Members of the Board

Emily Kinkead
Chairperson
Darrin Kelly
Patrick Catena
Harry Readshaw
Kimberly Salinetro
Shatara Murphy
Edward Bigley

Arletta Scott Williams
Executive Director

Douglas A. Jackson, P.E.
Director
Operations & Maintenance

Michelle M. Buys, P.E.
Director
Environmental Compliance

Kimberly N. Kennedy, P.E.
Director
Engineering & Construction

Karen Fantoni, CPA, CGMA
Director
Finance

Michael Lichte, P.E.
Director
Regional Conveyance

Julie Motley-Williams
Director
Administration

Phil Cole
Director
Information Technologies

Erica LaMar Motley
Director
Scholastic Programs

Tawanda Stamps
Director
Procurement

Jill Snyder
Director
Communications

OCTOBER 23RD, 2026

CONTRACT NO. 1820

PRIMARY SEDIMENTATION TANK E-4

ADDENDUM NO. 1

All bidders bidding **Contract No. 1820** shall read and take note of this **Addendum No. 1.** The Procurement Documents for **Contract No. 1820 PRIMARY SEDIMENTATION TANK E-4** are hereby revised and/or clarified as stated below.

Acknowledgement of Contract No. 1820 Addendum No. 1

The Acknowledgement attached to **Addendum No. 1** is to be signed and returned immediately via email at contract.clerks@alcosan.org and acknowledged with Bidder's Proposal.

Kimberly Kennedy

Kimberly Kennedy, P.E.

Director – Engineering and Construction

ACKNOWLEDGEMENT OF

CONTRACT NO. 1820 G, E, H – PRIMARY SEDIMENTATION TANK E-4

ADDENDUM NUMBER 1

FIRM NAME: _____

SIGNATURE: _____

TITLE: _____

DATE: _____

OCTOBER 23RD, 2026

CONTRACT NO. 1820 G, E, H

PRIMARY SEDIMENTATION TANK E-4

ADDENDUM NO. 1

OCTOBER 23RD, 2026

CONTRACT NO. 1820 G, E, H

PRIMARY SEDIMENTATION TANK E-4

ADDENDUM NO. 1

A. Contract Documents – All Volumes

1. **REPLACE** Article 1-3G. Refer to Attachment 2. See attached revised Article 1-3G as Attachment 2 of this Addendum. The following revisions were made:
    a. Unit Price Item 1: **REPLACE** 12" auger cast piles with 18".
    b. Unit Price Item 10: **ADD** "Methods 1-4" for crack repair methods
    c. Unit Price Item 11: **ADD** " Types A,B,C" for joint repair methods
2. **REPLACE** 01 22 00 in its entirety. See attached 01 22 00 as Attachment 3 of this Addendum. The following revisions were made:
    a. **REMOVE** 3.1.H: Pay Item 8 for Additional Concrete Demolition
    b. **ADD** 3.1.L: Pay Item 11 for Expansion Joint Repair
    c. **REPLACE** 3.1.M: Pay Item 16 for Grout and Seal Crack with Pay Item 12 for Allowance for Other Contaminated Waste
    d. **RENUMBER** 3.1.B - 3.1.O to reflect Pay Items 1-14 shown in Article 1-3G.
3. **REPLACE** 03 01 30 in its entirety. See attached 03 01 30 as Attachment 4 of this Addendum. The following revisions were made:
    a. **REMOVE** Section 1.2.B.3 items a, b & c for concrete surface repair.
    b. **RENUMBER** Section 1.2.B.3 items d, e & f to a, b & c.

B. Questions and Answers

Q1: What are the anticipated on-site construction start and end dates?

A1: The anticipated NTP is mid-April 2027. The anticipated Substantial Completion is December 2029.

Q2: Are there any Union requirements?

A2: Yes. See Project Labor Agreement and Letter of Assent in Article 2 of Bid Documents.

Q3: Are there any Funding Requirements such as Prevailing Wage rates, BABA, etc?

A3: There are no funding requirements. See Articles 2 and 3 for material procurement requirements. See Article 7 for Prevailing Wage requirements.

Q4: If available, what is the Engineer's estimate for the electrical contract and/or the overall project magnitude?

A4: No Engineer's estimate will be provided to bidders.

Q5: Unit Price items are inconsistent between Article 1 Bid Form, 01 22 00 and 03 01 30.

A5: See attached corrected specifications 01 22 00 and 03 01 30. The Unit Price items as shown in in the Article 1-3G Bid Form govern.

Q6: The auger cast pile size is inconsistent between the Unit Price bid form and the specification.

A6: See attached corrected bid form Article 1-3. The correct pile size is 18".

Q7: Is attending the prebid meeting mandatory to submit a bid?

A7: No. Attending the prebid meeting is not mandatory to submit a bid.

Q8: Please confirm that it is acceptable to track MBE/WBE solicitation on an Excel spreadsheet.

A8: Yes, this is acceptable.

Q9: Please confirm if it is acceptable to make our own bid envelope since one was not provided with the bid documents.

A9: Yes, it is acceptable to use a plain manilla envelope.

Other Information:

1. See attached PreBid Meeting minutes.
2. See attached Article 1-3G
3. See attached revised specification 01 22 00
4. See attached revised specification 03 01 30

*** * * * END OF ADDENDUM NO. 1* * * ***

Attachment 1: Prebid Meeting Minutes

ALCOSAN
Primary Sedimentation Tank E-4

October 15, 2026

Legal Notice

- **Bid Opening is Thursday, February 4th 2027 at 11:00 AM**
- **All Bids to be Submitted to Alcosan Engineering Department before bid opening. If sent by courier, bidder must allow enough time for delivery to clerks.**
- **Contract Documents must be purchased directly from ALCOSAN to qualify as an eligible bidder**

Legal Notice

- Technical Questions: Stephanie.Downs@mbakerintl.com
- Bidding/Bid Document Questions: Contract.clerks@alcosan.org
- The final day for questions is COB January 22nd, 2027. Responses will be distributed as Addenda.

MBE/WBE Participation

- 10% - 25% of Contract Value.
- Participation goal can be met through suppliers, subcontractors or lower tier subcontractors

Bidding Documents

- Submit 1-1 through 1-23G, 1-1 through 1-21E or 1-1 through 1-22H.

- Total Base Bid
  - G Contract: Lump Sum + Unit Price Work
  - E Contract: Lump Sum only
  - H Contract: Lump Sum + Line Item for Air Handler

- Unit Price work is inclusive of contract time and disposal costs. If spoils exceed PADEP contamination thresholds in 31 23 00, disposal costs will be paid out on a T&M basis against Allowance Item 12.

Bidding Documents

- Acknowledge all Addenda by number on Bid Form. Attach signed acknowledgement of each Addendum with bid packet.
- Provide valid, named contact on page 1-7G, 1-5E or 1-6H.
- Provide Bid Bond or Certified Check in 10% of Bid Amount.
- Submit signed copy of Letter of Assent to Project Labor Agreement (See Article 2, Attachment A). Prime submits this with bid, Subs submit prior to starting work on project.

Information for Bidders

- Ensure Bids conform to requirements of Article 2.04. Deviation from these requirements may result in the bid being rejected as non-responsive.
- Contract Execution & Notice to Proceed (2.07). February 2027 award and April 2027 NTP are anticipated.
- Bidders to Investigate (2.13). Coordinate site visits through Stephanie Downs.

Information for Bidders

- Tax Exemptions (see Article 2.18, 3.22 & Article 3 Exhibit D)
- Qualifications and Experience of Bidders (2.24)
- MBE/WBE Participation (2.25)
- Project Labor Agreement (2.33)

Contract Provisions

- Project Coordination (3.7 & 3.28)
- Retainage (3.35) 10% at start reduced to 5% at 50% completion
- Bonds (3.58). Performance Bond and Labor & Material Payment Bond provided prior to execution of contract. Maintenance Bond required upon final acceptance of work.
- Compliance with Health, Safety & Environmental Laws (3.75). Contractor to submit a project specific safety plan prior to starting work.
- Working hours (3.77) Work shall be performed between 7:00 AM and 5:00 PM unless otherwise approved by Owner.

Contract Provisions

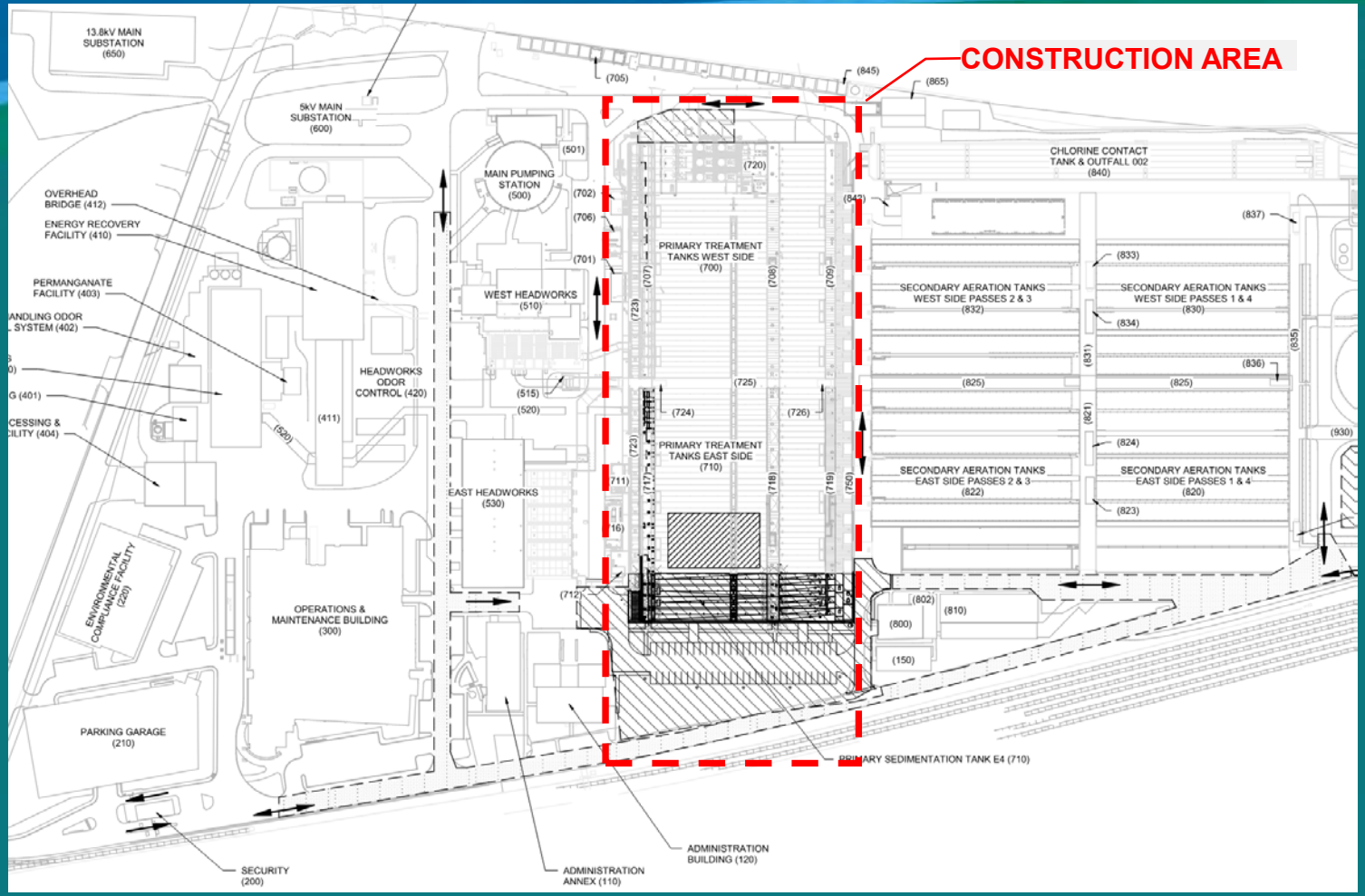
- Pennsylvania Prevailing Wage Rates (see Article 3.78 & Article 7)
- Compliance with Buy American (3.79)
- Compliance with PA Steel Products Procurement Act (3.80)

Contract Agreement

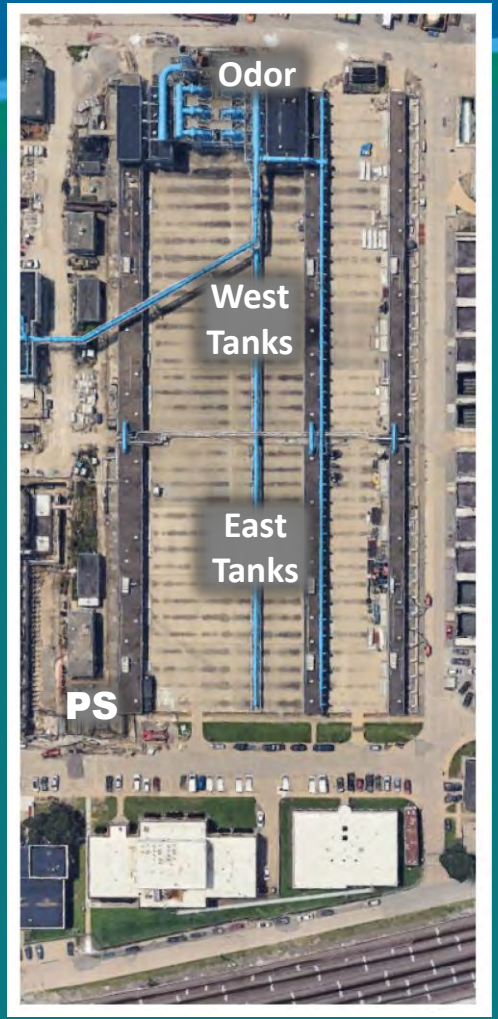
- Substantial Completion: 997 Days from NTP
- Final Completion: 1057 Days from NTP
- Liquidated Damages:
  - $5,000/calendar day past Substantial Completion
  - $1,000/calendar day past Final Completion

Project Overview

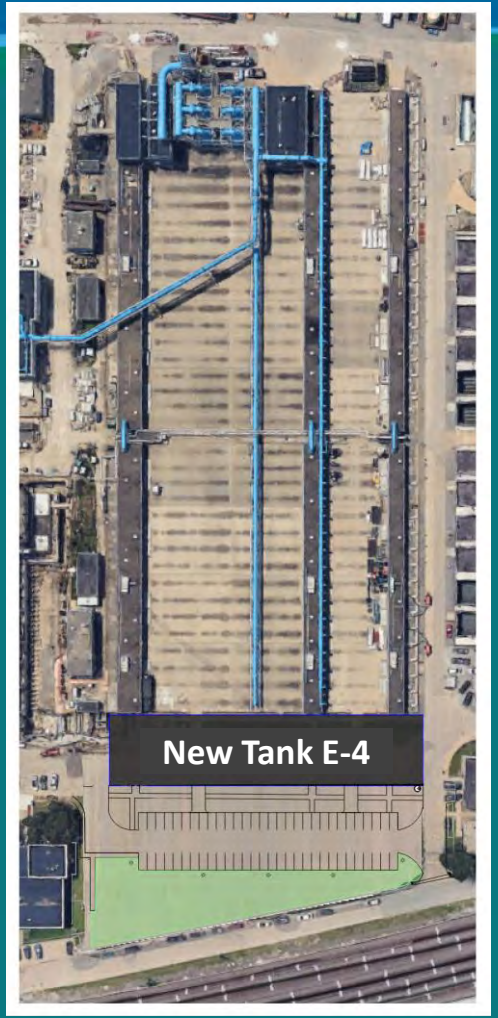
Site Access


CONSTRUCTION AREA
13.8kV MAIN SUBSTATION (650)
5kV MAIN SUBSTATION (600)
MAIN PUMPING STATION (500)
CHLORINE CONTACT TANK & OUTFALL 002 (840)
OVERHEAD BRIDGE (412)
ENERGY RECOVERY FACILITY (410)
PERMANGANATE FACILITY (403)
HEADWORKS ODOR CONTROL (420)
WEST HEADWORKS (510)
PRIMARY TREATMENT TANKS WEST SIDE (700)
SECONDARY AERATION TANKS WEST SIDE PASSES 2 & 3 (832)
SECONDARY AERATION TANKS WEST SIDE PASSES 1 & 4 (830)
PRIMARY TREATMENT TANKS EAST SIDE (710)
SECONDARY AERATION TANKS EAST SIDE PASSES 2 & 3 (822)
SECONDARY AERATION TANKS EAST SIDE PASSES 1 & 4 (820)
EAST HEADWORKS (530)
ENVIRONMENTAL COMPLIANCE FACILITY (220)
OPERATIONS & MAINTENANCE BUILDING (300)
PARKING GARAGE (210)
SECURITY (200)
ADMINISTRATION ANNEX (110)
ADMINISTRATION BUILDING (120)
PRIMARY SEDIMENTATION TANK E4 (710)

Construction Area Overview



Existing Conditions

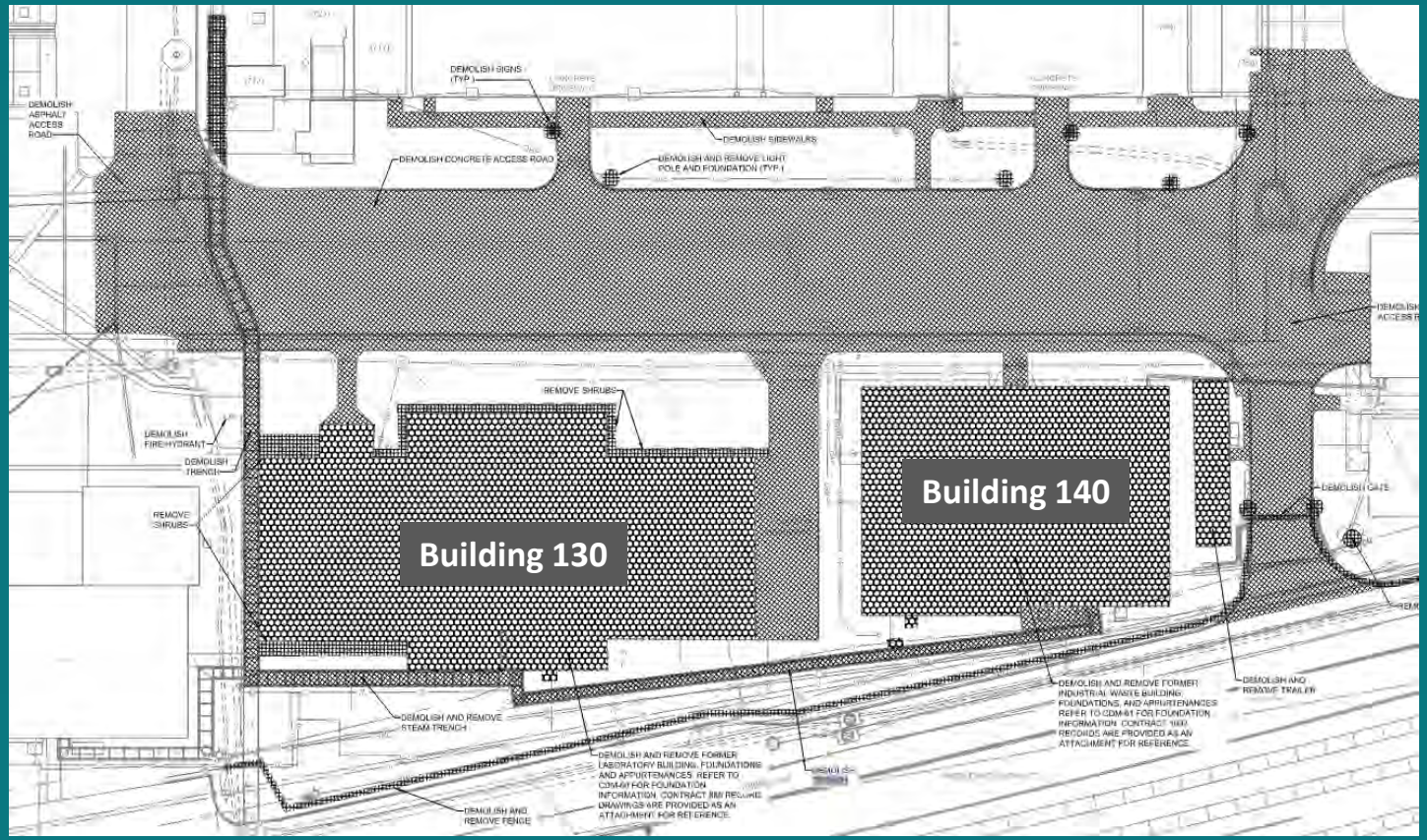


Proposed Conditions

General Contract (G & P)

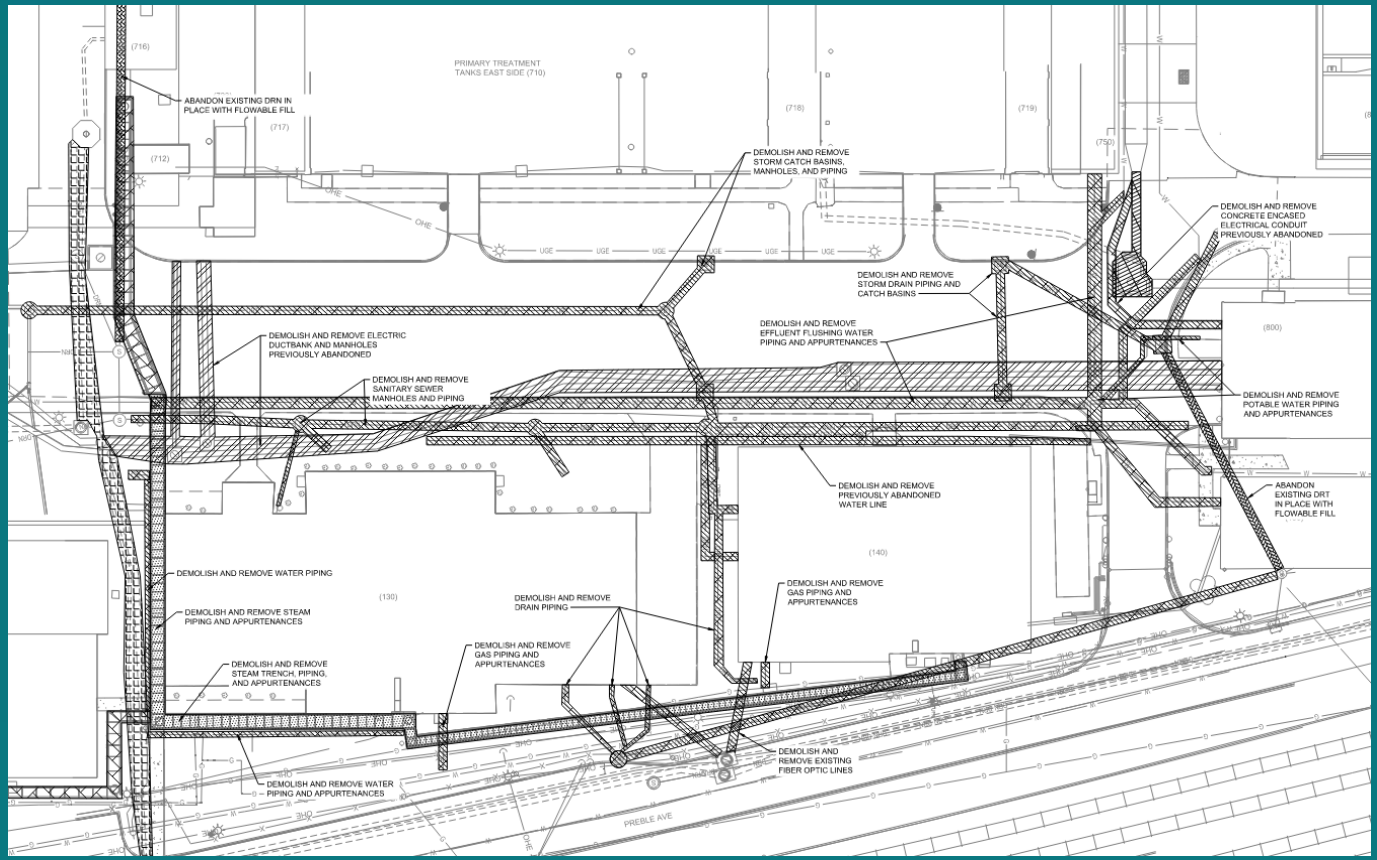
Civil Demolition – Above Grade

- Demo Building 130 & 140
- Make room for Proposed Tank E-4 and Future Tank E-5

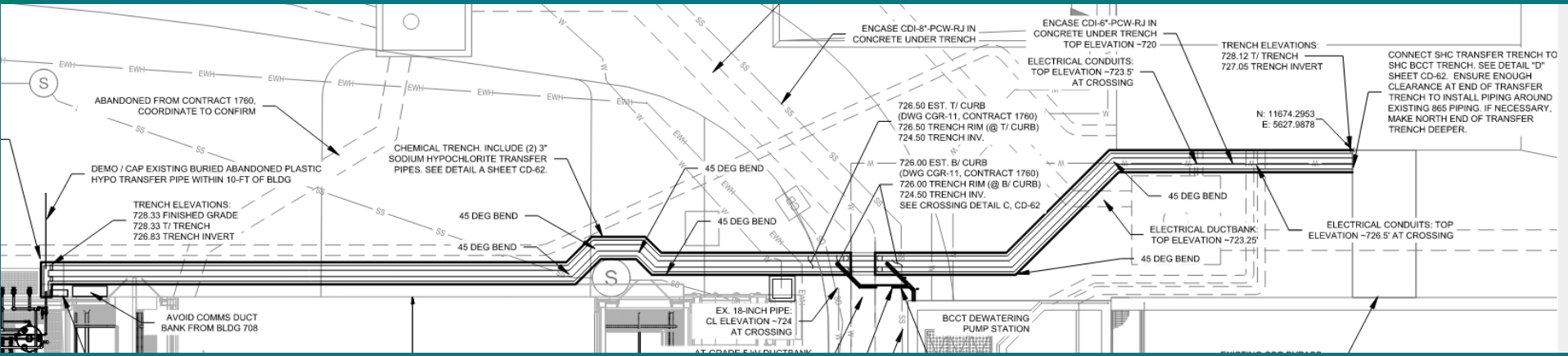


Civil Demolition – Below Grade

- Relocate utilities within the footprint of Tank E-4 and Future Tank E-5
- Do this before E-4 work can begin



Civil Work on West Side: Sodium Hypochlorite Trench



- Construct piping trench from Area 720 to Building 865
- Coordinate with existing utilities
- Install hypochlorite transfer piping in trench

Structural - Sed Tank E4

Footprint = Approx 320’ x 70’ (incl. channels)

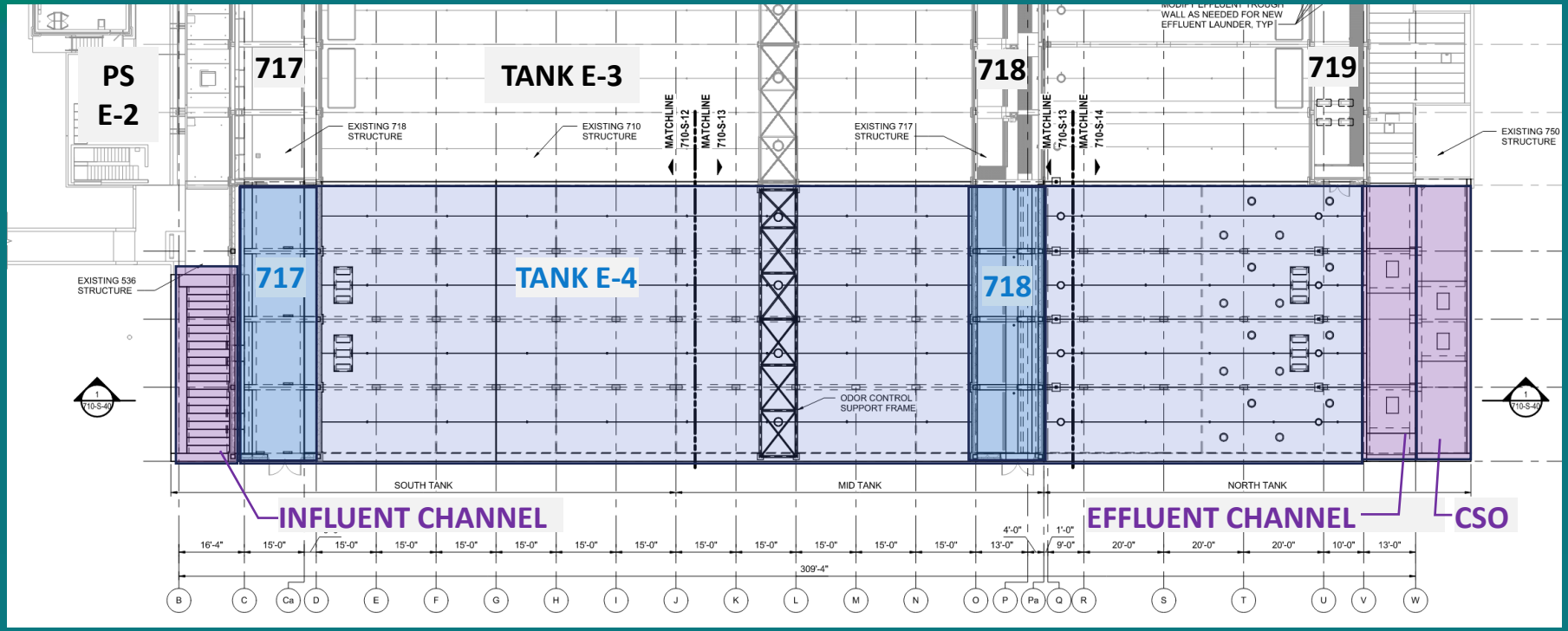
- Construct Tank E-4
- Extend Primary Influent, Primary Effluent, and CSO Bypass Channels

Base slab on 18-in auger cast piles

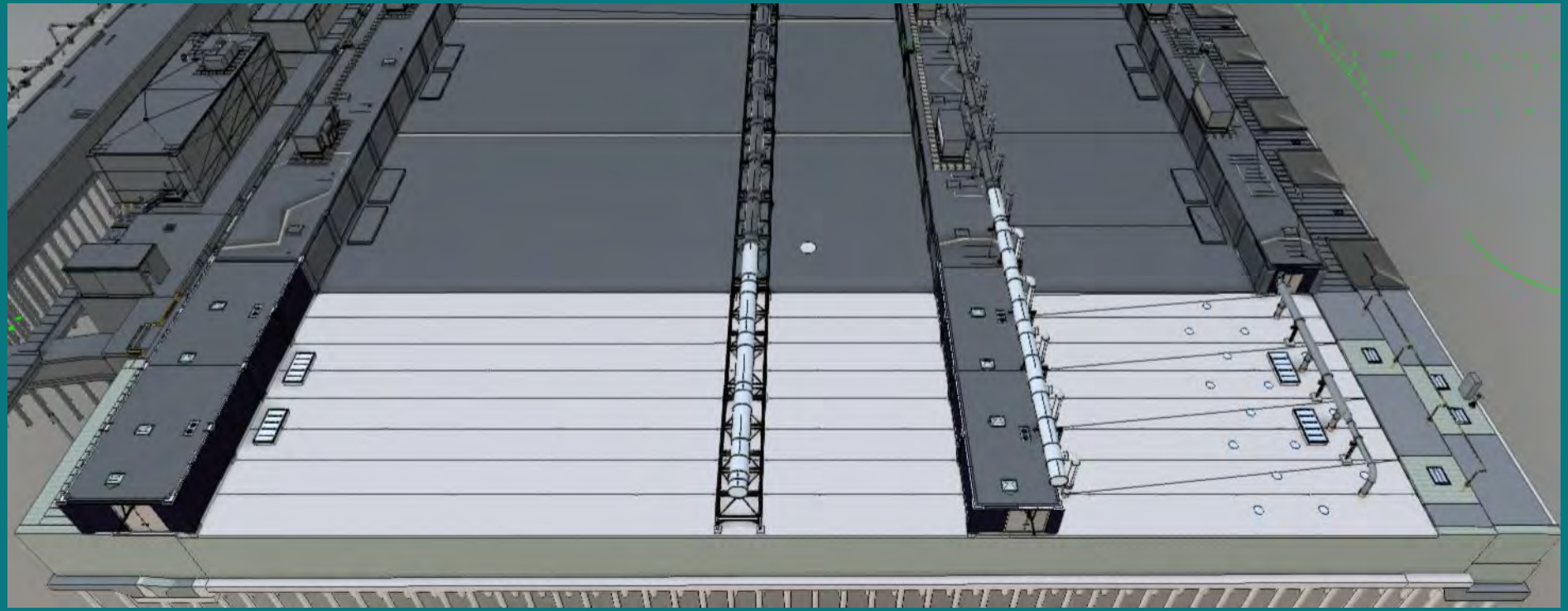
Tank consist of 4 parallel bays

Columns, beams, tank covers part of structure

Structural - Sed Tank E4



Structural - Sed Tank E4



Sed Tank Process Mechanical

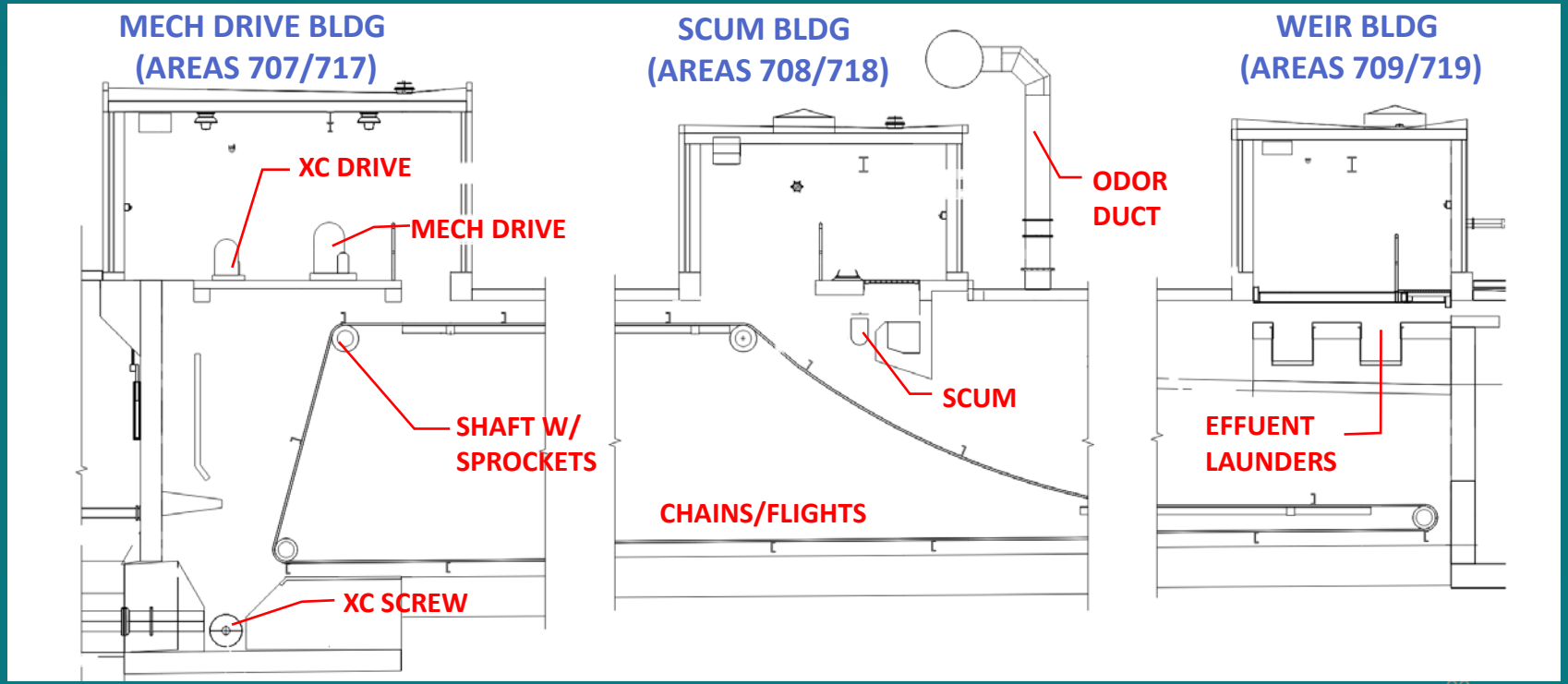
New Sed. Tank E-4

- Procure/Install all equipment after structure is complete. But while E-4 is being constructed…

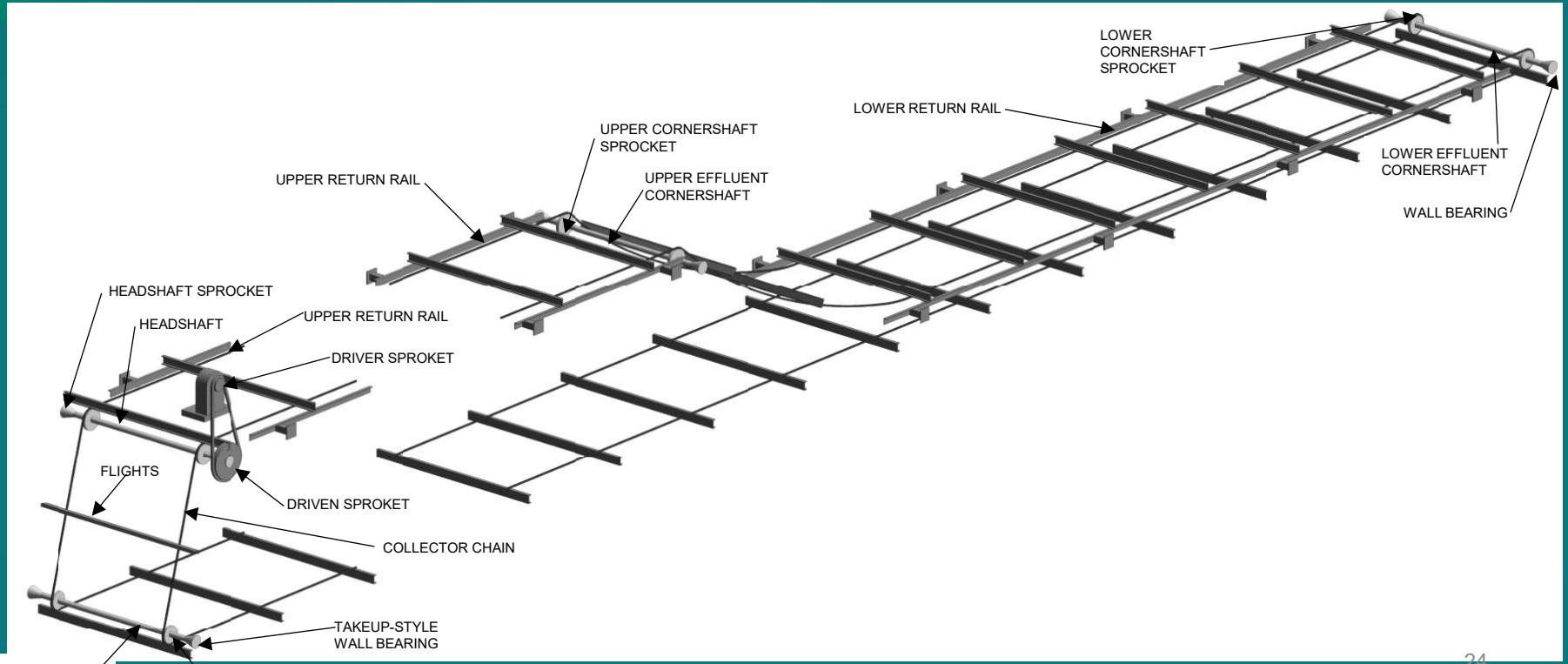
Existing Sed. Tanks

- Nine (9) existing sed tanks to upgrade. Only one allowed offline at a time.
- Chains on-site, and not all equipment replaced equally. Check scope.
- EARLY work! First tank's shop submittals are high priority.

Tank Section (Typical)

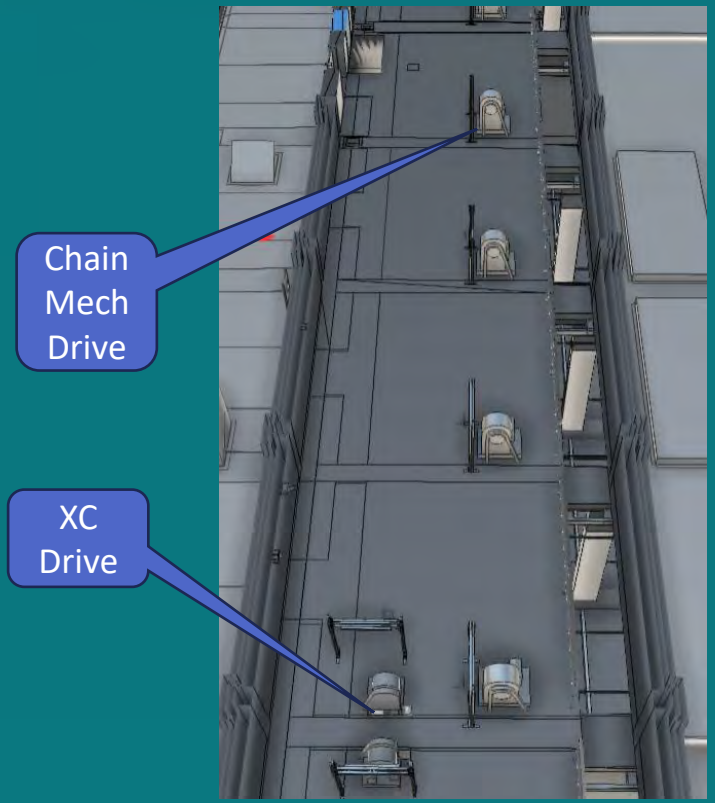


Tank Internals



Electrical Mech Drive Area

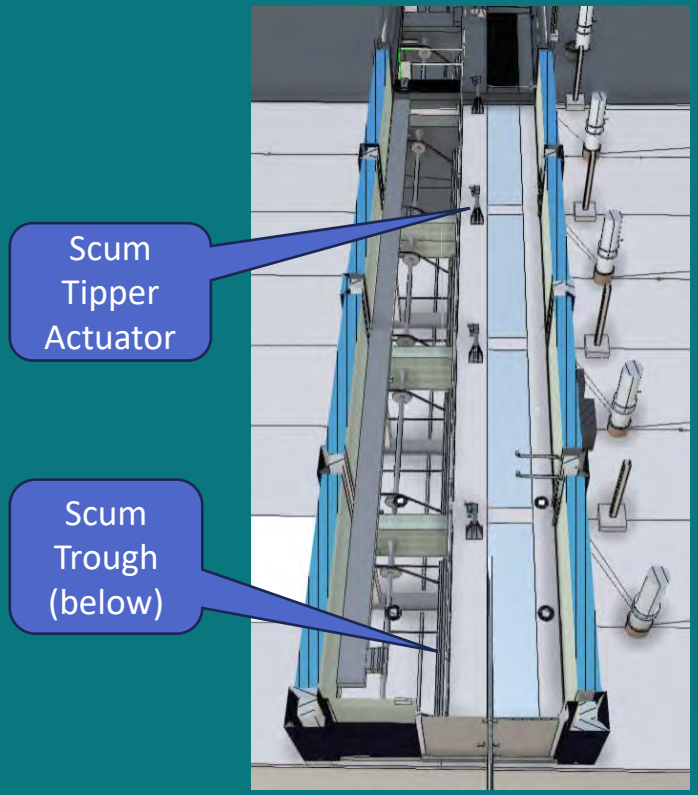
- Four chain mechanism drive units per tank (one per bay).
- Not all tanks will get new chain drives, even if their chains and sprockets are updated.
- One Cross Collector (XC) drive unit per tank. All existing tanks will get new XC units and drives.
- New Tank E-4 will also have eight new gate actuators on back wall. Existing tank gate actuators will remain.



Typical Drive Area Layout

Scum Skimmer Area

- Four actuators to tip scum skimming troughs (one per bay)
- Only in new Tank E-4 building extension (Bldg 718)
- All existing tanks have newly updated scum troughs and existing actuators
- Other electrical associated with building extension



Scum Skimming Bldg Layout

Scope of Supply

SCOPE OF SUPPLY, PRIMARY SED TANK EQUIPMENT										
ITEM	W0	W1	W2	W3	W4	E0	E1	E2	E3	E4
CROSS COLLECTOR SCREW, BEARINGS, HANGERS, DRIVEN SPROCKET	C	C	C	C	C	C	C	C	C	C
CROSS COLLECTOR DRIVE AND CHAIN	C	C	C	C	C	C	C	C	C	C
COLLECTOR DRIVE UNITS	-	C	C	C	-	-	C	C	C	C
COLLECTOR DRIVE CHAIN	-	A	A	A	-	-	A	A	A	C
COLLECTOR CHAINS	A	A	A	A	A	A	A	A	A	C
COLLECTOR FLIGHTS	A	A	A	A	A	A	A	A	A	C
COLLECTOR SHAFTS, SPROCKETS, BEARINGS	C	C	C	C	C	C	C	C	C	C
UPPER RETURN RAILS	A	A	A	A	A	-	A	A	A	C
LOWER RETURN RAILS	C	C	C	C	C	C	C	C	C	C
LOWER WEAR BARS	A	A	A	A	A	A	A	A	A	C
EFFLUENT LAUNDERS AND WEIRS	C	C	C	C	C	C	C	C	C	C
SCUM COLLECTOR PIPE AND DRIVES	-	-	-	-	-	-	-	-	-	C

SCOPE CODE

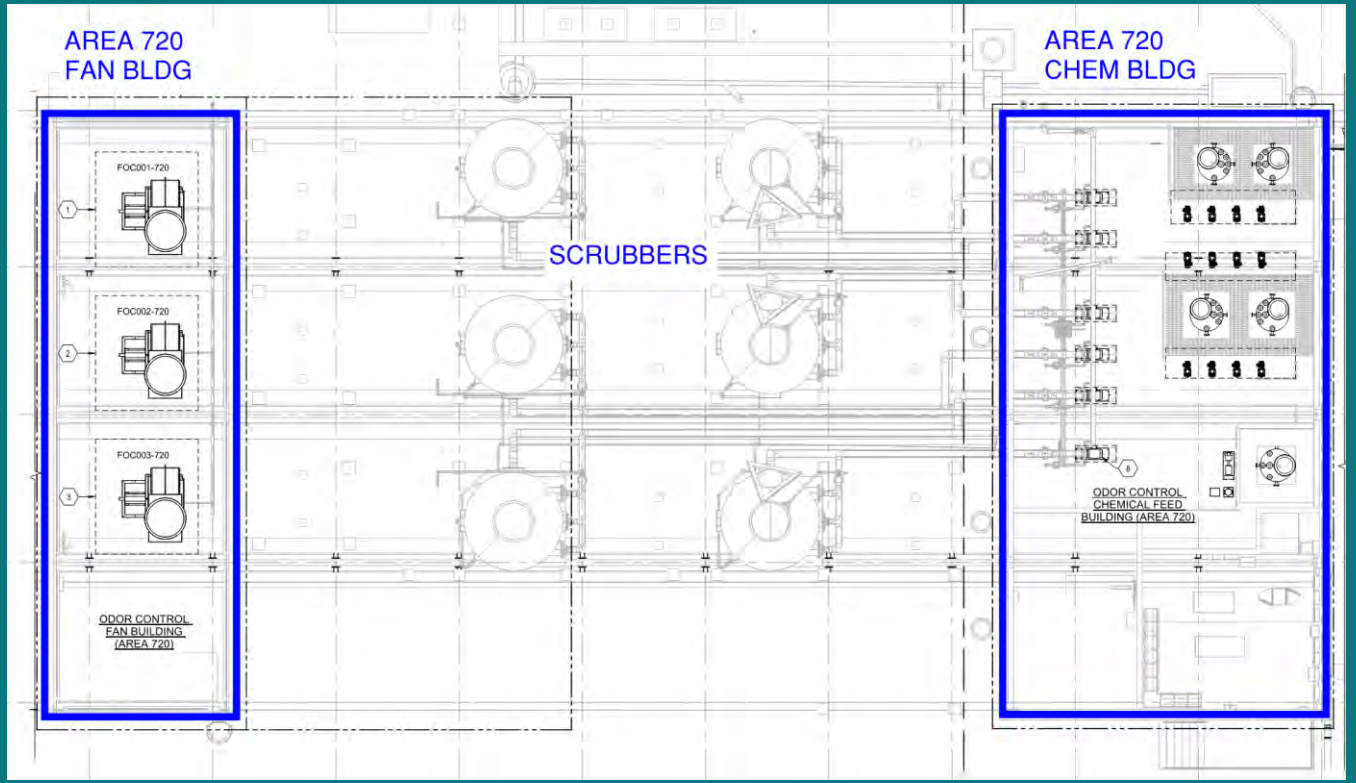
"-"	NO PROCUREMENT OR INSTALLATION REQUIRED BY CONTRACTOR
A	PROCURED / SUPPLIED BY ALCOSAN; INSTALLED BY CONTRACTOR
C	PROCURED / SUPPLIED / INSTALLED BY CONTRACTOR

Odor Control



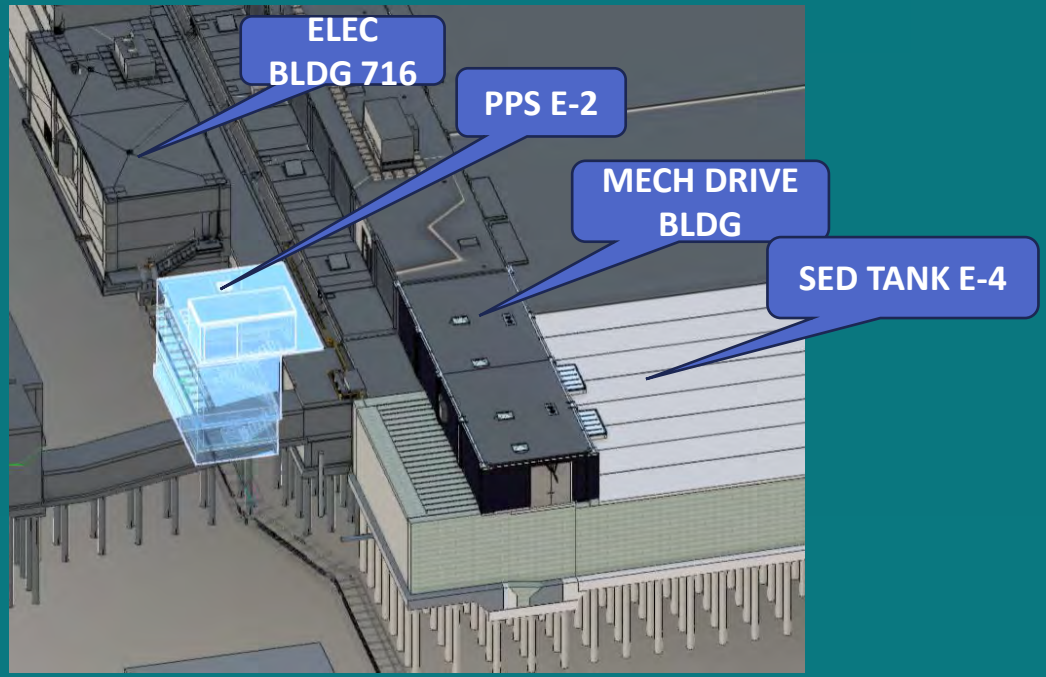
Odor Control

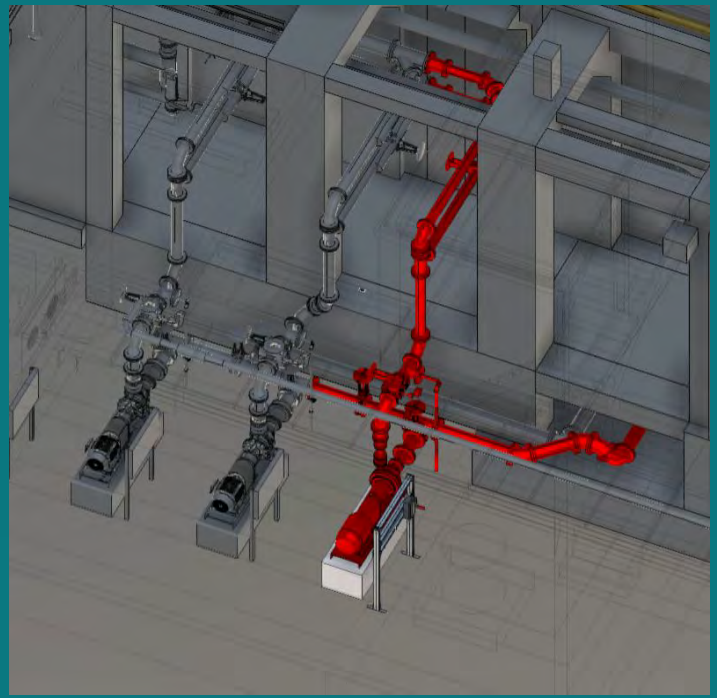
- Replace pumps, tanks, piping in Chem area
- Replace three odor control fans
- Updating demisters is only work in scrubber area
- Expand odor control intake ducting onto Tank E-4



Primary Sludge Pump Station E-2

- Existing pump station E-2
- Update to add new sludge pump and drive
- Tie into existing piping





Electrical Contract

Electrical – Mechanical Areas

Sludge Pump Station (Area 712)

- New sludge pump and VFD

Mechanism Drive Building (707/717)

- New drives for chain mechanisms and cross collectors. General building expansion items

Scum Building (Area 718)

- Scum actuators. Lighting for building expansion. Gas detectors, Go / No-Go systems

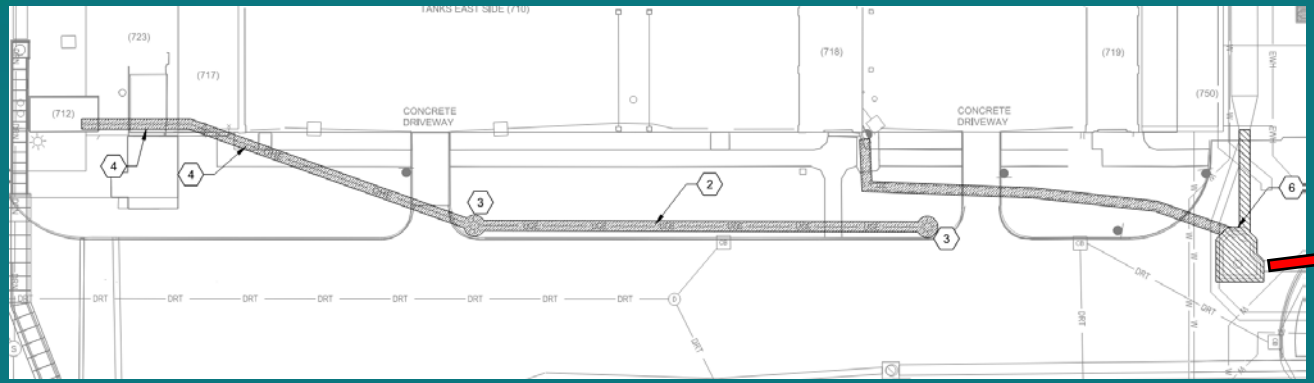
Odor Control (Area 720)

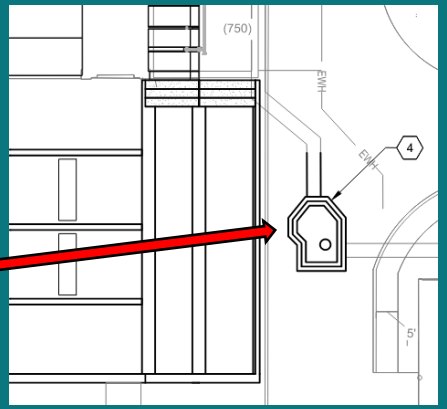
- Re-terminate at Odor Fans, Recirc Pumps, Chemical Pumps/Tanks. Heat trace hypo lines.

Effluent / CSO Area

- Flushing gate and flushing valve

Electrical Site Work

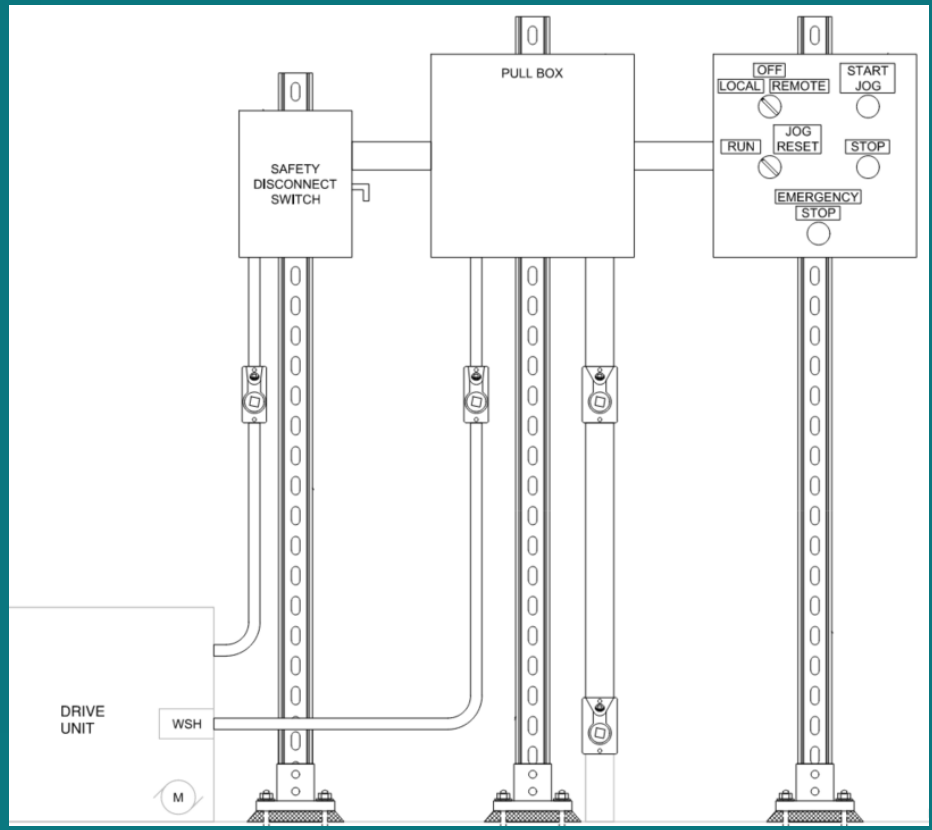




- Relocate numerous utilities per civil/electrical plans
- Early task to relocated EMH-109 and remove / reroute cables
- Heat trace hypochlorite lines in new pipe trench
- Site lighting for updated parking

Electrical Mech Drive Area

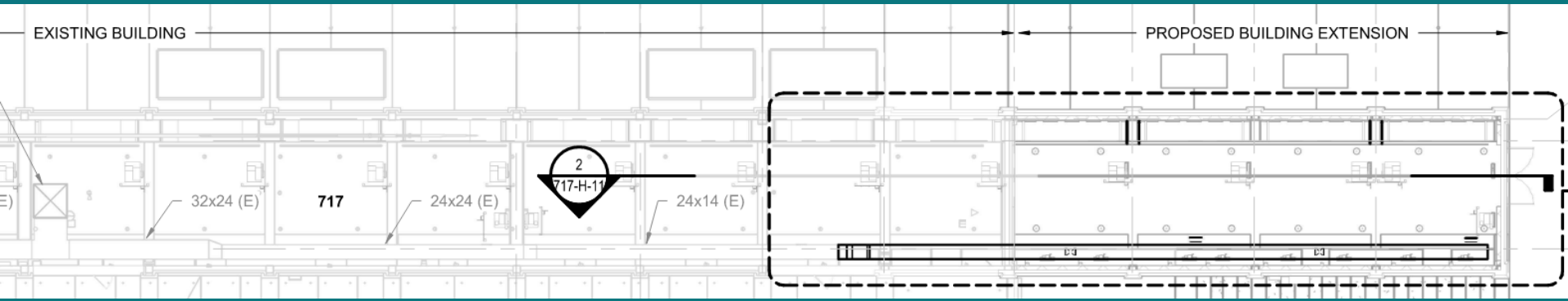
- Connect all proposed drive units.
- Re-use cabling to extent practical.
- All replacement drives still powered from existing MCCs
- Tank E-4 new equipment to connect to expanded existing MCC004-716
- 717 Building lighting, gates, gas detectors , Go / No-Go systems

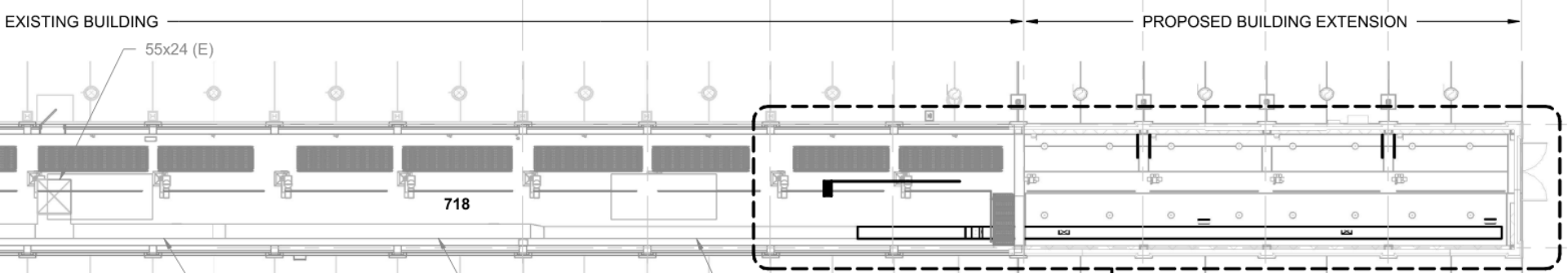


Typical Drive Panel Configuration

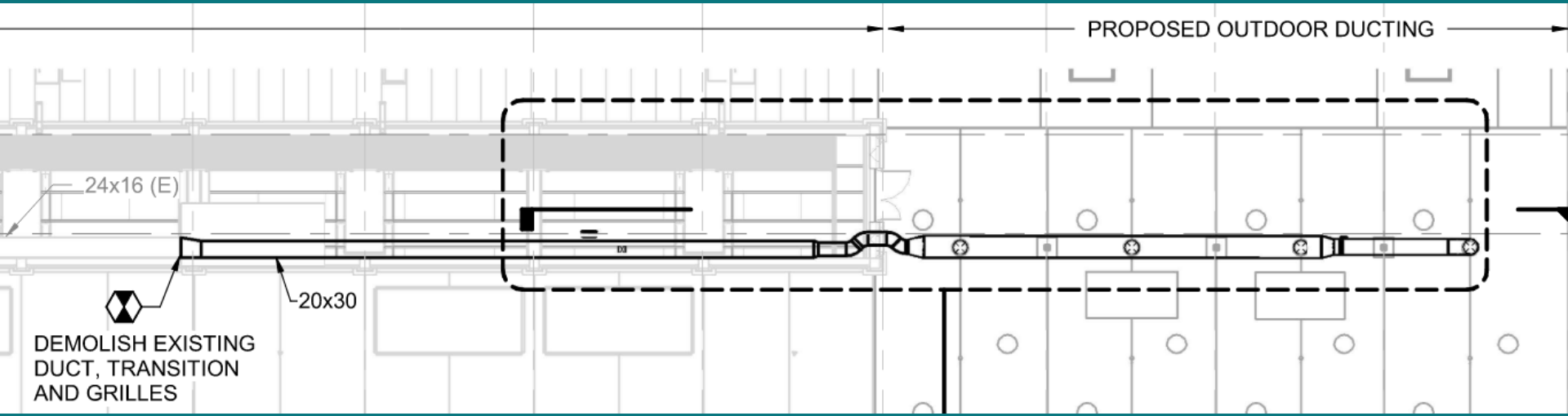
HVAC Contract

Extension of East Mechanism Drive Building (717) and East Skimmer Drive Building (718)



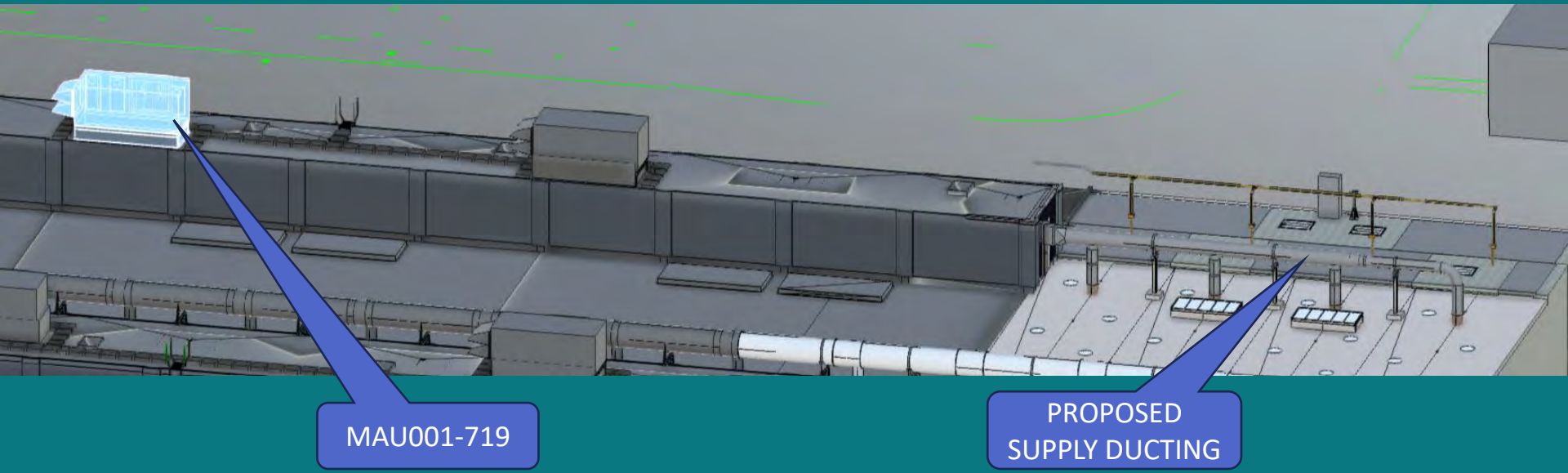


Extension of Effluent Weir Building (719) Ducting (Indoor & Outdoor)



Make Up Air Unit in East Effluent Weir Building (719)

- Make Up Air Unit (MAU001-719) to be procured under this contract. Upon delivery, the unit will be turned over to ALCOSAN for installation



Questions / Comments?

CONTRACTS 1820 G, E, H
Primary Sed Tank E-4
Pre-Bid Meeting Minutes

Thursday, October 15th, 2026 @ 11:00 AM
ALCOSAN O&M Building Auditorium

ATTENDEES

See attached Sign-in Sheet for those in-person.

Call-in:

- Stephanie Downs, MBI
- Marki Johnson, MBI
- Jeff Kana
- Makenna Pick
- Tyler Trainor
- Ken Fuller
- Lori Miller
- Scott Olson
- Glenn Gmitter
- Chad Hickman
- Brad Lomago

INTRODUCTION

a. Opening comments from ALCOSAN PM, Cody Edgell
b. Meeting moderated by Michael Baker Construction Manager, Stephanie Downs
c. Overview of MBE/WBE requirements from ALCOSAN DBE Coordinator, Tawanda Stamps
d. Overview of Bidding Requirements by Cody Edgell
e. Presentation of Contract Scope by HDR
f. Post Meeting Site Walk

BID DOCUMENTS

1. Legal Notice

a. All bids are to be submitted to Alcosan Engineering Department clerks (2nd floor of the O&M Building, 3300 Preble Ave. Pittsburgh PA, 15233) on or before bid opening date and time. If the bid package is sent to ALCOSAN by land courier (UPS, FedEx, etc.), allow enough time for delivery to the clerks.
b. Bid opening on **Thursday, February 4, 2027,** at **11:00 AM** sharp! Those who have purchased bid documents will be given the link to the virtual public bid opening
c. WBE/MBE participation (target 10% to 25% of contract value). Participation may include subcontracts and materials/supplies; document good-faith outreach with the Statement of Solicitation.
d. Bid security 10% of bid price by certified check or bid bond.
e. Contract documents must be purchased directly from ALCOSAN to qualify as an eligible bidder.
f. All questions regarding the Technical Aspects of the Project shall be submitted to **Stephanie Downs, Michael Baker via email to** stephanie.downs@mbakerintl.com. Verbal answers to any question shall be considered informal and without legal or binding effect on the contract, or to the Owner, unless formalized by an addendum.
g. Any questions regarding the purchase of Contract Documents should be directed to **Jackie Kresen, via email to** Contract.clerks@alcosan.org.
h. This Pre-Bid Meeting is not mandatory for bidders.

i. The last day for questions is Close of Business **January 22, 2027**. Responses will be distributed as addenda, as soon as possible, as deemed applicable.

2. Bidding Documents [Article One]

a. Bid Forms – For contract G, fill in TOTAL BASE BID (Sum of lines 8.3.1 and 8.3.2) on page 1-4G. For contracts E and H, fill in Total Base Bid on pages 1-2E, 1-2H. For contract H, include lump sum price for Hasting's air handler. There are no alternates to be bid. Bids shall be submitted with all bid forms complete and signed by an authorized representative of the Company. The bid forms required to be submitted: (Article 1 pages 1-1G through 1-23G or 1-21E or 1-22H and Solicitation and Commitment Statement pages 1 through 4), not the entire book.

b. Bid Form for General Contractor paragraph 8.2 Unit Price Work. Item 01 includes all of the work required to install 100% of the piles along with disposal of residual waste spoils from drilling. If the spoils meet contamination thresholds established by the PADEP, the special costs to handle and dispose of said spoils will be compensated on a T&M basis against the Allowance established in item 12.

c. Acknowledge all Addenda received and made part of the Bid Documents page 1-2. (Art.2.16) AND attach a signed Acknowledgement of Receipt of each individual addendum to the front of the Bid Form package.

d. Provide a contact for your company in the space designated on page 1-7G or 1-5E or 1-6H) for receipt of any communications necessary for the bid evaluation. Identify a specific, readily available company contact for bid evaluation; generic email addresses are not sufficient.

e. Bid Bond - Certified check or Bid Bond. (Art. 2.19)

f. Project Labor Agreement (Art. 2.33) - Primes to sign and submit Letter of Assent with bid. Subs sign before working on project.

3. Information for Bidders [Article Two]

a. Submission of Bids (2.04); Sealed Bid to be submitted to ALCOSAN Engineering Department on or before bid opening date and late bids (anything received after 11:00 AM) will be treated as "non-responsive" and returned to the Bidder unopened.

b. Award Contract Execution and Notice to Proceed (2.07); Intend to award Contract 1820 at the **February 25, 2027** ALCOSAN Board Meeting. Contract execution typically requires 6 weeks to process paperwork (including bonds and certificates of insurance). Anticipate a Notice to Proceed to be issued by the first week of April.

c. Bidders to Investigate (2.13); Bidders may coordinate site visits through the Construction Manager, Stephanie Downs, at stephanie.downs@mbakerintl.com. Access to tank interiors and Buildings 130/140 requires advance scheduling. Further details will be provided by addendum.

d. Tax Exemptions (2.18) See Article 3.22 and Exhibit D.

e. Qualifications and Experience of Bidders (2.24)

f. MBE & WBE Participation (2.25); Lower-tier subcontractor participation counts towards 10%-25% goal.

g. Project Labor Agreement and Letter of Assent (Prime and Subs) (2.33).

4. Contract Provisions [Article Three]

a. Project Coordination (3.7 & 3.28). This is a multi-prime project. All prime contractors and their subcontractors must coordinate activities with each other and the Construction Manager.

b. Retainage; (3.35): 10% to start. Reduced to 5% at 50% completion.

c. Bonds (3.58); Performance Bond and Labor and Material Payment Bond to be provided prior to the execution of the Contract Agreement by Owner in the amount (100%) of the Contract Sum. Also, Maintenance Bond (100% of Contract sum) required upon final acceptance of the completed work.

d. Compliance with Health, Safety, and Environmental Laws (3.75); requires a project-specific written safety program, tailored specifically for the work on this contract to be submitted to the Construction

Manager prior to performing any work on-site. The Heath and Safety Plan is also subject to Alcosan Safety approval.

e. Working hours (3.77); Normally for an 8-hour period between 7:00 AM to 5:00 PM, Monday through Friday. Work performed after hours, during ALCOSAN holidays and weekends shall be overseen by the Construction Manager, ALCOSAN and FDC staff as required, at the sole expense of the Contractor.
f. Pennsylvania Prevailing Wage Rates (3.78); Minimum wage rates as set forth by the PA Prevailing Wage Act. (See Article 7).
g. Compliance to the Buy American (3.79).
h. Compliance to the PA Steel Products Procurement Act/Trade Practices Act (3.80).

5. Contract Agreement [Article Four]

a. Contract Milestones:

Construction Milestones	Contract Time (Calendar Days)	Notes
Substantial Completion of Contract	997 days	From Notice to Proceed
Final Completion of Contract	1057 days	From Notice to Proceed

b. Liquidated Damages:

Construction Milestone	Liquidated Damages
Substantial Completion of Contract	$5,000/calendar day
Final Completion of Contract	$1,000/calendar day

6. Project Specifications [Article 6]

a. Summary of Work 011100 – presentation by HDR Project Manager, Jim Beninati
b. Additional Details to Consider:
   1) Demolition: Buildings 130 and 140 and associated pavement; relocation of existing utilities ahead of Tank E-4 construction.
   2) Existing tanks: retrofit internal process equipment in all nine sedimentation tanks.
   3) Nine existing tanks are arranged in east and west groups, with four bays per tank.
   4) Odor control improvements are included in Area 720.
   5) Most civil construction is on the east side; west-side work includes a chemical pipe trench and heat tracing.
   6) Install one additional sludge pump in existing Pump Station E2; no new pump station is required.
   7) Utility relocations are critical early work and must precede Tank E-4 foundation construction.
   8) Construct a pipe trench between Area 720 and Building 865 for sodium hypochlorite transfer. Coordinate crossings of existing utilities and the electrical duct bank.
   9) The electrical duct-bank underpass is to be constructed under the separate CSO project; Contract 1820 will connect to either side. Details to follow by addendum.
   10) New Tank E-4 and channel extensions have an approximate overall footprint of 320 feet by 70 feet, with four bays and an auger-cast pile-supported foundation. Pile diameter discrepancy is pending formal clarification.
   11) Extend the influent, effluent, and CSO bypass channels, including associated gates and valves.
   12) Extend mechanism drive Building 717 and scum Building 718 adjacent to new Tank E-4.
   13) Building 719 will not be extended; modify its end wall and fresh-air ducting.

14) Contract G furnishes and installs new E-4 process equipment. Existing tanks are upgraded one at a time, with only one tank out of service at any given time. See mechanical drawing M-10 for Owner-furnished versus Contractor-furnished equipment.
15) Early tank shutdowns and field measurements are required to verify dimensions prior to ordering custom equipment, particularly weirs and related components.
16) Existing tank scum troughs have been replaced under another contract; E-4 receives new scum troughs and actuators. Existing tank influent gate actuators are excluded.
17) Area 720: replace three odor control fans, process-area chemical tanks and pumps, recirculation piping, and outdoor scrubber demister pads; reuse existing electrical cabling where practical.
18) Install new sludge pump at Pump Station E2 and associated VFD in Building 716; pump must match existing standardized equipment.
19) Relocate electrical manhole EMH-109 and associated electrical infrastructure as shown in the contract drawings; exact cable relocation scope remains subject to addendum.
20) Contract 1820E includes relocated electrical services, parking lot lighting, electrical connections, gas detection and ventilation warning panels. Reuse existing cable and conduits where practicable.
21) Contract 1820H includes fresh-air duct extensions and procurement of the specified makeup air unit for turnover to ALCOSAN for installation; odor vapor ductwork is part of Contract G.

SITE TOUR REQUESTS

a. To reserve an appointment, send requests to Stephanie Downs at stephanie.downs@mbakerintl.com. Access to tank interiors and Buildings 130/140 will be limited and coordinated in advance. A site walk followed the meeting.

QUESTIONS

a. All questions must be submitted in writing to the Construction Manager, Stephanie Downs, at stephanie.downs@mbakerintl.com.
b. Provide name and affiliation prior to asking question (s).
c. Questions asked during Pre-Bid Meeting:
    1) Q1: May an Excel spreadsheet be used to track MBE/WBE participation? A1: Yes.
    2) Q2: If no bid envelope was provided, may bidders use their own? A2: Yes; a standard manila envelope is acceptable.
    3) Q3: Specification Section 030130, unit prices, appear inconsistent with the bid price schedule. A3: Submit in writing; ALCOSAN will address by addendum.
    4) Q4: Does relocation of electrical manhole EMH-109 include associated feeders, cabling and retermination? A4: Tentatively yes; exact scope requires a written question and formal addendum.
    5) Q5: The bid form identifies 12-inch auger-cast piles, while the presentation identified 18-inch piles. Which applies? A5: Submit in writing; ALCOSAN will clarify by addendum.
    6) Q6: Can bidders view the existing sludge pumps during the site walk? A6: Yes; the pumps were included in the planned tour.

♦ ♦ ♦ ♦ ♦ END OF MINUTES ♦ ♦ ♦ ♦ ♦

1820 Pre-Bid Sign-In Sheet

Name	Company	Phone	Email
Tawanda Stamps	Alcosan	412 732-8020	Tawanda.Stamps@alcosan.org
Bob Foltz	Kirby	724-316-5534	bfoltz@kirbyelectric.com
Jesse Shaw	Mele	412 315-9133	Jshaw@meleinc.com
Randy Baldwin	Mele	—	—
Jeff Marcink	WCI	724-630-5573	jmarcink@waynecousa.com
Fred Vogt	WCI		fvogt@waynecousa.com
Donna Chappel	AIG	412-913-0318	DCHAPPEL@AIGCONTROLS.COM
Mike Hogg	Wellington	412-292-0332	Mhogg@wellingtonpower.com
Dave DeDicchis	Mascaro	412-290-5646	ddedicchis@mascaroconstruction.com
Brian Hart	JCI	724-831-4620	brian.hart@jci.com
Jackie Kresan	Alcosan	9049	
Cody Eagon	ALCOSAN	6260	

Attachment 2: Article 1-3G

8.2 Unit Price Work: Bidder further proposes to accept as full payment for the Unit Price Work proposed herein the amounts computed under the provisions of the Bidding Documents and based on the following unit price amounts, it being expressly understood that the unit prices are independent of the exact quantities involved. Bidder agrees that the unit prices represent a true measure of the labor, materials, and services required to furnish and install the item, including all allowances for overhead and profit for each type and unit of Work called for in these Bidding Documents.

Item	Description	Quantity	Unit	Unit Price	Extended Total Amount
1	18 INCH DIAMETER AUGER-CAST PILES	18,375	VLF		
2	AUGER-CAST PILE TESTING-COMPRESSION TEST PILES	2	EA		
3	DRILLING THROUGH UNKNOWN OBSTRUCTIONS FOR PILE INSTALLATION	50	LF		
4	CONTINGENT UNCLASSIFIED EXCAVATION	2,380	CY		
5	EXCAVATION OF UNKNOWN OBSTRUCTIONS	500	CY		
6	BACKFILL FOR REMOVAL OF UNKNOWN OBSTRUCTIONS	500	CY		
7	REMOVAL OF UNKNOWN CONCRETE AND MASONRY STRUCTURES	100	CY		
8	EXCAVATION OF "HARD SLAG" REMOVAL	100	CY		
9	CONTINGENT PLACEMENT OF BACKFILL MATERIAL	2,380	CY		
10	CRACK INJECTION REPAIR-HORIZONTAL AND VERTICAL SURFACE (METHODS 1-4)	100	LF		
11	EXPANSION JOINT REPAIR IN WALLS (TYPES A,B,C)	100	LF		
12	ALLOWANCE FOR OTHER CONTAMINATED WASTE	$500,000	USD	*N/A*	
13	ALLOWANCE FOR NON-COMPLIANT GROUNDWATER DISPOSAL	$500,000	USD	*N/A*	
14	ALLOWANCE FOR HANDLING AND DISPOSAL OF LEAD-BASED COATINGS, AND ASBESTOS-CONTAINING MATERIALS (GREATER THAN 1% ASBESTOS)	$20,000	USD	*N/A*	
TOTAL OF EXTENDED ITEM AMOUNTS FOR UNIT PRICE WORK LISTED ABOVE (Sum of Extended Total Amount for 01 thru 14):					

Attachment 3: Specification 01 22 00

SECTION 01 22 00
MEASUREMENT AND PAYMENT (LUMP SUM AND UNIT PRICES)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Defines how work items are measured and paid for on Lump Sum and Unit Price Contracts. These items include unit price, lump sum price, and allowance payment items.
   2. In the case of conflict between this Section and the measurement methods specified in the individual Technical Specification Sections, the measurement methods in Technical Specification Sections shall govern.
   3. Receive payment for work after it is installed. Payment for material on hand can only be paid for if allowed by the Agreement, the General and/or Special Conditions.
   4. Partial payment may be requested for items partially installed when agreed to by the Owner.

B. Related Specification Sections include but are not necessarily limited to:
   1. Volume One – General Contract Conditions
   2. Division 01 – General Requirements.
   3. Applications for Payment requirements are included in this specification section.

C. Provisions of this section apply to the work of each Prime Contractor.

1.2 UNIT PRICE ITEMS

A. Quantity and measurement estimates stated in the Bid Form are estimates for bidding purposes only. Actual payments shall be based on actual quantities installed, in-place, as measured and/or verified by the Construction Manager.

B. Quality Assurance:
   1. Acceptance or Rejection:
      a. The Owner reserves the right to accept Unit Prices or reject those of a bidder where the cost proposal is inconsistent with a reasonable evaluation of the work involved and project conditions.
   2. The Owner may consider the Bids of other bidders in evaluating the Unit Prices.
      a. The sole right to accept or reject Unit Prices is vested in the Owner and that decision shall be final.

C. Unless otherwise stated in the Contract Documents, the bid unit prices shall be in effect throughout the contract duration. When the variance between the estimated quantities and the actual installed quantities is more than 25%, the Contractor or the Owner may negotiate a change to the Unit Price. That change will be made in accordance with the Change Order process as defined in the Contract Documents.

D. Except as defined above, make no claim, nor receive any compensation, for anticipated profits, loss of profit, damages, or any extra payment due to any difference between the amounts of work actually completed, or materials or equipment furnished, and the estimated quantities.

E. If the added quantities will result in payments that exceed the Contract Quantity, a Change Order will need to be executed before payment can be made for the added quantities.

F. Assist Construction Manager by providing necessary equipment, workers, and survey personnel as required to measure quantities.

G. Unless stated in the Contract Documents, measured quantities shall be rounded to the nearest whole integer.

H. Measurement:
   1. Measurement for progress payment shall be made by, or approved by, the Construction Manager based on the actual quantities installed. The actual quantities installed can be adjusted for corrections to previous calculations, incomplete elements or components if agreed to in advance and in writing by the Construction Manager.
   2. Unless otherwise provided for in the Contract Documents, unit price items are all inclusive of all related work, direct and indirect costs, to provide a complete and functional item.
   3. The final measurement shall be based on actual installed quantities, jointly measured, and agreed to by the Contractor and the Construction Manager. Quantities can be adjusted (increased or decreased) based on a final calculation of quantities by the Construction Manager.

I. Payment:
   1. Progress payments shall be in accordance with the Contract Documents based on estimated quantities installed paid at the bid unit price.
   2. The final payment shall be based on actual quantities, fully installed, tested and placed into service, paid at the bid unit price.

1.3 LUMP SUM ITEMS – GENERAL

A. Payment for the work completed under this Contract will be made at the lump sum bid. The lump sum shall include the furnishing of all labor, tools, equipment and materials and the performance of all work required to complete the Contract as indicated and specified in accordance with all requirements of the Contract Documents and to the satisfaction of the Construction Manager. Should there be discrepancies among Contract Documents, it shall be assumed that the more costly and higher quality design, as solely judged by the Construction Manager, was the basis of the bid; no additional payment shall be required from the Owner.

B. Before the first Application for Payment, the Contractor shall submit to the Construction Manager a Schedule of Values allocated to the various portions of the Work, as set forth in this section and supported by such data to substantiate its accuracy as the Owner may require. This Schedule of Values, when approved by the Owner shall be used as the basis for the Contractor's Applications for Payment and only for this purpose.

C. No progress payments will be made by the Owner until the Progress Schedule, including the Schedule of Values, has been submitted to and approved by the Owner.

D. The total bid amount shall include all lump sum and unit price bid items for all Prime Contracts.

E. The Contractor agrees that it will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated quantities.

1.4 ALLOWANCES

A. Allowances if indicated in the Bid Schedule are defined in the Contract Documents. No work may be performed under an allowance item without prior written approval of the Owner.

B. Allowance is for exclusive use of Owner for changes as a result of changed conditions, design refinements, and unanticipated design issues. Not for use by Contractor as Contractor's construction contingency.

C. Owner approval of adjustment required prior to authorization by the Construction Manager of progress payments from Contingency Allowance. Adjustments will include either:
   1. Contractor's measured time and materials amount.
   2. Contractor's related costs, and reasonable overhead and profit as stipulated in Contract Documents and Article 3 when Work is performed on the cost of the work basis.

D. Allowances shall be executed through an approved Work Order in accordance with Article 3 of the General Conditions.

E. Any unused balance of the allowances shall revert to the Owner upon completion of the project. Prior to final payment, the original amount provided for allowances shall be adjusted to actual costs by deductive/final adjusting Change Order, adjusting the contract price, accordingly.

F. Make no claim, nor receive any compensation, for anticipated profits, loss of profit, damages, or any extra payment due to any unexpended portion of the allowances.

G. The Contractor is to include time for allowance work in the construction schedule. No adjustment of Contract Time shall be allowed for any work performed under allowance items.

H. The measurable and allowable costs for work performed under an allowance item(s) shall be limited to the actual costs associated with that allowance item unless otherwise stated in the specific measurement and payment provisions under allowance items.

1.5 SCHEDULE OF VALUES

A. The Schedule of Values is a statement furnished by the Contractor to the Construction Manager. It shall be submitted within seven calendar days prior to the Preconstruction Conference and shall reflect the portions of the contract price allocated to various portions of the Work.

B. Once accepted by the Construction Manager, the Schedule of Values shall be the basis for reviewing Payment Applications by the Contractor in accordance with the Schedule of Payments in the Contract Provisions.

C. This Schedule will contain all of the major components making up the work, shall be coordinated with the Schedule of Payments, and shall contain, as a minimum, the following information:
   1. Organization of Work Items by Specification; Section; Reference.
   2. For all major Work Items/Components
      a. Listing of Labor Value
      b. Listing of Material/Equipment/Deliverable Value
      c. Reflect all activities shown on the Project Schedule.
   3. Show all Subtotals and Totals as directed by the Construction Manager to support the Payment Application Form.

D. The Contractor shall include a line item in the Schedule of Values for the submission of approved Operation & Maintenance Manuals in the amount of 0.025% of the Contract Value or $2,500, whichever is greater.

E. The Contractor shall include a line item in the Schedule of Values for the submission of approved as-built drawings with an associated value of 0.05% of the Contract Value or $5,000, whichever is greater.

1.6 APPLICATION FOR PAYMENT

A. General:
   1. Progress payments applications will be made monthly on the date established at the preconstruction meeting.

B. Pay Applications shall be submitted in Trimble Unity Construct®. Pencil copy shall be submitted to the CM for review prior to submission of progress Pay Application. Pencil copy shall be submitted on form provided by the CM.

C. Payment for all work shown or specified in the Contract Documents is included in the Contract Price. No measurement or payment will be made for individual items.

D. General:
   1. The lump sum bid price for this work will consist of work identified in the Specifications and on the Contract Drawings associated with installation in the Specifications and on the Contract Drawings associated with installation of the new Primary Sedimentation Tank E-4 facilities**.**
   2. Major items of work are provided in Section 01 11 00, Summary of Work, paragraph 1.2.B.

3. Measurement and payment for this item will be a physical percent complete as agreed upon by the Construction Manager and the Contractor per the Contractor's Schedule of Values.

E. Electrical:
   1. The lump sum bid price for this work will consist of work identified in the specifications and on the Contract Drawings associated with installation of the new Primary Sedimentation Tank E-4 facilities.
   2. Major items of work are provided in Section 01 11 00, Summary of Work, paragraph 1.2.C
   3. Measurement and payment for this item will be a physical percent complete as agreed upon by the Construction Manager and the Contractor per the Contractor's Schedule of Values.

F. HVAC:
   1. The lump sum bid price for this work will consist of work identified in the specifications and on the Contract Drawings associated with installation of the new Primary Sedimentation Tank E-4 facilities.
   2. Major items of work are provided in Section 01 11 00, Summary of Work, paragraph 1.2.D.
   3. Measurement and payment for this item will be a physical percent complete as agreed upon by the Construction Manager and the Contractor per the Contractor's Schedule of Values.

1.7 NON-PAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:
   1. Loading, hauling, and disposing of rejected material.
   2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
   3. Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provisions of Contract Documents.
   4. Material not unloaded from transporting vehicle.
   5. Defective work not accepted by Owner.
   6. Material remaining on hand after completion of work.

1.8 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

A. Partial Payment:
   1. No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings or preliminary operation and maintenance manuals are acceptable to Construction Manager.

B. Final Payment:
   1. Final payment shall not be made for material and equipment incorporated in work unless all deliverables required in Sections 01 33 04, Operation and Maintenance Manuals; 01 75 00, Facility Startup, through 01 78 39, Contract Closeout and Execution Documents; and Article 3 are submitted and approved.

1.9 PARTIAL PAYMENT FOR UNDELIVERED, PROJECT-SPECIFIC MANUFACTURED OR FABRICATED EQUIPMENT

A. Notwithstanding the above provisions, partial payments for undelivered (not yet delivered to site or not stored in the vicinity of site) products specifically manufactured for this Project, excluding off the shelf or catalog items, may be made for products listed below when all following conditions exist:
   1. Partial payment request is supported by written acknowledgment from Supplier(s) that invoice requirements have been met.
   2. Equipment is adequately insured, maintained, stored at a location acceptable to the Owner, protected by appropriate security measures, and verification of same is provided to the Owner.
   3. Each equipment item is clearly marked and segregated from other items to permit inventory and accountability.

4. Authorization has been provided for access to storage site for Construction Manager and Owner. All costs related to inspections shall be at the Contractor's expense.
5. Equipment meets applicable specifications of these Contract Documents.

B. Payment of 15% of manufacturer's quoted price for undelivered, Project specific manufactured equipment will be made following shop drawing approval. Thereafter, monthly payments will be made based on progress of fabrication as determined by Construction Manager, but in no case will total of payments prior to delivery exceed 75% of manufacturer's quoted price. This amount shall be identified in the Schedule of Values.

C. Failure of Contractor to continue compliance with above requirements shall give cause for Owner to withhold payments made for such equipment from future partial payments.

D. Failure of Contractor to supply Operation and Maintenance Manuals will cause the Owner to withhold payment in the amount of 0.025% or $2,500, whichever is greater. Failure of Contractor to supply as-built drawings will cause the Owner to withhold payment in the amount of 0.05% or $5,000, whichever is greater. This amount shall be identified in the Schedule of Values.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - PART 3 - EXECUTION

3.1 GENERAL CONSTRUCTION CONTRACT – PAY ITEMS

A. Lump Sum:
1. This pay item will not be measured for payment.
2. Payment for this pay item will be made at the lump sum bid price, which price and payment will include all labor, materials, equipment, tools, testing, fees, and incidentals needed to complete the work specified, except as otherwise itemized in the Schedule of Values.
3. All mechanical, civil, and structural improvements performed as part of this project is considered part of this lump sum bid price.

B. Pay Item 1 – 18-Inch Diameter Auger-Cast Piles
1. This pay item will be measured in VLF.
2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, equipment, and accessories required for complete 18-inch diameter auger-cast pile installation and pile load testing as indicated in the Contract Documents.
3. Adjustment to bid price for pile length to be made in accordance with unit prices in the Bid Proposal.
   a. No price adjustment will be made for individual piles but will be made on the total lineal footage of piling installed.
4. Payment will be made for piles that are discontinued due to hitting obstructions and for additional piles and foundation construction required at locations of discontinued piles.
5. No payment will be made for the following:
   a. Damaged or rejected piles or for the installation of piles and additional foundation construction resulting from the damaged or rejected piles
   b. Additional pile and concrete construction required when a test pile fails at a location where the test pile is required for support of the structure.
   c. Piles installed beyond specified tolerance limits and piles and concrete foundation construction required due to piles installed beyond the tolerance limits.
   d. Pile lengths extending above cut-off elevation.

C. Pay Item 2 – Auger-Cast Pile Testing - Test Piles
1. This pay item will be measured per EA.

2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and accessories required for pile load testing and non-destructive integrity testing at piles as indicated in the Contract Documents.
    a. Payment will include costs associated with load testing and integrity testing per paragraph 3.5 in Section **31 63 16**, Auger Cast-in-Place Piling .
    b. No payment will be made for the following: Pile load test where either the testing system or anchor pile fails before test is complete.
    c. Additional pile and concrete construction required when a test pile fails at a location where the test pile is required for support of the structure.

D. Pay Item 3 – Drilling Through Unknown Obstructions For Pile Installation
1. This pay item will be measured per LF.
2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, equipment, and accessories required for drilling through unknown obstructions as needed to complete the installation of piles as indicated in the Contract Documents.
    a. Payment for this item will be made for drilling through unknown obstructions that cannot be drilled with conventional equipment etc.

E. Pay Item 4 – Contingent Unclassified Excavation
1. This pay item will be measured per CY.
2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and equipment required for excavation, handling, and disposal of excavated material outside the scope of work included in the Contract Documents as requested by the Owner.
3. Payment will be made for excavations completed with written authorization by the Owner.
4. No payment will be made for the following:
    a. Excavations made by the Contractor without prior written authorization from the Owner.

F. Pay Item 5 – Excavation Of Unknown Obstructions
1. This pay item will be measured per CY.
2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, equipment, and accessories for excavation, handling, and disposal of natural or manmade obstructions found during installation of structures, installation of river wall rock anchors, or sheet piling.

G. Pay Item 6 – Backfill For Removal of Unknown Obstructions
1. This pay item will be measured per CY.
2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, equipment, and accessories for placement and compaction of backfill material in place of excavated obstruction completed as part of Pay Item 5 - Excavation of Unknown Obstructions.

H. Pay Item 7 – Removal of Unknown Concrete and Masonry Structures
1. This pay item will be measured per CY.
2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and equipment required for removal of unknown concrete and masonry structures found during excavation nearby existing structures.

I. Pay Item 8 – Excavation of “Hard Slag” Removal
1. This pay item will be measured per CY.
2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and equipment required for removal of hard slag found during excavation throughout the project area that cannot be removed utilizing conventional excavation equipment and methods.
3. No payment will be made for the following:

a. Removal of hard slag material utilizing conventional excavation equipment.

J. Pay Item 9 – Contingent Placement of Backfill Material
   1. This pay item will be measured per CY.
   2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and equipment required for installation of backfill material due to required unanticipated excavation.
   3. No payment will be made for the following:
      a. Placement of backfill materials at the Contractors convenience, not required by unanticipated excavation.

K. Pay Item 10 - Concrete Crack Repair and Injection:
   1. Measurement will be the length, in feet, of existing concrete crack repaired, measured at the concrete surface.
   2. Sub-Items: This Work of this item is divided into the following, separate sub-items, with separate quantity for each sub-item as indicated in the Bid Form and Agreement:
      a. Method 1: Repair of passive cracks and cracks requiring structural repair in walls
      b. Method 2: Repair of passive cracks and cracks requiring structural repair in slabs.
      c. Method 3: Repair of active, non-structural cracks, cracks that exhibit leakage, or as directed by Engineer.
      d. Method 4: Repair of active cracks requiring structural repair.
   3. Item Includes (all in accordance with the Contract Documents):
      a. As indicated in Section 03 64 23 - Crack Repair and Injection Concrete.
   4. Not included in this bid/pay item:
      a. As indicated in Section 03 64 23 - Crack Repair and Injection.
      b. Repair of cracks in new concrete Work provided by Contractor is not eligible for payment under the Unit Price Work of this item. Such repairs shall be performed without additional cost to Owner.
   5. Payment: Unit price per foot for the crack repair Work of the type indicated, under this item will be full compensation for Work for the associated type of crack repair Work, performed under the associated sub-item, complete in accordance with the Contract Documents, and not specifically included under other bid/pay items or contracts.

L. Pay Item 11 – Expansion Joint Repair
   1. Measurement will be in length, in feet, of existing concrete expansion joints repaired, measured at the concrete surface.
   2. Sub-Items: This work of this item is divided into the following, separate sub-items, with separate quantity for each sub-item as indicated in the Bid Form and Agreement:
      a. Method 1: Expansion Joint Repair – Type A.
      b. Method 2: Expansion Joint Repair – Type B.
      c. Method 3: Expansion Joint repair – Type C.
   3. Payment: Unit price per foot for the expansion joint repair Work of the type indicated, under this item will be full compensation for Work for the associated type of expansion joint repair Work, performed under the associated sub-item, complete in accordance with the Contract Documents, and not specifically included under other bid/pay items or contracts.

M. Pay Item 12 – Allowance For Other Contaminated Waste
   1. Allowance for potential force account work identified in Section 31 23 00, Management, Handling, and Disposal of Excavated Soil and Other Excavated Material and Other Excavated Material, paragraphs 1.5.C.1.b, 3.4.B.3, 3.5.C, and 3.6 A.
   2. Payment for this pay item will be made as an allowance in USD, per Article 1.4 above which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for proper sampling, testing, handling, removal, and disposal of other contaminated waste, that is discovered due to work outside the Lump Sum Work Items. Other contaminated waste is defined in Section **31 23 00**, Management, Handling, and Disposal of Excavated Soil.

3. Payment will be made for time and materials required to handle, remove, and properly dispose of other contaminated wastes due to additional work approved by the Owner in writing.
4. No payment will be made for the following:
    a. Any handling, removal, or disposal of other contaminated waste due to work that has not been approved in writing by Owner, prior to work commencement.

N. Pay Item 13 – Allowance For Non-Compliant Groundwater Disposal
1. Allowance for potential force account work, as identified in Section 31 21 00**,** Earthwork, Excavation, Trenching and Backfilling, paragraph 1.6L**;** and 31 23 00**,** Management, Handling, and Disposal of Excavated Soil and Other Excavated Material, paragraph 1.5.D.
2. Payment for this pay item will be made as an allowance in USD per Article 1.4 above, which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for proper sampling, testing, handling, removal, and disposal of non-compliant groundwater encountered during excavation activities.
3. Payment will be made for time and materials required to handle, remove, and properly dispose of non-compliant groundwater.
4. No payment will be made for the following:
    a. Any handling, removal, or disposal of compliant groundwater, or non-compliant groundwater due to work not included in the Lump Sum Bid items or that has not been approved in writing by Owner, prior to work commencement.

O. Pay Item 14 – Allowance For Handling and Disposal of Lead-Based Coatings and Asbestos-Containing Materials (ACM) (Greater Than 1 Percent Asbestos)
1. Payment for this pay item will be made as an allowance in USD, per Article 1.4 above, which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for proper testing, handling, removal, and disposal of hazardous materials encountered during project work. Hazardous materials are required to be removed if work requires the demolition, disturbance, relocation, or modification of equipment or structures.
2. Hazardous materials include:
    a. Lead-based paint on structures and/or equipment.
    b. ACM (defined as containing greater than 1 percent asbestos) including, but not limited to, electrical wiring/materials, pipe materials, masonry materials, and insulation materials.
3. Contractor shall submit for identification testing of any material suspected or with the potential to be hazardous as directed by Owner.
4. Payment will be made by tracking of for time and materials required to test, handle, remove, and properly dispose of hazardous materials.
5. No payment will be made for the following:
    a. Any handling, removal, or disposal of hazardous materials due to work not included in the Lump Sum Bid items or that has not been approved in writing by Owner, prior to work commencement.

3.2 ELECTRICAL CONSTRUCTION CONTRACT – PAY ITEMS

A. Lump Sum:
1. This pay item will not be measured for payment.
2. Payment for this pay item will be made at the lump sum bid price, which price and payment will include all labor, materials, equipment, tools, testing, fees, and incidentals needed to complete the work specified, except as otherwise itemized in the Schedule of Values.
3. All electrical improvements performed as part of this project is considered part of this lump sum bid price.

3.3 HVAC CONSTRUCTION CONTRACT – PAY ITEMS

A. Lump Sum:

1. This pay item will not be measured for payment.
2. Payment for this pay item will be made at the lump sum bid price, which price and payment will include all labor, materials, equipment, tools, testing, fees, and incidentals needed to complete the work specified, except as otherwise itemized in the Schedule of Values.
3. All HVAC improvements performed as part of this project is considered part of this lump sum bid price.

3.4 INITIAL APPLICATION FOR PAYMENT

A. Administrative actions and submittals that must precede the first Application for Payment include the following:
   1. Contractor's Mobilization Schedule (first 90 days).
   2. Baseline Construction Schedules information.
   3. Contractor's Schedule of Values.
   4. Contractor's Submittal Schedule.
   5. List of Subcontractors (if required).
   6. List of Principal Suppliers and Fabricators (if required).
   7. List of Contractor's staff assignments (if required).
   8. Copies of Building Permits (if applicable).
   9. Copies of licenses and authorizations from governing authorities for performance of the work (if applicable).
   10. Certificates of Insurance.
   11. Required Bonds.
   12. Safety Program reviewed by the ALCOSAN and Construction Manager and recorded as reviewed without comments.
   13. WBE/MBE submittal accepted.
   14. Preconstruction photograph and video session completed and three copies provided to the Construction Manager.

3.5 MONTHLY APPLICATION FOR PAYMENT

A. Administrative actions and submittals that must precede each monthly Application for Payment include the following:
   1. Contractor's Project Schedule with brief summary narrative (updated).
   2. Contractor's submittal schedule (updated).
   3. Certified payrolls.
   4. Certificates of Insurance (updated).
   5. Required backup/approved shop drawings for materials stored on site.
   6. Maintenance of on-site as-built drawings.
   7. Resolution of all Site Safety Notices.
   8. Disposition of all Non-Conformance Notices by the Construction Manager.
   9. WBE/MBE compliance update.
   10. Weekly safety meeting minutes.

3.6 FINAL APPLICATION FOR PAYMENT

A. Administrative actions and submittals that must precede the Final Application for Payment are outlined in Article 3, General Contract Conditions.

END OF SECTION

Attachment 4: Specification 03 01 30

SECTION 03 01 30

REPAIR AND REHABILITATION OF EXISTING CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Preparation and assessment of existing concrete for repair and rehabilitation:
      a. Concrete removal for repairs.
      b. Preparation of exposed reinforcing steel.
      c. Preparation for joint sealant installation.
   2. Repair of damaged (and deteriorated) concrete.
      a. Application of repair mortar.
      b. Repair of exposed items embedded in concrete.
   3. Expansion joint repair.

B. Scope:
   1. Contractor shall provide all materials, equipment, labor, tools, services, and incidentals necessary to repair and rehabilitate existing concrete, whether damaged or deteriorated, at locations shown on the Drawings or at locations indicated by Engineer, in accordance with the Contract Documents.
   2. Re-sealing concrete joints as shown on the Drawings, and at other locations directed by Engineer, and indicated in this Section.
      a. Included in the unit price(s) for joint sealant Work are repairs of existing concrete adjacent to the associated joint sealant Work, in accordance with this Section.
   3. Surface repairs of new concrete Work are addressed in Section 03 35 00 - Concrete Finishing and Repair of Surface Defects.
   4. Repair of cracks in concrete existing prior to the Contract is addressed in Section 03 64 23 - Crack Repair and Injection.

C. Related Requirements: Include but are not necessarily limited to:
   1. Section 03 15 19 - Anchorage to Concrete.
   2. Section 03 21 00 - Reinforcement.
   3. Section 03 35 00 - Concrete Finishing and Repair of Surface Defects.
   4. Section 03 64 23 - Crack Repair and Injection.
   5. Section 07 92 00 - Joint Sealants.

1.2 PRICE AND PAYMENT PROCEDURES

A. Repairs not shown on the Contract Drawings and directed by the owner shall be paid by change order.

B. Unit Prices:
   1. The Work of this Section is United Price Work unless otherwise shown or indicated. Work covered by this Section but not eligible for payment under Unit Price Work bid/pay items shall be performed at Contractor's expense.
   2. Bid/pay item classifications of Unit Price Work addressed in this Section are indicated in the Bid Form, the Agreement (or an exhibit thereto), and Section 01 22 00 - Measurement and Payment.
   3. Unit Price Work of this Section is classified as follows:
      a. Expansion Joint Repair - Type A: Replacement of existing expansion joint material including removing existing backer rod, joint filler, and sealant and providing new materials and repair, in accordance with this Section. Expansion joint repair not designated in the Contract Documents as other types is Type A unless directed otherwise by Engineer.

b. Expansion Joint Repair - Type B: Provide where shown or indicated on the Drawings or where directed by Engineer. Includes sealing existing expansion joints by providing new epoxy resin adhesive sealant system over existing expansion joints.
c. Expansion Joint Repair - Type C: Provide where shown or indicated on the Drawings or where directed by Engineer. Includes sealing existing expansion joints by providing new polyurethane joint sealing system over existing expansion joints.

C. Measurement:
1. Criteria for measurement for payment of this Section's Unit Price Work are in the General Conditions (as may be modified by the Supplementary Conditions), Section 01 22 00 - Measurement and Payment, and this Section.
2. Quantities of this Section's Unit Price Work:
a. Unit Price Work of this Section shall be measured for payment prior to commencement of the associated Work in each work area.
b. Work not measured in advance for payment will not be eligible for payment by Owner.
c. Engineer will observe the associated concrete repair and rehabilitation Work performed. Such Work shall be in accordance with the Contract Documents for to such Work to be eligible for payment by Owner, even when such Work was measured (for payment) in advance.
3. Repair of new concrete Work provided by Contractor is not eligible for payment under the Unit Price Work bid/pay items covered by this Section. Such repairs are included in the Work of the associated bid/pay item under which the subject new concrete Work was provided.

1.3 REFERENCES

A. Terminology:
1. This provision indicates terminology used in this Section and in other Contract Documents that coordinate with this Section. Such terminology may or may not be indicated using initial capital letters and, when used in relation to the Work of this Section, have the meanings indicated below.
2. "Existing concrete damage" means damage to existing concrete surfaces deeper than 1/8 inches, such as:
a. Concrete corrosion.
b. Corroded items embedded within concrete or through the concrete surface.
c. Spalls.
d. Cracking at depth and arrangement that, in Engineer's sole opinion, cannot be repaired in accordance with Section 03 64 23 - Crack Repair and Injection.
3. "Installer" means the entity installing or applying repair materials at the Site. The terms "installer" and "applicator" have the same meaning. Installer or applicator may be Contractor or Subcontractor.
4. "MPII" means, "manufacturer's printed installation instructions".
5. "Rehabilitation" means repairing and restoring concrete to structurally-sound, durable condition suitable for the structure's intended purpose as determined by Engineer, including repair of existing concrete damage in accordance with this Section and other applicable provisions of the Contract Documents.
6. "Water-bearing structure" means concrete structure with a surface that is normally, or may be, in contact with water or process fluids or slurries during typical operation of the completed Project, including, but not limited to: tanks, channels, wet wells, distribution chambers, dams, and the like. Also, where specifically indicated on the Drawings, "water-bearing structures" includes basements and structures extending below the ordinary, wet-season groundwater surface.
7. Other terminology used in this Section is consistent with terminology of ACI CT.

B. Reference Standards:
1. American Concrete Institute (ACI):
a. CT, Concrete Terminology.

b. 117, Specification for Tolerances for Concrete Construction and Materials.
c. 308, Standard Practice for Curing Concrete.

2. ASTM International (ASTM):
   a. C150, Standard Specification for Portland Cement.
   b. C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
   c. C881, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
   d. C1315, Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
   e. D1682, Breaking Load and Elongation of Textile Fabric.
   f. D1876, Standard Test Method for Peel Resistance of Adhesives (T-Peel Test).
   g. D4060, Abrasion Resistance of Organic Coatings by the Taber Abraser.
   h. D4258, Standard Practice for Surface Cleaning Concrete for Coating.
   i. D4259, Standard Practice for Abrading Concrete.
   j. D4263, Indicating Moisture in Concrete by the Plastic Sheet Method.
   k. D7234, Standard Test Method for Pull-off Adhesion Strength of Coatings on Concrete Using Portable Pull-off Adhesion Tests.
3. International Concrete Repair Institute (ICRI).
   a. 310.1R, Guide for Surface Preparation.
   b. 310.1R, Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Steel Corrosion.
4. Society for Protective Coatings/NACE International (SSPC/NACE):
   a. SP 13/NACE No. 6, Surface Preparation of Concrete.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Installer:
      a. Installer of materials for rehabilitation of existing concrete shall possess not less than five years of relevant experience performing concrete rehabilitation of similar type, scope, and complexity to that required for this Project.
      b. Certification or Approval by Materials Manufacturer:
         1) Installer (as either business entity or individual) of materials associated with rehabilitation of existing concrete shall be certified or expressly approved in writing, by manufacturer of materials to be provided.
         2) As an option, installer may be certified or approved, in writing, at the Site during initial Work of this Section, in accordance with this Section's Paragraph 3.4.D.
      c. Submit documentation of qualifications and experience in sufficient detail to demonstrate to Engineer's satisfaction compliance with requirements of this Section's qualifications requirements.
   2. Structural Concrete Repairer:
      a. This provision is in addition to qualifications requirements applicable to installers of the Work under this Section. This provision applies to business entities physically performing rehabilitation of structural concrete.
      a. Entity performing structural concrete repair Work shall have not less than two years active membership in good standing in International Concrete Repair Institute (ICRI).
      b. Structural concrete repairer shall have not less than five years' current, relevant experience in repairing and rehabilitating concrete structures in facilities of generally similar environmental exposures as the Work of this Section for this Project
      c. Submit documentation of qualifications and experience in sufficient detail to demonstrate to Engineer's satisfaction compliance with requirements of this Section's qualifications requirements.
   3. Joint Sealant System Installer:
      a. This provision is in addition to qualifications requirements applicable to all installers of the Work of this Section. This provision applies to entities performing concrete joint sealant system repair or rehabilitation Work.

b. Entity performing joint sealant system Work shall possess not less than 10 years' relevant experience in waterproofing concrete joints, crack and leak repair, and concrete coating application on projects of similar size, complexity, and environment as the concrete joint sealing Work on this Project.
c. Entity performing concrete joint sealant system Work shall have completed not less than five projects of size, type, and complexity similar to the Work under this Section within the most-recent period indicated in the paragraph immediately above, on structures that have been in service for not less than three years each. Projects shall have utilized the required type of joint sealant system materials indicated for the Work.
d. Entity performing concrete joint sealant system Work shall be certified or approved, in writing, by joint sealant system manufacturer (whose product is used in the Work) to furnish and install the required concrete joint sealant system materials.
e. Submit documentation of qualifications and experience in sufficient detail to demonstrate to Engineer's satisfaction compliance with requirements of this Section's qualifications requirements

1.5 SUBMITTALS

A. Action Submittals: Submit the following:
1. Shop Drawings:
a. Schedule (table) indicating, for each type of concrete rehabilitation Work required by this Section, the material type and product manufacturer proposed for each application.
2. Product Data:
b. Manufacturer's published, technical data for each manufactured material proposed for use in the Work of this Section.
c. Manufacturer's written certification that proposed materials comply with associated reference standards cited in this Section.
3. Samples:
a. Advise Engineer in writing when required mock-ups will be provided and the location proposed for each.
4. Test Procedures:
e. Procedure for pre-repair condition survey required in this Section's Article 3.1, including method for recording results of survey.
f. Written method of performing pull-off testing of repair material and testing equipment information and accessory materials proposed for use in testing.

B. Informational Submittals: Submit the following:
1. Certifications:
a. Laboratory test reports (for previously-tested materials identical to those to be furnished) and material manufacturer's certificates verifying that ingredients comply with the Contract Documents and have a minimum of six months' residual shelf life at the time of shipment to the Site.
b. Certification from Supplier stating that material is suitable for the intended use on this Project.
c. Certification that materials proposed for use are compatible with each other, when such materials will contact each other, and will not interfere with bonding of future floor or wall finishes.
2. Test and Evaluation Reports:
a. Results of pre-rehabilitation condition survey required in this Section's Article 3.1.
3. Manufacturer's Instructions:
a. Manufacturer's instructions for all concrete rehabilitation materials, for handling, storing, and installing materials.
4. Field Quality Control Submittals:
a. In-situ pull-off test results for joint sealant system.
5. Qualifications Statements:
a. Installer: Documentation of qualifications in accordance with this Section's "Quality Assurance" Article.

b. Manufacturer's written approval of installer or certification of training performed at the Site in accordance with Paragraph 3.4.D of this Section.
   1) Affidavit, signed by either materials manufacturer or by installer's business entity, indicating that manufacturer of rehabilitation materials has instructed installer in proper handling and installation of each rehabilitation material to be used in the Work.
c. Entity performing structural concrete repair Work.
d. Entity performing joint sealant system Work.

C. Closeout Submittals: Submit the following:
1. Affidavit of compliance from joint sealant system manufacturer, certifying that sealants were installed at the Site in accordance with manufacturer's written instructions and recommendations.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with material manufacturer's written instructions and recommendations regarding delivery, handling, and storage or materials to be incorporated into the Work.

B. Storage:
1. Store materials in tightly sealed, original containers, off the ground and in dry location with humidity controls.
2. Do not store in direct sunlight.
3. Protect materials from temperature extremes and avoid freezing temperatures.

PART 2 - PRODUCTS

A. Subject to compliance with Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
1. Anti-Corrosion Bonding Agent:
   a. Sika Corporation.
   b. Euclid Chemical Company.
   c. Master Builders Solutions.
   d. Or equal..
2. Epoxy Bonding Adhesive:
   a. Sika Corporation.
   b. Euclid Chemical Company.
   c. Or equal.
3. Repair Mortar:
   a. Master Builders Solutions.
   b. Euclid Chemical Company.
   c. Five Star Products, Inc.
   d. Sika Corporation.
   e. Or equal.

2.2 MATERIALS

A. Bonding Agents:
1. Bonding agents and adhesives shall have pot life that allows proper placement of new material against existing material in accordance with manufacturer's written instructions.
2. For repair of existing concrete damage, when no reinforcing steel is exposed, and where specifically shown or indicated on the Drawings, use epoxy bonding adhesive.
3. For repair of existing concrete damage, when reinforcing steel is exposed, and where specifically shown or indicated on the Drawings, use anti-corrosion bonding agent.
4. For repair of new concrete: Comply with Section 03 35 00 - Concrete Finishing and Repair of Surface Defects.

B. Water:
1. Potable.

2. Clean and free from deleterious substances.
3. Free of oils, acids and organic matter.

C. Reinforcing Steel: In accordance with 03 21 00 - Reinforcement.

D. Epoxy Patch Seal:
1. For use as seal on patches at repair of existing concrete damage and as otherwise shown or specified in the Contract Documents.
   a. Sikadur 32 Hi-Mod LPL by Sika Corporation.
   b. Or equal.

E. Anti-Corrosion Bonding Agent:
1. Three-component, moisture tolerant, cementitious bonding agent manufactured for purpose of bonding fresh concrete to hardened concrete and providing anti-corrosion coating to embedded reinforcing materials.
   a. Sika Armatec 110 EpoCem by Sika Corporation.
   b. Duralprep A.C. by Euclid Chemical Company.
   c. Or equal.

F. Epoxy Bonding Adhesive:
1. For use where bonding new concrete or patch material to existing concrete.
2. Two-component, moisture insensitive adhesive manufactured for purpose of bonding fresh concrete to hardened concrete.
   a. Sikadur 32 Hi-Mod LPL by Sika Corporation.
   b. Euco No. 452 MV by Euclid Chemical Company.
   c. Or equal.

G. Repair Mortar:
1. Pre-packaged cement-based, modified (polymer or latex) product specifically formulated for repair of concrete surface defects, with the following properties:

Physical Property	Value	ASTM Standard
Compressive strength (minimum)		C109
at one day	2000 psi	
at 28 days	6000 psi	
Bond strength (minimum)		C882 (*)
at 28 days	1800 psi	

(*) Modified for use with repair mortars.

2. Trowelable, selection based on horizontal, vertical, or overhead application.
3. Where the least dimension of the placement, in width or thickness, exceeds 1.5 inches, repair mortar shall be extended by addition of aggregate per MPII.
4. Acceptable Products:
   a. Five Star Structural Concrete by Five Star Products, Inc.
   b. SikaRepair SHA, SikaTop 123 Plus, SikaTop 111 Plus by Sika Corporation.
   c. Verticoat by Euclid Chemical Company.
   d. Emaco S88-CI, Emaco S66-CI by BASF Corporation.
   e. Or equal.

H. Epoxy Coating:
1. Use as a coating over concrete repairs and at repaired embedded items in concrete where shown or indicated on the Drawings.
2. Pigmented, two-component, 100% solids, moisture-tolerant epoxy resin specifically formulated to serve as a protective, corrosion-resistant coating to all common structural substrates.
3. Acceptable Products:

a. Sikagard 62 by Sika Corporation.
b. Or equal.

I. Epoxy Resin Adhesive Sealing System:
1. Provide sealing system consisting of the following components:
a. Epoxy Resin Adhesive:
1) Two-component, 100% solids, high-strength, non-sag structural epoxy paste adhesive.
2) Color: Gray.
3) Minimum Pot Life: 30 minutes.
4) Acceptable Products:
a) Sikadur 31 Hi-Mod Gel .
b) Or equal.
b. Hypalon Sheeting:
1) Composed of Hypalon rubber with perforations along bonding edges of sheeting to provide mechanical key.
a) Shall have the ability to be vulcanized with aromatic hydrocarbon solvent to allow its adhesion to an epoxy resin adhesive.
b) Sheet Dimensions: 8 inches wide and 40 mils thick.
c) Provided with a removable center expansion strip.
c. Activating Solvent:
1) Aromatic hydrocarbon with a specific gravity of 0.86.
2) All sealing system components shall be fully compatible with each other.
3) Acceptable Products:
a) Sikadur Combiflex System by Sika Corporation.
b) Or equal.

J. Polyurethane Joint Sealing System:
1. Provide high-solids, two-component liquid, cold-applied, asphalt extended urethane elastomer that cures to durable abrasion-resistant film, forming flexible, water-impermeable barrier.
2. Provide all components from a single manufacturer to ensure compatibility of components with each other, except for hydrophobic polyurethane grout material.
3. Concrete Surface Primer: Acceptable products:
a. CIM 61BG Epoxy Primer, by CIM Industries.
b. Or equal.
4. Tack Coat and Top Coat: Acceptable products:
a. CIM 1061, by CIM Industries.
b. Or equal.
5. Joint/Crack Filler: Acceptable products:
a. CIM 1000TG, by CIM Industries.
b. CIM 1000TG Cartridges, by CIM Industries.
c. Or equal.
6. Cant Strip Material: Acceptable products:
a. CIM 1000 TG Cartridges, by CIM Industries
b. Or equal..
7. Reinforcing Fabric (Scrim): Acceptable Products:
a. CIM Scrim, by CIM Industries.
b. Or equal.
8. Bonding Agent (for re-application of CIM 1061 if recoat window exceeded):
a. Acceptable products:
1) CIM Bonding Agent, by CIM Industries.
2) Or equal.
b. Material:
1) Organo-silane compound dispersed in isopropyl alcohol.
9. Hydrophobic Polyurethane Grout: Acceptable products:

a. SikaFix HH LV, by Sika Corporation.
b. De Neef Hydro Active Flex LV, by GCP Applied Technologies.
c. Or equal.

K. Expansion Joint Sealant and Backer Rod:
1. Provide in accordance with Section 07 92 00 - Joint Sealants.

PART 3 - EXECUTION

3.1 PREPARATION AND ASSESSMENT

A. As indicated in Article 1.1 of this Section, repair of surface defects in new concrete provided under the Contract and repair of cracks in concrete are addressed in other Specification Sections.

B. Condition Survey:
1. Contractor and Owner's Site Representative shall jointly perform condition survey of each existing concrete structure included in the scope of the concrete repair Work before scheduling and performing the associated repair Work.
2. Contracting and payment for specialty inspections and tests by third-parties will be by Owner.
3. Prior to Condition Survey:
a. Submit to Engineer, and obtain Engineer's acceptance, of procedure for performing condition survey. Indicate proposed date(s) of the condition survey and other procedures for inspecting and documenting extent of concrete repair Work to be performed.
b. Prior to the condition survey, power-wash all concrete surfaces within the scope of the concrete repair Work. Power-wash at not less than 4,000 psi using orbital nozzle.
4. Condition survey shall include, but is not necessarily limited to:
a. Visual inspection for:
1) Deficiencies in joints.
2) Cracks.
3) Leakage and efflorescence.
4) Scaling.
5) Spalling
6) Exposed reinforcing.
7) Previous repairs.
b. Extent of chemical attack using phenolphthalein.
c. Delamination survey.
d. Half-cell measurements for corrosion potential of reinforcing.
5. Results of Condition Survey:
a. Submit written results of condition survey to Engineer promptly following the condition survey at the Site.
b. Condition survey results shall clearly indicate the location, nature, size, length, width, and depth of all deficiencies in existing concrete in the area(s) surveyed.
c. Engineer will use results of condition survey to determine extent of repair Work required.
6. Engineer's Direction to Contractor:
a. After consulting with Owner as necessary, Engineer will transmit to Contractor written direction on extent of concrete repairs required.
b. Engineer will issue such direction promptly after Engineer's receipt of acceptable results of condition survey. Allow in the Progress Schedule 14 days for issuance of Engineer's written direction.
c. Where such Work would either exceed Contract quantities of associated Unit Price Work or requires Work not in the Contract's bid/pay items, an appropriate Contract modification will be issued.

C. Concrete Removal:

1. Remove all loose and unsound concrete from areas to be repaired, in accordance with ICRI Guideline 310.1R, as modified by the Contract Documents.
2. Removals:
    a. At areas of damage or deterioration of existing concrete, saw-cut the perimeter of unsound concrete surface areas, to depth of not less than 1/2 inches.
    b. Saw-cuts to be perpendicular to or slightly undercutting existing concrete surface. Concrete removal boundaries shall be straight and aligned parallel to opposite boundary edges resulting in repair areas that are approximately rectangular.
    c. Remove all existing concrete from within the saw-cut repair boundary to of not less than 1/2 inches.
    d. Featheredges are unacceptable.
3. Clean surfaces of repair areas in accordance with ASTM D4258 to remove dust, dirt, grease, and other contaminants prior to abrasive blasting, chipping, grinding or wire brushing.
4. Abrasive-blast surfaces in accordance with ASTM D4259 and SSPC SP 13/NACE No. 6 to completely open defects down to sound concrete and remove laitance.
5. Chip concrete substrate to obtain a surface profile of 1/16 inches to 1/8 inches deep with new fractured aggregate surface. The area to be repaired shall not be less than 1/2 inches in depth.
6. Concrete removal shall extend along any exposed existing reinforcing to locations along the bar that are free of bond inhibiting corrosion and where the bar is well-bonded to surrounding concrete.
7. Rinse surface with clean water and allow surface water to evaporate prior to repairing the surface.

D. Preparing Exposed Steel Reinforcing:
1. Clean and prepare exposed embedded steel reinforcing in accordance with ICRI Guideline 310.1R and the Contract Documents.
2. Where one-half or more of the steel reinforcing diameter is exposed, either by existing conditions or concrete removal, bond between concrete and steel reinforcing is inhibited or lost completely, or corrosion is present, remove concrete to provide not less than 1 inch clearance around the entire perimeter and along the entire exposed length of the steel reinforcing.
3. If existing, exposed steel reinforcing is cut through, cracked, or cross-sectional area is reduced by more than 20%, provide new steel reinforcing bar the same size as existing steel reinforcing. Lap the new bar with existing in accordance with ACI requirements. Coat all new and existing steel reinforcing with anti-corrosion bonding agent, as specified in this Section. Abrasive-blast exposed reinforcing to remove contaminants and corrosion to provide white-metal, bright steel finish.

E. Preparation for Joint Sealant System Installation:
1. Provide adequate surface preparation in area of each joint sealant repair, to not less than 6 IN from face of joint, on each side of joint.
2. Surface preparation shall remove existing concrete laitance, loose material, oil, grease, and shall expose tops of underlying aggregate to an ICRI concrete surface profile of 4-6. The following methods may be used:
    a. Abrasive-blasting in accordance with ASTM D4259.
    b. High-pressure water blasting at not less than 5,000 psi, in accordance with ASTM D4259.
    c. Shot-blasting in accordance with ASTM D4259, at horizontal surfaces only.
3. Concrete joint areas to receive joint sealant system shall be fully dried prior to application of joint sealant system. Test substrate moisture at not less than three locations per structure to confirm moisture. The following methods may be used to determine moisture:
    a. Plastic Sheet Method (ASTM D4263): Pass/fail.
    b. Relative Humidity Test (ASTM F2170): Less than 85%.
    c. Calcium Chloride Test: Less than 5 pounds per 1000 square feet per 24 hours.
    d. Radio Frequency Test: Less than 5% moisture.

4. Perform adhesion tests at not less than three locations per structure in mock-up (non-joint) areas to verify adequacy of the joint surface preparation. Perform modified T-Peel (ASTM D1876) field test:
    a. Apply duct tape on substrate.
    b. Apply the coating top coat material to the substrate, fully lapping onto the duct tape.
    c. After coating material has fully cured, cut 1-inch-wide strips through coating material, perpendicular to duct tape strip: a minimum of three pull tests per testing location.
    d. Peel up the outside edge of duct tape and provide tarp clip.
    e. Hook a fish weighing or similar scale through the tarp clip and pull perpendicular to the substrate to point of coating adhesion failure and record the load at failure. Scale used for this field measurement shall be calibrated immediately prior to testing.
    f. Minimum acceptable coating adhesion force at failure shall be 15 pounds; no test performed shall demonstrate adhesion below this threshold for surface preparation to be acceptable.
5. Inspect concrete surfaces in area of surface preparation and repair as follows:
    a. Blast/expose all bug-holes to eliminate blind side surfaces.
    b. Cracks less than 1/16 inches wide that extend through the joint coating areas do not require special treatment.
    c. Cracks 1/16 inches to 1/8 inches wide that extend through the joint coating areas shall be stripe-coated for not less than 2 inches on each side and filled with CIM (trowel grade) prior to application of the joint sealant system (after moisture content and surface preparation are acceptable in accordance with the Contract Documents)
    d. Cracks greater than 1/8 inches wide and cracks that experience movement (that extend through the joint coating areas) shall be reinforced with scrim material, similar to the joint coating, prior to sealing the joints.
    e. Cracks greater than 1/4 inches -wide: Provide backer rod, in addition to complying with the paragraph immediately above.
    f. In areas of joint coatings, patch surface spalls and other concrete defects in accordance with requirements for concrete repairs indicated in this Section.
6. Inspect existing joint filler material. If defects in existing joint filler material extend greater than 1/2 inches deep, or if determined by sealant installer to be unsatisfactory, remove not less than 1 inch of existing filler material and pack joint with appropriately sized backer rod soaked in polyurethane grout. Trim grout foam/backer rod flush with surface of concrete once cured. Joints to be coated shall be filled according to this provision and trimmed flush prior to application of coating system.
7. Provide and tool 1-inch minimum cant strips at wall-slab and slab-column joints to be coated. Allow cant strips to cure prior to applying coating system.
8. Perform surface preparation, substrate moisture field tests, adhesion test results, treatment of defects in joint coating areas, and filling (as required) of existing joints for approved by coating manufacturer's technical representative prior to installing joint coating system.

3.2 INSTALLATION AND APPLICATION

A. Environmental Conditions for Installation:
    1. Comply with material manufacturer's written instructions for substrate temperature and moisture content, ambient temperature, and ambient humidity, ventilation, and other conditions affecting performance of concrete repair materials.
    2. Do not repair existing concrete damage when ambient temperature is or is expected to be below 50 degrees F. If necessary to maintain the progress Schedule, enclose and heat area to between 50 and 70 degrees F during repair of surface defects and curing of patching material. Use only indirect fired heating using clean-burning fuel.
    3. If proper environmental conditions do not comply with the Contract Documents and manufacturer's instructions, do not perform the Work until such conditions are acceptable. Provide means to bring conditions into compliance by providing temporary environmental controls, enclosures, and other temporary construction and temporary facilities.

4. Contractor is not eligible for changes in Contract Times or Contract Price for delays or costs incurred to bring environmental conditions for installation into compliance.

B. Existing Concrete Damage Repair:
   1. Type I Repair:
      a. Provide epoxy bonding adhesive and repair mortar.
   2. Type II Repair:
      a. Provide epoxy bonding adhesive, if no reinforcing steel is exposed. Use anti-corrosion bonding agent, if reinforcing steel is exposed.
      b. Prepare exposed reinforcing steel in accordance with Paragraph 3.1.D of this Section.
      c. Provide repair mortar:
         1) Provide 3/8 inches aggregate in accordance with MPII.
   3. Type III Repair:
      a. Provide anti-corrosion bonding agent.
      b. Prepare exposed steel reinforcement per the requirements of Paragraph 3.1.B.
      c. Provide new adhesive anchor dowels as shown on the Drawings and as indicated in Section 03 15 19 - Anchorage to Concrete.
      d. Provide repair mortar:
         1) Provide 3/8 inches aggregate in accordance with MPII.

C. Repair Mortar Application:
   1. Comply with MPII for mixing and placement of repair mortar.
   2. After initial mixing of repair mortar, do not introduce additional water to change consistency. Discard repair mortar if consistency becomes too stiff to place.
   3. Place repair mortar to not less than recommended minimum thickness indicated in the MPII and in no event less than 3/8 inches.
      a. Apply repair mortar in accordance with the following minimum requirements:
         1) Not less than 3/8 inches over existing sound, exposed coarse aggregate.
         2) Not less than 2 inches of cover (unless otherwise required) over exposed reinforcing steel.
   4. At horizontal applications, repair mortar shall be screeded and bull floated to the proper elevation, to ensure all surface moisture will drain freely and properly without puddle areas.
   5. Provide repair mortar in even, uniform plane to restore the concrete member to its original surface finish and plane.
      a. Tolerance for being out-of-plane shall be such that gap between a 1-foot straight edge and repair mortar surface shall not exceed 1/4 inches, and gap between a 4 feet straight edge and repair mortar surface shall not exceed 3/8 inches. This shall apply to straight edges placed in any orientation at any and all location on the repair mortar surface.
   6. Prevention of Drying:
      a. Prevent exposed plastic mortar surfaces from drying. Provide windbreaks, foggers, and evaporation retarders, as necessary, during finishing.
      b. Foggers shall maintain humidity at height of 2 feet to 3 feet above surface of concrete.
      c. If necessary, apply evaporation retarder between finishing operations.
   7. Repair mortar shall receive smooth, steel troweled finish.

D. Repair of Exposed Embedded Items in Concrete:
   1. This provision addresses repair and rehabilitation of corroded metal items embedded in existing concrete and to other locations as expressly shown or indicated on the Drawings. Existing concrete damage by corrosion of embedded metal shall be repaired in accordance with this Section's Paragraph 3.2.B.
   2. Preparation:
      a. Fully expose extent of metal corrosion within each embedded item by chipping to sound material. Where specifically shown or indicated on the Drawings, completely remove exposed metal item to extent shown or indicated.
      b. Prepare exposed reinforcing steel attached to or adjacent to embedded, corroded metal items in accordance with this Section's Paragraph 3.1.D.

c. If existing concrete has been removed during chipping and repair of metal item, prepare repair area in accordance with this Section's Paragraph 3.1.C.
d. Remove corrosion on embedded metal item and corrosion on exposed reinforcing steel by abrasive blasting to a white-metal finish.

3. Repair:
   a. Where no existing concrete has been removed or damaged adjacent to embedded metal item:
      1) On surface of embedded metal item, provide two coats of epoxy coating in accordance with coating manufacturer's recommendations.
         a) Color of First Coating: Red.
         b) Color of Second Coating: Gray.
      2) Before applying second coat, allow first coat of epoxy coating to fully cure in accordance with coating manufacturer's recommendations.
   b. Where areas of existing concrete have been removed or damaged adjacent to embedded metal item:
      1) Patch area of removed or damaged concrete in accordance with this Section's Paragraph 3.2.B.
      2) Provide on surface of embedded metal item two coats of epoxy coating in accordance with coating manufacturer's recommendations.
         a) Color of First Coat: Red.
         b) Color of second Coat: Gray.
      3) Before applying second coating, allow first coat of epoxy coating to fully cure in accordance with coating manufacturer's recommendations.

E. Extend existing control, construction, and expansion joints through concrete repairs.

F. For repairs of existing concrete damage, finish of repaired areas shall match the finish of existing adjacent concrete surface.

G. Expansion Joint Repair – Type A:
   1. Provide materials and installation methods in accordance with sealant manufacturer recommendations and the Contract Documents.
   2. Provide sealant and backer rod at moderate, reasonably stable, concrete temperature to optimize repair performance.
   3. Comply with Section 07 92 00 - Joint Sealants.

H. Expansion Joint Repair – Type B:
   1. Provide epoxy resin adhesive sealing system, in accordance with joint sealant system manufacturer's instructions and the Contract Documents, at locations shown or indicated on the Drawings:
      a. Existing sealant, backer rod, and joint filler material in acceptable condition are to remain in-place at existing joint locations to receive sealing system.
      b. Concrete substrate on both sides of existing joint must be clean, dry, sound, and free of surface contaminants to not less than 10 inches wide strip centered on existing joint or greater when recommended by sealant manufacturer.
         1) Remove dust, laitance, grease, oils, curing compounds, form release agents, and foreign matter by sandblasting or other mechanical means acceptable to Engineer.
      c. Mix epoxy resin adhesive and install hypalon sheeting in accordance with adhesive manufacturer's printed installation instructions and the Contract Documents.
      d. Cleanup:
         1) Leave finished Work and work area in a neat, clean condition without evidence of spillovers on adjacent surfaces.
         2) Clean uncured epoxy resin adhesive with approved solvent appropriate for the application and area.
         3) Remove cured epoxy resin adhesive only by mechanical means.

I. Expansion Joint Repair – Type C (Joint Sealant System):

1. Installation of joint coating system shall comply with applicable material manufacturer's published recommendations and the Contract Documents.
2. Do not install concrete joint coating when substrate is in a rising-temperature mode.
3. Substrate, air, and coating material temperatures shall comply with applicable material manufacturer's recommendations and the Contract Documents.
4. Primer:
    a. Provide epoxy primer to concrete prior to installing final coating materials.
    b. Applied Thickness: 5 to 10 wet mils.
    c. Reapply coating as necessary to achieve pinhole/holiday-free surface
5. Comply with material manufacturer's recoat time. If recoat time(s) are exceeded, comply with material manufacturer's recommended procedures for surface abrasion, cleaning, and application of bonding agent.
6. Application of Coatings:
    a. Provide primer, base coat, scrim, and top coat in accordance with material manufacturer's requirements, as shown in the Drawings, and in accordance with other Contract Documents.
    b. Install primer (see item 4 above)
    c. Provide initial tack coat at thickens of 10 to 20 wet mils, to 6 inches on each side of joints to be coated.
    d. Push scrim material evenly into wet tack coat and allow to cure one to four hours, as recommended by coating manufacturer.
    e. Provide not less than thickness of 60 wet mils of top coat over scrim material.
    f. Protect and cure in accordance with material manufacturer's recommendations and the Contract Documents.
7. Should substrate temperatures be less than sealant system manufacturer's written recommended minimum temperature, comply with material manufacturer's modified procedures provide materials approved by Engineer and suitable for installation in cold conditions.

3.3 CURING

A. Curing of Repair Mortar:
    1. Perform curing of repair mortar immediately after final finishing.
    2. Perform curing by combination of covering repair Work with wet burlap and applying liquid membrane-forming curing compound.
    3. Employ methods and sequence to maintain moisture for not less than seven days.

3.4 FIELD QUALITY CONTROL

A. Field Tests:
    1. In-Situ Pull-Off Tests:
        a. Perform in-situ pull-off tests on repaired areas at locations indicated by Engineer.
            1) Perform not less than one pull-off test, in accordance with ASTM C1583, for each surface (wall, roof, floor, and other). In event of unacceptable pull-off test, repair the defective Work in accordance with the Contract Documents and perform additional test(s) at location(s) indicated by Engineer.
        b. Submit written results of testing, indicating: date of test, entity performing testing, personnel present during testing, time of test, location of test, pertinent results recorded, and other relevant observations.
        c. Criteria for Acceptance: Pull-off test will be deemed as passing (acceptable results) when failure occurs within the existing concrete substrate (cohesive concrete failure). If failure occurs at the joint surface with existing concrete (bond failure), within the repair material, or at connection to testing device, pull-out test will be deemed as passing (acceptable results) when the unit tensile stress acting on the core cross section at failure exceeds 300 psi. If failure occurs within the repair material, additional test samples of the repair material in the area of the test shall be taken for compressive testing to verify strength of repair material.

d. Remedy all damage resulting from in-situ testing, in accordance with the Contract Documents.

B. Observations and Inspections:
1. Owner or their representative will witness surface preparation, substrate moisture conditions, and installation of materials indicated in this Section. Such observations do not relieve Contractor from obligation to comply with the Contract Documents.
2. Owner-retained special inspector shall be present while material manufacturer's technical representatives are at the Site instructing Contractor's structural concrete repair personnel, Contractor's joint sealant system personnel, and installers in the use of the associated material(s).

C. Defective Work:
1. Defective Repair:
a. Any and all repairs are defective Work when one or more of the following occurs:
1) Pull-off test fails.
2) When grout cube tests yield results less than 3500 psi for repair mortars in seven days.
3) Repair is not properly finished and in accordance with specified tolerances.
b. Promptly remove and remedy defective concrete repair Work in accordance with the Contract Documents.
2. Damaged Work:
a. Before acceptance of the Work (following final inspection in accordance with the General Conditions and other Contract Documents), neatly repair damaged surfaces, corners of concrete, and finish.
b. When performing surface remedial repairs, finish areas to smooth, dense watertight condition.
c. Replace unsatisfactory concrete patching Work.
3. Corrective Work:
a. If correction of defective Work (under this Section) is necessary, remove defective Work. Key area to be remedied, clean, and soak surface with water and patch with approved materials. Patch concrete to match existing adjacent concrete surfaces.
b. Clean surface cavities resulting from form ties, other holes, honeycomb spots, broken corners and edges, and other effects. Saturate with water and point with a mortar of patching material paste. Comply with patching material manufacturer's recommendations concerning placement, pot life, and curing.
c. Prepare pointing material not more than 30 minutes prior to use. Cure mortar patches properly. Carefully tool contraction and articulated joints in completed Work and keep them free of concrete. Where necessary, leave joint filler exposed for its full length with clean and true edges.
d. Tolerance deviations and other surface defects may also be corrected, when approved by Engineer, by grinding high areas of swales.
e. Where remedial work is unsatisfactory, completely remove such Work and replace with new Work in accordance with the Contract Documents.
4. Special inspection of remedial work is required. Special inspection will be performed after completion of surface preparation and during installation of remedial Work. Refer to Section 01 45 33 - Special Inspections and Testing Program, for additional requirements.
5. Defective Joint Sealant System Work:
a. Any and all locations where joint sealant system has separated from concrete or exhibits cracking or tearing is defective Work.
b. Remove defective joint sealant system Work, clean the surface, and re-provide new joint sealant system materials.
c. Unless directed otherwise by Engineer, when area of defective joint sealant Work exceeds 25% of total area of joint sealant system Work provided, replace all joint sealant system Work in accordance with the Contract Documents.

D. Suppliers' Services:

1. Manufacturers' factory-trained technical representatives of concrete repair materials and joint sealant system shall be at the Site prior to and during first installation of the materials furnished under this Section to review surface preparation, surface moisture conditions and adhesion testing, and proposed installation methods. Joint sealant system manufacturer's representative shall also inspect the entire completed installation and submit, through Contractor, an affidavit of compliance certifying that installed materials comply with manufacturer written instructions and recommendations. Compensation for which is part of the associated unit price for such Work.

END OF SECTION