

CONTRACT DOCUMENTS - DRAWINGS

FOR

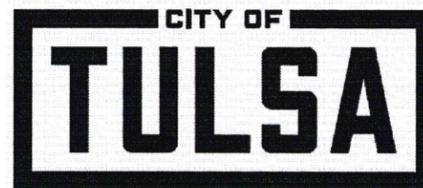
**PROJECT NO. WPC 26-1
FY'26 WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS**

ATTENDANCE AT PRE-BID CONFERENCE IS MANDATORY

PREPARED BY:



HOLLOWAY, UPDIKE AND BELLEN, INC.
2001 N WILLOW AVE
BROKEN ARROW, OK 74012
918-251-0717 OFFICE
C.A. No. 219
EXPIRES 6/30/27



ERIC LEE, DIRECTOR
WATER AND SEWER DEPARTMENT

Account Numbers: 7503362-544003
7503365-544003
7503368-544003

Matt Vaughan
for Eric Lee, Director Water & Sewer Dept.

3.13.26
Date

Stephen Tolar
Stephen Tolar P.E., S.E. No. OK 20679

Cindy Cantero
Cindy Cantero, Water Pollution Control Manager

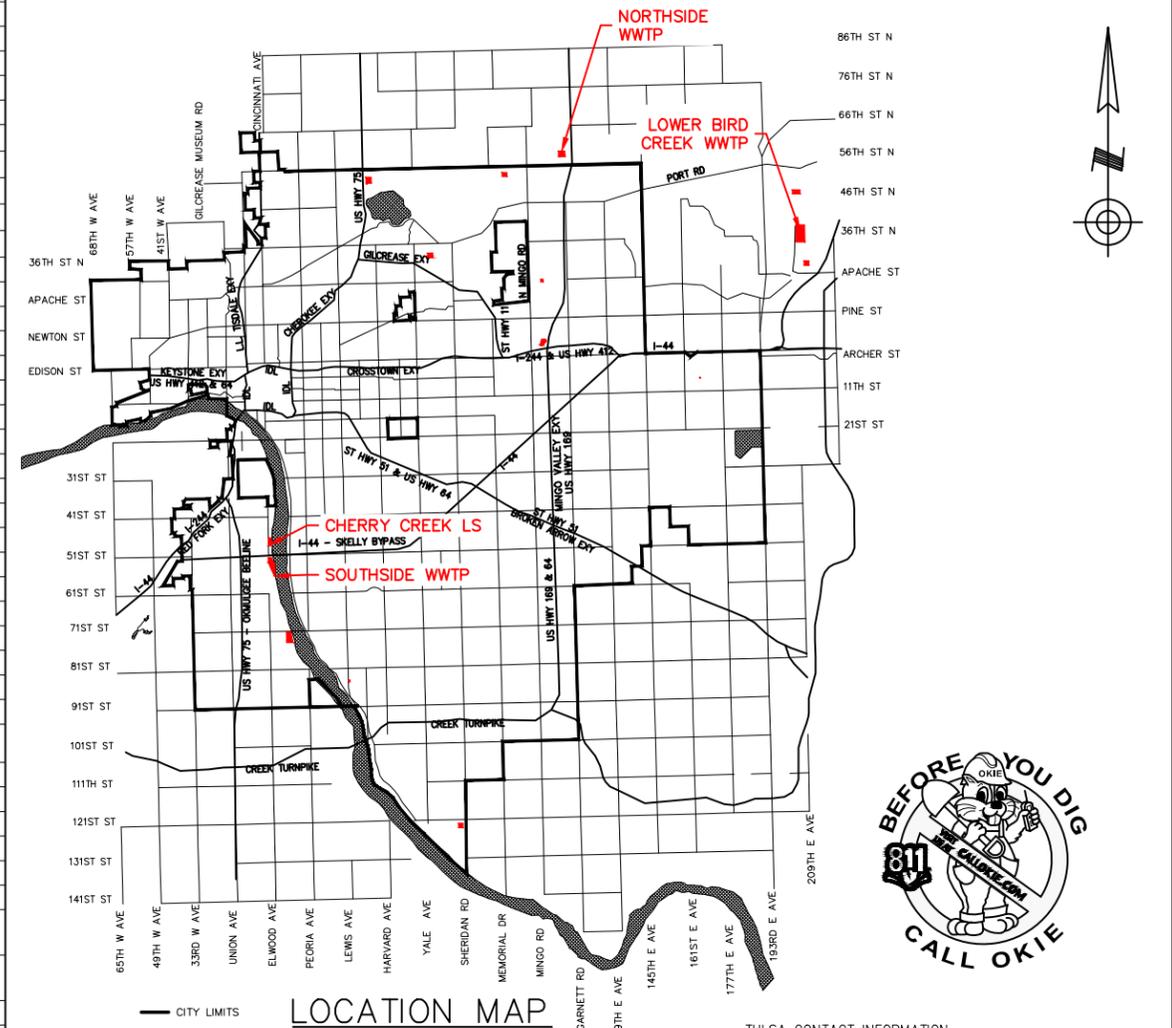
3-16-26
Date

Note: The Drawings attached hereto as part of these Specifications are for information purposes only. The Authority makes no representation or guarantee with respect to the accuracy of any information contained in the Drawings. It is the Contractor's responsibility to verify information on the drawings to ensure the equipment installed or controlled by work performed under this Contract performs as specified herein.

Water and Sewer Department
175 E. 2nd Street, Suite 1300
Tulsa, Oklahoma 74103
(918) 596-9870

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7	203.100.B	GALLERY #1 (SOUTH) RAS METER REPLACEMENTS		NSWWTP
8	203.100.C	GALLERY #1 (SOUTH) RAS METER REPLACEMENTS		NSWWTP
9	203.100.D	GALLERY #1 (SOUTH) RAS METER REPLACEMENTS		NSWWTP
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11	203.350.A	CHEMICAL FILL STATION REHABILITATION	N060-CHL1-CPL01; N060-DCL1-CPL02	NSWWTP
12	203.350.B	CHEMICAL FILL STATION REHABILITATION		NSWWTP
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14	203.400.A	MAIN LIFT STATION PUMP #2 DEMOLITION PLAN	S101-LFT1-RSP02	SSWWTP
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18	203.600.A	WAS METER VAULT REHABILITATION	L050-RAP1-VLV15	LBCWWTP
19	203.620.A	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT	S040-ARB2-BAS04	SSWWTP
20	203.620.B	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT		SSWWTP
21	203.620.C	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT		SSWWTP
22	203.620.D	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT		SSWWTP
23	203.620.E	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT		SSWWTP
24	203.620.F	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT		SSWWTP
25	203.620.G	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT		SSWWTP
26	203.620.H	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT		SSWWTP
27	203.620.I	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT		SSWWTP
28	203.620.J	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT		SSWWTP
29	203.620.K	AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT		SSWWTP
30	203.660.A	FEB 36" BALL VALVE REPLACEMENTS (ADDITIVE ALTERNATE #1)	S104-LFT1-BLV05	CHERRY CREEK LS
31	203.680.A	RDT REHABILITATION PLAN	S070-RDT1-RDT01 thru 03	SSWWTP
32	203.680.B	RDT REHABILITATION SECTIONS		SSWWTP
33	203.700.A	WAS PUMPS & VALVE REPLACEMENTS	S020-GRT1-PTP01 thru PTP03	SSWWTP
34	203.700.B	SERVICE WATER LINE & DRAIN PIPING SCHEMATIC		SSWWTP
35	203.700.C	WAS PUMPS & VALVE REPLACEMENT DETAILS		SSWWTP
36		MISCELLANEOUS DETAILS		
37	203.510.A	OPERATIONS BUILDING HVAC SUPPLEMENTARY IMPROVEMENTS (BASE BID & ADDITIVE ALTERNATE #2)	N001-OPS-HAU-01 through 09, N001-OPS-ACU 01, ACU 02, ACU 05, AND N001-OPS-ACU 03 & ACU 04	NSWWTP
38	203.510.B	OPERATIONS BUILDING HVAC SUPPLEMENTARY IMPROVEMENTS (BASE BID & ADDITIVE ALTERNATE #2)		NSWWTP
39	203.510.C	MISCELLANEOUS ROOF DETAILS		NSWWTP
40/E1	203.500/203.510	ELECTRICAL POWER & LIGHTING LEGEND		NSWWTP
41/E2	203.500/203.510	ELECTRICAL RENOVATION - LEVEL 1		NSWWTP
42/E3	203.500/203.510	ELECTRICAL POWER PLAN - ROOF (ADDITIVE ALTERNATE #2)		NSWWTP
43/E4	203.500/203.510	ELECTRICAL SCHEDULES & ONE-LINE (ADDITIVE ALTERNATE #2)		NSWWTP
44/M1	203.500/203.510	MECHANICAL NOTES & LEGENDS		NSWWTP
45/M2	203.500/203.510	MECHANICAL DEMOLITION - LEVEL 1 (ADDITIVE ALTERNATE #2)		NSWWTP
46/M3	203.500/203.510	MECHANICAL DEMOLITION - LEVEL 2 (ADDITIVE ALTERNATE #2)		NSWWTP
47/M4	203.500/203.510	MECHANICAL DEMOLITION - ROOF		NSWWTP
48/M5	203.500/203.510	MECHANICAL RENOVATION - LEVEL 1		NSWWTP
49/M6	203.500/203.510	MECHANICAL RENOVATION - LEVEL 2 (ADDITIVE ALTERNATE #2)		NSWWTP
50/M7	203.500/203.510	MECHANICAL RENOVATION - ROOF (ADDITIVE ALTERNATE #2)		NSWWTP
51/M8	203.500/203.510	MECHANICAL ISOMETRICS I		NSWWTP
52/M9	203.500/203.510	MECHANICAL ISOMETRICS II		NSWWTP
53/M10	203.500/203.510	MECHANICAL SCHEDULES (ADDITIVE ALTERNATE #2)		NSWWTP
54/M11	203.500/203.510	MECHANICAL DETAILS I		NSWWTP
55/M12	203.500	MECHANICAL DETAILS II		NSWWTP
56/E1		ELECTRICAL LEGEND		
57/E2	203.860	ELECTRICAL GRIT BUILDING BASEMENT		SSWWTP
58/E3	203.860	ELECTRICAL ONE-LINE DIAGRAM GRIT BUILDING		SSWWTP
59/E4		ELECTRICAL GRIT BUILDING		SSWWTP
60/E5	203.800	ELECTRICAL HEADWORKS FLOOR PLAN		NSWWTP
61/E6	203.800	ELECTRICAL HEADWORKS FLOOR PLAN		NSWWTP
62/E1	203.820	ELECTRICAL POWER & LIGHTING LEGEND		
63/E2	203.820	ELECTRICAL RENOVATION PLAN - RENOVATION (ADDITIVE ALTERNATE #3)		NSWWTP
64/E3	203.820	ELECTRICAL SCHEDULES & ONE-LINE (ADDITIVE ALTERNATE #3)		NSWWTP
65/M1		MECHANICAL NOTES & LEGENDS		
66/M2	203.820	HVAC DEMOLITION PLAN	N080-DIG3-HVAC1 (AC, HEAT, EMS)	NSWWTP
67/M3	203.820	HVAC RENOVATION PLAN		NSWWTP
68/M4	203.820	HVAC SCHEMATIC		NSWWTP
69/M5	203.820	HVAC SEQUENCE OF OPERATION		NSWWTP
70/M6	203.820	MECHANICAL SCHEDULES		NSWWTP
71/M7		MECHANICAL DETAILS I		
72/M8		MECHANICAL DETAILS II		



TULSA CONTACT INFORMATION
 SOUTHSIDE WASTEWATER TREATMENT PLANT
 JOSH FISHER, SUPERINTENDENT 918-591-4450
 NORTHSIDE WASTEWATER TREATMENT PLANT
 COLIN WILMERING, SUPERINTENDENT 918-591-4570

REVISION	BY	DATE

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INDEX OF SHEETS & LOCATION MAP
 WATER POLLUTION CONTROL
 CAPITAL EQUIPMENT REPLACEMENTS
 TMUA PROJECT WPC 26-1
 CITY OF TULSA, OKLAHOMA
 TULSA METROPOLITAN UTILITY AUTHORITY
 WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE & BELLEN, INC.
 2001 N WILLOW AVE, BROOKHURST, OKLAHOMA 74102
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PLAN SCALE:	DRAWN	CMW
	DESIGNED	TJR
	SURVEY	
PROFILE SCALE:	PROJ. MGR.	
	LEAD ENGR.	
HORIZONTAL:	FIELD MGR.	
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GENERAL NOTES

1. THE CONTRACTOR SHALL CALL WWTP PERSONNEL AND CALL OKIE AT 1-800-522-6543 PRIOR TO ANY EXCAVATION TO DETERMINE LOCATION OF EXISTING UTILITIES.
2. THE CONTRACTOR SHALL, AT CONTRACTOR'S EXPENSE, UNCOVER AND DETERMINE THE DEPTH OF PIPE LINES AND OTHER UTILITIES WHICH, IN CONTRACTOR'S OPINION, COULD INTERFERE WITH THE CONSTRUCTION.
3. THE CITY OF TULSA ENGINEERING SERVICES DEPARTMENT STANDARD SPECIFICATIONS AND STANDARD DETAILS, CURRENT VERSION, ARE HEREBY ADOPTED AS PART OF THESE SPECIFICATIONS WHERE REFERENCE IS MADE. SAID SPECIFICATIONS WILL BE HEREINAFTER REFERRED TO AS THE "STANDARD SPECIFICATIONS".
4. CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION SITE AT ALL TIMES. TRASH, SPENT PALLETS, CONTAINER REMNANTS, BINDINGS, ETC. SHALL BE PICKED UP WHEN NO LONGER IN USE AND DEPOSITED IN TRASH CONTAINERS.
5. ALL STAINLESS STEEL SHALL BE MINIMUM TYPE 316 SUITABLE FOR SANITARY APPLICATIONS, UNLESS SPECIFICALLY NOTED OTHERWISE. ALL ANCHOR BOLTS, SUPPORTS, BRACKETS, FASTENERS AND UNISTRUT SHALL BE 316 SS UNLESS NOTED SPECIFICALLY OTHERWISE.
6. ALL DIMENSIONS SHOWN WITH ± SHALL BE CONFIRMED BY THE CONTRACTOR ACCORDING TO ACTUAL FIELD CONDITIONS OR EQUIPMENT REQUIREMENTS.
7. DISSIMILAR METALS SHALL BE SEPARATED BY GASKET TO PREVENT GALVANIC CORROSION.
8. ANY EXISTING ITEMS, EQUIPMENT, STRUCTURES OR SURFACES DISTURBED OR DAMAGED BY CONTRACTOR SHALL BE REPAIRED OR REPLACED TO ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST TO THE OWNER.
9. CONTRACTOR SHALL VERIFY EXISTING UTILITIES IN THE VICINITY OF PROPOSED CONSTRUCTION PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF DISCREPANCIES FROM DRAWINGS.
10. CONTRACTOR SHALL CONFIRM ALL DIMENSIONS WITH EQUIPMENT SUPPLIERS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF DISCREPANCIES.
11. CONSTRUCTION STAKING SHALL BE PROVIDED BY THE CONTRACTOR, UNLESS SPECIFICALLY NOTED OTHERWISE.
12. THE IMPROVEMENTS SET FORTH IN THE PLANS SHALL NOT PROHIBIT ON-SITE TRAFFIC AND/OR RELATED TASKS REQUIRED IN THE TREATMENT AND DISCHARGE OF WASTEWATER.
13. TOPSOIL (MINIMUM 6") IN THE DISTURBED AREAS SHALL BE REMOVED, STOCKPILED AND REPLACED AFTER CONSTRUCTION OPERATIONS. ALL WASTE SOILS AND DEBRIS BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE HAULED OFFSITE AND DISPOSED OF PROPERLY.
14. ALL WORKMANSHIP SHALL BE NEAT, PLUMB, SQUARE AND CONSTRUCTED IN A PROFESSIONAL MANNER.
15. ALL ELECTRICAL CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH ALL N.E.C. AND CITY OF TULSA ELECTRICAL CODES. ELECTRICAL, MECHANICAL, AND PLUMBING INSPECTIONS ARE REQUIRED AT BOTH ROUGH AND FINAL STAGES OF THE PROJECT.
16. BYPASS PUMPING OR BYPASS PIPING, IF UTILIZED BY CONTRACTOR, SHALL BE SCHEDULED FOR DRY WEATHER PERIODS AND COMPLETELY OPERATED AND MAINTAINED BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR PREVENTING UNAUTHORIZED DISCHARGES. BYPASS PUMPING SHALL BE MANNED CONTINUOUSLY (24/7) BY THE CONTRACTOR WHEN OPERATING. AVERAGE DRY WEATHER FLOWS ARE AVAILABLE FROM CITY BY REQUEST.
17. CONTRACTOR IS RESPONSIBLE FOR ANY DEWATERING REQUIRED TO CONSTRUCT FOUNDATIONS IN DRY CONDITIONS AND TO PROTECT EXCAVATION SIDE SLOPES.
18. ALL BURIED CONSTRUCTION, INCLUDING BUT NOT LIMITED TO PIPE AND CONDUIT, SHALL BE PHOTOGRAPHED PRIOR TO COVER. EQUIPMENT DATA TAGS SHALL ALSO BE PHOTOGRAPHED WITH EQUIPMENT. SUBMIT IN A DIGITAL JPEG FORMAT ON JUMP DRIVE AS PART OF CONTRACTORS CONSTRUCTION PHOTOGRAPHIC RECORD. CONTRACTOR SHALL SUBMIT GPS COORDINATES AND ELEVATIONS OF THE ϕ OF ALL PIPING AT BENDS, FITTING, VALVES AND OTHER BURIED ITEMS.
19. WHERE RED TEXT AND LINWORK IS USED IT CONVEYS NEW OR PROPOSED WORK. RECORD DRAWING USED AS BASE DRAWINGS MAY SHOW BOLD LINWORK AND TEXT. THIS SHOULD BE VIEWED AS EXISTING.

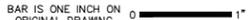
GENERAL PIPING NOTES

- P1. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
- P2. SIZE OF FITTINGS SHOWN ON THE PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED.
- P3. ALL BURIED D.I.P., C.I.P. AND PVC PIPE SHALL UTILIZE RESTRAINED D.I. MECHANICAL JOINT FITTINGS AT ALL CONNECTIONS UNLESS DEPICTED ON THE PLANS SPECIFICALLY OTHERWISE.
- P4. ALL UNRESTRAINED, BURIED FITTINGS SUCH AS BENDS, TEES, WYES, ETC. SHALL BE BLOCKED FOR THRUST BLOCKS AS SHOWN ON STANDARD DETAILS. THIS REQUIREMENT INCLUDES BOTH GRAVITY AND PRESSURE PIPING.
- P5. A MINIMUM OF 10 FEET OF HORIZONTAL SEPARATION (FOR PARALLEL LINES) AND 2 FEET OF VERTICAL SEPARATION (FOR LINES CROSSING) SHALL BE MAINTAINED BETWEEN WATER AND SANITARY SEWER LINES IN ACCORDANCE WITH OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY.
- P6. CONTRACTOR SHALL REMOVE AND RECONSTRUCT INVERTS WHERE NEW CONNECTIONS ARE MADE TO EXISTING MANHOLES. WORK SHALL BE PAID FOR IN OTHER ITEMS OF WORK.
- P7. ALL FLANGE COUPLING ADAPTERS SHOWN ON THE CONSTRUCTION DRAWINGS SHALL BE RESTRAINED TYPE, MEGAFLANGE SERIES 2100, OR EQUAL.
- P8. CONTRACTOR IS REQUIRED TO VACUUM TEST ALL MANHOLES ACCORDING TO CITY OF TULSA, ENGINEERING SERVICES STANDARDS AND SPECIFICATIONS.
- P9. EXPOSED PIPING SHALL BE PAINTED PER COLOR CODE REQUIREMENTS AND INCLUDE SIGNAGE/LABELS.

SPECIAL WPC PROJECT NOTES & REQUIREMENTS:

- 1) ALL UNISTRUT SUPPORTS, ANCHOR BOLTS, BOLTS, SCREWS, FASTENERS AND OTHER RELATED COMPONENTS WITHIN THE PLANT FACILITY SHALL BE 316 STAINLESS STEEL UNLESS SPECIFICALLY NOTED OTHERWISE. IF A DISCREPANCY IS NOTED, THE MATERIAL SELECTION SHALL DEFAULT TO 316 STAINLESS STEEL IN ALL EXTERIOR, SUBMERGED, H2S AND CLASSIFIED SPACES.
- 2) ALL NEW DISCONNECTS, ELECTRICAL/CONTROL DISPLAY DEVICES AND SMALL PANELS SHALL BE MOUNTED ON THE CUSTOM ALUMINUM PANEL SUPPORT AS SHOWN IN THE MISCELLANEOUS DETAILS, UNLESS SPECIFICALLY NOTED OTHERWISE PER PLAN SHEET NOTES.
- 3) ALL NEW PIPING AND MODIFIED PIPING SHALL BE PAINTED, STANDARD COLOR CODED, WITH DIRECTION ARROWS AND SIGNAGE AS PART OF THE NEW WORK.
- 4) ALL AREAS OF DEMOLITION SHALL INCLUDE REPAIRS TO THE WALLS, CEILING, ROOF, FLOORING, AND CONCRETE. OTHER AREAS OF WORK TO INCLUDE TOUCH UP PAINTING TO MATCH AND CONCRETE REPAIRS AS SHOWN IN THE MISCELLANEOUS DETAILS. SEE SPECIFICATIONS AND SPECIFIC PLAN SHEETS FOR ADDITIONAL DETAILS.
- 5) ALL ELECTRICAL AND CONTROLS DEMOLITION FOR BIDDING PURPOSES, UNLESS SPECIFICALLY NOTED OTHERWISE, SHALL BE REMOVED COMPLETELY BACK TO CLOSEST POINT OF TERMINATION. CONTRACTOR SHALL SUBMIT WRITTEN SKETCHES, DETAILS AND A WORK PLAN TO FURTHER DEFINE EXTENT OF EACH AREA OF DEMOLITION AND NEW WORK FOR PLANT OPERATIONS COORDINATION.
- 6) SEE SPECIFICATIONS AND CITY OF TULSA STANDARDS AND DETAILS FOR ADDITIONAL REQUIREMENTS. ALL WWTP FACILITY'S ROADS, PARKING AND PAVED AREAS ARE CONSIDERED CITY OF TULSA ROADS AND CITY OF TULSA STANDARDS APPLY.
- 7) THE CONTRACTOR SHALL SELECT MATERIALS AND INSTALL MATERIALS TO MINIMIZE CORROSION AND DISSIMILAR METALS IN ALL AREAS OF WORK. COAT ALL ALUMINUM IN CONTACT WITH CONCRETE, ISOLATION WASHERS ON BOLTS/FASTENERS AND OTHER MATERIAL SEPARATION METHODS SHALL BE USED.
- 8) ALL COPPER PIPING SHALL BE COATED OR PAINTED PRIOR TO INSTALLATION TO ENSURE COPPER IS COVERED COMPLETELY. ALL HVAC LINES, OTHER COPPER TUBING OR COPPER SERVICE LINES SHALL BE OPTIONED FOR CORROSION RESISTANT COATINGS BY THE MANUFACTURER IF AVAILABLE. IF A FACTORY COATING OPTION IS NOT AVAILABLE, APPLY A SPRAY COATING ONSITE WITH HERESITE COATING OR EQUAL. PROTECTIVE COATINGS SHALL BE APPLIED PRIOR TO ASSEMBLY/INSTALLATION. REQUIREMENTS APPLY TO ALL HVAC MECHANICAL EQUIPMENT AND PLUMBING SYSTEMS WITHIN ALL PLANT FACILITY GROUNDS, EXTERIOR EQUIPMENT, SERVICES AND INSIDE OF BUILDINGS, MANHOLES, VAULTS, SHEDS OR OTHER AREAS, EXCEPT PERSONNEL OCCUPIED SPACES LIKE OPERATIONS BUILDING, OFFICE SPACE OR ADMINISTRATION BUILDINGS. BURIED COPPER WATERLINES ARE ALSO EXEMPT.
- 9) ALL PVC PIPING SIZES BETWEEN 1/2" - 4" SHALL BE SCH. 80 CPVC UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLAN SHEET OR APPLICABLE SPECIFICATION SECTION. 316 SST PIPE SUPPORT SHALL BE ON 4'-0" AND AT ALL CHANGES IN DIRECTION.

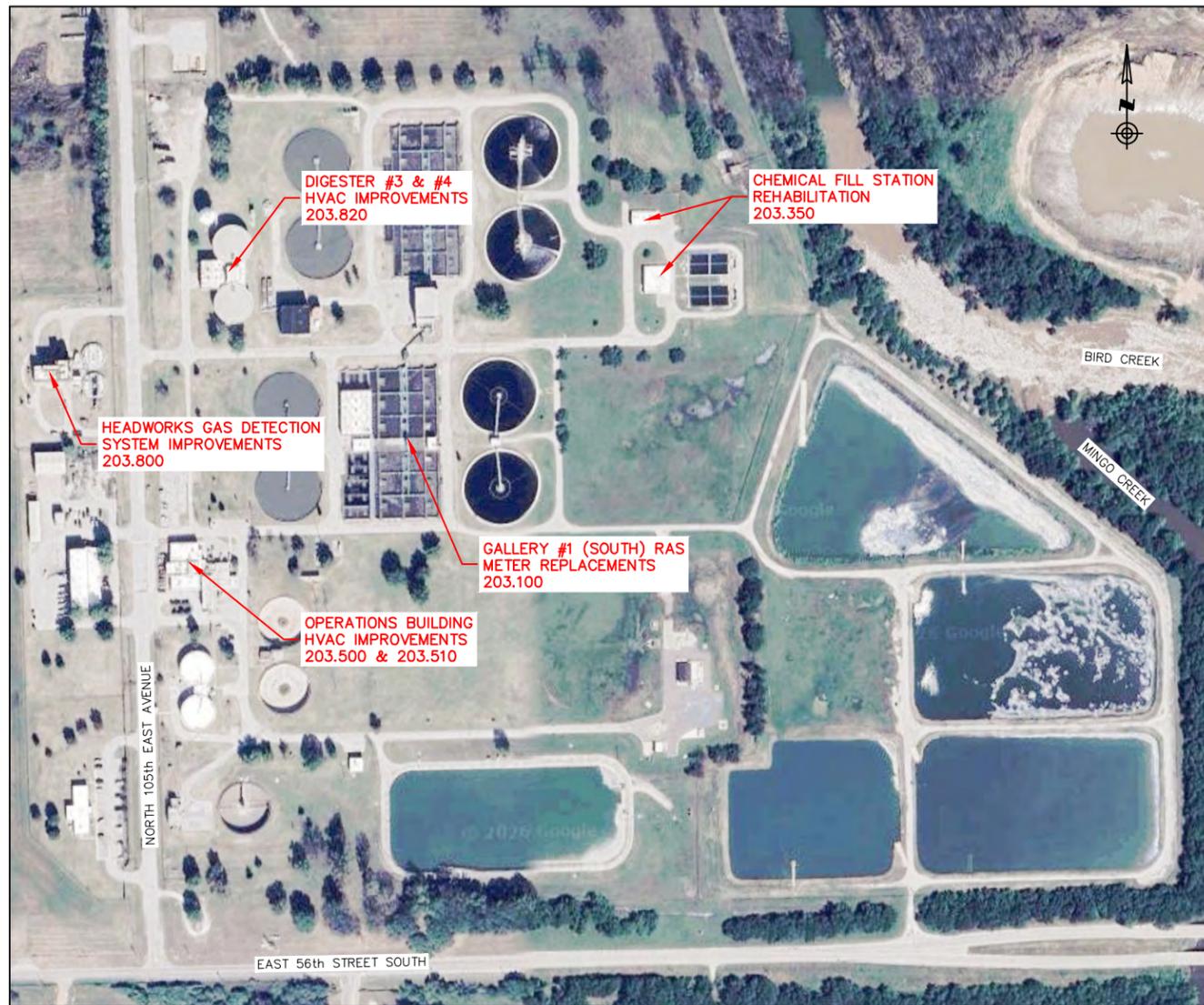
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GENERAL NOTES & LOCATION MAP		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:  HOLLOWAY, UPDIKE + BELLEN, Inc. 2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74002 (918)224-0770, FAX (918)224-0764		
PLAN SCALE:	DRAWN DESIGNED SURVEY	CMW TJR
PROFILE SCALE:	PROJ. MGR.	
HORIZONTAL:	LEAD ENGR. FIELD MGR.	
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1 SOUTHSIDE WWTP
4 5300 S. ELWOOD AVE.



2 NORTHSIDE WWTP
4 5628 N. 105TH EAST AVE.

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1 CHERRY CREEK FEB & LS
5 4899 S. ELWOOD AVE.



2 LOWER BIRD CREEK WWTP
5 151 W. 36TH ST. N.

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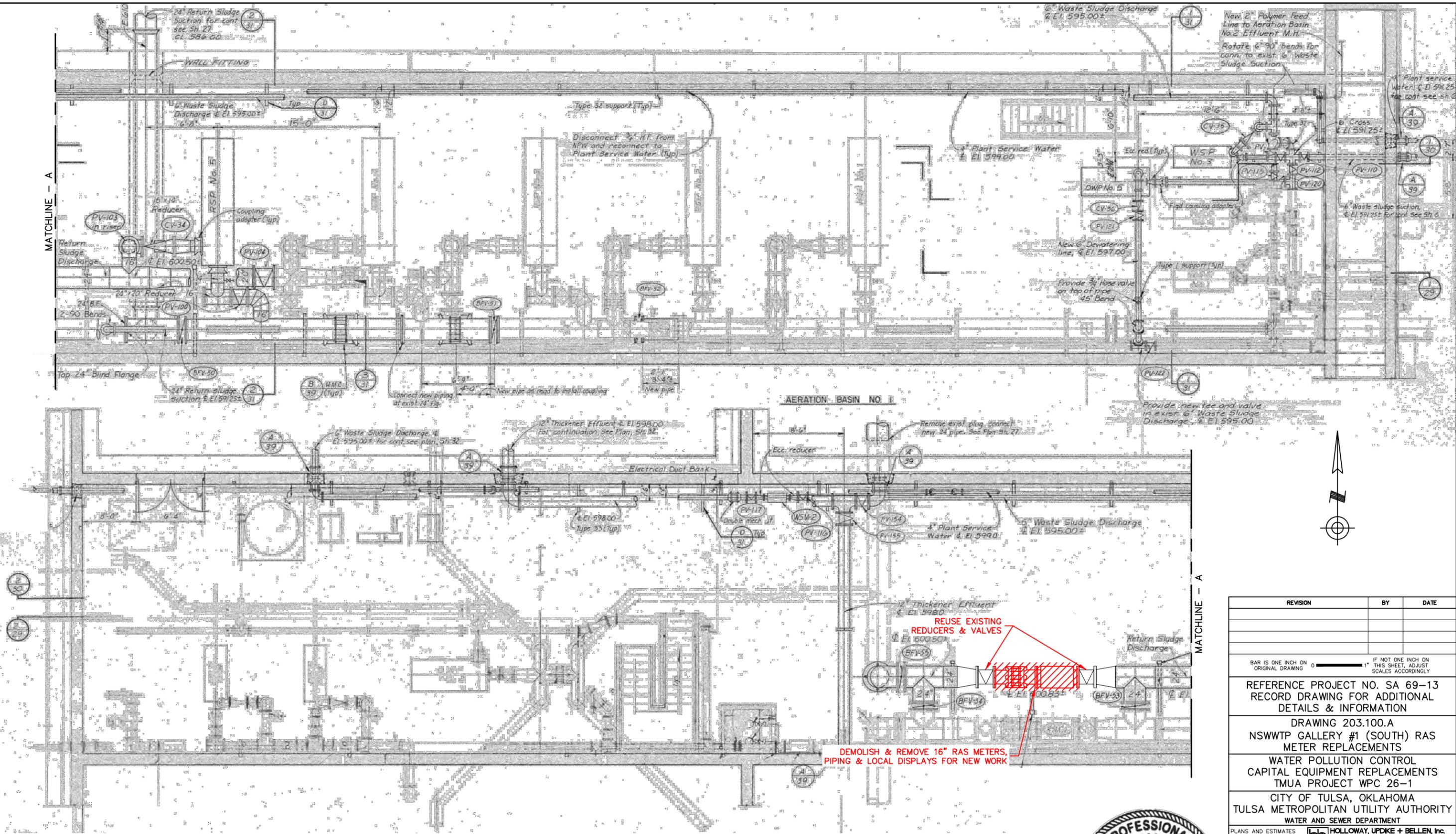
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1 NSWWT GALLERY #1 DEMOLITION SECTION (SOUTH)
6 NTS



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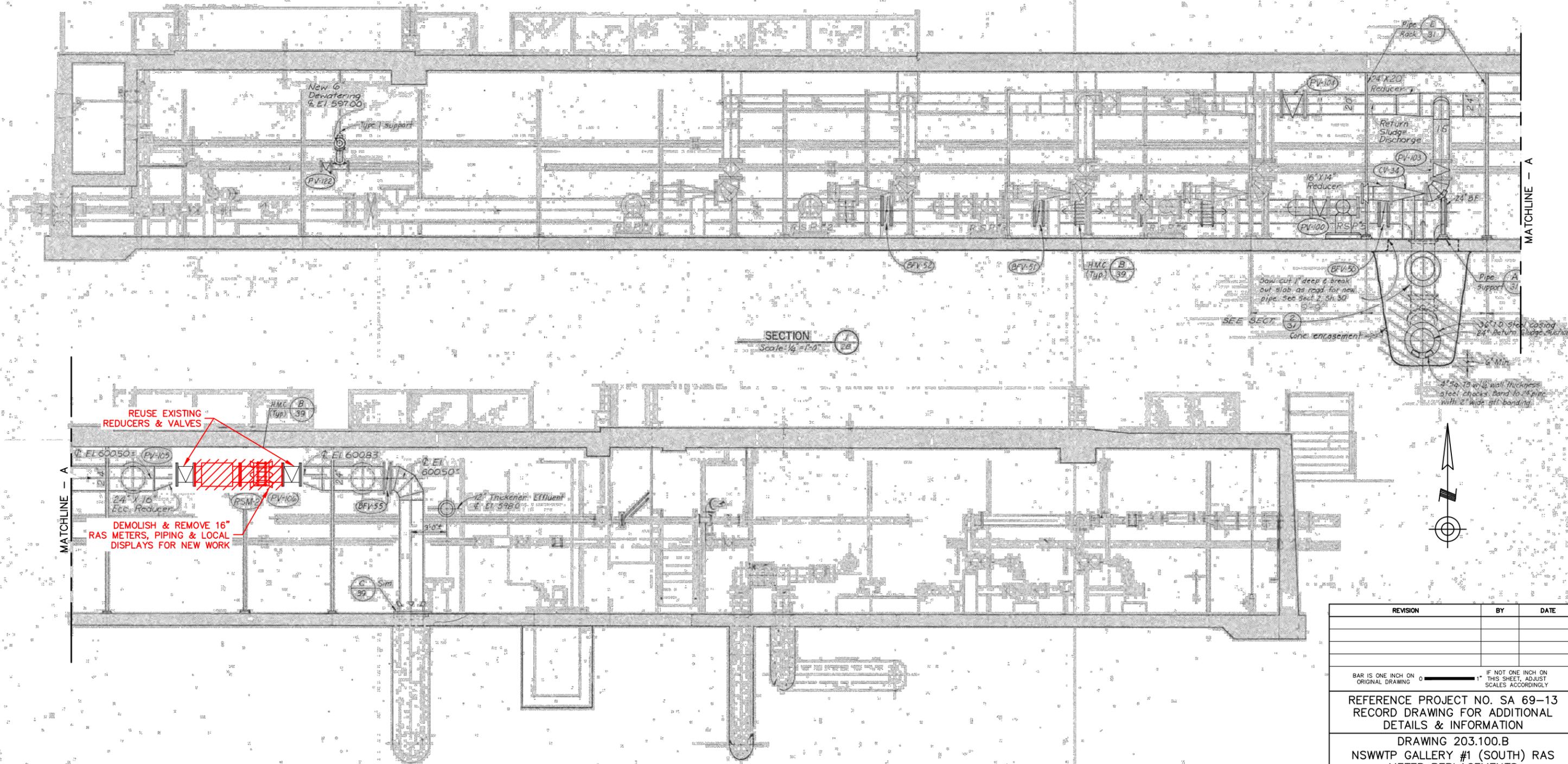
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RECORD DRAWING FOR ADDITIONAL DETAILS & INFORMATION
DRAWING 203.100.A
NSWWTP GALLERY #1 (SOUTH) RAS METER REPLACEMENTS
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PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
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PLAN SCALE:	DRAWN	CMW
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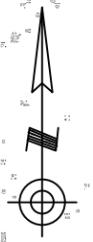
SECTION
Scale: 1/4" = 1'-0"

REUSE EXISTING
REDUCERS & VALVES

DEMOLISH & REMOVE 16"
RAS METERS, PIPING & LOCAL
DISPLAYS FOR NEW WORK

Down cut 1' deep & break
out slab as road for new
pipe. See Sect 2, Sh. 30
SEE SECT. 2
Conc. encasement

4" Min.
4" to 10" to wall thickness
steel checks hard to slip
with 2" wide grt bonding



1 NSWWTP GALLERY #1 DEMOLITION SECTION (SOUTH)
7 NTS

REVISION	BY	DATE

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DRAWING 203.100.B
NSWWTP GALLERY #1 (SOUTH) RAS
METER REPLACEMENTS

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

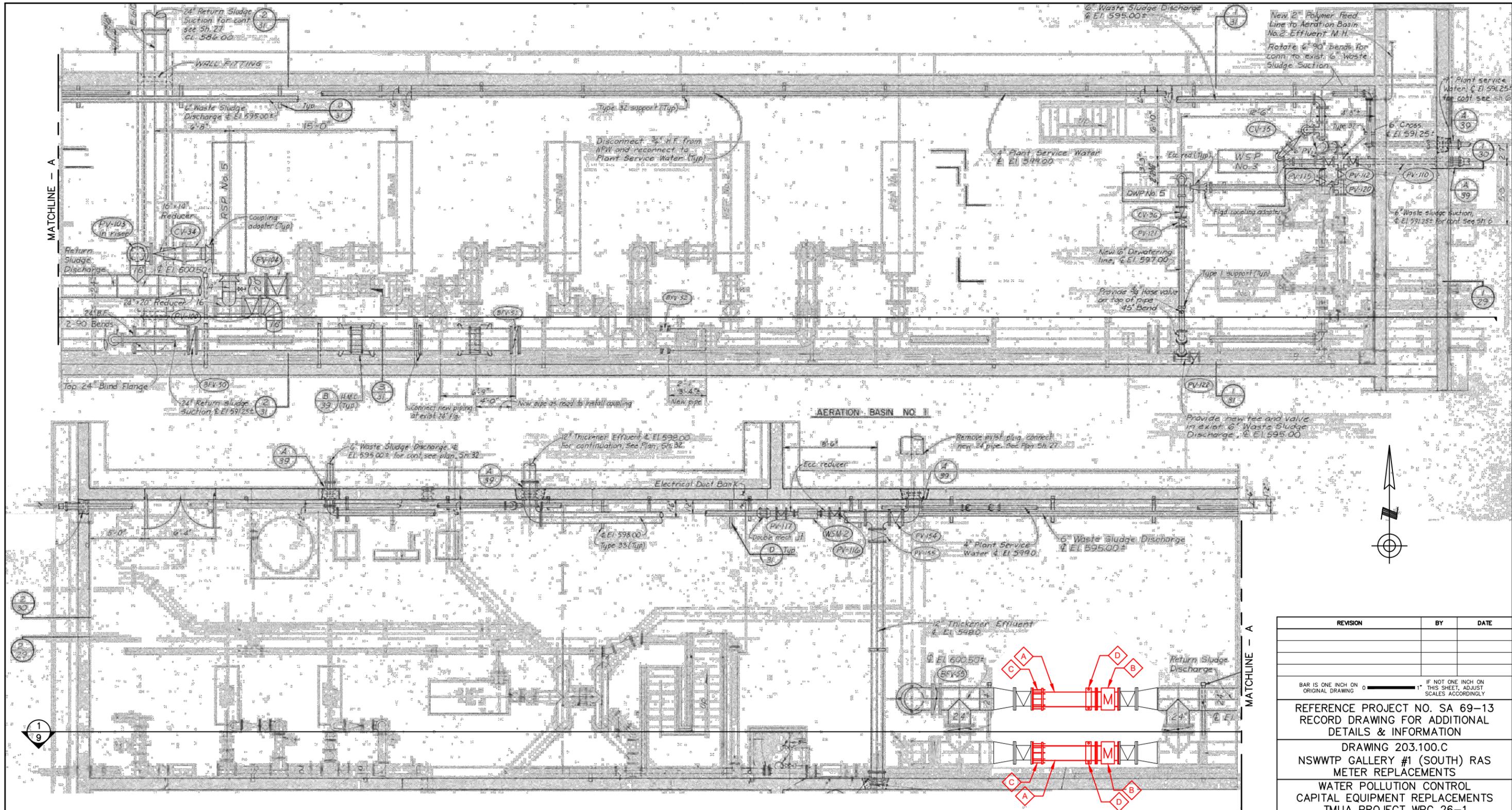
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES
PREPARED BY: HOLLOWAY, UPDIKE & BELLEN, Inc.
2001 N. MELLOW AVE., BROKEN ARROW, OKLAHOMA 74002
918-258-0777, FAX 918-258-0764

PLAN SCALE:	DRAWN	CMW	
	DESIGNED	TJR	
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EQUIPMENT SCHEDULE						
ID	QTY	DESCRIPTION	MANUFACTURER	MODEL/STYLE	SIZE	DETAILS
⬠	2	FLGxPE SPOOL			16"	PROTECTO 401 LINED
⬠	2	MAGNETIC FLOW METER	ENDRESS+ HAUSER, OR APPROVED EQUAL	PROMAG W 400 METER, 5W4C7F, DN750 16", 5W4C7F-4VP5/0 (5W4C7F-AAKLHP5D HW1KGA+CBE8)	16"	NEW REMOTE DISPLAYS, FULLY POTTED
⬠	2	FCA (REST. JT.)			16"	
⬠	2	4" SADDLE W/ U-BOLT PIPE SUPPORT	EMPIRE INDUSTRIES OR EQUAL	HDG W/ 316 SST ANCHOR BOLTS	16"	

1 8 NSWWT GALLERY #1 REPLACEMENT SECTION
NTS



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NSWWTP GALLERY #1 (SOUTH) RAS METER REPLACEMENTS
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

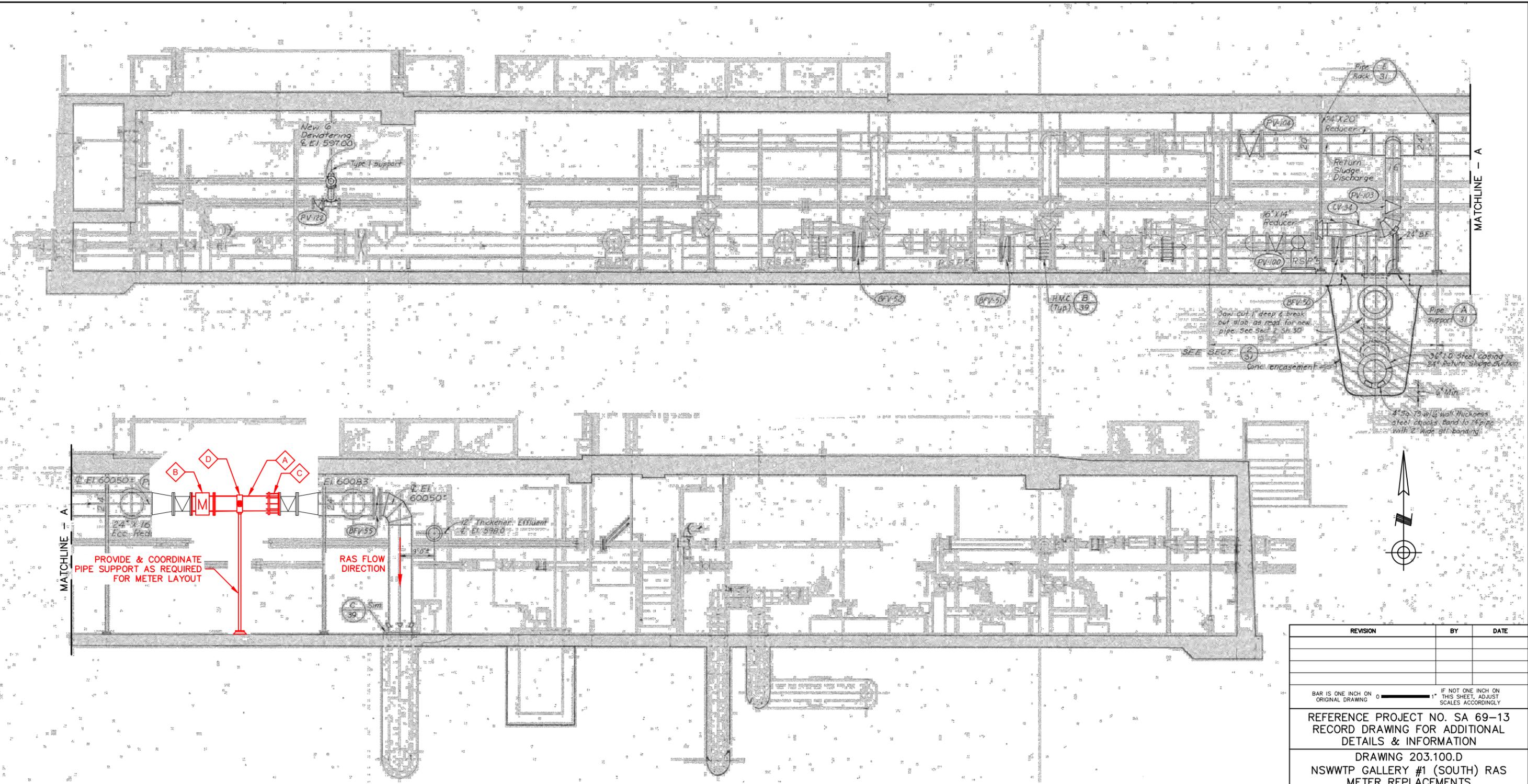
CITY OF TULSA, OKLAHOMA
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PROVIDE & COORDINATE PIPE SUPPORT AS REQUIRED FOR METER LAYOUT

RAS FLOW DIRECTION

1 NSWWTP GALLERY #1 REPLACEMENT SECTION
9 NTS

NOTES:

1. REFERENCE EQUIPMENT SCHEDULE ON PLAN SHEET 8.
2. PROTECT, REMOVE & DELIVER THE EXISTING PIPE SUPPORT TO THE CITY AS SPARE PARTS. SEE CONCRETE REPAIR DETAIL 1/36.

REVISION	BY	DATE

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DETAILS & INFORMATION

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NSWWTP GALLERY #1 (SOUTH) RAS
METER REPLACEMENTS

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

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2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
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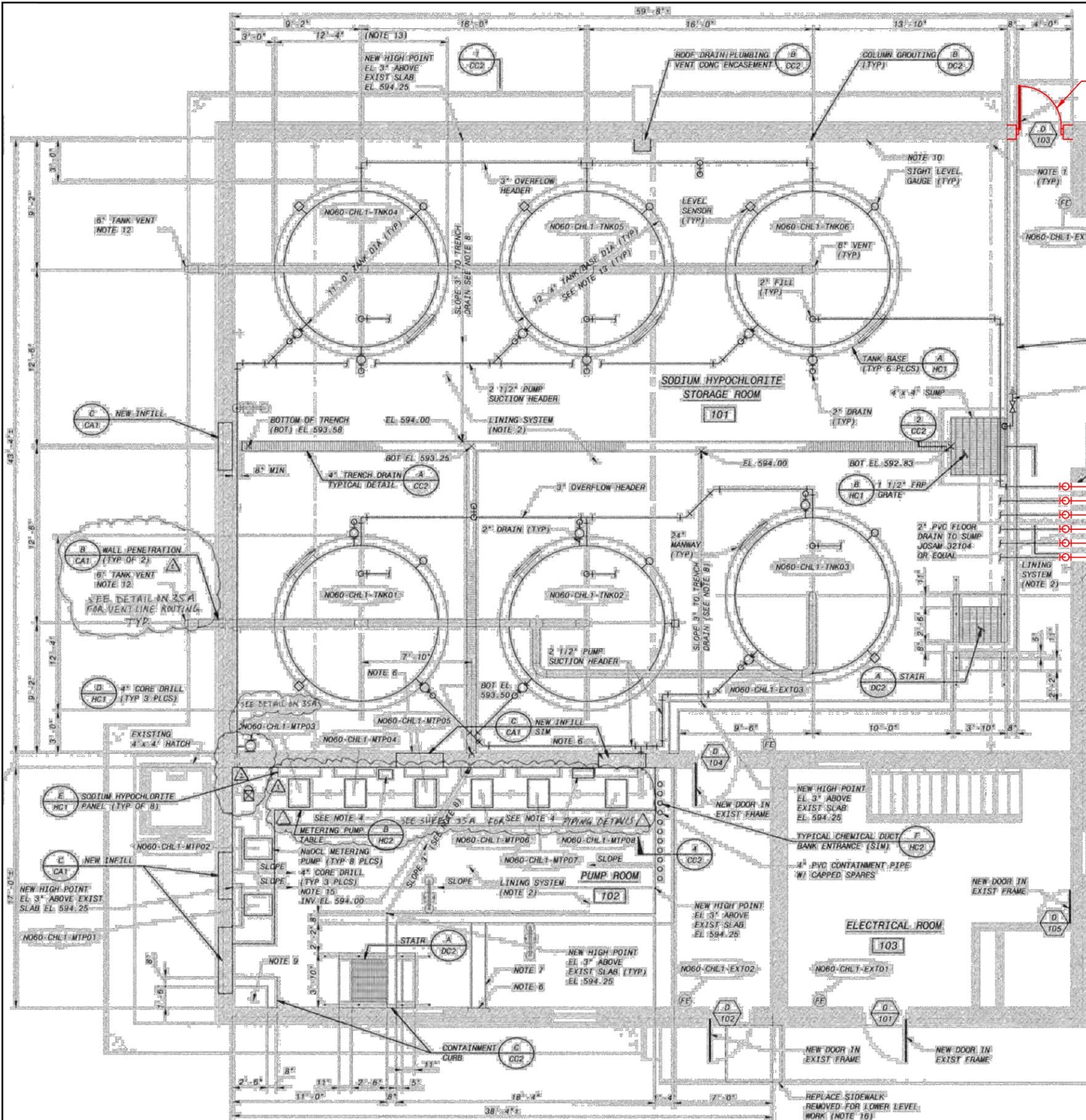
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10 PHOTO — LOOKING SOUTHWEST
NTS

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DRAWING 203.100.E NSWWTP GALLERY #1 (SOUTH) RAS METER REPLACEMENTS		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:		 HOLLOWAY, UPDIKE + BELLEN, Inc. <small>2001 N. WILLOW AVE., BROCKEN ARROW, OKLAHOMA 74002 (918) 259-0700, FAX (918) 259-0764</small>
PLAN SCALE: DRAWN DESIGNED SURVEY	CMW TJR	
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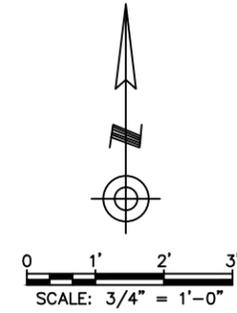


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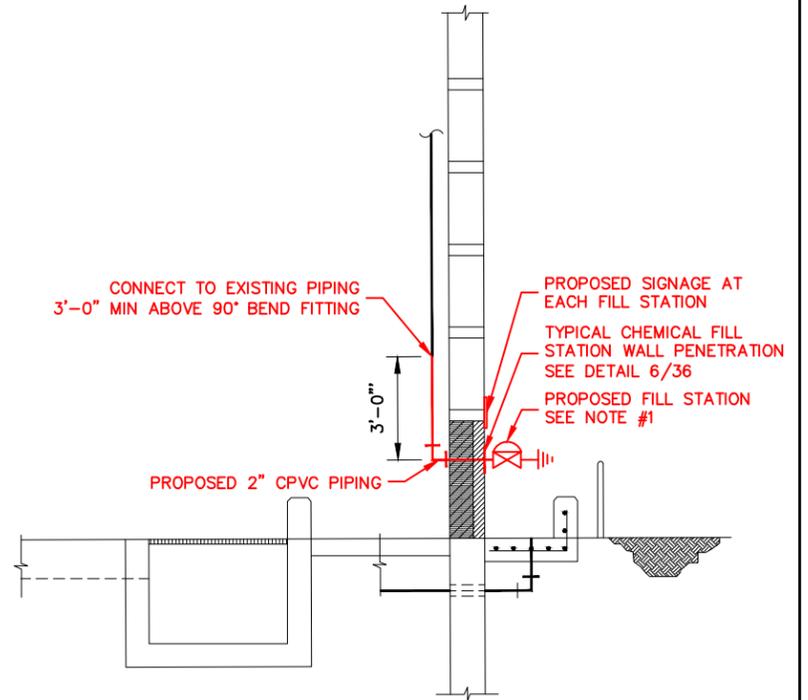


1 CHLORINATION BUILDING PLAN
SCALE: 3/4" = 1'-0"

REPLACE METAL DOOR, FRAME & HARDWARE
SEE NOTE #2.



REPLACE FILL VALVES & PIPING
SEE NOTE #1.



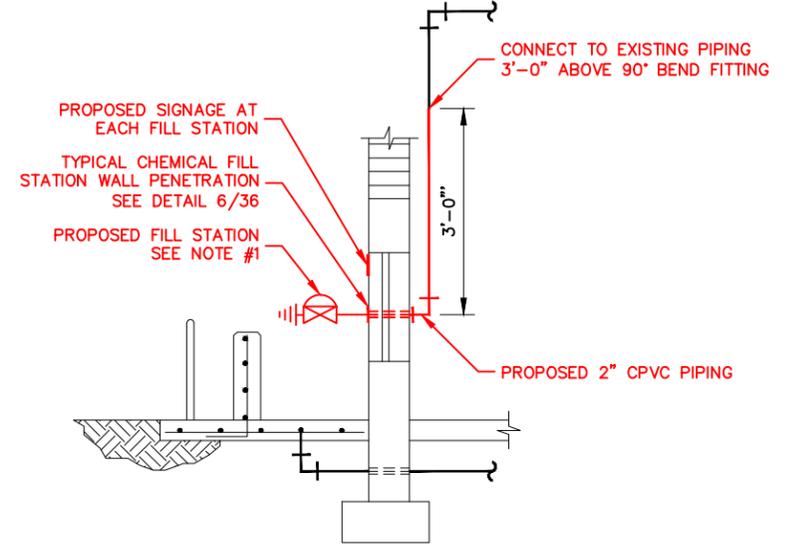
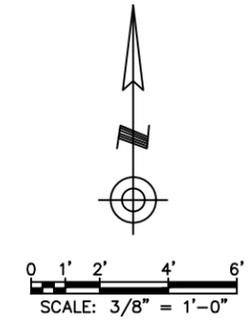
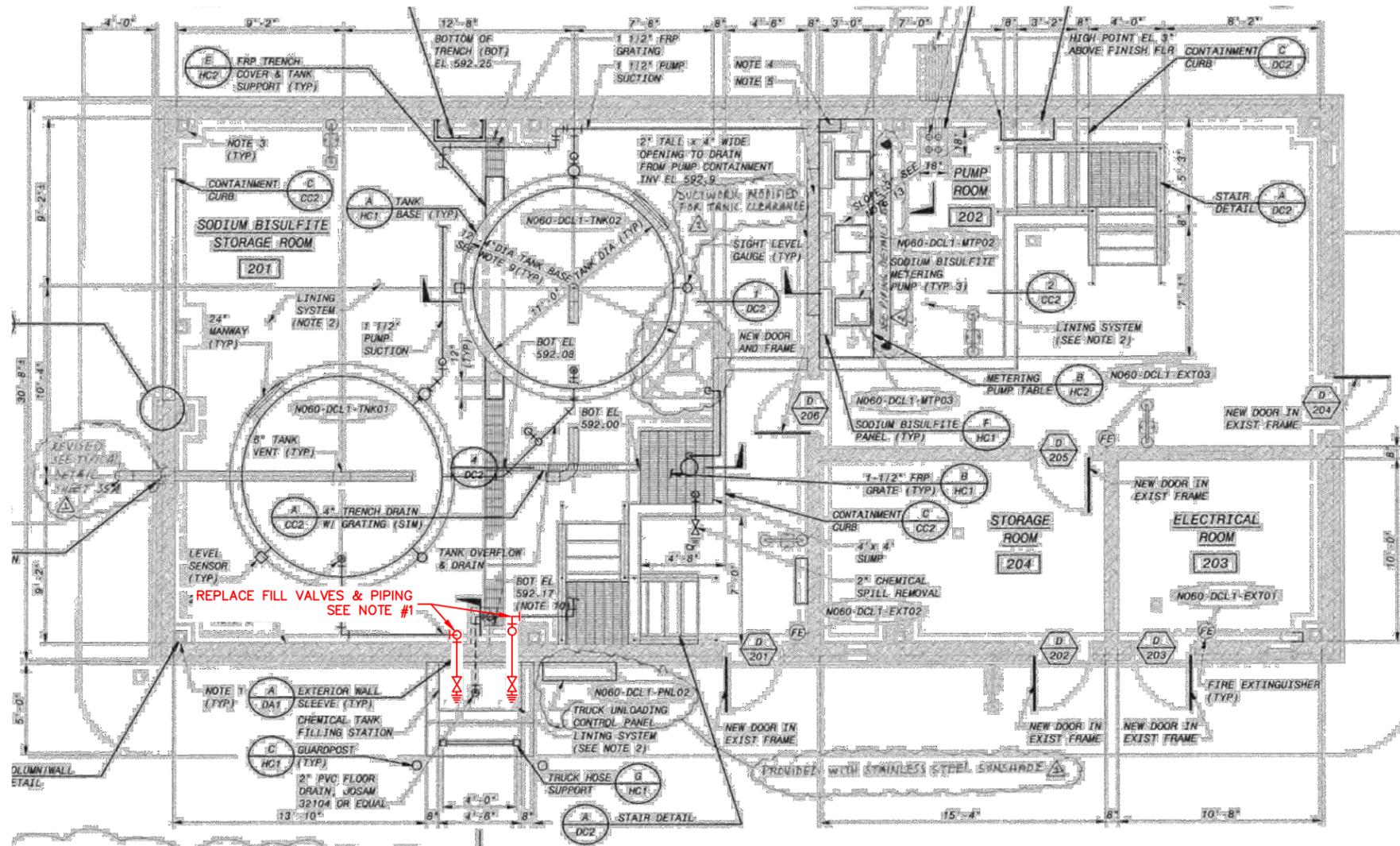
2 CHLORINATION BUILDING
FILL STATION SECTION
SCALE: 3/8" = 1'-0"

NOTES:

1. REPLACE FILL VALVES & PIPING INTO THE BUILDING 3'-0" MIN, REPLACE LINK-SEAL AND CAULK WALL. SEE DETAIL 6/36. PROVIDE GEORG FISCHER, DIAPHRAGM VALVE WITH EPDM SEALS, TRUE UNION, TYP.
2. REPLACE FRP DOOR, FRAME & HARDWARE WITH 316 SST DOOR SET, PANIC BAR & CLOSURE. PROVIDE SPECIAL ALUMINUM PIANO HINGE, FULL HEIGHT. FRP DOOR AND FRAMES SHALL BE CHEM-PROOF CP1 OR EQUAL.

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DRAWING 203.350.A NSWWTP CHEMICAL FILL STATION REHABILITATION		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:		HOLLOWAY, UPDIKE + BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74002 918.259-0770, FAX 918.259-0764
PLAN SCALE: 1/4" = 1'-0"	DRAWN DESIGNED SURVEY	CMW TJR
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2 DECHLORINATION BUILDING
FILL STATION SECTION
SCALE: 3/4" = 1'-0"

1 DECHLORINATION BUILDING PLAN
SCALE: 3/8" = 1'-0"

- NOTES:
1. REPLACE FILL VALVES & PIPING INTO THE BUILDING 3'-0" MIN, REPLACE LINK-SEAL AND CAULK WALL. SEE DETAIL 6/36. PROVIDE GEORG FISCHER, DIAPHRAGM VALVE WITH EPDM SEALS, TRUE UNION, TYP.

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NSWWTP CHEMICAL FILL STATION REHABILITATION

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74002
918-258-0770, FAX 918-258-0764

PLAN SCALE: 1/4" = 1'-0"	DRAWN	CMW
	DESIGNED	TJR
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A
13 NTS
CHLORINATION BUILDING, SODIUM HYPOCHLORITE FILL STATION EXTERIOR



B
13 NTS
DECHLORINATION BUILDING, SODIUM BISULFATE FILL STATION EXTERIOR



C
13 NTS
CHLORINATION BUILDING, SODIUM HYPOCHLORITE FILL STATION INTERIOR



D
13 NTS
DECHLORINATION BUILDING, SODIUM BISULFATE FILL STATION INTERIOR



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WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

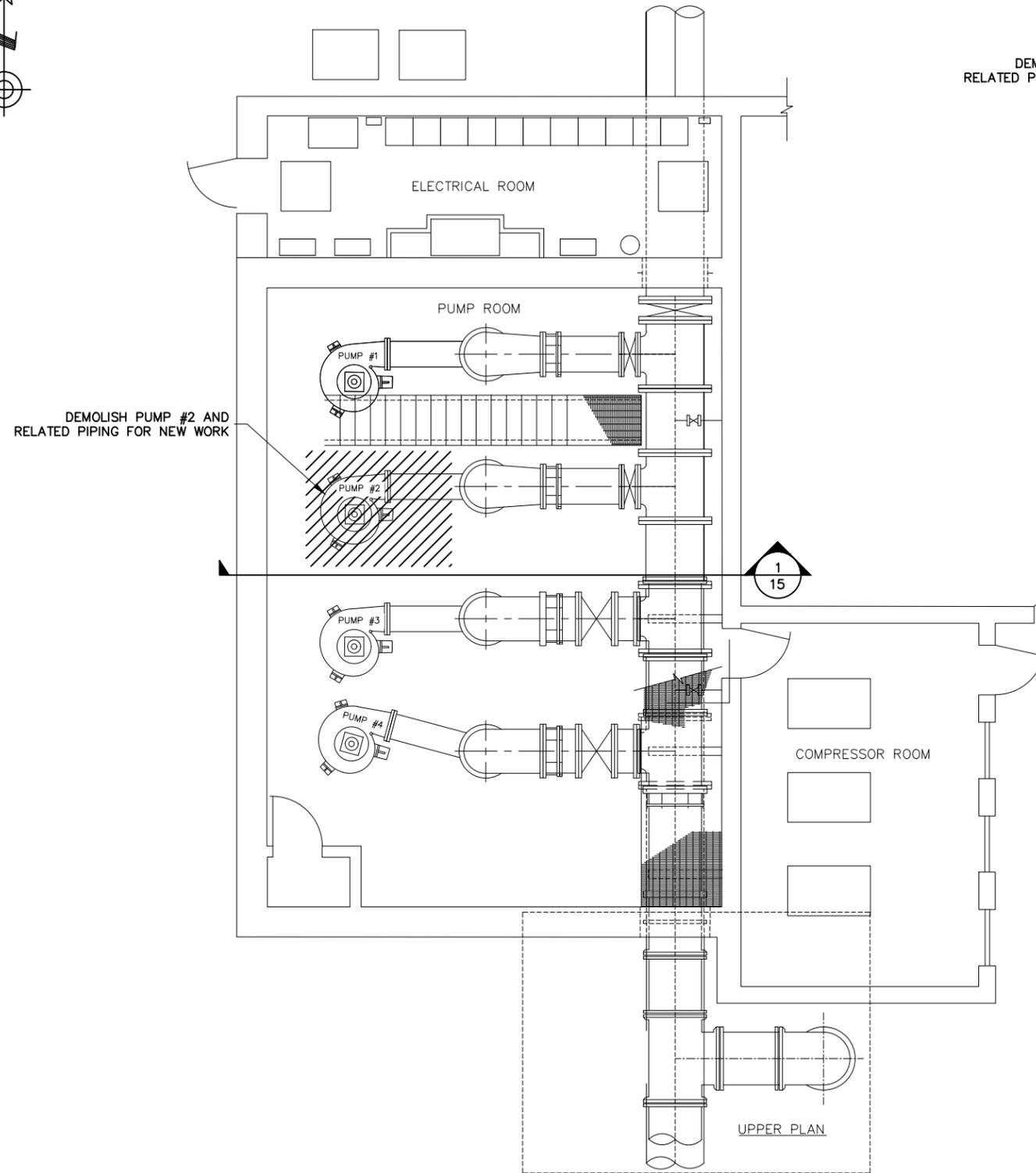
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1 SSWWTP MAIN LIFT STATION – UPPER LEVEL PIPING DEMOLITION PLAN
14 SCALE: 1/4" = 1'-0"

DEMOLISH PUMP #2 AND RELATED PIPING FOR NEW WORK



A PHOTO – EXISTING MAIN LIFT STATION
14 SCALE: 1/8" = 1'-0"

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SSWWTP MAIN LIFT STATION PUMP #2 DEMOLITION PLAN

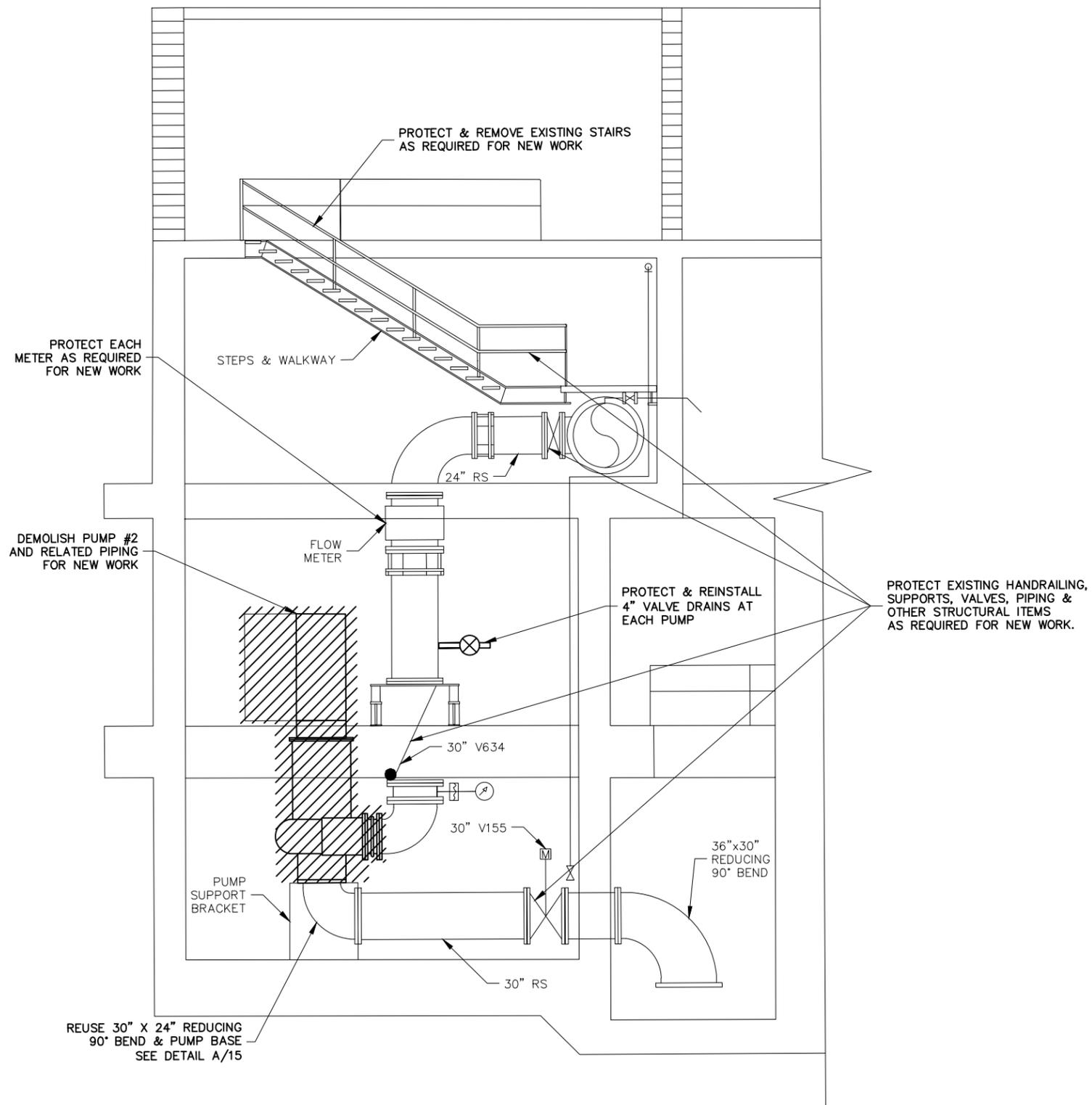
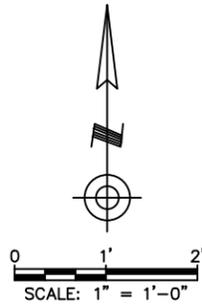
WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

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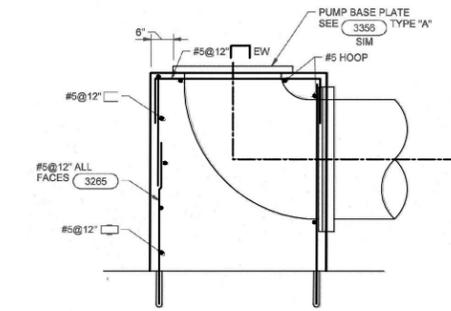
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NOTES:

1. DEMOLISH PUMP, MOTOR AND FRAME AS REQUIRED FOR NEW WORK. PROTECT AND USE THE EXISTING ANCHOR BOLTS AND CONCRETE PUMP PADS ON EITHER SIDE OF THE PUMP(S). REUSE THE EXISTING REDUCING SUCTION 90 BEND FITTING AND SUCTION PIPING TO EXTENT POSSIBLE WITH NEW BOLT SETS AND GASKETS.
2. PROVIDE GALVANIZED BOLT SETS AT PIPING CONNECTIONS AND NEW ANCHOR BOLT NUTS.
3. WARNING – PROTECT THE EXISTING SURROUNDING ELECTRICAL DEVICES, PLUMBING AND OTHER SURROUNDING EXISTING EQUIPMENT. AREA EQUIPMENT IS VITAL TO THE OPERATIONS OF THE MAIN LIFT STATION AT SOUTHSIDE AND ALL NECESSARY PRECAUTIONS SHOULD BE TAKEN.
4. COORDINATE THE PUMP REPLACEMENT(S) WITH PLANT OPERATIONS AND DURING LOW FLOW CONDITIONS. MAINTAIN THREE (3) PUMPS IN SERVICE AT ALL TIMES.
5. CITY SALVAGED ITEMS – PALLETIZE THE PUMP, MOTOR, & ROTATING ASSEMBLY AND DELIVER IT TO THE CITY WITHIN SSWWTP. PROVIDE CUSTOM, STURDY SUITABLE METAL PALLETS FOR THE PUMP, MOTOR AND PARTS INDIVIDUALLY.



NOTE - RECORD DRAWING SHOWN FOR INFORMATION PURPOSES

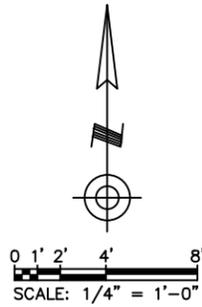
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EXISTING PUMP BASE

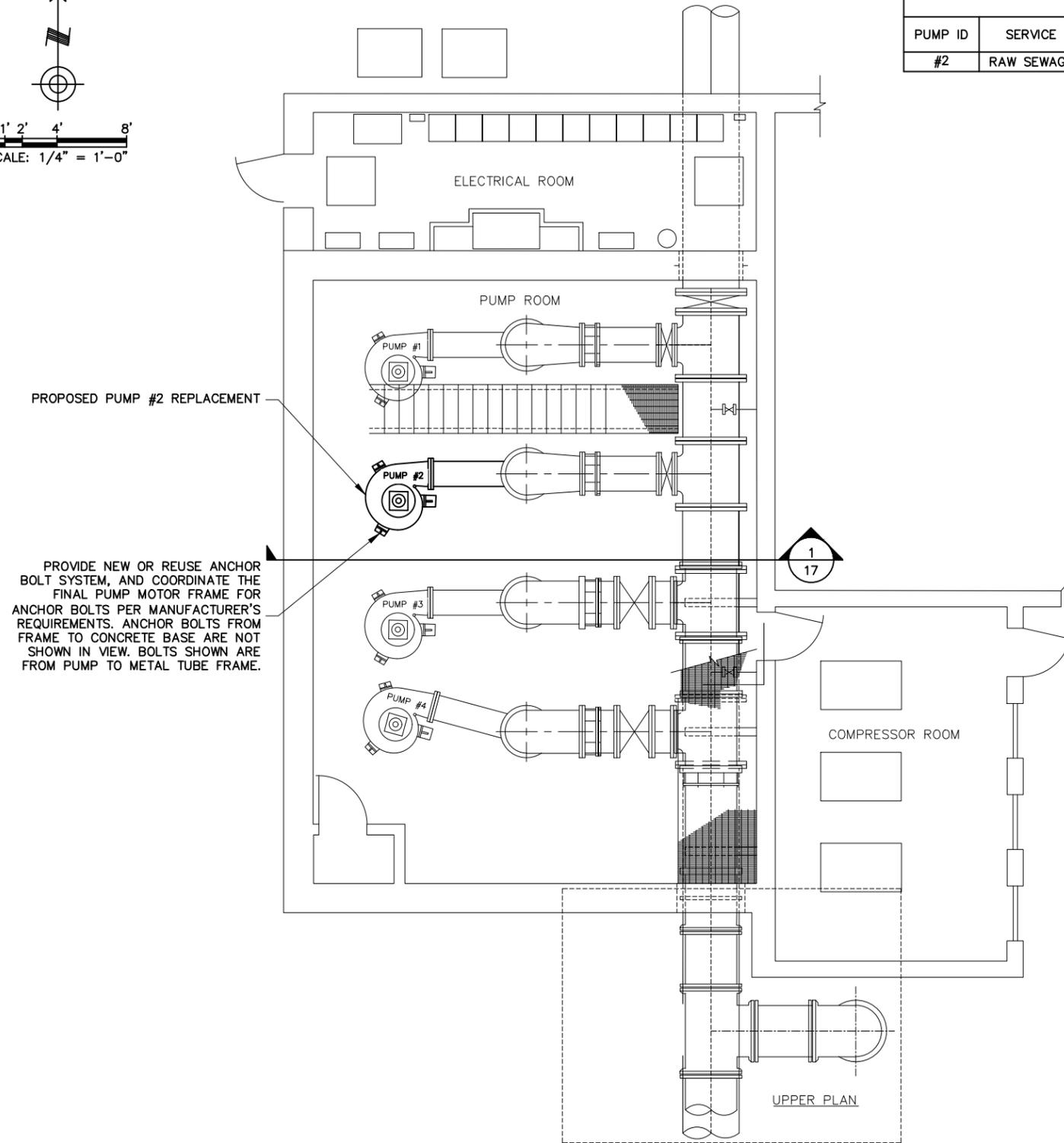
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DRAWING 203.400.B SSWWTP MAIN LIFT STATION PUMP #2 DEMOLITION SECTIONS		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:  HOLLOWAY, UPDIKE + BELLEN, Inc. 2001 N WILLOW AVE, BROCKEN ARROW, OKLAHOMA 74002 (918)298-0770, FAX (918)298-0764		
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1
15
SSWWTP MAIN LIFT STATION PIPING SECTION (SECTION AT PUMP #2)
SCALE: 1"=1'-0"



PROPOSED PUMP INFORMATION												
PUMP ID	SERVICE	DRIVE	CAPACITY (GPM)	TDH (FT)	MIN% EFFICIENCY	HP	VOLTAGE	PHASE	HZ	SPEED (RPM)	DISCHARGE (IN)	SUCTION (IN)
#2	RAW SEWAGE	VARIABLE	19,500	40	85	250	460	3	60	600	24	24



1 SSWWTP MAIN LIFT STATION - UPPER LEVEL PIPING PLAN
 16 SCALE: 1/4"=1'-0"

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WATER POLLUTION CONTROL
 CAPITAL EQUIPMENT REPLACEMENTS
 TMUA PROJECT WPC 26-1

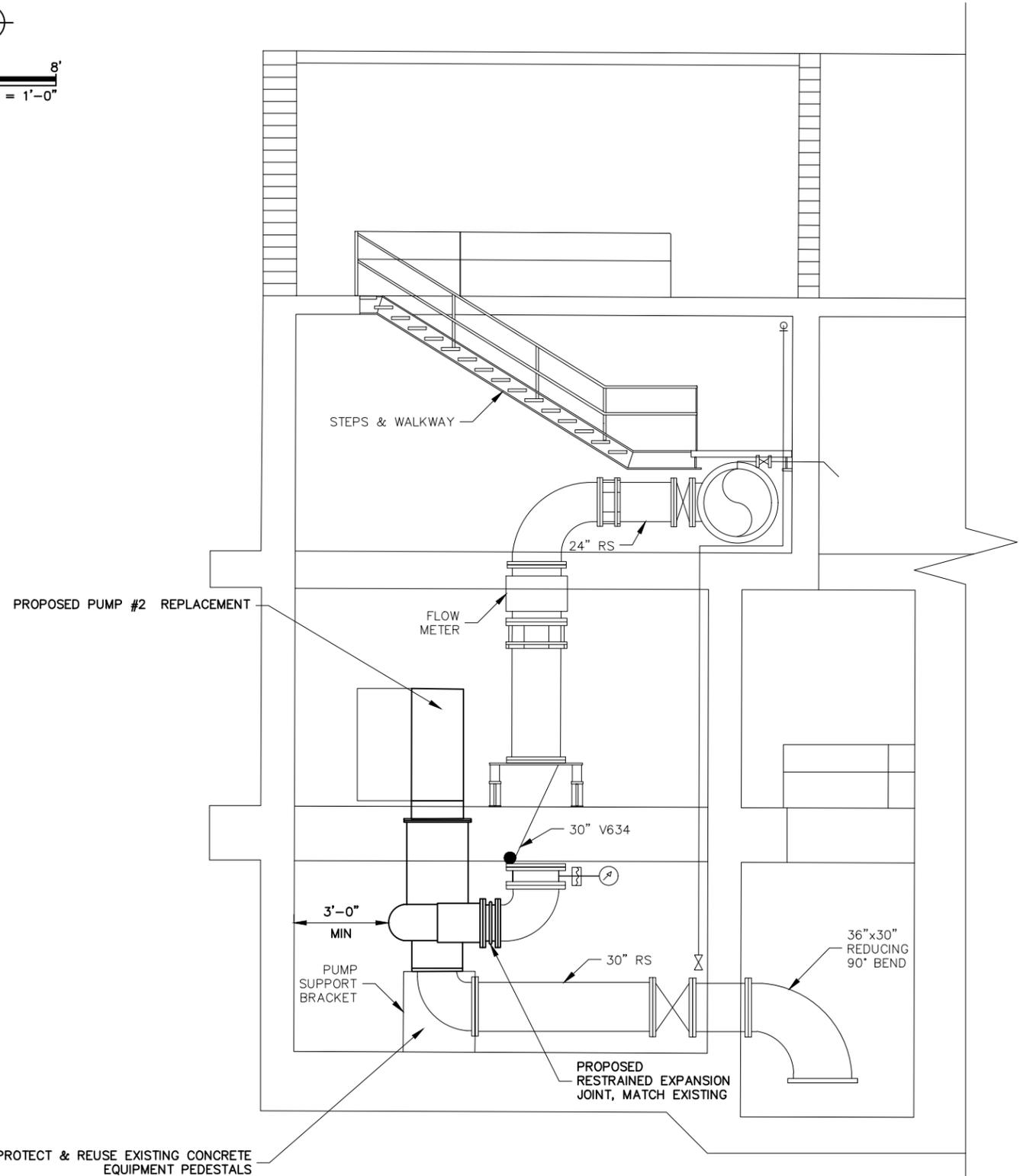
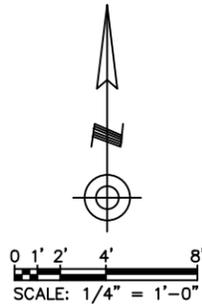
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1 SSWTP MAIN LIFT STATION PIPING SECTION
 17 SCALE: 1/4" = 1'-0"

NOTES:

1. MODIFY EXISTING PIPING AS REQUIRED. PROVIDE NEW FLANGE BY FLANGE PIPING AND FITTINGS AS SHOWN. CONTRACTOR TO INCLUDE IN THE SUBMITTAL PACKAGE COMPLETE PIPING, SUPPORT AND PUMP LAYOUT DRAWINGS WITH ALL EXISTING DIMENSIONS FOR APPROVAL WITH PUMP SUBMITTAL. ACCESS BETWEEN THE PUMP AND THE NORTH WALL SHALL NOT BE LESS THAN 36" MIN. CLEARANCE.
2. PAINT NEW PIPING TO MATCH OTHER EXISTING PIPING IN LIFT STATION. SEE SPECIFICATION SECTION 204 FOR PAINTING AND COATING REQUIREMENTS.
3. CITY HAS SALVAGE RIGHTS. DELIVER PUMP AND MOTOR PALLETIZED TO THE SSWTP MAINTENANCE BUILDING OR TO A SELECTED LOCATION AT SSWTP. PROVIDE THREE (3) HEAVY-DUTY CUSTOM DESIGNED, CONSTRUCTED AND PAINTED METAL PALLETS. A PALLET FOR THE PUMP, FRAME, AND MOTOR. EACH PALLET SHALL BE CONSTRUCTED OF 3"x1/4" ANGLE MIN, 3" CHANNEL MIN, 1/4"x2" PLATE AND/OR OTHER MATERIALS RATED FOR LONG TERM STORAGE AND MOVING OF THE SALVAGED MATERIALS. COORDINATE ANY FINAL DETAILS WITH THE MANUFACTURER'S RECOMMENDATIONS FOR PERMANENT STORAGE.
4. PROVIDE NEW GASKETS, RODS, BOLTS, AND SUPPORTS AT AREAS OF NEW WORK.
5. ALL BRACKETS, SUPPORTS, ANCHOR BOLTS, FASTENERS AND RELATED ITEMS SHALL BE 316 STAINLESS STEEL.
6. ALL NEW PIPING PROVIDED SHALL BE PROTECTO 401 LINED DUCTILE IRON PIPE, CLASS 53.
7. RECONNECT EXISTING SEAL WATER PIPING AND APPURTENANCES.

ELECTRICAL NOTES:

1. REUSE EXISTING PUMP FEEDERS.
2. FURNISH AND INSTALL NEW RDT CONDUIT AND WIRING FROM NEW MOTOR AND BEARINGS TO EXISTING PLC. 10(RDT CABLES)3"C. COORDINATE RDT CABLE TYPE WITH RDT'S SUPPLIED WITH MOTOR.
3. FURNISH AND INSTALL NEW RDT INPUT MODULES IN EXISTING PLC. CONFIGURE RDT MODULES AND INTEGRATE NEW RDT'S INTO EXISTING SCADA SYSTEM. COORDINATE RDT INPUT MODULE WITH RDT'S SUPPLIED WITH MOTOR. CONFIGURE ALARMS AS DIRECTED BY OWNER.
4. FURNISH AND INSTALL NEW CONDUIT AND WIRE AND INSTALL A NEW VIBRATION SWITCH. CONFIGURE VIBRATION SWITCH AND INTEGRATE INTO EXISTING SCADA SYSTEM. CONFIGURE ALARMS AS DIRECTED BY OWNER.

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WATER POLLUTION CONTROL
 CAPITAL EQUIPMENT REPLACEMENTS
 TMUA PROJECT WPC 26-1

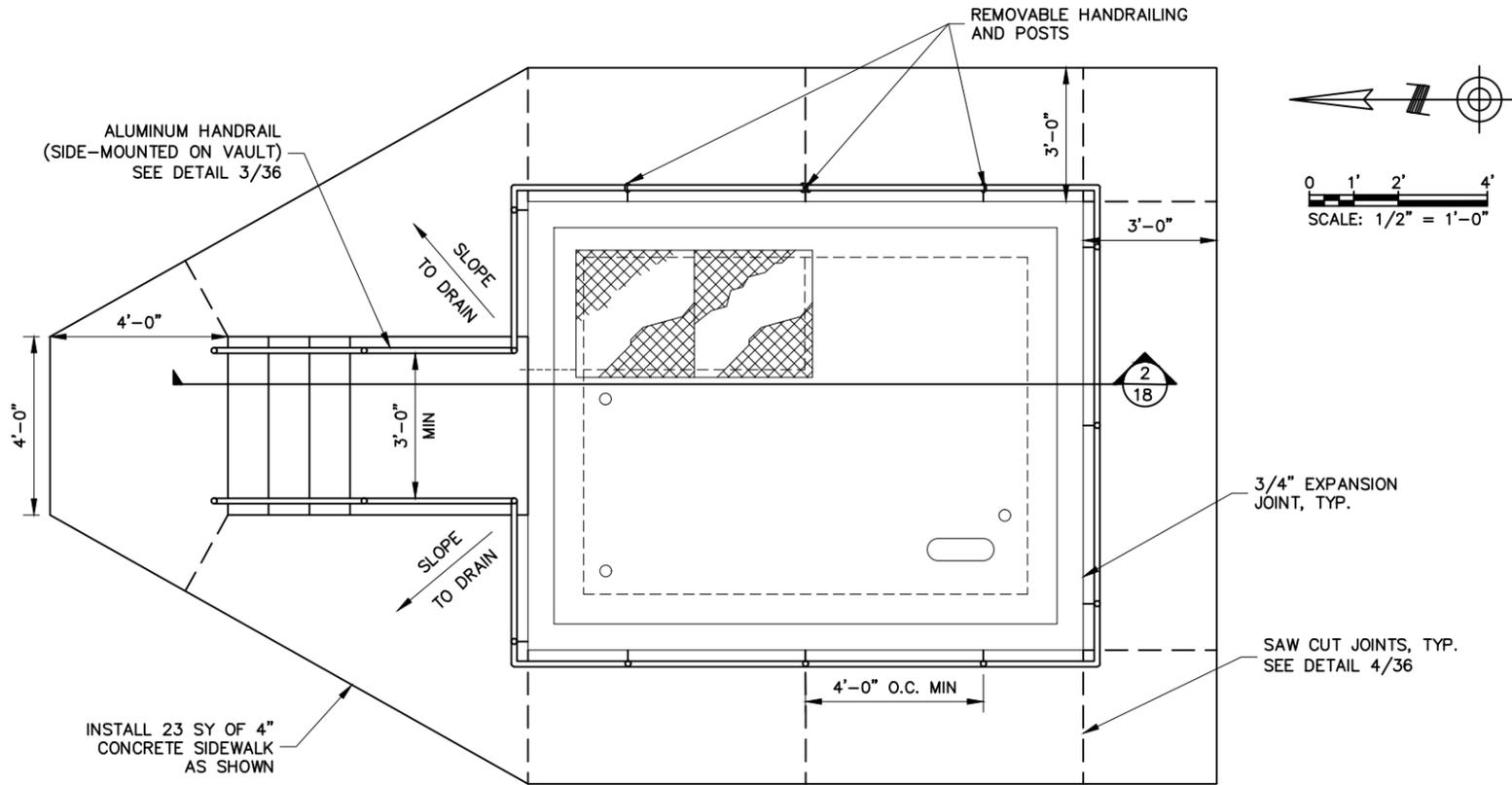
CITY OF TULSA, OKLAHOMA
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 2001 N. WILLOW AVE., BROCKTON AVE. OKLAHOMA 74102
 (918)291-0777, FAX (918)291-0764

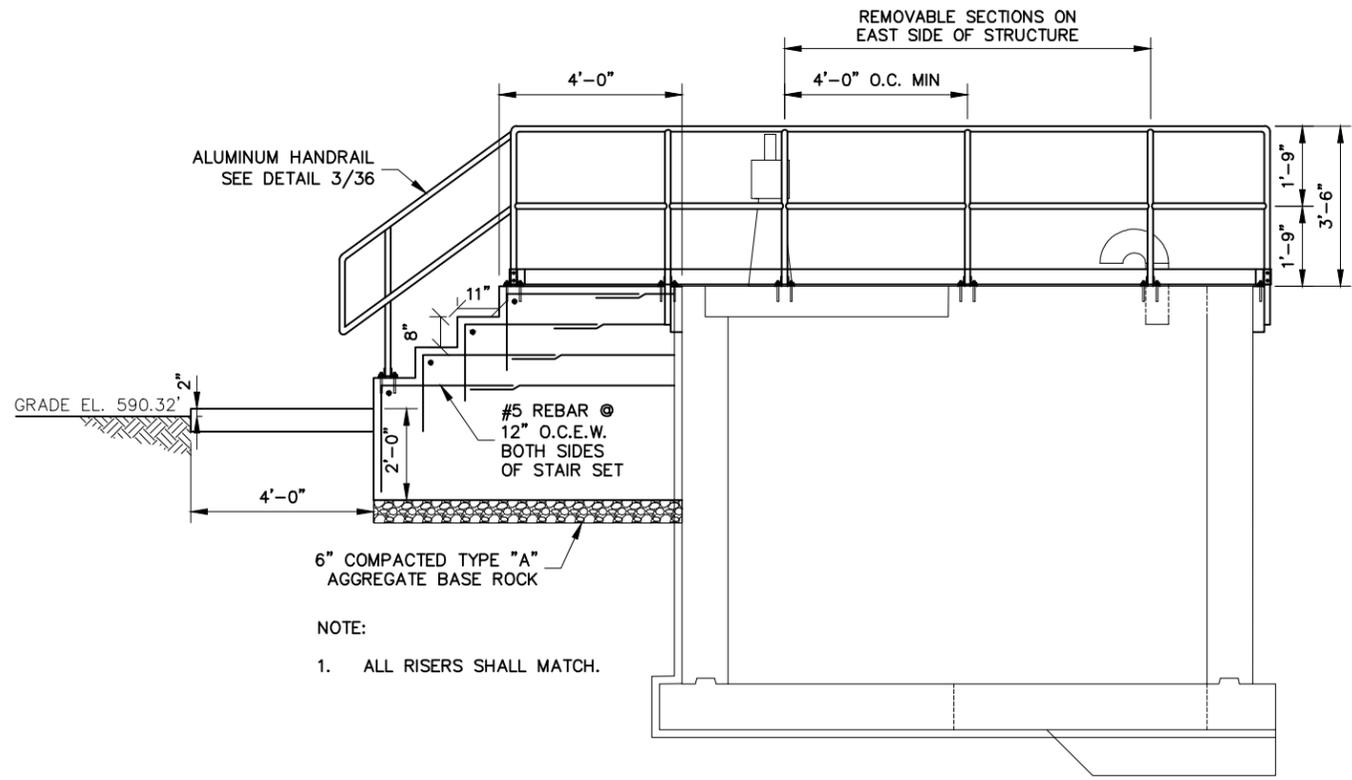
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1 WAS METER VAULT PLAN
SCALE: 1/2" = 1'-0"



2 WAS METER VAULT SECTION
SCALE: 1/2" = 1'-0"

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REFERENCE ORIGINAL PROJECT ES-2006-01 RECORD DRAWINGS FOR ADDITIONAL DETAILS & INFORMATION

DRAWING 203.600.A
LBCWWTP WAS METER VAULT REHABILITATION

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

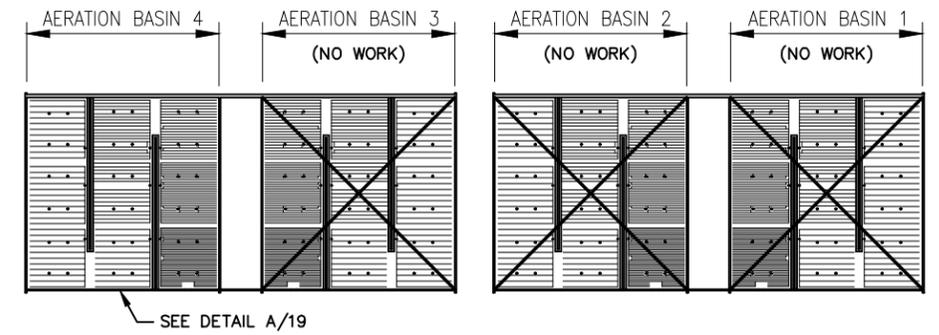
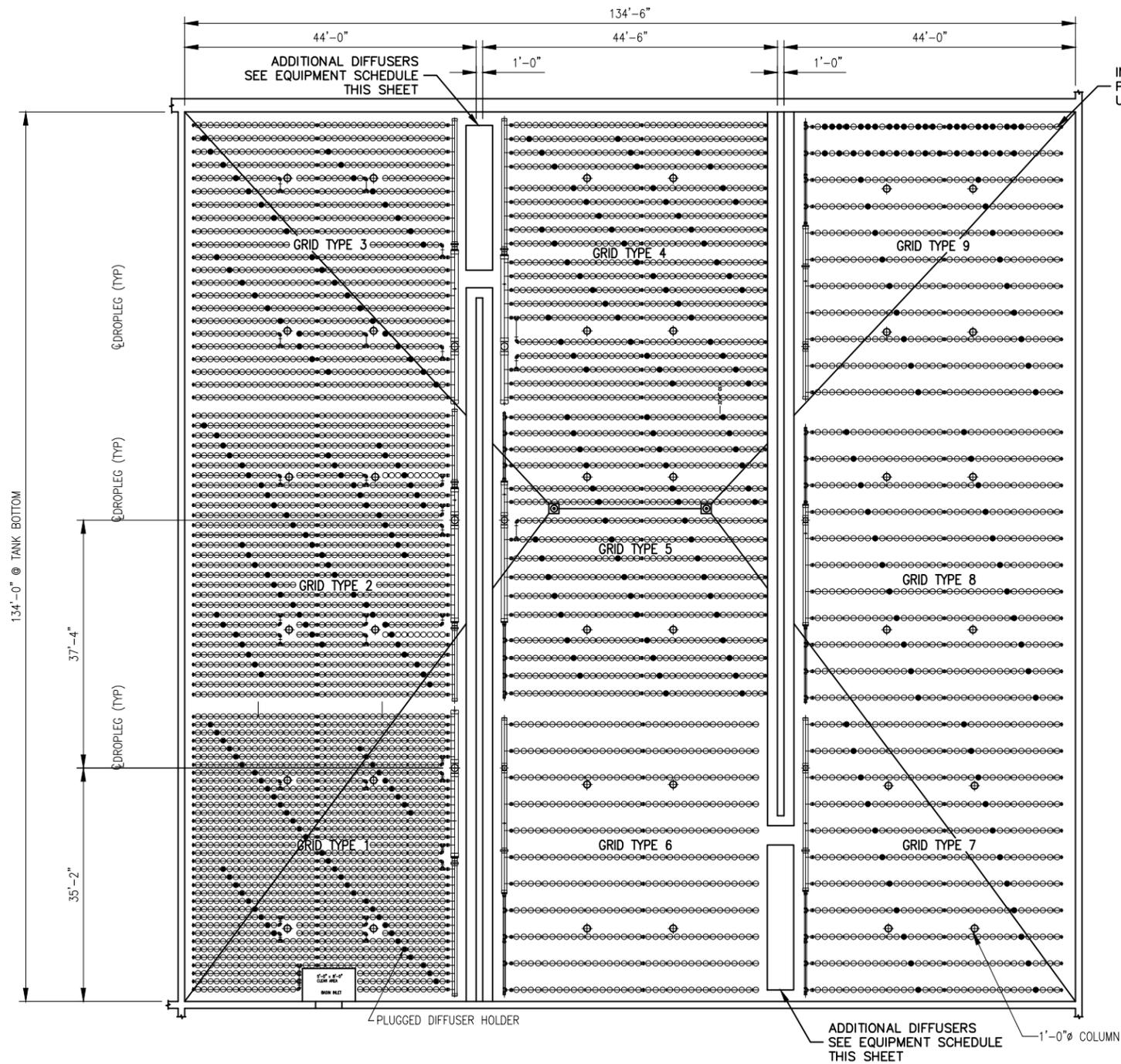
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2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012
918-258-0770, FAX 918-258-0764

PLAN SCALE:	DRAWN	CMW
	DESIGNED	TJR
	SURVEY	
PROFILE SCALE:	PROJ. MGR.	
HORIZONTAL:	LEAD ENGR.	
	FIELD MGR.	
VERTICAL:		
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B
19 NTS
AERATION BASIN 1-4

EQUIPMENT SCHEDULE				
BASE NAME	AERATION ZONES PER BASIN	FINE BUBBLE EPDM MEMBRANE DIFFUSERS PER ZONE	DIFFUSERS PER BASIN	DETAILS/SPARE
AERATION BASIN	9	VARIES	5850	PROVIDE CITY W/ UNUSED AS SPARE MATERIALS
SPECIAL INSTALLATION TOOL	N/A	N/A	N/A	PROVIDE THREE FOR INSTALLATION & CITY SPARES.

A
19 SCALE: 3/32" = 1'-0"
AERATION BASIN (BASIN #3 SHOWN, #4 SIMILAR)

REVISION	BY	DATE

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SSWWTP AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN AUTHORITY
WATER AND SEWER DEPARTMENT

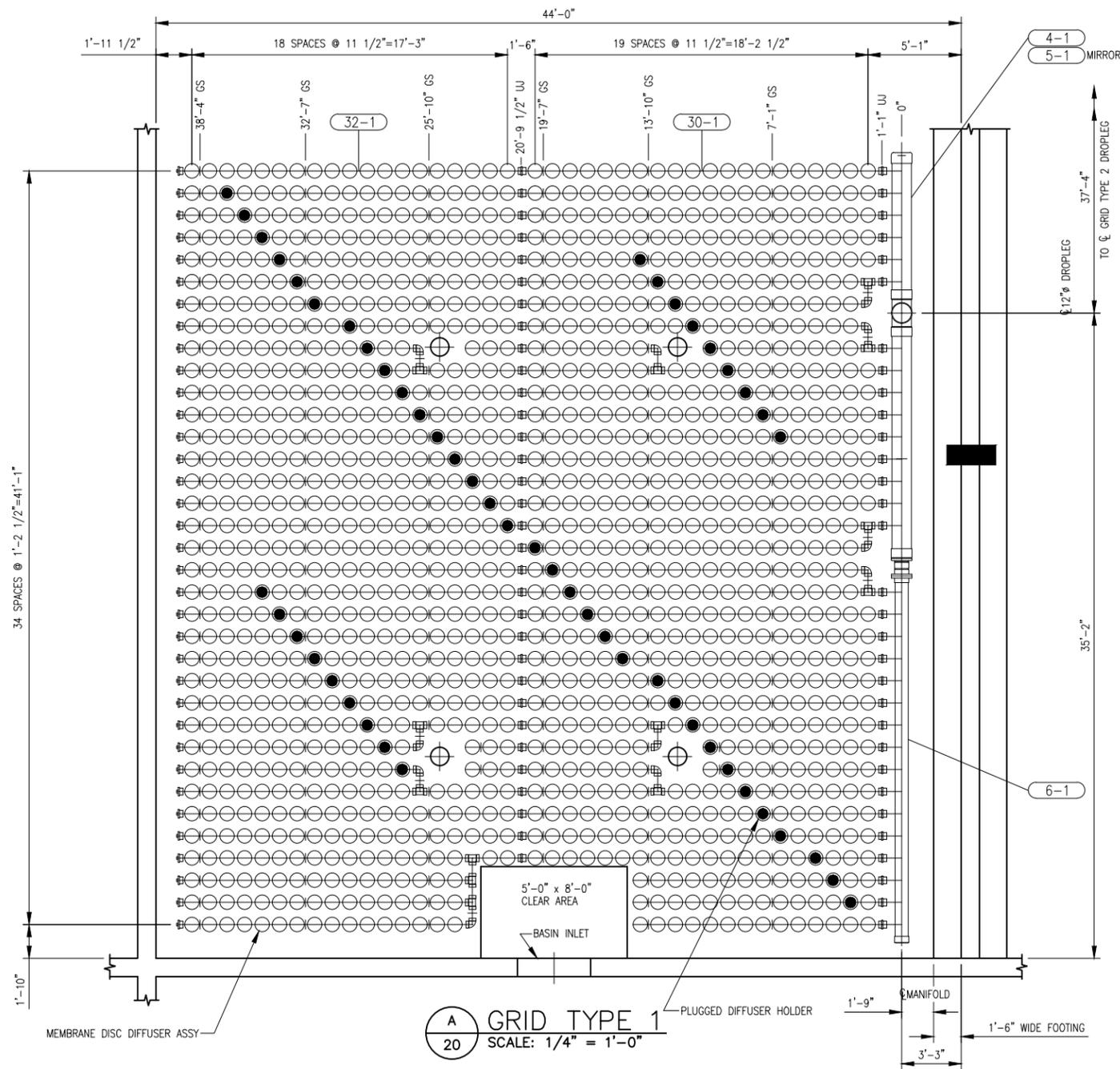
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918.258-0777, FAX 918.258-0764

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VARIABLES	DESIGNED	TJR
	SURVEY	
PROFILE SCALE:	PROJ. MGR.	
HORIZONTAL:	LEAD ENGR.	
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ATLAS PAGE NO: ---		SHEET 19 OF 39 SHEETS



NOTES:

1. SEE EQUIPMENT REPLACEMENT SCHEDULE & NOTES ON PLAN SHEET 19
2. SOME INFORMATION SHOWING PIPING & BASIN STRUCTURE SHOWN FOR INFORMATIONAL PURPOSE.



LEGEND
 UJ- UNION JOINT ASSY
 SEE DOCUMENT #UJA-40000-P
 GS- 5/16"Ø GUIDE SUPPORT ASSY
 SEE DOCUMENT #GSA-31B18-4
 ASSEMBLY #GSB-31813-4
 FOR TYPICAL AIR HEADER SECTION
 SEE DETAIL SHEET 20

**GRID TYPE 1
 GRID INFORMATION**
 4- TANK(S)
 1- GRID(S) PER TANK
 35- AIR HEADERS PER GRID
 VARIES- DIFFUSER HOLDERS PER AIR HEADER
 1305- DIFFUSER HOLDERS PER GRID
 VARIES- DIFFUSERS INSTALLED PER AIR HEADER
 1254- DIFFUSERS INSTALLED PER GRID
 5016- TOTAL DIFFUSERS INSTALLED

NOTE:
 QUANTITY OF DIFFUSER HOLDERS (1305) IS PER
 THE GRID LAYOUT AS SHOWN. ACTUAL
 QUANTITY MAY VARY SLIGHTLY DEPENDING
 ON LOCATIONS OF COLUMNS.

REVISION	BY	DATE

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SSWWTP AERATION BASIN #4 DIFFUSER & LOCKING RING REPLACEMENT
WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

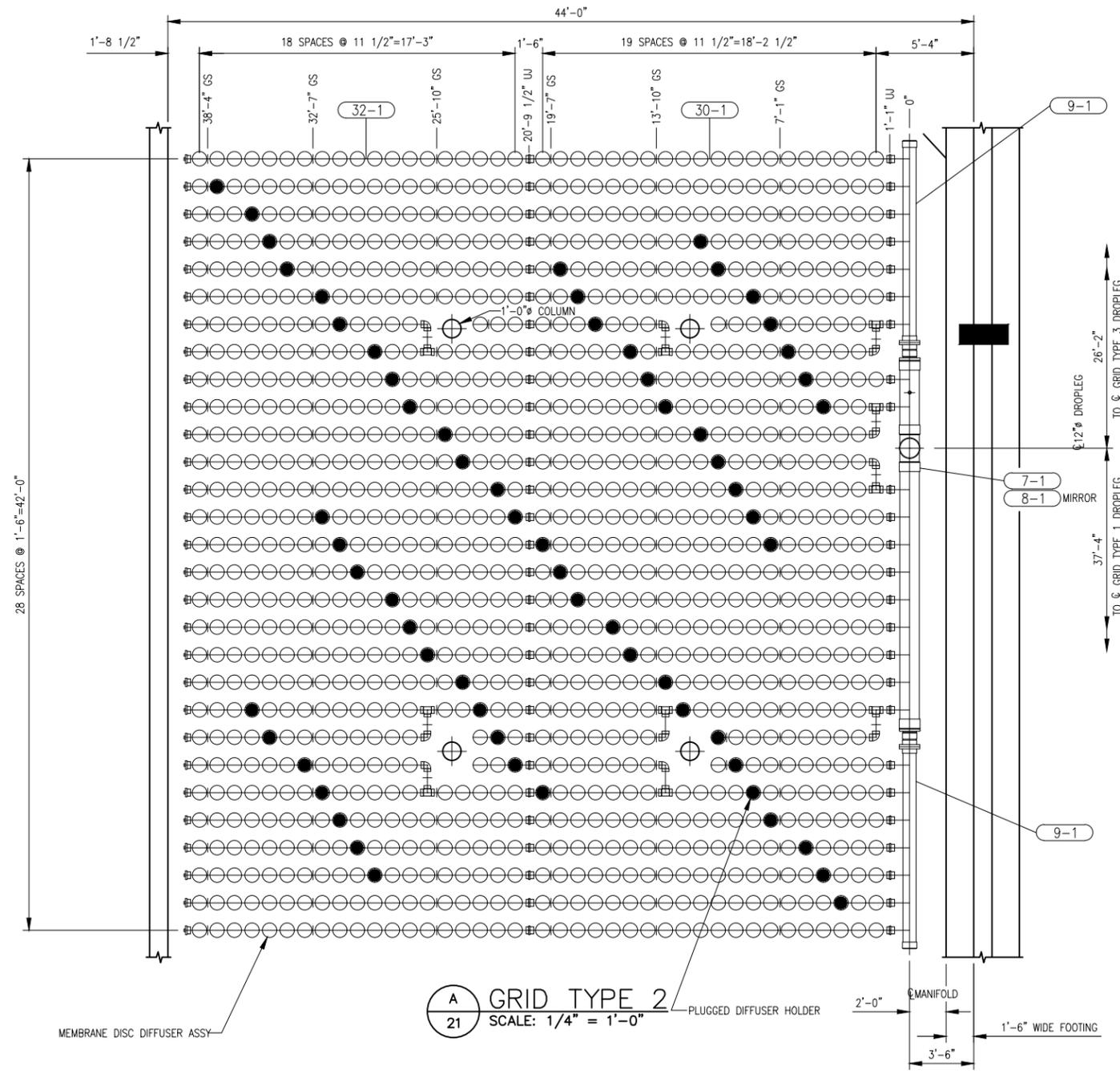
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 (918)228-0770, FAX (918)228-0764

PLAN SCALE:	DRAWN	CMW
VARIES	DESIGNED	TJR
	SURVEY	
PROFILE SCALE:	PROJ. MGR.	
HORIZONTAL:	LEAD ENGR.	
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NOTES:

1. SEE EQUIPMENT REPLACEMENT SCHEDULE & NOTES ON PLAN SHEET 19
2. SOME INFORMATION SHOWING PIPING & BASIN STRUCTURE SHOWN FOR INFORMATIONAL PURPOSE.



LEGEND
 UJ- UNION JOINT ASSY
 SEE DOCUMENT #UJA-40000-P
 GS- 5/16"Ø GUIDE SUPPORT ASSY (UNLESS OTHERWISE SPECIFIED)
 SEE DOCUMENT #GSA-31B18-4
 ASSEMBLY #GSB-31813-4
 FOR TYPICAL AIR HEADER SECTION
 SEE DETAIL SHEET 20

**GRID TYPE 2
 GRID INFORMATION**
 4- TANK(S)
 1- GRID(S) PER TANK
 29- AIR HEADERS PER GRID
 VARIES- DIFFUSER HOLDERS PER AIR HEADER
 1099- DIFFUSER HOLDERS PER GRID
 VARIES- DIFFUSERS INSTALLED PER AIR HEADER
 1036- DIFFUSERS INSTALLED PER GRID
 4144- TOTAL DIFFUSERS INSTALLED

NOTE:
 QUANTITY OF DIFFUSER HOLDERS (1099) IS PER
 THE GRID LAYOUT AS SHOWN. ACTUAL
 QUANTITY MAY VARY SLIGHTLY DEPENDING
 ON LOCATIONS OF COLUMNS.

A GRID TYPE 2
 21 SCALE: 1/4" = 1'-0"
 PLUGGED DIFFUSER HOLDER

REVISION	BY	DATE

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 TMUA PROJECT WPC 26-1
 CITY OF TULSA, OKLAHOMA
 TULSA METROPOLITAN UTILITY AUTHORITY
 WATER AND SEWER DEPARTMENT

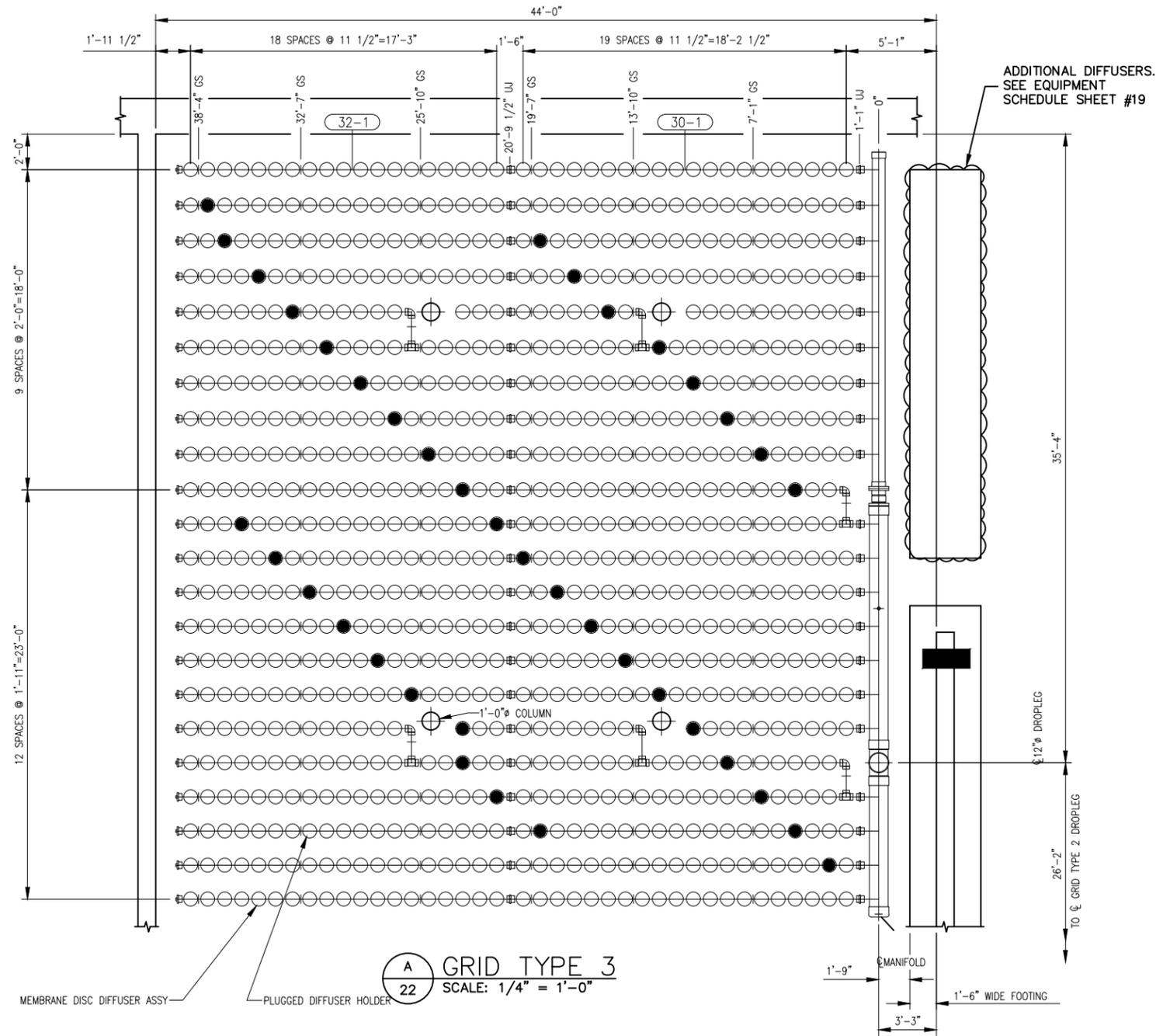
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PLAN SCALE:	DRAWN	CMW	
VARIES	DESIGNED	TJR	
	SURVEY		
PROFILE SCALE:	PROJ. MGR.		
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	FIELD MGR.		
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NOTES:

1. SEE EQUIPMENT REPLACEMENT SCHEDULE & NOTES ON PLAN SHEET 19
2. SOME INFORMATION SHOWING PIPING & BASIN STRUCTURE SHOWN FOR INFORMATIONAL PURPOSE.



LEGEND

UJ- UNION JOINT ASSY
SEE DOCUMENT #UJA-40000-P

GS- 5/16"Ø GUIDE SUPPORT ASSY (UNLESS OTHERWISE SPECIFIED)
SEE DOCUMENT #GSA-31B18-4
ASSEMBLY #GSB-31813-4

FOR TYPICAL AIR HEADER SECTION
SEE DETAIL SHEET 20

**GRID TYPE 3
GRID INFORMATION**

4- TANK(S)
1- GRID(S) PER TANK
22- AIR HEADERS PER GRID
VARIES- DIFFUSER HOLDERS PER AIR HEADER
838- DIFFUSER HOLDERS PER GRID
VARIES- DIFFUSERS INSTALLED PER AIR HEADER
800- DIFFUSERS INSTALLED PER GRID
3200- TOTAL DIFFUSERS INSTALLED

NOTE:
QUANTITY OF DIFFUSER HOLDERS (838) IS PER THE GRID LAYOUT AS SHOWN. ACTUAL QUANTITY MAY VARY SLIGHTLY DEPENDING ON LOCATIONS OF COLUMNS.

A GRID TYPE 3
22 SCALE: 1/4" = 1'-0"

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WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

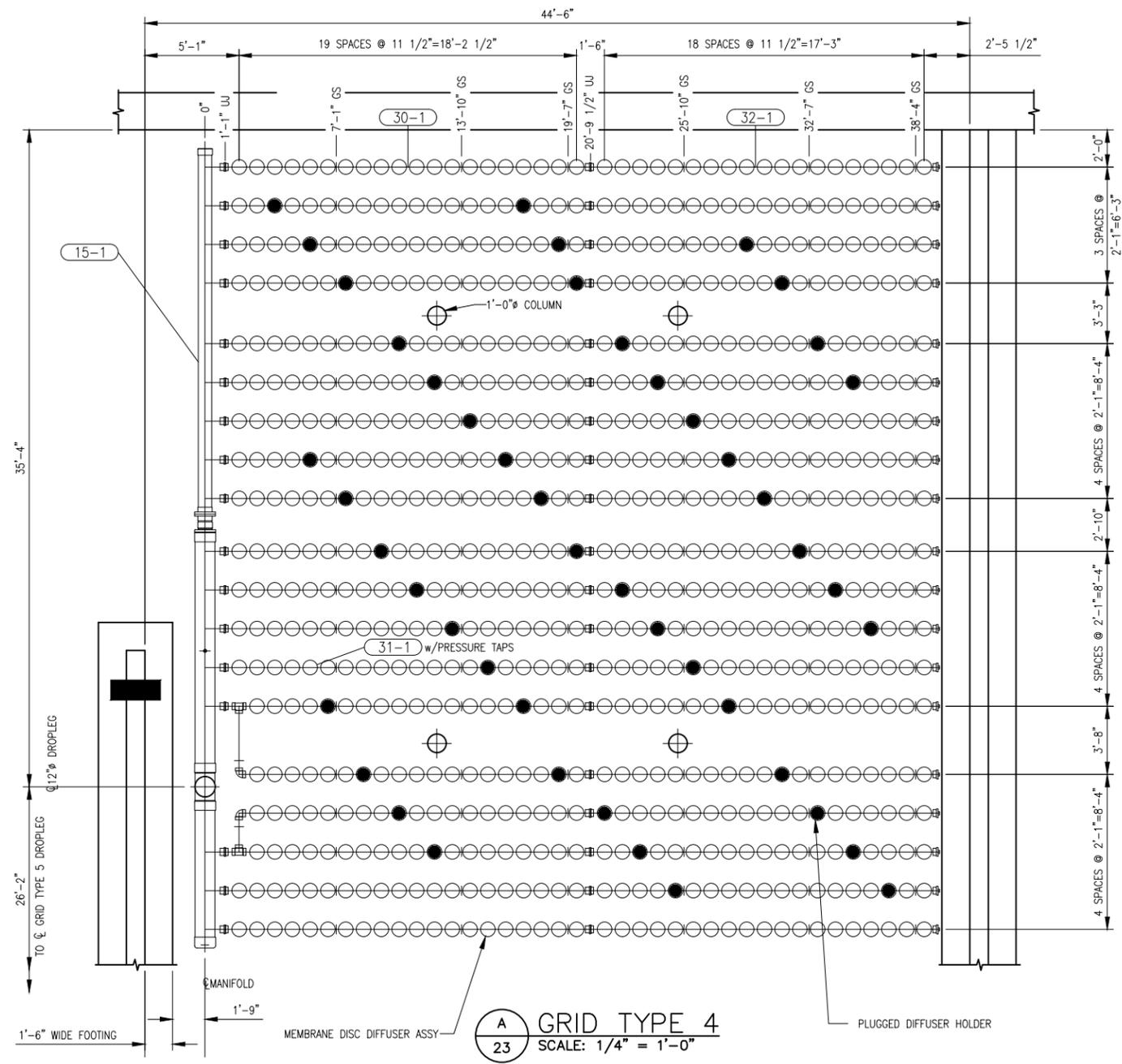
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PLAN SCALE:	DRAWN	CMW	
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NOTES:

1. SEE EQUIPMENT REPLACEMENT SCHEDULE & NOTES ON PLAN SHEET 19
2. SOME INFORMATION SHOWING PIPING & BASIN STRUCTURE SHOWN FOR INFORMATIONAL PURPOSE.



LEGEND
 UJ- UNION JOINT ASSY
 SEE DOCUMENT #UJA-40000-P
 GS- 5/16" Ø GUIDE SUPPORT ASSY (UNLESS OTHERWISE SPECIFIED)
 SEE DOCUMENT #GSA-31B18-4
 ASSEMBLY #GSB-31B13-4
 FOR TYPICAL AIR HEADER SECTION
 SEE DETAIL SHEET 20

**GRID TYPE 4
 GRID INFORMATION**
 4- TANK(S)
 1- GRID(S) PER TANK
 19- AIR HEADERS PER GRID
 VARIES- DIFFUSER HOLDERS PER AIR HEADER
 737- DIFFUSER HOLDERS PER GRID
 VARIES- DIFFUSERS INSTALLED PER AIR HEADER
 690- DIFFUSERS INSTALLED PER GRID
 2760- TOTAL DIFFUSERS INSTALLED

AS REQUIRED

A 23 GRID TYPE 4
 SCALE: 1/4" = 1'-0"

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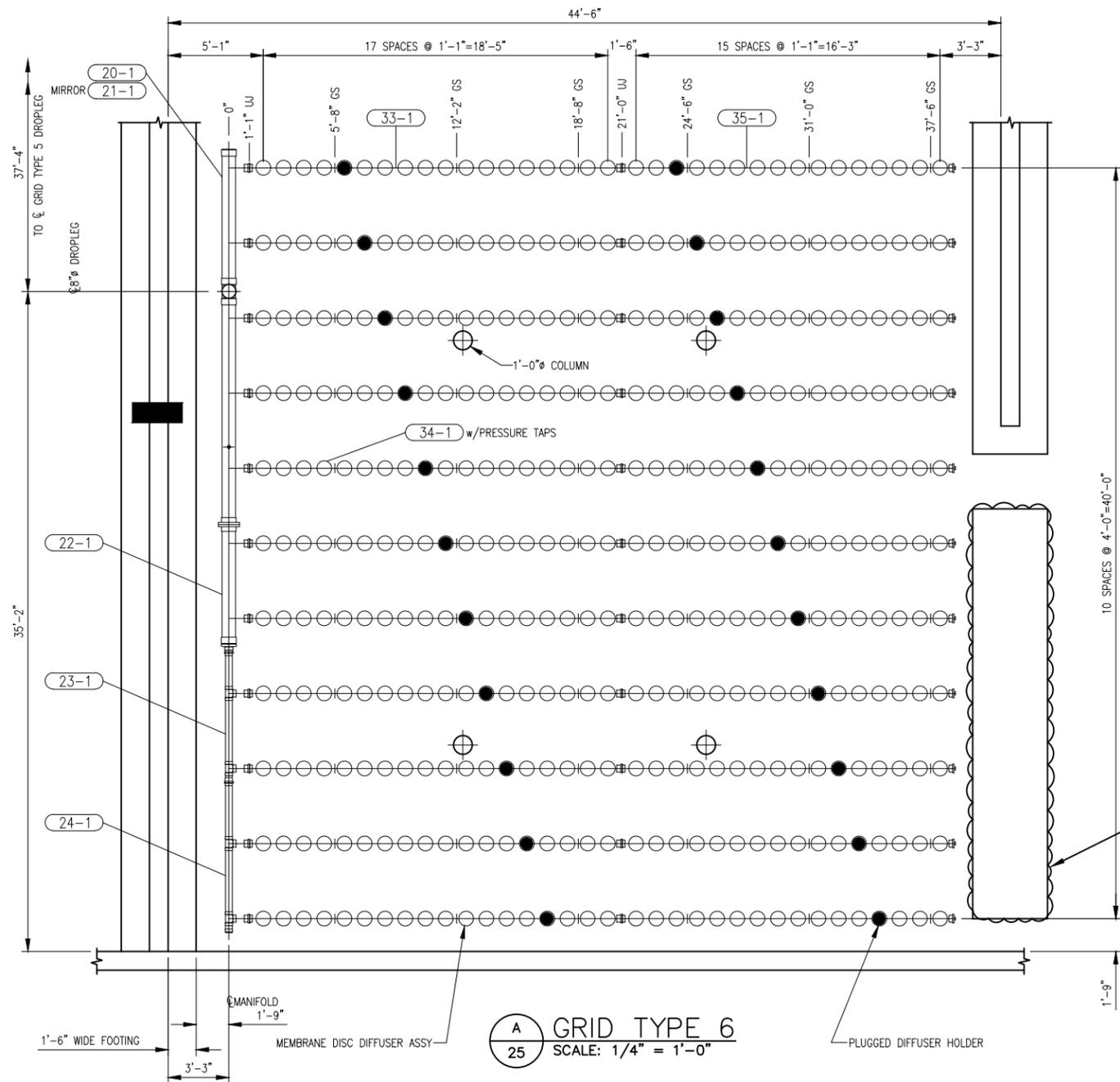
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 WATER POLLUTION CONTROL
 CAPITAL EQUIPMENT REPLACEMENTS
 TMUA PROJECT WPC 26-1
 CITY OF TULSA, OKLAHOMA
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PLAN SCALE:	DRAWN	CMW	
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	SURVEY		
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NOTES:

1. SEE EQUIPMENT REPLACEMENT SCHEDULE & NOTES ON PLAN SHEET 19
2. SOME INFORMATION SHOWING PIPING & BASIN STRUCTURE SHOWN FOR INFORMATIONAL PURPOSE.



LEGEND
 UJ- UNION JOINT ASSY
 SEE DOCUMENT #UJA-40000-P
 GS- 5/16"Ø GUIDE SUPPORT ASSY
 SEE DOCUMENT #GSA-31B18-4
 ASSEMBLY #GSB-31B13-4
 FOR TYPICAL AIR HEADER SECTION
 SEE DETAIL SHEET 20

**GRID TYPE 6
 GRID INFORMATION**
 4- TANK(S)
 1- GRID(S) PER TANK
 11- AIR HEADERS PER GRID
 34- DIFFUSER HOLDERS PER AIR HEADER
 374- DIFFUSER HOLDERS PER GRID
 32- DIFFUSERS INSTALLED PER AIR HEADER
 352- DIFFUSERS INSTALLED PER GRID
 1408- TOTAL DIFFUSERS INSTALLED

ADDITIONAL DIFFUSERS.
 SEE EQUIPMENT
 SCHEDULE SHEET #19

A
 25
GRID TYPE 6
 SCALE: 1/4" = 1'-0"

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 & LOCKING RING REPLACEMENT
 WATER POLLUTION CONTROL
 CAPITAL EQUIPMENT REPLACEMENTS
 TMUA PROJECT WPC 26-1
 CITY OF TULSA, OKLAHOMA
 TULSA METROPOLITAN UTILITY AUTHORITY
 WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES
 PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
 2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
 (918)228-0777, FAX (918)228-0764

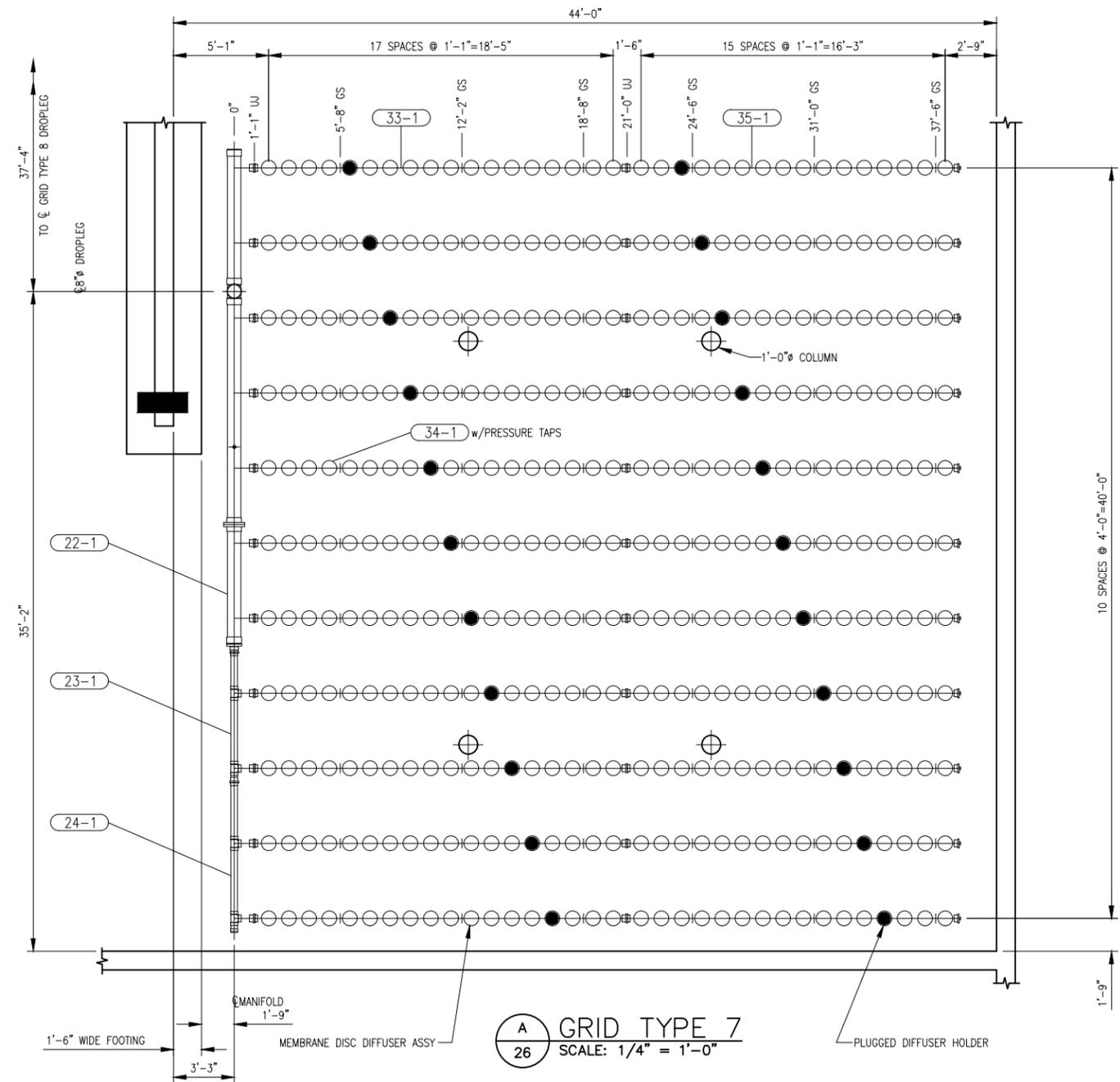
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NOTES:

1. SEE EQUIPMENT REPLACEMENT SCHEDULE & NOTES ON PLAN SHEET 19
2. SOME INFORMATION SHOWING PIPING & BASIN STRUCTURE SHOWN FOR INFORMATIONAL PURPOSE.



LEGEND
 UJ- UNION JOINT ASSY
 SEE DOCUMENT #UJA-40000-P
 GS- 5/16"Ø GUIDE SUPPORT ASSY
 SEE DOCUMENT #GSA-31B18-4
 ASSEMBLY #GSB-31813-4
 FOR TYPICAL AIR HEADER SECTION
 SEE DETAIL SHEET 20

*-SPACING HAS BEEN MODIFIED TO AVOID EXISTING COLUMNS

**GRID TYPE 7
 GRID INFORMATION**
 4- TANK(S)
 1- GRID(S) PER TANK
 11- AIR HEADERS PER GRID
 34- DIFFUSER HOLDERS PER AIR HEADER
 374- DIFFUSER HOLDERS PER GRID
 32- DIFFUSERS INSTALLED PER AIR HEADER
 352- DIFFUSERS INSTALLED PER GRID
 1408- TOTAL DIFFUSERS INSTALLED

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 SSWWTP AERATION BASIN #4 DIFFUSER
 & LOCKING RING REPLACEMENT
 WATER POLLUTION CONTROL
 CAPITAL EQUIPMENT REPLACEMENTS
 TMUA PROJECT WPC 26-1
 CITY OF TULSA, OKLAHOMA
 TULSA METROPOLITAN UTILITY AUTHORITY
 WATER AND SEWER DEPARTMENT

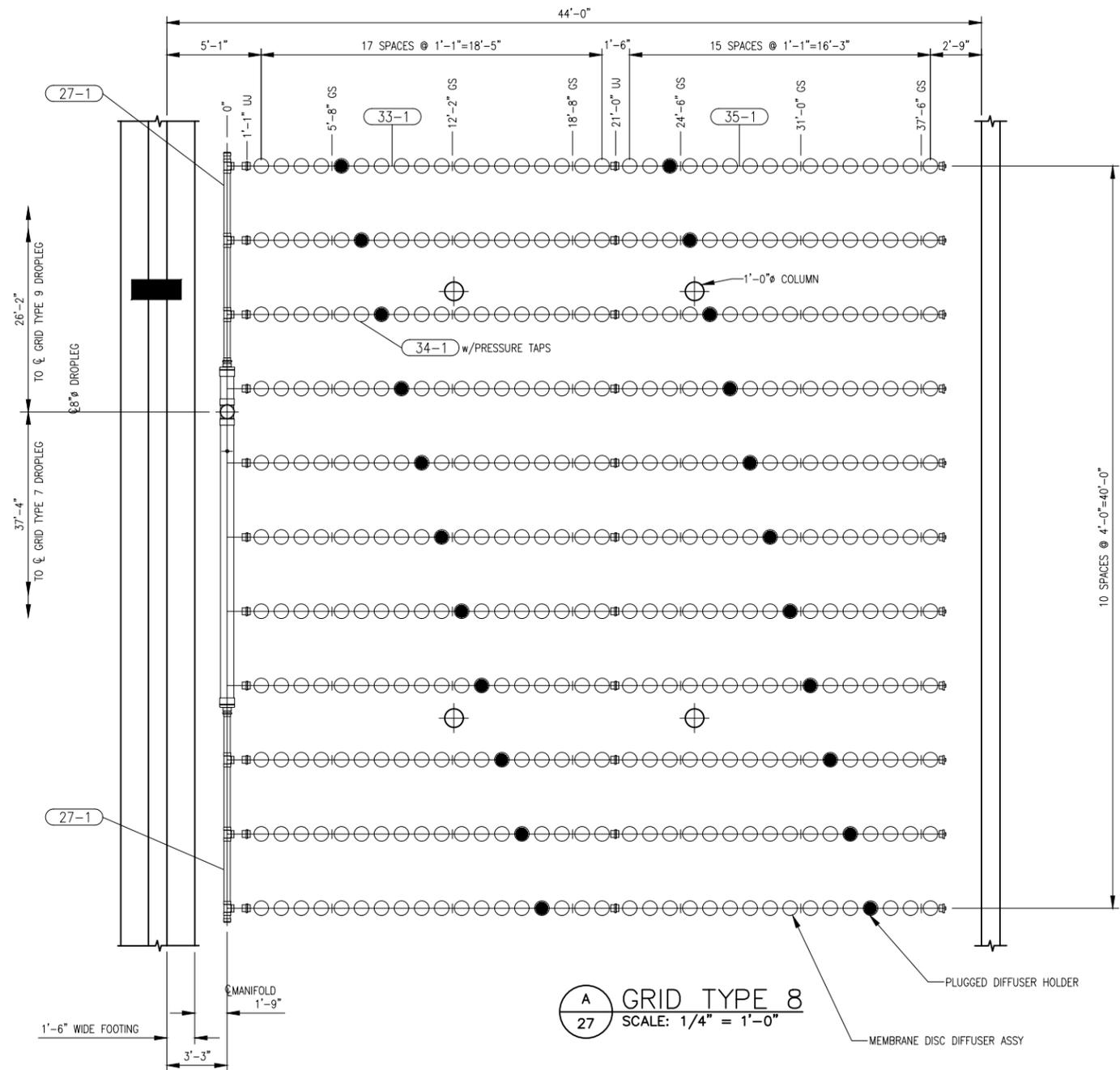
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 (918)228-0770, FAX (918)228-0764

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	SURVEY	
PROFILE SCALE:	PROJ. MGR.	
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NOTES:

1. SEE EQUIPMENT REPLACEMENT SCHEDULE & NOTES ON PLAN SHEET 19
2. SOME INFORMATION SHOWING PIPING & BASIN STRUCTURE SHOWN FOR INFORMATIONAL PURPOSE.



LEGEND
 UJ- UNION JOINT ASSY
 SEE DOCUMENT #UJA-40000-P
 GS- 5/16"Ø GUIDE SUPPORT ASSY (UNLESS OTHERWISE SPECIFIED)
 SEE DOCUMENT #GSA-31B18-4
 ASSEMBLY #GSB-31813-4
 FOR TYPICAL AIR HEADER SECTION
 SEE DETAIL SHEET 20

GRID TYPE 8
 GRID INFORMATION
 4- TANK(S)
 1- GRID(S) PER TANK
 11- AIR HEADERS PER GRID
 34- DIFFUSER HOLDERS PER AIR HEADER
 374- DIFFUSER HOLDERS PER GRID
 32- DIFFUSERS INSTALLED PER AIR HEADER
 352- DIFFUSERS INSTALLED PER GRID
 1408- TOTAL DIFFUSERS INSTALLED

A GRID TYPE 8
 27 SCALE: 1/4" = 1'-0"

REVISION	BY	DATE

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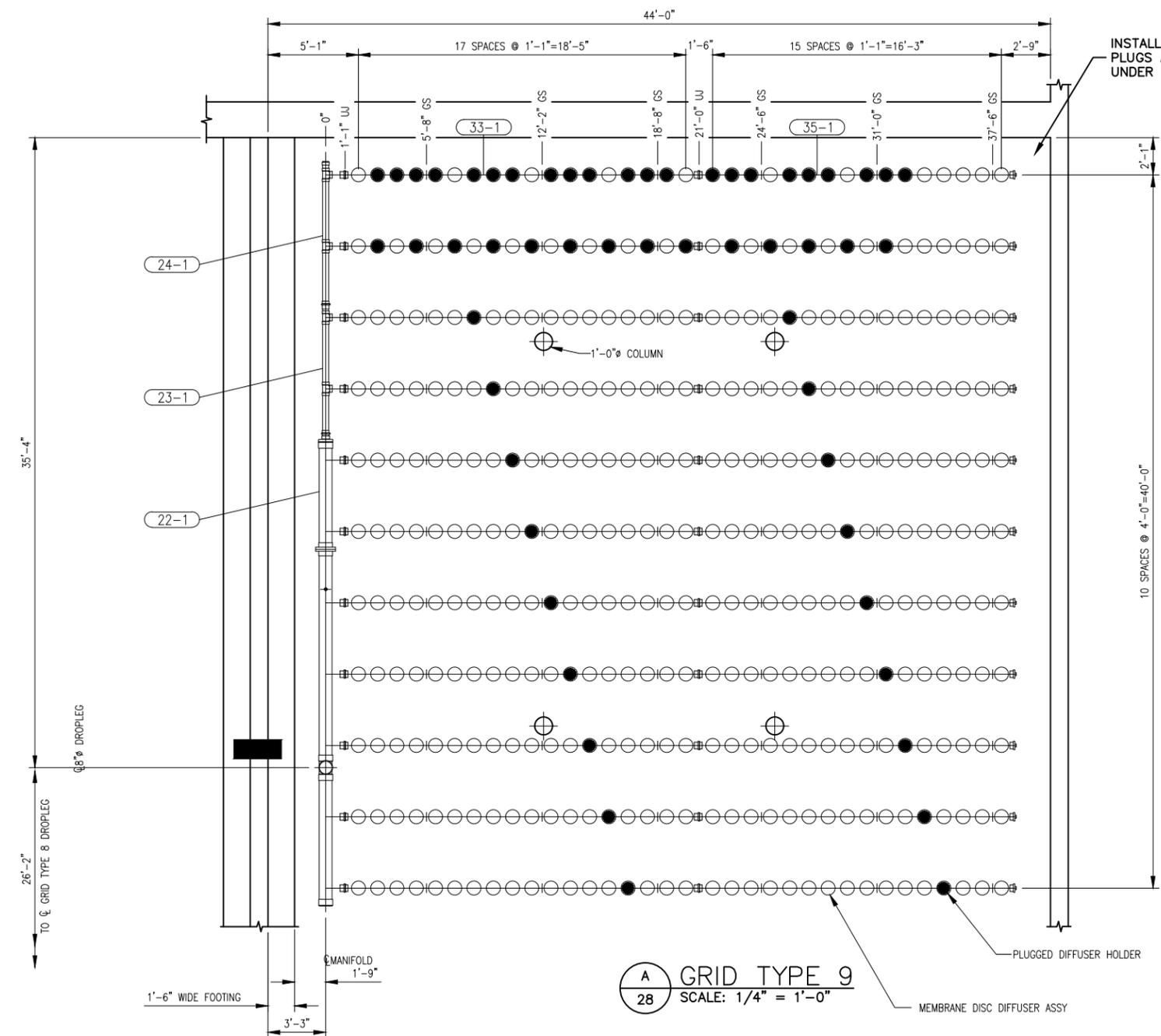
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 WATER POLLUTION CONTROL
 CAPITAL EQUIPMENT REPLACEMENTS
 TMUA PROJECT WPC 26-1
 CITY OF TULSA, OKLAHOMA
 TULSA METROPOLITAN UTILITY AUTHORITY
 WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY:		HOLLOWAY, UPDIKE + BELLEN, Inc. 2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012 (918)228-0770, FAX (918)228-0764	
PLAN SCALE:	DRAWN	CMW	
VARIABLES	DESIGNED	TJR	
	SURVEY		
PROFILE SCALE:	PROJ. MGR.		
HORIZONTAL:	LEAD ENGR.		
	FIELD MGR.		
VERTICAL:			
FILE:	DRAWING:		DATE: 2026
ATLAS PAGE NO: ---			SHEET 27 OF 39 SHEETS



NOTES:

1. SEE EQUIPMENT REPLACEMENT SCHEDULE & NOTES ON PLAN SHEET 19
2. SOME INFORMATION SHOWING PIPING & BASIN STRUCTURE SHOWN FOR INFORMATIONAL PURPOSE.



LEGEND

UJ- UNION JOINT ASSY
SEE DOCUMENT #UJA-40000-P

GS- 5/16"Ø GUIDE SUPPORT ASSY (UNLESS OTHERWISE SPECIFIED)
SEE DOCUMENT #GSA-31B18-4
ASSEMBLY #GSB-31B13-4

FOR TYPICAL AIR HEADER SECTION
SEE DETAIL SHEET 20

*-SPACING HAS BEEN MODIFIED TO AVOID EXISTING COLUMNS

**GRID TYPE 9
GRID INFORMATION**

4- TANK(S)
1- GRID(S) PER TANK
11- AIR HEADERS PER GRID
34- DIFFUSER HOLDERS PER AIR HEADER
374- DIFFUSER HOLDERS PER GRID
32- DIFFUSERS INSTALLED PER AIR HEADER
352- DIFFUSERS INSTALLED PER GRID
1408- TOTAL DIFFUSERS INSTALLED

A
28 **GRID TYPE 9**
SCALE: 1/4" = 1'-0"

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WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

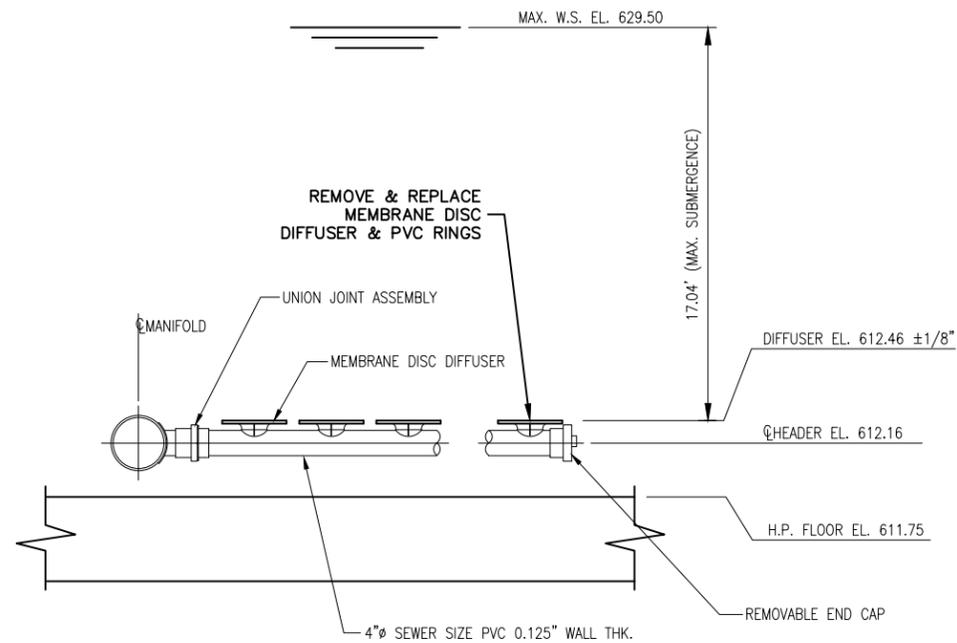
PLANS AND ESTIMATES PREPARED BY: **HOLLOWAY, UPDIKE + BELLEN, Inc.**
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
918.258-0770, FAX 918.258-0764

PLAN SCALE:	DRAWN	CMW	
VARIABLES:	DESIGNED	TJR	
	SURVEY		
PROFILE SCALE:	PROJ. MGR.		
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	FIELD MGR.		
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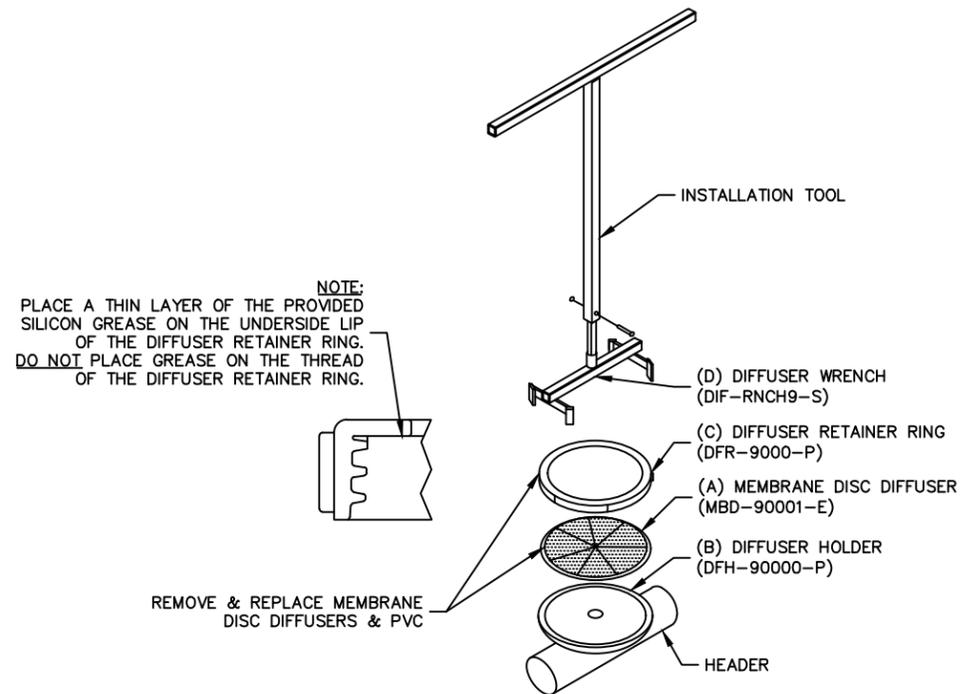


NOTES:

1. SEE EQUIPMENT REPLACEMENT SCHEDULE & NOTES ON PLAN SHEET 19
2. SOME INFORMATION SHOWING PIPING & BASIN STRUCTURE SHOWN FOR INFORMATIONAL PURPOSE.



A
29 TYPICAL HEADER SECTION
SCALE: 3/8" = 1'-0"



MEMBRANE DISC ASSEMBLY INSTALLATION PROCEDURE:

1. PLACE THE MEMBRANE DISC DIFFUSER (ITEM A) ON THE DIFFUSER HOLDER (ITEM B)
2. PLACE A THIN LAYER OF THE PROVIDED SILICON GREASE ON THE UNDERSIDE LIP OF THE DIFFUSER RETAINER RING (ITEM C). CAUTION - DO NOT PLACE GREASE ON THE THREAD OF THE DIFFUSER RETAINER RING.
3. INSTALL THE DIFFUSER RETAINER RING (ITEM C) ON THE DIFFUSER HOLDER & TIGHTEN "HAND-TIGHT". CAUTION - DO NOT CROSS THREAD THE DIFFUSER RETAINER RING.
4. USE THE DIFFUSER WRENCH (ITEM D) AND CONTINUE TIGHTENING THE DIFFUSER RETAINER RING TO A POSITION APPROXIMATELY 1/4-1/3 MAXIMUM TURN PAST HAND TIGHT.

CAUTION:

DO NOT OVER-TIGHTEN. INSTALL PER MANUFACTURER'S INSTRUCTIONS & REQUIREMENTS.

B
29 MEMBRANE DISC DIFFUSER ASSEMBLY & TOOL
NTS

REVISION	BY	DATE

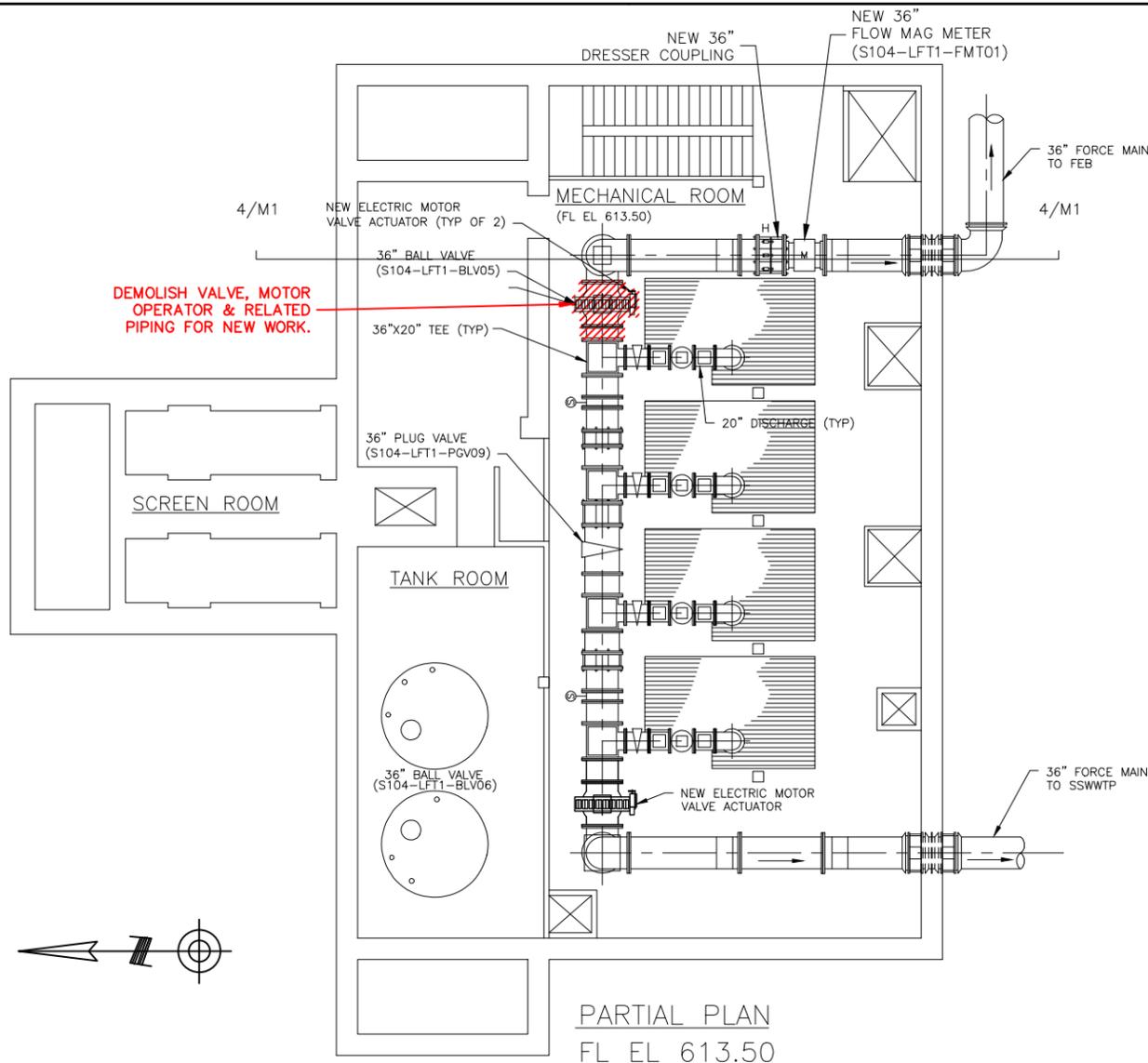
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WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
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CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

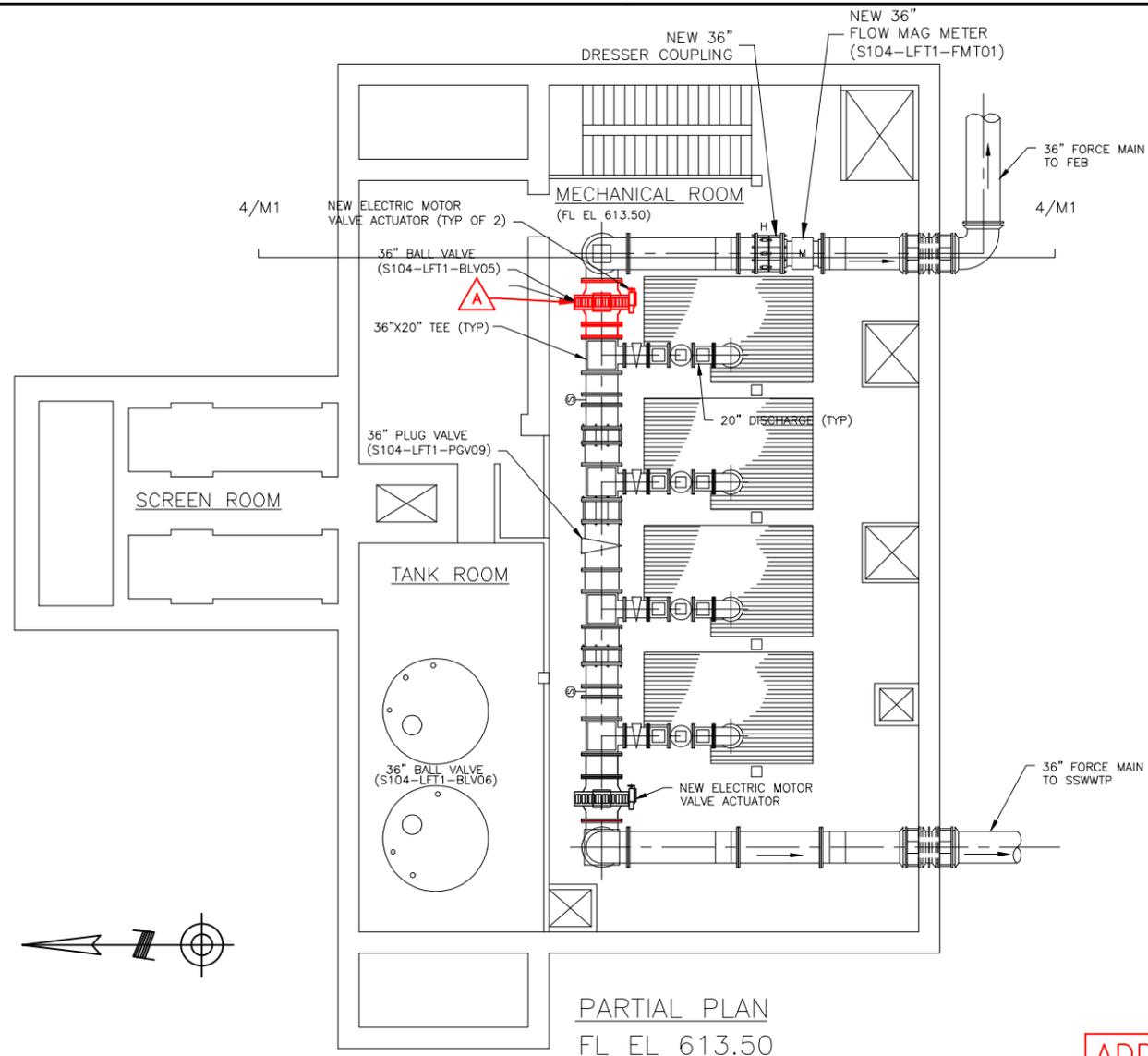
PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74002
918-258-0770, FAX 918-258-0764

PLAN SCALE:	DRAWN	CMW	
VARIABLES	DESIGNED	TJR	
	SURVEY		
PROFILE SCALE:	PROJ. MGR.		
HORIZONTAL:	LEAD ENGR.		
	FIELD MGR.		
VERTICAL:			
FILE:	DRAWING:		DATE: 2026
ATLAS PAGE NO: ---			SHEET 29 OF 39 SHEETS





1
30 CHERRY CREEK 36" FEB FM BALL VALVE DEMOLITION DETAILS
SCALE: 1/4" = 1'-0"



2
30 CHERRY CREEK 36" FEB FM BALL VALVE IMPROVEMENTS DETAILS
SCALE: 1/4" = 1'-0"



ADDITIVE ALTERNATE #1

REVISION	BY	DATE

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REFERENCE ORIGINAL ES 2009-07 RECORD DRAWINGS FOR ADDITIONAL DETAILS & INFORMATION

DRAWING 203.660.A
CHERRY CREEK LS FEB 36" BALL VALVE REPLACEMENTS

WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE & BELLEN, Inc.
2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74002
918-259-0770, FAX 918-259-0764

PLAN SCALE: 1/4" = 1'-0"	DRAWN CMW	DESIGNED TJR	SURVEY
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PROFILE SCALE:	PROJ. MGR.		
HORIZONTAL:	LEAD ENGR.		
	FIELD MGR.		

FILE:	DRAWING:	DATE: 2026
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ATLAS PAGE NO: ---	SHEET 30 OF 39 SHEETS
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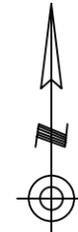
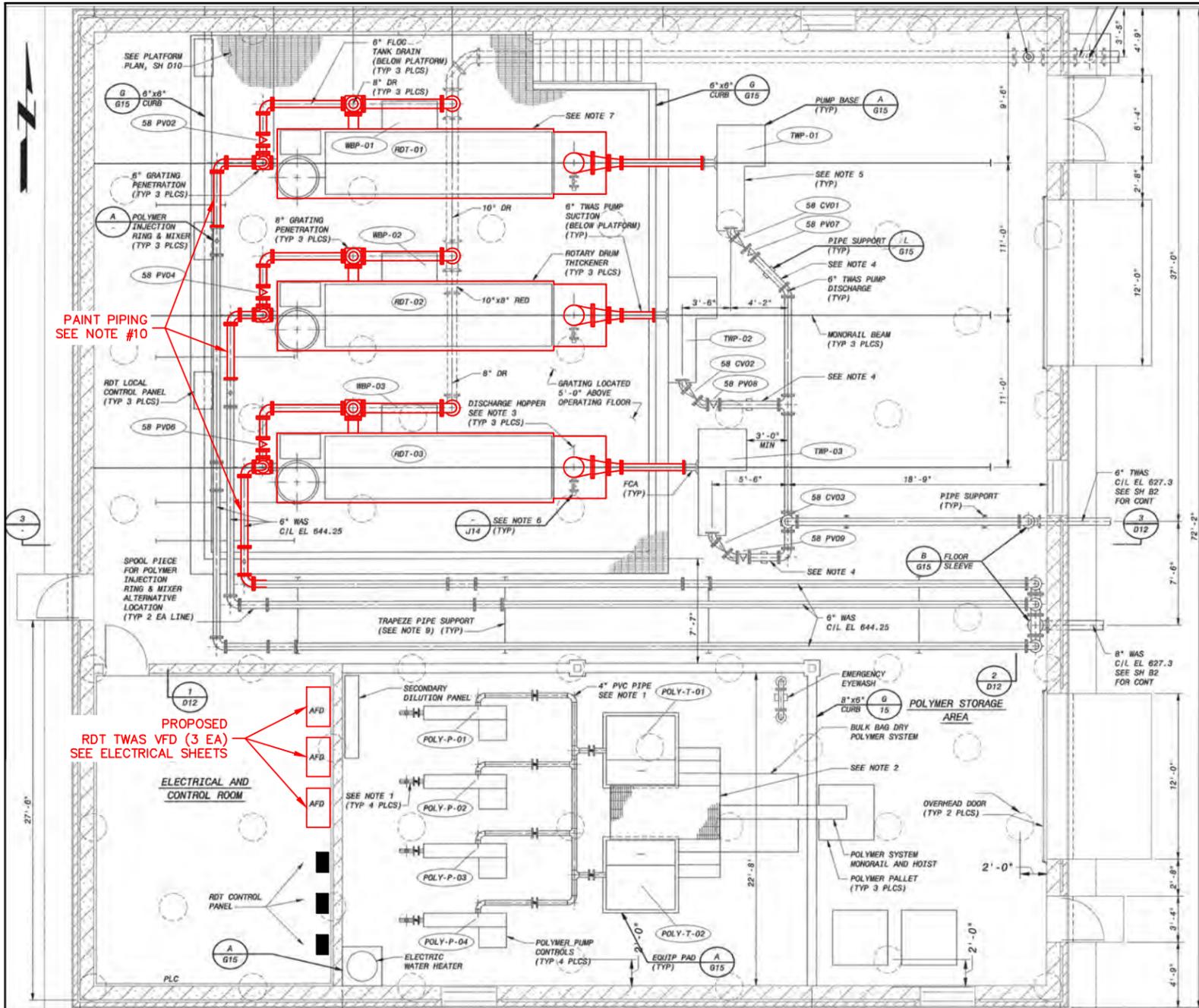


A
30 PHOTO @ EXISTING VALVE
NTS

EQUIPMENT SCHEDULE				
SYMBOL	DESCRIPTION	MANUFACTURER	MODEL/STYLE	DETAILS
A	36" METAL SEATED BALL VALVE & MOTOR OPERATOR	DEZURIK 36" METAL SEATED BALL VALVE W/ LIMITORQUE EMO MX MODULATING ACTUATOR W/ PROPERLY SIZED GEAR BOX.	VBL, 36, SS, F1, D1, 150, ML-DIS5-S2, SH, FR, DTR, EMO	SUBMERSIBLE DUTY NEW PLATED BOLT SET & GASKETS NEW LOCAL HOA W/PEDESTAL MOUNT, SCADA CONTROL & SCADA STATUS. LARGE HAND WHEEL (SAFETY RED) VALVE POSITION SENSOR TO SCADA CONSTANT DUTY RATED

- NOTES:
- REUSE PIPING TO EXTENT POSSIBLE.
 - REUSE THE EXISTING DISCONNECT AND PROVIDE A NEW SUPPORT MOUNT DETAIL 8/36.
 - CONTRACTOR SHALL PROVIDE WORK PLAN TO HELP SCHEDULE & COORDINATE WORK. FORCEMAIN OUTAGE IS LIMITED TO 8 HOURS DURING DRY WEATHER & LOW FLOW AS COORDINATED WITH PLANT OPERATIONS.
 - PROVIDE ONE FULL DAY OF MANUFACTURER'S STARTUP SERVICES & INSPECTIONS TO OBSERVE INSTALLATION, SET LIMITS & PROVIDE TRAINING.
 - PROVIDE INTEGRATION SERVICES TO RESTORE AND CONFIRM ALL CONTROL FUNCTIONS. EXISTING FUNCTIONS ARE ON/OFF STATUS, LOCAL REMOTE, ALARM, POSITION INDICATION & OPEN/CLOSE OPERATIONS.
 - CITY SALVAGE RIGHTS - THE CONTRACTOR SHALL PROTECT, REMOVE, PALLETIZE & DELIVER THE OLD VALVE TO THE CITY. PROVIDE A CUSTOM STEEL PALLET SIZED & RATED FOR THE VALVE AS REQUIRED. THE DELIVERY LOCATION WILL BE AT SSWWTP DIGESTER 3-4 INSIDE THE BUILDING & PLACE IN A LOCATION SELECTED BY THE OWNER'S REPRESENTATIVE.

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Rotary Drum Thickener Rehabilitation Service and Parts Replacement Schedule		
Parkson Thicketech Model RDT400 parts for the rehabilitation required at three (3) units		
Item #	Description	Quantity
1	Drive Chain, Includes Connecting Link and Offset Link, Carbon Steel	300
2	Drive Sprocket, Carbon Steel	3
3	Driven Sprocket, Carbon Steel	3
4	Chain Tensioner	3
5	Idler Sprocket	3
6	Trunnion Wheel Kit, Includes Shaft & Wheel	18
7	Trunnion Wheel Mounting Bracket, 316sst	18
8	Stabilizer Wheel, 316sst	12
9	Booster Pump, Includes Motor	3
10	Cleaning Brush for Water Spray	3
11	Shipping Crate for Brush	3
12	Packing Seal for Spray Header	3
13	Spray Nozzles, Includes Gaskets	111
14	Spray Nozzles, Includes Gaskets	9
15	Gearmotor, 1/2 HP, Floc Drive	3
16	Gearmotor, 3 HP, Drum Drive	3
17	Wire Cloth, State 1-4, Includes Flange Bars (Cloth is the same from 2006 change out)	12
18	Misc. Hardware per Manufacturer as required for startup certification(s).	3
19	Nameplates & Labels (New replacement of the existing with updates for both equipment number and equipment description, see City of Tulsa standard requirements)	3

1 ROTARY DRUM THICKENER BUILDING
31 NTS

NOTES:

- PROVIDE AND INSTALL A TOTAL OF NINE (9) NEW DISCONNECTS. INSTALL ONE DISCONNECT ADJACENT TO EACH OF THREE MOTORS ON EACH OF THREE ROTARY DRUM THICKENER (RDT) UNITS.
 - EACH DISCONNECT SHALL BE 30A/3P, NEMA 4X, 316 SST.
- DISCONNECTS SHALL BE INSTALLED ON 316 SST UNISTRUT RACK WITH RACK MOUNT FLOOR SUPPORTS OFF THE WALKWAY FRAME.
- CONTRACTOR SHALL COORDINATE AND PROVIDE SERVICES FOR REHABILITATION OF ALL THREE RDT UNITS. SEE RDT REHABILITATION SERVICE AND PARTS REPLACEMENT SCHEDULE FOR THE SCOPE OF WORK TO BE PERFORMED.
- CONTRACTOR SHALL SEQUENCE WORK SO THAT ONLY ONE (1) RDT UNIT IS OUT OF SERVICE AT A TIME.
- AT THE CONTRACTOR'S OPTION THE REHABILITATION/REPLACEMENT WORK MAY BE PERFORMED IN ONE OF TWO WAYS:
 - CONTRACTOR COORDINATES WITH PARKSON CORPORATION TO PURCHASE AND HAVE DELIVERED ALL REQUIRED PARTS. PARKSON PROVIDES ALL REQUIRED INSTRUCTIONS. CONTRACTOR USES OWN PERSONNEL TO PERFORM ALL THE WORK.
 - CONTRACTOR COORDINATES WITH PARKSON. PARKSON PROVIDES ALL REQUIRED PARTS AND PERFORMS ALL WORK.
- AFTER REHABILITATION/REPLACEMENT WORK ON EACH UNIT IS COMPLETE THE CONTRACTOR SHALL COORDINATE WITH PARKSON TO PERFORM A TECHNICAL INSPECTION PRIOR TO STARTUP. CONTRACTOR SHALL ADDRESS ANY ISSUES REQUIRING CORRECTION.
- AFTER TECHNICAL INSPECTION IS COMPLETED, CONTRACTOR SHALL COORDINATE WITH PARKSON TO PROVIDE START UP SERVICES.
- ONCE RETURNED TO SERVICE EACH RDT UNIT MUST OPERATE WITHOUT FAILURES FOR A 2-WEEK PERIOD BEFORE THE NEXT RDT IS ALLOWED TO BE TAKEN OUT OF SERVICE. CONTRACTOR SHALL INCLUDE ALL COORDINATION AND COSTS REQUIRED FOR THE MULTIPLE SITE VISITS IN THE BID.
- PROVIDE RDT MANUFACTURER SERVICES FOR THE INSPECTION AND START UP AT EACH RDT UNIT. AFTER THE FIRST UNIT HAS BEEN PUT INTO SERVICE, PROVIDE ONE MANUFACTURER'S TECHNICAL REPRESENTATIVE TRAINING DAY INCLUDING THE OPERATIONS AND MAINTENANCE OF THE RDT SYSTEMS. TRAINING IS NOT REQUIRED AFTER THE SECOND OR THIRD UNIT ARE PUT IN SERVICE, BUT MANUFACTURER'S INSPECTION AND START UP SERVICES ARE REQUIRED AS NOTED ABOVE. AT THE CONTRACTOR'S OPTION, THE REHABILITATION OF THE RDT UNITS CAN BE PERFORMED BY THE MANUFACTURER OR BY THE CONTRACTOR'S STAFF.
- PAINT 15 LF OF INFLUENT & DRAIN PIPING AT EACH RDT UNIT AND MATCH EXISTING COLOR.

REVISION	BY	DATE

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DRAWING 203.680.A
SSWWTP RDT REHABILITATION PLAN

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

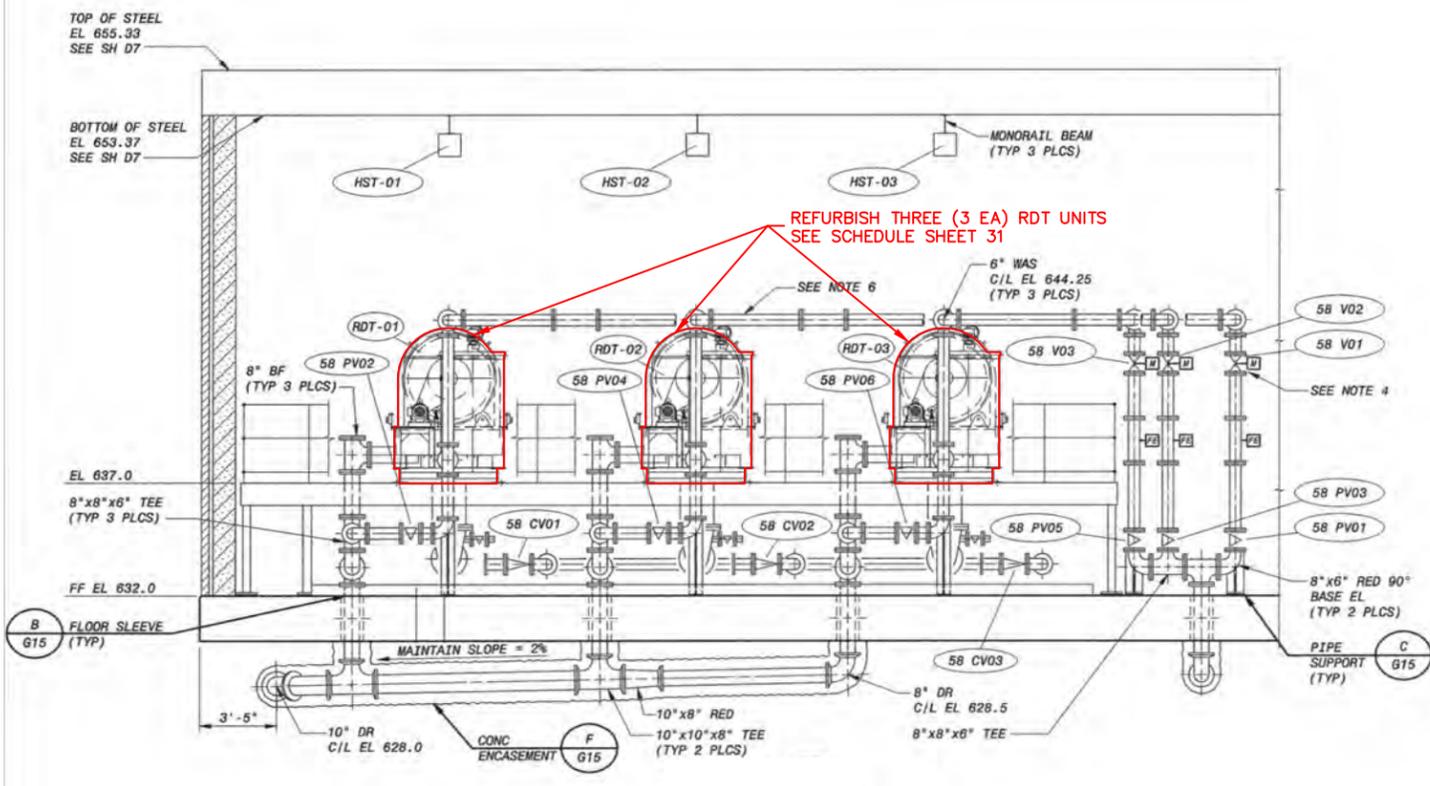
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES
PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N. WILLOW AVE., BROCKTON AVEENUE, OKLAHOMA 74102
(918)228-0770, FAX (918)228-0764

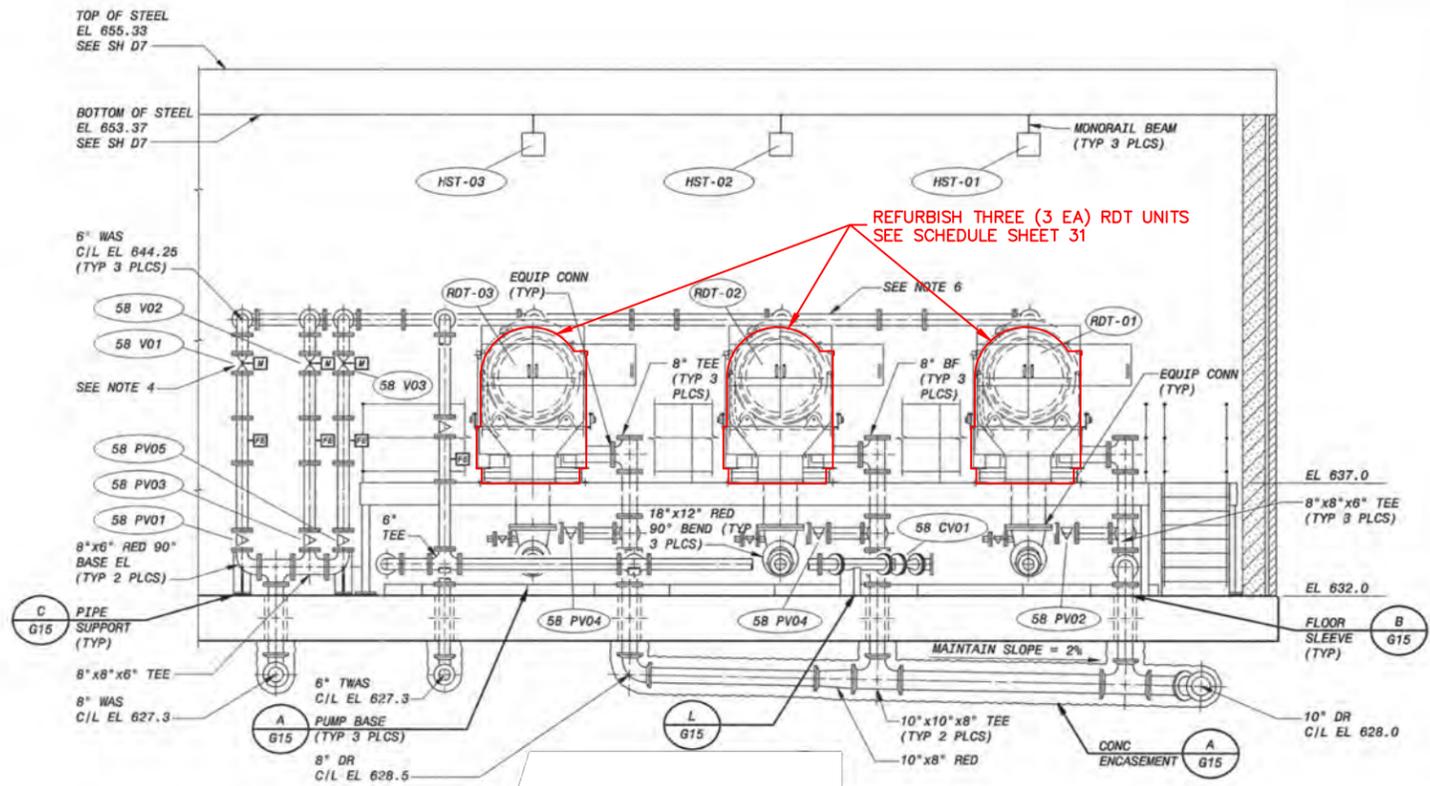
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	FIELD MGR.	
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ATLAS PAGE NO: ---		SHEET 31 OF 39 SHEETS



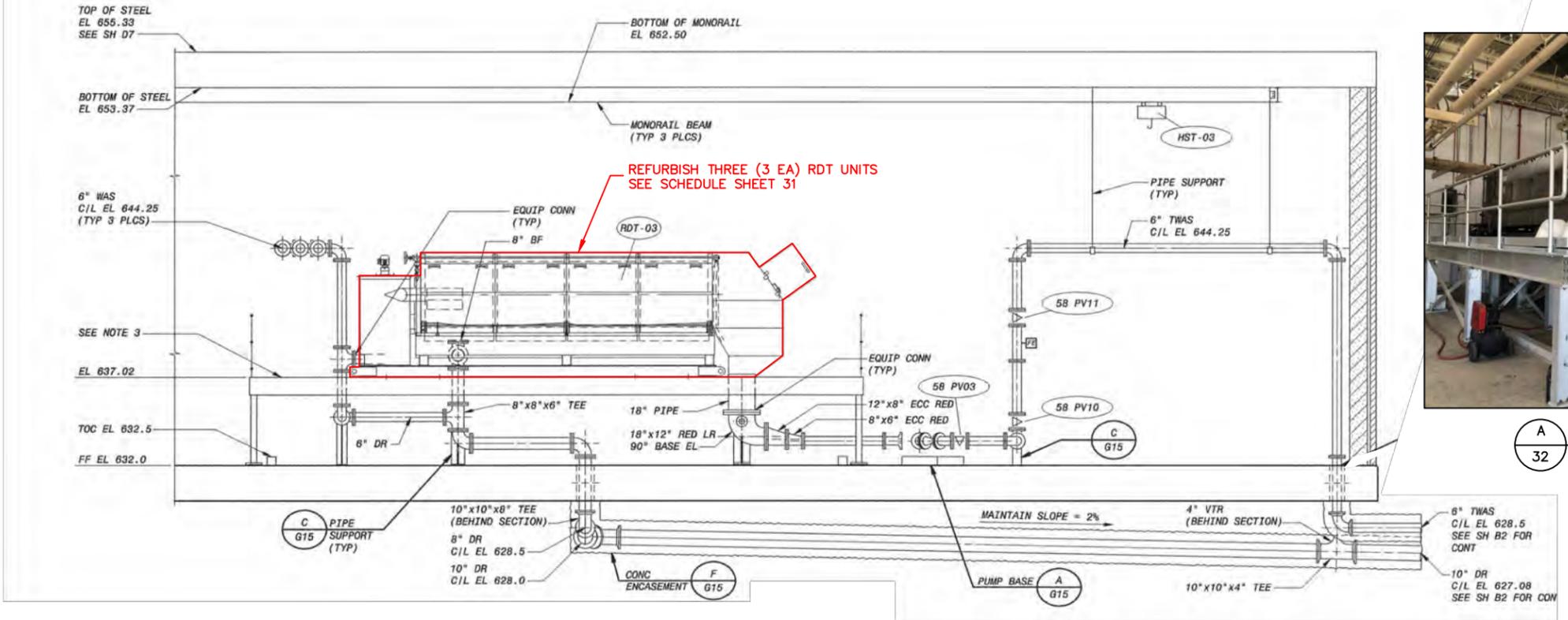
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1 RDT SECTION (WEST)
32 NTS



2 RDT SECTION (EAST)
32 NTS



3 RDT SECTION (SOUTH)
32 NTS



A PHOTO - EXISTING
32 NTS

- NOTES
- SEE PLAN SHEET 31, 203.680.A FOR PROPOSED PIPE PIPING REQUIREMENTS.

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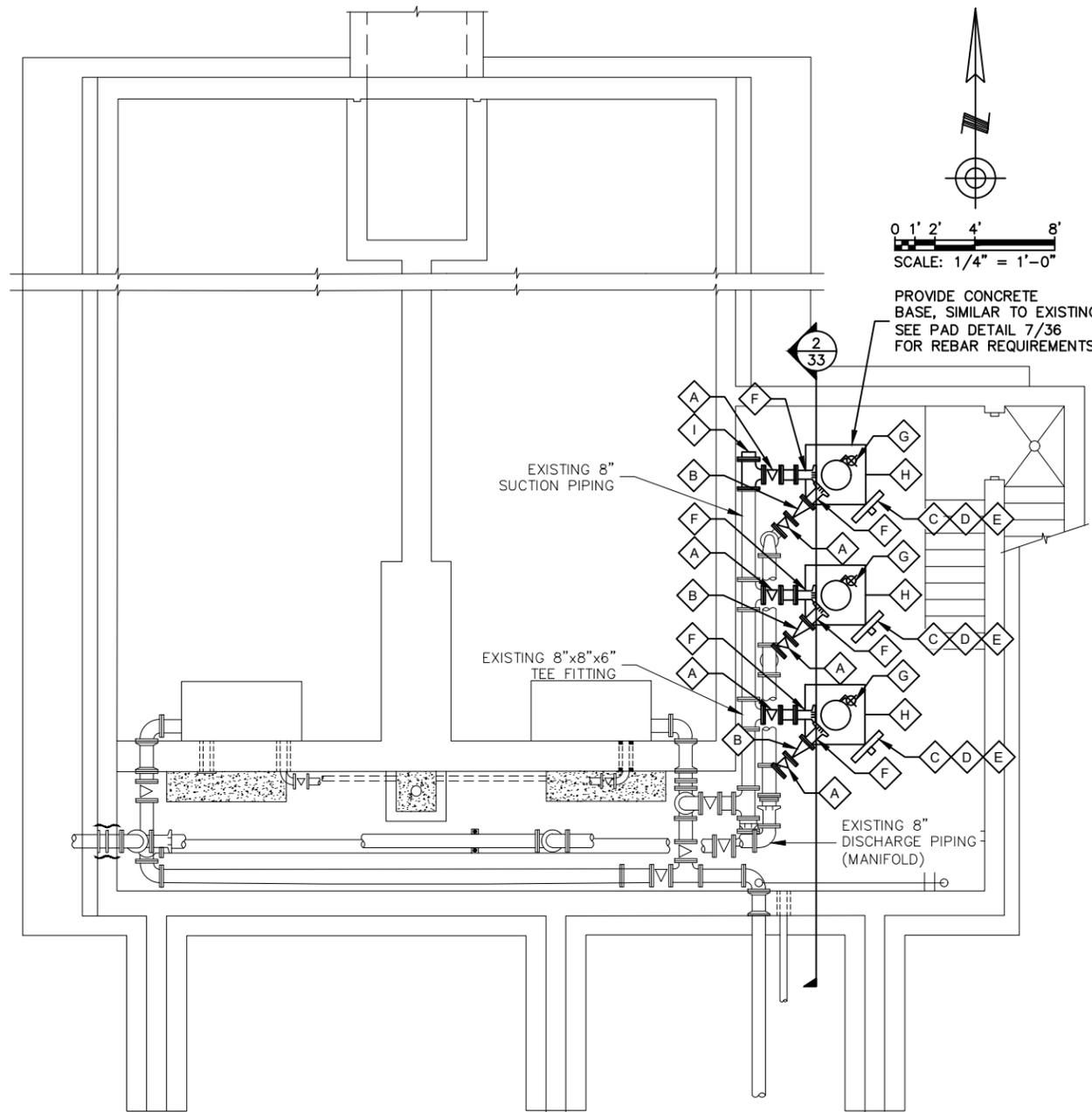
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DRAWING 203.680.B
SSWWTP RDT REHABILITATION SECTIONS
WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

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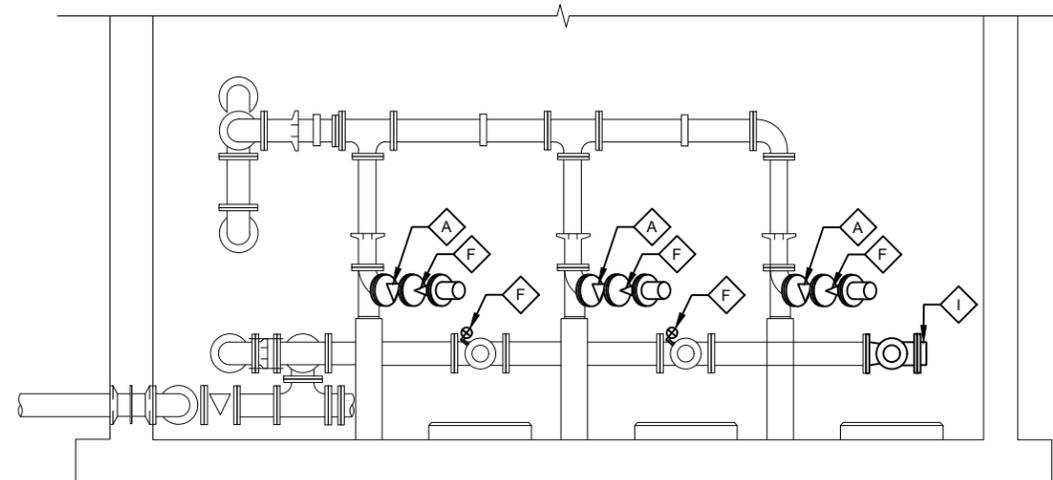


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1 WAS PUMP ROOM PLAN (LOWER PARTIAL)
33 SCALE: 1/4" = 1'-0"

EQUIPMENT SCHEDULE				
ID	DESCRIPTION	MANUFACTURER	MODEL/STYLE	DETAILS
A	6" PLUG VALVE	SEE SPECIFICATIONS		PAINT TO SERVICE COLOR, TYP.
B	6" CHECK VALVE	SEE SPECIFICATIONS		PAINT TO SERVICE COLOR, TYP.
C	LOGAL DISCONNECT	SEE SPECIFICATIONS	316 SST NEMA 4X	PAINT TO SERVICE COLOR, TYP.
D	E-STOP SWITCH (EMERGENCY STOP)		316 SST NEMA 4X	
E	CUSTOM ALUMINUM SUPPORT			MISC DETAILS, DETAIL 8/36
F	4" PRESSURE GAUGE (SUCTION & DISCHARGE)	ASHCROFT	LIQUID FILLED	FULL PUMP PRESSURE RANGE(S) WITH 316 SST ISOLATION BALL VALVE, 316 STAINLESS HANDLE AND 3/4" THREADED 316 SST PIPING TREE WITH SAMPLE DRAIN
G	PUMP VOLUTE DRAIN		PER MANUFACTURER RECOMMENDATIONS AND LAYOUT	3/4" THREADED 316 SST WITH 316 SST BALL VALVE AND 316 SST HANDLE, TYPICAL
H	CONCRETE PUMP PAD			MISC DETAILS, PUMP PAD DETAIL 7/36
I	8"x6"x8" TEE FITTING WITH 8" BLIND FLANGE AND 2" FLUSHING CONN.			2" TAP, THREADED SCHEDULE 40 PIPING, 2" 90° BEND, 2" BALL VALVE INCL. HANDLE AND ALUMINUM QUICK COUPLING



2 WAS PUMP ROOM ELEVATION
33 SCALE: 1/4" = 1'-0"

NOTES:

- REUSE PIPING TO EXTENT POSSIBLE.
- PAINT ALL PIPING REUSED & NEW AS PART OF WORK.
- REPAIR CONCRETE PER DETAIL 1/36.
- SEE 203.700.B - SSWTP SERVICE WATER LINE AND DRAIN PIPING SCHEMATIC PLAN SHEET 34.

PROPOSED PUMP INFORMATION												
PUMP ID	SERVICE	DRIVE	CAPACITY (GPM)	TDH (FT)	MIN% EFFICIENCY	HP	VOLTAGE	PHASE	HZ	SPEED (RPM)	DISCHARGE (IN)	SUCTION (IN)
#1, 2, & 3	WAS	VARIABLE	600	110	85	30	230-460	3	60	2770	4"	4"

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REFERENCE ORIGINAL ES-2002-07 RECORD DRAWINGS FOR ADDITIONAL DETAILS & INFORMATION

DRAWING 203.700.A
SSWTP WAS PUMPS & VALVE REPLACEMENTS

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

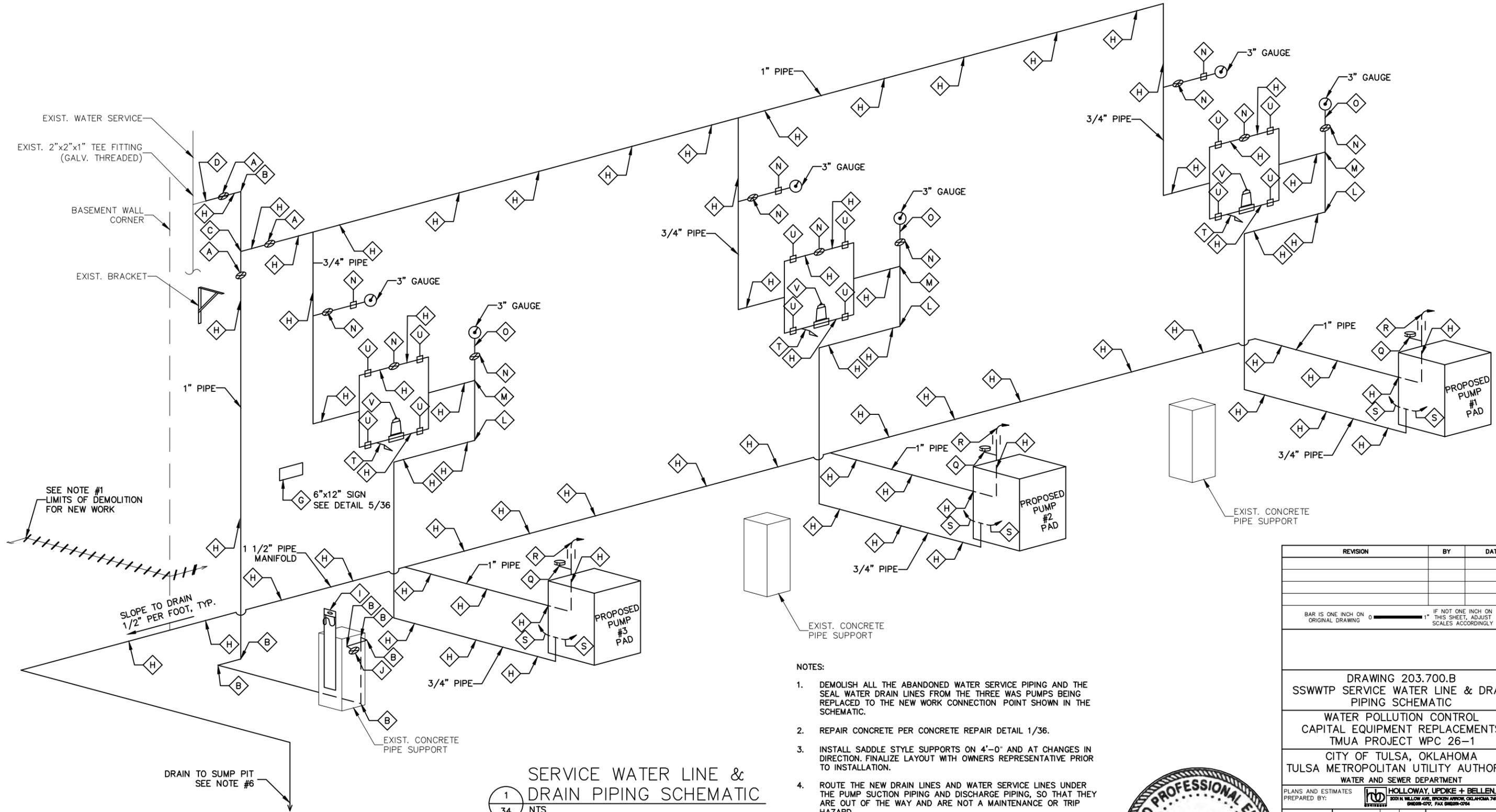
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: **HOLLOWAY, UPDIKE + BELLEN, Inc.**
2001 N. WILLOW AVE., BROCKTON, OKLAHOMA 74002
918-259-0707, FAX 918-259-0764

PLAN SCALE: 1/4" = 1'-0"	DRAWN DESIGNED SURVEY	CMW TJR
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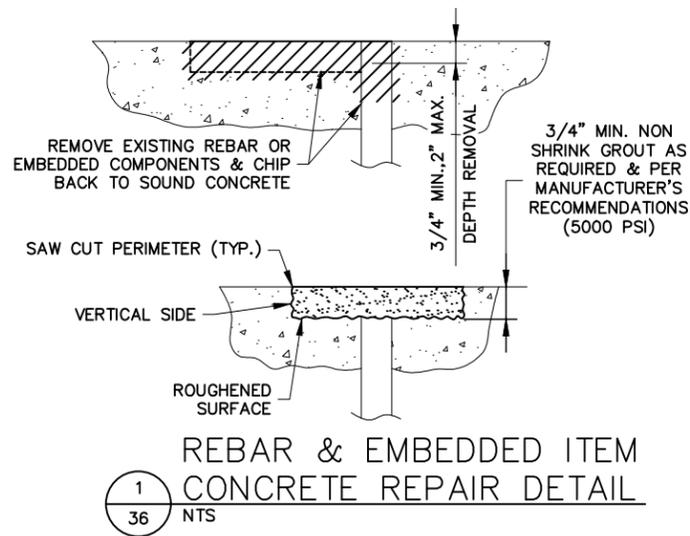
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34 NTS

SERVICE WATER LINE & DRAIN PIPING SCHEMATIC

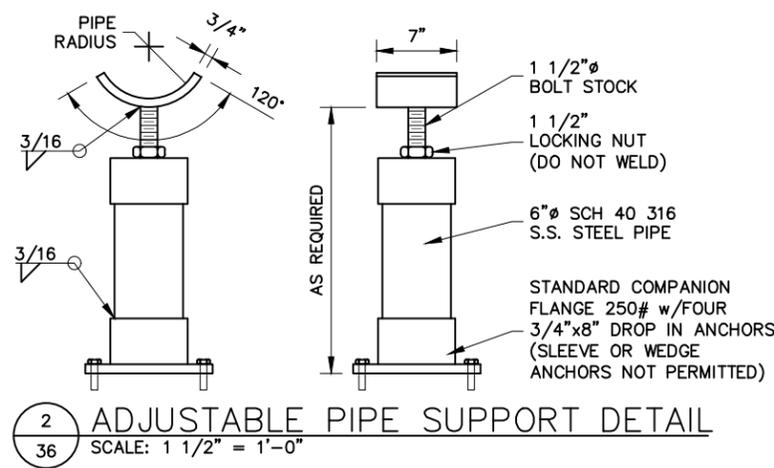
- NOTES:**
- DEMOLISH ALL THE ABANDONED WATER SERVICE PIPING AND THE SEAL WATER DRAIN LINES FROM THE THREE WAS PUMPS BEING REPLACED TO THE NEW WORK CONNECTION POINT SHOWN IN THE SCHEMATIC.
 - REPAIR CONCRETE PER CONCRETE REPAIR DETAIL 1/36.
 - INSTALL SADDLE STYLE SUPPORTS ON 4'-0" AND AT CHANGES IN DIRECTION. FINALIZE LAYOUT WITH OWNERS REPRESENTATIVE PRIOR TO INSTALLATION.
 - ROUTE THE NEW DRAIN LINES AND WATER SERVICE LINES UNDER THE PUMP SUCTION PIPING AND DISCHARGE PIPING, SO THAT THEY ARE OUT OF THE WAY AND ARE NOT A MAINTENANCE OR TRIP HAZARD.
 - PUMP DESIGN IS THE SAME AS THE EXISTING PUMPS BEING REPLACED. PROTECT AND REUSED PIPE SUPPORT ON THE DISCHARGE PIPING.
 - PROVIDE AND ROUTE DRAIN LINE TO THE WEST WALL, WALL MOUNT AND TURN DOWN, ROUTING DRAIN PIPING INTO SUMP PIT.
 - SEE EQUIPMENT SCHEDULE KEY NOTE TABLE ON SHEET 35.



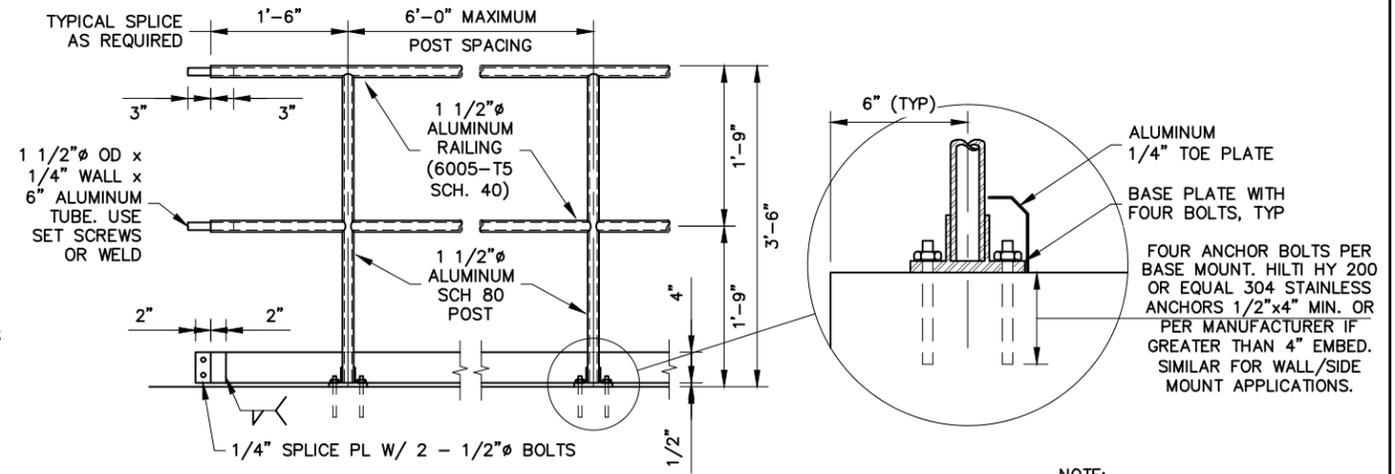
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BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY		
DRAWING 203.700.B SSWWTP SERVICE WATER LINE & DRAIN PIPING SCHEMATIC WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1 CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, INC. <small>2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)298-0770, FAX (918)298-0764</small>		
PLAN SCALE:	DRAWN CMW	DESIGNED TJR
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1 REBAR & EMBEDDED ITEM CONCRETE REPAIR DETAIL
36 NTS

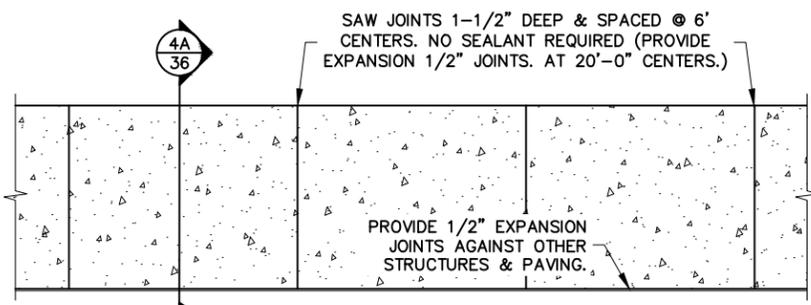


2 ADJUSTABLE PIPE SUPPORT DETAIL
36 SCALE: 1 1/2" = 1'-0"

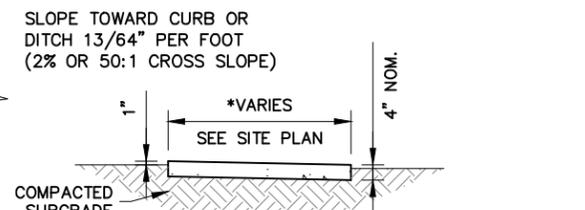


3 DETAIL @ ALUMINUM HANDRAIL
36 SCALE: 1" = 1'-0"

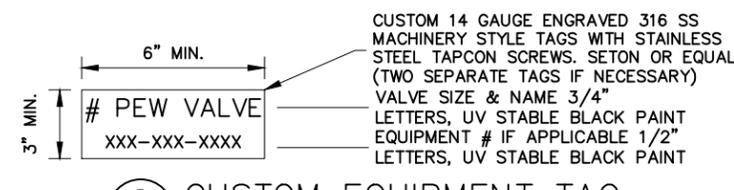
NOTE:
SEE PLAN SHEET FOR ADDITIONAL REQUIREMENTS IF SIDE MOUNTED.



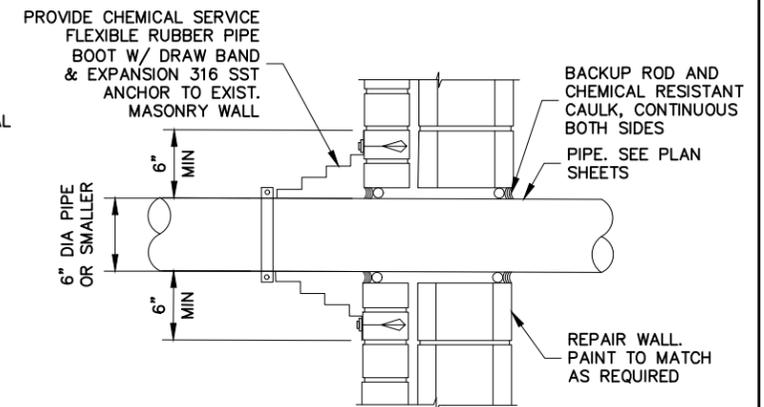
4 PLAN @ SIDEWALK/MOW STRIP
36 SCALE: 1/2" = 1'-0"



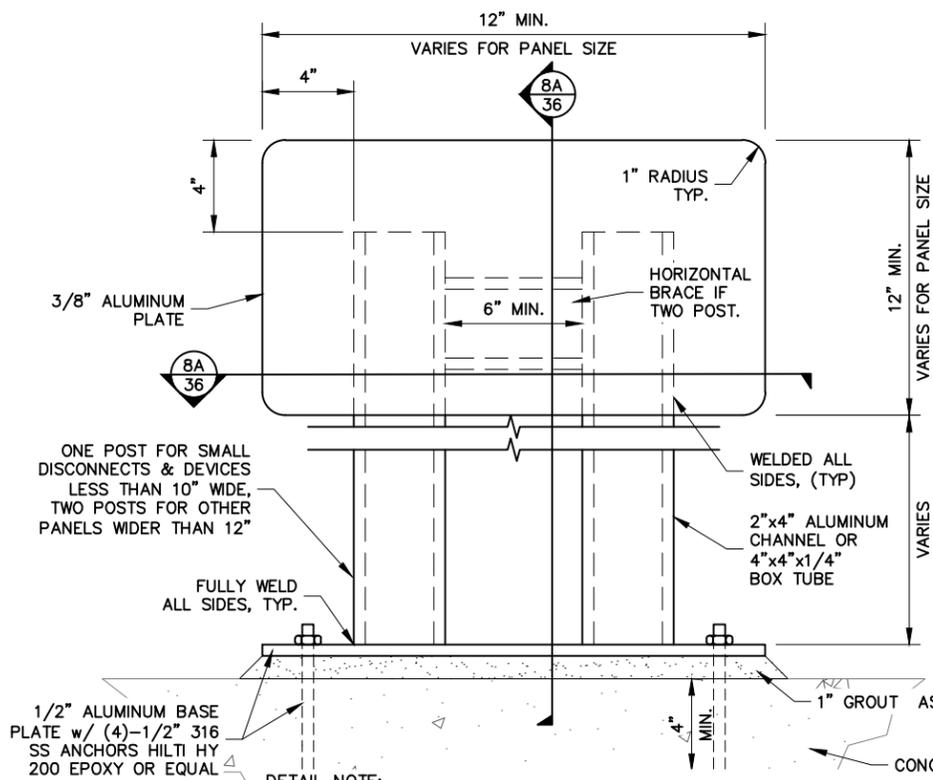
4A SECTION @ SIDEWALK/MOW STRIP
36 SCALE: 1/2" = 1'-0"



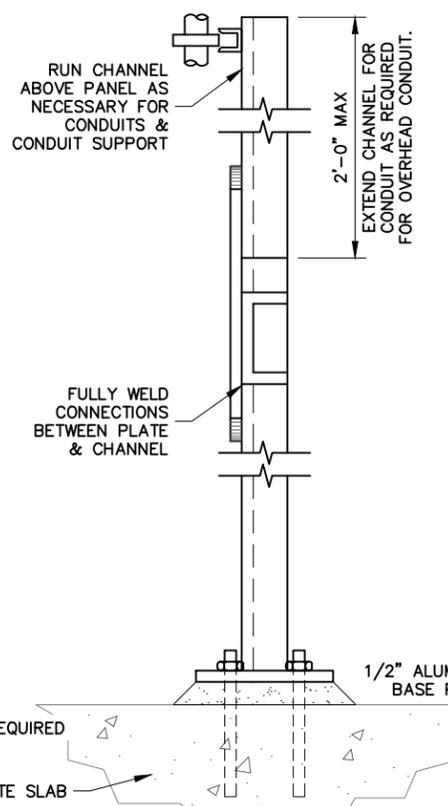
5 CUSTOM EQUIPMENT TAG
36 SCALE: 3" = 1'-0"



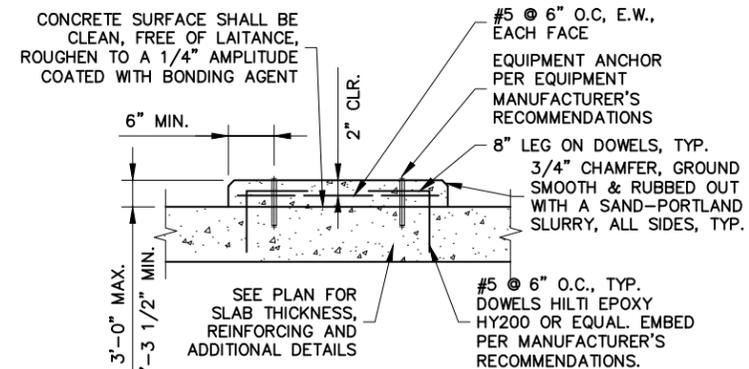
6 CHEMICAL FILL STATION WALL PENETRATION
36 SCALE: 1 1/2" = 1'-0"



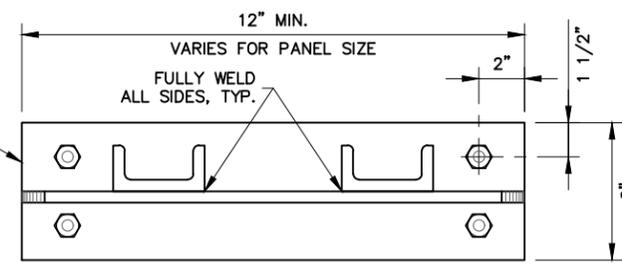
8 CUSTOM ALUMINUM PANEL SUPPORT
36 SCALE: 3" = 1'-0"



8A SUPPORT SECTION
36 SCALE: 3" = 1'-0"



7 RAISED PAD DETAIL
36 SCALE: 1" = 1'-0"



8B BASE PLATE DETAIL
36 SCALE: 3" = 1'-0"

REVISION	BY	DATE

MISCELLANEOUS DETAILS
WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY:	HOLLOWAY, UPDIKE + BELLEN, Inc.
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FILE:	DRAWING:
ATLAS PAGE NO:	DATE: 2026
	SHEET 36 OF 39 SHEETS





A
37
PHOTO EXISTING—OPERATIONS BUILDING
LOOKING NORTH ALONG EAST WALL
NTS



B
37
PHOTO EXISTING—INTERIOR STAIR WELL
ELECTRICAL DEMOLITION/MASONRY REPAIR AREA
NTS



C
37
PHOTO EXISTING—STORAGE ROOM, ELECTRICAL
DEMOLITION/MASONRY REPAIR AREA NEAR
NE BUILDING CORNER
NTS

ADDITIVE ALTERNATE #2

REVISION	BY	DATE

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REFERENCE PROJECT NO. SA 69-13
RECORD DRAWING FOR ADDITIONAL
DETAILS & INFORMATION

DRAWING 203.510.A
NSWWTP OPERATIONS BUILDING HVAC
SUPPLEMENTARY IMPROVEMENTS

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

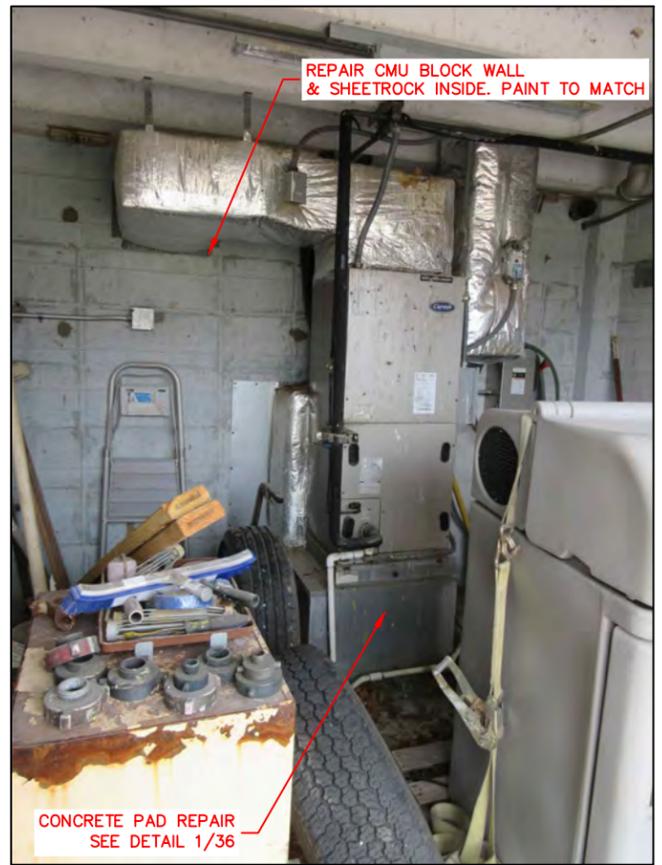
PLANS AND ESTIMATES
PREPARED BY:  HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
918-258-0770, FAX 918-258-0764

PLAN SCALE: AS SHOWN	DRAWN DESIGNED SURVEY	CMW TJR	
PROFILE SCALE:	PROJ. MGR.		
HORIZONTAL:	LEAD ENGR.		
	FIELD MGR.		
VERTICAL:			
FILE:	DRAWING:		DATE: 2026
ATLAS PAGE NO: ---			SHEET 37 OF 39 SHEETS





A
37 NTS
PHOTO EXISTING—EXISTING CONDUIT WALL PENETRATION & MASONRY REPAIR AREA



B
38 NTS
PHOTO EXISTING—STORAGE ROOM, ELECTRICAL HVAC DEMOLITION/CMU REPAIR AREA



C
38 NTS
PHOTO EXISTING—TYPICAL ROOF AREA

ADDITIVE ALTERNATE #2

REVISION	BY	DATE

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REFERENCE PROJECT NO. SA 69-13
RECORD DRAWING FOR ADDITIONAL
DETAILS & INFORMATION

DRAWING 203.510.B
NSWWTP OPERATIONS BUILDING HVAC
SUPPLEMENTARY IMPROVEMENTS

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES
PREPARED BY:  HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012
918-258-0770, FAX 918-258-0764

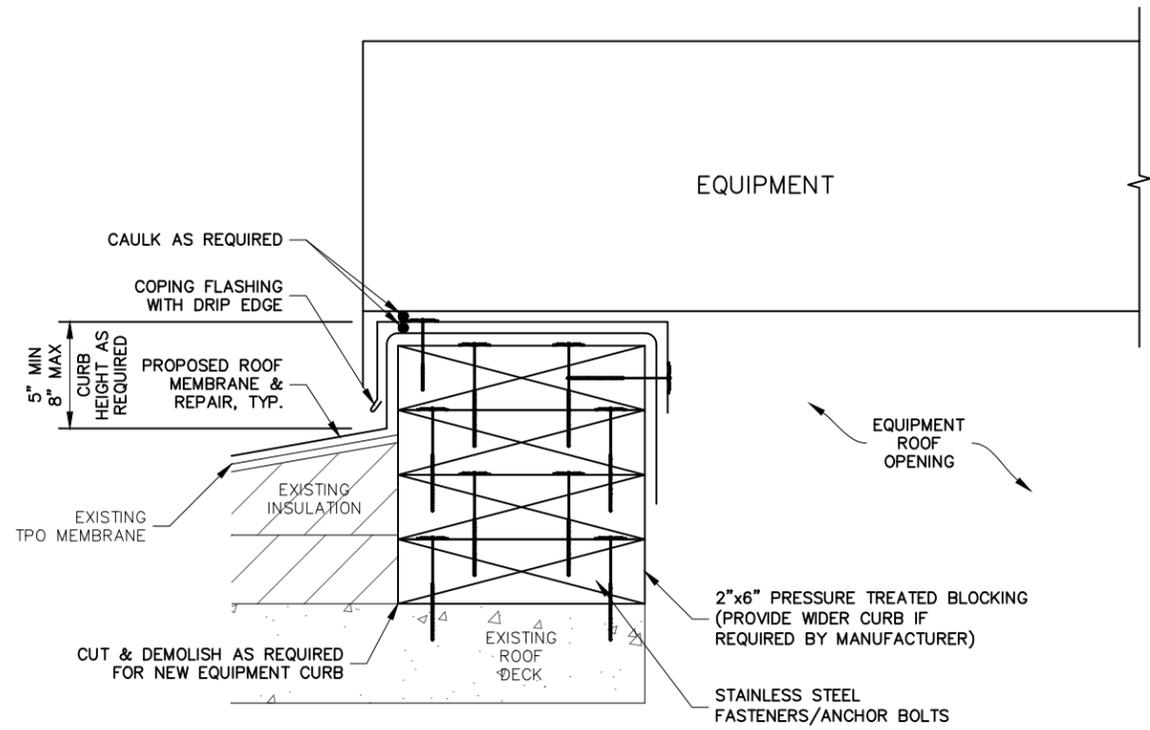
PLAN SCALE:	DRAWN	CMW
AS SHOWN	DESIGNED	TJR
	SURVEY	

PROFILE SCALE:	PROJ. MGR.	
HORIZONTAL:	LEAD ENGR.	
	FIELD MGR.	

VERTICAL:	
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FILE:	DRAWING:	DATE: 2026
ATLAS PAGE NO: ---		SHEET 38 OF 39 SHEETS





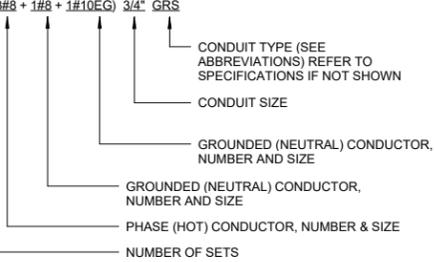
1 TPO ROOF CURB DETAIL
 39 SCALE: 6" = 1'-0"

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REVISION	BY	DATE
BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY		
DRAWING 203.510.C MISCELLANEOUS ROOF DETAILS		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:		HOLLOWAY, UPDIKE + BELTEN, Inc. <small>2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74002 (918)298-0770, FAX (918)298-0764</small>
PLAN SCALE: AS SHOWN	DRAWN DESIGNED SURVEY	CMW TJR
PROFILE SCALE:	PROJ. MGR. LEAD ENGR. FIELD MGR.	_____ _____ _____
HORIZONTAL:	_____ _____	_____ _____
VERTICAL:	_____ _____	_____ _____
FILE:	DRAWING:	DATE: 2026
ATLAS PAGE NO: ---	SHEET 39 OF 39 SHEETS	---



POWER AND LIGHTING LEGEND

ABBREVIATION OR SYMBOL	DESCRIPTION	ABBREVIATION OR SYMBOL	DESCRIPTION	ABBREVIATION OR SYMBOL	DESCRIPTION																											
FIXTURE DESIGNATION  2x4 LAY-IN OR SURFACE MOUNTED FIXTURE  2x4 LAY-IN OR SURFACE MOUNTED FIXTURE; SHADING INDICATES EMERGENCY POWERED BATTERY  2x2 LAY-IN OR SURFACE MOUNTED FIXTURE  2x2 LAY-IN OR SURFACE MOUNTED FIXTURE; SHADING INDICATES EMERGENCY POWERED BATTERY  SURFACE OR STRIP FIXTURE  RECESSED STRIP FIXTURE; SHADING INDICATES EMERGENCY POWERED BATTERY  RECESSED DOWNLIGHT  RECESSED DOWNLIGHT; SHADING INDICATES EMERGENCY POWERED BATTERY  WALL-MOUNTED LINEAR FIXTURE  DOWNLIGHT FIXTURE  DOWNLIGHT FIXTURE; SHADING INDICATES EMERGENCY POWERED BATTERY  WALL-MOUNTED FIXTURE  EXIT SIGN; LED TYPE. DARKENED AREA INDICATES FACE, ARROWS INDICATE DIRECTION OF EGRESS  RECESSED ELECTRICAL PANEL WITH REQUIRED CLEARANCE  SURFACE MOUNTED ELECTRICAL PANEL WITH REQUIRED CLEARANCE  COMBINATION STARTER DISCONNECT SWITCH  NON FUSED DISCONNECT SWITCH  FUSED DISCONNECT SWITCH  MOTOR STARTER  ELECTRIC MOTOR, HORSEPOWER AS SHOWN.  JUNCTION BOX  SPECIALTY JUNCTION BOX WITH DESIGNATION "XYZ". REFER TO JBOX ABBREVIATION LEGEND.		FLOOR BOXES FLOOR/WALL BOX WITH DESIGNATION "XYZ". REFER TO FLOOR/WALL BOX ABBREVIATION SCHEDULE.  XYZ (1) DUPLEX RECEPTACLE (2) GFI DUPLEX RECEPTACLE (3) QUADRUPLX RECEPTACLE (4) GFI QUADRUPLX RECEPTACLE (6) TELEPHONE OUTLET (7) DATA OUTLET (8) COMBO TELE/DATA OUTLET (9) AUDIO VISUAL		SWITCHES S SINGLE POLE LIGHT SWITCH S _M PADLOCKABLE HP RATED SWITCH S _X SPECIALTY SWITCH FOR "X" DESIGNATION, SEE LIGHTING SWITCH ABBREVIATION SCHEDULE BELOW. LIGHTING -- SWITCH ABBREVIATION SCHEDULE		SENSORS  SPECIALTY CEILING MOUNT SENSOR WITH DESIGNATION "XX", REFER TO ABBREVIATION LEGEND BELOW.  SPECIALTY CORNER MOUNT SENSOR WITH DESIGNATION "XX", REFER TO ABBREVIATION LEGEND BELOW. LIGHTING -- SENSOR ABBREVIATION SCHEDULE																										
POWER -- FLOOR/WALL BOX ABBREVIATION SCHEDULE <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">DUPLEX</td> <td style="text-align: center;">QUADRUPLX</td> <td style="text-align: center;">STANDARD</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> </table>		DUPLEX	QUADRUPLX	STANDARD																									ELECTRICAL GENERAL NOTES 1. ALL ELECTRICAL WORK SHALL COMPLY WITH ALL LOCAL CODES, AUTHORITIES HAVING JURISDICTION, DRAWINGS AND SPECIFICATIONS. IF DISCREPANCIES ARE FOUND - THE MOST STRINGENT REQUIREMENT SHALL GOVERN WORK. 2. REFER TO SPECIFICATIONS AND PROJECT MANUAL FOR ADDITIONAL INFORMATION AND REQUIREMENTS. 3. REFER TO ALL PROJECT DRAWINGS FOR DETAILS OF CONSTRUCTION AND INSTALLATION REQUIREMENTS. 4. PRIOR TO BID, CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE REQUIREMENTS OF THESE NOTES AS WELL AS OTHER NOTES SHOWN ON THE CONTRACT DOCUMENTS. 5. THESE DRAWINGS REFLECT A SYSTEM DESIGNED AROUND SPECIFIED REFERENCE PRODUCTS, THE SELECTION OF WHICH HAS INFLUENCED THE DESIGNS OF OTHER TRADES. IF SUBSTITUTE MANUFACTURERS, SIZES, OR MODEL NUMBERS ARE BID OR SUBMITTED, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL DIFFERENCES PRIOR TO BID. ALL COSTS OF ALL TRADES ASSOCIATED WITH THE SUBSTITUTION SHALL BE INCLUDED IN THE BID. 6. REFER TO ELECTRICAL SCHEDULES AND SPECIFICATIONS FOR BASIS OF DESIGN, ACCEPTABLE MANUFACTURERS, AND MODELS OF ELECTRICAL FIXTURES AND EQUIPMENT. 7. ALL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRICAL RELATIONSHIPS OF EQUIPMENT AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, DEVICE, OPTION, FITTING, OR COMPONENT. 8. CONTRACTOR SHALL NOT SCALE DRAWINGS. DRAWINGS SPECIFIC TO THIS DISCIPLINE DO NOT LIMIT THE RESPONSIBILITY OF WORK REQUIRED BY THE CONTRACT DOCUMENTS. 9. COORDINATION OF ALL MODIFICATIONS TO EACH DISCIPLINE WHICH RESULT FROM SUBSTITUTION OF EQUIPMENT OR MATERIALS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SUBSTITUTIONS WHICH ARE INSTALLED AND SUBSEQUENTLY ARE PROVEN UNSATISFACTORY BY OWNER AND/OR ENGINEER WITHIN THE WARRANTY PERIOD, SHALL BE REMOVED COMPLETELY BY THE CONTRACTOR AND REPLACED WITH THE ORIGINAL DESIGN OR CORRECTED AS DIRECTED BY THE ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER. 10. ALL ELECTRICAL CONDUIT SHALL BE 1/2" OR GREATER. 11. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL WORK WITH THAT OF OTHER TRADES. REFER TO ALL CONSTRUCTION DOCUMENTS FOR COMPLETE INFORMATION PRIOR TO BID. 12. NO ELECTRICAL SYSTEMS SHALL BE SUSPENDED, HUNG, OR SUPPORTED FROM DUCTWORK OR PIPING. 13. CONTRACTOR SHALL BE RESPONSIBLE FOR FLASHING AND SEALING OF ALL ROOF PENETRATIONS AIR AND WATER TIGHT. 14. CLOSELY COORDINATE FINAL LOCATIONS OF INSTALLED EQUIPMENT TO ACHIEVE THE GREATEST ACCESSIBILITY FOR MAINTENANCE. 15. CONTRACTOR SHALL VISIT THE SITE TO ESTABLISH THE EXISTING CONDITIONS PRIOR TO CONDUIT OR ELECTRICAL EQUIPMENT FABRICATION. SYSTEMS SHALL BE ERECTED USING FIELD MEASUREMENTS FOR COORDINATION WITH THE EXISTING EQUIPMENT, STRUCTURE, FIRE PROTECTION AND ELECTRICAL. ALL EQUIPMENT, DEVICES, AND FIXTURES SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATION. 16. EXPOSED CONDUIT AND MC CABLE SHALL BE FURNISHED SUITABLE FOR PAINTING, AND SHALL BE PAINTED AS REQUIRED BY ARCHITECTURAL SPECIFICATIONS. 17. PROVIDE ALL FITTINGS, COUPLINGS, AND OTHER ACCESSORIES NEEDED TO COMPLETE CONNECTIONS AND PROVIDE FOR PROPER OPERATION OF ELECTRICAL FIXTURES AND ELECTRICAL EQUIPMENT. 18. REFER TO ELECTRICAL SPECIFICATIONS FOR CONDUIT MATERIALS AND INSTALLATION REQUIREMENTS. 19. FIRE STOP ALL CONDUIT PENETRATIONS THROUGH RATED WALLS. REFER TO SPECIFICATIONS. 20. REFER TO ARCHITECTURAL PLANS FOR CEILING GRILL AND LIGHT FIXTURE LOCATIONS, FOR CEILING TYPE, AND FOR MOUNTING REQUIREMENTS. CONTRACTOR SHALL PROVIDE AND INSTALL ALL LIGHTS WITH MOUNTING DESIGNED FOR MOUNTING SURFACE TYPE. PROVIDE CONCRETE PADS FOR ALL GROUND MOUNTED EQUIPMENT. 21. REPLACE ALL ARCHITECTURAL FEATURES REMOVED OR DAMAGED DURING THE COURSE OF THE WORK. 22. CONTRACTOR SHALL PATCH ALL WALLS, FLOORS, AND CEILINGS TO MATCH NEW/EXISTING FOR OPENINGS CREATED BY INSTALLATION OF EQUIPMENT AND ELECTRICAL SERVICE PENETRATIONS. 23. ALL HVAC WITH ELECTRICAL REQUIREMENTS SHALL BE INSTALLED WITH ELECTRICAL INFRASTRUCTURE NECESSARY TO PROVIDE A FULLY FUNCTIONING SYSTEM. IF NOT SPECIFICALLY SHOWN ON ELECTRICAL SCHEDULE. HVAC FIXTURES REQUIRING ELECTRICAL SERVICE SHALL BE FED FROM BREAKER OF ADEQUATE CAPACITY. 24. REFER TO STRUCTURAL ENGINEERING CONTRACT FOR PROJECT SEISMIC DESIGN CRITERIA. PROVIDE VIBRATION ISOLATION AND SEISMIC RESTRAINT FOR EQUIPMENT AND CONDUIT AS REQUIRED.		COMMUNICATIONS DEVICES I INTERCOM STATION I _M MASTER INTERCOM STATION C CLOCK C _D CLOCK, DUAL SIDED C _{WG} CLOCK, WITH WIREGUARD H HORN SPEAKER H _{WP} HORN SPEAKER - WEATHERPROOF P PAGING SPEAKER C CAMERA WITH PAN, TILT, & ZOOM C _{WP} CAMERA - WEATHERPROOF WITH PAN, TILT, & ZOOM J _V SPECIAL SYSTEMS JUNCTION BOX ABOVE CEILING. ROUTE 1" C WITH PULL STRING TO DATA/ELECTRICAL ROOM. (V) VIDEO, (A) ALARMAccess A ACCESS CONTROL - PROVIDE ACCESS CONTROL ROUGH-IN AT DOOR. REFER TO DETAILS FOR ACCESS CONTROL ROUGH-IN REQUIREMENTS. D MAGNETIC DOOR HOLDER F FIRE ALARM PULL STATION F _A FIRE ALARM COMBINATION HORN/STROBE DEVICE S _A FIRE ALARM COMBINATION SPEAKER/STROBE DEVICE F _S FIRE ALARM STROBE DEVICE Z _I , Z _C , Z _M FIRE ALARM ZAM DEVICE; IAM (I), CONTROL (C), OR MONITOR MODULE (M) S SMOKE DETECTOR H HEAT DETECTOR S _D DUCT SMOKE DETECTOR S _{DA} DUCT SMOKE DETECTOR WITH AUXILIARY CONTACTS TS FS TAMPER SWITCH / FLOW SWITCH ATS SERVICE ENTRANCE RATED AUTOMATIC TRANSFER SWITCH M MANHOLE, HANDHOLE DESIGNATION REFER TO SCHEDULE.	
DUPLEX	QUADRUPLX	STANDARD																														
																																
																																
																																
																																
																																
																																
																																
																																
POWER -- RECEPTACLE ABBREVIATION LEGEND		ROOM CONTROLLERS / POWER PACKS P ^{XX} SPECIALTY POWER PACK WITH DESIGNATION "XX", REFER TO ABBREVIATION LEGEND BELOW. R ^{XX} SPECIALTY ROOM CONTROLLER WITH DESIGNATION "XX", REFER TO ABBREVIATION LEGEND BELOW.		DATA DEVICES  TELEPHONE OUTLET; ABOVE COUNTER, & FIREMANS  DATA OUTLET; ABOVE COUNTER & CEILING MOUNTED  COMBINATION DATA/TELEPHONE OUTLET & COMBINATION DATA/TELEPHONE OUTLET ABOVE COUNTER  TELEVISION OUTLET WITH HEIGHT A.F.F. DESIGNATION																												
POWER -- J-BOX ABBREVIATION SCHEDULE		LIGHTING -- ROOM CONTROLLER ABBREVIATION SCHEDULE		DEVICE MOUNTING HEIGHTS DEVICE MOUNTING HEIGHTS ARE FROM FINISHED FLOOR TO CENTER OF OUTLET BOX UNLESS NOTED OTHERWISE ON PLANS. COORDINATE THE STANDARD MOUNTING HEIGHTS WITH MASONRY, MILLWORK, AND OTHER DISCIPLINES: 1. STANDARD RECEPTACLE: +18" 2. STANDARD DATA JACK: +18" 3. ABOVE COUNTER RECEPTACLE: +6" ABOVE COUNTERTOP 4. ABOVE COUNTER DATA JACK: +6" ABOVE COUNTERTOP 5. REFRIGERATOR RECEPTACLE: +48" 6. WASHER/DRYER RECEPTACLE: +36" 7. SWITCHES: +44" 8. INTERCOM CALL STATION: +44" 9. FIRE ALARM SPEAKER/STROBES: +84" 10. FIRE ALARM PULL STATIONS: +44"																												
WIRE TYPES  LIGHTING CONTROL CABLING		EQUIPMENT AND CONDUIT LINE TYPES  FURNISH + INSTALL NEW  EXISTING  DEMOLISH  UNDERGROUND CONNECT TO EXISTING  <p>2 (3#8 + 1#8 + 1#10EG) 3/4" GRS CONDUIT TYPE (SEE ABBREVIATIONS) REFER TO SPECIFICATIONS IF NOT SHOWN CONDUIT SIZE GROUNDED (NEUTRAL) CONDUCTOR, NUMBER AND SIZE GROUNDED (NEUTRAL) CONDUCTOR, NUMBER AND SIZE PHASE (HOT) CONDUCTOR, NUMBER & SIZE NUMBER OF SETS HOME RUN TO PANEL. LETTER(S) INDICATE NAME OF PANEL. NUMBER(S) INDICATE CIRCUIT NUMBERS.</p>																														

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 501.448.0100 tel
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REVISION	BY	DATE

**BID ITEM 203.500 / 203.510
 ELECTRICAL POWER AND LIGHTING LEGEND
 DRAWING E0.1**

**WATER POLLUTION CONTROL
 CAPITAL EQUIPMENT REPLACEMENTS
 TMUA PROJECT WPC 26-1**

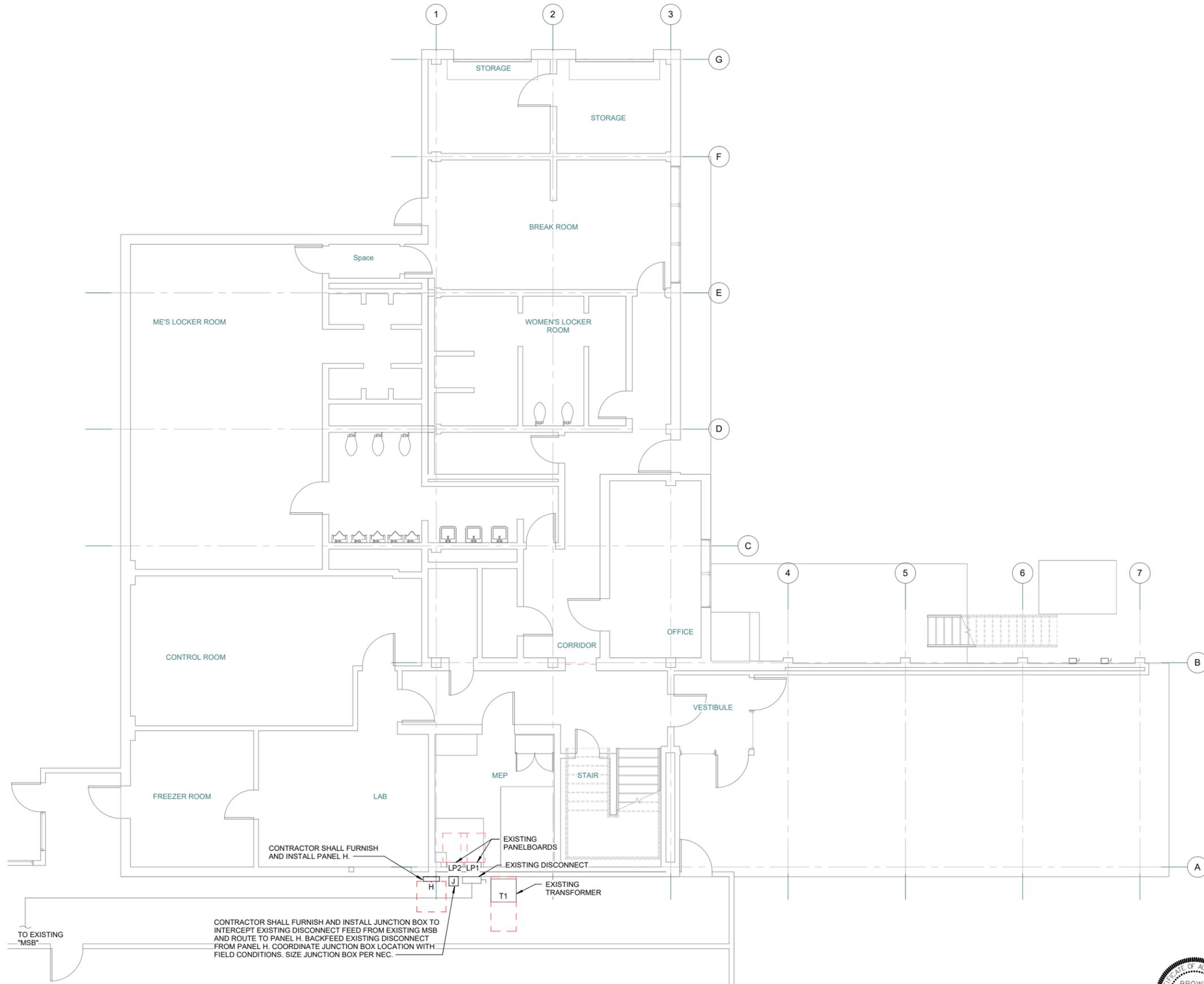
**CITY OF TULSA, OKLAHOMA
 TULSA METROPOLITAN UTILITY AUTHORITY
 WATER AND SEWER DEPARTMENT**

PLANS AND ESTIMATES		HOLLOWAY, UPDIKE & BELLEN, Inc.	
PREPARED BY:		2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754	
PLAN SCALE:	DRAWN	NL	APPROVED:
	DESIGNED	AE	
	SURVEY		
PROFILE SCALE:	FIELD MGR.		
	SECT. MGR.		
HORIZONTAL:	PROJ. MGR.		
	RECOMMENDED:		
VERTICAL:	DEPUTY DIRECTOR		
			PUBLIC WORKS DIRECTOR
FILE:	DRAWING: E0.1	DATE:	3-13-2026
ATLAS PAGE NO.:	--	SHEET	40/E1 OF 4 SHEETS



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CONTRACTOR SHALL FURNISH AND INSTALL PANEL H.
 EXISTING PANELBOARDS
 EXISTING DISCONNECT
 EXISTING TRANSFORMER

CONTRACTOR SHALL FURNISH AND INSTALL JUNCTION BOX TO INTERCEPT EXISTING DISCONNECT FEED FROM EXISTING MSB AND ROUTE TO PANEL H. BACKFEED EXISTING DISCONNECT FROM PANEL H. COORDINATE JUNCTION BOX LOCATION WITH FIELD CONDITIONS. SIZE JUNCTION BOX PER NEC.

TO EXISTING "MSB"

1 ELEC. RENOVATION NSWWTP OPS BUILDING - LEVEL 1

3/16" = 1'-0"



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 ELEC. RENOVATION - LEVEL 1
 DRAWING E1.1**

**WATER POLLUTION CONTROL
 CAPITAL EQUIPMENT REPLACEMENTS
 TMUA PROJECT WPC 26-1**

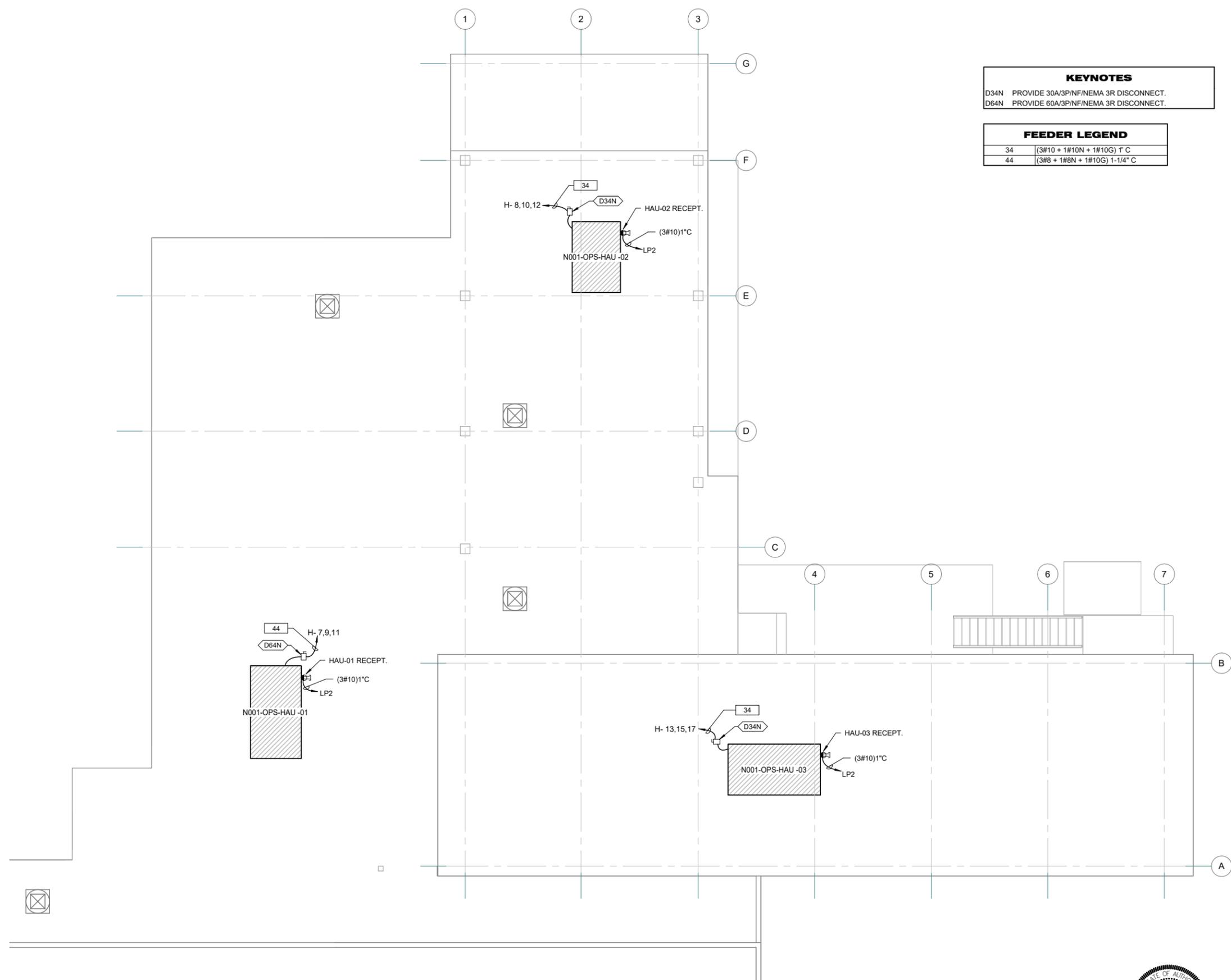
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	SURVEY		
PROFILE SCALE:	FIELD MGR.		
HORIZONTAL:	SECT. MGR.		
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	DEPUTY DIRECTOR		
FILE:	DRAWING: E1.1	DATE: 3-13-2026	PUBLIC WORKS DIRECTOR
ATLAS PAGE NO: --			SHEET 41/42 OF 4 SHEETS



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 DATE: 3/11/2026 12:57:59 PM
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KEYNOTES	
D34N	PROVIDE 30A/3P/NF/NEMA 3R DISCONNECT.
D64N	PROVIDE 60A/3P/NF/NEMA 3R DISCONNECT.

FEEDER LEGEND	
34	(3#10 + 1#10N + 1#10G) 1\" C
44	(3#8 + 1#8N + 1#10G) 1-1/4\" C

ALL WORK ASSOCIATED WITH N001-OPS-HAU-03 IS ADDITIVE ALTERNATE #2

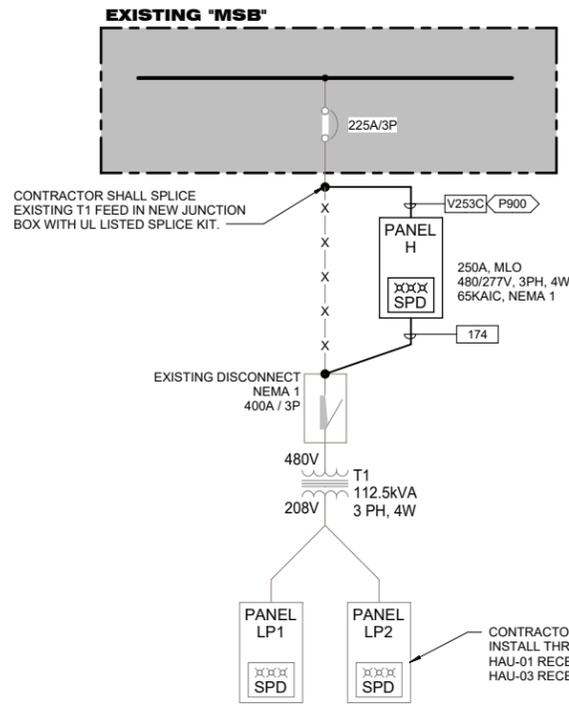
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REVISION	BY	DATE
BID ITEM 203.500 / 203.510 ELEC. POWER PLAN - ROOF DRAWING E2.1		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:		 HOLLOWAY, UPDIKE & BELLEN, Inc. <small>2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754</small>
PLAN SCALE: DRAWN DESIGNED SURVEY	NL AE	APPROVED: PUBLIC WORKS DIRECTOR
PROFILE SCALE: HORIZONTAL:	FIELD MGR. SECT. MGR. PROJ. MGR.	RECOMMENDED: DEPUTY DIRECTOR
FILE:	DRAWING: E2.1	DATE: 3-13-2026
ATLAS PAGE NO: --	SHEET 42/43 OF 4 SHEETS	SHEET 42/43 OF 4 SHEETS

1 ELEC. POWER PLAN NSWTP OPS BUILDING - ROOF
 3/16" = 1'-0"





FEEDER LEGEND

174	(3#2/0 + 1#2/0N + 1#6G) 3" C
V253C	(3#300 + 1#1/0G) 4" C

KEYNOTES

P900 CONTRACTOR SHALL BID AS SHOWN. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDUCTORS AND CONDUIT SIZE. CONTRACTOR SHALL SPLICE AND MATCH EXISTING CONDUCTORS AND CONDUIT SIZE. CONTRACTOR SHALL PROVIDE UL LISTED MEANS AS NECESSARY TO PROPERLY TERMINATE CONDUCTORS.

P901 CONTRACTOR SHALL DEMOLISH AND REMOVE CONDUIT AND WIRE FROM PANEL TO LOAD. CONTRACTOR SHALL LABEL BREAKER AS SPARE.

P902 CONTRACTOR SHALL FURNISH AND INSTALL (3) 20A/1P BREAKERS AND LABEL BREAKERS FOR LOAD FED.

ALL WORK ASSOCIATED WITH SECOND FLOOR ELECTRICAL AND N001-OPS-HAU-03 IS ADDITIVE ALTERNATE #2

Branch Panel: H

Location: Volts: 480/277 Wye
Supply From: Phases: 3
Mounting: Surface Wires: 4
Enclosure: NEMA 1

A.I.C. Rating: 65KA
Panel Rating: 250 A
Main Breaker: 225 A

Notes:

CKT	Load Name	Trip	Poles	A	B	C	A	B	C	Poles	Trip	Load Name	CKT
1				10.50			0.00						2
3	EXISTING DISCONNECT	175 A	3		10.50			0.00		3	60 A	SPD	4
5						10.50			0.00				6
7				8.59			6.10						8
9	N001-OPS-HAU-01	35 A	3		8.59			6.10		3	25 A	N001-OPS-HAU-02	10
11					8.59			6.10					12
13				7.33			0.00						14
15	N001-OPS-HAU-03	30 A	3		7.33			0.00		3	20 A	SPARE	16
17						7.33			0.00				18
19				0.00			0.00						20
21	SPARE	30 A	3		0.00			0.00		3	50 A	SPARE	22
23						0.00			0.00				24
25				--			0.00						26
27	SPACE	--	3		--			0.00		3	225 A	SPARE	28
29						--			0.00				30

Panel Totals

	PHASE A	PHASE B	PHASE C
Total Load:	32.52 kVA	32.52 kVA	32.52 kVA
Total Amps:	117 A	117 A	117 A
Total Conn. Load:	97.55 kVA		
Total Design Current:	147 A		

Notes:

ONE-LINE DIAGRAM
NOT TO SCALE

Branch Panel: LP1 EXISTING

Location: Volts: 120/208 Wye
Supply From: T1 Phases: 3
Mounting: Surface Wires: 4
Enclosure: Type 1

A.I.C. Rating: 25,000
Panel Rating: 225 A MCB

Notes: EXISTING

CKT	Load Name	Trip	Poles	A	B	C	A	B	C	Poles	Trip	Load Name	CKT
1				0.00			0.00						2
3	MAKE UP AIR HANDLING UNIT "MU-1"	60 A	3		0.00			0.00		3	40 A	MAKE UP AIR HANDLING UNIT "MU-2"	4
5						0.00			0.00				6
7				4.00			3.24						8
9	HOT WATER HEATER "WH-1"	40 A	3		4.00			3.24		3	40 A	ENTRY WAY HEATER "HTR-1"	10
11						4.00			3.24				12
13				0.00			0.00						14
15	SPARE	20 A	2				0.00						16
17						0.00			0.00	3	50 A	SPARE	18
19	SPARE	100 A	3				0.00						20
21						0.00			0.00	3	50 A	SPARE	22
23						0.00			0.00				24
25	SPARE	40 A	3		0.00			0.00					26
27					0.00			0.00		3	100 A	SPARE	28
29						0.00			0.00				30
31	SPARE	40 A	3		0.00			0.00					32
33					0.00			0.00		3	20 A	SPARE	34
35						0.00			0.00				36
37	SPARE	50 A	3		0.00			0.00					38
39						0.00			0.00	3	30 A	SPARE	40
41	SPARE	20 A	1			0.00			0.00				42

Panel Totals

	PHASE A	PHASE B	PHASE C
Total Load:	7.24 kVA	7.24 kVA	7.24 kVA
Total Amps:	60 A	60 A	60 A
Total Conn. Load:	21.72 kVA		
Total Design Current:	94 A		

Notes:

Branch Panel: LP2 EXISTING

Location: Volts: 120/208 Wye
Supply From: T1 Phases: 3
Mounting: Surface Wires: 4
Enclosure: Type 1

A.I.C. Rating: 25,000
Panel Rating: 225 A MCB

Notes: EXISTING

CKT	Load Name	Trip	Poles	A	B	C	A	B	C	Poles	Trip	Load Name	CKT
1				0.00			0.00						2
3	MIX SPLIT "FC" 2ND FLOOR OFFICE	15 A	2		0.00			0.00		2	15 A	MIX SPLIT "WC" 2ND FLOOR OFFICE	4
5	MIX SPLIT "DC" 2ND FLOOR OFFICE	15 A	2			0.00			0.00	2	15 A	MIX SPLIT "DC" 2ND FLOOR HALL	6
7				0.00			0.00						8
9	MIX SPLIT "FC" 2ND FLOOR CONF.	15 A	2			0.00			0.00	2	15 A	MIX SPLIT "WC" 2ND FLOOR STAIR	10
11						0.00			0.00				12
13	NORTH CONDENSER PAD RECEIPT.	20 A	1	0.00			0.00			2	15 A	MIX SPLIT "DC" 2ND FLOOR OPEN OFFICE	14
15	MIX SPLIT "DC" 2ND FLOOR OPEN OFFICE	15 A	2			0.00			0.00				16
17						0.00			0.00	2	30 A	MIX SPLIT CONDENSER "CU"	18
19	MIX SPLIT CONDENSER "CU"	30 A	2		0.00			0.00					20
21					0.00			0.00		2	30 A	MIX SPLIT CONDENSER "CU"	22
23						0.00			0.00				24
25	AIR HANDLIGHT UNIT "AHU-1"	50 A	3		0.00		0.18			1	20 A	SOUTH CONDENSER PAD RECEIPT.	26
27					0.00			0.00		1	20 A	SPARE	28
29						1.69			0.00	2	20 A	SPARE	30
31	CU-1	20 A	3		1.69			0.00					32
33					1.69			0.00		2	20 A	SPARE	34
35	SPARE	20 A	2			0.00			0.00				36
37					0.00			0.00					38
39	SPARE	20 A	2			0.00			0.00	3	100 A	SPARE	40
41						0.00			0.00				42

Panel Totals

	PHASE A	PHASE B	PHASE C
Total Load:	1.87 kVA	1.69 kVA	1.69 kVA
Total Amps:	16 A	14 A	14 A
Total Conn. Load:	5.25 kVA		
Total Design Current:	23 A		

Notes:

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BID ITEM 203.500 / 203.510
ELECTRICAL SCHEDULES AND ONLINE
DRAWING E3.1

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES		HOLLOWAY, UPDIKE & BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754	
PREPARED BY:		APPROVED:	
PLAN SCALE:	DRAWN: NL DESIGNED: AE SURVEY:		
PROFILE SCALE:	FIELD MGR. SECT. MGR. PROJ. MGR.		
HORIZONTAL:	RECOMMENDED:		
VERTICAL:	DEPUTY DIRECTOR	PUBLIC WORKS DIRECTOR	
FILE:	DRAWING: E3.1	DATE:	3-13-2026
ATLAS PAGE NO.:	--	SHEET	43/44 OF 4 SHEETS



HVAC LEGEND

ABBREVIATION OR SYMBOL	DESCRIPTION	ABBREVIATION OR SYMBOL	DESCRIPTION	ABBREVIATION OR SYMBOL	DESCRIPTION
AHU	AIR HANDLING UNIT		CEILING SUPPLY DIFFUSER		NEW EQUIPMENT
AFF	ABOVE FINISHED FLOOR		CEILING RETURN/EXHAUST GRILLE		EXISTING EQUIPMENT TO REMAIN
AP	ACCESS PANEL		GRILLE OR REGISTER ON BOTTOM OF DUCTWORK		EXISTING EQUIPMENT TO BE REMOVED
BHP	BRAKE HORSEPOWER		SIDEWALL SUPPLY (RETURN SIMILAR)		NEW DUCT
BTUH	BRITISH THERMAL UNIT PER HOUR		RECTANGULAR DUCT WITH DUCT SIZE TAG		EXISTING DUCT TO REMAIN
CFM	CUBIC FEET PER MINUTE		ROUND DUCT WITH DUCT SIZE TAG		DEMOLISH EXISTING DUCT BACK TO POINT
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT		OVAL DUCT WITH DUCT SIZE TAG		CONNECT TO EXISTING DUCT
D	DRY BULB TEMPERATURE		SUPPLY DUCT UP	<p>AIR DEVICE DESIGNATION</p> <p>AIR DEVICE "MARK" C/350 AIRFLOW CFM</p>	
DB	DOWN		SUPPLY DUCT DOWN		
DN	EXHAUST AIR		RETURN DUCT UP		
EA	ENTERING AIR TEMPERATURE OF THE COIL		RETURN DUCT DOWN		
ESP	EXTERNAL STATIC PRESSURE		EXHAUST DUCT UP		
EWT	ENTERING WATER TEMPERATURE		EXHAUST DUCT DOWN		
FCU	FAN COIL UNIT		RECTANGULAR/OVAL TRANSITION		
FLR	FLOOR		RECTANGULAR/ROUND TRANSITION		
FO	FLAT OVAL		FLEXIBLE DUCT CONNECTION		
FFM	FEET PER MINUTE (VELOCITY)		(1) FIRE DAMPER		
GPM	GALLONS PER MINUTE		(2) SMOKE DAMPER		
HP	HORSEPOWER		(3) MOTORIZED DAMPER		
KW	KILOWATT		(4) CONTROL DAMPER		
LAT	LEAVING AIR TEMPERATURE OF THE COIL		(1) BALANCING DAMPER		
LWT	LEAVING WATER TEMPERATURE		(2) SMOKE DETECTOR		
MAU	MAKE-UP AIR UNIT		BALANCING DAMPER, SET TO INDICATED CFM		
MAX	MAXIMUM				
MIN	MINIMUM				
MHP	MOTOR HORSEPOWER				
NTS	NOT TO SCALE				
OSA	OUTSIDE AIR				
PSI	POUNDS PER SQUARE INCH				
RA	RETURN AIR				
RH	RELATIVE HUMIDITY				
RPM	REVOLUTION PER MINUTE				
RTU	ROOF TOP (AIR CONDITIONING) UNIT				
SA	SUPPLY AIR				
SP	STATIC PRESSURE				
TYP	TYPICAL				
VAV	VARIABLE AIR VOLUME				
WB	WET BULB TEMPERATURE				
XFR	TRANSFER AIR				
'	FEET				
"	INCHES				
ø	ROUND DUCT				
Φ	OVAL DUCT				

MECHANICAL GENERAL NOTES

- ALL MECHANICAL WORK SHALL COMPLY WITH ALL LOCAL CODES, DRAWINGS, SPECIFICATIONS, AND AUTHORITIES HAVING JURISDICTION. IF DISCREPANCIES ARE FOUND, THE MOST STRINGENT REQUIREMENT SHALL GOVERN WORK. WHERE INSPECTIONS ARE REQUIRED BY AUTHORITIES HAVING JURISDICTION, WORK MUST NOT BE CONCEALED UNTIL INSPECTIONS AND TESTING ARE COMPLETE AND WORK IS ACCEPTED.
- REFER TO SPECIFICATIONS AND PROJECT MANUAL FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- REFER TO ALL PROJECT DRAWINGS FOR DETAILS OF CONSTRUCTION AND INSTALLATION REQUIREMENTS.
- PRIOR TO BID, CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE REQUIREMENTS OF THESE NOTES AS WELL AS OTHER NOTES SHOWN ON THE CONTRACT DOCUMENTS.
- THESE DRAWINGS REFLECT A MODEL DESIGNED AROUND SPECIFIED REFERENCE PRODUCTS, THE SELECTION OF WHICH HAS INFLUENCED THE DESIGNS OF OTHER TRADES. IF SUBSTITUTE MANUFACTURERS, SIZES, OR MODEL NUMBERS ARE BID OR SUBMITTED, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL DIFFERENCES PRIOR TO BID. ALL COSTS OF ALL TRADES ASSOCIATED WITH THE SUBSTITUTION SHALL BE INCLUDED IN THE BID.
- COORDINATION OF ALL MODIFICATIONS TO EACH DISCIPLINE WHICH RESULT FROM SUBSTITUTION OF EQUIPMENT OR MATERIALS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SUBSTITUTIONS WHICH ARE INSTALLED AND SUBSEQUENTLY ARE PROVEN UNSATISFACTORY BY OWNER, SHALL BE REMOVED COMPLETELY BY THE CONTRACTOR AND REPLACED WITH THE ORIGINAL DESIGN OR CORRECTED AS DIRECTED BY THE ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER.
- ALL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRICAL RELATIONSHIPS OF EQUIPMENT AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, SEQUENCE, DEVICE, OPTION, FITTING, OR COMPONENT.
- INFORMATION AND COMPONENTS ON DETAILS OR IN SPECIFICATIONS, BUT NOT SHOWN ON PLANS, AND VICE VERSA, SHALL BE PROVIDED AS IF EXPRESSLY REQUIRED BY BOTH.
- CONTRACTOR SHALL NOT SCALE DRAWINGS. DRAWINGS SPECIFIC TO THIS DISCIPLINE DO NOT LIMIT THE RESPONSIBILITY OF WORK REQUIRED BY THE CONTRACT DOCUMENTS.
- EXACT LOCATIONS OF ALL EQUIPMENT, ROOF CURBS, DUCTS, DIFFUSERS, AND PIPING SHALL BE COORDINATED WITH OTHER TRADES. CEILING MOUNTED SPRINKLER, LIGHTING, AND ELECTRICAL REQUIREMENTS TAKE PRECEDENCE OVER CEILING MOUNTED MECHANICAL REQUIREMENTS. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING GRID AND LIGHTING LAYOUT FOR COORDINATION OF FINAL DIFFUSER LOCATIONS.
- FIELD VERIFY EXISTING DIMENSIONS FOR EXISTING ARCHITECTURE AND STRUCTURE. COORDINATE ALL NEW MECHANICAL SYSTEMS WITH AVAILABLE SPACE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL WORK WITH THAT OF OTHER TRADES. REFER TO ALL CONSTRUCTION DOCUMENTS FOR COMPLETE INFORMATION PRIOR TO BID.
- ALL MECHANICAL CONSTRUCTION DETAILS SHALL BE AS SHOWN AND AS REQUIRED TO MAINTAIN "UL" ASSEMBLY RATINGS AS SHOWN ON ARCHITECTURAL SHEETS. SEAL AROUND ALL PENETRATIONS THROUGH UL RATED ASSEMBLIES, FIRE AND SMOKE WALLS. COORDINATE WITH GENERAL CONTRACTOR.
- NO OTHER TRADES, I.E., ELECTRICAL, CEILING, PLUMBING, OR OTHER SYSTEMS SHALL BE SUSPENDED, HUNG, OR SUPPORTED FROM DUCTWORK OR PIPING.
- SPECIAL CARE SHALL BE TAKEN ON [EXISTING] ROOFS TO PREVENT DAMAGE. ANY DAMAGE SHALL BE PROMPTLY REPAIRED AT NO EXPENSE TO THE OWNER. COMPLY WITH BONDING REQUIREMENTS OF [EXISTING] ROOF.
- CONTRACTOR SHALL BE RESPONSIBLE FOR FLASHING AND SEALING OF ALL ROOF PENETRATIONS AIR AND WATER TIGHT.
- CLOSELY COORDINATE FINAL LOCATIONS OF INSTALLED EQUIPMENT TO ACHIEVE THE GREATEST ACCESSIBILITY FOR MAINTENANCE PURPOSES.
- CONTRACTOR SHALL VISIT THE SITE TO ESTABLISH THE EXISTING CONDITIONS PRIOR TO DUCT, PIPE OR EQUIPMENT FABRICATION. SYSTEMS SHALL BE ERRECTED USING FIELD MEASUREMENTS FOR COORDINATION WITH THE EXISTING EQUIPMENT, STRUCTURE, FIRE PROTECTION AND ELECTRICAL IN THE SPACE.
- MAINTAIN THE SECURITY OF THE BUILDING AT ALL TIMES.
- CORE DRILL ALL PIPING PENETRATIONS OF CONCRETE WALLS AND FLOORS.
- ALL HVAC WORK TO BE PER SMACNA AND ALL APPLICABLE CODES. DUCT SIZES REPRESENT FREE AREA.
- ALL LOW PRESSURE DUCTWORK THAT HAS TO BE OFFSET DUE TO AN OBSTRUCTION SHALL BE OFFSET WITH TWO - 45 DEGREE, 1.5 RADIUS ELBOWS UNLESS OTHERWISE NOTED.
- PROVIDE ACCESS DOORS IN WALLS, FLOORS, OR CEILINGS FOR ACCESS TO ALL FIRE DAMPERS, SMOKE DAMPERS, EQUIPMENT, COILS, VALVES, AND BALANCING DAMPERS. ACCESS DOORS ARE NOT REQUIRED WHERE DEVICES ARE DIRECTLY ACCESSIBLE THROUGH AIR DEVICES.
- ALL DUCTWORK UPSTREAM OF VAV BOXES SHALL BE CONSIDERED "MEDIUM-PRESSURE DUCT".
- DUCT FITTINGS ARE AS FOLLOWS: 1) FLEX DUCT IS ONLY PERMITTED IN LINEAR DUCT RUNS. FLEX DUCT SHALL NOT BE USED WHERE DUCTWORK CHANGES DIRECTION. ALL ELBOWS SHALL BE HARD TIGHTED. 2) ALL 90 DEGREE ELBOWS TO HAVE R/D = 1.5. UNLESS OTHERWISE NOTED. 3) ALL MITERED RECTANGULAR ELBOWS GREATER THAN 90 DEGREES NOTED ARE TO HAVE TURNING VANES. 4) SIDE TAKE-OFF FITTINGS SHALL BE EQUAL TO FLEXMASTER ST0803. 5) DAMPERS SHALL BE EQUAL TO FLEXMASTER SLDB03
- PROVIDE BRANCH TAKEOFF AND DAMPER AT EACH CONNECTION OF ROUND OR RECTANGULAR BRANCH DUCTS TO A RECTANGULAR DUCT. SEE DETAILS.
- MAINTAIN A MINIMUM OF 10'-0" BETWEEN ALL FRESH AIR INTAKES AND PLUMBING VENTS, EXHAUST FAN DISCHARGE, AND FLUES. MAINTAIN MINIMUM CLEAR DISTANCE OF 50" BETWEEN PARAPET WALL AND ALL ROOF MOUNTED MECHANICAL EQUIPMENT.
- ALL ROOF MOUNTED EQUIPMENT SHALL BE PROVIDED WITH MANUFACTURER'S FABRICATED CURBS WHICH FACILITATE LEVEL MOUNTING OF THE EQUIPMENT (I.E. FACTORY FABRICATED TO COMPENSATE FOR ROOF SLOPE). OBTAIN ROOF SLOPES AND DIRECTION OF SLOPE FROM ARCHITECTURAL AND/OR STRUCTURAL PLANS. ALL ROOF CURBS SHALL BE A MINIMUM OF 8" HIGH. SHIMMING OF CURBS IS NOT ACCEPTABLE.
- ROOF PENETRATIONS AND FLASHING OR SEALING MUST COMPLY WITH ROOF MANUFACTURER'S RECOMMENDATIONS AND WARRANTY REQUIREMENTS.
- ALL DUCTS SHALL BE MOUNTED HIGH AS POSSIBLE AGAINST BOTTOM OF STRUCTURE EXCEPT AS REQUIRED TO AVOID CONFLICTS WITH INTERSECTING SYSTEMS. DIAGONALLY OFFSET DUCTS IMMEDIATELY BEFORE AND AFTER PASSING UNDER INTERSECTING SYSTEMS TO MAINTAIN DUCT TIGHT TO STRUCTURE.
- CONTRACTOR SHALL FIELD VERIFY ALL PIPE ROUTING AND ADJUST ELEVATIONS AS REQUIRED TO AVOID CONFLICTS. FINAL PLACEMENT OF PIPING SHALL BE DETERMINED BY FIELD MEASUREMENT AND VERIFICATION. ELEVATIONS ARE REFERENCED TO PIPE CENTERLINE UNLESS OTHERWISE NOTED.
- DUCTWORK SHALL CONFORM TO THE FOLLOWING PRESSURE CLASSES: SUPPLY UPSTREAM OF TERMINAL BOXES: 3" SP; SUPPLY DOWNSTREAM OF TERMINAL BOXES: 2" SP; RETURN/RELIEF/OUTSIDE AIR/EXHAUST: 2" SP. ALL DUCTWORK IS REQUIRED TO BE TESTED IN ACCORDANCE WITH THE SPECIFICATIONS.
- ALL EQUIPMENT, DEVICES, AND FIXTURES SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATION.
- CONTRACTOR SHALL VERIFY CLOSELY AT SITE TRANSPORTATION OF NEW HVAC EQUIPMENT INTO MECHANICAL AREAS BEFORE BIDDING. PROVIDE COMPLETE DISASSEMBLY AND RE-ASSEMBLY OF NEW EQUIPMENT AS REQUIRED FOR A COMPLETE INSTALLATION.
- PROVIDE FLEXIBLE CONNECTIONS AND TRANSITIONS ON DUCT INLET AND OUTLET CONNECTIONS TO ALL EQUIPMENT WITH MOVING PARTS.
- DUCTWORK VISIBLE THROUGH RETURN AIR OPENINGS SHALL BE PAINTED FLAT BLACK TO REDUCE VISIBILITY.
- EXPOSED DUCTWORK AND PIPING SHALL BE FURNISHED SUITABLE FOR PAINTING, AND SHALL BE PAINTED PER OWNER.
- NOT ALL REQUIRED PIPING, VALVES, OR FITTINGS ARE SHOWN ON DRAWINGS FOR CLARITY. COORDINATE PLAN DETAILS WITH SPECIFICATIONS, SCHEMATICS, FLOW DIAGRAMS, AND OTHER DETAILS TO PROVIDE COMPLETE PIPING SYSTEMS.
- COORDINATE WORK CLOSELY WITH CONTROL REQUIREMENTS. PROVIDE ALL NECESSARY DUCT TAPS, PIPE TAPS, WELLS, AND OTHER APPURTENANCES REQUIRED BY CONTROL SYSTEM. PROVIDE SPARE PIPE WELL ADJACENT TO EACH TEMPERATURE SENSOR IN PIPING.
- FIELD VERIFY EXISTING CEILING AND WALL TYPES, AND PROVIDE AIR TERMINALS SUITABLE FOR MOUNTING ON THE SURFACES AT EACH LOCATION.
- COORDINATE FINAL PLACEMENT OF ALL THERMOSTATS WITH WALL-MOUNTED DEVICES AND OWNER'S REPRESENTATIVE. MOUNT PER A.D.A. REQUIREMENTS. ANY THERMOSTAT THAT IS REQUIRED TO BE MOUNTED ON AN EXTERIOR WALL SHALL BE MOUNTED ON AN INSULATED PAD.
- INSTALL SMOKE DETECTOR IN SUPPLY AND RETURN DUCT OF ALL AIR HANDLERS SUPPLYING GREATER THAN 2,000 CFM.
- PROVIDE CONCRETE PADS FOR ALL GROUND MOUNTED EQUIPMENT.
- REPLACE ALL ARCHITECTURAL FEATURES REMOVED OR DAMAGED DURING THE COURSE OF THE WORK.
- CONTRACTOR SHALL PATCH ALL WALLS, FLOORS, AND CEILINGS TO MATCH NEW/EXISTING FOR ALL OPENINGS CREATED BY INSTALLATION OF EQUIPMENT AND HVAC SERVICE PENETRATIONS.
- ALL SUPPLY, RETURN, RELIEF, AND OUTSIDE AIR DUCTWORK SHALL BE EXTERNALLY INSULATED EXCEPT WHERE LINED, DOUBLE WALL LINED DUCT, OR FABRIC DUCT IS INDICATED. INSULATE TOPS OF SUPPLY AIR DIFFUSERS WITH 2" THICK FIBERGLASS DUCT WRAP.
- REFER TO SPECIFICATIONS FOR INSULATION AND R-VALUES FOR MECHANICAL PIPING AND DUCTWORK INSULATION.
- SEE ARCHITECTURAL PLANS FOR ROOF PENETRATION DETAILS.
- ALL HVAC COMPONENTS WITH ELECTRICAL REQUIREMENTS SHALL BE INSTALLED WITH ELECTRICAL INFRASTRUCTURE NECESSARY TO PROVIDE A FULLY FUNCTIONING SYSTEM. IF NOT SPECIFICALLY SHOWN ON ELECTRICAL SCHEDULE, HVAC FIXTURES REQUIRING ELECTRICAL SERVICE SHALL BE FED FROM BREAKER OF ADEQUATE CAPACITY.
- ALL CONTROL WIRING SHALL BE INSTALLED IN CONDUIT.
- PLENUM CABLING SHALL HAVE ITS OWN SYSTEM OF SUPPORT AND BE STRUCTURALLY SOUND. ATTACHMENT TO CEILING GRID AND HANGER WIRES IS PROHIBITED.
- WHERE NOT INSTALLED IN CONDUIT, CABLING SHALL BE RUN IN CABLE HOOKS, CABLING LAYING ON CEILING TILES IS PROHIBITED.
- CONTRACTOR SHALL PROVIDE FURR DOWN AND ANY OTHER CEILING MODIFICATIONS NEEDED TO ACCOMMODATE DUCTWORK PENETRATIONS.
- PROVIDE ALL HVAC UNITS WITH AN EXTRA SET OF MANUFACTURER'S RECOMMENDED FILTERS AFTER PROJECT COMPLETION.
- ALL ROOFTOP HVAC EQUIPMENT SHALL HAVE CURBS AND SUPPORTS DESIGNED TO RESIST WIND LOADS SPECIFIED BY A LICENSED ENGINEER IN ACCORDANCE WITH ASCE 7 REQUIREMENTS. SUBMITTALS SHALL INCLUDE ENGINEERED WIND CALCULATIONS FOR CURBS AND SUPPORTS.

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* NOT ALL SYMBOLS MAY APPLY TO THIS PROJECT

DEMOLITION GENERAL NOTES

- ALL EXISTING BUILDING HVAC EQUIPMENT NOTED ON PLANS FOR DEMOLITION IS TO BE DEMOLISHED IN ITS ENTIRETY.
- THE MECHANICAL RELATED DEMOLITION WORK INDICATED ON THE PLANS, SPECIFICATIONS, AND NOTES IS TO BE CLOSELY COORDINATED WITH THE OWNER'S REPRESENTATIVE. NO DEMOLITION SHALL TAKE PLACE IN ANY AREA OR BUILDING UNTIL THE CONTRACTOR HAS BEEN GIVEN APPROVAL TO PROCEED IN THAT SPECIFIC LOCATION. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR ADDITIONAL INFORMATION AND DEMOLITION SCOPE OF WORK.
- IF, DURING DEMOLITION, IT BECOMES NECESSARY TO TEMPORARILY REMOVE ANY EQUIPMENT, PIPING, OR OTHER SYSTEM WHICH IS NOT SPECIFICALLY NOTED TO BE REMOVED (THEREBY IMPLYING THAT THEY ARE TO BE LEFT FOR FUTURE USE), THE CONTRACTOR SHALL REINSTALL SAID SYSTEMS TO FULLY OPERABLE CONDITION IN THEIR ORIGINAL LOCATIONS.
- ALL DEMOLITION WORK SHALL BE SCHEDULED WITH THE OWNER'S REPRESENTATIVE AT LEAST 48 HOURS PRIOR TO THE WORK.
- PATCH ALL OPENINGS IN WALLS, FLOORS, AND CEILINGS WHERE DUCT, PIPING, AND CONTROLS HAVE BEEN REMOVED TO MATCH EXISTING.
- ANY DAMAGE TO THE OWNER'S PROPERTY, BUILDING, EXISTING SYSTEMS, OR EQUIPMENT RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER AND ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER.
- MAINTAIN THE SECURITY OF THE BUILDING AT ALL TIMES.
- REMOVE EXISTING CONTROL SYSTEMS SERVING DEMOLISHED HVAC EQUIPMENT UNLESS OTHERWISE NOTED.
- REMOVE ALL EXISTING SUPPORTS ASSOCIATED WITH EQUIPMENT, DUCTWORK, AND PIPE BEING REMOVED UNLESS NOTED OTHERWISE.
- DISPOSE OF ALL REMOVED EQUIPMENT AS DIRECTED BY THE OWNER.
- SCHEDULE UTILITY WORK WITH OWNER TO KEEP TO A MINIMUM ACCEPTABLE DOWNTIME AND TO NOT INTERFERE WITH THE BUILDING OPERATIONAL SCHEDULE, IF POSSIBLE.
- MAINTAIN THE FIRE AND SMOKE CONSTRUCTION INTEGRITY OF THE BUILDING.
- DO NOT VENT REFRIGERANT TO ATMOSPHERE. RECOVER REFRIGERANT FOR REUSE USING ASHRAE RECOMMENDED PROCEDURES.
- IF DURING THE COURSE OF THE WORK MATERIAL WHICH MAY CONTAIN ASBESTOS IS DISCOVERED, STOP WORK IMMEDIATELY AND COMPLY WITH EPA REGULATIONS TO PROTECT WORKERS AND OCCUPANTS. NOTIFY OWNER AND ENGINEER.
- EXISTING EQUIPMENT SHALL BE RELOCATED AS NECESSARY FOR THE INSTALLATION OF THE NEW SYSTEMS. METHODS AND POSITIONS OF THE RELOCATIONS SHALL HAVE PRIOR APPROVAL OF THE ARCHITECT.
- DEMOLITION AND SHUTDOWN OF EXISTING HVAC SYSTEMS SHALL BE COORDINATED WITH OWNER'S REPRESENTATIVE AND PLANNED TO LIMIT INCONVENIENCE AND DISRUPTION OF BUILDING OPERATIONS AS MUCH AS POSSIBLE. WORK SHALL BE PHASED ACCORDINGLY. PLUMBING OR HVAC WORK REQUIRED IN OCCUPIED AREAS SHALL BE SCHEDULED WITH THE OWNER 48 HOURS IN ADVANCE.
- SPECIAL CARE SHALL BE TAKEN ON THE EXISTING ROOFS TO PREVENT DAMAGE. ANY DAMAGE SHALL BE PROMPTLY REPAIRED AT NO EXPENSE TO THE OWNER. COMPLY WITH BONDING REQUIREMENTS OF EXISTING ROOF.
- DEMOLITION AND SHUTDOWN OF EXISTING HVAC SYSTEMS THAT WILL AFFECT PORTIONS OF THE BUILDING OUTSIDE OF PROJECT AREA SHALL BE COORDINATED WITH OWNER'S REPRESENTATIVE AND PLANNED TO LIMIT INCONVENIENCE AND DISRUPTION OF BUILDING OPERATIONS AS MUCH AS POSSIBLE. WORK SHALL BE PHASED ACCORDINGLY.

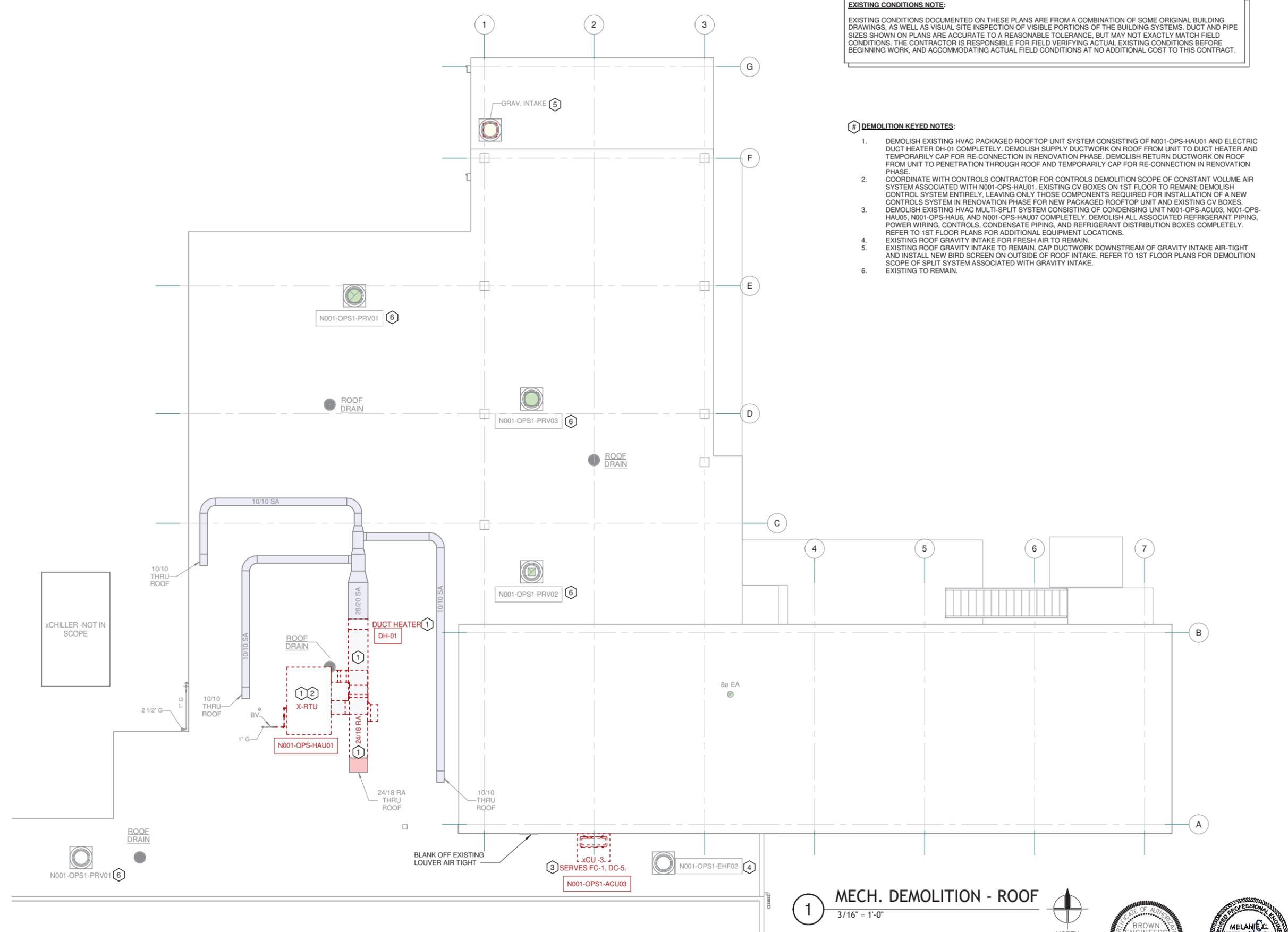
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REVISION	BY	DATE
BID ITEM 203.500 / 203.510 MECHANICAL NOTES AND LEGENDS DRAWING M0.1		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY <small>WATER AND SEWER DEPARTMENT</small>		
PLANS AND ESTIMATES PREPARED BY:		HOLLOWAY, UPDIKE & BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754
PLAN SCALE:	DRAWN Author DESIGNED Designer SURVEY	APPROVED:
PROFILE SCALE:	FIELD MGR. SECT. MGR. PROJ. MGR.	RECOMMENDED:
HORIZONTAL:	DEPUTY DIRECTOR	PUBLIC WORKS DIRECTOR
VERTICAL:	FILE: DRAWING: M0.1	DATE: 3-13-2026
ATLAS PAGE NO: --	SHEET 44/01	OF 12 SHEETS

EXISTING CONDITIONS NOTE:
 EXISTING CONDITIONS DOCUMENTED ON THESE PLANS ARE FROM A COMBINATION OF SOME ORIGINAL BUILDING DRAWINGS, AS WELL AS VISUAL SITE INSPECTION OF VISIBLE PORTIONS OF THE BUILDING SYSTEMS. DUCT AND PIPE SIZES SHOWN ON PLANS ARE ACCURATE TO A REASONABLE TOLERANCE, BUT MAY NOT EXACTLY MATCH FIELD CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ACTUAL EXISTING CONDITIONS BEFORE BEGINNING WORK, AND ACCOMMODATING ACTUAL FIELD CONDITIONS AT NO ADDITIONAL COST TO THIS CONTRACT.

- # DEMOLITION KEVED NOTES:**
1. DEMOLISH EXISTING HVAC PACKAGED ROOFTOP UNIT SYSTEM CONSISTING OF N001-OPS-HAU01 AND ELECTRIC DUCT HEATER DH-01 COMPLETELY. DEMOLISH SUPPLY DUCTWORK ON ROOF FROM UNIT TO DUCT HEATER AND TEMPORARILY CAP FOR RE-CONNECTION IN RENOVATION PHASE. DEMOLISH RETURN DUCTWORK ON ROOF FROM UNIT TO PENETRATION THROUGH ROOF AND TEMPORARILY CAP FOR RE-CONNECTION IN RENOVATION PHASE.
 2. COORDINATE WITH CONTROLS CONTRACTOR FOR CONTROLS DEMOLITION SCOPE OF CONSTANT VOLUME AIR SYSTEM ASSOCIATED WITH N001-OPS-HAU01. EXISTING CV BOXES ON 1ST FLOOR TO REMAIN; DEMOLISH CONTROL SYSTEM ENTIRELY, LEAVING ONLY THOSE COMPONENTS REQUIRED FOR INSTALLATION OF A NEW CONTROLS SYSTEM IN RENOVATION PHASE FOR NEW PACKAGED ROOFTOP UNIT AND EXISTING CV BOXES.
 3. DEMOLISH EXISTING HVAC MULTI-SPLIT SYSTEM CONSISTING OF CONDENSING UNIT N001-OPS-ACU03, N001-OPS-HAU05, N001-OPS-HAU6, AND N001-OPS-HAU07 COMPLETELY. DEMOLISH ALL ASSOCIATED REFRIGERANT PIPING, POWER WIRING, CONTROLS, CONDENSATE PIPINGS, AND REFRIGERANT DISTRIBUTION BOXES COMPLETELY. REFER TO 1ST FLOOR PLANS FOR ADDITIONAL EQUIPMENT LOCATIONS.
 4. EXISTING ROOF GRAVITY INTAKE FOR FRESH AIR TO REMAIN.
 5. EXISTING ROOF GRAVITY INTAKE TO REMAIN. CAP DUCTWORK DOWNSTREAM OF GRAVITY INTAKE AIR-TIGHT AND INSTALL NEW BIRD SCREEN ON OUTSIDE OF ROOF INTAKE. REFER TO 1ST FLOOR PLANS FOR DEMOLITION SCOPE OF SPLIT SYSTEM ASSOCIATED WITH GRAVITY INTAKE.
 6. EXISTING TO REMAIN.



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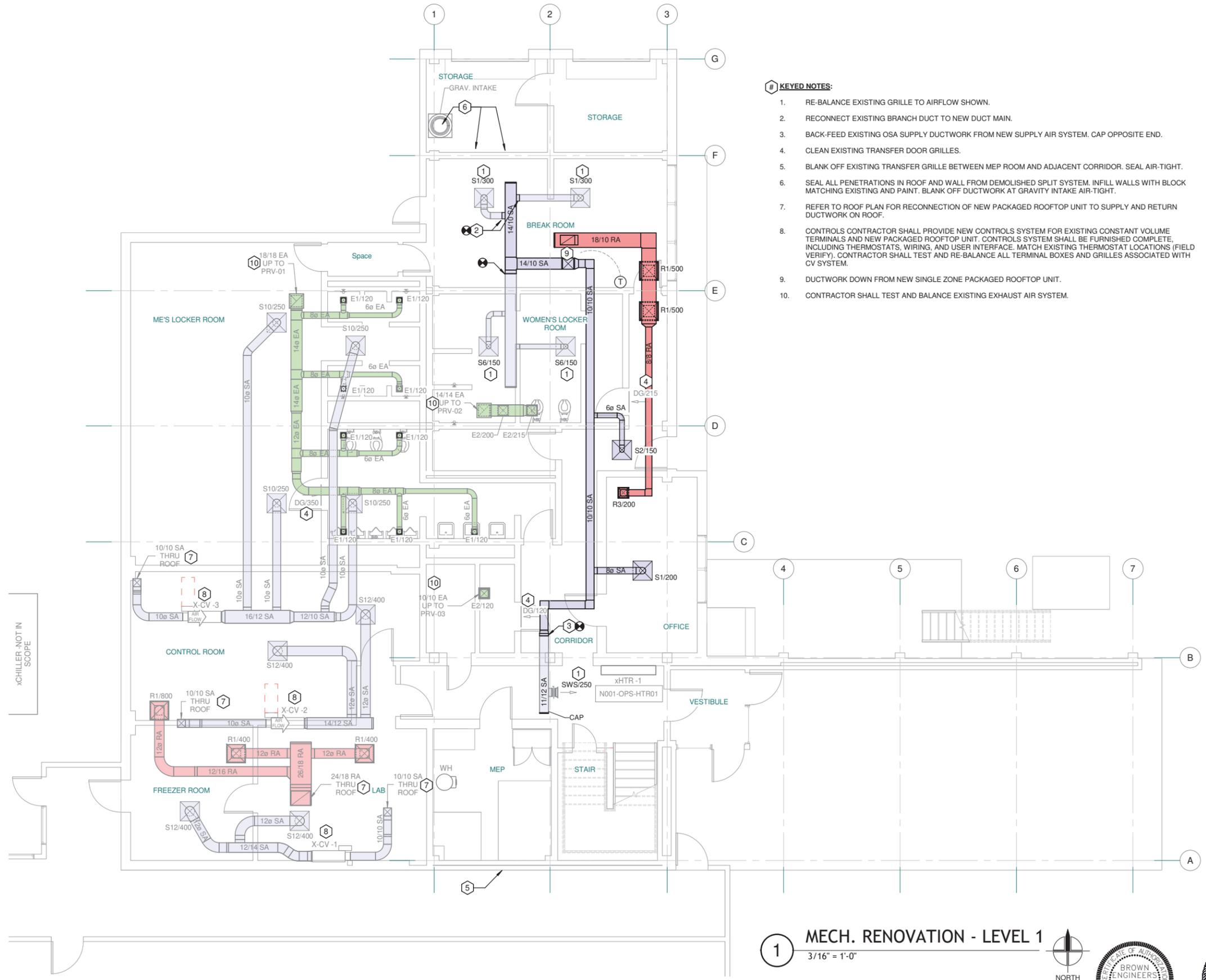


REVISION	BY	DATE
BID ITEM 203.500 / 203.510 MECHANICAL DEMOLITION - ROOF DRAWING M1.3		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:	 HOLLOWAY, UPDIKE & BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754	
PLAN SCALE:	DRAWN Author DESIGNED Designer SURVEY	APPROVED:
PROFILE SCALE:	FIELD MGR.	
HORIZONTAL:	SECT. MGR.	
	PROJ. MGR.	
	RECOMMENDED:	
VERTICAL:	DEPUTY DIRECTOR	
FILE:	DRAWING: M1.3	DATE: 3-13-2026
ATLAS PAGE NO: -		SHEET 47/44 OF 12 SHEETS

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- # KEYED NOTES:
1. RE-BALANCE EXISTING GRILLE TO AIRFLOW SHOWN.
 2. RECONNECT EXISTING BRANCH DUCT TO NEW DUCT MAIN.
 3. BACK-FEED EXISTING OSA SUPPLY DUCTWORK FROM NEW SUPPLY AIR SYSTEM. CAP OPPOSITE END.
 4. CLEAN EXISTING TRANSFER DOOR GRILLES.
 5. BLANK OFF EXISTING TRANSFER GRILLE BETWEEN MEP ROOM AND ADJACENT CORRIDOR. SEAL AIR-TIGHT.
 6. SEAL ALL PENETRATIONS IN ROOF AND WALL FROM DEMOLISHED SPLIT SYSTEM. INFILL WALLS WITH BLOCK MATCHING EXISTING AND PAINT. BLANK OFF DUCTWORK AT GRAVITY INTAKE AIR-TIGHT.
 7. REFER TO ROOF PLAN FOR RECONNECTION OF NEW PACKAGED ROOFTOP UNIT TO SUPPLY AND RETURN DUCTWORK ON ROOF.
 8. CONTROLS CONTRACTOR SHALL PROVIDE NEW CONTROLS SYSTEM FOR EXISTING CONSTANT VOLUME TERMINALS AND NEW PACKAGED ROOFTOP UNIT. CONTROLS SYSTEM SHALL BE FURNISHED COMPLETE, INCLUDING THERMOSTATS, WIRING, AND USER INTERFACE. MATCH EXISTING THERMOSTAT LOCATIONS (FIELD VERIFY). CONTRACTOR SHALL TEST AND RE-BALANCE ALL TERMINAL BOXES AND GRILLES ASSOCIATED WITH CV SYSTEM.
 9. DUCTWORK DOWN FROM NEW SINGLE ZONE PACKAGED ROOFTOP UNIT.
 10. CONTRACTOR SHALL TEST AND BALANCE EXISTING EXHAUST AIR SYSTEM.

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REVISION	BY	DATE
BID ITEM 203.500 / 203.510 MECHANICAL RENOVATION - LEVEL 1 DRAWING M2.1		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:		HOLLOWAY, UPDIKE & BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754
PLAN SCALE:	DRAWN AL DESIGNED AL SURVEY	APPROVED:
PROFILE SCALE:	FIELD MGR. SECT. MGR. PROJ. MGR.	
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FILE:	DRAWING: M2.1	DATE: 3-13-2026
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1 MECH. RENOVATION - LEVEL 1
 3/16" = 1'-0"



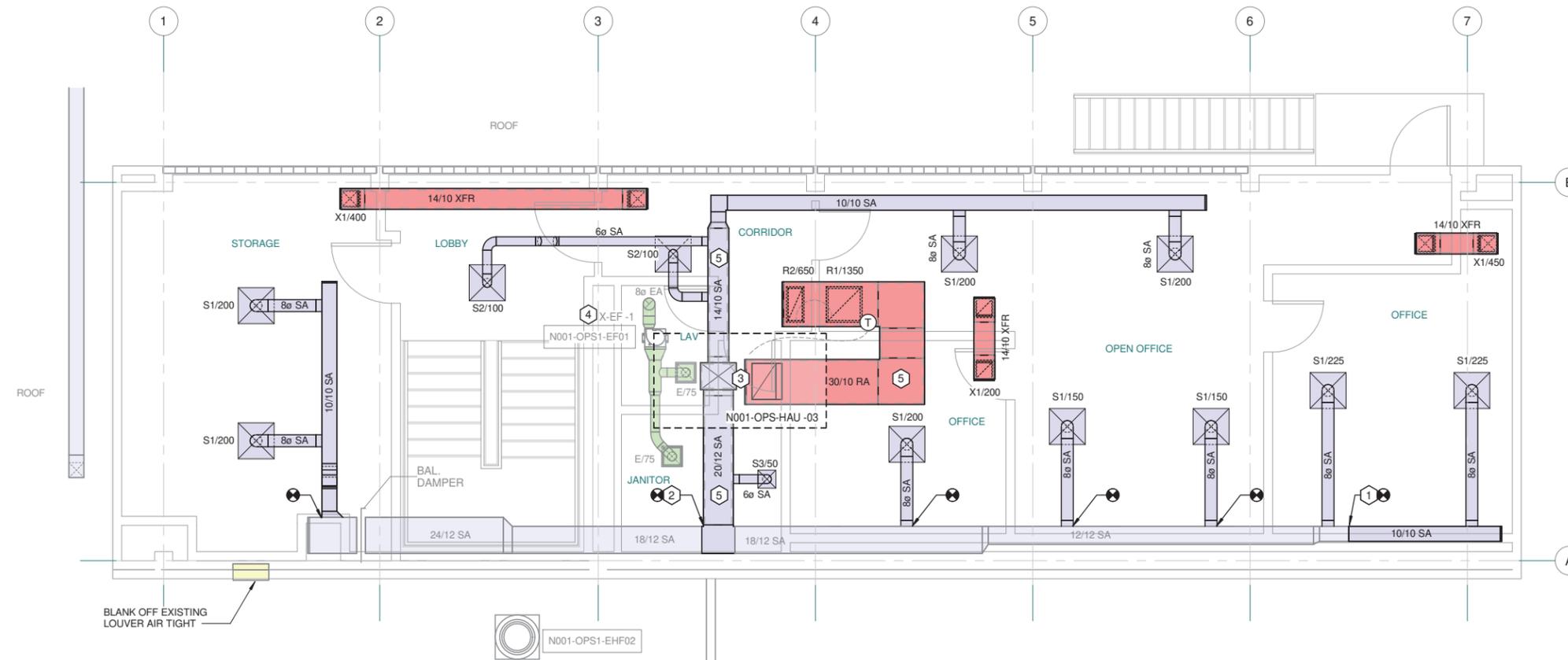
GENERAL NOTE:

ABOVE-CEILING SPACE ON 2ND FLOOR IS EXTREMELY LIMITED. CONTRACTOR SHALL FIELD VERIFY EXISTING STRUCTURE AND OTHER CONFLICTING SYSTEMS ABOVE CEILING BEFORE BEGINNING WORK. ESTIMATED MAXIMUM AVAILABLE SIDEWALL HEIGHT FOR NEW DUCTWORK (INCLUDING INSULATION) IS APPROXIMATELY 12".

KEYED NOTES:

1. EXTEND EXISTING DUCT MAIN.
2. BACK-FEED EXISTING OSA SUPPLY DUCTWORK FROM NEW SUPPLY AIR SYSTEM.
3. DUCTWORK DOWN FROM NEW SINGLE ZONE PACKAGED ROOFTOP UNIT.
4. CONTRACTOR SHALL TEST AND BALANCE EXISTING EXHAUST AIR SYSTEM.
5. INSTALL DUCT LINER IN RETURN DUCTWORK, AND FIRST 10' OF SUPPLY AIR DUCTWORK.

ALL LEVEL 2 WORK THIS SHEET IS PART OF ADDITIVE ALTERNATE #2



1 MECH. RENOVATION - LEVEL 2
1/4" = 1'-0"

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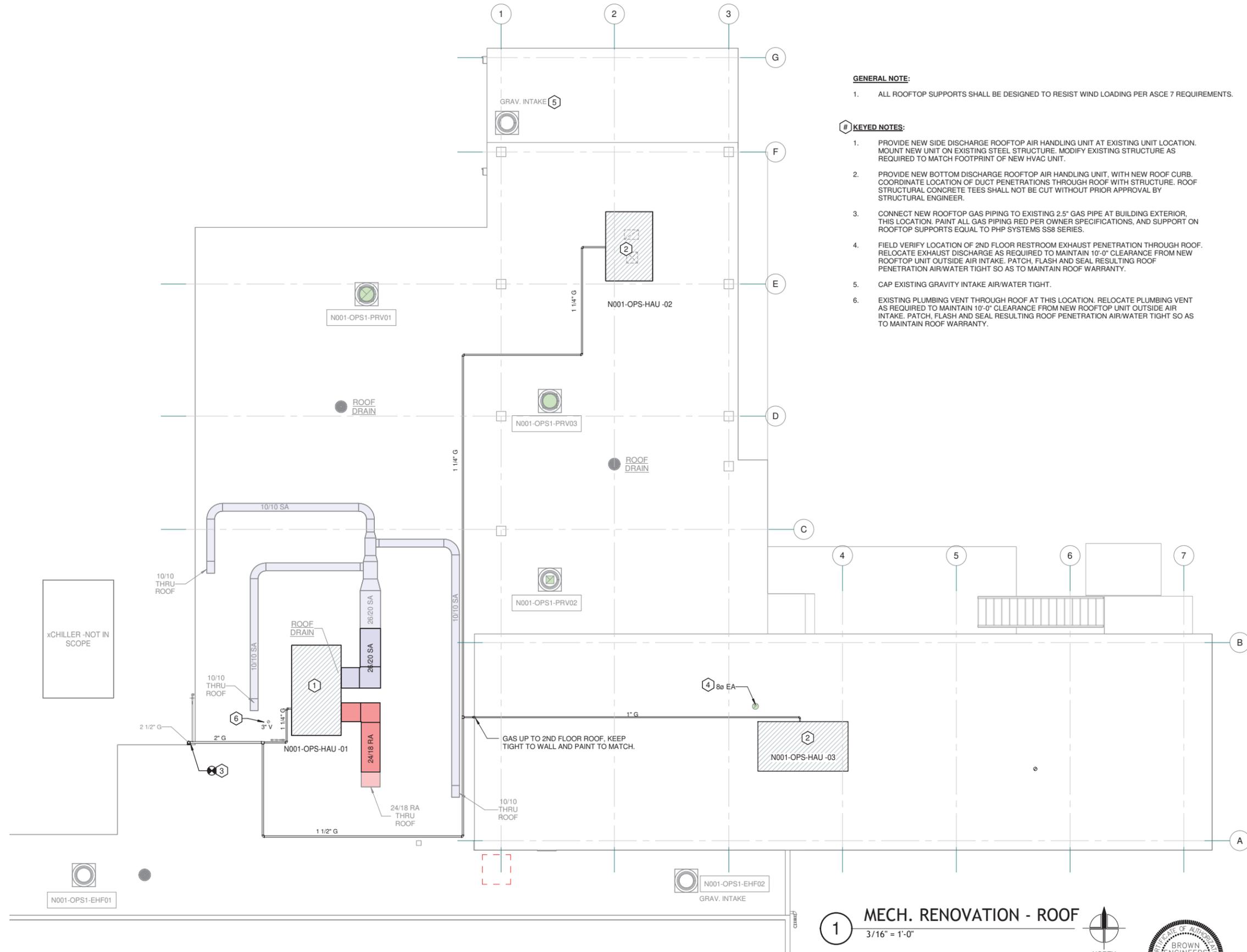


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BID ITEM 203.500 / 203.510 MECHANICAL RENOVATION - LEVEL 2 DRAWING M2.2		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
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GENERAL NOTE:

1. ALL ROOFTOP SUPPORTS SHALL BE DESIGNED TO RESIST WIND LOADING PER ASCE 7 REQUIREMENTS.

KEYED NOTES:

1. PROVIDE NEW SIDE DISCHARGE ROOFTOP AIR HANDLING UNIT AT EXISTING UNIT LOCATION. MOUNT NEW UNIT ON EXISTING STEEL STRUCTURE. MODIFY EXISTING STRUCTURE AS REQUIRED TO MATCH FOOTPRINT OF NEW HVAC UNIT.
2. PROVIDE NEW BOTTOM DISCHARGE ROOFTOP AIR HANDLING UNIT, WITH NEW ROOF CURB. COORDINATE LOCATION OF DUCT PENETRATIONS THROUGH ROOF WITH STRUCTURE. ROOF STRUCTURAL CONCRETE TEES SHALL NOT BE CUT WITHOUT PRIOR APPROVAL BY STRUCTURAL ENGINEER.
3. CONNECT NEW ROOFTOP GAS PIPING TO EXISTING 2.5" GAS PIPE AT BUILDING EXTERIOR, THIS LOCATION. PAINT ALL GAS PIPING RED PER OWNER SPECIFICATIONS, AND SUPPORT ON ROOFTOP SUPPORTS EQUAL TO PHP SYSTEMS SS8 SERIES.
4. FIELD VERIFY LOCATION OF 2ND FLOOR RESTROOM EXHAUST PENETRATION THROUGH ROOF. RELOCATE EXHAUST DISCHARGE AS REQUIRED TO MAINTAIN 10'-0" CLEARANCE FROM NEW ROOFTOP UNIT OUTSIDE AIR INTAKE. PATCH, FLASH AND SEAL RESULTING ROOF PENETRATION AIR/WATER TIGHT SO AS TO MAINTAIN ROOF WARRANTY.
5. CAP EXISTING GRAVITY INTAKE AIR/WATER TIGHT.
6. EXISTING PLUMBING VENT THROUGH ROOF AT THIS LOCATION. RELOCATE PLUMBING VENT AS REQUIRED TO MAINTAIN 10'-0" CLEARANCE FROM NEW ROOFTOP UNIT OUTSIDE AIR INTAKE. PATCH, FLASH AND SEAL RESULTING ROOF PENETRATION AIR/WATER TIGHT SO AS TO MAINTAIN ROOF WARRANTY.

ALL WORK ASSOCIATED WITH N001-OPS-HAU-03 IS ADDITIVE ALTERNATE #2

NATURAL GAS DESIGN NOTES:

1. SYSTEM PRESSURE: LESS THAN 2psi
2. SYSTEM LONGEST LENGTH: 400'-0"

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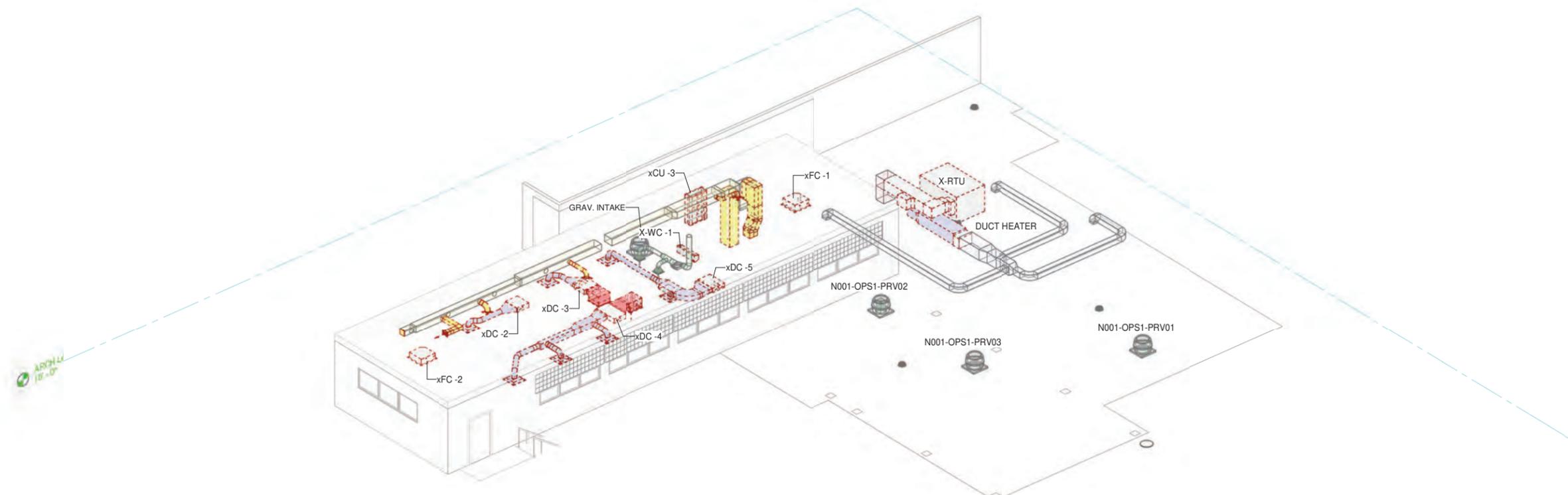


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WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
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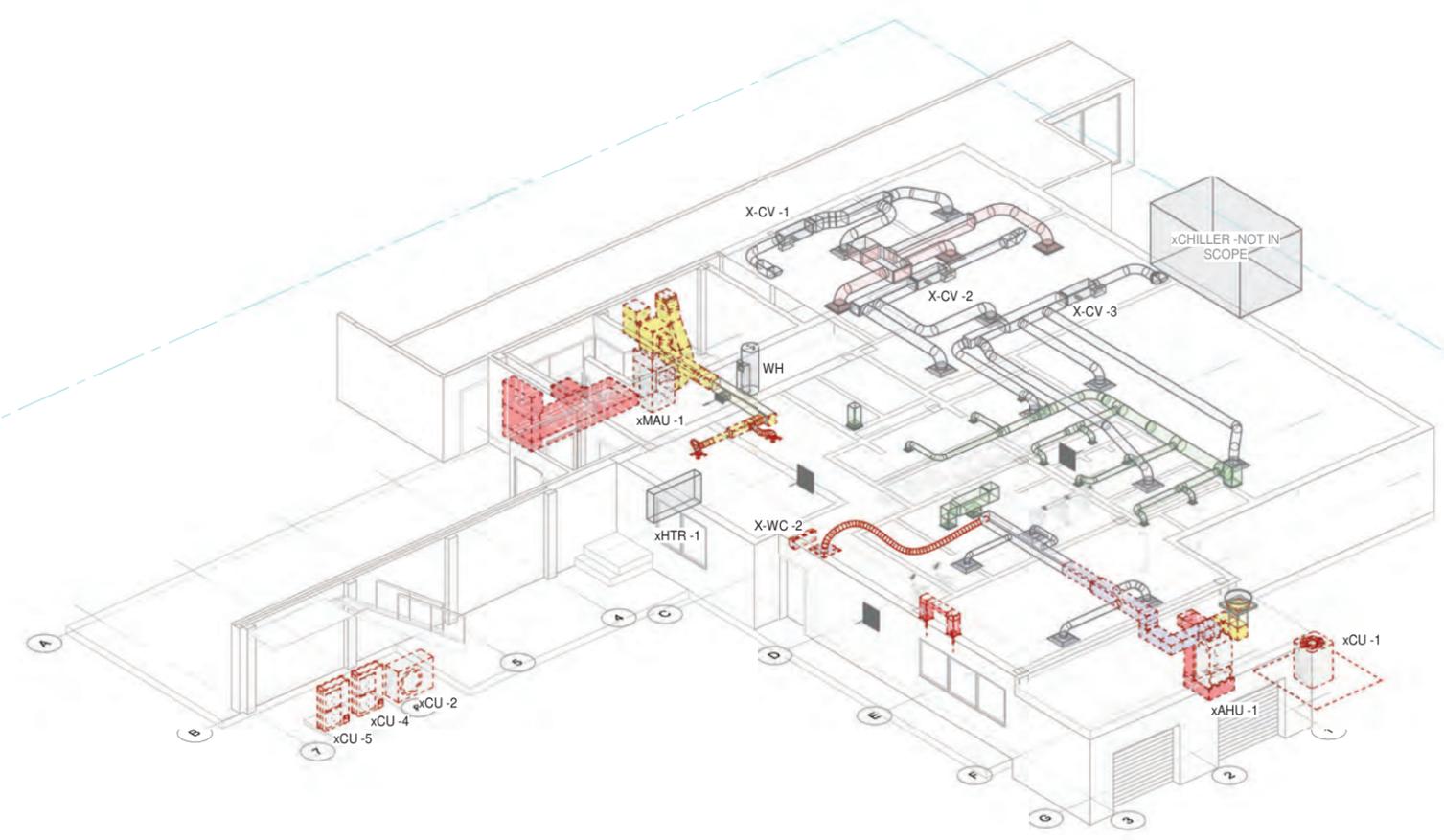
1 MECH. RENOVATION - ROOF
 3/16" = 1'-0"



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2 MECHANICAL DEMO - REF. ISO. - 2ND FLR



1 MECHANICAL DEMO - REF. ISO. - 1ST FLR

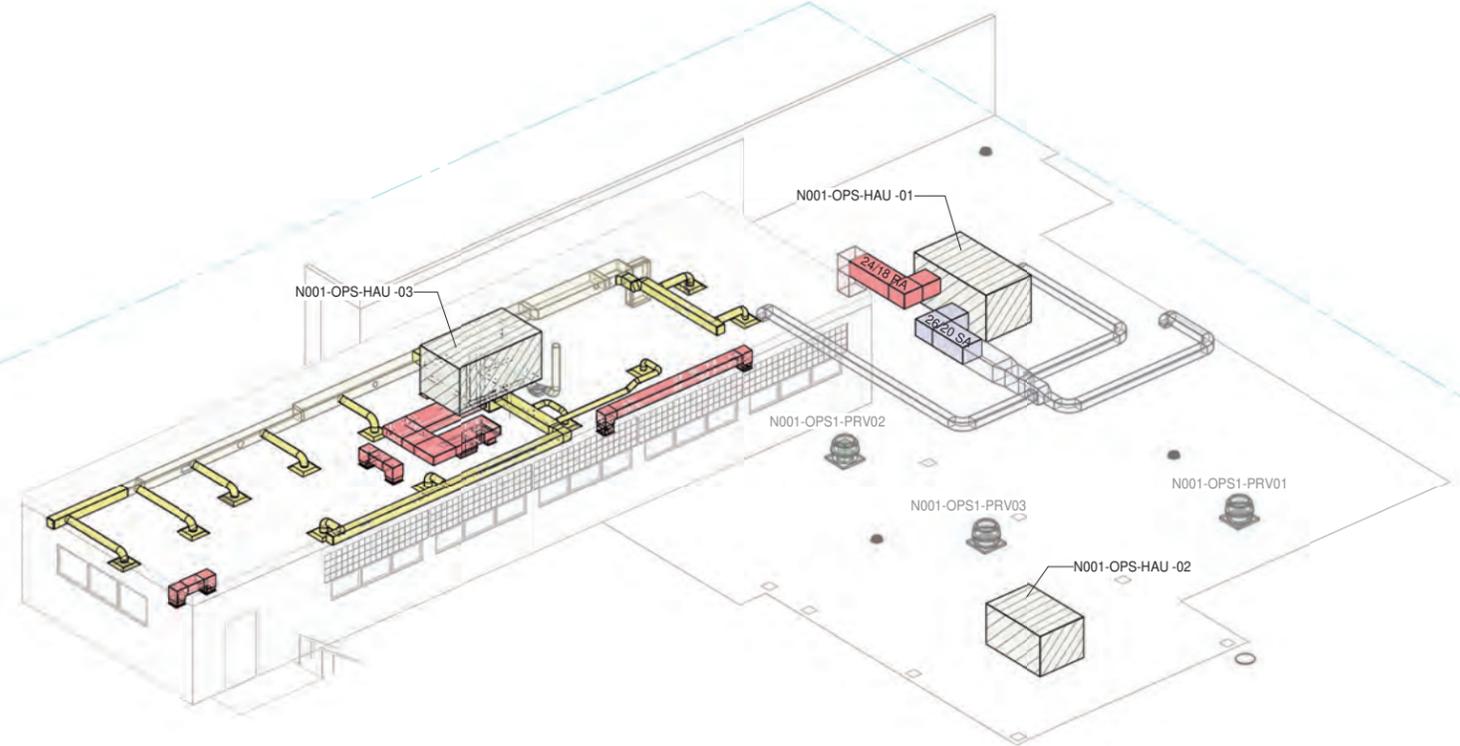
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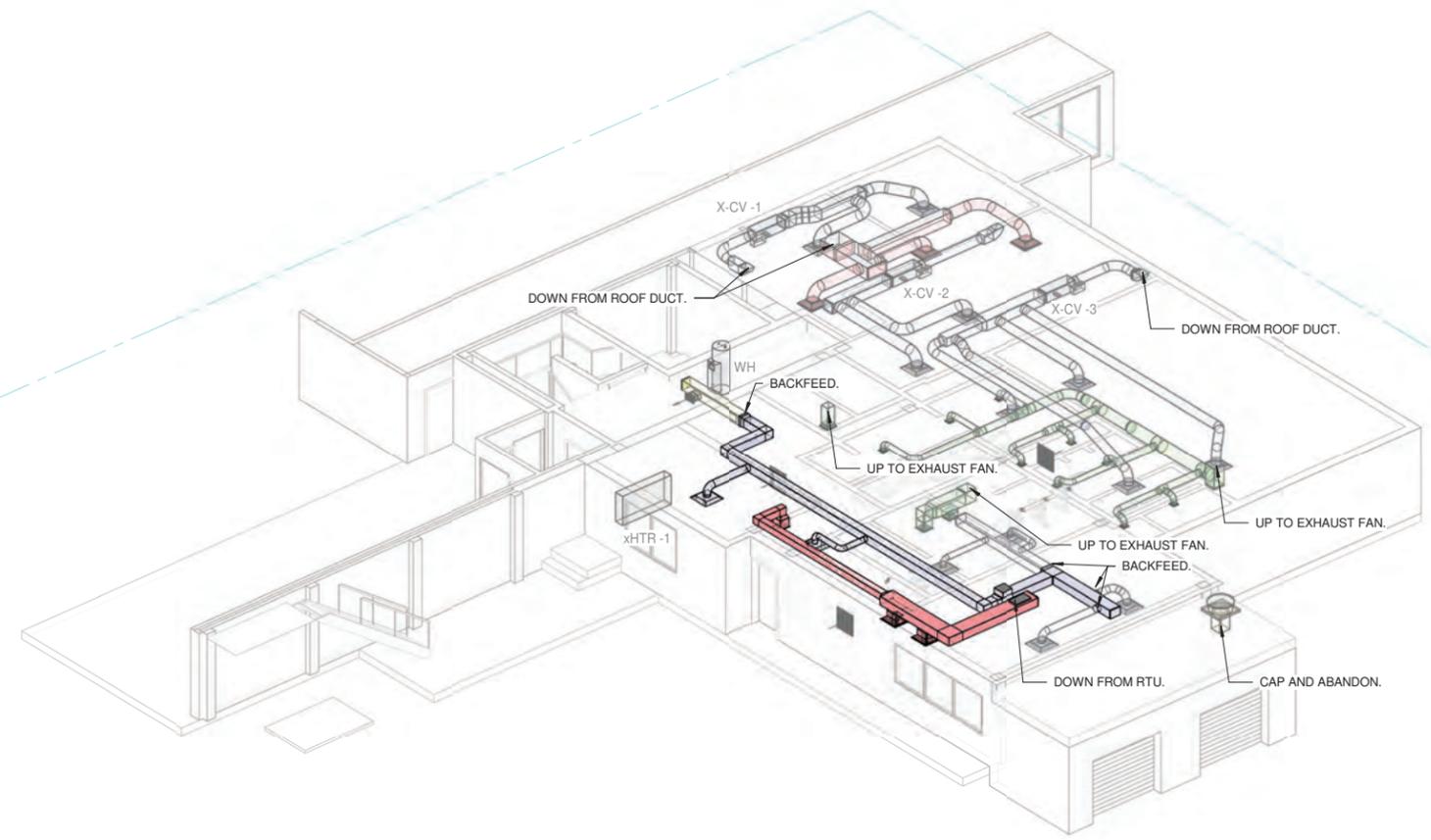
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<small>PLANS AND ESTIMATES</small> <small>PREPARED BY:</small>		 HOLLOWAY, UPDIKE & BELLEN, Inc. <small>2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012</small> <small>(918)251-0717, FAX (918)251-0754</small>																											
<small>PLAN SCALE:</small> <small>PROFILE SCALE:</small> <small>HORIZONTAL:</small> <small>VERTICAL:</small>	<table border="1"> <tr> <th>DRAWN</th> <th>Author</th> <th>APPROVED:</th> </tr> <tr> <td>DESIGNED</td> <td>Designer</td> <td> </td> </tr> <tr> <td>SURVEY</td> <td> </td> <td> </td> </tr> <tr> <td>FIELD MGR.</td> <td> </td> <td> </td> </tr> <tr> <td>SECT. MGR.</td> <td> </td> <td> </td> </tr> <tr> <td>PROJ. MGR.</td> <td> </td> <td> </td> </tr> <tr> <td>RECOMMENDED:</td> <td> </td> <td> </td> </tr> <tr> <td>DEPUTY DIRECTOR</td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td>PUBLIC WORKS DIRECTOR</td> </tr> </table>	DRAWN	Author	APPROVED:	DESIGNED	Designer		SURVEY			FIELD MGR.			SECT. MGR.			PROJ. MGR.			RECOMMENDED:			DEPUTY DIRECTOR					PUBLIC WORKS DIRECTOR	<small>FILE:</small> <small>ATLAS PAGE NO.:</small>
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2 MECHANICAL RENO - REF. ISO. - 2ND FLR



1 MECHANICAL RENO - REF. ISO. - 1ST FLR

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HVAC -- AHU - PACKAGED SCHEDULE

DESIGNATION	TYPE	MARK	DESCRIPTION	MANUFACTURER	MODEL	AIRFLOWS		SUPPLY FAN	COOLING DATA				HEATING DATA			ELECTRICAL DATA			REMARKS	
						SUPPLY AIR	OUTSIDE AIR (MINIMUM)	EXTERNAL STATIC PRESS.	NOMINAL COOLING	NET TOTAL COOLING	NET SENSIBLE COOLING	DB	WB	TYPE	INPUT	VOLTAGE	PHASE	MCA		MOC
N001-OPS-AHU		01	DX PACKAGED ROOFTOP AIR HANDLER	CARRIER	48WE4H12MPM6-ZA5C0	2,600 CFM	1,200 CFM	2.00 in-wg	10.0 ton	121,910 Btu/h	79,720 Btu/h	56.0 °F	55.0 °F	NAT. GAS	120,000 Btu/h	480 V	3	31.0 A	35 A	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
N001-OPS-AHU		02	DX PACKAGED ROOFTOP AIR HANDLER	CARRIER	48WE4H07MNM6-ZA5C0	1,500 CFM	615 CFM	0.75 in-wg	6.0 ton	73,000 Btu/h	46,970 Btu/h	56.8 °F	55.9 °F	NAT. GAS	70,000 Btu/h	480 V	3	22.0 A	25 A	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13
N001-OPS-AHU		03	DX PACKAGED ROOFTOP AIR HANDLER	CARRIER	48WE4H08MNM6-ZA5C0	2,000 CFM	250 CFM	0.75 in-wg	7.5 ton	82,180 Btu/h	55,860 Btu/h	49.3 °F	48.0 °F	NAT. GAS	80,000 Btu/h	480 V	3	26.0 A	30 A	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13

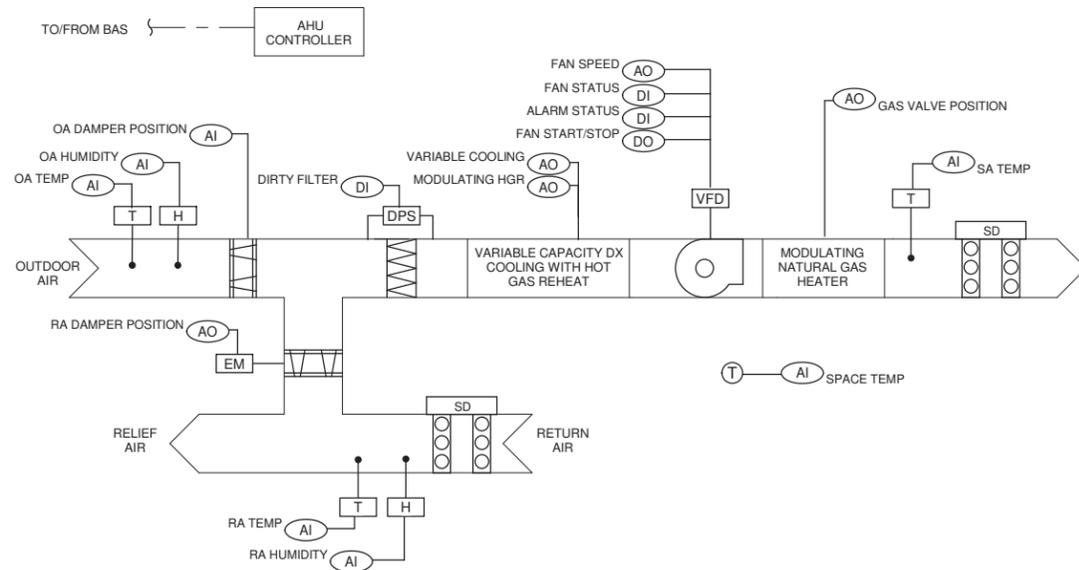
1 REFRIGERANT SHALL BE R-454B OR R-32.
 2 PROVIDE WITH MODULATING HOT GAS REHEAT.
 3 PROVIDE WITH INTEGRAL DISCONNECT AND POWERED CONVENIENCE OUTLET.
 4 PROVIDE WITH SMOKE DETECTORS ON SUPPLY AND RETURN.
 5 PROVIDE WITH 2" MERV 8 FILTERS, AND A SECOND SET OF FILTERS TO OWNER AT PROJECT COMPLETION.
 6 PROVIDE WITH MODULATING NATURAL GAS HEAT, 5 TO 1 TURNDOWN OR GREATER.
 7 PROVIDE WITH ECONOMIZER MODE.
 8 PROVIDE WITH STAINLESS STEEL DRAIN PAN AND CONDENSATE OVERFLOW SWITCH.
 9 PROVIDE WITH BAROMETRIC RELIEF.
 10 PROVIDE WITH MFR'S LOUVERED HAIL GUARDS.
 11 PROVIDE WITH HINGED ACCESS PANELS.
 12 SIDE DISCHARGE UNIT. PROVIDE ADAPTER CURB TO MOUNT ON EXISTING ROOF STRUCTURAL PLATFORM. CURB SHALL BE RATED FOR WIND AS DETERMINED BY WIND LOAD CALCULATIONS. SEE SEISMIC AND WIND SPECIFICATION.
 13 BOTTOM DISCHARGE UNIT. PROVIDE WITH 24" INSULATED BOTTOM DISCHARGE ROOF CURB. CURB SHALL BE RATED FOR WIND AS DETERMINED BY WIND LOAD CALCULATIONS. SEE SEISMIC AND WIND SPECIFICATION.

HVAC -- AIR TERMINAL SCHEDULE

MARK	MANUFACTURER	MODEL	DESCRIPTION	AIRFLOW DATA		INLET SIZE			FACE SIZE		MAX. NOISE CRITERIA	OPTIONS				
				MIN FLOW	MAX FLOW	DIAMETER	WIDTH	LENGTH	W	L		FACE STYLE	FINISH	DAMPER STYLE	MATERIAL	MOUNTING
R1	Titus	50F	EGGCRATE RETURN GRILLE	940 CFM	2,200 CFM	22"	22"	22"	24"	24"	25	EGGCRATE	WHITE	OPPOSED BLADE	ALUMINUM	LAY-IN CEILING
R2	Titus	50F	EGGCRATE RETURN GRILLE	410 CFM	960 CFM	22"	22"	10"	24"	12"	25	EGGCRATE	WHITE	OPPOSED BLADE	ALUMINUM	LAY-IN CEILING
R3	Titus	50F	EGGCRATE RETURN GRILLE	265 CFM	615 CFM	12"	12"	12"	14"	14"	25	EGGCRATE	WHITE	OPPOSED BLADE	ALUMINUM	LAY-IN CEILING
S1	Titus	TMS AA-08-24x24-1-26	ALUMINUM SQUARE CONE DIFFUSER	140 CFM	340 CFM	8"	8"	8"	24"	24"	25	LOUVER	WHITE	OPPOSED BLADE	ALUMINUM	LAY-IN CEILING
S2	Titus	TMS AA-06-24x24-1-26	ALUMINUM SQUARE CONE DIFFUSER	75 CFM	215 CFM	6"	6"	6"	24"	24"	25	LOUVER	WHITE	OPPOSED BLADE	ALUMINUM	LAY-IN CEILING
S3	Titus	TMS AA-06-12x12-1-26	ALUMINUM SQUARE CONE DIFFUSER	75 CFM	245 CFM	6"	6"	6"	12"	12"	25	LOUVER	WHITE	OPPOSED BLADE	ALUMINUM	LAY-IN CEILING
X1	Titus	50F	EGGCRATE TRANSFER GRILLE	265 CFM	615 CFM	12"	12"	12"	14"	14"	25	EGGCRATE	WHITE	-	ALUMINUM	LAY-IN CEILING

1 CONTRACTOR SHALL PROVIDE ALL AIR DISTRIBUTION DEVICES WITH MANUFACTURER'S MOUNTING SYSTEM FOR CEILINGS ON WHICH DEVICE SHALL BE MOUNTED.
 2 CONTRACTOR SHALL SUBMIT MANUFACTURER'S COLOR OPTIONS TO ARCHITECT BEFORE ORDERING AIR DISTRIBUTION DEVICES.

ALL WORK ASSOCIATED WITH N001-OPS-AHU-03 IS ADDITIVE ALTERNATE #2



AHU SEQUENCE OF OPERATION

BAS SHALL COMMUNICATE SCHEDULED ADJUSTABLE SPACE TEMPERATURE SETPOINT TO BE EITHER OCCUPIED (74 DEG) OR UNOCCUPIED (70 DEG HEATING, 78 DEG COOLING) WITH MANUAL TIMED OVERRIDE.

AHU CONTROLLER SHALL ENERGIZE SUPPLY FAN AND MODULATE VARIABLE CAPACITY DX COOLING, HOT GAS REHEAT, AND NATURAL GAS HEAT IN SEQUENCE TO MAINTAIN SPACE TEMPERATURE SETPOINTS.

ECONOMIZER MODE

CONTROLLER SHALL MODULATE RETURN AIR AND OUTDOOR AIR DAMPERS IN SEQUENCE PER MANUFACTURER FURNISHED DIFFERENTIAL ENTHALPY ECONOMIZER CONTROLS.

FOR AIR HANDLERS GREATER THAN 2,000 CFM AIRFLOW, SUPPLY AND RETURN DUCT SMOKE DETECTORS SHALL SOUND FIRE ALARM SYSTEM. BAS CONTROLLER SHALL MONITOR FIRE ALARM PANEL AND DE-ENERGIZE SUPPLY FAN AND CLOSE THE DAMPERS UPON SENSING PRODUCTS OF COMBUSTION.

CONTROLLER SHALL COMMUNICATE FAN STATUS, SUPPLY AIR TEMPERATURE, AND DIRTY FILTER ALARMS TO BAS.

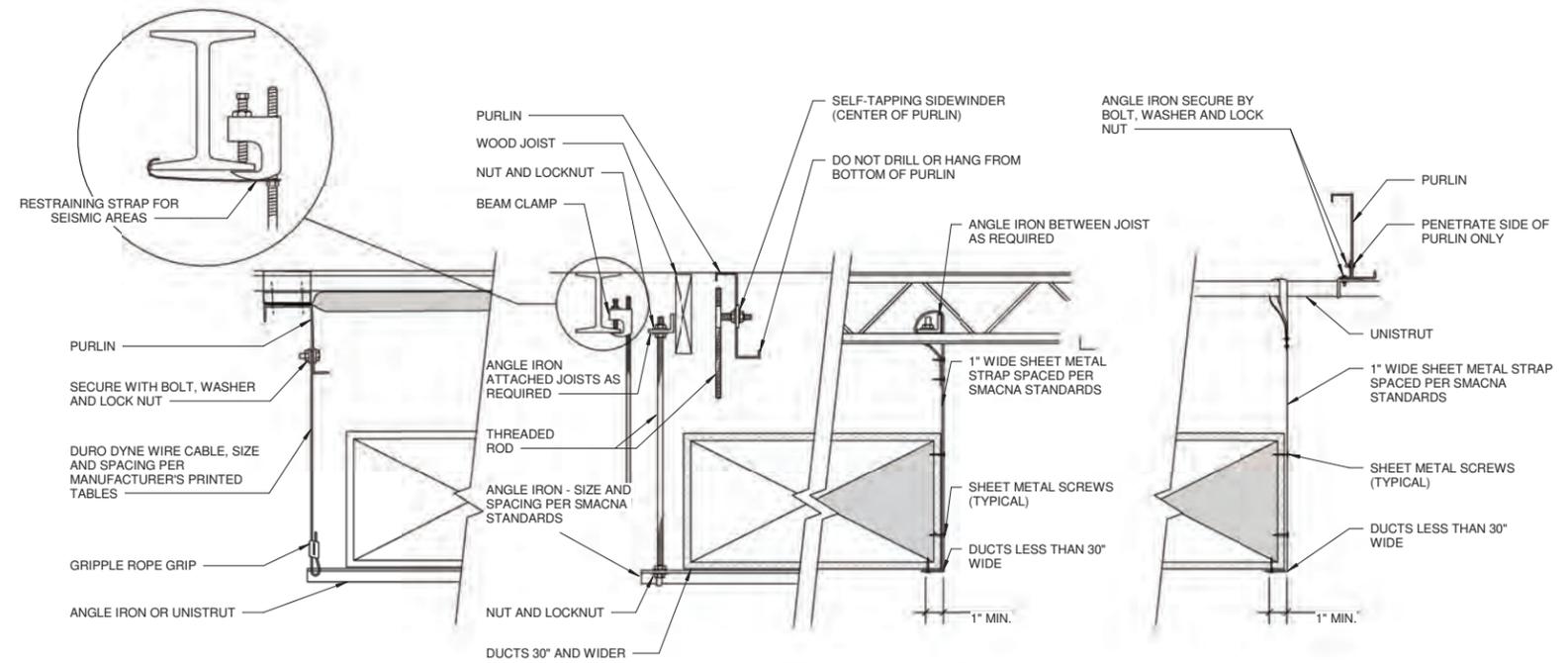
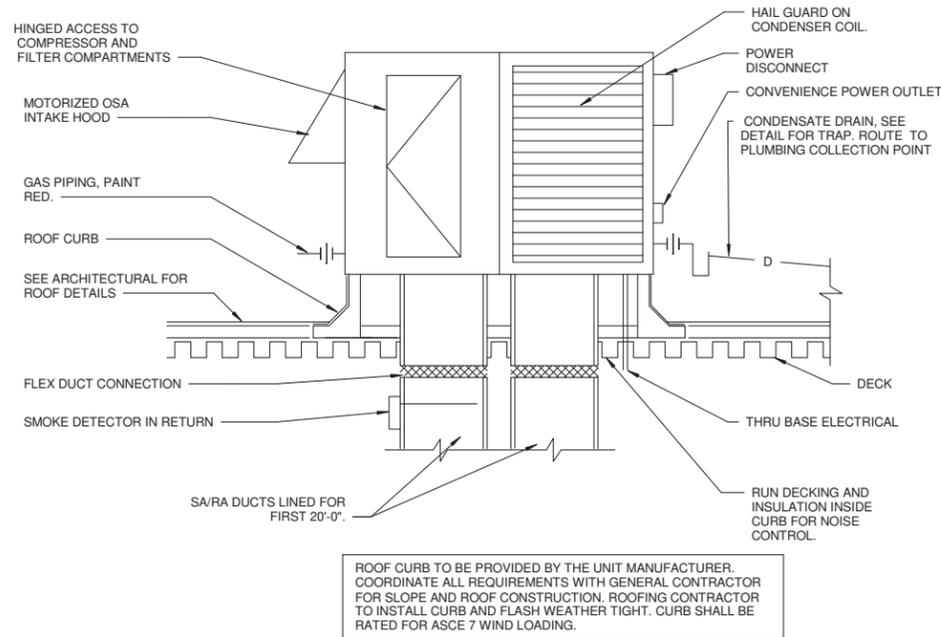
1 AHU CONTROLS
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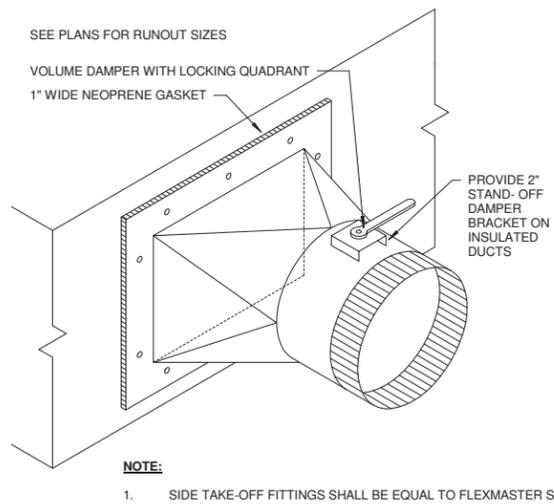
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WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
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FILE:	DRAWING: M4.1	DATE: 3-13-2026
ATLAS PAGE NO: --	SHEET 53/110 OF 12 SHEETS	--



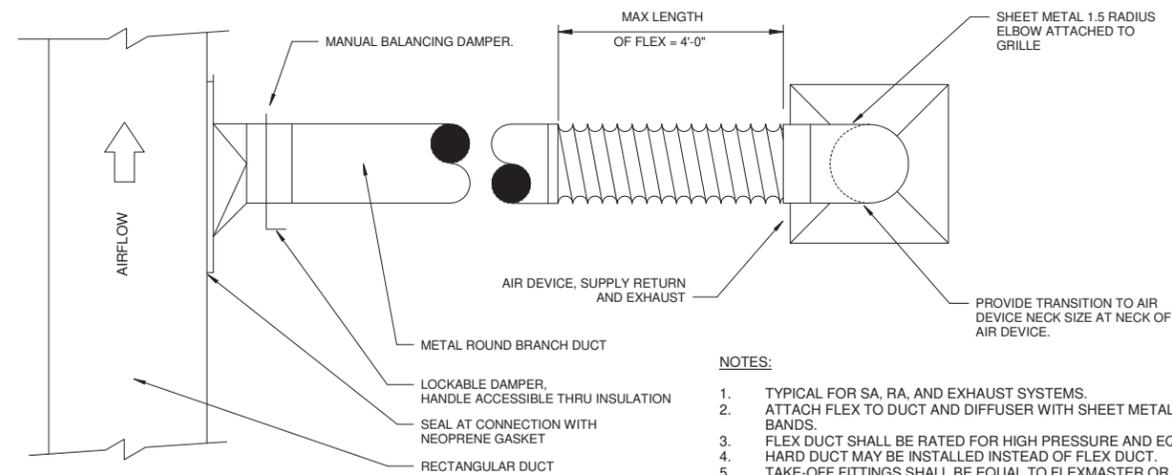


1 PACKAGED UNIT - ROOF
NOT TO SCALE

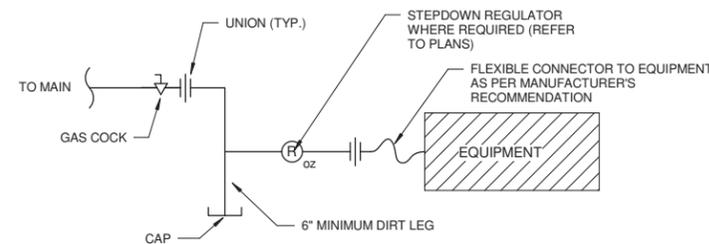
2 DUCT SUPPORT
NOT TO SCALE



3 BRANCH DUCT FITTING-ROUND
NOT TO SCALE



4 BRANCH DUCT TAKE OFF
NOT TO SCALE



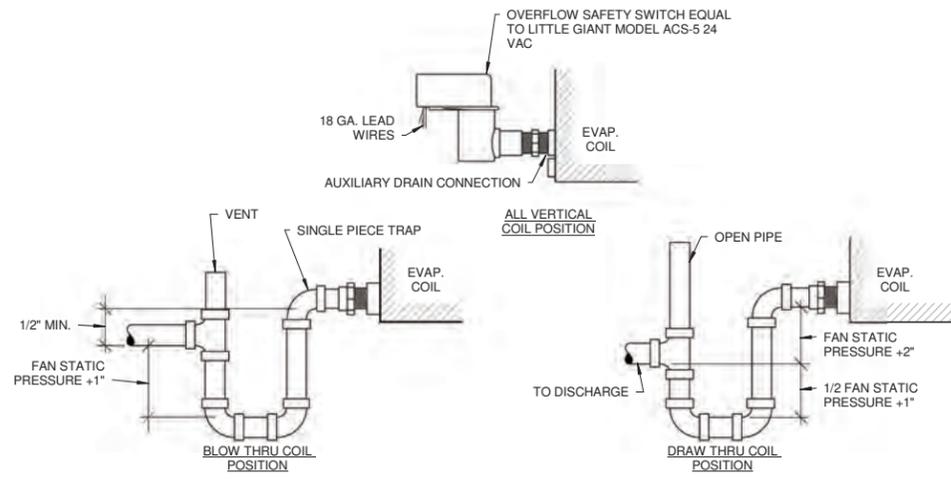
5 GAS CONNECTION TO EQUIPMENT
NOT TO SCALE

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CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:		HOLLOWAY, UPDIKE & BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754
PLAN SCALE:	DRAWN Author DESIGNED Designer SURVEY	APPROVED:
PROFILE SCALE:	FIELD MGR. SECT. MGR. PROJ. MGR.	RECOMMENDED:
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VERTICAL:		
FILE:	DRAWING: M5.1	DATE: 3-13-2026
ATLAS PAGE NO.:	—	SHEET 54/M11 OF 12 SHEETS

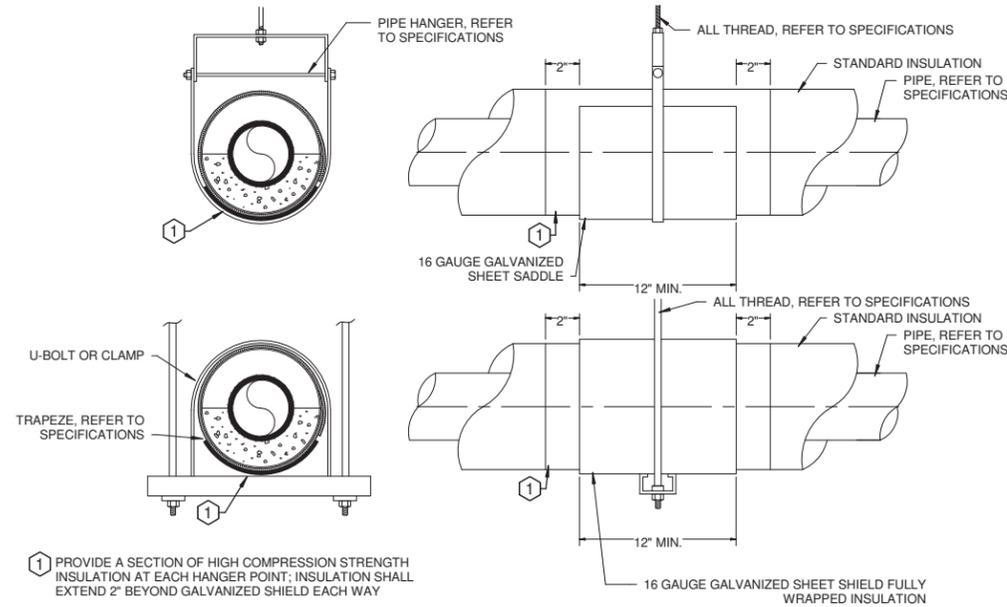




NOTES:

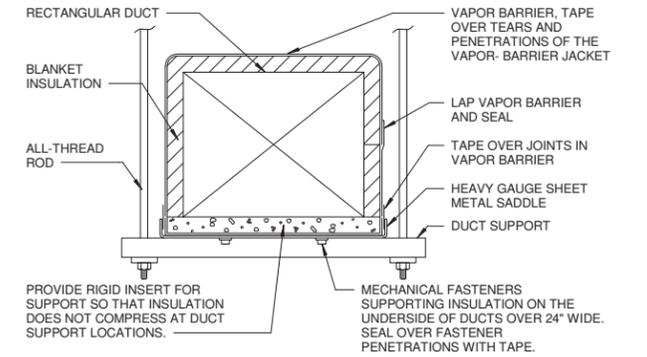
1. RUNNING TRAPS WILL NOT BE ACCEPTED.
2. INSTALL FACTORY FURNISHED TRAP WITH OUTSIDE AIR UNITS.
3. CONDENSATE DISCHARGE LOCATION SHALL MEET REQUIREMENTS OF ALL LOCAL CODES AND AUTHORITIES HAVING JURISDICTION.

1 CONDENSATE TRAP1
NOT TO SCALE



- 1 PROVIDE A SECTION OF HIGH COMPRESSION STRENGTH INSULATION AT EACH HANGER POINT: INSULATION SHALL EXTEND 2" BEYOND GALVANIZED SHIELD EACH WAY

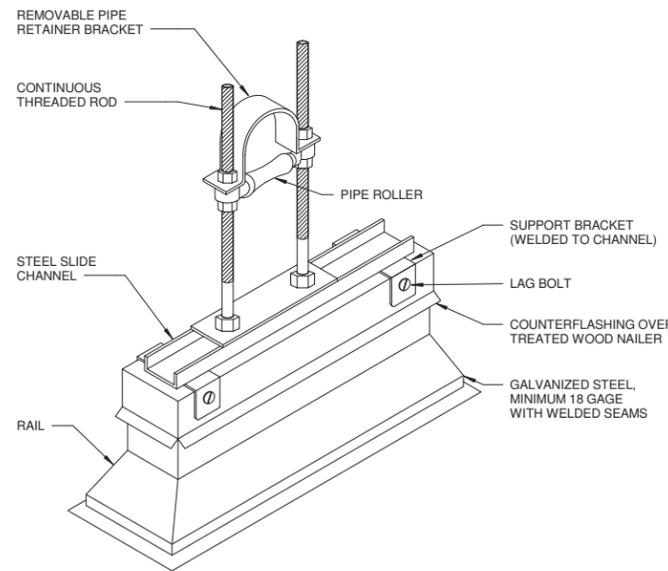
2 INSULATED PIPE HANGER
NOT TO SCALE



NOTES:

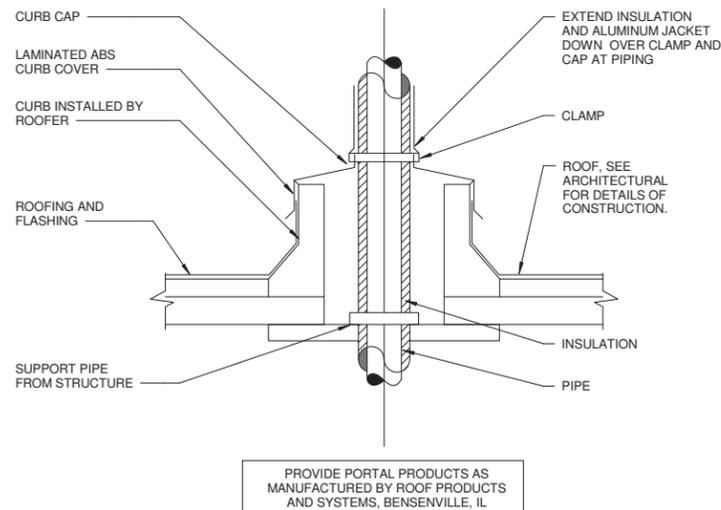
1. PROVIDE SADDLES AT DUCT SUPPORT POINTS.
2. DO NOT TAKE DUCT SUPPORTS OR STRAPS INTO THE INSULATION.
3. PROVIDE INSULATION INSERT SO THAT INSULATION DOES NOT COMPRESS FROM WEIGHT OF DUCT.
4. PROVIDE SEMI-RIGID INSULATION ON ALL DUCTWORK IN MECHANICAL EQUIPMENT ROOMS AND OTHER HIGH ABUSE AREAS.
5. IN AREAS WHERE SPACE LIMITS INSTALLATION OF TRAPEZE SYSTEM SHOWN, LOW PROFILE DUCT SUPPORT SYSTEM MAY BE PERMITTED. SYSTEM TO BE EQUAL TO GRIPPLE. ALL SYSTEMS SHALL BE APPROVED BY SMACNA OR WILL NOT BE PERMITTED.

3 INSULATION AT DUCT SUPPORT
NOT TO SCALE

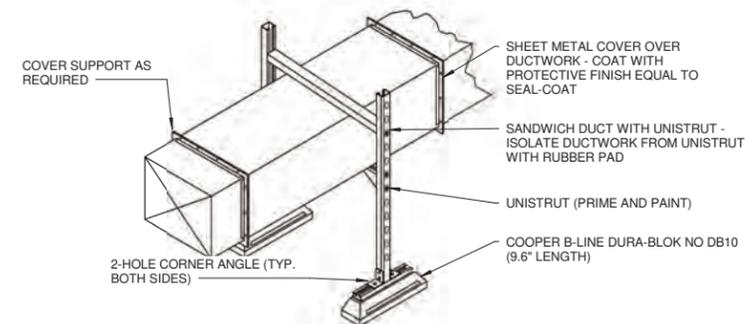


NOTE: ALL PRE-MANUFACTURED ROOF PIPE SUPPORTS SHALL BE EQUAL TO DURABLOK

4 ROOF MOUNTED PIPE SUPPORT
NOT TO SCALE



5 ROOF PENETRATION PIPING
NOT TO SCALE



6 DUCT SUPPORT EXTERIOR (IN DURABLOC)
NOT TO SCALE

17200 Chenal Pkwy.
Suite 300 PMB 324
Little Rock, AR 72223
501.448.0100 tel
www.browngineers.net



REVISION	BY	DATE

BID ITEM 203.500 / 203.510
MECHANICAL DETAILS II
DRAWING M5.2

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

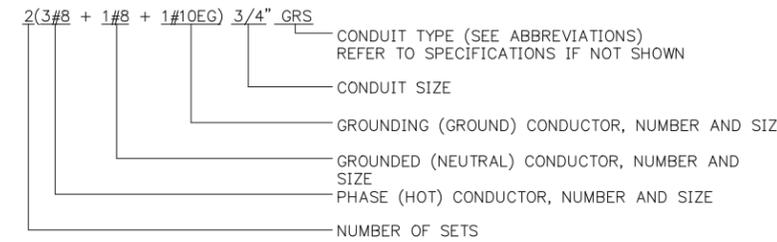
PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE & BELLEN, Inc.
2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012
(918)251-0717, FAX (918)251-0754

PLAN SCALE:	DRAWN	Author	APPROVED:
	DESIGNED	Designer	
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FILE:	DRAWING: M5.2	DATE: 3-13-2026	
ATLAS PAGE NO.:		SHEET 55/112 OF 12 SHEETS	



POWER, LIGHTING & SYSTEM LEGEND

	UNDER CABINET LIGHT FIXTURE		BRANCH CIRCUIT WITH PHASE, NEUTRAL, SWITCHED PHASE AND EQUIPMENT GROUNDING CONDUCTORS
	1x4 FLUORESCENT LIGHT		TELEPHONE OR DATA OUTLET, SINGLE GANG BOX MTD. 18" A.F.F. WITH 3/4" STUB TO ABOVE LAY-IN CEILING. "W" INDICATES 4'-6" MTD. HEIGHT FOR WALL PHONE.
	2x4 FLUORESCENT LIGHT		3/4" PLYWOOD, TELEPHONE BACKBOARD, SIZE AS NOTED, MTD. 5'-6" TO TOP
	FLUORESCENT LIGHT WITH EMERGENCY LIGHT (EL) BATTERY 1400 LUMENS MINIMUM FOR 2 LAMPS		JUNCTION BOX 42 CUBIC INCH MINIMUM CAPACITY
	2x2 FLUORESCENT LIGHT		FLOOR TELEPHONE OUTLET, CAST JUNCTION-BOX
	RECESSED LIGHT, UNLESS OTHERWISE SHOWN		WALL TELEPHONE/DATA OUTLET
	WALL MOUNTED LIGHT-MOUNTING HEIGHT AS INDICATED		DOOR SWITCH MOUNTED IN DOOR JAMB
	LED EXIT LIGHT, CEILING MOUNTED OR AS INDICATED, DARKENED AREA INDICATES FACE, ARROWS INDICATE DIRECTION OF EGRESS		DOOR BUTTON WEATHER PROOF, 50" A.F.F.
	EMERGENCY EXIT LIGHT, WALL MOUNT 7'-6" A.F.F. OR AS NOTED		DOOR BUZZER MTD 7'-0" A.F.F.
	4 FT. STRIP FLUORESCENT LIGHT		HANDHOLE OR MANHOLE, IDENTIFIER SHOWN, REFER TO HANDHOLE OR MANHOLE SCHEDULE FOR SIZE
	LIGHT SWITCH, MTD. 4'-0" A.F.F.		CIRCUIT BREAKER, TRIP RATING SHOWN, 3-POLE UNLESS NOTED
	LIGHT SWITCH, 2 POLE, MTD 4'-0" A.F.F.		FUSE, CURRENT LIMITING, RATING AS SHOWN
	LIGHT SWITCH, 3-WAY, MTD. 4'-0" A.F.F.		TRANSFORMER, RATINGS AS SHOWN
	LIGHT SWITCH, 4-WAY, MTD. 4'-0" A.F.F.		ELECTRIC MOTOR, HORSEPOWER SHOWN
	LIGHT SWITCH WITH PILOT LIGHT, MTD. 4'-0" A.F.F.		MOTOR STARTER, SIZE AS SHOWN OR REQUIRED. FVNR UNLESS NOTED
	20 AMP DUPLEX RECEPTACLE MTD. HORIZ. 6" ABOVE COUNTER TOP UNLESS OTHERWISE SHOWN		HAND-OFF-AUTO STARTER CONTROLS
	20 AMP DUPLEX RECEPTACLE MTD. 18" A.F.F., WITH #12 GROUND WIRE, GFCI INDICATES GROUND FAULT CIRCUIT INTERRUPTER, WP INDICATES WEATHERPROOF WHILE IN USE ENCLOSURE AND COVER		VARIABLE FREQUENCY DRIVE
	SINGLE RECEPTACLE, RATINGS AS NOTED		DUCT BANK, IDENTIFIER SHOWN. REFER TO DUCT BANK SCHEDULE FOR SIZE AND CONFIGURATION.
	HP RATED TOGGLE SWITCH, 1 OR 2 POLES AS REQUIRED W/OVERLOADS		3/4" x 10' COPPER CLAD GROUND ROD
	NON-FUSED DISCONNECT SWITCH, SIZE AS NOTED		SURGE ARRESTOR
	COMBINATION DISCONNECT AND MOTOR STARTER, SIZE AS NOTED. FUSED TYPE SHOWN.		GENERATOR
	FUSED DISCONNECT SWITCH, SIZE AS NOTED		ATS/BP/IS 3P400
	PUSHBUTTON STATION, NEMA 4X		WEATHERHEAD
	ELECTRICAL PANEL, SURFACE MOUNTED, 5'-6" TO TOP OF ENCLOSURE		CABLE CONNECTION
	ELECTRICAL PANEL, RECESSED MOUNTED, 5'-6" TO TOP OF ENCLOSURE		KIRK KEY INTERLOCK
	EQUIPMENT CABINET SIZE AS NOTED, RECESSED MOUNTED, 5'-6" TO TOP OF ENCLOSURE		INTERCEPT CONDUIT. PULL NEW FEEDER THE ENTIRE LENGTH OF CIRCUIT.
	EQUIPMENT CABINET SIZE AS NOTED, SURFACE MOUNTED, 5'-6" TO TOP OF ENCLOSURE		DUCT BANK CIRCUIT DESIGNATION SEE DUCT BANK CONDUIT AND CABLE SCHEDULE
	HOME RUN TO PANEL, RECEPTACLES AND EQUIPMENT SHALL HAVE GREEN GROUND WIRE. NUMBER OF ARROWS INDICATES NUMBER OF PHASE CONDUCTORS, OR AS SHOWN ON SCHEDULE		



ABBREVIATIONS:

P-LSI(G) PROGRAMMABLE BREAKER MICROLOGIC OR EQUAL WITH ADJUSTMENTS LISTED:
 L = LONG-TIME
 S = SHORT TIME
 I = INSTANTANEOUS
 G = GROUND FAULT
 P = POWER METERING WITH ETHERNET CONNECTIVITY

MM ENERGY REDUCING MAINTENANCE SWITCHING WITH LOCAL STATUS TO COMPLY WITH NEC 240.87

AVT ABSENCE OF VOLTAGE TESTER (PANDUIT VERISAFE VS-AVT-C08-L10 OR APPROVED EQUAL)

ABBREVIATIONS

A	AMP	G	GROUND	PB	PUSH BUTTON
ACU	AIR CONDITIONING UNIT	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	PDESC	POWER DISTRIBUTION SERVICES CABINET
AFF	ABOVE FINISHED FLOOR	GND	GROUND	PEC	PHOTO ELECTRIC CELL
AHU	AIR HANDLER UNIT	GRS	GALVANIZED RIGID STEEL	PF	POWER FACTOR
AIC	AMPS INTERRUPTING CAPACITY	HOA	HAND-OFF-AUTO	PFR	POWER FAIL RELAY
AM	AMP-METER	HP	HORSEPOWER OR HEAT PUMP	PL	PILOT LIGHT
ANN	ANNUNCIATOR	HR	HOUR	PMR	PHASE MONITOR RELAY
AP	AERIAL PRIMARY	JB	JUNCTION BOX	PNL	PANEL
AS	AERIAL SECONDARY	kVA	KILOVOLT-AMPERE	PTT	PUSH-TO-TEST
ATS	AUTOMATIC TRANSFER SWITCH	kVAR	KILOVOLT-AMPERE, REACTIVE	PVC	SCHEDULE 40 POLYVINYL CONDUIT
AUX	AUXILIARY	kW	KILOWATT	RECPT	RECEPTACLE
BFI	BLOWN FUSE INDICATOR	L	LINE (PHASE)	RM	ROOM
BKR	BREAKER	LA	LIGHTNING ARRESTOR	RVAT	REDUCED VOLTAGE AUTO-TRANSFORMER STARTER
C	CONDUIT	L.O.	LUGS ONLY	S	SECOND
CGRS	PVC COATED GALVANIZED RIGID STEEL	LSI	LONG-TIME, SHORT-TIME, INSTANTANEOUS TRIP UNIT	SA	SURGE ARRESTER
CKT	CIRCUIT	LV	LOW VOLTAGE	SDBC	SOFT DRAWN BARE COPPER
COM	COMMON	MCB	MAIN CIRCUIT BREAKER	SE	SERVICE ENTRANCE
CONT	CONTINUOUS	MCC	MOTOR CONTROL CENTER	SHT	SHEET
CP	CONTROL PANEL	MCP	MOTOR CIRCUIT PROTECTOR	SN	SOLID NEUTRAL
CPT	CONTROL POWER TRANSFORMER	MFR	MANUFACTURER	SS	STAINLESS STEEL
CR	CONTROL RELAY	MIN	MINIMUM	STA	STATION
CS	CORD SET	MLO	MAIN LUGS ONLY	SW	SWITCH
CU	COEFFICIENT OF UTILIZATION	MM	MAINTENANCE MODE	TC	TIME CLOCK
CU	CONDENSING UNIT	MS	(ENERGY-REDUCING MAINTENANCE SWITCHING WITH LOCAL STATUS)	TEL	TELEPHONE
DEB	DIRECT EARTH BURIED	MTD	MOUNTED	TD	TIME DELAY
EC	EMPTY OR EMBEDDED CONDUIT	MTS	MANUAL TRANSFER SWITCH	TDD	TIME DELAY ON DE-ENERGIZATION
EF	EXHAUST FAN	N	NEUTRAL	TDE	TIME DELAY ON ENERGIZATION
EG	EQUIPMENT GROUND	NFDS	NON-FUSED DISCONNECT SWITCH	TYP	TYPICAL
ECC	EQUIPMENT GROUND CONDUCTOR	NTS	NOT TO SCALE	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
EL	ELEVATION	OC	ON CENTER	UG	UNDER GROUND
EMT	ELECTRICAL METALLIC TUBING	OH	OVERHEAD	UH	UNIT HEATER
ETM	ELAPSED TIME METER	OL	OVERLOAD	UP	UNDERGROUND PRIMARY
FA	FIRE ALARM	OPGP	OFFICE PRINCIPAL GROUND POINT	US	UNDERGROUND SECONDARY
FAP	FIRE ALARM PANEL			VA	VOLT-AMP
FC	FAN COIL			VFD	VARIABLE FREQUENCY DRIVE
FLR	FLOOR			VM	VOLT-METER
FOC	FIBER OPTIC CABLE			W	WATT OR WIRE
FS	FLOAT SWITCH			WH	WEATHER HEAD
FT	FEET			WM	WATT METER
FVNR	FULL VOLTAGE NON-REVERSING STARTER			WP	WEATHERPROOF
FVR	FULL VOLTAGE REVERSING STARTER			W/	WITH
				XMFR	TRANSFORMER

CONTROL SCHEMATIC LEGEND

	WIRING WITHIN PANEL		LIMIT SWITCH CONTACT, NORMALLY OPEN
	WIRING TO FIELD DEVICE		LIMIT SWITCH CONTACT, NORMALLY CLOSED
	PUSHBUTTON SWITCH, NORMALLY OPEN		LIMIT SWITCH CONTACT, HELD OPEN
	PUSHBUTTON SWITCH, NORMALLY CLOSED		LIMIT SWITCH CONTACT, HELD CLOSED
	SELECTOR SWITCH, NUMBER OF POSITIONS AND CONTACTS AS SHOWN		RELAY COIL, "TR" INDICATES "TIMING RELAY"
	RELAY CONTACT, NORMALLY OPEN		PILOT LIGHT; "A" INDICATES "AMBER LENS", "G" INDICATES "GREEN LENS", "R" INDICATES "RED LENS"
	RELAY CONTACT, NORMALLY CLOSED		SOLENOID
	TIME DELAY CONTACT, CLOSE ON ENERGIZATION		ELAPSED TIME METER
	TIME DELAY CONTACT, OPEN ON ENERGIZATION		TERMINAL BLOCK
	TIME DELAY CONTACT, OPEN ON DE-ENERGIZATION		ELECTRICAL CONNECTION
	TIME DELAY CONTACT, CLOSE ON DE-ENERGIZATION		FUSE, AMPERE RATING AS SHOWN OR REQUIRED "BFI" INDICATES "BLOWN FUSE INDICATOR" TYPE
	LEVEL SWITCH		GROUND CONNECTION TO ENCLOSURE GROUND BAR
	PRESSURE SWITCH		

GENERAL NOTES:

- SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET AND NOT BE UTILIZED ON THE PROJECT.

REVISION	BY	DATE

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ELECTRICAL LEGEND

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74002 (918)291-0777, FAX (918)291-0764

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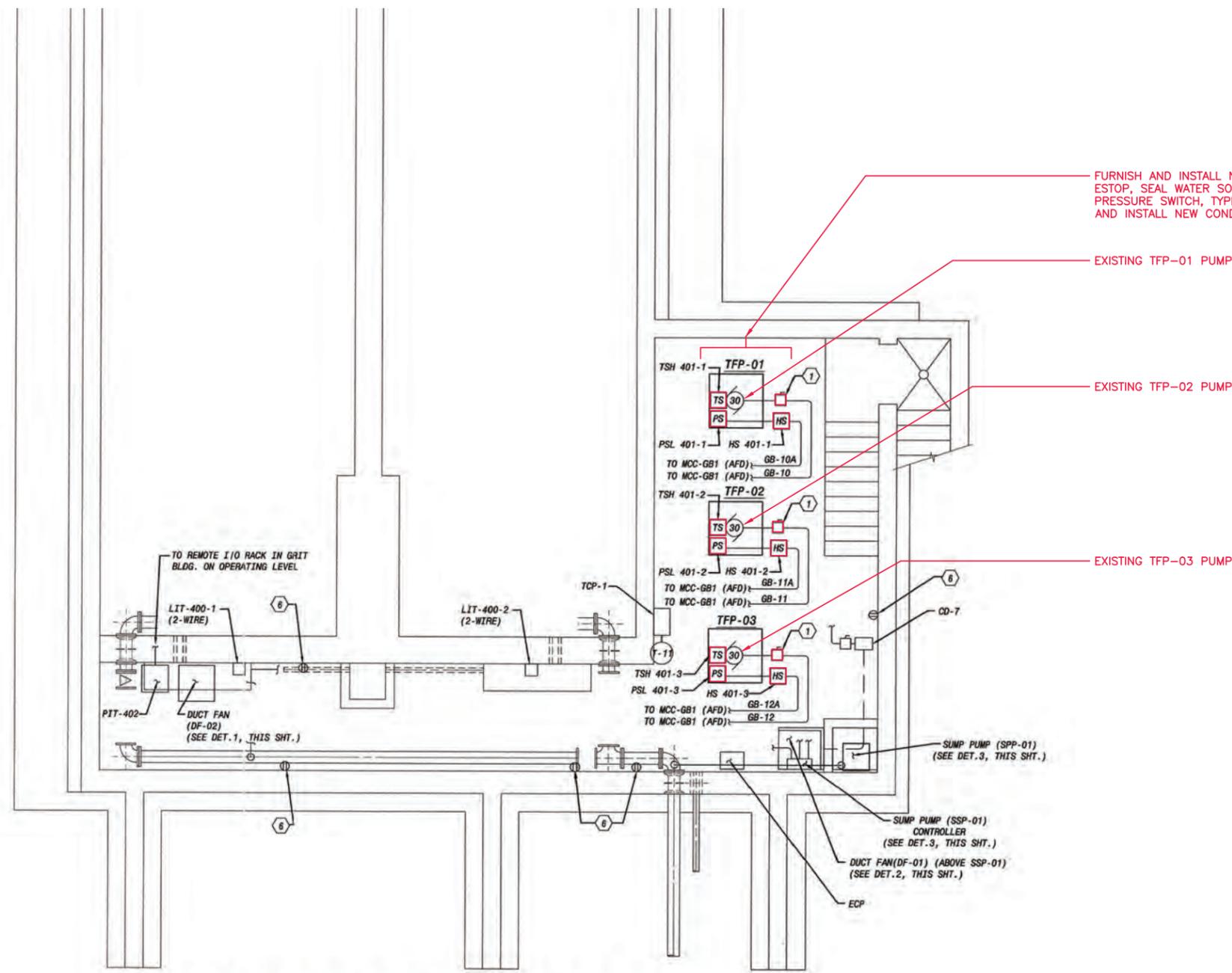
DESIGN ENGINEERING MANAGER

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ATLAS PAGE NO: --- SHEET 96/91 OF 3 SHEETS

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P:\PRODUCTION\PROJECTS\HUB ENGINEERS (HUB)\HUB-316 TULSA CAPITAL EQUIPMENT REPLACEMENT WPC-26\DWG\E02_SSWWP GRIT FLOOR PLAN BASEMENT.DWG
3/9/2026 2:59 PM



B GRIT BUILDING BASEMENT - POWER
SCALE: 1/4"=1'-0"

1 SSWWP GRIT BUILDING BASEMENT ELECTRICAL FLOOR PLAN
SCALE: NONE



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**REFERENCE ORIGINAL SA 83-1
RECORD DRAWINGS FOR
ADDITIONAL DETAILS &
INFORMATION**

**BID ITEM 203.860
ELECTRICAL GRIT BLDG BASEMENT**

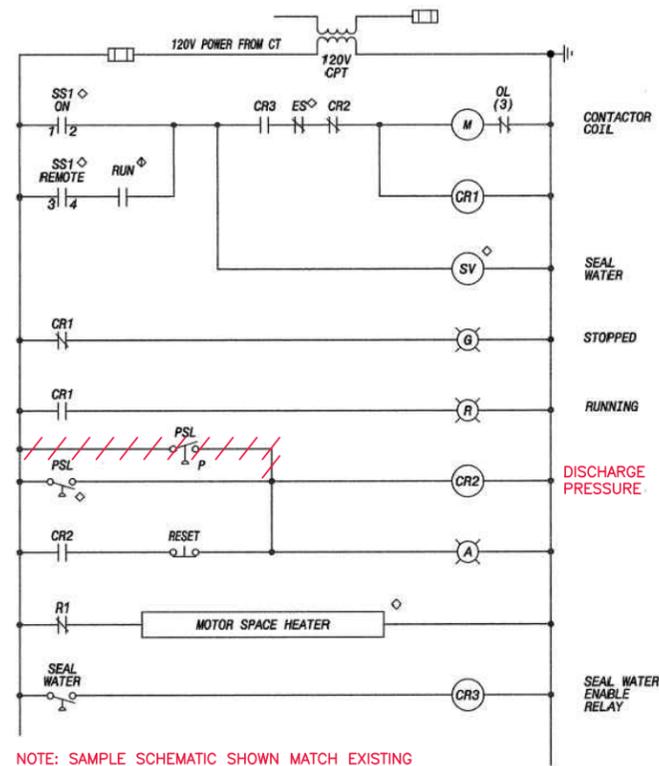
WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
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2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74002
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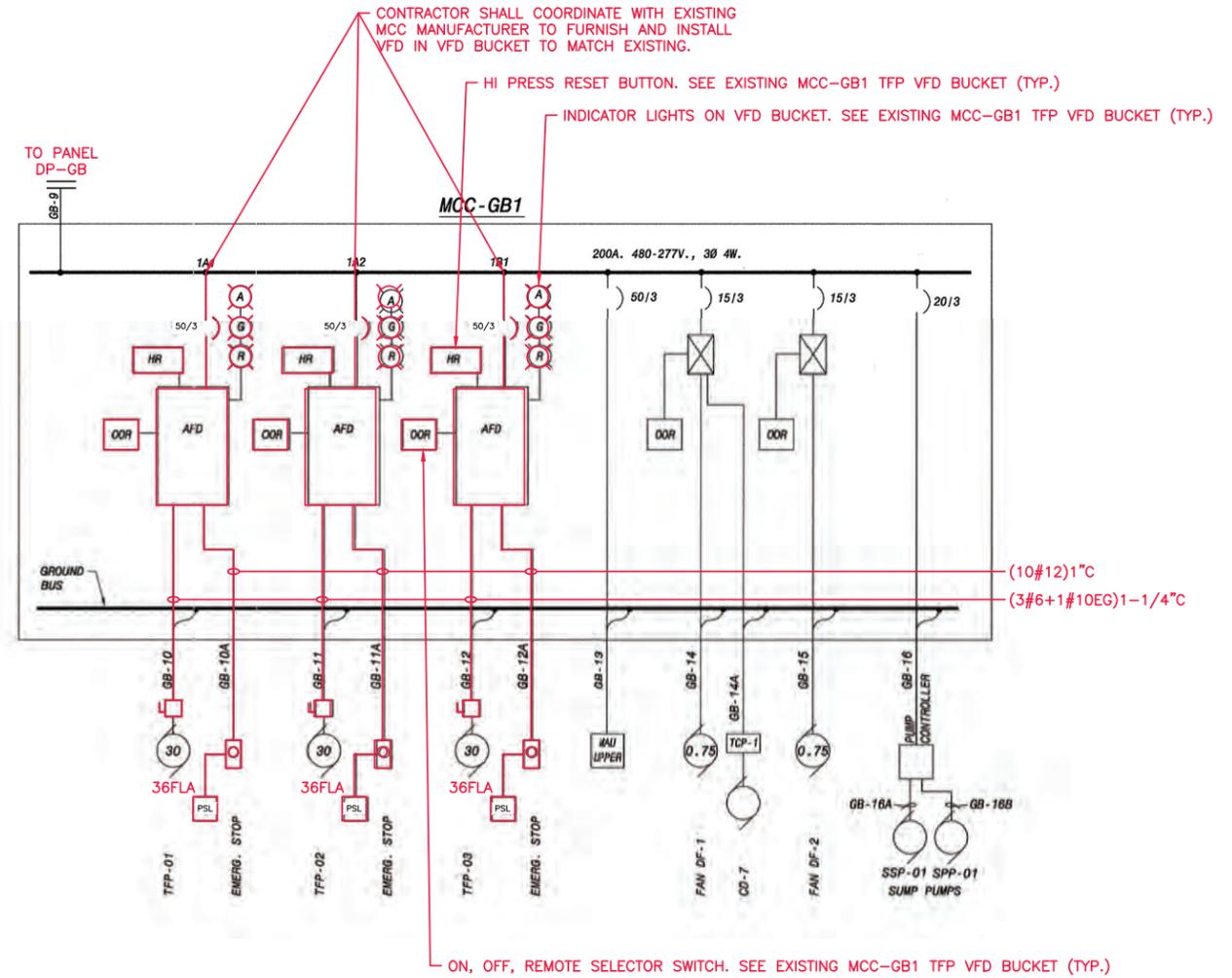
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NOTE: SAMPLE SCHEMATIC SHOWN MATCH EXISTING

1 SSWWTP EXISTING TFP VFD SAMPLE DIAGRAM 2
SCALE: NONE



2 SSWWTP TFP ONE-LINE DIAGRAM
SCALE: NONE

GENERAL NOTES

1. CONTRACTOR SHALL COORDINATE DIAGRAMS WITH FIELD CONDITIONS.
2. DIAGRAMS SHOWN TYPICAL OF ALL THREE EXISTING TFP VFDS.
3. CONTRACTOR SHALL INTEGRATE NEW TFP VFD INTO EXISTING SCADA SYSTEM TO MATCH EXISTING CONFIGURATIONS FOR FULLY ACCEPTED SYSTEM.
4. CONTRACTOR SHALL INTEGRATE NEW DISCHARGE PRESSURE, SEAL WATER, SEAL WATER PRESSURE, AND E-STOP INTO NEW VFD TO MATCH EXISTING CONFIGURATION.

REVISION	BY	DATE

REFERENCE ORIGINAL ES 2002-07
RECORD DRAWINGS FOR ADDITIONAL
DETAILS & INFORMATION

BID ITEM 203.860
ELECTRICAL ONE-LINE DIAGRAM
GRIT BUILDING

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
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1 EXISTING MCC-GB1
SCALE: NONE



2 EXISTING TFP MOTOR NAMEPLATE
SCALE: NONE



- REPLACE EXISTING E-STOP
- REPLACE EXISTING DISCONNECT
- REPLACE EXISTING DISCHARGE PRESSURE SWITCH
- REPLACE EXISTING SEAL WATER PRESSURE SWITCH
- REPLACE EXISTING SEAL WATER SOLENOID

3 EXISTING TFP PUMP ROOM
SCALE: NONE



TYPICAL OF 3

5 EXISTING MCC-GB1 TFP VFD BUCKET
SCALE: NONE



4 EXISTING MCC-GB1 NAMEPLATE
SCALE: NONE



TYPICAL OF 3

6 EXISTING MCC-GB1 TFP VFD BUCKET
SCALE: NONE

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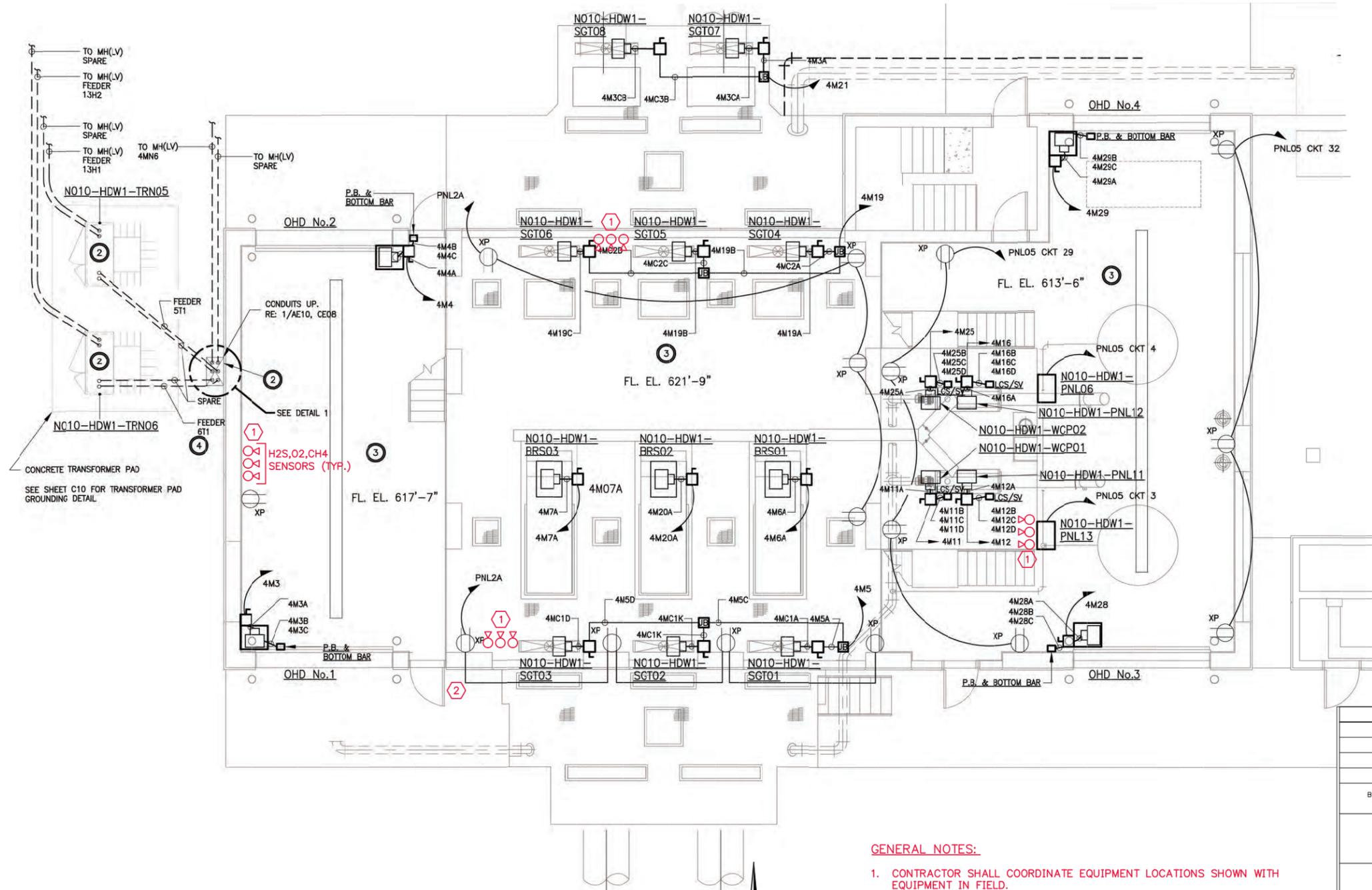
**BID ITEM 203.860
ELECTRICAL GRIT BUILDING**

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
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ATLAS PAGE NO: ---			SHEET 99/E4 OF 6 SHEETS





1 NSWWTP HEADWORKS FLOOR PLAN - GROUND LEVEL
SCALE: NONE

GENERAL NOTES:

- CONTRACTOR SHALL COORDINATE EQUIPMENT LOCATIONS SHOWN WITH EQUIPMENT IN FIELD.

KEYED NOTES:

- CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING MSA ULTIMA XL GAS MONITORS. FURNISH AND INSTALL MSA ULTIMA X5000 GAS MONITORS TO MATCH EXISTING GAS MONITORS. CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY HARDWARE FOR COMPLETE INSTALLATION.
- CONTRACTOR SHALL FURNISH AND INSTALL SECONDARY DISPLAY MOUNTED OUTSIDE TO DISPLAY ALL GAS MONITOR VALUES, INCLUDING LOCATION WITHIN BUILDING. CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY HARDWARE AND CONDUIT AND WIRE FOR A COMPLETE AND OPERABLE SYSTEM.

REVISION	BY	DATE

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REFERENCE ORIGINAL ES 2007-02 RECORD DRAWINGS FOR ADDITIONAL DETAILS & INFORMATION

BID ITEM 203.800 ELECTRICAL HEADWORKS FLOOR PLAN

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
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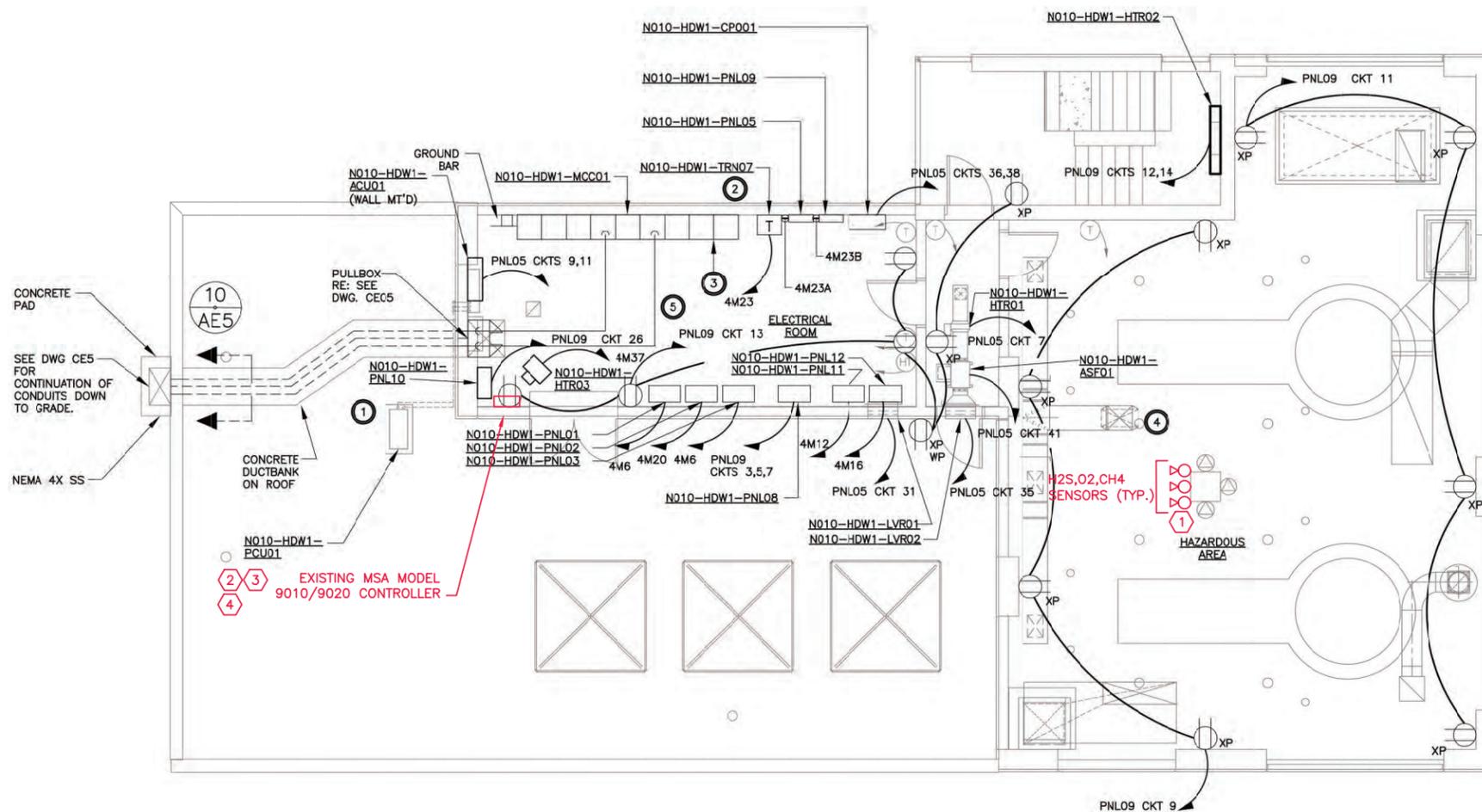
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3/9/2026 2:57 PM



1 NSWWTP HEADWORKS FLOOR PLAN - SECOND FLOOR
SCALE: NONE



ITEM	QUANTITY	MODEL/DESCRIPTION
1	5	X5000-0-M-0-1-0-16-00-0 (X5000, RELAYS, SINGLE SENSOR O2)
2	5	X5000-0-M-0-1-0-22-00-0 (X5000, RELAYS, SINGLE SENSOR H2S)
3	5	X5000-0-M-0-1-0-160-00-0 (X5000, RELAYS, SINGLE SENSOR METHANE LEL)
4	5	10213892 (JB5000 JUNCTION BOX)
5	5	10206632 (JB5000 MOUNTING BRACKET)
6	5	10215687 (SENTRY IO, 16 CHANNEL)
7	1	10246524 = DISPLAY, 24VDC, LCD (DISPLAY)

2 LIST OF MATERIALS
SCALE: NONE

GENERAL NOTES:

- CONTRACTOR SHALL COORDINATE EQUIPMENT LOCATIONS SHOWN WITH EQUIPMENT IN FIELD.

KEYED NOTES:

- CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING MSA ULTIMA XL GAS MONITOR. FURNISH AND INSTALL MSA ULTIMA X5000 GAS MONITORS TO MATCH EXISTING GAS MONITORS. CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY HARDWARE FOR COMPLETE INSTALLATION.
- CONTRACTOR SHALL FIELD VERIFY EXISTING MSA 9010/9020 CONTROLLER TO CONFIRM MSA SENTRY IO CONTROLLER IS AN APPROPRIATE REPLACEMENT THEN FURNISH AND INSTALL NEW MSA CONTROLLER AND ALL NECESSARY HARDWARE FOR COMPLETE INSTALLATION.
- CONTRACTOR SHALL DEMOLISH AND REMOVE MSA EXISTING CONTROLLER PRESERVING ALL CONDUCTORS. CONTRACTOR SHALL RECONNECT ALL CONDUCTORS TO NEW MSA CONTROLLER.
- CONTRACTOR SHALL FURNISH ALL LABOR AND MATERIAL INCLUDING MANUFACTURER RECOMMENDED AND APPROVED START-UP AND COMMISSIONING SERVICES OF NEW MSA CONTROLLER FOR COMPLETE OPERABLE SYSTEM. CONTRACTOR SHALL IMPLEMENT EXISTING MSA CONTROLLER LADDER LOGIC IN NEW MSA CONTROLLER FOR COMPLETE AND ACCEPTED SYSTEM.

REVISION	BY	DATE

BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

REFERENCE ORIGINAL ES 2007-02
RECORD DRAWINGS FOR ADDITIONAL
DETAILS & INFORMATION

BID ITEM 203.800
ELECTRICAL HEADWORKS
FLOOR PLAN

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74002
(918)291-0777, FAX (918)291-0764

PLAN SCALE: AS SHOWN	DRAWN: CD	DESIGNED: BB	SURVEY:	APPROVED:
PROFILE SCALE:	PROJ. MGR.	LEAD ENGR.	FIELD MGR. TJR	DESIGN ENGINEERING MANAGER:
HORIZONTAL:				
VERTICAL:				
FILE:	DRAWING:	DATE: MARCH 2026		
ATLAS PAGE NO: ---				SHEET 61/66 OF 6 SHEETS



POWER AND LIGHTING LEGEND

ABBREVIATION OR SYMBOL	DESCRIPTION	ABBREVIATION OR SYMBOL	DESCRIPTION	ABBREVIATION OR SYMBOL	DESCRIPTION		
FIXTURE DESIGNATION 2x4 LAY-IN OR SURFACE MOUNTED FIXTURE 2x4 LAY-IN OR SURFACE MOUNTED FIXTURE; SHADING INDICATES EMERGENCY POWERED BATTERY 2x2 LAY-IN OR SURFACE MOUNTED FIXTURE 2x2 LAY-IN OR SURFACE MOUNTED FIXTURE; SHADING INDICATES EMERGENCY POWERED BATTERY SURFACE OR STRIP FIXTURE RECESSED STRIP FIXTURE; SHADING INDICATES EMERGENCY POWERED BATTERY RECESSED DOWNLIGHT RECESSED DOWNLIGHT; SHADING INDICATES EMERGENCY POWERED BATTERY WALL-MOUNTED LINEAR FIXTURE DOWNLIGHT FIXTURE DOWNLIGHT FIXTURE; SHADING INDICATES EMERGENCY POWERED BATTERY WALL-MOUNTED FIXTURE EXIT SIGN; LED TYPE. DARKENED AREA INDICATES FACE, ARROWS INDICATE DIRECTION OF EGRESS RECESSED ELECTRICAL PANEL WITH REQUIRED CLEARANCE SURFACE MOUNTED ELECTRICAL PANEL WITH REQUIRED CLEARANCE COMBINATION STARTER DISCONNECT SWITCH NON FUSED DISCONNECT SWITCH FUSED DISCONNECT SWITCH MOTOR STARTER ELECTRIC MOTOR, HORSEPOWER AS SHOWN. JUNCTION BOX SPECIALTY JUNCTION BOX WITH DESIGNATION "XYZ". REFER TO JBOX ABBREVIATION LEGEND.		FLOOR BOXES FLOOR/WALL BOX WITH DESIGNATION "XYZ". REFER TO FLOOR/WALL BOX ABBREVIATION SCHEDULE. XYZ (1) (2) (1) DUPLEX RECEPTACLE (2) (3) (2) GFI DUPLEX RECEPTACLE (3) (4) (3) QUADRUPLUX RECEPTACLE (4) (4) GFI QUADRUPLUX RECEPTACLE (6) (7) (6) TELEPHONE OUTLET (7) (7) DATA OUTLET (8) (8) COMBO TELE/ DATA OUTLET (9) (9) AUDIO VISUAL POWER -- FLOOR/WALL BOX ABBREVIATION SCHEDULE		SWITCHES S SINGLE POLE LIGHT SWITCH S _M PADLOCKABLE HP RATED SWITCH S _X SPECIALTY SWITCH. FOR "X" DESIGNATION, SEE LIGHTING SWITCH ABBREVIATION SCHEDULE BELOW. LIGHTING -- SWITCH ABBREVIATION SCHEDULE		SENSORS SPECIALTY CEILING MOUNT SENSOR WITH DESIGNATION "XX", REFER TO ABBREVIATION LEGEND BELOW. SPECIALTY CORNER MOUNT SENSOR WITH DESIGNATION "XX", REFER TO ABBREVIATION LEGEND BELOW. LIGHTING -- SENSOR ABBREVIATION SCHEDULE	
POWER -- RECEPTACLE ABBREVIATION LEGEND STANDARD ABOVE COUNTER GFCI GFCI ABOVE COUNTER WEATHER PROOF CEILING MOUNT MULTI POLE RECEPTACLE. REFER TO RECEPTACLE ABBREVIATION LEGEND FOR DETAILS. SIMPLEX RECEPTACLE. REFER TO RECEPTACLE ABBREVIATION LEGEND FOR DETAILS. POWER -- RECEPTACLE ABBREVIATION LEGEND		ELECTRICAL GENERAL NOTES 1. ALL ELECTRICAL WORK SHALL COMPLY WITH ALL LOCAL CODES, AUTHORITIES HAVING JURISDICTION, DRAWINGS AND SPECIFICATIONS. IF DISCREPANCIES ARE FOUND - THE MOST STRINGENT REQUIREMENT SHALL GOVERN WORK. 2. REFER TO SPECIFICATIONS AND PROJECT MANUAL FOR ADDITIONAL INFORMATION AND REQUIREMENTS. 3. REFER TO ALL PROJECT DRAWINGS FOR DETAILS OF CONSTRUCTION AND INSTALLATION REQUIREMENTS. 4. PRIOR TO BID, CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE REQUIREMENTS OF THESE NOTES AS WELL AS OTHER NOTES SHOWN ON THE CONTRACT DOCUMENTS. 5. THESE DRAWINGS REFLECT A SYSTEM DESIGNED AROUND SPECIFIED REFERENCE PRODUCTS. THE SELECTION OF WHICH HAS INFLUENCED THE DESIGNS OF OTHER TRADES. IF SUBSTITUTE MANUFACTURERS, SIZES, OR MODEL NUMBERS ARE BID OR SUBMITTED, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL DIFFERENCES PRIOR TO BID. ALL COSTS OF ALL TRADES ASSOCIATED WITH THE SUBSTITUTION SHALL BE INCLUDED IN THE BID. 6. REFER TO ELECTRICAL SCHEDULES AND SPECIFICATIONS FOR BASIS OF DESIGN, ACCEPTABLE MANUFACTURERS, AND MODELS OF ELECTRICAL FIXTURES AND EQUIPMENT. 7. ALL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRICAL RELATIONSHIPS OF EQUIPMENT AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, DEVICE, OPTION, FITTING, OR COMPONENT. 8. CONTRACTOR SHALL NOT SCALE DRAWINGS. DRAWINGS SPECIFIC TO THIS DISCIPLINE DO NOT LIMIT THE RESPONSIBILITY OF WORK REQUIRED BY THE CONTRACT DOCUMENTS. 9. COORDINATION OF ALL MODIFICATIONS TO EACH DISCIPLINE WHICH RESULT FROM SUBSTITUTION OF EQUIPMENT OR MATERIALS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SUBSTITUTIONS WHICH ARE INSTALLED AND SUBSEQUENTLY ARE PROVEN UNSATISFACTORY BY OWNER AND/OR ENGINEER WITHIN THE WARRANTY PERIOD, SHALL BE REMOVED COMPLETELY BY THE CONTRACTOR AND REPLACED WITH THE ORIGINAL DESIGN OR CORRECTED AS DIRECTED BY THE ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER. 10. ALL ELECTRICAL CONDUIT SHALL BE 1/2" OR GREATER. 11. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL WORK WITH THAT OF OTHER TRADES. REFER TO ALL CONSTRUCTION DOCUMENTS FOR COMPLETE INFORMATION PRIOR TO BID. 12. NO ELECTRICAL SYSTEMS SHALL BE SUSPENDED, HUNG, OR SUPPORTED FROM DUCTWORK OR PIPING. 13. CONTRACTOR SHALL BE RESPONSIBLE FOR FLASHING AND SEALING OF ALL ROOF PENETRATIONS AIR AND WATER TIGHT. 14. CLOSELY COORDINATE FINAL LOCATIONS OF INSTALLED EQUIPMENT TO ACHIEVE THE GREATEST ACCESSIBILITY FOR MAINTENANCE. 15. CONTRACTOR SHALL VISIT THE SITE TO ESTABLISH THE EXISTING CONDITIONS PRIOR TO CONDUIT OR ELECTRICAL EQUIPMENT FABRICATION. SYSTEMS SHALL BE ERRECTED USING FIELD MEASUREMENTS FOR COORDINATION WITH THE EXISTING EQUIPMENT. STRUCTURE, FIRE PROTECTION AND ELECTRICAL ALL EQUIPMENT, DEVICES, AND FIXTURES SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATION. 16. EXPOSED CONDUIT AND MC CABLE SHALL BE FURNISHED SUITABLE FOR PAINTING, AND SHALL BE PAINTED AS REQUIRED BY ARCHITECTURAL SPECIFICATIONS. 17. PROVIDE ALL FITTINGS, COUPLINGS, AND OTHER ACCESSORIES NEEDED TO COMPLETE CONNECTIONS AND PROVIDE FOR PROPER OPERATION OF ELECTRICAL FIXTURES AND ELECTRICAL EQUIPMENT. 18. REFER TO ELECTRICAL SPECIFICATIONS FOR CONDUIT MATERIALS AND INSTALLATION REQUIREMENTS. 19. FIRE STOP ALL CONDUIT PENETRATIONS THROUGH RATED WALLS. REFER TO SPECIFICATIONS. 20. REFER TO ARCHITECTURAL PLANS FOR CEILING GRILL AND LIGHT FIXTURE LOCATIONS, FOR CEILING TYPE, AND FOR MOUNTING REQUIREMENTS. CONTRACTOR SHALL PROVIDE AND INSTALL ALL LIGHTS WITH MOUNTING DESIGNED FOR MOUNTING SURFACE TYPE. PROVIDE CONCRETE PADS FOR ALL GROUND MOUNTED EQUIPMENT. 21. REPLACE ALL ARCHITECTURAL FEATURES REMOVED OR DAMAGED DURING THE COURSE OF THE WORK. 22. CONTRACTOR SHALL PATCH ALL WALLS, FLOORS, AND CEILINGS TO MATCH NEW/EXISTING FOR OPENINGS CREATED BY INSTALLATION OF EQUIPMENT AND ELECTRICAL SERVICE PENETRATIONS. 23. ALL HVAC WITH ELECTRICAL REQUIREMENTS SHALL BE INSTALLED WITH ELECTRICAL INFRASTRUCTURE NECESSARY TO PROVIDE A FULLY FUNCTIONING SYSTEM. IF NOT SPECIFICALLY SHOWN ON ELECTRICAL SCHEDULE, HVAC FIXTURES REQUIRING ELECTRICAL SERVICE SHALL BE FED FROM BREAKER OF ADEQUATE CAPACITY. 24. REFER TO STRUCTURAL ENGINEERING CONTRACT FOR PROJECT SEISMIC DESIGN CRITERIA. PROVIDE VIBRATION ISOLATION AND SEISMIC RESTRAINT FOR EQUIPMENT AND CONDUIT AS REQUIRED.		COMMUNICATIONS DEVICES INTERCOM STATION MASTER INTERCOM STATION CLOCK CLOCK, DUAL SIDED CLOCK, WITH WIREGUARD HORN SPEAKER HORN SPEAKER - WEATHERPROOF PAGING SPEAKER CAMERA WITH PAN, TILT, & ZOOM CAMERA - WEATHERPROOF WITH PAN, TILT, & ZOOM SPECIAL SYSTEMS JUNCTION BOX ABOVE CEILING. ROUTE 1" C WITH PULL STRING TO DATA/ELECTRICAL ROOM. (V) VIDEO, (A) ALARM/ACCESS ACCESS CONTROL - PROVIDE ACCESS CONTROL ROUGH-IN AT DOOR. REFER TO DETAILS FOR ACCESS CONTROL ROUGH-IN REQUIREMENTS. MAGNETIC DOOR HOLDER FIRE ALARM PULL STATION FIRE ALARM COMBINATION HORN/STROBE DEVICE FIRE ALARM COMBINATION SPEAKER/STROBE DEVICE FIRE ALARM STROBE DEVICE FIRE ALARM ZAM DEVICE; IAM (I), CONTROL (C), OR MONITOR MODULE (M) SMOKE DETECTOR HEAT DETECTOR DUCT SMOKE DETECTOR DUCT SMOKE DETECTOR WITH AUXILIARY CONTACTS TAMPER SWITCH / FLOW SWITCH SERVICE ENTRANCE RATED AUTOMATIC TRANSFER SWITCH MANHOLE, HANDHOLE DESIGNATION REFER TO SCHEDULE.			
POWER -- J-BOX ABBREVIATION SCHEDULE DATA DEVICES TELEPHONE OUTLET; ABOVE COUNTER, & FIREMAN'S DATA OUTLET; ABOVE COUNTER & CEILING MOUNTED COMBINATION DATA/TELEPHONE OUTLET & COMBINATION DATA/TELEPHONE OUTLET ABOVE COUNTER TELEVISION OUTLET WITH HEIGHT A.F.F. DESIGNATION		ROOM CONTROLLERS / POWER PACKS SPECIALTY POWER PACK WITH DESIGNATION "XX", REFER TO ABBREVIATION LEGEND BELOW. SPECIALTY ROOM CONTROLLER WITH DESIGNATION "XX", REFER TO ABBREVIATION LEGEND BELOW.		WIRE TYPES LIGHTING CONTROL CABLING EQUIPMENT AND CONDUIT LINE TYPES FURNISH + INSTALL NEW EXISTING DEMOLISH UNDERGROUND CONNECT TO EXISTING 2 (3#8 + 1#8 + 1#10EG) 3/4" GRS CONDUIT TYPE (SEE ABBREVIATIONS) REFER TO SPECIFICATIONS IF NOT SHOWN CONDUIT SIZE GROUNDED (NEUTRAL) CONDUCTOR, NUMBER AND SIZE GROUNDED (NEUTRAL) CONDUCTOR, NUMBER AND SIZE PHASE (HOT) CONDUCTOR, NUMBER & SIZE NUMBER OF SETS XX - ## HOME RUN TO PANEL. LETTER(S) INDICATE NAME OF PANEL, NUMBER(S) INDICATE CIRCUIT NUMBERS.			
POWER -- FLOOR/WALL BOX ABBREVIATION SCHEDULE		POWER -- RECEPTACLE ABBREVIATION LEGEND		COMMUNICATIONS DEVICES			
POWER -- J-BOX ABBREVIATION SCHEDULE		ROOM CONTROLLERS / POWER PACKS		WIRE TYPES			
DATA DEVICES		ROOM CONTROLLERS / POWER PACKS		EQUIPMENT AND CONDUIT LINE TYPES			

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**BID ITEM 203.820
ELECTRICAL POWER AND LIGHTING LEGEND
DRAWING E1.0**

**WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1**

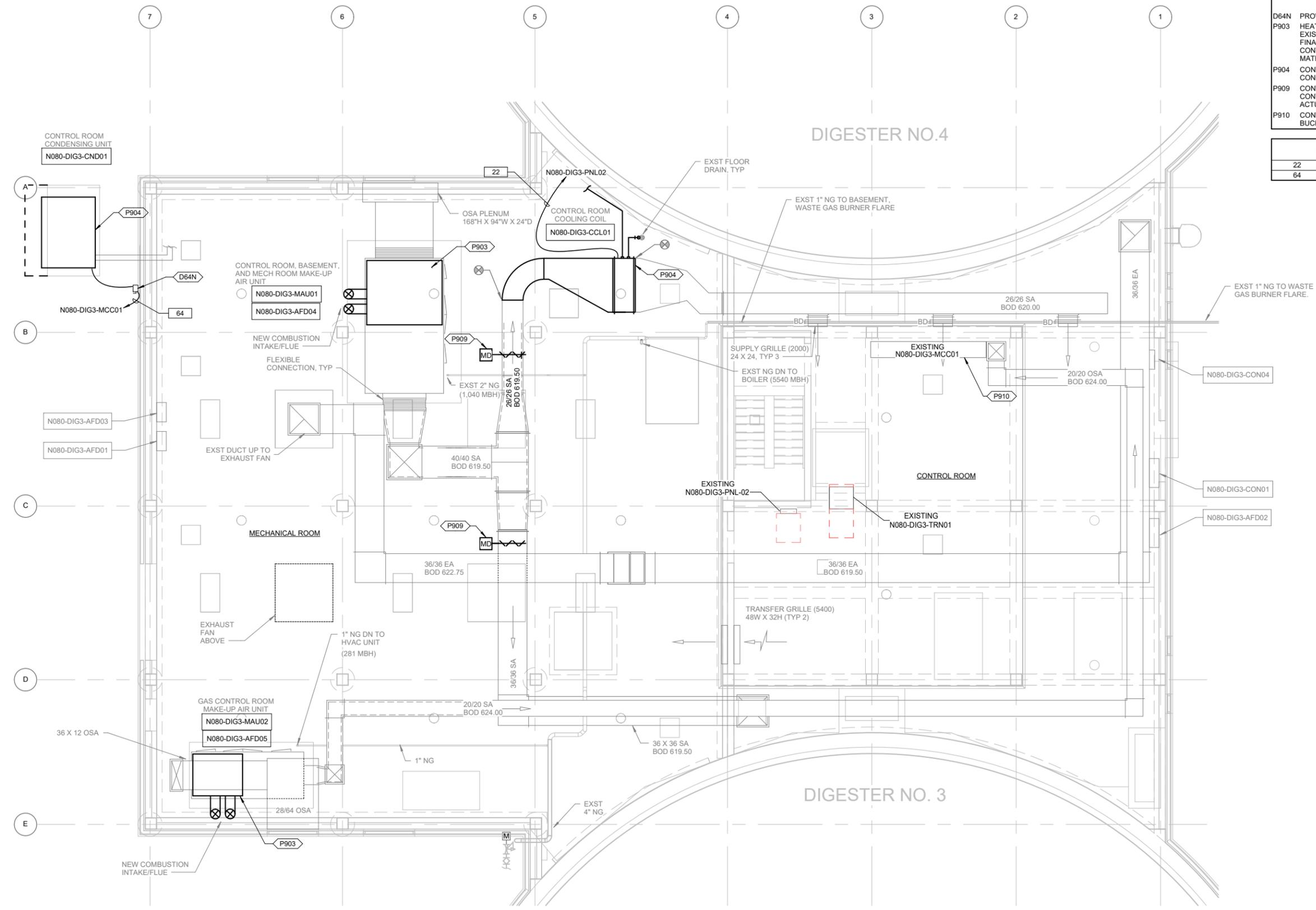
**CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT**

PLANS AND ESTIMATES		 HOLLOWAY, UPDIKE & BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754	
PREPARED BY:		APPROVED:	
PLAN SCALE:	DRAWN: NL DESIGNED: AE SURVEY:		
PROFILE SCALE:	FIELD MGR. SECT. MGR. PROJ. MGR.		
HORIZONTAL:	RECOMMENDED:		
VERTICAL:	DEPUTY DIRECTOR		
FILE:	DRAWING: E1.0	DATE:	3-13-2026
ATLAS PAGE NO.:	---	SHEET	42/41 OF 3 SHEETS



KEYNOTES	
D64N	PROVIDE 60A/3P/NF/NEMA 3R DISCONNECT.
P903	HEATERS IN MAKEUP AIR UNIT SHALL BE FED FROM EXISTING CIRCUIT IN UNIT. CONTRACTOR SHALL MAKE FINAL CONNECTIONS PER MANUFACTURER REQUIREMENTS. CONTRACTOR SHALL FURNISH AND INSTALL LABOR AND MATERIALS.
P904	CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING CONDUIT AND WIRE FROM SOURCE TO LOAD.
P909	CONTRACTOR SHALL COORDINATE WITH CONTROLS CONTRACTOR TO CONNECT NEW MOTORIZED DAMPER ACTUATOR TO EXISTING CIRCUIT.
P910	CONTRACTOR SHALL FURNISH AND INSTALL NEW FEEDER BUCKET IN EXISTING MCC FOR NEW CONDENSER.

FEEDER LEGEND	
22	(1#12 + 1#12N + 1#12G) 3/4" C
64	(3#6 + 1#6N + 1#10G) 1" C



ADDITIVE ALTERNATE #3

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**BID ITEM 203.820
ELEC RENOVATION PLAN - RENO
DRAWING E2.0**

**WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1**

**CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT**

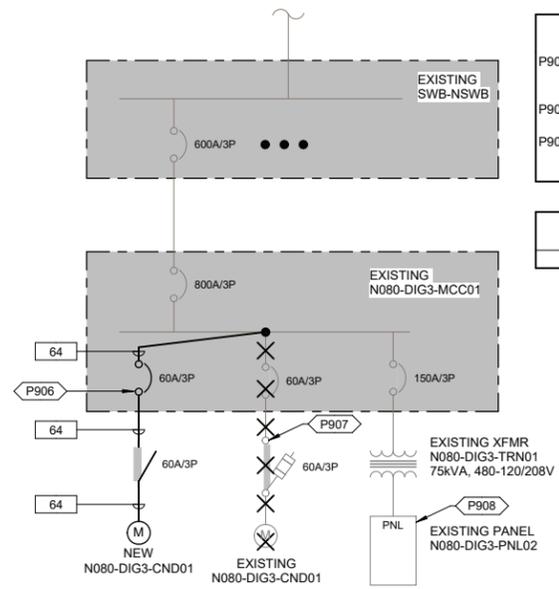
PLANS AND ESTIMATES		HOLLOWAY, UPDIKE & BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754	
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ATLAS PAGE NO.:	---	SHEET	43/E2 OF 3 SHEETS

1 ELEC RENOVATION PLAN DIGESTER 3 AND 4
3/16" = 1'-0"



DRAWING NAME: HUB-316 - E2.0
DATE: 3/11/2026 12:57:09 PM
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DRAWING NAME: HUB-316 - E3.0
 DATE: 3/11/2026 12:57:09 PM
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KEYNOTES

P906 CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING BREAKER IN EXISTING MCC. CONTRACTOR SHALL FURNISH AND INSTALL NEW BREAKER AS SHOWN.

P907 CONTRACTOR SHALL DEMOLISH AND REMOVE ALL CONDUIT, WIRE, AND DISCONNECTS FROM SOURCE TO LOAD.

P908 CONTRACTOR SHALL FURNISH AND INSTALL 20A/1P BREAKER FOR N080-DIG3-CCL01 CONTROLS. CONTRACTOR SHALL UPDATE PANEL SCHEDULE ACCORDINGLY.

FEEDER LEGEND

64 (3#6 + 1#6N + 1#10G) 1" C

1 ONE LINE DIAGRAM
 NOT TO SCALE

ADDITIVE ALTERNATE #3

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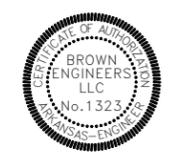
BID ITEM 203.820
ELECTRICAL SCHEDULES AND ONE-LINE
DRAWING E3.0

WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1

CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
 WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES
 PREPARED BY: HOLLOWAY, UPDIKE & BELLEN, Inc.
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PLAN SCALE:	DRAWN	NL	APPROVED:
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	SURVEY		
PROFILE SCALE:	FIELD MGR.		
	SECT. MGR.		
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VERTICAL:	DEPUTY DIRECTOR		
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FILE:	DRAWING: E3.0		DATE: 3-13-2026
ATLAS PAGE NO: --			SHEET 64/63 OF 3 SHEETS

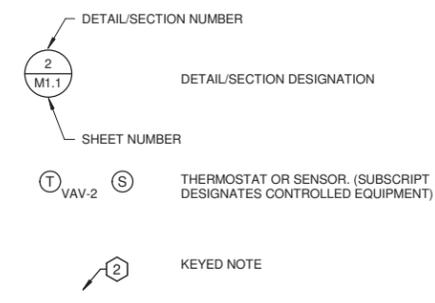


HVAC LEGEND

ABBREVIATION OR SYMBOL	DESCRIPTION	ABBREVIATION OR SYMBOL	DESCRIPTION	ABBREVIATION OR SYMBOL	DESCRIPTION
AFD	ADJUSTABLE FREQUENCY DRIVE (A.K.A. VFD)		CEILING SUPPLY DIFFUSER		NEW EQUIPMENT
AHU	AIR HANDLING UNIT		CEILING RETURN/EXHAUST GRILLE		EXISTING EQUIPMENT TO REMAIN
AFF	ABOVE FINISHED FLOOR		GRILLE OR REGISTER ON BOTTOM OF DUCTWORK		EXISTING EQUIPMENT TO BE REMOVED
AP	ACCESS PANEL		SIDEWALL SUPPLY (RETURN SIMILAR)		NEW DUCT
BHP	BRAKE HORSEPOWER		RECTANGULAR DUCT WITH DUCT SIZE TAG		EXISTING DUCT TO REMAIN
BTUH	BRITISH THERMAL UNIT PER HOUR		ROUND DUCT WITH DUCT SIZE TAG		DEMOLISH EXISTING DUCT BACK TO POINT
CFM	CUBIC FEET PER MINUTE		OVAL DUCT WITH DUCT SIZE TAG		CONNECT TO EXISTING DUCT
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT		SUPPLY DUCT UP		
D	DRAIN		SUPPLY DUCT DOWN		
DB	DRY BULB TEMPERATURE		RETURN DUCT UP		
DN	DOWN		RETURN DUCT DOWN		
EA	EXHAUST AIR		EXHAUST DUCT UP		
EAT	ENTERING AIR TEMPERATURE OF THE COIL		EXHAUST DUCT DOWN		
ESP	EXTERNAL STATIC PRESSURE		RECTANGULAR/OVAL TRANSITION		
EWT	ENTERING WATER TEMPERATURE		RECTANGULAR/ROUND TRANSITION		
FCU	FAN COIL UNIT		FLEXIBLE DUCT CONNECTION		
FLR	FLOOR		(1) FIRE DAMPER		
FO	FLAT OVAL		(2) SMOKE DAMPER		
FPM	FEET PER MINUTE (VELOCITY)		(3) MOTORIZED DAMPER		
GPM	GALLONS PER MINUTE		(4) CONTROL DAMPER		
HP	HORSEPOWER		(1) BALANCING DAMPER		
KW	KILOWATT		(2) SMOKE DETECTOR		
LAT	LEAVING AIR TEMPERATURE OF THE COIL				
LWT	LEAVING WATER TEMPERATURE				
MAU	MAKE-UP AIR UNIT				
MAX	MAXIMUM				
MIN	MINIMUM				
MHP	MOTOR HORSEPOWER				
NTS	NOT TO SCALE				
OSA	OUTSIDE AIR				
PSI	POUNDS PER SQUARE INCH				
RA	RETURN AIR				
RH	RELATIVE HUMIDITY				
RPM	REVOLUTION PER MINUTE				
RTU	ROOF TOP (AIR CONDITIONING) UNIT				
SA	SUPPLY AIR				
SP	STATIC PRESSURE				
TYP	TYPICAL				
VAV	VARIABLE AIR VOLUME				
WB	WET BULB TEMPERATURE				
XFR	TRANSFER AIR				
'	FEET				
"	INCHES				
ø	ROUND DUCT				
Ø	OVAL DUCT				

MECHANICAL GENERAL NOTES

- ALL MECHANICAL WORK SHALL COMPLY WITH ALL LOCAL CODES, DRAWINGS, SPECIFICATIONS, AND AUTHORITIES HAVING JURISDICTION. IF DISCREPANCIES ARE FOUND, THE MOST STRINGENT REQUIREMENT SHALL GOVERN WORK. WHERE INSPECTIONS ARE REQUIRED BY AUTHORITIES HAVING JURISDICTION, WORK MUST NOT BE CONCEALED UNTIL INSPECTIONS AND TESTING ARE COMPLETE AND WORK IS ACCEPTED.
- REFER TO SPECIFICATIONS AND PROJECT MANUAL FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- REFER TO ALL PROJECT DRAWINGS FOR DETAILS OF CONSTRUCTION AND INSTALLATION REQUIREMENTS.
- PRIOR TO BID, CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE REQUIREMENTS OF THESE NOTES AS WELL AS OTHER NOTES SHOWN ON THE CONTRACT DOCUMENTS.
- THESE DRAWINGS REFLECT A SYSTEM DESIGNED AROUND SPECIFIED REFERENCE PRODUCTS, THE SELECTION OF WHICH HAS INFLUENCED THE DESIGN OF OTHER TRADES. IF SUBSTITUTE MANUFACTURERS, SIZES, OR MODEL NUMBERS ARE BID OR SUBMITTED, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL DIFFERENCES PRIOR TO BID. ALL COSTS OF ALL TRADES ASSOCIATED WITH THE SUBSTITUTION SHALL BE INCLUDED IN THE BID.
- COORDINATION OF ALL MODIFICATIONS TO EACH DISCIPLINE WHICH RESULT FROM SUBSTITUTION OF EQUIPMENT OR MATERIALS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SUBSTITUTIONS WHICH ARE INSTALLED AND SUBSEQUENTLY ARE PROVEN UNSATISFACTORY BY OWNER AND/OR ENGINEER WITHIN THE WARRANTY PERIOD, SHALL BE REMOVED COMPLETELY BY THE CONTRACTOR AND REPLACED WITH THE ORIGINAL DESIGN OR CORRECTED AS DIRECTED BY THE ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER.
- ALL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRICAL RELATIONSHIPS OF EQUIPMENT AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, SEQUENCE, DEVICE, OPTION, FITTING, OR COMPONENT.
- INFORMATION AND COMPONENTS ON DETAILS OR IN SPECIFICATIONS, BUT NOT SHOWN ON PLANS, AND VICE VERSA, SHALL BE PROVIDED AS IF EXPRESSLY REQUIRED BY BOTH.
- CONTRACTOR SHALL NOT SCALE DRAWINGS. DRAWINGS SPECIFIC TO THIS DISCIPLINE DO NOT LIMIT THE RESPONSIBILITY OF WORK REQUIRED BY THE CONTRACT DOCUMENTS.
- EXACT LOCATIONS OF ALL EQUIPMENT, ROOF CURBS, DUCTS, DIFFUSERS, AND PIPING SHALL BE COORDINATED WITH OTHER TRADES. CEILING MOUNTED SPRINKLER, LIGHTING, AND ELECTRICAL REQUIREMENTS TAKE PRECEDENCE OVER CEILING MOUNTED MECHANICAL REQUIREMENTS. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING GRID AND LIGHTING LAYOUT FOR COORDINATION OF FINAL DIFFUSER LOCATIONS.
- SEE ORIGINAL DRAWINGS FOR BUILDING DETAILS AND DIMENSIONS. COORDINATE PLACEMENT OF MECHANICAL SYSTEMS WITH EXISTING EQUIPMENT AND STRUCTURE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL WORK WITH THAT OF OTHER TRADES. REFER TO ALL CONSTRUCTION DOCUMENTS FOR COMPLETE INFORMATION PRIOR TO BID.
- ALL MECHANICAL CONSTRUCTION DETAILS SHALL BE AS SHOWN AND AS REQUIRED TO MAINTAIN "UL" ASSEMBLY RATINGS AS SHOWN ON ARCHITECTURAL SHEETS. SEAL AROUND ALL PENETRATIONS THROUGH UL RATED ASSEMBLIES, FIRE AND SMOKE WALLS. COORDINATE WITH GENERAL CONTRACTOR.
- NO OTHER TRADES, I.E., ELECTRICAL, CEILING, PLUMBING, OR OTHER SYSTEMS SHALL BE SUSPENDED, HUNG, OR SUPPORTED FROM DUCTWORK OR PIPING.
- SPECIAL CARE SHALL BE TAKEN ON EXISTING ROOFS TO PREVENT DAMAGE. ANY DAMAGE SHALL BE PROMPTLY REPAIRED AT NO EXPENSE TO THE OWNER. COMPLY WITH BONDING REQUIREMENTS OF EXISTING ROOF.
- CONTRACTOR SHALL BE RESPONSIBLE FOR FLASHING AND SEALING OF ALL ROOF PENETRATIONS AIR AND WATER TIGHT.
- CLOSELY COORDINATE FINAL LOCATIONS OF INSTALLED EQUIPMENT TO ACHIEVE THE GREATEST ACCESSIBILITY FOR MAINTENANCE PURPOSES.
- CONTRACTOR SHALL VISIT THE SITE TO ESTABLISH THE EXISTING CONDITIONS PRIOR TO DUCT, PIPE OR EQUIPMENT FABRICATION. SYSTEMS SHALL BE ERECTED USING FIELD MEASUREMENTS FOR COORDINATION WITH THE EXISTING EQUIPMENT, STRUCTURE, FIRE PROTECTION AND ELECTRICAL IN THE SPACE.
- MAINTAIN THE SECURITY OF THE BUILDING AT ALL TIMES.
- CORE DRILL ALL PIPING PENETRATIONS OF CONCRETE WALLS AND FLOORS.
- ALL HVAC WORK TO BE PER SMACNA AND ALL APPLICABLE CODES. DUCT SIZES REPRESENT FREE AREA.
- ALL LOW PRESSURE DUCTWORK THAT HAS TO BE OFFSET DUE TO AN OBSTRUCTION SHALL BE OFFSET WITH TWO - 45 DEGREE, 1.5 RADIUS ELBOWS UNLESS OTHERWISE NOTED.
- PROVIDE ACCESS DOORS IN WALLS, FLOORS, OR CEILINGS FOR ACCESS TO ALL FIRE DAMPERS, SMOKE DAMPERS, EQUIPMENT, COILS, VALVES, AND BALANCING DAMPERS. ACCESS DOORS ARE NOT REQUIRED WHERE DEVICES ARE DIRECTLY ACCESSIBLE THROUGH AIR DEVICES.
- ALL DUCTWORK UPSTREAM OF VAV BOXES SHALL BE CONSIDERED "HIGH-PRESSURE DUCT".
- DUCT FITTINGS ARE AS FOLLOWS: 1) FLEX DUCT IS ONLY PERMITTED IN LINEAR DUCT RUNS. FLEX DUCT SHALL NOT BE USED WHERE DUCTWORK CHANGES DIRECTION. ALL ELBOWS SHALL BE HARD DUCTED. 2) ALL 90 DEGREE ELBOWS TO HAVE R/D = 1.5, UNLESS OTHERWISE NOTED. 3) ALL MITERED RECTANGULAR ELBOWS GREATER THAN 90 DEGREES NOTED ARE TO HAVE TURNING VANES. 4) SIDE TAKE-OFF FITTINGS SHALL BE EQUAL TO FLEXMASTER STODBO3. 5) DAMPERS SHALL BE EQUAL TO FLEXMASTER SLD803
- MAINTAIN A MINIMUM OF 10'-0" BETWEEN ALL FRESH AIR INTAKES AND PLUMBING VENTS, EXHAUST FAN DISCHARGE, AND FLUES. MAINTAIN MINIMUM CLEAR DISTANCE OF 5'-0" BETWEEN PARAPET WALL AND ALL ROOF MOUNTED MECHANICAL EQUIPMENT.
- ALL ROOF MOUNTED EQUIPMENT SHALL BE PROVIDED WITH MANUFACTURER'S FABRICATED CURBS WHICH FACILITATE LEVEL MOUNTING OF THE EQUIPMENT (I.E. FACTORY FABRICATED TO COMPENSATE FOR ROOF SLOPE). OBTAIN ROOF SLOPES AND DIRECTION OF SLOPE FROM ARCHITECTURAL AND/OR STRUCTURAL PLANS. ALL ROOF CURBS SHALL BE A MINIMUM OF 8" HIGH. SHIMMING OF CURBS IS NOT ACCEPTABLE.
- ALL DUCTS SHALL BE MOUNTED HIGH AS POSSIBLE AGAINST BOTTOM OF STRUCTURE EXCEPT AS REQUIRED TO AVOID CONFLICTS WITH INTERSECTING SYSTEMS. DIAGONALLY OFFSET DUCTS IMMEDIATELY BEFORE AND AFTER PASSING UNDER INTERSECTING SYSTEMS TO MAINTAIN DUCT TIGHT TO STRUCTURE.
- CONTRACTOR SHALL FIELD VERIFY ALL PIPE ROUTING AND ADJUST ELEVATIONS AS REQUIRED TO AVOID CONFLICTS. FINAL PLACEMENT OF PIPING SHALL BE DETERMINED BY FIELD MEASUREMENT AND VERIFICATION. ELEVATIONS ARE REFERENCED TO PIPE CENTERLINE UNLESS OTHERWISE NOTED.
- DUCTWORK SHALL CONFORM TO THE FOLLOWING PRESSURE CLASSES: SUPPLY FROM AIR HANDLING UNITS AT OR ABOVE 2" ESP: 3" SP (HIGH PRESSURE); SUPPLY FROM UNITS BELOW 2" ESP: 2" SP (LOW PRESSURE); RETURN/RELIEF/OUTSIDE AIR/EXHAUST: 2" SP. ALL DUCTWORK IS REQUIRED TO BE TESTED IN ACCORDANCE WITH THE SPECIFICATIONS.
- ALL EQUIPMENT, DEVICES, AND FIXTURES SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATION.
- CONTRACTOR SHALL VERIFY CLOSELY AT SITE TRANSPORTATION OF NEW HVAC EQUIPMENT INTO MECHANICAL AREAS BEFORE BIDDING. PROVIDE COMPLETE DISASSEMBLY AND RE-ASSEMBLY OF NEW EQUIPMENT AS REQUIRED FOR A COMPLETE INSTALLATION.
- PROVIDE FLEXIBLE CONNECTIONS AND TRANSITIONS ON DUCT INLET AND OUTLET CONNECTIONS TO ALL EQUIPMENT WITH MOVING PARTS.
- EXPOSED DUCTWORK AND PIPING SHALL BE FURNISHED SUITABLE FOR PAINTING, AND SHALL BE PAINTED AS REQUIRED BY OWNER.
- NOT ALL REQUIRED PIPING, VALVES, OR FITTINGS ARE SHOWN ON DRAWINGS FOR CLARITY. COORDINATE PLAN DETAILS WITH SPECIFICATIONS, SCHEMATICS, FLOW DIAGRAMS, AND OTHER DETAILS TO PROVIDE COMPLETE PIPING SYSTEMS.
- COORDINATE WORK CLOSELY WITH CONTROL REQUIREMENTS. PROVIDE ALL NECESSARY DUCT TAPS, PIPE TAPS, WELLS, AND OTHER APPURTENANCES REQUIRED BY CONTROL SYSTEM. PROVIDE SPARE PIPE WELL ADJACENT TO EACH TEMPERATURE SENSOR IN PIPING.
- COORDINATE FINAL PLACEMENT OF ALL THERMOSTATS WITH WALL-MOUNTED DEVICES AND OWNER'S REPRESENTATIVE. MOUNT PER A.D.A. REQUIREMENTS. ANY THERMOSTAT THAT IS REQUIRED TO BE MOUNTED ON AN EXTERIOR WALL SHALL BE MOUNTED ON AN INSULATED PAD.
- INSTALL SMOKE DETECTOR IN SUPPLY AND RETURN DUCT OF ALL AIR HANDLERS SUPPLYING GREATER THAN 2,000 CFM.
- PROVIDE CONCRETE PADS FOR ALL GROUND MOUNTED EQUIPMENT.
- REPLACE ALL ARCHITECTURAL FEATURES REMOVED OR DAMAGED DURING THE COURSE OF THE WORK.
- CONTRACTOR SHALL PATCH ALL WALLS, FLOORS, AND CEILINGS TO MATCH EXISTING FOR ALL OPENINGS CREATED BY INSTALLATION OF EQUIPMENT AND HVAC SERVICE PENETRATIONS.
- SUPPLY, RETURN, RELIEF, AND OUTSIDE AIR DUCTWORK SHALL BE EXTERNALLY INSULATED EXCEPT WHERE LINER, DOUBLE WALL LINED DUCT, OR FABRIC DUCT IS INDICATED. INSULATE TOPS OF SUPPLY AIR DIFFUSERS WITH 2" THICK FIBERGLASS DUCT WRAP.
- REFER TO SPECIFICATIONS FOR INSULATION AND R-VALUES FOR MECHANICAL PIPING AND DUCTWORK INSULATION.
- ROOF PENETRATIONS AND FLASHING MUST COMPLY WITH ROOF MANUFACTURER'S RECOMMENDATIONS AND WARRANTY REQUIREMENTS.
- ROOF PENETRATIONS AND FLASHING SHALL BE INSTALLED BY ROOFING CONTRACTOR.
- ALL HVAC COMPONENTS WITH ELECTRICAL REQUIREMENTS SHALL BE INSTALLED WITH ELECTRICAL INFRASTRUCTURE NECESSARY TO PROVIDE A FULLY FUNCTIONING SYSTEM. IF NOT SPECIFICALLY SHOWN ON ELECTRICAL SCHEDULE, HVAC FIXTURES REQUIRING ELECTRICAL SERVICE SHALL BE FED FROM BREAKER OF ADEQUATE CAPACITY.
- ALL CONTROL WIRING SHALL BE INSTALLED IN CONDUIT.
- CONTRACTOR SHALL PROVIDE FURR DOWN AND ANY OTHER CEILING MODIFICATIONS NEEDED TO ACCOMMODATE DUCTWORK PENETRATIONS.
- ALL EXTERIOR HVAC EQUIPMENT AND PIPING SHALL HAVE CURBS AND SUPPORTS DESIGNED TO RESIST THE WIND LOADS SPECIFIED BY A LICENSED ENGINEER IN ACCORDANCE WITH ASCE 7 REQUIREMENTS. SUBMITTALS SHALL INCLUDE ENGINEERED WIND CALCULATIONS FOR CURBS AND SUPPORTS.



* NOT ALL SYMBOLS MAY APPLY TO THIS PROJECT

DEMOLITION AND RENOVATION GENERAL NOTES:

- THE MECHANICAL RELATED DEMOLITION WORK INDICATED ON THE PLANS, SPECIFICATIONS, AND NOTES IS TO BE CLOSELY COORDINATED WITH THE OWNER'S REPRESENTATIVE. NO DEMOLITION SHALL TAKE PLACE IN ANY AREA OR BUILDING UNTIL THE CONTRACTOR HAS BEEN GIVEN APPROVAL TO PROCEED IN THAT SPECIFIC LOCATION. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR ADDITIONAL INFORMATION AND DEMOLITION SCOPE OF WORK.
- IF DURING DEMOLITION, IT BECOMES NECESSARY TO TEMPORARILY REMOVE ANY EQUIPMENT, PIPING, OR OTHER SYSTEM WHICH IS NOT SPECIFICALLY NOTED TO BE REMOVED (THEREBY IMPLYING THAT THEY ARE TO BE LEFT FOR FUTURE USE), THE CONTRACTOR SHALL REINSTALL SAID SYSTEMS TO FULLY OPERABLE CONDITION IN THEIR ORIGINAL LOCATIONS.
- ALL DEMOLITION WORK SHALL BE SCHEDULED WITH THE OWNER'S REPRESENTATIVE AT LEAST 48 HOURS PRIOR TO THE WORK.
- PATCH ALL OPENINGS IN WALLS, FLOORS, AND CEILINGS WHERE DUCT, PIPING, AND CONTROLS HAVE BEEN REMOVED TO MATCH EXISTING.
- ANY DAMAGE TO THE OWNER'S PROPERTY, BUILDING, EXISTING SYSTEMS, OR EQUIPMENT RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER AND ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER.
- MAINTAIN THE SECURITY OF THE BUILDING AT ALL TIMES.
- REMOVE EXISTING CONTROL SYSTEMS SERVING DEMOLISHED HVAC EQUIPMENT UNLESS OTHERWISE NOTED.
- REMOVE ALL EXISTING SUPPORTS ASSOCIATED WITH EQUIPMENT, DUCTWORK, AND PIPE BEING REMOVED UNLESS NOTED OTHERWISE.
- DISPOSE OF ALL REMOVED EQUIPMENT AS DIRECTED BY THE OWNER.
- CONTRACTOR SHALL COORDINATE REMOVAL OF UTILITY SERVICES WITH UTILITY COMPANIES AND LOCAL AUTHORITIES AND PAY ALL FEES.
- SCHEDULE UTILITY WORK WITH OWNER TO KEEP TO A MINIMUM ACCEPTABLE DOWNTIME AND TO NOT INTERFERE WITH THE BUILDING OPERATIONAL SCHEDULE, IF POSSIBLE. UTILITY DOWN-TIME SHALL BE KEPT TO A MINIMUM AND SCHEDULED THREE DAYS IN ADVANCE. (MAYBE KEEP)
- MAINTAIN THE FIRE AND SMOKE CONSTRUCTION INTEGRITY OF THE EXISTING BUILDINGS. FIREPROOFING ON EXISTING STRUCTURE SHALL BE REPLACED OR REPAIRED WHERE DISTURBED FROM THE INSTALLATION OF MECHANICAL SYSTEMS.
- DO NOT VENT REFRIGERANT TO ATMOSPHERE. RECOVER REFRIGERANT FOR REUSE USING ASHRAE RECOMMENDED PROCEDURES.
- IF DURING THE COURSE OF THE WORK MATERIAL WHICH MAY CONTAIN ASBESTOS IS DISCOVERED, STOP WORK IMMEDIATELY AND COMPLY WITH EPA REGULATIONS TO PROTECT WORKERS AND OCCUPANTS. NOTIFY OWNER AND ENGINEER.
- ALL UNDERGROUND PIPING WHICH IS SHOWN TO BE TAKEN OUT OF SERVICE SHALL BE REMOVED TO POINTS INDICATED, AND REMAINING PIPE SHALL BE PURGED AND PLUGGED.
- EXISTING EQUIPMENT SHALL BE RELOCATED AS NECESSARY FOR THE INSTALLATION OF THE NEW SYSTEMS. METHODS AND POSITIONS OF THE RELOCATIONS SHALL HAVE PRIOR APPROVAL OF THE ARCHITECT.
- DEMOLITION AND SHUTDOWN OF EXISTING HVAC SYSTEMS THAT WILL AFFECT PORTIONS OF THE BUILDING OUTSIDE OF PROJECT AREA SHALL BE COORDINATED WITH OWNER'S REPRESENTATIVE AND PLANNED TO LIMIT INCONVENIENCE AND DISRUPTION OF BUILDING OPERATIONS AS MUCH AS POSSIBLE. WORK SHALL BE PHASED ACCORDINGLY. PLUMBING OR HVAC WORK REQUIRED IN OCCUPIED AREAS OUTSIDE OF THE PROJECT AREA SHALL BE SCHEDULED WITH THE OWNER 48 HOURS IN ADVANCE.
- SPECIAL CARE SHALL BE TAKEN ON THE EXISTING ROOFS TO PREVENT DAMAGE. ANY DAMAGE SHALL BE PROMPTLY REPAIRED AT NO EXPENSE TO THE OWNER. COMPLY WITH BONDING REQUIREMENTS OF EXISTING ROOF.
- THE EQUIPMENT LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE FINAL LOCATIONS SHALL BE ESTABLISHED IN THE FIELD TO BEST FIT THE AVAILABLE SPACE. COORDINATE WITH STRUCTURAL DRAWINGS.
- INSPECT THE EXISTING SYSTEM; ANY EXISTING EQUIPMENT, DUCTS, OR PIPING FOUND TO BE DAMAGED OR NON-OPERABLE SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE IMMEDIATELY.
- PHASE DEMOLITION AND RENOVATION WORK TO MAINTAIN EXISTING BUILDING AS REQUIRED BY BUILDING OWNER/OCCUPANTS. PROVIDE TEMPORARY SERVICES AS REQUIRED.
- VISIT THE SITE TO ESTABLISH THE EXISTING CONDITIONS PRIOR TO DUCT, PIPE, OR EQUIPMENT FABRICATION. SYSTEMS SHALL BE ERECTED USING FIELD MEASUREMENTS FOR COORDINATION WITH THE EXISTING SYSTEMS IN THE SPACE.
- USE EXISTING PIPING SYSTEM VALVES WHERE POSSIBLE TO ISOLATE SYSTEMS AND TO CAP EXISTING PIPING. REPLACE EXISTING VALVES WHERE NECESSARY WHEN EXISTING VALVES WILL NOT HOLD.
- REPLACE AND/OR PATCH TO MATCH EXISTING ANY EXISTING DUCT OR PIPING INSULATION THAT IS TO REMAIN EXISTING AND IS DAMAGED DURING CONSTRUCTION.
- INSPECT THE EXISTING DUCTWORK WITHIN PROJECT BOUNDARIES FOR POSSIBLE DAMAGE OR CONDENSATION. REPAIR AND RE-INSULATE.

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**BID ITEM 203.820
MECHANICAL NOTES AND LEGENDS
DRAWING M1.0**

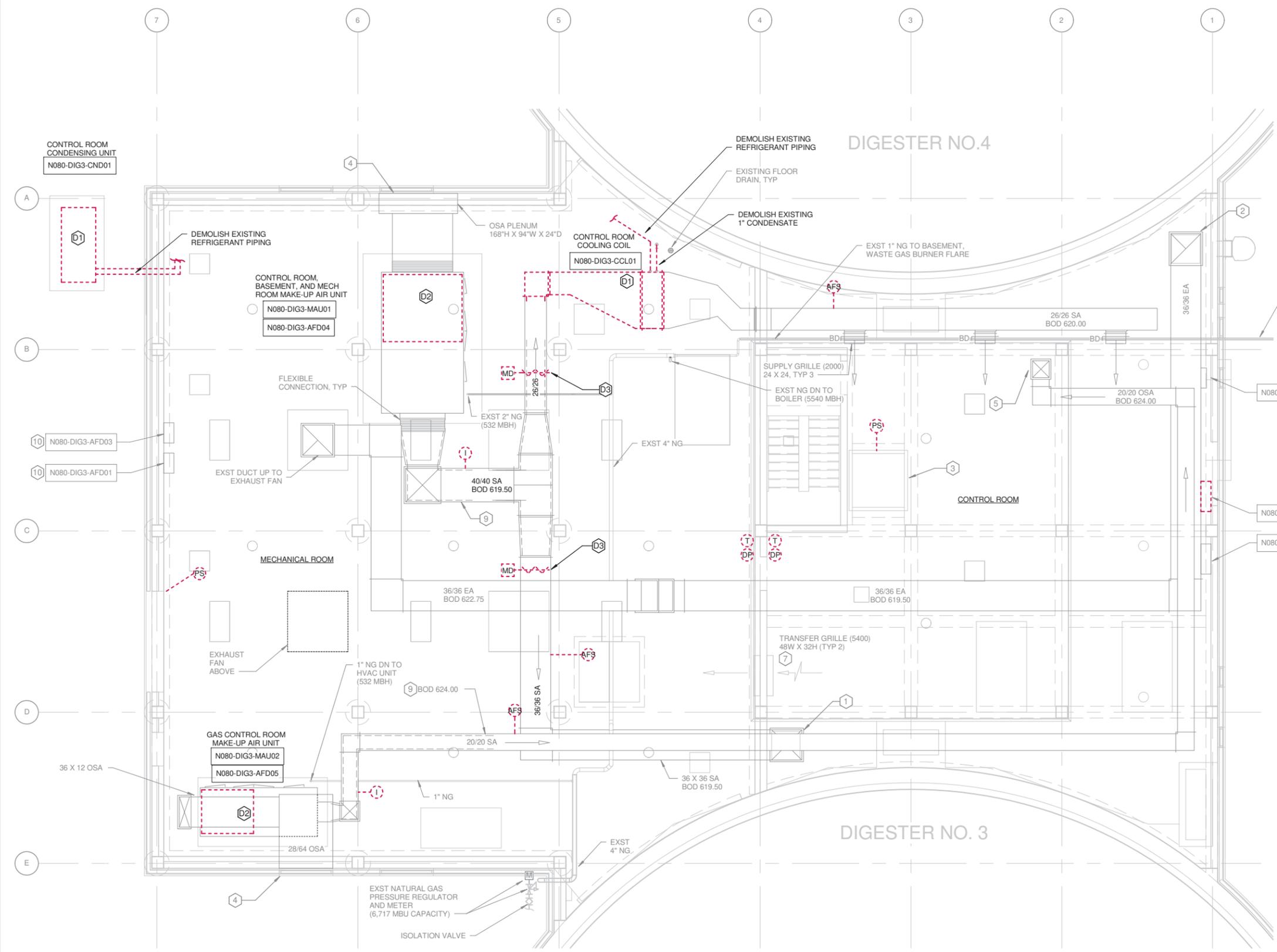
**WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1**

**CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT**

PLANS AND ESTIMATES PREPARED BY:		HOLLOWAY, UPDIKE & BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754
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- GENERAL NOTES:**
- DUCT ROUTINGS ARE GENERAL IN NATURE. FIELD VERIFY EXISTING CONDITIONS.
 - PROVIDE RECTANGULAR DUCT TURNING VANES PER SPECIFICATIONS. TURNING VANES NOT SHOWN FOR CLARITY.
- # KEYED NOTES (EXISTING ITEMS, TO REMAIN):**
- SA DOWN TO BASEMENT.
 - EA DOWN TO BASEMENT.
 - EXISTING FLOOR HATCH.
 - EXISTING INTAKE LOUVER.
 - SA UP TO GAS CONTROL ROOM.
 - EXISTING CONTROL CABINET LOCATION.
 - EXISTING TRANSFER GRILLE.
 - EXISTING DDC CABINET.
 - INTERNALLY LINED DUCTWORK.
 - EXISTING ADJUSTABLE FREQUENCY DRIVE.

- # DEMOLITION KEYED NOTES:**
- DEMOLISH EXISTING DX COOLING COIL N080-DIG3-CCL01 AND CONDENSER N080-DIG3-CND01 COMPLETELY. DEMO ASSOCIATED REFRIGERANT PIPING AND CONDENSATE DRAIN PIPING. PRESERVE EXISTING DUCT CONNECTION FOR INSTALLATION OF NEW COOLING COIL AND CONDENSER AT EXISTING LOCATIONS.
 - DEMOLISH EXISTING DIRECT-FIRED GAS HEATING MODULE FROM N080-DIG3-MAU01 AND N080-DIG3-MAU02. PRESERVE EXISTING MAU HOUSING AND GAS CONNECTIONS FOR INSTALLATION OF NEW INDIRECT-FIRED GAS MODULES IN EXISTING LOCATIONS.
 - DEMOLISH EXISTING MOTOR ACTUATOR. EXISTING DAMPER TO REMAIN.
 - DEMOLISH ALL EXISTING COMPONENTS WITHIN CONTROL CABINET AS REQUIRED TO ALLOW FOR FULL REPLACEMENT OF CONTROL SYSTEM IN RENOVATION PHASE. CONTROL WIRING TO REMAIN. TEST INTEGRITY OF ALL CONTROL WIRING FOR HVAC SYSTEMS AND REPLACE ANY NON-FUNCTIONAL.

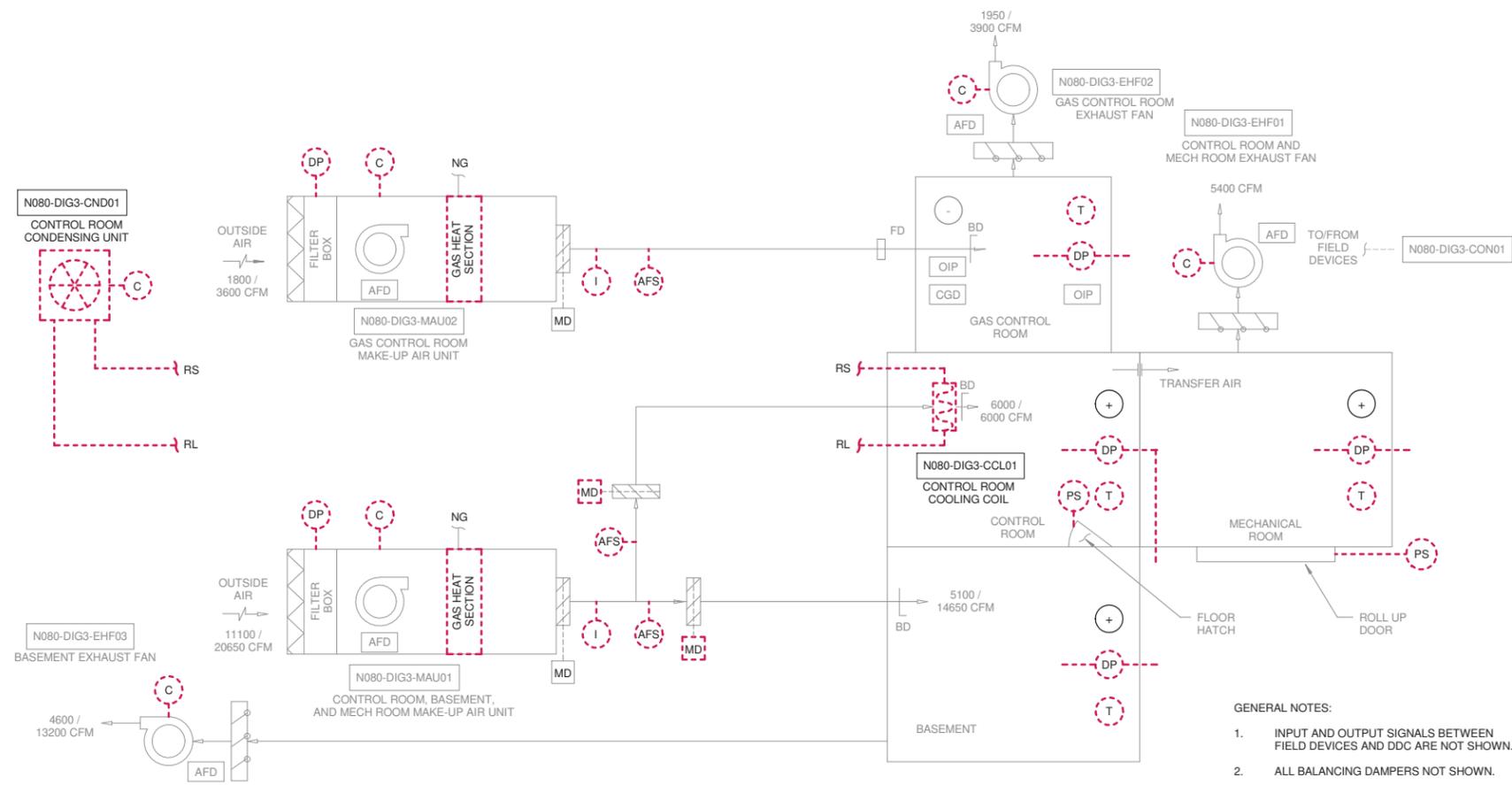
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WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
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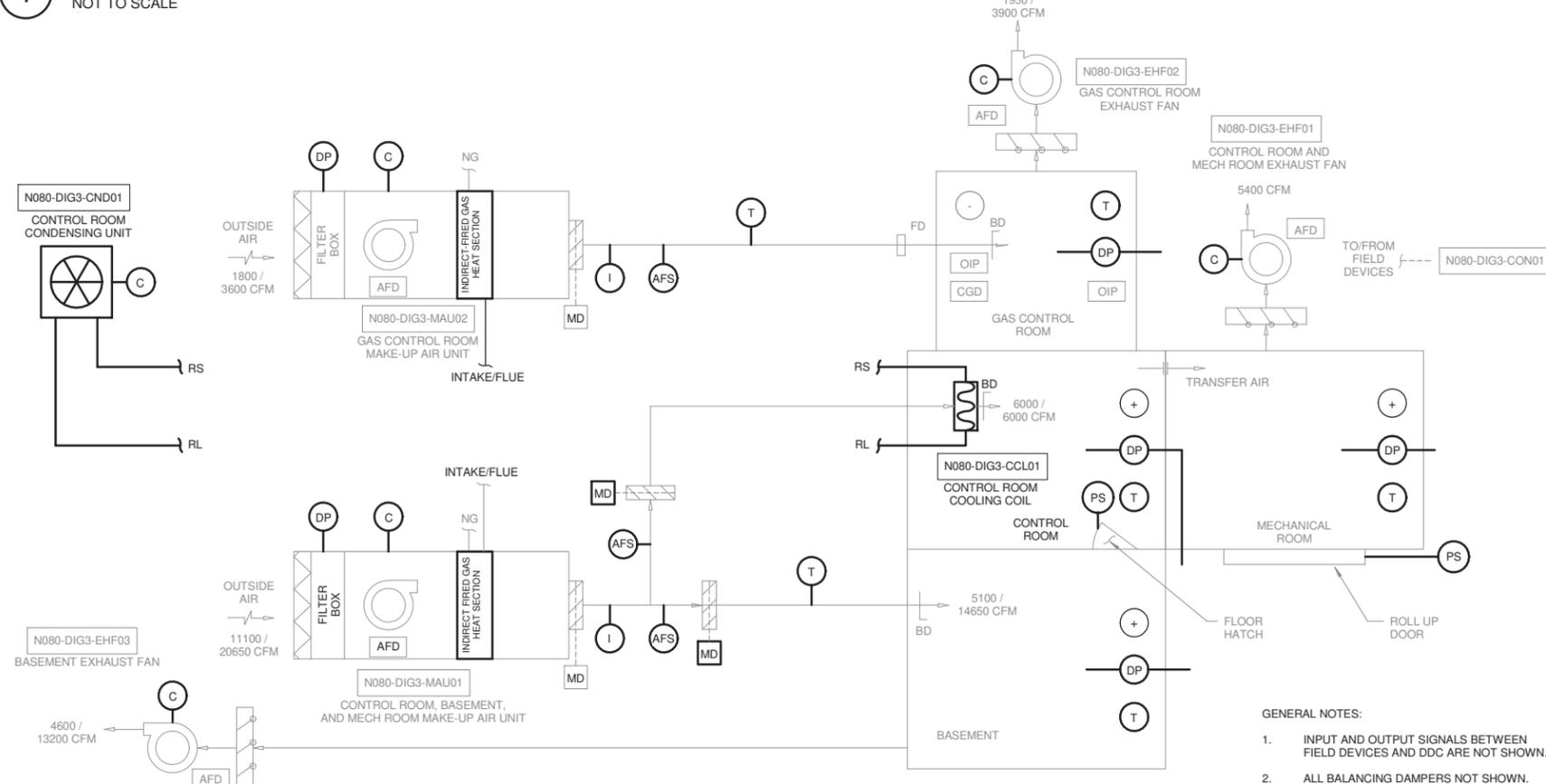
1 HVAC DEMOLITION PLAN - FIRST FLOOR
 3/16" = 1'-0"





1 HVAC SCHEMATIC (DEMOLITION)
NOT TO SCALE

NOT TO SCALE



2 HVAC SCHEMATIC (RENOVATION)
NOT TO SCALE

NOT TO SCALE

HVAC CONTROLS LEGEND

	CONTROL WIRING
	BAS TRUNK CABLING
	CONTROL DAMPER BY CONTROL SYSTEM MANUFACTURER, UNLESS OTHERWISE NOTED.
	FAN
	PUMP
	DUCT SMOKE DETECTOR
	FILTER
	FILTER MAGNEHELIC GAUGE BY FILTER MANUFACTURER
	ELECTRIC TWO-WAY, MODULATING CONTROL VALVE UNLESS NOTED AS TWO-POSITION
	ELECTRIC THREE-WAY, MODULATING CONTROL VALVE UNLESS NOTED AS TWO-POSITION
	FAN OR PUMP STARTER W / HOA
	LOW LIMIT TEMPERATURE CONTROLLER DAMPER
	MOTORIZED DAMPER
	GRAVITY DAMPER
	VAV
	COOLING COIL
NG	NATURAL GAS
FD	FIRE DAMPER
NO	NORMALLY OPEN
CV	CONSTANT VOLUME
T	SPACE TEMPERATURE SENSOR
H	SPACE HUMIDITY SENSOR
P	SPACE PRESSURE SENSOR
AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT

HVAC CONTROLS LEGEND

DPS	DIFFERENTIAL PRESSURE SWITCH
AFD	ADJUSTABLE FREQUENCY DRIVE BY CONTROL MANUFACTURER
OIP	OPERATOR INTERFACE PANELS
CGD	COMBUSTIBLE GAS DETECTION SENSOR
EM	ELECTRIC DAMPER OPERATOR
T	TEMPERATURE SENSOR
H	HUMIDITY SENSOR
AMS	AIRFLOW MEASURING STATION
HOS	FUME HOOD OCCUPANCY SENSOR
ODP	FUME HOOD OPERATOR DISPLAY PANEL
HSS	FUME HOOD SASH POSITION SENSOR
AFM	AIR FLOW MEASUREMENT SIGNAL
DFA	DIRTY FILTER ALARM
P	PRESSURE SENSOR
HPA	HIGH PRESSURE ALARM
SP	STATIC PRESSURE SENSOR
HHL	HUMIDITY HIGH LIMIT SENSOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
CO2	SPACE CO2 SENSOR
DP	DIFFERENTIAL PRESSURE SWITCH
C	CURRENT SENSOR
I	SMOKE DETECTOR
AFS	AIR FLOW SENSOR
PS	POSITION SWITCH
+	RELATIVE ROOM PRESSURE (POSITIVE)
-	RELATIVE ROOM PRESSURE (NEGATIVE)
BD	BALANCING DAMPER

GENERAL NOTES:
1. INPUT AND OUTPUT SIGNALS BETWEEN FIELD DEVICES AND DDC ARE NOT SHOWN.
2. ALL BALANCING DAMPERS NOT SHOWN.

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1. INPUT AND OUTPUT SIGNALS BETWEEN FIELD DEVICES AND DDC ARE NOT SHOWN.
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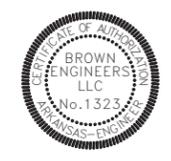
**WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
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HVAC CONTROLS SEQUENCE OF OPERATION SPACES AND FACILITIES

DIGESTER 3 & 4 CONTROL BUILDING
Overview Existing Control System.

The Digester Control Building HVAC system(s) serve four areas with two HVAC systems. The first area's system, Gas Control Room, consists of a 100 percent outside air makeup unit (MAU) and a wall-mounted exhaust fan (EHF). The Basement, Control Room, and Mechanical Room areas are served by a 100 percent outside air MAU, two roof-mounted exhaust fans (EHFs), one air-cooled condensing unit (CND) and air-cooling coil (CCL) assembly. Current control of the HVAC equipment is provided by an Alerion DDC (N080-DIG3-CON01). The facility's plant-wide control system (PCS) and Environmental Monitoring System (EMS) are by others.

AREA: GAS CONTROL ROOM

Equipment: N080-DIG3-MAU02, N080-DIG3-EHF02

General Control Description: Make Up Air Unit (MAU02) supply fan operates continuously, is fitted with a Variable Speed Drive (VFD) controlled by the DDC, providing a minimum air flow when the space is UNOCCUPIED, varying the MAU fan speed from the minimum air flow when UNOCCUPIED up to the maximum air flow when cooling is required, and operating at the maximum air flow when OCCUPIED. The associated Exhaust Fan (EHF02) operates continuously and is controlled by the DDC.

MAU02 Supply Air Damper: MAU02 is provided with a motorized supply air damper. When MAU02 is off, the supply damper closes. The damper also closes upon activation of the MAU02 supply air smoke detector.

MAU02 Fan Speed: MAU02 has a minimum initial air flow 1,725 cfm (adjustable) when the space is UNOCCUPIED and a required air flow of 3,450 cfm (adjustable) required when the space is OCCUPIED. Air flow is measured by a supply duct mounted air flow station reporting to the DDC. An alarm is generated in the DDC when the air flow is less than the UNOCCUPIED set point when in the UNOCCUPIED mode and less than the OCCUPIED set point when in the OCCUPIED mode.

Existing Operator Interface Panels (OIP): Two OIPs are located on the control panel doors in the Gas Control Room allowing the operators to monitor when the space is in all modes. If either momentary OCCUPIED push button is pushed, the system goes to OCCUPIED mode. If either momentary UNOCCUPIED push button is pushed, the system goes to UNOCCUPIED mode. The panels include RUN and FAIL indicator lights for equipment controlled by the OIP, OCCUPIED and UNOCCUPIED lights to indicate space occupancy, and the OCCUPIED and UNOCCUPIED pushbuttons for the operator to initiate or deactivate the space occupancy.

Minimum Space Air Flow: The minimum UNOCCUPIED air flow to the space is only permitted when the following three conditions are all met.

1. The space is UNOCCUPIED as determined by the OIPs.
2. The outside air temperature is less than 50 Degrees F.
3. The combustible gas detector (CGD) is not in alarm.

The minimum UNOCCUPIED or OCCUPIED air flow rates must be met at all times, regardless of cooling or heating requirements.

MAU02 Heating: MAU02 is an indirect gas-fired unit. Space temperature sensor in the Gas Control Room monitors the space temperature, reporting to the DDC. When the space temperature falls below the initial set point of 50 degrees F (adjustable), the DDC signals the MAU to heat. Control of the heating section is by the DDC74 with discharge temperature limited to 120 degrees F (adjustable).

MAU02 Cooling: MAU02 provides only ventilation to the Gas Control Room. In the UNOCCUPIED mode, space temperature sensor in the Gas Control Room monitors the temperature, reporting to the DDC. When space temperature rises above the set point of 100 degrees F (adjustable), the DDC modulates the MAU speed from the minimum flow to the maximum flow to maintain space temperature set point. In the OCCUPIED mode, the MAU runs at the required maximum air flow and is not controlled by the cooling temperature control.

MAU02 Filter Differential Pressure: A differential pressure sensor for the MAU filter monitors filter pressure drop. When the measured differential pressure is greater than the initial set point of 0.6 inches w.c. (adjustable), an alarm signal is sent to the DDC.

EHF02 Fan Speed: EHF02 speed is controlled via the DDC and the EHF VFD.

EHF02 Fan Current: A current sensor for the EHF monitors the current for the fan motor. When the current falls to zero or is above the motor maximum current draw plus 10% (initial set point, adjustable), an alarm signal is sent to the DDC.

Smoke Control: A smoke detector is installed in the MAU02 supply duct inside the Digesters 3 & 4 Control Building. If smoke is detected in the duct, the signal is sent to the DDC and the smoke detector shuts down MAU02.

Room Pressure Control: The Gas Control Room must maintain a negative pressure in relation to the outdoors. A differential pressure sensor measures the pressure difference and sends the signal to the DDC. If the differential pressure is less than the initial set point of negative 0.1 inches w.c. (adjustable), the DDC controls the EHF02 VFD to increase speed and therefore increase the differential pressure. A low differential pressure alarm signal is transmitted to the DDC and EMS.

Room Combustible Gas Detection: A Combustible Gas Detector (CGD) sensor and monitor (N080-AID-903) are located in the Gas Control Room. High alarm and trouble signals are monitored by the Combustible Gas Monitoring Panel N080-GCM-003 (provided with the CGDs) and sent to the plant-wide control system via the EMS. Upon detection of combustible gas above set point or a trouble signal, an alarm is transmitted to the Combustible Gas Monitoring Panel. The Electrical Contractor will provide the wiring and signals from these devices. Refer to Electrical Dwg's.

EMS (provided by the Electrical Contractor): The EMS notifies Plant personnel when either the MAUs or EHF's initiate a failure signal, the combustible gas detection system senses a level of combustible gas above the set point, or the individual space pressurizations are less than the negative 0.1 inches w.c. The failure signal is also transmitted to the PLC through the EMS. The EMS activates a warning strobe and alarms within and outside the Digester Control Building upon any failure signal.

AREA: CONTROL ROOM, BASEMENT AND MECHANICAL ROOM

Equipment: N080-DIG3-MAU01, N080-DIG3-EHF01, N080-DIG3-EHF03, N080-DIG-CND01, N080-DIG3-CCL01

General Control Description: MAU01 supply fan operates continuously under DDC control. It provides minimum airflow to the Basement to satisfy space classification requirements and maintains a constant airflow to the Control Room for the same purpose. When ventilation cooling is required in the Basement, the MAU increases airflow to maintain space temperature. Exhaust Fan EHF01 serving the Control Room and Mechanical Room operates continuously at a constant speed under DDC control. EHF01 transfers air from the Control Room into the Mechanical Room and exhausts from the building.

MAU01 Supply Air Damper: MAU01 is provided with a supply air damper. When the MAU is off the supply damper closes. The damper also closes upon activation of the MAU supply air smoke detector.

MAU01 Fan Speed: The MAU supply fan is equipped with a VFD, fan speed is controlled to maintain supply duct static pressure. The initial static pressure setpoint is 1.5 in. w.g. (adjustable). The system includes:

- One pressure-independent array consisting of a duct mounted Ebtron airflow sensor and a modulating volume control damper serving the Control Room, providing a fixed airflow of 6,000 (adj) cfm.
- Basement airflow is varied by modulating a pressure-independent array consisting of a duct mounted Ebtron airflow sensor and a modulating volume control damper serving the Control Room. Airflow to the Basement varies from a minimum of 5,100 cfm (adj) to a maximum of 14,650 cfm (adj), depending on the Basement's ventilation requirements.

Damper Modulation/Control Room Airflow Control: The pressure-independent damper/Ebtron airflow sensor array serving the Control Room modulates the volume damper to maintain a constant airflow of 6,000 cfm (adjustable). Basement airflow is controlled exclusively by MAU fan speed modulation.

Damper Modulation/Basement Airflow Control: The pressure-independent damper/Ebtron airflow sensor array serving the Basement modulates the volume damper from a minimum of 5,000 cfm (adj) to a maximum of 14,650 cfm (adj) based on cooling ventilation requirements in the Basement.

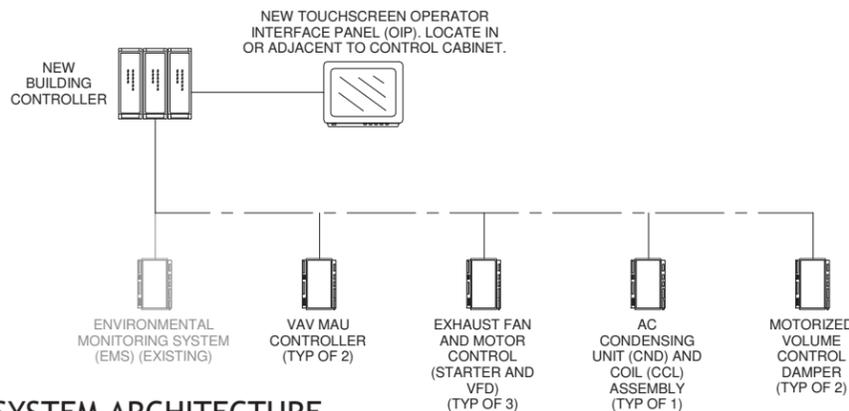
When MAU01 operates in automatic mode, fan speed is maintained by supply duct static pressure set at 1.5" (adj). This minimum required 6,000 cfm to the Control Room and 5,100 cfm to the Basement is confirmed by calibration and by certified pitot traverse measurement at the 36 in. x 36 in. Basement supply duct and the 26" x 26" Control Room supply duct. These measurements establish the minimum fan speed and static pressure for MAU01 operation.

HVAC CONTROLS GENERAL NOTES:

CONTRACTOR SHALL FURNISH AND INSTALL BUILDING AUTOMATION SYSTEM (BAS) AS FOLLOWS:

- NATIVE BACNET BUILDING CONTROLLER AND EQUIPMENT CONTROLLERS CAPABLE OF ALL HVAC SYSTEMS INTEGRATION AND MONITORING AS SHOWN.
- NEW OPERATOR INTERFACE TO REPLACE MISSING / NON-FUNCTIONAL COMPONENTS.
- INTERLOCKS WITH EXISTING ENVIRONMENTAL MONITORING SYSTEM.

CONTRACT DOCUMENT CONTROLS DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ONLY ILLUSTRATE CONTROLS AS REQUIRED TO ACHIEVE DESIGN INTENT. CONTROLS CONTRACTOR SHALL PROVIDE ALL INSTRUMENTATION AND PROGRAMMING AS REQUIRED TO FURNISH A FULLY FUNCTIONING SYSTEM.



1 SYSTEM ARCHITECTURE
NOT TO SCALE

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Mechanical Room Roll-up Door: A roll-up door is installed in the Mechanical Room. A door limit switch will send a signal to the DDC to temporarily override the Control Room, Basement, and Mechanical Room positive differential pressure and temperature control when the roll-up door is raised. After an initial 1-minute time delay (adjustable), the DDC will send an alarm signal to the PCS to indicate a COMMON alarm for the DDC system. The DDC will indicate that the roll-up door is in the open position and the positive differential pressure is not being maintained. Control of differential pressure and temperature to remain over-ridden until door is closed.

Control Room Floor Hatch Door: A floor hatch door is installed in the Control Room, fitted with a limit switch that will send a signal to the DDC to temporarily override the Control Room, Basement, and Mechanical Room positive differential pressure and temperature control when the floor hatch is open. After an initial 10-minute time delay (adjustable), the DDC will send an alarm signal to the PCS to indicate a COMMON alarm for the DDC system. The DDC will indicate that the floor hatch is in the open position. Control of differential pressure and temperature to remain over-ridden until floor hatch is closed.

GENERAL BUILDING CONTROL:

DDC Common Alarm: A common alarm from the DDC is sent to the PCS and the EMS.

DDC alarms to EMS: Alarms generated by the DDC for MAU failure (2 systems), EHF failure (3 systems), room differential pressure failure (4 systems), and DDC Common alarms are sent to the EMS. These signals are then passed on to the PCS.

The two MAU common alarms will be sent to the PCS.

Refer to the Electrical EMS Block Diagram for the DDC to EMS interface.

END

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BID ITEM 203.820 HVAC SEQUENCE OF OPERATION DRAWING M4.1		
WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:		HOLLOWAY, UPDIKE & BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754
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PROFILE SCALE:	FIELD MGR. SECT. MGR. PROJ. MGR.	RECOMMENDED:
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FILE:	ATLAS PAGE NO: --	SHEET 69/65 OF 8 SHEETS



HVAC -- CONDENSER SCHEDULE

DESIGNATION		DESCRIPTION	MANUFACTURER	MODEL	COOLING STAGES	ELECTRICAL DATA					REMARKS
TYPE	MARK					COOLING PERFORMANCE @ 100°F AMBIENT	VOLTAGE	PHASE	MCA	MOCP	
N080-DIG3	CND01	CONDENSER UNIT	CARRIER	38AXDT28A0P6-0A0A0	3	192,000 Btu/h	480 V	3	45.0 A	60.0 A	PROVIDE ALL ACCESSORIES LISTED BELOW. MOUNT ON EXISTING UNIT PAD.
1 OUTDOOR UNIT SHALL BE PROVIDED WITH DISCONNECT SWITCH, SEE ELECTRICAL. 2 PROVIDE WITH CRANKCASE HEATER, HAIL GUARDS, ANTI-CORROSION COIL COATING, AND ANTI-CORROSION CABINET PROTECTION. 3 PROVIDE 5-YEAR COMPRESSOR WARRANTY FOR ALL COMPRESSORS. 4 PROVIDE WITH LOW-AMBIENT COOLING KIT, LIQUID LINE FILTER/DRYER, LIQUID SOLENOID VALVE, AND MOTOR CONTACTOR/STARTER.											

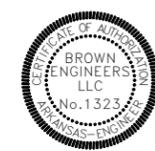
HVAC -- MAKE UP AIR UNIT SCHEDULE

DESIGNATION		DESCRIPTION	MANUFACTURER	MODEL	AIRFLOW DATA			FAN/MOTOR DATA			HEATING DATA				ELECTRICAL DATA		REMARKS		
TYPE	MARK				MAKEUP AIR CFM (MAX)	TOTAL STATIC PRESS.	EXTERNAL STATIC PRESS.	SUPPLY FAN MOTOR HP	MOTOR BHP	FAN DRIVE TYPE	HEATING TYPE	HEATING STAGES	GAS HEAT INPUT	GAS HEAT OUTPUT	ENTERING DB	LEAVING DB		VOLTAGE	PHASE
N080-DIG3	MAU01	EXISTING CONTROL ROOM, BASEMENT, MECH ROOM MAKEUP AIR UNIT	AIR ZONE INTERNATIONAL	HDT-40D	20,650 CFM	3.3 in-wg	2.0 in-wg	25	20.6	VARIABLE SPEED	INDIRECT-FIRED NATURAL GAS	MODULATING	1,040,000 Btu/h	832,000 Btu/h	-2 °F	58 °F	480 V	3	AIR HANDLER IS EXISTING TO REMAIN. REMOVE DIRECT-FIRED GAS HEAT SECTION AND REPLACE WITH INDIRECT-FIRED SECTION FROM ORIGINAL EQUIPMENT MANUFACTURER.
N080-DIG3	MAU02	EXISTING GAS CONTROL ROOM MAKEUP AIR UNIT	AIR ZONE INTERNATIONAL	HDT-40D	3,600 CFM	2.1 in-wg	0.9 in-wg	3	2.5	VARIABLE SPEED	INDIRECT-FIRED NATURAL GAS	MODULATING	281,250 Btu/h	225,000 Btu/h	-2 °F	48 °F	480 V	3	AIR HANDLER IS EXISTING TO REMAIN. REMOVE DIRECT-FIRED GAS HEAT SECTION AND REPLACE WITH INDIRECT-FIRED SECTION FROM ORIGINAL EQUIPMENT MANUFACTURER.
1 NOTE: TOTAL STATIC AND EXTERNAL STATIC PRESSURES LISTED ARE BASED ON EXISTING EQUIPMENT OPERATING POINTS. CONTRACTOR SHALL ADJUST SUPPLY FAN AFD AS REQUIRED TO BALANCE SYSTEM TO REQUIRED AIRFLOWS AFTER INSTALLATION OF NEW HEATING SECTIONS FOR MAU-01 AND MAU-02, AND NEW DOWNSTREAM AIR CONTROL DEVICES FOR MAU-02. 2 COORDINATE WITH MAU ORIGINAL EQUIPMENT MANUFACTURER TO PROVIDE ALL NEW SENSORS, CONTROLS, VALVES, PIPING, WIRING, AND ACCESSORIES REQUIRED TO MAKE NEW GAS HEATING SECTION FULLY FUNCTIONAL AND INTERLOCK WITH BUILDING CONTROLS.																			

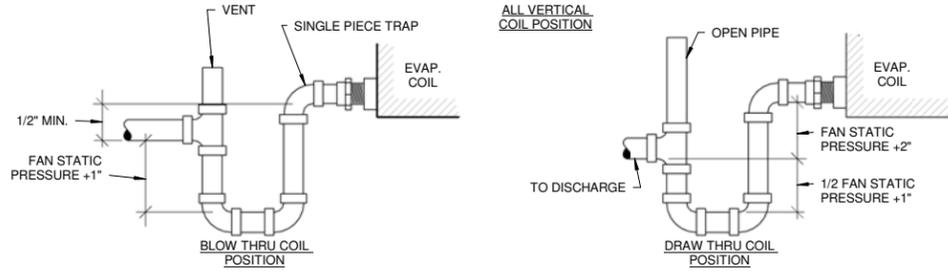
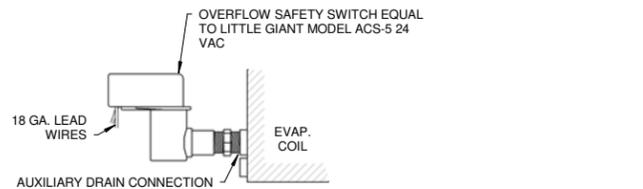
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WATER POLLUTION CONTROL CAPITAL EQUIPMENT REPLACEMENTS TMUA PROJECT WPC 26-1		
CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
PLANS AND ESTIMATES PREPARED BY:	HOLLOWAY, UPDIKE & BELLEN, Inc. 2001 N. WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0754	
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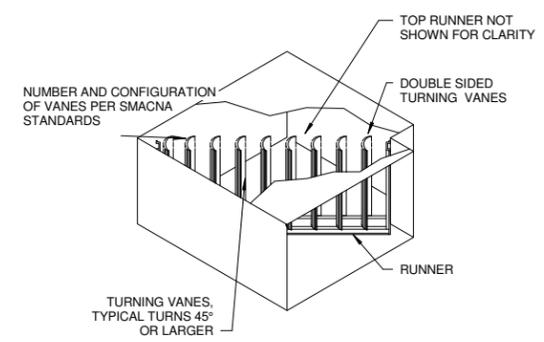


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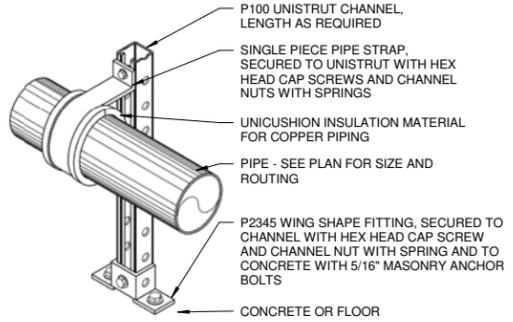
- NOTES:**
1. RUNNING TRAPS WILL NOT BE ACCEPTED.
 2. INSTALL FACTORY FURNISHED TRAP WITH OUTSIDE AIR UNITS.
 3. CONDENSATE DISCHARGE LOCATION SHALL MEET REQUIREMENTS OF ALL LOCAL CODES AND AUTHORITIES HAVING JURISDICTION.

1 CONDENSATE TRAP
NOT TO SCALE

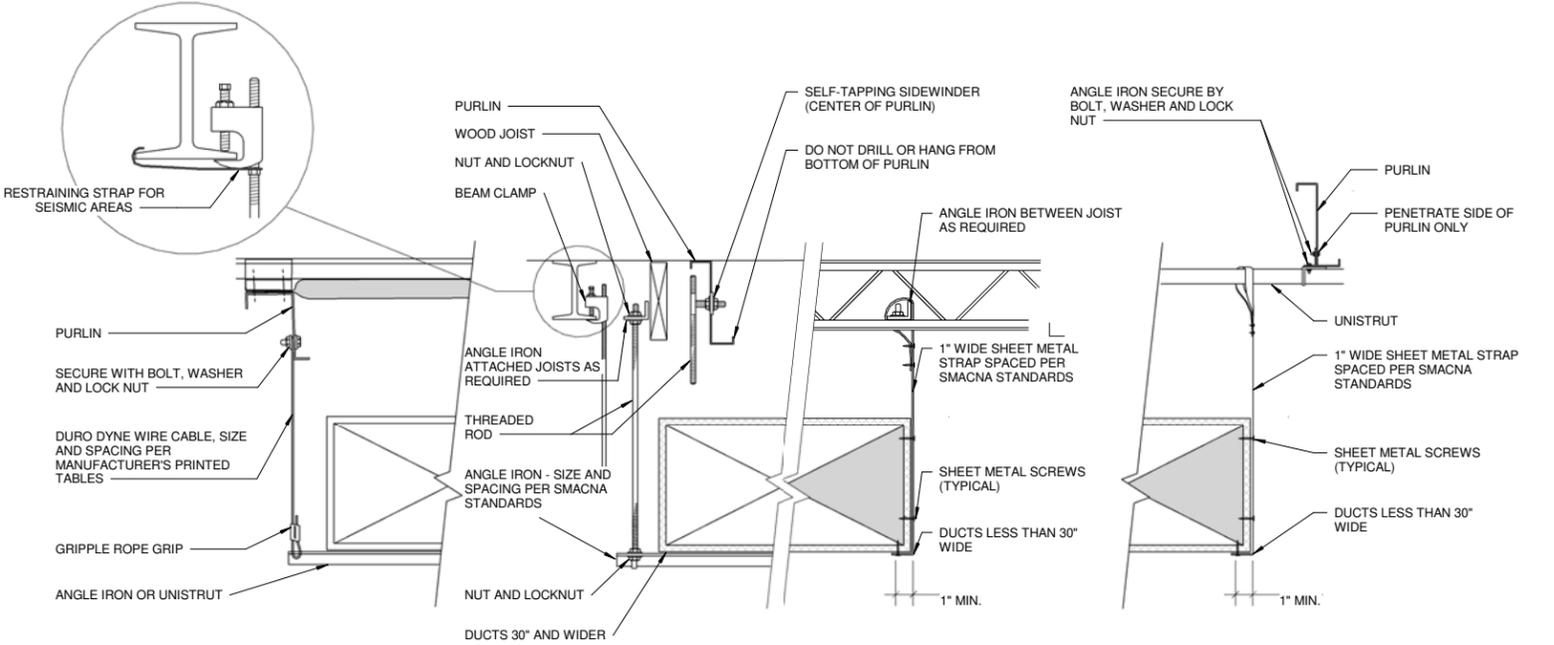


3 TURNING VANE
NOT TO SCALE

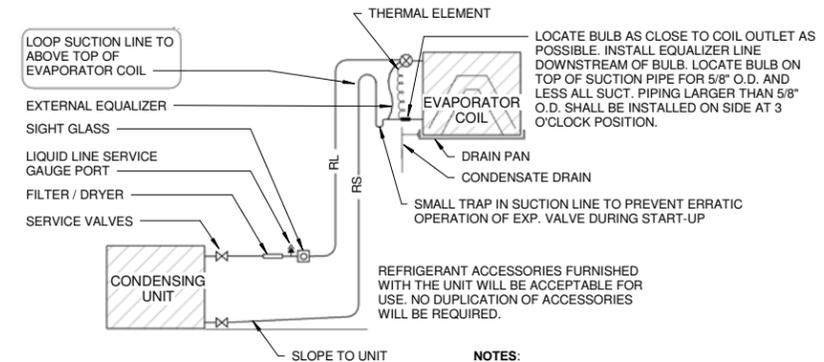
RADIUS ELBOWS TO BE USED WHEN INDICATED



4 PIPE SUPPORT 2 - W/INSULATION (REFRIGERANT)
NOT TO SCALE



2 DUCT SUPPORT
NOT TO SCALE



- NOTES:**
1. WRAP EXPANSION VALVE, BULB AND FITTINGS WITH ARMAFLEX INSULATION TAPE AND SECURE WITH BLACK CABLE TIES.
 2. TRAP AND LOOP AT EVAPORATOR COIL IS NOT REQUIRED FOR UNITS WITH LIQUID LINE SOLENOID VALVES.
 3. SUCTION LINES SHALL BE INSULATED. LIQUID LINES SHALL BE INSULATED ONLY ON DUCTLESS MINI-SPLITS.

5 REFRIGERANT PIPING
NOT TO SCALE

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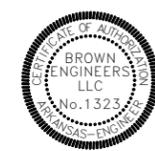
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MECHANICAL DETAILS I
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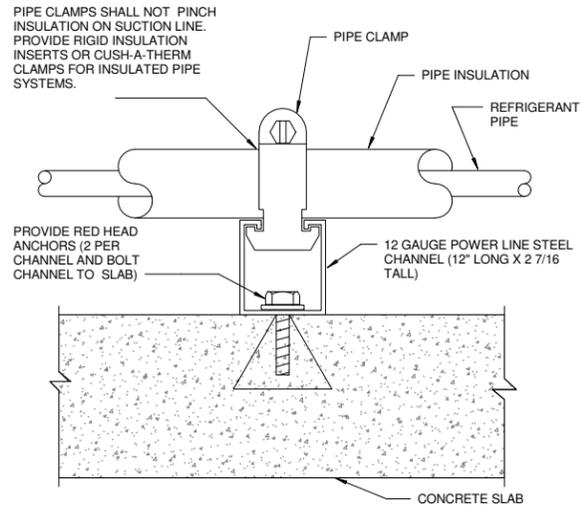
**WATER POLLUTION CONTROL
CAPITAL EQUIPMENT REPLACEMENTS
TMUA PROJECT WPC 26-1**

**CITY OF TULSA, OKLAHOMA
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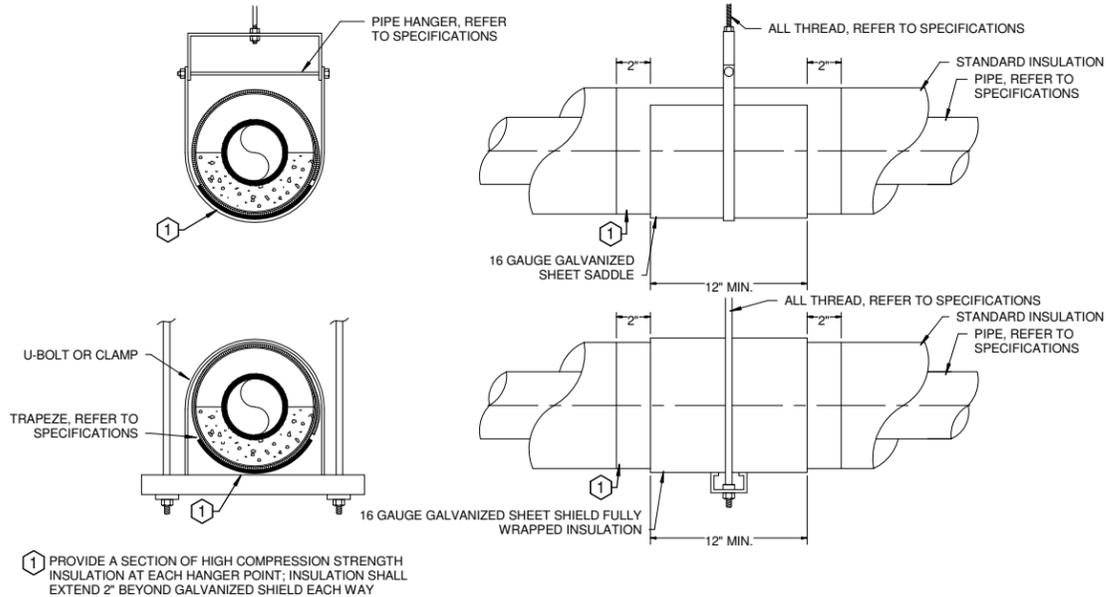
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1 REFRIGERANT PIPING SUPPORT
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2 INSULATED PIPE HANGER
NOT TO SCALE

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CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY WATER AND SEWER DEPARTMENT		
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