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## ADDENDUM NO. 2

**Date: February 27, 2026**

**Project Name: Moore WWTP Improvement Projects**

**Owner: City of Moore**

**Owner Project No: 2026-007**

**Garver Project Nos: 2302254, 2500545, 2501328**

This addendum shall be a part of the Plans, Contract Documents and Specifications to the same extent as though it were originally included therein, and it shall supersede anything contained in the Plans, Contract Documents, and Specifications with which it might conflict. This addendum, including all attachments, shall become part of the Contract and all provisions of the Contract shall apply thereto, **with exception to the items listed under “Other Project Information” at the end of this Addendum No. 2, which are supplements provided for the Contractor’s convenience.** The time provided for completion of the Contract has not been changed as noted in this addendum. Acknowledgement of receipt of this addendum must be noted in the appropriate section of the Bid Form and included with the Contract Documents.

### A. SPECIFICATIONS – Volume 1

1. Remove the following specification sections in their entirety, and replace with the same, attached hereto:
  - a. 01 14 00 – WORK RESTRICTIONS
  - b. 01 50 00 – TEMPORARY FACILITIES AND CONTROLS
  - c. 40 23 39.36 – STAINLESS STEEL PIPE AND FITTINGS - GENERAL SERVICE DATA SHEET
  - d. 44 42 17 – PVC COARSE BUBBLE AERATION EQUIPMENT
2. Remove the following in their entirety, and replace with the same, attached hereto:
  - a. BID SCHEDULE, sheet 17 of Section 00 10 00 – City of Moore Contract Documents
3. Add the following specification sections, attached hereto:
  - a. 02 31 15 – EXISTING CHANNEL CONCRETE INSPECTION AND REPAIR
  - b. 08 62 00 – UNIT SKYLIGHTS
  - c. 41 22 23.20 – MONORAIL WITH ELECTRIC HOIST AND TROLLEY
4. Remove Section ORF-402 WAGE DETERMINATIONS Davis-Bacon Wage placeholder sheet and replace with the attached hereto:
  - a. ORF-402 WAGE DETERMINATIONS Davis-Bacon Wage Decisions

**Addendum No. 2 for Moore WWTP Improvement Projects  
February 27, 2026**

5. Revise Section 01 20 00 – PRICE AND PAYMENT PROCEDURES as follows:
  - a. Delete paragraph 1.2 – Bid Item Descriptions
6. Revise Section 40 05 57 – ACTUATORS FOR PROCESS VALVES AND GATES as follows:
  - a. Remove paragraph 3.8 - ATTACHMENT A (POWER OPERATED VALVE SCHEDULES)
  - b. Remove paragraph 3.8 - ATTACHMENT B (PNEUMATIC OPERATED VALVE SCHEDULES)

**B. STANDARD DETAILS - Volume 2**

1. No items for Standard Details are included in this addendum.

**C. DRAWINGS - Volume 3**

1. Remove the following drawing sheets in their entirety, and replace with the same, attached hereto:
  - a. 66-P102, Sheet 20
  - b. 66-P301, Sheet 21
2. Revise the Drawings as follows:
  - a. Drawing 10-S101, revise Note 2 to replace “System 17” with “System 19”
  - b. Drawing 10-S102, revise Note 1 to the following:
    1. "INSTALL ALUMINUM COVERS, SUPPORTS, AND ALL OTHER REQUIRED APPURTENANCES. COORDINATE ALL DIMENSIONS, CONNECTION POINTS, AND INSTALLATION REQUIREMENTS WITH THE MANUFACTURER PRIOR TO FABRICATION AND INSTALLATION"
  - c. Drawing 10-S102, remove Note 5.
  - d. Drawing 10-S104, revise Note 2 to remove “24 GA.”.
  - e. Drawing 50-X101, revise Note 1 to the following:
    1. “CONDITION OF CONCRETE INTERFACE WITH THE PROPOSED COVERS SHALL BE INVESTIGATED. ANY DELETERIOUS CONDITIONS SHALL BE REPAIRED PER SECTION 03 01 00 - MAINTENANCE OF CONCRETE, APPROXIMATELY 300 SF.”

**D. OTHER PROJECT INFORMATION**

1. Moore WWTP record drawings dated 3/19/2010, prepared by Eagle Consultants, Inc. 2803 South Bryant Avenue Edmond, Oklahoma 73013, entitled “Plans for Wastewater Treatment System Improvements” and prepared for the “City of Moore/Moore Public Works Authority”. These record drawings are provided only for the Contractor’s convenience; these record drawings are not Contract Documents.

**Addendum No. 2 for Moore WWTP Improvement Projects  
February 27, 2026**

By: \_\_\_\_\_

Michael Nguyen, PE  
Project Manager



**Attachments:**

1. Specifications
  - a. BID SCHEDULE, sheet 17 of Section 00 10 00 – City of Moore Contract Documents
  - b. ORF-402 WAGE DETERMINATIONS Davis-Bacon Wage Decisions
  - c. 01 14 00 – WORK RESTRICTIONS
  - d. 01 50 00 – TEMPORARY FACILITIES AND CONTROLS
  - e. 02 31 15 – EXISTING CHANNEL CONCRETE INSPECTION AND REPAIR
  - f. 08 62 00 – UNIT SKYLIGHTS
  - g. 33 01 20 – WASTEWATER LIQUID AND SOLIDS REMOVAL
  - h. 40 23 39.36 – STAINLESS STEEL PIPE AND FITTINGS - GENERAL SERVICE DATA SHEET
  - i. 41 22 23.20 – MONORAIL WITH ELECTRIC HOIST AND TROLLEY
  - j. 44 42 17 – PVC COARSE BUBBLE AERATION EQUIPMENT
2. Drawings
  - a. 66-P102
  - b. 66-P301
3. Other Project Information (Not Contract Documents)
  - a. Moore WWTP Record drawings dated 3/19/2010, prepared by Eagle Consultants, Inc., entitled “Plans for Wastewater Treatment System Improvements”

END OF ADDENDUM NO. 2

**BID SCHEDULE**  
**Moore WWTP Improvement Projects**  
**BASE BID**

ITEM #	EST. QTY.	UNIT	DESCRIPTION	UNIT PRICE	ITEM TOTAL
1	1	L.S.	All Work as defined in the Contract Documents except those items listed separately below, for the lump sum of:	\$	\$
Unit Price In Words			Dollars		
2	1	L.S.	Headworks bypass pumping, for the lump sum of:	\$	\$
Unit Price In Words			Dollars		
3	770	S.F.	Headworks Concrete Removal and Repair (0.5 in. to 3 in.), per square foot.	\$	\$
Unit Price In Words			Dollars		
4	6250	S.F.	Headworks Concrete Coating (includes up to 0.49 in. of concrete repair if needed), per square foot.	\$	\$
Unit Price In Words			Dollars		
5	100	L.F.	Headworks Building Steel Truss Repairs, per linear foot.	\$	\$
Unit Price In Words			Dollars		
6	50	L.F.	UV Building Steel Truss Repairs, per linear foot.	\$	\$
Unit Price In Words			Dollars		
7	200	E.A.	Digester Facility: chipping out concrete around existing building anchor bolts, cutting of anchor bolts, and filling with non-shrink grout, for the lump sum of:	\$	\$
Unit Price In Words			Dollars		
8	87	E.A.	Digester Facility: grinding embeds of existing interior platform smooth, applying cold galvanizing, for the lump sum of:	\$	\$
Unit Price In Words			Dollars		
9	1,400	C.Y.	North Storm Ponds: Total volume of waste sludge to be removed and disposed, as specified in Section 33 01 20. This quantity and pricing are applicable for removing sludge for any structure specified within Section 33 01 20, for the unit price of:	\$	\$
Unit Price In Words			Dollars		
10	1	L.S.	Utility Allowance, for the lump sum of:	N/A	\$50,000
Unit Price In Words:			<b>Fifty Thousand Dollars</b>		
11	1	L.S.	Contingency Allowance 1 for Work Change Directives (miscellaneous work on a change authorization basis) required during completion of the Project to be used solely at the discretion of the OWNER and ENGINEER, for the lump sum of:	N/A	\$ 750,000
Unit Price In Words:			<b>Seven Hundred and Fifty Thousand Dollars</b>		
TOTAL AMOUNT BID				\$	
Total Amount Bid In Words			Dollars		

"General Decision Number: OK20260029 01/02/2026

Superseded General Decision Number: OK20250029

State: Oklahoma

Construction Type: Heavy

Counties: Canadian, Cleveland, Grady, Lincoln and McClain Counties in Oklahoma.

HEAVY CONSTRUCTION PROJECTS (including sewer/water line construction; heavy construction projects on treatment plants and industrial sites) (excludes heavy dredging and water well drilling)

Modification Number 0 Publication Date 01/02/2026

ENGI0627-015 06/01/2025

	Rates	Fringes
POWER EQUIPMENT OPERATOR:		
Group 1.....	\$ 38.09	19.05
Group 2.....	\$ 36.14	19.05
Group 3.....	\$ 35.40	19.05
Group 4.....	\$ 34.07	19.05
Group 6.....	\$ 30.87	19.05
Group10.....	\$ 27.25	19.05

POWER EQUIPMENT OPERATOR

GROUP 1: All Crane Type Equipment 200 ton and larger and including 400 ton capacity cranes. All Tower Cranes.

GROUP 2: All Crane Type Equipment 100 ton capacity and larger cranes, and less than 200 ton capacity.

GROUP 3: All Crane Type Equipment 50 ton capacity and larger cranes, and less than 100 ton capacity. Crane Equipment (as rated by mfg.) 3 cu. yd. and over Guy derrick Whirley Power Driven Hole Digger (with 30' and longer mast).

GROUP 4: CRANES with Boom Incl. Jib less than 100 ft and less than 3 cu. Yd.; Overhead Monorail Crane and Bulldozer.

GROUP 6: Roller (Asphalt and Dirt)

GROUP 10:Oiler

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IRON0048-005 06/01/2025

	Rates	Fringes
IRONWORKER (Structural, Reinforcing, and Ornamental).....	\$ 32.10	17.38

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SUOK2012-007 05/18/2012

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 12.49	1.23

ELECTRICIAN.....	\$ 22.00	4.76
FORM WORKER.....	\$ 11.77	0.00
LABORER: Common or General.....	\$ 11.81	1.09
LABORER: Pipelayer.....	\$ 11.13	0.00
OPERATOR: Backhoe/Excavator.....	\$ 18.17	6.28
OPERATOR: Drill.....	\$ 17.15	0.78
OPERATOR: Grader/Blade.....	\$ 17.76	3.87
OPERATOR: Loader (Front End)....	\$ 13.51	0.00
OPERATOR: Mechanic.....	\$ 19.61	9.39
OPERATOR: Scraper.....	\$ 16.00	1.55
OPERATOR: Trackhoe.....	\$ 17.50	2.78
TRUCK DRIVER: Dump Truck.....	\$ 16.50	0.74

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least \$13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

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The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

#### Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

#### Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

#### Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that

classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

#### State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

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#### WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to [davisbaconinfo@dol.gov](mailto:davisbaconinfo@dol.gov) or by mail to:

Branch of Wage Surveys  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to [BCWD-Office@dol.gov](mailto:BCWD-Office@dol.gov) or by mail to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the

decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210.

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END OF GENERAL DECISION

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## SECTION 01 14 00 – WORK RESTRICTIONS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Work restrictions.
  - 2. Work sequencing.
  
- B. Related Section:
  - 1. Section 01 20 00 – Price and Payment Procedures.
  - 2. Section 01 32 16 – Construction Progress Schedule.
  - 3. Section 01 50 00 – Temporary Facilities and Controls
  - 4. Section 01 70 00 – Execution Requirements
  - 5. Section 01 77 00 – Closeout Procedures

#### 1.2 GENERAL WORK RESTRICTIONS

- A. Wastewater Treatment Facilities:
  - 1. The existing facility is the City of Moore's only means of treating domestic and industrial wastewater prior to discharging. Impairing the operational capabilities of this facility will result in serious environmental damage and monetary fines.
  - 2. Contractor shall bear the cost of penalties imposed on the Owner for discharge violations or other violations caused by actions of the Contractor.
  - 3. Conduct work in a manner that WILL NOT impair the operational capabilities of essential elements of the treatment process or reduce the capacity of the entire treatment plant below levels sufficient to treat the quality of raw wastewater to the water quality limitations specified in the discharge permit.
  - 4. The status of the treatment plant shall be defined as "operational" when it is capable of treating the entire quantity of wastewater received to the water quality limits specified in the discharge permit.
  
- B. Time Restrictions for Performing Work:
  - 1. Regular operating hours as determined by the Owner.
  
- C. Onsite Workday Restrictions:
  - 1. DO NOT perform Work on Site during Work blackout days specified by Owner.
  
- D. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction (AHJ).
  
- E. Provide safe, continuous access to process control equipment for plant operations personnel.
  
- F. Noise, Vibration, Dust, and Odors:
  - 1. Coordinate with Owner operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy.
  - 2. Notify Engineer or Owner NOT less than two days in advance of proposed disruptive operations.
  - 3. Obtain Engineer's or Owner's written permission before proceeding with disruptive operations.
  
- G. Smoking and Controlled Substance Restrictions:
  - 1. Use of tobacco products, alcoholic beverages, marijuana, and other controlled substances on Project Site, premises, or on Owner's property is NOT permitted.

- H. Employee Identification:
  - 1. Provide identification tags for Contractor personnel working on Project Site. Require personnel to use identification tags at all times.
- I. Employee Screening:
  - 1. Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project Site.
  - 2. Maintain list of approved screened personnel with Owner's representative.

### 1.3 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Restricted Use of Site:
  - 1. Contractor shall have limited use of Project Site for construction operations as specified in Drawings by the Contract limits and as specified in this Section.
- B. Limits on Use of Site:
  - 1. Limit use of Project Site to Work in areas specified.
  - 2. DO NOT disturb portions of Project Site beyond areas in which the Work is specified.
- C. Limits on Use of Site:
  - 1. Limit use of Site and premises to allow:
    - a. Owner occupancy.
    - b. Work by Owner.
    - c. Work by Others.
    - d. Use by the public where required.
  - 2. Driveways, Walkways, and Entrances:
    - a. Keep driveways, parking areas, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. DO NOT use these areas for parking or for storage of materials.
    - b. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    - c. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on Site.
- D. Construction Operations:
  - 1. Limited to areas specified in Drawings.
  - 2. Noisy and Disruptive Operations (such as Use of Jack Hammers and Other Noisy Equipment):
    - a. NOT allowed in close proximity to existing building during regular hours of operation. Coordinate and schedule such operations with Owner to minimize disruptions.
- E. Sound Level Restrictions:
  - 1. Sound pressure level measured at boundary of Site SHALL NOT exceed levels required by local ordinances or codes, and at NO time shall exceed 40 dBA

### 1.4 FACILITY OPERATIONS

- A. Existing Utility Interruptions:
  - 1. DO NOT interrupt utilities serving facilities occupied by Owner or others unless permitted under the conditions, and only after arranging for temporary utility services as specified:
    - a. Notify Engineer and Owner NOT less than seven days in advance of proposed utility interruptions.
    - b. Submit outage request plan to Engineer and Owner itemizing dates, times, and duration of each requested outage.

- c. Obtain Owner's written permission before proceeding with utility interruptions.
- B. Existing Operations Interruptions:
- 1. DO NOT shutdown, interrupt, or otherwise impair the operational capability of treatment facilities or processes unless permitted under the following conditions. A facility or process shall be considered operational when it can achieve its defined treatment or process objective as defined by the Owner or Engineer.
  - 2. Specify required shutdowns of existing facilities or interruptions of existing operations on Construction Progress Schedule.
  - 3. Where required to minimize interruptions or impairments to systems operations while complying with specified work constraints, provide temporary treatment equipment, pumping, bypass systems, connections, power, lighting, controls, instrumentation, and safety devices.
  - 4. DO NOT remove or demolish systems required to keep the existing facilities operational at the capacities specified until the existing systems are replaced by temporary or new systems.
- C. Shutdown Constraints:
- 1. Perform work within critical operational constraints:
    - a. Bypass pumping must be done during the dry weather periods.
    - b. Three of the six digester basins will be in operation. Phasing of which digesters that will need to be offline shall be coordinated with the Owner.
    - c. Work within the North Storm Ponds may only be done during dry weather periods.
    - d. The return lift station at the North Pond Electrical building, which is powered out of the North Pond Electrical building, must remain fully operational during improvements in that area. Contractor shall provide backup power generators for continuous operation of the pump station.
- D. Shutdown Definitions:
- 1. Minor Shutdown:
    - a. Any shutdown requiring less than 4 hrs.
  - 2. Major Shutdown:
    - a. Any shutdown other than a minor shutdown.
  - 3. Dry Weather Period:
    - a. Generally, June 15 – October 1.
    - b. Final determination made by Owner based on weather, flows entering the plant, and plant operation requirements.
  - 4. Wet Weather Period:
    - a. Any time NOT within the defined dry weather period.
  - 5. Low Flow Period:
    - a. 2:00am – 6:00am.
- E. Shutdown Procedures:
- 1. Notify Engineer and Owner NOT less than 14 days in advance of proposed minor shutdowns.
  - 2. Notify Engineer and Owner NOT less than 30 days in advance of proposed major shutdowns.
  - 3. Contractor shall schedule a shutdown coordination meeting with Owner and Engineer one week prior to each shutdown.
  - 4. Any and all plant shutdowns shall require a shutdown plan, including detailed schedule, backup tools and equipment, personnel involved, contingency plan, and any procedures involved in restarting the process or facility.
  - 5. Obtain Engineer's or Owner's written permission before proceeding with proposed shutdowns.
  - 6. Shutdowns will only be allowed in dry weather periods or as determined by Owner. Shutdowns may be limited to low flow periods.

## 1.5 WORK SEQUENCE

- A. Use identified work sequences in this section as a guideline for scheduling and performing work. Perform work in a manner that WILL NOT prevent the facility from achieving the final treated water quality requirements established by regulation. It is ultimately the responsibility of the Contractor to execute the work in a sequence that meets all requirements of the contract documents.
- B. Work sequence and constraints presented DO NOT include all items affecting completion of the Work. They are intended to describe critical events necessary to minimize disruption to existing operations and to ensure compliance with treatment regulations and permit requirements.
- C. Construct Work in phases during construction period. Coordinate construction schedule and operations with Engineer and Owner:
  - 1. Task 1: Headworks Improvements
    - a. Phase 1: Bypass Headworks Facility
      - 1) Sequence 1: With approval of bypass plan (Section 01 50 00) and during the low flow period, the Owner will shut influent pumps off and divert flow to the storm ponds.
      - 2) Sequence 2: Contractor shall install bypass pump discharge piping to the existing pump station discharge pipe header. The temporary piping shall include an isolation valve to allow the existing pumps, if required, to run while the temporary connection is in place. The Contractor will be limited to perform this tie-in to 4 hours.
      - 3) Sequence 3: Following installation of the temporary connection, the Owner will drain the storm ponds back to the headworks facility and pump down the wet well, which will take approximately 8 hours.
      - 4) Sequence 4: Once Owner has verified the storm ponds have been drained, the Contractor shall provide bypass pumping, downstream of screening and grit removal to existing pump station discharge pipe header, to perform work to the Headworks pump station junction box and wet well while junction box and wet well work is being performed.
      - 5) Sequence 5: When junction box and wet well repairs and coatings are completely cured and ready for service, Contractor shall coordinate with Owner on bringing the Headworks facility back online. The Contractor shall then end bypass pumping, remove the temporary piping from the 30" discharge header, and reinstall the existing pipe and/or fittings previously removed. Once the header is reinstalled, the Owner shall run the headworks facility. The Contractor will be limited to perform this sequence to 4 hours.
    - b. Phase 2: Concrete repair and coat interior of Headworks junction box and wet well.
      - 1) Sequence 1: Clean and prep the interior of the Headworks junction box and wet well.
      - 2) Sequence 2: Repair concrete in junction box.
      - 3) Sequence 3: Coat the junction box and wet well.
    - c. Phase 3: Channel and Wet Well Covers.
      - 1) Sequence 1: Remove existing grating as needed.
      - 2) Sequence 2: Install channel and wet well covers.
    - d. Phase 4: Roof Replacement
      - 1) Sequence 1: Remove roof.
      - 2) Sequence 2: Clean and coat roof support system.
      - 3) Sequence 3: Install roof.
    - e. Phase 5: HVAC and Odor Control Ductwork Modifications (This phase can done concurrently with other phases as needed)
      - 1) Sequence 1: Install makeup air unit and ductwork.
      - 2) Sequence 2: Install and repair odor control ductwork.

2. Task 2: Digester Improvements (This task can done concurrently with other tasks as needed)
  - a. Phase 1: Removal of existing interior walkways, grind and coat embedded walkway supports, and chip concrete around existing building anchor bolts, remove anchor bolts and grout flush.
  - b. Phase 2: Installation of digester covers.
    - 1) Installation of the digester covers may be sequenced as needed, as 3 of the 6 digester basins must remain in operation.
  - c. Phase 3: Installation of digester instrumentation.
  - d. Phase 4: Installation of digester odor control ducting.
  - e. Phase 5: Installation of digester handrails and lighting.
3. Task 3: Sequencing Batch Reactor Building Improvements (This task can done concurrently with other tasks as needed)
  - a. Phase 1: Replacement of the building ridge cap.
  - b. Phase 2: Installation of the odor control intake louvers.
4. Task 4: UV and Effluent Pump Station Building Improvements (This task can done concurrently with other tasks as needed)
  - a. Phase 1: Replacement of the grating with plating at the pump station junction box.
  - b. Phase 2: Clean and coat the interior roof system.
  - c. Phase 3: Replacement of the monorail crane.
  - d. Phase 4: Demolition and installation of the ventilation systems.
5. Task 5: North Storm Ponds
  - a. Phase 1: Cleaning and disposing existing storm pond interior solids and debris.
  - b. Phase 2: Demolition of existing blower concrete pads and surrounding sidewalk.
  - c. Phase 3: Installation of sub-grade blower piping.
  - d. Phase 4: Installation of blower pads and concrete.
  - e. Phase 5: Electrical feed upgrades at the electrical building.
    - 1) Provide temporary power to return lift station until permanent power is provided.
  - f. Phase 6: Installation of packaged air conditioning system.
  - g. Phase 7: Installation of the blower VFDs and other required electrical gear.

## 1.6 SEQUENCING OF CONSTRUCTION PLAN

- A. Before start of construction, post electronic file to Project website of construction plan regarding phasing of project and new Work for acceptance by Owner.
- B. After acceptance of plan, comply with accepted plan when coordinating construction sequencing unless deviations are accepted by Owner in writing.

## PART 2 - PRODUCTS (NOT USED)

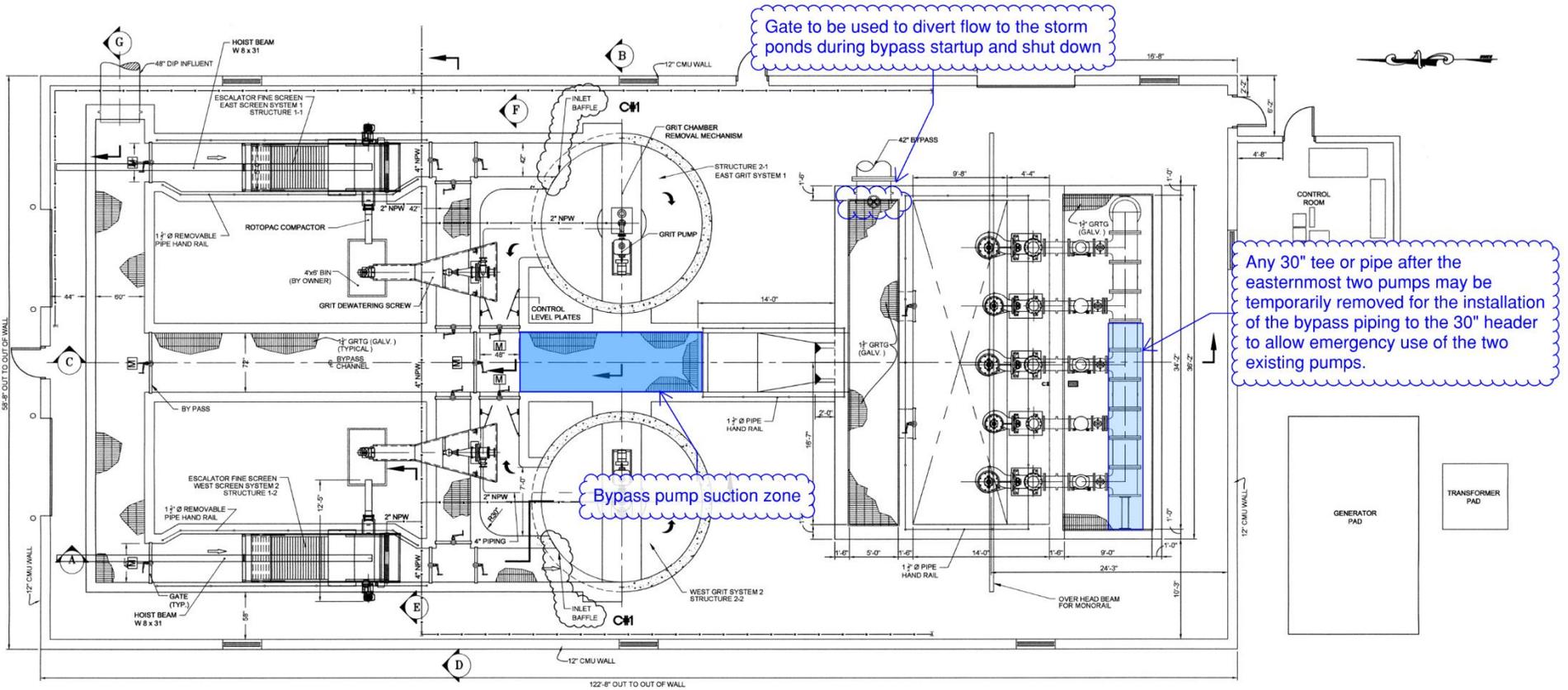
## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Use identified work sequences in this section as a guideline for scheduling and performing work. Perform work in a manner that WILL NOT prevent the facility from achieving the final treated water quality requirements established by regulation. It is ultimately the responsibility of the Contractor to execute the work in a sequence that meets all requirements of the contract documents.
- B. Work sequence and constraints presented DO NOT include all items affecting completion of the Work. They are intended to describe critical events necessary to minimize disruption to existing operations and to ensure compliance with treatment regulations and permit requirements.

PROPOSED TASK 1 PHASE 1 SEQUENCE

Task/Phase	Task 1/Phase 1 - Bypass Pumping
Description	Bypass pumping of the Headworks facility.
Work to be Completed	Repair the junction box concrete and coat the junction box and wet well walls.
Shutdowns Required During Sequence	Minor Shutdown of headworks pumps for force main tie-in.
Isolation Locations	Install temporary isolation in channel downstream of screening and grit removal  The gate serving the junction box overflow shall remain closed and sealed  Headworks existing effluent pump discharge isolation valves shall remain closed.
Construction Duration during Shutdown	As needed to complete repair of junction box concrete and coating of the junction box and wet well.
Total Shutdown	As needed to complete repair of junction box concrete and coating of the junction box and wet well.
Temporary Bypass Pumping or Piping	Temporary bypass pumping and piping is required for rerouting plant influent flows downstream of screening and grit removal to the headworks pump station discharge piping.
Notes	Historical data indicates an average daily flow of 8 MGD and instantaneous peak influent flows up to 18 MGD.



END OF SECTION

## SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section Includes:
1. Temporary Utilities:
    - a. Temporary electricity.
    - b. Temporary lighting for construction purposes.
    - c. Temporary heating.
    - d. Temporary cooling.
    - e. Temporary ventilation.
    - f. Communication services.
    - g. Temporary water service.
    - h. Temporary sanitary facilities.
    - i. Temporary process pumping and piping
  2. Construction Facilities:
    - a. Field offices and sheds.
    - b. Vehicular access.
    - c. Parking.
    - d. Progress cleaning and waste removal.
    - e. Project identification.
    - f. Traffic regulation.
    - g. Fire-prevention facilities.
  3. Temporary Controls:
    - a. Barriers.
    - b. Enclosures and fencing.
    - c. Security.
    - d. Water control.
    - e. Dust control.
    - f. Erosion and sediment control.
    - g. Noise control.
    - h. Pest and rodent control.
    - i. Pollution control.
  4. Removal of utilities, facilities, and controls.

#### 1.2 REFERENCES

- A. ASTM International:
1. E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
  2. E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
  3. E119 – Standard Test Methods for Fire Tests of Building Construction and Materials.

#### 1.3 SUBMITTALS

- A. Subject to the requirements of Section 01 33 00 – Submittal Procedures.
- B. Temporary Pumping and Piping Systems
1. Submit pump data, performance curves, and other operating information.
  2. Detailed plan and description of proposed pumping system. Indicate number, size, material, location and method of installation of suction and discharge piping, size of pipeline or conveyance system to be bypassed, staging area for pumps, site access point, and expected flow.

3. Submit detailed plan and schedule of procedures for bypass installation, startup, shutdown, and uninstallation.
4. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill, if buried.
5. Temporary pipe supports and anchoring required.
6. Thrust and restraint block sizes and locations.
7. Bypass pump sizes, capacity, number of each size to be on the site and power requirements. Backup pump, power and piping equipment.
8. Calculations of static lift, friction losses, and flow velocity. Pump curves and showing pump operating range.
9. Design plans and access to bypass pumping locations indicated on drawings.
10. Calculations for selection of bypass pumping pipe size.
11. Schedule for installation and maintenance of bypassing pumping lines.
12. Procedures to monitoring suction line pressure drops.
13. Procedures for setup and breakdown of pumping operations.
14. Emergency plan detailing procedures to be followed in event of pump failures.
15. Maintain copy of emergency plan on site for duration of project.
16. Submit all information at least 30 days prior to when temporary pumping system is scheduled to be installed.

C. QUALITY ASSURANCE

1. Follow national standards and as specified herein.
2. Perform leakage and pressure tests on discharge piping using clean water, before operation. Notify Engineer 24 hours prior to testing.
3. Keep and maintain spare parts for pumps and piping on site, as required.
4. Maintain adequate hoisting equipment and accessories on site for each pump.

1.4 TEMPORARY FACILITIES

A. Temporary Provisions Provided by Contractor:

1. Temporary barriers, barricades, covered walkways, fencing, exterior closures, and interior closures.
2. Temporary field offices.
3. Cleaning during construction.
4. Access roads and approaches.
5. Temporary sanitary facilities.
6. Temporary heating and ventilating after enclosure.
7. Temporary electrical service and distribution system for power and lighting.
8. Temporary telephone and internet service.
9. Temporary tree and plant protection.
10. Temporary heating before building enclosure.
11. Temporary fire protection, dust control, erosion and sediment control, water control, noise control, and other necessary temporary controls
12. Temporary provisions for protection of installed Work

1.5 TEMPORARY ELECTRICITY

- A. Provide and pay for temporary power service required from utility source as needed for construction operation.
- B. When using Owner's existing power service, provide separate metering, and reimburse Owner for cost of energy used.
- C. Complement existing power service capacity and characteristics as required for construction operations.

- D. Provide power outlets with branch wiring and distribution boxes located as required for construction operations. Provide suitable, flexible power cords as required for portable construction tools and equipment. All temporary electrical work shall comply with electrical codes and regulations.

#### 1.6 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain lighting for construction operations at lighting levels NOT less than required by OSHA (Occupational Safety and Health Administration).
- B. Provide and maintain lighting to exterior staging and storage areas and interior work areas after dark for security purposes.
- C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtailed lamps, and the like, for specified lighting levels.
- D. Permanent building lighting may be used during construction. When used, maintain lighting and provide routine repairs including replacement of lamps.

#### 1.7 TEMPORARY HEATING

- A. Provide temporary heating devices and heat as needed to maintain specified conditions for construction operations.
- B. Before operating permanent equipment for temporary heating purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Replace filters at Substantial Completion.
- C. Maintain minimum ambient temperature of 50°F in areas where construction is in progress unless indicated otherwise in individual product Sections.

#### 1.8 TEMPORARY COOLING

- A. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.
- B. Before operating permanent equipment for temporary cooling purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Replace filters at Substantial Completion.
- C. Maintain maximum ambient temperature of 80°F in areas where construction is in progress unless indicated otherwise in individual product Sections.

#### 1.9 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. For construction activity in hazardous locations, provide ventilation levels to achieve unclassified ratings in accordance with NFPA 820.

## 1.10 COMMUNICATION SERVICES

### A. Internet Service:

1. Provide, maintain, and pay for broadband Internet service to field office at time of Project mobilization. Internet service must provide a minimum of 1,000 mbps upload and download speeds. Provide desktop computer with Microsoft operating system and appropriate office function software, modem, and printer.

## 1.11 TEMPORARY WATER SERVICE

- A. Provide and pay for suitable quality water service as needed to maintain specified conditions for construction operations. Where existing water service is used, provide separate metering and reimburse Owner for cost of water used.
- B. Extend branch piping with outlets located so that water is available by hoses with threaded connections. Provide temporary pipe insulation and heat tape to prevent freezing as necessary.
- C. Remove temporary piping and connections and restore affected portions of the facility to original condition before Final Completion.

## 1.12 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Existing facility use is NOT permitted. Provide facilities at time of Project mobilization. Remove facilities at completion of project and leave Site in neat and sanitary condition.

## 1.13 FIELD OFFICES AND SHEDS

- A. DO NOT use existing facilities for field offices or for storage.
- B. Contractor's Field Office:
  1. Portable or mobile building, or building constructed with floors raised aboveground, securely fixed to foundations with steps and landings at entrance doors.
  2. Construction: Structurally sound, secure, weathertight enclosures for office and storage spaces. Maintain during progress of Work; remove enclosures at completion of Work.
  3. Provide lighting, electrical outlets, heating, cooling, and ventilating equipment, and equipped with sturdy furniture including conference table, drawing rack, filing cabinets, and drawing display table.
  4. Provide space for Project meetings, with table and chairs to accommodate eight people.
  5. Thermal Resistance of Floors, Walls, and Ceilings: Compatible with occupancy and storage requirements.
  6. Exterior Materials: Weather-resistant, finished in color acceptable to Engineer.
  7. Interior Materials in Field Offices: Sheet-type materials for walls and ceilings, prefinished or painted; resilient floors and bases.
  8. Environmental Control:
    - a. Heating, Cooling, and Ventilating for Offices: Automatic equipment to maintain comfort conditions.
- C. Storage Areas and Sheds:
  1. Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and inspection of products to suit requirements in Section 01 60 00 – Product Requirements.
- D. Preparation:
  1. Fill and grade Sites for temporary structures sloped for drainage away from buildings.

- E. Installation:
  1. Install field office spaces ready for occupancy 15 days after date established by Notice to Proceed.
  2. Locate field offices where directed.
  3. Raise grade under field offices, as necessary, to elevation adequate to avoid flooding.
  4. Provide sanitary facilities in compliance with state and local health authorities.
- F. Maintenance and Cleaning:
  1. Arrange and pay for Janitorial service including daily trash service, continuous supply of toilet paper, hand towels, and hand soap, and monthly comprehensive cleaning for both Contractor field offices.
  2. Maintain walks free of mud, water, snow, and the like.
- G. Removal:
  1. At completion of Work remove buildings, foundations, utility services, and debris. Restore areas to same or better condition as original condition.

#### 1.14 VEHICULAR ACCESS

- A. Construct temporary all-weather access roads from public thoroughfares to serve construction area, of width and load-bearing capacity to accommodate unimpeded traffic for construction purposes. Roads shall be use gravel, crushed rock, or other stabilization material.
- B. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.
- C. Where access roads cross existing fences, install and maintain gates.
- D. Maintain road grade and crown to eliminate potholes, rutting, and other irregularities that restrict access.
- E. Extend and relocate vehicular access as Work progress requires and provide detours as necessary for unimpeded traffic flow.
- F. Locate as required and within easements, rights-of-way, or Project limits. Obtain Engineer's approval of access roads.
- G. Provide unimpeded access for emergency vehicles.
- H. Provide and maintain access to fire hydrants and control valves free of obstructions.
- I. Provide means of removing mud from vehicle wheels before entering streets.
- J. Only use existing onsite roads for construction traffic when designated and with Owner or Engineer approval.
- K. Upon completion of construction, restore ground surface disturbed by access road construction to original condition.

#### 1.15 PARKING

- A. Arrange for temporary surface parking areas to accommodate construction personnel.
- B. Locate as specified in Drawings or as approved by Engineer or Owner.
- C. If Site space is NOT adequate, provide additional offsite parking.

- D. NO employee or equipment parking will be permitted on Owner's existing parking areas, except as specifically designated for Contractor's use.
- E. DO NOT allow heavy vehicles or construction equipment in parking areas.
- F. DO NOT allow vehicle parking on existing pavement.
- G. Designate parking spaces for Engineer or Owner construction observation personnel.
- H. Permanent Pavements and Parking Facilities:
  - 1. Before Substantial Completion, bases for permanent roads and parking areas may be used for construction traffic.
  - 2. Avoid traffic loading beyond paving design capacity. Tracked vehicles are NOT allowed.
  - 3. Use of permanent parking structures is NOT permitted.
- I. Maintenance:
  - 1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, ice, and the like.
  - 2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original condition.
- J. Removal, Repair:
  - 1. Remove temporary materials and construction when permanent paving is usable.
  - 2. Remove underground Work and compacted materials to depth of 2 ft; fill and grade Site as specified.
  - 3. Repair facilities damaged by use, to original condition.
- K. Mud from Site vehicles:
  - 1. Provide means of removing mud from vehicle wheels before entering streets.

#### 1.16 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, before enclosing spaces.
- C. Broom and vacuum clean interior areas before starting surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from Site to maintain a clean and orderly Site and dispose of offsite, at least at weekly intervals.
- E. Open free-fall chutes are NOT permitted. Terminate closed chutes into appropriate containers with lids.

#### 1.17 PROJECT IDENTIFICATION

- A. Project Identification Sign:
  - 1. One painted sign, 32 ft<sup>2</sup> area, bottom 6 ft aboveground.
  - 2. Content:
    - a. Project number, title, logo, and name of Owner.
    - b. Names and titles of authorities.

- c. Names and titles of Engineer and Consultants.
  - d. Name of Prime Contractor.
- 3. Lettering: Series C of Standard Alphabet for Traffic Control Devices, "Manual on Uniform Traffic Control Devices for Streets and Highways," Federal Highway Administration.
- B. Project Informational Signs:
  - 1. Painted informational signs of same colors and lettering as Project identification sign or standard products; size lettering for legibility at 100 ft distance.
  - 2. Provide sign at each field office and storage shed, and provide directional signs to direct traffic into and within Site. Relocate as Work progress requires.
  - 3. NO other signs are allowed without Owner's permission except those required by law.
- C. Design signs and structure to withstand 60 mph wind velocity.
- D. Finishes, Painting:
  - 1. Adequate to withstand weathering, fading, and chipping for duration of construction.
- E. Sign Materials:
  - 1. Structure and Framing: Metal or treated wood, structurally adequate.
  - 2. Sign Surfaces: Exterior grade plywood with medium-density overlay, minimum of 3/4 in. thick, standard large sizes to minimize joints.
  - 3. Rough Hardware: Galvanized or aluminum.
  - 4. Paint and Primers: Exterior quality, two coats.
  - 5. Lettering: Exterior quality paint, contrasting colors.
- F. Installation:
  - 1. Install Project identification sign within 15 days after date established by Notice to Proceed.
  - 2. Erect at designated location.
  - 3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
  - 4. Install sign surface plumb and level, with butt joints. Anchor securely.
  - 5. Paint exposed surfaces of sign, supports, and framing.
- G. Maintenance:
  - 1. Maintain clean signs and supports; repair deterioration and damage.
- H. Removal:
  - 1. Remove signs, framing, supports, and foundations at completion of Project and restore area.

## 1.18 TRAFFIC REGULATION

- A. Signs, Signals, and Devices:
  - 1. Post-Mounted and Wall-Mounted Traffic Control and Informational Signs: As approved by authorities having jurisdiction.
  - 2. Traffic Control Signals: As approved by local jurisdictions.
  - 3. Traffic Cones, Drums, Flares, and Lights: As approved by authorities having jurisdiction.
  - 4. Flag Person Equipment: As required by authorities having jurisdiction.
- B. Flag Persons:
  - 1. Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.
- C. Flares and Lights:

1. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- D. Haul Routes:
1. Consult with authorities having jurisdiction and establish public thoroughfares to be used for haul routes and Site access.
- E. Traffic Signs and Signals:
1. Provide signs at approaches to Site and on Site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
  2. Provide, operate, and maintain traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control and areas affected by Contractor's operations.
  3. Relocate signs and signals as Work progresses, to maintain effective traffic control.
- F. Removal:
1. Remove equipment and devices when NO longer required.
  2. Repair damage caused by installation.
  3. Remove post settings to depth of 2 ft.

#### 1.19 FIRE-PREVENTION FACILITIES

- A. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does NOT exist.
- B. Portable Fire Extinguishers:
1. NFPA 10; 10 lb. capacity, 4A-60B: C UL rating.
  2. Provide one fire extinguisher at each stairway on each floor of buildings under construction and demolition.
  3. Provide minimum of one fire extinguisher in every construction trailer and storage shed.
  4. Provide minimum of one fire extinguisher on roof during roofing operations using heat-producing equipment.

#### 1.20 CONSTRUCTION AIDS

- A. Provide railings, kick plates, enclosure, safety devices, and controls as required for adequate protection of life and property as required by applicable laws and regulations.
- B. Design temporary supports with adequate safety factor for designed load bearing capability. When requested, provide design calculations by a Professional Engineer prior to application of loads. Submitted design calculations are for information and record purposes only.

#### 1.21 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of Site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way and for public access to existing building. All devices shall conform to minimum requirements of OSHA and State agencies.
- C. Tree and Plant Protection:
1. Preserve and protect existing trees and plants designated to remain.

2. Protect areas within drip lines from traffic, parking, storage, dumping, chemically injurious materials and liquids, ponding, and continuous running water.
  3. Replace trees and plants damaged by construction operations.
- D. Protect non-owned vehicular traffic, stored materials, Site, and structures from damage.

#### 1.22 ENCLOSURES AND FENCING

- A. Provide 6 ft high fence around construction Site to protect Work against theft, violence, and vandalism; equip with vehicular and pedestrian gates with locks, as required.
- B. Exterior Enclosures:
1. Provide temporary weathertight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
- C. Interior Enclosures:
1. Provide temporary partitions and ceilings as indicated on Drawings to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
  2. Construction: Framing and sheet materials with closed joints and sealed edges at intersections with existing surfaces.
  3. Paint surfaces exposed to view from Owner-occupied areas.

#### 1.23 SECURITY

- A. Security Program:
1. Protect Work on existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
  2. Initiate program in coordination with Owner's existing security system at Project mobilization.
  3. Maintain program throughout construction period until Owner occupancy or as directed by Engineer.
- B. Entry Control:
1. Restrict entrance of persons and vehicles to Project Site.
  2. Allow entrance only to authorized persons with proper identification.
  3. Maintain log of workers and visitors and make available to Owner on request.
  4. Coordinate access of Owner's personnel to Site in coordination with Owner's security forces.
- C. Personnel Identification:
1. Provide identification badge for each person authorized to enter premises.
  2. Badge to Include: Personal photograph, name, expiration date, and employer.
  3. Maintain list of accredited persons and submit copy to Owner on request.
  4. Require return of badges at expiration of employment on the Work.
- D. Restrictions:
1. DO NOT allow cameras on Site or photographs taken except by written approval of Owner.

#### 1.24 WATER CONTROL

- A. Grade Site to drain. Maintain excavations free of water. Provide, operate, and maintain necessary pumping equipment.
- B. Protect Site from puddles or running water. Provide water barriers as required to protect Site from soil erosion.

#### 1.25 DUST CONTROL

- A. Execute Work by methods that minimize raising dust from construction operations.
- B. Provide positive means to prevent airborne dust from dispersing into atmosphere, into Owner-occupied areas, and onto roadways, including dust pollution as a result of dumping and hauling rock or dirt.

#### 1.26 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills from borrow and waste disposal areas. Prevent erosion and sedimentation.
- B. Minimize surface area of bare soil exposed at one time.
- C. Provide temporary measures including berms, dikes, drains, and other devices to prevent water flow.
- D. Construct fill and waste areas by selective placement to avoid erosive surface silts and clays.
- E. Periodically inspect earthwork to detect evidence of erosion and sedimentation. Promptly apply corrective measures.
- F. See sediment and erosion control plan as specified in Drawings.

#### 1.27 NOISE CONTROL

- A. Provide methods, means, and facilities to minimize noise produced by construction operations.

#### 1.28 PEST AND RODENT CONTROL

- A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work.
- B. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

#### 1.29 POLLUTION CONTROL

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.
- B. DO NOT cause or permit action to occur which would result in an overflow to an existing waterway.
- C. Burning of waste materials, rubbish, or other debris will NOT be permitted on or adjacent to Site.

- D. See pollution and environmental control requirements of authorities having jurisdiction, including EPA guidance document 430/9-73-007 "Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity".

#### 1.30 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials before Substantial Completion inspection.
- B. Remove underground installations to minimum depth of 2 ft and grade to match surrounding conditions.
- C. Clean and repair damage caused by installation or use of temporary Work.
- D. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

#### 1.31 PROTECTION OF WORK AND PROPERTY

- A. Maintain in continuous service all existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and all other utilities encountered along line of the Work, unless other arrangements satisfactory to owners of said utilities have been made.
- B. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
- C. Maintain original Site drainage wherever possible

#### 1.32 TEMPORARY PROCESS PIPING

- A. Contractor shall provide all piping, appurtenances, and other materials as required to provide temporary piping systems as specified herein, as indicated on the Drawings, and as needed to perform the Work.
- B. Contractor shall field route piping as needed and as field conditions dictate, unless otherwise indicated on the Drawings, and determine appropriate lengths of piping and quantity/type of pipe fittings needed to construct temporary piping system. DO NOT block access points such as stairs, doors, and walkways to existing facilities unless approved in writing by the Owner.
- C. Restrain piping at valves and at fitting where piping changes direction, changes sizes, and at ends:
  - 1. When piping is buried, use concrete thrust block or mechanical restraints.
  - 2. When piping is exposed or under water, use mechanical or structural restraints.
  - 3. Determine thrust forces by multiplying the nominal cross-sectional area of the piping by the operating pressure of the piping.
- D. Temporary piping systems shall be installed in a manner that WILL NOT damage existing or new facilities.
- E. Piping material, including gaskets, shall be suitable for the process fluid requiring temporary piping.
- F. After temporary piping is NO longer required, remove piping, clean and repair damage caused by installation or use, and restore existing facilities to original condition.

- G. High-Density Polyethylene (HDPE).
  - 1. Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.
    - a. Defective areas of pipe: Cut out and joint fused as stated herein.
  - 2. Assembled and joined at site using couplings, flanges or butt-fusion method to provide leak proof joint. Follow manufacturer's instructions and ASTM D 2657.
    - a. Threaded or solvent joints and connections are not permitted.
  - 3. Fusing: By personnel certified as fusion technicians by manufacturer of HDPE pipe and/or fusing equipment.
  - 4. Butt-fused joint: True alignment and uniform roll-back beads resulting from use of proper temperature and pressure.
    - a. Allow adequate cooling time before removal of pressure.
    - b. Watertight and have tensile strength equal to that of pipe.
    - c. Acceptance by Engineer before insertion.
  
- H. Flexible Hoses and Associated Couplings and Connectors.
  - 1. Abrasion resistant.
  - 2. Suitable for intended service.
  - 3. Rated for external and internal loads anticipated, including test pressure.
    - a. External loading design: Incorporate anticipated traffic loadings, including traffic impact loading.
  - 4. When subject to traffic loading, compose system, such as traffic ramps or covers.
    - a. Install system and maintain H-20 loading requirements while in use or as directed by the Engineer.
  
- I. Valves and Fittings: Determined according to flow calculations, pump sizes previously determined, and system operating pressures.
  
- J. Aluminum "irrigation type" piping or glued PVC piping will not be permitted.
  
- K. Discharge hose will not be allowed.

### 1.33 TEMPORARY BYPASS PUMPING AND PIPING - HEADWORKS

- A. DESIGN REQUIREMENTS
  - 1. Bypass pumping systems:
    - a. System static head: See record drawings, confirm in the field. Existing pumps design total dynamic head is 55-ft.
    - b. Capacity: Historical data indicates an average daily flow of 8 MGD and instantaneous peak influent flows up to 18 MGD.
    - c. Operate 24 hours per day.
    - d. Include controls to match the collection system influent flow to the plant.
  
- B. Contractor shall provide temporary process pumping where required to complete the Work. Temporary process pumping shall be coordinated with the Owner and Engineer prior to implementation.
  - 1. Pumps.
    - a. Anticipated pressure will vary based on headloss and the final length and size of temporary piping. Contractor shall calculate headlosses and provide pumping with sufficient pressure to meet flow requirements. Calculations shall be sealed and signed by a Professional Engineer registered in the State where the Work is being performed.
    - b. Pumps shall be capable of passing solids of a sufficient size for the type of liquid being pumped, with minimum capacity up to 3-inch solids.
    - c. Fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in priming system.

- d. Electric or diesel powered.
  - e. Provide necessary stop/start controls for each pump.
  - f. Variable speed pumping controls.
  - g. One standby pump of each size maintained on site, on-line, isolated from primary system by a valve.
- 2. Temporary pump systems must be configured to match the operational condition of permanent systems. Where required, provide variable speed pumping to match incoming flows.
  - 3. Provide and pay for all power required to operate temporary pump system.
  - 4. All electrical and instrumentation components shall comply with applicable code requirements.
  - 5. Temporary pumping will be required 24 hours per day during the time period when pumping is required and is critical to the proper operation of the Owner's system. Provide 24-hour on-site supervision of pumps to ensure that pumps are always operational and performing as required. Notify the Owner immediately if temporary pumping cannot be provided. The existing wet well pumps shall remain installed and available for emergency use.
  - 6. Contractor shall be responsible for repairing any damage or reimbursing the Owner for any regulatory fines or additional plant staff time resulting from the Contractor's failure to maintain temporary pumping.
  - 7. All necessary spare equipment and appurtenances shall be available at the Site to allow immediate repair and/or replacement of any pumping system component that is not functioning properly.
- C. Provide temporary piping systems as specified in Paragraph 1.32.
  - D. After temporary process pumping is no longer required, remove pumping system components, clean and repair damage cause by installation or use, and restore existing facilities to original condition.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

## SECTION 02 31 15 – EXISTING CHANNEL CONCRETE INSPECTION AND REPAIR

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes scope of repairs for the existing headworks junction channel (between the parshall flume and pump wet well) and references to other applicable specification sections.
- B. Related Sections:
  - 1. Section 03 01 00 – Maintenance of Concrete
  - 2. Section 03 60 00 – Grout
  - 3. Section 03 64 00 – Concrete Repair Crack Injection
  - 4. Section 09 90 00 – Painting and Protective Coatings

#### 1.2 BID PRICE

- A. The contractor shall provide a base bid price for the concrete surface repair based upon the following estimated quantities provided below. Actual quantities for concrete repair will be determined by the preliminary inspection report.
  - 1. Total Concrete Surface Repair for walls = 770 SF
- B. The base bid unit prices for the concrete crack injection and the concrete surface repair shall be indicated on the bid form. These unit prices shall be used as the basis for payment for the actual quantities of concrete repair that are required by the preliminary inspection reports.
- C. Preliminary inspections should be included in the base bid.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Preliminary Inspection Report: Prior to beginning the work, the contractor shall, perform a preliminary inspection of the walls indicated on the Drawings with the facility in service. The contractor shall provide product application specialist(s), representing manufacturers of proposed repair product(s), to review the application and make specific recommendations for the repairs. The contractor shall submit a legible, detailed plan for the repairs to the Engineer for review and approval. Once the area is bypassed, dewatered, and cleaned, Contractor shall verify the quantity, extent of proposed repairs, and suitability of proposed repair product and provide to the Engineer an updated plan, if necessary.
  - 1. The report shall include at minimum
    - a. Date of inspection
    - b. Inspector's name and contact information.
    - c. Inspectors' qualifications
    - d. Owner, Engineer, and Contractor representatives present during inspection.
    - e. Drawing showing location and size of defect, crack or surface defect.
    - f. Identify on drawing which repair method will be used for each defect.
    - g. Total quantity of surface repair in square feet.
- C. Field quality-control test and inspection reports, as outlined in related sections.
- D. Refer to original equipment submittal at the end of the section.

#### 1.4 QUALITY ASSURANCE

- A. As required by specifications listed in related sections.

#### PART 2 - PRODUCTS

- A. As required by specifications listed in related sections.

#### PART 3 - EXECUTION

- A. As required by specifications listed in related sections and as follows:
  - 1. Repair surface irregularities, per section 03 01 00 Maintenance of Concrete, in all Headworks channel walls indicated in Drawings, as required by preliminary inspection report.
    - a. Blast clean cracks and surfaces to be repaired prior to beginning work. Remove all loose matter, dirt, laitance, oil, grease, salt, rust, and other contaminants.
    - b. Exposed rebar shall be blast cleaned to remove all rust, corrosion, dirt, debris, and other contaminants prior to repairs.

END OF SECTION

## SECTION 08 62 00 – UNIT SKYLIGHTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Self-flashing unit skylights with integral curb.
- B. Related Sections:
  - 1. Section 07 92 00 – Joint Sealants

#### 1.2 SUBMITTALS

- A. Subject to the requirements of Section 01 33 00 – Submittal Procedures.
- B. Product Data:
  - 1. For each type of unit skylight indicated.
- C. Shop Drawings:
  - 1. For unit skylight work. Include plans, elevations, sections, details, and connections to supporting structure and other adjoining work.
- D. Samples for Verification:
  - 1. For each type of exposed finish required, in a representative section of each unit skylight in manufacturer's standard size.
- E. Qualification data.
- F. Product test reports.
- G. Field quality-control reports.
- H. Maintenance data.
- I. Sample warranty.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Unit Skylight Standard:
  - 1. See AAMA/WDMA 101/I.S.2/NAFS, "North American Fenestration Standard Voluntary Performance Specification for Windows, Skylights and Glass Doors," for minimum standards of performance, materials, components, accessories, and fabrication. Comply with more stringent requirements if indicated.
- B. Performance Class and Grade:
  - 1. SKP-C30/30-1200x1200.
- C. Surface-Burning Characteristics of Plastic Glazing:
  - 1. Provide plastic glazing sheets identical to those tested for fire-exposure behavior per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

- D. Self-Ignition Temperature:
  - 1. 650°F (343°C) or more for plastic sheets in thickness indicated when tested per ASTM D1929.
- E. Smoke-Production Characteristics:
  - 1. Smoke Density: 75 or less when tested per ASTM D2843 on plastic sheets in thickness indicated for use.
- F. Light Transmission Criteria:
  - 1. Solar Heat Gain Coefficient:
    - a. Goal:
      - 1) 0.25 or less
    - b. Allowable:
      - 1) 0.49 or less
    - c. Visible Light Transmittance:
      - 1) 0.59 or more
- G. Thermal Transmittance U-Factor:
  - 1. 1.30. or less.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
  - 1. A manufacturer capable of fabricating unit skylights that meet or exceed performance requirements indicated and of documenting this performance by inclusion in lists and by labels, test reports, and calculations.
- B. Installer Qualifications:
  - 1. An installer acceptable to unit skylight manufacturer for installation of units required for this Project.

#### 1.5 WARRANTY

- A. Special Warranty:
  - 1. Manufacturer's standard form in which manufacturer agrees to repair or replace components of unit skylights that fail in materials or workmanship within specified warranty period.
- B. Warranty Period:
  - 1. Five years from date of Substantial Completion.
- C. See Section 01 78 36 – Warranties and Bonds for additional information.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers are subject to requirements.
- B. Available Manufacturers:
  - 1. Sunoptics Prismatic Skylights  
Double Glazed Signature Series Dome Fixed Industrial Skylight with insulated thermal break and safety security guard, Model 800MD.
  - 2. American Skylites
  - 3. APC Dayliter; C/S Group

4. Auburn Skylights; Major Industries, Inc.
5. Bristolite Skylights
6. Dur-Red Products
7. Exarc Skylights, Inc.
8. Fiore Skylights, Inc.
9. GE Polymer Shapes; General Electric Company
10. Glazed Structures Inc.
11. Hi Pro International, Inc.
12. Lane-Aire Manufacturing Corp.
13. Naturalite Skylight Systems; Vistawall Group (The)
14. Plasteco, Inc.
15. Plastic Engineering Company of Tulsa, Inc.
16. Skyline Sky-Lites, LLC
17. Solar Industries, Inc.
18. Sunglo Skylight Products
19. VELUX America
20. Wasco Products, Inc.
21. Or Approved Equal.

## 2.2 MATERIALS

- A. Aluminum Components:
  1. Sheets: ASTM B209, alloy and temper to suit forming operations and finish requirements but with NOT less than the strength and durability of alclad Alloy 3005-H25.
  2. Extruded Shapes: ASTM B221, alloy and temper to suit structural and finish requirements but with NOT less than the strength and durability of Alloy 6063-T52.
  3. Fasteners: Same metal as metal being fastened, nonmagnetic stainless steel, or other noncorrosive metal as recommended by manufacturer. Finish exposed fasteners to match material being fastened.

## 2.3 GLAZING

- A. Acrylic Glazing:
  1. ASTM D4802, thermoformable, monolithic sheet, category as standard with manufacturer, Type UVF (formulated with UV absorber).
- B. Double-Glazing Profile:
  1. Dome, 25% rise
  2. Thicknesses: NOT less than thicknesses required to exceed performance requirements
  3. Outer Glazing Lens: Colorless, transparent, smooth, or polished finish
  4. Inner Glazing Lens: White, translucent, prismatic upper finish
- C. Glazing Gaskets:
  1. Manufacturer's standard.

## 2.4 INSTALLATION MATERIALS

- A. Bituminous Coating:
  1. SSPC-Paint 12, solvent-type, bituminous mastic, nominally free of sulfur and containing no asbestos fibers, formulated for 15 mil (0.4 mm) dry film thickness per coating.
- B. Joint Sealants:
  1. As specified in Section 07 92 00 – Joint Sealants.
- C. Mastic Sealant:

1. Polyisobutylene; nonhardening, non-skinning, nondrying, nonmigrating sealant.

D. Roofing Cement:

1. ASTM D4586, asbestos free, designed for trowel application or other adhesive compatible with roofing system.

## 2.5 UNIT SKYLIGHTS

A. General:

1. Provide factory-assembled unit skylights that include glazing, extruded-aluminum glazing retainers, gaskets, and inner frames and that are capable of withstanding performance requirements indicated.

B. Prefabricated Curb:

1. As specified in Section 07 92 00 – Roof Accessories.

C. Unit Shape and Size:

1. Square, 48 in. by 72 in. inside curb

D. Condensation Control:

1. Fabricate unit skylights with integral internal gutters and non-clogging weeps to collect and drain condensation to the exterior.

E. Thermal Break:

1. Fabricate unit skylights with thermal barrier separating exterior and interior metal framing.

## 2.6 ALUMINUM FINISHES

A. Mill Finish:

1. Manufacturer's standard.

## 2.7 ACCESSORIES

A. Safety-Security Guard:

1. Guard fabricated from 4 in. by 4 in. wire mesh galvanized cold rolled steel. The safety screen shall be tested to withstand the impact of a 240 lbs. weight, 1 ft. in diameter, dropped from a height of 3 ft and support a concentrated load of 600 lbs. after the impact. Install using manufacturer supplied installed 12 in. o.c.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Coordinate installation of unit skylight with installation of substrates, vapor retarders, roof insulation, roofing membrane, and flashing as required to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight.
- B. See AAMA 1607 and with manufacturer's written instructions for installing unit skylights.

### 3.2 FIELD QUALITY REQUIREMENTS

- A. After completion of installation and nominal curing of sealant and glazing compounds but before installation of interior finishes, test for water leaks according to AAMA 501.2.
- B. Perform test for total area of each unit skylight.

C. Work shall be considered defective if it does NOT pass tests and inspections.

### 3.3 CLEANING

A. Clean exposed unit skylight surfaces according to manufacturer's written instructions.

END OF SECTION

## SECTION 33 01 20 – WASTEWATER LIQUID AND SOLIDS REMOVAL AND DISPOSAL

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes: Removal and disposal of wastewater liquids and solids from the facility's wastewater treatment facilities.
- B. Related sections:
  - 1. Section 01 14 00 – Work Restrictions.
  - 2. Section 01 33 00 – Submittal Procedures

#### 1.2 DEFINITIONS

- A. Process Sludge: This material is the liquid volume of existing tankage and mixture of process water, mixed liquor, organic settled solids and sludge that will be transferred by the CONTRACTOR to another treatment basin as approved by the Owner. The transfer of process sludge is required to execute construction activities.
- B. Waste Sludge: This material includes an undetermined volume and mixture of grit, inorganic settled solids and sludge that will be removed and disposed by the CONTRACTOR. The disposal of waste sludge is required to execute construction activities.
- C. Sludge Management Plan (SMP): A plan for removing, processing, treating, storing, transporting, and disposing of mixed liquor, settled solids, partially digested sludge, and sludge in addition to soils intermixed with the various types of sludge.
- D. Sludge Disposal Plan (SDP): A plan for sludge removed from the treatment facility and disposed of in a landfill.
- E. Added Water: This water is added by the Contractor to aide in the removal of, cleaning of, and transport of the existing solids to be removed from the wastewater facilities and disposed of off-site. The added water is the sole responsibility of the Contractor. The volume of added water is not included in the specified volumes of the Bid Quantities of material to be removed from the wastewater facilities. The Contractor is responsible for all effort and costs required to provide, use, transport, and dispose of added water used in the tasks associated with liquid and solids removal. The Contractor shall include all costs for added water in the base bid quantity prices and the Bid Form Unit Prices for Sludge Removal. The Contractor's use of added water shall not be grounds for a scope change nor a contract change.
- F. Sludge Removal: Construction activities to remove mixed liquor, settled solids, partially digested sludge, and sludge from any wastewater treatment facility in an effort to gain access for subsequent construction activities and/or cleaning of a facility to facilitate inspection, repair, and/or other construction activities as required by the Contract Documents.
- G. Treatment Basin: Structures, both existing and new, whose primary function is to hold, treat and/or process wastewater, wastewater solids, and sludge. For this project, the facilities listed in paragraph 3.2.A are the primary treatment basins associated with this project however any basin, wet well, vault and chamber within the confines of the wastewater treatment plant are included.
- H. Project Locations: Facilities from which sludge is to be removed.

### 1.3 SUBMITTALS

- A. Engineer and Oklahoma Department of Environmental Quality (ODEQ) approved Sludge Management Plan.
- B. See Section 01 33 00, SUBMITTAL PROCEDURES.

### 1.4 QUALITY ASSURANCE

- A. Obtain Engineer's approval before proceeding with mixed liquor, settled solids, and/or sludge removal. Contractor must have obtained the ODEQ approval for SMP OR SDP prior to commencing sludge removal and disposal operations.

### 1.5 SCHEDULING AND SEQUENCING

- A. Conduct sludge removal only after schedule has been approved by the Engineer and the Contractor has submitted SMP or SDP and received written approval of same from ODEQ. Sludge removal schedule and sequencing must allow for continued operation of the facilities. If land application is used for disposal, apply sludge only after adequate erosion and sediment controls are in place.
- B. Schedule shall achieve the requirements of Section 01 14 00 – Work Restrictions.

### 1.6 MEASUREMENT AND PAYMENT

- A. Process Sludge Handling:
  - 1. Measurement: Will not be measured. It is considered to be the full volume of any tankage that is required to be drained to execute construction activities.
  - 2. Payment is subsidiary to the Lump Sum Bid Item No. 1 of the Bid Form. Payment shall be full compensation for the following: equipment, labor, any added water, gas/fuel, sludge and soil testing, spill clean-up, and temporary pumping and piping. Contractor is responsible for all efforts and costs associated with procuring, transport, and final disposal of any added water.
- B. Waste Sludge Handling and Disposal:
  - 1. Measurement: The tank will be drained of Process Sludge to the minimum level practical. Prior to removal of any Waste Sludge, the Owner, Engineer, and Contractor will agree on that the remaining sludge is of a nature that cannot be processed by the existing solids handling facility at the plant. Upon agreement the sludge depth will be measured at a minimum spacing of 25', and at each corner and at least one point in the center of the basin. The depth measurements along with the basin plan view area will be used to calculate Cubic Yards of Waste Sludge to be disposed of. No payment will be made for Added Water.
  - 2. Payment: Payment for sludge disposal will be by the Cubic Yard of sludge disposed at the Bid Price for Item 9 of the Bid Form. The Bid Item will be full compensation for removal of waste sludge, dewatering, hauling, landfill tipping fees, permitting, tools, labor and any other incidentals required to complete the work.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. The CONTRACTOR with coordination from the OWNER will be responsible for transferring Process Sludge from one basin to another.

- B. CONTRACTOR is responsible for removal, handling and disposal of all Waste Sludge, including the material resulting from the tanks' cleaning.
- C. Remove Waste Sludge from the existing North Ponds and dispose of the Waste Sludge in accordance with an ODEQ approved SMP or SDP. Contractor is responsible for developing and obtaining ODEQ approval for SMP or SDP.
- D. Do not damage the existing basins and equipment or remove material that is not designated for removal. If any damage occurs, Contractor shall be responsible for all expenses related to repair during work at no additional cost to the Owner.
- E. Contractor is responsible for all expenses related to Process Sludge removal and transfer, which shall be covered under the BASE BID.
- F. Contractor is responsible for maintaining and protecting all roads, drives, dikes, equipment, structures, etc during sludge removal, processing, land application, hauling, and disposal and shall repair any damaged as a result of their work.
- G. The Contractor will be required to keep a Daily Record and a Project Record, of the volume of liquid biosolids land-applied each day. The Daily Record will need to be provided to the Project Manager, or his designee, at the end of each workday. The Project Record will need to be provided to the Project Manager, or his designee, at the end of the project.
- H. The Contractor will communicate daily with the Project Manager, or his designee, to determine which land application site will be used. This discussion is also designed to ensure that the Contractor does not over apply biosolids to any approved application site.
- I. The Contractor will be responsible for biosolids sampling, sample preservation, sample delivery, and storage in accordance with methods developed by the City of Moore Wastewater Treatment Plant Laboratory Staff.
- J. The Contractor is required to maintain a cooperative and courteous relationship with the landowner while delivering and land-applying sludge, grit, and biosolids. Care shall be taken to leave the fields and roadway in reasonable condition upon project completion.

### 3.2 PROJECT LOCATION

- A. As follows, but not to extend beyond Project limits.
  - 1. North Storm Ponds

### 3.3 TREATMENT BASIN CLEANING

- A. Transfer Process Sludge to another basin designated by the OWNER and take measurements of Waste Sludge In-Situ prior to commencing cleaning activities.
- B. Remove sludge from the Treatment Basins within limits or as specified, or directed.
- C. As part of the treatment basin cleaning, do not remove any existing equipment within the treatment basin, the treatment basin coating, liner/seal or damage the lagoon coating or structural wall. Please note that equipment and associated equipment that are designated for removal and demolition may be removed with written approval by the Owner.

### 3.4 EQUIPMENT

- A. Provide necessary equipment for Process Sludge transfer from on basin to another OWNER designated basin.
- B. Provide necessary equipment for Waste Sludge removal, transport from the facility to the disposal location, and final application or disposal.
- C. Provide necessary equipment for added water, procurement, transport from the facility to the disposal location, and final application or disposal.

### 3.5 DISPOSAL PERMITTING

- A. Contractor will be responsible for registration, authorization, and/or permitting of the SPD land application with the appropriate regulatory agencies and shall pay the related regulatory fees if land application is required.
- B. Contractor will maintain all chain of custody forms and provide documentation of all sludge volumes land applied and the application sites.
- C. Contractor shall submit a copy of all associated forms to the Owner for proper record keeping.

### 3.6 TESTING

- A. Contractor will be responsible for obtaining all sludge and soil samples and their required lab analyses for permitting.
- B. Contractor will pay for the lab analysis and will include such lab analysis expenses with as part of the Work.

### 3.7 DISPOSAL

- A. Apply the sludge and/or added water for beneficial use as fertilizer/soil amendment or dispose of the material using a disposal method approved by the appropriate permitting agency.
- B. When sludge application is via the subsoil injection method, such application shall be according to sound agronomic rates as defined by ODEQ.
- C. Contractor is responsible for determining application rates based on cover crops and analytical testing of the sludge.
- D. Contractor may remove and separately dispose of oil/grease from the sludge prior to land application.
- E. Contractor is responsible for providing commercially reasonable handling of sludge once it has been collected, including cleanup of any spills.
- F. Contractor is responsible for meeting the dewatering requirements of landfill disposal.

### 3.8 RECORD KEEPING

- A. Maintain records of sludge application and submit records to Engineer, Owner, and regulating agencies, as required by this specification and any related permits.

Sludge Removal Records		
Facility	Description of Line Item	Estimated Cubic Yards

3.9 BIDDING QUANTITIES

- A. Contractor is responsible to remove and dispose of the following waste sludge volumes from the designated structures:

Estimated Quantities	
Description of Line Item	Estimated Cubic Yards
Total Volume of Waste Sludge to be handled from the North Ponds, scheduled to be refurbished. Waste Sludge to be handled and disposed of by Contractor per Specification Section 33 01 20 Wastewater Liquid and Solids Removal.	1,400 Cubic Yards
Total Estimated Waste Sludge	1,400 Cubic Yards

- B. The individual facility volumes listed are for reference only, payment will be based on the total quantity of Waste Sludge removed from all facilities. No additional payment will be made if quantities removed exceed the estimated quantity listed for any individual facility, unless the total quantity is exceeded. If the total quantity removed meets the total estimated, sludge removal will stop until the OWNER and CONTRACTOR agree to Contract Modification to handle the remaining Waste Sludge.

END OF SECTION

**SECTION 40 23 39.36  
STAINLESS STEEL PIPE AND FITTINGS – GENERAL SERVICE**

<b>Item</b>	<b>Size</b>	<b>Description</b>
Pipe	2 in. & smaller	<b>Minimum Schedule 40S or as required to meet testing pressures as specified in the pipe schedule:</b> ASTM A312-93, Type 304 Stainless Steel seamless, pickled and passivated.
	2 1/2 in. – 6 in.	<b>Minimum Schedule 10S or as required to meet testing pressures as specified in the pipe schedule:</b> ASTM A778 Rev A-90 “as-welded” grade, Type 304 Stainless Steel.
	8 in. & larger	<b>Minimum Schedule 5S or as required to meet testing pressures as specified in the pipe schedule:</b> ASTM A778 Rev A-90 “as-welded” grade, Type 304 Stainless Steel.
Joints	2 in. & smaller	Threaded or flanged at equipment as required or shown.
	2 1/2 in. & larger	Butt-welded or flanged at valves and equipment.
Fittings	2 in. & smaller	<b>Threaded Forged:</b> 1,000 CWP, ASTM A182 Rev C-93 Grade 304L.
	2 1/2 in. & larger	<b>Butt Welded:</b> ASTM A774-94 Grade 304L conforming to MSS SP-43, “as-welded” grade, pickled and passivated; fitting wall thickness to match adjoining pipe; long radius elbows unless shown otherwise.
Branch Connections	2 in. & smaller	Tee or reducing tee in conformance with Fittings above.
	2 1/2 in. & larger	Butt-welding tee or reducing tee in accordance with Fittings above.
Flanges	1/2 in. – 4 in.	Forged Stainless Steel, ASTM A182 Rev C-93, and Grade 304L ANSI B16.5-88 Class 150 or Class 300 slip-on weld neck or raised face.
	4 in.–24 in.	Forged Stainless Steel, ASTM A182 Grade 304L, ANSI B16.5- Class 150 or Class 300 slip-on or weld neck with raised face. Bore shall match pipe.
	24 in. & larger	Forged Stainless Steel: ASTM A182 304L, ANSI B16.47 Series A Class 125 or 150 weld neck with raise face. Bore shall match pipe.
Unions	2 in. & smaller	<b>Threaded Forged:</b> ASTM A182 Rev C-93 Grade 304, 2,000 pound or 3,000 pound WOG, integral ground seats, AAR design meeting the requirements of ANSI B16.11-91, bore to match pipe.
Bolting	All	<b>Forged Flanges:</b> Type 304 Stainless Steel , ASTM A320-94 Grade B8M hex head bolts and ASTM A194-94 Grade 8M hex head nuts.
		<b>Van Stone Flanges:</b> Carbon steel ASTM A307-94 Grade B hex head bolts and ASTM A563-93 Grade A hex head nuts. Provide same on mating cast iron flange on valve or equipment with flat ring gasket.

**SECTION 40 23 39.36  
STAINLESS STEEL PIPE AND FITTINGS – GENERAL SERVICE**

Item	Size	Description
Gaskets	All Flanges	<p><b>Flanged, Water, and Wastewater Service:</b> 1/8 in. thick, unless otherwise specified, homogenous black rubber (EPDM), hardness 60 (Shore A), rated to 212°F, as specified in ANSI B16.21 and ASTM D1330 Steam Grade.</p> <p><b>Flanged, Air Services:</b> 1/16 in. thick, Teflon, PTFE, or compressed inorganic fiber with nitrile binder; suitable for temperatures to 550°F and pressures to 1,000 psi. Ring gaskets shall not be permitted.</p> <p>Blind flanges shall be gasketed covering the entire inside face with the gasket cemented to the blind flange.</p>
Thread Lubricant	2 in. & smaller	Teflon Tape.
Welding	All	<p>All welding shall be performed in the shop as specified in the latest editions of Section IX of the ASME Boiler and Pressure Vessel Code and ASME Code for Pressure Piping, ASME B31.3 (severe cyclic), as applicable.</p> <p>All welds shall have 100% penetration. The internal weld bead shall be small, smooth and continuous with no crevices, pits or other voids. The external weld bead shall be well rounded, smooth and continuous with no anomalies.</p> <p>All welded connections shall be parallel and perpendicular to the extent that the piping appears to be correct to the naked eye.</p> <p><b>Procedure:</b> Pipe edges shall be prepared by machine cutting or shaping using an aluminum oxide blade. Beveled ends shall conform to the requirements of ANSI B16.9.</p> <p>Clean weld joints and weld joint areas both before and after welding in accordance with ASTM A380 using stainless steel wire brushes or stainless steel wool.</p> <p><b>Alignment:</b> Align ends to be joined within commercial tolerances on diameter, wall thickness, and out of roundness.</p> <p>When joining pipes of different wall schedule, taper bore the interior of the larger schedule pipe to match the interior diameter of the connecting pipe with a maximum 1:3 slope.</p> <p>Root opening at the joint shall be as stated in the procedure specification.</p> <p><b>Welding:</b> The direct current, straight polarity, gas tungsten-arc (GTAW) process shall be used for all welding. Welding may be by manual GTAW or automatic (orbital) GTAW processes.</p> <p>The inside of the pipe shall be purged with Argon gas during welding and while the weld is cooling to prevent oxidation of the weld.</p> <p><b>Tack Welds:</b> All tack welds shall be made by a qualified welder.</p>

**SECTION 40 23 39.36  
STAINLESS STEEL PIPE AND FITTINGS – GENERAL SERVICE**

Item	Size	Description
<del>Welding (Cont.)</del>	All	<p>All tack welds shall be made with welding rod the same as that used for the succeeding root pass.</p> <p>Tack welds shall be small enough to be readily fused into the bead of the root pass.</p> <p>Thoroughly clean tack welds with a stainless steel wire brush prior to the root pass to prevent pinholing or excessive porosity.</p> <p>Tack welds that have cracked shall be completely removed prior to making the root pass.</p> <p>Surface defects that will affect the soundness of the weld shall be removed, visually inspected, and rewelded.</p> <p>Where permitted, branch connections shall be fitted and groove-welded as specified in the details described and in Chapter V of ASME B31.3.</p> <p>Finished welds shall be as specified in Chapter V of ASME B31.3 (severe cyclic), as applicable.</p> <p>Field welding of stainless steel piping will not be allowed.</p>
Pipe Finish	All	<p>Pickle all stainless-steel pipe, fittings, and finished assemblies inside and out following fabrication to remove all mill scale, weld inclusions and color; as specified in ASTM A380.</p> <p>Passivate inside and out as specified in ASTM A967.</p> <p><del>Outer surface shall be bead blasted per ASTM A380.</del></p>

END OF SECTION

## SECTION 41 22 23.20 – MONORAIL WITH ELECTRIC HOIST AND TROLLEY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. The Work necessary to furnish and install a monorail hoist and trolley system for removing equipment as specified herein and as indicated on the drawings. All related equipment, material, and appurtenances shall be provided for a complete and functional system.
- B. Related Sections:
1. Section 05 12 00 – Structural Steel (for Monorail Frames and Supports)
  2. Section 05 50 00 – Metal Fabrications (for Monorail Frames and Supports)
  3. Section 09 90 00 – Painting and Protective Coatings
  4. Division 26 – Electrical
- C. General Requirements:
1. Hoist Locations:
    - a. See drawings for specific information for each.
      - 1) UV Building
  2. The equipment specified herein is included in the Manufacturer/ Subcontractor Form. Refer to the Bid Form and the Instructions to Bidders for additional requirements.
- D. Unit Responsibility:
1. The Work requires that the hoist, trolley, and components, complete with all accessories and appurtenances be the end product of one responsible system manufacturer or responsible system supplier. Unless otherwise indicated, the Contractor shall obtain each system from the responsible supplier of the equipment, which supplier shall furnish all components and accessories of the system to enhance compatibility, ease of operation and maintenance, and as necessary to place the equipment in operation in conformance with the specified performance, features, and functions without altering or modifying the Contractor's responsibilities under the Contract Documents. The Contractor is responsible to the Owner for providing the equipment systems as specified herein.

#### 1.2 REFERENCES

- A. AISC (American Institute of Steel Construction):
1. 348 (2000) Structural Joints Using ASTM A325 or A490 Bolts
- B. ASME International:
1. B30.16 – (2003) Overhead Hoists (Underhung)
  2. HST-4 – (1999; R 2004) Overhead Electric Wire Rope Hoists
- C. ASTM International:
1. A275 – (2003) Magnetic Particle Examination of Steel Forgings
  2. A325 – (204b) Structural bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
  3. A563 – (2004a) Carbon and Alloy Steel Nuts
  4. F959 – (2004) Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners.

- D. CMAA:
    - 1. No. 74 “Specifications for Top Running & Under Running Single Girder Electric Traveling Cranes Utilizing Under Running Trolley Hoist”
  - E. MMA:
    - 1. MH27.1 – (2003) Underhung Cranes and Monorail Systems
  - F. NEMA:
    - 1. NEMA MG 1 – (2003) Motors and Generators
  - G. AWS:
    - 1. D14.1 – Specification for Welding Industrial and Mill Cranes
    - 2. D1.1 – Code for Welding in Building Construction
  - H. NFPA:
    - 1. 70 – (2005) National Electrical Code
  - I. GSA:
    - 1. FS RR-W-410 – (Rev E) Wire Rope and Strand
  - J. NARA:
    - 1. 29 CFR 1910 179 – Overhead and Gantry Cranes
- 1.3 SUBMITTALS

- A. Subject to requirements for Section 01 33 00 – Submittal Procedures.
- B. Action Submittals:
  - 1. Shop Drawings:
    - a. Equipment Assembly: Make, model, weight, and horsepower of each.
    - b. Manufacturer’s Catalog: Product information, descriptive literature, dimensional layouts, specifications, standard and specialized equipment assembly cuts, and identification of materials of construction.
    - c. Detailed Drawings:
      - 1) Structural, Mechanical, and Electrical: Show equipment fabrications and interface with other items including dimensions, size, and locations of connections to other work, and weights of associated equipment.
      - 2) Structural and Mechanical: Location of and attachment to support beams and columns. Clearance requirements.
    - d. Painting/Coating System(s): Include manufacturer’s descriptive technical catalogue literature and specifications.
    - e. Structural Loads: Static, dynamics loads to be transferred into structure.
    - f. Power and control wiring diagrams
    - g. Motor nameplate data per NEMA MG-1, horse powers, motor manufacturer, and any appurtenances.
- C. Informational Submittals:
  - 1. Test Reports
    - a. Operational tests
    - b. Hook test
    - c. No-load test
    - d. Load test
    - e. Rated load speed test
  - 2. Certificates

- a. Overload test certificate
- 3. Operation and Maintenance Data:
  - a. Operation and maintenance manual

#### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Delivery and Storage:
  - 1. Inspect materials delivered to site for damage; unload and store with minimum handling. Materials shall be stored on-site in enclosures or under protective coverings. Protect materials NOT suitable for outdoor storage to prevent damage during periods of inclement weather, including sub-freezing temperatures, precipitation and high winds. Store materials susceptible to deterioration by direct sunlight under cover and avoid damage due to high temperatures. DO NOT store materials directly on ground. Take special precautions when equipment is outside of its crating.
- B. Handling:
  - 1. Handle materials in such a manner as to ensure delivery to final location in undamaged condition. Make repairs to damaged materials at no cost to Owner.

#### 1.5 QUALITY ASSURANCE

- A. Certificates:
  - 1. Overload Test Certificate: Submit a statement that the hoist system can be periodically load tested to 125% of rated load.
- B. Manufacturer's Certificate of Compliance, as specified in Division 01 – General Requirements.
- C. Test Procedures
- D. Test results, reports, and certifications
- E. Special shipping, storage, protection, and handling instructions
- F. Manufacturer's Certificate of Proper Installation
- G. Contract Closeout Submittals:
  - 1. Service records for maintenance performed during construction.

#### 1.6 OPERATION AND MAINTENANCE DATA

- A. O&M Manuals:
  - 1. Content, form, and schedule for providing as specified in Section 01 77 00 – Closeout Procedures.
- B. Maintenance Summary Forms:
  - 1. As specified in Section 01 77 00 - Closeout Procedures.

#### 1.7 WARRANTY

- A. Provide warranty for a period of 12 months after the final acceptance of the equipment by the Owner and Engineer. The warranty shall stipulate that the equipment furnished is suitable for the purpose intended and free from defects of material and workmanship for the duration of the warranty. In the event the equipment fails to perform as specified, the Manufacturer shall promptly repair or replace the defective equipment without additional cost to the Owner.

- B. Spare parts identified within this specification shall NOT be used to address warranty repairs.
- C. See Section 01 78 36 – Warranties and Bonds for additional requirements.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Where a manufacturer's standard equipment name and/or model number is listed, the equipment system shall be provided and modified as required to conform to the performance, functions, features, and materials of construction as specified herein.
- B. Acceptable Manufacturers:
  - 1. Yale Hoist
  - 2. Harrington Crane and Hoist
  - 3. Or Approved Equal.
- C. See drawings for dimensions, capacities, and other hoist/trolley details specific for each.

### 2.2 OVERHEAD HOIST SYSTEM

- A. Provide overhead hoist system conforming to MMA MH27.1, Class C, for outdoor service, with an electric wire rope on an electric trolley. Trolley shall be motor operated. System shall operate on 460 volts, AC, 60 Hz, three phase power source.
  - 1. Support Beam and Columns: Existing truss bottom chord monorail shall be inspected, repaired as needed, and reused.
  - 2. Hoist and Trolleys shall be designed to withstand all stresses imposed under safe operation conditions while handling loads within the rated capacity. Load bearing parts shall be designed such that the static stress, calculated for rated load, shall NOT exceed 20% of the ultimate strength of the material.
  - 3. Capacity: See drawings for hoist capacity for each. Mark the hoist capacity in pounds on both sides of the hoist or load block.
  - 4. Lift: 50 ft.
  - 5. Speeds: The hoist shall be either constant speed or 2-speed variable, capable of moving the rated load approximately 15 fpm. The trolley shall be 2-speed variable, capable of moving the rated load approximately 20 fpm–60 fpm.
  - 6. Bearings shall be heavy duty, anti-friction type with a minimum B10 life of 5,000 hours. Motor bearings shall be lifetime lubricated, sealed ball bearings.
  - 7. Hoists are to be furnished complete with a suitable pushbutton control pendant.
  - 8. The breaking system shall be capable, under normal operating conditions with rated load, to stop and hold load when controls are released. Controlled lowering shall be limited to 120% of rated lowering speed. In the event of a complete power failure, load shall be stopped and held.
  - 9. Material Limitations: Shafts, keys, couplings, sprockets, and chains shall be steel. All gears shall be steel except for worm gears, which shall be bronze or steel. Cast iron and aluminum used to support components of the hoist power transmission train shall be ductile. Trolley wheels and axles shall be made from high strength forged steel and shall be precision machined to assure concentricity of axle and tread.
  - 10. Bottom block shall be completely shrouded for safety and fabricated from steel. Sheaves shall be forged or rolled steel, running on anti-friction bearings. Hooks are to be forged steel supported by anti-friction bearings. Hooks shall be equipped with latches unless the application makes the use of the latch impractical. When required, a latch shall be provided to bridge the opening of the hook for the purpose of retaining slings, chains, etc., under slack conditions.
  - 11. Safety: Comply with the mandatory and advisory safety requirements of ASME B30.11, ASME B30.16 and 29 CFR 1910.179.

12. Design shall be such to facilitate ease of installation or removal of wheels at any point along the track system without removing the carrier assembly from the track.
13. Each hoist shall incorporate an upper plugging type limit switch automatically stopping the hoist motion when the block reaches its highest position.
14. Electric hoist controls shall comply with NEC requirements for the application being considered and shall include control circuit fusing and contactors mechanically and electrically interlocked.

### 2.3 ELECTRIC WIRE ROPE HOIST

- A. ASME HST-4, Class H3, except as modified herein. Hoist shall be double reeved.
  1. Hoisting Ropes: FS RR-W-410, improved or extra improved plow steel, regular lay, uncoated, 6 by 37 class construction with an independent wire rope core. Provide proof of wire rope breaking strength test report.
  2. Sheaves: Sheaves shall be steel or ductile cast iron. Pitch diameter of running sheaves shall NOT be less than 16 times the rope diameter. Pitch diameter of non-running sheaves shall NOT be less than 12 time the rope diameter.
  3. Drum: Drum shall be steel or ductile cast iron. Pitch diameter of the drum shall NOT be less than 18 times the rope diameter. NOT less than two dead wraps of the hoisting rope shall remain on each anchorage when the hook is in its extreme low position.
  4. Meet the requirements listed below:
    - a. Location: UV Building
      - 1) Rated Capacity: 3-Tons
      - 2) Lift Height: 50 ft
      - 3) Length: 38 ft.

### 2.4 TROLLEY

- A. Trolley shall meet all applicable requirements of MMA MH27.1, ASME HST-1 and ASME HST-4 and as stated herein. Trolley shall have elastomeric bumpers to engage runway stops.

### 2.5 MOTORS

- A. Motors shall be totally enclosed, specifically designed for hoist and trolley service capable of starting and operating under any condition within the designed capacity.
- B. NEMA MG 1:
  1. Hoist and trolley motors shall be AC squirrel cage induction type. Motor insulation shall be Class B minimum. Provide totally enclosed non-ventilated (TENV) motor enclosures.

### 2.6 CONTROLS

- A. Hoist and trolley shall be controlled from a pendant push-button station. Arrange push-buttons in accordance with ASME B30.11 recommendations. Locate pendant station as indicated on drawings.
- B. The pendant shall be provided with retractable cable reel for multi-level operation. A mushroom type emergency stop (E-Stop) button shall be provided.

### 2.7 LIMIT SWITCHES

- A. Provide upper and lower limit switches which de-energize the hoist motor.

## 2.8 BRAKES

- A. Provide hoist with an electro-mechanical holding brake and a mechanical load brake, each capable of holding 130% of the rated hoist capacity. Hoist holding brake shall be capable of being released to test the load brake. Provide trolley with an electro-mechanical brake. Provide trolley brake with a minimum torque rating of 1,000% of the drive motor rated torque. Trolley brake torque shall be adjustable down to 85% of its torque rating.

## 2.9 LOAD BLOCK AND HOOK

- A. Construct load blocks of steel:
  - 1. Provide forged steel, swivel type hook with hook nut keyed to hook shank by means of a setscrew installed in a plane parallel to the longitudinal axis of the hook shank or other similar easily removable securing device. Provide hook with spring loaded steel safety latch for closing the hook throat opening. The hook and hook nut shall be unpainted. Permanently mark hook and hook nut with an identification number.
- B. Hook and Hook Nut Magnetic Particle Inspection:
  - 1. Magnetic particle inspect the hook and nut over the entire area in accordance with ASTM A275. Acceptance standard shall be no defects. A defect is defined as a linear indication that is greater than 1/8 in. long whose length is equal to or greater than three times its width.

## 2.10 BEARINGS

- A. All bearings except those subject to a small rocker motion shall be anti-friction type. Bearings NOT considered lifetime lubricated by the manufacturer shall be provided with a means for lubrication.

## 2.11 ELECTRIFICATION

- A. Runway electrification shall be of the flat festooned type. Provide single point of connection for electrical power supply as indicated on the drawings. Electrical work for the hoist system shall comply with NFPA 70, Division 26 – Electrical Sections, and electrical drawings. All electrical conductors shall be installed in conduit apart from the festoon furnished with the system. The rail shall be grounded as indicated on the drawings.

## 2.12 IDENTIFICATION PLATES

- A. Provide identification plates of noncorrosive metal with clearly legible permanent lettering giving the manufacturer's name, model number, capacity in pounds and other essential information or identification.

## 2.13 PAINTING SYSTEM

- A. Provide a primer and a finish coat. Blast-clean all components prior to painting. Paint coats shall be smooth and even, free of runs, sags, orange peel or other defects. Provide painting system in accordance with Section 09 90 00 – Painting and Protective Coatings.

## PART 3 - EXECUTION

### 3.1 ERECTION AND INSTALLATION

- A. Erect and install the hoist system, complete in accordance with the approved submittals and in condition to perform the operational and acceptance tests.

### 3.2 FIELD QUALITY REQUIREMENTS

- A. Inspector:
1. The Contractor shall provide an Inspector to perform all post erection inspection and operational tests. The inspector shall be a licensed or certified individual in this field.
- B. Post-Erection Inspection:
1. After erection, the Inspector, Contractor and the Engineer or Owner shall jointly inspect the hoist systems and components to determine compliance with specifications and approved submittals. The Contractor shall notify the Owner seven (7) days before the inspection. Provide a report of the inspection indicating the hoist system is considered ready for operational tests.
- C. Operational Tests:
1. After erection and inspection, test the hoist and trolley as specified herein. Test the systems in service to determine that each component of the system operates as specified, is properly installed and adjusted, and is free from defects in material, manufacturer, installation, and workmanship. Rectify all deficiencies disclosed by testing and retest the system or component to prove the hoist system is operational. The Contractor shall furnish loads for testing, operating personnel, instruments, and all other necessary apparatus.
- D. Test Data:
1. Record test data on appropriate test record forms suitable for retention for the life of the hoist system. Record operating and startup current measurements for electrical equipment (motors and coils) using appropriate instrumentation (i.e., clamp-on ammeters). Compare recorded values with design specifications or manufacturer's recommended values; abnormal differences (i.e., greater than 10% from manufacturer's or design values) shall be justified or appropriate adjustments performed. In addition, high temperatures or abnormal operation of any equipment or machinery shall be noted, investigated, and corrected. Record hoist and trolley speeds during each test cycle.
- E. Hook Test:
1. Measure hook for hook throat spread before and after load test. Establish a throat dimension base measurement by installing two tram points and measuring the distance between these tram points (greater or less than 1/64 in). Record this base dimension. Measure the distance between tram points before and after load test. An increase in the throat opening by more than 5% from the base measurement shall be cause for rejection.
- F. No-Load Test:
1. Hoist: Raise the load hook the full operating lift distance and verify satisfactory operation of hoist, upper limit switch, lower limit switch and the hoisting and lowering speeds.
  2. Trolley: Operate trolley assembly the full length of the monorail in both directions. Verify satisfactory operation and verify trolley speed.
- G. Load Test:
1. 125% (plus 5% minus 0%) of rated capacity.
  2. Hoist Static Test: Raise test load approximately 1 ft above the floor and hold for 10 minutes. Observe load lowering that may occur which will indicate malfunction of hoisting component or brake. Lower the test load to the floor until the hoist line is slack.
  3. Hoist Dynamic Test: Raise the test load to approximately 5 ft above the floor. Lower the load back to the floor. Stop the test load at least once while lowering and observe proper brake operation. Wait 5 minutes then repeat the above cycle.
  4. Load Brake Test: Raise test load approximately 5 ft. With the hoist controller in the neutral position, release the holding brake. The load brake should hold the test load. Again with the holding brake in the released position, start the test load down and return

the controller to off position as the test load lowers. The load brake should prevent the test load from accelerating. NOTE: It is NOT necessary for the load brake to halt the downward motion of the test load.

5. Loss of Power Test: Raise the test load approximately 3 ft and while lowering test load, cut main power to hoist. Load should stop.
6. Trolley Test: With test load hoisted to a height of 1 ft above the floor, operate trolley the full distance of the monorail in both directions. Observe for any malfunctioning of the trolley assembly and monorail system.

H. Rated Load Speed Test:

1. With the hoist loaded to rated capacity, raise, and lower the load, verifying the hoisting and lowering speed is satisfactory. With the hoist loaded to rated capacity, operate trolley along the monorail beam verifying that the trolley speed is satisfactory. Further, verify that the trolley stops in each direction within a distance (in ft) equal to 10% of rated capacity when initially traveling and carrying the rated capacity load. Record voltage, amperage, hoisting and lowering speeds, trolley travel speed and motor speed for each motor.

END OF SECTION

## SECTION 44 42 17 - PVC COARSE BUBBLE AERATION EQUIPMENT

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes: The Work necessary to furnish all labor, materials, equipment and incidentals required, completely install, adjust, protect, put in operation and test the Coarse Bubble Aeration Equipment for the North Storm Pond as shown on the Drawings and as specified herein.
- B. Related sections:
  - 1. Section 01 33 00 – Submittal Procedures.
  - 2. Section 01 60 00 – Product Requirements.

#### 1.2 GENERAL

- A. Like items of equipment provided hereinafter shall be the end products of one Manufacturer to achieve standardization of appearance, operation, maintenance, spare parts, and Manufacturer's services.
- B. General Requirements: See Division 01, GENERAL REQUIREMENTS, which contains information and requirements that apply to the Work specified herein and are mandatory for this project.
- C. Unit Responsibility: The Work requires the Coarse Bubble Aeration Systems complete with all accessories and appurtenances (including, but not necessarily limited to, drop legs, manifolds, lateral pipes, piping supports, couplings, diffusers, retainers, gaskets, orifices, drain lines, moisture purge system, nuts, bolts, anchors, taps, valves) be the end product of one responsible Manufacturer. The Manufacturer shall assume all responsibility for mating the Coarse Bubble Aeration Systems to the Aeration Distribution Systems piping to obtain the performances specified. The Manufacturer shall furnish all components and accessories of the system to enhance compatibility, ease of operation and maintenance, and as necessary to place the equipment in operation in conformance with the specified performance, features and functions without altering or modifying the Contractor's responsibilities under the Contract Documents.
- D. The equipment specified herein is included in the MANUFACTURER/ SUBCONTRACTOR Form. Refer to the Bid Form and the Instructions to Bidders for additional requirements.

#### 1.3 SUBMITTALS

- A. General: Administrative, shop drawings, samples, quality control, and contract closeout submittals shall conform to the requirements of Section 01 33 00, SUBMITTAL PROCEDURES.
- B. In addition to the requirements of Section 01 33 00, SUBMITTAL PROCEDURES, submit the following additional specific information:
  - 1. Shop Drawings:
    - a. Make, model, and weight of each equipment assembly.
    - b. Manufacturer's catalog information, descriptive literature, specifications, and identification of materials of construction with accompanying chemical compatibility data.
    - c. Performance data showing compliance with specification requirements. Include:
      - 1). Complete head loss calculations for the aeration equipment starting from the Manufacturer's limit of responsibility (drop leg through diffuser orifice and water in each half of pond) as shown on the Drawings.

- d. Detailed mechanical and structural drawings showing the equipment fabrications, all plans, elevations, and cross section details of construction, dimensions and anchor bolt locations and interface with other items. Include:
    - 1). Dimensions, size, and locations of connections to other work, and weights of equipment associated therewith.
  - e. Details, including materials of construction, of the Diffuser Element
  - f. Details showing how the diffuser element holder is attached to the distribution header.
  - g. Details of piping supports, expansion joints, and pipe taps.
  - h. Details showing how the drop leg, manifold and distribution lateral supports will be connected to the North Storm Pond.
  - i. Certify that the diffuser Manufacturer has coordinated with manufacturer of blower and air filtration system for compatibility with diffuser system (i.e. blowers meet removal requirements of the filters).
  - j. Diffuser Testing Plan as specified herein.
  - k. PVC Solvent.
- 2. Quality Control Submittals:
    - a. Certified copies of the results of all Factory Functional and Field Performance Test reports after tests have been completed.
    - b. Certified copies of the dynamic wet pressure (DWP) test report prior to delivery of diffusers.
    - c. Certified copies of the oxygen transfer efficiency (OTE) test report.
    - d. Special shipping, storage and protection, and handling instructions.
    - e. Manufacturer's printed installation instructions. Include:
      - 1). Description of the Contractor's proposed method for ensuring a level installation of all equipment and methods of tightening of bolts, diffuser hold-down rings, etc.
    - f. List special tools, materials, and supplies furnished with equipment for use prior to and during startup and for future maintenance.
  - 3. Contract Closeout Submittals:
    - a. Service records for maintenance performed during construction.
    - b. Warranty.

#### 1.4 FACTORY TESTING

- A. Prior to initiation of production, the Contractor shall submit for the Engineer's review a testing plan to ensure consistently good quality and uniformity of the diffuser assemblies. A sampling plan shall be included. After testing, test results for all diffusers tested shall be submitted for approval and tested diffusers shall be identified.

#### 1.5 OPERATION AND MAINTENANCE DATA

- A. O&M Manuals: Content, format, and schedule for providing as specified in Section 01 77 CLOSEOUT PROCEDURES.
- B. Maintenance Summary Forms: As specified in Section 01 77 CLOSEOUT PROCEDURES..

#### 1.6 WARRANTY

- A. Provide warranty for a period of 12 months after the final acceptance of the equipment by the Owner and Engineer. The warranty shall stipulate that the equipment furnished is suitable for the purpose intended and free from defects of material and workmanship for the duration of the warranty. In the event the equipment fails to perform as specified, the Manufacturer will promptly repair or replace the defective equipment without additional cost to the Owner.
- B. Spare parts identified within this specification shall not be used to address warranty repairs.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Where a Manufacturer's standard equipment name and/or model number is listed, the equipment system shall be provided as modified to conform to the performance, functions, features, and materials of construction as specified herein.
- B. Manufacturer of components and accessories specified herein shall be as follows:
  - 1. EDI (Environmental Dynamics International)
  - 2. SSI (Stamford Scientific International, Inc.)

### 2.2 GENERAL REQUIREMENTS

- A. See Section 01 60 00, PRODUCT REQUIREMENTS, for specific requirements related to the equipment specified herein.
- B. All equipment shall be supplied complete. Parts shall be proportioned to have liberal strength, stability and stiffness and shall be especially adapted for the intended service. Ample room and facilities shall be provided for inspection, repairs, and adjustments.
- C. All equipment furnished herein is intended to be submerged. Materials for piping/accessories are to be schedule 40 PVC (air header/distribution manifold) or 304L stainless steel.
- D. The number of diffusers, laterals, and manifolds shown on the Drawings shall be considered the minimum acceptable and is provided primarily for Contractor's informational purposes. It shall be the responsibility of the Manufacturer to ensure the actual equipment furnished meets all requirements specified herein.
- E. The equipment shall be suitable for operation with compressed air at temperatures entering the header of 215°F.
- F. Manufacturer shall coordinate with blower manufactures to ensure compatibility of components furnished, include air intake filters. Provide documentation to Engineer demonstrating such coordination.

### 2.3 NORTH STORM POND SERVICE CONDITIONS

- A. The Coarse Bubble Aeration Systems will be located in the two halves of the North Storm Pond.
- B. The supplied diffuser systems shall be capable of providing the oxygen rates and efficiencies given the following site conditions:
  - 1. Maximum Ambient Air Temperature: 100°F.
  - 2. Minimum Ambient Air Temperature: 0°F.
  - 3. Site Elevation: 1169.00 FT AMSL.
- C. The entire system, including the drop leg, manifold, and laterals shall allow for expansion and contraction under the following conditions:
  - 1. Winter conditions, low water pond (0°F).
  - 2. Summer conditions, low water pond (100°F).
  - 3. Operation with air supply at 200°F and pond full.
  - 4. Operation with air supply at 200°F and water level 1-ft above diffusers.
- D. Side Water Depth:14.0 FT.

Standard Conditions are defined as 14.7 psia, 20°C/68°F and 40% relative humidity.

## 2.4 NORTH STORM POND DESCRIPTION

- A. The North Storm Pond is divided into two equally sized halves. Blowers are proposed on the east side of the pond, with a combined header and two separate drop legs (one for each side of the pond). See drawings for dimensions/layout.
1. The North Storm Pond shall be provided with coarse bubble diffusers as specified herein and shown on the Drawings.
- B. All of the equipment specified herein is intended to be a complete aeration system capable of transferring atmospheric oxygen into the storm flows and keeping the ponds sufficiently aerated. The following components are part of this system and shall be installed as shown on the Drawings and as specified herein:
1. Piping: Connection to contractor provided drop legs, manifolds, lateral pipes, piping supports and couplings to PVC headers.
  2. Diffusers: Coarse bubble diffusers, diffuser connectors, and orifices.
  3. Diffuser Accessories:
    - a. Fixed joints.
    - b. 316 stainless steel bolts, nuts and gaskets for flange joints.
    - c. 316 stainless steel anchor bolts.
    - d. Accessory piping, taps, and valves as specified.
  4. Other equipment as required for provision of a completely operational aeration system.

## 2.5 DIFFUSER PERFORMANCE REQUIREMENTS

- A. The maximum dynamic pressure losses through the installed aeration systems (including flow control orifices, diffusers, and water level in the North Storm Pond) starting from connection to contractor provided drop legs, at below air flows per grid, at maximum operating water depths, with required diffusers in place, can be found in the table below.

Total Pressure Required at Connection to Dropleg	
North Storm Pond	6.70 psi

- B. North Storm Pond
1. Furnish for each grid as defined: connection to contractor provided drop leg, manifold header, coarse bubble diffusers, and flow control orifices to operate at the following air flow rates per grid:

North Storm Pond Design Requirements	
<b>North Half of Pond</b>	
Floor Length	248' 0"
Floor Width	153'-0"
Max Side Water Depth	14 FT
Max Air Flow Rate	6,632 SCFM
<b>South Half of Pond</b>	
Floor Length	248' 0"
Floor Width	153'-0"
Max Side Water Depth	14 FT
Max Air Flow Rate	6,632 SCFM

## 2.6 PIPING

- A. Unless otherwise specified, all piping shall be in accordance with Division 40.
- B. Contractor to provide stainless steel piping from blowers to discharge flange on pipes entering the storm pond. Coarse bubble aeration equipment manufacturer shall provide appropriate connection to this stainless steel flange and transition to schedule 40 PVC piping for aeration system.
- C. All welded piping and parts shall be manufactured from sheets and plates of 304 stainless steel with a 2D finish conforming to ASTM A240
- D. Air header and distribution manifold shall be schedule 40 PVC.
- E. Connections to droplegs and manifolds shall be supplied with flexible couplings, expansion joints, pipe supports, etc as required by the manufacturer for alignment of the system and to meet expansion and contraction requirements.
- F. The dropleg connections and headers shall include the piping, factory installed connector tees and joints as required.
- G. The diffusers shall be level to plus or minus 3/8-in. All diffuser piping and diffusers shall be capable of being leveled to this tolerance and remaining level under all operating conditions.
- H. Header supports shall be of Type 316 stainless steel and shall be mounted on Type 316 stainless steel anchor bolts mounted to the floor.
  - 1. Provide supports with a mechanism to provide for plus or minus 2-in vertical and ½-in lateral adjustment for alignment of the manifold in the field.
- I. All piping gaskets shall be butyl rubber, neoprene, or a composition suitable for air to 245 degrees F. Gasket material shall be suitable for long term immersion in wastewater.
- J. All welding (where applicable) shall be performed at the factory and shall use MIG, TIG, or plasma-arc welding inert gas processes. ER316L filler wire shall be added to all welds to provide a cross-section area equal to or greater than the parent material. Butt welds shall penetrate to the interior surface and shall incorporate gas shielding to interior and exterior joint. Field welding is not permitted.
- K. Clean all stainless steel surfaces after fabrication and welding by using the following procedure:
  - 1. Pre-clean all outside weld areas to remove weld splatter with the use of stainless steel brushes and/or deburring and finishing grinding wheel.
  - 2. Finish clean to remove all carbon deposits, light oxide films and similar contaminants by full immersion pickling and rinsing, to aid the regeneration of a uniform corrosion resistant chromium oxide film as follows:
    - a. Completely immerse all stainless steel assemblies and components in an acid solution as described by ASTM A380-88. The acid shall be a nitric-hydrofluoric solution as defined by ASTM A380.
    - b. Corrosion protection techniques not using full immersion methods will not be acceptable.
  - 3. At least two weeks prior to cleaning the equipment, the Manufacturer shall notify the Engineer of the schedule so that the Engineer can observe the procedure, if desired. If full immersion pickling is not observed by the Engineer, the Manufacturer shall verify that cleaning has been performed per the above specification.

## 2.7 COARSE BUBBLE DIFFUSERS AND ASSEMBLIES

- A. Furnish coarse bubble diffusers and assemblies required to supply the total air flows as specified without exceeding the maximum allowable headloss.
- ~~B. Each air diffuser assembly shall incorporate a non-clog coarse bubble diffuser element with no flexible or moving parts, a flow control device with orifice inserts (if required), an inverted air reservoir, air exit ports, cast end cap at inlet end and a full length deflector.~~
- ~~C. Diffusers shall be fabricated of PVC.~~
- D. Diffuser assemblies shall be shipped to the jobsite assembled and properly crated and protected for shipment and handling.
- E. Design diffuser for operating range of ~~10 – 30 scfm.~~ **shall fall between 3 – 30 scfm.**
- ~~F. All diffusers shall be designed to provide full wide band aeration with a minimum air release perimeter of 48 in per diffuser. Release air uniformly along a minimum 2 ft band beyond each side of the header. Exit ports discharging air into liquid shall be located on horizontal planes at two levels.~~

## 2.8 TOOLS AND SPARE PARTS

- A. Spare Parts:
  - 1. Spare parts shall be tagged by project equipment number and identified as to part number, equipment manufacturer, and subassembly component (if appropriate). Spare parts subject to deterioration shall be properly protected by encapsulated in hermetically sealed plastic wrapping. Spare parts with individual weights less than 50 pounds and dimensions less than 2 feet wide, or 18 inches high, or 3 feet in length shall be stored in a wooden box with hinged wooden cover and locking clasp. Hinges shall be strap type. The box shall be painted and identified with stenciled lettering stating the name of the equipment, equipment numbers, and the words "spare parts." A neatly typed inventory of spare parts shall be taped to the underside of the cover.
- B. Provide the following spare parts and special tools:
  - 1. Coarse bubble diffusers and ancillary equipment equal to 10% of the total number of coarse bubble diffusers provided for the North Storm Pond. This shall include diffusers, inlet nozzles, orifice inserts and all required bolts, hold-down rings, nuts and gaskets.
- C. Spare parts shall not be used during warranty period.
- D. All spare parts shall be packed in suitable storage containers and legibly marked as to the contents.

## 2.9 FABRICATION

- A. Shop Assembly: The system shall be factory assembled and tested.

## PART 3 - EXECUTION

### 3.1 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Comply with Section 01 60 00, PRODUCT REQUIREMENTS.

- B. All diffusers shall be packed in suitable strong cartons or boxes. Diffusers of the same permeability rating shall be stamped on each carton in legible numerals.
- C. All parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay between time of shipment and installation, including any prolonged period at the site.
- D. No shipment shall be made until the Contractor has an approved shop drawing submittal.

### 3.2 INSTALLATION

- A. All equipment shall be installed in accordance with the Manufacturer's instructions and as shown on the Drawings.
- B. Clean air mains, blowers, filters and drop legs prior to installing diffuser elements.
- C. Protect diffuser elements from freezing at all times.
- D. Protect diffuser elements from un-pressurized submergence in wastewater.

### 3.3 FIELD QUALITY CONTROL

- A. Functional Test: After the installation of all aeration system equipment, the equipment shall be subject to field acceptance tests as specified herein.
- B. Mounting Tests: Support and tie-down provisions of the piping shall be tested to ensure that they have a factor of safety of 10 against calculated buoyant forces.
  - 1. Upon installation of the supports and prior to installation of piping, all of the supports of each type shall be tested. Testing shall include no less than 10% of the supports of each type, chosen at random. Each support chosen for test shall be attached to a lever which shall be placed on a fulcrum. A static load shall be applied to the opposite end producing a vertical extracting force on the support tie-down equal to 10 times the calculated maximum buoyant force to which the support tie-downs will be subjected in normal operation as detailed above. The application of the test load shall be such that the entire pipe support, including pipe hold down strap, is tested. Upon a test failure, the entire system will require testing under the above specified conditions. Repair and replace all equipment not meeting the test requirements.
- C. Inspection of Piping: The piping shall be inspected for proper joints, supports and tie-downs, end plugs and drain relief valves.
- D. Level Test: Pond shall be filled with clear water to the top of the diffusers. The level of the diffusers shall then be checked to see that they are at an elevation differential that the Manufacturer has recommended. Should it be necessary to correct the elevation of any diffuser assembly as a result of this check, such action shall be taken prior to proceeding further.
- E. Uniformity and Leakage Test: Pond shall be filled with water to a depth of 1' above the diffusers. The air supply will be turned on to minimum and maximum air flow rates as specified herein and air supplied evenly to all headers. The surface of the water will then be visually inspected to see that air flow is uniformly distributed across the tanks and that no air leaks are present within the piping system. All piping joints will be soap bubble tested to ensure no air leaks are present. If, in the opinion of the Engineer, there are areas of consistently low or high air quantity release, or leaks within the piping system, make all necessary adjustments to correct these deficiencies.
  - 1. During the uniformity and leakage test the aeration system pressure shall be monitored and recorded.

- F. Operations Test: Perform an operations test by filling the pond with clean water to the design depth and operating the aeration system at design conditions for 5 consecutive days. After the operations test is complete, drain the tank and inspect the aeration system for any damage. Repair any damage to the satisfaction of the Engineer and the Manufacturer's Representative.
- G. Cost of Testing: All of the above field tests, including the filling, dewatering, and cleaning of the ponds, shall be conducted at the expense of the Contractor. The costs of all re-testing, if required, shall also be borne by the Contractor.

### 3.4 MANUFACTURER'S SERVICES

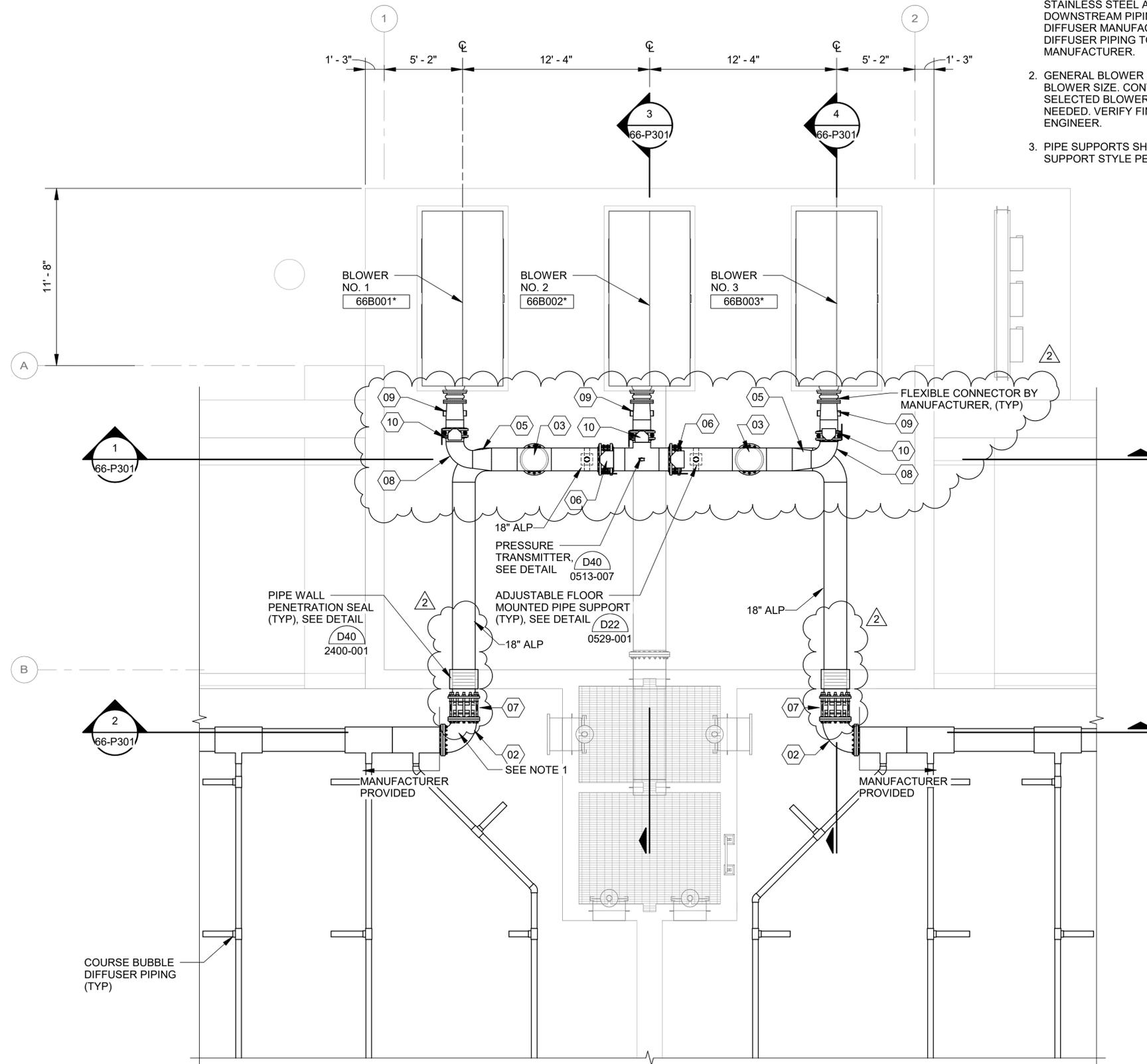
- A. A Manufacturer's representative for the equipment specified herein shall be present at the jobsite for the minimum person-days listed for the services here under, travel time excluded:
  - 1. (1) person-day for installation assistance, inspection, and certification of the installation. Provide Certificate.
  - 2. (1) person-day during operational field testing.
  - 3. (1/2) person-day for pre-startup classroom or jobsite training of Owner's personnel.
- B. Training of Owner's personnel shall be at such times and at such locations as required and approved by the Owner.
- C. See Section 01 75 00 STARTUP TESTING AND TRAINING.

### 3.5 MANUFACTURER'S CERTIFICATES

- A. Provide Manufacturer's certificate(s) in accordance with Section 01 75 00 STARTUP TESTING AND TRAINING.

END OF SECTION

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**NOTES:**

1. MANUFACTURER SUPPLIED DIFFUSER PIPING SHOWN FOR REFERENCE ONLY. DISCHARGE ELBOW SHALL BE STAINLESS STEEL AND PROVIDED BY CONTRACTOR. DOWNSTREAM PIPING SHALL BE PVC AND PROVIDED BY DIFFUSER MANUFACTURER. FINAL DESIGN/LAYOUT OF DIFFUSER PIPING TO BE COORDINATED BY MANUFACTURER.
2. GENERAL BLOWER LAYOUT IS SHOWN FOR ONE POTENTIAL BLOWER SIZE. CONTRACTOR TO VERIFY DIMENSIONS OF SELECTED BLOWER AND ADJUST SPACING OF BLOWERS AS NEEDED. VERIFY FINAL SPACING OF BLOWERS WITH ENGINEER.
3. PIPE SUPPORTS SHALL BE NON-RESTRAINED SADDLE SUPPORT STYLE PER STANDARD DETAIL **D22** 0529-001

**KEYNOTES**

01	18" 90° BEND (WLD x WLD)
02	18" 90° BEND (FLG x FLG)
03	18" TEE (WLD x WLD x FLG)
04	18" x 18" x 14" TEE (WLD x WLD x FLG)
05	18" x 14" REDUCER (WLD x WLD)
06	18" BUTTERFLY VALVE V511 (FLG x FLG)
07	18" FLANGED COUPLING ADAPTER (FLG x FLG)
08	14" 90° BEND (WLD x FLG)
09	14" x 12" REDUCER (FLG x FLG)
10	14" BUTTERFLY VALVE V511 (FLG x FLG)



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REV	DATE	DESCRIPTION	BY
2	02/25/26	ADDENDUM 2	BCR



CITY OF MOORE  
 MOORE, OK  
 MOORE WWTP NORTH STORM POND IMPROVEMENTS

NORTH STORM POND  
 - ENLARGED PLAN

JOB NO.: 2501328  
 DATE: JAN. 2026  
 DESIGNED BY: DEO  
 DRAWN BY: EG  
 CHECKED BY: RDT

BAR IS ONE INCH ON ORIGINAL DRAWING

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRAWING NUMBER

**66-P102**

SHEET NUMBER **20**

PROJECT NORTH  
 1  
 66-P102  
**ENLARGED PLAN**  
 SCALE: 1/4" = 1'-0"



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REV	DATE	DESCRIPTION	BY
2	02/25/26	ADDENDUM 2	BCR



CITY OF MOORE  
 MOORE, OK  
 MOORE WWTP NORTH STORM  
 POND IMPROVEMENTS

NORTH STORM POND  
 - SECTIONS 1

JOB NO.: 2501328  
 DATE: JAN. 2026  
 DESIGNED BY: DEO  
 DRAWN BY: EG  
 CHECKED BY: RDT

BAR IS ONE INCH ON ORIGINAL DRAWING  
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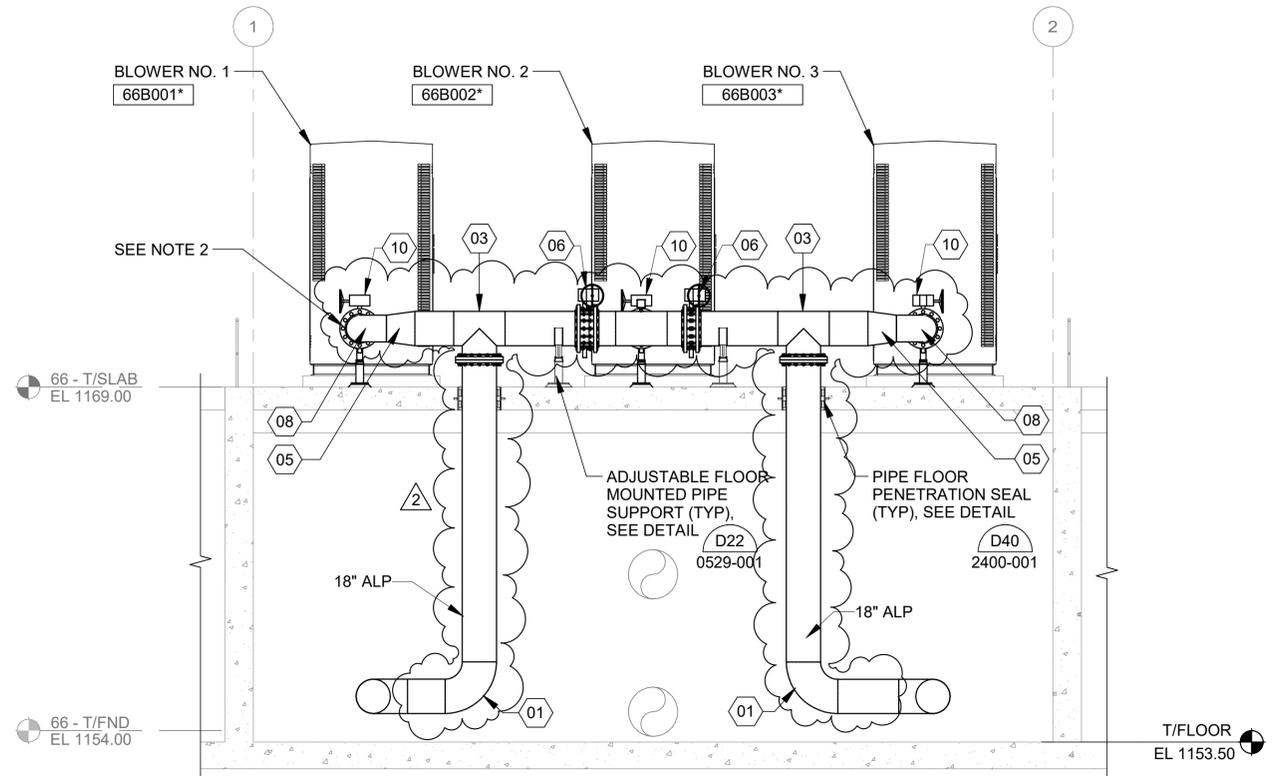
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**66-P301**  
 SHEET NUMBER  
**21**

**NOTES:**

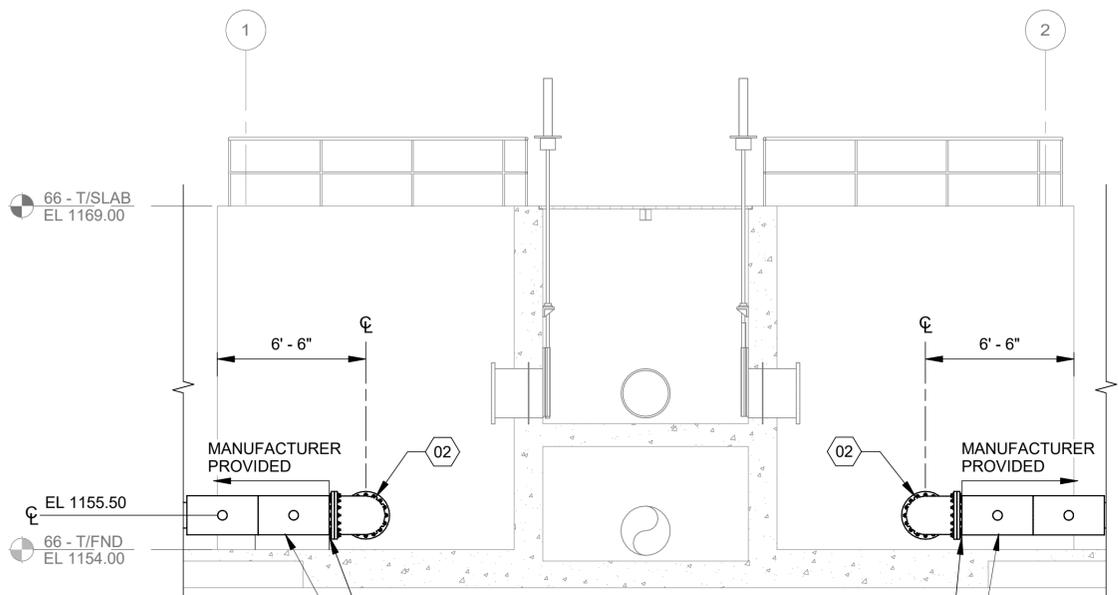
- AERATION SYSTEM PIPING SHALL BE PROVIDED BY MANUFACTURER DOWNSTREAM OF CONTRACTOR PROVIDED 90 BEND AS SHOWN.
- CONTRACTOR TO ADJUST AIR HEADER ELEVATION BASED ON SELECTED BLOWER DISCHARGE ELEVATION.
- PIPE SUPPORTS SHALL BE NON-RESTRAINED SADDLE SUPPORT STYLE PER STANDARD DETAIL D22 0529-001

**KEYNOTES:**

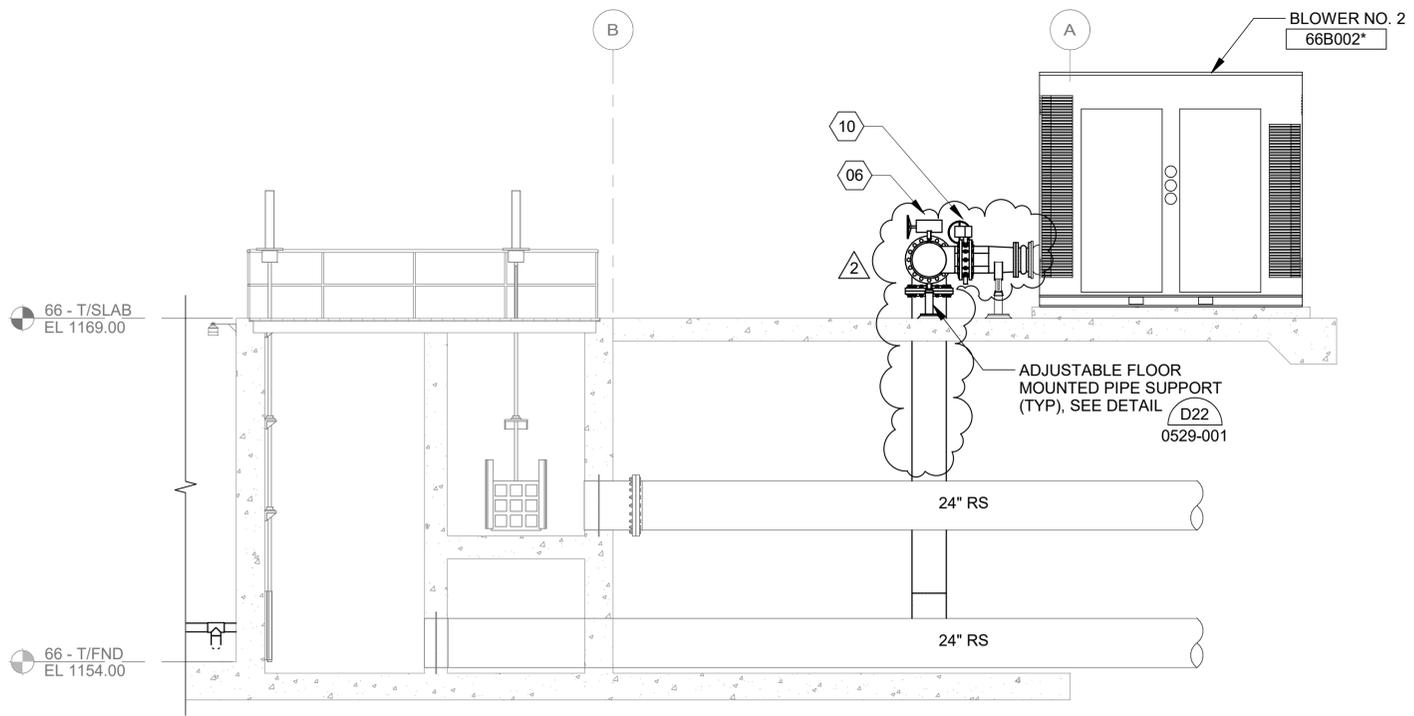
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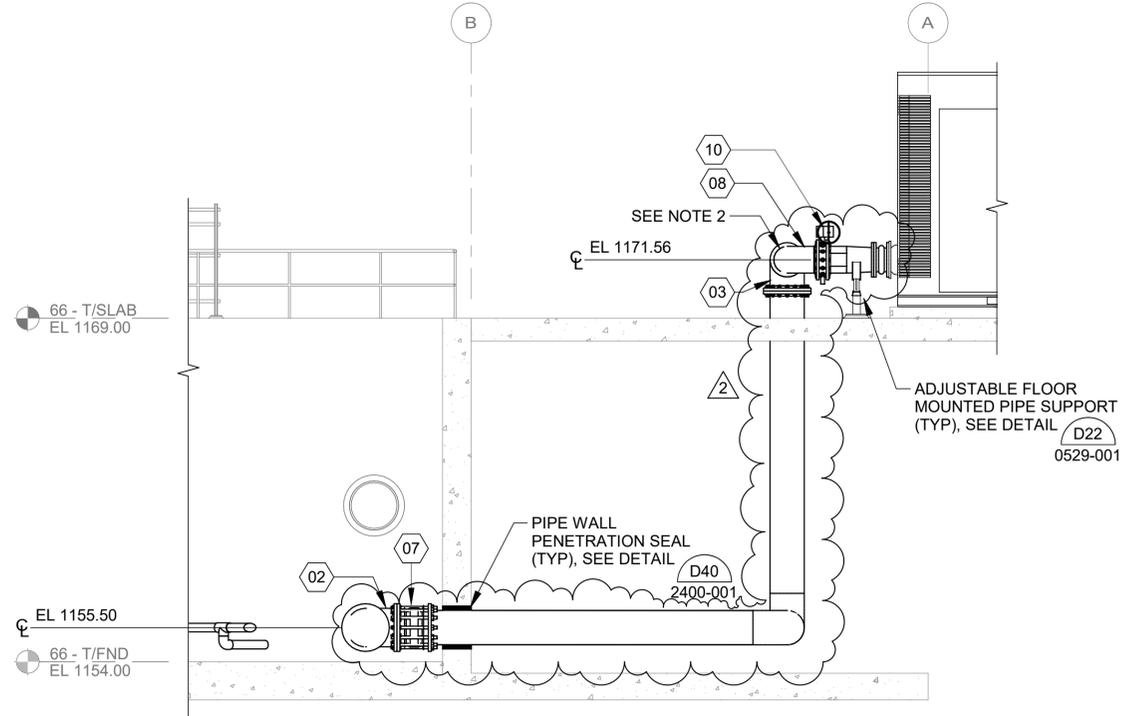
**SECTION 1**  
 66-P102 SCALE: 1/4" = 1'-0"



**SECTION 2**  
 66-P102 SCALE: 1/4" = 1'-0"



**SECTION 3**  
 66-P102 SCALE: 1/4" = 1'-0"



**SECTION 4**  
 66-P102 SCALE: 1/4" = 1'-0"

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