

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				I. CONTRACT ID CODE	PAGE OF PAGES	
				J	1	1
2. AMENDMENT/MODIFICATION NO. 0004		3. EFFECTIVE DATE 08-Aug-2003	4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO.(If applicable)	
6. ISSUED BY USA ENGINEER DISTRICT, JACKSONVILLE PRUDENTIAL OFFICE BLDG 701 SAN MARCO BLVD CESAJ-CT JACKSONVILLE FL 32207-8175		CODE DACW17	7. ADMINISTERED BY (If other than item 6) CO-W SO FL AREA OFFICE 4400 PGA BLVD, SUITE 203 CESAJ-CO-W PALM BEACH FL 33410		CODE DACW17	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)				X	9A. AMENDMENT OF SOLICITATION NO. DACW17-02-B-0019	
				X	9B. DATED (SEE ITEM 11) 14-Jun-2002	
					10A. MOD. OF CONTRACT/ORDER NO.	
					10B. DATED (SEE ITEM 13)	
CODE		FACILITY CODE				
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS						
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input checked="" type="checkbox"/> is extended, <input type="checkbox"/> is not extended.						
Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.						
12. ACCOUNTING AND APPROPRIATION DATA (If required)						
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.						
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.						
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).						
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:						
D. OTHER (Specify type of modification and authority)						
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.						
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM RESTORATION PROJECT, TEN MILE CREEK WATER PRESERVE AREA, ST. LUCIE COUNTY, FLORIDA Any enclosures accompanying this amendment should be inserted in the plans and/or specifications as applicable. All superseded materials should be removed or adequately marked to indicate that they have been superseded. THE NEW BID OPENING DATE IS BEING EXTENDED TO 19 AUGUST 2003, 2:00 P.M.						
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.						
15A. NAME AND TITLE OF SIGNER (Type or print)				16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)		
				TEL:	EMAIL:	
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED	16B. UNITED STATES OF AMERICA		16C. DATE SIGNED	
(Signature of person authorized to sign)			BY _____ (Signature of Contracting Officer)		08-Aug-2003	

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

SF 30 CONTINUATION SHEET

Ten Mile Creek Water Preserve Area, Central and Southern Florida Ecosystem
Critical Restoration Project, St. Lucie County Florida.

DESCRIPTIVE CHANGES TO SPECIFICATIONS: The following are descriptive changes to the specifications. Specifications should be adequately marked to indicate that they have been changed.

1. Asterisks appear before and after the line or lines where revisions have been made to the text on the enclosed revised pages and pertain only to the changes made by this amendment except where the reverse side of a page has been previously amended; however, these can be identified by the amendment number opposite the page number at the bottom of each page.

2. Some specification revisions include additions with underlined text or deletions with line/cross-outs.

3. The text changes may have necessitated reformatting of subsequent text or pages. If this is the case, those pages have also been issued as amended pages but are not marked with asterisks, underlining or line/cross-outs.

SECTION 00010 (SF 1442):

a. **Remove** page 1 and page 2 of Section 00010 and **replace** them with the new page 1 and page 2 of Section 00010.

SECTION 00330:

a. On page 3, paragraph 1.3.2.1, **insert** the following at the end of the paragraph: "Contact Area Engineer for project site access. See Section 01330, paragraph 3.1."

SECTION 01500:

- a. On page 13, paragraph 3.8, line 3, **change** "at the work site" to "along the entire work site boundary".
- b. On page 13, paragraph 3.9a, line 2, **change** "entire right-of-way lines" to "project work boundary."
- c. On page 13, paragraph 3.9b, line 1, **delete** "28".
- d. On page 14, paragraph 3.10.2, **insert** the following to the list of required office equipment: "3 - Telephone lines - 1 for voice, 1 for Fax and 1 for data (Internet)."

SECTION 01571:

a. On page 6, **delete** paragraph 1.10.

SECTION 02220A:

a. On page 6, paragraph 3.7.3, add the following sentence to the end of the paragraph: "This work includes tree and vegetation removal from all ditches and canals within the clearing limits."

SECTION 02230A:

a. On page 2, paragraph 3.1, **insert** the following before the first sentence: "Clearing of the entire site, as defined by the limits of work/clearing, shall be performed once, and should be performed as one of the initial construction activities."

SECTION 02331A:

- a. **Remove** Section 02331A in its entirety and **replace** it with the new Section 02331A.

SECTION 02378A:

- a. **Remove** Section 02378A in its entirety and **replace** it with the new Section 02378A.

SECTION 02381:

- a. On page 7, paragraph 2.2, line 2, **change** "1,0000" to "1,000".
- b. On page 10, paragraph 3.5.3, line 3, **change** "8" to "12".

SECTION 07170N:

- a. On page 4, paragraph 3.2, line 1, **insert** "when indicated," after "waterproofing".
- b. On page 4, paragraph 3.2, line 2, **replace** "where indicated" with "elsewhere".

SECTION 11150:

- a. On page 9, paragraph 2.4.2, line 1, **delete** "In salt-water applications, use 316 stainless steel".
- b. On page 9, paragraph 2.4.7, line 2, **delete** "If under water or used in a salt-water application, use 316 stainless steel".
- c. On page 9, paragraph 2.4.8, line 2, **delete** "If under water or used in a salt-water application, use 316 stainless steel".
- d. On page 10, paragraph 2.4.9, line 2, **delete** "In salt-water applications, use 316 stainless steel".

SECTION 11288A:

- a. On page 4, paragraph 1.2.1, **add** the following to the schedule:

<u>Item</u>	<u>Description</u>	<u>Quantity</u>	<u>Working Hydrostatic Pressure in PSI</u>
5	42" x 42" Vertical Lift Slide Gate for Distribution Flume	2	10

SECTION 15133A:

- a. On page 25, paragraph 2.14.1, line 1, **insert** "The ECP/EIB shall be the responsibility of the engine manufacturer. See other specification sections and contract plans for details." before the word "Each".

SECTION 16450A:

- a. On page 8, paragraph 3.3, line 1, **insert** "The ECP/EIB shall be the responsibility of the engine manufacturer. See other specification sections and contract plans for details." before the word "The".
- b. **Insert** Appendix "A" at the end of Section 16450A.

DESCRIPTIVE CHANGES TO THE DRAWINGS: The following are descriptive changes to the drawings. Drawings should be adequately marked to indicate that they have been changed.

DRAWING 1/3:

- a. **Remove** Drawing 1/3 and **replace** it with the new Drawing 1/3.

DRAWING 1/5:

- a. **Remove** Drawing 1/5 and **replace** it with the new Drawing 1/5.

DRAWING 3/21:

- b. **Remove** Drawing 3/21 and **replace** it with the new Drawing 3/21.

DRAWING 3/42:

- a. **Remove** Drawing 3/42 and **replace** it with the new Drawing 3/42.

DRAWING 3/48:

- a. **Remove** Drawing 3/48 and **replace** it with the new Drawing 3/48.

DRAWING 5/1:

- a. **Remove** Drawing 5/1 and **replace** it with the new Drawing 5/1.

DRAWING 6/1:

- a. **Remove** Drawing 6/1 and **replace** it with the new Drawing 6/1.

DRAWING 6/40:

- a. **Remove** Drawing 6/40 and **replace** it with the new Drawing 6/40.

DRAWING 6/42:

- a. **Remove** Drawing 6/42 and **replace** it with the new Drawing 6/42.

DRAWING 6/43:

- a. **Remove** Drawing 6/43 and **replace** it with the new Drawing 6/43.

DRAWING 6/44:

- a. **Remove** Drawing 6/44 and **replace** it with the new Drawing 6/44.

DRAWING 6/65:

- a. **Remove** Drawing 6/65 and **replace** it with the new Drawing 6/65.

DRAWING 6/66:

- a. **Remove** Drawing 6/66 and **replace** it with the new Drawing 6/66.

DRAWING 7/3:

- a. **Remove** Drawing 7/3 and **replace** it with the new Drawing 7/3.

DRAWING 7/4:

- a. **Remove** Drawing 7/4 and **replace** it with the new Drawing 7/4.

DRAWING 7/8:

- a. **Remove** Drawing 7/8 and **replace** it with the new Drawing 7/8.

DRAWING 8/3:

- a. **Remove** Drawing 8/3 and **replace** it with the new Drawing 8/3.

DRAWING 8/8:

a. **Remove** Drawing 8/8 and **replace** it with the new Drawing 8/8.

DRAWING 8/14:

a. **Remove** Drawing 8/14 and **replace** it with the new Drawing 8/14.

DRAWING 8/16:

a. **Remove** Drawing 8/16 and **replace** it with the new Drawing 8/16.

--End of Changes--

SOLICITATION, OFFER, AND AWARD <i>(Construction, Alteration, or Repair)</i>	1. SOLICITATION NO. DACW17-02-B-0019	2. TYPE OF SOLICITATION <input checked="" type="checkbox"/> SEALED BID <i>(IFB)</i> <input type="checkbox"/> NEGOTIATED <i>(RFP)</i>	3. DATE ISSUED 06 JUNE 2003	PAGE OF PAGES
	IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.			

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.
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7. ISSUED BY USA ENGINEER DISTRICT, JACKSONVILLE PRUDENTIAL OFFICE BUILDING 701 SAN MARCO BLVD., CESAJ-CT JACKSONVILLE, FL 32207-8175	CODE DACW17	8. ADDRESS OFFER TO BY HAND: DELIVER TO "ISSUED BY" ADDRESS BY MAIL: USAED JACKSONVILLE, PO BOX 4970, ATTN: CESAJ-CT JACKSONVILLE, FL 32232-0019
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9. FOR INFORMATION CALL:	A. NAME CLAURICE M. DINGLE	B. TELEPHONE NO. <i>(Include area code) (NO COLLECT CALLS)</i> 904 232-3736
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SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS *(Title, identifying no., date):*

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM CRITICAL RESTORATION PROJECT, TEN MILE CREEK WATER PRESERVE AREA, ST. LUCIE COUNTY, FLORIDA

DRAWINGS: D.O. FILE #402-38,236, DATED OCTOBER 2001, 231 SHEETS PLUS COVER

DESCRIPTION OF WORK: SEE PAGE 00010-3

MAGNITUDE OF CONSTRUCTION IS BETWEEN \$10,000,000 AND \$25,000,000

THIS IS AN UNRESTRICTED PROCUREMENT BEING ISSUED PURSUANT TO PL 100-656 UNDER THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM. ALL BUSINESSES ARE ENCOURAGED TO PARTICIPATE.

YOU MUST BE REGISTERED IN THE CENTRAL CONTRACTING REGISTRATION IN ORDER TO BE ELIGIBLE TO RECEIVE AN AWARD FROM THE SOLICITATION. CALL 1-888-227-2423 FOR INFORMATION.

* 11. The Contractor shall begin performance within 30 calendar days and complete it within 730 calendar days after receiving award, notice to proceed. This performance period is mandatory, negotiable. (See Section 00700)

12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? <i>(If "YES," indicate within how many calendar days after award in Item 12B.)</i>	12B. CALENDAR DAYS
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10

13. ADDITIONAL SOLICITATION REQUIREMENTS:
- A. Sealed offers in original and 0 copies to perform the work required are due at the place specified in Item 8 by 14:00:00 (hour) local time 8/19/03 (date). If this is a sealed bid solicitation, offers will be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.
 - B. An offer guarantee is, is not required.
 - C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.
 - D. Offers providing less than 60 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

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02331A

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02331A

LEVEE CONSTRUCTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils
ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))
ASTM D 2216	(1998) Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D 2487	(1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1996) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4253	(1993; R 1996) Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D 4254	(1991; R 1996) Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
ASTM D 4318	(1998) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 4643	(1993) Determination of Water (Moisture)

Content of Soil by the Microwave Oven
Method

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (1996) U.S. Army Corps of Engineers Safety
and Health Requirements Manual

FLORIDA STATE HIGHWAY AND TRANSPORTATION DEPARTMENT (F.D.O.T.)

Section 901 (2000) F.D.O.T. Standard Specifications
for Road and Bridge Construction, Coarse
Aggregates

1.2 DEFINITIONS

1.2.1 Clearing

Clearing shall consist of the removal and satisfactory disposal of all above ground and below ground trees, downed timber, snags, slash, brush, garbage, trash, debris, fencing, and other items occurring in the designated areas to be cleared.

1.2.2 Grubbing

Grubbing shall consist of the removal and satisfactory disposal of stumps, roots larger than 2 inches in diameter, and matted roots from the designated grubbing areas. Grubbing also includes filling of holes from the grubbing operation.

1.2.3 Stripping

Stripping shall consist of the removal and satisfactory disposal of crops, weeds, grass, and other vegetative materials to the ground surface and topsoil to a depth of 12 inches.

1.2.4 Satisfactory Materials

Satisfactory materials shall consist of materials classified in accordance with ASTM D 2487 as SP, SW, GW, GP, GM, SW-SM, SP-SM, SP-SC free from: roots and other organic matter; contamination from hazardous, toxic or radiological substances; trash, debris; and materials with a maximum 12 percent passing the No. 200 sieve. Not all satisfactory materials can be used in levee. Only the satisfactory materials stated above, meeting the additional or modified requirements of paragraph TYPES OF FILL MATERIALS, can be used for levee construction. Material for compacted levee fill classified SP-SC may be classified as suitable material if not more than 12 percent of the material by weight shall pass a standard No. 200 sieve and shall be blended with other satisfactory materials.

1.2.5 Unsatisfactory Materials

Unsatisfactory materials shall not be used in any levee or other required fill. Unsatisfactory materials includes all other materials that are not defined above as satisfactory materials and include man-made structures,

refuse, garbage, and previously compacted fills.

1.2.6 Embankment

The terms "levee" or "embankment" as used in these specifications are defined as the earth fill portions of the levee structure or other fills related to the levee structure, and includes all types of earth fill and filter materials for the levee and all other fills within the limits of the levee, excepting those stone and filter materials used for slope protection, which are described in Section 02381 SOIL AND PORTLAND CEMENT LEVEE PROTECTION.

1.2.7 Backfill

Backfill as used in this section is defined as that fill material which cannot be placed around or adjacent to a structure until the structure is completed or until a specified time interval has elapsed after completion.

1.2.8 Excavation

Excavation shall consist of removal of material to the lines and grades shown on the drawings, or as otherwise directed or approved by the Contracting Officer and as described in paragraph 3.8 EXCAVATION in PART 3 EXECUTION.

1.2.9 Classification of Soils

Materials used to construct the embankments and for backfills shall be classified in accordance with ASTM D 2487 (Unified Soil Classification System).

1.2.9.1 Cohesionless and Cohesive Materials

Cohesionless materials shall include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.

1.2.10 Degree of Compaction

1.2.10.1 Cohesionless Material

Degree of compaction shall be expressed as a percentage of the relative density in accordance with ASTM D 1557.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Contractor-Furnished Rights-of-way for Drainage

If private property is to be used for drainage, submit written evidence that the right has been obtained from the property owner for drainage on his property. Written evidence shall consist of an authenticated copy of the conveyance or easement under which the Contractor acquired the property rights and access thereto, prepared and executed in accordance with applicable State and local requirements.

Work Plan

Submit a Work Plan for construction of the reservoir earth levee for approval of the Contracting Officer.

SD-03 Product Data

Shoring, Sheeting, and Bracing

Submit a detailed shoring, sheeting and bracing plan, including Florida Trench Safety Act compliance, 30 days prior to the beginning of any excavation so supported. The plan for shoring, sheeting and bracing shall be prepared and certified by licensed professional engineer. The plan shall include drawings and design computations of the proposed shoring, sheeting, and bracing, and documentation, showing details of the coordination and approval of shoring, sheeting, and bracing by the applicable parties. Approval of the detailed plan shall be obtained from the Contracting Officer prior to starting the work. If necessary, the plan shall be modified as required to meet field conditions, and the modifications shall be approved by the Contracting Officer prior to use.

Excavation

Submit a written excavation plan, as part of the Work Plan, 30 days prior to the beginning of any excavation. Approval of the detailed plan shall be obtained from the Contracting Officer prior to starting the work. If necessary, the plan shall be modified as required to meet field conditions, and the modifications shall be approved prior to use. As a minimum, the plan shall contain, the following:

- a. Proposed methods for preventing interference with, or damage to, existing underground or overhead utility lines, trees designated to remain and other man-made facilities or natural features designated to remain within or adjacent to the construction rights-of-way.
- b. Provision for coordinating the work with other Contractors working in the construction rights-of-way or on facilities crossing or adjacent to this work.

- c. The proposed methods for controlling surface and ground water in the borrow areas and required excavations.
- d. Stockpiling plan for embankment material before it is transported to the project site showing locations, stockpile heights, slopes, limits, and drainage around the stockpile areas.
- e. A complete listing of equipment used for excavation and to transport the excavated material.
- f. The Contractor's proposed sequence of work for excavating the borrow areas with plan and cross sectional views showing starting and final work locations and clearing, grubbing and stripping limits.
- g. The Contractor's proposals for conserving arable land and for making optimum use of available borrow, including the Contractor's proposed methods for grading the bottom of the borrow areas after completing use of the borrow areas.
- h. The Contractor's proposed plan for implementing dust control measures.

Borrow Areas; G|AE.

Submit a written statement to the Government not later than 30 days after receipt of Notice to Proceed indicating the Contractor's intention to use the specified Government-furnished borrow area(s), Contractor-furnished borrow area(s) or a combination of these borrow areas.

Levee Material; G|AE

At least 30 days prior to use of any soil materials, the Contractor shall submit soil classification test results and gradation curves per 7500 cubic yards used of each type of soil material.

Filter Materials; G|AE

At least 30 days prior to delivery of any Contractor-furnished material to the site of the work, the Contractor shall submit soil classification test results and a gradation curve for each of the proposed filter materials to be used. See paragraph 3.8.7 Toe Drains.

Nuclear Density

Nuclear density testing equipment shall be used in accordance with ASTM D 2922 and ASTM D 3017. In addition, the following condition shall apply:

- a. Prior to using the nuclear density testing equipment on the site, the Contractor shall submit to the Contracting Officer a

certification that the operator has completed a training course approved by the nuclear density testing equipment manufacturer, the most recent data sheet from the manufacturer's calibration, and a copy of the most recent statistical check of the standard count precision.

b. The nuclear density testing equipment shall be capable of extending a probe a minimum of 6 inches down into a hole.

SD-06 Test Reports

Test Reports shall be submitted to the Contracting Officer within 24 hours of test being done.

1.4 SYSTEM DESCRIPTION

The work covered by this section consists of furnishing all equipment, labor, materials, and incidentals, and performing all operations necessary for the clearing, grubbing, and stripping of the areas specified herein or indicated on the drawings, and for the removal and disposal of cleared, grubbed, and stripped materials, removal of existing drainage structures, and refilling of holes resulting from grubbing; excavation of borrow areas and for all other excavations incidental to the construction of levees, channels, ditches and structures as specified and shown; foundation preparation and the construction of new levee, backfill of berms, road crossings, backfill at drainage structures, and other incidental earthwork as may be necessary to complete the levee as specified herein and as shown on the drawings. All work under this section shall comply with the requirements of EM 385-1-1.

1.5 GENERAL CONDITIONS

1.5.1 Lines and Grades

The embankment and backfill shall be constructed to the lines, grades, and cross sections indicated on the drawings, unless otherwise directed by the Contracting Officer. The Government reserves the right to increase or decrease the foundation widths and embankment slopes or to make such other changes in the embankment or backfill sections as may be deemed necessary to produce a safe structure. Changes in quantities resulting from such revisions will not constitute justification for change in contract unit prices, except as provided for in the Variations in Estimated Quantities Clause. The Contractor shall correct settlement or consolidation of the embankment material subsequent to the completion of the embankment at no additional cost to the Government. The end slopes and side slopes of partial fill sections shall not be steeper than one vertical on 2 horizontal, unless otherwise shown on the drawings.

1.5.2 Conduct of the Work

The Contractor shall maintain and protect the embankment and backfill in a satisfactory condition at all times until final completion and acceptance of all work under the Contract. If, in the opinion of the Contracting Officer, the hauling equipment causes horizontal shear planes or slicken

sides, rutting, quaking, heaving, cracking, or excessive deformation of the embankment or backfill, the Contractor shall limit the type, load, or travel speed of the hauling equipment on the embankment or backfill. The Contractor may be required to remove, at his own expense, any embankment material placed outside of prescribed slope lines. Any approved embankment or backfill material which is lost in transit or rendered unsuitable after being placed in the embankment or backfill and before final acceptance of the work shall be replaced by the Contractor in a satisfactory manner and no additional payment will be made therefor. The Contractor shall excavate and remove from the embankment or backfill any material which is unsatisfactory and shall also dispose of such material and refill the excavated area as directed, all at no cost to the Government.

1.5.3 Materials

Materials for embankment and backfill construction will be obtained from on-site borrow sources and required excavation. Materials obtained from required excavation which meet or which can be processed to meet the requirements for each embankment material, or any other material required for this project, as specified herein, may be utilized in the embankment or as backfill. All roots, limbs, and wood fragments shall be removed from embankment materials. Materials containing sod, other organic or perishable material, trash, debris, and frozen materials shall not be used in the embankment. The intention is to use the most suitable materials obtainable from these sources. Material to be wasted will be specifically designated at the time the material is excavated. Mixing of materials during the excavating process at the borrow area may be required.

1.5.4 Haul Roads

Haul roads shall be located and constructed as approved by the Contracting Officer within the project boundaries. Prior to the commencement of construction the Contractor shall submit for approval a site plan detailing the location of all haul roads within the project limits. Haul road(s) between the borrow site(s) and the levee embankment shall be located within the limits approved by the Contracting Officer. The limits of the borrow haul road shall be clearly marked in the field using construction fencing or similar methods approved by the Contracting Officer. Areas on each side of the borrow haul road corridor shall not be disturbed. Haul roads shall be constructed to maintain the intended traffic, be free draining, and be maintained in good condition throughout the contract period. Any haul road which crosses any creek or drainage channel shall be constructed, and maintained by the Contractor so as to not flood either upstream areas by restricting stream flows or flood downstream areas by the release of any stored water in the event that the crossing fails for any cause. Haul roads constructed during the contract duration shall be removed after work is completed and the impacted area restored to its preconstruction conditions except for haul roads for stockpile of suitable soil in the designate spoil storage area. All costs associated with these haul roads shall be considered as a subsidiary obligation of the Contractor.

1.5.5 Ramps and Crossings

The Contractor, at his expense, will be permitted to construct temporary

ramps and crossings at locations approved by the Contracting Officer. Ramps and crossings shall be constructed only by adding material to the levee crown and slopes. Ramps shall have a minimum 12 foot crown width, a grade not to exceed 8 percent, and 1V on 4H side slopes.

1.5.6 Stockpiling

When the excavation from approved borrow sources progresses at a faster rate than placement in the fill is being accomplished, such excavated material shall be stockpiled at approved locations adjacent to the work until its use is authorized. Any on-site stockpiling of levee embankment materials shall be in accordance with paragraph 3.11 Stockpiles. No payment will be made for such stockpiling nor for the reloading and hauling of these materials to their final position.

1.5.7 Slides and Foundation Failures

When sliding occurs in any part of the embankment and backfills prescribed in this section after they have been placed, but prior to final acceptance of all work under the contract, the Contractor shall repair the slide as directed by the Contracting Officer. When the slide is caused through the fault of the Contractor, the repair shall be made at no cost to the Government. When the slide is not the fault of the Contractor, an equitable adjustment in the contract price shall be made pursuant to the Contract Clause CHANGES to cover the cost of the repairs.

1.5.8 Protection of Existing Man-Made Facilities and Natural Features

Embankment construction shall be conducted in such a manner as to avoid damage to trees left standing outside the embankment areas, existing F.P.L. power lines and fiber optic cables, man-made facilities and natural environmental sensitive areas, with due regard to the safety of employees and others, and in compliance with EM 385-1-1.

1.5.9 Drainage

The Contractor shall not block or restrict the flow in a natural drain, existing culvert, ditch or channel at any time without obtaining prior written approval from the Contracting Officer. This approval shall not relieve the Contractor from responsibility for any damage caused by his operation. The Contractor shall monitor the canal or drain flows and provide sufficient free discharge areas so that conditions are not worsened upstream or downstream by possible floods during construction. Surface water shall be directed away from excavations and construction sites so as to prevent erosion and undermining of foundations. Diversion ditches, dikes, and grading shall be provided and maintained as necessary during construction. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site and the area immediately surrounding the site and affecting operations at the site shall be continually and effectively drained.

1.6 PERMITS

In accordance with Contract Clause PERMITS AND RESPONSIBILITIES, the

Contractor shall obtain all necessary permits required for disposal, hauling, erosion control, burning, dewatering, well drilling, septic tank, and pay all fees associated with permitting and compliance. In addition, the Contractor shall obtain permits for storm water discharge, as specified in Section 01355 ENVIRONMENTAL PROTECTION and Section 1571 TEMPORARY CONTROLS - CIVIL HEAVY EARTH WORKS. The Contractor shall comply with the terms of these permits and with the requirements of these sections.

1.7 PROJECT SITE CONDITIONS

1.7.1 Protection of Cultural and Natural Resources

All work and Contractor operations shall comply with the requirements of Section 01355 ENVIRONMENTAL PROTECTION and with the requirements of this section.

1.7.2 Protection of Existing Man-Made Facilities and Natural Features

Trees within the clearing area shall be felled in such a manner as to avoid damage to trees left standing and trees outside the clearing area, existing utilities, man-made drainage facilities and natural features, with due regard to the safety of employees and others, and in compliance with EM 385-1-1. Excavation shall be conducted in such a manner as to avoid damage to trees left standing and trees outside the clearing and excavation area, existing Florida Power & Light, BellSouth, man-made facilities and environment sensitive natural features, with due regard to the safety of employees and others, and in compliance with EM 385-1-1. Existing utility lines that are shown on the drawings or the locations of which are made known to the Contractor prior to excavation are to be retained shall be protected from damage during excavation. When utility lines that are to be removed are encountered within the area of operations, the Contractor shall notify the applicable utility companies in sufficient time for measures to be taken to prevent interruption of the services.

1.7.3 Historical, Archeological, and Cultural Resources

Historical, archeological, and cultural resources within the Contractor's work limits may exist. If, during construction activities, the Contractor observes items that may have historical or archeological value, such observations shall be reported immediately to the Contracting Officer so that appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in the destruction of these resources and shall prevent his employees from trespassing on or otherwise damaging such resources.

1.7.4 Subsurface Data

Subsurface investigation reports and samples of materials obtained from subsurface investigations may be examined at the U.S. Army Corps of Engineering Distribution Warehouse, Tallyrand Avenue at 20th Street, Jacksonville, Florida District Office. These data represent subsurface information at the boring locations; however, variations may exist in the subsurface between boring locations. Groundwater levels indicated on the

soil boring logs were levels found at the time of exploration. The groundwater table can vary significantly depending on time of year, variation from normal precipitation, and river stage or tide level.

1.8 SEQUENCE OF WORK

1.8.1 Clearing and Grubbing

All clearing and grubbing work shall be completed at least 300 feet in advance of embankment construction. In locations where work on drainage structures is performed prior to embankment construction, all clearing and grubbing shall be completed for the structure at least 300 feet on each side of the structure, measured along the levee centerline and 100 feet perpendicular to the structure. If regrowth of vegetation or trees occurs after clearing and grubbing and before placement of embankment, the Contractor will be required to clear and grub again prior to embankment construction.

1.8.2 Stripping

After inspection and acceptance of cleared and grubbed areas, stripping may proceed. All stripping work shall be completed not more than 300 feet in advance of embankment construction.

PART 2 PRODUCTS

2.1 HAUL ROAD MATERIALS

See Paragraph 1.5.4 Haul Roads.

2.2 TYPES OF FILL MATERIALS

2.2.1 Pervious Fill

This material for levee construction shall consist of an inorganic, non-plastic, granular soil containing less than 12 percent material passing the No. 200 mesh sieve (relatively clean sand or a crushed limerock with a 3-inch maximum particle size with a Unified Soil Classification of GP, GW, SP, SW, SP-GM, SW-GM, SP-SC, SW-SM or SP-SM. Each lift of soil or blended on-site soils (sandy clay and clayey sand) to produce a blend having not more than 12 percent material passing the No. 200 sieve thoroughly compacted with the vibratory roller until densities equivalent to at least 95 percent of the modified proctor maximum dry density in accordance with ASTM D 1557.

2.2.2 Coarse Drainage Gravel

Coarse gravel material for the rectangular toe drains shall be obtained from a source provided by the Contractor. Coarse drainage gravel shall be non-calcareous, composed of tough durable particles, and shall not contain any organic material or soft, friable particles in quantities. Blast furnace slag will not be permitted. The gravel material in-place shall meet the requirements of F.D.O.T. Section 901, Size No. 24.

2.2.3 Filter Fabric

Filter fabric for the continuous levee toe drain enclosure shall meet the requirements of Section 02378 GEOTEXTILES USED AS FILTERS.

2.2.4 Bedding

Bedding material, placed as a backing layer shall consist of satisfactory pervious fill material satisfying the material requirements presented in Section 02380 STONE CHANNEL SHORELINE/COASTAL PROTECTION FOR STRUCTURES.

2.2.5 Topsoil

Topsoil consists of organic soil and shall be placed on the levee slopes as shown on the contract drawings and as specified in Section 02921 SEEDING.

PART 3 EXECUTION

3.1 CLEARING

- a. Clearing shall be accomplished within the limits of a line 20 feet outside the toe of slope of the storage reservoir and the treatment cell levees.
- b. Clearing shall be accomplished to the edge of the natural native tree line on the north, west and south in the surplus material storage area, clear to the Canal 93 right-of-way on the east.
- c. Clearing within the limits of the FP&L right-of-way along the west side of the storage reservoir. Trees within 25 feet either side of FP&L fiber optic cables shall be sawed off 6 inches above grade and removed without disturbing their root system.
- d. Clearing shall be accomplished to the limits of work line shown on the drawings for Pump Station 382.
- e. Clearing shall be accomplished within the limits described above. Trees, downed timber, snags, slash, brush, garbage, trash debris, fencing and other items shall be cleared flush with the ground surface. Trees, power poles and vegetation to be left standing or to remain shall be protected from construction operations.

3.2 GRUBBING

* Grubbing shall be accomplished within the limits described for clearing in paragraphs 3.1a and 3.1b. ~~Grubbing shall be accomplished to a depth of at least 3 feet below the existing ground surface.~~ Roots or other intrusions over 1-1/2 inches in diameter within the levee foundation area shall be removed to a depth of 3 feet below natural ground surface. *

3.2.1 Filling of Holes

All holes caused by grubbing operations and removal of pipes and drains, excluding holes in borrow areas and ditches above required grade, shall be

* filled with satisfactory material as specified in paragraph 2.1.1. This material shall be placed in 212 inch layers to the elevation of the adjacent ground surface and each layer compacted to a density at least equal to that of the adjoining undisturbed material. *

3.2.2 Existing Ditches That Occur Beneath the Levee Footprint

Clear, grub and demuck ditches to remove all vegetation and any soft or organic soils from the ditch for a distance of 25 feet outside the interior and exterior toes of the levee. The sides of the ditches within this section should be sloped back on a 1h:1v or flatter slope. The bottom and side slopes of the ditches should be scarified prior to placing any backfill. Backfill consisting of the same material as will be used for levee construction, should be placed in 12 inch loose lifts and each lift compacted in the same degree of compaction as the levee embankment material.

3.3 STRIPPING

* The entire area within the limits of clearing (except FP&L easement) shall be stripped to remove crops, weeds, grass, and other vegetative materials to the ground surface and topsoil to a depth of 612 inches. *

3.4 DISPOSITION OF CLEARED, GRUBBED, AND STRIPPED MATERIAL

Except as otherwise specified or indicated on the drawings, all materials resulting from clearing and grubbing operations shall, at the Contractor's option, be disposed of either by burning, removal from the site, or a combination thereof. In no case shall any material resulting from clearing and grubbing operations be buried or permanently placed within the levee foundation or any structural foundation. The Contractor shall make a reasonable effort to channel merchantable material into the commercial market and to make beneficial use of the materials resulting from clearing and grubbing. The topsoil material resulting from the stripping operations shall be temporarily stockpiled within the reservoir area.

3.4.1 Burning

Subject to applicable Federal Clean Air Act requirements, State and local burning restrictions enacted under the authority of the Federal Clean Air Act, the Contractor may by and, in accordance with Contractor secured permit, burn material within the storage reservoir limits per specification Section 02220 DEMOLITION. Burning operations shall be conducted so as to prevent damage to adjacent man-made facilities and natural features. The Contractor shall be responsible for any damage to life and property resulting from fires that are started by the Contractor's employees or as a result of the Contractor's operations. The Contractor shall furnish, at the site of burning operations, adequate fire fighting equipment to properly equip personnel for fighting fires. Fires shall be guarded at all times and shall be under constant surveillance until they have been extinguished. All unburned material (material not reduced to ash) shall be removed from the site and disposed of by the Contractor off site.

3.4.2 Removal from Site of Work

The Contractor shall remove all of the cleared and grubbed materials from the site of the work. The Contractor shall, at his option, either retain any such materials of value for his own use or dispose of them by sale or otherwise. The Government is not responsible for the protection and safekeeping of any materials retained by the Contractor. Such materials shall be removed from the site of the work before the date of completion of the work.

3.5 REMOVAL OF ABANDONED PIPE AND CONDUITS

Abandoned pipes and conduits shall be removed to the limits of clearing specified and as shown on the drawings and as specified in Section 02220 DEMOLITION.

3.6 SHORING, SHEETING, AND BRACING

Shoring, sheeting, and bracing shall be installed where required for the protection of existing natural features and man-made facilities, for the safety of workers and the public, in compliance with EM 385-1-1, and to insure the integrity of the embankment. Shoring, sheeting and bracing shall not be used in lieu of the required excavation slopes. Shoring, sheeting, and bracing shall be adequately designed and properly installed to withstand anticipated loads. Shoring, sheeting and bracing shall be planned and designed by a registered professional engineer. The Contractor shall submit a plan for shoring, sheeting, and bracing in accordance with paragraph SUBMITTALS. All shoring, sheeting and bracing shall be removed as embankment and backfill operations progress.

3.7 DEWATERING AND DIVERSION

Surface and groundwater control shall be accomplished in coordination with the required excavation and embankment construction. Surface and/or groundwater control may necessitate the use of temporary diversion ditches, cofferdams and/or dewatering by the use of pumping. Methods for care of surface water and for controlling the surface and groundwater levels shall conform to Section 1355 ENVIRONMENTAL PROTECTION and Section 1571 TEMPORARY CONTROLS - CIVIL HEAVY EARTHWORKS, paragraph Work Plan and as required by the Contracting Officer.

3.8 EXCAVATION

Excavation shall consist of removal of material in preparing the foundations to the lines and grades shown on the drawings, removal of material from ditches and channels to the lines and grades shown on the drawings, removal of objectionable materials and obtaining required fill materials from the excavated areas. Over excavation shall be backfilled to grade with similar over excavated material or satisfactory material and compacted to a density of at least that of the surrounding material.

3.8.1 Over Excavation

3.8.1.1 Outside Limits of Levee Foundations or Structures

Over excavation outside the limits of the foundations of levees or

structures shall be backfilled to grade with similar over excavated material or satisfactory material and compacted to a density of at least that of the surrounding material.

3.8.1.2 Within Limits of Levee Foundations or Structures

Over excavation within the limits of the foundations of levees or structures shall be backfilled to grade in accordance with paragraph PREPARATION OF FOUNDATION, PARTIAL FILL SURFACES AND ABUTMENTS.

3.8.2 Structures

Excavations for structures shall conform to the dimensions and elevations indicated for each structure and footing, except as specified hereinafter, and shall include trenching for utility and foundation drainage systems to a point 5 feet beyond each structure and all work incidental thereto. Excavation shall extend a sufficient distance from walls and footings to allow for placing and removal of forms. Satisfactory material removed below the depths indicated without specific direction of the Contracting Officer shall be replaced at no additional cost to the Government and filled in accordance with paragraph OVER EXCAVATION above. Over excavation below required invert elevations or bottoms of footings shall be backfilled with lean concrete at no additional cost to the Government. No footings shall be constructed on unsatisfactory material as determined by the Contracting Officer. Excessively wet and/or soft material in subgrades resulting from water ponding in footing excavations shall be removed and replaced with satisfactory material compacted to the density of the surrounding undisturbed material.

3.8.3 Channels

Pump station intake channels shall be excavated at the locations and to the lines and grades shown on the drawings and in accordance with paragraph TOLERANCES.

3.8.4 Ditches

Drainage ditches and bench areas shall be excavated at the locations and to the lines and grades shown on the drawings and in accordance with paragraph TOLERANCES.

3.8.5 Slopes and Surcharges

Temporary excavation slopes for any channel, structure excavation, or other required excavation shall not be steeper than the specified finished slope or the specified construction slope, as applicable, and subject to the approval of the Contracting Officer. This may be accomplished by benching the temporary slope so that the average slope is not steeper than the specified slope. In addition, no temporary, permanent, or construction slope shall be surcharged with excavated or stockpiled material or with heavy construction equipment which would have the same effect as the surcharge material. The toe of stockpiled material shall be maintained a minimum distance back from the top of the finished excavation equal to the depth of the excavation. The maximum height of such stockpile without

causing instability of the excavation slope shall be determined by the Contractor. Any slide or other adverse conditions caused by failure of the Contractor to maintain these conditions shall be considered the responsibility of the Contractor and remedial measures shall be at the Contractor's expense.

3.8.6 Borrow Areas

Borrow from collector ditches and bench areas shall be excavated by the Contractor to the lines and grades as shown on the drawings. Any excavation below the depths and slopes specified herein or shown on the drawings shall be backfilled by the Contractor, at the Contractor's expense, to the specified permissible excavation line, with satisfactory material(s) as specified by the Contracting Officer to a density of at least that of the surrounding material. Borrow areas shall be drained and kept dry during excavation.

3.8.7 Toe Drains

Levee toe drains shall be excavated to the dimensions and the locations indicated on the drawings. Material shall meet the requirements of F.D.O.T. Section 901.

3.8.8 Utilities

Excavations for pipe beds shall be shaped to fit the contour of the pipe over a width of not less than 0.6 of the pipe diameter, or as shown on the drawings.

3.8.9 Riprap and Soil Cement

Excavations for riprap and soil cement shall be performed at the locations and to the lines and grades shown. See Section 02380 STONE AND CHANNEL PROTECTION FOR STRUCTURES and Section 02381 SOIL AND PORTLAND CEMENT LEVEE PROTECTION.

3.9 TOLERANCES

* ~~A tolerance of 1 inch above or below the prescribed grade will be allowed in the excavation for ditches, bedding, and mandatory borrow areas. A tolerance of 3 inches above or below the prescribed grade will be allowed in the excavation for ditches, bedding, and mandatory borrow areas. All embankments and backfills shall be constructed to the grades, lines, and cross-sections shown on the drawings. At all points a tolerance plus 6 inches minus 0 inches the prescribed grade will be permitted in the final dressing, provided that any excess material is so distributed that the crown of the levee drains and that there are no abrupt humps or depressions in any surfaces. For topsoil, a tolerance of 1 inch above the thickness as shown on the drawings will be permitted.~~
~~All embankments and backfills shall be constructed to the grades, lines, and cross-sections shown on the drawings. At all points a tolerance of 1 inch above or below the prescribed grade will be permitted in the final dressing, provided that any excess material is so distributed that the crown of the levee drains and that there are no abrupt humps or depressions~~

~~in any surfaces. For topsoil, a tolerance of 1 inch above the thickness as shown on the drawings will be permitted.~~ *

3.10 SLIDES

In case sliding occurs in any part of the excavations prescribed in this section after they have been excavated, but prior to final acceptance of all work under the contract, the Contractor shall repair the slide as directed by the Contracting Officer. In case the slide is caused through the fault of the Contractor, it shall be repaired at no cost to the Government. In case the slide is due to no fault of the Contractor, an equitable adjustment in the contract price will be made for the repairs in accordance with the Contract Clause CHANGES.

3.11 STOCKPILES

Provisions of paragraph SLOPES AND SURCHARGES are applicable to all stockpiled materials. Upon completion of construction operations, all remaining stockpiled material shall be removed and disposed of by the disposal methods specified in paragraph DISPOSITION OF EXCAVATED MATERIALS.

3.12 SURFACE DRAINAGE OF COMPLETED AREAS

The areas shown on the drawings designated as "GRADE FOR SURFACE DRAINAGE", the borrow areas, and the finished embankment areas shall be graded to the lines and grades shown on the drawings. The surface shall be free from sharp ridges, gullies, potholes, sinkholes, and any other surface irregularities. A tolerance of 1 inch above or below the prescribed grade will be allowed provided that the surface drains in the direction as indicated on the drawings.

3.13 MAINTENANCE OF WORK

3.13.1 Debris Removal

The Contractor shall maintain all ditch and channel excavations free from leaves, brush, sticks, trash, and other debris until final acceptance of all work under the contract at no additional cost to the Government.

3.13.2 Sediment Removal

Prior to final acceptance of all work under this contract, the removal of sediments from ditch or channel excavations shall be required to restore design grade and section at no additional cost to the Government.

3.14 DISPOSITION OF EXCAVATED MATERIALS

3.14.1 Satisfactory Materials

Satisfactory excavated material shall be incorporated in the appropriate zones of the embankment. Satisfactory material shall consist of material as defined in paragraph DEFINITIONS, subparagraph SATISFACTORY MATERIALS. When direct placement is not practicable, satisfactory material from the excavation shall be stockpiled for subsequent use in parts of the work for

which it is specified herein and/or as indicated on the drawings. Satisfactory materials in excess of the quantity necessary to construct backfills, embankments and maximum spoil storage for future levee repairs shall be disposed of as specified for unsatisfactory materials.

3.14.2 Unsatisfactory Materials

Unsatisfactory materials shall be as defined in paragraph DEFINITIONS, subparagraph UNSATISFACTORY MATERIALS. Unsatisfactory materials from the excavations prescribed in this section shall be permanently disposed of by removal from the site to a Contractor-furnished disposal area. No additional payment will be made for Contractor-furnished disposal areas.

3.15 PREPARATION OF FOUNDATION, PARTIAL FILL SURFACES AND ABUTMENTS

3.15.1 Earth

After excavation (as described in paragraph EXCAVATION) or stripping (as described in paragraph CLEARING, GRUBBING AND STRIPPING) of the embankment foundation to the extent indicated or otherwise required, the sides of stump holes, test pits, and other similar cavities or depressions shall be broken down so as to flatten out the slopes, and the sides of the cut or hole shall be scarified to provide bond between the foundation material and the fill. Unless otherwise directed, each depression shall be filled with the same material type that is to be placed immediately above the foundation. The fill shall be placed in layers, moistened, and compacted in accordance with the applicable provisions of paragraphs PLACEMENT, MOISTURE CONTROL, and COMPACTION for the specific material type. Materials which cannot be compacted by roller equipment because of inadequate clearances shall be compacted with power tampers in accordance with the paragraph COMPACTION for the specific material type. After filling of depressions and immediately prior to placement of compacted fill in any section of the embankment, the foundation of such section shall be loosened thoroughly by scarifying, plowing, discing or harrowing to a minimum depth of 4 inches, and the moisture content shall be adjusted to the amount specified in paragraph MOISTURE CONTROL for the appropriate type of material. After removal of roots or other debris turned up in the process of loosening, the entire surface of the embankment foundation area shall be compacted by a minimum of 16 complete coverages of the compaction equipment as specified for the appropriate type of fill and additional passes as required to achieve specified material compaction. Immediately prior to placement of compacted fill on or against the surfaces of any partial fill section, all soft or loose material, all material containing cracks or gullies, and all material that does not conform with the specified zoning of the embankment shall be removed. The remaining surface of the partial fill shall be loosened by scarifying, plowing, discing or harrowing to a minimum depth of 6 inches, and the moisture content shall be adjusted as specified in paragraph MOISTURE CONTROL for the appropriate type of material. The surface of the partial fill section upon which fill is to be placed shall then be compacted as hereinafter specified for the appropriate type of fill. No separate payment will be made for loosening and rolling the foundation area, the abutment area, or the surfaces of partial fill sections, but the entire cost thereof shall be included in the applicable contract price for Bid Item No. 2.

3.15.2 Benching

Benching into existing levee embankment and abutments is required in order to place and compact the material in horizontal layers. The vertical face cut into the existing embankment or abutment resulting from the benching operation shall be a minimum of 12 inches in height but shall not exceed 18 inches in height.

3.16 TEST FILL STRIPS

3.16.1 General

Before beginning embankment construction, the Contractor shall construct a test strip for earth fill materials to demonstrate that the equipment and compaction procedure will achieve the moisture-dry density relationship as specified. The test strips may be incorporated as part of the final embankment, if the fills meet the requirements of the specifications. The test strips shall be constructed using materials from the borrow sources which have been approved by the Contracting Officer. A test strip shall be performed for each of the following type of fill materials SP, SW and SC and all satisfactory backfill. Each test strip shall be of sufficient size to allow compaction equipment to achieve normal operating speed over a 50 foot length. The test strip shall be a minimum of two (2) times wider than the compaction equipment. Each test strip shall be constructed with a minimum of 4 lifts. Prior to the construction of the test strips, the foundation (subgrade) shall be proof rolled as specified in paragraph PREPARATION OF FOUNDATION, PARTIAL FILL SURFACES AND ABUTMENTS and an 8 inch thick subbase layer installed. The subbase layer shall consist of the same material to be used in the test strip and shall be spread and compacted to the same requirements. The test strips shall be constructed in accordance with the applicable provisions of paragraphs PLACEMENT, MOISTURE CONTROL, and COMPACTION for the specific material type. The fill material shall be placed and spread in layers in accordance with the applicable provisions of paragraphs PLACEMENT for the specific material type. Each layer of the fill shall be compacted with a minimum of sixteen (16) complete coverages using the specified compaction equipment, and as many additional coverages as may be required to achieve the specified density. Even if the results from the test strips show that the required densities can be obtained with less than four coverages by the compaction equipment, the Contractor shall still be required to compact the impervious and random fills with a minimum of (16) complete coverages. If the use of the proposed compaction equipment causes shearing of the fill, laminations in the fill, or results in inadequate compaction, the Contracting Officer may direct that such roller be removed from the fill and that another appropriate tamping roller be used.

3.16.2 Testing and Reporting Requirements for Test Strips

Prior to construction of the test strips, the Contractor shall perform one laboratory compaction test for each type of material used in test strips. The compaction tests shall be performed in accordance with the requirements specified in paragraph MATERIALS TESTING. Test results shall be submitted to the Contracting Officer before construction of the test strips. After

placement and spreading of the fill in the test strip, but prior to compaction, five samples shall be obtained from each lift for moisture content determination in accordance with ASTM D 2216. After compaction of the fill, a minimum of 5 in-place nuclear density and moisture content tests in accordance with ASTM D 2922 and ASTM D 3017, respectively and one density test (in accordance with ASTM D 1556) shall be performed on each lift. One sample shall be obtained from each test strip for classification testing as specified in paragraph MATERIALS TESTING. All testing and sampling locations shall be determined by the Contracting Officer. The Contractor's QC personnel shall monitor and document construction and testing of the test strips. Documentation shall include weather conditions, soil type, spreading and compaction equipment type, lift thickness, number of coverages, moisture content, dry density, and a plan showing approximate location of sampling and testing. Documentation of the test strip construction procedures and results of all testing shall be provided to the Contracting Officer. Full scale embankment construction shall not commence until the equipment and placement methods are approved by the Contracting Officer.

3.17 PLACEMENT AND SPREADING

3.17.1 General

Prior to beginning embankment placement on the levee foundation the Contractor shall notify the Government that the foundation is ready to receive fill. No fill shall be placed on any part of the embankment foundation until such areas have been inspected and given final approval by the Contracting Officer.

3.17.1.1 Gradation and Distribution

The gradation and distribution of materials throughout each zone of the levee shall be such that the embankment will be free from lenses, pockets, streaks, and layers of material differing substantially in texture or gradation from surrounding material of the same class. If lenses, pockets, or layers of materials differing substantially in texture or gradation from surrounding material occur in the spread material, the layer shall be mixed by harrowing or any other approved method to blend the materials. During the placing and spreading process, the Contractor shall maintain at all times a force of workers adequate to remove all roots, debris, and oversize stone from all embankment materials. All stones and rock fragments larger than 3 inches in any dimension shall be removed at the source prior to hauling to the fill. No fill shall be placed upon a frozen surface, nor shall snow, ice, or frozen earth be incorporated in the embankment.

3.17.1.2 Foundations and Partial Embankment Fills

The foundations and all partial embankment receiving fills shall be kept thoroughly drained. Placing operations will be such as to avoid mixing of materials from adjacent sections as much as practicable.

3.17.1.3 Equipment Traffic

Equipment traffic on any embankment zone shall be routed to distribute the

compactive effort as much as practicable. Ruts formed in the surface of any layer of spread material will be filled before that material is compacted. If, in the opinion of the Contracting officer, the compacted surface of any layer of material is too smooth to bond properly with the succeeding layer, the surface shall be loosened by scarifying or other approved methods before material from the succeeding layer is placed.

3.17.2 Placement on Surfaces Containing Frozen Materials

Embankment shall not be placed on a foundation which contains frozen material, or which has been subjected to freeze-thaw action. This prohibition encompasses all foundation types, including the natural ground, all prepared subgrades whether in an excavation or on an embankment, and all layers of previously placed and compacted earth fill which become the foundations for successive layers of earth fill. All material that freezes or has been subjected to freeze-thaw action during the construction work, or during periods of temporary shutdowns, such as, but not limited to nights, holidays, weekends, or winter shutdowns of earthwork operations, shall be removed to a depth that is acceptable to the Contracting Officer and replaced with new material. Alternatively, the material shall be thawed, dried, reworked and recompactd to the specified criteria before additional material is placed. The Contracting Officer will determine when placement of fill shall cease due to cold weather. The Contracting Officer may elect to use average daily air temperatures, and/or physical observation of the soils for the determination. Levee embankment material shall not contain frozen clumps of soil, snow or ice.

3.17.3 Placement of Embankment and Backfill Against Structures

No embankment or backfill shall be placed on or against concrete less than 7 days after placement or 70 percent of the design strength, without prior approval of the Contracting Officer. Vibratory equipment and other similar compaction equipment shall not be used within 4 feet of any completed or partially completed structure. Compaction within 4 feet of completed or partially completed structures shall be accomplished by the use of mechanical hand tampers, vibrating plates, or other approved methods and equipment. The Contractor shall ensure that compaction operations do not damage any existing utilities. Any damage caused by the Contractor's operation shall be repaired at the Contractor's expense.

3.17.4 Select Fill

Select fill material shall be placed and spread in layers not more than 8 inches in uncompacted thickness, except that within 4 feet of structures, the uncompacted layer thickness shall be reduced to 6 inches. Layers should be started full out to the slope stakes and shall be carried substantially horizontal and parallel to the levee centerline with sufficient crown or slope to provide satisfactory drainage during construction.

3.17.5 Coarse Drainage Gravel

Coarse drainage gravel sand shall be placed and spread in layers not more than 12 inches in uncompacted thickness, except that within 4 feet of the

structures, the uncompacted layer thickness shall be reduced to 6 inches. The method of placement of all gravel and sand material shall be controlled to minimize segregation of particle sizes and contamination with other embankment materials.

3.17.6 Pervious Fill

The pervious fill material shall be placed and spread in layers not more than 12 inches in uncompacted thickness, except that within 4 feet of structures, the uncompacted layer thickness shall be reduced to 6 inches. Layers should be started full out to the slope stakes and shall be carried substantially horizontal and parallel to the levee centerline with sufficient crown or slope to provide satisfactory drainage during construction.

3.18 MOISTURE CONTROL

3.18.1 General

The materials in each layer of the fill shall contain the amount of moisture, within the limits specified below or as directed by the Contracting Officer, necessary to obtain the required compaction. Material that is not within the specified moisture content limits after compaction shall be reworked to obtain the specified moisture content, regardless of density.

3.18.1.1 Insufficient Moisture for Suitable Bond

If the top or contact surfaces of a partial fill section become too dry to permit suitable bond between these surfaces and the additional fill to be placed thereon, the Contractor shall loosen the dried materials by scarifying or discing to such depths as may be directed by the Contracting Officer, shall dampen the loosened material to an acceptable moisture content, and shall compact this layer in accordance with the applicable requirements of paragraph COMPACTION.

3.18.1.2 Excessive Moisture for Suitable Bond

If the top or contact surfaces of a partial fill section become too wet to permit suitable bond between these surfaces and the additional fill to be placed thereon, the wet material shall be scarified and permitted to dry, assisted by discing or harrowing, if necessary, to such depths as may be directed by the contracting officer. The material shall be dried to an acceptable moisture content, and shall be compacted in accordance with the applicable requirements of paragraph COMPACTION.

3.18.1.3 Drying Wet Material

Material that is too wet shall be dried in the borrow area prior to bringing to the levee embankment be assisted by discing or harrowing, if necessary, until the moisture content is reduced to an amount within the specified limits.

3.18.1.4 Increasing Moisture in Dry Material

The moisture content of material that is too dry, will be adjusted in the borrow area prior to bringing to the levee embankment. The Contractor will add water to the fill material and by harrowing, or other approved methods, work the moisture into the material until a uniform distribution of moisture within the specified limits is obtained. Water applied on a layer of fill on the levee embankment shall be accurately controlled in amount so that free water will not appear on the surface during or subsequent to rolling. Should too much water be added to any part of the embankment, the rolling on that section of the embankment shall be delayed until the moisture content of the materials is reduced to an amount within the specified limits. If it is impracticable to obtain the specified moisture content by wetting or drying the material on the fill, the Contractor may be required to pre-wet or dry back the material at the source of excavation in the ditch borrow area.

3.18.2 Pervious Fill

Each layer of material shall be placed, worked, and compacted at the optimum for compaction.

3.18.3 Coarse Drainage Gravel

The moisture content shall be controlled such that hauling, spreading, and compacting equipment can operate with normal procedure without excessive rutting of the fill. If the material is too wet or too dry to facilitate proper compaction, the coarse drainage gravel shall be wetted or dried as required.

3.19 COMPACTION

3.19.1 Compaction Equipment

Compaction equipment shall conform to the following requirements and shall be used as prescribed in subsequent paragraphs.

3.19.1.1 Vibratory Rollers

* ~~Vibratory rollers for compacting pervious sand fills and drainage layers shall be equipped with a smooth steel compaction drum and shall be operated at a frequency of vibration during compaction operations between 1100 and 1500 vpm. Vibratory rollers may be either towed or self-propelled and shall have an unsprung drum weight that is a minimum of 60 percent of the rollers' static weight. Towed rollers shall have at least 90 percent of their weight transmitted to the ground through the compaction drum when the roller is standing in a level position hitched to the towing vehicle. Rollers for compacting sand fills, or filter and drainage layers shall have a minimum static weight of 20,000 pounds, a minimum dynamic force of 40,000 pounds when operating at 1400 vpm, and an applied force not less than 9,000 pounds per foot of compaction drum length. Rollers for compacting sand and gravel fills or filter and drainage layers shall have a minimum static weight of 8,000 pounds, a minimum dynamic force of 16,000 pounds when operating at 1400 vpm, and an applied force not less than 5,000 pounds nor greater than 9,000 pounds per foot of compaction drum length. The~~

~~level of amplitude and vibration frequency during compaction will be maintained uniform throughout the embankment zone within which it is operating. Rollers shall be operated at speeds not to exceed 1.5 mph. The equipment manufacturer shall furnish sufficient data, drawings, and computation for verification of the above specifications, and the character and efficiency of this equipment shall be subject to approval.~~Vibratory rollers for compacting shall be equipped with a smooth steel compaction drum. Vibratory rollers may be either towed or self-propelled and shall have an un-sprung drum weight that is sufficient to achieve specified compaction. The level of amplitude and vibration frequency shall be sufficient to achieve the specified compaction. The equipment manufacturer shall furnish sufficient data subject to approval, for verifications of character and efficiency of this equipment.

*

3.19.1.2 Hand Operated Compactors

Compaction of material, in areas where it is impracticable to use a roller or tractor compaction shall be performed by the use of approved hand operated power compactors.

a. Power Tampers: Power tampers shall be hand operated equipment capable of compacting material in confined areas. The compactors shall be either an internal combustion or pneumatic activated tamper. Tampers shall have sufficient weight and striking power to produce the specified compaction. The character and efficiency of this equipment shall be subject to the approval of the Contracting Officer.

b. Vibratory Plate Compactor: Vibratory compactors operated by hand in confined areas shall utilize the oscillating cam principal and shall deliver an impact of not less than 2000 pounds at a rate of approximately 2000 impulses per minute. The character and efficiency of this equipment shall be subject to the approval of the Contracting Officer.

3.19.1.3 Sprinkling Equipment

Sprinkling equipment shall consist of tank trucks, pressure distributors or other equipment designed to apply water uniformly and in controlled quantities to variable width of surface.

3.19.1.4 Miscellaneous Equipment

Scarifiers, disks, spring-tooth or spike-tooth harrows, spreaders, and other equipment shall be suitable for use in embankment construction and approved by the Contracting Officer. Equipment used for blending fill material shall be capable of penetrating the full loose lift thickness of the specific material type.

3.19.2 Compaction of Pervious Fill

After a layer of material has been dumped and spread it shall be harrowed as required to break up and blend the fill materials and to obtain uniform moisture distribution. Harrowing shall be performed with a heavy disk plow, or other approved harrow, to the full depth of the layer. If one pass

of the harrow does not accomplish the breaking up and blending of the materials, additional passes of the harrow shall be required, but in no case will more than three passes of the harrow on any one layer be required for this purpose. When the moisture content and the condition of the layer are satisfactory, the lift shall be compacted to a minimum 95 percent modified proctor relative density in accordance with ASTM D 1557. ~~and with not less than sixteen complete coverages of an approved vibratory roller.~~

In areas which are not accessible by roller, the fill shall be placed in layers not more than 4 inches in uncompacted depth and compacted with an approved hand operated compactor to a density equal to that obtained in other areas which are accessible to rollers. Dumping, spreading, sprinkling, and compacting may be performed at the same time at different points along a section when there is sufficient area to permit these operations to proceed simultaneously. Compaction equipment shall be operated such that the strip being traversed by the roller shall overlap the rolled adjacent strip by not less than 3 feet.

3.19.3 Compaction of Coarse Drainage Gravel

Coarse drainage gravel placed in the drains shall be placed in maximum 12 inch loose lifts and compacted by not less than four (4) complete coverages with a static roller.

3.19.4 Compaction Adjacent to Structures and Utilities

Heavy equipment for spreading and compacting fill shall not be operated within 4 feet of structures or utilities, except as otherwise specified herein. Material within 4 feet shall be compacted using appropriate hand operated compactors specified herein.

3.19.5 Topsoil

Topsoil shall be placed on the embankment surfaces as shown on the contract drawings and as specified in SECTION 02921 SEEDING.

3.20 FIELD QUALITY CONTROL

3.20.1 Clearing, Grubbing, and Stripping

The Contractor shall establish and maintain quality control for clearing, grubbing, and stripping operations to assure compliance with contract requirements, and maintain records of the quality control for all construction operations including but not limited to the items indicated below. These records, as well as the records of corrective actions taken, shall be furnished to the Government in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

3.20.1.1 Clearing

Station to station limits, transverse clearing limits from applicable centerline; percentage of area complete; types of materials cleared.

3.20.1.2 Grubbing

Station to station limits, transverse grubbing limits from applicable centerline; percentage of area complete; type of material; filling of grubbed holes.

3.20.1.3 Stripping

Station to station limits, transverse stripping limits from applicable centerline; percentage of area complete; type of material; depth of stripping.

3.20.2 Excavation

The Contractor shall establish and maintain quality control for excavation operations to assure compliance with contract requirements, and maintain records of the Contractor's quality control for all construction operations including but not limited to the following:

- a. Lines, grades and tolerances,
- b. Segregation of materials,
- c. Disposal and/or stockpiling of materials,
- d. Unsatisfactory materials,
- e. Conditions that may induce seepage or weaken the foundation or embankment,
- f. Stability of excavations.

Records of inspections and tests, as well as the records of corrective actions taken, shall be furnished to the Government in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

3.20.3 Embankment

3.20.3.1 General

As a part of the Contractor Quality Control (CQC) system required by SECTION 01451 CONTRACTOR QUALITY CONTROL, the Contractor shall establish and maintain field quality control for foundation preparation, embankment and backfill operations to assure compliance with contract requirements and maintain detailed records of field quality control for all operations including but not limited to the following:

a. Earthwork Equipment

Type, size, number of units and suitability for construction of the prescribed work.

b. Foundation Preparation

Methods of preparing the foundations in advance of embankment and backfill construction and methods for providing drainage of the

foundation and partially completed fills.

3.20.3.2 Materials Testing

The contractor shall perform sufficient testing to insure that the fill is being constructed as specified. The testing program specified below shall be considered the minimum acceptable frequency of testing. This does not relieve the Contractor from the responsibility of performing additional testing, if required to ensure compliance with these specifications.

a. Soil Classification Tests

Soil classification tests shall be performed in accordance with ASTM D 2487. One initial classification test shall be required for each different classification of material to be utilized as embankment fill or backfill. As prescribed in ASTM D 2487, grain size analyses in accordance with ASTM D 422 and Atterberg limits in accordance with ASTM D 4318 shall be performed on each different classification. The Contractor shall submit additional tests for every 5,000 cubic yards of embankment or backfill material. Soil classification tests shall be performed on foundation material as required to determine the acceptability of the in-situ soils. Additional tests will be required if noticeable changes in the material occur.

b. Cohesionless Material Testing

(1) Compaction Tests. The Contractor shall run not less than one relative density test for every 5,000 cubic yards of cohesionless fill in accordance with ASTM D 4253 and ASTM D 4254.

(2) In-Place Density Tests. The in-place density of the cohesionless materials shall be determined in accordance with ASTM D 1556. The Contractor shall run not less than one (1) field in-place density test on each lift of material or every 5,000 cubic yards of completed embankment fill or backfill whichever is less. Horizontal locations shall be randomly staggered in the fill. When nuclear method is used for in-place density testing according to ASTM D 2922 and ASTM D 3017, the first test and every tenth test thereafter for each material type shall include a sand cone correlation test in accordance with ASTM D 1556. The sand cone test shall be performed adjacent to the location of the nuclear test, and shall include a nominal 6 inch diameter sand cone, and shall include a minimum wet soil weight of 6 pounds extracted from the hole. The density correlations shall be submitted with test results. Each transmittal including density test data shall include a summary of all density correlations for the job neatly prepared on a summary sheet including at a minimum:

- (i) Meter serial number and operators initials.
- (ii) Standard count for each test.
- (iii) Material type.
- (iv) Probe depth.
- (v) Moisture content by each test method and the deviation.

(vi) Wet density by each test method and the deviation.

(3) Water (Moisture) Content Tests. Determination of water content shall be performed in accordance with ASTM D 2216. ASTM D 4643 may be used when rapid moisture content results are needed. All rapid results obtained by ASTM D 4643 shall be confirmed by a test on a duplicate sample performed in accordance with ASTM D 2216.

In the event of disagreement between the results, ASTM D 2216 shall govern. One water content test will be performed for each 5,000 cubic yards of material placed or each lift of material whichever is less. These test will be in addition to the water content tests performed in conjunction with in-place density tests. Backfill and fills not meeting the required specifications for water content shall be retested after corrective measures have been applied.

d. Additional Testing

The Contracting Officer may request additional tests if there is reason to doubt the adequacy of the compaction, or special compaction procedures are being used, or materials change or if the Contracting Officer determines that the Contractor's testing is inadequate or the Contractor is concentrating backfill and fill operations in a relatively small area.

3.20.3.3 Materials

Suitability of materials for use in embankment and backfill.

3.20.3.4 Fill Placement

Layout, maintaining existing drainage, moisture control, thickness of layers, removal of oversized material, spreading and compaction for embankment and backfill.

3.20.3.5 Grade and Cross Section

Surveys to verify that the dimensions, slopes, lines and grades conform to those shown on the drawings.

3.20.3.6 Testing by the Government

During the life of this contract, the Government or its contractors will perform quality assurance tests. The contractor shall make available to the government or its contractors the equipment to perform these test.

3.20.3.7 Reporting

On a daily basis, the Contractor shall furnish the inspection records and all material testing results, quantity of fill placed, as well as the records of corrective action taken, in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

3.21 Work Plan

Thirty (30) days prior to commencement of haul road construction or placing embankment and backfill, whichever is earlier, the Contractor shall submit for approval a Work Plan for accomplishing all embankment and backfill construction and for the location and construction of haul roads. This plan shall include, but not be limited to, the Contractor's proposed sequence of construction for embankment and backfill items, and methods and types of equipment to be utilized for all embankment and backfill operations, including transporting, placing, and compaction. This plan shall also include the names and addresses of the commercial testing labs which will perform the soil testing and inspection and describe how all required soils testing will be performed.

If Contractor proposes to furnish any off-site material for levee construction, Contractor shall submit soil classification test results, moisture-density curves, gradation curves, and laboratory results of the required tests of the proposed material.

Contractor shall have a plan prepared by a geotechnical professional engineer registered in the State of Florida for the dewatering and disposal of groundwater for each excavation task of the Work Plan. The geotechnical engineer shall prepare, sign and oversee the plan for each excavation. The plan shall describe the method to be used, location, operation and maintenance requirements and submit with each plan design, notes, drawings, descriptive literature, layout of piping and pumps and disposal of groundwater. Contractor shall submit the geotechnical plans for approval of the Contracting Officer 30 days in advance of each dewatering.

-- End of Section --

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DIVISION 02 - SITE WORK

SECTION 02378A

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SECTION 02378A

GEOTEXTILES USED AS FILTERS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 123	(1996a) Standard Terminology Relating to Textiles
ASTM D 4354	(1996) Sampling of Geosynthetics for Testing
ASTM D 4355	(1992) Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
ASTM D 4491	(1999) Water Permeability of Geotextiles By Permittivity
ASTM D 4533	(1991; R 1996) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 1996) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(1999) Determining Apparent Opening Size of a Geotextile
ASTM D 4833	(1988; R 1996) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 4873	(1997) Identification, Storage, and Handling of Geosynthetic Rolls
ASTM D 4884	(1996) Strength of Sewn or Thermally Bonded Seams of Geotextiles

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 1110-2-1601	(1991; Change 1-1994) Hydraulic Design of Flood Control Channels
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1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-04 Samples

Geotextile

Submit geotextile samples for testing to determine compliance with the requirements in this specification. When required, submit samples a minimum of 60 days prior to the beginning of installation of the same textile. Upon delivery of the geotextile, submit duplicate copies of the written certificate of compliance signed by a legally authorized official of the manufacturer. The certificate shall state that the geotextile shipped to the site meets the chemical requirements and exceeds the minimum average roll value listed in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE. Upon request, supply quality control and quality assurance tests for the geotextile. All samples provided shall be from the same production lot as will be supplied for the contract, and shall be the full manufactured width of the geotextile by at least 10 feet long, except that samples for seam strength may be a full width sample folded over and the edges stitched for a length of at least 5 feet. Samples submitted for testing shall be identified by manufacturers lot designation. For needle punched geotextile, the manufacturer shall certify that the geotextile has been inspected using permanent on-line metal detectors and does not contain any needles.

1.3 SHIPMENT, HANDLING, AND STORAGE

1.3.1 Shipment and Storage

Only approved geotextile rolls shall be delivered to the project site. All geotextile shall be labeled, shipped, stored, and handled in accordance with ASTM D 4873. No hooks, tongs, or other sharp instruments shall be used for handling geotextile.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Geotextile

2.1.1.1 General

The geotextile shall be a non-woven pervious sheet of plastic yarn as defined by ASTM D 123. The geotextile shall equal or exceed the minimum average roll values listed in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE. Strength values indicated in the table are for the

weaker principal direction.

TABLE 1
MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE

PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
GRAP STRENGTH	lb	1100 <u>200</u>	ASTM D 4632
SEAM STRENGTH	lb	990 <u>200</u>	ASTM D 4632
PUNCTURE	lb	400 <u>80</u>	ASTM D 4833
TRAPEZOID TEAR	lb	400 <u>50</u>	ASTM D 4533
PERMEABILITY	cm/sec	<u>.02</u>	ASTM D 4491
APPARENT OPENING SIZE	U.S. SIEVE	40	ASTM D 4751
PERMITTIVITY	sec -1	0.5	ASTM D 4491
ULTRAVIOLET DEGRADATION	Percent	50 AT 500 Hrs 50 AT 500 Hrs	ASTM D 4355
FDOT Geotextile		Type D-3	FDOT Index No. 199 or equivalent

2.1.1.2 Geotextile Fiber

Fibers used in the manufacturing of the geotextile shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of polyolefins, polyesters, or polamides. Stabilizers and/or inhibitors shall be added to the base polymer if necessary to make the filaments resistant to deterioration caused by ultraviolet light and heat exposure. Reclaimed or recycled fibers or polymer shall not be added to the formulation. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. The edges of the geotextile shall be finished to prevent the outer fiber from pulling away from the geotextile.

2.1.2 Seams

The seams of the geotextile shall be sewn with thread of a material meeting the chemical requirements given above for geotextile yarn or shall be bonded by cementing or by heat. The sheets of geotextile shall be attached at the factory or another approved location, if necessary, to form sections not less than 10 feet wide. Seams shall be tested in accordance with method ASTM D 4884. The strength of the seam shall be not less than 90 percent of the required grab tensile strength of the unaged geotextile in any principal direction.

2.1.3 Securing Pins

The geotextile shall be secured to the embankment or foundation soil by pins to prevent movement prior to placement of revetment materials. Other appropriate means to prevent movement such as staples, sand bags, and stone could also be used. Securing pins shall be inserted through both strips of overlapped geotextile along the line passing through midpoints of the overlap. Securing pins shall be removed as placement of revetment materials are placed to prevent tearing of geotextile or enlarging holes maximum spacing between securing pins depends on the steepness of the embankment slope. The maximum pins spacing shall be equal to or less than the values listed in TABLE 2, MAXIMUM SPACING FOR SECURING PINS. When windy conditions prevail at the construction site, the number of pins should be increased upon the demand of the Contracting Officer. Terminal ends of the geotextile shall be anchored with key trench or apron at crest, toe of the slope and upstream and downstream limits of installation.

TABLE 2
MAXIMUM SPACING FOR SECURING PINS

EMBANKMENT	SPACING, feet
STEEPER THAN 1V ON 3H	2
1V ON 3H TO 1V ON 4H	3
FLATTER THAN 1V ON 4H	5

2.2 INSPECTIONS, VERIFICATIONS, AND TESTING

2.2.1 Manufacturing and Sampling

Geotextiles and factory seams shall meet the requirements specified in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE. Conformance testing shall be performed in accordance with the manufacturers approved quality control manual. Geotextiles shall be randomly sampled in accordance with ASTM D 4354 (Procedure Method A). Factory seams shall be sampled at the frequency specified in ASTM D 4884.

2.2.2 Site Verification and Testing

Samples shall be collected at approved locations upon delivery to the site in accordance with ASTM D 4354 (Procedure Method B) at a frequency of once per 100,000 square feet. Samples shall be tested by the Contractor's testing laboratory to verify that the geotextile meets the requirements specified in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE. Samples shall be identified by manufacturers name, type of geotextile, lot number, roll number, and machine direction. Testing shall be performed at an approved laboratory. Test results from the lot under review shall be submitted and approved prior to deployment of that lot of geotextile. Rolls which are sampled shall be immediately rewrapped in their protective covering.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Surface on which the geotextile will be placed shall be prepared to a relatively smooth surface condition, in accordance with the applicable portion of this specification and shall be free from obstruction, debris, depressions, erosion feature, or vegetation. Any irregularities will be removed so as to insure continuous, intimate contact of the geotextile with all the surface. Any loose material, soft or low density pockets of material, will be removed; erosion features such as rills, gullies etc. must be graded out of the surface before geotextile placement.

3.2 INSTALLATION OF THE GEOTEXTILE

3.2.1 General

The geotextile shall be placed in the manner and at the locations shown. At the time of installation, the geotextile shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage.

3.2.2 Placement

The geotextile shall be placed with the long dimension parallel to the centerline of the embankment or channel and laid smooth and free of tension, stress, folds, wrinkles, or creases. The strips shall be placed to provide a minimum width of 12 inches of overlap for each joint. The placement procedure requires that the length of the geotextile be approximately 10 percent greater than the slope length. The Contractor shall adjust the actual length of the geotextile used based on initial installation experience. Temporary pinning of the geotextile to help hold it in place until the granular filter and bedding material layer is placed shall be allowed. The temporary pins shall be removed as the granular material is placed to relieve high tensile stress which may occur during placement of material on the geotextile. Design protection of riprap should be in compliance with EM 1110-2-1601. Trimming shall be performed in such a manner that the geotextile shall not be damaged in any way.

3.3 PROTECTION

The geotextile shall be protected at all times during construction from contamination by surface runoff and any geotextile so contaminated shall be removed and replaced with uncontaminated geotextile. Any damage to the geotextile during its installation or during placement of granular filter and bedding materials shall be replaced by the Contractor at no cost to the Government. The work shall be scheduled so that the covering of the geotextile with a layer of the specified material is accomplished within 7 calendar days after placement of the geotextile. Failure to comply shall require replacement of geotextile. The geotextile shall be protected from damage prior to and during the placement of riprap or other materials. This may be accomplished by limiting the height of drop to less than 1 foot, or other methods deemed necessary. Care should be taken to ensure that the

utilized cushioning materials shall not impede the flow of water. Before placement of riprap or other materials, the Contractor shall demonstrate that the placement technique will not cause damage to the geotextile. In no case shall any type of equipment be allowed on the unprotected geotextile.

3.4 PLACEMENT OF CUSHIONING MATERIAL

Placing of cushioning material shall be performed in a manner to insure intimate contact of the geotextile with the prepared surface and with the cushioning material. The placement shall also be performed in a manner that shall not damage the geotextile including tear, puncture, or abrasion.

On sloping surfaces the cushioning material shall be placed from the bottom of the slopes upward. During placement, the height of the drop of riprap material shall not be greater than 12 inches. Any geotextile damaged beneath the cushioning material shall be uncovered as necessary and replaced at no cost to the Government.

3.5 OVERLAPPING AND SEAMING

3.5.1 Overlapping

The overlap of geotextile rolls shall be 12 inches. Appropriate measures will be taken to insure required overlap exists after cushion placement.

3.5.2 Sewn Seams

High strength thread should be used such that seam test should conform to ASTM D 4884. The thread shall meet the chemical, ultraviolet, and physical requirements of the geotextile, and the color shall be different from that of the geotextile. The seam strength shall be equal to the strength required for the geotextile in the direction across the seam. Overlapping J-type seams are preferable over prayer-type seams as the overlapping geotextile reduces the chance of openings to occur at the seam. Double sewing shall be used specially for field seams to provide a safety factor against undetected missed stitches.

-- End of Section --

SECTION 16450A
Appendix A

I/O and SAMPLES

ENGINE CONTROL PANEL (ECP)/ENGINE INSTRUMENT BOARD(EIB)

ITEM #	ITEM	
1	RED ALARM STROBE LIGHT	
2	TACHOMETER ROUND GAUGE	
3	COOLANT TEMPERATURE GAUGE	No live line into ECP/EIB
4	OIL TEMPERATURE GAUGE	No live line into ECP/EIB
5	RUNNING TIME COUNTER	
6	FUEL PRESSURE GAUGE	No live line into ECP/EIB
7	OIL PRESSURE GAUGE	No live line into ECP/EIB
8	ANNUNCIATION PANEL	
9	FOUR POSITION SELECTOR SWITCH: MAN-OFF-LOCAL AUTO-REMOTE AUTO	
10	INDICATOR LED LAMP TO SHOW ENGINE IS UNDER REMOTE AUTO.	
11	EMERGENCY STOP ILLUMINATED PUSH BUTTON WITH TRIP PROTECTION RING	Hard wired to kill power.
12	RESET ALARM PUSH BUTTON	Hard wired for annunciator
13	TEST ALARM PUSH BUTTON	and VO for horn Test and Reset.
14	AUTO CONTROLS ON/OFF	Illuminated in On Position
15	DAY TANK MANUAL/AUTO	Illuminated in Auto Position
16	INDICATOR LED LAMP TO SHOW DAY TANK IS UNDER AUTO MODE.	
17	MANUAL INTERLOCK PUSH BUTTON	
18	CRANK PUSH BUTTON	
19	STOP PUSH BUTTON	
20	THREE POSITION SELECTOR SWITCH WITH SPRING RETURN TO CENTER POSITION FOR SPEED CONTROL SLOWER AT 10:00 AND FASTER AT 2:00	
21	SUCTION BELL BEARING TEMPERATURE - DIGITAL READ OUT	
22	DISTRIBUTOR BEARING - DIGITAL READ OUT	
23	LOWER PUMP SHAFT BEARING - DIGITAL READ OUT	
24	UPPER PUMP SHAFT BEARING - DIGITAL READ OUT	
25	TENSION NUT BEARING - DIGITAL READ OUT	
26	HMI CONTROL PANEL - PANELVIEW - 550	
27	HORN	
28	START ALARM ACKNOWLEDGE PUSH BUTTON	

ANNUNCIATION SCHEDULE FOR ECP/EIB					
ITEM #	1ST LINE	2ND LINE	3RD LINE	4TH LINE	TYPE
1	LOW	BATTERY	VOLTAGE		ALARM
2	HIGH	ENGINE	OIL TEMP		ALARM
3	HIGH	ENGINE	OIL TEMP		SHUT DOWN
4	HIGH	GEARBOX	OIL TEMP		ALARM
5	HIGH	GEARBOX	OIL TEMP		SHUT DOWN
6	HIGH PUMP	BTM SHAFT	BEARING	TEMP	ALARM
7	HIGH PUMP	BTM SHAFT	BEARING	TEMP	SHUT DOWN
8	HIGH	BATTERY	VOLTAGE		ALARM
9	LOW	ENGINE OIL	PRESSURE		ALARM
10	LOW	ENGINE OIL	PRESSURE		SHUT DOWN
11	HIGH	ENGINE	SPEED		SHUT DOWN
12	LOW WATER	LEVEL AT	SUMP		SHUT DOWN
13	HIGH PUMP	TOP SHAFT	BEARING	TEMP	ALARM
14	HIGH PUMP	TOP SHAFT	BEARING	TEMP	SHUT DOWN
15	BATTERY	CHARGER	FAILURE		ALARM
16	LOW ENGINE	COOLANT	LEVEL		ALARM
17	LOW ENGINE	COOLANT	LEVEL		SHUT DOWN
18	HIGH	GEARBOX	VIBRATION		SHUT DOWN
19	HIGH PUMP	SUCTION	BEARING	TEMP	ALARM
20	HIGH PUMP	SUCTION	BEARING	TEMP	SHUT DOWN
21	HIGH PUMP	NUT	BEARING	TEMP	ALARM
22	HIGH PUMP	NUT	BEARING	TEMP	SHUT DOWN
23	PUMP	LOW OIL	LEVEL		SHUT DOWN
24	HIGH ENGIN	COOLANT	TEMP		ALARM
25	HIGH ENGIN	COOLANT	TEMP		SHUT DOWN
26	LOW	DAYTANK	FUEL LEVEL		ALARM
27	HIGH PUMP	BOWL	BEARING	TEMP	ALARM
28	HIGH PUMP	BOWL	BEARING	TEMP	SHUT DOWN
29	ENGINE	RUNNING	NORMAL		STATUS

ENGINE CONTROL PANEL/ENGINE INSTRUMENT BOARD I/O

ITEM #	TAG ID	DESCRIPTION	I/O TYPE	REMARKS
1	HZS	MANUAL MODE	D/I	MANUAL MODE - NO PLC
2	UYZ	LOCAL AUTO	D/I	CONTROL FROM LOCAL PLC
3	YZ	REMOTE AUTO	D/I	CONTROL FROM TELEMETRY
4	HMS	RESET ALARM	D/I	ACKNOWLEDGE FOR HORN
5	HAYP	TEST ALARM	D/I	TEST FOR HORN
6	SYS1	OVER SPEED RELAY	D/I	SHUT DOWN
7	FYSH1	COOLANT HIGH TEMP SW.	D/I	SHUT DOWN
8	TYSH2	OIL HIGH TEMP. SW.	D/I	SHUT DOWN
9	TYSH3	SUCTION BRNG H- TEMP SW.	D/I	SHUT DOWN
10	TYSH4	DISTRIBUTION BRNG H-TEMP SW.	D/I	SHUT DOWN
11	TYSH5	LOWER SHAFT BRNG H-TEMP SW.	D/I	SHUT DOWN
12	TYSH6	UPPER SHAFT BRNG H-TEMP SW.	D/I	SHUT DOWN
13	TYSH7	TENSION BRNG H-TEMP SW.	D/I	SHUT DOWN
14	PYSL1	LOW OIL PRESSURE SW.	D/I	SHUT DOWN
15	LYSL1	COOLANT LEVEL LOW SW.	D/I	SHUT DOWN
16	TYSH8	GEAR BOX OIL H-TEMP SW.	D/I	SHUT DOWN
17	PYSL2	GEAR BOX LUBE OIL PRESS. SW.	D/I	SHUT DOWN
18	LYSL2	PUMP BAY WATER LOW LEVEL SW.	D/I	SHUT DOWN
19	LYSL3	DAY TANK LOW LEVEL SW.	D/I	SHUT DOWN
20	LYSH1	DAY TANK HIGH LEVEL SW.	D/I	INFO./WARNING/CONTROL
21	VSHL1	GEAR BOX VIBRATION SW.	D/I	SHUT DOWN
22	VSHL2	ENGINE VIBRATION SW.	D/I	SHUT DOWN
23	KY	OVERCRANK TIMER	D/I	SHUT DOWN
24	FQS	LUBE WATER FLOW SW.	D/I	SHUT DOWN
25	YY1	RAW WATER PUMP ON (PAFM)	D/I	SHUT DOWN
26	CY1	CRANK DISC ENG RUNNING OK.	D/I	INFORMATION
27	EYL	BATTERY VOLTAGE LOW	D/I	INFORMATION
28	EYH	BATTERY VOLTAGE HIGH	D/I	INFORMATION
29	CY2	BATTERY CHARGER STATUS	D/I	INFORMATION
30	UYZ1	DAY TANK AUTO MODE	D/I	INFORMATION
31	CYS1	RED ALARM STROBE LIGHT	D/O	CONTROL
32	CYS2	HORN	D/O	CONTROL
33	CY3	PRE-LUBE OIL PUMP	D/O	CONTROL
34	CY4	RECIRC OIL PUMP	D/O	CONTROL
35	CY5	ENGINE HEATERS	D/O	CONTROL
36	CY6	RAW WATER PUMP	D/O	CONTROL
37	CY7	LUBE WATER PUMP	D/O	CONTROL
38	CY8	DAY TANK INTAKE SOL. VALVE	D/O	CONTROL
39	CY9	FUEL PUMP	D/O	CONTROL
40	SYS2	GOVERNOR - SLOW DOWN	D/O	SPEED CONTROL
41	SYS3	GOVERNOR - RAISE UP	D/O	SPEED CONTROL
42	SYS4	ENGINE RUNNING NORMAL	D/O	INFO. TO ANNUNCIATOR
43	SYS5	VACUUM PUMP CONTROL	D/O	CONTROL
44	SYS6	REMOTE AUTO	D/O	INFO./WARNINGS
45	SYS7	DAY TANK AUTO MODE CONF.	D/O	INFO./WARNINGS
46	SIS1	ENGINE RPM	AI	INFO./WARNINGS/SHUT DOWNS
47	PIs1	FUEL PRESSURE	AI	INFO./WARNINGS/SHUT DOWNS
48	PIs2	OIL PRESSURE	AI	INFO./WARNINGS/SHUT DOWNS
49	TIS1	OIL TEMPERATURE	AI	INFO./WARNINGS/SHUT DOWNS
50	TIS2	COOLANT TEMPERATURE	AI	INFO./WARNINGS/SHUT DOWNS
51	TIS3	SUCTION BELL BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS

ENGINE CONTROL PANEL/ENGINE INSTRUMENT BOARD I/O

ITEM #	TAG ID	DESCRIPTION	I/O TYPE	REMARKS
52	TIS4	DISTRIBUTOR BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
53	TIS5	LOWER SHAFT BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
54	TIS8	UPPER SHAFT BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
55	TIS7	TENSION NUT BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
56	TIS8	COMBINED EXHAUST TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
57	SIS1	PUMP RPM	AI	INFO./WARNINGS/SHUT DOWNS
58	FQTS1	PUMP FLOW	AI	INFO./WARNINGS/SHUT DOWNS
59	TIS9	GEAR BOX OIL TEMP	AI	INFO./WARNINGS/SHUT DOWNS
60	PIS3	GEAR BOX OIL PRESSURE	AI	INFO./WARNINGS/SHUT DOWNS
61	VITS1	GEAR BOX VIBRATION	AI	INFO./WARNINGS/SHUT DOWNS
62	VITS2	ENGINE VIBRATION	AI	INFO./WARNINGS/SHUT DOWNS
63	FQTS2	LUBE WATER FLOW	AI	INFO./WARNINGS/SHUT DOWNS
64	EITS1	BATTERY VOLTAGE	AI	INFO./WARNINGS/SHUT DOWNS
65	LITS1	DAY TANK FUEL LEVEL	AI	INFO./WARNINGS/SHUT DOWNS
66	PIT1	VACUUM REFERENCE	AI	INFO./WARNINGS/SHUT DOWNS

S-382 MCTP-1 - STATION PLC I/O

ITEM #	TAG ID	DESCRIPTION	I/O TYPE	REMARKS
ITEMS 1 THROUGH 19 ARE REQUIRED FOR THE DIESEL ENGINE/PUMP CONTROL				
1	HZS1	MANUAL MODE ENGINE NO. 1	D/I	MANUAL MODE - NO PLC
2	UYZ1	LOCAL AUTO ENGINE NO. 1	D/I	CONTROL FROM LOCAL PLC
3	YZ1	REMOTE AUTO ENGINE NO. 1	D/I	CONTROL FROM TELEMETRY
4	HMS1	RESET ALARM ENGINE NO. 1	D/I	ACKNOWLEDGE FOR HORN
5	HAYP1	TEST ALARM ENGINE NO. 1	D/I	TEST FOR HORN
6	HZS2	MANUAL MODE ENGINE NO. 2	D/I	MANUAL MODE - NO PLC
7	UYZ2	LOCAL AUTO ENGINE NO. 2	D/I	CONTROL FROM LOCAL PLC
8	YZ2	REMOTE AUTO ENGINE NO. 2	D/I	CONTROL FROM TELEMETRY
9	HMS2	RESET ALARM ENGINE NO. 2	D/I	ACKNOWLEDGE FOR HORN
10	HAYP2	TEST ALARM ENGINE NO. 2	D/I	TEST FOR HORN
11	HZS3	MANUAL MODE ENGINE NO. 3	D/I	MANUAL MODE - NO PLC
12	UYZ3	LOCAL AUTO ENGINE NO. 3	D/I	CONTROL FROM LOCAL PLC
13	YZ3	REMOTE AUTO ENGINE NO. 3	D/I	CONTROL FROM TELEMETRY
14	HMS3	RESET ALARM ENGINE NO. 3	D/I	ACKNOWLEDGE FOR HORN
15	HAYP3	TEST ALARM ENGINE NO. 3	D/I	TEST FOR HORN
16		ENGINE NO. 1 PLC	D/I	INFO./WARNINGS/SHUT DOWNS
17		ENGINE NO. 2 PLC	D/I	INFO./WARNINGS/SHUT DOWNS
18		ENGINE NO. 3 PLC	D/I	INFO./WARNINGS/SHUT DOWNS
19	LYSL1	RESERVOIR HIGH WATER LEVEL	D/I	INFO./WARNINGS/SHUT DOWNS
20				
ITEMS 21 THROUGH 32 ARE REQUIRED FOR THE TRASH RACKS CONTROLS				
21	CS1	TRASH RACK 1 ON/OFF	DI	INFORMATION
22	YY2	TRASH RACK 1 RUN CONF. (PAFM)	DI	INFORMATION
23	CSY1	TRASH RACK 1 START	DO	CONTROL
24	CITS2	TRASH RACK 1 MOTOR AMPS	AI	INFORMATION
25	CS2	TRASH RACK 2 ON/OFF	DI	INFORMATION
26	YY3	TRASH RACK 2 RUN CONF. (PAFM)	DI	INFORMATION
27	CSY2	TRASH RACK 2 START	DO	CONTROL
28	CITS3	TRASH RACK 2 MOTOR AMPS	AI	INFORMATION
29	CS3	TRASH RACK 3 ON/OFF	DI	INFORMATION
30	YY4	TRASH RACK 3 RUN CONF. (PAFM)	DI	INFORMATION
31	CSY3	TRASH RACK 3 START	DO	CONTROL
32	CITS4	TRASH RACK 3 MOTOR AMPS	AI	INFORMATION

S-382 MCTP-1 - STATION PLC I/O

ITEM #	TAG ID	DESCRIPTION	I/O TYPE	REMARKS
ITEMS 33 THROUGH 47 ARE REQUIRED FOR THE EXHAUST FAN CONTROLS				
33	YS1	EXHAUST FAN 1 AUTO	DI	INFORMATION
34	YY7	EF1 RUN CONFIRM (PAFM)	DI	INFORMATION
35	CSY6	EXHAUST FAN 1 START	DO	CONTROL
36	YS2	EXHAUST FAN 2 AUTO	DI	INFORMATION
37	YY8	EF 2 RUN CONFIRM (PAFM)	DI	INFORMATION
38	CSY7	EXHAUST FAN 2 START	DO	CONTROL
39	YS3	EXHAUST FAN 3 AUTO	DI	INFORMATION
40	YY9	EF 3 RUN CONFIRM (PAFM)	DI	INFORMATION
41	CSY8	EXHAUST FAN 3 START	DO	CONTROL
ITEMS 42 THROUGH 43 ARE REQUIRED FOR MODULATING GATE CONTROLS				
42		GATE POSITION	DI	INFORMATION
43		GATE CONTROL	DO	CONTROL
ITEMS 44 THROUGH 51 ARE REQUIRED FOR BUILDING/GENERATOR CONTROLS				
44	CYSS1	UTILITY POWER -TRANSFER SW.	DI	INFORMATION
45	CYSS2	GENERATOR FAULT	DI	INFORMATION
46	EY1	PHASE MONITORING RELAY	D/I	INFORMATION
47	CYS1	RED ALARM STROBE LIGHT	D/O	CONTROL
48	CYS2	HORN	D/O	CONTROL
49		BUILDING HIGH TEMPERATURE	DI	INFORMATION
50		FUTURE SECURITY	DI	INFORMATION
51	CYSS3	GENERATOR RE-START	DO	CONTROL
ITEMS 52 THROUGH 57 ARE REQUIRED FOR THE SITE SPECIFIC SIGNALS				
52	LITS1	BAY 1 WATER LEVEL INDICATION	AI	INFORMATION
53	LITS2	BAY 2 WATER LEVEL INDICATION	AI	INFORMATION
54	LITS3	BAY 3 WATER LEVEL INDICATION	AI	INFORMATION
55	LITS4	HEAD WATER LEVEL S-382	AI	INFORMATION
56	LITS5	HEAD WATER LEVEL - OUTLET INTAKE	AI	INFORMATION
57	LITS6	TAIL WATER S-382 FOR ALL PUMPS	AI	INFORMATION
ITEMS 58 THROUGH 63 ARE REQUIRED FOR THE FUEL SYSTEM SIGNALS & CONTROLS				
58	CYSS4	FUEL MGMT SYST IN TROUBLE	D/I	INFORMATION
59	CYSS5	CONDENSATION WATER PRESENT	D/I	INFORMATION
60	YS11	FUEL PUMP AUTO	D/I	INFORMATION
61	YY17	FUEL PUMP RUN CONFIRM (PAFM)	D/I	INFORMATION
62	CSY16	FUEL PUMP START	D/O	CONTROL
63	LITS7	FUEL TANK LEVEL	AI	INFO./WARNINGS/SHUT DOWNS
ITEMS 64 THROUGH 67 ARE REQUIRED FOR THE STATION/CENTRAL CONTROLS AND MISC.				
64	YZ1	STATION/CENTRAL PUMP1	D/I	CONTROL
65	YZ2	STATION/CENTRAL PUMP2	D/I	CONTROL
66	YZ3	STATION/CENTRAL PUMP3	D/I	CONTROL
67	CSY17	AUTO SAMPLER	D/O	CONTROL

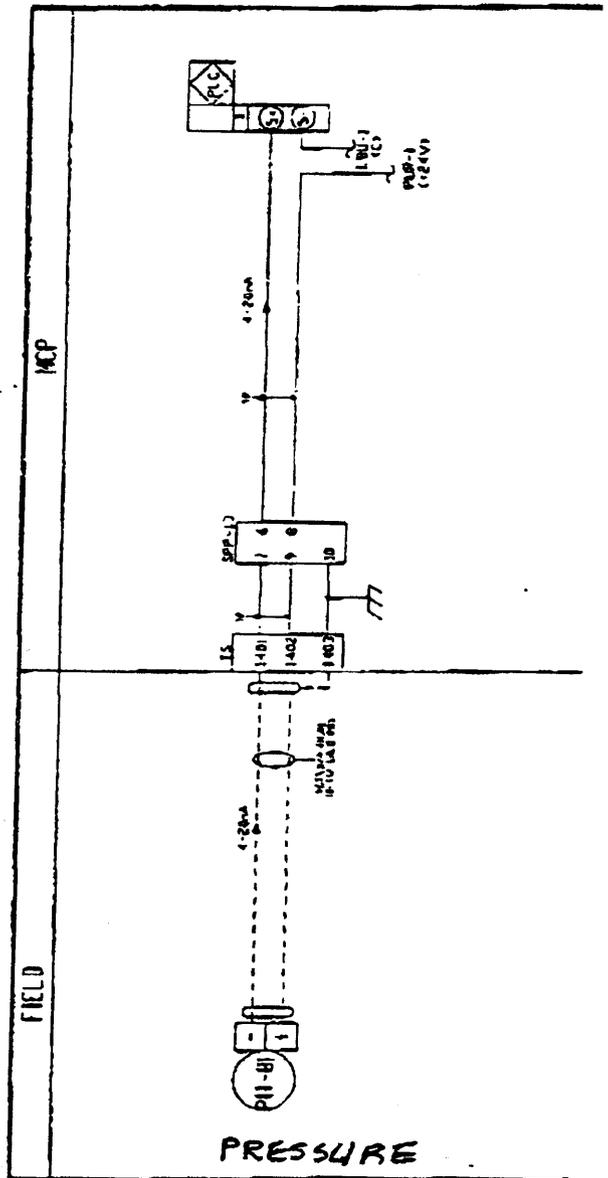
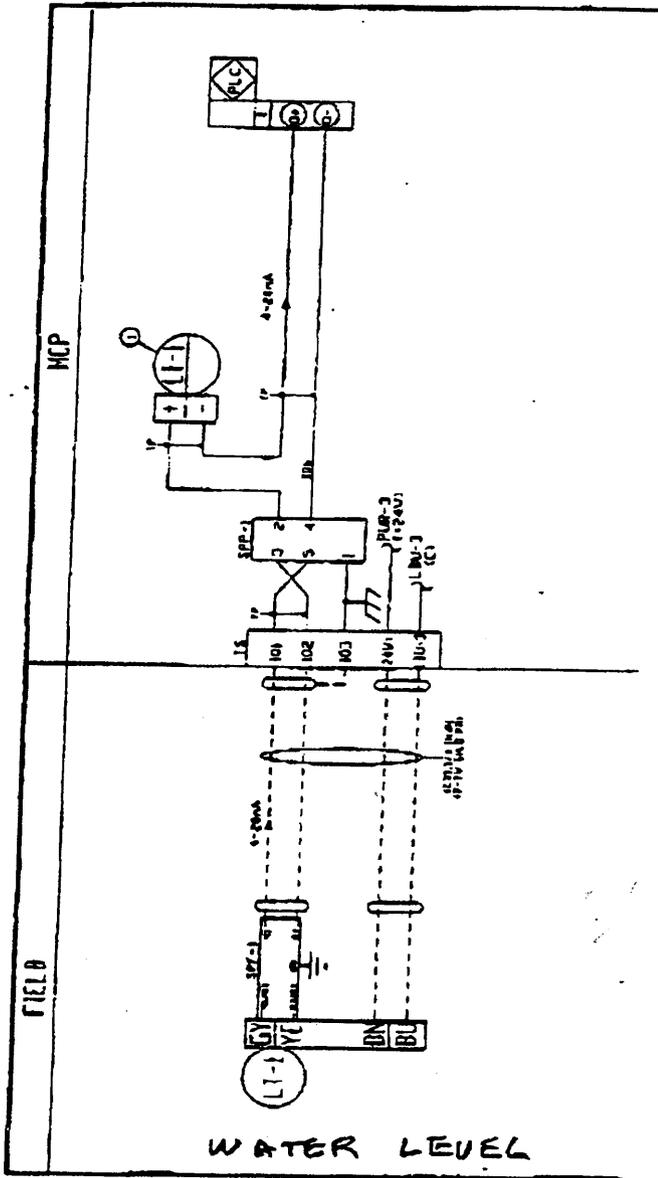
S-383 MCTP-2 - I/O

ITEM #	TAG ID	DESCRIPTION	I/O TYPE	REMARKS
ITEMS 1 THROUGH 36 ARE REQUIRED FOR THE ELECTRIC PUMP CONTROL OF EACH OF TWO MOTORS				
1	HZS	MANUAL MODE MOTOR NO. 1	DI	MANUAL MODE - NO PLC
2	UYZ	LOCAL AUTO MOTOR NO. 1	DI	CONTROL FROM LOCAL PLC
3	YZ	REMOTE AUTO MOTOR NO. 1	DI	CONTROL FROM TELEMETRY
4	HMS	RESET ALARM MOTOR NO. 1	DI	ACKNOWLEDGE FOR HORN
5	HAYP	TEST ALARM MOTOR NO. 1	DI	TEST FOR HORN
6	TYSH1	OVER HEAT SW. MOTOR NO. 1	DI	SHUT DOWN
7	LYSL1	PUMP BAY 1 WATER LOW LVL SW.	DI	SHUT DOWN
8	TYSH1	SUCTION BRNG H- TEMP SW.	DI	SHUT DOWN
9	TYSH2	DISTRIBUTION BRNG H-TEMP SW.	DI	SHUT DOWN
10	TYSH3	LOWER SHAFT BRNG H-TEMP SW.	DI	SHUT DOWN
11	TYSH4	UPPER SHAFT BRNG H-TEMP SW.	DI	SHUT DOWN
12	TYSH5	TENSION BRNG H-TEMP SW.	DI	SHUT DOWN
13	TYSH6	GEAR BOX OIL H-TEMP	DI	SHUT DOWN
14	VSHL1	GEAR BOX VIBRATION SW.	DI	SHUT DOWN
15	VSHL2	MOTOR VIBRATION SW.	DI	SHUT DOWN
16	LYSL2	PUMP BRNG LOW OIL LEVEL SW.	DI	SHUT DOWN
17	EY1	PHASE MONITORING RELAY	DI	SHUT DOWN
18	KY1	ELECTRIC MTR RUN TIME RELAY	DI	INFORMATION
19	YY1	RUN CONFIRMATION (PAFM)	DI	INFORMATION
20	CY1	START SOFT STARTER BYPASS	DI	INFORMATION
21	CY2	START SOFT STARTER	D/O	CONTROL
22	CY3	STOP SOFT STARTER	D/O	CONTROL
23	CYS1	RED ALARM STROBE LIGHT	D/O	CONTROL
24	CYS2	HORN	D/O	CONTROL
25	TIS1	SUCTION BELL BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
26	TIS2	DISTRIBUTOR BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
27	TIS3	LOWER SHAFT BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
28	TIS4	UPPER SHAFT BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
29	TIS5	TENSION NUT BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
30	TIS6	MOTOR BEARING TEMP.	AI	INFO./WARNINGS/SHUT DOWNS
31	SIS1	PUMP RPM	AI	INFO./WARNINGS/SHUT DOWNS
32	FQTS1	PUMP FLOW	AI	INFO./WARNINGS/SHUT DOWNS
33	TIS7	GEAR BOX OIL TEMP	AI	INFO./WARNINGS/SHUT DOWNS
34	VITS1	GEAR BOX VIBRATION	AI	INFO./WARNINGS/SHUT DOWNS
35	CITS1	MOTOR AMPS	AI	INFO./WARNINGS/SHUT DOWNS
36	LYSL2	PUMP BAY 1 WATER LOW LVL SW.	DI	SHUT DOWN
ITEMS 37 THROUGH 48 ARE REQUIRED FOR THE TRASH RACKS CONTROLS				
37	CS1	TRASH RACK 1 ON/OFF	DI	INFORMATION
38	YY2	TRASH RACK 1 RUN CONF. (PAFM)	DI	INFORMATION
39	CSY1	TRASH RACK 1 START	DO	CONTROL
40	CITS2	TRASH RACK 1 MOTOR AMPS	AI	INFORMATION
41	CS2	TRASH RACK 2 ON/OFF	DI	INFORMATION
42	YY3	TRASH RACK 2 RUN CONF. (PAFM)	DI	INFORMATION
43	CSY2	TRASH RACK 2 START	DO	CONTROL
44	CITS3	TRASH RACK 2 MOTOR AMPS	AI	INFORMATION
45	CS3	TRASH RACK 3 ON/OFF	DI	INFORMATION
46	YY4	TRASH RACK 3 RUN CONF. (PAFM)	DI	INFORMATION
47	CSY3	TRASH RACK 3 START	DO	CONTROL
48	CITS4	TRASH RACK 3 MOTOR AMPS	AI	INFORMATION

S-383 MCTP-2 - I/O

ITEM #	TAG ID	DESCRIPTION	I/O TYPE	REMARKS
ITEMS 49 THROUGH 66 ARE REQUIRED FOR MODULATING GATE/WEIR CONTROLS				
49		WEIR NO. 3 POSITION		POSITION
50		WEIR NO. 3 CONTROL		CONTROL
51		WEIR NO. 4 POSITION		POSITION
52		WEIR NO. 4 CONTROL		CONTROL
53		WEIR NO. 5 POSITION		POSITION
54		WEIR NO. 5 CONTROL		CONTROL
55		WEIR NO. 6 POSITION		POSITION
56		WEIR NO. 6 CONTROL		CONTROL
57		WEIR NO. 7 POSITION		POSITION
58		WEIR NO. 7 CONTROL		CONTROL
59		WEIR NO. 8 POSITION		POSITION
60		WEIR NO. 8 CONTROL		CONTROL
61		WEIR NO. 9 POSITION		POSITION
62		WEIR NO. 9 CONTROL		CONTROL
63		WEIR NO. 10 POSITION		POSITION
64		WEIR NO. 10 CONTROL		CONTROL
65		CULVERT S-383 GATE POSITION		POSITION
66		CULVERT S-383 GATE CONTROL		CONTROL
ITEMS 66 THROUGH 72 ARE REQUIRED FOR THE SITE SPECIFIC SIGNALS				
66	LITS1	BAY 1 WATER LEVEL INDICATION	AI	INFORMATION
67	LITS2	BAY 2 WATER LEVEL INDICATION	AI	INFORMATION
68	LITS3	HEAD WATER LEVEL S-383	AI	INFORMATION
69	LITS4	HEAD WATER LEVEL DIST. BOX	AI	INFORMATION
70	LITS5	HEAD WATER LEVEL RESERVOIR	AI	INFORMATION
71	LITS6	TAIL WATER LEVEL S-383	AI	INFORMATION
72	LITS7	TAIL WATER LEVEL DIST. BOX	AI	INFORMATION
ITEMS 73 THROUGH 75 ARE REQUIRED FOR THE STATION/CENTRAL CONTROLS AND MISC.				
73	YZ1	STATION/CENTRAL PUMP1	D/I	CONTROL
74	YZ2	STATION/CENTRAL PUMP2	D/I	CONTROL
75	CSY17	AUTO SAMPLER	D/O	CONTROL

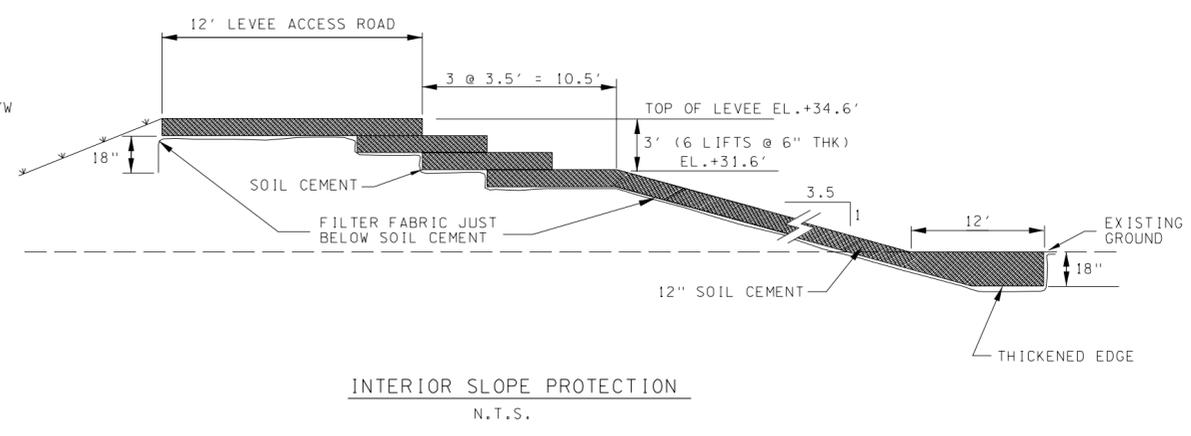
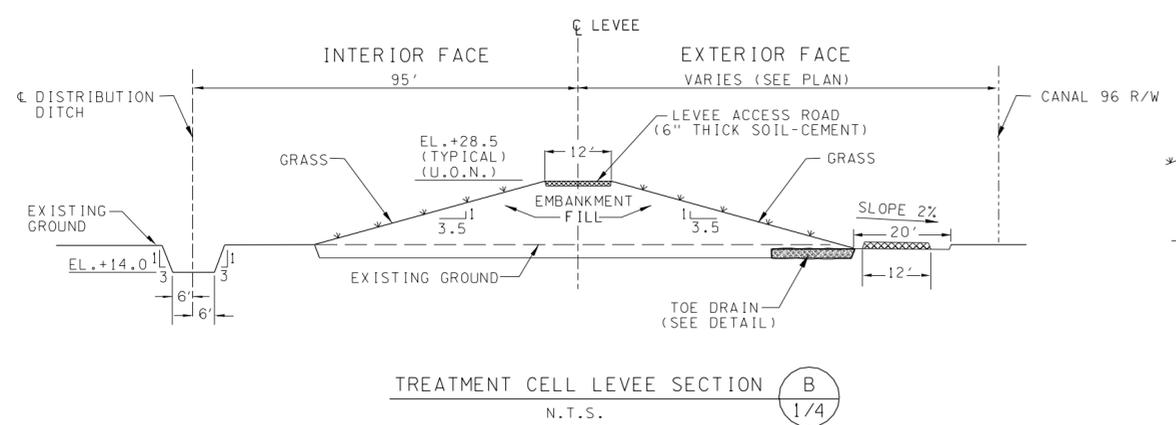
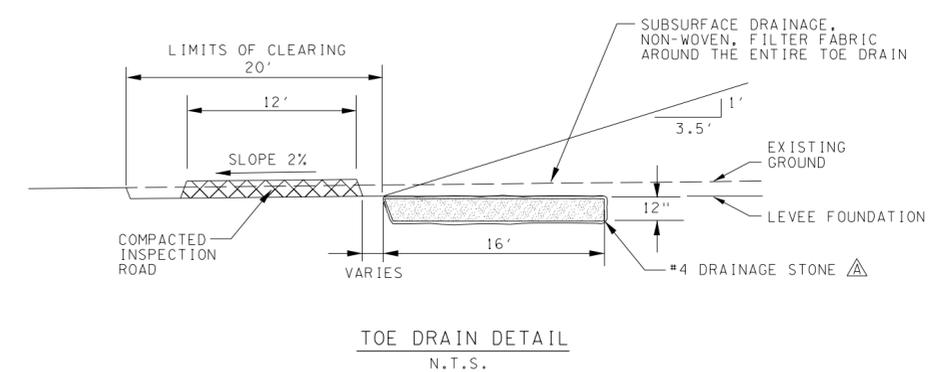
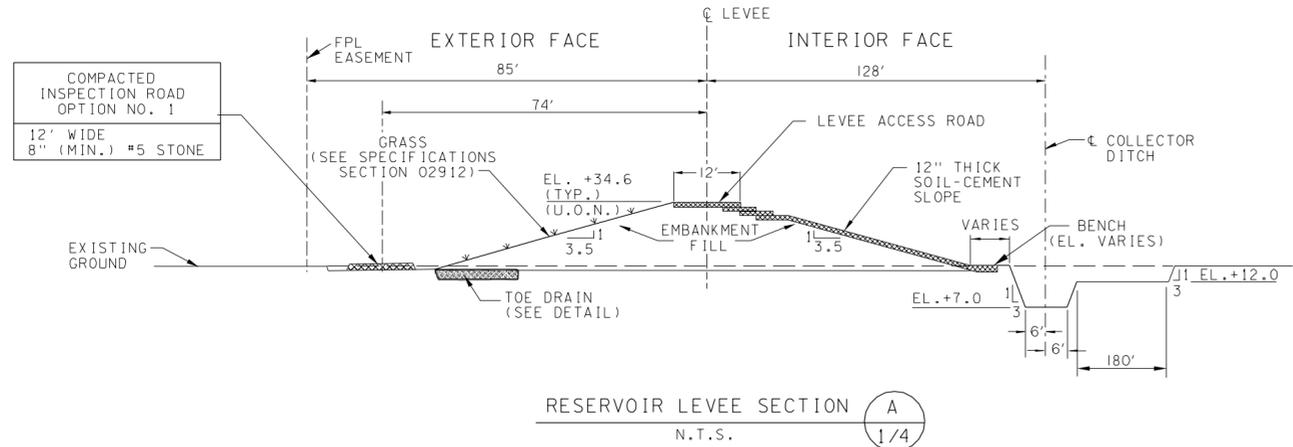
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US Army Corps of Engineers
Jacksonville District
SAFETY ON THIS JOB
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1	H-5	REVISED TO ACCOMPANY AMENDMENT NO. 004	DESCRIPTION
			Approved



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

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ENGINEERING - PLANNING - ARCHITECTURE

Inv. No. DAC417-02-9-0019
Designed by: [blank]
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Scale: AS SHOWN
Reference files: [blank]
C-0008R-001

Project date: APR. 26, 2002
Plot date: [blank]
Plot scale: [blank]

Revised: SEPTEMBER 2001
D.O.F. FILE NO. 402-38.236

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
CRITICAL RESTORATION PROJECT
TEN MILE CREEK
WATER PRESERVE AREA

SECTIONS

DRAWING NO.
1/5

01/31/02 SUBMITTAL

17.8

6

5

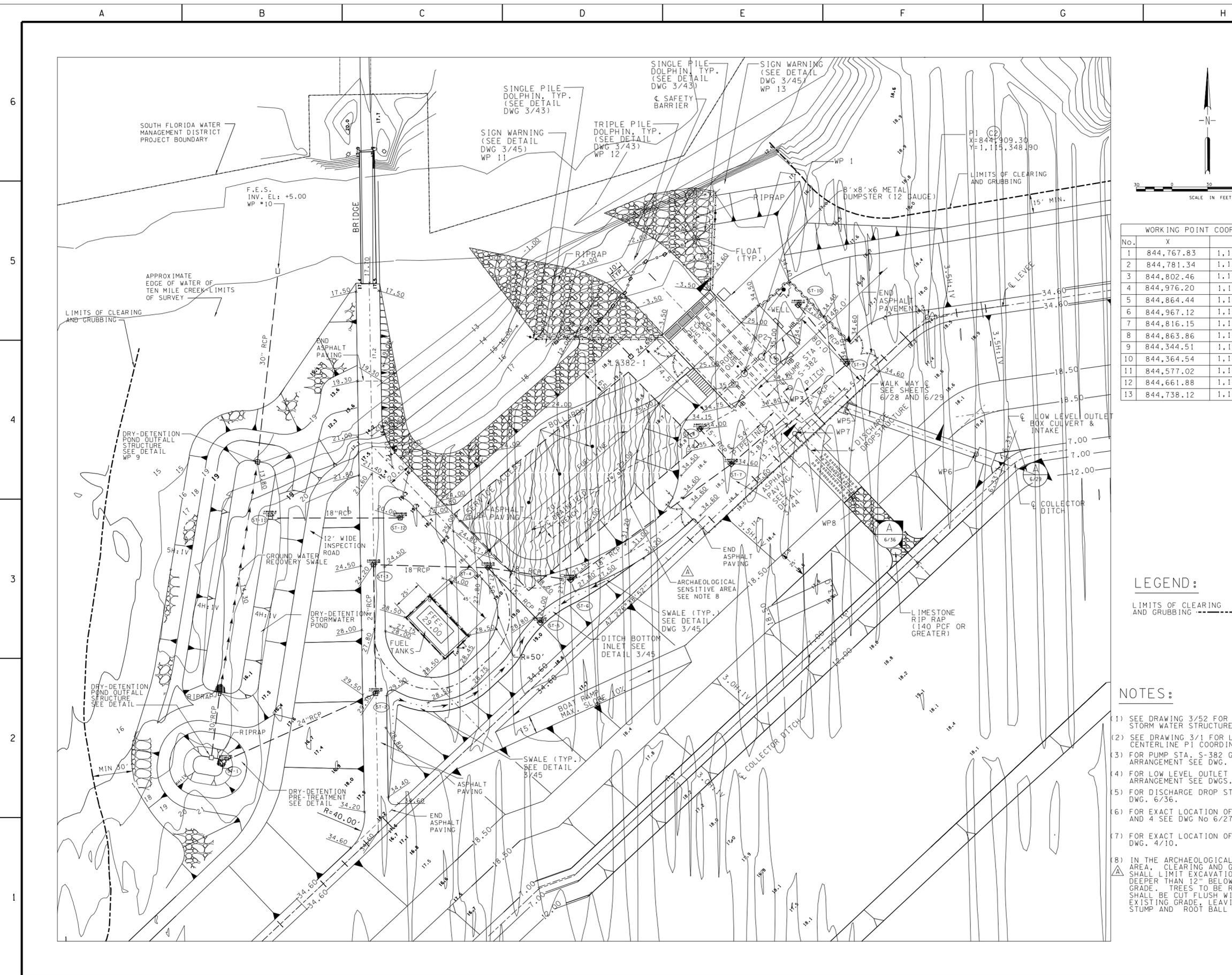
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1

01/31/02 SUBMITTAL



US Army Corps of Engineers
 Jacksonville District
 SAFETY ON THIS JOB DEPENDS ON YOU

Approved

1	REVISED TO ACCOMPANY AMENDMENT NO. 0004	Disc# 13110
2	REVISED TO ACCOMPANY AMENDMENT NO. 0004	Disc# 13110

DEPARTMENT OF THE ARMY
 JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
 JACKSONVILLE, FLORIDA

PBS&J

1700 BANKERS WAY
 JACKSONVILLE, FL 32204
 TEL: (904) 351-8883
 ENGINEERING - PLANNING - ARCHITECTURE

Inv. No. DAC17-02-9-0019
 Date: AS SHOWN
 Scale: AS SHOWN
 Proj. date: APR. 26, 2002
 P1: E/JF
 P1: score:

DESIGNED BY: ER-AD
 CHECKED BY: E/JF

DATE: SEPTEMBER 2001

D.O.F. FILE NO. 402-38.236

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
 CRITICAL RESTORATION PROJECT
 TEN MILE CREEK
 WATER PRESERVE AREA

PUMP STATION S-382
 SITE LAYOUT

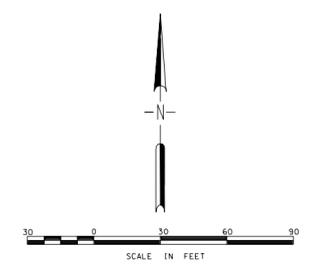
DRAWING NO.
3/42

WORKING POINT COORDINATES

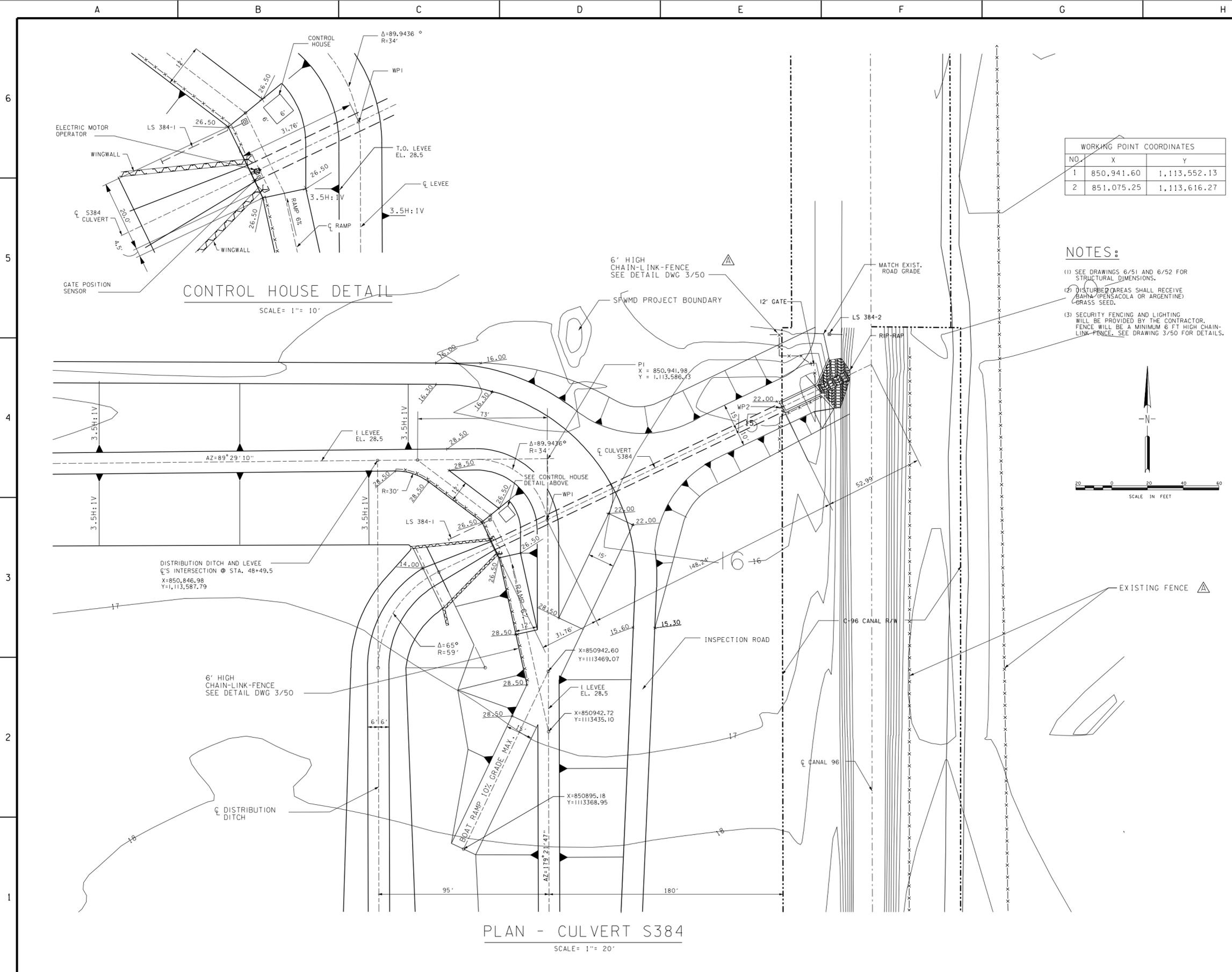
No.	X	Y
1	844,767.83	1,115,307.53
2	844,781.34	1,115,320.32
3	844,802.46	1,115,297.98
4	844,976.20	1,115,239.99
5	844,864.44	1,115,297.64
6	844,967.12	1,115,261.06
7	844,816.15	1,115,250.70
8	844,863.86	1,115,200.16
9	844,344.51	1,115,226.19
10	844,364.54	1,115,416.97
11	844,577.02	1,115,330.72
12	844,661.88	1,115,397.20
13	844,738.12	1,115,462.04

LEGEND:
 LIMITS OF CLEARING AND GRUBBING

- NOTES:**
- SEE DRAWING 3/52 FOR DRAINAGE STORM WATER STRUCTURES INFORMATION.
 - SEE DRAWING 3/1 FOR LEVEE CENTERLINE P1 COORDINATES.
 - FOR PUMP STA. S-382 GENERAL ARRANGEMENT SEE DWG. 4/10.
 - FOR LOW LEVEL OUTLET INTAKE GENERAL ARRANGEMENT SEE DWGS. 4/1 & 4/2.
 - FOR DISCHARGE DROP STRUCTURE SEE DWG. 6/36.
 - FOR EXACT LOCATION OF WP'S 2 AND 4 SEE DWG No 6/21.
 - FOR EXACT LOCATION OF WP1 SEE DWG. 4/10.
 - IN THE ARCHAEOLOGICAL SENSITIVE AREA, CLEARING AND GRUBBING SHALL LIMIT EXCAVATION TO NO DEEPER THAN 12" BELOW EXISTING GRADE. TREES TO BE REMOVED, SHALL BE CUT FLUSH WITH THE EXISTING GRADE, LEAVING THE STUMP AND ROOT BALL INTACT.



01/31/02 SUBMITTAL

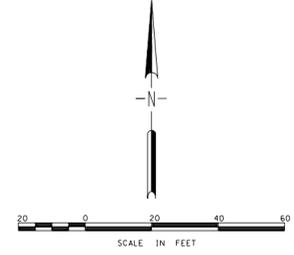


CONTROL HOUSE DETAIL
SCALE= 1"= 10'

PLAN - CULVERT S384
SCALE= 1"= 20'

WORKING POINT COORDINATES		
NO.	X	Y
1	850,941.60	1,113,552.13
2	851,075.25	1,113,616.27

- NOTES:**
- SEE DRAWINGS 6/51 AND 6/52 FOR STRUCTURAL DIMENSIONS.
 - DISTURBED AREAS SHALL RECEIVE BAHIA (PENSACOLA OR ARGENTINE) GRASS SEED.
 - SECURITY FENCING AND LIGHTING WILL BE PROVIDED BY THE CONTRACTOR. FENCE WILL BE A MINIMUM 6 FT HIGH CHAIN-LINK FENCE. SEE DRAWING 3/50 FOR DETAILS.



US Army Corps of Engineers
Jacksonville District
SAFETY ON THIS JOB DEPENDS ON YOU

NO.	DATE	DESCRIPTION	APPROVED
1			
2		REVISED TO ACCOMPANY ADJUMENT NO. 0004	

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

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ENGINEERING - PLANNING - ARCHITECTURE

Inv. No. DAC417-02-9-0019
Designed by: [Blank]
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Scale: AS SHOWN
Reference files: [Blank]
V: 1000007.DGN
C: 0000047.DGN

DATE: SEPTEMBER 2001
D.O.F. FILE NO. 402-38-236

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
CRITICAL RESTORATION PROJECT
TEN MILE CREEK
WATER PRESERVE AREA

CULVERT S384
PLAN SHEET

DRAWING NO.
3/48

	A	B	C	D	E	F	G	H																																																
6	<p>COORDINATION</p> <p>CONTRACTOR SHALL COORDINATE ALL PIPE AND CONDUIT LOCATIONS THROUGH CONCRETE WITH THE ARCHITECTURAL, CIVIL, ELECTRICAL AND MECHANICAL DRAWINGS PRIOR TO PLACING CONCRETE.</p> <p>GOVERNING DOCUMENTS</p> <p>WHERE THESE NOTES AND/OR STRUCTURAL DRAWINGS MAY BE IN CONFLICT WITH PROJECT SPECIFICATIONS, THE PROJECT SPECIFICATIONS SHALL GOVERN.</p> <p>PRECAUTIONS</p> <p>ALL CAST-IN-PLACE AND PRECAST CONCRETE STRUCTURES SHALL BE CONSTRUCTED IN THE "DRY". THE GROUND WATER ELEVATIONS SHALL BE MAINTAINED TWO (2) FEET BELOW THE BOTTOM OF FOUNDATION EXCAVATIONS, AT ALL TIMES, DURING CONSTRUCTION AND INSTALLATION OF A GIVEN STRUCTURE. STRUCTURES ARE DESIGNED TO BE FULLY CONSTRUCTED IN DRY CONDITIONS, ONLY.</p> <p>CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT FLOATION OF STRUCTURES UNTIL FULLY CONSTRUCTED AND BACKFILL IS IN PLACE AND COMPACTED. ALL STRUCTURES WERE DESIGNED TO BE CONSTRUCTED IN THE "DRY".</p> <p>NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURE WALL UNTIL THE WALL HAS ATTAINED MINIMUM 3,000 PSI COMPRESSIVE STRENGTH.</p> <p>THE CONTRACTOR IS HEREBY ADVISED OF THE FOLLOWING WATER SURFACE ELEVATIONS AND SHALL TAKE NECESSARY PRECAUTIONS ACCORDINGLY:</p> <table border="1"> <tr> <td>100 YEAR FLOOD</td> <td>ELEV. 20.0</td> </tr> <tr> <td>25 YEAR FLOOD</td> <td>ELEV. 16.5</td> </tr> <tr> <td>GROUND WATER</td> <td>ELEV. 13.0</td> </tr> </table> <p>THE GROUND WATER ELEVATION MAY VARY. THE ELEVATION INDICATED ABOVE IS THE MAXIMUM RECORDED AS OF SEPTEMBER 2001.</p> <p>THE CONTRACTOR IS RESPONSIBLE FOR HIS DEWATERING TECHNIQUES AND FOR MONITORING THE GROUND WATER LEVELS ACCORDINGLY DURING CONSTRUCTION. THE TEMPORARY COFFERDAM ILLUSTRATIONS SHOWN ON THE DRAWINGS ARE BASED ON LOWERING AND MAINTAINING THE GROUND WATER TABLE A MINIMUM OF 2 FEET BELOW THE BOTTOM OF FOUNDATION SLABS AND/OR FOOTINGS. FAILURE TO MAINTAIN THE WATER TABLE MAY RESULT IN UNSAFE CONDITIONS AND STRUCTURAL CONSEQUENCES.</p> <p>CONSTRUCTION LAYOUT</p> <p>FOR THE ACCURATE LOCATION AND ORIENTATION OF STRUCTURES REFER TO THE CIVIL DRAWINGS ONLY. STRUCTURAL DRAWINGS DO NOT NECESSARILY SHOW TRUE LOCATION AND/OR ORIENTATION OF STRUCTURES.</p> <p>WORKING POINTS</p> <p>FOR COORDINATES OF WORKING POINTS (WP) SHOWN ON THE STRUCTURAL ("6" SERIES) DRAWINGS, REFER TO CIVIL ("3" SERIES) DRAWINGS.</p> <p>STRUCTURAL DESIGN LOADS</p> <p>THE FOLLOWING LIVE LOADS SERVE AS THE BASIS OF DESIGN, UNLESS OTHERWISE NOTED ON THE DRAWINGS:</p> <table border="1"> <tr> <td>MOBILE CRANE</td> <td>15 TONS</td> </tr> <tr> <td>ROOFS</td> <td>50 PSF</td> </tr> <tr> <td>STAIRWAYS</td> <td>100 PSF</td> </tr> <tr> <td>GRATING</td> <td>100 PSF</td> </tr> <tr> <td>OFFICE SPACES</td> <td>100 PSF</td> </tr> <tr> <td>CONTROL ROOMS</td> <td>200 PSF</td> </tr> <tr> <td>MAINTENANCE SHOPS</td> <td>300 PSF</td> </tr> <tr> <td>OPERATING FLOOR WITH TRUCK ACCESS</td> <td>H520</td> </tr> </table> <p>THE FOLLOWING WIND LOADS SERVE AS THE BASIS OF DESIGN UNLESS OTHERWISE NOTED ON THE DRAWINGS:</p> <table border="1"> <tr> <td>BASIC WIND SPEED (100 YR RETURN)</td> <td>160 MPH</td> </tr> <tr> <td>BUILDING CLASSIFICATIONS</td> <td>CATEGORY II</td> </tr> <tr> <td>IMPORTANCE FACTOR (I)</td> <td>1.00</td> </tr> <tr> <td>EXPOSURE CATEGORY</td> <td>D</td> </tr> <tr> <td>INTERNAL PRESSURE COEFFICIENTS</td> <td>#0.18</td> </tr> <tr> <td>COMPONENTS AND CLADDING</td> <td>REFER TO 6/20</td> </tr> </table> <p>CAST-IN-PLACE CONCRETE</p> <p>THE 28-DAY CAST-IN-PLACE CONCRETE COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:</p> <table border="1"> <tr> <td>WORKING MATS AND FILL CONCRETE</td> <td>3,000 PSI</td> </tr> <tr> <td>ALL STRUCTURAL CONCRETE</td> <td>4,000 PSI</td> </tr> </table> <p>PROVIDE 3/4 INCH CHAMFER ON ALL EXPOSED CONCRETE CORNERS AND EDGES, UNLESS OTHERWISE NOTED.</p> <p>CONSTRUCTION, CONTRACTION AND EXPANSION JOINTS INCLUDING KEYWAYS SHALL BE AS SHOWN ON THE STRUCTURAL DRAWINGS, UNLESS VARIATIONS ARE DETAILED ON SHOP DRAWINGS AND APPROVED BY THE CONTRACTING OFFICER.</p> <p>WATERSTOPS SHALL BE INSTALLED AT CONSTRUCTION, CONTRACTION AND EXPANSION JOINTS IN SLABS AND WALLS IN CONTACT WITH SOIL AS SPECIFIED BELOW AND AS OTHERWISE SHOWN ON THE DRAWINGS:</p> <table border="1"> <tr> <td>PUMP STATION 382</td> <td>ALL JOINTS BELOW ELEVATION 20.00</td> </tr> <tr> <td>PUMP STATION 383</td> <td>ALL JOINTS BELOW ELEVATION 29.00</td> </tr> <tr> <td>BOX CULVERTS</td> <td>ALL JOINTS BELOW FINISHED GRADE</td> </tr> <tr> <td>LOW LEVEL OUTLET INTAKE STRUCTURE</td> <td>ALL JOINTS BELOW ELEVATION 33.0</td> </tr> <tr> <td>DISCHARGE DROP STRUCTURE</td> <td>ALL JOINTS BELOW ELEVATION 38.0</td> </tr> <tr> <td>DISTRIBUTION BOX</td> <td>ALL JOINTS BELOW ELEVATION 27.0</td> </tr> </table> <p>WATERSTOPS SHALL BE SIZED AND POSITIONED IN ACCORDANCE WITH THE TYPICAL WATERSTOP DETAILS SHOWN ON DRAWING 6/65.</p> <p>CONCRETE FINISHES</p> <p>CLASS A (ALPHA) FINISH SHALL BE USED FOR THE EXPOSED INTERIOR SURFACES OF BOX CULVERTS AND THE EXPOSED INTERIOR SURFACES OF THE EMERGENCY SPILLWAY AND DISCHARGE DROP STRUCTURES.</p> <p>CLASS B (BETA) FINISH SHALL BE USED FOR ALL SURFACES EXPOSED TO VIEW INCLUDING BOTH THE INTERIOR AND EXTERIOR SURFACES OF ALL WATER CONTAINING STRUCTURES AND BUILDINGS ABOVE FINAL GRADE, NOT DESIGNATED TO RECEIVE A CLASS A FINISH.</p> <p>CLASS D (DELTA) FINISH SHALL BE USED FOR ALL SURFACES BELOW FINAL GRADE NOT EXPOSED TO VIEW, OF WHICH BACKFILL WILL BE PLACED, UNLESS OTHERWISE NOTED.</p> <p>WHERE THE ABOVE DOES NOT SPECIFICALLY DEFINE IT, A CLASS B (BETA) FINISH SHALL BE USED.</p> <p>FOR PRECAST CONCRETE FINISHES REFER TO ARCHITECTURAL DRAWINGS.</p>		100 YEAR FLOOD	ELEV. 20.0	25 YEAR FLOOD	ELEV. 16.5	GROUND WATER	ELEV. 13.0	MOBILE CRANE	15 TONS	ROOFS	50 PSF	STAIRWAYS	100 PSF	GRATING	100 PSF	OFFICE SPACES	100 PSF	CONTROL ROOMS	200 PSF	MAINTENANCE SHOPS	300 PSF	OPERATING FLOOR WITH TRUCK ACCESS	H520	BASIC WIND SPEED (100 YR RETURN)	160 MPH	BUILDING CLASSIFICATIONS	CATEGORY II	IMPORTANCE FACTOR (I)	1.00	EXPOSURE CATEGORY	D	INTERNAL PRESSURE COEFFICIENTS	#0.18	COMPONENTS AND CLADDING	REFER TO 6/20	WORKING MATS AND FILL CONCRETE	3,000 PSI	ALL STRUCTURAL CONCRETE	4,000 PSI	PUMP STATION 382	ALL JOINTS BELOW ELEVATION 20.00	PUMP STATION 383	ALL JOINTS BELOW ELEVATION 29.00	BOX CULVERTS	ALL JOINTS BELOW FINISHED GRADE	LOW LEVEL OUTLET INTAKE STRUCTURE	ALL JOINTS BELOW ELEVATION 33.0	DISCHARGE DROP STRUCTURE	ALL JOINTS BELOW ELEVATION 38.0	DISTRIBUTION BOX	ALL JOINTS BELOW ELEVATION 27.0	<p>PRECAST CONCRETE WALL PANELS:</p> <p>THE 28-DAY PRECAST WALL PANEL CONCRETE COMPRESSIVE STRENGTH SHALL BE 5,000 PSI.</p> <p>THE CONCRETE STRENGTH AT RELEASE SHALL BE 3,500 PSI.</p> <p>FOR ADDITIONAL DESIGN AND MANUFACTURING NOTES REFER TO "PRECAST WALL PANEL DRAWINGS" AND THE ARCHITECTURAL DRAWINGS.</p> <p>REINFORCING</p> <p>ALL REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60.</p> <p>CLEAR COVER SHALL BE 4 INCHES FOR SECTIONS GREATER THAN OR EQUAL TO 24 INCHES IN THICKNESS.</p> <p>CLEAR COVER SHALL BE 3 INCHES FOR WALLS GREATER THAN 12 INCHES BUT LESS THAN 24 INCHES IN THICKNESS.</p> <p>CLEAR COVER SHALL BE 2 INCHES FOR WALLS 12 INCHES OR LESS IN THICKNESS.</p> <p>OTHER COVER REQUIREMENTS ARE SHOWN ON THE STRUCTURAL DRAWINGS.</p> <p>BAR BENDING AND PLACEMENT DETAILS SHALL CONFORM TO ACI 315, 318 AND SP-66.</p> <p>LAP SPLICES SHALL BE CLASS B AND CONFORM TO THE TABLE SHOWN ON THIS SHEET. FOR DIFFERENT BAR SIZES, THE SPLICE LENGTH SHALL BE BASED ON THE SMALLER BAR SIZE.</p> <p>EMBEDMENT LENGTHS SHALL BE IN CONFORMANCE WITH THE TABLE SHOWN ON THIS SHEET. ALL TOP BARS (BARS WITH MORE THAN 12 INCHES OF CONCRETE BELOW THE BAR) SHALL HAVE THE EMBEDMENT INCREASED BY A FACTOR OF 1.3.</p> <p>CONCRETE MASONRY:</p> <p>CONCRETE MASONRY UNITS SHALL BE IN CONFORMANCE WITH ASTM C90, TYPE 1, NORMAL WEIGHT. MORTAR SHALL CONFORM TO ASTM C 270, TYPE M, STRENGTH f'm = 1,500 PSI.</p> <p>STRUCTURAL STEEL</p> <p>ALL STEEL SHAPES, BARS, AND PLATES, ETC. SHALL CONFORM TO ASTM A 572, GRADE 50, UNLESS OTHERWISE NOTED.</p> <p>STRUCTURAL TUBE SHALL CONFORM TO ASTM A500, GRADE 50.</p> <p>STRUCTURAL PIPE SHALL CONFORM TO ASTM A53, GRADE B.</p> <p>BARS AND PLATES NOTED AS STAINLESS STEEL (SS) SHALL CONFORM TO ASTM A 167 UNS S30403 (TYPE 304L). OTHER MATERIALS NOTED AS STAINLESS STEEL (SS), SHALL BE TYPE 304 WITH A LOW CARBON CONTENT.</p> <p>CONNECTIONS:</p> <p>ALL BOLTED CONNECTIONS SHALL BE TYPE 1, ASTM A 325 BOLTS.</p> <p>BOLT HOLES SHALL BE AISC STANDARD UNLESS OTHERWISE NOTED.</p> <p>FURNISH BOLTS WITH ONE NUT AND WASHER UNLESS OTHERWISE NOTED. GALVANIZED BOLTS, NUTS, WASHERS AND MISCELLANEOUS HARDWARE, UNLESS OTHERWISE NOTED.</p> <p>A MINIMUM OF TWO BOLTS ARE REQUIRED FOR ALL BEAM CONNECTIONS.</p> <p>THE MINIMUM WELD SIZE SHALL BE 3/4 INCH, UNLESS OTHERWISE NOTED. WELDED ELECTRODES SHALL CONFORM TO E70XX</p> <p>HEADED STUDS:</p> <p>HEADED STUDS SHALL CONFORM TO ASTM A 108. STUD DIAMETERS SHALL BE MINIMUM OF 1/2 INCH DIAMETER OR AS NOTED ON THE PLANS. STUD LENGTH SHALL BE AUTOMATICALLY END WELDED ON THE SHOP OR FIELD WITH EQUIPMENT RECOMMENDED BY THE MANUFACTURER.</p> <p>EXPANSION BOLTS:</p> <p>EXPANSION BOLTS SHALL BE ICBO APPROVED AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS. BOLT SPACING AND EMBEDMENT SHALL BE AS SHOWN ON THE DRAWINGS.</p> <p>GALVANIZED ITEMS:</p> <p>GALVANIZED ITEMS SHALL BE GALVANIZED AFTER FABRICATION. WHERE GALVANIZED ITEMS LOSE THEIR COATING DUE TO FIELD WELDING OR CHIPPING, MAKE GALVANIZING REPAIRS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.</p>		<p>ALUMINUM NEEDLE PANELS</p> <p>ALL ALUMINUM SHAPES SHALL CONFORM TO ALLY 6061, TEMPER T6. ALL BOLTS SHALL CONFORM TO ASTM F593 (GROUP 1) WITH ASTM F594 (GROUP 1) NUTS AND STAINLESS STEEL WASHERS IN CONFORMANCE WITH ASME B18.22.1. RUBBER WATERSTOPS SHALL BE NEOPRENE IN CONFORMANCE WITH ASTM D-2240.</p> <p>STRUCTURAL ALUMINUM</p> <p>ALL ALUMINUM SHAPES SHALL CONFORM TO ASTM B 308, ALLOY 6061, TEMPER T6. ALUMINUM BARS SHALL CONFORM TO ASTM B211 ALLOY 6061, TEMPER T6. ALUMINUM PLATES SHALL CONFORM TO ASTM B209, ALLOY 6061, TEMPER T6.</p> <p>SHEET PILE WALLS</p> <p>ALL STEEL SHEET PILE MATERIAL SHALL CONFORM TO ASTM A 572, GRADE 50.</p> <p>STEEL FOR STEEL PILE TIE RODS SHALL CONFORM TO ASTM A615, GRADE 75. WALERS (CHANNEL SECTIONS) SHALL CONFORM TO ASTM A572, GRADE 50. TIE RODS, WALERS AND RELATED CONNECTIONS SHALL BE GALVANIZED IN CONFORMANCE WITH ASTM A153.</p> <p>SPECIFIC SHEET PILING WALL SECTIONS ARE SHOWN ON THE DRAWINGS. CONTRACTOR MAY PROPOSE ALTERNATE SECTIONS PROVIDING THE MATERIAL PROPERTIES OF THE PROPOSED SECTIONS ARE EQUAL OR GREATER THAN THAT SHOWN AND SPECIFIED. THE CONTRACTOR SHALL SUBMIT DETAILS OF PROPOSED CHANGES TO THE SHEET PILING WALLS FOR APPROVAL BY THE CONTRACTING OFFICER.</p> <p>TEMPORARY SHEET PILING COFFERDAM MATERIAL SHALL BE COATED WITH A BOND BREAKER PRIOR TO DRIVING TO ALLOW REMOVAL BY PULLING (EXTRACTING) THE SHEETS.</p> <p>SHEET PILE WALL COATINGS</p> <p>ALL PERMANENT STEEL PILE WALLS SHALL BE COATED WITH A TWO COAT SYSTEM IN CONFORMANCE WITH THE PROJECT SPECIFICATIONS.</p> <p>GRATING</p> <p>ALL GRATING SHALL BE GALVANIZED STEEL AS SCHEDULED AND DETAILED ON THE "TYPICAL GRATING DETAILS" DRAWING.</p> <p>HANDRAILING</p> <p>ALL HANDRAILING POSTS, RAILS AND CONNECTIONS SHALL BE STEEL, AND GALVANIZED IN CONFORMANCE WITH ASTM 123. FOR RAILING DESIGN AND INSTALLATION DETAILS REFER TO THE "TYPICAL HAND RAILING DETAILS" DRAWING.</p> <p>TYPICAL DETAILS</p> <p>TYPICAL DETAILS APPLY TO ALL APPROPRIATE LOCATIONS, UNLESS OTHERWISE NOTED. TYPICAL DETAIL DRAWINGS ARE LOCATED AT THE END OF THE STRUCTURAL DRAWINGS SET.</p> <p>FOUNDATION PREPARATION</p> <p>THE FOLLOWING FOUNDATION PREPARATION SHALL BE ADHERED TO, UNLESS OTHERWISE NOTED ON THE DRAWINGS OR DESCRIBED IN THE PROJECT SPECIFICATIONS:</p> <p>REMOVE ALL ORGANIC TOPSOIL, SURFACE VEGETATION, AND DEBRIS ETC. AT EACH STRUCTURE, FOR A MINIMUM DISTANCE OF 5 FEET OUTSIDE THE STRUCTURE PERIPHERY.</p> <p>PERFORM EXCAVATIONS AND DEWATER AS REQUIRED. INSTALL TEMPORARY COFFERDAMS AND TRENCH SHEETING AS REQUIRED.</p> <p>COMPACT SUBGRADE BELOW FOUNDATIONS TO A DENSITY OF 95 PERCENT OF THE MODIFIED PROCTOR DRY DENSITY TEST (ASTM D-1557) TO 2 FEET BELOW THE STRUCTURE FOUNDATION AND/OR EXCAVATED SURFACE. COMPACT SUBGRADE FOR A MINIMUM DISTANCE OF 2 FEET OUTSIDE THE STRUCTURE PERIPHERY.</p> <p>IF FILL IS REQUIRED, PLACE IN LOOSE LIFTS NOT TO EXCEED 12 INCHES AND COMPACT TO A DENSITY OF 95 PERCENT OF THE MODIFIED PROCTOR DRY DENSITY TEST (ASTM D-1557) AS NOTED ABOVE.</p> <p>BACKFILL AND COMPACT FILL AROUND NEW CONSTRUCTION TO A DENSITY OF 95 PERCENT OF THE MODIFIED PROCTOR DRY DENSITY TEST (ASTM D-1557).</p> <p>MEANS AND METHODS</p> <p>THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION. STRUCTURAL ("6" SERIES) DRAWINGS SHOW THE CONFIGURATION OF FINAL CONSTRUCTION ONLY. "SUGGESTED" CONSTRUCTION SEQUENCES ARE FOR CONTRACTOR'S CONSIDERATION ONLY AND DOES NOT CONSTITUTE AN ABSOLUTE "MEANS AND METHODS" OF CONSTRUCTION.</p>	
100 YEAR FLOOD	ELEV. 20.0																																																							
25 YEAR FLOOD	ELEV. 16.5																																																							
GROUND WATER	ELEV. 13.0																																																							
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DISCHARGE DROP STRUCTURE	ALL JOINTS BELOW ELEVATION 38.0																																																							
DISTRIBUTION BOX	ALL JOINTS BELOW ELEVATION 27.0																																																							
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STRUCTURAL ABBREVIATIONS

A.B.	ANCHOR BOLT	I.F.	INSIDE FACE
ADD.	ADDITIONAL	I.J.	ISOLATION JOINT
ALUM.	ALUMINUM	L.P.	LOW POINT
ARCH.	ARCHITECT (URAL)	MFR.	MANUFACTURE (ER)
BRG.	BEARING	MAX.	MAXIMUM
BM.	BEAM	MECH.	MECHANICAL
B.	BOTTOM	MIN.	MINIMUM
BLDG.	BUILDING	N.T.S.	NOT TO SCALE
COV.	COVER	NO.	NUMBER
CL.	CENTER LINE	O.C.	ON CENTER
CL.	CLEAR (ANCE)	O.F.	OUTSIDE FACE
CONC.	CONCRETE	OPNG.	OPENING
CONN.	CONNECTION	PL.	PLATE
COL.	COLUMN	P.S.F.	POUNDS PER SQUARE FOOT
C.J.	CONSTRUCTION JOINT	P.S.I.	POUNDS PER SQUARE INCH
CT.J.	CONTRACTION JOINT	REF.	REFERENCE
DET. (S)	DETAIL(S)	REINF.	REINFORCE (D) (ING)
DIA.	DIAMETER	REQ'D.	REQUIRED
D.T.	DOUBLE TEE	SHT.	SHEET
DWGS.	DRAWINGS	SIM.	SIMILAR
DWL.	DOWEL	SP.	SPACE (S)
EQUIPT.	EQUIPMENT	SPECS.	SPECIFICATIONS
EACH	EACH	SQ.	SQUARE
E.F.	EACH FACE	SS.	STAINLESS STEEL
E.W.	EACH WAY	STD.	STANDARD
EL.	ELEVATION	STL.	STEEL
EQ. SP.	EQUAL SPACED	SYMM.	SYMMETRICAL
ENG.	ENGINE	T. & B.	TOP AND BOTTOM
F.D.	FLOOR DRAIN	T/	TOP OF
FIN. GR.	FINISH GRADE	TYP.	TYPICAL
FTG.	FOOTING	U.O.N.	UNLESS OTHERWISE NOTED
GALV.	GALVANIZED	VERT.	VERTICAL
H.D.	HEAVY DUTY (HS 20)	WIDE	WIDE
H.	HIGH	WS.	WATERSTOP
HOR.	HORIZONTAL	W/	WITH
H.P.	HIGH POINT	WP.	WORKING POINT
ICBO	INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS	@	AT

REINFORCEMENT LENGTH TABLE

BAR SIZE/LENGTH	3	4	5	6	7	8	9	10
STANDARD HOOK EMBEDMENT	7"	9 1/2"	1'-0"	1'-4 1/2"	1'-2 1/2"	1'-7"	1'-9 1/2"	1'-11 1/2"
BAR EXTENSION BEYOND HOOK (90°)	4 1/2"	6"	7 1/2"	9"	10 1/2"	1'-0"	1'-1 1/2"	1'-3"
BAR EXTENSION BEYOND HOOK (180°)	7"	9"	10 1/2"	1'-0 1/2"	1'-2 1/2"	1'-4 1/2"	1'-10"	2'-0 1/2"
LAP SPLICE	1'-6 1/2"	2'-1"	2'-7"	3'-1"	4'-6"	5'-2"	5'-9 1/2"	6'-5"
BASIC BAR EMBEDMENT	1'-2"	1'-7"	2'-0"	2'-4 1/2"	3'-5 1/2"	4'-5 1/2"	4'-5 1/2"	4'-11 1/2"

US Army Corps of Engineers
Jacksonville District

SAFETY ON THIS JOB DEPENDS ON YOU

Approved: _____
No. _____
A-2
2

REVISSED TO ACCOMPANY ADHMENT NO 0004

Department of the Army
Jacksonville District
Jacksonville, Florida

1185 BAYLORVILLE AVENUE
JACKSONVILLE, FL 32218
TEL: (904) 751-1822
FAX: (904) 751-1822
ENGINEERING - PLANNING - ARCHITECTURE

PBS&J

Inv. No. _____
Desig'd By: _____
Date: _____
Scale: _____
P/pt date: _____
P/pt date: _____
Date: _____

D.O.F.I.L.E. NO. 402-38-236

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM CRITICAL RESTORATION PROJECT

TEN MILE CREEK WATER PRESERVE AREA GENERAL NOTES AND ABBREVIATIONS

DRAWING NO. 6/1



US Army Corps
of Engineers
Jacksonville District
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No.	Symbol	Zone	Description	W.M.P.	Approved
1		A	REVISION		
2		A	REVISION		

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

PBS

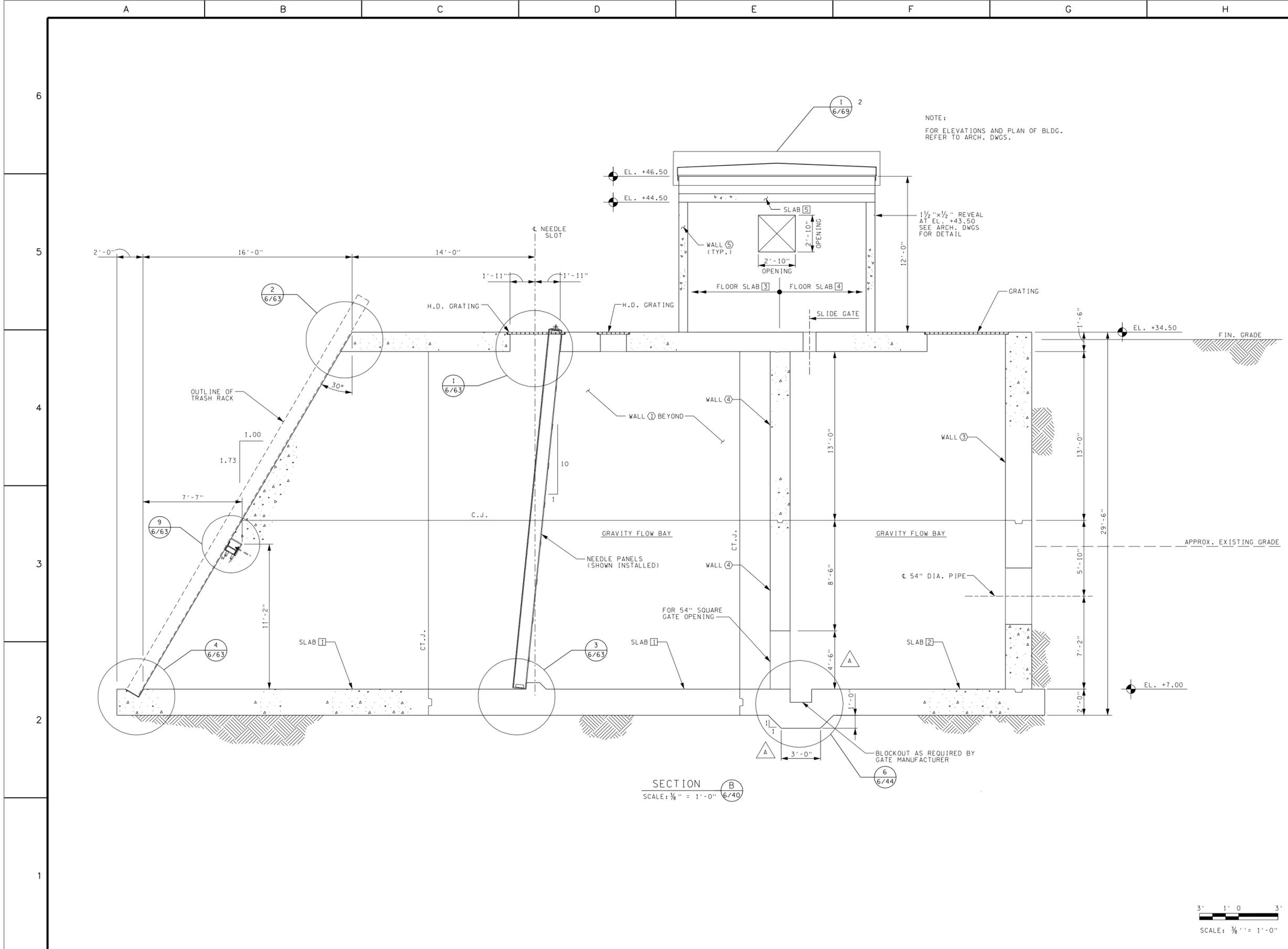
1195 BAYVIEW DR. WY.
JACKSONVILLE, FL 32256
TEL: 904/731-8821
FAX: 904/731-8821
ENGINEERING - PLANNING - ARCHITECTURE

Assigned By: Inv. No. DACW17-02-B-0019
 Drawn By: Date: AS SHOWN
 Scale: AS SHOWN
 PLOT DATE: JUL 29, 2003
 PLOT SCALE:
 DATES: SEPTEMBER 2001
 D.O.F.I.E. NO. 402-38,236

File name: S:\30606.dgn
 Reference files: EMV15
 B:\00bar.dgn

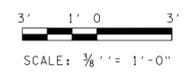
CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
CRITICAL RESTORATION PROJECT
TEN MILE CREEK
WATER PRESERVATION AREA
CULVERT SECTION

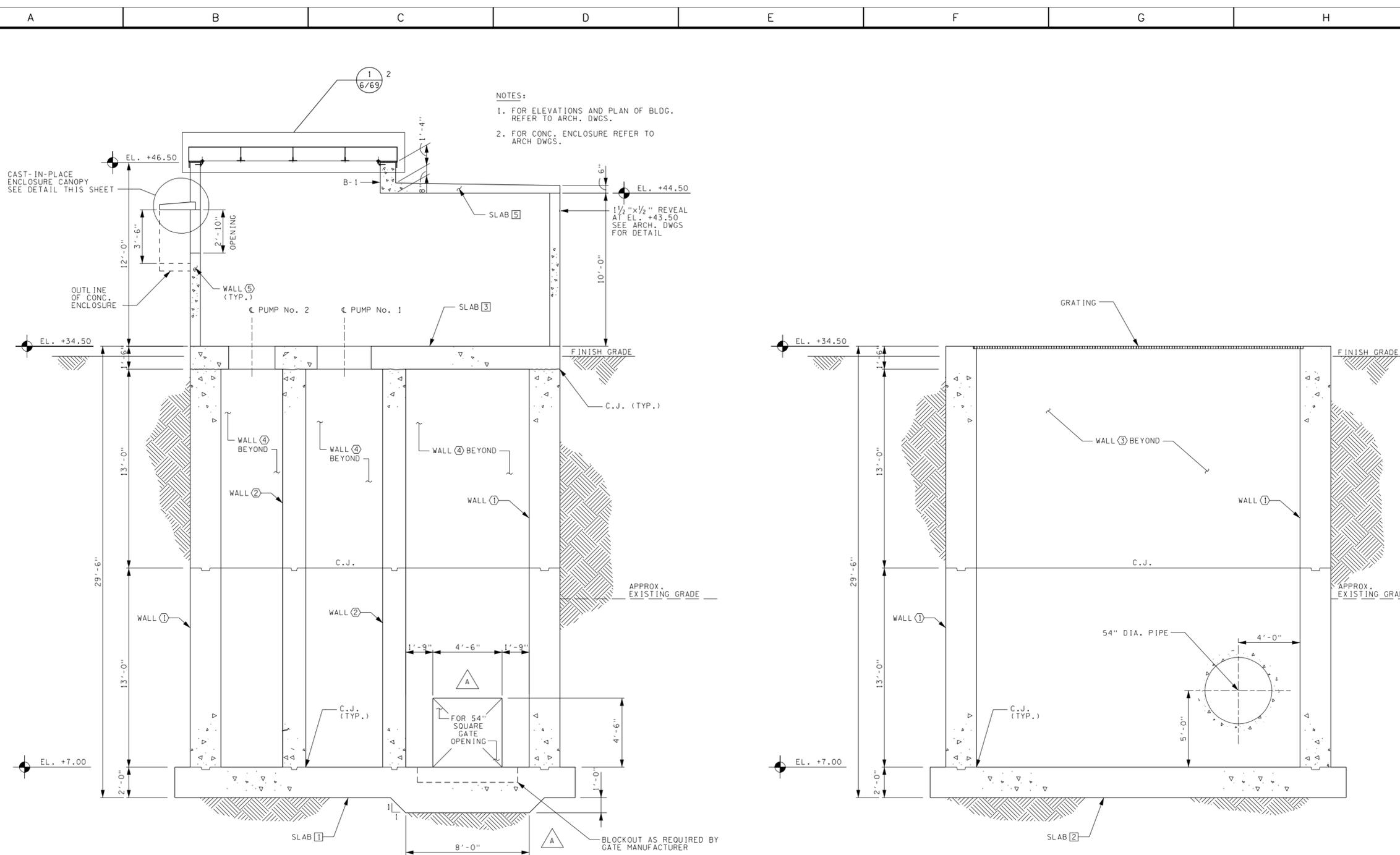
DRAWING NO.
6/42



NOTE:
FOR ELEVATIONS AND PLAN OF BLDG.
REFER TO ARCH. DWGS.

SECTION B
SCALE: 3/8" = 1'-0" 6/40

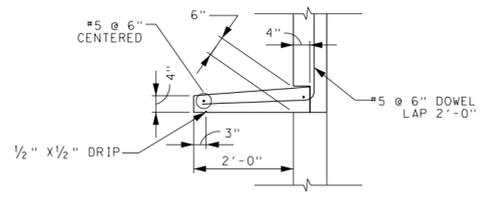




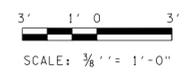
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 1. FOR ELEVATIONS AND PLAN OF BLDG. REFER TO ARCH. DWGS.
 2. FOR CONC. ENCLOSURE REFER TO ARCH DWGS.

SECTION C
 SCALE: 3/8" = 1'-0" (6/40)

SECTION D
 SCALE: 3/8" = 1'-0" (6/40)



ENCLOSURE CANOPY (CAST-IN-PLACE)
 SCALE: 3/4" = 1'-0"



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 Jacksonville District
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No.	Symbol	Zone	Revised To	Accompanying Amendment No.	Issue Date	Approved
1				0004		

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 JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
 JACKSONVILLE, FLORIDA

PBS&J

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 Drawn By: [Blank] Scale: AS SHOWN
 Check By: [Blank] PLOT DATE: JUL 29, 2003
 Date: [Blank] PLOT SCALE: [Blank]
 Date: SEPTEMBER 2001
 D.O.F. FILE NO. 402-38,236

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
 CRITICAL RESTORATION PROJECT

TEN MILE CREEK
 WATER PRESERVE AREA
 CULVERT S&S
 SECTIONS

DRAWING NO.
6/43

1	Symbol	Zone	Revised To	Accompany	Amendment No.	0004	Designation

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

THIS DRAWING WAS
DESIGNED BY: [Name]
CHECKED BY: [Name]
DATE: [Date]
SCALE: [Scale]

DESIGNED BY: [Name]
CHECKED BY: [Name]
DATE: [Date]
SCALE: [Scale]

DESIGNED BY: [Name]
CHECKED BY: [Name]
DATE: [Date]
SCALE: [Scale]



Inv. No. DACV17-02-B-0019
Project: AS SHOWN
Prior date: APR-26-2002
Prior scale:

DESIGNED BY: [Name]
CHECKED BY: [Name]
DATE: [Date]
SCALE: [Scale]

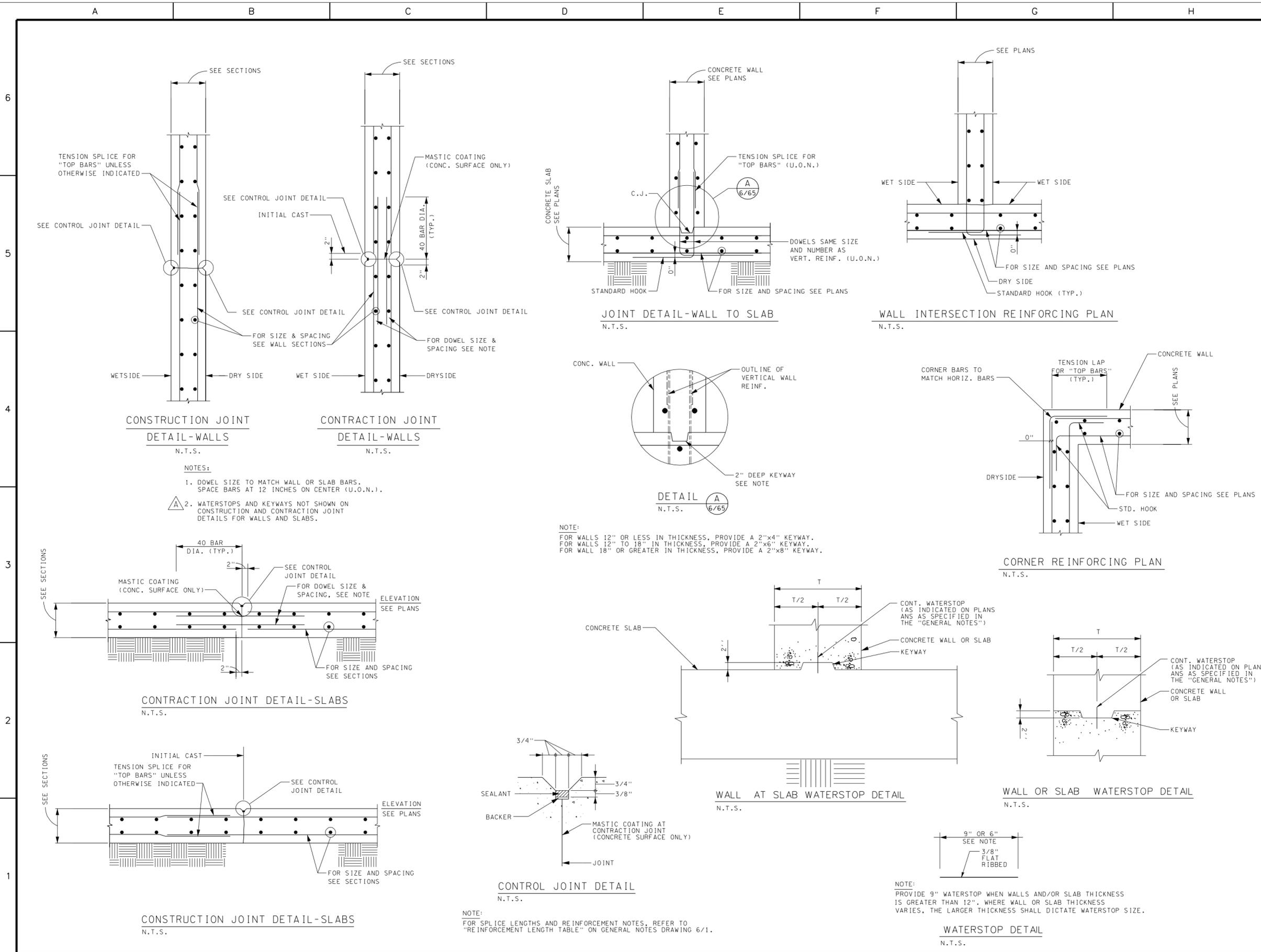
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Reference files: B-100bar.dgn

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
CRITICAL RESTORATION PROJECT

TEN MILE CREEK
WATER PRESERVE AREA

TYPICAL CONCRETE DETAILS

DRAWING NO.
6/65





US Army Corps of Engineers
Jacksonville District
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2	NO. SYMBOL ZONE	REVISOR	DATE	DESCRIPTION
1	A-6	REVISED TO ACCOMPANY ADJUTANT NO. 0004		

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

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1105 BAYHAWK DR.
JACKSONVILLE, FL 32225
TEL. (904) 751-1622
FAX. (904) 751-1622
ENGINEERING - PLANNING - ARCHITECTURE

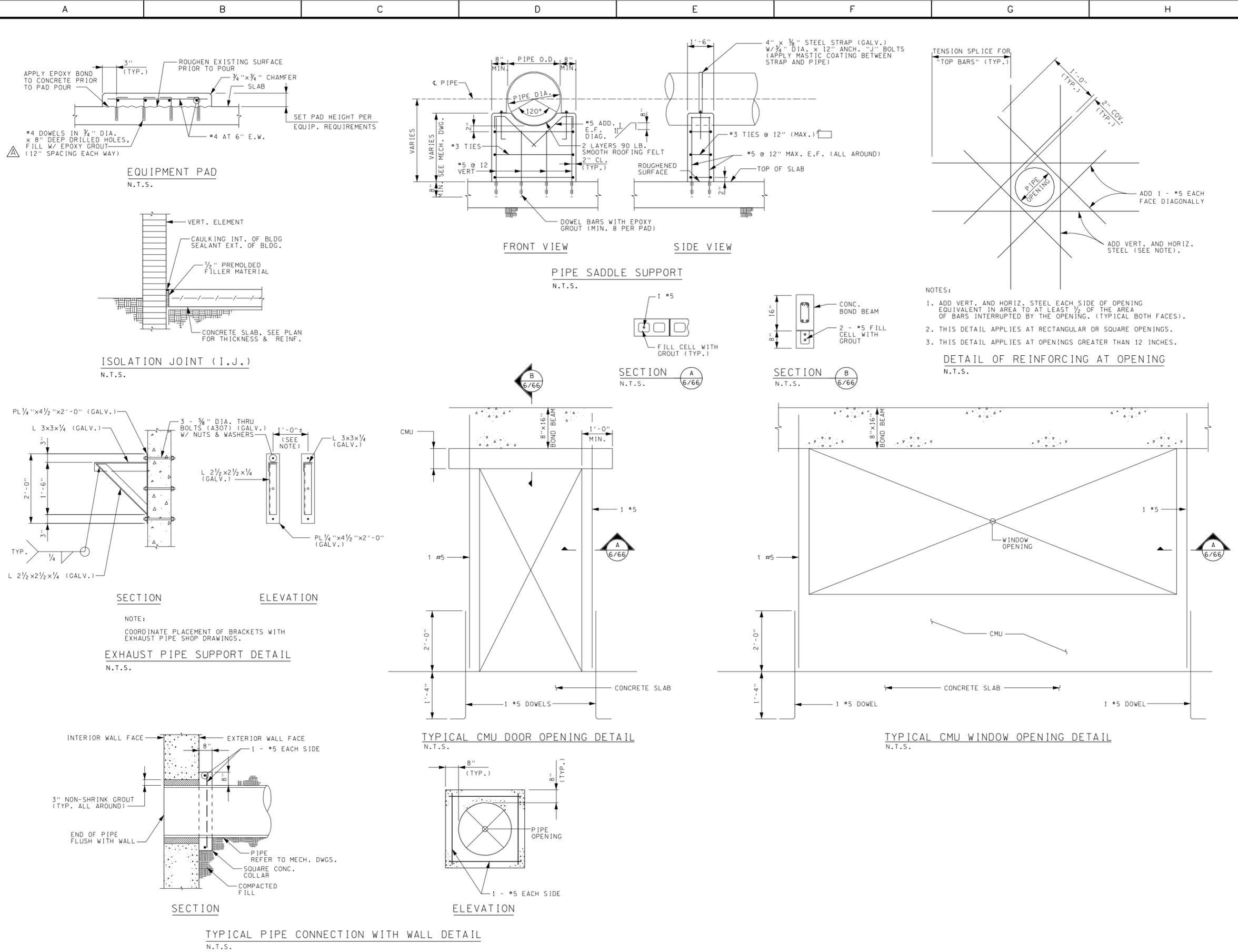
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Reference files:	B:\06065.dgn
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Drawn by:	
Checked by:	
Scale:	
Plot date:	
Plot scale:	
Author:	
D.O.F. FILE NO.	402-38-236

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
CRITICAL RESTORATION PROJECT

TEN MILE CREEK
WATER PRESERVE AREA

TYPICAL CONCRETE DETAILS

DRAWING NO.
6/66





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REVIS	Revised
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5	A
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DESCR. POSITION	

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

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1105 BAYLOR AVENUE
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ENGINEERING - PLANNING - ARCHITECTURE

Inv. No. DAC417-02-B-0019
Dated: AS SHOWN
Scale: AS SHOWN
P101 date: APR. 26, 2002
P101 scale:

DESIGNED BY: ER
CHECKED BY: ER
DATE: 10/05/01
DRAWN BY: MA-105001-05P

DATE: SEPTEMBER 2001
D. O. FILE NO. 402-38-236

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
CRITICAL RESTORATION PROJECT

TEN MILE CREEK
WATER PRESERVE AREA
PUMP STATION S-382
FUEL SYSTEM PLAN

DRAWING NO.
7/3

FUEL SYSTEM SEQUENCE OF OPERATION

- 1- SELECTION OF THE FUEL STORAGE TANK TO BE USED AS THE FUEL SOURCE IS ACCOMPLISHED AT THE STATION'S FUEL SYSTEM CONTROL PANEL BY REMOTE ACTIVATION OF THE TWO-POSITION/THREE-WAY FUEL RETURN SOLENOID AND ENABLING ONE OF THE TWO MAIN TANK SUCTION SOLENOIDS LOCATED IN THE FUEL SUPPLY PUMPS ENCLOSURE TO ALLOW FUEL RETURN AND SUCTION FROM THE SELECTED STORAGE TANK.
- 2- A STAGED/ALTERNATING DUPLEX FUEL SUPPLY PUMPS PACKAGE AUTOMATICALLY DRAWS FUEL FROM THE SELECTED MAIN TANK. WHEN EITHER ONE OF THE TWO FUEL SUPPLY PUMPS RUN, THE STORAGE TANK SUCTION SOLENOID CORRESPONDING TO THE SELECTED STORAGE TANK NOTED ABOVE IS ENERGIZED. THIS SUCTION SOLENOID IS DE-ENERGIZED WHEN THE LEAD SUPPLY PUMP STOPS. THE LEAD SUPPLY PUMP AUTOMATICALLY REFILLS THE DAY TANKS OVER THE TANKS' NORMAL OPERATING RANGE OF 50% TO 90%. THE LAG SUPPLY PUMP STARTS UPON A DROP IN LEVEL BELOW A 35% TO FULL AND CONTINUES TO RUN, ALONG WITH THE LEAD SUPPLY PUMP UNTIL ALL THE TANKS ARE FULL. A CONCURRENT SECOND LOW-LEVEL SIGNAL FROM ANY OF THE OTHER DAY TANKS ALSO ENERGIZES THE LAG PUMP, AND THE SAME SEQUENCE AS ABOVE IS FOLLOWED. FAILURE OF THE LEAD PUMP TO START, ALSO ENERGIZES THE LAG PUMP.
- 3- FUEL IS SUPPLIED AND RETURNED FROM THE STATION'S PUMPS AND GENERATOR DAY TANKS VIA SECONDARILY-CONTAINED UNDERGROUND LINES. THE STATION'S FUEL SUPPLY MANIFOLD SUPPLIES THE FUEL FOR STORAGE IN THE INDIVIDUAL ENGINE AND/OR GENERATOR DAY TANKS, AS NEEDED TO SATISFY THE ENGINES/GENERATOR'S DEMAND.
- 4- FUEL FEED THE DAY TANKS ARE AUTOMATICALLY FED BY INDIVIDUAL LEVEL CONTROL SOLENOIDS OVER THE TANK'S NORMAL OPERATING RANGE OF 50% TO 90%. ALARM LEVELS: LOW 35%, HIGH 95%. A REDUNDANT OVERFILL SOLENOID AUTOMATICALLY CLOSES AT 95% LEVEL. THE ENGINES HOT FUEL RETURN IS RETURNED TO THE DAY TANKS VIA AN AIR-COOLED HEAT EXCHANGER.
- 5- DAY TANK FUEL OVERFLOWS FLOW BY GRAVITY INTO THE OVERFLOW TANK WHERE STAGED/ALTERNATING DUPLEX FUEL RETURN PUMPS AUTOMATICALLY PUMP IT BACK TO THE MAIN STORAGE TANK. THE FUEL RETURN PUMPING OPERATION IS SIMILAR TO THE DUPLEX FUEL SUPPLY SYSTEM EXCEPT THAT THE LEAD FUEL RETURN PUMP AUTOMATICALLY EMPTIES THE TANK OVER THE TANK'S NORMAL OPERATING RANGE OF 15 TO 35%. THE FUEL LEVEL SHOULD NEVER RISE OVER 35%. LEVELS OVER 35% INDICATE A FAILURE OF THE LEAD RETURN PUMP OR AN EXTREME OVERFLOW CONDITION AND START THE LAG FUEL RETURN PUMP. ALARM LEVELS: LOW 10%, HIGH 40%.

DIESEL FUEL MAIN STORAGE TANKS DATA

TWO 12,000GAL EACH, ABOVEGROUND, SECONDARILY CONTAINED, CONCRETE-ENCASED, WITH ACCESS LADDER/PLATFORM AND GROUND LEVEL FILLING SYSTEM WITH 1/2HP SPILL CONTAINMENT PUMP. BASED ON CONVAULT OR EQUAL AS DESIGN MANUFACTURER

DIESEL FUEL SUPPLY EQUIPMENT DATA

THE FUEL SUPPLY EQUIPMENT/SYSTEMS, SHALL BE PROVIDED BY THE PUMP ENGINE MANUFACTURER. IT SHALL BE HIS RESPONSIBILITY TO COORDINATE ALL INTERPHASING, INTERCONNECTIONS, ETC. AMONG THE DIFFERENT MANUFACTURERS, SUPPLIERS, USERS FOR FULL COMPATIBILITY OF FUEL DELIVERY, DAY TANK, RETURN, CONTROLS, ALARMS WITH PUMP ENGINE AND MAIN STATION CONTROL PANELS FOR MANNED AND FUTURE UNMANNED STATION OPERATION

FUEL SUPPLY PUMPS: (2) 10GPM, 3/4 HP DUPLEX PUMPS FOR ALTERNATING & ADDITIVE SERVICE TO AUTOMATICALLY FILL THE PUMPS & GENERATOR DAY TANKS IN THE PUMP STATION. PROVIDE INDIVIDUAL DISCHARGE CHECK VALVES, PRESSURE RELIEF VALVES, SUCTION SOLENOIDS, STRAINERS & STRAINERS & PRIMING TEES, SUCTION & DISCHARGE ISOLATION VALVES PER PUMP. A TWO-POSITION 3-WAY FUEL RETURN DIVERTING SOLENOID VALVE, AND MAIN STORAGE TANK SUCTION CONNECTION SOLENOID VALVES. ALL FACTORY PRE-PLUMBED & PRE- WIRED, INCLUDING LOCAL & REMOTE CONTROLLERS, DISPLAYS, ALL IN A SECONDARILY CONTAINED NEMA3R ENCLOSURE PACKAGE READY FOR CONNECTION TO FIELD PIPING & WIRING.

DAY TANKS DT-1 (275GAL), DT-2 (275GAL), DT-3 (100GAL), DT-4 (75GAL) & DT-5 (50GAL); PROVIDE INDIVIDUAL SOLENOID VALVES TO AUTOMATICALLY FILL THE TANKS, INLET STRAINERS, OVERFILL SAFETY SHUTOFF SOLENOID AND AN AIR-COOLED ENGINE RETURN FUEL LINE COOLERS. ALL FACTORY PRE-PLUMBED & PRE- WIRED, INCLUDING LOCAL & REMOTE CONTROLLERS, DISPLAYS. SECONDARILY CONTAINED TANK PACKAGES READY FOR CONNECTION TO FIELD PIPING & WIRING.

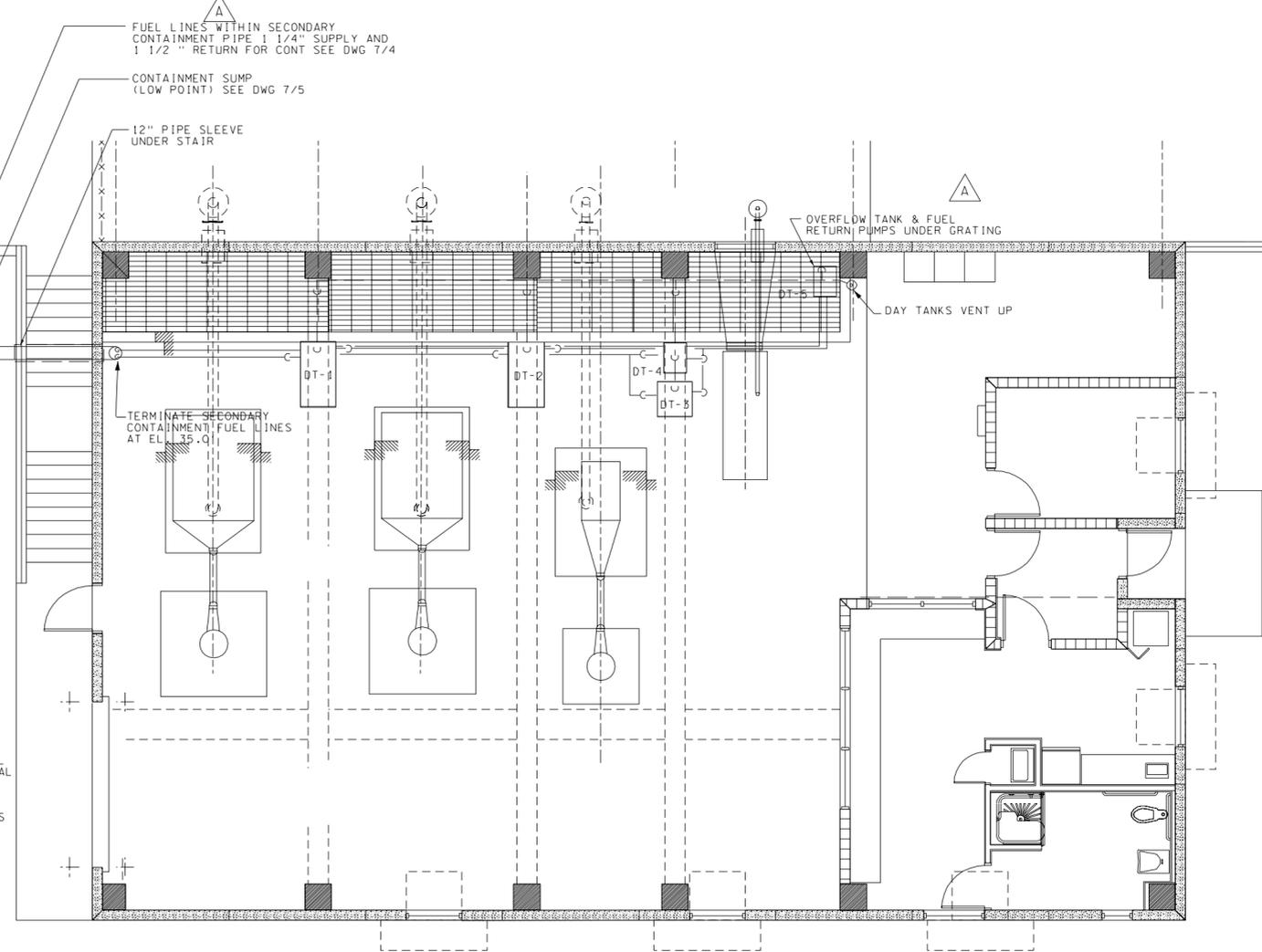
OVERFLOW TANK & RETURN FUEL PUMPS DT-5: (2) 15GPM, 1HP DUPLEX PUMPS FOR ALTERNATING & ADDITIVE SERVICE TO AUTOMATICALLY RETURN PUMPS & GENERATOR DAY TANKS' FUEL OVERFLOW TO THE STORAGE TANKS. PROVIDE INDIVIDUAL DISCHARGE CHECK VALVES, SUCTION & DISCHARGE SOLENOIDS, STRAINERS & PRIMING TEES, SUCTION & DISCHARGE ISOLATION VALVES PER PUMP. ALL FACTORY PRE-PLUMBED & PRE- WIRED, INCLUDING LOCAL & REMOTE CONTROLLERS, DISPLAYS, ALL IN A SECONDARILY CONTAINED NEMA3R ENCLOSURE PACKAGE READY FOR CONNECTION TO FIELD PIPING & WIRING.

BASED ON SIMPLEX OR EQUAL AS DESIGN MANUFACTURER.

PROVIDE INDIVIDUAL LOCAL CONTROL PANELS AT THE DUPLEX SUPPLY PUMPING SYSTEM, AT EACH INDIVIDUAL DAY TANK AND AT THE DUPLEX RETURN PUMPING SYSTEM ALL INTERCONNECTED TO THE STATION'S CENTRAL FUEL CONTROL AND LEAK MONITORING PANELS.

DUPLEX CONTROLLERS SHALL BE MULTI-FUNCTION DUPLEX PUMPS CONTROLLER SYSTEMS PROVIDE: MANUAL LEAD PUMP SELECTION, AUTOMATIC LEAD PUMP ALTERNATING WITH AUTOMATIC LAG PUMP BACKUP; BOTH PUMPS CAN RUN SIMULTANEOUSLY; AUTOMATIC LEVEL CONTROL; MANUAL-OFF-AUTO MODE SELECTION SWITCHES; PUMP RUNNING INDICATOR FOR EACH PUMP AND FULL INDICATION FUNCTIONS AND ALARM OUTPUTS AT ALL PANELS.

LEAK SENSOR TO LOCKOUT SUPPLY AND RETURN PUMPS UPON ACTIVATION OF LEAK ALARM



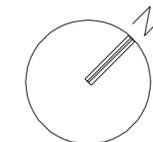
FUEL PIPING FLOOR PLAN

SCALE: 1/4" = 1'-0"

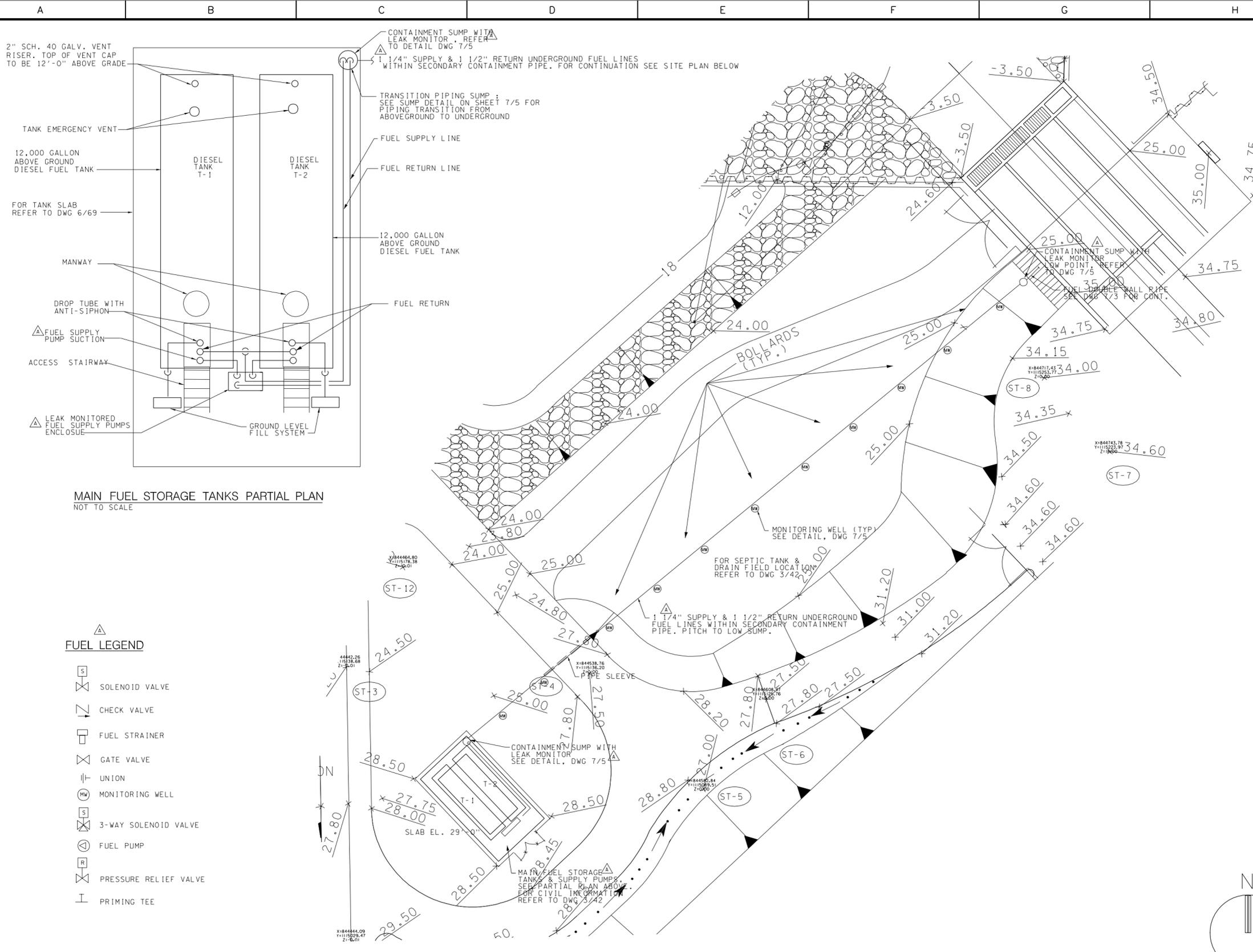
NOTES: FOR FUEL PIPING DIAGRAM REFER TO DWG 7/8

FOR FUEL PIPE SLAB PENETRATION REFER TO DWG 7/6

FOR FUEL LEGEND REFER TO DWG 7/4

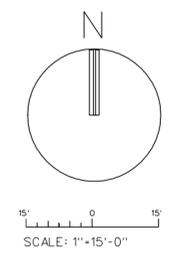


SCALE: 1/4" = 1'-0"



MAIN FUEL STORAGE TANKS PARTIAL PLAN
NOT TO SCALE

- FUEL LEGEND**
- SOLENOID VALVE
 - CHECK VALVE
 - FUEL STRAINER
 - GATE VALVE
 - UNION
 - MONITORING WELL
 - 3-WAY SOLENOID VALVE
 - FUEL PUMP
 - PRESSURE RELIEF VALVE
 - PRIMING TEE



US Army Corps of Engineers
Jacksonville District
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No.	Symbol	Zone	Description
9	A	4G	REVISIT TO CONFORM TO AMENDMENT NO.0004

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

PBS

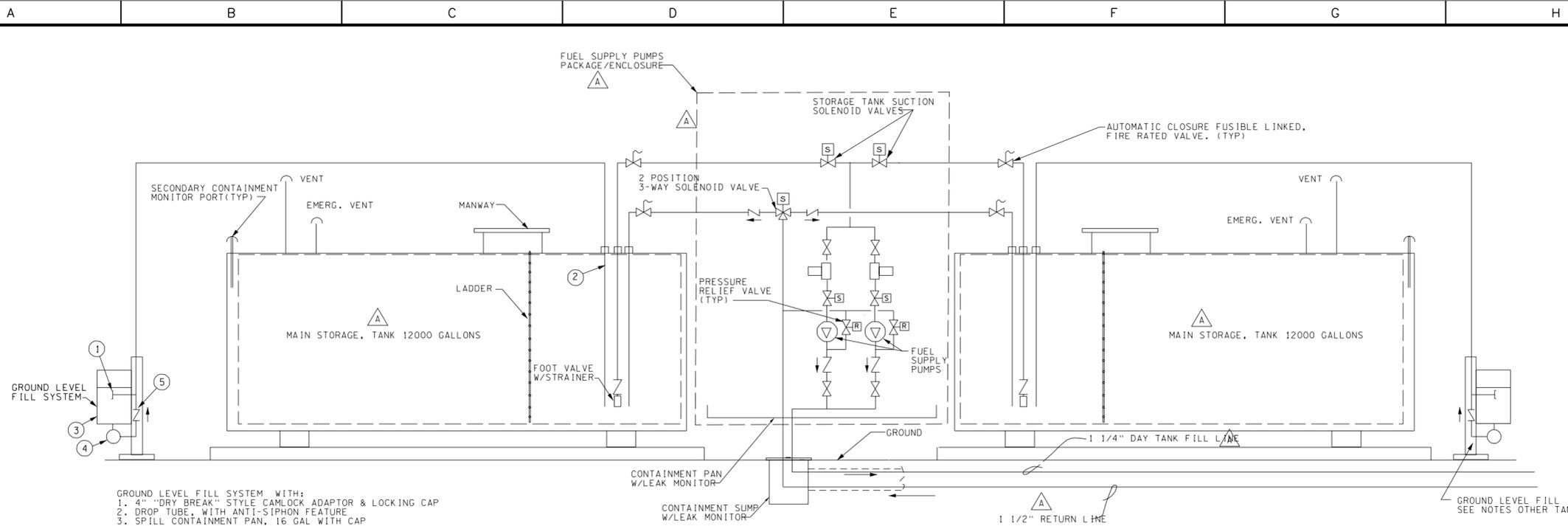
1185 BAYHAWK DR
JACKSONVILLE, FL 32226
TEL: (904) 751-8822
ENGINEERING - PLANNING - ARCHITECTURE

File names:	Inv. No. (DMS) 7-02-B-0009
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B-103004.dgn	Scale: AS SHOWN
C-103042.dgn	Plot date: APR.26.2002
C-104plan.dgn	Plot scale:
Drawn: SEPTEMBER 2001	D.O.F. FILE NO. 402-38-236

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
CRITICAL RESTORATION PROJECT

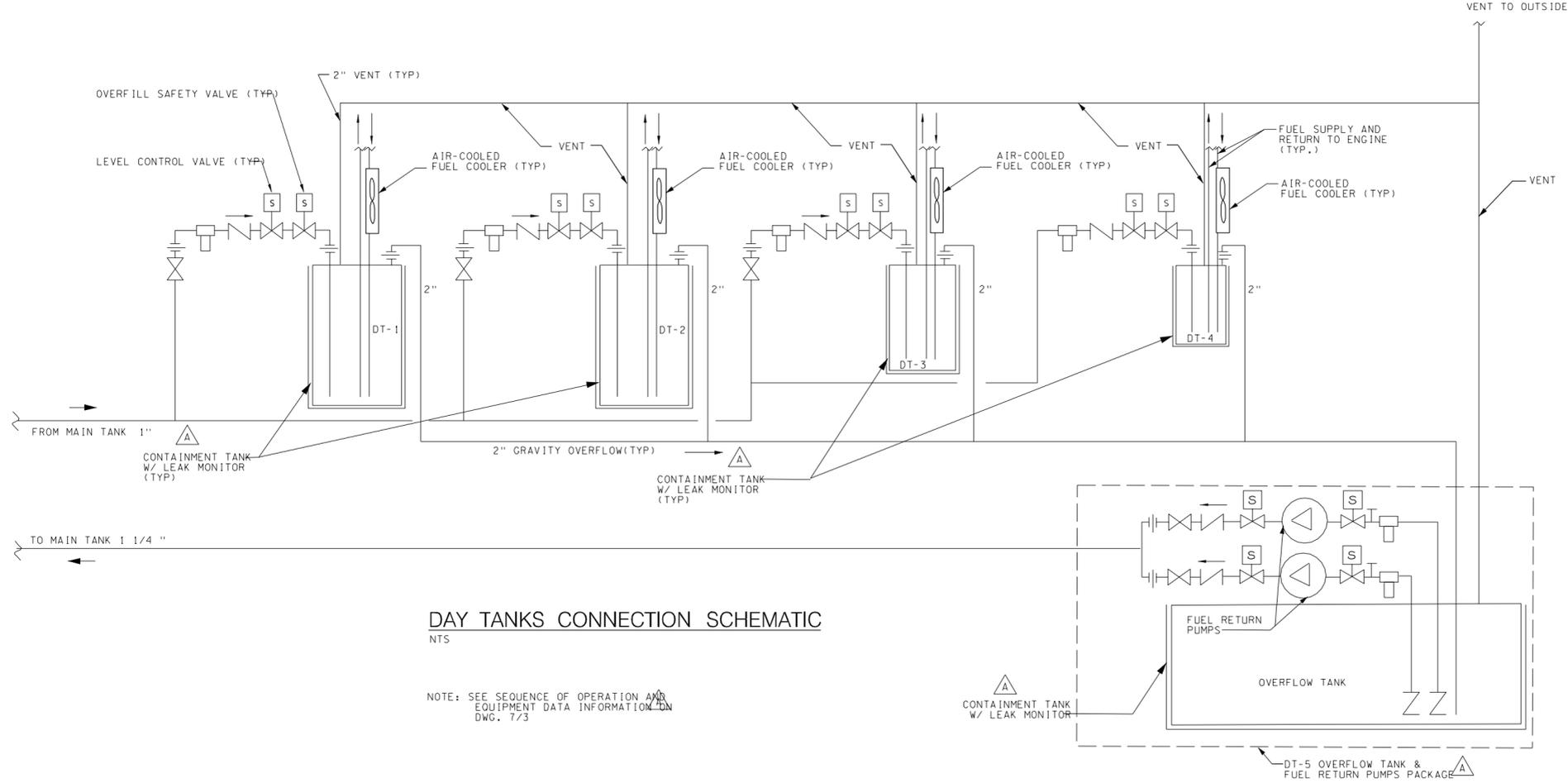
TEN MILE CREEK
WATER PRESERVE AREA
PUMP STATION S-382
FUEL SITE PLAN

DRAWING NO.
7/4



- GROUND LEVEL FILL SYSTEM WITH:
 1. 4" "DRY BREAK" STYLE CAMLOCK ADAPTOR & LOCKING CAP
 2. DROP TUBE, WITH ANTI-SIPHON FEATURE
 3. SPILL CONTAINMENT PAN, 16 GAL WITH CAP
 4. 1/2 HP SPILL CONTAINMENT PUMP
 5. FUEL RETURN SWING CHECK VALVE
 6. ALL WELDED, UNITIZED CONSTRUCTION

STORAGE TANKS & FUEL SUPPLY PUMPS SCHEMATIC
 NTS



DAY TANKS CONNECTION SCHEMATIC
 NTS

NOTE: SEE SEQUENCE OF OPERATION AND EQUIPMENT DATA INFORMATION ON DWG. 7/3

US Army Corps of Engineers
 Jacksonville District
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ER	Approved
4C	Zone
11	No. Symbol
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Description	

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 JACKSONVILLE, FLORIDA

PBS&J

1185 BAYHOLDS AVENUE
 JACKSONVILLE, FL 32216
 FALL 1998 7515 0027
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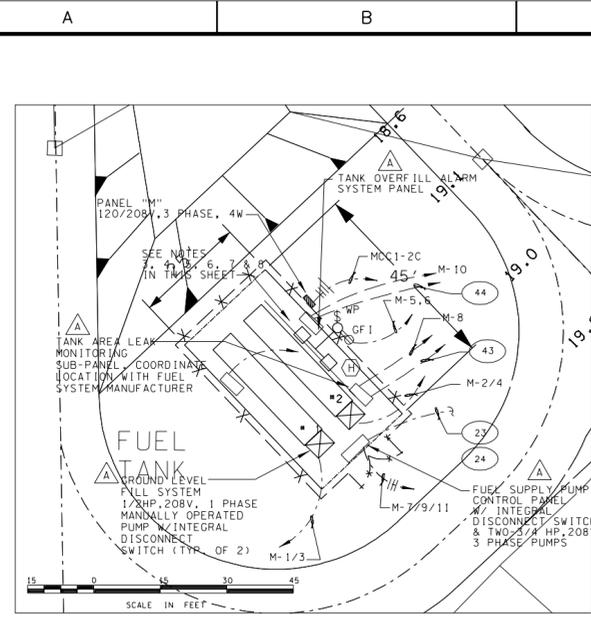
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Reference files	Scale	Scale	Scale
B-100bdr.dgn	AM	ER	AS SHOWN
	Project date	Project date	Project date
	SEP 26, 2002	SEP 26, 2002	SEP 26, 2002
	Project score	Project score	Project score

DESIGNED: SEPTEMBER 2001
 D. O. FILE NO. 402-38-236

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
 CRITICAL RESTORATION PROJECT

TEN MILE CREEK
 WATER PRESERVE AREA
 PUMP STATION S-382
 FUEL SYSTEM SCHEMATIC

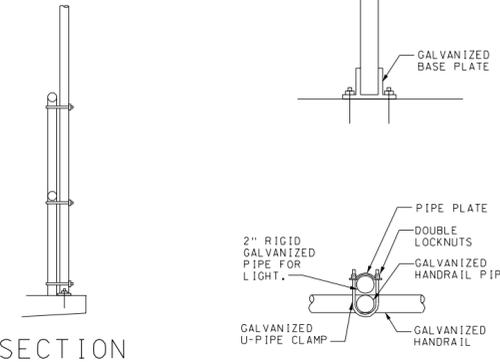
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7/8



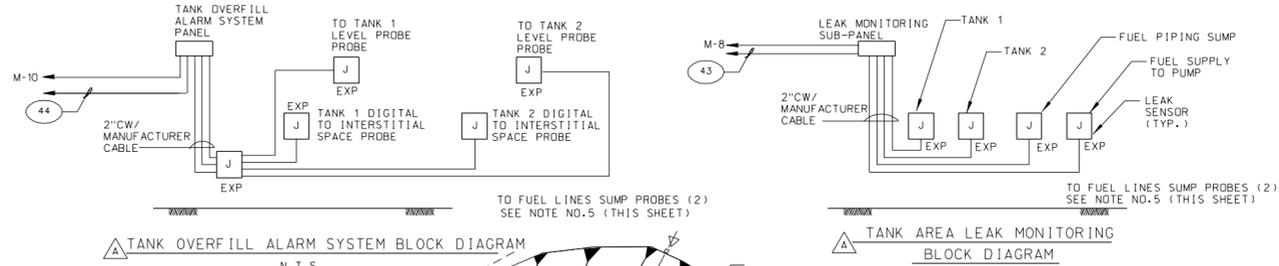
FUEL SUPPLY TANK PARTIAL PLAN

ELECTRICAL SITE PLAN LEGEND

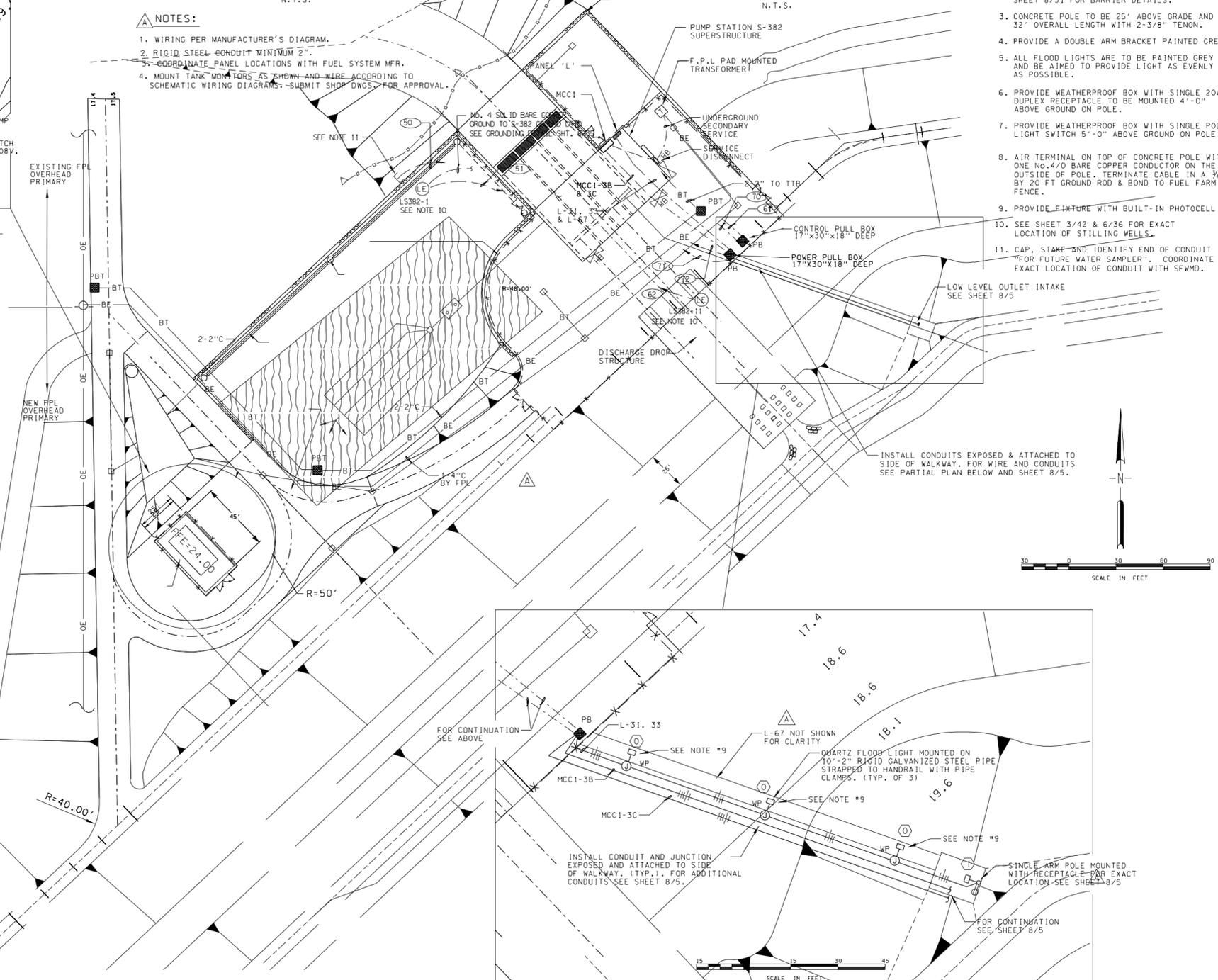
- OE — NEW ELECTRICAL PRIMARY, AERIAL, BY FPL
- BE — NEW ELECTRICAL PRIMARY, UNDERGROUND, BY FPL
- BT — NEW BURIED TELEPHONE CONDUITS BY CONTRACTOR
- UTILITY POLE, BY FPL
- PBT TELEPHONE PULL BOX, 17"x30"x18" DEEP PRECAST POLYMER CONCRETE, WITH HEAVY DUTY COVER STAMPED "TEL"
- ELECTRICAL TRANSFORMER



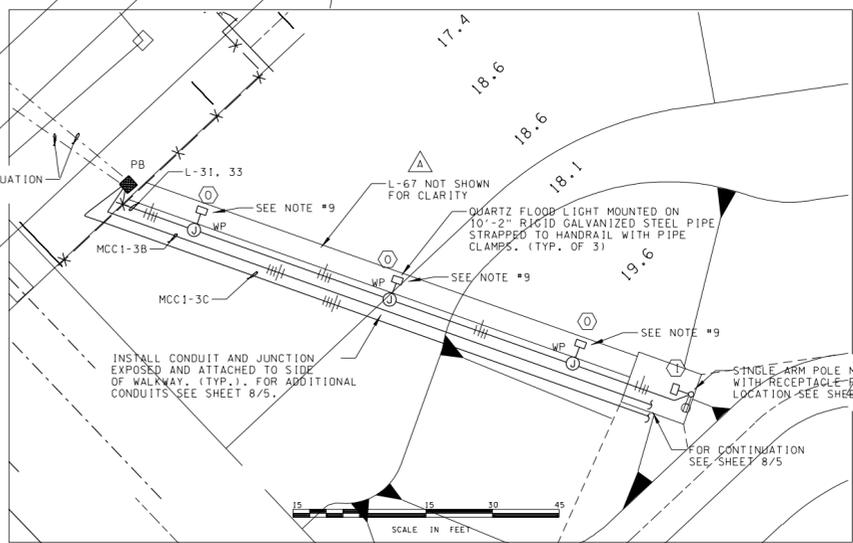
SECTION FLOOD LIGHT MOUNTING DETAILS
N.T.S.



- NOTES:**
1. WIRING PER MANUFACTURER'S DIAGRAM.
 2. RIGID STEEL CONDUIT WITHIN 2".
 3. COORDINATE PANEL LOCATIONS WITH FUEL SYSTEM MFR.
 4. MOUNT TANK MONITORS AS SHOWN AND WIRE ACCORDING TO SCHEMATIC WIRING DIAGRAMS - SUBMIT SHD DWGS FOR APPROVAL.



PUMP STATION S-382 PARTIAL SITE PLAN



WALKWAY PARTIAL PLAN

- ELECTRICAL SITE PLAN NOTES:**
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH FLORIDA POWER & LIGHT (FPL) FOR TIMELY COMPLETION OF THE POWER LINE UPGRADING WORK AND SERVICE CONNECTION. THE METER BOX, AND FPL INSTALLATION REQUIREMENTS FOR CT'S AND PT'S SHALL BE CLARIFIED AHEAD OF TIME AND FIELD COORDINATED. CONTRACTOR SHALL ALSO CLARIFY AMOUNT OF WORK FPL WILL DO AND THAT THE CONTRACTOR WILL BE REQUIRED TO DO FOR COMPLETED POWER LINE AND SERVICE WORK, INCLUDING CONNECTION CHARGES, AT NO ADDITIONAL COST TO THE GOVERNMENT.
 2. THE CONTRACTOR SHALL INSTALL BARRIERS TO PROTECT THE NEW PAD MOUNTED TRANSFORMER. THE BARRIERS SHALL BE SPACED NOT GREATER THAN 3'-0" APART AND PROTECT ALL SIDES OF THE TRANSFORMER WHICH ARE EXPOSED TO VEHICULAR TRAFFIC. SEE SHEET 8/31 FOR BARRIER DETAILS.
 3. CONCRETE POLE TO BE 25' ABOVE GRADE AND 32' OVERALL LENGTH WITH 2-3/8" TENON.
 4. PROVIDE A DOUBLE ARM BRACKET PAINTED GREY.
 5. ALL FLOOD LIGHTS ARE TO BE PAINTED GREY AND BE AIMED TO PROVIDE LIGHT AS EVENLY AS POSSIBLE.
 6. PROVIDE WEATHERPROOF BOX WITH SINGLE 20A DUPLEX RECEPTACLE TO BE MOUNTED 4'-0" ABOVE GROUND ON POLE.
 7. PROVIDE WEATHERPROOF BOX WITH SINGLE POLE LIGHT SWITCH 5'-0" ABOVE GROUND ON POLE.
 8. AIR TERMINAL ON TOP OF CONCRETE POLE WITH ONE NO.4/0 BARE COPPER CONDUCTOR ON THE OUTSIDE OF POLE. TERMINATE CABLE IN A 3/4" BY 20 FT GROUND ROD & BOND TO FUEL FARM FENCE.
 9. PROVIDE FIXTURE WITH BUILT-IN PHOTOCELL.
 10. SEE SHEET 3/42 & 6/36 FOR EXACT LOCATION OF STILLING WELLS.
 11. CAP, STAKE AND IDENTIFY END OF CONDUIT "FOR FUTURE WATER SAMPLER". COORDINATE EXACT LOCATION OF CONDUIT WITH SFMFD.

US Army Corps of Engineers
Jacksonville District
SAFETY ON THIS JOB DEPENDS ON YOU

PLT	Approved
REVISY TO CONFORM TO AMENDMENT NO. 0004	Description
T. A. 4548DFE	Zone
No. 1	Symbol

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

PBS
1105 BAYHOLDS AVENUE
JACKSONVILLE, FL 32256
TEL: (904) 751-4622
ENGINEERING - PLANNING - ARCHITECTURE

Inv. No. DAC417-02-B-0019	Drawn	Scale	AS SHOWN
Designed By: AR/AB	Checked By: AR/AB	PLT	PLT
File name: 0-108003.dgn	Reference files: B-1000d-02.dgn, C-103304.dgn	Plot date: APR.26.2002	Plot scale:
Drawn: SEPTEMBER 2001	D.O.F FILE NO. 402-38-236		

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM CRITICAL RESTORATION PROJECT
TEN MILE CREEK WATER PRESERVE AREA
S-382 PARTIAL SITE PLAN

A B C D E F G H

6

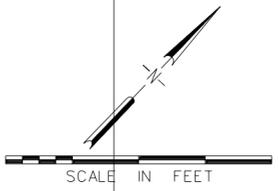
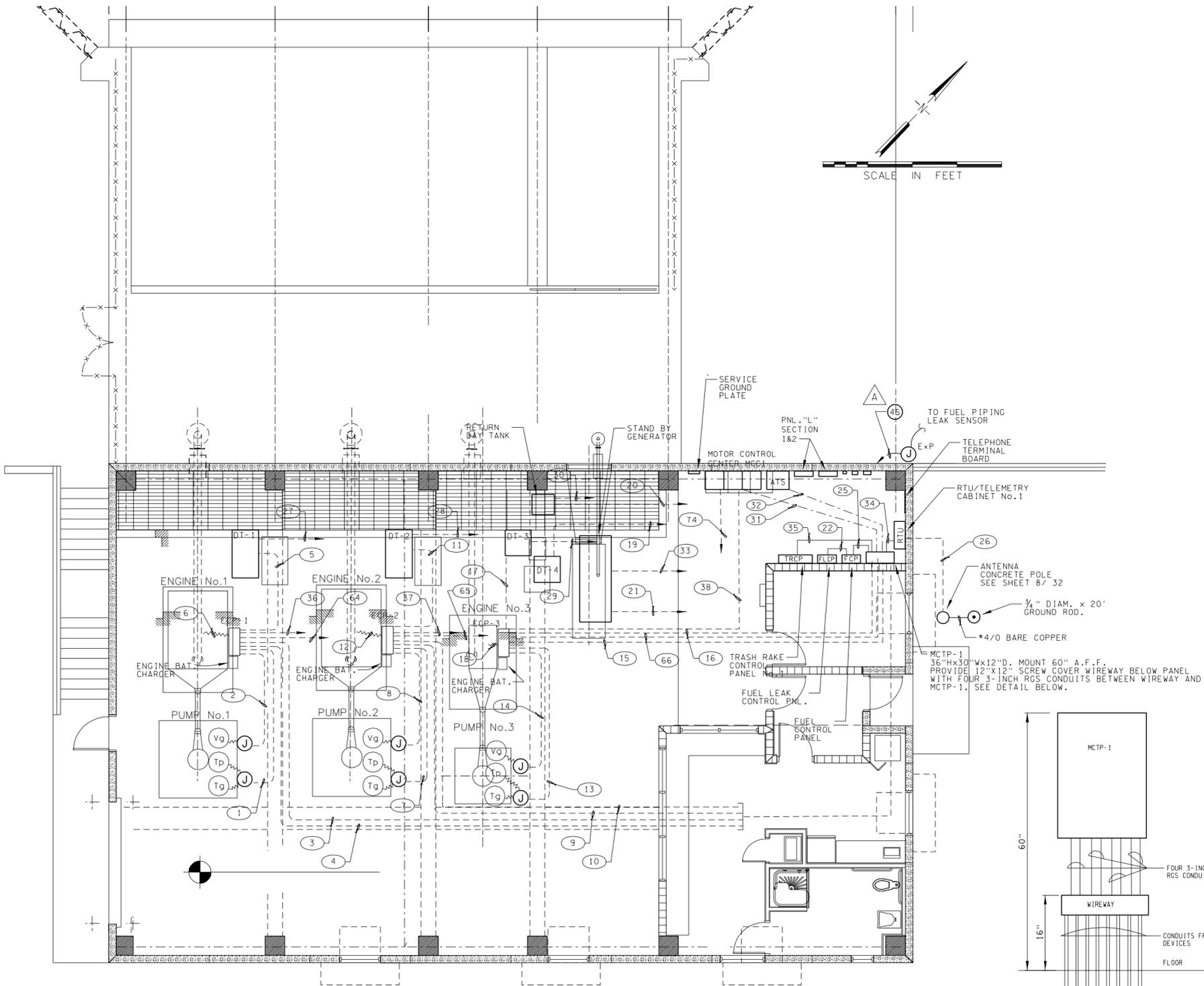
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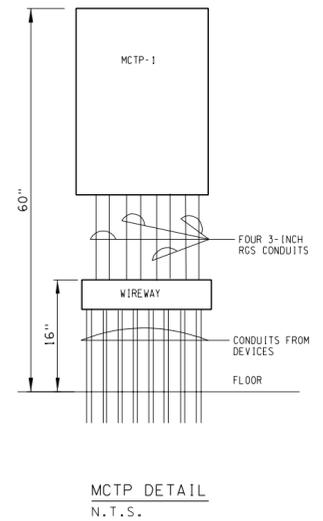
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1



S-382 CONTROL PLAN AT ELEV. +35.00
SCALE: 1/4" = 1'-0"



NOTES
1. PUMP MOTOR AND PUMP GEAR BOXES SHALL BE EQUIPPED WITH (MOTOR/GEAR BOX MOUNTED) VIBRATION CUT-OFF SWITCHES AND SHALL BE WIRED TO MOTOR AND ENGINE CONTROL CIRCUIT AND RESPECTIVE DISPLAYS. ENGINE AND PUMP MANUFACTURER SHALL BE RESPONSIBLE TO PROVIDE VIBRATION SWITCHES WITH PROPER SETTINGS AND INITIAL AND RUNNING VIBRATION TIME DELAYS TO AVOID NUISANCE TRIPPING. TIME AND MONITORING DELAYS SHALL BE SET AS NEEDED.

US Army Corps of Engineers
Jacksonville District
SAFETY ON THIS JOB DEPENDS ON YOU

PLT	Approved
4C	REVIS TO CONFORM AMENDMENT NO. 0004
1	1. Symbol Zone
1	Description

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TBS BAYLOR/0005 MT
JACKSONVILLE, FL 32256
FALL 1999 7513 0027
ENGINEERING - PLANNING - ARCHITECTURE

PBS

Inv. No. DAC417-02-B-0019
Designed By: [Blank] / [Blank] / [Blank] / [Blank] / [Blank] / [Blank]
Checked By: [Blank] / [Blank] / [Blank] / [Blank] / [Blank] / [Blank]
Drawn By: [Blank] / [Blank] / [Blank] / [Blank] / [Blank] / [Blank]
Scale: AS SHOWN
Title Date: APR. 26, 2002
PLOT Scale: [Blank]
PLOT Scale: [Blank]

Revised: SEPTEMBER 2001
D. O. F. L. E. NO. 402-38-236

CENTRAL AND SOUTHERN FLORIDA ECOSYSTEM
CRITICAL RESTORATION PROJECT
TEN MILE CREEK
WATER PRESERVE AREA
S-382 CONTROL PLAN
EL. +35.00

DRAWING NO.
8/8

EQUAL TO: TYPE: MOUNTING: SURFACE A. 1. C. 1.0.0.00		PANEL " L "										VOLTAGE: 120/208V, 3Ø, 4W MAINS: 225A NEUTRAL: 5/N TYPE MAINS: M.L.O. MAINS LOCATION: BOTTOM	
		W/GROUND BAR (SECTION No. 1) PROVIDE SUB-FEED LUGS											
DESCRIPTION	ØA KVA	ØB KVA	ØC KVA	WIRES & CONDUIT	POLES & STRIP	CIR. NO.	CIR. NO.	POLES & STRIP	WIRES & CONDUIT	ØA KVA	ØB KVA	ØC KVA	DESCRIPTION
FLUORESCENT LIGHT	0.70			3*12, 3/4"	1/20	1	2	1/20	3*12, 3/4"	1.08			RECEP. CONTROL RM/BATH
RECEPTACLES		0.72		3*12, 3/4"	1/20	3	4	1/20	3*12, 3/4"	0.80			REFRIGERATOR
RECEPTACLES			0.90	3*12, 3/4"	1/20	5	6	1/20	3*12, 3/4"		1.0		MICROWAVE
LIGHT METAL-HALIDE	1.76			3*10, 3/4"	2/30	7	8	1/20	3*12, 3/4"	1.5			APPLIANCE
208V, IPH		1.76				9	10	2/40	2*8,		3.0		ENGINE JACKET HTR*1
ECP-1 PLC			0.2	3*12, 3/4"	1/20	11	12	1*100, 3/4"			3.0		208V, IPH
ECP-1 ANN	0.2			3*12, 3/4"	1/20	13	14	2/40	2*8,	3.0			ENGINE JACKET HTR*2
ECP-2 PLC		0.2		3*12, 3/4"	1/20	15	16	1*100, 3/4"			3.0		208V, IPH
ECP-2 ANN			0.3	3*12, 3/4"	1/20	17	18	2/40	2*8,	3.0			ENGINE JACKET HTR*3
ECP-3 PLC	0.3			3*12, 3/4"	1/20	19	20	1*100, 3/4"		1.5			208V, IPH
ECP-3 ANN		0.3		3*12, 3/4"	1/20	21	22	1/20	3*12, 3/4"	0.8			MCCI-HEATER
GENERATOR JACKET HTR			1.5	3*12, 3/4"	2/20	23	24	1/20	3*12, 3/4"		0.1		GENERATOR BATTERY CHARGER
208V, IPH	1.5					25	26	1/20	3*12, 3/4"	0.2			EF-8
CU-1		1.96		2*10,	2/30	27	28	1/20	3*12, 3/4"		0.58		RETURN FUEL COOLER
208V, IPH			1.96	1*10, 3/4"	2/30	29	30	2/20	2*12,		2.5		AHU-1
WALKWAY LOW LEVEL QUARTZ LTC	0.6			3*10, 3/4"	1/20	31	32	1*120, 3/4"		2.5			208V, IPH
LOW LEVEL RECEPTACLE		1.0		3*12, 3/4"	1/20	33	34	2/20	3*12, 3/4"	0.5			EXTERIOR WALL LIGHT
BAY LIGHTING			1.12	3*12, 3/4"	1/20	35	36				0.5		208V, IPH
BAY LIGHTING	1.06			3*12, 3/4"	1/20	37	38	1/20	3*12, 3/4"	0.72			RECEPTACLES
EXTERIOR WALL LIGHTS		0.76		3*12, 3/4"	2/20	39	40	2/20	3*12, 3/4"	0.80			RETURN DAY TANK PUMPS
208V, IPH			0.76			41	42				0.80		208V, IPH
	6.16	6.70	6.74						9.0	9.48	10.9		

* INCLUDES GROUND CONDUCTORS

TOTAL CONNECTED KVA: SEE SECTION #2 PANEL "L"
TOTAL DEMAND KVA:

EQUAL TO: TYPE: MOUNTING: SURFACE A. 1. C. :		PANEL " L "										VOLTAGE: 120/208V, 3Ø, 4W MAINS: 225A NEUTRAL: 5/N TYPE MAINS: M.L.O. MAINS LOCATION: NONE	
		W/GROUND BAR (SECTION No. 2)											
DESCRIPTION	ØA KVA	ØB KVA	ØC KVA	WIRES & CONDUIT	POLES & STRIP	CIR. NO.	CIR. NO.	POLES & STRIP	WIRES & CONDUIT	ØA KVA	ØB KVA	ØC KVA	DESCRIPTION
ELECTRIC WATER HEATER	0.76			3*10, 3/4"	2/30	43	44	1/20	3*12, 3/4"	0.2			DAYTANK #1
208V, IPH		0.76				45	46	1/20	3*12, 3/4"	0.2			DAYTANK #2
TIME CLOCK/ILC-1			0.2	3*12, 3/4"	1/20	47	48	1/20	3*12, 3/4"	0.2			DAYTANK #3
PORTABLE DEWATERING PUMP 208V, 3PH	0.9			4*12, 3/4"	3/15	51	52	2/20	3*12, 3/4"	0.92			DAYTANK #4
			0.9			53	54				0.92		OVERHEAD DOOR
ENGINE #1 CHARGER	0.72			3*12, 3/4"	1/20	55	56	1/20	3*12, 3/4"	0.72			208V, IPH
ENGINE #2 CHARGER		0.72		3*12, 3/4"	1/20	57	58	1/20	3*12, 3/4"	0.74			PORTABLE COMPUTER
ENGINE #3 CHARGER			0.72	3*12, 3/4"	1/20	59	60	1/30	3*10, 3/4"		1.5		LIGHT CONTROL RM/STO.
INTRUSION PANEL	0.72			3*12, 3/4"	1/20	61	62	1/20	3*12, 3/4"	0.72			MCTP-1
RTU CABINET		0.9		3*12, 3/4"	1/20	63	64			1.32			TELEPHONE
RTU CABINET			0.9	3*12, 3/4"	1/20	65	66	3/20	4*12, 3/4"		1.32		208V, 3PH
GATE INST. POWER SUPPLY	0.72			3*12, 3/4"	1/20	67	68			1.32			WELL PUMP
RECEPTACLE		0.72		3*12, 3/4"	1/20	69	70	1/20	3*12, 3/4"	0.72			FCP & FLC
SPARE			0.72	-	1/20	71	72	1/20	-	0.72			SPARE
SPARE	0.72			-	1/20	73	74	1/20	-	0.72			SPARE
SPARE			0.72	-	1/20	75	76	1/20	-	0.72			SPARE
SPARE	0.72			-	1/20	77	78	1/20	-	0.72			SPARE
SPARE			0.72	-	1/20	79	80	1/20	-	0.72			SPARE
SPACE		0.72		-	-	81	82	-	-	0.72			SPACE
SPACE			0.72	-	-	83	84	-	-	0.72			SPACE
	5.26	5.26	4.7						4.6	5.34	6.1		

* INCLUDES GROUND CONDUCTORS

TOTAL CONNECTED KVA: 74.38
TOTAL DEMAND KVA: 74.38+206.61

① THRU LIGHTING CONTACTOR LC-1 (PHOTOCELL ON, TIME SWITCH OFF)

NEMA CLASS: 11 NEMA TYPE: B SERVICE: 3Ø, 4W VOLTAGE: 120/208V		MOTOR CONTROL CENTER SCHEDULE "MCCI"										MAIN BUS RATING: 600A SHORT CIRCUIT BRACING: 42,000 NEUTRAL BUS: 200A GROUND BUS: 200A									
		(ALL DEVICES WITH PADLOCK PROVISION)																			
UNIT	LOAD SERVED	LOAD		CIRCUIT BREAKERS		STARTERS		CIRCUITS		REMARKS											
SECT	UNIT NO.	H.P.	CONV. KVA	DEBNV. H.A.	TYPE	POLES	RATING AMPS	TRIP AMPS	SYM. A.I.C.	TYPE	POLES	SIZE	PILOT LNS	CONTR. EDGE	AUX. CONTACTS	POWER	GROUND	CONTROL	COND		
1	A																				AM, VM, AS, VS, PM BKR FACTORY SIZED
	B																				
	C																				
	D																				
2	A		16.2	16.2	MC	3	100	60	35,000	-	-	-	-	-	-	3*4	1*10		1"		
	B		6.01	6.01	MC	3	100	35	35,000	-	-	-	-	-	-	3*10	1*10		3/4"		
	C		15.24	15.24	MC	3	100	60	35,000	-	-	-	-	-	-	4*1	1*1		1 1/4"		
	D		17.2	17.2	MC	3	100	35	35,000	-	-	-	-	-	-	3*8	1*10		3/4"		
	E		3	3.82	3.82	MCP	3	100	20	35,000	FVNR	3	1	R,G	TOL	2NO	3*12	1*12	2*12	3/4"	2*12 FOR MOTOR HEATER, CPT
	F		3	3.82	3.82	MCP	3	100	20	35,000	FVNR	3	1	R,G	TOL	2NO	3*12	1*12	2*12	3/4"	2*12 FOR MOTOR HEATER, CPT
	G		3	3.82	3.82	MCP	3	100	20	35,000	FVNR	3	1	R,G	TOL	2NO	3*12	1*12	2*12	3/4"	2*12 FOR MOTOR HEATER, CPT
	H		3	3.82	3.82	MCP	3	100	20	35,000	FVNR	3	1	R,G	HOA	2NO	3*12	1*12	2*12	3/4"	2*12 FOR MOTOR HEATER, CPT
3	A		3	3.82	3.82	MCP	3	100	20	35,000	FVNR	3	1	R,G	HOA	2NO	3*12	1*12	2*12	3/4"	2*12 FOR MOTOR HEATER, CPT
	B		1/2	0.90	0.90	MCP	3	100	15	35,000	FVR	3	1	R,G	TOL	2NO	3*10	1*10	2*12	1"	2*12 FOR MOTOR HEATER, CPT
	C		1/2	0.90	0.90	MCP	3	100	15	35,000	FVR	3	1	R,G	LOR	2NO	3*10	1*10	2*12	1"	2*12 FOR MOTOR HEATER, CPT
	D		74.38	74.38	MC	3	225	225	35,000	-	-	-	-	-	-	4*4/0	1*4		2"		
	E			20.0	20.0	-	3	100	-	-	-	-	-	-	-	-	-	-	-	-	

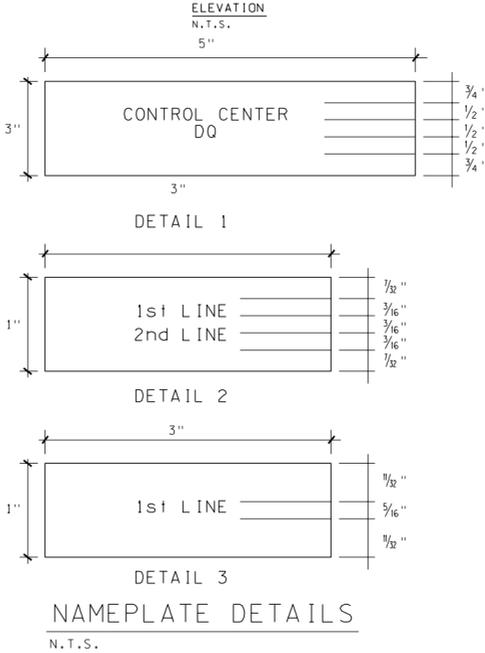
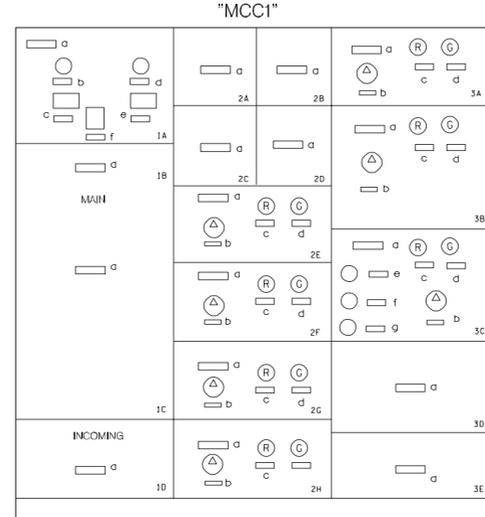
TOTAL CONNECTED LOAD: 168.0 KVA
TOTAL DEMAND LOAD: 168.0 KVA
FEEDER:
FED FROM: FP&L PAD TRANSFORMER

MCP - MOTOR CIRCUIT PROTECTOR
MC - MOLDED CASE
VM - VOLT METER
AM - AMMETER
VS - VOLT METER SWITCH
AS - AMMETER SWITCH
PM - PHASE MOTOR

FVNR - FULL VOLTAGE NON-REVERSING
SSRV - SOLID STATE REDUCE VOLTAGE
N.O. - NORMALLY OPEN
N.C. - NORMALLY CLOSED
R - RED
G - GREEN
FVR - FULL VOLTAGE REVERSING

CPT - CONTROL POWER TRANSFORMER
ETM - ELAPSED TIME METER
P.B. - PUSH BUTTON
M.C. - MAINTAINED CONTACT
H.O.A. - HAND, OFF, AUTOMATIC
MCC - MOMENTARY CONTACT
S.S. - STOP, START

RV AT - REDUCED VOLTAGE AUTOTRANSFORMER
VFD - VARIABLE FREQUENCY DRIVE
MA - MANUAL AUTOMATIC
LOR - LOCAL, OFF, REMOTE SELECTOR SWITCH
TOL - TELE, OFF, LOCAL SELECTOR SWITCH
RSL - RAISE, STOP, LOWER PUSH BUTTON



EQUAL TO: TYPE: CIRCUIT BREAKER MOUNTING: SURFACE A. 1. C. :		PANEL " M "										VOLTAGE: 120/208V, 3Ø, 4W MAINS: 100A NEUTRAL: 5/N TYPE MAINS: 60A M.C.B. MAINS LOCATION: BOTTOM	
		W/GROUND BAR (NEMA 4X ENCLOSURE)											
DESCRIPTION	ØA KVA	ØB KVA	ØC KVA	WIRES & CONDUIT	POLES & STRIP	CIR. NO.	CIR. NO.	POLES & STRIP	WIRES & CONDUIT	ØA KVA	ØB KVA	ØC KVA	DESCRIPTION
FUEL FILL PUMP No.1	1.37			2*12; 2/20	1	2	2/20	1*120-3/4"	1.37				FUEL FILL PUMP No.2
		1.37				3	4	2/20	1*120-3/4"		1.37		
FUEL TANK POLE LIGHT			0.6	3*12-3/4"	1/20	5	6	1/20	3*12-3/4"		1.0		FUEL TANK RECEP.
FUEL SUPPLY PUMP	2.0			3*10;	3/35	9	10	1/20	3*12-3/4"		0.72		LEAK MONITOR SUB PNL
CONTROL PANEL			2.0	1*100-3/4"	11	12	1/20	-	-		0.72		TANK OVERFILL PNL
						13	14						SPARE
						15	16						
						17	18						
						19	20						
						21	22						
						23	24						
						25	26						
						27	28						
						29	30						
						31	32						
						33	34						
						35	36						
						37	38						
						39	40						
						41	42						
CONNECT LOAD	3.37	3.37	2.6							2.6	2.6	1.72	

TOTAL CONNECTED KVA: 15.24
TOTAL DEMAND KVA: 15.24+42.33A

MCC1 NAME PLATE SCHEDULE					
COMPT.	PART	1st LINE	2nd LINE	NP No.	
1	A	a	MOTOR CONTROL CENTER MCC1	1	
	b		AMMETER	3	
	c		AMMETER SWITCH	3	
	d		VOLTMETER	3	
	e		VOLTMETER SWITCH	3	
	f		PHASE MONITOR	3	
1	B	a	SURGE ARRESTER (TVSS)	2	
1	C	a	MAIN	3	
1	D	a	INCOMING	3	
2	A	a	WELDING RECEPTACLE	2	
2	B	a	CRANE	3	
2	C	a	PANEL "M"	FUEL SUPPLY TANK	2
2	D	a	TRASH RAKE CTL. PNL	PS-S-382	2
2	E	a	EXHAUST FAN	No.1	2
	b		TELE-OFF-LOCAL		3
	c		ON		3
	d		OFF		3
2	F	a	EXHAUST FAN	No.2	2
	b		TELE-OFF-LOCAL		3
	c		ON		3
	d		OFF		3
2	G	a	EXHAUST FAN	No.3	2
	b		TELE-OFF-LOCAL		3
	c		ON		3
	d		OFF		3
2	H	a	EXHAUST FAN	No.4	2
	b		HAND-OFF-AUTO		3
	c		ON		3
	d		OFF		3
3	A	a	EXHAUST FAN	No.5	2
	b				

A B C D E F G H

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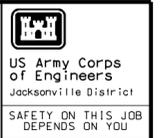
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S-382 CONTROL CABLE AND CONDUIT SCHEDULE					
NO.	FROM	TO	CABLE	CONDUITS	REMARKS
1	RTD'S PUMP BAY No.1	ECP-1 TEMP. DISPLAYS	TWISTED SHIELDED PAIRS	1"	RESISTANCE TEMP DETECTORS PUMP & GEAR. (SEE NOTE 5)
2	VIBRATION SENSOR PUMP BAY No.1	ENGINE CONTROL PANEL No.1	2*12 1*12GND	1"	VIBRATION SENSOR No.1
3	ENGINE CONTROL PANEL No.1	MCTP-1	F.O.	1"	AUTOMATIC STATUS No.1
4	ENGINE CONTROL PANEL No.1	MCTP-1	-	1"	SPARE
5	ENGINE CONTROL PANEL No.1	DT-1	6*14	1"	STATUS
6	ENGINE CONTROL PANEL No.1	ENGINE No.1	BY ENGINE MANUFACTURER	-	ENGINE CABLE
7	RTD'S PUMP BAY No.2	ECP-2 TEMP. DISPLAYS	TWISTED SHIELDED PAIRS	1"	RESISTANCE TEMP DETECTORS PUMP & GEAR. (SEE NOTE 5)
8	VIBRATION SENSOR PUMP BAY No.2	ENGINE CONTROL PANEL No.2	2*12 1*12GND	1"	VIBRATION SENSOR No.2
9	ENGINE CONTROL PANEL No.2	MCTP-1	F.O.	1"	AUTOMATIC STATUS No.2
10	ENGINE CONTROL PANEL No.2	MCTP-1	-	1"	SPARE
11	ENGINE CONTROL PANEL No.2	DT-2	6*14	1"	STATUS
12	ENGINE CONTROL PANEL No.2	ENGINE No.2	BY ENGINE MANUFACTURER	-	ENGINE CABLE
13	RTD'S PUMP BAY No.3	ECP-3 TEMP. DISPLAYS	TWISTED SHIELDED PAIRS	1"	RESISTANCE TEMP DETECTORS PUMP & GEAR. (SEE NOTE 5)
14	VIBRATION SENSOR PUMP BAY No.3	ENGINE CONTROL PANEL No.3	2*12 1*12GND	1"	VIBRATION SENSOR No.3
15	ENGINE CONTROL PANEL No.3	MCTP-1	F.O.	1"	AUTOMATIC STATUS No.3
16	ENGINE CONTROL PANEL No.3	MCTP-1	-	1"	SPARE
17	ENGINE CONTROL PANEL No.3	DT-3	6*14	1"	STATUS
18	ENGINE CONTROL PANEL No.3	ENGINE No.3	BY ENGINE MANUFACTURER	-	ENGINE CABLE
19	DT-4	FCP	SEE NOTE 6.	2"	FUEL LEVEL READING, STATUS AND ALARMS
20	RETURN DAY TANK	FCP	SEE NOTE 6.	2"	FUEL LEVEL STATUS AND ALARMS
21	GENERATOR	AUTOMATIC TRANSFER SWITCH	PER MANUF. RECOMMENDATION	1 1/4"	GENERATOR CONTROL
22	FUEL LEAK CONTROL PANEL	FCP	SEE NOTE 6.	1"	HIGH, LOW, RUPTURE ALARMS
23	FCP	FUEL SUPPLY PUMP CONTROL PANEL	SEE NOTE 6.	2"	FUEL LEVEL READING, STATUS AND ALARMS
24	FCP	FUEL SUPPLY PUMP CONTROL PANEL	SEE NOTE 6.	2"	FUEL LEVEL READING, STATUS AND ALARMS
25	FCP	MCTP-1	SEE NOTE 6.	2"	FUEL LEVEL READING STATUS AND ALARMS
26	ANTENNA POLE	RTU/TELEMETRY CABINET*1	BY SFWMP	1" RGS	CABLE BY SFWMP
27	DT-1	FCP	6*14	1"	FUEL LEVEL STATUS AND ALARM
28	DT-2	FCP	6*14	1"	FUEL LEVEL STATUS AND ALARM
29	DT-3	FCP	6*14	1"	FUEL LEVEL STATUS AND ALARM
30	RETURN DAY TANK	MCTP-1	6*14	1"	FUEL LEVEL STATUS AND ALARM
31	MCC1	MCTP-1	18*14	1"	EXH. FAN # 1, 2 & 3 CONTROL & STATUS
32	ATS	MCTP-1	6*14	1"	STATUS INDICATION NORMAL POWER ON/ POWER FAILURE
33	GENERATOR	MCTP-1	9*14	1"	GENERATOR ALARMS
34	MCTP-1	RTU/TELEMETRY CABINET*1	BY SFWMP	2" RGS	
35	TRCP-1	MCTP-1	18*14	1"	TRASH RAKE CONTROL, STATUS AND ALARM. SEE NOTE 5
36	ECP-1	MCC1	3*14	1"	EXH. FAN # 1 INTERLOCK
37	ECP-2	MCC1	3*14	1"	EXH. FAN # 2 INTERLOCK
38	ECP-3	MCC1	3*14	1"	EXH. FAN # 3 INTERLOCK
39	TRASH RAKE*1 PUSH BUTTON STA	TRCP-1	9*14	1"	TRASH RAKE #1 LOCAL CONTROL AT RAKE. SEE NOTE 4.
40	TRASH RAKE*2 PUSH BUTTON STA	TRCP-1	9*14	1"	TRASH RAKE #2 LOCAL CONTROL AT RAKE. SEE NOTE 4.
41	TRASH RAKE*3 PUSH BUTTON STA	TRCP-1	9*14	1"	TRASH RAKE #3 LOCAL CONTROL AT RAKE. SEE NOTE 4.

S-382 CONTROL CABLE AND CONDUIT SCHEDULE					
NO.	FROM	TO	CABLE	CONDUITS	REMARKS
42	HEAT DETECTOR	MCTP-1	2*14	3/4"	HIGH TEMPERATURE INSIDE PUMP STATION
43	TANK AREA LEAK MONITORING SUB PANEL	FLCP	SEE NOTE 6	2"	LEAK & ALARMS
44	TANK OVERFILL ALARM SYSTEM PNL	FCP	SEE NOTE 6	2"	TANK LEVEL & ALARMS
45	STATION FUEL LEAK SENSOR	FLCP	SEE NOTE 6	2"	LEAK ALARMS
46					
47					
48					
49					
50	HEAD WATER AREA S382	RTU/TELEMETRY CABINET*1	BY SFWMP	1" RGS	FUTURE SFWMP WATER SAMPLER
51	LS382-1	MCTP-1	3 TSP *20 BELDEN 9883	1" RGS	HEAD WATER S382 TAIL WATER LOW LEVEL OUTLET
52	LS382-3	ECP-1	3*12	1" RGS	NORMAL CUT-OFF PUMP #1
53	LS382-3A	ECP-1	3*12	1" RGS	ULTIMATE CUT-OFF PUMP #1
54	LS382-4	MCTP-1	3 TSP *20 BELDEN 9883	1" RGS	PUMP BAY #1 CONTINUOUS READING
55	LS382-5	ECP-2	3*12	1" RGS	NORMAL CUT-OFF PUMP #2
56	LS382-5A	ECP-2	3*12	1" RGS	ULTIMATE CUT-OFF PUMP #2
57	LS382-6	MCTP-1	3 TSP *20 BELDEN 9883	1" RGS	PUMP BAY #2 CONTINUOUS READING
58	LS382-7	ECP-3	3*12	1" RGS	NORMAL CUT-OFF PUMP #3
59	LS-382-7A	ECP-3	3*12	1" RGS	ULTIMATE CUT-OFF PUMP #3
60	LS382-8	MCTP-1	3 TSP *20 BELDEN 9883	1" RGS	PUMP BAY #3 CONTINUOUS READING
61	LS382-10	MCTP-1	3 TSP *20 BELDEN 9883	1" RGS	HEAD WATER FOR LOW LEVEL OUTLET
62	LS382-11	MCTP-1	3 TSP *20 BELDEN 9883	1" RGS	TAIL WATER S382 FOR ALL PUMPS
63	LS382-12	MCTP-1	3*10	1"	EMERGENCY CUT-OFF S382 PUMPS #1, #2 AND #3
64	MCTP-1	ECP-1	3*12	1"	CUT-OFF PUMP #1
65	MCTP-1	ECP-2	3*12	1"	CUT-OFF PUMP #2
66	MCTP-1	ECP-3	3*12	1"	CUT-OFF PUMP #3
67					
68					
69					
70	LOW LEVEL OUTLET MODULATING GATE	MCTP-1	3 TSP *20 BELDEN 9883	1" RGS	GATE POSITIONING ANALOG INPUT TO MCTP
71	PUSH BUTTON STA AT MAINTENANCE GATE	MCC1-3C	7/C *14	1"	RAISE-STOP-LOWER LOCAL CONTROL AT GATE
72	PUSH BUTTON STA AT MODULATING GATE	MCC1-3B	7/C *14	1"	RAISE-STOP-LOWER LOCAL CONTROL AT GATE
73	PERSONNAL COMPUTER	MCTP-1	DATA	1" RGS	1770 CD SHIELDED TWIN AXIAL CABLE
74	MCTP-1	MCC1-3C	THREE 7/C *14	2" RGS	GATE STATUS & CONTROL TO/FROM MCTP
75	MCC1-3B	LOW LEVEL OUTLET MAINTENANCE GATE	4*12	1"	OPEN/CLOSE STATUS AT MCC PILOT LIGHTS
76	MCC1-3C	LOW LEVEL OUTLET MODULATING GATE	TWO 7/C *14	2"	GATE STATUS & CONTROL
77					

- NOTES:
- ALL LEVEL SENSORS ARE MOUNTED WITHIN STILLING WELLS AS DETAILED ON MECHANICAL DRAWING SHEET 3/55.
 - LEVEL SENSOR DESIGNATION LS382-2 AND LS382-9 ARE NOT USED.
 - CONTRACTOR SHALL COORDINATE WITH THE ENGINE MANUFACTURER FOR THE NUMBER OF TWISTED SHIELDED CABLES NEEDED BASED ON THE NUMBER OF RESISTANCE TEMPERATURE DETECTORS PROVIDED.
 - CONTRACTOR SHALL COORDINATE WITH THE RAKE MANUFACTURER FOR THE ACTUAL NUMBER OF CONDUCTORS NEEDED FROM THE REMOTE CONTROL STATION TO THE TRASH RAKE CONTROL PANEL.
 - CONTRACTOR SHALL COORDINATE WITH THE RAKE MANUFACTURER FOR THE ACTUAL NUMBER OF CONDUCTORS NEEDED FROM THE MCTP TO THE TRASH RAKE CONTROL PANEL.
 - CONTRACTOR SHALL COORDINATE WITH THE FUEL SYSTEM MANUFACTURER FOR THE NUMBER AND TYPE OF CONDUCTORS NEEDED BASED ON THE SPECIFIED REQUIREMENTS. SEE SEQUENCE OF OPERATION AND EQUIPMENT DATA INFORMATION ON DWG. 7/3



SAFETY ON THIS JOB DEPENDS ON YOU

PLT	Approved
REVISED TO CONFORM TO MEASUREMENT No.0004	Descr: P11.0n
5	A
No. 1	Symbol Zone

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TEN MILE CREEK
WATER PRESERVE AREA
S-382 CONTROL
CONDUIT SCHEDULE

DESIGNED BY: [blank]
DRAWN BY: [blank]
CHECKED BY: [blank]
SCALE: AS SHOWN
PILOT DATE: APR. 26, 2002
PILOT SCALE: [blank]

DATE: SEPTEMBER 2001
D. O. FILE NO. 402-38-236

DESIGNED BY: [blank]
DRAWN BY: [blank]
CHECKED BY: [blank]
SCALE: AS SHOWN
PILOT DATE: APR. 26, 2002
PILOT SCALE: [blank]

DESIGNED BY: [blank]
DRAWN BY: [blank]
CHECKED BY: [blank]
SCALE: AS SHOWN
PILOT DATE: APR. 26, 2002
PILOT SCALE: [blank]

DRAWING NO.
8/16