Progress Energy

Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: ITS Appendix B

December 5, 2009
3F1209-09

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 – Revision to the Crystal River Units 1, 2 and 3 Industrial Wastewater Permit FL0000159

Reference: PEF to FDEP letter dated September 11, 2009, "NPDES Permit No. FL0000159, Major Permit Modification – Helper Cooling Tower South"

Dear Sir:

In accordance with the Environmental Protection Plan (Non-Radiological) Improved Technical Specifications (ITS) for Crystal River Unit 3 (CR-3), Section 3.2.4, Florida Power Corporation, doing business as Progress Energy Florida, Inc. (PEF), hereby provides a copy of a requested revision the National Pollutant Discharge Elimination System (NPDES) Permit that was submitted to the Florida Department of Environmental Protection (FDEP). The NPDES Permit encompasses Crystal River Units 1, 2 and 3.

As a result of the ongoing Extended Power Uprate (EPU) project at CR-3, an increase in thermal load to the discharge canal will occur. In order to maintain compliance with the existing permitted thermal limit at the point of discharge, PEF must construct and operate a new cooling tower at the location of an unused clarification pond. In the above referenced letter, PEF provided documentation to FDEP requesting a modification to the NPDES Permit to authorize two new outfalls to the site discharge canal and one relocated outfall to the site intake canal to allow construction of the Helper Cooling Tower South, and the associated stormwater system, to support the EPU project.

No new regulatory commitments are made in this letter.

If you have any questions regarding this submittal, please contact Mr. Brandon Barr at (352) 563-4778.

Sincerely,

J. W. Holt

James W. Holt
Plant General Manager
Crystal River Nuclear Plant

JWH/ff

Attachment: Major Permit Modification – Helper Cooling Tower South

xc: Regional Administrator, Region II
Senior Resident Inspector
NRR Project Manager

C001
NRR

Progress Energy Florida, Inc.
Crystal River Nuclear Plant
15760 W. Power Line Street
Crystal River, FL 34428

Progress Energy

September 11, 2009

Mr. Marc Harris
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Crystal River Units 1,2 & 3
NPDES Permit No. FL0000159
Major Permit Modification
Helper Cooling Tower South

Dear Mr. Harris:

Progress Energy Florida Inc. (PEF) is in the process of performing an Extended Power Uprate (EPU) of the Crystal River Unit 3 nuclear plant. A result of this uprate will be an increase in thermal load to the discharge canal. In order to comply with the existing permitted thermal limit at the point of discharge, PEF must construct and operate a new cooling tower (Helper Cooling Tower South – HCTS) at the location of the unused clarification pond. A post certification submittal to the existing Crystal River Units 1,2 & 3 Conditions of Certification will be submitted to the Siting Office to allow construction of the HCTS and the associated stormwater system. Concurrently, PEF is requesting a modification to the NPDES permit referenced above to authorize two new outfalls to the site discharge canal and one relocated outfall to the site intake canal. The intake and discharge for the HCTS will be located on the site discharge canal. Additionally, associated with the new HCTS, there will be a new screen wash discharge outfall and a stormwater management system discharge outfall installed on the site discharge canal.

In order to facilitate the construction of the new tower at the site of the unused clarification pond, the existing industrial wastewater percolation pond emergency overflow (D-0C2) discharge will be moved from the existing location on the discharge canal to a location on the intake canal as indicated in the following documentation. Please see the attached FDEP required application forms and supporting documentation for specifics regarding the design and construction of the HCTS, the associated stormwater management system and the relocated industrial wastewater emergency overflow outfall. Also included is a check (#185481) for the required $7500.00 administrative processing fee.

If you have any questions or require additional information regarding this request, please contact Mr. Michael Shrader at 727-820-5588.

Sincerely,

Michael Shrader
Lead Environmental Specialist
Progress Energy Florida, Inc.

Enclosures

WASTEWATER FACILITY OR ACTIVITY PERMIT APPLICATION FORM 1 GENERAL INFORMATION

I - IDENTIFICATION NUMBER:

Facility ID FL0000159

II - CHARACTERISTICS:

INSTRUCTIONS: Complete the questions below to determine whether you need to submit any permit application forms to the Department of Environmental Protection. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the blank in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements. See Section B of the instructions. See also, Section C of the instructions for definitions of the terms used here.

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a domestic wastewater facility which results in a discharge to surface or ground waters?		X	
B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters?		X	
C. Does or will this facility (other than those describe in A. or B.) discharge process wastewater, or non-process wastewater regulated by effluent guidelines or new source performance standards, to surface waters?	X		2CS
D. Does or will this facility (other than those described in A. or B.) discharge process wastewater to ground waters?	X		N/A
E. Does or will this facility discharge non-process wastewater, not regulated by effluent guidelines or new source performance standards, to surface waters?		X	
F. Does or will this facility discharge non-process wastewater to ground waters?	X		N/A
G. Does or will this facility discharge stormwater associated with industrial activity to surface waters?	X		2F
H. Is this facility a non-discharging/closed loop recycle system?		X	
I. Is this facility a public water system whose primary purpose is the production of potable water for public consumption and which discharges demineralization concentrate to surface water or groundwater?		X	

III - NAME OF FACILITY: (80 characters and spaces)

Crystal River Power Plant Units 1, 2, 3

DEP Form 62-620.910(1)
(Effective July 7, 2006)

Facility ID FL0000159

IV - FACILITY CONTACT: (A. 30 characters and spaces)

A. Name and Title (Last, first, & title)	B. Phone (area code & no.)
Shrader, Michael, Lead Environ. Spec.	727-820-5588

V - FACILITY MAILING ADDRESS: (A. 30 characters and spaces; B. 25 characters and spaces)

A. Street or P.O. Box: P.O. Box 14042, PEF-903		
B. City or Town: St. Petersburg	State: FL	Zip Code: 33733

VI - FACILITY LOCATION: (A. 30 characters and spaces; B. 24 characters and spaces; C. 3 spaces (if known); D. 25 characters and spaces; E. 2 spaces; F. 9 spaces)

A. Street, Route or Other Specific Identifier: 15760 W. Powerline St.		
B. County Name: Citrus	C. County Code (if known):	
D. City or Town: Crystal River	E. State: FL	F. Zip Code: 34428

VII - SIC CODES: (4-digit, in order of priority)

1. Code #: 4911	(Specify) Electric Svc.	2. Code #:	(Specify)
3. Code #:	(Specify)	4. Code #:	(Specify)

VIII - OPERATOR INFORMATION: (A. 40 characters and spaces; B. 1 character; C. 1 character (if other, specify); D. 12 characters; E. 30 characters and spaces; F. 25 characters and spaces; G. 2 characters; H. 9 characters)

A. Name: Progress Energy Florida, Inc		B. Is the name in VIII A. the owner? ☒Yes ☐No	
C. Status of Operator: F = Federal; S = State; P = Private; O = Other; M = Public (other than F or S)	(code) P	(specify) Utility	D. Phone No.: 352-563-4484
E. Street or P. O. Box: 15760 W. Powerline St.			
F. City or Town: Crystal River		G. State: FL	H. Zip Code: 34428

IX - INDIAN LAND:

A. Is the facility located on Indian lands?	☐ Yes	☒ No

Facility ID FL0000159

X - EXISTING ENVIRONMENTAL PERMITS:

A. NPDES Permit No.	B. UIC Permit No.	C. Other (specify)	D. Other (specify)
FL0000159	N/A	FLA016960 - IWW	FLA118753 - DWW

XI - MAP: Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII - NATURE OF BUSINESS (provide a brief description)

Crystal River Units 1 & 2 are coal-fired steam electric generating facilities.

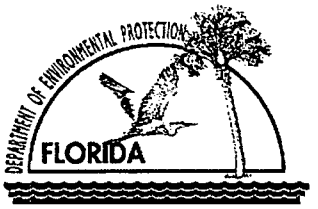
Crystal River Unit 3 is a nuclear-powered steam electric generating facility.

XIII - CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Larry Hatcher	Billy A. Hatcher FOR LARRY HATCHER
A. Name (type or print)	B. Signature
CR Fossil Plant Manager	9/16/09
Official Title (type or print)	C. Date Signed

FORM
2CS



WASTEWATER APPLICATION FOR PERMIT TO DISCHARGE PROCESS WASTEWATER FROM NEW OR EXISTING INDUSTRIAL WASTEWATER FACILITIES TO SURFACE WATERS

Facility I.D. Number: FL0000159

Please print or type information in the appropriate areas.

I OUTFALL LOCATION For each outfall, list the X,Y coordinates and the name of the receiving water.
(latitude/longitude to the nearest 15 seconds)

A. Outfall No. (List)	B. Latitude			C. Longitude			D. Name of Receiving Water
	Deg.	Min.	Sec.	Deg.	Min.	Sec.	
HCTS	28	57	31	82	42	20	Discharge Canal
D-0C2R	28	57	23	82	42	30	Intake Canal
Screen Wash	28	57	32	82	42	30	Discharge Canal

II OUTFALL DESIGN

A. Outfall No. (List)	B. Design Configuration and Construction Materials	C. Distance from shore	D. Diameter	E. Elevation of Discharge Invert (MSL)	F. Receiving Water Depth at POD (MSL)
HCTS	Concrete Flume	0	20'	0	-12'
D-0C2R	RCP	Approx. 60 ft.	24"	7.67'	-20'
Screen Wash	HDPE Pipe	0	24"	1'	-12'

Facility I.D. Number: FL0000159

III RECEIVING WATER INFORMATION

For each surface water that will receive effluent, supply the following information:

A. Name of Receiving Water	B. Check One		C. Classification (See Ch. 62-302, F.A.C.)	D. Type of Receiving Water (canal, river, lake, etc.)
	Fresh	Salt or Brackish		
Discharge Canal then to the Gulf of Mexico	☐	☒	Class III	Canal
Intake Canal	☐	☒	Class III	Canal
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		

E. Minimum 7-day 10-year low flow of the receiving water at each outfall (if appropriate). N/A

F. Identify and describe the flow of effluent from each outfall to a major body of water. A suitably marked map or aerial photograph may be used. See Attachments 1A and 1B

G. Do you request a mixing zone under Rule 62-4.244, F.A.C.? If yes, for what parameters or pollutants? No

IV FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of:

1. All operations contributing wastewater to the effluent; including process wastewater, sanitary wastewater, cooling water, and stormwater runoff;

2. The average flow contributed by each operation; and

3. The treatment received by the wastewater.

See Attachment 2

Use the space on the next page. Continue on additional sheets, if necessary.

IV B. Contd.

Facility I.D. Number: FL0000159

(1) Outfall No. (List)	(2) Operation(s) Contributing Flow		(3) Treatment		
	(a) Operation (list)	(b) Avg. Flow & Units	(a) Description	(b) List Code from Table 2CS-1	
HCTS	Helper Cooling Tower South Once	460.8 MGD	See Attachement 2	4-A	
	through cooling water				
D-0C2R	Percolation Pond Emergency	0.0 MGD	See Attachement 2	4-A	
	Overflow				
Screen Wash	Screen Wash from HCTS	1.4 MGD	See Attachment 2	4-A	

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?
☐ Yes (complete the following table) ☒ No (go to D. below)

(1) Outfall No. (List)	(2)Operation(s) Contributing Flow(List)	(3) Frequency		(4) Flow				
		(a) Days per Week (specify avg.)	(b) Months per Yr. (specify avg.)	(a) Flow Rate (in mgd)		(b) Total Volume (specify with units)		(c) Duration (in days)
				Long Term Avg.	Max. Daily	Long Term Avg.	Max. Daily	

D. Describe practices to be followed to ensure adequate wastewater treatment during emergencies such as power loss and equipment failures causing shutdown of pollution abatement equipment of the proposed/permitted facilities.

See Attachment 2

E. List the method(s) and location(s) of flow measurement.

See Attachment 2

V PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☒ Yes (complete Item V-B) ☐ No (go to Section VI)

B. Are the limitations in the applicable guideline expressed in terms of production (or other measure of operation)?

☐ Yes (complete Item V-C) ☒ No (go to Section VI)

C. If you answered "yes" to Item V-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. Affected Outfalls
a. Quantity per Day	b. Units of Measure	c. Operation, Product, Materials, Etc. (specify)	(list outfall nos.)

Facility I.D. Number: FL0000159

VI IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement order, enforcement compliance schedule letter, stipulations, court orders, and grant or loan conditions.

☐ Yes (complete the following table) ☒ No (go to Item VI-B)

1. Identification of Condition, Agreement, Etc.	2. Affected Outfalls		3. Brief Description of Project	4. Final Compliance Date	
	a. No.	b. Source of Discharge		a. Required	B. Projected

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ Mark "X" if description of additional control programs is attached.

VII INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding--Complete one set of tables for each outfall -- Annotate the outfall number in the space provided. NOTE: Tables VII-A, VII-B, and VII-C are included on separate sheets number VII-1 through VII-9.

D. Use the space below to list any of the pollutants listed in Table 2CS-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. Pollutant	2. Source	1. Pollutant	2. Source
None			

Facility I.D. Number: FL0000159

VIII POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item VII-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or by-product?

☐ YES (list all such pollutants below) ☒ NO (go to IX)

IX BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ YES (identify the test(s) and describe their purposes below) ☒ NO (go to Section X)

All discharge indicated are proposed new discharges.

X CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item VII performed by a contract laboratory or consulting firm?

☐ YES (list the name, address, telephone number, and certification number of, and pollutants analyzed by each such laboratory or firm below) ☒ NO (go to Section XI)

A. Name	B. Address	C. Telephone (area code & no.)	D. Pollutants Analyzed (list)

Facility I.D. Number: FL0000159

XI CONNECTION TO REGIONAL POTW

A. Indicate the relationship between this project and area regional planning for wastewater treatment. List steps to be taken for this industrial wastewater facility to become part of an area-wide wastewater treatment system.

N/A

XII-A CERTIFICATIONS FOR NEW OR MODIFIED FACILITIES

This is to certify the engineering features of this pollution control project have been designed by me and found to be in conformity with sound engineering principles, applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules of the Department. It is also agreed that the undersigned, if authorized by the owner, will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Misty B. Day
Signature

MISTY B. DAY
Name (please type)

(Affix Seal)

MESA ASSOCIATES
Company Name

Address
10604 MURDOCK DRIVE
KNOXVILLE TN 37932

Florida Registration No.: #69469 / COA #7981

Telephone No:: 865-671-5400

Date 9/8/09

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Larry Hatcher, Crystal River Fossil Plant Manager
Name & Official Title (Please type or print)

Bobby A. Elliott FOR LARRY HATCHER
Signature

352-563-4484
Telephone No. (area code & No.)

9/10/09
Date Signed

FORM

2F

APPLICATION FOR PERMIT FOR STORMWATER DISCHARGE ASSOCIATED WITH INDUSTRIAL ACTIVITY

Facility I.D. Number: FL0000159

Please type or print in black ink. If additional space is needed for your answer, use plain sheets and attach to the application form.

I. Outfall Location:

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. Outfall Number (list)	B. Latitude			C. Longitude			D. Receiving Water (Name)
HCTS Stormwater Pond	28	57	31	82	42	28	Discharge Canal

II. Improvements:

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading or operation of stormwater or wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions?

1. Identification of Conditions, Agreements	2. Affected Outfalls		3. Brief Description of Project	4. Final Compliance Date	
	No.	Source of Discharge		a. required	b. projected
None					

B. You may attach additional sheets describing any additional water pollution or other environmental projects which may affect your discharge that you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction. N/A

III. Site Drainage Map:

Attach a site map showing topography depicting the facility including each of its intake and discharge structures; the drainage area of each stormwater outfall; paved areas and buildings within the drainage area of each stormwater outfall; each known past or present areas used for outdoor storage or disposal of significant materials; each existing structural control measure to reduce pollutants in stormwater runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal units; each well where fluids from the facility are injected underground; springs, and other surface water bodies which receive stormwater discharges from the facility. Show hazardous waste storage or disposal areas that do not require a RCRA permit separate from those which do require a permit.

See Attachments - Note that the stormwater system is being authorized through a COC Post Certification Submittal.

Facility I.D. Number: FL0000159

IV. Narrative Description of Pollutant Sources:

A. For each outfall, provide an estimate of the area (include units) of impervious surfaces, including paved areas and building roofs, drained to the outfall, and an estimate of the total surface area drained by the outfall.

Outfall No.	Area of Impervious Surface (units)	Total Area Drained (units)	Outfall No.	Area of Impervious Surface (units)	Total Area Drained (units)
HCTS	3.25 Acres	6.02 Acres			

B. Provide a narrative description of significant materials that are currently, or in the past three years have been, treated, stored or disposed in a manner that allows exposure to stormwater; method of treatment, storage, or disposal; past and present materials management practices employed to minimize contact with stormwater runoff; materials loading and access areas; and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied.

The facility has implemented a BMP which includes stormwater pollution prevention practices. There are no significant materials within this drainage area that will be exposed to stormwater.

C. For each outfall, provide the location and a description of existing structural and nonstructural control measures to reduce pollutants in stormwater runoff; and a description of the treatment the stormwater receives, including the schedule and type of maintenance for control and treatment measures and the ultimate disposal of any solid or fluid wastes other than by discharge.

Outfall No.	Treatment	Table 2F-1 Code
HCTS	The stormwater system will utilize a detention pond that discharges to the site discharge canal through a control structure.	1-V, 4-A

V. Non-stormwater Discharges:

A. I certify under penalty of law that the outfall(s) covered by this application have been tested or evaluated for the presence of non-stormwater discharges, and that all non-stormwater discharges from these outfall(s) are identified in either an accompanying DEP Form 62-620.910(5) or (7) (Forms 2CS or 2ES) application for the outfall.

Name and Official Title (type or print)	Signature	Date Signed
Michael Shrader, Lead Environmental Specialist		9/11/09

B. Provide a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test.

The proposed stormwater system is designed to receive non-contact stormwater only. No non-stormwater discharges will be released through this outfall.

Facility I.D. Number: FL0000159

VI. Significant Leaks or Spills:

Provide existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last three years, including the approximate date and location of the spill or leak, and the type and amount of material released.

N/A

VII. Discharge Information:

A, B, C, & D: See instructions before proceeding. Complete one set of tables for each outfall. Annotate the outfall number in the space provided. Tables VII-A, VII-B, and VII-C are included on separate sheets numbered VII-1 and VII-2.

E. Potential discharges not covered by analysis - is any toxic pollutant listed in Table 2F-2, 2F-3, or 2F-4, a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or by-product?

☐ Yes (list all such pollutants below) ☒ No (go to section VIII)

VIII. Biological Toxicity Testing Data

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ Yes (list results below) ☒ No (go to Section IX)

IX. Contract Analysis Information

Were any of the analysis reported in item VII performed by a contract laboratory or consulting firm?

☐ Yes (list the name, address, and telephone number of, and pollutants analyzed by each such laboratory or firm below) ☒ No (go to Section X)

A. Name	B. Address	C. Area Code & Phone No.	D. Pollutants Analyzed

Facility I.D. Number: FL0000159

X-A. CERTIFICATIONS FOR NEW OR MODIFIED FACILITIES

I certify that the engineering features of this pollution control project have been designed by me and found to be in conformity with sound engineering principles, applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules of the Department. It is also agreed that the undersigned, if authorized by the owner, will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Misty B Day
Signature

MISTY B. DAY
Name (please type):

(Affix Seal)

MESA ASSOCIATES
Company Name:

Address: 10604 MURDOCK DRIVE
KNOXVILLE TN 37772

Florida Registration No.: #69469 / COA#7981

Telephone No.: 865-671-5400

Date: 9/8/09

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Larry Hatcher, Crystal River Fossil Plant Manager
Name & Official Title (type or print)

Robin A. Alexander FOR LARRY HATCHER
Signature

352-563-4484
Telephone No. (area code & no.)

9/10/09
Date Signed

X-B. CERTIFICATIONS FOR PERMIT RENEWALS

I certify that the engineering features of this pollution control project have been examined by me and found to be in conformity with sound engineering principles, applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules of the Department.

Signature

Name (please type):

(Affix Seal)

Company Name:

Address:

Florida Registration No.:

Telephone No.:

Date:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

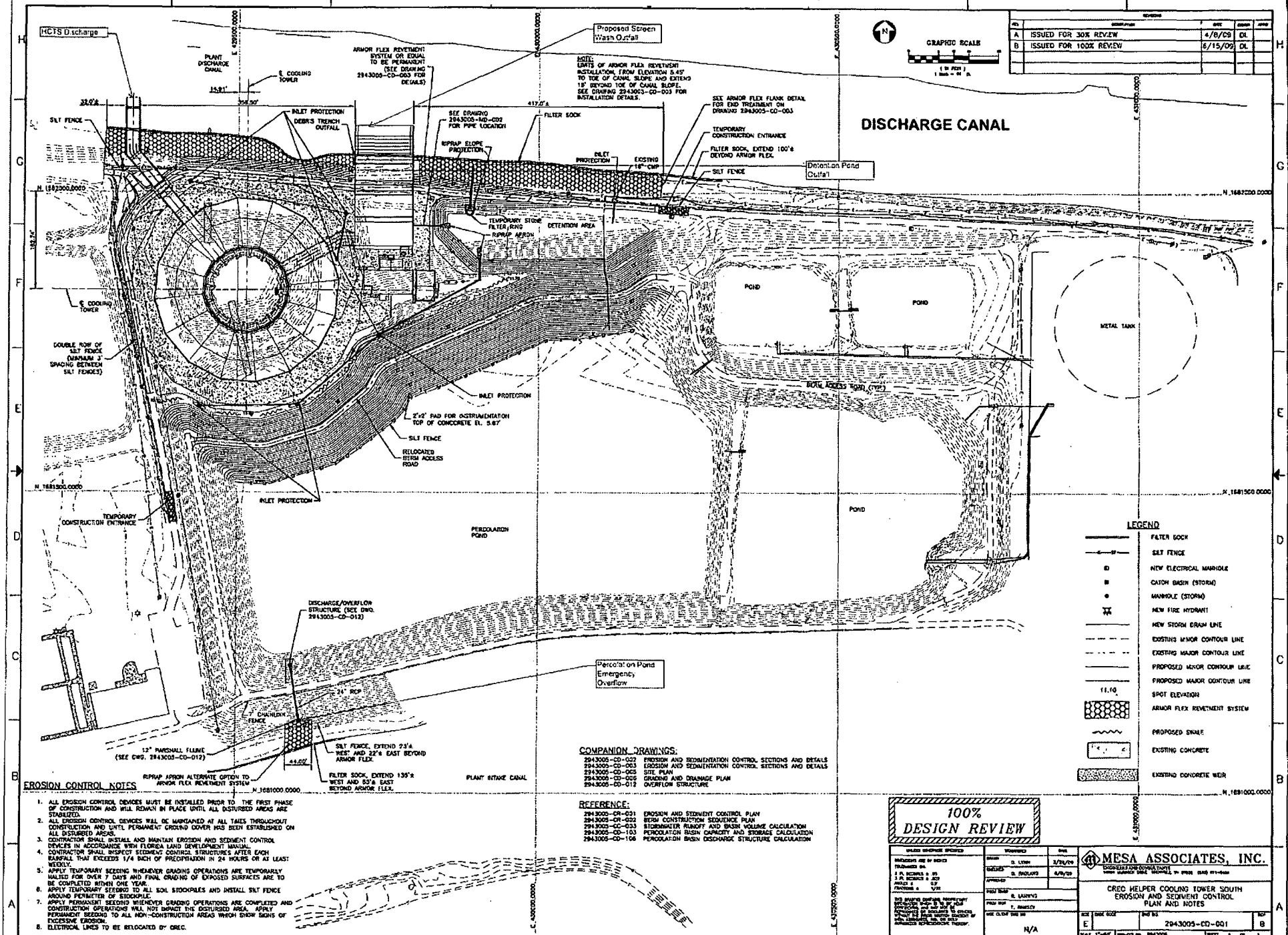
Name & Official Title (type or print)

Signature

Telephone No. (area code & no.)

Date Signed

ATTACHMENT 1A - GENERAL LAYOUT AND DISCHARGE LOCATIONS



REVISIONS				
NO.	DESCRIPTION	DATE	DRAWN	APPD
A	ISSUED FOR 30% REVIEW	4/8/09	DL	
B	ISSUED FOR 100% REVIEW	6/15/09	DL	

EROSION CONTROL NOTES

1. ALL EROSION CONTROL DEVICES MUST BE INSTALLED PRIOR TO THE FIRST PHASE OF CONSTRUCTION AND WILL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED.
2. ALL EROSION CONTROL DEVICES WILL BE MAINTAINED AT ALL TIMES THROUGHOUT CONSTRUCTION AND UNTIL PERMANENT GROUND COVER HAS BEEN ESTABLISHED ON ALL DISTURBED AREAS.
3. CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION AND SEDIMENT CONTROL DEVICES IN ACCORDANCE WITH FLORIDA LAND DEVELOPMENT MANUAL.
4. CONTRACTOR SHALL INSPECT SEDIMENT CONTROL STRUCTURES AFTER EACH RAINFALL THAT EXCEEDS 1/4 INCH OF PRECIPITATION IN 24 HOURS OR AT LEAST WEEKLY.
5. APPLY TEMPORARY SEEDING WHENEVER GRADING OPERATIONS ARE TEMPORARILY HALTED FOR OVER 7 DAYS AND FINAL GRADING OF EXPOSED SURFACES ARE TO BE COMPLETED WITHIN ONE YEAR.
6. APPLY TEMPORARY SEEDING TO ALL SOIL STOCKPILES AND INSTALL SILT FENCE AROUND PERIMETER OF STOCKPILE.
7. APPLY PERMANENT SEEDING WHENEVER GRADING OPERATIONS ARE COMPLETED AND CONSTRUCTION OPERATIONS WILL NOT IMPACT THE DISTURBED AREA. APPLY PERMANENT SEEDING TO ALL NON-CONSTRUCTION AREAS WHICH SHOW SIGNS OF EXCESSIVE EROSION.
8. ELECTRICAL LINES TO BE RELOCATED BY CREC.

COMPANION DRAWINGS:

2943005-CD-002	EROSION AND SEDIMENTATION CONTROL SECTIONS AND DETAILS
2943005-CD-003	EROSION AND SEDIMENTATION CONTROL SECTIONS AND DETAILS
2943005-CD-005	SITE PLAN
2943005-CD-006	GRADING AND DRAINAGE PLAN
2943005-CD-012	OVERFLOW STRUCTURE

REFERENCE:

2943005-CR-001	EROSION AND SEDIMENT CONTROL PLAN
2943005-CR-002	BERM CONSTRUCTION SEQUENCE PLAN
2943005-CC-033	STORMWATER RUNOFF AND BASIN VOLUME CALCULATION
2943005-CD-103	PERCOLATION BASIN CAPACITY AND STORAGE CALCULATION
2943005-CD-106	PERCOLATION BASIN DISCHARGE STRUCTURE CALCULATION

100% DESIGN REVIEW

DESIGNED	D. LYON	3/26/09
DRAWN	D. RADLAND	4/8/09
APPROVED		
PROJ MGR	R. LARKIN	
PROJ SUP	T. RAMSEY	
WBE CLOSE OUT NO.	N/A	

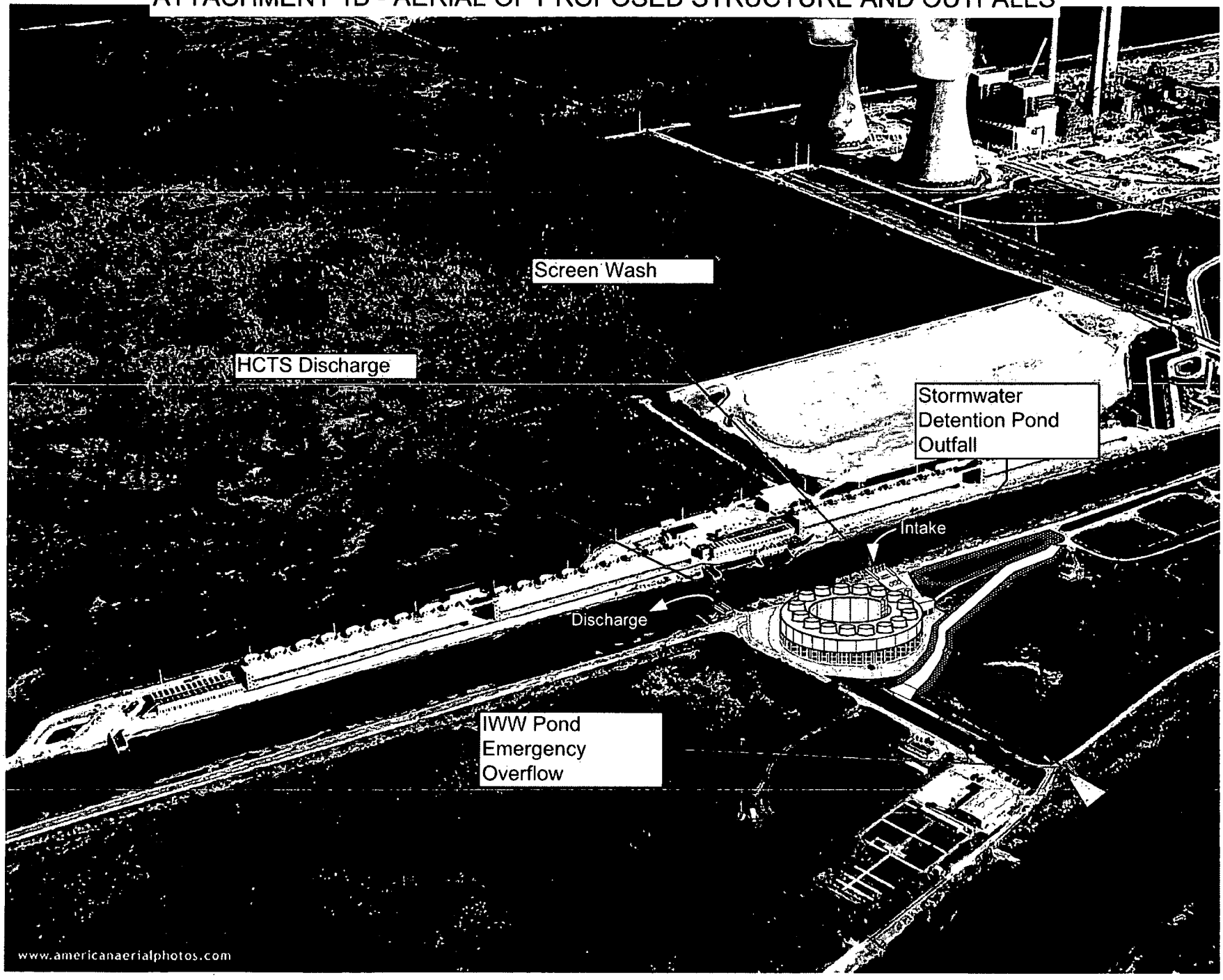
MESA ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS

CREC HELPER COOLING TOWER SOUTH
EROSION AND SEDIMENT CONTROL
PLAN AND NOTES

SIZE	DWG. CODE	DWG NO.	REV
E		2943005-CD-001	B

SCALE 1"=60' PROJECT NO. 2943005 SHEET 1 OF 1

ATTACHMENT 1B - AERIAL OF PROPOSED STRUCTURE AND OUTFALLS



ATTACHMENT 2

PROPOSED NEW DISCHARGE DESCRIPTION

HCTS

The new Helper Cooling Tower South (HCTS) will have an intake and discharge to the existing Crystal River Site discharge canal. Heated once through cooling water will be removed from the discharge canal via intake pumps. After cooling in the forced draft cooling tower, the water will then be discharged back into the discharge canal via a concrete flume structure. See the attached drawings for structural detail. No pollutants will be added to the discharge as the result of this process. The HCTS is designed for a maximum flow or 460.8 MGD.

- Method of Flow Measurement
  - Flow will be measured by pump curves and timers.

D-0C2R

There currently is a permitted discharge point for the existing permitted industrial waste water (IWW) pond system. This discharge is located after the unused clarification pond and is identified as D-0C2. The clarification pond will be removed and the HCTS will be built on the site. This will necessitate to relocation of D-0C2 to the location shown on Attachment 1 and designated as D-0C2R.

- Method of Flow Measurement
  - The discharge structure will be designed with a calibrated weir, from which an operator can manually read the flow. A control room alarm will let operations know if the pond is nearing an overflow condition.

HCTS Screen Wash

This discharge is produced when the screen wash pumps utilize water from the discharge canal to wash debris from the rotating traveling screens that will be installed to protect the HCTS intake pumps. The screen wash water is collected and conveyed back to the discharge canal.

- Method of Flow Measurement
  - Flow will be measured by pump curves and timers.

HCTS Stormwater Pond

The existing stormwater pond for the area will be enhanced and be designed as a detention pond. There will be intentional bleed off of the stormwater through a internal outfall structure and then through a pipe which discharges to the discharge canal. The pond receives non contact stormwater from impervious surfaces installed as part of HCTS construction. The design of the stormwater system will be reviewed and authorized through a Conditions of Certification – Post Certification Submittal.

- Method of Flow Measurement
  - By calculation if needed.

Attachment 2 (cont.)

Additional Information

2CS IV.D

In the unlikely event of a total power failure, there would be a cessation of discharges.

2CS VII

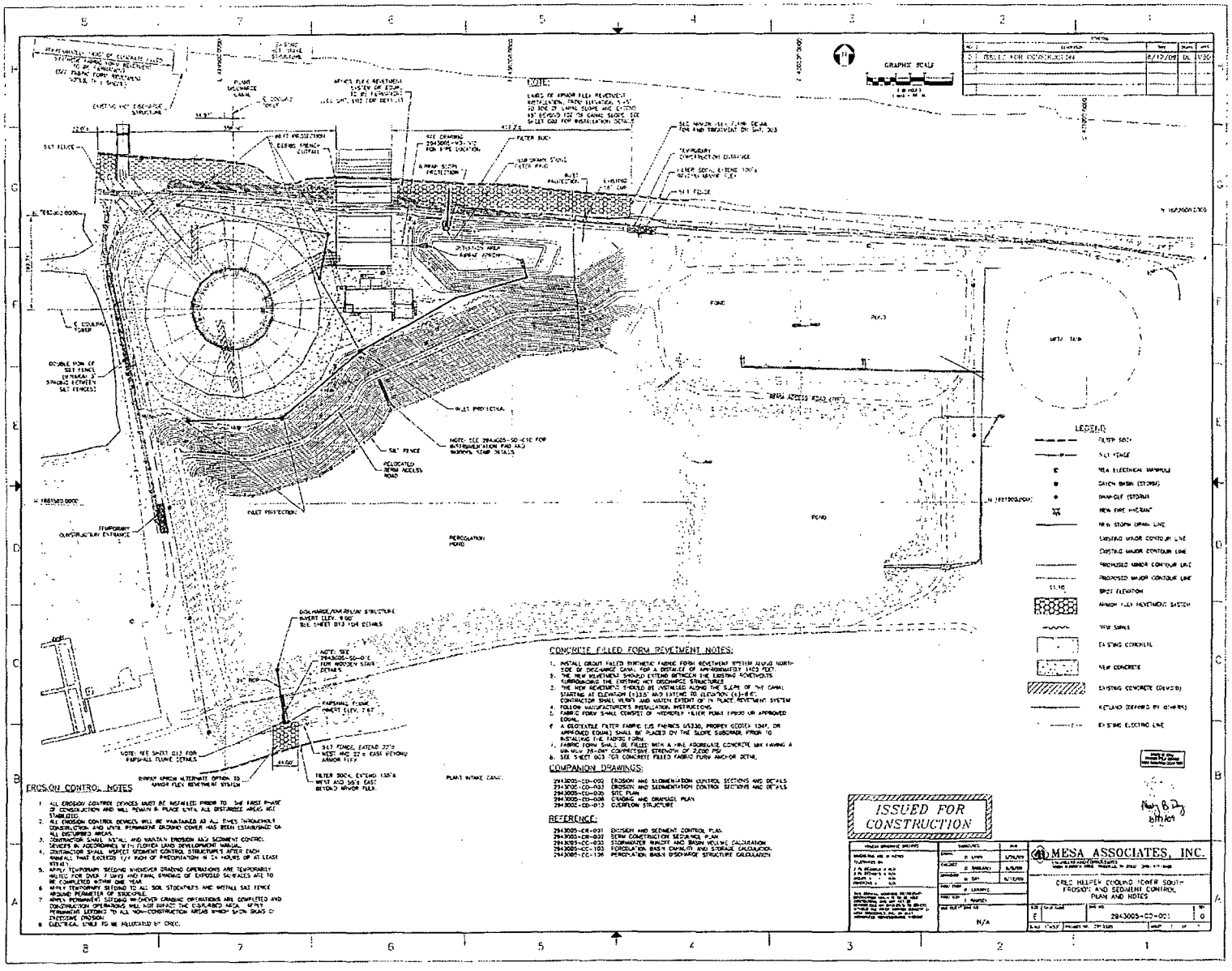
Constituent analysis for HCTS and HCTS Screen Wash discharges are estimates only. Estimates are based on previous analysis of outfall D-011. Neither the HCTS nor the HCTS Screen Wash discharges will introduce additional pollutants in to the receiving water body.

Since D-0C2R is a relocation of an existing outfall and is intended as an emergency outfall to the intake canal only, no 2CS VII form estimates are included.

DRAWINGS

&

PROCESS FLOW DIAGRAMS



CONCRETE FILLED FORM REVETMENT NOTES:

1. INSTALL GROUT FILLED SYNTHETIC FABRIC FORM REVETMENT SYSTEM ALONG NORTH SIDE OF DISCHARGE CANAL FOR A DISTANCE OF APPROXIMATELY 1400 FEET.
2. THE NEW REVETMENT SHOULD EXTEND BETWEEN THE EXISTING POWERPOLES SURROUNDING THE EXISTING HOT DISCHARGE STRUCTURES.
3. THE NEW REVETMENT SHOULD BE INSTALLED ALONG THE SLOPE OF THE CANAL STARTING AT ELEVATION (-)3.5' AND EXTEND TO ELEVATION (-)6.6'. CONTRACTOR SHALL VERIFY AND MARK EXTENT OF IN PLACE REVETMENT SYSTEM
4. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.
5. FABRIC FORM SHALL CONSIST OF HEAVY DUTY FILTER POINT WOVEN OR APPROVED EQUAL.
6. A GEOTEXTILE FILTER FABRIC (US FABRICS US230, PROPEX GEOSEE 1269, OR APPROVED EQUAL) SHALL BE PLACED ON THE SLOPE SUBGRADE PRIOR TO INSTALLING THE FABRIC FORM.
7. FABRIC FORM SHALL BE FILLED WITH A FINE AGGREGATE CONCRETE MIX HAVING A MIN MUM 28-DAY COMPRESSIVE STRENGTH OF 2,000 PSI.
8. SEE SHEET 003 FOR CONCRETE FILLED FABRIC FORM ANCHOR DETAIL.

COMPANION DRAWINGS:

2943005-CD-002 EROSION AND SEDIMENTATION CONTROL SECTIONS AND DETAILS
2943005-CD-003 EROSION AND SEDIMENTATION CONTROL SECTIONS AND DETAILS
2943005-CD-020 SITE PLAN
2943005-CD-038 GRADING AND DRAINAGE PLAN
2943002-CD-013 OVERFLOW STRUCTURE

REFERENCE:

2943005-GR-031 EROSION AND SEDIMENT CONTROL PLAN
2943005-CD-033 BERM CONSTRUCTION SECTIONS PLAN
2943005-CC-033 STORMWATER RUNOFF AND BASIN VOLUME CALCULATION
2943005-CC-103 PERCOLATION BASIN CAPACITY AND STORAGE CALCULATION
2943005-CC-136 PERCOLATION BASIN DISCHARGE STRUCTURE CALCULATION

EROSION CONTROL NOTES

1. ALL EROSION CONTROL DEVICES MUST BE INSTALLED PRIOR TO THE FIRST PHASE OF CONSTRUCTION AND WILL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED.
2. ALL EROSION CONTROL DEVICES WILL BE MAINTAINED AT ALL TIMES THROUGHOUT CONSTRUCTION AND UNTIL PERMANENT GROUND COVER HAS BEEN ESTABLISHED ON ALL DISTURBED AREAS.
3. CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION AND SEDIMENT CONTROL DEVICES IN ACCORDANCE WITH FLORIDA LAND DEVELOPMENT MANUAL.
4. CONTRACTOR SHALL INSPECT SEDIMENT CONTROL STRUCTURES AFTER EACH RAINFALL THAT EXCEEDS 1/2" PATH OF PRECIPITATION IN 24 HOURS, OR AT LEAST WEEKLY.
5. APPLY TEMPORARY SEEDING WHENEVER GRADING OPERATIONS ARE TEMPORARILY HALTED FOR OVER 7 DAYS AND FINAL GRADING OF EXPOSED SLOPES ARE TO BE COMPLETED WITHIN ONE YEAR.
6. APPLY TEMPORARY SEEDING TO ALL SOIL STOCKPILES AND INSTALL SILT FENCE AROUND PERIMETER OF STOCKPILE.
7. APPLY PERMANENT SEEDING AS SHOWN GRADING OPERATIONS ARE COMPLETED AND CONSTRUCTION OPERATIONS WILL NOT IMPACT THE DISTURBED AREA. APPLY PERMANENT SEEDING TO ALL NON-CONSTRUCTION AREAS WHICH SHOW SIGNS OF EXCESSIVE EROSION.
8. ELECTRICAL LINES TO BE RELOCATED BY OREC.

ISSUED FOR CONSTRUCTION

MESA ASSOCIATES, INC.

OREC HELIPEK CYCLONE TOWER SOUTH
EROSION AND SEDIMENT CONTROL PLAN AND NOTES

2943005-CD-001

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CIVIL GENERAL NOTES

A. GENERAL CONSIDERATIONS:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.
2. OBTAIN ALL APPLICABLE PERMITS PRIOR TO ANY CONSTRUCTION, DEMOLITION OR AND LAND DISTURBING ACTIVITIES.
3. LOCATION OF UTILITIES SHOWN ARE APPROXIMATE. SEE NOTES IN SECTION D UTILITY CONSIDERATIONS. ALL FEATURES SHOWN WERE TAKEN FROM A FIELD SURVEY. UNDERGROUND UTILITIES MAY NOT BE SHOWN. THE CONTRACTOR SHALL VERIFY ALL UNDERGROUND UTILITIES BEFORE STARTING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY INTERFERENCES OR DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.
4. LIMITS OF CONSTRUCTION AND EROSION CONTROL ARE APPROXIMATE.
5. ELEVATIONS & BENCHMARKS SHOWN ARE BASED ON THE CURRENT SURVEYING, INC. SITE SPECIFIC SURVEY.
6. ALL DISTURBED AREAS NOT RECEIVING STRUCTURES OR PAVEMENT SHALL RECEIVE TOPSOIL AND TURF.
7. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE ENGINEER-OF-RECORD.

B. DEMOLITION CONSIDERATIONS:

1. ALONG ALL EDGES WHERE ADJOINING PAVEMENT IS REMOVED, PROVIDE NEAT AND STRAIGHT FULL DEPTH SAW-CUTS OF BEFORE REMOVING PAVEMENT.
2. DISPOSAL OF DEMOLITION DEBRIS SHALL BE IN ACCORDANCE WITH STANDARD PROGRESS ENERGY PROCEDURES AND APPLICABLE FLORIDA STATE LAWS.
3. ALL DEMOLITION WORK SHALL BE PERFORMED IN ACCORDANCE WITH CONTRACTOR PROJECT DEMOLITION PROCEDURES. DEMOLITION PROCEDURES TO BE APPROVED BY OWNER.
4. ITEMS AND FEATURES NOT NOTED TO BE DEMOLISHED MUST BE PRESERVED IN WORKING ORDER DURING ALL PHASES OF CONSTRUCTION.
5. REFER TO ELECTRICAL AND MECHANICAL DRAWINGS FOR DEMOLITION OF EXISTING ELECTRICAL AND COMMUNICATION LINES, MECHANICAL FEATURES, AND ARCHITECTURAL FEATURES.

C. GRADING AND DRAINAGE CONSIDERATIONS

1. THE CONTRACTOR SHALL OBTAIN AN EXCAVATING/DIGGING PERMIT PRIOR TO INITIATING ANY EXCAVATION OR DEMOLITION.
2. CONTOURS AND ELEVATIONS SHOWN ON THESE DRAWINGS REPRESENT FINISHED GRADES. THE CONTRACTOR SHALL ALLOW FOR PAVEMENT THICKNESS, TOPSOIL THICKNESS, SLABS, ETC. WHEN GRADING TO SUBGRADE.
3. CONTRACTOR SHALL MATCH ALL NEW PAVEMENT FLUSH WITH EXISTING.
4. CONTRACTOR SHALL GRADE ALL DISTURBED AREAS TO ENSURE POSITIVE DRAINAGE TO DRAINAGE STRUCTURES AND DITCHES. NATURAL FLOW OF SURROUNDING WATERS SHALL NOT BE DISTURBED DURING CONSTRUCTION.
5. CONTRACTOR SHALL SEED ALL DISTURBED AREAS WHICH ARE NOT PAVED OR PERMANENTLY STABILIZED. SODDING WILL BE PERFORMED WHEN REQUIRED.
6. COMPACTED FILL RECOMMENDATIONS ARE AS FOLLOWS
   - A. PRIOR TO PLACING FILL THE SITE SHOULD BE CLEARED OF SURFACE VEGETATION, TOP SOIL, AND OTHER DELETERIOUS MATERIAL, INCLUDING ROOTS, ORGANICS, PAVEMENT AND STRUCTURE REMNANTS. CLEARING SHOULD EXTEND A MINIMUM OF 10 FEET BEYOND THE BUILDING FOOTPRINTS AND NEW BERM AND TO A DEPTH NEEDED TO REMOVE DELETERIOUS MATERIAL.
   - B. AFTER CLEARING, THE EXPOSED SUBGRADE SHOULD BE PROOF ROLLED TO DETERMINE IF ALL UNSUITABLE MATERIALS HAVE BEEN REMOVED. A GEOTECHNICAL PROFESSIONAL SHALL OBSERVE PROOF ROLLING ACTIVITIES. THE PROOF ROLLING SHOULD CONSIST OF COMPACTION USING A LARGE DIAMETER, HEAVY VIBRATORY DRUM ROLLER. THE VIBRATORY DRUM ROLLER SHALL HAVE A STATIC DRUM WEIGHT OF 8-10 TONS AND BE CAPABLE OF EXERTING A MINIMUM IMPACT FORCE OF 36,000 POUNDS. THE PROOF ROLLING EQUIPMENT SHOULD PERFORM A MINIMUM OF 8 PASSES WITH THE SUCCESSIVE PASSES ALIGNED PERPENDICULAR.
   - C. THE NATURAL GROUND, TO A MINIMUM OF 1 FOOT BELOW STRIPPED GRADE, SHOULD BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MODIFIED PROCTOR MAXIMUM DENSITY.
   - D. FILL SOILS SHOULD CONSIST OF FINE SANDS WITH LESS THAN 12% PASSING THE NO. 200 SIEVE, FREE OF RUBBLE, ORGANICS, CLAY, DEBRIS, AND OTHER UNSUITABLE MATERIAL. THE MATERIAL SHALL ALSO HAVE A MAXIMUM DRY DENSITY OF NO LESS THAN 95 POUNDS PER CUBIC FOOT (PCF).
   - E. BEFORE FILLING OPERATIONS ARE SCHEDULED TO BEGIN, THE PROPOSED FILL SHOULD BE TESTED TO DETERMINE IF THE PROPOSED SOIL IS ACCEPTABLE AND FOR QUALITY CONTROL DURING FILL PLACEMENT. TESTING SHOULD INCLUDE MAXIMUM DRY DENSITY, OPTIMUM MOISTURE CONTENT, NATURAL MOISTURE CONTENT, AND PLASTICITY.
   - F. FILL SOILS SHOULD BE PLACED IN LOOSE LIFTS NOT EXCEEDING 12 INCHES IN THICKNESS AND SHOULD BE COMPACTED TO A MINIMUM DENSITY OF 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY.
   - G. A GEOTECHNICAL ENGINEERING TECHNICIAN SHOULD OBSERVE FILL PLACEMENT AND VERIFY SPECIFIED COMPACTION LEVELS ARE ACHIEVED THROUGH FIELD DENSITY TESTING.
7. IN THE EVENT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THE PROJECT TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES, AND SLOPES SHOWN.
9. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION. ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
10. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION IN THE AREAS INDICATED:

	HORIZONTAL	VERTICAL	COMPACTION
A. PAVEMENT AREA SUBGRADE	0.1'±	+0.0' TO -0.1'	SEE NOTE 6f
B. ENGINEERED FILL	0.5'±	+0.1' TO -0.1'	SEE NOTE 6f

COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

11. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
12. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
13. THE CONTRACTOR SHALL MAINTAIN CREC ACCESS ROADS WITHIN THE PROJECT AREA IN A CLEAN, SAFE AND USEABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT.
14. THE EXCAVATION SHALL CONSIST OF THE REMOVAL OF ALL MATERIALS NECESSARY FOR THE CONSTRUCTION OF STORM DRAINS, CULVERT PIPES, OTHER PIPE LINES AND ALL DRAINAGE STRUCTURES, SUCH AS MANHOLES, CATCH BASINS, JUNCTION BOXES, HEAD WALLS, WING WALLS AND CONCRETE COLLARS.
15. EXCAVATION SHALL BE MADE IN OPEN CUTS UNLESS SHOWN OTHERWISE ON THE PLANS. EXCAVATION SHALL BE MADE TO THE LINES AND GRADES SHOWN ON THE PLANS OR ESTABLISHED BY THE ENGINEER-OF-RECORD. THE WIDTH OF TRENCHES SHALL BE SUFFICIENT TO PERMIT SATISFACTORY JOINTING OF THE PIPE AND PERMIT THOROUGH TAMPING AROUND THE PIPE, BUT SHALL NOT EXCEED THE WIDTH SPECIFIED FOR THE CLASS OF BEDDING SPECIFIED. THE BOTTOM OF THE TRENCHES SHALL BE CAREFULLY CUT TO THE REQUIRED GRADE OF THE PIPE EXCEPT WHERE BEDDING MATERIAL OR CRADLES ARE SHOWN, IN WHICH CASE THE EXCAVATION SHALL EXTEND TO THE BOTTOM OF THE BEDDING OR CRADLES AS SHOWN ON THE PLANS. EXCAVATIONS AROUND MANHOLES, CATCH BASINS, JUNCTION BOXES, AND END WALLS SHALL BE SUCH AS TO ALLOW PROPER COMPACTION AROUND THE STRUCTURE.
16. ANY UNSATISFACTORY MATERIAL SHALL BE EXCAVATED BELOW THE GRADES SHOWN ON THE PLANS AS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE, AND BACKFILLED WITH BEDDING MATERIAL OR OTHER APPROVED MATERIAL AND COMPACTED.
17. ANY EXCAVATION BELOW THE ELEVATIONS SHOWN ON THE PLANS OTHER THAN FOR UNSUITABLE MATERIAL AS DESIGNATED BY THE ENGINEER-OF-RECORD AND BACKFILLED WITH BEDDING SHALL BE FILLED AT THE CONTRACTOR'S EXPENSE WITH PROPERLY COMPACTED BEDDING MATERIAL OR LEAN CONCRETE.
18. IN ALL CASES WHERE MATERIALS ARE DEPOSITED ALONG OPEN TRENCHES THEY SHALL BE PLACED SO THAT NO DAMAGE WILL RESULT TO THE WORK AND/OR ADJACENT PROPERTY IN CASE OF RAIN OR OTHER SURFACE WASH.

D. UTILITY CONSIDERATIONS:

1. COORDINATE UTILITY INTERRUPTIONS IN ACCORDANCE WITH CREC FACILITIES STAFF. INTERRUPTIONS OF UTILITIES SERVING FACILITIES SURROUNDING THE SITE SHALL BE HELD TO A MINIMUM.
2. THE CONTRACTOR SHALL PROVIDE ALL TEES, PLUGS, AIR VENTS OR SADDLES REQUIRED FOR PRESSURE TESTING OF ANY NEW WATERLINE PIPING AND ASSOCIATED THRUST RESTRAINTS.
3. THE CONTRACTOR SHALL USE SHORING, SHELTING AND LAYBACK, FOR ALL UTILITY CONSTRUCTION, TO ASSURE NOT TO UNDERMINE ANY EXISTING PAVEMENT, UTILITIES AND STRUCTURES THAT ARE NOT CALLED OUT TO BE DEMOLISHED.
4. ALL TRENCHES SHALL BE EXCAVATED AND MAINTAINED TO MEET OSHA 29 CFR PART 1926 SUBPART P-EXCAVATIONS CRITERIA FOR SLOPES OR SHORING AND AS DETAILED AND NOTED HEREWITH.
5. THESE DRAWINGS DENOTE EXISTING UTILITIES, ROUTING, AND LOCATIONS AS MAPPED DURING AN UNDERGROUND SURVEY PERFORMED BY GLOWEN, APRIL 2009. THIS INFORMATION SHALL ONLY BE CONSIDERED AS APPROXIMATE, AND ANY ENTITY PERFORMING PHYSICAL WORK IN THIS PLANT AREA IS RESPONSIBLE FOR DETERMINING IN-SITU LOCATIONS OF UNDERGROUND UTILITIES.
6. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF THE LOCATION AND ELEVATION OF EXISTING UTILITIES. ALL EXCAVATION AND ASSOCIATED UNDERGROUND CONSTRUCTION WORK MUST BE AUTHORIZED IN WRITING BY CREC PLANT FACILITIES STAFF PRIOR TO THE COMMENCEMENT OF ANY PHYSICAL WORK BY THE CONTRACTOR.
7. ALL EXISTING WATER LINES, UNDERGROUND CONDUITS, TELEPHONE LINES, ELECTRIC LINES, OR OTHER UTILITIES OR STRUCTURES IN THE VICINITY SHALL BE CAREFULLY PROTECTED BY THE CONTRACTOR FROM DAMAGE AT ALL TIMES.
8. CONTRACTOR SHALL COMPLY WITH LOCAL UTILITY REGULATIONS AND STANDARDS PERTAINING TO THE INSTALLATION OF UNDERGROUND UTILITIES.
9. EXISTING ELECTRIC POWER LINES ARE TO BE REROUTED BY CREC PERSONNEL.

PAINT:

1. ALL AREA DRAIN GRATES AND MANHOLE COVERS LOCATED IN PAVED AREAS SHALL BE PAINTED WITH YELLOW TRAFFIC MARKING PAINT CONFORMING TO MPI NO. 97.
2. SEE SHEET 2943005-SD-001 FOR ALL OTHER PAINT SPECIFICATIONS.

COMPANION DRAWING LIST:

2943005-CD-001	EROSION AND SEDIMENT CONTROL PLAN AND NOTES
2943005-CD-002	EROSION AND SEDIMENT CONTROL SECTIONS AND DETAILS
2943005-CD-003	EROSION AND SEDIMENT CONTROL SECTIONS AND DETAILS
2943005-CD-005	SITE PLAN
2943005-CD-006	GRADING AND DRAINAGE PLAN
2943005-CD-007	ROAD PROFILE
2943005-CD-008	STORM SEWER PROFILES
2943005-CD-009	SITE EXCAVATION SECTIONS AND DETAILS
2943005-CD-010	DETENTION AREA SECTIONS AND DETAILS
2943005-CD-011	DETENTION STRUCTURE SECTIONS AND DETAILS
2943005-CD-012	STORM SEWER DETAILS
2943005-CD-013	PERCOLATION POND OVERFLOW STRUCTURE

REFERENCE CALCULATIONS

2943005-CC-003	STORMWATER RUNOFF AND BASIN VOLUME CALCULATION
2943005-CC-103	PERCOLATION BASIN CAPACITY AND STORAGE CALCULATION
2943005-CC-104	PERCOLATION POND DISCHARGE STRUCTURE CALCULATION
2943005-CC-012	MOUNDING CALCULATION

REFERENCE DOCUMENTS

2943005-CN-001	EROSION AND SEDIMENT CONTROL PLAN
2943005-CN-002	BERM CONSTRUCTION SEQUENCE PLAN

CONCRETE:

1. ALL CONCRETE WORK, INCLUDING MATERIALS, CONSTRUCTION PROCESSES, WORKMANSHIP, TESTING, QA/QC AND REPAIRS SHALL MEET THE REQUIREMENTS OF ACI 301-99 (SPECIFICATIONS FOR STRUCTURAL CONCRETE), EXCEPT AS MODIFIED BY THE PROJECT SPECIFICATIONS AND/OR DRAWINGS. A COPY OF ACI 301-99 SHALL BE MAINTAINED IN THE CONTRACTOR'S FIELD OFFICE, ALONG WITH THE PROJECT SPECIFICATIONS, FOR READY REFERENCE.
2. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5000 PSI WITH A 4" SLUMP (+/- 1" TOLERANCE) FOR STRUCTURAL CONCRETE AND 3000 PSI FOR ROADWAY CURB CONCRETE. MAXIMUM WATER/CEMENT RATIO SHALL BE .40 FOR STRUCTURAL CONCRETE AND .50 FOR ROADWAY CURB CONCRETE.
3. PORTLAND CEMENT IN CONCRETE MIX SHALL CONFORM TO ASTM C-150, TYPE II.
4. TO ENHANCE DURABILITY AND MINIMIZE CRACKING, ALL CONCRETE SHALL INCLUDE GROUND GRANULATED BLAST FURNACE SLAG (GGBS) AND/OR FLY ASH (CLASS F) TO A MINIMUM OF 20 PERCENT OF TOTAL CEMENTITIOUS MATERIAL.
5. COARSE AGGREGATE GRADATION SHALL BE IN ACCORDANCE WITH FDOT SECTION 348-2.4. THE LARGEST SIZE MATERIAL (SIZE NO.-67) IS PREFERRED AND CONSIDERATION FOR ENHANCING THE GRADATION BY BLENDING WITH A SMALLER SIZE IS SUGGESTED.
6. A HIGH RANGE WATER-REDUCING ADMIXTURE (HRWRA), ASTM C494 TYPE F (POLYCARBOXYLATE-BASED) SHALL BE USED IN ALL CONCRETE.
7. ENTRAINED AIR SHALL BE 1.0 TO 6.0 PERCENT CONSISTENT WITH FDOT 346-3.1.
8. MAXIMUM CHLORIDE CONTENT SHALL BE 0.40 LB/YD³.
9. IN INSTANCES WHERE PRACTICABLE MEASURES FAIL TO HOLD THE TEMPERATURE OF THE CONCRETE TO 85°F OR UNDER AT TIME OF PLACEMENT, THE WORK SHALL PROCEED IN STRICT ACCORDANCE WITH ACI 305, HOT WEATHER CONCRETING, WHERE CONCRETE TEMPERATURES ARE 86° TO 100°F. CONCRETE WITH PLACEMENT TEMPERATURE EXCEEDING 100°F SHALL BE UNACCEPTABLE.
10. PROPOSED MIX DESIGNS SHALL BE DEVELOPED AND SUBMITTED ALONG WITH SUPPORTING TEST DATA FOR WRITTEN APPROVAL BY THE ENGINEER-OF-RECORD PRIOR TO BEGINNING CONCRETE WORK. INCLUDED SHALL BE DATA ON SLUMPS BOTH BEFORE AND AFTER ADDITION OF THE HRWRA.
11. CONCRETE MIXING OPERATIONS SHALL CONFORM TO ASTM C-94. ALL CONCRETE SHALL BE VIBRATED.
12. TESTING OF CONCRETE SHALL BE PER ACI 301 SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS, MINIMUM THREE STRENGTH TEST FOR EACH 100 CUBIC YARDS EACH DAY OR FROM EACH DAY'S POUR IF LESS THAN 100 CUBIC YARDS, FOR EACH MIX DESIGN. AT LEAST ONE AIR TEST SHALL BE MADE FOR EACH 100 CUBIC YARDS OF CONCRETE, PROVIDED FURTHER THAT NO LESS THAN 2 AIR TEST SHALL BE MADE FOR EACH DAY'S POUR IF LESS THAN 100 CUBIC YARDS. FOR EACH MIX DESIGN, SAMPLING, PREPARATION, STORING, SHIPPING, AND TESTING OF THE CYLINDERS SHALL BE THE RESPONSIBILITY OF AN INDEPENDENT TESTING LABORATORY.
13. ALL REINFORCING BARS, INSERTS, SLEEVES, CONDUITS, WATERSTOPS, ANCHORS, AND OTHER EMBEDDED ITEMS OR RECESSES SHALL BE SECURED IN POSITION PRIOR TO PLACING CONCRETE. LOCATIONS AND SIZES FOR EMBEDDED ITEMS AND RECESSES REQUIRED FOR OTHER DISCIPLINES, BUT SHOWN ON STRUCTURAL DRAWINGS, SHALL BE REGARDED AS APPROXIMATE AND FOR INFORMATION ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING MECHANICAL, PIPING, PLUMBING, HVAC, ELECTRICAL, AND I&C DRAWINGS ALONG WITH PERTINENT VENDOR DRAWINGS FOR REQUIREMENTS ON EMBEDDED ITEMS AND RECESSES, AND OBTAIN A POUR RELEASE FROM THE OWNER'S SITE ENGINEER BEFORE PLACING CONCRETE.
14. GROUT USED SHALL BE CEMENT BASED, NON-SHRINK, NON-METALLIC GROUT. THE GROUT SHALL EXHIBIT NO SHRINKAGE IN ACCORDANCE WITH ASTM C827, "TEST METHOD FOR EARLY VOLUME CHANGE OF CEMENTITIOUS MIXTURES", AND SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5000 PSI (UNLESS NOTED OTHERWISE) WHEN TESTED IN ACCORDANCE WITH ASTM C109, "TEST METHOD FOR COMPRESSIVE STRENGTH OF HYDRAULIC CEMENT MORTARS".

CONCRETE REINFORCING STEEL:

1. REINFORCING BARS SHALL CONFORM TO MATERIAL REQUIREMENTS OF ASTM A615, GRADE 60, UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO MATERIAL REQUIREMENTS OF ASTM A185, UNLESS NOTED OTHERWISE.
2. DETAILING OF CONCRETE REINFORCEMENT SHALL BE IN ACCORDANCE WITH THE ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES, AND ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.
3. REINFORCING BARS SHALL BE FREE OF RUST, GREASE, OR OTHER MATERIALS THAT COULD LIKELY IMPAIR THEIR BONDING ABILITY TO CONCRETE. ALL REINFORCING BAR BENDS SHALL BE MADE COLD. REINFORCING BARS SHALL NOT BE HEATED OR WELDED.
4. PROVIDE THE FOLLOWING MINIMUM CONCRETE COVER FOR REINFORCEMENT BASED ON THE USE OF #67 STONE AGGREGATE SIZE IN THE CONCRETE MIX DESIGN, UNLESS NOTED OTHERWISE ON SPECIFIC DRAWING DETAILS.

CONC. SUBMERGED OR EXPOSED TO MARINE ATMOSPHERE:	2.5"
CONC. IN SPLASH ZONE OR EXPOSED TO SEAWATER SPRAY:	3.0"
CONC. CAST AGAINST EARTH:	3.0"

STIRRUPS MAY HAVE 0.5" LESS COVER THAN THE MINIMUM FOR REINFORCEMENT.

5. DEVELOPMENT LENGTH AND SPLICES OF REINFORCING BARS SHALL CONFORM TO REQUIREMENTS OF ACI 318, CLASS B TENSION LAPS.
6. WELDED WIRE FABRIC SHALL LAP A MINIMUM OF 9" AND BE SECURELY WIRED AT EACH SIDE AND END.
7. WHERE REINFORCING IS SHOWN CONTINUOUS THROUGH CONSTRUCTION JOINTS, MECHANICAL BAR SPLICE DEVICES MAY BE USED. SIZES AND TYPES SHALL BE SELECTED TO DEVELOP THE FULL TENSION STRENGTH OF THE BAR, AND SUBMITTED TO THE ENGINEER-OF-RECORD FOR APPROVAL PRIOR TO FABRICATION.
8. REINFORCING STEEL SHALL BE STORED ABOVE GROUND ON PLATFORMS, SKIDS, OR RACKS, AND PROTECTED FROM PROLONGED EXPOSURE TO WEATHER.
9. POSITION OF REINFORCING STEEL HAS PRIORITY OVER CONDUIT, DUCT WORK, OR PIPING. LARGE OPENINGS REQUIRED FOR CERTAIN SERVICES SHALL BE SPECIALLY DESIGNED.
10. PLACING TOLERANCES FOR THE REINFORCING STEEL SHALL NOT BE MORE THAN 1/2 OF AN INCH FOR STRUCTURAL SLABS AND 1/2 OF AN INCH FOR OTHER MEMBERS SUCH AS BEAMS, WALLS, ETC. WELDED WIRE MESH SHALL BE PLACED AT 3/5 OF THE SLAB THICKNESS FROM THE BOTTOM OF THE SLAB UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS.

REV	REVISION	DATE	BY
0	ISSUED FOR CONSTRUCTION	8/12/09	[illegible]

LEGEND

- FILTER SOCK
- SILT FENCE
- CB ● CATCH BASIN (STORM)
- MANHOLE (STORM)
- NEW FIRE HYDRANT
- NEW ELECTRICAL MANHOLE
- NEW STORM DRAIN LINE
- EXISTING MINOR CONTOUR LINE
- EXISTING MAJOR CONTOUR LINE
- PROPOSED MINOR CONTOUR LINE
- PROPOSED MAJOR CONTOUR LINE
- EXISTING ELECTRIC LINE
- EXISTING POWER POLE
- PROPOSED POWER POLE
- 11.10 SPOT ELEVATION
- PROPOSED SWALE
- PROPOSED COORDINATE POINT NUMBER
- EXISTING CONCRETE
- PROPOSED CONCRETE
- EXISTING CONCRETE (REMOVE)
- WETLAND

ABBREVIATIONS:

AASHTO	= THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
A.D.	= ALGEBRAIC DIFFERENCE IN GRADES
APPROX.	= APPROXIMATELY
ASTM	= AMERICAN SOCIETY OF TESTING AND MATERIALS
BLDG	= BUILDING
CMP	= CORRUGATED METAL PIPE
CONC.	= CONCRETE
CY	= CUBIC YARD
Δ	= DELTA
DIA	= DIAMETER
DWG	= DRAWING
E	= EAST
ELEV	= ELEVATION
EP	= ELECTRIC POWER UTILITY LINES
EXIST.	= EXISTING
FDN	= FOUNDATION
F.F.E	= FINISHED FLOOR ELEVATION
FRP	= FIBERGLASS REINFORCED PLASTIC
FT.	= FEET
FW	= FIRE WATER
GA	= GAUGE
GAS	= NATURAL GAS UTILITY LINES
HDPE	= HIGH DENSITY POLYETHYLENE PIPE MATERIAL
H.P.	= HIGH POINT
INV	= INVERT ELEVATION
IN.	= INCHES
K	= VERTICAL CURVE CONSTANT BASED ON DESIGN SPEED
L.P.	= LOW POINT
MAX	= MAXIMUM
MIN	= MINIMUM
MISC.	= MISCELLANEOUS
N	= NORTH
N.T.S	= NOT TO SCALE
OSHA	= OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PC	= POINT OF CURVATURE
PI	= POINT OF INTERSECTION
PT	= POINT OF TANGENCY
P.V.C.	= POLYVINYL CHLORIDE PIPE MATERIAL
PVC	= POINT OF VERTICAL CURVATURE
PVI	= POINT OF VERTICAL INTERSECTION
PVT	= POINT OF VERTICAL TANGENCY
RCP	= REINFORCED CONCRETE PIPE
SIM.	= SIMILAR
SS	= SANITARY SEWER
SQ. FT.	= SQUARE FEET
STA	= STATION
STD	= STANDARD
TYP.	= TYPICAL
UG	= UNDERGROUND
UNO	= UNLESS NOTED OTHERWISE
VC	= VERTICAL CURVE
WAT	= WATER SUPPLY UTILITY LINES
W/	= WITH
WS	= WATERSTOP
YD	= YARD

ISSUED FOR CONSTRUCTION

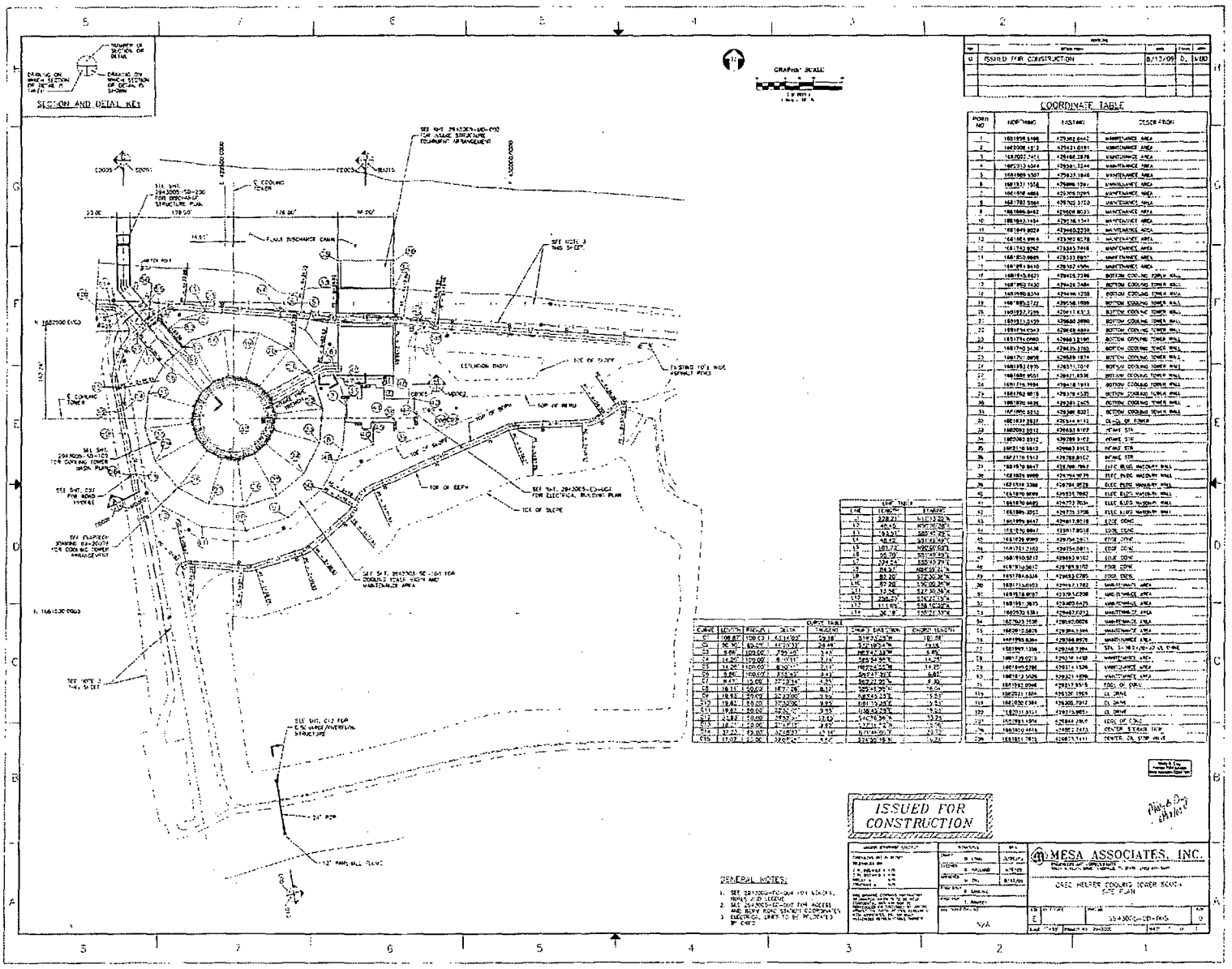
	SIGNATURES	DATE
DRAWN	J. WATSON	3/24/09
CHECKED	G. RAGLAND	8/6/09
APPROVED	W. [illegible]	8/12/09
PROJ. ENGR.	R. [illegible]	
PROJ. MGR.	[illegible]	

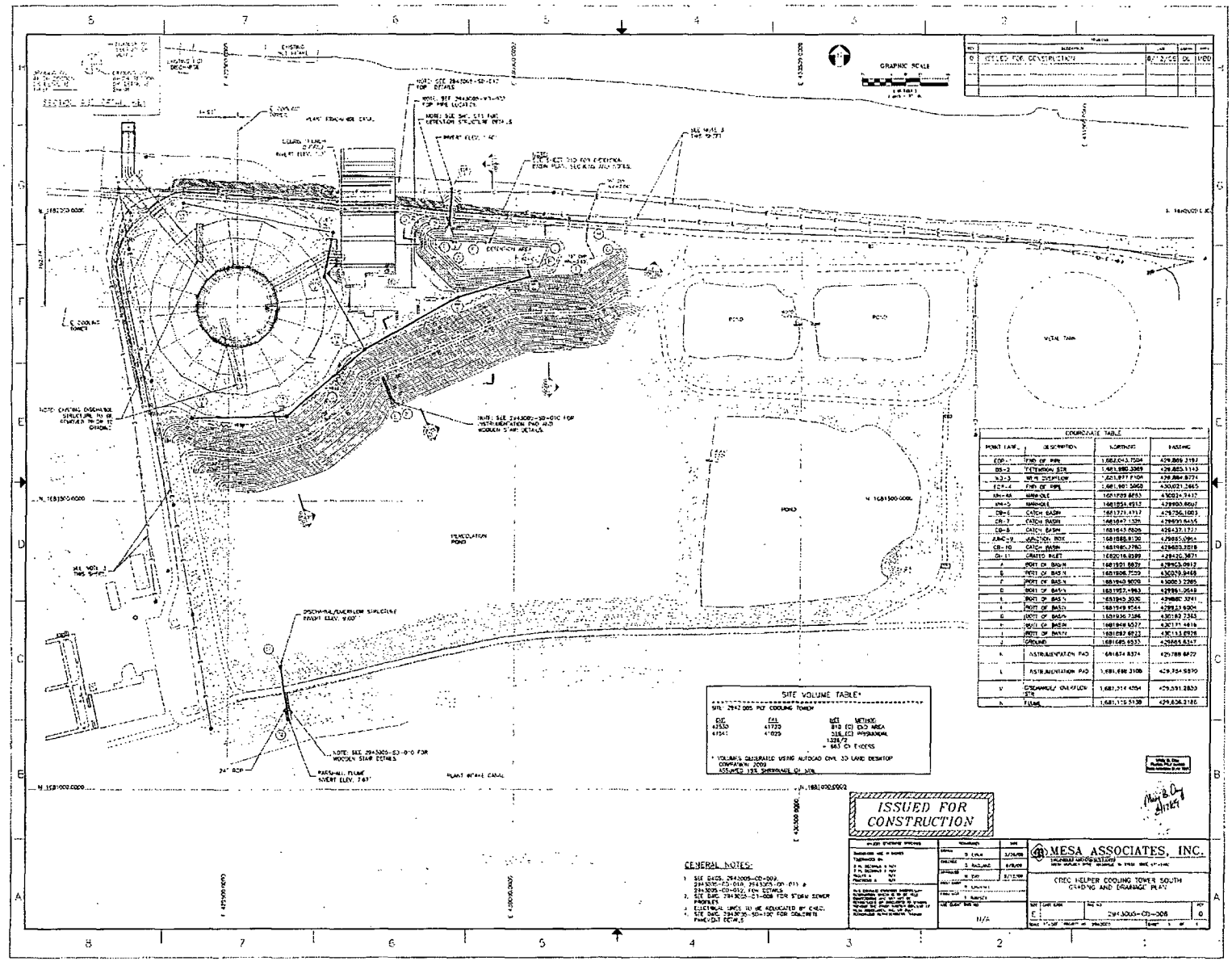
N/A

MESA ASSOCIATES, INC.

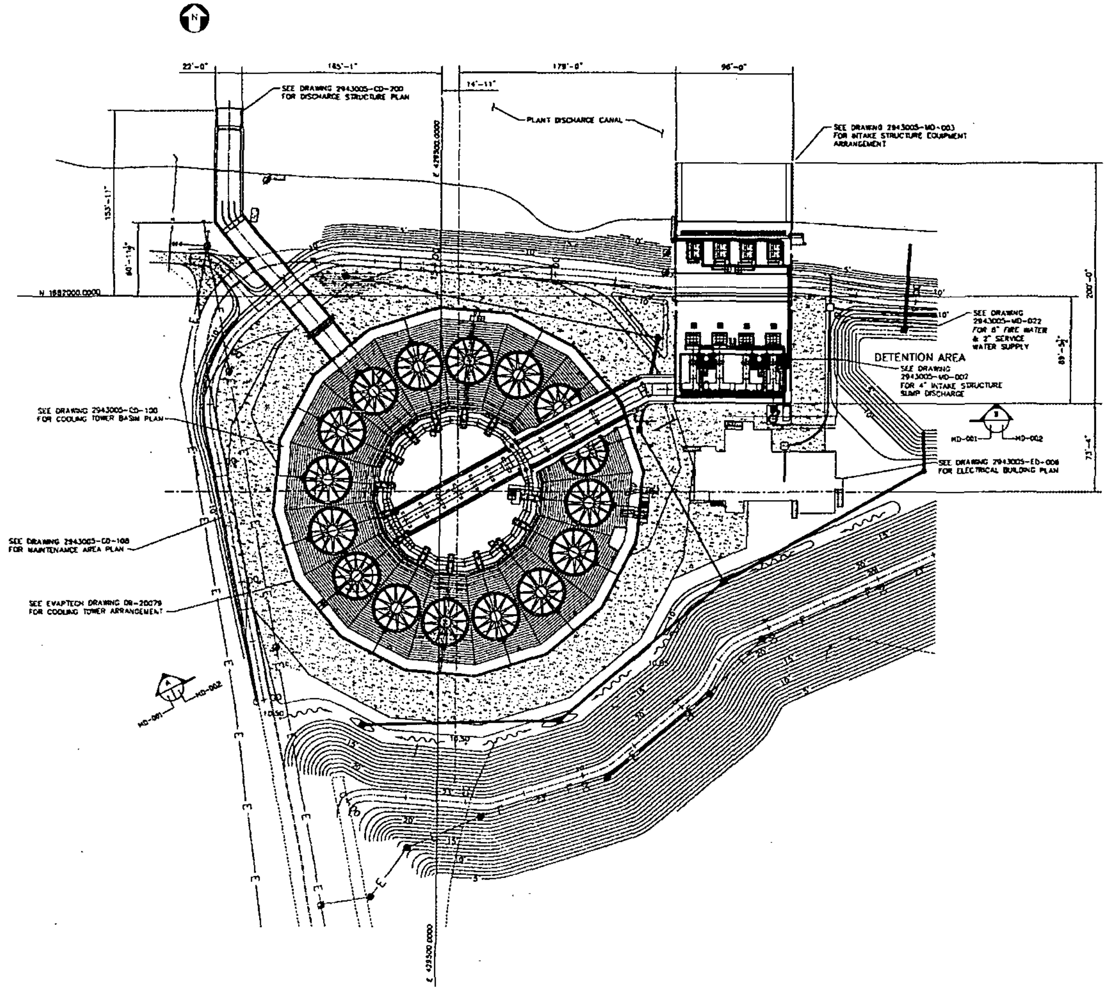
CREC HELPER COOLING TOWER SOUTH
CIVIL SITE GENERAL NOTES

SIZE	DWG NO.	REV
E	2643005-CD-004	0


SECTION AND DETAIL KEY
GRAPHIC SCALE
ISSUED FOR CONSTRUCTION
MESA ASSOCIATES, INC.
GENERAL NOTES:


GRAPHIC SCALE
ISSUED FOR CONSTRUCTION
MESA ASSOCIATES, INC.
CREC HELPER COOLING TOWER SOUTH
GRADING AND DRAINAGE PLAN
294-3005-CD-006
SITE VOLUME TABLE*
COORDINATE TABLE
GENERAL NOTES:
DISCHARGE/OVERFLOW STRUCTURE
EVAPORATION POND
PLANT INTAKE CANAL
MARSHALL FLUME
POND
VITAL TANK

REV	DESCRIPTION	DATE	DRAWN	APPR
A	ISSUED FOR INFORMATION	6/12/09	JMF	
B	ISSUED FOR 60% REVIEW	6/24/09	JMF	
C	ISSUED FOR PERMIT	8/6/09	JCB	



OVERALL SITE PLAN

COMPANION DRAWING LIST

2943005-MD-002 OVERALL SITE PLAN SECTIONS
2943005-MD-003 INTAKE STRUCTURE EQUIPMENT ARRANGEMENT PLAN VIEW AT ELEVATION 11'-6"
2943005-MD-004 INTAKE STRUCTURE EQUIPMENT ARRANGEMENT PLAN VIEW AT ELEVATION 9'-6"
2943005-MD-005 INTAKE STRUCTURE EQUIPMENT ARRANGEMENT SECTIONS
2943005-MD-006 COOLING TOWER DISTRIBUTION HEADER, DETAIL AND SECTIONS
2943005-MD-007 INTAKE STRUCTURE PIPING ARRANGEMENT PLAN VIEW AT ELEVATION 11'-6"
2943005-MD-008 INTAKE STRUCTURE PARTIAL PLAN 1
2943005-MD-009 INTAKE STRUCTURE PARTIAL PLAN 2
2943005-MD-010 INTAKE STRUCTURE PARTIAL PLAN 3
2943005-MD-011 INTAKE STRUCTURE PARTIAL PLAN 4
2943005-MD-012 INTAKE STRUCTURE PIPING SECTION
2943005-MD-013 INTAKE STRUCTURE PIPING SECTION
2943005-MD-014 INTAKE STRUCTURE PIPING SECTION
2943005-MD-015 INTAKE STRUCTURE PIPING SECTION
2943005-MD-016 TANK DATA SHEET
2943005-MD-017 INTAKE PUMP DISCHARGE SPOOL DATA SHEET
2943005-MD-018 INTAKE STRUCTURE PIPING SUPPORTS
2943005-MD-019 INTAKE STRUCTURE PIPING SUPPORTS
2943005-MD-022 INTAKE STRUCTURE UNDERGROUND UTILITIES SITE PLAN
2943005-MD-023 INTAKE STRUCTURE UNDERGROUND UTILITIES SECTION DETAILS
2943005-MD-024 HVAC SYSTEM GENERAL LAYOUT
2943005-MD-025 HVAC SYSTEM DETAILS, NOTES AND BOM
2943005-MD-026 HVAC SYSTEM NOTES AND BOM

MECHANICAL SPECIFICATIONS

2943005-MS-001 INTAKE PUMP SPECIFICATION
2943005-MS-002 TRAVELING SCREEN SPECIFICATION
2943005-MS-003 FRP PIPING SPECIFICATION
2943005-MS-005 VALVE SPECIFICATION (LARGE BORE)
2943005-MS-006 HORIZONTAL CENTRIFUGAL PUMP SPECIFICATION
2943005-MS-007 VACUUM PRIMING SPECIFICATION
2943005-MS-008 PROJECT PIPE SPECIFICATION

MECHANICAL CALCULATIONS

2943005-MC-001 DISCHARGE CANAL STUDY/CALCULATION
2943005-MC-002 INTAKE STRUCTURE CALCULATION
2943005-MC-003 INTAKE LIFT PUMP CALCULATION - PRELIMINARY
2943005-MC-004 INTAKE LIFT PUMP CALCULATION - FINAL
2943005-MC-005 SCREEN WASH/PRIMING PUMP CALCULATION
2943005-MC-006 INTAKE STRUCTURE LARGE BORE PIPE STRESS CALCULATION
2943005-MC-007 LINE SIZING CALCULATION
2943005-MC-008 BUILDING HEAT LOAD CALCULATION

MECHANICAL COMPONENTS

2943005-MF-001 MOTOR LIST
2943005-MF-002 PIPE LINE LIST
2943005-MF-003 VALVE LIST
2943005-MF-004 FUNCTIONAL SPECIFICATION

NOT FOR CONSTRUCTION
FOR PERMIT APPLICATION ONLY

MESA ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS

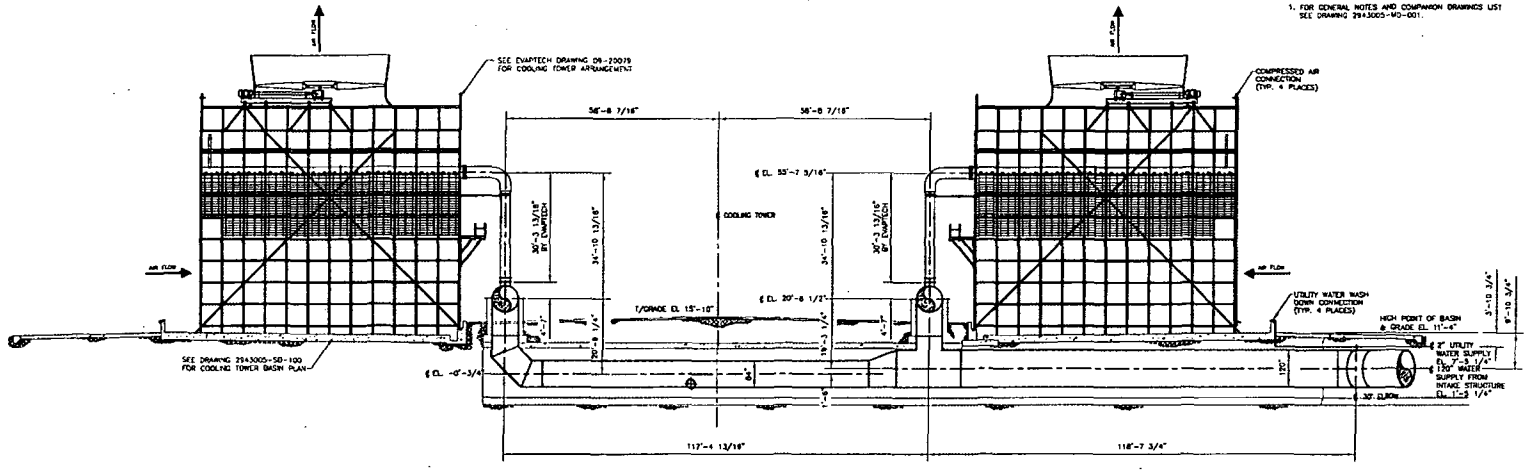
CREC HELPER COOLING TOWER SOUTH
OVERALL SITE PLAN

DRAWN: J. FRANKLIN
PROJ ENGR: P. LANNING
UNIT DESIGN DWG NO: N/A
SIZE: E
DWG NO: 2943005-MD-001
REV: C

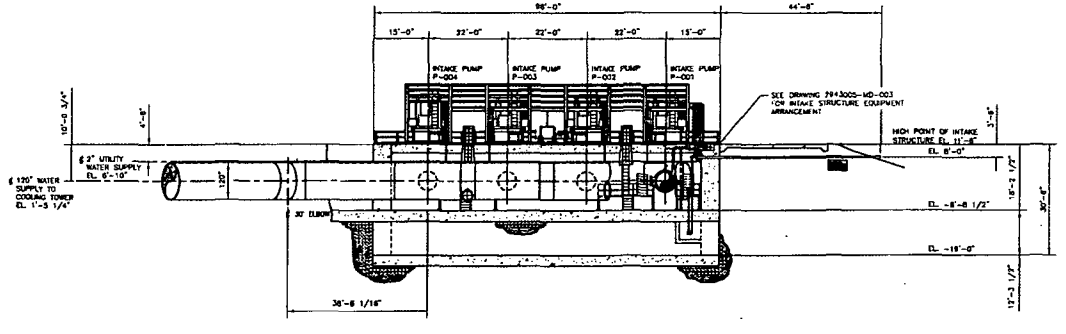
NO.	DESCRIPTION	DATE	DRAWN	APPD
A	ISSUED FOR 30% REVIEW	4/8/09	JMF	
B	ISSUED FOR BID (GENERAL REVISION)	5/4/09	JMF	
C	ISSUED FOR INFORMATION	5/12/09	JMF	
D	ISSUED FOR 60% REVIEW	6/24/09	JMF	
E	ISSUED FOR PERMIT	9-8-09	JEB	

GENERAL NOTES:

1. FOR GENERAL NOTES AND COMPANION DRAWINGS LIST SEE DRAWING 2943005-MD-001.



SECTION A
MD-001 MD-002



SECTION B
MD-001 MD-002

NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

MESA ASSOCIATES, INC.

CREC HELPER COOLING TOWER SOUTH
OVERALL SITE PLAN
SECTIONS

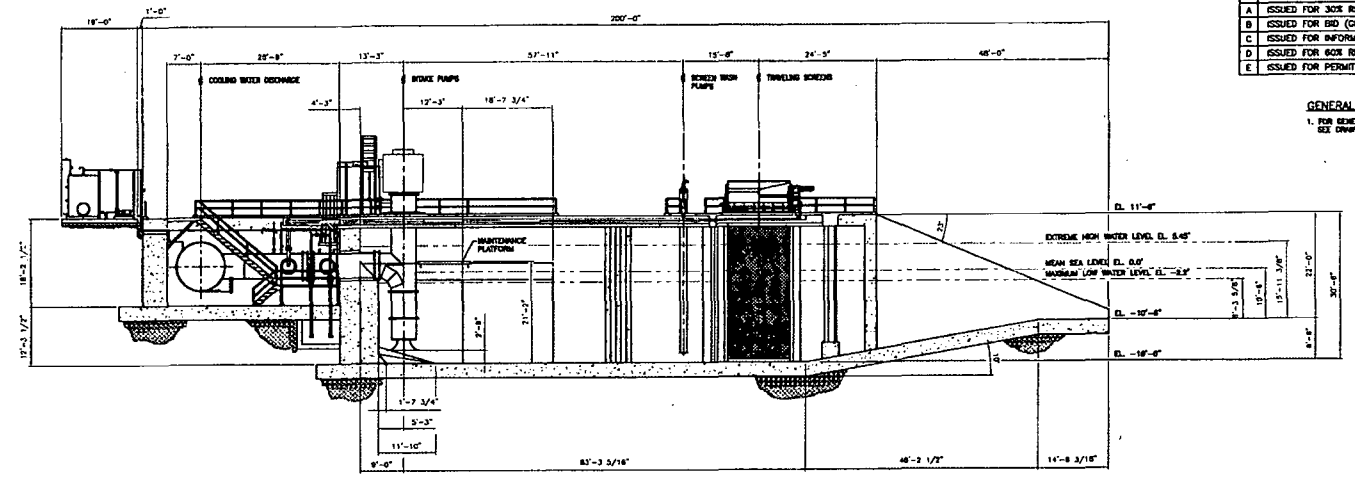
SIZE	DWG NO.	REV
E	2943005-MD-002	E

N/A

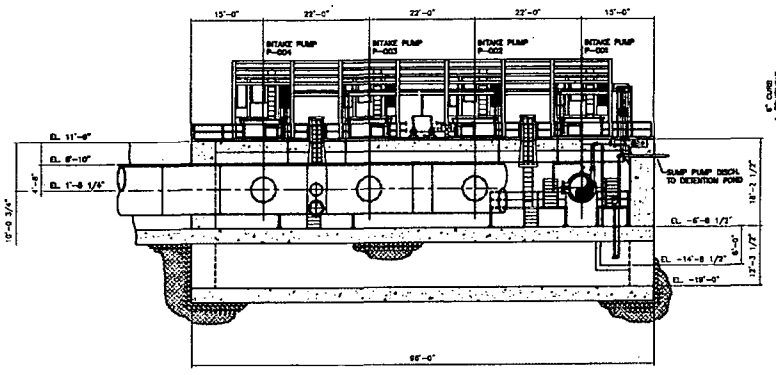
REV	DESCRIPTION	DATE	DRAWN	APVD
A	ISSUED FOR 30% REVIEW	4/8/09	JMF	
B	ISSUED FOR BID (GENERAL REVISION)	5/4/09	JMF	
C	ISSUED FOR INFORMATION	5/12/09	JMF	
D	ISSUED FOR 60% REVIEW	6/24/09	JMF	
E	ISSUED FOR PERMIT	8/6/09	JCB	

GENERAL NOTES:

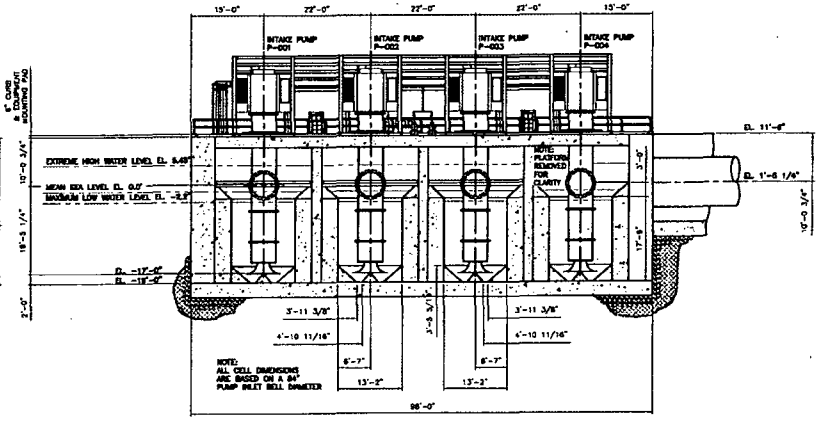
1. FOR GENERAL NOTES AND CONFIRMATION DRAWINGS LIST SEE DRAWING 2943005-MD-001.



SECTION A
MD-003 MD-004 MD-005



SECTION B
MD-003 MD-004 MD-005



SECTION C
MD-003 MD-004 MD-005

NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

MESA ASSOCIATES, INC.

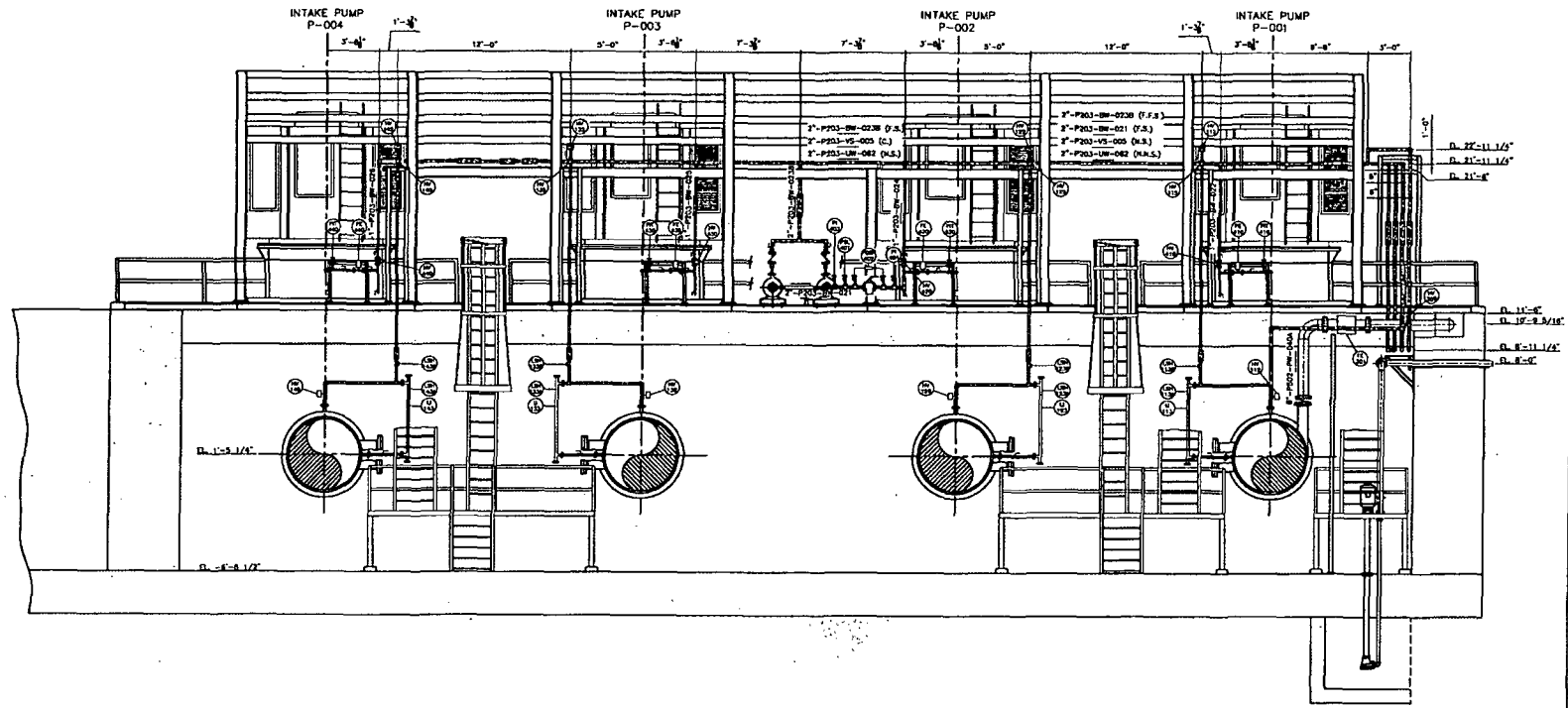
CREC HELPER COOLING TOWER SOUTH
INTAKE STRUCTURE EQUIPMENT ARRANGEMENT SECTIONS

SIZE	WORK ORDER	DRAWING NO.	REV
E		2943005-MD-005	E

SCALE 1/8"=1' PROJECT NO. 2943005 SHEET 1 OF 1

N/A

A	ISSUED FOR INFORMATION	8/17/09	JEB	
B	ISSUED FOR 60% REVIEW	8/24/09	JAS	
C	ISSUED FOR PERMIT	8/5/09	JEB	



SECTION D
SCALE: 3/8"=1'-0"
MD-007 MD-011

NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

GENERAL NOTES:

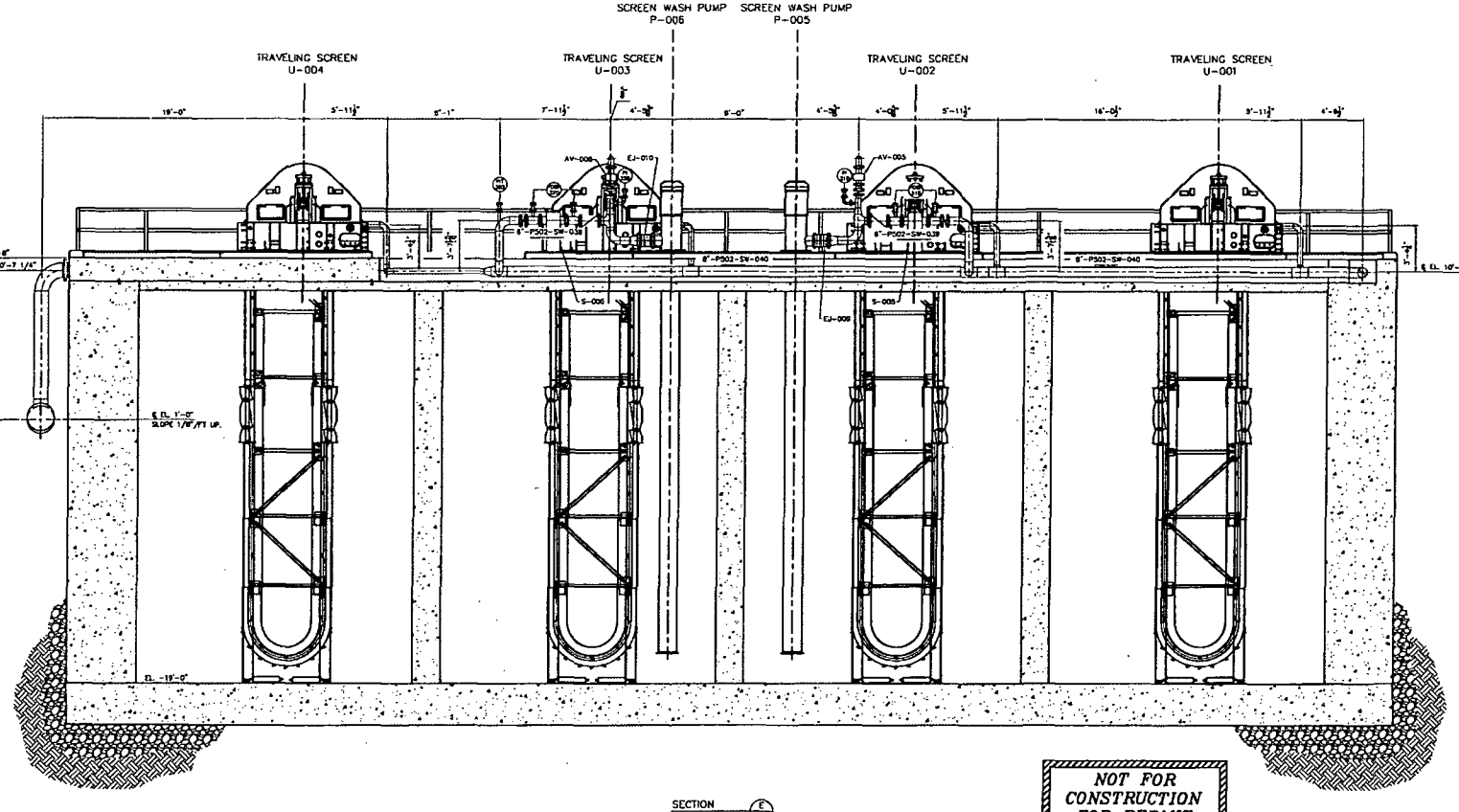
1. FOR GENERAL NOTES AND COMPANION DRAWINGS LIST SEE DRAWING 2943005-MD-001.

MESA ASSOCIATES, INC.

CREE HELPER COOLING TOWER SOUTH
INTAKE STRUCTURE PIPING ARRANGEMENT
SECTION D-D

E | 2943005-MD-011 | C

REVISIONS				
REV	DESCRIPTION	DATE	BY	APP
A	ISSUED FOR INFORMATION	6/17/09	JEB	
B	ISSUED FOR 60% REVIEW	6/24/09	JMF	
C	ISSUED FOR PERMIT	8/6/09	JEB	



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

MD-007 — E — MD-012

NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

GENERAL NOTES:

1. FOR GENERAL NOTES AND COMPANION DRAWINGS LIST SEE DRAWING 2943005-MD-001.

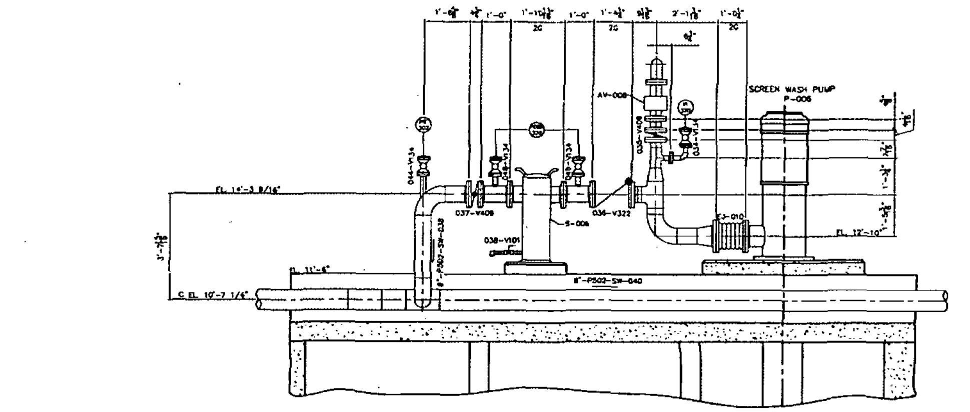
DESIGNED	J. BOCHOLIS	6/16/09
DRAWN		
APPROVED		
FIELD SUPV.	S. LARSEN	
FIELD SUPV.	T. RAMEY	
AS-BUILT SUPV.	N/A	

MESA ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS

CREC HELPER COOLING TOWER SOUTH
INTAKE STRUCTURE PIPING ARRANGEMENT
SECTION E-E

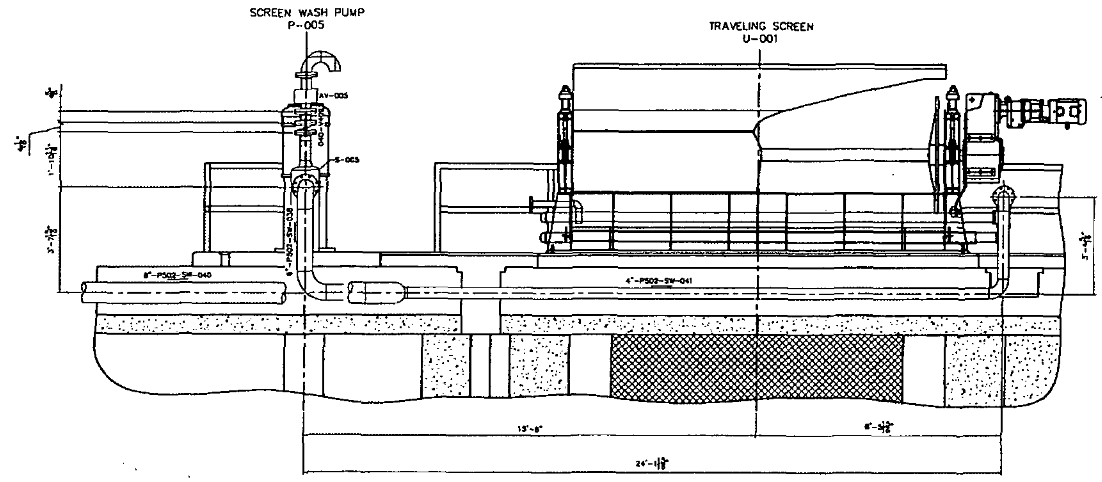
SCALE	PROJECT NO.	DWG NO.	REV
3/8"=1'	2943005	2943005-MD-012	C
		SHEET 1 OF 1	

REV	DESCRIPTION	DATE		
A	ISSUED FOR 60% REVIEW	6/10/09	JEB	
B	ISSUED FOR PERMIT	8/8/09	JEB	



SECTION (G)
SCALE: 3/4"=1'-0"
MD-007 — MD-014

SCREEN WASH P-006 SHOWN
SCREEN WASH P-005 OPPOSITE HAND



SECTION (H)
SCALE: 3/4"=1'-0"
MD-007 — MD-014

NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

GENERAL NOTES:

1. FOR GENERAL NOTES AND COMPANION DRAWINGS LIST SEE DRAWING 2943005-MD-001.

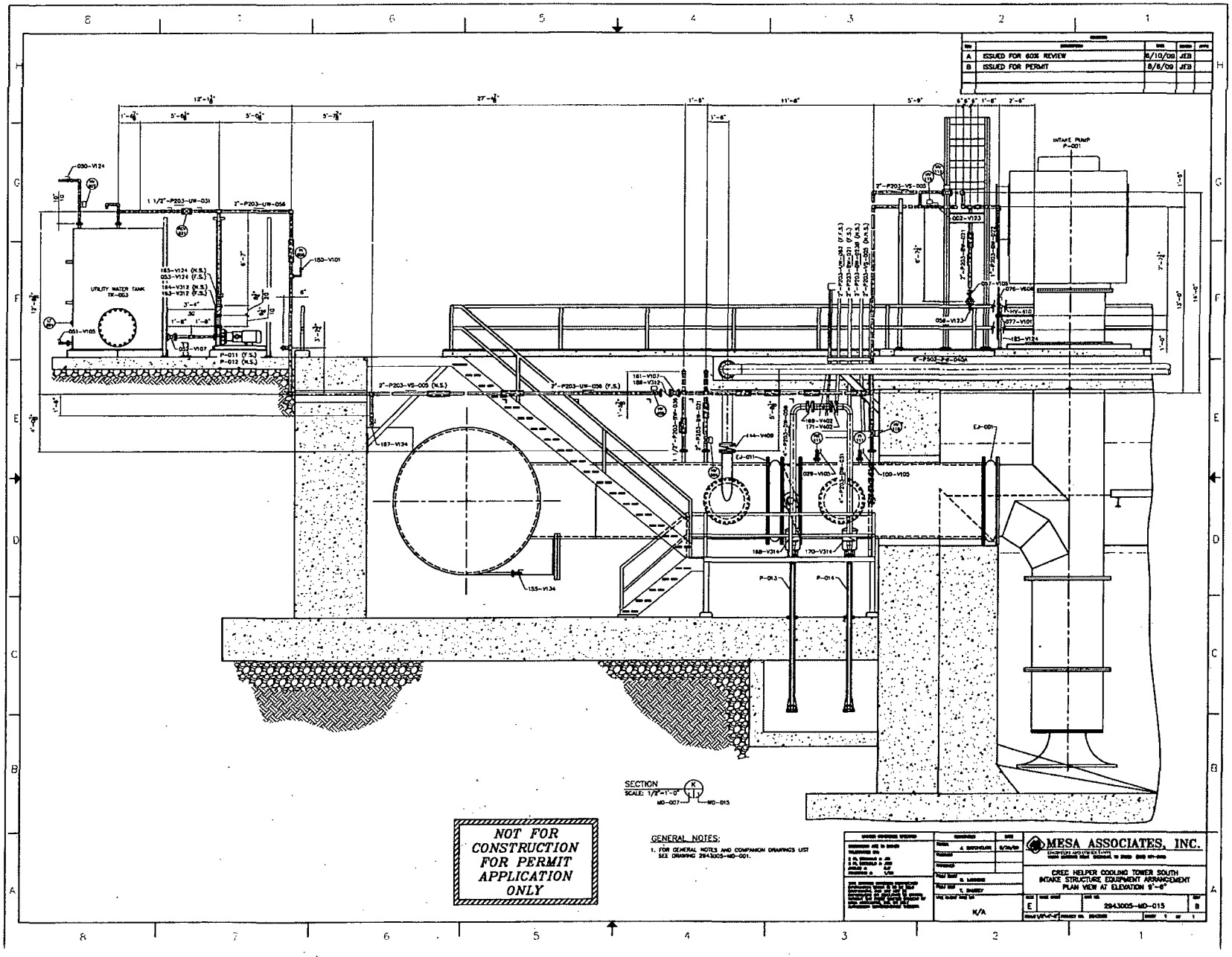
MESA ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS

CREC HELPER COOLING TOWER SOUTH
INTAKE STRUCTURE PIPING ARRANGEMENT
SECTIONS G-G & H-H

E | 2943005-MD-014 | B

N/A

SHEET 1 OF 1



NO	DESCRIPTION	DATE	BY	APP'D
A	ISSUED FOR 60% REVIEW	8/10/09	JEB	
B	ISSUED FOR PERMIT	8/8/09	JEB	

NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

GENERAL NOTES:

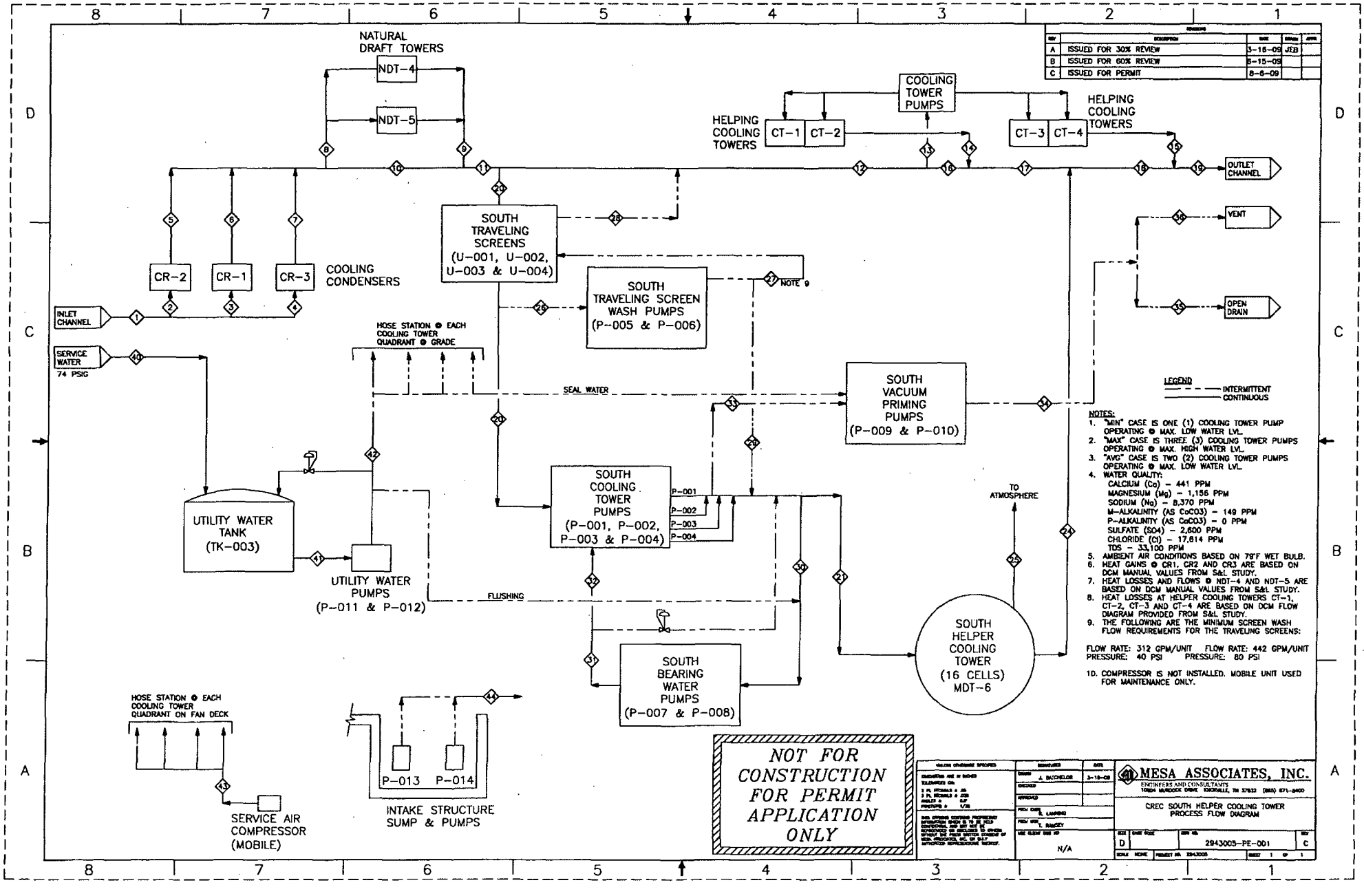
1. FOR GENERAL NOTES AND COMPANION DRAWINGS LIST SEE DRAWING 2943005-MD-001.

MESA ASSOCIATES, INC.

CREC HELPER COOLING TOWER SOUTH
INTAKE STRUCTURE EQUIPMENT ARRANGEMENT
PLAN VIEW AT ELEVATION 0'-0"

SIZE	DRAWING NO.	REV
E	2943005-MD-015	B

K/A



REV	DESCRIPTION	DATE	BY	APP
A	ISSUED FOR 30% REVIEW	3-16-09	JEB	
B	ISSUED FOR 60% REVIEW	5-15-09		
C	ISSUED FOR PERMIT	8-6-09		

NOTES:
1. "MIN" CASE IS ONE (1) COOLING TOWER PUMP OPERATING @ MAX. LOW WATER LVL.
2. "MAX" CASE IS THREE (3) COOLING TOWER PUMPS OPERATING @ MAX. HIGH WATER LVL.
3. "AVG" CASE IS TWO (2) COOLING TOWER PUMPS OPERATING @ MAX. LOW WATER LVL.
4. WATER QUALITY:
   CALCIUM (Ca) – 441 PPM
   MAGNESIUM (Mg) – 1,155 PPM
   SODIUM (Na) – 8,370 PPM
   M-ALKALINITY (AS CaCO3) – 149 PPM
   P-ALKALINITY (AS CaCO3) – 0 PPM
   SULFATE (SO4) – 2,600 PPM
   CHLORIDE (Cl) – 17,814 PPM
   TDS – 33,100 PPM
5. AMBIENT AIR CONDITIONS BASED ON 79°F WET BULB.
6. HEAT GAINS @ CR1, CR2 AND CR3 ARE BASED ON DCM MANUAL VALUES FROM S&L STUDY.
7. HEAT LOSSES AND FLOWS @ NDT-4 AND NDT-5 ARE BASED ON DCM MANUAL VALUES FROM S&L STUDY.
8. HEAT LOSSES AT HELPER COOLING TOWERS CT-1, CT-2, CT-3 AND CT-4 ARE BASED ON DCM FLOW DIAGRAM PROVIDED FROM S&L STUDY.
9. THE FOLLOWING ARE THE MINIMUM SCREEN WASH FLOW REQUIREMENTS FOR THE TRAVELING SCREENS:

FLOW RATE: 312 GPM/UNIT FLOW RATE: 442 GPM/UNIT
PRESSURE: 40 PSI PRESSURE: 80 PSI

10. COMPRESSOR IS NOT INSTALLED. MOBILE UNIT USED FOR MAINTENANCE ONLY.

NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

MESA ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS
10804 MURDOCK DRIVE KNOXVILLE, TN 37932 (865) 671-6400

CREC SOUTH HELPER COOLING TOWER PROCESS FLOW DIAGRAM

2943005-PE-001 REV C

DRAWN J. BATCHELOR 3-18-09
CHECKED
APPROVED
PROJ. ENGR. T. RAMSEY
N/A

REVISIONS				
REV	DESCRIPTION	DATE	BY	APP'D
A	ISSUED FOR 30% REVIEW	3-16-09	JEB	
B	ISSUED FOR 60% REVIEW	6-15-09		
C	ISSUED FOR PERMIT	8-6-09		

ITEM NO.	1	2	3	4	5	6	7	8	9	10	11	12
DESCRIPTION	INLET CHANNEL	INTAKE CR-2 FROM INLET CHANNEL	INTAKE CR-1 FROM INLET CHANNEL	INTAKE CR-3 FROM INLET CHANNEL	DISCHARGE CR-2 TO OUTLET CHANNEL	DISCHARGE CR-1 TO OUTLET CHANNEL	DISCHARGE CR-3 TO OUTLET CHANNEL	INTAKE NDT-4/NDT-5 FROM OUTLET CHANNEL	DISCHARGE NDT-4/NDT-5 TO OUTLET CHANNEL	OUTLET CHANNEL BETWEEN NDT INTAKE AND NDT DISCHARGE	OUTLET CHANNEL BETWEEN NDT DISCHARGE & SOUTH TRAVELING SCREEN WASH PUMPS INTAKE	OUTLET CHANNEL BETWEEN SOUTH TRAVELING SCREENS DISCHARGE & COOLING TOWER PUMPS INTAKE
FLUID	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER
	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.
FLOW (LIQUID GPM)	1,318,000	328,000	310,000	680,000	329,000	311,000	683,000	20,000	7,000	1,302,000	1,309,000	977,900
FLOW (GAS ACFM)												
FLOW (LB/HOUR)	658,300,000	163,300,000	154,400,000	338,600,000	163,320,000	154,360,000	338,590,000	9,940,000	3,480,000	648,340,000	649,800,000	485,300,000
PRESSURE (PSIG)	0	0	0	0	0	0	0		0	0	0	0
TEMPERATURE (°F)	91	91	91	91	105	102	111	107	94	107.32	106	106
SPECIFIC GRAVITY	1.025	1.025	1.025	1.025	1.022	1.02279	1.021	1.022	1.022	1.022	1.022	1.022
DENSITY (PCF)												

ITEM NO.	13	14	15	16	17	18	19	20			21		
DESCRIPTION	INTAKE COOLING TOWER PUMPS FROM OUTLET CHANNEL	DISCHARGE CT-1/CT-2 TO OUTLET CHANNEL	DISCHARGE CT-3/CT-4 TO OUTLET CHANNEL	OUTLET CHANNEL BETWEEN COOLING TOWER PUMPS INTAKE AND CT-1/CT-2 DISCHARGE	OUTLET CHANNEL BETWEEN CT-1/CT-2 DISCHARGE & SOUTH HELPER COOLING TOWER MDT-6 DISCHARGE	OUTLET CHANNEL BETWEEN SOUTH HELPER COOLING TOWER MDT-6 DISCHARGE & CT-3/CT-4 DISCHARGE	OUTLET CHANNEL AFTER CT-3/CT-4 DISCHARGE	INTAKE SOUTH COOLING TOWER PUMPS FROM OUTLET CHANNEL			INTAKE SOUTH HELPER COOLING TOWER MDT-6 FROM DISCHARGE SOUTH COOLING TOWER PUMPS		
FLUID	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER	SEA WATER			SEA WATER		
	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.	MAX.			MAX.			MAX.
FLOW (LIQUID GPM)	680,000	338,900	338,900	297,900	638,800	963,200	1,302,000			346,812			346,812
FLOW (GAS ACFM)													
FLOW (LB/HOUR)	337,500,000	168,700,000	168,700,000	147,800,000	316,600,000	479,100,000	647,900,000			164,500,000			164,500,000
PRESSURE (PSIG)	0	0	0	0	0	0	0			0			30.4
TEMPERATURE (°F)	106	92	92	106	99	96	95			106			106
SPECIFIC GRAVITY	1.022	1.025	1.025	1.022	1.023	1.024	1.024			1.022			1.022
DENSITY (PCF)													

ITEM NO.	24			25			26				27		
DESCRIPTION	DISCHARGE SOUTH HELPER COOLING TOWER MDT-6 TO OUTLET CHANNEL			DISCHARGE SOUTH HELPER COOLING TOWER MDT-6 TO ATMOSPHERE			INTAKE SOUTH TRAVELING SCREEN WASH PUMPS FROM SOUTH COOLING TOWER PUMPS INTAKE				INTAKE SOUTH TRAVELING SCREENS FROM SOUTH TRAVELING SCREEN WASH PUMPS DISCHARGE		
FLUID	SEA WATER			WATER VAPOR			SEA WATER				SEA WATER		
			MAX.			MAX.				MAX.			MAX.
FLOW (LIQUID GPM)			341,712			5,100				988			988
FLOW (GAS ACFM)													
FLOW (LB/HOUR)			162,600,000			2,530,000							
PRESSURE (PSIG)			0			0				45			45
TEMPERATURE (°F)			90			90				106			106
SPECIFIC GRAVITY			1.02176							1.03			1.03
DENSITY (PCF)													

ITEM NO.	28			29	30				31			
DESCRIPTION	DISCHARGE SOUTH TRAVELING SCREENS TO OUTLET CHANNEL			INTERMITTENT LINE BETWEEN SOUTH TRAVELING SCREEN WASH PUMPS DISCHARGE & SOUTH COOLING TOWER PUMP DISCHARGE	BEARING WATER PUMP SUCTION				BEARING WATER PUMP DISCHARGE			
FLUID	SEA WATER			SEA WATER	SEA WATER				SEA WATER			
			MAX.	START-UP				MAX.				MAX.
FLOW (LIQUID GPM)			988	3,000				36				36
FLOW (GAS ACFM)												
FLOW (LB/HOUR)												
PRESSURE (PSIG)			0	5				30.4				47
TEMPERATURE (°F)			106	106				106				106
SPECIFIC GRAVITY			1.03	1.03				1.022				1.03
DENSITY (PCF)												

NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
X PL DECIMALS ± .05
X PL DECIMALS ± .010
ANGLES ± 1/2°
FINISHES ± 125

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	SIGNATURE	DATE
DRAWN	J. BATCHELOR	3-16-09
CHECKED		
APPROVED		
PROJ. ENG.	L. LANGINO	
PROJ. MGR.	T. RAMSEY	
LEAD CLIENT ENG. MGR.	N/A	

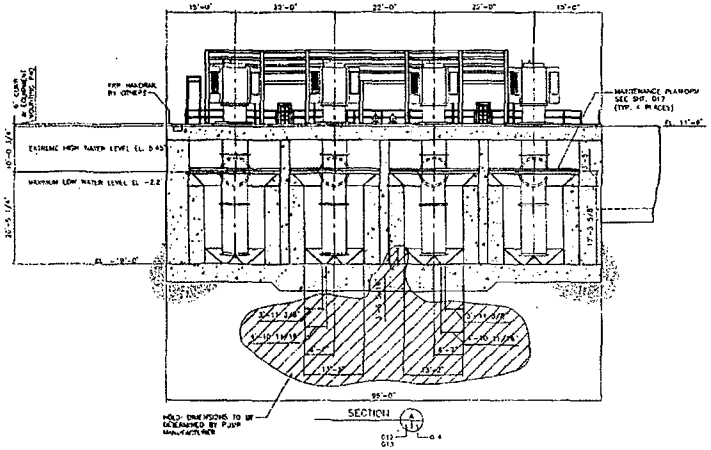
MESA ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS
10814 MURDOCH DRIVE KNOXVILLE, TN 37932 (865) 671-6400

CREC HELPER COOLING TOWER SOUTH
PROCESS FLOW DIAGRAM

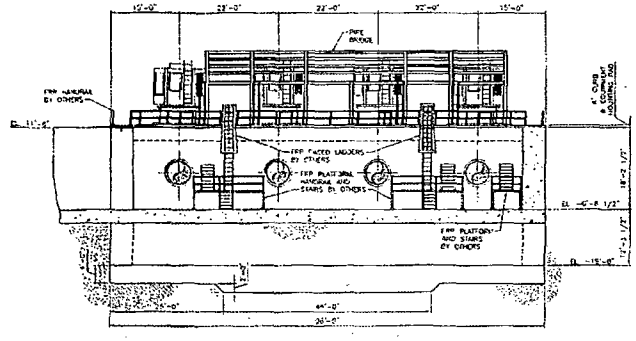
SIZE	CAGE CODE	DWG NO.	REV
D		2943005-PE-002 SHT 1	C
SCALE NONE	PROJECT NO. 000	SHEET 1 OF 2	

No.	Description	Date	Drawn	Appd
A	ISSUED FOR 30% REVIEW	4/8/09	JAH	
B	ISSUED FOR 60% REVIEW	6/18/09	JAH	
C	FOR PERMIT APPLICATION ONLY	9/12/09	JAH	

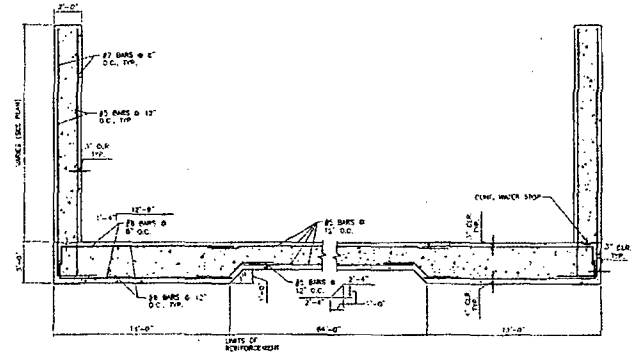
SECTION AND DETAIL KEY



SECTION



SECTION



SECTION

NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

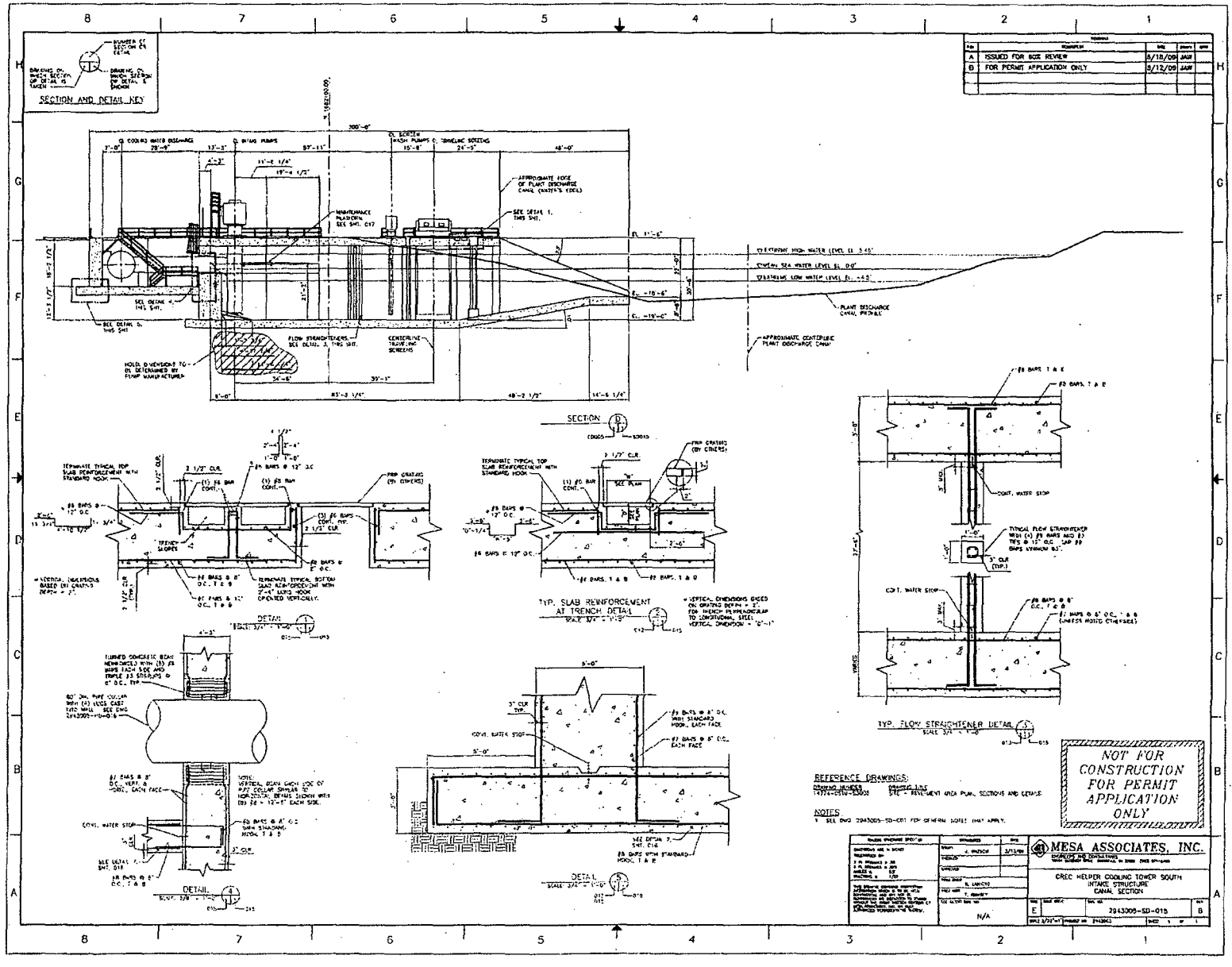
NOTES
1. SEE DWG. 2943005-SD-001 FOR GENERAL NOTES THAT APPLY
2. SEE DWG 2943005-CD-005 FOR SITE LAYOUT.

MESA ASSOCIATES, INC.

CREC HELPER COOLING TOWER SOUTH INTAKE STRUCTURE SECTIONS

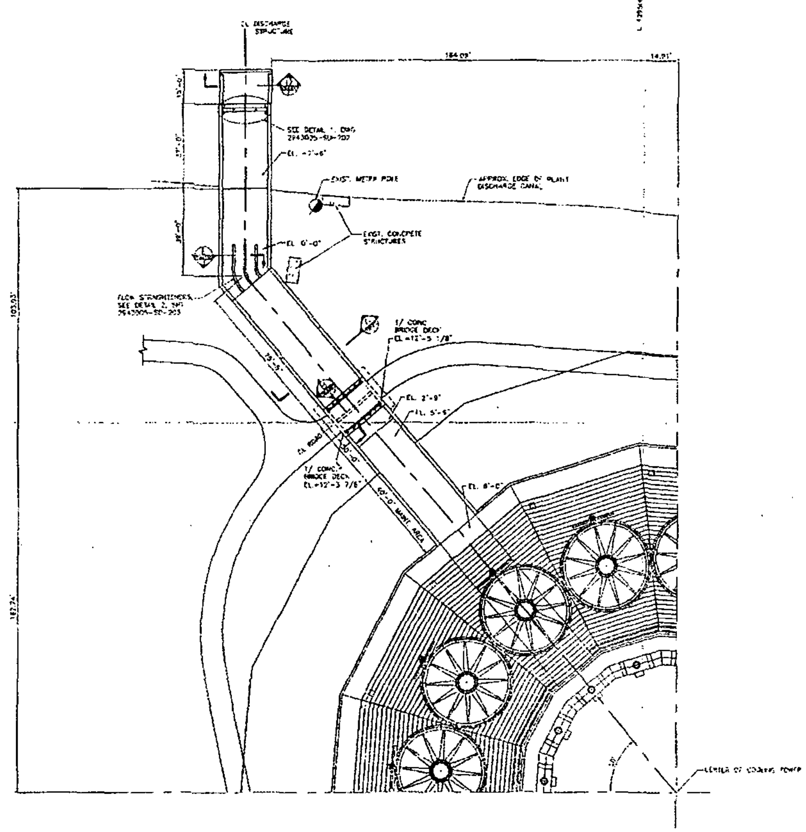
2943005-SD-014

N/A


SECTION AND DETAIL KEY
SECTION
TYP. SLAB REINFORCEMENT AT TRENCH DETAIL
DETAIL
DETAIL
TYP. FLOW STRAIGHTENER DETAIL
NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY
REFERENCE DRAWINGS:
NOTES
MESA ASSOCIATES, INC.
CREC HELPER COOLING TOWER SOUTH INTAKE STRUCTURE CANAL SECTION
2943005-SD-015
B

SECTION AND DETAIL KEY

REV	DESCRIPTION	DATE	DRAWN	APPR
A	ISSUED FOR 30% REVIEW	4/8/09	JAW	
B	ISSUED FOR 60% REVIEW	6/18/09	JAW	
C	FOR PERMIT APPLICATION ONLY	8/12/09	JAW	



PLAN VIEW

NOTES
1. SEE DWG 2943005-SD-001 FOR GENERAL NOTES THAT APPLY.
2. SEE DWG 2943005-SD-005 FOR SITE LAYOUT.

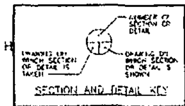
NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

DRAWN	J. WATSON	3/25/09
CHECKED	A. COLLETT	6/18/09
APPROVED		
PROJ ENGR	R. LARKINS	
PROJ MGR	E. BAILEY	
	N/A	

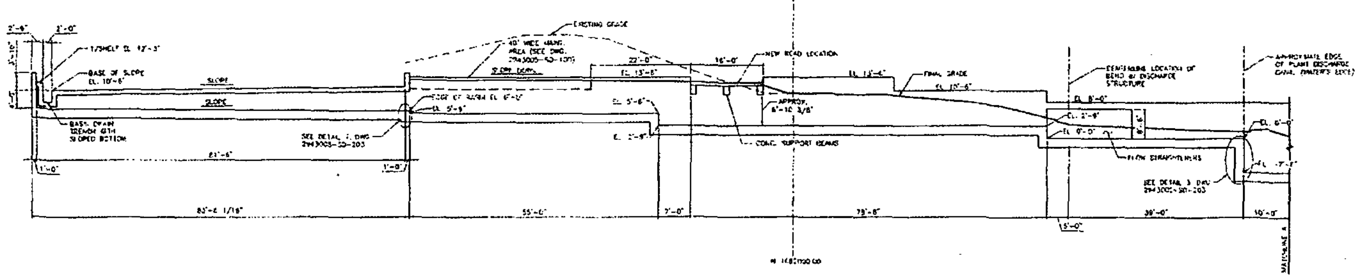
MESA ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS

CREC HELPER COOLING TOWER SOUTH
DISCHARGE STRUCTURE
PLAN VIEW

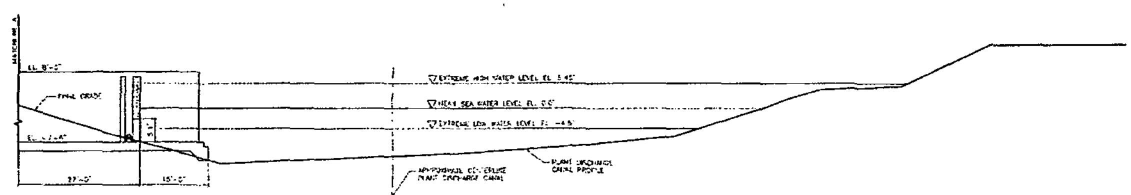
SIZE E — DWG NO. 2943005-SD-200 — REV C
PROJECT NO. 2943005 — SHEET 1 OF 1



REV	DESCRIPTION	DATE	DRAWN	APPR
A	ISSUED FOR 30% REVIEW	4/8/09	JAW	
B	ISSUED FOR 60% REVIEW	6/18/09	JAW	
C	FOR PERMIT APPLICATION ONLY	8/12/09	JAW	



SECTION



SECTION (CONT.)

NOT FOR CONSTRUCTION FOR PERMIT APPLICATION ONLY

NOTES
1. SEE DWG 2943005-SD-001 FOR GENERAL NOTES THAT APPLY.

REFERENCE DRAWINGS:

MESA ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS

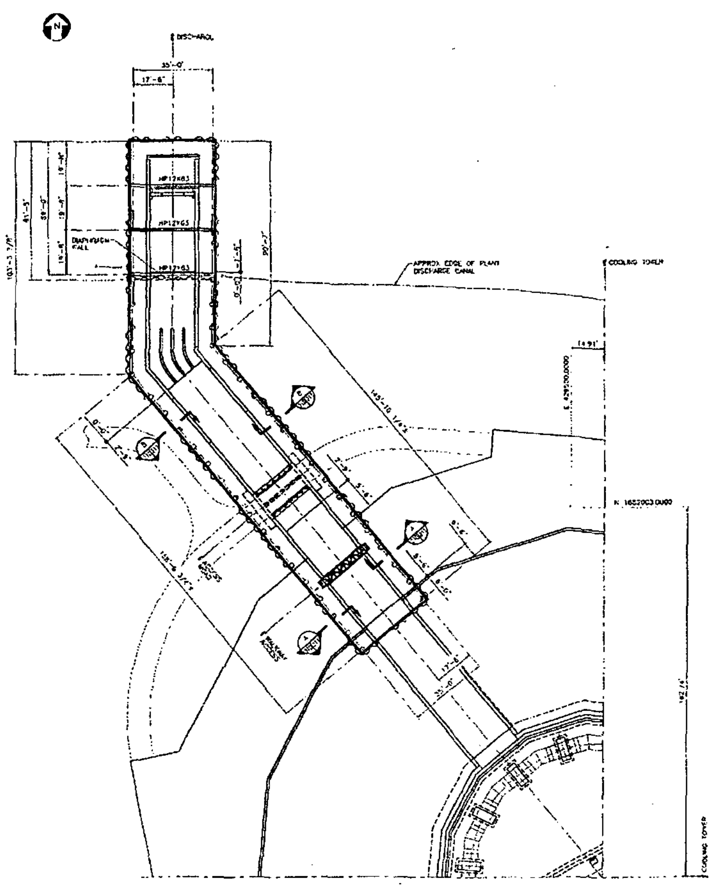
CREC HELPER COOLING TOWER SOUTH
DISCHARGE STRUCTURE
SECTION

N/A

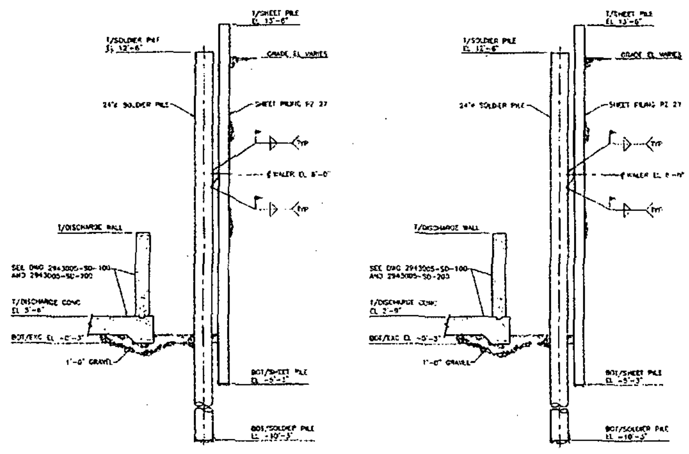
E | 2943005-SD-201 | C

REV	DESCRIPTION	DATE	DRAWN	APPR
A	ISSUED FOR 60% REVIEW	6/18/09	SB	
B	FOR PERMIT APPLICATION ONLY	8/12/09	JAW	

SECTION AND DETAIL KEY



PLAN - DISCHARGE STRUCTURE COFFERDAM



SECTION A
SCALE: 3/4" = 1'-0"

SECTION B
SCALE: 3/4" = 1'-0"

NOT FOR CONSTRUCTION
FOR PERMIT APPLICATION ONLY

NOTE:
1. SEE DWG 2943005-SD-201 FOR GENERAL NOTES THAT APPLY.

MESA ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS

CREC HELPER COOLING TOWER SOUTH
COFFERDAM - DISCHARGE STRUCTURE
PLAN

SIZE	E
DWG NO	2943005-SD-210
REV	B
SCALE	1/16" = 1'
PROJECT NO	2943005
SHEET	1 OF 1
REF. DWG. NO.	N/A
DATE	2/5/09
ENGINEER	R. LAUGHING
PROJ. MGR.	T. HAWLEY