarifying, applying an asphalt rejuvenating agent (emulsifier), thoroughly re-mixing and reshaping the existing surface, and application of the final overlay. The overlay of the new HMAC placed over the rejuvenated layer of existing asphalt, shall be in compliance with the lines, grades, thickness and typical cross section established by the County.

The machine that heats, scarifies, rejuvenates, and remixes must also lay the recycled asphalt material, as well as lay the new HMAC material. The County will provide the list of streets and surface selected for this application. Additional pre-heaters may be required to achieve the specified depth, as directed by the County.

PART 2 - MATERIALS

A. Asphalt Recycling Agent (Emulsifier): The County will appove the asphalt-recycling agent. The recycling agent used to restore the plasticity of the existing asphaltic pavement shall be an emulsified agent. The recycling agent shall meet the requirements of ECR 1 or equal. A manufacturer's certification shall be submitted to the County for the recycling agent.

B. Hot Mix Aphaltic Concrete (HMAC): The delivery of the new HMAC will be coordinated with the HMAC supplier by the selected recycling contractor.

PART 3 - JOB CONDITIONS

A. Weather limitation for this work shall be a minimum of 50° F and rising.

B. Prior to the repaving operation, the pavement shall be cleaned so as to be reasonably free from sand, dirt and other deleterious substances that would affect the quality of the recycled mix. No separate payment shall be made for this requirement.

C. Existing manholes, water valves boxes, junction boxes, etc. that do not conform to the finished pavement grades shall be adjusted to finish grade.

D. The Contractor shall be responsible for protecting the areas adjacent to the work from damage. (Heat, etc.)

PART 4 - EQUIPMENT

A. All tools, equipment, and machinery shall be maintained in satisfactory working condition and shall be subject to the approval of the County Engineer.

B. Repaving Machine: The machine shall be an approved, self-contained, self propelled, automated unit that heats, scarifies (or mills), automatically applies recycling agent at a uniform rate, thoroughly mixes, redistributes and levels the existing asphalt to the specified depth, and lays the new HMAC material overlay. The new HMAC must be laid within 30 seconds after the scarification begins to ensure a hot monolithic bond with the recycled asphalt pavement. The machine shall also be capable of reworking the material around manholes and other obstacles; the machine shall be capable of adding and mixing the recycling agent evenly and shall be equipped with a leveling blade and screed for re-grading of the existing asphaltic concrete surface.

C. Pre-heater: This unit shall be hooded to prevent damage to adjacent property, including trees shrubs and landscaping. The heating hood shall be capable of heating the pavement surface to a minimum temperature of 225 degrees F, not to exceed 325 degrees F. This will allow for scarification to the required depth without breaking the aggregate particles or charring the pavement surface.

D. Scarifying and Milling units shall be automatically controlled units in order to control the depth of penetration and to clear utility manholes and other obstructions. The depth of scarification shall be directed by the County. Note: Scarifying depth may vary in range form 3/4 of one inch to 1 ½ inches.

E. Recycling Agent Applicator: This system shall be automatically controlled; the recycling agent must be applied to the scarified material at a uniform rate. The application rate shall be synchronized with the machine's forward speed to maintain a tolerance within ± *5%* of the specified rate.

F. Receiving hopper and Conveying System: The machine shall consist of a

hopper and conveyor system to collect and transport the new HMAC to the finishing unit without segregation of the new material.

G. Recycling Unit: The machine shall consist of a system that mixes and redistributes and levels the scarified material over the width being processed to produce a uniform cross-section of recycled material. The recycling screed shall be heated and have crown control, and be capable of redistributing the recycled material to the desired longitudinal grade and transverse cross section.

H. Finishing unit: The machine shall have an automatic controlled screed to produce a surface conforming to the surface thickness as required by the County. The thickness of the surface course lift shall not exceed 2 inches. This unit shall be capable of a plying the new HMAC to a uniform longitudinal profile and cross slope of 1/4 inch per foot. The finishing screed must be heated and capable of electronically controlling the cross slope, and applying he n ew HMAC to produce a uniform surface and texture.

I. Rollers: Rolling equipment shall be of sufficient type and weight to compact the new HMAC and the recycled material to the required density as specified in Section 2500. Sufficient numbers of rollers (2 minimum) shall be furnished to keep up with the operation. All rolling should be completed before the temperature of the new HMAC drops below 190 F.

PART 5 - TRAFFIC CONTROL

A. Pavement markings shall conform to the requirements of *Section 04040*.

B. Maintenance of Traffic: Suitable methods shall be used by the contractor to protect the new asphalt surface from all types of vehicular traffic without damage. Opening to traffic does not constitute acceptance of work. Conform to requirements of *Section 04060*.

C. The Contractor will maintain at least one-way traffic and shall provide effective Traffic Control at all times. Two-Lane traffic shall be maintained wherever possible.

D. No interruption of access to property shall be made unless prior arrangements acceptable to the occupant or owner of the affected property have been made and approved by the County.

E. Submit a Traffic Control Plan forapproval in accordance with *Section 04060.*

PART 6 - EXECUTION

A. Notify the County at least 48 hours prior to commencement of any paving operation.

B. The heating unit shall produce sufficient heat to soften the pavement uniformly without burning or charring the existing asphalt pavement.

C. The process shall produce a welded, longitudinal joint, the standing edge of the ajoining asphalt pavement shall be fully heated to a width of t least 2 inches beyond the width to be scarified and recycled.

D. Immediately following heating of the pavement, the existing surface shall be scarified (milled) to the specified depth. The machine shall have the capability of maintaining a recycled mat with a minimum temperature of 190°F and a maximum temperature of 2 25°F throughout the repaving operation.

E. Due to the varying locations and properties of the existing asphalt pavement, the following adjustments may be made, if directed by the County.

1. Depth of scarification may be varied to correct existing cross slopes and grades.

2. Application rate for the recycling agent may be adjusted as necessary to maintain a uniform mixture.

3. Spot leveling may be necessary.

4. Variable Message Boards may be required. No additional compensation will be made for these traffic control devices after contract is awarded.

F. CLEANUP

The Contractor will keep the work site free from accumulations of waste material, rubbish and debris from the Contractor's performance of the scope of work resulting from the use of all tools, construction equipment, and machinery, and surplus materials, and will leave the site clean and ready for use. The Contractor will restore to their original condition those portions of the work site, such as staging and stockpile areas, not designed for alteration as contained in the Contract Documents. This will include returning the area to the proper grade and slope, as well as replacing sod, if so required by the County.

PART 7 - QUALITY CONTROL

The County has the option of testing to ensure the surface is in compliance with thickness, smoothness, etc. and meets requirements of the specifications as directed by the County and as outlined in *Section 2500*.

Contractor will assign a Quality Control (QC) Supervisor to the project. The QC Supervisor will work in conjunction with the County.

PART 8 - MEASUREMENT/PAYMENT

8.1 METHOD OF MEASUREMENT

A. The accepted quantities of asphalt pavement surface recycled will be measured and paid by the square yard. Pay item, Hot In-Place Recycling, Square Yard.

B. Asphalt recycling agent will be measured by the gallon, used in place, as determined by the County and the Contractor Supervisor. Pay item, Emulsifier, Gallon.

C. New HMAC will be measured by the tons used in place. Pay item, HMAC, Tons.

8.2 BASIS OF PAYMENT

A. Price and payment will be full compensation for all work specified in this Section.

B. No separate payment for traffic control will be made.

C. Spot leveling will be paid for by the measured square yards under the unit price for Hot-In-Place Recycling.

END OF SECTION 02580

SECTION 02600 - STORMWATER SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Specification Sections, specifically 2300, 3300, and Florida Department of Transportation *Design Standards*, apply to this Section.

B. Florida Department of Transportation, *Standard Specifications for Road and Bridge Construction, Sections 425, 430 and 530*, *Latest Edition*.

1.2 SUMMARY

This Section includes stormwater system piping and appurtenances. All labor, material, equipment, appurtenances, services, and other work or costs necessary to construct the facilities and place them into operation shall be furnished by the Contractor.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract.

B. Shop drawings for drainage pipe, pre-cast concrete storm drainage manholes and catch basins, including frames, covers, and grates.

C. Shop drawings for cast-in-place concrete or field-erected masonry storm drainage manholes and catch basins, including frames and covers.

1.4 QUALITY ASSURANCE

A. Environmental Compliance: Comply with applicable portions of local, state, and federal environmental agency regulations pertaining to stormwater systems impacts.

B. Utility Compliance: Comply with local utility regulations and standards pertaining to relocation, clearances, etc. related to installation of stormwater systems.

C. Quality control to adhere to QA/QL Plan.

1.5 PROJECT CONDITIONS

Site Information: Perform site inspection, research public utility records, and verify existing utility locations. Verify that stormwater system piping may be installed in compliance with design plans and referenced standards. Locate existing stormwater system piping and structures that are out of service and

closed as per 3.8 this section.

1.6 SEQUENCING AND SCHEDULING

A. Notify the County Inspector assigned to the subdivision or Project Coordinator assigned to project prior to pouring backfilling or form work.

B. Coordinate connection to existing private and public drainage system with Owner and/or County.

C. Coordinate with adjacent utilities work.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 PIPE

Meet the following requirements of *FDOT Specifications*, *Latest Edition*:

Reinforced Concrete Pipe	Section 449
Round Rubber Gaskets	Section 942
Corrugated Steel Pipe & Pipe Arch	Section 943
Corrugated Aluminum Pipe & Pipe Arch	Section 945
Corrugated Polyethylene Pipe	Section 948
Polyvinyl Chloride (PVC)	Section 948

2.1.2 MANHOLES

A. Precast Concrete Manholes: Per FDOT Standard Specification 425-5 and ASTM C 478, precast reinforced concrete, of depth indicated with provision for rubber gasket joints.

B. Cast-in-Place Manholes: Per FDOT Standard Specification 425 Cast reinforced concrete of dimensions and with appurtenances indicated.

C. Manhole Frames and Covers: Construct Per FDOT Standard Specification 42 5-3.2 and FDOT Design Standards. All units shall bear the lettering "STORM SEWER" cast into cover. All proposed substitutes must have equal or greater opening sizes and weights.

2.1.3 INLETS

A. Precast Concrete Catch Basins Inlets: Construct per FDOT Standard Specification 425-5.

B. Cast-in-Place Inlets: Construct per FDOT Standard Specification 425 to dimensions and with appurtenances indicated.

1. Bottom, Walls, and Top: Reinforced concrete.
2. Channel and Bench: Concrete.

C. Inlet Frames and Grates: Per FDOT Standard Specification 425-3.2 & FDOT Design Standards. All units shall bear the lettering "STORM SEWER" cast into cover.

2.1.4 END TREATMENT

General: Head wall, apron, and mitered ends, per FDOT Standard Specification 430-4.6.

2.2 CONCRETE AND REINFORCEMENT

A. Concrete: Portland cement mix, 3,000 psi; shall be in accordance with Section 03300.

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Reinforcement: Steel conforming to the following:

1. Fabric: ASTM A 185, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615, Grade 60, deformed.

C. Forms:

1. Form Materials: Plywood, metal, metal-framed plywood, or other acceptable panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces without distortion or defects. Material shall be of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal.

2. Form Release Agent: Provide commercial formulation form-release agent with a maximum of 350 mg/l volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces. Release agent to be within allowable volatile limits according to applicable local, state and federal codes.

2.3 MASONRY

Materials for accessories shall be per FDOT Standard Specification 949. Mortar shall be one part Portland cement and three parts masonry sand to which shall

be added lime putty in the amount of 50% of the volume of cement. Special commercial mortar mixes may be used if approved by the Engineer. All masonry materials shall conform to the latest applicable ASTM specifications. Set all masonry units in full beds of mortar, with full joints and strike all joints flush. Masonry reinforcements shall be galvanized Dur-O-Wal, or approved equal, and shall be installed at every other bed joint. Hollow block shall be poured solid with re-bar as designed.

2.4 CURING MATERIALS

Conform to FDOT Standard Specification 520-8.

2.5 BEDDING STONE

Subbase or base materials shall meet requirements of FDOT Standard Specification 530-2.3.

PART 3 - EXECUTION

3.1 EXCAVATIONS FOR MANHOLES, INLETS, AND PIPE

Excavation shall be sufficient enough to leave at least 12 inches in the clear between their outer surfaces and the embankment. Excavation for all structures shall be made to the dimensions and elevations indicated on the drawings. Where the excavation is made below the indicated elevations, the excavation shall be restored to the proper elevation with compacted suitable material without extra compensation.

3.2 PREPARATION OF FOUNDATION FOR BURIED STORMWATER SYSTEMS

A. Grade trench bottom to provide a smooth, firm, stable, and rock-free foundation, throughout the length of the pipe.

B. Remove unstable, soft, and unsuitable materials at the surface upon which pipes are to be laid, and backfill with bedding stone per FDOT Standard Specification 530-2.3 to indicated level.

C. Shape bottom of trench to fit bottom of pipe. Fill unevenness with tamped sand backfill. Dig bell holes at each pipe joint to relieve the bells of all loads and to ensure continuous bearing of the pipe barrel on the foundation.

3.3 PIPE INSTALLATION

A. Drawings (plans and details) indicate the general location and arrangement of the underground stormwater system piping. Location and arrangement of piping layout takes into account many design considerations. Install the piping as indicated, to the extent practical.

Deviations shall be approved by the County.

B. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. When installing gaskets, seals, sleeves, and couplings, follow manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.

The pipe shall be carefully examined for defects and the inside cleaned. After placing pipe in the ditch, the ends shall be wiped free from all dirt, sand and foreign material. All pipe and joints shall be made, handled, and installed in strict accordance with the manufacturer's recommendations and instructions. Install pipe in accordance with FDOT Standard Specification 430.

C. Install piping pitched down in direction of flow, at minimum slope per plans and in accordance with manufacturer's recommendations, specifications, and design plans.

D. Boring: Install pipe under streets or other obstructions that cannot be disturbed, by boring, jacking, or a combination of both. These methods of installation are not allowed for newly paved roadways. Utility conduit should be installed prior to paving.

E. All RCP joints shall be sock/filter wrapped prior to backfilling unless a manufacturer recommended coupling is used.

F. Field repairs of pipeline shall be in strict accordance with manufacturer's recommendations and specifications.

G. Only conventional concrete pipe shall be allowed under dedicated County roads.

H. Pipe Cover: Cover shall be a minimum of 12", unless approved by the County.

I. Pipe Size: Minimum Pipe size shall be 18" diameter or equivalent, unless approved by the County.

3.4 MANHOLES

A. General: Install manholes complete with accessories as indicated. Form continuous concrete or split pipe section channel and benches between inlets and outlet. Set tops of frames and covers flush with finish surface where manholes occur in pavements. Elsewhere, set tops 3 inches above finished grade, unless otherwise indicated.

B. Place precast concrete manhole sections as indicated, and install in accordance with ASTM C 891.

C. Construct cast-in-place manholes as indicated.

D. Provide rubber joint gasket complying with ASTM C443 at joints of sections; or apply bituminous mastic coating at joints of sections.

3.5 INLETS

A. Construct inlets to sizes and shapes indicated per FDOT Standard Specification 425-6, or as modified in the plans.

B. Set frames and grates to elevations indicated.

C. Inlet throat openings larger than 7" in height must be equipped with horizontal trash bar(s). Trash bar(s) shall be 1” diameter galvanized rod installed in the center of the opening, or evenly spaced if more than one is used.

3.6 OUTFALL STRUCTURES

A. Pipe systems shall be utilized for primary out fall of retention/detention areas.

B. Weirs and flumes will not be acceptable for use as primary pond outfall structures or to primarily route stormwater to retention/detention areas at the end of down-gradient roadways.

3.7 END TREATMENT

Construct End Treatment per FDOT Standard Specification 430-4.6.

3.8 STORMWATER SYSTEM BACKFILL

Place and compact backfill material in accordance with Section 02300 and FDOT Specification 125-8.

3.9 CLOSING OUT-OF-SERVICE STORMWATER SYSTEMS

A. Out-of-Service Piping: Close open ends of out of service underground piping that is indicated to remain in place. Provide sufficiently strong closures to withstand hydrostatic or earth pressure that may result after pipe ends have been closed and grout filled with non-shrink grout.

1. Close open ends of concrete pipe or structures with not less than 8-inch-thick brick masonry bulkheads and grout fill.

2. Close open ends of other piping with plastic plugs, or other acceptable methods suitable for size and type of material being closed. Wood plugs are not acceptable.

B. Out-of-Service Structures: Remove structure and close open ends of the remaining piping or remove top of structure down to not less than 3 feet below final grade; fill structure with stone, rubble, gravel, compacted dirt, or flowable fill to within 1 foot of top of structure remaining, and fill with concrete.

3.10 FIELD QUALITY CONTROL

A. Refer to Section 03300 for Concrete Testing and 02300 for Earthwork Testing.

B. Cleaning: Interior of piping and structures shall be cleared of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.

1. In large, accessible piping, brushes and brooms may be used for cleaning.

2. Place plugs in ends of uncompleted pipe at end of day or whenever work stops.

3. Flush piping between manholes, to remove collected debris.

C. Interior Inspection: Inspect piping to determine whether line displacement or other damage has occurred.

1. Make inspections after pipe between manholes has been installed, cleaned and approximately 2 feet of backfill is in place, and again at completion of project. Each section of pipe between structures is to show from either end on examination, a full circle of light. Each appurtenance to the system shall be of the specified size and form, to be neatly and substantially constructed, with the top set permanently to exact position and grade.

2. If inspection indicates poor alignment, debris, displaced pipe, infiltration, or other defects, correct such defects and re-inspect. All repairs shown necessary by the inspections are to be made, broken, cracked, or punctured pipe replaced, all deposits removed and the pipe left true to line and grade as herein specified, or shown on the plans, entirely clean and free from abnormalities and ready for use at no additional expense to the County.

3. All stormwater pipes will be subject to video camera inspection by County staff.

D. Trench Backfill Around and Above Pipe:

1. In each compacted backfill layer, perform density test as specified in Section 02300.

2. Other tests may be required at County's discretion.

E. Clean Up: Before final inspection and acceptance, the Contractor shall clean ditches, shape shoulders and restore all disturbed areas, including street crossings, grass plots, to as good as condition as existed before work started. All trenches shall be leveled and loose material removed from pavement gutters, sidewalks, pipelines, and inlet sediment traps, employing hand labor, if necessary.

F. Pipe Inspection: The County may elect for the contractor to perform pipe inspection according to the following.

For pipes installed under the roadway, inspection is to be conducted when backfill reaches 3 feet above the pipe crown or upon completion of placement of the stabilized subgrade. For pipe installed within fills, including embankments confined by walls, inspection is to be conducted when compacted embankment reaches 3 feet above the pipe crown or the finished earthwork grade as specified in the Plans. Prior to conducting the inspection, submit to the Engineer a video recording schedule for videoing, dewater installed pipe, and remove all silt, debris and obstructions. Submit pipe videoing and reports to the County for review prior to the continuation of paving.

For pipe 48 inches or less in diameter, submit to the Engineer a video DVD. For all pipe types, provide a Pipe Observation Summary Report for each pipe run that includes:

1. Actual recorded length and width measurements of all cracks within the pipe.
2. Actual recorded separation measurement of all rigid pipe joints.
3. Detailed written observations of leaks, debris, or other damage or defects.

For flexible pipe types, submit a Pipe Quality Report for each pipe run that includes:

1. Representative diameter of the pipe.
2. Pipe deformation/deflections measurements with the 5% deflection limit clearly delineated.

Reports submitted in electronic media are preferred. The Engineer may waive this requirement for side drains and cross drains which are short enough to inspect from each end of the pipe.

G. Video Report: Provide a high-quality DVD in a MPEG2 format video with a standard resolution of 720 x 480. Use a camera with lighting suitable to allow a clear picture of the entire periphery of the pipe. Center the camera in the pipe both vertically and horizontally and be able to pan and tilt to a 90 degree angle with the axis of the pipe and rotating 360 degrees. Use equipment to move the camera through the pipe that will not obstruct the camera's view or interfere with proper documentation of the pipe's condition.

The video image shall be clear, focused, and relatively free from roll, static, or other image distortion qualities that would prevent the reviewer from evaluating the condition of the pipe. The video will include identification before each section of pipe filmed. The identification will include the project number, the structure number corresponding to the structure number in the Plans for the project, size of pipe, the date and time, and indicate which pipe is being filmed if multiple pipes are connected to the structure. Notes should be taken during the video recording process. Submit these notes along with the video.

Move the camera through the pipe at a speed not greater than 30 feet per minute. Mark the video with the distance down the pipe. The distance shall have an accuracy of one foot per 100 feet. Film the entire circumference at each joint. Stop the camera and pan when necessary to document and measure defects. Position the camera head perpendicular to all defects requiring measurement by the video micrometer.

H. Reinspection: At any time after reviewing the submitted pipe inspection reports, the Engineer may direct additional inspections. If no defects are observed during the reinspection, the County will pay for the cost of the reinspections. If defects are observed, the reinspection and all work performed to correct the defects will be done at no cost to the County. Acceptance of all replacements or repairs will be based on video documentation of the completed work prior to Final Completion.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

The quantities to be paid for will be (1) the number of inlets, manholes, end walls, mitered end sections, flared end sections, junction boxes, and yard drains, including fittings and appurtenances, completed and accepted; (2) length of pipe to the nearest foot of type specified; and (3) the number of structures of these types (including also valve boxes and monument boxes) satisfactorily adjusted.

4.2 BASIS OF PAYMENT

Price and payment will be full compensation for finishing all materials and completing all work described herein or shown in the plans, including all clearing and grubbing outside the limits of clearing and grubbing as shown in the plans, all excavation except the volume included in the measurement designated to be paid for under the items for the grading work on the project, all backfilling around the structures, the disposal of surplus material, and the furnishing and placing of all the gratings, frames, covers, and any other necessary fittings.

If the County elects for the contractor to perform pipe inspection, payment shall be made under a separate line item and be based upon linear foot of pipe videoing. No additional payment will be made for cleaning new stormwater pipe systems.

END OF SECTION 02600

SECTION 02800 - FENCING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

B. Florida Department of Transportation, *Standard Specifications for Road and Bridge Construction*, *Section 550 and* Florida Department of Transportation *Design Standards Index 800, Latest Editions*

1.2 SUMMARY

A. This Section includes, but is not limited to, the following:

1. Chain link fence

2. Farm Fence

3. Wood privacy fence

B. Where existing fences are to be relocated, but existing materials are deteriorated or damaged, fencing shall be replaced in kind or as specified by the County.

1.3 PROJECT CONDITIONS

A. Traffic: Conduct fencing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities and to minimize disturbance of the activities of adjacent property owners. Do not close or obstruct streets, walks, or other occupied or used facilities without prior approval.

B. Security: Do not leave any fence unfinished or incomplete which might allow the escape of livestock or household pets, access to a private/public pool or pond, etc without temporary measures in place during construction.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver material in manufacturer's original packaging with all tags and labels intact and legible.

B. Handle and store material in such a manner as to avoid damage.

PART 2 - PRODUCTS

2.1 CHAIN LINK FENCING:

Chain link fence shall meet the requirements of FDOT *Design Standards Index 802*.

2.2 GATES

A. Swing Gates: Per FDOT Design Standards Index 802, as modified herein, construct of 1.625" o.d. steel pipe galvanized in accord with ASTM A-53 and weighing 2.27 pounds per lineal foot. Provide gates more than 8 feet wide with either intermediate members or diagonal truss rods. Provide gates less than 8 feet wide with truss rods or intermediate braces. Arrange latches for padlocking to provide accessibility from both sides of the gate. Where a double swing gate is called out, Construct Concrete Anchor rod Base 8” in diameter a nd 4” deep flush with top of ground. Opening in base for rod shall accommodate standard size in accordance with manufacturer and shall be PVC or galvanized steel pipe.

B. Slide Gates: shall be constructed per FDOT Design Standards Index 803.

2.3 ACCESSORIES

Post Tops: pressed steel, or malleable iron. Where top rail is used, provide post tops to permit passage of top rail.

2.4 FARM FENCING

Farm Fencing shall meet the requirements of FDOT Design Standards Index 801.

2.5 WOOD PRIVACY FENCE

A. Where existing fences are to be relocated, but existing materials are deteriorated or damaged, fencing shall be replaced in kind or as specified by the County.

B. Shall be constructed as per industry standard with proper clearance below fence so as not to impede stormwater flow.

PART 3 - EXECUTION

3.1 CHAIN LINK FENCING

Chain link fence shall meet the requirements of FDOT Design Standards Index 802.

A. Drill holes for post footings in firm, undisturbed or compacted soil.

B. Place concrete around posts in a continuous pour, tamp for

consolidation. Check each post for vertical and top alignment.

C. Set Keepers, stops, sleeves and other accessories into concrete as required.

D. Topping of the fence with barbed wire shall not be included unless specifically shown on the plans.

3.2 INSTALLATION

A. Brace Assemblies: install braces so posts are plumb when diagonal rod is under proper tension.

B. Tension Wire: install tension wires before stretching fabric and tie to each post with ties or clips.

C. Fabric: pull fabric taut 2 inches above grade level and tie to posts, rails, and tension wires. Attach fabric to terminal or gateposts by a stretcher bar and clip to other framework so that fabric remains in tension after pulling force is released.

D. Hinge gates to swing through 180 degrees from closed to open.

3.3 FARM FENCING

A. General installation shall be in accordance with FDOT Design Standards Index 801, as modified herein.

B. Fence shall be installed with wire side to the private property side.

C. Topping of the fence with barbed wire shall not be included unless existing farm fence includes barbed wire topping.

3.4 WOOD PRIVACY FENCING:

Shall be constructed as per industry standard with proper clearance below fence so as not to impede stormwater flow.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

A. GENERAL

The quantities to be paid for will be either the number of gates, the length of each type of fence, the number of corner post assemblies, constructed and accepted for the length of each type of fence with all other items necessary for construction as incidental. In addition, extra payment will be

made, for additional lengths of post approved by the County.

B. MEASUREMENT OF FENCE LENGTH

The length of fence to be paid for will be measured along the bottom of the fabric, out-to-out of end posts, in the completed and accepted fence. Measurement for Resetting Fence will be the actual length of existing fence reset, including gates when applicable.

C. CORNER POST ASSEMBLIES, PULL, AND END POST ASSEMBLIES

The number of corner post assemblies and of pull and end post assemblies to be paid for will be the number of such post as semblies constructed and accepted.

4.2 BASIS OF PAYMENT

A. BASIC ITEMS OF FENCING

The contract unit price will be full compensation for all work and materials necessary for the complete installation, including line posts, but not including the corner, end, and pull posts and the assemblies thereof.

B. ITEMS OF POST ASSEMBLIES

The Contract unit prices for the items of Corner Post Assemblies and Pull and End Post Assemblies will include the posts and the complete assemblies therewith for each such item. Approach posts and brace posts will be considered as part of the assembly of the corner, end, or pull post serves as a brace in more than one horizontal line.

C. PAYMENT RATES FOR EXTRA-LENGTH POSTS

For any length of posts in excess of the standard length for each particular type of post, approved by the Engineer as provided above, payment will be made for each foot in excess of the standard length at the percentage of the Contract unit price per foot for the item of Fencing, as shown in the following schedule:

Total Post Length	Steel and Aluminum Posts	Recycled Plastic & Timber Posts
Standard up to 14’	50%	60%
Between 14’ – 20’	60%	80%
Over 20’ *	*	*

*When the length of post exceeds 20 feet, the work of finishing and installing such posts and the costs incidental thereto will be paid for as unforeseeable through a change order.

The standard length of steel, recycled plastic and aluminum posts will be the required length as indicated in the plans for each type and case. The above provisions for extra length payment will apply to end, corner and pull posts.

The payment for additional length of post will include the cost of additional concrete to extend concrete bases, as applicable.

D. GATE PAYMENT

The quantities to be paid for will be full compensation for all labor, materials, posts and associated hardware for the complete installation of the type gate specified in the plans, and accepted by the County.

END OF SECTION 02800

SECTION 02900 - GRASSING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Specifications Sections apply to this Section.

B. Florida Department o f Transportation*, Standard Specifications for Road and Bridge Construction,* Section 570 and Section 981, *Latest Edition*

1.2 SUMMARY

Extent of grassing work is as specified or shown on the construction plans. Sodded areas disturbed during construction shall be re-sodded to match existing. Areas disturbed beyond specified construction area shall be sodded, at no additional expense, either to match existing or as per County direction.

1.3 SUBMITTALS

See par agraph 1. 9 A *Quality Control/Quality Assurance Submittals*, Section 1300.

1.4 DELIVERY AND STORAGE

A. General: Seed, fertilizer, sod and other grassing materials shall be stored under cover and protected from damaged which would make them unacceptable for use.

B. Seed: All seed shall be labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act in effect on the date of invitation for bids. All seed shall be furnished in sealed standard containers, unless exception is granted in writing. Seed, which has become wet, moldy, or otherwise damaged in transit or in storage, shall not be used.

C. Fertilizer: Fertilizer shall be delivered to the site in the original, unopened containers, each b earing the manufacturer's guaranteed analysis. Any fertilizer, which becomes caked or otherwise damaged, making it unsuitable for use, shall not be used.

D. Sod: Do not use sod which has been cut (stripped) for more than 48 hours. Stack all sod that is not planted 24 hours after cutting and maintain proper moist condition.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Lime: Lime shall be ground limestone (Dolomite) containing not less than 85 percent of total carbonates, and shall be ground to such a fineness that 50-percent will pass a 100-mesh sieve and 90-percent will pass a 20-mesh sieve.

B. Fertilizer: Apply fertilizer at the following rates:
10-10-10 1000 lbs/acre=0.2 lbs/sq yd
13-13-13 770 lbs/acre=0.16 lbs/sq yd

C. Seed: Apply seed at the rate as specified:

GRASS SEEDING RATES (Lbs/Ac)

TYPE OF SEED	**ZONE I**				**ZONE II**			
	COASTAL*		**INLAND**		**COASTAL***		**INLAND**	
	Mar.-Nov.	Nov.-Mar.	Mar.-Nov.	Nov.-Mar.	Mar.-Nov.	Nov.-Mar	Mar.-Nov.	Nov.-Mar.
PERMANENT GRASSES								
Unhulled Bermuda**		90		20		90		20
Hulled Bermuda**	60		15		60		15	
Bahia (Argentine or Pensacola)			180	180			180	180
QUICK GROWING GRASS								
Annual Rye Grass		90		90		90		90
TOTAL POUNDS PER ACRE	60	180	195	290	60	180	195	290

* Locations where salt sensitive plants may be adversely affected by high concentrations of salt in soils, water, or air. This may include seaside locations, low-lying areas subjected to periodic saltwater inundation from storms or high tides, or where salt intrusion into groundwater supply has occurred.

** Bermuda shall not be used in areas adjacent to existing or proposed landscaping.

NOTE: All seeding shall be performed meeting the requirements of Section 570 of the Standard Specifications

Activities such as clearing, grading, and excavating that will disturb one or more acres of land require coverage under the Generic Permit for Stormwater Discharge from Large and Small Construction Activities from the Florida Department of Environmental Protection, and implementation

of appropriate pollution prevention measures to minimize erosion and sedimentation. Please refer to the National Pollutant Discharge Elimination System (NPDES) Permit.

E. Mulch: The mulch material shall be dry straw or hay, consisting of oat, rye, or wheat straw, or of pangola, peanut, coastal Bermuda or Bahia grass, hay or compost; and shall be free from noxious weeds and plants. Any plant officially listed, as being noxious or undesirable by any Federal Agency, any agency of the State of Florida or any local jurisdiction in which the project is being constructed shall not be used. Furnish to the engineer, prior to incorporation onto the project, a certification from the Florida Department of Agriculture and Consumer Services, Division of Plant Industry, stating that the Mulch materials are free of noxious weeds. Any such noxious plant or plant part found to be delivered shall be removed by the Contractor at his expense. Only undeteriorated mulch, which can readily be cut into the soil, shall be used. The “air-dry” weight (as defined by the Technical Association of the Pulp and Paper Industry, for wood cellulose) shall be marked on each package by the producer. Apply mulch at a rate of 2 ton/acre or 1 lb/sq yd.

E. Sod: All sod shall be healthy Centipede Sod unless otherwise required. Sod shall be strongly rooted, free of weeds and undesirable grasses and capable of providing vigorous growth and development when planted. Sod shall match existing species where restoration is required as a result of the Contractor's work.

PART 3 - EXECUTION

3.1 REQUIREMENTS

All areas disturbed by the Contractor's operations, shall be grassed, unless otherwise noted.

3.2 PLANTING SEED

A. Grading: Areas to be grassed shall be graded to remove depressions, undulations, and irregularities in the surface before grassing. Adhere to grades as shown on plans.

B. Tillage: The area to be grassed shall be thoroughly tilled to a depth of four inches using a plow and disc harrow or rotary tilling machinery until a suitable bed has been prepared and no clods or clumps remain larger than 1½ inches in diameter. Remove sticks, roots, and rubbish.

C. Applying Lime: The pH of the soil shall be determined. If the pH is below 5.0, sufficient lime shall be added to provide a pH between 5.5 and 6.5. The lime shall be thoroughly incorporated into the top three to four inches

of the soil. Lime and fertilizer may be applied in one operation.

D. Applying Fertilizer: Fertilizer shall be applied in accordance with the rates specified in Part 2, and shall be thoroughly incorporated into the top three to four inches of soil before sod is installed. FDOT Section 982.

E. Seed and Mulch: Apply in accordance with the rates specified in Part 2.

F. Maintenance: Maintenance shall begin immediately following the last operation of grassing and continue until final acceptance. Maintenance shall include watering, mowing, replanting, and all other work necessary to produce a uniform stand of grass, all at the contractor's expense.

3.3 PLACING SOD

A. Use Centipede sod (Eremochloa ophiuroides) unless otherwise required. The sod shall have a thick mat of roots (minimum 2") with enough adhering soil to assure growth. Apply sod within 48 hours of stripping. Protect sod against drying and breaking of rolled strips.

B. Placement: Prepare the g ound by loosening the soil. Place sod perpendicular to the slope. Place sod on the prepared soil to form a solid mass with tightly fitted joints. Ensure the butt ends and sides of sod strips do not overlap. The seam should have a flush tight transition from new to existing sod with no overlap. Stagger strips to avoid a continuous downhill seam. Tamp or roll lightly to ensure contact with subgrade. Tamp the outer edges of the sodded area to produce a s mooth contour. Work sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering o f adjacent g rass. Water sod thoroughly with a fine spray immediately after planting.

C. Pinning: All sod placed on a slope steeper than 3:1 shall be pinned, at the top of the sod, at a rate listed in the table below:

Sod Size	Pins Required
Square Sod	2 pins per sod square
Mini Roll	3 pins per roll
Standard Rolls	1 pin per linear foot

C. Watering: Keep sod continuously moist to a depth below the root zone for three weeks after placement. If there is no water available to the site, the Contractor shall provide the water. Do not water in excess of 1" (one inch) per square yard per week for establishment.

D. Clean-Up: All excess soil, excess grass materials, stones, pallets and other waste shall be removed from the site daily and not allowed to accumulate. All paved areas shall be kept clean at all times.

E. Maintenance: Maintain sod by watering, fertilizing, weeding, mowing, trimming and other operations such as rolling, re-grading, and re-planting as required to establish a lawn free of eroded or bare areas and acceptable to the County. Where inspected work and materials do not comply with requirements, replace rejected work and continue maintenance until re-inspected by County and found to be acceptable. Remove rejected materials promptly from the project site. FDOT Section 570-4.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

The quantities to be paid for will be for the following items, completed and accepted: square yards of seeding, square yards of seeding and mulching, and square yards of sodding.

4.2 BASIS OF PAYMENT

Prices and payments will be full compensation for all work and materials specified in this Section.

END OF SECTION 02900

SECTION 03300 – PORTLAND CEMENT CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Specification Sections, apply to this Section.

B. Florida Department of Transportation (FDOT), *FDOT Material's Manual, Chapter 9.2, Volume II, FDOT Standard Specifications for Road and Bridge Construction, Section 346, 347, 350, 400, 522, & 925, Latest Edition.*

1.2 SUMMARY

This Section includes concrete work for the following:

1. Roadways
2. Parking lots
3. Curbs and gutters
4. Walkways
5. Pads
6. Flumes
7. Curb Ramps
8. Cast in Place Structures

1.3 SUBMITTALS

A. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, joint systems, curing compounds, dry-shake finish materials, and others if requested by the County.

B. Design mixes for each class of concrete. Include revised mix proportions when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

C. Material certificates in lieu of material laboratory test reports when permitted by the County. Material certificates shall be signed by manufacturer and Contractor certifying that each material item complies with or exceeds requirements. Provide certification from admixture manufacturers that chloride content complies with requirements.

1.4 PROJECT CONDITIONS

A. Traffic Control: Comply with requirements of Escambia County Specification, Section 04060, "Maintenance of Traffic."

B. Utilize flagmen, barricades, warning signs and warning lights as required, as shown on plans, or as directed by the County.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Concrete shall conform to requirements of FDOT Standard Specification, Sections 346, 347, & 522 for curbs, gutters, sidewalks, structures and miscellaneous concrete.

B. Concrete for pavement shall conform to requirements of FDOT Standard Specification, Section 350.

C. Curb Ramps shall conform to FDOT Design Standards Index 304.

2.2 REINFORCING MATERIALS

A. Reinforcing Bars and Tie Bars: ASTM A 615, Grade 60, deformed.

B. Welded Steel Wire Fabric: ASTM A 185.

1. Furnish in flat sheets, not rolls.

C. Deformed-Steel Welded Wire Fabric: ASTM A 497.

D. Fabricated Bar Mats: Welded or clip-assembled steel bar mats, ASTM A184. Use ASTM A615, Grade 60 steel bars, unless otherwise indicated.

E. Joint Dowel Bars: Plain steel bars, ASTM A615, Grade 60. Cut bars true to length with ends square and free of burrs.

F. Hook Bolts: ASTM A307, Grade A bolts, internally and externally threaded. Design hook bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

G. Supports for Reinforcement: Chairs, spacers, dowel bar supports and other devices for spacing, supporting, and fastening reinforcing bars, welded wire fabric, and dowels in place. Use wire bar-type supports complying with CRSI specifications. Use supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

A. Portland Cement: Type I, Type IP, Type IS, Type IP (MS), Type II, or Type III.

1. Use one brand of cement throughout Project.

2. All concrete shall develop a 28-day compressive strength of 3000 psi for non -structural (NS). If any concrete should fail to meet the strength requirement the structure shall be removed as necessary to remove the defective concrete and shall then be rebuilt at the Contractor's expense.

B. Fly Ash: ASTM C618, Class C or Class F.

C. Normal-Weight Aggregates: ASTM C33, Class 4, and as follows. Provide aggregates from a single source.

1. Maximum Aggregate Size: 1-1/2 inches.

2. Do not use fine or coarse aggregates that contain substances that cause spalling.

3. Local aggregates not complying with ASTM C33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to Engineer.

D. Water: Potable.

E. Fiber Reinforcement: Synthetic fibers engineered and designed for secondary reinforcement of concrete slabs, complying with ASTM C1116, Type III.

2.4 ADMIXTURES

A. Provide concrete admixtures that contain not more than 0. 01 percent chloride ions.

B. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.

C. Water-Reducing Admixture: ASTM C494, Type A.

D. High-Range Water-Reducing Admixture: ASTM C494, Type F or Type G.

E. Water-Reducing and Accelerating Admixture: ASTM C494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C494, Type D.

2.5 CONCRETE MIX

A. Prepare design mixes for each type and strength of normal-weight concrete

per FDOT Standard Specification, Section 346-6.2 and FDOT Material's Manual, Chapter 9. 2, Volume II. Use a qualified independent testing laboratory for preparing and reporting proposed mix designs. Do not use the Owner's field quality-control testing laboratory as the independent testing laboratory.

B. Fiber Reinforcement: Add to mix at rate of 1. 5 l b per cu. yd., unless manufacturer recommends otherwise.

C. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, project conditions, weather, test results, or other circumstances warrant.

2.6 CONCRETE MIXING

Ready-Mixed Concrete: Comply with requirements of FDOT Standard Specification, Section 346-7 and FDOT Material's Manual, Chapter 9.2, Volume II.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION FOR CONCRETE PAVEMENT

A. Proof-roll prepared base or subgrade surface to check for unstable areas and verify need for additional compaction. Do not begin concrete work until such conditions have been corrected and are ready to receive paving.

B. Remove loose material from compacted subbase surface immediately before placing concrete.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install sufficient forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.

B. Check completed formwork and screeds for grade and alignment to following tolerances:

1. Top of Forms: Not more than 1/8 inch in 10 feet.

2. Vertical Face on Longitudinal Axis: Not more than 1/4 inch in 10 feet.

C. Clean forms after each use and coat with form release agent as required ensuring separation from concrete without damage.

3.3 PLACING REINFORCEMENT

A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for " Placing Reinforcing Bars" for placing and supporting reinforcement. Comply with FDOT Standard Specification, Section 350-7.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Secure reinforcemen einforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces. Maintain minimum cover to reinforcement.

D. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction. Use of chairs is required. Welded wire fabric shall not be “pulled” to center of slab.

E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.

3.4 JOINTS

A. General: Construct control (contraction) joints, construction, and isolation joints true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to the centerline, unless indicated otherwise. When joining existing paving, place transverse joints to align with previously placed joints, unless indicated otherwise.

B. Control (Contraction) Joints: Control joints are grooved, formed, or sawed into sidewalks, driveways and concrete pavements so that cracking will occur in these joints randomly. If not specified on drawings, intervals shall be not greater than 10 feet or less than 5 feet. Construct control joints for a depth equal to at least 1/4 of the concrete thickness, as follows:

1. Tooled Joints: Form contraction joints in fresh concrete by grooving and finishing each edge of joint with a radiused jointer tool.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into hardened concrete when cutting action will not tear, abrade, spawl or ot herwise dam age s urface and before development of

random contraction cracks.

3. Inserts: Form contraction joints by inserting premolded plastic, hardboard, or fiberboard strips into fresh concrete until top surface of strip is flush with paving surface. Radius each joint edge with a jointer tool. Carefully remove strips or caps of two-piece assemblies after concrete has hardened. Clean groove of loose debris.

C. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than ½ hour, unless paving terminates at isolation joints.

1. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless indicated otherwise. Embed keys at least 1-1/2 inches into concrete.

2. Continue reinforcement across construction joints unless indicated otherwise.

D. Expansion Joints: Form expansion joints of preformed joint filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 30 feet, unless indicated otherwise or directed by County.

2. Extend joint fillers full width and depth of joint, not less than ½ inch or more than 1 inch below finished surface where joint sealant is indicated. Place top of joint filler flush with finished concrete surface when no joint sealant is required.

3. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together.

4. Protect top edge of joint filler during concrete placement with a metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

E. Filler and Sealants: Submit specifications to Engineer for approval.

F. Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one half of dowel length to prevent concrete bonding to one side of joint.

3.5 CONCRETE PLACEMENT

A. Comply with requirements of FDOT Standard Specification, Sections 350-8

and 400-7 for placing concrete.

B. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place. No concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. Deposit concrete as nearly as practical to its final location to avoid segregation. When concrete placing is interrupted for more than ½ hour, place a construction joint.

C. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

D. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, floating, or tamping. Use equipment and procedures to consolidate concrete complying with FDOT Standard Specification, Section 350-9.

E. Screed paved surfaces with a straightedge and strike off. Use bull floats or darbies to form a smooth surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces prior to beginning finishing operations.

F. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed. Remove and replace portions of bottom layer of concrete that have been placed more than 15 minutes without being covered by top layer or use bonding agent if acceptable to County.

G. Curbs and Gutters: Shall be constructed in accordance with FDOT Specs. When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete.

H. Slip-Form Pavers: When automatic machine placement is used for paving, submit revised mix design and laboratory test results that meet or exceed requirements. Produce paving to required thickness, lines, grades, finish, and jointing as required for formed paving. Compact subgrade of sufficient width to prevent displacement of paver machine during operations.

I. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength, or sufficient strength to carry loads without damage or injury. Maturity Method Testing, as outlined in FDOT Standard Specification, Section 353-10.2, should be used to determine

concrete strength.

J. Cold-Weather Placement: Comply with provisions of FDOT Standard Specification, Sections 346-7.4 and 400-7.1.1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

K. Hot-Weather Placement: Place concrete complying with FDOT Standard Specification, Sections 346-7.5 and 400-7.1.2, and as specified when hot weather conditions exist.

3.6 CONCRETE FINISHING

A. Float Finish: Begin floating when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand -floating if area is small or inaccessible to power units. Finish surfaces to true planes within a tolerance of 1/8 inch in 10 feet as determined by a 10-foot-long straight-edge placed anywhere on the surface in any direction. Cut down high spots and fill low spots. Refloat surface immediately to a uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across concrete surface perpendicular to line of traffic to provide a uniform fine line texture finish.

2. Tine Finishes: Apply to curb cut ramps and other areas as noted on the drawings. Finish shall be applied by an approved hand method and shall consist of transverse grooves which are 0.03 to 0.12 inch in width and 0.10 to 0.15 inch in depth, spaced at approximately ½ inch center to center.

B. Final Tooling: Tool edges of paving, gutters, curbs, and joints formed in fresh concrete with a jointing tool to the following radius. Repeat tooling of edges and joints after applying surface finishes. Eliminate tool marks on concrete surfaces. Radius: ½ inch.

3.7 CONCRETE PROTECTION AND CURING

General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with the recommendations of FDOT Standard Specification, Sections 350-11 and 925.

3.8 QUALITY CONTROL TESTING

A. A qualified, accredited testing and inspection laboratory, under the direction of a Professional Engineer, licensed in the State of Florida, shall sample materials, perform tests, and submit test reports during concrete placement as follows:

1. Sampling Fresh Concrete: ASTM C172, except modified for slump to comply with ASTM C94. All concrete should be sampled by ACI certified technicians.

    a. Slump: ASTM C143; one test at point of placement for each compressive-strength test but no less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.

    b. Air Content: ASTM C231, pressure method; one test for each compressive-strength test but no less than one test for each day's pour of each type of air-entrained concrete.

    c. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 40 deg F (4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.

    d. Compression Test Specimens: ASTM C31; one set of four standard cylinders for each compressive- strength test, unless directed otherwise. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.

    e. Compressive-Strength Tests: ASTM C39; one set for each day's pour of each concrete class, plus one set for each additional 50 cu. yd. Test one specimen at 7 days, two specimens at 28 days, and retain one specimen in reserve for earlier or later testing if required. Class I Concrete NS compression test specimens cylinders are not required, except as directed by County.

    f. Contractor shall repair the area to the satisfaction of the Engineer where material was removed for testing purposes. Should any work or materials fail to meet the requirements set forth in the plans and specifications, contractor shall pay for retesting of same.

2. Basis for acceptance of concrete will be per FDOT Standard Specification, Sections 346-8 through 346-11.

B. Test results will be reported in writing to the County, within 24 hours of testing. Reports of compressive strength tests shall contain the Project identification name and number, date and location of concrete placement, name of concrete testing laboratory, concrete type and class, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day and 28-day tests.

C. Nondestructive Testing: Non-destructive test methods may be used with approval of the Engineer, but shall not be used as the sole basis for acceptance or rejection.

D. Additional Tests: The testing laboratory will make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Engineer. Testing laboratory may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

3.9 REPAIRS AND PROTECTION

A. Remove and replace concrete work that is broken, damaged, or defective, or does not meet the requirements of this Section.

B. Drill test cores where directed by the County when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory concrete areas with Portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete from damage. Exclude traffic from concrete pavement for at least 14 days after placement. When construction traffic is permitted, maintain concrete as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete work free of stains, discoloration, dirt, and other foreign material. Sweep concrete paving not more than 2 days prior to date scheduled for Substantial Completion inspections.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

The quantities to be paid for will be the plan quantity, in square yards, of Plain Cement Concrete Pavement, Reinforced Cement Concrete Pavement, square yards of sidewalk, and linear feet of curb and/or gutter.

4.2 JOINTS AND CRACKS

The Contractor shall include the cost for Cleaning and Sealing Joints in the cost of the newly constructed pavement for: (1) transverse and longitudinal joint construction for new pavement; and (2) abutting joints between existing pavement and new pavement.

For replacing joint seals and sealing random cracks in existing Portland cement concrete pavement, the quantity to be paid for will be as specified below:

A. The length of pavement joint that has been satisfactorily cleaned and sealed in existing Portland cement concrete pav ement, as determined by field measurement along the joints, will be paid for at the Contract unit price per foot for Cleaning and Resealing Joints.

B. The length of random cracks in existing Portland cement concrete pavement that have been satisfactorily cut, cleaned, and sealed, as determined by field measurement along the joints, will be paid for at the Contract unit price per foot for Cleaning and Sealing Random Cracks.

4.3 BASIS OF PAYMENT

Prices and payment will be full compensation for all work specified in this Section, including any preparation of the subgrade not included in the work to be paid for under another Contract item; all transverse and longitudinal joint construction, including tie-bars and dowel bars; the furnishing of test specimens; repair of core holes; and all incidentals necessary to complete the work.

END OF SECTION 03300

SECTION 03310 – TIED CONCRETE BLOCK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Specification Sections, apply to this Section.

1.2 SCOPE OF WORK

A. Scope of Work The Contractor shall furnish all labor, materials, equipment, and incidentals required and perform all operations in connection with the installation of tied concrete erosion control mats in accordance with the lines, grades, design and di mensions shown on the Contract Drawings and as specified herein.

1.3 SUBMITTALS

A. The Contractor shall submit to the Engineer all manufacturer's performance research results and calculations in support of the tied concrete block mat system. Calculations and shop drawings shall be provided by the manufacturer for the means and methods necessary to place the mats in accordance with PART 2.A and in accordance with the plans. The shop drawings shall indicate the size and location of mats and placement along with providing the details and how the mats are tied together and are to be moved.

B. The Contractor shall furnish to the Engineer all manufacturers' specifications, literature, shop drawings for the installation of the mats, and any recommendations, if applicable, that are specifically related to this project.

PART 2 – PRODUCTS

2.1 PROJECTS

A. General Tied concrete block mats shall be manufactured or field fabricated from individual concrete blocks tied together with a high strength geogrid.

Each block shall be tapered, beveled and interlocked. Each block shall incorporate interlocking surfaces or connections that prevent lateral displacement of the blocks within the mats when they are lifted for placement.

B. Tied Concrete Block Mat

1. Scope: This specification covers concrete blocks for erosion control

mats used for stabilizing channels.

2. Materials Cementitious Materials - Materials shall conform to the following applicable ASTM specifications:

   a. Portland Cements -Specification C 150, for Portland Cement.
   b. Blended Cements -Specification C 595, for Blended Hydraulic Cements.
   c. Hydrated Lime Types -Specification C 207, for Hydrated Lime Types.
   d. Pozzolans -Specification C 618, for Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement Concrete.

   Aggregates shall conform to the following ASTM specifications, except that grading requirements shall not necessarily apply: Normal Weight -Specification C 33, for Concrete Aggregates.

3. Physical Requirements Durability. The manufacturer shall satisfy the purchaser by proven field performance that the concrete units have adequate durability even if they are to be subjected to a freeze-thaw environment.

TABLE 1. PHYSICAL REQUIREMENTS			
Compressive Strength Net Area Min. psi (mPa)		Water Absorption Max., lb/ft3 (kg/m3)	
Avg. of 3 units	Individual Unit	Avg. of 3 units	Individual Unit
4,000 (27.6)	3,500 (24.)	10 (160)	12 (192)

4. Visual Inspection: All units shall be sound and free of defects that would interfere with the proper placing of the unit or impair the strength or permanence of the construction. Surface cracks incidental to the usual methods of manufacture, or surface chipping resulting from customary methods of handling in shipment and delivery, shall not be deemed grounds for rejection.

5. Sampling and Testing: The purchaser or his authorized representative shall inspect the units upon delivery. Units missing more than 4 blocks per 80 square feet section shall be deemed grounds for rejection.

6. The tied concrete block mats shall have one or more of the following nominal characteristics: Minimum open area of 10%

   The tied concrete block mat shall exhibit resistance to mild concentrations of acids, alkalis, and solvents.

   Polypropylene Geogrid Revetment mat shall be constructed of high tenacity, low elongating, and continuous filament polypropylene fibers.

Interlocking geogrid shall have the following physical characteristics:
Mass/Unit Area: ASTM D-5261 7.0 oz/yd2 240 g/m2
Aperture Size: Measured 1.6 x 1.6 inch 40 x 40 mm
Wide Width Tensile Strength:
Machine Direction (MD) ASTM D-6637 2,055 lb/ft 30 kN/m Cross
Machine Direction (CMD) ASTM D-6637 2,055 lb/ft 30 kN/m
Elongation at Break: ASTM D-6637 6% 6%
Tensile Strength @ 2% :
Machine Direction (MD) ASTM D-6637 822 lb/ft 12 kN/m
Cross Machine Direction (CMD) ASTM D-6637 822 lb/ft 12 kN/m
Tensile Strength @ 5% :
Machine Direction (MD) ASTM D-6637 1,640 lb/ft 24 kN/m Cross
Machine Direction (CMD) ASTM D-6637 1,640 lb/ft 24 kN/m
Tensile Modulus @ 2%:
Machine Direction (MD) ASTM D-6637 41,100 lb/ft 600 kN/m Cross
Machine Direction (CMD) ASTM D-6637 41,100 lb/ft 600 kN/m
Tensile Modulus @ 5%:
Machine Direction (MD) ASTM D-6637 32,900 lb/ft 480 kN/m Cross
Machine Direction (CMD) ASTM D-6637 32,900 lb/ft 480 kN/m

NOTE: Polypropylene geogrid shall be determined by the manufacturer.

Tied concrete block mats are packaged in rolls. These are packaged with high strength lifting straps for moving material into place with an excavator.

PART 3 – CONSTRUCTION

A. Prior to placing the tied concrete block mats, prepare the sub grade as detailed on the plans. All subgrade surfaces prepared for placement of mats shall be smooth and free of all rocks, stones, sticks, roots, other protrusions, or debris of any kind.

B. The prepared surface shall provide a firm unyielding foundation for the mats with no sharp or abrupt changes or breaks in the grade.

C. Apply seed directly to the prepared soil prior to installation of the Tied Concrete Block Mat. Use seed per project specifications.

D. Install mats to the line and grade shown on the plans and according to the manufacturer's installation guidelines.

E. The manufacturer will provide technical assistance during the slope preparation and installation of the tied concrete block mats as needed.

C. Clean forms after each use and coat with form release agent as required ensuring separation from concrete without damage.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

The completed work as described shall be measured and paid for at the contract unit price per square yard.

4.2 BASIS OF PAYMENT

Prices and payment for Tied Concrete Block Material will be full compensation for all work (including but not limited to labor, equipment, and materials) specified in this Section, including any preparation of the Subgrade not included in the work to be paid for under another Contract item, and all incidentals necessary to complete the work.

END OF SECTION 03310

SECTION 03350 – PERVIOUS CONCRETE PAVING

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The work to be completed under this contract includes the furnishing of all labor, materials and equipment necessary for the construction of the dual-use system in accordance with the plans and these specifications.

1.2 REFERENCES

A. Environmental Protection Agency (EPA)
   1. Green Infrastructure - Statement of Intent

B. National Institute of Building Sciences (NIBS)
   1. Federal Green Construction Guide for Specifiers

C. American Concrete Institute (ACI)
   1. ACI 305 "Hot Weather Concreting"
   2. ACI 306 "Cold Weather Concreting"
   3. ACI Flatwork Finisher Certification Program
   4. ACI Field Technician Certification Program

D. American Society for Testing and Materials
   1. ASTM C33 "Specification for Concrete Aggregates"
   2. ASTM C94 "Specification for Ready-Mixed Concrete"
   3. ASTM C150 "Specification for Portland Cement"
   4. ASTM C494 "Specification for Chemical Admixtures for Concrete"
   5. ASTM C595 "Specification for Blended Hydraulic Cements"
   6. ASTM D3385 "Test Method for Infiltration Rate of Soils Using Double-Ring Infiltrometer"

E. National Ready Mixed Concrete Association (NRMCA)
   1. Pervious Concrete Contractor Certification Manual

1.3 QUALITY ASSURANCE

A. Prior to the award of contract, the proposed contractor must submit evidence of having the appropriate tools, and experience, to accomplish the work. Experience will be based on at least one person, in charge of the crew, being NRMCA Certified as a Pervious Concrete "Craftsman",

plus two crew members being Certified by the NRMCA as Pervious Concrete Technicians.

1.4 SPECIAL EQUIPMENT

A. Contractor must show evidence of having the specialized equipment required for the installation of Pervious Concrete Pavements. Pervious Concrete is finished and jointed using three classes of specialized rollers. These rollers consist of form-to-form, steel-pipe rollers which are 8-inches to 12-inches in diameter, and smaller cross-rollers, with tapered edges. A special flanged-roller is used to place control joints in the pervious concrete before the pavement is covered to moist-cure.

B. Project may require the use of vibratory screeds. These screeds must provide an adjustment for the frequency of vibration.

C. Project may require the use of a power-sprayer with a "fogging-nozzle" attachment.

1.5 SUBMITTALS

A. All submittals shall be approved prior to construction.

B. Plans shall be submitted to the County Engineer's Representative, by the Contractor indicating:

1. Proposed Start Date, sequence of construction, and time of completion, for the scope of work.

2. Proposed locations for all construction-joints, and control joints, in the pavement.

3. Sections and Details showing depths, and types of materials, for all locations in the scope of work.

C. A one-square-foot section of the proposed filter fabric shall be submitted to the County Engineer's Representative. Information regarding the properties of the material, manufacturer, suggested method of placement and guarantees shall also be submitted with the fabric.

D. A one-quarter-cubic-foot sample of the proposed washed, crushed-stone/gravel-fill for the infiltration basin (pavement base) shall be submitted to the County Engineer's Representative.

E. A Mix-Design, showing the weights of all materials, for the proposed pervious concrete pavement shall be submitted to the County Engineer's Representative. It shall be the Contractor's responsibility to become familiar with the properties, and workability, of the proposed mix-design.

F. Evidence of qualifications of the Contractor, as per the "Quality Assurance" section shall be submitted to the County Engineer's Representative.

1.6 TEST PANELS

A test panel shall be constructed by the Contractor, and approved by the County Engineer's Representative. The test panel shall become the "standard" by which the Contractor's work is judged for completion of work and payment schedules.

A. The test panel shall be constructed in accordance with the plans and specifications, and shall be a minimum of 225 square-feet. Construction of the test panel shall be accomplished by the same crew, equipment and materials as submitted for approval. The depth of all materials shall be the same as shown on the plans.

B. The cost of constructing, and removing (if necessary), the test panel shall be included in the contract bid.

PART 2 - MATERIALS

2.1 Filter Fabric: The filter fabric shall be a non-woven geotextile fabric suitable for the application, and installed as per the manufacturer's directions.

2.2 Infiltration Basin Gravel-Fill: The Infiltration Basin shall be filled with clean (washed) gravel or crushed stone. The stone material shall be a single-size, and have a diameter of from 3/4-inch to 2-inches, and shall comply with ASTM C33. The total depth of the gravel-fill shall be indicated on the plans.

2.3 Pervious Concrete: The permeable pavement section shall consist of portland-cement based pervious concrete. Pervious concrete has no ACI or ASTM Specifications. It is therefore recommended that the guidelines for Ready-Mixed Concrete, ASTM C94, be used as a general guideline for the manufacturing and delivery of the pervious concrete. It is the responsibility of the Contractor to work with the local Ready-Mix suppliers to finalize a mix-design that will be acceptable for this project. If the mix-design is new to the local supplier, then at least three trial-batches shall be made before the decision is made to use that particular mix design. Both the Contractor, and the Supplier, must agree on any particular mix design before it is submitted to the County Engineer's Representative.

PART 3 - EXECUTION

3.1 Subgrade: The subgrade is defined as the native soil, or finished grade, of any cut-and-fill operation that may be required to bring the soil elevation to proper grade. The top of subgrade is also the bottom of the clean-gravel. The final grade of the top of subgrade shall be <u>flat</u> (no slope), and at the proper elevation to allow for the thickness of the layer of gravel and the pervious concrete pavement. Final compaction of the subgrade shall take into effect the type of soil and permeability requirements, and requirements for pavement support. Compaction should be uniform, and not greater than 95%

3.2 Filter Fabric: The filter fabric shall be placed on top of the final grade by the Contractor following the Manufacturer's directions.

3.3 Infiltration Basin Gravel-Fill: The placement of the gravel should be done to

minimize destruction of the filter fabric, and over-compaction of the subgrade. Compaction of the gravel is unnecessary.

3.4 Pervious Concrete: The Pervious Concrete, including any formwork requirements, placement, jointing and curing, shall be done in accordance with the NRMCA "Pervious Concrete Contractor Certification" guidelines. It is the responsibility of the Contractor to become familiar with the NRMCA document to gain the knowledge required to properly place and finish pervious concrete pavements. The inclusion of the requirements, as set forth in the NRMCA document, becomes an integral part of these specifications.

3.5 Testing: The testing requirements for pervious concrete are generally for permeability and durability. Testing of the fresh pervious concrete is a visual test. The Contractor must have the basic knowledge of what constitutes a proper mix by a visual inspection when the material arrives on the jobsite. Traditional tests for fresh concrete, such as slump and air content, and making cylinders & beams for strength tests are not required for pervious concrete.

3.6 Maintenance: Maintenance of the paving during construction is the Contractor's responsibility. The pervious concrete pavement should be checked periodically for buildup of trash and debris. Trash and debris should be removed from the pavement by hard-vacuum systems as required. The pavement should be pressure-washed with the residue being removed by wet-vacuuming within seven (7) days of requesting final acceptance by the County Engineer.

END OF SECTION 03350

SECTION 04000 - TRAFFIC CONTROL SIGNS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Specifications Sections, apply to work of this section.

B. Unless otherwise specified on the work orders, plan sheets, or in other sections of this contract, all materials and work shall conform to the applicable requirements in the following document:

1. USDOT, Federal Highway Administration, *Manual on Uniform Traffic Control Devices for Streets and Highways*, *Latest Edition*.

2. USDOT, Federal Highway Administration, *Standard Alphabets for Highway Signs and Pavement Markings*, *Latest Edition.*

3. Florida Department of Transportation, *Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System*, *Latest Edition*.

4. Florida Department of Transportation, *Standard Specifications for Road and Bridge Construction*, section 700, *Latest Edition*.

1.2 DESCRIPTION OF WORK

The work under this section includes the fabrication and installation of standard and special traffic control signs (warning, regulatory, and guide). The Contractor shall furnish all labor, materials, tools, supplies, equipment, and machinery necessary to fully complete the work shown in the plans and in these specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

All materials shall be new and of good quality unless otherwise specified. The Contractor, at his own expense and if requested by the County, shall furnish samples of material and/or shall certify that the material meets all FDOT requirements. All material or work that has been rejected shall be remedied by the Contractor at his own expense and without delay. If the Contractor fails to promptly remove and/or dispose of rejected material and replace the same, the County may remove and replace the same and deduct the cost of the work from the contract amount.

If the Contractor chooses to use material other than specified herein, a sample of the material with supporting manufacturer's literature and specifications must be submitted to the County for prior approval.

PART 3 - EXECUTION

3.1 UTILITY SPOTS

All street name signs shall be fabricated and installed in accordance with the plans and related documents. Contractor shall contact Sunshine State One Call of Florida (811 or 800-432-4770) at least 48 hours prior to digging or driving posts.

3.2 SIGN INSTALLATION

A. Signs shall be placed at the locations illustrated and/or specified in the plans or related documents. The soil around the post shall be solidly tamped so that the sign will stand vertically.

B. If a sign cannot be placed where indicated due to a conflict, the Contractor shall immediately notify the County for an alternate location.

C. The date when each sign is installed shall be marked in permanent ink on the rear side of each sign.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

The quantity to be paid for will be plan quantity, unless otherwise provided.

4.2 BASIS OF PAYMENT

Price and payment will constitute full compensation for all work specified in this section. Payment for all items relating to traffic control signs will be included in the lump sum Maintenance of Traffic pay item.

END OF SECTION 04000

SECTION 04020 - POST MOUNTED STREET NAME SIGNS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Specifications Sections, apply to work of this section.

B. Unless otherwise specified on the plan sheets or in other sections of this contract, all materials and work shall conform to the applicable requirements in the following document:

1. USDOT, Federal Highway Administration *Manual on Uniform Traffic Control Devices for Streets and Highways*, *Latest Edition*.

2. USDOT, Federal Highway Administration *Standard Alphabets for Highway Signs and Pavement Markings*, *Latest Edition*.

3. Florida Department of Transportation, *Standard Specifications for Road and Bridge Construction, Section 700*, *Latest Edition*.

4. FDOT *Design Standards for design, Construction, Maintenance, and utility operations on the State Highway System*, *Latest Edition*.

5. Escambia County *Standard Details for Street Name Signs, Latest Edition.*

1.2 DESCRIPTION OF WORK

The work under this section includes the fabrication and installation of post mounted street name signs as shown or noted on plans. The Contractor shall furnish all labor, materials, tools, supplies, equipment, and machinery necessary to fully complete the work shown in the work order and in these specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

All materials shall be new and of good quality unless otherwise specified. The Contractor, at his own expense, shall, if requested by the County, furnish samples of material and/or shall certify that the material meets all FDOT requirements. All material or work that has been rejected shall be remedied by the Contractor at his own expense and without delay. If the Contractor fails to promptly remove and/or dispose of rejected material and replace the same, the County may remove and replace the same and deduct the cost of the work from the contract amount.

If the Contractor chooses to use material other than specified herein, a sample of the material with supporting manufacturer's literature and specifications must be submitted to the County Contract Administrator for prior approval.

Sign-blades reflective sheeting and posts shall conform to the details for street name signs.

PART 3 - EXECUTION

3.1 UTILITY SPOTS

All street name signs shall be fabricated and installed in accordance with the plans and related documents. Contractor shall contact Sunshine State One Call of Florida (811 or 800-432-4770) at least 48 hours prior to digging or driving posts.

3.2 SIGN LAYOUT AND LEGEND

Letter shape and width of stroke shall comply with FHWA & MUTCD standards. For street name signs, lettering, border and blade dimensions shall be consistent with the County's standard detail for street name signs.

3.3 SIGN INSTALLATION

A. Signs shall be placed at the typical locations shown in the plans. The soil around the post shall be solidly tamped so that the sign will stand vertically.

B. If a sign cannot be placed where indicated due to a conflict, the Contractor shall immediately notify the County for an alternate location.

C. The Contractor shall submit a *Fabricate, Install, and Removal Daily Report Sheet* (Exhibit D) of each sign installation placed for inspection by the County. Contractor shall repair or replace signs deemed unacceptable by the County, at no expense to the County.

3.4 REMOVAL OF SIGNS AND MARKERS

A. Existing metal street name signs and painted concrete street name markers specified for removal shall be removed from the site, delivered, and unloaded, as directed by the County.

B. Holes created by the removal of the signs and markers shall be filled with clean soil, which shall be firmly hand tamped to match the level of the surrounding ground.

PART 4 – MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

The quantities to be paid for will be:

1. The num ber and type of street name sign assemblies plus the number and type of auxiliary signs of each designated class complete.

2. The number of existing metal street name signs and concrete markers removed, relocated, modified, and placed on specified supports, of each designated class of assembly complete.

3. The number of each existing sign panel removed, complete.

4.2 BASIS OF PAYMENT

Price and payment will be f ull compensation for furnishing and i nstallation of all materials necessary to complete the signs in accordance with the details shown in the plans; including sign panels complete with sheeting, painting, and message; sign posts and supports, footings, excavation, etc.; and all other work specified in this Section, including all incidentals necessary for the complete item.

END OF SECTION 04020

SECTION 04030 – SPAN MOUNTED STREET NAME SIGNS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Specifications Sections, apply to work of this section.

B. Unless otherwise specified on the plan sheets or in other sections of this contract, all materials and work shall conform to the applicable requirements in the following document.

1. USDOT, Federal Highway Administration *Manual on Uniform Traffic Control Devices for Streets and Highways*, *Latest Edition*.

2. USDOT, Federal Highway Administration *Standard Alphabets for Highway Signs and Pavement Markings*, *Latest Edition*.

3. Florida Department of Transportation, *Standard Specifications for Road and Bridge Construction*, *Section 700, Latest Edition*.

4. FDOT *Design Standards for Design, Construction, Maintenance, and Utility Operations on the State Highway System*, *Latest Edition*.

1.2 DESCRIPTION OF WORK

The work under this section includes the fabrication of span mounted signs. The Contractor shall furnish all labor, materials, tools, supplies, equipment, and machinery necessary to fully complete the work shown in the work order and in these specifications.

PART 2 – PRODUCTS

2.1 MATERIALS

All materials shall be new and of good quality unless otherwise specified. The Contractor, at his own expense and if requested by the County Contract, shall furnish samples of material and/or shall certify that the material meets all FDOT requirements except as defined herein. All material or work that has been rejected shall be remedied by the Contractor at his own expense and without delay. If the Contractor fails to promptly remove and/or dispose of rejected material, the County may remove and replace the same and deduct the cost of the work from the contract amount.

If the Contractor chooses to use material other than specified herein, a sample of the material with supporting manufacturer's literature and specifications must be submitted to the County for prior approval.

2.2 SIGN BLADES

1. 0.125 gauge, 5052-H38 domestic aluminum alloy, 18" in height by various lengths.

2. 0.50' radius rounded corners free of sharp edges.

3. Color and corrosion resistance per Alodine 1200 F treatment or approved equivalent.

2.3 SIGN FACING

The sign facing and legend may be fabricated by any of the following methods and materials:

A. Green retro-reflectivity ink silk-screened onto white Diamond grade material.

B. Green electronic cuttable prismatic sheeting film over white Diamond grade material.

PART 3 – EXECUTION

3.1 GENERAL

All street name signs shall be fabricated in accordance with the plans and related documents.

3.2 SIGN LAYOUT & LEGEND

Letter shape and width of stroke shall comply with FHWA & MUTCD standards except as modified below for street names:

A. SIGN LAYOUT

1. Left and right margins shall be at least 2 inches.

2. Border width shall be 1" with 2" radius at all corners.

3. Arrows shall be 4" in height and 8" in length and placed 2" above the lower border.

4. Prefixes and suffixes shall be placed 3" below the upper border.

5. Sign lengths shall be in 6” increments as determined by the legend. Minimum length shall be 48 inches.

B. LETTERS

1. Letters shall be FHWA Series “C”, upper and lower case. However, Clearview font should be available upon request.

2. Street Names: Initial letters shall be 12” upper case and subsequent letters shall be 9” lower case. Names shall be centered between the upper and lower borders.

3. Prefixes and suffixes: Initial letters shall be 4” upper case and subsequent letters shall be 3” lower case.

4. Suffixes “nd”,"rd”. “st”, and “th” associated with numbered street names shall be 4” in height and positioned in the upper portion of the primary street name field.

3.3 SIGN INSTALLATION

A. Signs shall be placed at the typical locations shown in the plans.

B. If a sign cannot be placed where indicated on the plans due to a conflict, the Contractor shall immediately notify the County for an alternate location.

3.4 REMOVAL OF SIGNS

Existing metal street name signs specified for removal shall be removed from the site, delivered, and unloaded, as directed by the Engineer.

PART 4 – MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

The quantities to be paid for will be the number of square- feet of overhead signs span wire mounted, complete.

4.2 BASIS OF PAYMENT

Price and payment will be full compensation for furnishing and installation of all materials necessary to complete the signs in accordance with the details shown in the plans; including sign panels complete with sheeting, painting, and message; and all other work specified in this Section, including all incidentals necessary for the complete item.

END OF SECTION 04030

SECTION 04040 – PAVEMENT MARKINGS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Specifications Sections, apply to work of this section.

B. Unless otherwise specified on the plan sheets or in other sections of this contract, all materials and work shall conform to the applicable requirements in the following documents:

1. Florida Department of Transportation *Roadway and Traffic Design Standards*, Indices 17344 through 17359, *Latest Edition*.

2. Florida Department of Transportation *Standard Specifications for Road and Bridge Construction*, Sections 701, 705, 706, 710, 711, 970, 971, and 993, *Latest Edition*.

3. USDOT, Federal Highway Administration *Manual on Uniform Traffic Control Devices for Streets and Highways*, *Latest Edition*.

1.2 DESCRIPTION OF WORK

The work under this section includes the installation and removal of temporary and permanent pavement markings, textured pavement, reflective markers, galvanized posts, flex posts, delineators, wheel stops, and audible and vibratory pavement markings. The Contractor shall furnish all labor, materials, tools, supplies, equipment, and machinery necessary to fully complete the work shown in the plans and in these specifications. Pavement marking notes on plan sheets shall take precedence over and modify conflicting Technical Specifications.

PART 2 – PRODUCTS

2.1 MATERIALS

All materials shall be new and of good quality unless otherwise specified. The Contractor, at his own expense and if requested by the County, shall furnish samples of material and/or shall certify that the material meets all FDOT requirements. All material or work that has been rejected shall be remedied by the Contractor at his own expense and without delay. If the Contractor fails to promptly remove and/or dispose of rejected material and replace the same, the County may remove and replace the same and deduct the cost of the work from the contract amount.

2.2 TEMPORARY PAVEMENT MARKINGS

Materials for temporary pavement marking shall meet all requirements of FDOT Specs, Section 710, *Latest Edition.*

2.3 PERMANENT PAVEMENT MARKINGS

Materials for permanent pavement markings shall meet all requirements of FDOT Specs, Section 711, *Latest Edition*.

2.4 REFLECTIVE PAVEMENT MARKERS

Materials for reflective pavement markers shall meet all requirements of FDOT Specifications, Sections 706, *Latest Edition*.

2.5 OBJECT MARKERS AND DELINEATORS

Materials for object markers shall meet all requirements of FDOT Specifications, Sections 705, *Latest Edition*.

2.6 AUDIBLE AND VIBRATORY PAVEMENT MARKINGS

Materials for audible and vibratory pavement markings shall meet all requirements of FDOT Specifications, Sections 701, *Latest Edition*.

PART 3 – EXECUTION

3.1 GENERAL

All pavement markings shall be applied in accordance with FDOT requirements.

3.2 TEMPORARY PAVEMENT MARKINGS

Temporary pavement markings shall be installed at the end of each day on new pavement surfaces and shall be maintained until permanent markings are installed.

3.3 PERMANENT PAVEMENT MARKINGS

Permanent pavement markings, including painted stripes, thermoplastic stripes, and reflective pavement markers, shall be installed as shown in the plans. Materials and installation shall conform to applicable standards in the documents referenced in Section 1.1. Installation of permanent markings on all final asphaltic concrete surfaces shall not be accomplished prior to 14 calendar days, nor later than 30 calendar days, after placement of the final surfaces.

3.4 RETROREFLECTIVITY

The Contractor shall, within thirty days of completion, furnish retroreflectivity

readings certifying the materials meet all FDOT requirements as per Part I, 1.1.B.2, Sections 710 and 711.

PART 4 – MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

The engineer or project manager may specify a lump sum or measurement of quantities.

The quantities to be paid for under this Section will be the length in feet or gross mile of Skip Traffic Stripes, the length in feet or gross mile of Solid Traffic Stripes, the number of directional arrows and pavement messages, painted, the area in square feet or of Reflective Paint (Island Nose), and the area in square feet or the length in feet to Remove Existing Markings. Measurement will be taken as the distance from the beginning of the first painted stripe to the end of the last painted stripe with proper deductions made for unpainted intervals will not be included in pay quantity.

4.2 BASIS OF PAYMENT

Prices and payment will be full compensation for all work specified in this Section, including, all cleaning and preparing of surfaces, furnishing all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.

END OF SECTION - 04040

SECTION 04060 - MAINTENANCE OF TRAFFIC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Specifications Sections, apply to work of this section.

B. Unless otherwise specified on the plan sheets or in other sections of the specifications, all materials and work shall conform to the applicable requirements in the following documents:

1. *Florida Department of Transportation Design Standards*, *Latest Edition*.

2. *Florida Department of Transportation Standard Specifications for Road and Bridge Construction*, Section 102, *Latest Edition*.

3. USDOT, Federal Highway Administration *Manual on Uniform Traffic Control Devices for Streets and Highways*, *Latest Edition*, Part 6 Temporary Traffic Controls.

4. *FDOT Minimum Specifications for Traffic control and Devices*, *Latest Edition*.

1.2 SUMMARY OF WORK

The work under this section includes the maintenance of traffic within the limits of the project for the duration of construction.

PART 2 – PRODUCTS - Not Used.

PART 3 - EXECUTION

3.1 RESPONSIBILITIES OF CONTRACTOR

A. Control and maintain traffic and provide for the safety of the work area in accordance with Maintenance of Traffic (MOT) Plan included in the contract documents. Contractor shall comply with all aspects of said plan. Conduct operations in a manner that will not interrupt pedestrian and vehicle traffic except as approved by the County Engineer/Traffic Division. Confine the work area to the smallest area practical to allow the maximum use of the street and sidewalk and to reduce any hazard to vehicles and pedestrians to a minimum.

B. Maintain access to properties that adjoin the work. Contact property owners

and assure that access is coordinated prior to commencing work that may block access.

C. Furnish all labor, materials, tools, supplies, equipment, and machinery needed to fully comply with the specifications described on the plan sheets and in this Section. At all times, the Contractor shall use workers and traffic control devices necessary to comply with all applicable provisions contained in the reference documents listed in Section 1.1.

D. The Contractor shall notify the agencies and media listed below in writing, 48 hours in advance, of any work within the road right-of-way that may interfere with vehicle and/or pedestrian traffic.

1. WCOA Radio – Tel: 478-6011; Fax: 478-3971

2. Pensacola News Journal Tel: 435-8500; Fax: 435-8633; Email: news@pensacolanewsjournal.com

3. Escambia County Emergency Management Tel: 471-6315; Fax: 471-6322; Email: bob_boschen@co.escambia.fl.us

4. Escambia County Engineering Tel: 595-3440

5. Escambia County Sheriff Tel: 436-9630; Fax: 436-9128; Email: traffic@escambiaso.com

6. Florida Highway Patrol Tel: 484-5000; Fax: 393-3405; Email: stevepreston@flhsmv.gov

7. Escambia County School District Tel: 469-5591; Fax: 469-5661; Email: transportation@escambia.k12.fl.us and rdoss@escambia.k12.fl.us

8. Escambia County Administration Tel: 595-4900; Fax: 595-4908; Email: Cheryl_Lively@co.escambia.fl.us

9. Escambia County Area Transit Tel: 595-3228; Fax: 595-3222; Email: Ted_Woolcock@co.escambia.fl.us

3.2 PENALTIES AND SUSPENSION OF WORK

The County may verbally direct the Contractor to immediately suspend work if appearance of violation of safety regulations is found. In such an event, Contractor shall immediately stop work and secure any potential hazards from the public until the potential violation is confirmed and/or corrected to satisfaction of the County. Law enforcement officers may be called to assist the County in suspending work if the Contractor is not responsive. Suspension of work for violation of safety

or additional payment.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

A. Maintenance of Traffic: Where the plans require the use of trucks and truck mounted impact attenuators, these items will not be paid for separately but shall be included in the cost of Maintenance of Traffic. Only use those attenuators that have been tested by a facility approved by the Engineer and certified as meeting the requirements as specified in NCHRP 350 and that have been properly maintained.

B. Law Enforcement Services: The quantity to be paid for will be at the Contract unit price per hour for the actual number of officers on the project site. Payment will be made only for those off-duty law enforcement officers specified in the MOT and authorized by the County.

C. When the plans show more than one detour facility is included in the proposal, payment will be made under Maintenance of Traffic.

D. Materials for Driveway Maintenance: The quantity to be paid for will be, in square yards, of all materials authorized by the County, acceptably placed and maintained for driveway maintenance. The quantity will be determined by in place measurement.

4.2 BASIS OF PAYMENT

A. MAINTENANCE OF TRAFFIC (GENERAL WORK): Price and payment will be full compensation for all work and costs specified under this Section except as may be specifically covered for payment under other items.

B. LAW ENFORECEMENT: Prices and payment will be considered full compensation for the services of the off-duty law enforcement officer, including a marked law enforcement vehicle and all other direct and indirect costs.

C. SPECIAL DETOURS: Price and payment will be full compensation for providing all detour facilities shown on the plans and all costs incurred in carrying our all requirements of this Section for general maintenance of traffic within the limits of the detour, as shown on the plans.

END OF SECTION 04060

SECTION 04090 – CONSTRUCTION OF TRAFFIC SIGNALS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Unless otherwise specified by the County, or in other sections of this specification, all work shall conform with the applicable requirements in the following documents:

1. Florida Department of Transportation, *Design Standards for Design, Construction,* Maintenance and Utility Operations on the State Highway System, *Latest Edition*.

2. FDOT, *Standard Specifications for Road and Bridge Construction*, *Latest Edition*.

3. FDOT, *Minimum Specifications for Traffic Control Signals and Devices, Latest Edition.*

4. United States Department of Transportation (USDOT), Federal Highway Administration, *Manual on Uniform Traffic Control Devices for Streets and Highways*, *Millennium Edition*.

5. *National Electric Code*, including latest revisions.

1.2 DESCRIPTION OF WORK

The work under this section involves the installation and modification of traffic signal equipment. Work will be initiated through the issuance of Work Orders that will identify a specific scope and location.

PART 2 - PRODUCTS

2.1 CONTRACTOR-FURNISHED PARTS AND EQUIPMENT

A. The Contractor shall furnish all transportation, plant, labor, materials, safety signs, supplies, equipment, and other facilities and things necessary to fully complete the work described in this specification.

B. The requirements and procedure described in Sections 603-2, 603-3, 603-5, 603-6, 603-7, and 603-8 of the FDOT *Standard Specifications for Road and Bridge Construction, Latest Edition* shall apply.

2.2 COUNTY-FURNISHED EQUIPMENT INSTALLED BY CONTRACTOR

Where the plans include installation of County-furnished equipment, the County will turn over such equipment to the Contractor when the construction progress allows or as designated in the plans. The County will bear the costs of correcting any defects in the equipment found by the Contractor. The Contractor will maintain the equipment in proper operational condition after pick-up at no cost to the County until either final acceptance or the equipment is returned to the County.

2.3 REMOVED PARTS AND EQUIPMENT

A. Equipment that is removed and suitable for reuse shall be delivered to the County as indicated on the construction plans. Such equipment shall be tagged as to the location from which it was removed.

B. Parts and equipment that are removed and not suitable for reuse, but have salvage value, shall be delivered to the Road Department facility, 601 North Hwy 297A, Cantonment.

C. Parts and equipment that are removed, not suitable for reuse, and without salvage value, shall be properly disposed by the Contractor, at his expense.

PART 3 - EXECUTION

3.1 QUALIFICATIONS

A. The Contractor shall have a sufficient amount of prior satisfactory experience in the construction of all traffic signal components including closed-loop systems and video detection systems.

B. All persons operating and maintaining signal equipment shall be fully trained and qualified. The Contractor shall have all work performed under the direct, on-site, supervision of a person certified at the “Traffic Signal, Level II” level, or higher, by the International Municipal Signal Association (I.M.S.A.). The Contractor shall furnish a copy of the certificate issued by the I.M.S.A. for each technician to the Contract Manager before execution of the contract.

3.2 OPERATIONS

A. The Contractor shall replace entire sidewalk slabs and driveway slabs, at the Contractor’s expense, if they are damaged.

B. All public land corners and monuments encountered shall be protected by the Contractor. Corners and monuments which conflict with the work and in danger of disturbance shall be properly referenced by a Florida registered surveyor prior to beginning work at the site. The Contractor

shall assume all costs associated with restoration of corners and monuments.

C. The Contractor shall coordinate and perform service transfers and adjustments with Gulf Power Company.

D. The Contractor shall remove all surplus materials from the right-of-way within 24 hours.

3.3 REPORTS

A. The Contractor shall test each new ground rod and ground rod assembly in accordance with FDOT standards. Record test results and certify accuracy on a Traffic Signal Resistance Data Sheet (re: Appendix "A"). Furnish the original certified data sheet to the Contract Manager.

B. Contractor shall test each new loop assembly in accordance with FDOT standards. Record test results and certify accuracy on a Traffic Signal Resistance Data Sheet (re: Appendix "A"). Furnish the original certified data sheet to the Contract Manager.

3.4 COMPLETION TIME

The Contractor shall complete work according to the schedule specified in the Work Order. Typically, completion time will be specified according to the representative schedule provided below.

A. Construct school zone flashing beacon assembly (pedestal-mount): complete within 60 days.

B. Construct new multi-phase traffic signal: Order equipment from vendors within 10 business days from date of Work Order. Complete installation within 30 days upon receipt of all equipment from vendors.

C. Install signal head and/or cable to create a left-turn phase: complete within 30 days.

D. Install new controller assembly: Order equipment from vendor within 5 business days from date of Work Order. Complete installation within 30 days upon receipt from vendor.

E. Install pedestrian detector station with or without signals: complete within 30 days.

F. Install new loop assembly: complete within 10 business days.

3.5 INSPECTION AND ACCEPTANCE OF WORK

Acceptance procedures described in Sections 611-2, 611-3, and 611-4 of the FDOT *Standard Specifications for Road and Bridge Construction, Latest Edition*, shall apply unless otherwise specified in the Work Order.

PART 4 - MEASUREMENT/PAYMENT

4.1 METHOD OF MEASUREMENT

Measurement and payment of all items will be made in accordance with the current Construction and Response Maintenance Contract on file with the Escambia County Office of Purchasing.

END OF SECTION 04090

Appendix “A”

TRAFFIC SIGNAL RESISTANCE MEASUREMENTS DATA SHEET

Intersection: _____

LOOP ASSEMBLY RESISTANCE

	Loop Location/No. Resistance	Series Resistance	Insulation Resistance
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

GROUND ROD RESISTANCE

	Rod	Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Signature of Contractor’s Representative
IMSA Level II-Certified Technician

Date