MANATEE COUNTY
FLORIDA

Email

November 18, 2011

TO: All Interested Bidders

SUBJECT: Invitation for Bid #11-2872DC
North Water Reclamation Facility Expansion 1

ADDENDUM #2

Bidders are hereby notified that this Addendum shall be made a part of the above named bidding and contract documents. The following items are issued to add to, modify, and clarify the bid and contract documents. These items shall have the same force and effect as the original bidding and contract documents, and cost involved shall be included in the bid prices. Bids to be submitted on the specified bid date, shall conform to the additions and revisions listed herein.

1. Bid Due Date is changed to **December 7, 2011 at 3:30 P.M.**

2. See attached information as prepared by McKim & Creed Engineers dated November 15, 2011.

Bids will be received at Manatee County Purchasing, 1112 Manatee Avenue West, Suite 803, Bradenton, Florida 34205 until **December 7, 2011 at 3:30 P.M.**

Sincerely,

Deborah Carey-Reed

Deborah Carey-Reed
Contract Specialist

/dcr
Attachment

Financial Management Department * Purchasing Division
1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205
deborah.carey-reed@mymanatee.org* PHONE: 941.749-3074 * FAX: 941.749-3034
WEB: *www.mymanatee.org*

McKIM&CREED

ENGINEERS
SURVEYORS
PLANNERS

NWRF Expansion Phase I
County Project No. 6011283
ADDENDUM 2
November 15, 2011

CHANGES TO THE TECHNICAL SPECIFICATIONS

1. Replace Specification Section 01150 and Bid Form in their entirety with the attached Specification Section 01150 and Bid Form.

2. Add the attached Specification Section 11316 Shafted Screw Conveyors and Appurtenances.

3. Add the attached Specification Section 11315 Self Cleaning Influent Screen.

4. Specification Section 13330, replace PLC Input / Output Schedule in its entirety with the attached PLC Input / Output Schedule.

5. Replace Specification Section 15062 Part 2.01 D in its entirety with, "Mechanical joint fittings for 30 to 60-inch diameter ductile iron pipe shall be compact ductile iron cast in accordance with ANSI/AWWA C153/A21.53. The working pressure rating for the fittings shall be 250 psi."

6. Specification Section 15100:

    a. Replace Part 2.01 C with, "Bodies shall be of ASTM A126 Class B cast iron. Port area shall be 100% of standard pipe area. The body shall have minimal pooling, and provide complete flushing of the valve every time it cycles. Port of valve shall be rectangular on valves sizes 14" and larger. Port of valve shall be either rectangular or round on valves sizes 12" and smaller. The term "full port" shall represent 100% port."

    b. Replace Part 2.01 D with, "Seats shall be rectangular or round ported, 1/8" thick welded overlay of not less than 95% pure nickel. Seat area shall at least 1/2" wide and raised, with the raised surface completely covered with weld to insure that the plug face contacts only nickel."

1365 Hamlet Avenue
Clearwater, FL 33765
727.442.7196.
Fax 727.461.3827
www.mckimcreed.com

c. Replace Part 2.01 H with "Shaft seals shall be of the multiple V-ring type with a packing gland follower or of the "U" cup type in accordance with AWWA C504. Shaft seals shall be self or externally adjustable and re-packable without removing the bonnet from the valve.

d. Replace Part 2.01 O with "Valves and actuators shall be DeZurik PEF, Val-matic 5600R, or Milliken 600 Series."

CHANGES TO THE DRAWINGS

1. Replace Drawing C-0.4.3 with the attached Drawing C-0.4.3 Rev. A.
2. Add the following new Drawings- M-2.1, 2.2 & 2.3; E-2.1, 2.2, 2.3, 2.4 & 2.5; I-2.1

RESPONSES TO CONTRACTOR QUESTIONS

1. Is there a drainage system under the green where the proposed pipeline is to be installed? Any as-builts for this? **It is not known if there is an existing drainage system under the green. There are no as-built drawings available.**
2. Do you have as-builts for the golf course irrigation system? **No.**
3. Do you have standards for restoration of golf course? **The Golf Course Sod is to be replaced with 419 Tifway Bermuda Grass.**
4. Drawing C-0.4.1 show the new 30" D.I.P. effluent line going under an existing vault. A note says that the Contractor shall support & protect vault. This could be very difficult. If this is absolutely necessary, please provide details of this vault including elevations. **The existing vault acts as a cover to shallow buried small diameter pipe. The vault shall be removed prior to construction and reinstalled afterwards.**
5. Drawing D-0.1 shows the contractor to demolish an existing 12" line which appears to pass through the vault mentioned above. Does the vault remain or get demolished? **The vault shall be removed prior to construction and reinstalled afterwards.** Is this the same vault as described in the previous question? **Yes.**

6. We understand that we must restore the golf course after construction is complete. Please provide information on irrigation and drain systems that are in the immediate vicinity of the work. What type of grass will we be replacing? **Information on the existing irrigation and drain systems is not currently available. The Golf Course Sod is to be replaced with 419 Tifway Bermuda Grass.**

7. Please see the bid form and measurement/payment section for the "Alternate Deduct #1". Could you please expand the description of this item further? To what extent are you asking for not including the electrical and control wiring? Does this include re-use of existing disconnects and everything or just the new wire run? **Alternate Deduct No. 1 is for the deduction in cost if the power and control wire run between the MCC and the disconnect and control junction box to the internal recycle pumps does not have to be replaced.**

8. Is there a spec regarding the 16" Intake Screens on M-7.2 coming out? Without any detail/direction we are unsure what to supply. **Please see Technical Specification Section 15103.**

9. We run into this issue a lot when we bid degritting. This material is disposed of by the ton, not the cubic yard. There is no way to quantify how much disposal of this material will cost based on cubic yards. We are only charged per ton at the land fill and degritting subcontractors only bid the removal by the ton. Would the engineer please consider changing the unit for this bid item to tons or provide an allowance for this item? **The unit price will remain in cubic yards.**

10. Section 15101 calls for the bonnet on the knife gate valves located at the New Internal Recycle Pumps on Sheet M3.1 to have the same pressure rating as the body. The manufacturer must have the working and required design pressures in order to assure that this can be done. Please provide this information. **The working pressure is approximately 6 psi and the required design pressure is 20 psi.**

SECTION 00300
(Submit in Triplicate)
BID FORM

For: IFB #11-2872DC NWRF EXPANSION PHASE 1

BID "A" TOTAL BID PRICE: $_____ (365 calendar day completion)

BID "B" TOTAL BID PRICE: $_____ (425 calendar day completion)
Two schedules for Completion of the Work shall be considered. Each bid for completion by the specified stated time shall be offered as a separate "Total Bid Price." The County has the sole authority to select the bid based on the Completion Time which is in the best interest of the County.

We, the undersigned, hereby declare that we have carefully reviewed the bid documents, and with full knowledge and understanding of the aforementioned herewith submit this bid, meeting each and every specification, term, and condition contained in the Invitation For Bids.

We understand that the bid specifications, terms, and conditions in their entirety shall be made a part of any agreement or contract between Manatee County and the successful bidder. Failure to comply shall result in contract default, whereupon, the defaulting contractor shall be required to pay for any and all reprocurement costs, damages, and attorney fees as incurred by the County.

Communications concerning this Bid shall be addressed as follows:

Person's Name: _____

Address: _____Phone:_____

Date: _____ EMAIL:_____

COMPANY'S NAME: _____

AUTHORIZED SIGNATURE(S): _____

_____
Name and Title of Above Signer(s)

CO. MAILING ADDRESS: _____

_____

TELEPHONE: (___)_____ FAX: (___)_____

Acknowledge Addendum Nos. _____ Dated: _____

BID FORM

For: NWRF EXPANSION PHASE 1

BID FORM "A" (365 Calendar Days Completion)

	DESCRIPTION	EST QTY	UNIT COST	EXTENDED COST
1.	Mobilization / Demobilization	LS		$
2.	Anoxic/Aerobic Basin Modifications	LS		$
3.	Lake Gravity Disc Filters	LS		$
4.	Plant Drain Pump Station	LS		$
5.	Anoxic/Aerobic Basin Cleaning			
a.	Removal and Disposal of Grit Material	2705 CY	$	$
b.	Pressure Wash Basin/Inspect Equip	2 EA	$	$
6.	Discretionary Work			$425,000.00
	TOTAL BID "A" 365 days completion			**$**
	ALTERNATE #1 - DEDUCT			
	Power and control wiring to pumps from Electrical Building No. 1	4 EA	$	$
	ALTERNATE #2 - ADDITIVE			
	Headwork's Screen and Conveyor	LS	$	$

	PRODUCT	MANUFACTURER
	Lake Gravity Disc Filters	

BIDDER: _____

BID FORM
BID FORM "B" (425 Calendar Days Completion)

For: NWRF EXPANSION PHASE 1

	DESCRIPTION	EST QTY	UNIT COST	EXTENDED COST
1.	Mobilization / Demobilization	LS		$
2.	Anoxic/Aerobic Basin Modifications	LS		$
3.	Lake Gravity Disc Filters	LS		$
4.	Plant Drain Pump Station	LS		$
5.	Anoxic/Aerobic Basin Cleaning			
a.	Removal and Disposal of Grit Material	2705 CY	$	$
b.	Pressure Wash Basin/Inspect Equip	2 EA	$	$
6.	Discretionary Work			$425,000.00
	TOTAL BID "B" 425 days completion			**$**
	ALTERNATE #1 - DEDUCT			
	Power and control wiring to pumps from Electrical Building No. 1	4 EA	$	$
	ALTERNATE #2 - ADDITIVE			
	Headwork's Screen and Conveyor	LS	$	$
	PRODUCT	**MANUFACTURER**		
	Lake Gravity Disc Filters			

BIDDER: _____

SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The scope of this section of the Contract Documents is to further define the items included in each Bid Item in the Bid Proposal section of these specifications. Payment will be made based on the specified items supplied and delivered in the description in this section for each bid item.

1.02 GENERAL

A. All contract lump sum prices included in the Bid Proposal section will be full compensation for all labor, equipment and incidentals to construct the wastewater treatment plant expansion and appurtenances as specified in the Contract Documents under this contract.

1.03 WORK OUTSIDE AUTHORIZED LIMITS

A. No payment will be made for work constructed outside the authorized limits of work.

1.04 PAYMENT

A. Lump Sum Items: Where payment for items is shown to be paid for on a lump sum basis, no separate payment will be made for any item of work required to complete the lump sum item within the limits of work shown or specified.

1.05 COSTS INCLUDED IN PAYMENT ITEMS

A. Separate Payment: No separate payment will be made for the following items and the cost of such work shall be included in the applicable pay items of work.

1. Clearing and grubbing.
2. Trench excavation, including necessary pavement and rock removal, sheeting or shoring except as otherwise specified.
3. Dewatering and disposal of surplus water.
4. Structural fill, backfill, grading, and related transport costs.
5. Replacement of paved or unpaved roadways, grass (sod) and shrubbery plots.
6. Cleanup.

7. Foundation and borrow materials, except as hereinafter specified.
8. Testing and placing system in operation.
9. Any material and equipment required to be installed and utilized for tests.
10. Pipe, structures, pavement replacement, restoration and/or appurtenances included within the limits of lump sum work, unless otherwise shown.
11. Maintaining the existing quality of service during construction, including any required by-pass pumping.
12. Appurtenant work as required for a complete and operable system.
13. Repair of damaged irrigation piping and sprinkler heads.
14. Maintaining access to treatment plant structures with barriers, lights, signage etc.
15. Relocation of utilities as required to perform the work.

B. Cleanup: CONTRACTOR's attention is called to the fact that cleanup is considered a part of the work of construction. No payment will be made until cleanup is essentially complete.

1.06 BID ITEMS

Bid Item No. 1 - Mobilization/Demobilization

A. Mobilization shall be the preparatory work and operations in mobilizing for beginning work on the project, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site, and for the establishment of temporary offices, storage buildings, safety equipment and first aid supplies, sanitary and other facilities, as required by the Contract Documents and applicable laws and regulations. The costs of bonds, required insurance, permits and any other preconstruction expense necessary for the start of the work, excluding the cost of construction materials, shall also be included in this item. Demobilization shall be the work of removing temporary facilities from the site.

B. Payment for mobilization/demobilization shall not exceed five percent (5%) of the total Bid Price. Partial payments for this item will be made in accordance with the following schedule:

Percent of Original Contract Amount Amount Earned	Allowable Percent of the Lump Sum Price for the Item
5	25
10	35
25	45
50	50
75	75
100	100

C. These payments will be subject to the standard retainage provided in the agreement. Payment of the retainage will be made after completion of the work and demobilization.

D. These payments will be subject to the standard retainage provided in the agreement. Payment of the retainage will be made after completion of the work and demobilization.

Bid Item No. 2 – Anoxic/Aerobic Basin Modifications

A. Payment of the applicable lump sum price shall be full compensation for furnishing all plant, labor, materials and equipment necessary for the modifications to the anoxic/aerobic basins including, but not limited to, removal of plug valves, temporary submersible pump/piping, and sluice gates; abandoned chlorine piping; removal and replacement of suction piping, piping appurtenances, seal water system, and internal recycle pumps (including the power and control wiring to the pumps from Electrical Building No. 1); installation of bonneted knife gates and support; weir gates and sluice gates; testing of power and control wiring to each of the internal recycle pumps; site restoration and all other appurtenant civil, mechanical, electrical and instrumentation work related to this lump sum pay item as presented in the Contract Documents.

B. If the Engineer’s inspection warrants concrete repair, the County may negotiate the repair work with the Contractor which shall be paid for under Bid Item 6.

Bid Item No. 3 – Lake Gravity Disc Filters

A. Payment of the applicable lump sum price shall be full compensation for furnishing all plant, labor, materials and equipment necessary for the construction of the lake gravity disc filters including, but not limited

to, removal and replacement of the lake intake structures; coffer damns; yard piping, valves, meters and associated appurtenances; filtration system equipment; chlorination system equipment; backwash lift station and associated force mains; concrete; asphalt pavement; stormwater system and swale; effluent pump station by-pass pumping and metering; site restoration; and all other appurtenant civil, mechanical, electrical and instrumentation work related to this lump sum pay item as presented in the Contract Documents.

Bid Item No. 4 – Plant Drain Pump Station

A. Payment of the applicable lump sum price shall be full compensation for furnishing all plant, labor, materials and equipment necessary to rehabilitate the plant drain pump station including, but not limited to, by-pass pumping; dewatering; removal and replacement of concrete, pipe and appurtenances, guide rail, floats, coating system, and control panel; removal and reinstallation of existing pumps; installation of ultrasonic level transmitter, stilling well, and flow meter (at headworks); site restoration and all other appurtenant civil, mechanical, electrical and instrumentation work related to this lump sum pay item as presented in the Contract Documents.

Bid Item No. 5 –Anoxic/Aerobic Basin Cleaning

A. Contractor shall be responsible to remove, dewater, haul, and dispose of any accumulated grit remaining in the basins after the County has drained the basins at its desired rate to the extent reasonably possible using the existing basin drains. Grit material shall be considered what is remaining in the basins after the basin has been drained and biosolids have been removed to the extent reasonably possible using conventional methods. Contractor shall also be responsible to dispose of the centrate produced from its dewatering efforts. This may be disposed of at the plant at a rate acceptable to the County. It is anticipated that this range would be 150 gpm or less. Following the removal of the sediment, the basin walls, floors and ceilings shall be pressure washed to allow the engineer to perform a visual inspection of the basins' structural integrity. The Contractor shall provide one scissor lift w/ wheels, two ladders of sufficient length, and the required OSHA safety equipment to provide a means for the inspector to enter and exit the basins and to perform his inspection as part of this bid item.

B. Payment for this bid item shall be a) by the cubic yard of accumulated grit removed as measured in the disposal truck by the Engineer to the nearest whole cubic yard and, b) for each basin pressure washed and inspection equipment provided for. The bid items shall constitute full compensation for all labor, equipment, materials and incidental work necessary to allow satisfactory completion of the work under this item.

Bid Item No. 6 – Discretionary Work

A. This payment item is for the Owner's requested changes in the work pertaining to the NWRF Phase 1 Expansion Work that requires authorization of the Owner prior to the work being performed. This item is not to cover work outlined in the plans and/or specifications or for work incidental to the completion of the project as outlined herein, and shall only be used when directed by the Owner.

B. Payment shall be made based on written authorization of the additional work. The authorization shall reflect the actual amounts agreed to by the Contractor and the Owner.

C. Payment of the applicable negotiated lump sum price shall be full compensation for furnishing, but is not limited to, all plant, labor, materials and equipment necessary to perform work not covered under Bid Item Nos. 2-5 and is considered outside of the original scope of work. All work performed under Bid Item No. 6 shall be submitted to the Engineer and the Owner for review and approval.

Alternate#1 Deduct- Power and control wiring to pumps from Electrical Building No. 1

A. Indicate the unit deduct from base bid for not providing and installing new power and control wiring to the four internal recycle pumps from Electrical Building No.1.

Alternate #2 Additive- Headwork's Screen and Conveyor

A. A. Payment of the applicable lump sum price shall be full compensation for furnishing all plant, labor, materials and equipment necessary for the installation of a redundant screen and conveyor at the existing headwork's structure including, but not limited to, headwork screen, conveyor and associated appurtenances; drain line; trash chute; drop pipe; control panels, monitoring equipment and all other appurtenant civil,

mechanical, electrical and instrumentation work as related to this lump sum pay item as presented in the Contract Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 11316

SHAFTED SCREW CONVEYORS AND APPURTENANCES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment, accessories and incidentals required and install and test, complete and ready for operation all shafted screw conveyors including all supports and appurtenances as shown on the Drawings and as specified herein.

B. Electric motors and capacitors shall be furnished as part of the work of this Section.

C. The shafted screw conveyors shall be furnished as an integrated design, as the full responsibility of a single system supplier.

1.02 RELATED WORK

A. Division 3 – Concrete
B. Division 5 – Metals
C. Division 9 – Finishes
D. Division 15 – Mechanical
E. Division 16 – Electrical

1.03 SUBMITTALS

A. Submit to the Engineer, in accordance with Section 01340, copies of all materials required to establish compliance with this Section. Submittals shall include at least the following:

1. Certified shop and erection drawings showing all important details of construction, dimensions and anchor bolt locations.
2. Descriptive literature, bulletins, and/or catalogs of the equipment.
3. Flight diameter and thickness of each screw.
4. Trough diameter for each screw.
5. Flight pitch of each screw.
6. Rotating speed of each screw.
7. Percentage of active trough area fill under design capacity for each screw.
8. Details of bearings.

9. Calculations certified to by a professional engineer that:
   a. Each auger is protected from overload when the auger's torsional loading exceeds 50 percent of its torsional rating.
   b. At its torsional rating, the stress in each auger does not exceed 50 percent of the Fy value in the outermost extreme fiber of the flight material.

10. The total weight of the equipment, the weight distribution when operating at maximum load and the weight of the single largest item or component.

11. Weights to be carried at each support column, bracket, hanger or other structural member.

12. A complete bill of materials for all equipment.

13. A list of the manufacturer's recommended spare parts. Include gaskets, seals, etc, in the list.

14. The recommended grades of lubricants along with alternative references to equal products of other manufacturers.

15. Complete data on the motors and capacitors in accordance with Division 16.

16. Certification that the gear box gears and bearings are in accordance with this Section.

17. Description of shop surface preparation and prime paint.

18. Operation and maintenance manual.

19. Training Program.

20. Installation requirements including screw laser alignment.

B. In the event that it is not possible to conform with certain details of this Section due to different manufacturing techniques, describe completely all nonconforming aspects.

C. Operating and Maintenance Data

1. Copies of an operating and maintenance manual shall be furnished as provided in Section 01730. The manual shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc, that are required to instruct operating and maintenance personnel unfamiliar with such equipment.

2. A factory representative who has complete knowledge of proper operation and maintenance shall be provided for one 8-hour day to instruct representatives of the Owner and Engineer on proper operation and maintenance. This work may be done in conjunction with the inspection of the installation and test run as provided under Paragraph 3.02 below. If there are difficulties in operation of the equipment due to the manufacturer's design or fabrication, additional service shall be provided at no additional cost to the Owner.

1.04 REFERENCE STANDARDS

A. American Iron and Steel Institute (AISI)

B. American Institute of Steel Construction (AISC)

C. American Gear Manufacturers Association (AGMA)

D. National Electrical Manufacturers Association (NEMA)

E. Anti-Friction Bearing Manufacturers Association (AFBMA)

F. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. All manufactured items provided under this Section shall be new, of current manufacture and shall be the products of reputable manufacturers specializing in manufacture and design of shafted screw conveyors; such manufacturers shall have had a minimum of 5 years experience in design and manufacture of shafted screw conveyors and shall, upon request of the Engineer, furnish the names of successful installations of its equipment of comparable nature to that offered under this contract. A minimum of twelve operating installations manufactured, designed and

supplied by the equipment supplier within the state of Florida, shall be required. All of these installations shall have been operating for a minimum of 3 years. Failure to furnish references acceptable to the Engineer will be cause of rejection.

B. The shafted screw conveyors shall be as manufactured by Keller Angelillis Design & Manufacturing, Inc. or approved equal.

C. Should equipment which differs from this Section and/or the Drawings be offered and determined to be equal to that specified or shown, such equipment will be acceptable only on the basis that any revisions in the design and/or construction of the structure, piping, appurtenant equipment, electrical work, etc, required to accommodate such a substitution shall be made at no additional cost to the Owner and be as approved by the Engineer

1.06 SYSTEM DESCRIPTION

A. All the equipment specified herein is intended to be standard equipment for use in screw conveyor systems for carrying screenings and grit and shall be installed as an integral part of the screenings and future grit removal design as shown on the Drawings.

B. The control of the conveyor is intended to provide for automatic starting of a conveyor directly related to the automatic bar screen and to stop the conveyor automatically when the automatic bar screen has been stopped. Full manual start and stop control, with status lights, will be a control requirement; the conveyor drives will be interlocked with all associated emergency shut-downs.

C. Control of the conveyors shall be provided through a unit control panel supplied by the conveyor manufacturer.

1. Conveyor drives shall all be constant speed.

D. The overall dimensions of the shafted screw conveyors and appurtenances shall fit within the space shown on the Drawings. Verify dimensions and clearances and coordinate the installation of the shafted screw conveyors with the related work included in other Sections. Verify equipment supports, structure dimensions and arrangement and notify the Engineer of any discrepancy before submitting shop and erection drawings

for approval. Coordinate all interfaces of the shafted screw equipment with all related equipment specified in other related Sections. The shafted screw conveyors shall comprise complete coordinated systems including, but not limited to: the shafted screws, drives, troughs, supports, trough covers, liners, gear reducers, motors, discharge chutes, limit switches, motion sensors, and all appurtenances as shown on the Drawings or specified herein.

1.07 MAINTENANCE

A. Tools and Spare Parts

1. One set of all special tools required for normal operation and maintenance shall be provided. A minimum of two liner replacement tools shall be provided.

2. The following spare parts shall be provided:

a. Sufficient wear stripping to completely replace the wear strips on the longest conveyor furnished
b. One complete set of tools and fasteners to make repairs
c. One complete set of all gaskets and seals for each sized chute provided. (Furnish within air-tight plasticene packaging)
d. One replacement motor
e. Sufficient oil for reducer gearmotors to provide two oil changes or an 18 month supply, whichever is greater

1.08 LINER WEAR WARRANTY

A. In addition to the equipment warranty required by the Contract Documents, each screw conveyor's trough liner shall not require replacement due to wear before 3,000 hours of operation or 18 months, after acceptance, whichever comes first. If any screw conveyor trough liner or segment thereof requires replacement due to wear, as evidenced within 3,000 hours of operation or 18 months after acceptance, whichever comes first, provide all labor and materials to replace the entire trough liner without additional cost to the Owner.

B. Liner failure shall be defined by a loss of 25 percent or more of liner depth over a length of more than 0.25 times the flight diameter at any point within the trough; or a

failure of the liner attachment method at more than one point on a given conveyor.

1.09 POLYETHYLENE SCREW WEAR WARRANTY

A. In addition to the equipment warranty required by the Contract Documents, the polyethylene screw shall not require replacement due to wear before 3,000 hours of operation or 18 months, after acceptance, whichever comes first. If any screw requires replacement due to wear, as evidenced within 3,000 hours of operation or 18 months after acceptance, whichever comes first, provide all labor and materials to replace the entire screw without additional cost to the Owner.

B. Polyethylene screw wear failure shall be defined by a loss of 3/8-inch or more of the radius of a 12-inch polyethylene screw which equates to a 6.25% loss of diameter for all screws diameters.

PART 2 - PRODUCTS

2.01 GENERAL

A. This Section calls attention to certain features, but does not purport to cover all details of construction of the equipment. Furnish and install the equipment complete in all details and ready for operation.

B. The shafted screw conveyor systems shall be designed for both continuous and for intermittent operation at a capacity not less than that specified.

C. The exact length of each conveyor will depend on the equipment selected. Ample room and facilities shall be provided for inspection, repairs, lubrication and adjustments.

D. The shafted screw conveyors shall convey screenings and grit in a neat, quiet, dependable, and nuisance-free manner. The equipment furnished shall have adequate capacity to convey the specified quantity of screenings and grit without failure and without exceeding the following trough filling:

1. 50 percent active trough area for horizontal screw conveyors.

E. The compatibility of the shafted screw conveyor equipment and all other related equipment shall be the responsibility of the Contractor.

F. The equipment shall be of high quality and of design and construction which, as a whole, will ensure satisfactory operation at all times under the conditions specified and satisfy the following requirements:

1. There shall be no projecting set screws or other parts to endanger workmen. All devices required for the compliance with safety laws shall be provided.

2. Sharp corners of all cut or sheared edges shall be smoothed by power grinders.

3. Provision shall be made for ample and convenient lubrication of all machinery without danger of injury to the operators.

4. All shafting shall be of ample diameter and provided with suitable bearings for the service required. Suitable means for making adjustment on parts subject to wear shall be provided where necessary.

5. Installations shall be easy to maintain and keep clean. The equipment shall be capable of withstanding a daily washdown using high pressure water.

G. Each conveyor shall be assembled to the greatest extent possible in the manufacturer's shop to ensure proper fitting of parts. Assembled sections shall then be matchmarked for field erection and disassembled prior to shipment. Deliveries shall be shipped in the maximum shipping lengths permitted.

H. Furnish all required anchor bolts and other anchorage for the structure. Anchor bolts, nuts and washers shall be of Type 316 stainless steel unless otherwise specified.

2.02 SHAFTED SCREW CONVEYORS

A. The shafted screw conveyor system shall consist of the following:

1. 12-inch diameter, inclined, right hand polyethylene screw conveyor.

B. The supporting framework for the conveyors shall be of AISI 316 stainless steel designed in conformance with the requirements of the latest revision of the AISC Standards for the Design, Fabrication and Erection of Structural Steel for Buildings, support loads shall be based on a completely filled trough plus dead weight of the equipment. Shop connections may be welded, riveted, or bolted. Supporting framework shall be in accordance with the following criteria:

1. The supporting framework shall be self supporting and designed to a minimum of twice the natural frequency of the screw conveyor unit under all loading conditions.

2. The ratio of the unbraced length to the least radius of gyration (slenderness ratio) shall not exceed 120 for any compression member and shall not exceed 240 for any tension member (of angles about the Z-Z axis).

3. All structural members and connections shall be designed so that the unit stresses will not exceed AISC allowable stresses by more than 1/3 when subject to loading of twice the running torque of the drive motor.

C. The support framework shall be designed and constructed such that each conveyor is independently supported.

D. Supports shall be provided near the drive units (approximately 1 to 2-ft) and at a quantity of not less than one for every 8-ft (or part thereof) of length of trough segment; provide a support adjacent to each transfer or discharge.

E. A separate support consisting of the same size and thickness of materials shall be integrally welded to the trough at the drive end to support the screw conveyor drive weight. A separate similar support foot shall be welded to the end face of the last segment of the trough of each screw conveyor.

F. Supports shall be constructed of AISI 316 stainless steel using welded construction with bolted connections to conveyor casings, feet and support points. Field connections shall be bolted using reamed, subpunched holes and finished bolts as follows:

1. Supporting members attached to concrete shall be by minimum 1/2-in diameter Type 316 stainless steel anchor bolts. A minimum of two bolts shall be used per supporting member.

2. Supporting members attached to structural steel elements shall be by minimum 1/2-in diameter Type 316 stainless steel hex bolts with one flat washer and one lock washer. A minimum of two bolts shall be used at each connection point.

G. Cover plates for shafted screw conveyors shall be provided along the entire conveyor length to contain splatter. Conveyor trough covers shall be clamped covers of 16 gauge, Type 316 stainless steel single-piece formed sheet metal, not greater than 40-in in length, and attached to the screw conveyor trough using toggle clamps with piano hinges on the opposite side. Such clamps shall require no tools to place or remove and when disconnected, such clamps shall not allow any of their parts to become detached from the conveyor trough. Trough covers are to be complete with turned-down edges parallel to the sides of the screw conveyor trough flange and turned up at 90 degrees for receiving a clamping bar at cover joints. Clamps shall be at less than 32-in centers along the length of the screw conveyor trough. Each cover section shall have two handles for ease of removal. The handles shall be made from 3/8-in diameter Type 316 stainless steel and formed into a "U". The handles shall be welded to the covers to a pre- drilled, Type 316 stainless steel backing plate. The backing plate shall be welded to the cover as reinforcing. The handle shall be fully welded to the cover and to the backing plate. Each conveyor trough cover shall be equipped with a wear strip manufactured from the same material as the liner attached to the underside of the cover. This strip shall be used to restrain vertical movement of the flights. In lieu of the strip attached to the covers, alternate holddown provisions may be provided as designed by and recommended by the conveyor manufacturer. A minimum 3/32-in Neoprene gasket of 50 Durometer shall be applied with an appropriate adhesive to the mating surfaces of the trough covers.

H. Spiral flighting for the shafted screw conveyors shall be full pitch, mounted on a 2.5 in x 3/16 in Type 316 stainless steel square tube. The drive and tail shaft shall be Type 316 stainless steel. The tail shaft shall run in a “Arguto” oil impregnated wooden bearing.

I. Conveyor troughs shall be fabricated from minimum 10 gauge Type 316 stainless steel. At the drive end of each trough, provide 1/4 in X 2 in end flanges with 1/4-in thick Type 316 stainless steel end plate and drive support base of all welded construction upon which the conveyor drive assembly shall be mounted. Trough segments shall consist of rolled sections with flanges butt welded together. The maximum length of a single segment shall not exceed 20-ft in length. The rolled trough sections shall have the specified diameter within a tolerance of plus or minus 0.010-in. Trough end flanges shall be roll formed of minimum inch by 3/8-in thick Type 316 stainless steel bar welded to the ends of the trough segments. Transition flange offset angles shall be accurate to plus or minus 0.25 degrees. Bolt holes for joining trough sections shall be located on the centerline of the roll formed flange within a tolerance of plus or minus 0.005-in of the theoretical radius centerline and at distances between adjacent bolt holes as shown on the Drawings with a tolerance of plus or minus 0.010-in. Bolt holes shall be uniformly located on either side of the trough's vertical centerline. A minimum 1/8-in Neoprene gasket of 50 Durometer shall be applied with an appropriate adhesive to flange faces. Alternatively, an approved compressible flow type string gasket material shall be applied to the flange faces. Support feet shall be provided at each vertical support location. Each support shall be made of Type 316 stainless steel. The dimensions and arrangement of the steel members for the support feet shall be as recommended by the conveyor manufacturer.

1. Trough stiffener channels made from Type 316 stainless steel approximately 2-1/2-in wide by 7/8-in deep by 1/8-in thickness shall be installed across the width of all troughs at a maximum center-to-center distance of 40-in. Each trough stiffener channel shall have down turned end. Each down turned end shall be drilled for, and bolted with a Type 316 stainless steel bolt. The trough stiffener channels' center to center spacing shall be set to seal the faces upon which the rough covers and chutes are bolted. Trough stiffener channels shall be bolted in place prior to shipment from the manufacturer.

J. The conveyor troughs shall be equipped as follows:

1. Each inclined screw conveyor trough shall have a 1-1/2-in diameter dewatering pipe connection at its

lower end for connection to the conveyor drain line. Pipe connection shall be fitted with tees, 45 degree bends, horizontal extension, and gate valve located in such a manner to provide positive drainage and easy access for cleaning out the drain. Horizontal extension and gate valve shall not present a tripping hazard.

2. The last trough cover of each inclined conveyor (discharge end) shall have a 3/4-in male hose thread of Type 316 stainless steel welded thereto to provide hose connection for flushing and water lubrication. The weldament shall be located at the center of the cover, approximately 1.5-ft upflow of the conveyor discharge. Weld shall be continuous and free of voids.

K. Shafted screw conveyor liner material shall be an industrial plastimeric material minimum 1/2-in thickness. The liner shall extend the full length of the trough, covering the entire semicircular bottom portion of the trough.

1. The liner material shall meet or exceed the following requirements.

   a. Yield strength at 75 degrees F: 5,000 psi
   b. Ultimate tensile strength at 75 degrees F: 8,500 psi
   c. Break elongation at 75 degrees F: 250 percent
   d. Dynamic coefficient of friction when running dry against polished steel: 0.10, work hardened: 0.08
   e. Resistant against acids, grease and chemicals, no water penetration.

2. Liner material shall be an ultra high molecular weight (UHMW) polyethylene Duraslide Xylethon manufactured by Durawear Corp. or equal.

3. The liners shall be installed as parallel strips, and shall be secured at intervals not to exceed 10-ft, using Type 316 stainless steel retaining clips of an approved design.

L. Each trough shall be equipped with filling and/or discharge chutes for transferring material to the dumpster chute. It shall be equipped to receive headwork screenings as well as grit from a future grit classifier.

1. Chutes shall be of all welded construction and be fabricated from at least 10 gauge Type 316 stainless steel. The juncture of all joints in plates shall be continuously seal welded inside and out so that the chutes are watertight. External stiffening ribs shall be provided as required to limit stresses and deformation in plates during shipping, installation and operation. Filling chutes from the equipment shall be supported from the conveyor trough or support framework but not from the equipment itself. The inlet chutes shall discharge into the top of the hinged covers. The discharge chute shall have a bolt on flange to match with the field equipment.

M. Each screw conveyor shall be driven by an electric motor connected to a gear reducer. The gear reducer shall be mounted to the trough end. The drive system shall be designed for starting the conveyor fully loaded. Drive size shall be as recommended by the manufacturer. All electric motors shall be totally enclosed and fan cooled. Motor input and drive output shall be perpendicular.

1. The drive motors shall be horizontal, severe duty, 1.15 service factor, NEMA Design B and shall conform to the motor specification in Section 16150. Horsepower shall be as determined by the conveyor manufacturer to be adequate to drive the equipment under all operating conditions but shall not exceed 3 Hp for horizontal shafted screw conveyors and shall not exceed 5 Hp for inclined shafted screw conveyors. Motor speed shall not exceed 1750 rpm and be designed for harsh environments. The service factor shall not be reduced under normal maximum loadings.

N. All gear reducers shall be commercially built, to minimum Quality Class No. II per AGMA Standard 390.03 Gear Classification Manual. Gear reducers shall be Dodge SCXT 225 double reduction gear reducer with “V” belt drive or equal. The belt guard shall be made out of 16-gauge Type 316 stainless steel. Gears shall be made of alloy steel, protuberance hobbed, gas carburized, oil quenched hardened, steel shot peened and ground, with a surface hardness after grinding of Rockwell RC-60 or greater and meeting the requirements of AGMA Standard 218.01. Gear reducers shall be suitable for the loading conditions imposed on the input shaft in the mounting arrangement shown on the Drawings. The gear reducers shall be suitable for continuous duty service with moderate shock

loadings and sized at the gear reducer's output shaft speed for not less than the greater of:

1. 1.5 times the break horsepower at the gear reducer output shaft.

2. 1.0 times the name plate motor horsepower of the drive motor.

3. Bearings shall be designed for the thrust loads from the spiral flights and shall have an AFBMA B-10 life of 50,000 hours. The reducers shall be standard oil lubricated, air-cooled units with no auxiliary cooling allowed. Low speed output shaft shall be chrome plated. Shaft seals shall be triple lipseal with taconite packing designed for severe conditions. The gear reducer housing shall be cast iron with removable inspection covers, oil breathers, oil level indicators and oil drain plugs. Gear reducers that are shipped from the factory without an initial factory oil fill shall be adequately treated or coated before shipment to protect the units during shipment and storage. Prior to installing the units, they shall be drained, flushed and filled with oil.

O. All necessary supports for the conveyors and the drive motors shall be provided by the manufacturer with the conveyor.

2.03 CONTROLS AND LOCAL CONTROL PANEL

A. Each conveyor shall be equipped with a motion failure alarm unit. The location and mounting details of these sensors shall be as recommended by the conveyor manufacturer and approved by the Engineer. Motion sensors shall be the non-contacting type using a probe with pre-amplifier and main electronic assembly. The probe shall be totally enclosed so it is impervious to dust and moisture. The pre-amplifier, if part of the probe, shall also be sealed. The operating temperature range shall be minus 40 to plus 140 degrees F. The probe shall be able to detect a moving ferromagnetic material from 1 to 2-in away. The ferromagnetic material shall be sensed during each rotation of the conveyor spiral and the probe shall produce a voltage pulse. This pulse shall be processed by the pre-amplifier which is wired to the main electronic unit. The main electronic unit shall operate on 120 Volt, single phase, 60 Hz power supply and

shall be housed in a NEMA 4X enclosure. The output shall be two form C contacts for remote alarm.

B. Each conveyor shall be furnished with emergency trip cord and trip switch. The safety trip cords shall be provided along both sides of each conveyor. Trip switch shall immediately stop conveyor when trip cord is pulled.

C. Each conveyor shall be provided with a local control panel for operation of the conveyor and shall incorporate all necessary devices to completely control the unit.

D. The control panel shall be a NEMA 4X stainless steel enclosure and shall be suitable for rack mounting. The control panel shall conform to the requirements of Section 13320 – Control Enclosures. All door-mounted equipment shall meet the enclosure rating so as to maintain the enclosure rating.

E. The following panel mounted devices, switches and indicators shall be provided, as a minimum:
   1. Power On indicating light.
   2. Emergency Stop pushbuttons at the enclosure.
   3. Hand-Off-Auto selector switch.
   4. Run Status indicating light.
   5. Motor Overload indicating light.
   6. Conveyor Start delay timer
   7. Conveyor Stop delay timer
   8. Overload Reset pushbutton
   9. Auxiliary contacts for remote indication of Run Status, Common Failure and Emergency Stop.

F. When the conveyor selector switch is in the Hand position, the conveyor shall operate continuously. When the selector switch is in the Off position, the conveyor shall not operate. When the selector switch is in the Auto position, the operation of the conveyor shall be tied to the operation of the bar screen.

G. When the bar screen begins operation, an adjustable 0-60 second start time delay will be generated for the conveyor. At the completion of the delay, the conveyor will start and will continue to run until the end of the bar screen cycle. The completion of the bar screen cycle will generate an adjustable 0-5 minute stop time delay for the conveyor. At the completion of the delay, the conveyor will stop.

H. The control panel shall be designed to operate using a 480 VAC, three-phase power source with control power at

120 VAC, single-phase. The panel shall be furnished with a main fusible or circuit breaker type disconnect switch with an external operable handle.

2.04 SURFACE PREPARATION AND SHOP PRIME PAINTING

A. Surface preparation and shop priming shall be part of the work of this Section and shall be as specified in Section 09900 and 09902. Ensure that shop painting and field painting are compatible. Stainless steel shall not be painted.

2.05 SHOP TESTING

A. Each conveyor shall be fully shop assembled and tested for conformance to the specified requirements, modified to reflect the use of a substitute material for the (screenings and grit) of similar density and fluidity.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The equipment shall be installed in accordance with the instructions and recommendations of the manufacturer and as indicated on the Drawings. Coordinate the equipment with the requirements of the related automatic bar screen and future grit classifier to obtain a complete, integrated and satisfactory operating installation of the conveying equipment.

B. Installation shall include furnishing the required oil and grease for initial operation. The grades of oil and grease shall be in accordance with the manufacturer's recommendations. Anchor bolts shall be furnished by the equipment manufacturer and set by the Contractor in accordance with the manufacturer's recommendations and setting Drawings.

3.02 INSPECTION AND TESTING

A. Furnish the services of a qualified factory representative as provided in Paragraph 1.03 above, to inspect the final installation and supervise testing of the equipment.

B. Upon completion of installation, the conveyors shall be operated by the Contractor in the presence of the

Engineer to demonstrate the ability of the conveyors to operate smoothly and the drive unit to operate continuously without noise, vibration or generation of excessive heat. The screw installation shall be confirmed to be laser aligned. The test shall also indicate no other apparent deficiencies in the system. The slide gates will be tested for jam free operation on opening and closing. Each gate will be cycled a minimum of twenty times and shall operate smoothly prior to acceptance.

3.03 FINAL ACCEPTANCE TESTING

A. A Final Acceptance Test shall be made under regular operating conditions to further demonstrate the ability of the conveyors to convey the screenings and grit hoppers and discharge it to the dumpsters, for a period of not less than seventy-two (72) hours with no deficiencies.

B. Any deficiencies found in the equipment shall be remedied by the Contractor at no additional cost to the Owner, and the Final Acceptance Test shall be redone.

END OF SECTION

SECTION 11315

SELF-CLEANING INFLUENT SCREEN

PART 1 - GENERAL

1.01 REQUIREMENTS

A. The Contractor shall furnish and install one (1) new fully automatic screening unit complete and operable, in accordance with the Contract Documents. The equipment shall be of the latest design and shall be fabricated of materials and in a fashion that will fully perform the functions described below.

B. The Contractor shall have the responsibility to coordinate the installation of the equipment.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01600 - Materials and Equipment

B. Section 05500 - Miscellaneous Metals

C. Section 09900 – Painting and Coatings

D. Division 16 - Electrical

1.03 SUBMITTALS

A. Product Data - In accordance with Section 01340 – Shop Drawings, Project Data and Samples, submit manufacturer's technical product data, including installation instructions for the unit. Include range, ratings, detailed drawings and electrical diagrams, certified by the manufacturer.

1.04 MANUFACTURER'S SERVICE

A. The Contractor shall obtain the services of a qualified factory representative following installation for startup inspection and training of the plant operations staff. The factory representative shall be on-site for at least two full days.

1.05 QUALITY ASSURANCE

A. Manufacturer's Qualifications - Firms regularly engaged in the manufacture of screening equipment and wastewater treatment plant equipment of the type and size required. Manufacturers must have been engaged in the manufacture of similar systems for a minimum of five (5) years and have similar units in satisfactory service. The Manufacturer must supply all equipment.

PART 2 - PRODUCTS

2.01 EXPERIENCE

A. The Contractor shall provide only products that have a proven reliability record of at least five (5) years in operation. NO equipment shall be considered which has an operating history of less than five (5) years.

2.02 SCREENING

A. The automatic self-cleaning filter screen shall be suitable for installation and operation in a channel measuring 4.0 ft. wide and 5.0 ft. deep, as measured from the nominal elevation of the channel bottom one channel width behind its base. The angle of inclination shall be 75 degrees from horizontal. There shall be a 0.50 feet recess (notch) in the channel bottom to accommodate the base of the screen.

B. The opening from which the unit discharges screenings from its enclosure shall be at least 5.0 ft. above the elevation at which its support legs are mounted. This is the available clearance for the compactor to collect the debris.

C. The total discharge height of the screen, as measured from its base to the screenings discharge point, shall be 10.5 ft.

D. The screen shall be capable of passing a maximum of 15.0 MGD of wastewater with a downstream water level of 2.25 ft. based on a nominal unit width of 4 ft. The loss of head at the maximum flow of clean water shall not exceed 21 inches of water. The head loss calculation is based on assumption of a clean screen, clean water and steady state flow.

E. The screen shall be capable of presenting a clean

filtration surface to the influent stream at all times during continuous operation. It shall be capable of intermittent operation in order to form a mat of material to provide maximum trash removal. Additionally, in order to maximize the capture of paper, rags, and other flexible debris, which tends to drape over and adhere to the filtration surfaces, the screen shall have 0.694 square feet of contact surface area per square foot of wetted filtration belt frontal surface.

F. The unit shall be capable of handling 4.128 cubic yards per hour of trash in order to ensure that the maximum amount captured by the screen can be transported out of the channel and into the waiting receptacle.

2.03 EQUIPMENT

A. Screening

1. The frame of the unit, which is stationary, shall be constructed from 316 stainless steel with a thickness of 1/2 inch. It supports and locates all of the operating components. The unit shall rest at the bottom of the channel, and be anchored at the operating floor elevation. No mounting or fastening of the unit frame shall be required to the sidewalls or bottom of the channel.

2. The "A" frame unit shall be supported at the operating floor elevation by support legs constructed from 316 stainless steel. The legs shall be designed to allow the unit to pivot the screen out of the channel without dewatering (e.g. for bypass purposes). Routine service of the unit is possible with the screen in the channel.

3. Guide rails shall be mounted to each side on the inside surface of the frame to direct the filter belt during its ascension out of the channel. The guide rails shall be 1 inch thick and will be constructed from 316 stainless steel.

4. At the top of the screen, circular chain guides shall gently direct the filter belt from its ascending path out of the channel towards the drive sprockets. These circular guides shall be constructed from 316 stainless steel and shall be welded to a 316 stainless steel shaft. In order to reduce the wear on both the chain and chain guides,

the shaft shall be secured to bearings on each side of the frame and free to rotate.

5. Circular chain guides shall also be provided to direct the filter belt from the drive sprockets to the descending path into the channel. These circular guides shall be constructed from 3/4-inch thick 316 stainless steel and shall be welded to a 316 stainless steel shaft. In order to reduce the wear on both the chain and chain guides, the shaft shall be secured to bearings on each side of the frame and free to rotate.

6. Lower return guides shall be provided at the base of the screen to direct the filter belt during its 180-degree turn from the descending to ascending paths. The lower guide rails shall be constructed from 316 stainless steel and shall be fixed in place as low as possible in the frame to optimize the submerged screen area. No submerged bearing or rotating guides are used that will require routine maintenance or that may become fouled by trash and debris.

7. Neoprene rubber seals with 316 stainless steel backing plates shall be mounted along the upstream edges of the frame to seal the outer edge of the frame against the channel wall, and the area between the frame and filter belt side plates.

8. The bottom of the unit shall be sealed with two rows of nylon brushes, which allow the elements to pass through, but prevents trash from passing beneath the filter elements, ensuring capture of all solids and trash by the filter belt.

9. All shaft bearings are mounted externally to the side frame for ease of access and maintenance.

10. The portion of the screen above the channel shall be equipped with covers to help control the emission of odors and protect operators from contact with moving parts. The covers will also minimize misting and dripping. All enclosures shall be removable. There shall be hinged sections on the front and rear of the unit for access to the screen and rotating brush assembly for periodic maintenance. The covers shall be fabricated from 14 gage 316 stainless steel.

B. Filter Belt/Screen Assembly

1. The screen shall provide dual filtration of all materials in order to minimize compaction of captured debris and minimize the head loss through the screen. This shall be accomplished by recessing the horizontal fine filtration opening in the face of the screen. The coarse horizontal openings formed by the upper or forward shank/arm of the elements shall be 14 mm and shall be the first opening the flow stream contacts as it passes through the screen. The lower or recessed shank/arm of the elements shall create a two dimensional grid which limits the maximum vertical opening to 59 mm and the fine horizontal opening of 6 mm. The elements are arranged in a staggered fashion to form an endless belt and to create a range of motion that allows the recessed shank/arm of one row of elements to pass through the plane of the forward arm of the next row of elements it meshes with. Each filter element shall be a single molded component with a rake integral to its shape. The filter belt shall form a row of these rakes spaced every 8 inches, capable of lifting material of up to 7 inches in diameter out of the channel. The elements are secured to two separate filter shafts that pass through individual bosses in the elements.

2. The side plates (or end plates) are mounted next to the outermost elements of each filter row, and overlap to form a continuous moving sidewall for the filter belt. This moving wall prevents captured trash and debris from spilling over the sides of the filter belt. The side plates shall be constructed from a high strength phenolic resin.

3. The tension of the moving screen/filter belt assembly shall be completely supported by a stainless steel link chain. The chain must connect the filter shaft ends on both sides of the belt assembly so that the elements are free of tension, and support no weight of the assembly. The chain shall be of closed link design with 2 link sidebars, chain rollers and pins per link. The chain assembly shall have a minimum cross sectional

area of 0.203 square inches at the weakest point of any individual link sidebar.

4. Chains shall be supplied with hollow pins that allow for the removal and replacement of the filter shafts, side plates and filter elements without releasing the chain tension. The unit is designed to allow this function to take place at the operating floor elevation with the screen in the channel. Chain rollers shall have a diameter of 3 inches.

5. All chain components shall be corrosion resistant stainless steel. Sidebars shall be 316 stainless steel. Pins and rollers shall be 17-4 stainless steel and the bushings shall be 17-4 stainless steel. 400 series components shall be heat treated to a minimum hardness of 39 on the Rockwell C Scale.

6. The filter shafts shall have a diameter of 1-3/8 inch and be spaced on 8-inch centers in the direction of travel of the filter belt. The shafts shall be constructed from 316 stainless steel.

C. Drive Assembly

1. The drive assembly consists of a gear reducer, motor, drive, sprocket, driven sprocket, drive chain, drive chain idler, drive shaft, and take up bearings. The drive mechanism shall be protected from the trash stream to ensure that the screen runs smoothly without jamming. The driving force must be transmitted to clean, trash free components to avoid mis-tracking or binding, which could render the screen inoperable, requiring manual cleaning and realignment.

2. The gear reducer is to be of cycloid gear design by Sumimoto or equal, mounted directly on to the unit at the top of the frame and connected to the drive shaft with a with the drive chain, drive and driven sprockets. The reducer shall be designed in accordance with AGMA recommendations for Class II service based on the required horsepower for operation of the machine.

3. The motor shall be a squirrel cage induction motor, TEFC, 230/460 volt, 3-phase, 60 Hz, 1800 RPM by Reliance. The motor Horsepower shall be ½ Hp. Motor shall be acceptable for use in a Class 1 Division 2

environment in accordance with paragraph 501-8(b) of the National Electrical Code.

4. Overload protection shall be provided by an electrical overload device that senses motor current draw.

5. The filter belt drive shaft is located in the head of the unit and is supported at each end by the take up bearings. The filter belt sprockets that engage the filter bed chain rollers and transmit motion to the filter belt assembly are welded to the drive shaft. The drive shaft, sprockets and stub ends shall be fabricated from type 316 stainless steel.

D. Rotating Brush Assembly

1. The filter belt assembly is cleaned by the interaction of the filter elements and the rotating brush assembly without requiring any water or other mechanical devices capable of jamming (i.e. doctor blade) to remove the captured material.

2. The rotating brush assembly is supported by bearings on each side of the machine mounted externally to the machine frame. The brush is chain driven by the filter belt drive shaft.

3. The brush is comprised of three separate components, the brush shaft, the brush and the brush hubs. The shaft is made of 316 stainless steel. The brush is composed of nylon bristles and secured to the shaft at each end by the brush hubs. The brush hubs are made of 316 stainless steel.

4. The brush shall be orientated in a paddlewheel design with rows of bristles located at 90,180, 270, and 360 degrees.

E. Discharge Chute

1. A discharge chute shall be provided integral to the machine, constructed from 14 gage 316 stainless steel and designed to direct the screenings to the collection equipment below.

2. The chute shall have a 1/4-inch thick flange that shall allow it to be connected to and collection equipment.

F. Lubrication

1. Lubrication lines hall be extended from each bearing housing to a central point located on the respective side of the machine, accessible from the operating floor for ease of maintenance.

2.06 FASTENERS

A. All fasteners will be type 316 stainless steel.

2.07 SURFACE FINISH

A. Surface Treatment of Stainless Steel Components. All frame and structural members will be mechanically cleaned using Dupont Starblast. Sheet metal components such as covers or the discharge chute will be furnished with a 2B finish.

B. Motors, gear reducers, bearings, sprockets and solenoid valves will be manufacturer's standard finish.

2.08 ELECTRICAL DEVICES AND CONTROLS

A. Electrical Devices: Interconnecting conduit and wiring will be the responsibility of the installing contractor. In addition to the drive motors, the following electrical devices will be furnished with each system:

1. Explosion Proof Ultrasonic Differential Level Sensors. A Siemens HydroRanger 200 ultrasonic level controller will be supplied with two (2) ST-H transducers, FM rated for Class 1, Division 1, Groups C and D. Each sensor is supplied with 33 feet of integral cable with a 1-inch NPT conduit connection. A 316 stainless steel mounting bracket will be provided for each sensor.

2. Emergency Stop Local Push Button Station. A NEMA 4X polycarbonate emergency stop push button station will be mounted to the frame of the unit with a 1/2" NPT conduit connection.

B. Controls: The following controls will be provided: A 480 Volt primary U.L. listed and labeled control panel in a NEMA 4X enclosure. It will contain the following logic devices for proper operation of the equipment.

1. Programmable relay to perform necessary logic functions and monitor equipment mounted electrical

devices.

2. Emergency Stop push button.
3. Hand-Off-Auto selector switch for screen operation.
4. Control power and run indicating lights.
5. Motor current monitor and hour meter.
6. Fault indicating light and system reset pushbutton.
7. Run and fault auxiliary dry contact outputs for customer use. Each output shall be form "C" rated for minimum 3 amps resistive at 24 volts DC.

C. A step-down control transformer, motor starter and main disconnect will be provided.

D. Sequence of Operation

1. Hand Operation.

a. Screen. When the Hand mode is selected the screen will run forward continuously. Placing the selector switch in the OFF position will stop the screen.

2. Automatic Operation

a. Screen. When the Auto mode is selected, the unit will run via the water level sensor or repeat cycle timer. After the water level has lowered, the unit will continue to run for the length of time set on the off delay timer, typically set at 30 seconds.

3. Emergency Stop. The units can be deactivated at any time by pressing either the control panel or unit mounted Emergency Stop push buttons.

4. Fault Conditions. Motor overload or high motor current will stop the drive motors and illuminate the fault light.

2.09 ANCHOR BOLTS

A. The manufacturer will supply 316 stainless steel threaded rods for use with the HILTI HY-150 Adhesive Anchoring system. Adhesive to be provided by others.

2.10 FACTORY SERVICE

A. The manufacturer will provide a qualified service representative following installation for one (1) trip for two (2) days for inspection of installation,

equipment startup and operator training.

2.11 FACTORY ASSEMBLY, TESTING, AND INSPECTION

A. The equipment shall be factory assembled and tested prior to being shipped. The Engineer and/or Owner may, at their option and own expense, witness the factory test. The equipment will be shipped completely assembled other than the motor/reducer, discharge chute and support legs. It shall be capable of being set in place and field erected by the contractor with a minimum of field assembly.

2.12 INSTALLATION, OPERATION AND MAINTENANCE MANUAL

A. In addition to the normal Installation, Operation, and Maintenance manuals required by the contract, a spare manual will be shipped with the unit in order to allow for proper operation of the equipment prior to the release of all final Installation, Operation, and Maintenance manuals.

2.13 SPARE PARTS

The following spare parts shall be provided for each automatic self-cleaning filter screen.

A. 20 - Filter Elements
B. 10 - Side Plates
C. 20 - Snap Rings, 1-3/8” Dia.
D. 10 - Snap Rings, 1-11/16" Dia.
E. 1 - Rotating Brush Core Placement Assembly.

2.14 MANUFACTURER

The manufacturer shall be Parkson Corporation, Ft. of Lauderdale, Florida. There shall be no approved equals.

PART 3 - EXECUTION

3.01 GENERAL

A. Installation shall be in strict accordance with contract documents and requirements of the manufacturer's written instructions and shop drawings. It is the Contractor's responsibility to verify the accuracy of all necessary

dimensions in the field to ensure compatibility with the specifications and equipment.

B. In the event that equipment is supplied which is different than specified, it shall be the responsibility of the Contractor to coordinate and make all changes to related structures, controls, drawings and documentation. All changes must be reviewed and approved by the engineer prior to any installation of equipment. In addition, all costs associated with such changes shall be borne by the Contractor.

3.02 EQUIPMENT TESTING

A. Upon completion of installation by the Contractor and startup of the equipment by the Manufacturer's field service representative, the equipment shall be operated for a minimum of seventy two (72) hours with no deficiencies as a Final Acceptance Test. The purpose is to ensure that all clearances, vibrations, tracking and motor operating characteristics are within acceptable limits.

B. Any deficiencies found in the equipment shall be remedied by the Contractor at no additional cost to the Owner, and the Final Acceptance Test shall be redone.

END OF SECTION

North Water Reclamation Facility
Manatee County, Florida

PLC Input / Output Schedule

TAG	DESCRIPTION	TYPE	MIN	MAX	EGU	PANEL	COMMENTS
LSH-131	Bar Screen 3 Channel High Level	DI	NORMAL	ALARM		SP-1	
dLIT-132	Bar Screen 3 Channel Differential Level	AI	0	XX	INCHES	SP-1	
OL-132	Bar Screen 3 Run Status	DI	OFF	ON		SP-1	
OA-132-1	Bar Screen 3 Fail	DI	OFF	ALARM		SP-1	
OA-132-2	Bar Screen 3 E-Stop	DI	OFF	ALARM		SP-1	
OL-133	Screw Conveyor 3 Run Status	DI	OFF	ON		SP-1	
OA-132-1	Screw Conveyor 3 Fail	DI	OFF	ALARM		SP-1	
OA-132-2	Screw Conveyor 3 E-Stop	DI	OFF	ALARM		SP-1	
OL-316-1	Aeration Basin 1 Internal Recycle Pump No. 1 In Remote	DI	OFF	REMOTE		SP-4	
OL-316-2	Aeration Basin 1 Internal Recycle Pump No. 1 Fast Run Status	DI	OFF	FAST		SP-4	
OL-316-3	Aeration Basin 1 Internal Recycle Pump No. 1 Slow Run Status	DI	OFF	SLOW		SP-4	
OA-316	Aeration Basin 1 Internal Recycle Pump No. 1 Fail	DI	NORMAL	FAIL		SP-4	
HC-316-1	Aeration Basin 1 Internal Recycle Pump No. 1 Call to Run Fast	DO	OFF	FAST		SP-4	
HC-316-2	Aeration Basin 1 Internal Recycle Pump No. 1 Call to Run Slow	DO	OFF	SLOW		SP-4	
ZSL-316	Aeration Basin 1 Internal Recycle Pump No. 1 No Flow	DI	OFF	ALARM		SP-4	
OL-317-1	Aeration Basin 1 Internal Recycle Pump No. 2 In Remote	DI	OFF	REMOTE		SP-4	
OL-317-2	Aeration Basin 1 Internal Recycle Pump No. 2 Fast Run Status	DI	OFF	FAST		SP-4	
OL-317-3	Aeration Basin 1 Internal Recycle Pump No. 2 Slow Run Status	DI	OFF	SLOW		SP-4	
OA-317	Aeration Basin 1 Internal Recycle Pump No. 2 Fail	DI	NORMAL	FAIL		SP-4	
HC-317-1	Aeration Basin 1 Internal Recycle Pump No. 2 Call to Run Fast	DO	OFF	FAST		SP-4	
HC-317-2	Aeration Basin 1 Internal Recycle Pump No. 2 Call to Run Slow	DO	OFF	SLOW		SP-4	
ZSL-317	Aeration Basin 1 Internal Recycle Pump No. 2 No Flow	DI	OFF	ALARM		SP-4	
OL-326-1	Aeration Basin 2 Internal Recycle Pump No. 1 In Remote	DI	OFF	REMOTE		SP-4	
OL-326-2	Aeration Basin 2 Internal Recycle Pump No. 1 Fast Run Status	DI	OFF	FAST		SP-4	
OL-326-3	Aeration Basin 2 Internal Recycle Pump No. 1 Slow Run Status	DI	OFF	SLOW		SP-4	
OA-326	Aeration Basin 2 Internal Recycle Pump No. 1 Fail	DI	NORMAL	FAIL		SP-4	
HC-326-1	Aeration Basin 2 Internal Recycle Pump No. 1 Call to Run Fast	DO	OFF	FAST		SP-4	
HC-326-2	Aeration Basin 2 Internal Recycle Pump No. 1 Call to Run Slow	DO	OFF	SLOW		SP-4	
ZSL-326	Aeration Basin 2 Internal Recycle Pump No. 1 No Flow	DI	OFF	ALARM		SP-4	
OL-327-1	Aeration Basin 2 Internal Recycle Pump No. 2 In Remote	DI	OFF	REMOTE		SP-4	
OL-327-2	Aeration Basin 2 Internal Recycle Pump No. 2 Fast Run Status	DI	OFF	FAST		SP-4	
OL-327-3	Aeration Basin 2 Internal Recycle Pump No. 2 Slow Run Status	DI	OFF	SLOW		SP-4	
OA-327	Aeration Basin 2 Internal Recycle Pump No. 2 Fail	DI	NORMAL	FAIL		SP-4	
HC-327-1	Aeration Basin 2 Internal Recycle Pump No. 2 Call to Run Fast	DO	OFF	FAST		SP-4	
HC-327-2	Aeration Basin 2 Internal Recycle Pump No. 2 Call to Run Slow	DO	OFF	SLOW		SP-4	
ZSL-327	Aeration Basin 2 Internal Recycle Pump No. 2 No Flow	DI	OFF	ALARM		SP-4	
OL-701	Golf Course Storage Lake Control Valve No 1 In Remote	DI	OFF	REMOTE		DFS RTU	
ZCO-701	Golf Course Storage Lake Control Valve No 1 Command to Open	DO	OFF	OPEN		DFS RTU	
ZCC-701	Golf Course Storage Lake Control Valve No 1 Command to Close	DO	OFF	CLOSE		DFS RTU	
ZIO-701	Golf Course Storage Lake Control Valve No 1 Open	DI	OFF	OPEN		DFS RTU	
ZIC-701	Golf Course Storage Lake Control Valve No 1 Closed	DI	OFF	CLOSED		DFS RTU	
OA-701	Golf Course Storage Lake Control Valve No 1 Fail	DI	OFF	FAIL		DFS RTU	
OL-702	Lake Storage Outfall Isolation Valve In Remote	DI	OFF	REMOTE		DFS RTU	
ZSC-702	Lake Storage Outfall Isolation Valve Closed	DO	OFF	OPEN		DFS RTU	
ZSO-702	Lake Storage Outfall Isolation Valve Open	DO	OFF	CLOSE		DFS RTU	
ZCC-702	Lake Storage Outfall Isolation Valve Command to Close	DI	OFF	OPEN		DFS RTU	
ZCO-702	Lake Storage Outfall Isolation Valve Command to Open	DI	OFF	CLOSED		DFS RTU	
OA-702	Lake Storage Outfall Isolation Valve Fail	DI	OFF	FAIL		DFS RTU	
OA-707	Lake Storage Return Valve Fail	DI	OFF	FAIL		DFS RTU	
OL-707	Lake Storage Return Valve in Remote	DI	OFF	REMOTE		SP-3	
ZSC-707	Lake Storage Return Valve Closed	DI	OFF	CLOSED		SP-3	

North Water Reclamation Facility
Manatee County, Florida

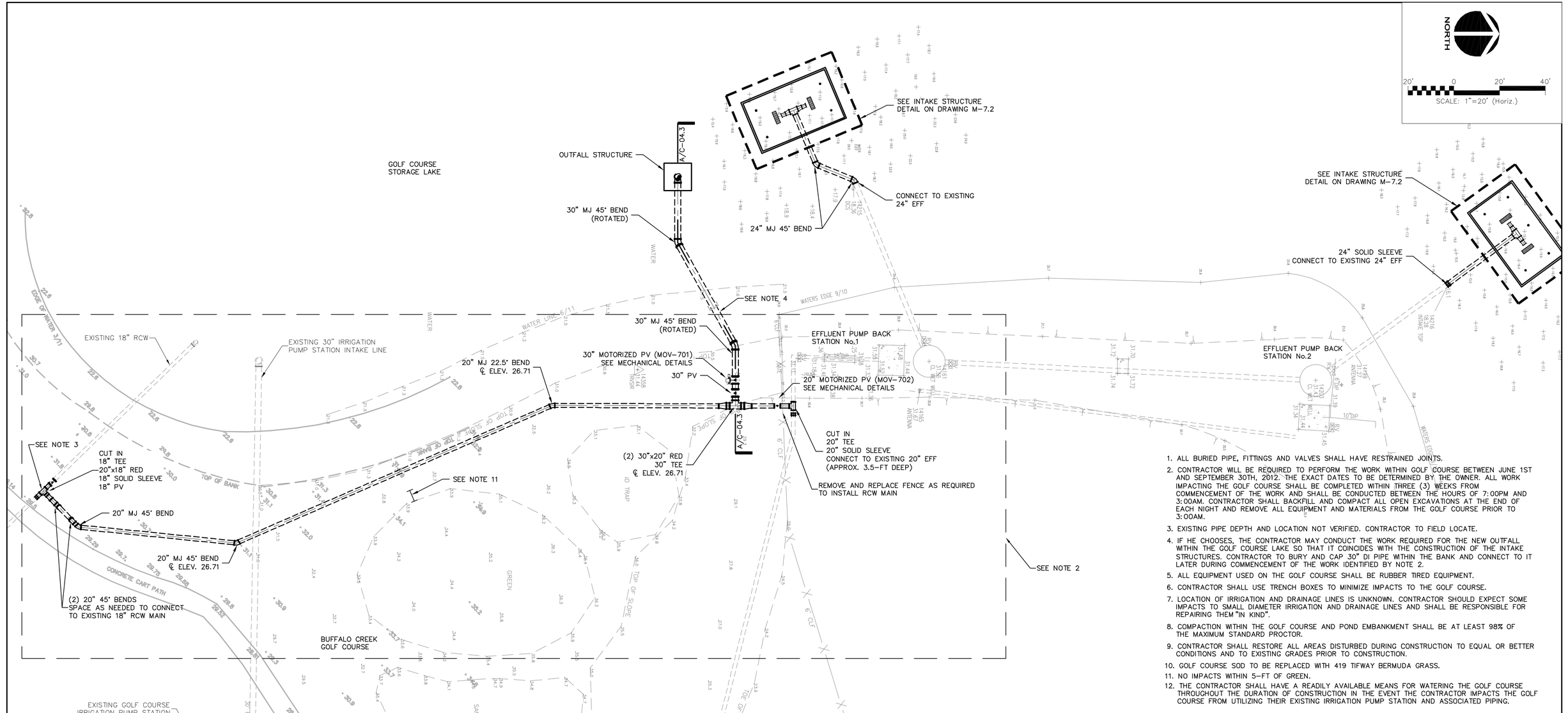
PLC Input / Output Schedule

ZSO-707	Lake Storage Return Valve Open	DI	OFF	OPEN		SP-3	
ZCC-707	Lake Storage Return Valve Command to Close	DO	OFF	CLOSE		SP-3	
ZCO-707	Lake Storage Return Valve Command to Open	DO	OFF	OPEN		SP-3	
FI-709	Golf Course Lake Return Flow	AI	0	1500	GPM	SP-8	
FI-710	Golf Course Lake Storage Flow	AI	0	1500	GPM	SP-4	
OA-711	Golf Course Lake Storage Control Valve Fail	DI	OFF	FAIL		SP-4	
OL-711	Golf Course Lake Storage Control Valve in Remote	DI	OFF	REMOTE		SP-4	
ZCC-711	Golf Course Lake Storage Control Valve Close Command	DO	OFF	CLOSE		SP-4	
ZCO-711	Golf Course Lake Storage Control Valve Open Command	DO	OFF	OPEN		SP-4	
ZSC-711	Golf Course Lake Storage Control Valve Closed	DI	OFF	CLOSED		SP-4	
ZSO-711	Golf Course Lake Storage Control Valve Opened	DI	OFF	OPEN		SP-4	
ZSC-712	Effluent Pump Station to Lake Storage Valve Closed	DI	OFF	CLOSED		DFS	
ZCC-712	Effluent Pump Station to Lake Storage Valve Command to Close	DO	OFF	CLOSE		DFS	
PIT-713	M.A.R.S System Pressure	AI	0	1500		DFS	
ZCO-713	M.A.R.S Return Valve Open Command	DO	OFF	OPEN		SP-8	
ZSO-713	M.A.R.S Return Valve Opened	DI	OFF	OPEN		SP-8	
OL-714	Lake Gravity Disk Filters Inlet Valve in Remote	DI	OFF	REMOTE		SP-8	
ZI-714	Lake Gravity Disk Filters Inlet Valve Position Feedback	AI	0	100	%	SP-8	
ZC-714	Lake Gravity Disk Filters Inlet Valve Position Command	AO	0	100	%	SP-8	
PIT-717	Effluent To Storage System Pressure	AI	0	1500		SP-4	
ZSC-719	Effluent Pump to Storage Valve Closed	DI	OFF	CLOSED		SP-4	
ZSO-719	Effluent Pump to Storage Valve Open	DI	OFF	OPEN		SP-4	
ZCC-719	Effluent Pump to Storage Command to Close	DO	OFF	CLOSE		SP-4	
ZCO-719	Effluent Pump to Storage Command to Open	DO	OFF	OPEN		SP-4	
OL-723	Lake Gravity Disk Filter No. 1 Overflow	DI	OFF	OVERFLOW		SP-8	
OL-726	Lake Gravity Disk Filter No. 1 in Backwash	DI	OFF	BACKWASH		SP-8	
OA-724-1	Lake Gravity Disk Filter No. 1 Drive Motor No. 1 Overload	DI	NORMAL	ALARM		SP-8	
OA-724-2	Lake Gravity Disk Filter No. 1 Drive Motor No. 1 Fail	DI	NORMAL	ALARM		SP-8	
OL-724	Lake Gravity Disk Filter No. 1 Drive Motor No. 1 Run Status	DI	NORMAL	ON		SP-8	
OA-725-1	Lake Gravity Disk Filter No. 1 Drive Motor No. 2 Overload	DI	NORMAL	ALARM		SP-8	
OA-725-2	Lake Gravity Disk Filter No. 1 Drive Motor No. 2 Fail	DI	NORMAL	ALARM		SP-8	
OL-725	Lake Gravity Disk Filter No. 1 Drive Motor No. 2 Run Status	DI	NORMAL	ON		SP-8	
OA-724	Lake Gravity Disk Filter No. 1 Common Alarm	DI	NORMAL	ALARM		SP-8	
OL-733	Lake Gravity Disk Filter No. 2 Overflow	DI	OFF	OVERFLOW		SP-8	
OL-736	Lake Gravity Disk Filter No. 2 in Backwash	DI	OFF	BACKWASH		SP-8	
OA-734-1	Lake Gravity Disk Filter No. 2 Drive Motor No. 1 Overload	DI	NORMAL	ALARM		SP-8	
OA-734-2	Lake Gravity Disk Filter No. 2 Drive Motor No. 1 Fail	DI	NORMAL	ALARM		SP-8	
OL-734	Lake Gravity Disk Filter No. 2 Drive Motor No. 1 Run Status	DI	NORMAL	ON		SP-8	
OA-735-1	Lake Gravity Disk Filter No. 2 Drive Motor No. 2 Overload	DI	NORMAL	ALARM		SP-8	
OA-735-2	Lake Gravity Disk Filter No. 2 Drive Motor No. 2 Fail	DI	NORMAL	ALARM		SP-8	
OL-735	Lake Gravity Disk Filter No. 2 Drive Motor No. 2 Run Status	DI	NORMAL	ON		SP-8	
OA-734	Lake Gravity Disk Filter No. 2 Common Alarm	DI	NORMAL	ALARM		SP-8	
OL-743	Lake Gravity Disk Filter No. 3 Overflow	DI	OFF	OVERFLOW		SP-8	
OL-746	Lake Gravity Disk Filter No. 3 in Backwash	DI	OFF	BACKWASH		SP-8	
OA-744-1	Lake Gravity Disk Filter No. 3 Drive Motor No. 1 Overload	DI	NORMAL	ALARM		SP-8	
OA-744-2	Lake Gravity Disk Filter No. 3 Drive Motor No. 1 Fail	DI	NORMAL	ALARM		SP-8	
OL-744	Lake Gravity Disk Filter No. 3 Drive Motor No. 1 Run Status	DI	NORMAL	ON		SP-8	
OA-745-1	Lake Gravity Disk Filter No. 3 Drive Motor No. 2 Overload	DI	NORMAL	ALARM		SP-8	
OA-745-2	Lake Gravity Disk Filter No. 3 Drive Motor No. 2 Fail	DI	NORMAL	ALARM		SP-8	
OL-745	Lake Gravity Disk Filter No. 3 Drive Motor No. 2 Run Status	DI	NORMAL	ON		SP-8	
OA-744	Lake Gravity Disk Filter No. 3 Common Alarm	DI	NORMAL	ALARM		SP-8	
LAL-750	Lake Gravity Disk Filter Backwash Pump Station Low Level	DI	OFF	LOW		SP-8	

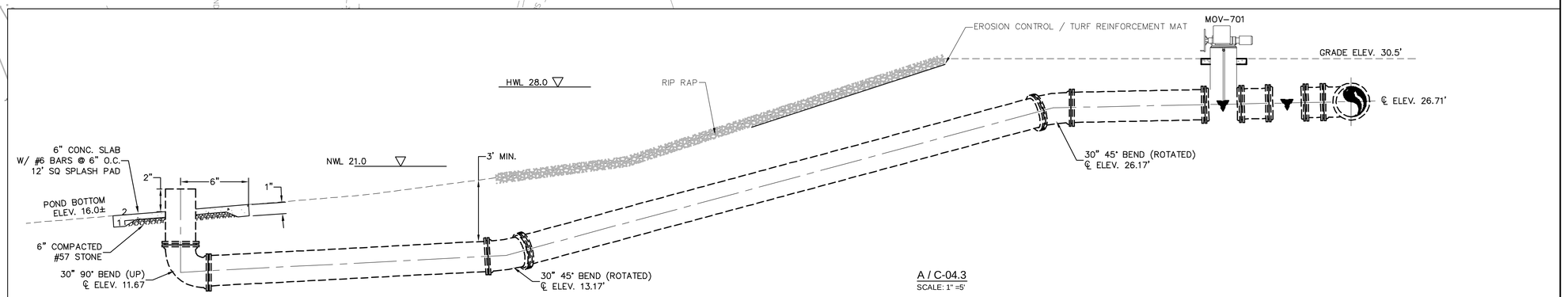
North Water Reclamation Facility
Manatee County, Florida

PLC Input / Output Schedule

LAH-750	Lake Gravity Disk Filter Backwash Pump Station High Level	DI	OFF	HIGH		SP-8	
OL-751	Lake Gravity Disk Filter Backwash Pump Station Pump No. 1 Run Status	DI	OFF	ON		SP-8	
OA-751	Lake Gravity Disk Filter Backwash Pump Station Pump No. 1 Fail	DI	NORMAL	FAIL		SP-8	
OL-752	Lake Gravity Disk Filter Backwash Pump Station Pump No. 2 Run Status	DI	OFF	ON		SP-8	
OA-752	Lake Gravity Disk Filter Backwash Pump Station Pump No. 2 Fail	DI	NORMAL	FAIL		SP-8	
HS-805	Sodium Hypochlorite Metering Pump No. 1 Run Command	DO	OFF	ON		SP-3	
OL-805-1	Sodium Hypochlorite Metering Pump No. 1 In Remote	DI	OFF	REMOTE		SP-3	
OL-805-2	Sodium Hypochlorite Metering Pump No. 1 Run Status	DI	OFF	ON		SP-3	
OA-805	Sodium Hypochlorite Metering Pump No. 1 Fail	DI	OFF	FAIL		SP-3	
SI-805	Sodium Hypochlorite Metering Pump No. 1 Speed Feedback	AI	0	100	%	SP-3	
SC-805	Sodium Hypochlorite Metering Pump No. 1 Speed Command	AO	0	100	%	SP-3	
HS-806	Sodium Hypochlorite Metering Pump No. 2 Run Command	DO	OFF	ON		SP-3	
OL-806-1	Sodium Hypochlorite Metering Pump No. 2 In Remote	DI	OFF	REMOTE		SP-3	
OL-806-2	Sodium Hypochlorite Metering Pump No. 2 Run Status	DI	OFF	ON		SP-3	
OA-806	Sodium Hypochlorite Metering Pump No. 2 Fail	DI	OFF	FAIL		SP-3	
SI-806	Sodium Hypochlorite Metering Pump No. 2 Speed Feedback	AI	0	100	%	SP-3	
SC-806	Sodium Hypochlorite Metering Pump No. 2 Speed Command	AO	0	100	%	SP-3	
HS-807	Sodium Hypochlorite Metering Pump No. 3 Run Command	DO	OFF	ON		SP-3	
OL-807-1	Sodium Hypochlorite Metering Pump No. 3 In Remote	DI	OFF	REMOTE		SP-3	
OL-807-2	Sodium Hypochlorite Metering Pump No. 3 Run Status	DI	OFF	ON		SP-3	
OA-807	Sodium Hypochlorite Metering Pump No. 3 Fail	DI	OFF	FAIL		SP-3	
AI-810	Reclaimed Water Discharge Chlorine Residual	AI	0	5	ppm	SP-8	
LAL-1001	Plant Drain Pump Station Low Level	DI	OFF	LOW		SP-8	
LAH-1001	Plant Drain Pump Station High Level	DI	OFF	HIGH		SP-8	
LI-1002	Plant Drain Pump Station Level	AI	0	15	FEET	SP-8	
OL-1011-1	Drain Pump 1 In Auto Status	DI	OFF	AUTO		SP-8	
OL-1011-2	Drain Pump 1 Run Status	DI	OFF	ON		SP-8	
OA-1011	Drain Pump 1 Fail	DI	NORMAL	FAIL		SP-8	
OL-1012-1	Drain Pump 2 In Auto Status	DI	OFF	AUTO		SP-8	
OL-1012-2	Drain Pump 2 Run Status	DI	OFF	ON		SP-8	
OA-1012	Drain Pump 2 Fail	DI	NORMAL	FAIL		SP-8	
OL-1013-1	Drain Pump 3 In Auto Status	DI	OFF	AUTO		SP-8	
OL-1013-2	Drain Pump 3 Run Status	DI	OFF	ON		SP-8	
OA-1013	Drain Pump 3 Fail	DI	NORMAL	FAIL		SP-8	
FI-1015	Plant Drain Pump Station Flow	AI	0	5000	GPM	SP-1	



1. ALL BURIED PIPE, FITTINGS AND VALVES SHALL HAVE RESTRAINED JOINTS.
2. CONTRACTOR WILL BE REQUIRED TO PERFORM THE WORK WITHIN GOLF COURSE BETWEEN JUNE 1ST AND SEPTEMBER 30TH, 2012. THE EXACT DATES TO BE DETERMINED BY THE OWNER. ALL WORK IMPACTING THE GOLF COURSE SHALL BE COMPLETED WITHIN THREE (3) WEEKS FROM COMMENCEMENT OF THE WORK AND SHALL BE CONDUCTED BETWEEN THE HOURS OF 7:00PM AND 3:00AM. CONTRACTOR SHALL BACKFILL AND COMPACT ALL OPEN EXCAVATIONS AT THE END OF EACH NIGHT AND REMOVE ALL EQUIPMENT AND MATERIALS FROM THE GOLF COURSE PRIOR TO 3:00AM.
3. EXISTING PIPE DEPTH AND LOCATION NOT VERIFIED. CONTRACTOR TO FIELD LOCATE.
4. IF HE CHOOSES, THE CONTRACTOR MAY CONDUCT THE WORK REQUIRED FOR THE NEW OUTFALL WITHIN THE GOLF COURSE LAKE SO THAT IT COINCIDES WITH THE CONSTRUCTION OF THE INTAKE STRUCTURES. CONTRACTOR TO BURY AND CAP 30" DI PIPE WITHIN THE BANK AND CONNECT TO IT LATER DURING COMMENCEMENT OF THE WORK IDENTIFIED BY NOTE 2.
5. ALL EQUIPMENT USED ON THE GOLF COURSE SHALL BE RUBBER TIRED EQUIPMENT.
6. CONTRACTOR SHALL USE TRENCH BOXES TO MINIMIZE IMPACTS TO THE GOLF COURSE.
7. LOCATION OF IRRIGATION AND DRAINAGE LINES IS UNKNOWN. CONTRACTOR SHOULD EXPECT SOME IMPACTS TO SMALL DIAMETER IRRIGATION AND DRAINAGE LINES AND SHALL BE RESPONSIBLE FOR REPAIRING THEM "IN KIND".
8. COMPACTION WITHIN THE GOLF COURSE AND POND EMBANKMENT SHALL BE AT LEAST 98% OF THE MAXIMUM STANDARD PROCTOR.
9. CONTRACTOR SHALL RESTORE ALL AREAS DISTURBED DURING CONSTRUCTION TO EQUAL OR BETTER CONDITIONS AND TO EXISTING GRADES PRIOR TO CONSTRUCTION.
10. GOLF COURSE SOD TO BE REPLACED WITH 419 TIFWAY BERMUDA GRASS.
11. NO IMPACTS WITHIN 5-FT OF GREEN.
12. THE CONTRACTOR SHALL HAVE A READILY AVAILABLE MEANS FOR WATERING THE GOLF COURSE THROUGHOUT THE DURATION OF CONSTRUCTION IN THE EVENT THE CONTRACTOR IMPACTS THE GOLF COURSE FROM UTILIZING THEIR EXISTING IRRIGATION PUMP STATION AND ASSOCIATED PIPING.



A / C-04.3
SCALE: 1" =5'

REV.NO.	DESCRIPTIONS	DATE
A	ADDENDUM NO. 2	11/15/11

REVISIONS

SEAL

DAVID C. WEHNER, P.E. No. 59541

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www.mckimcreed.com

MANATEE COUNTY, FLORIDA

NWRF EXPANSION PHASE 1

YARD PIPING PLAN NO. 3

DATE:	JULY 2011
MCE PROJ. #	1024-0143
DRAWN	BFN
DESIGNED	NJS
CHECKED	DCW
PROJ. MGR.	DCW

SCALE
HORIZONTAL: 1" = 20'
VERTICAL: NA

DRAWING NUMBER: C-0.4.3

STATUS: ISSUED FOR BID
REVISION

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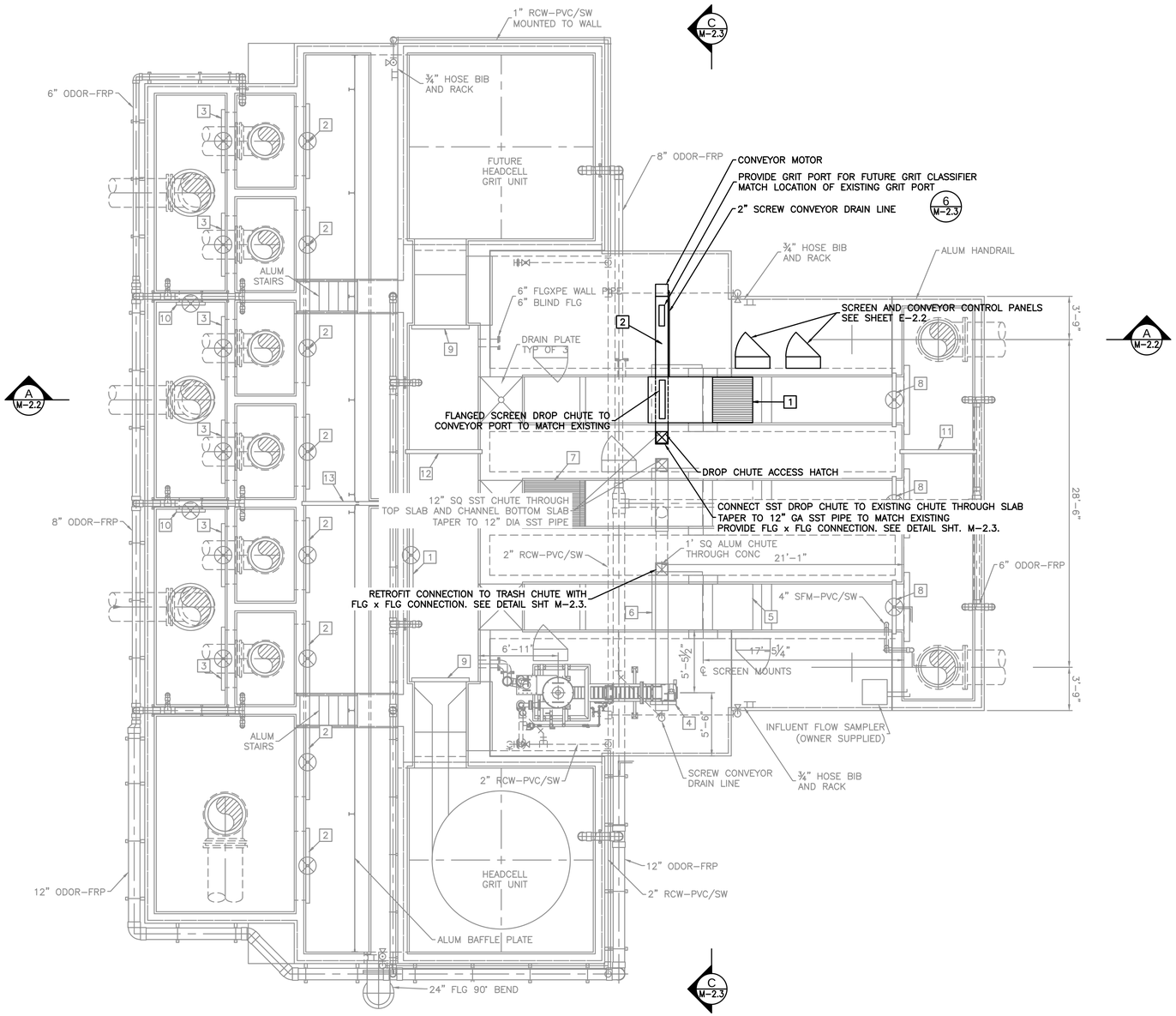

PLAN VIEW AT TOP OF STRUCTURE
SCALE: 3/16"=1'–0"

EQUIPMENT LIST
1. AUTOMATIC FINE SCREEN "PARKSON CORPORATION". SEE TECHNICAL SPECIFICATIONS FOR ADDITIONAL DETAILS.
2. SCREW CONVEYOR "SHAFTED TYPE". SEE TECHNICAL SPECIFICATION FOR ADDITIONAL DETAILS.

BACKGROUND INFORMATION FROM RECORD DRAWINGS DATED APRIL 2010 FOR MANATEE COUNTY, FL. NORTH WATER RECLAMATION FACILITY INFLUENT STRUCTURE PROJECT NO. 6011281

REVISIONS

REV.NO.	DESCRIPTIONS	DATE

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DAVID C. WEHNER, P.E.
No. 59541

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MANATEE COUNTY, FLORIDA

NWRF EXPANSION PHASE 1

HEADWORKS MECHANICAL PLAN AT TOP

DATE:	JULY 2011
MCE PROJ. #	1024–0143
DRAWN	BFN
DESIGNED	DCW
CHECKED	MSL
PROJ. MGR.	DCW

SCALE
HORIZONTAL: 3/16" = 1'–0"
VERTICAL: NA

DRAWING NUMBER
M-2.1

STATUS: ISSUED FOR BID
REVISION

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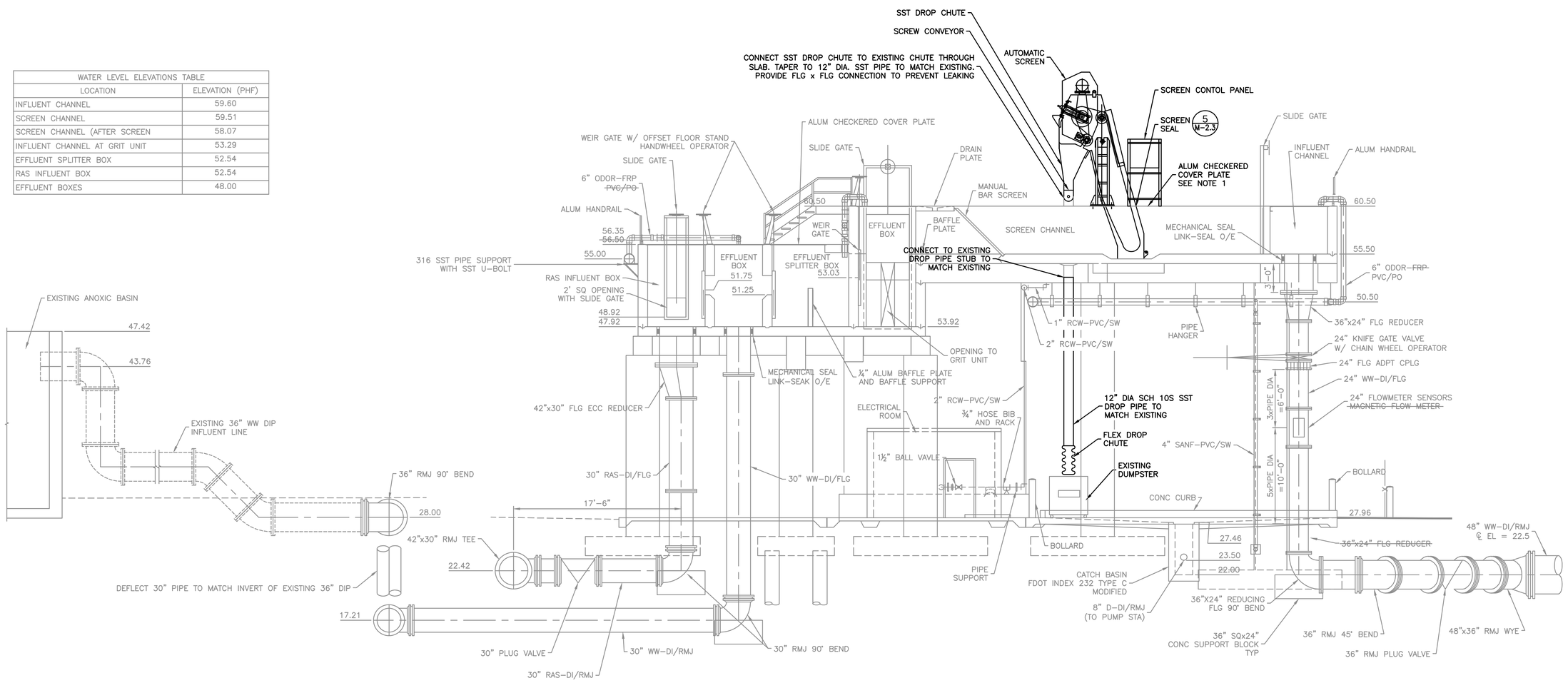
NOTES:
1. PROVIDE ALUMINUM CHECKERED COVER PLATE TO CLOSE GAP BETWEEN ADJACENT PLATE AND SCREEN. SEE DETAIL 4 ON SHEET M-2.3

WATER LEVEL ELEVATIONS TABLE	
LOCATION	ELEVATION (PHF)
INFLUENT CHANNEL	59.60
SCREEN CHANNEL	59.51
SCREEN CHANNEL (AFTER SCREEN	58.07
INFLUENT CHANNEL AT GRIT UNIT	53.29
EFFLUENT SPLITTER BOX	52.54
RAS INFLUENT BOX	52.54
EFFLUENT BOXES	48.00



A M-2.1 SECTION
SCALE: 3/16"=1'-0"

BACKGROUND INFORMATION FROM RECORD DRAWINGS DATED APRIL 2010 FOR MANATEE COUNTY, FL. NORTH WATER RECLAMATION FACILITY INFLUENT STRUCTURE PROJECT NO. 6011281

REV.NO.	DESCRIPTIONS	DATE
	REVISIONS	

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MANATEE COUNTY, FLORIDA

NWRF EXPANSION PHASE 1

HEADWORKS MECHANICAL SECTION

DATE:	JULY 2011
MCE PROJ. #	1024-0143
DRAWN	BFN
DESIGNED	DCW
CHECKED	MSL
PROJ. MGR.	DCW

SCALE
HORIZONTAL: 3/16" = 1'-0"
VERTICAL: NA

DRAWING NUMBER: M-2.2

STATUS: ISSUED FOR BID
REVISION

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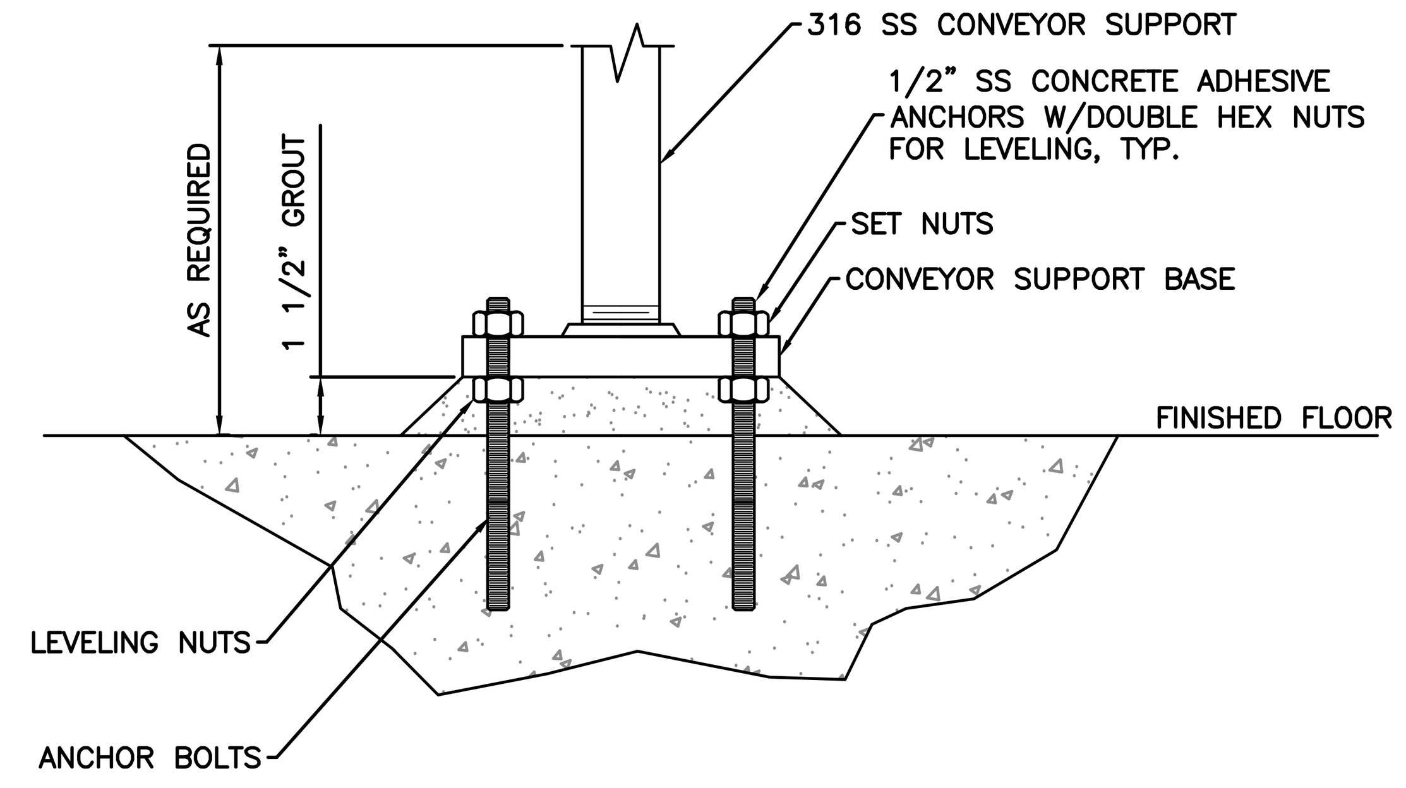
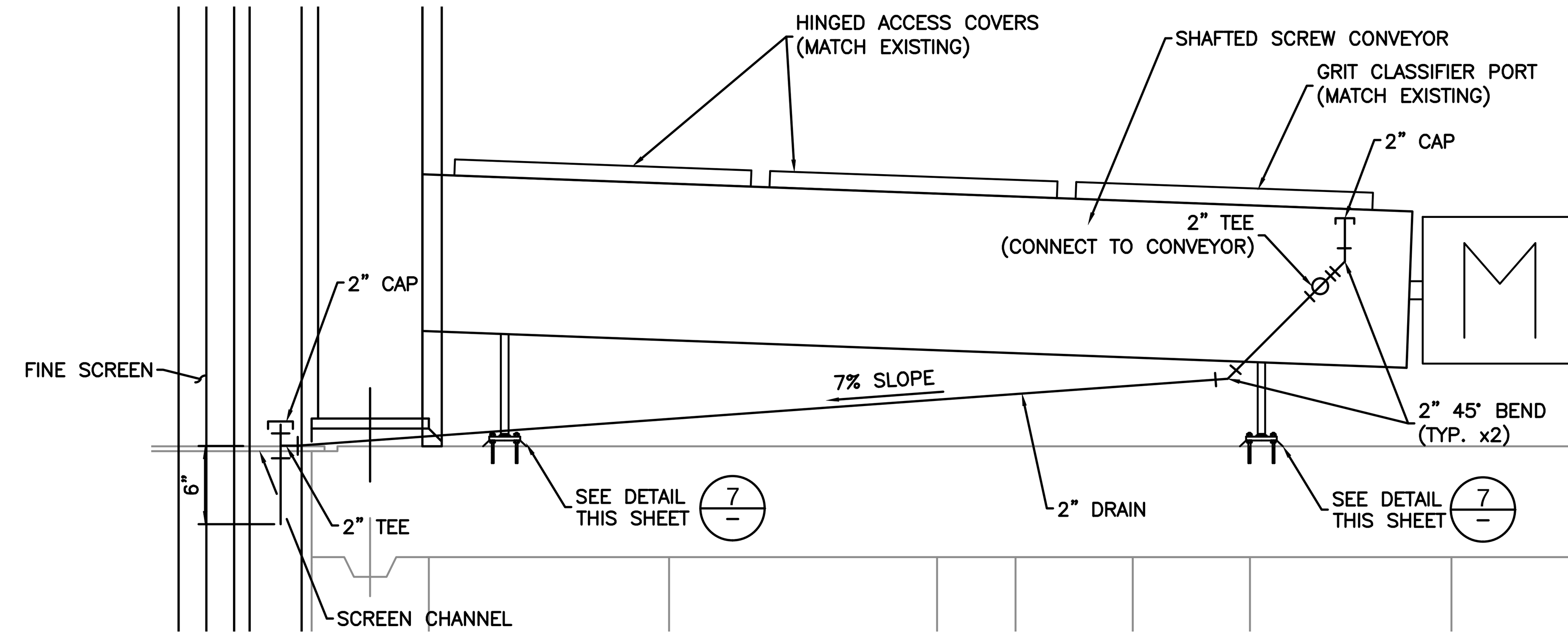
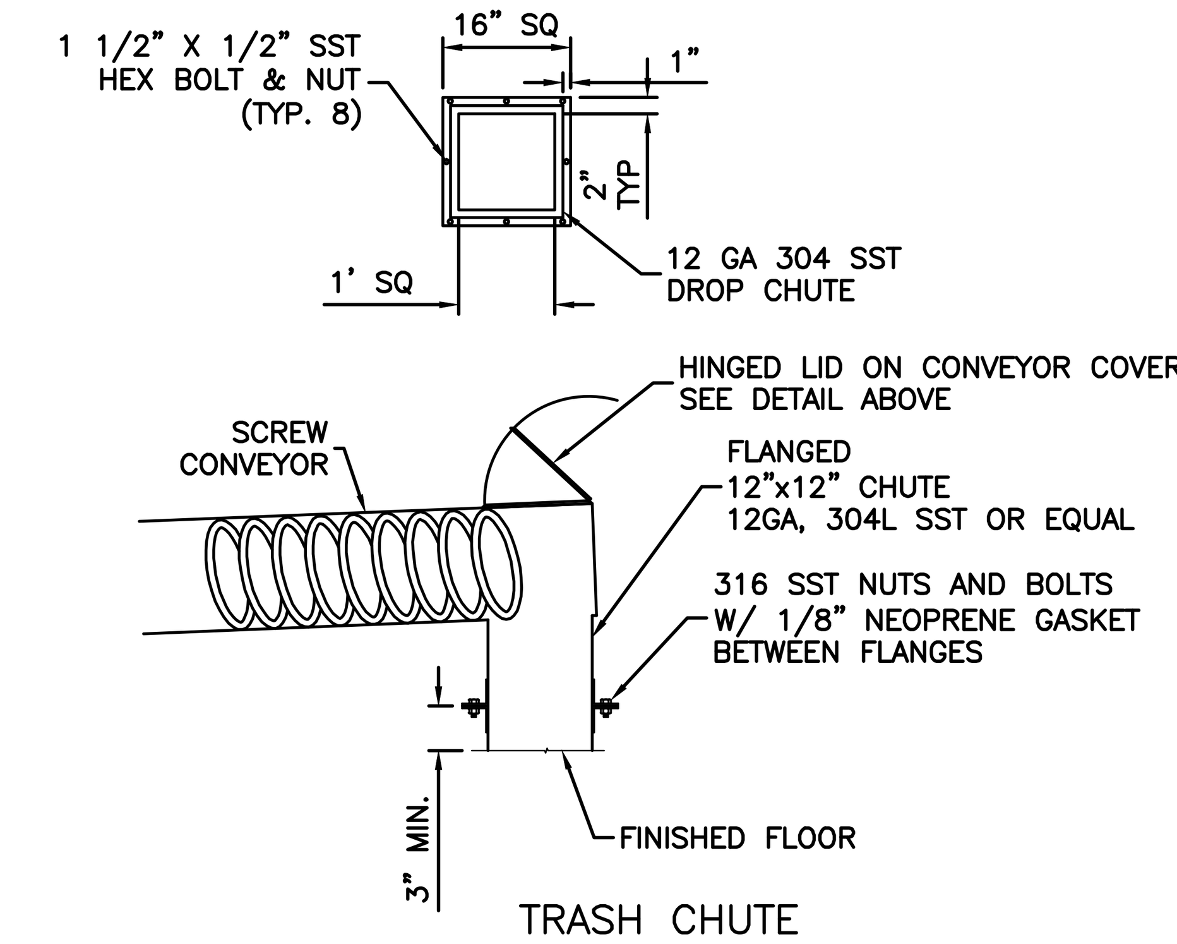


CONVEYOR SUPPORT
7 DETAIL
– SCALE: NTS

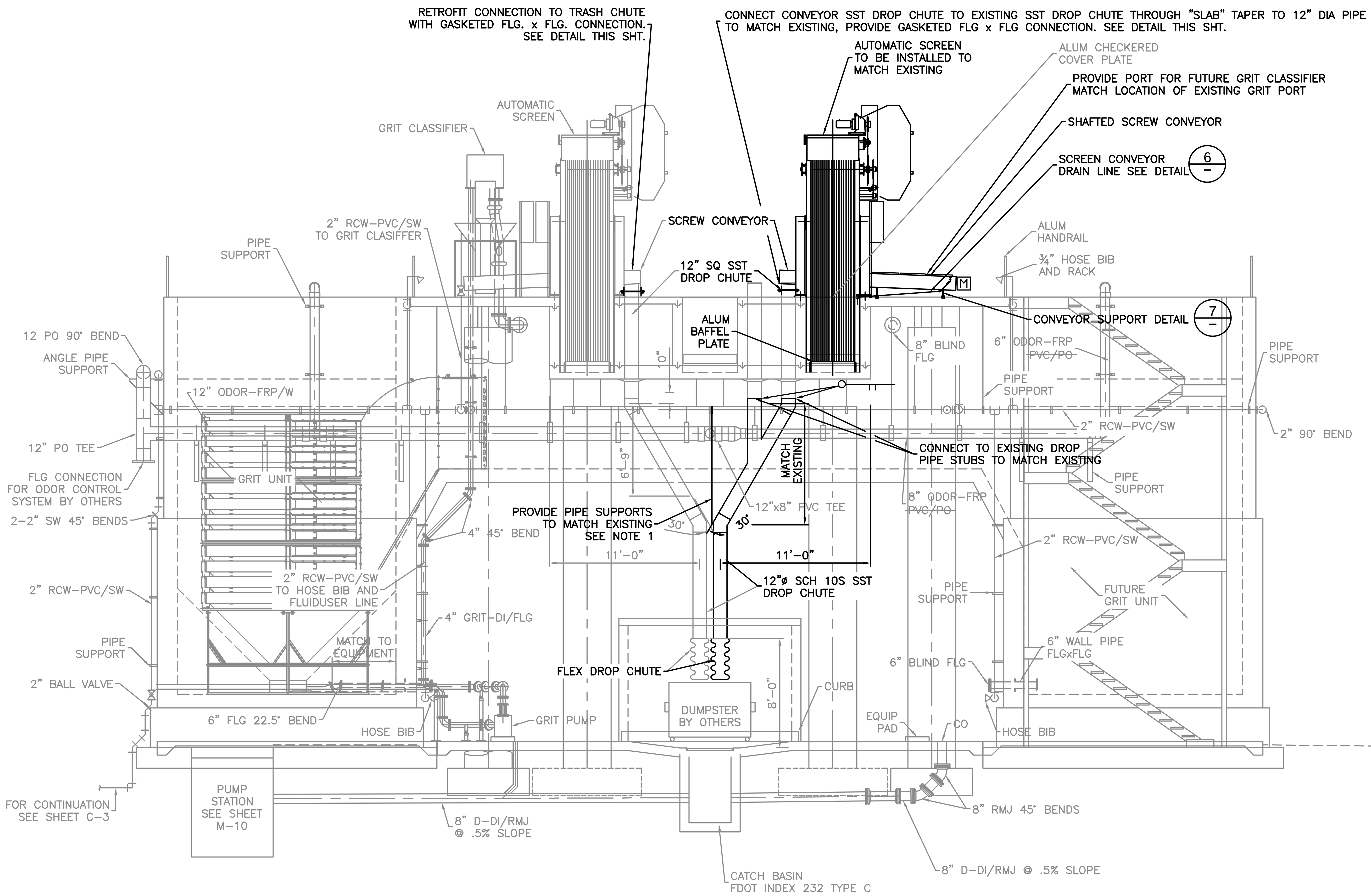


SCREEN CONVEYOR DRAIN LINE
6 DETAIL
– SCALE: NTS

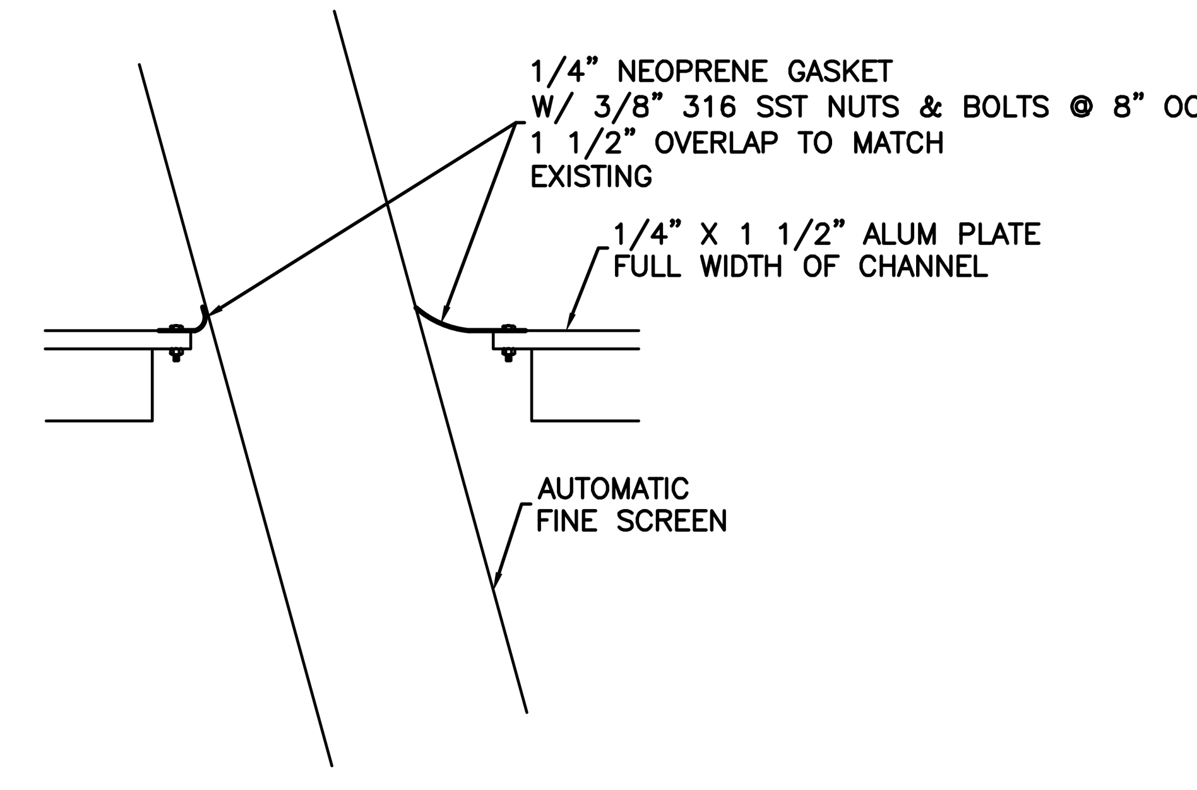


TRASH CHUTE
2 DETAIL
– SCALE: NTS

PHOTO
4 DETAIL
– SCALE: NTS



C SECTION
M-2.1 SCALE: 3/16"=1'-0"



SCREEN SEAL
5 DETAIL
– SCALE: NTS

NOTES:
1. ANCHOR PIPE SUPPORT RODS INTO EXISTING CONCRETE SLAB WITH HILTI HIT-RE500 SD EPOXY ADHESIVE, EMBED 4" MIN.

BACKGROUND INFORMATION FROM RECORD DRAWINGS DATED APRIL 2010 FOR MANATEE COUNTY, FL. NORTH WATER RECLAMATION FACILITY INFLUENT STRUCTURE PROJECT NO. 6011281

REV.NO.	DESCRIPTIONS	DATE
	REVISIONS	

SEAL

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MANATEE COUNTY, FLORIDA

NWRF EXPANSION PHASE 1

HEADWORKS MECHANICAL SECTION AND DETAILS

DATE:	JULY 2011
MCE PROJ. #	1024-0143
DRAWN	BFN
DESIGNED	DCW
CHECKED	MSL
PROJ. MGR.	DCW

SCALE
HORIZONTAL: AS SHOWN
VERTICAL: NA

DRAWING NUMBER
M-2.3

STATUS: ISSUED FOR BID
REVISION

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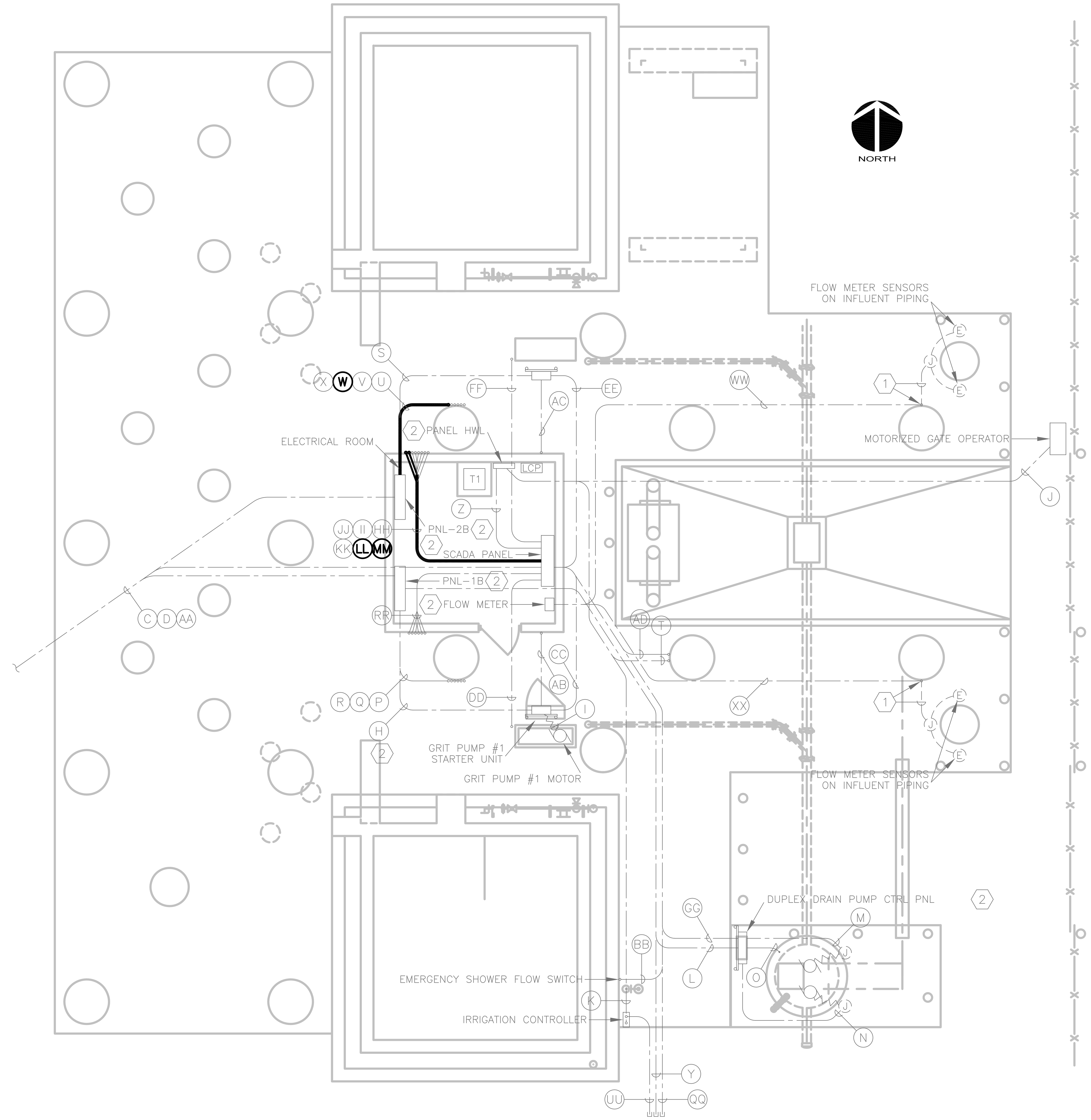
GENERAL NOTES:

1. REFER TO SHEET E-2.4 FOR CONDUIT SCHEDULE.

REFERENCE NOTES:

(2) EXTEND CONDUIT STUB UP IN KIND WITH EXPOSED CONDUIT OVERHEAD TO FLOW METER SENSORS. TERMINATE CONDUIT TO FLOW METER SENSORS USING LFNC.

(3) SEAL ENDS OF EACH CONDUIT TERMINATED IN BOTTOM OF CABINET/ ENCLOSURE WITH DUCT SEAL COMPOUND AFTER ALL CABLES/WIRES ARE INSTALLED, CHECKED OUT, TESTED, AND PLACED INTO SERVICE.



HEADWORKS LOW LEVEL - POWER AND CONTROLS CONDUIT PLAN

SCALE: 3/16" = 1'

BACKGROUND INFORMATION FROM
RECORD DRAWINGS DATED APRIL 2010
FOR MANATEE COUNTY, FL.
NORTH WATER RECLAMATION FACILITY
INFLUENT STRUCTURE
PROJECT NO. 6011281

REV.NO.	DESCRIPTIONS	DATE

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MANATEE COUNTY, FLORIDA

NWRF EXPANSION PHASE 1

HEADWORKS LOW LEVEL
POWER AND CONTROLS PLANS

DATE:	JULY 2011
MCE PROJ. #	1024-0143
DRAWN	CJR
DESIGNED	CJR
CHECKED	ALA
PROJ. MGR.	DCW

SCALE
HORIZONTAL: NA
VERTICAL: NA

DRAWING NUMBER
E-2.1

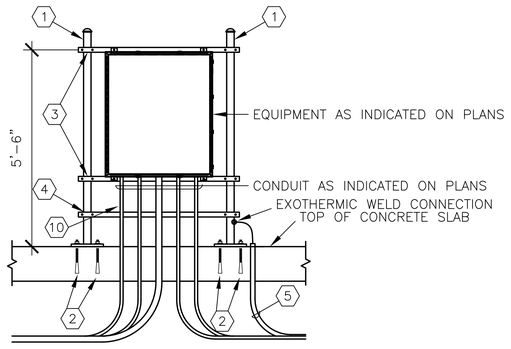
STATUS: ISSUED FOR BID
REVISION

REFERENCE NOTES:

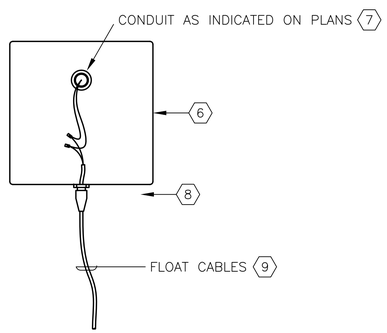
1. PROVIDE 3 1/2" DIA. BY 6'-0" LONG ASTM A/S A312, A778 SCH. 80 304 STAINLESS STEEL TUBE POST WITH 304 STAINLESS STEEL BUTTWELD CAP ON TOP.
2. PROVIDE 3/8" x 6" 316-SST EXPANSION BOLTS.
3. PROVIDE 1 5/8" SQ. BY LENGTH AS REQUIRED, 304 STAINLESS STEEL STRUT SPACED AS REQUIRED FOR MOUNTING OF EQUIPMENT. SECURE STRUT TO POST USING STAINLESS STEEL 3/8" U-BOLT, NUTS, WASHERS, AND LOCK WASHERS.
4. PROVIDE 1 5/8" SQ. BY LENGTH AS REQUIRED, 304 STAINLESS STEEL STRUT LOCATED AS REQUIRED FOR SUPPORTING CONDUIT. PROVIDE COMPLETE WITH 304 STAINLESS STEEL CONDUIT STRAPS; QUANTITY AND SIZES AS REQUIRED. SECURE STRUT TO POST USING STAINLESS STEEL 3/8" U-BOLT, NUTS, WASHERS, AND LOCK WASHERS.

REFERENCE NOTES CONT. . .

5. CONNECT TO EXISTING GROUNDING CONDUCTOR ROUTED VIA SCH. 80 PVC CONDUIT.
6. PROVIDE 10" SQ. BY 6" DEEP NEMA 4X POLYESTER HINGED COVER JUNCTION BOX WITH QUICK RELEASE LATCHES AND STAINLESS STEEL HARDWARE, HOFFMAN ENCLOSURES INC. A10106PHC SERIES OR APPROVED EQUAL. RIGIDLY MOUNT JUNCTION BOX TO WET WELL WALL USING 316 STAINLESS STEEL HARDWARE IN ACCORDANCE WITH THE WET WELL MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS.
7. TERMINATE CONDUIT INTO REAR OF JUNCTION BOX. SEAL END OF CONDUIT WITH DUCT SEAL COMPOUND AFTER ALL WIRES ARE INSTALLED, CHECKED OUT, TESTED, AND PLACED INTO SERVICE.
8. PROVIDE NON-METALLIC CORROSION-RESISTANT CABLE STRAIN RELIEF CONNECTOR SIZED FOR THE EXACT FLOAT CABLE FURNISHED, CROUSE-HINDS NCGB SERIES OR APPROVED EQUAL.
9. ADJUST LENGTH OF EACH FLOAT CABLE LENGTH FOR OPTIMAL FLOAT OPERATION AT INDICATED ACTUATION LEVEL. SECURE FLOAT CABLES TO WET WELL WALL SO AS TO PREVENT FLOAT CABLES FROM BECOMING ENTANGLED.
10. PROVIDE SEAL OFFS AS SHOWN ON SINGLE LINE DIAGRAM ON SHEET E-2.5.



ELEVATION
TYPICAL CONCRETE MOUNTED EQUIPMENT RACK
NTS

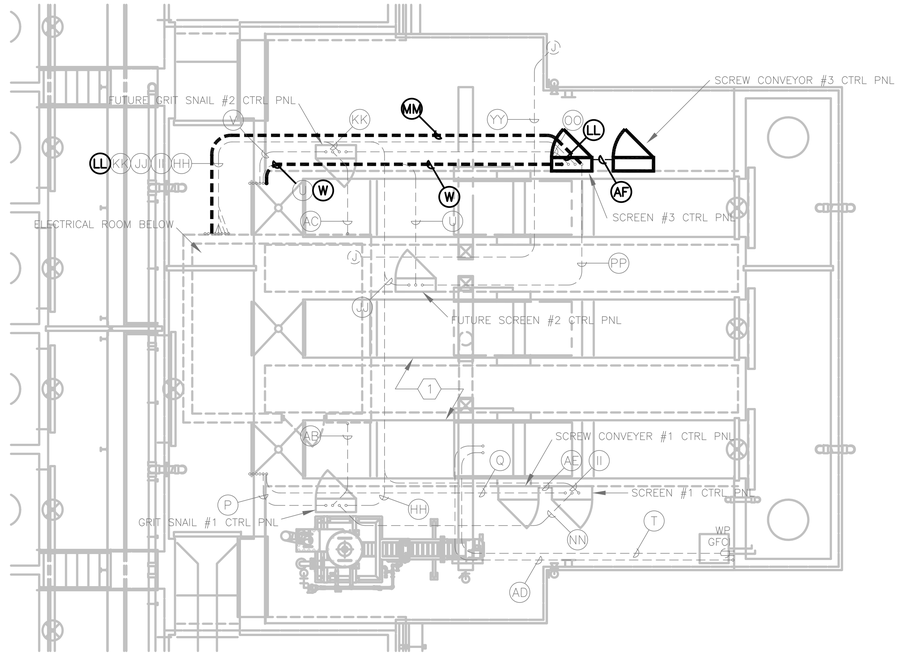


DETAIL
FLOAT SWITCH JUNCTION BOX
NTS

ELECTRICAL EQUIPMENT DETAILS
SCALE: N.T.S.

REFERENCE NOTES:

1. ALL CONDUITS SHOWN ON THIS PLAN ARE TO BE ROUTED EXPOSED ALONG THE UNDERSIDE OF THE UPPER LEVEL DECK SLAB.
2. MOUNT ALL CONTROL PANELS, JUNCTION BOXES, ETC, A MINIMUM OF 24" ABOVE THE SLAB



HEADWORKS UPPER LEVEL - POWER AND CONTROLS CONDUIT PLAN
SCALE: 3/16" = 1'

BACKGROUND INFORMATION FROM RECORD DRAWINGS DATED APRIL 2010 FOR MANATEE COUNTY, FL.
NORTH WATER RECLAMATION FACILITY
INFLUENT STRUCTURE
PROJECT NO. 6011281

REV.NO.	DESCRIPTIONS	DATE
	REVISIONS	

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MANATEE COUNTY, FLORIDA

NWRF EXPANSION PHASE 1

HEADWORKS UPPER LEVEL
POWER AND CONTROLS PLANS,
AND DETAILS

DATE:	JULY 2011
MCE PROJ. #	1024-0143
DRAWN	CJR
DESIGNED	CJR
CHECKED	ALA
PROJ. MGR.	DCW

SCALE
HORIZONTAL: NA
VERTICAL: NA

DRAWING NUMBER
E-2.2

STATUS: ISSUED FOR BID
REVISION

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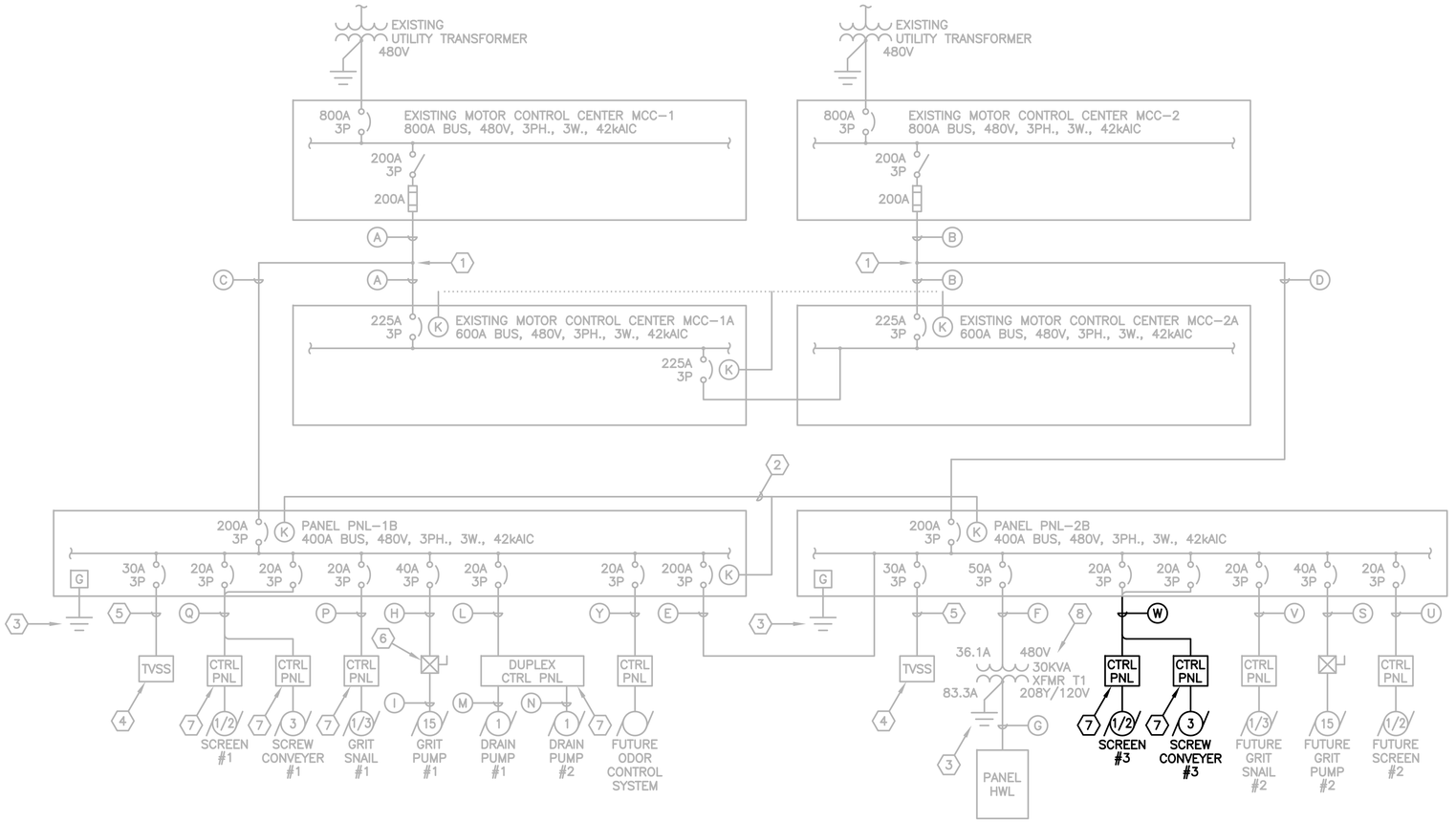

GENERAL NOTES:

1. "LIGHT" LINES OR NOTES INDICATE EXISTING OR FUTURE EQUIPMENT AS INDICATED. "BOLD" LINES OR NOTES INDICATE NEW WORK.
2. REFER TO SHEET E–2.4 FOR CONDUIT SCHEDULE.

REFERENCE NOTES:

1. SPLICE NEW FEEDER TO EXISTING FEEDER INSIDE EXISTING POWER HANDHOLE.
2. PROVIDE KIRK KEY INTERLOCK SYSTEM CONSISTING OF THREE (3) KEY OPERATED MECHANISMS, ALL KEYED ALIKE, AND TWO (2) KEYS. SYSTEM SHALL BE CONFIGURED TO ENSURE THAT ONLY TWO OF THE THREE CIRCUIT BREAKERS MAY BE CLOSED AT ANY GIVEN POINT IN TIME.
3. NOT USED.
4. PROVIDE TVSS UNIT. REFER TO SPECIFICATIONS FOR REQUIREMENTS.
5. PROVIDE 1" SCH. 80 PVC CONDUIT NIPPLE WITH 3–#8 PH. AND 1–#8 GND WIRES TWISTED TOGETHER IN ACCORDANCE WITH THE TVSS MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS. ROUTE WIRES FOLLOWING THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. WHERE BENDS ARE REQUIRED, MAKE BENDS FOLLOWING THE LARGEST RADIUS POSSIBLE, SPACE PERMITTING. DO NOT KINK CONDUCTORS. NO CONDUCTOR SHALL BE LONGER THAN 60" IN LENGTH BETWEEN ITS TERMINATION INSIDE THE PANELBOARD AND ITS TERMINATION INSIDE THE TVSS UNIT.
6. PROVIDE FVNR COMBINATION STARTER UNIT. COMBINATION STARTER UNIT SHALL HAVE MAGNETIC ONLY MOTOR CIRCUIT PROTECTOR TYPE CIRCUIT BREAKER, NEMA SIZE 2 MAGNETIC MOTOR STARTER WITH 120V AC COIL, TRIP CLASS 20 SOLID STATE OVERLOAD RELAY, PHASE FAILURE RELAY, 500VA 480V–120V CONTROL POWER TRANSFORMER, 2–POSITION "ON–OFF" SELECTOR SWITCH, GREEN "POWER ON" 120V AC LED PILOT LIGHT, RED "MOTOR RUNNING" 120V AC LED PILOT LIGHT, PILOT RELAYS, FIELD WIRING TERMINAL BLOCKS, AUXILIARY CONTACTS AS REQUIRED TO IMPLEMENT SPECIFIED CONTROL SCHEME, AND NEMA TYPE 4X WATERTIGHT, DUSTTIGHT, AND CORROSION RESISTANT POLYESTER ENCLOSURE. PHASE FAILURE RELAY SHALL BE PANEL MOUNT TYPE WITH THE FOLLOWING PROTECTION MODES: (1) PHASE LOSS, (2) PHASE REVERSAL, (3) PHASE VOLTAGE UNBALANCE OF 10% OR GREATER, AND (4) UNDERVOLTAGE, ADJUSTABLE FROM 75% TO 100% OF NOMINAL. PILOT RELAYS SHALL BE PLUG–IN TYPE INDUSTRIAL CONTROL RELAY WITH 20A, 120V AC RATED DPDT CONTACTS, 120V AC COIL, AND MATING MODULAR SOCKET.
7. EQUIPMENT CONTROL PANELS AND ANCILIARY DEVICES SHIPPED LOOSE WITH EQUIPMENT. PROVIDE FOR THE INSTALLATION OF EQUIPMENT CONTROL PANELS AND ANCILIARY DEVICES, INCLUDING ALL CONDUIT AND CABLES/WIRING, IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS.
8. TRANSFORMER T1 SHALL BE 115°C RISE DRY TYPE WITH EPOXY–RESIN ENCAPSULATED CORE AND COIL ASSEMBLY AND NEMA 3R 316 STAINLESS STEEL ENCLOSURE.

BACKGROUND INFORMATION FROM
RECORD DRAWINGS DATED APRIL 2010
FOR MANATEE COUNTY, FL.
NORTH WATER RECLAMATION FACILITY
INFLUENT STRUCTURE
PROJECT NO. 6011281

REV.NO.	DESCRIPTIONS	DATE
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MANATEE COUNTY, FLORIDA

NWRF EXPANSION PHASE 1

EXISITING INFLULENT STRUCTURE
SINGLE LINE DIAGRAM

DATE:	JULY 2011
MCE PROJ. #	1024–0143
DRAWN	CJR
DESIGNED	CJR
CHECKED	ALA
PROJ. MGR.	DCW

SCALE
HORIZONTAL: NA
VERTICAL: NA

DRAWING NUMBER
E-2.3

STATUS: ISSUED FOR BID
REVISION

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CONDUIT SCHEDULE

ID NO.	QTY–SIZE	CONTENTS	CONDUIT/CABLE/WIRE ORIGIN	CONDUIT/CABLE/WIRE DESTINATION	NOTES
A	1–3"	3–#4/0 PH. AND 1–#2 GND	MCC–1	MOTOR CONTROL CENTER MCC–1A	
B	1–3"	3–#4/0 PH. AND 1–#2 GND	MCC–2	MOTOR CONTROL CENTER MCC–2A	
C	1–3" 1–3"	3–#4/0 PH. AND 1–#2 GND PULL STRING FOR FUTURE USE BY COUNTY	EXISTING POWER HANDHOLE	PANEL PNL–1B	
D	1–3" 1–3"	3–#4/0 PH. AND 1–#2 GND SPARE WITH PULL STRING FOR USE BY COUNTY	EXISTING POWER HANDHOLE	PANEL PNL–2B	
E	1–2 1/2"	3–#4/0 PH. 1–#2 GND	PANEL PNL–1B	PANEL PNL–2B	
F	1–3/4"	3–#8 PH. AND 1–#10 GND	PANEL PNL–2B	TRANSFORMER T1	
G	1–1 1/2"	3–#2 PH., 1–#2 NEUT., AND 1–#8 GND	TRANSFORMER T1	PANEL HWL	
H	1–3/4"	3–#8 PH. AND 1–#10 GND	PANEL PNL–1B	GRIT PUMP #1 STARTER UNIT	
I	1–3/4"	3–#8 PH., 2–#14 MTR HTR PWR, 2–#14 THERMAL CUTOUT, AND 1–#10 GND	GRIT PUMP #1 STARTER UNIT	GRIT PUMP #1 MOTOR	
J	1–3/4"	1–#12 PH., 1–#12 NEUT., AND 1–#12 GND	PANEL HWL	MOTORIZED GATE OPERATOR	
K	1–3/4"	1–#12 PH., 1–#12 NEUT., AND 1–#12 GND	PANEL HWL	IRRIGATION CONTROLLER	
L	1–3/4"	3–#12 PH. AND 1–#12 GND	PANEL PNL–1B	DUPLEX DRAIN PUMP CONTROL PANEL	
M	1–3/4"	3–#14 PH. AND 1–#14 GND	DUPLEX DRAIN PUMP CONTROL PANEL	DRAIN PUMP #1	
N	1–3/4"	3–#14 PH. AND 1–#14 GND	DUPLEX DRAIN PUMP CONTROL PANEL	DRAIN PUMP #2	
O	1–1"	10–#14 CTRL (INTRINSICALLY SAFE)	DUPLEX DRAIN PUMP CONTROL PANEL	JUNCTION BOX IN WET WELL	
P	1–3/4"	3–#12 PH. AND 1–#12 GND	PANEL PNL–1B	GRIT SNAIL #1 CONTROL PANEL	
Q	1–3/4"	3–#12 PH. AND 1–#12 GND (SCREEN #1 CONTROL PANEL) 3–#12 PH. (SCREW CONVEYER #1 CONTROL PANEL)	PANEL PNL–1B	SCREEN #1 CONTROL PANEL SCREW CONVEYER #1 CONTROL PANEL	
R	4–3/4"	SPARE WITH PULL STRINGS FOR FUTURE USE BY COUNTY	PANEL PNL–1B	–	
S	1–3/4"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	PANEL PNL–2B	FUTURE GRIT PUMP #2 STARTER UNIT	
T	1–3/4"	1–#12 PH., 1–#12 NEUT., AND 1–#12 GND	PANEL HWL	INFLUENT FLOW SAMPLER	
U	1–3/4"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	PANEL PNL–2B	FUTURE SCREEN #2 CONTROL PANEL	
V	1–3/4"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	PANEL PNL–2B	FUTURE GRIT SNAIL #2 CONTROL PANEL	
W	**1–3/4"**	**3–#10 PH. AND 1–#10 GND (SCREEN #3 CONTROL PANEL) 3–#10 PH. (SCREW CONVEYER #3 CONTROL PANEL)**	**PANEL PNL–2B**	**SCREEN #3 CONTROL PANEL SCREW CONVEYER #3 CONTROL PANEL**	**1, 2**
X	3–3/4"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	PANEL PNL–2B	–	
Y	1–1"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	PANEL PNL–1B	FUTURE ODOR CONTROL SYSTEM	
Z	1–3/4"	1–#12 PH., 1–#12 NEUT., AND 1–#12 GND	PANEL HWL	SCADA PANEL	
AA	1–3" 1–3"	12–STRAND OPTICAL FIBER CABLE SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	EXISTING HEADWORKS SCADA PANEL	NEW HEADWORKS SCADA PANEL	
BB	1–3/4"	2–#14 CTRL AND 1–#14 GND	SCADA PANEL	EYEWASH STATION FLOW SWITCH	
CC	1–3/4"	2–#14 CTRL AND 1–#14 GND	SCADA PANEL	GRIT PUMP #1 STARTER UNIT	
DD	1–3/4"	2–#14 CTRL AND 1–#14 GND	SCADA PANEL	GRIT PUMP #1 DISCHARGE PRESSURE SWITCH	
EE	1–3/4"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	SCADA PANEL	FUTURE GRIT PUMP #2 STARTER UNIT	
FF	1–3/4"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	SCADA PANEL	FUTURE GRIT PUMP #2 DISCHARGE PRESSURE SWITCH	
GG	1–3/4"	6–#14 CTRL AND 1–#14 GND	SCADA PANEL	DUPLEX DRAIN PUMP CONTROL PANEL	
HH	1–1"	16–#14 CTRL, 2–#14 SPARE, AND 1–#14 GND	SCADA PANEL	GRIT SNAIL #1 CONTROL PANEL	
II	1–1 1/4"	18–#14 CTRL, 2–#14 SPARE, AND 1–#14 GND	SCADA PANEL	SCREEN #1 CONTROL PANEL	
JJ	1–1"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	SCADA PANEL	SCREEN #2 CONTROL PANEL	
KK	1–1"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	SCADA PANEL	GRIT SNAIL #2 CONTROL PANEL	
LL	**1–1"**	**20–#14 CTRL, 2–#14 SPARE, AND 1–#14 GND**	**SCADA PANEL**	**SCREEN #3 CONTROL PANEL**	**2**
MM	2–1"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	SCADA PANEL	–	
MM	**1–1"**	**1 TSP (ULTRASONIC TRANSMITTER)**	**SCADA PANEL**	**SCREEN #3 CONTROL PANEL**	**1, 2, 4**
NN	1–3/4"	INTERLOCK WIRING AS PER APPROVED MANUFACTURER'S SHOP DRAWINGS AND 1–#14 GND	GRIT SNAIL #1 CONTROL PANEL	SCREW CONVEYER #1 CONTROL PANEL VIA SCREEN #1 CONTROL PANEL	
OO	1–3/4"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	GRIT SNAIL #2 CONTROL PANEL	SCREEN #3 CONTROL PANEL	
PP	1–3/4"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	SCREEN #2 CONTROL PANEL	SCREEN #3 CONTROL PANEL	
QQ	1–1"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	SCADA PANEL	FUTURE ODOR CONTROL SYSTEM	
RR	6–3/4"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	SCADA PANEL	–	
SS	1–1/2"	1–#14 PH., 1–#14 NEUT., AND 1–#14 GND	SCADA PANEL	FLOW METER	
TT	1–1/2"	1–ANALOG I/O CABLE FOR 4–20 mA ANALOG FLOW RATE INPUT PER SCADA INTEGRATOR RECOMMENDATIONS	SCADA PANEL	FLOW METER	
UU	1–3/4"	WIRES AS SPECIFIED BY IRRIGATION CONTROLLER INSTALLER	IRRIGATION CONTROLLER	IRRIGATION SYSTEM FIELD DEVICES	
VV	–	–	–	–	
WW	1–1"	2–FLOW METER SENSOR ANALOG I/O CABLES PER APPROVED FLOW METER MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS	FLOW METER	FLOW METER SENSORS	
XX	1–1"	2–FLOW METER SENSOR ANALOG I/O CABLES PER APPROVED FLOW METER MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS	FLOW METER	FLOW METER SENSORS	
YY	1–1"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	EAST WALL OF ELECTRICAL ROOM	LIGHT POLE ALONG THE NORTH SIDE OF THE HEADWORKS UPPER LEVEL	
AB	1–3/4"	2–#14 INTERLOCK AND 1–#14 GND	GRIT PUMP #1 STARTER UNIT	GRIT SNAIL #1 CONTROL PANEL	
AC	1–3/4"	SPARE WITH PULL STRING FOR FUTURE USE BY COUNTY	FUTURE GRIT PUMP #2 STARTER UNIT	FUTURE GRIT SNAIL #2 CONTROL PANEL	
AD	1–3/4"	1–ANALOG I/O CABLE FOR 4–20 mA ANALOG FLOW RATE INPUT PER SCADA INTEGRATOR RECOMMENDATIONS	SCADA PANEL	INFLUENT FLOW SAMPLER	
AE	1–3/4"	INTERLOCK WIRING AS PER APPROVED MANUFACTURER'S SHOP DRAWINGS AND 1–#14 GND	SCREEN #1 CONTROL PANEL	SCREW CONVEYER #1 CONTROL PANEL	
AF	**1–3/4"**	**6#14, 1#14G, 3/4"C (24VDC STATUS) 6#14, 1#14G, 3/4"C (120V CONTROL)**	**SCREEN #3 CONTROL PANEL**	**SCREW CONVEYER #3 CONTROL PANEL**	**3**
AG	**1–3/4" 1–3/4" 1–3/4"**	**2#12, 1#12G, 3/4"C (120V POWER) 4#14, 1#14G, 3/4"C 1 TSP, 3/4"C**	**SCREEN #3 CONTROL PANEL**	**ULTRA SONIC TRANSMITTER**	**3**

CONDUIT SCHEDULE NOTES:

1. **PROVIDE TEE CONDULET IN CONDUIT AS REQUIRED TO FEED BOTH THE SCREEN #3 CONTROL PANEL AND THE SCREW CONVEYER #3 CONTROL PANELS.**
2. **INSTALL PVC COATED RGS CONDUIT AS REQUIRED FROM UNDERSIDE OF TOP SLAB OF INFLUENT STRUCTURE TO STUB–UPS OUTSIDE OF ELECTRICAL ROOM AT GROUND LEVEL.**
3. **ALL EXTENDING CONDUIT SHALL BE PVC COATED RGS.**
4. **CONDUITS LABELED 'MM' ON CONDUIT SCHEDULE ARE LABELED 'M' INSIDE SCADA PANEL.**

BACKGROUND INFORMATION FROM
RECORD DRAWINGS DATED APRIL 2010
FOR MANATEE COUNTY, FL.
NORTH WATER RECLAMATION FACILITY
INFLUENT STRUCTURE
PROJECT NO. 6011281

REV.NO.	DESCRIPTIONS	DATE
	REVISIONS	

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www.mckimcreed.com

MANATEE COUNTY, FLORIDA

NWRF EXPANSION PHASE 1

CONDUIT SCHEDULE

DATE:	JULY 2011
MCE PROJ. #	1024–0143
DRAWN	CJR
DESIGNED	CJR
CHECKED	ALA
PROJ. MGR.	DCW

SCALE
HORIZONTAL: NA
VERTICAL: NA

DRAWING NUMBER
E-2.4

STATUS: ISSUED FOR BID
REVISION

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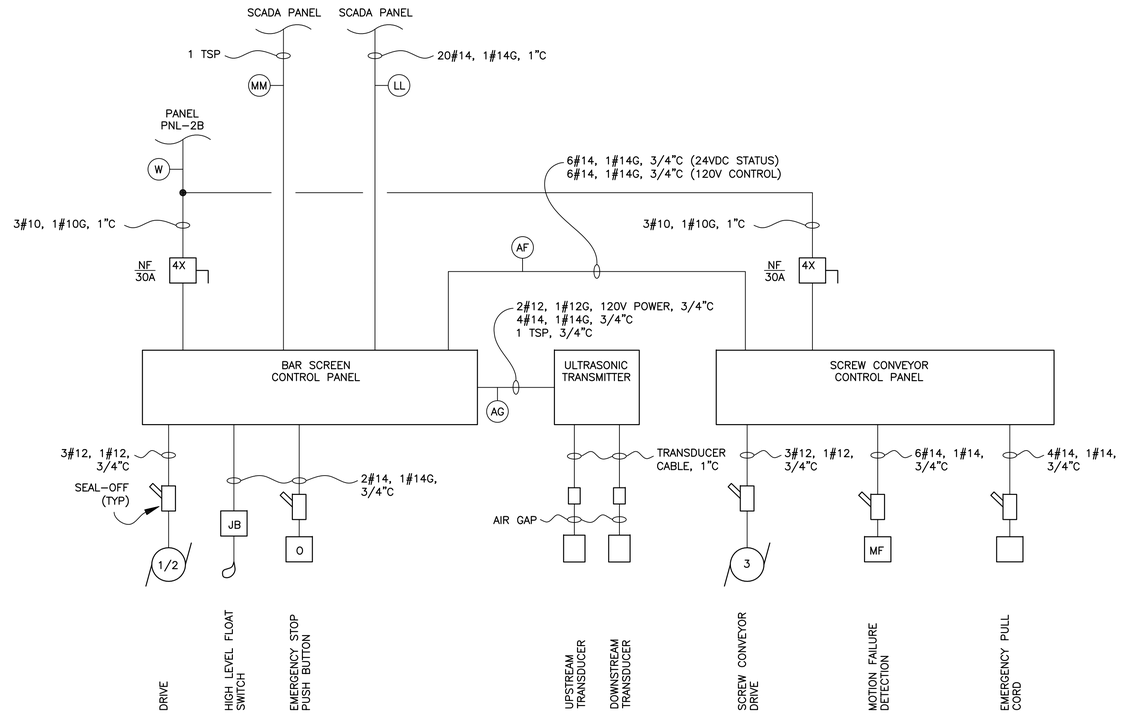

BACKGROUND INFORMATION FROM
RECORD DRAWINGS DATED APRIL 2010
FOR MANATEE COUNTY, FL.
NORTH WATER RECLAMATION FACILITY
INFLUENT STRUCTURE
PROJECT NO. 6011281

REV.NO.	DESCRIPTIONS	DATE

REVISIONS

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MANATEE COUNTY, FLORIDA

NWRF EXPANSION PHASE 1

RISER DIAGRAM FOR BAR SCREEN #3

DATE:	JULY 2011
MCE PROJ. #	1024-0143
DRAWN	CJR
DESIGNED	CJR
CHECKED	ALA
PROJ. MGR.	DCW

SCALE
HORIZONTAL: NA
VERTICAL: NA

DRAWING NUMBER
E-2.5

STATUS: ISSUED FOR BID
REVISION

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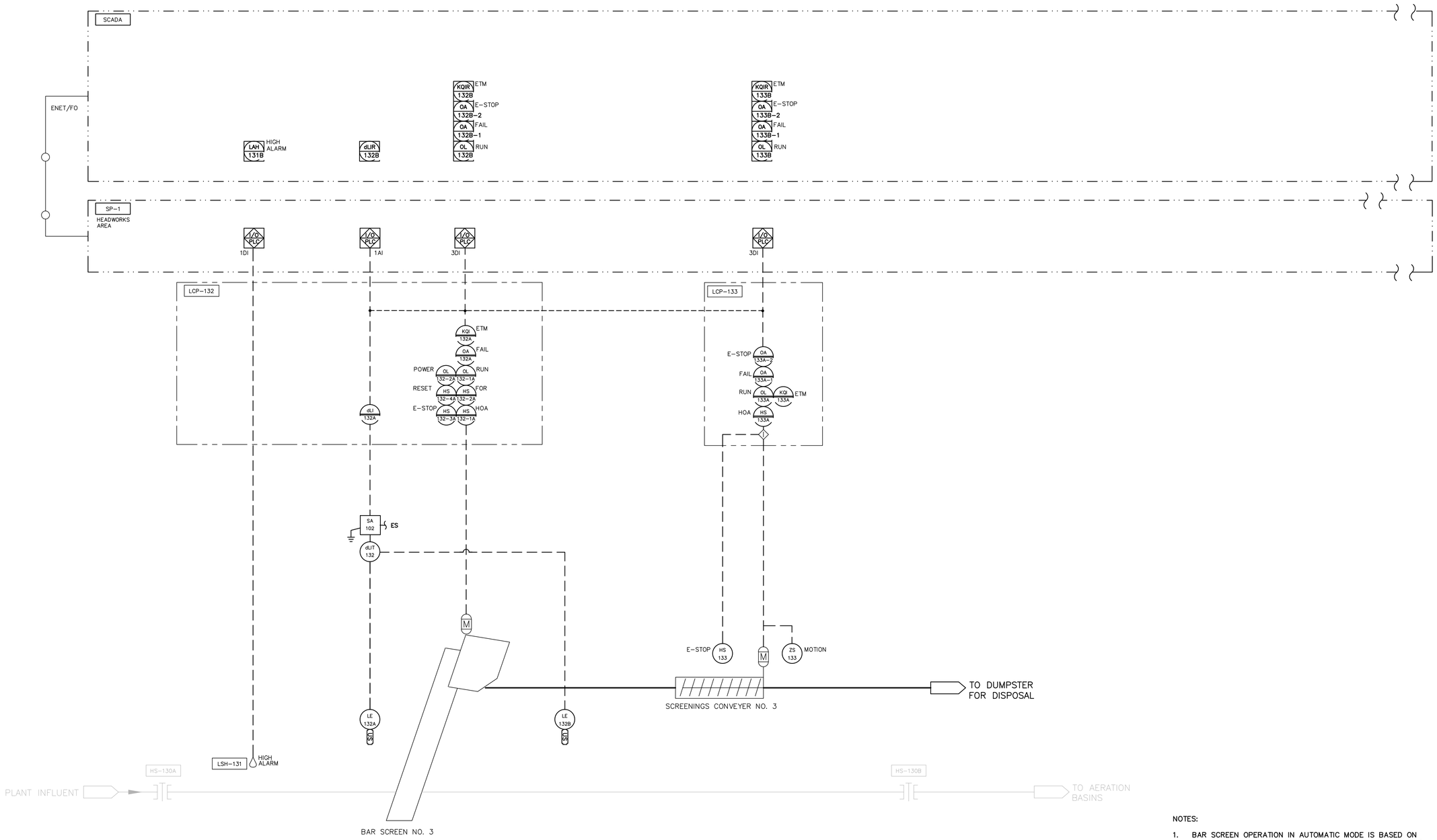

NOTES:

1. BAR SCREEN OPERATION IN AUTOMATIC MODE IS BASED ON A MAINTAINED HIGH DIFFERENTIAL WATER LEVEL ACROSS THE SCREEN,
2. INTERLOCK SCREENINGS CONVEYOR CONTROLS TO OPERATION OF BAR SCREEN. START CONVEYOR AN ADJUSTABLE TIME DELAY AFTER START OF BAR SCREEN. CONTINUE TO OPERATE CONVEYOR FOR AN ADJUSTABLE TIME DELAY AFTER BAR SCREEN SHUTS DOWN.

REV.NO.	DESCRIPTIONS	DATE
	REVISIONS	

SEAL

MICHAEL TWEEDEL, P.E.
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MANATEE COUNTY, FLORIDA

NWRF EXPANSION PHASE 1

PROCESS AND INSTRUMENTATION DIAGRAM HEADWORKS BAR SCREEN & CONVEYOR

DATE:	JULY 2011
MCE PROJ. #	1024-0143
DRAWN	MDT
DESIGNED	MDT
CHECKED	TER
PROJ. MGR.	DCW

SCALE
HORIZONTAL: NA
VERTICAL: NA

DRAWING NUMBER
I-2.1

STATUS: ISSUED FOR BID
REVISION

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