

# EAST 53rd STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS

TMUA PROJECT NUMBER: ES 2009-07, CONTRACT 2, PHASE 2

ACCOUNT NUMBER: 2231S00005.SEWERLINES.SEWER.7500.75003122.541101

## DRAWING INDEX

SHEET NUMBER	DRAWING NUMBER	DRAWING TITLE
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### GENERAL

1	G01	COVER W/INDEX
2	G02	PROJECT SITE MAP & CONTRACT ITEMS
		GENERAL NOTES & ABBREVIATIONS

### CIVIL

3	C01	EXISTING PROCESS FLOW DIAGRAM
4	C02	NEW PROCESS FLOW DIAGRAM
5	C03	VALVE VAULT LOCATION PLAN AND YARD PIPING
6	C04	TYPICAL DETAILS
7	C05	PUMP CONTROL TABLES

### MECHANICAL

8	M01	PIPING SYMBOL LEGEND
9	M02	CHERRY CREEK LIFT STATION - DEMOLITION PLANS & SECTION
10	M03	CHERRY CREEK LIFT STATION - NEW PLANS & SECTIONS
11	M04	PIPING AND EQUIPMENT DETAILS
12	M05	ODOR CONTROL DIAGRAMS AND SCHEDULES
13	M06	CHERRY CREEK LIFT STATION - ODOR CONTROL PLANS
14	M07	CHERRY CREEK LIFT STATION - ODOR CONTROL SECTIONS
15	M08	MODIFIED VALVE VAULT NO. 6
16	M09	NEW VALVE VAULT NO. 8
17	M10	NEW CHERRY CREEK FM 12" DRAIN VALVE MH

### STRUCTURAL

18	S01	GENERAL NOTES
19	S02	TYPICAL DETAILS
20	S03	TYPICAL DETAILS
21	S04	MODIFIED VALVE VAULT NO. 6 PLANS AND SECTIONS
22	S05	NEW VALVE VAULT NO. 8 PLANS AND SECTIONS
23	S06	NEW DRAIN VALVE MANHOLE PLANS AND SECTIONS
24	S07	CHERRY CREEK LIFT STATION - CONCRETE REPAIR NOTES AND DETAILS
25	S08	CHERRY CREEK LIFT STATION - CONCRETE REPAIR NOTES AND DETAILS

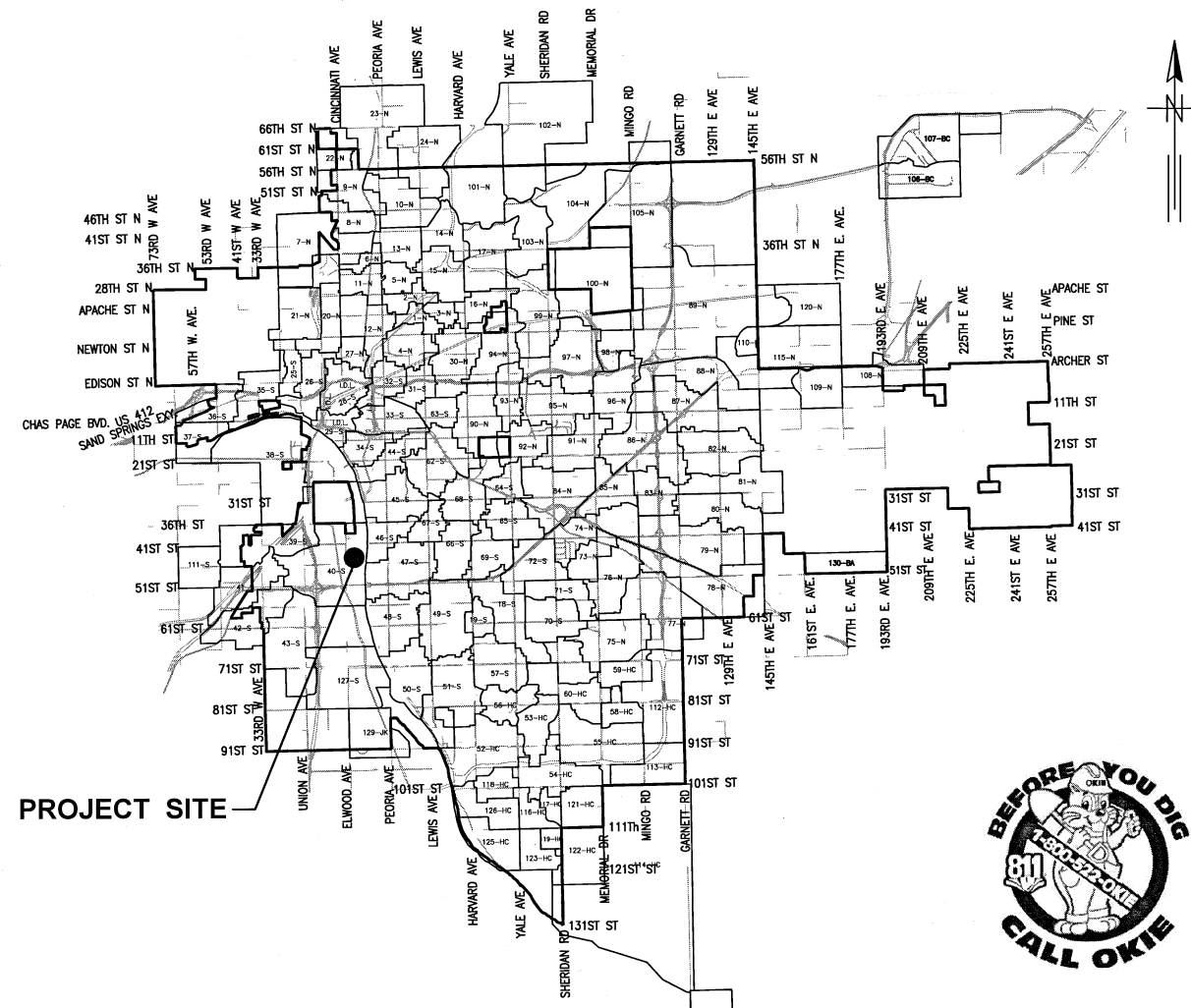
### ELECTRICAL

26	E01	SYMBOL LEGEND
27	E02	ELECTRICAL SITE PLAN
28	E03	ONE-LINE DIAGRAM AND SCHEDULES
29	E04	CHERRY CREEK LIFT STATION - PLANS EL 594.00, EL 613.50 AND EL 633.00
30	E05	ELECTRICAL SCHEDULE AND DETAILS
31	E06	VFD SCHEMATICS

### INSTRUMENTATION & CONTROLS

32	N01	SYMBOL LEGEND
33	N02	CHERRY CREEK LIFT STATION P&ID (PARTIAL)

## ENGINEERING SERVICES DEPARTMENT CITY OF TULSA, OKLAHOMA



LOCATION MAP  
NOT TO SCALE

PREPARED BY:



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APPROVED BY:

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CITY ENGINEER

DATE: 05.27.22  
ADVERTISE DATE

*Clayton Edwards* DATE: 5.24.22  
DIRECTOR, WATER AND SEWER DEPARTMENT ADVERTISE DATE



## PROJECT COORDINATION/CONTACTS

	NUMBER
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CITY OF TULSA PM - BRITT VANCE	918-596-9583
CITY OF TULSA OPERATIONS - MATT VAUGHAN	918-596-9845
CITY OF TULSA FIELD MANAGER - RYAN MCKASKLE	918-596-9518
SOUTHSIDE WWTP - JOSHUA FISHER	918-591-4450
UTILITY COORDINATION BOX	
OKLAHOMA NATURAL GAS CO.	918-831-8261
AMERICAN ELECTRIC POWER/PUBLIC SERVICE COMPANY OF OKLAHOMA (EAP/PSO)	918-599-2844
TULSA PERMIT CENTER	918-596-1865
AT&T	918-596-4283
COX COMMUNICATIONS	918-669-4866
SOUTHWEST BELL TELEPHONE	918-596-6702
BIXBY TELEPHONE COMPANY	918-366-8000

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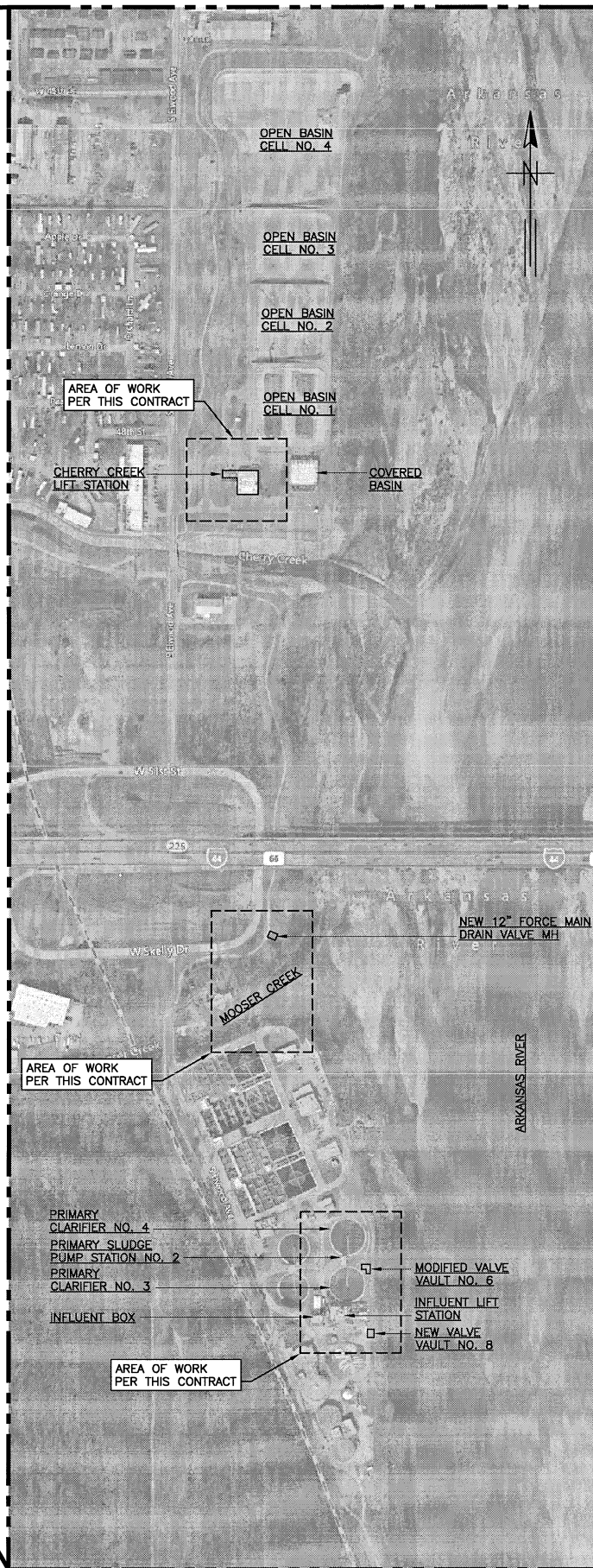
#### DESCRIPTION OF WORK:

- A. GENERAL: THE WORK TO BE DONE UNDER THIS CONTRACT CONSISTS OF THE CONSTRUCTION OF PUMP RESTORATION IMPROVEMENTS AT THE CHERRY CREEK LIFT STATION (C.C.L.S.) AS SHOWN AND SPECIFIED IN CONTRACT DOCUMENTS TITLED EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS, TMA PROJECT NUMBER: ES 2009-07, CONTRACT 2. THE CHERRY CREEK LIFT STATION IS LOCATED AT 4899 SOUTH ELWOOD AVENUE IN TULSA, OKLAHOMA. THE IMPROVEMENTS INCLUDE THE FOLLOWING:
1. CCLS PUMP RESTORATION IMPROVEMENTS (BASE BID)
- A. INSTALLATION OF FOUR (4) 20-INCH PUMP DISCHARGE CONTROL VALVES FOR PUMP STARTUP AND SHUTDOWN OPERATIONS.
- B. INSTALLATION OF FOUR (4) 20-INCH OR 19.38-INCH PUMP IMPELLER FOR EACH NEW NSY 100/150 PUMP ROTATING ASSEMBLY. FINAL SIZE WILL BE DETERMINED BASED ON 90-DAY PILOT TESTING.
- C. REPLACEMENT OF (4) PUMP ROTATING ASSEMBLIES, INCLUDING TWO (2) NEW VIBRATION SENSORS, ONE (1) NEW SUCTION COVER, AND ONE (1) NEW SUCTION COVER WEAR RING FOR EACH EXISTING 16X16X20 NSY MODEL 100/150 CENTRIFUGAL PUMP.
- D. 90-DAY PILOT TESTING OF ONE (1) NEW NSY 100/150 CENTRIFUGAL PUMP ROTATING ASSEMBLY WITH ONE (1) NEW 20-INCH DIAMETER IMPELLER FOR PUMP NO. 2. AFTER COMPLETION OF 90-DAY PILOT TESTING, AND RESULTS DEMONSTRATE PUMP OPERATIONS MEET THE CONTRACT REQUIREMENTS, THE REMAINING THREE (3) PUMP ROTATING ASSEMBLIES CAN BE INSTALLED WITH A NEW 20-INCH DIAMETER IMPELLER.
- E. INSTALLATION OF FOUR (4) NEW SELF CONTAINED SEAL WATER SUPPORT SYSTEMS FOR EACH PUMP.
- F. INTEGRATION OF EIGHT (8) NEW VIBRATION SENSORS FOR THE NEW PUMP ROTATING ASSEMBLIES FOR VIBRATION MONITORING WITHIN THE SCADA SYSTEM.
- G. REMOVAL OF FOUR (4) DISC ACCELERATORS WITHIN THE EXISTING 20-INCH SURGEBUSTER CHECK VALVES FOR ACHIEVING PERFORMANCE SIMILAR TO A SWING-FLEX CHECK VALVE.
- H. REPLACEMENT OF EIGHT (8) EXISTING PUMP SUCTION AND DISCHARGE PRESSURE GAUGES WITH EIGHT (8) NEW DIFFERENTIAL PRESSURE TRANSMITTERS FOR TRENDING PRESSURE DIFFERENTIAL ACROSS THE PUMP WITHIN THE SCADA SYSTEM.
- I. INTEGRATION OF ONE (1) NEW TRANSIENT PRESSURE MONITORING SYSTEM (TPMS) FOR LOCAL MONITORING OF TRANSIENT PRESSURE SPIKES ACROSS PUMP NO. 2 (SUCTION AND DISCHARGE) AND ITS DOWNSTREAM CHECK VALVE.
- J. REPLACEMENT OF FOUR (4) EXISTING 24-INCH SUCTION BELLS AND PIPING WITHIN THE CCLS WET WELL.
- K. REMOVAL OF SOLIDS AND GRIT WITHIN THE CHERRY CREEK LIFT STATION WET WELL.
- L. REPLACEMENT OF EXISTING CHERRY CREEK LIFT STATION WET WELL CROSS OVER GATE.
- M. INSPECTION AND REPAIR OF CONCRETE SURFACES ON THE TOP SLAB AND WITHIN THE CHERRY CREEK WET WELL.
- N. REPLACEMENT OF THE EXISTING ODOR CONTROL PIPING WITHIN THE CHERRY CREEK WET WELL.
2. CCLS FORCE MAIN IMPROVEMENTS (ADDITIVE ALTERNATES)
- A. REMOVAL AND REPLACEMENT OF AN EXISTING 12-INCH DRAIN VALVE ON THE 36-INCH CHERRY CREEK FORCE MAIN'S BLOW-OFF LINE WITH A NEW DRAIN VALVE MANHOLE.
- B. MODIFICATION TO EXISTING VALVE VAULT NO. 6, LOCATED AT THE SSWTP, AND CONSTRUCTION OF A NEW VALVE VAULT NO. 8 WHERE THE 36-INCH CHERRY CREEK FORCE MAIN AND 24-INCH 71ST STREET FORCE MAIN COMBINE FLOW AT THE SSWTP.

#### VICINITY MAP NOT TO SCALE



#### PROJECT SITE MAP NOT TO SCALE

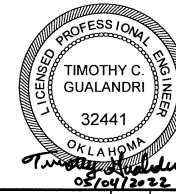


#### CONTRACT ITEMS

CONTRACT ITEM	DESCRIPTION	UNIT	QUANTITY
1	MOBILIZATION AND DEMOBILIZATION	EA	1
2	20-INCH PUMP DISCHARGE CONTROL VALVE	EA	4
3	BACK PULLOUT/ROTATING ASSEMBLY WITHOUT IMPELLER FOR EXISTING 16X16X20 NSY MODEL 100/150 CENTRIFUGAL PUMP	EA	4
4	20-INCH OR 19.38-INCH IMPELLER ASSEMBLY FOR THE 16X16X20 NSY MODEL 100/150 CENTRIFUGAL PUMP	EA	4
5	PRESSURE TRANSMITTERS	EA	4
6	SELF CONTAINED SEAL WATER SUPPORT SYSTEM	EA	4
7	TRANSIENT PRESSURE MONITORING SYSTEM	EA	1
8	REMOVAL OF DISC ACCELERATORS ON EXISTING CHECK VALVE	EA	4
9	EQUIPMENT INTEGRATION AND COMMISSIONING	EA	1
10	PUMP CONTROL INTEGRATION AND COMMISSIONING	EA	1
11	24-INCH SUCTION BELL AND PIPING	EA	4
12	REMOVAL OF GRIT AND SOLIDS WITHIN C.C.L.S. WET WELL AND INSPECTION OF CONCRETE SURFACES	EA	2
13	CHERRY CREEK WET WELL CROSS OVER GATE	EA	1
14	CONDITION ASSESSMENT TESTING TOP SLAB OF C.C.L.S. WET WELL	EA	1
15	SLAB REPAIR (PARTIAL DEPTH)	SF	800
16	VERTICAL SURFACE/WALL REPAIR (PARTIAL DEPTH)	SF	800
17	OWNER ALLOWANCE	ALLOW	1

#### ADDITIVE ALTERNATE CONTRACT ITEMS

CONTRACT ITEM	DESCRIPTION	UNIT	QUANTITY
1	MODIFIED VALVE VAULT NO. 6 AND NEW VALVE VAULT NO. 8	EA	1
2	NEW 12" FORCE MAIN DRAIN VALVE AND MANHOLE	EA	1



GENERAL PROJECT SITE MAP & CONTRACT ITEMS	
PROJECT NO. ES 2009-07 EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION - PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS	
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT	
PLANS AND ESTIMATES PREPARED BY: <b>GREELEY AND HANSEN</b> 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103	
REVISION	BY DATE
AS SHOWN	DESIGNED TG SURVEY TG
PROFILE SCALE	PROJ. MGR. TG
HORIZONTAL:	LEAD ENGR. <b>AB 5-22</b> FIELD MGR. <b>RWS 5/22</b> RECOMMENDED <b>HAS 5-22</b> DESIGN MANAGER
VERTICAL:	
FILE: 0141C2G01	DRAWING: G01
ATLAS PAGE NO: -	DATE: MAY 2022
APPROVED: <b>[Signature]</b> SHEET 1 OF 33 SHEETS	



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GENERAL NOTES:

1. MAKE AN ON-SITE INSPECTION OF THE FACILITY AND RELATED CONDITIONS PRIOR TO BIDDING THIS CONTRACT.
2. A DISTINCTION BETWEEN NEW AND EXISTING MATERIALS, EQUIPMENT AND STRUCTURES HAS BEEN MADE ON THE DRAWINGS BY LINE WEIGHT. HEAVY REPRESENTS NEW, LIGHT REPRESENTS EXISTING.
3. TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING STRUCTURES, UTILITIES AND EQUIPMENT, AND TO MAINTAIN UNINTERRUPTED PLANT OPERATION. PROVIDE ALL TEMPORARY SUPPORTS, BRACES SHEETING AND SHORING AS NECESSARY TO PROTECT AND MAINTAIN ALL STRUCTURES, PIPING, EQUIPMENT AND APPURTENANCES. ANY DAMAGE RESULTING FROM THE ACTIONS, OR LACK OF ACTIONS BY THE CONTRACTOR SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR AT HIS EXPENSE.
4. AN ASTERISK (\*) AT NEW CONSTRUCTION DENOTES LOCATIONS, ELEVATIONS, DIMENSIONS AND OTHER INFORMATION DEPENDENT ON THE CONTRACTOR'S SUBMITTALS. DEVELOP AND SHOW THE INFORMATION MARKED WITH AN ASTERISK (\*) ON SUBMITTALS, DEVELOP AND PROVIDE SUCH INFORMATION FOR ALL ASTERISKS (\*) WITHIN OR INTERFACING WITH ANY SUBMITTALS AND BETWEEN SUBMITTALS. THIS REQUIREMENT ALSO EXTENDS TO CONDITIONS OR SITUATIONS WHERE A LOCATION, DIMENSION, ELEVATION OR OTHER ITEM IS INDICATED TO BE DETERMINED AFTER FINAL SELECTION OF EQUIPMENT AND/OR APPURTENANCES. ALL INFORMATION FOR ASTERISK (\*) AND EQUIPMENT/-APPURTENANCES SITUATIONS DESCRIBED HEREIN ARE THE RESPONSIBILITY OF THE CONTRACTOR TO DEVELOP AND ASSURE COMPATIBLE INTERFACING FOR A COMPLETE, COORDINATED AND TROUBLE-FREE OPERATING INSTALLATION. ALL REQUIREMENTS HEREIN SHALL BE BASED ON FINAL PROCESSING AND/OR REVIEW OF THE CONTRACTOR'S SUBMITTALS OR SELECTIONS.
5. LOCATIONS, ELEVATIONS AND DIMENSIONS OF EXISTING PIPING, EQUIPMENT, STRUCTURES AND OTHER EXISTING WORK ARE BASED ON INFORMATION FURNISHED BY THE CITY EXISTING RECORD DRAWINGS AND CONTRACT DOCUMENTS AND IN SOME INSTANCES FIELD MEASUREMENTS BUT DO NOT PURPORT TO BE ABSOLUTELY CORRECT. LOCATIONS, ELEVATIONS AND DIMENSIONS OF NEW WORK CONNECTING OR ADJACENT TO OR INTERFACING WITH EXISTING WORK HAVE BEEN DEVELOPED AND ARRANGED BASED ON THE FOREGOING INFORMATION AND FIELD MEASUREMENTS. THE CONTRACTOR IS RESPONSIBLE TO FIELD CHECK AND MEASURE LOCATIONS, ELEVATIONS AND DIMENSIONS AND TO FIT AND OTHERWISE INSTALL THE NEW WORK TO ACTUAL EXISTING LOCATIONS, ELEVATIONS AND DIMENSIONS FOR A COMPLETE AND TROUBLE-FREE OPERATING FACILITY.
6. MAKE ALL MEASUREMENTS NECESSARY TO LOCATE, FABRICATE, ERECT, CONSTRUCT AND OTHERWISE INSTALL ALL NEW WORK IN EXISTING AND NEW LOCATIONS AND RELOCATE AND REWORK EXISTING WORK ALL TO THE ARRANGEMENTS, GUIDANCE AND INSTRUCTIONS SHOWN AND REQUIRED FOR A COMPLETE TROUBLE-FREE OPERATING INSTALLATION.
7. FABRICATE, ERECT, CONSTRUCT AND OTHERWISE INSTALL ALL NEW WORK CONNECTING TO EXISTING WORK AND MAKE ALL NECESSARY RELOCATIONS TO THE ARRANGEMENTS AND GENERAL DESIGN SHOWN. MAKE ANY ADJUSTMENTS IN FABRICATION, ERECTION, CONSTRUCTION AND INSTALLATION NECESSARY TO FIT NEW WORK AND RELOCATIONS TO EXISTING CONDITIONS TO CONFORM TO THE ARRANGEMENTS AND GENERAL DESIGN SHOWN. ADJUSTMENTS PROPOSED OR CONTEMPLATED SHALL CONFORM TO REQUIREMENTS AND STANDARDS OF THE CONTRACT DOCUMENTS.
8. MAKE RELOCATIONS SHOWN TO MATCH THE MATERIAL AND QUALITY OF THE FACILITY, CONSTRUCTION OR WORK TO BE RELOCATED. RELOCATIONS SHOWN ARE TO BE ARRANGED AS REQUIRED TO PRODUCE PERFORMANCE, UTILITY AND ACCESS EQUAL TO THE EXISTING WORK.
9. INCORPORATE ALL INFORMATION AND WORK REQUIRED UNDER THESE GENERAL NOTES FOR THESE WORKING DRAWINGS. ALL SUCH INFORMATION AND WORK SHALL BE SO INCORPORATED PRIOR TO THE TIME WORKING DRAWINGS ARE SUBMITTED.
10. THE REQUIRED WORK WILL TAKE PLACE WITHIN AN OPERATING SEWAGE TREATMENT FACILITY, AND THE WORK WILL REQUIRE MODIFICATION AND REHABILITATION OF EXISTING EQUIPMENT, PIPING AND STRUCTURES. EXISTING EQUIPMENT, PIPING AND STRUCTURES WILL BE IN SERVICE UNTIL THEY ARE TAKEN OUT OF SERVICE EITHER PERMANENTLY OR TEMPORARILY AS REQUIRED FOR THE CONTRACTOR'S WORK. PROVIDE LABOR AND MATERIALS TO CLEAN AND OTHERWISE PREPARE WORK AREAS TO THE ENGINEER'S SATISFACTION. ALL CLEANING WILL BE PROVIDED BY THE CONTRACTOR.
11. COORDINATE WORK WITH WASTEWATER TREATMENT PERSONNEL IN ORDER TO MAINTAIN THE FACILITIES IN CONTINUOUS OPERATION. CERTAIN FACILITIES MAY BE TAKEN OUT OF SERVICE TEMPORARILY ONLY WITH PRIOR APPROVAL OF THE ENGINEER. REFER TO SPECIFICATIONS.
12. NOTIFY ENGINEER A MINIMUM OF 72 HOURS IN ADVANCE IF THE CONTRACTOR REQUIRES OPERATION OF ANY VALVES, PUMPS, OR OTHER EQUIPMENT TO FACILITATE CONSTRUCTION ACTIVITIES.
13. PROVIDE WRITTEN NOTICE TO THE ENGINEER OF ANY WORK REQUIRING CHANGES IN OPERATING PROCEDURES OR REMOVAL OF EQUIPMENT OR STRUCTURES FROM SERVICE A MINIMUM OF 30 DAYS IN ADVANCE TO THE REQUIRED DATE.
14. LIMIT OPERATIONS GENERALLY TO THE AREA AROUND THE FACILITIES IN THIS CONTRACT. ACCESS OF WORK REQUIRED IN OTHER AREAS OF THE SITE SHALL BE ARRANGED AND COORDINATED WITH THE ENGINEER. ALL EMPLOYEES OF THE CONTRACTOR AND HIS/HER SUBCONTRACTORS SHALL BE REQUIRED TO OBTAIN CITY OF TULSA ID BADGE. EACH EMPLOYEE SHALL SUBMIT A COMPLETED CITY OF TULSA ACCESS CARD/IDENTIFICATION CARD/DRIVER'S LICENSE AND KEY REQUEST FORM TO CITY OF TULSA PUBLIC FACILITIES SECURITY. EACH EMPLOYEE SHALL SUBMIT COMPLETED APPLICATION FOR CITY OF TULSA SECURITY BACKGROUND AND PRESCREEN INVESTIGATION FORM. SEE APPENDIX A IN SPECIFICATIONS FOR BLANK FORMS.
15. ALL SHOP AND WORKING DRAWING SUBMITTALS SHALL BE PREPARED BY THE CONTRACTOR TO INCORPORATE ALL REQUIREMENTS AND RESPONSIBILITIES OF THESE GENERAL NOTES.
16. PROVIDE ALL SUPPORT OR ANCILLARY ITEMS AND WORK FOR ITEMS SUBMITTED AS EQUIVALENT TO SPECIFIED ITEMS THAT ARE REQUIRED TO PROVIDE THE SAME FUNCTIONAL, OPERATIONAL AND CONTROL CAPABILITIES, NEEDS AND REQUIREMENTS SHOWN AND SPECIFIED FOR THE SPECIFIED ITEM. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE TO SUBMIT ALL SUPPORT AND ANCILLARY ITEMS AND WORK WITH HIS SUBMITTAL OF THE PROPOSED EQUIVALENT ITEM AND TO SHOW THAT THE PROPOSED EQUIVALENT ITEM HAS BEEN PROPERLY COORDINATED, INTERFACED AND OTHERWISE INCORPORATED INTO THE WORK. PROVIDE ALL SUCH SUPPORT OR ANCILLARY ITEMS AND WORK WHETHER THE NEED FOR THEM HAS BEEN DETERMINED BEFORE, DURING OR AFTER APPROVAL OR ACCEPTANCE OF THE EQUIVALENT ITEM.



GENERAL NOTES: (Cont'd)

17. IF THERE IS DISAGREEMENT IN WORK SHOWN BETWEEN DRAWINGS IN THE PLANS AND BETWEEN THE PLANS AND CONTRACT DOCUMENTS PROVIDE THE MINIMUM WORK NEEDED TO SATISFY FUNCTIONAL, CONTROL AND INTERFACING REQUIREMENTS AND PROVIDE A TROUBLE-FREE OPERATING INSTALLATION.
  18. IN COMPLYING WITH ALL RESPONSIBILITIES AND REQUIREMENTS UNDER THESE GENERAL NOTES PROVIDE ALL DESIGNS, LABOR, EQUIPMENT AND SERVICES NEEDED FOR SUCH COMPLIANCE.
  19. NEW WORK INCLUDES ALL WORK SHOWN AS SUCH IN ANY MANNER ON THE PLANS, SPECIFIED AND OTHERWISE INDICATED IN THE CONTRACT DOCUMENTS.
  20. EXISTING WORK SHALL BE REMOVED TO THE EXTENT SHOWN AND SPECIFIED AND AS NEEDED TO BE COMPATIBLE AND ACCOMMODATE NEW WORK OR REPLACEMENT WORK.
  21. EXISTING FACILITIES OR WORK TO BE USED, IMPACTED OR OTHERWISE AFFECTED BY THE CONTRACTOR SHALL BE INSPECTED PRIOR TO STARTING WORK. REPAIR, MODIFY, UPGRADE, PROTECT, SUPPLEMENT OR SUPPORT EXISTING FACILITIES OR WORK TO OBTAIN THE DEGREE OF SERVICE REQUIRED BY THE CONTRACTOR TO PERFORM NEW WORK. RETURN EXISTING FACILITIES OR WORK TO ITS FUNCTIONAL EQUIVALENCY FOUND PRIOR TO THE START OF THE WORK TO THE SATISFACTION OF THE ENGINEER.
  22. PAINT EXISTING FACILITIES AND WORK IF EXISTING PAINT OR COATINGS ARE DAMAGED BY THE OPERATIONS. ALL EXISTING WORK INCORPORATED WITHIN OR AS PART OF NEW WORK SHALL BE PAINTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
  23. PRIOR TO REMOVING ANY EXISTING PIPING, EQUIPMENT, STRUCTURES, CONDUITS, BUILDINGS, CONTROLS, INSTRUMENTATION, FACILITIES OR WORK FROM SERVICE OR OPERATION BY THE CITY, DEMONSTRATE THAT ALL NEW ITEMS AND WORK ARE AVAILABLE FOR CONSTRUCTION AND INSTALLATION. ONCE EXISTING ITEMS ARE REMOVED FROM SERVICE, WORK DILIGENTLY AND CONTINUOUSLY IN ACCORDANCE WITH APPROVED CONSTRUCTION SCHEDULE TO MINIMIZE THE TIME PERIOD THAT ANY EXISTING ITEM IS OUT OF SERVICE. EXISTING ITEMS SHALL BE RETURNED TO SERVICE AS QUICKLY AS POSSIBLE WITH OUT-OF-SERVICE PERIODS KEPT TO A MINIMUM.
  24. ACCESS TO SOME AREAS OF WORK MAY BE LIMITED AND MAY NOT BE EASILY ACCESSIBLE BY SOME TYPES OF CONSTRUCTION EQUIPMENT FROM EXISTING PLANT ROADS. INSPECT THE SITE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND PROVIDE ANY AND ALL EQUIPMENT REQUIRED TO PERFORM THE WORK. SUBMIT STRUCTURAL LOAD CALCULATIONS AND WORKING DRAWINGS PREPARED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF OKLAHOMA FOR PRIOR APPROVAL SHOWING ALL CONSTRUCTION LOADS ON EXISTING STRUCTURES AND FACILITIES AND DEMONSTRATE TO THE SATISFACTION OF THE ENGINEER THAT THE CAPACITY OF EXISTING STRUCTURES AND FACILITIES WILL NOT BE EXCEEDED BY ANY LOAD DEVELOPED DURING CONSTRUCTION.
  25. ALL COSTS ASSOCIATED WITH COMPLIANCE WITH THESE GENERAL NOTES SHALL BE INCLUDED IN THE VARIOUS CONTRACT ITEMS, AND NO SEPARATE PAYMENT WILL BE MADE THEREFORE.
  26. LOCATIONS AND ELEVATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE. HAVE ALL UTILITIES LOCATED PRIOR TO BEGINNING WORK. CONTRACTOR IS TO VERIFY LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES AFFECTING THE WORK PRIOR TO CONSTRUCTION.
  27. CONTRACTOR SHALL NOT STORE EQUIPMENT OR MATERIALS WITHIN THE FLOODPLAIN.
  28. ALL SIGNAL AND ELECTRICAL WORK SHALL BE DONE BY A LICENSED ELECTRICAL CONTRACTOR.
- GENERAL MECHANICAL NOTES:
1. PIPE FITTINGS, FLANGES, HARNESSSED SLEEVE TYPE COUPLINGS, AND LOCATIONS AND ELEVATIONS OF PIPING ARE SHOWN TO GENERALLY DESCRIBE THE WORK AND DO NOT PURPORT TO BE COMPLETE FINAL CONSTRUCTION DETAILS. SHOP DRAWINGS SHALL BE PREPARED AND SUBMITTED FOR ACCEPTANCE AS SPECIFIED.
  2. HARNESSSED SLEEVE TYPE COUPLINGS AND FLANGES ON PIPING SYSTEMS SHALL BE PROVIDED WHERE SHOWN AND AT OTHER LOCATIONS AS REQUIRED AND APPROVED TO FACILITATE THE FUTURE DISMANTLING OR REMOVAL OF PIPING SEGMENTS WITHOUT DISTURBING ADJACENT AND RELATED PIPING.
  3. CONTRACT DRAWINGS DO NOT SHOW ALL PIPE SUPPORTS. PROVIDE PIPE SUPPORTS IN ACCORDANCE WITH SPECIFICATION SECTION 15109 AND THE CONTRACT DRAWINGS.
  4. PIPE SUPPORTS SHALL BE PROVIDED ON EACH SIDE OF ALL HARNESSSED COUPLINGS SYMMETRICALLY LOCATED WITHIN TWO FEET OF THE END OF THE COUPLING.
  5. IF ANY EXISTING PIPES, FITTINGS, VALVES, OR RELATED APPURTENANCES ARE TEMPORARILY REMOVED THEY SHALL BE REPLACE WITH THE SAME IN KIND, WITH NEW MATERIAL (OR EXISTING MATERIAL WHERE SHOWN) AND NO SEPARATE PAYMENT WILL BE MADE THEREFORE, UNLESS OTHERWISE NOTED OR SPECIFIED.
  6. ALL ANCHOR BOLTS, NUTS, WASHERS, AND EXPANSION ANCHORS, OUTSIDE EXPOSED TO THE WEATHER, AND PARTIALLY OR TOTALLY SUBMERGED SHALL BE OF TYPE 304 STAINLESS STEEL.
  7. WALL AND FLOOR SLEEVES SHALL BE LARGE ENOUGH TO ACCOMMODATE FLANGES IF NECESSARY OR REQUIRED.
  8. ALL SHOP AND WORKING DRAWING SUBMITTALS SHALL BE PREPARED TO INCORPORATE ALL REQUIREMENTS AND RESPONSIBILITIES OF THESE MECHANICAL NOTES.
  9. IN COMPLYING WITH ALL RESPONSIBILITIES AND REQUIREMENTS UNDER THESE MECHANICAL NOTES, PROVIDE ALL DESIGNS, LABOR, EQUIPMENT AND SERVICES NEEDED FOR SUCH COMPLIANCE.
  10. ALL COSTS ASSOCIATED WITH COMPLIANCE WITH THESE GENERAL MECHANICAL NOTES SHALL BE INCLUDED IN THE VARIOUS CONTRACT ITEMS, AND NO SEPARATE PAYMENT WILL BE MADE THEREFORE.
  11. DIAGRAMMED PIPELINES

VARIOUS PIPELINES ARE SHOWN ON THE CONTRACT DRAWINGS IN DIAGRAM FORM. WHERE SUCH PIPELINES ARE SHOWN ONLY IN DIAGRAM, ARRANGE THE PIPELINES CLEAR OF OTHER PIPELINES, EQUIPMENT, AND WALKING AREAS, AND SO THAT THEY ARE ACCESSIBLE FOR MAINTENANCE. SUCH PIPELINES ARE TO BE FITTED AND INSTALLED IN A NEAT AND WORKMANLIKE MANNER IN ACCORDANCE WITH THE SPECIFICATION SECTIONS 02650, 15080 AND 15095, MANUFACTURER'S RECOMMENDATIONS, APPROVED SHOP DRAWINGS AND AS SPECIFIED IN DIVISION 1. AN ADEQUATE NUMBER OF UNIONS ARE TO BE PROVIDED IN MAIN PIPE AND BRANCH PIPE. RUNS TO FACILITATE DISMANTLING AND REMOVAL OF PIPELINE SECTIONS WITHOUT DISTURBING BRANCHES OR CONNECTING PIPELINES. THE FINAL LOCATION OF HOSE VALVES, PIPE DRAINS, VALVES, AND OTHER SUCH APPURTENANCES INCLUDED AS A PART OF DIAGRAMMED PIPELINES ARE TO BE AS SHOWN ON APPROVED SHOP DRAWINGS OR AS APPROVED IN THE FIELD BY THE ENGINEER. THE COST OF FURNISHING, FABRICATING, LOCATING, ERECTING AND OTHERWISE COMPLETELY AND PROPERLY INSTALLING ALL DIAGRAMMED PIPELINES IS TO BE INCLUDED IN THE LUMP SUM CONTRACT ITEM NO. 1, AND NO SEPARATE PAYMENT WILL BE MADE THEREFORE.

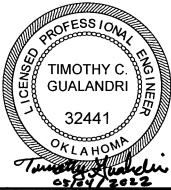
12. ALL COSTS ASSOCIATED WITH COMPLIANCE WITH THESE GENERAL MECHANICAL NOTES SHALL BE INCLUDED IN THE VARIOUS CONTRACT ITEMS, AND NO SEPARATE PAYMENT WILL BE MADE THEREFORE.

ABBREVIATIONS

AER	AERATOR	PA	PRESSURE AIR
BAS	BASIN	PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
BP	BYPASS	PEW	PLANT EFFLUENT WATER
BLV	BALL VALVE	PGV	PLUG VALVE
CL	CENTER LINE	PIV	PINCH VALVE
CKV	CHECK VALVE	PMAC	PLANT MIX ASPHALT CONCRETE
CY	CUBIC YARD	PP	POWER POLE
D	DRAIN	PPT	PEAK POWER TRACKER
DIP	DUCTILE IRON PIPE	PW	POTABLE WATER
DS	DIVERSION STRUCTURE	R	RESTRAINED
EA	EACH	RCP	REINFORCED CONCRETE PIPE
EXIST	EXISTING	RS	RAW SEWAGE
FEB	FIRE EQUALIZATION BASIN	RSP	RAW SEWAGE PUMP
FI	FIRE HYDRANT	RW	RECYCLE WATER
FL	FLOOR	SD	STORM DRAIN
FM	FORCE MAIN	SF	SILT FENCE/SQUARE FEET
FMT	FLOW METER	SGT	SLUICE GATE
FRP	FIBERGLASS REINFORCED PLASTIC	SPD	SUMP PUMP DISCHARGE
GP	GUARD POST	SS	SANITARY SEWER
GUY	GUY WIRE	SSM	SECONDARY SCUM
HYD	HYDRANT	SSMH	SANITARY SEWER MANHOLE
ICV	IRRIGATION CONTOL VALVE	SSWTP	SOUTHSIDE WASTEWATER TREATMENT PLANT
IE	INVERT ELEVATION	ST	STORM SEWER
JB	JUNCTION BOX	SUP	SUMP PUMP
KGV	KNIFE GATE VALVE	SY	SQUARE YARD
LFT	LIFT STATION	TOW	TOP OF WALL
LF	LINEAL FEET	TR	TOP OF RIM
LP	LIGHT POLE	UE	UNDERGROUND ELECTRIC
MH	MANHOLE	UC	UNDERGROUND CABLE
MJ	MECHANICAL JOINT	UTMH	UNIVERSAL
NG	NATURAL GAS	VL	VALVE VAULT
NPW	NON POTABLE WATER	WM	WATER MAIN
OC	ODOR CONTROL	WV	WATERVALVE
OE	OVERHEAD ELECTRIC	WWL	WETWELL
OF	OVERFLOW	WWP	WASTEWATER PUMP
P	PUMP	XFMR	TRANSFORMER

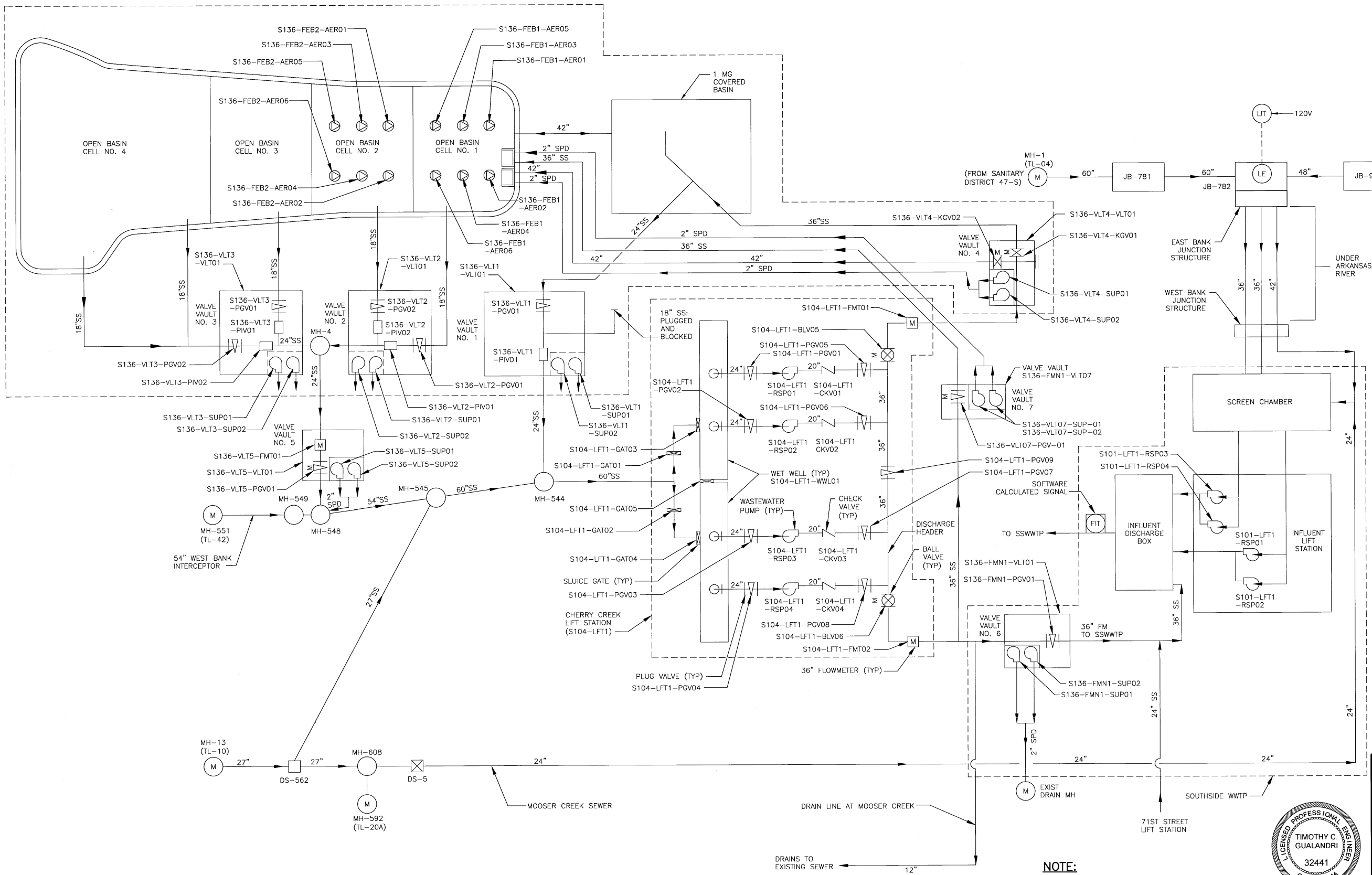
SITE LEGEND

	EXISTING CONTOUR
	BENCHMARK
	SPOT ELEVATION
	DENOTES DEMOLITION
	RIGHT-OF-WAY
	PROPERTY LINE
	FENCE
	OVERHEAD ELECTRIC
	ELECTRIC
	ODOR CONTROL
	UNDERGROUND FIBER
	PLANT EFFLUENT WATER
	SILT FENCING
	○ DRAIN SEWER LESS THAN 18"
	○ SANITARY SEWER LESS THAN 18"
	○ STORM SEWER LESS THAN 18"
	— WATER MAIN LESS THAN 18"
	— GAS MAIN
	— UNDERGROUND TELEPHONE CABLE
	○ DRAIN SEWER LARGER THAN 18"
	○ SANITARY SEWER LARGER THAN 18"
	○ STORM SEWER LARGER THAN 18"
	— WATER MAIN LARGER THAN 18"



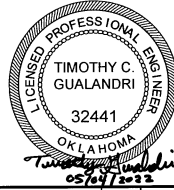
GENERAL GENERAL NOTES & ABBREVIATIONS			
PROJECT NO. ES 2009-07 EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION – PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS			
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT			
PLANS AND ESTIMATES PREPARED BY:  GREELEY AND HANSEN 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103			
REVISION	BY	DATE	APPROVED:
AS SHOWN			
PROFILE SCALE:	PROJ. MGR.	TG	
HORIZONTAL:	LEAD ENGR.	AGS 5/22	
VERTICAL:	FIELD MGR.	Kim 5/22	
	RECOMMENDED	HAS 5/22	
	DESIGN MANAGER		
FILE: 0141C2G02	DRAWING: G02	DATE: MAY 2022	
ATLAS PAGE NO: --			SHEET 2 OF 33 SHEETS

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EXISTING PROCESS FLOW DIAGRAM  
SCALE: NOT TO SCALE

NOTE:  
REFERENCE DRAWING M01 FOR PIPING SYMBOL LEGEND.

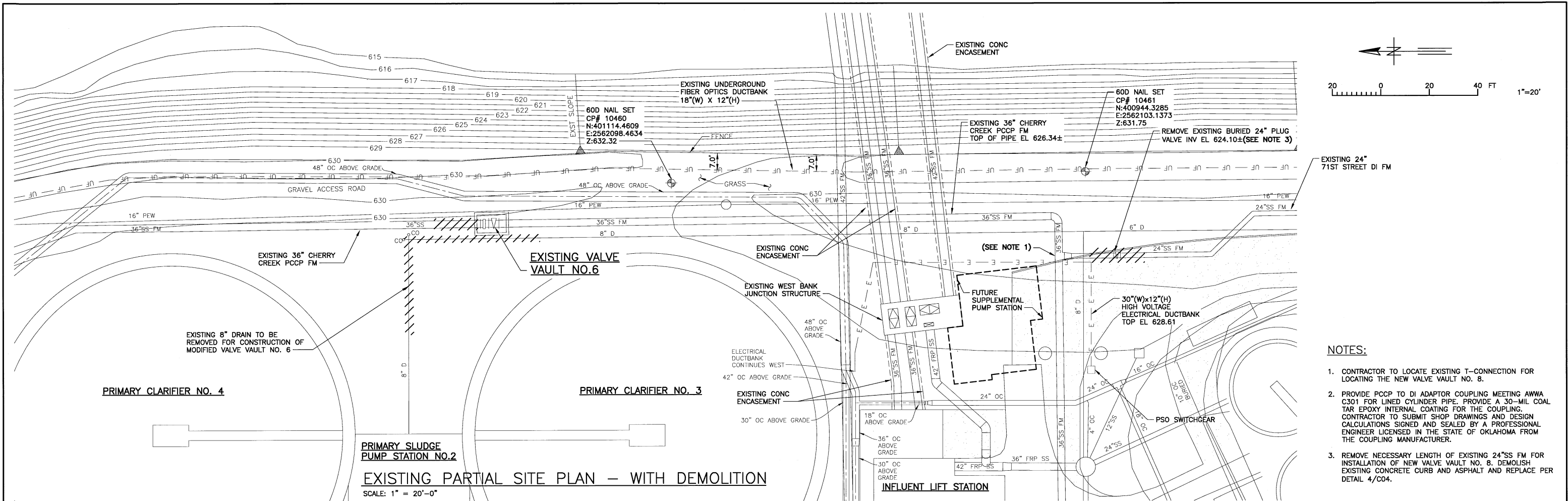


CIVIL EXISTING PROCESS FLOW DIAGRAM			
PROJECT NO. ES 2009-07			
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION - PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS			
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT			
PLANS AND ESTIMATES PREPARED BY: <b>GREELEY AND HANSEN</b> 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103			
REVISION	BY	DATE	APPROVED:
AS SHOWN	DESIGNED	NV	
	SURVEY		
PROFILE SCALE	PROJ. MGR.	TG	
HORIZONTAL:	LEAD ENGR.	ADJ 5/22	
VERTICAL:	FIELD MGR.	EM 5/22	
	RECOMMENDED		
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FILE: 0141C2001	DRAWING: C01	DATE: MAY 2022	ENGINEER:
ATLAS PAGE NO: -			SHEET 3 OF 33 SHEETS



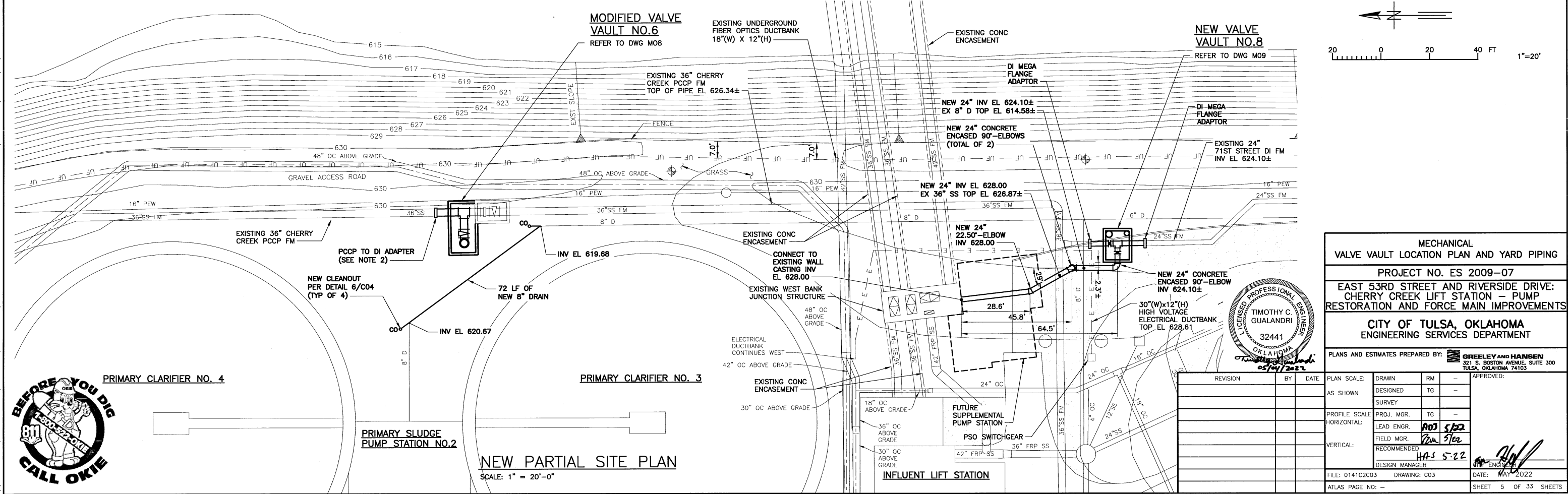


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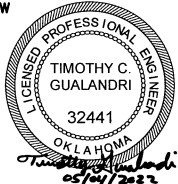
NOTES:

- CONTRACTOR TO LOCATE EXISTING T-CONNECTION FOR LOCATING THE NEW VALVE VAULT NO. 8.
- PROVIDE PCCP TO DI ADAPTOR COUPLING MEETING AWWA C301 FOR LINED CYLINDER PIPE. PROVIDE A 30-MIL COAL TAR EPOXY INTERNAL COATING FOR THE COUPLING. CONTRACTOR TO SUBMIT SHOP DRAWINGS AND DESIGN CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF OKLAHOMA FROM THE COUPLING MANUFACTURER.
- REMOVE NECESSARY LENGTH OF EXISTING 24"SS FM FOR INSTALLATION OF NEW VALVE VAULT NO. 8. DEMOLISH EXISTING CONCRETE CURB AND ASPHALT AND REPLACE PER DETAIL 4/C04.



MECHANICAL  
VALVE VAULT LOCATION PLAN AND YARD PIPING  
PROJECT NO. ES 2009-07  
EAST 53RD STREET AND RIVERSIDE DRIVE:  
CHERRY CREEK LIFT STATION - PUMP  
RESTORATION AND FORCE MAIN IMPROVEMENTS  
CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

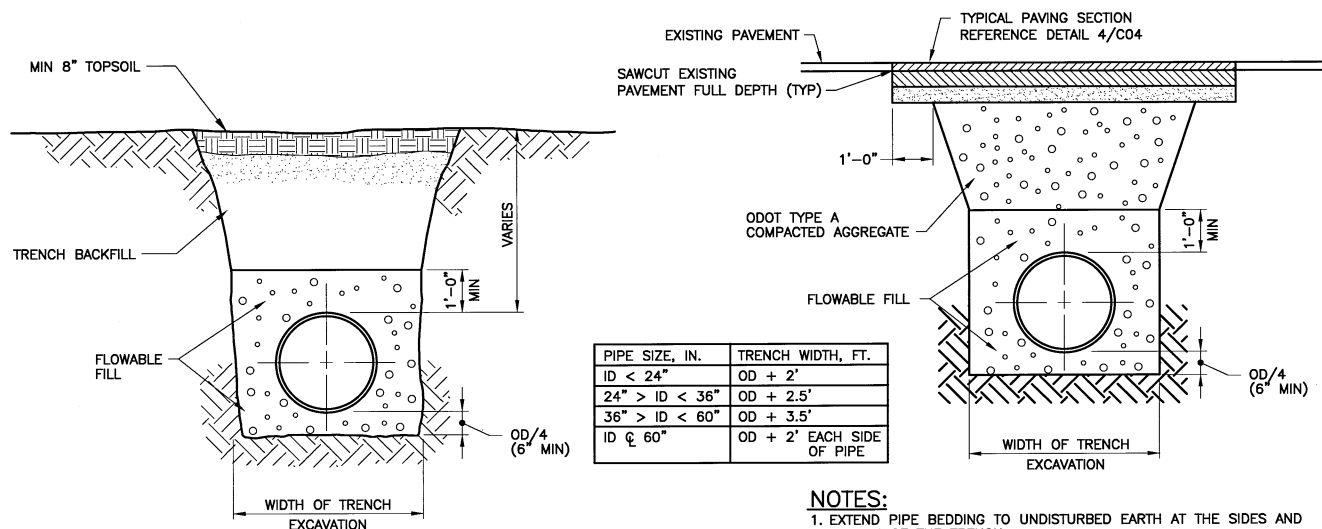
PLANS AND ESTIMATES PREPARED BY: **GREELEY AND HANSEN**  
321 S. BOSTON AVENUE, SUITE 300  
TULSA, OKLAHOMA 74103



REVISION	BY	DATE	PLAN SCALE:	DRAWN	RM	APPROVED:
			AS SHOWN	DESIGNED	TG	
			PROFILE SCALE:	SURVEY	TG	
			HORIZONTAL:	PROJ. MGR.	TG	
			VERTICAL:	LEAD ENGR.	ADJ 5/22	
				FIELD MGR.	RM 5/22	
				RECOMMENDED	HAS 5-22	
				DESIGN MANAGER		
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			ATLAS PAGE NO: --		SHEET 5 OF 33 SHEETS	



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- NOTES:**
1. EXTEND PIPE BEDDING TO UNDISTURBED EARTH AT THE SIDES AND BOTTOM OF THE TRENCH.
  2. SEE SPECIFICATION 31 23 23 FOR MATERIAL REQUIREMENTS, PLACEMENT AND COMPACTION OF PIPE BEDDING AND TRENCH BACKFILL.
  3. TRENCH OUTLINES DO NOT INDICATE ACTUAL TRENCH EXCAVATION SHAPE OF SOIL CONDITIONS. EMBEDMENT MATERIAL SHALL EXTEND THE FULL WIDTH OF THE ACTUAL TRENCH EXCAVATION.

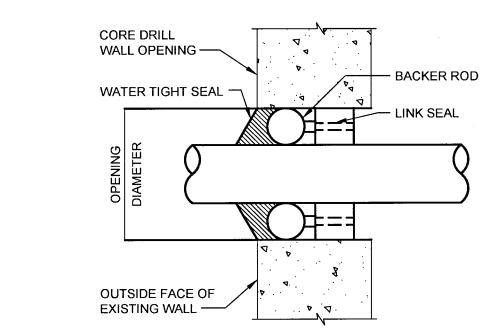
**TRENCH DETAIL UNIMPROVED AREAS**  
SCALE: NOT TO SCALE

PIPE SIZE, IN.	TRENCH WIDTH, FT.
ID < 24"	OD + 2'
24" > ID < 36"	OD + 2.5'
36" > ID < 60"	OD + 3.5'
ID ≥ 60"	OD + 2' EACH SIDE OF PIPE

- NOTES:**
1. EXTEND PIPE BEDDING TO UNDISTURBED EARTH AT THE SIDES AND BOTTOM OF THE TRENCH.
  2. SEE SPECIFICATION 31 23 23 FOR MATERIAL REQUIREMENTS, PLACEMENT AND COMPACTION OF PIPE BEDDING AND TRENCH BACKFILL.
  3. TRENCH BACKFILL WITHIN A HORIZONTAL DISTANCE OF 5 FEET AND BENEATH ALL ROADWAYS, DRIVEWAYS, PARKING AREAS AND HIGHWAY SHOULDERS SHALL BE ODOT TYPE A AGGREGATE BASE.
  4. TRENCH OUTLINES DO NOT INDICATE ACTUAL TRENCH EXCAVATION SHAPE OF SOIL CONDITIONS. EMBEDMENT MATERIAL SHALL EXTEND THE FULL WIDTH OF THE ACTUAL TRENCH EXCAVATION.

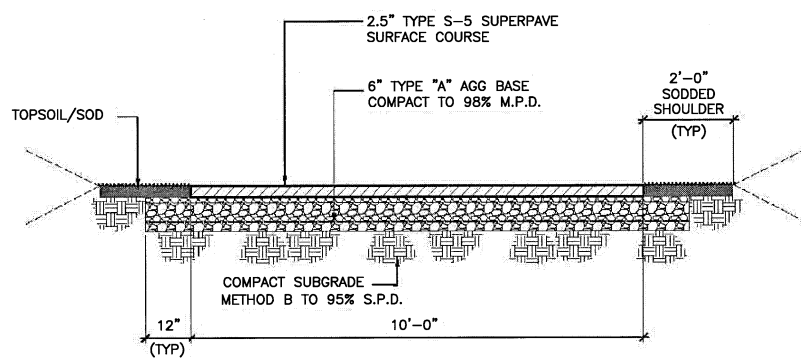
**TRENCH DETAIL UNDER IMPROVED AREAS**  
SCALE: NOT TO SCALE

**DETAIL 1/C04— TYPICAL PIPE BEDDING**  
SCALE: NOT TO SCALE

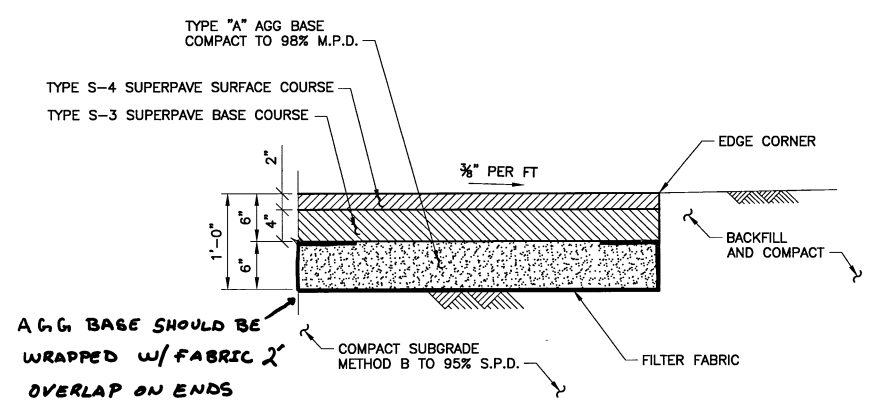


**DETAIL 2/C04**  
**PIPE PENETRATION THRU EXISTING WALL**  
NOT TO SCALE

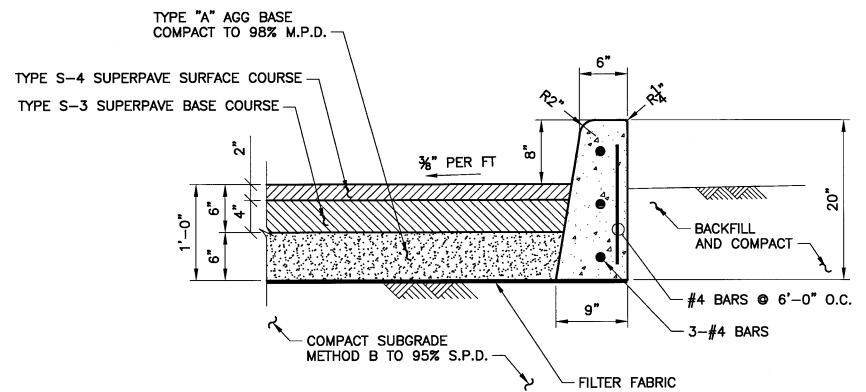
- GENERAL TRAIL NOTES**
1. CONSTRUCT 2% CROSS SLOPE IN SAME DIRECTION AS EXISTING GRADE UNLESS OTHERWISE DESIGNATED.
  2. WHEN SETTING GRADES FOR TRAIL, CONTRACTOR SHALL FIELD VERIFY THAT TRAIL ELEV. WILL NOT TRAP WATER ON EITHER SIDE OF TRAIL AND WILL ALLOW WATER TO FLOW FREELY TO DRAIN AWAY FROM AREA.
  3. THE 2'-0" SHOULDER FROM THE TRAIL EDGE TO BE GRADED SMOOTH AND SODDED. SLOPE AT 2% IN THE SAME DIRECTION AS CROSS SLOPE OF TRAIL.
  4. THE GROUND BEYOND SODDED SHOULDERS SHALL MEET EXISTING GRADE WITH MAX. SLOPE OF 3:1.



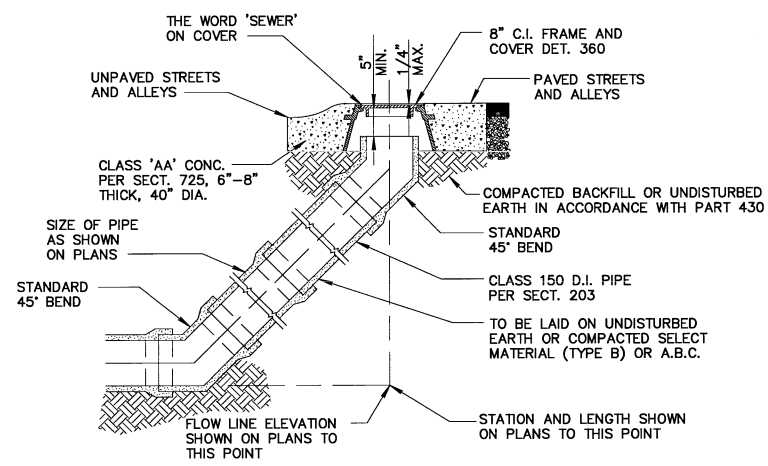
**TYPICAL DETAIL 3/C04**  
**PAVEMENT FOR BIKE PATH**  
NOT TO SCALE



**DETAIL 4/C04 — TYPICAL PAVING SECTION**  
SCALE: NOT TO SCALE

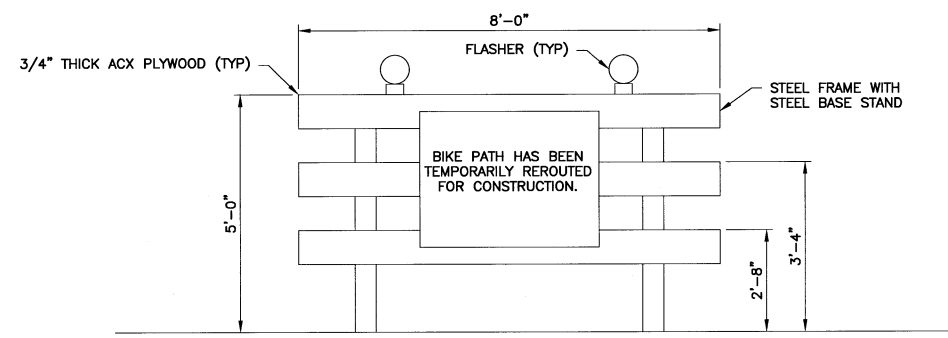


**DETAIL 5/C04 — TYPICAL PAVING SECTION W/CONCRETE CURB**  
SCALE: NOT TO SCALE

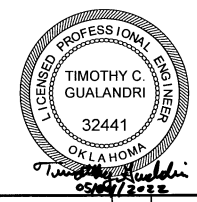


- NOTES:**
- CITY OF TULSA SPEC DIV.IV, SECTION 417:
1. CLEANOUT DIAMETER SHALL BE 8-INCHES
  2. BACKFILL SHALL BE IN ACCORDANCE WITH PART 403 BACKFILL.
  3. FRAME AND COVER DESIGN SHALL CONFORM TO THE CITY OF TULSA DET.360
  4. NO LARGER THAN A 1/8" GAP BETWEEN GAP AND LID.
  5. RISER SECTION SHALL BE CONSTRUCTED USING DIP AS DIRECTED BY THE ENGINEER

**DETAIL 6/C04— CLEANOUT**  
SCALE: NOT TO SCALE



**TYPICAL DETAIL 7/C04 — TYPE 1 BARRICADE**  
SCALE: NOT TO SCALE



CIVIL TYPICAL DETAILS				
PROJECT NO. ES 2009-07				
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION — PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS				
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT				
PLANS AND ESTIMATES PREPARED BY: <b>GREELEY AND HANSEN</b> 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103				
REVISION	BY	DATE	PLAN SCALE:	APPROVED:
			AS SHOWN	
			DESIGNED	
			SURVEY	
			PROFILE SCALE	
			HORIZONTAL:	
			VERTICAL:	
			LEAD ENGR.	
			FIELD MGR.	
			RECOMMENDED	
			DESIGN MANAGER	
FILE: 0141C2C04 DRAWING: C04				DATE: MAY 2022
ATLAS PAGE NO. —				SHEET 6 OF 33 SHEETS





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WHEN PUMPING TO THE SSWWTP															
Mode of Operation: Normal Flow Mode (7 to 45 MGD)															
Type of Pump Operation: Wet Well Control (Variable Speed)															
Flow Mode Setpoint: Rate of Change to Wet Well Level When No Pumps are Operating is greater than 2.5 ft/minute															
Pump	Pump Impeller Size (Inch)	Wet Well Setpoints		Pump Speed Set Points				Pump Discharge Control Valve Setpoints				Total Pumping Range To SSWWTP (MGD)	Total Dynamic Head When Pumping To SSWWTP (PSI)	Pump Wet Well Operating Range (ft)	Pump Speed Operating Range (Hz)
		Pump Start Setpoint (ft)	Pump Stop Setpoint (ft)	Pump Start Speed Setpoint (Hz)	Pump Ramping Up Speed Setpoint (Hz/sec)	Pump Stop Speed Setpoint (Hz)	Pump Ramping Down Speed Setpoint (Hz/sec)	Valve Position at Initial Pump Start Sequence (% Open)	Valve Position at End of Pump Start Sequence (% Open)	Valve Position at Initial Pump Stop Sequence (% Open)	Valve Position at Initial Pump Stop Sequence (% Open)				
Lead	20	>12.5	<10	43	1	43	1	5	100	100	0	7.5 to 14.5	16.9 to 18.2	10 to 17	43 to 52
Lag 1	20	>17	<12	45	1	45	1	5	100	100	0	15 to 30	19.5 to 26	12 to 18	45 to 58
Lag 2	20	>18	<15	48	1	48	1	5	100	100	0	24.5 to 37.5	22 to 29	15 to 20	48 to 58
Standby	20	>20	<18	53	1	53	1	5	100	100	0	34.8 to 41	26.6 to 30.5	18 to 20	53 to 58

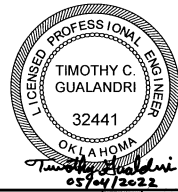
WHEN PUMPING TO THE SSWWTP															
Mode of Operation: Low Flow Mode (Less Than 7 MGD)															
Type of Pump Operation: Pump Cycling (Constant Speed)															
Flow Mode Setpoint: Rate of Change to Wet Well Level When No Pumps are Operating is less than 2.5 ft/minute															
Pump	Pump Impeller Size (Inch)	Wet Well Setpoints		Pump Speed Set Points				Pump Discharge Control Valve Setpoints				Pumps Flow Range To SSWWTP (MGD)	Total Dynamic Head When Pumping To SSWWTP (PSI)	Pump Wet Well Operating Range (ft)	Pump Operating Speed (Hz)
		Pump Start Setpoint (ft)	Pump Stop Setpoint (ft)	Pump Start Speed Setpoint (Hz)	Pump Ramping Up Speed Setpoint (Hz/sec)	Pump Stop Speed Setpoint (Hz)	Pump Ramping Down Speed Setpoint (Hz/sec)	Valve Position at Initial Pump Start Sequence (% Open)	Valve Position at End of Pump Start Sequence (% Open)	Valve Position at Initial Pump Stop Sequence (% Open)	Valve Position at Initial Pump Stop Sequence (% Open)				
Lead	20	>20	<12	43	1	43	1	5	100	100	0	7.5 to 10.5	16.8 to 14.2	10 to 20	43
Lag 1	20	Lead Pump Failure		43	1	43	1	5	100	100	0	7.5 to 10.5	16.8 to 14.2	10 to 20	43
Lag 2	20	Lag 1 Pump Failure		43	1	43	1	5	100	100	0	7.5 to 10.5	16.8 to 14.2	10 to 20	43
Standby	20	Lag 2 Pump Failure		43	1	43	1	5	100	100	0	7.5 to 10.5	16.8 to 14.2	10 to 20	43

WHEN PUMPING TO THE FEBs															
Mode of Operation: Normal Flow Mode (8 to 45 MGD)															
Type of Pump Operation: Wet Well Control (Variable Speed)															
Flow Mode Setpoint: Rate of Change to Wet Well Level When No Pumps are Operating is greater than 2.5 ft/minute															
Pump	Pump Impeller Size (Inch)	Wet Well Setpoints		Pump Speed Set Points				Pump Discharge Control Valve Setpoints				Pumps Flow Range To FEBs (MGD)	Total Dynamic Head When Pumping To FEBs (PSI)	Pump Wet Well Operating Range (ft)	Pump Speed Operating Range (Hz)
		Pump Start Setpoint (ft)	Pump Stop Setpoint (ft)	Pump Start Speed Setpoint (Hz)	Pump Ramping Up Speed Setpoint (Hz/sec)	Pump Stop Speed Setpoint (Hz)	Pump Ramping Down Speed Setpoint (Hz/sec)	Valve Position at Intial Pump Start Sequence (% Open)	Valve Position at End of Pump Start Sequence (% Open)	Valve Position at Intial Pump Stop Sequence (% Open)	Valve Position at Intial Pump Stop Sequence (% Open)				
Lead	20	>12.5	<10	43	1	43	1	5	100	100	0	8.8 to 12.6	16 to 15	10 to 17	43 to 46
Lag 1	20	>17	<12	43	1	43	1	5	100	100	0	16.1 to 29.3	17.8 to 19.3	12 to 18	43 to 50
Lag 2	20	>18	<15	43	1	43	1	5	100	100	0	25 to 49.5	17.5 to 23.7	15 to 20	43 to 58
Standby	20	>20	<18	43	1	43	1	5	100	100	0	31 to 56.1	16.7 to 23.8	18 to 20	43 to 58

WHEN PUMPING TO THE FEBs															
Mode of Operation: Low Flow Mode (Less Than 8 MGD)															
Type of Pump Operation: Pump Cycling (Constant Speed)															
Flow Mode Setpoint: Rate of Change to Wet Well Level When No Pumps are Operating is less than 2.5 ft/minute															
Pump	Pump Impeller Size (Inch)	Wet Well Setpoints		Pump Speed Set Points				Pump Discharge Control Valve Setpoints				Pumps Flow Range To FEBs (MGD)	Total Dynamic Head When Pumping To FEBs (PSI)	Pump Wet Well Operating Range (ft)	Pump Speed Operating Range (Hz)
		Pump Start Setpoint (ft)	Pump Stop Setpoint (ft)	Pump Start Speed Setpoint (Hz)	Pump Ramping Up Speed Setpoint (Hz/sec)	Pump Stop Speed Setpoint (Hz)	Pump Ramping Down Speed Setpoint (Hz/sec)	Valve Position at Initial Pump Start Sequence (% Open)	Valve Position at End of Pump Start Sequence (% Open)	Valve Position at Initial Pump Stop Sequence (% Open)	Valve Position at Initial Pump Stop Sequence (% Open)				
Lead	20	>20	<12	43	1	43	1	5	100	100	0	8.8 to 11.7	16 to 14.2	10 to 20	43
Lag 1	20	Lead Pump Failure		43	1	43	1	5	100	100	0	8.8 to 11.7	16 to 14.2	10 to 20	43
Lag 2	20	Lag 1 Pump Failure		43	1	43	1	5	100	100	0	8.8 to 11.7	16 to 14.2	10 to 20	43
Standby	20	Lag 2 Pump Failure		43	1	43	1	5	100	100	0	8.8 to 11.7	16 to 14.2	10 to 20	43

NOTES:

1. ALL SET POINTS ARE ADJUSTABLE IN SCADA.
2. TOTAL DYNAMIC HEAD (TDH) CAN BE CHECKED IN SCADA READING THE DISCHARGE PRESSURE GAUGE.
3. STANDBY PUMP STARTS UPON WWL > 20 FEET OR FAILURE TO START LEAD, LAG 1 OR LAG 2 PUMPS.
4. PUMP DISCHARGE CONTROL VALVE SHALL OPEN AND CLOSE IN SEQUENCE WITH PUMP RAMP UP AND DOWN SPEED CONTROL SETPOINTS.
5. WHEN BRINGING ON A NEW PUMP, THE LEAD AND LAG PUMPS WHICH ARE OPERATING SHOULD BE RAMPED DOWN TO THE PUMP START SPEED SETPOINT.
6. CONTRACTOR TO PERFORM FIELD PUMP TESTS TO CONFIRM EACH SETPOINT PROVIDED ON EACH TABLE. ALL DEVIATIONS SHALL BE UPDATED ON THE TABLE BASED ON FIELD TEST RESULTS.



CIVIL PUMP CONTROL TABLES									
PROJECT NO. ES 2009-07									
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION – PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS									
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT									
PLANS AND ESTIMATES PREPARED BY:  GREELEY AND HANSEN 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103									
REVISION	BY	DATE	PLAN SCALE:	DRAWN	RM	–	APPROVED:		
			AS SHOWN	DESIGNED	TG	–			
				SURVEY					
			PROFILE SCALE	PROJ. MGR.	TG	–			
			HORIZONTAL:	LEAD ENGR.	AD 5/22				
				FIELD MGR.	Tom 5/22				
			VERTICAL:	RECOMMENDED	HA 5/22				
				DESIGN MANAGER					
			FILE: 0141C2C05	DRAWING: C05	DATE: MAY 2022				
			ATLAS PAGE NO: –						
							SHEET 7	OF 33	SHEETS

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VALVE SYMBOLS			
DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
GATE			
KNIFE GATE			
BUTTERFLY			
PLUG			
CHECK (SWING)			
CONE			
BALL			
DIAPHRAGM			
GLOBE			
ANGLE			
THREE WAY			
FOUR WAY			
FLAP			
PRESSURE RELIEF			
AUTO AIR AND VACUUM RELEASE			
AUTO AIR RELEASE			
AUTO VACUUM RELEASE			
PRESSURE REDUCING			
HOSE			
STOP AND DRAIN			

PIPE FITTINGS			
DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
CROSS	NA		
CROSS	NA		
TEE	NA		
TEE	NA		
TEE	NA		
SIDE OUTLET TEE	NA		
SIDE OUTLET TEE	NA		
LATERAL	NA		
90° ELBOW	NA		
90° ELBOW	NA		
90° ELBOW	NA		
90° ELBOW (LONG RADIUS)	NA		
45° ELBOW	NA		
45° ELBOW	NA		
45° ELBOW	NA		
45° ELBOW (LONG RADIUS)	NA		
SIDE OUTLET ELBOW	NA		
SIDE OUTLET ELBOW	NA		
BASE ELBOW	NA		

#### VALVE OPERATORS

0 PLACE KEY FOR  
OPERATOR IN  
PLACE OF 0

NONE MANUAL  
C CHAINWHEEL  
D DIAPHRAGM  
F FLOAT  
G GEAR  
H HYDRAULIC CYLINDER

M MOTOR (ELECTRIC)  
P PNEUMATIC CYLINDER  
S SOLENOID  
A AIR MOTOR  
N NUT

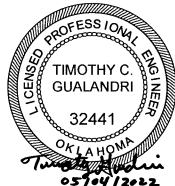
PIPE FITTINGS			
DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
UNION (SCREWED)			
REDUCER			
REDUCER - ECCENTRIC (OFFSET VIEW)	NA		
BLIND FLANGE			
SLEEVE TYPE COUPLING			
SLEEVE TYPE COUPLING (HARNESSED)			
GROOVED TYPE COUPLING			
EXPANSION JOINT RUBBER BELLOWS TYPE			
EXPANSION JOINT METAL BELLOWS TYPE			
VENTURI METER			
METER			
STRAINER			
DUPLEX STRAINER			
LUBE OIL FILTER		NA	
MOISTURE SEPARATOR		NA	
SCALE TRAP		NA	
FLAME TRAP			
VENT			
THERMOSTAT (TEMPERATURE REGULATOR)			
PRESSURE GAUGE			
THERMOMETER			
WATER LEVEL ALARM			
DIFFERENTIAL PRESSURE GAUGE			

#### NOTES:

- THIS IS A GENERAL LEGEND PROVIDED TO FACILITATE USE OF THE DRAWINGS. REFER TO THE DRAWINGS AND SPECIFICATIONS FOR ITEMS REQUIRED.
- VALVES AND PIPE FITTINGS ARE SHOWN WITH FLANGED JOINTS. ITEMS ARE AVAILABLE WITH VARIOUS JOINTS AND ARE SHOWN AS REQUIRED.
- NA MEANS NOT APPLICABLE.

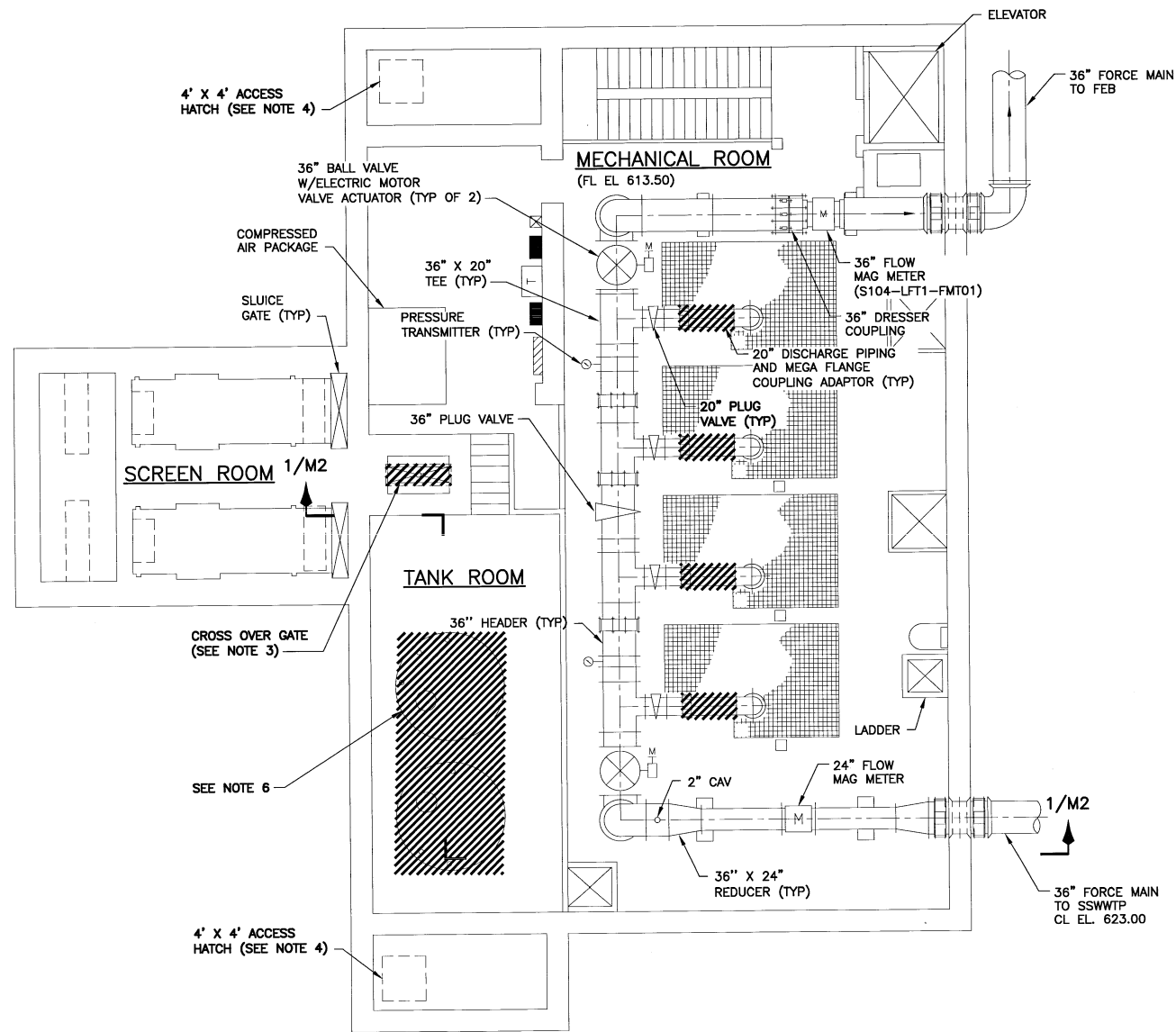
PIPE JOINTS			
DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
FLANGE	NA		
MECHANICAL JOINT	NA		
MECHANICAL JOINT (RESTRAINED)	NA		
PUSH ON OR BELL AND SPIGOT	NA		
PUSH ON OR BELL AND SPIGOT (RESTRAINED)	NA		
WELDED	NA		NA
SCREWED	NA		
JOINT IN CONCRETE PIPE	NA		NA

WALL FITTINGS			
DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
WALL SLEEVE (CAULKED)	NA		
WALL SLEEVE (ANNULAR TYPE SEAL)	NA		
WALL SLEEVE (MECHANICAL JOINT)	NA		
FLANGE AND FLANGE WALL PIPE WITH INTERMEDIATE COLLAR (F x F x F)	NA		
BELL AND BELL WALL PIPE WITH INTERMEDIATE COLLAR (B x F x B)	NA		
MECHANICAL JOINT AND MECHANICAL JOINT WALL PIPE WITH INTERMEDIATE COLLAR (MJ x F x MJ)	NA		
BELL AND FLANGE WALL PIPE WITH INTERMEDIATE COLLAR (B x F x F)	NA		
MECHANICAL JOINT AND FLANGE WALL PIPE WITH INTERMEDIATE COLLAR (MJ x F x F)	NA		
STEEL WALL RING FOR MECHANICAL JOINT AND CONCRETE PIPE (RUBBER AND STEEL)	NA		NA

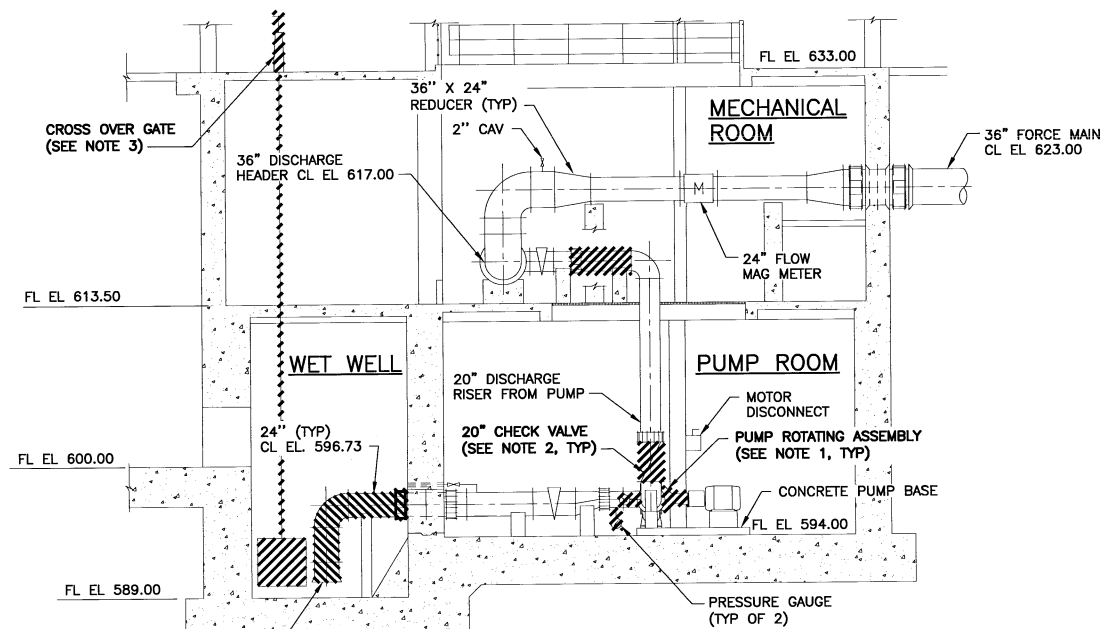


MECHANICAL PIPING SYMBOL LEGEND			
PROJECT NO. ES 2009-07			
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION - PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS			
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT			
PLANS AND ESTIMATES PREPARED BY: <b>GREELY AND HANSEN</b> 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103			
REVISION	BY	DATE	APPROVED:
AS SHOWN	DESIGNED	TG	
	SURVEY		
PROFILE SCALE	PROJ. MGR.	TG	
HORIZONTAL:	LEAD ENGR.	APD 5/22	
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VERTICAL:	RECOMMENDED	HKS 5-22	
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ATLAS PAGE NO: -		SHEET 8 OF 33 SHEETS	

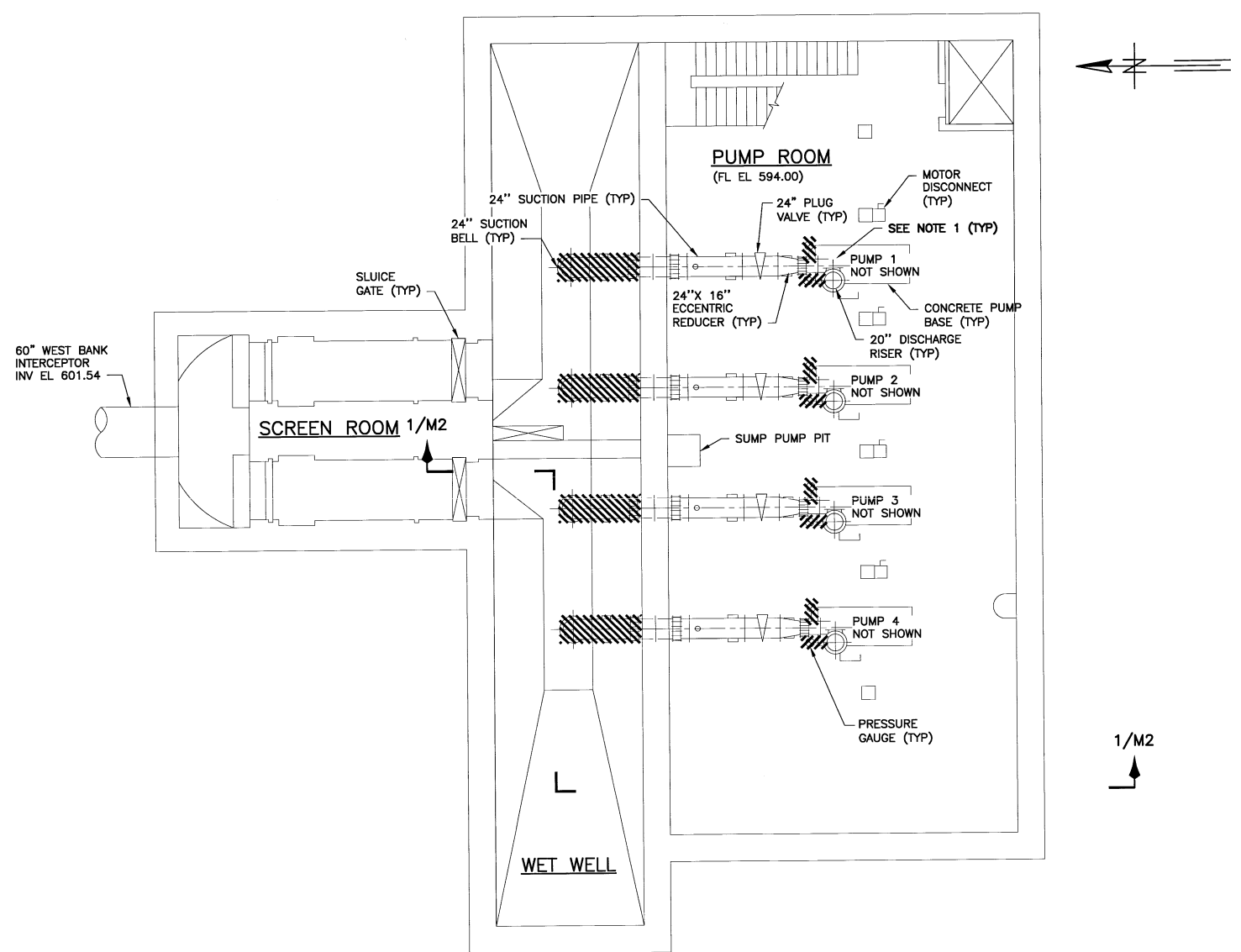
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PLAN @ FL EL 613.50  
SCALE: 1/8" = 1'-0"



SECTION 1/M2  
SCALE: 1/8" = 1'-0"



PLAN @ FL EL 594.00  
SCALE: 1/8" = 1'-0"

#### NOTES:

- CONTRACTOR TO DISCONNECT AND RECONNECT BOTH THE EXISTING SEAL WATER SYSTEM AND MECHANICAL VIBRATION SWITCHES FOR REPLACEMENT OF EACH PUMP ROTATING ASSEMBLY.
- CONTRACTOR TO MODIFY EXISTING 20" CHECK VALVE PER NOTE 2 ON DWG M03.
- EXISTING CROSS OVER GATE, STEM EXTENSION AND OPERATOR BETWEEN WET WELLS TO BE REPLACED BY CONTRACTOR.
- AVAILABLE ACCESS FOR CONTRACTOR TO PERFORM WET WELL CLEANOUT.
- CONTRACTOR TO CUT EXISTING PIPING AND TIE RODS TO INSTALL THE NEW 20" PUMP DISCHARGE CONTROL VALVE. REUSE MEGA FLANGE COUPLING ADAPTOR. CONTRACTOR TO TORQUE DOWN EACH MEGA LUG PER THE MANUFACTURER'S RECOMMENDATION.
- CONTRACTOR TO REMOVE EXISTING TANK AND ALL ASSOCIATED PIPING, CHEMICAL FEED PUMPS, AND ELECTRICAL CONDUITS. ALL ELECTRICAL CONDUITS TO BE REMOVED BACK TO WALL AND CAPPED.



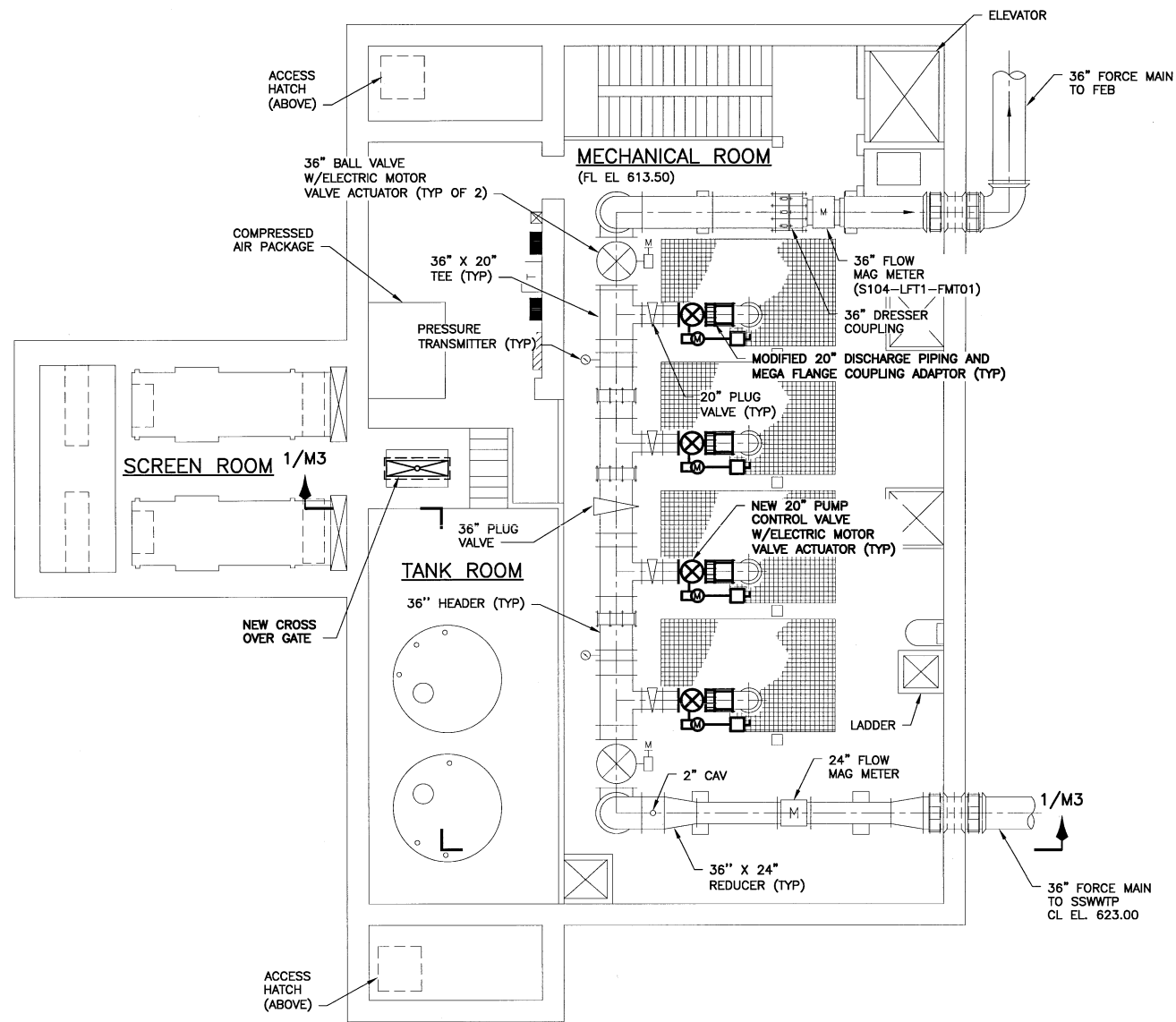
REVISION				BY	DATE

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AS SHOWN	DESIGNED	TG	
	SURVEY		
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VERTICAL:	FIELD MGR.		
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FILE: 0141C2M02	DRAWING: M02	DATE: MAY 2022
ATLAS PAGE NO: -		SHEET 9 OF 33 SHEETS

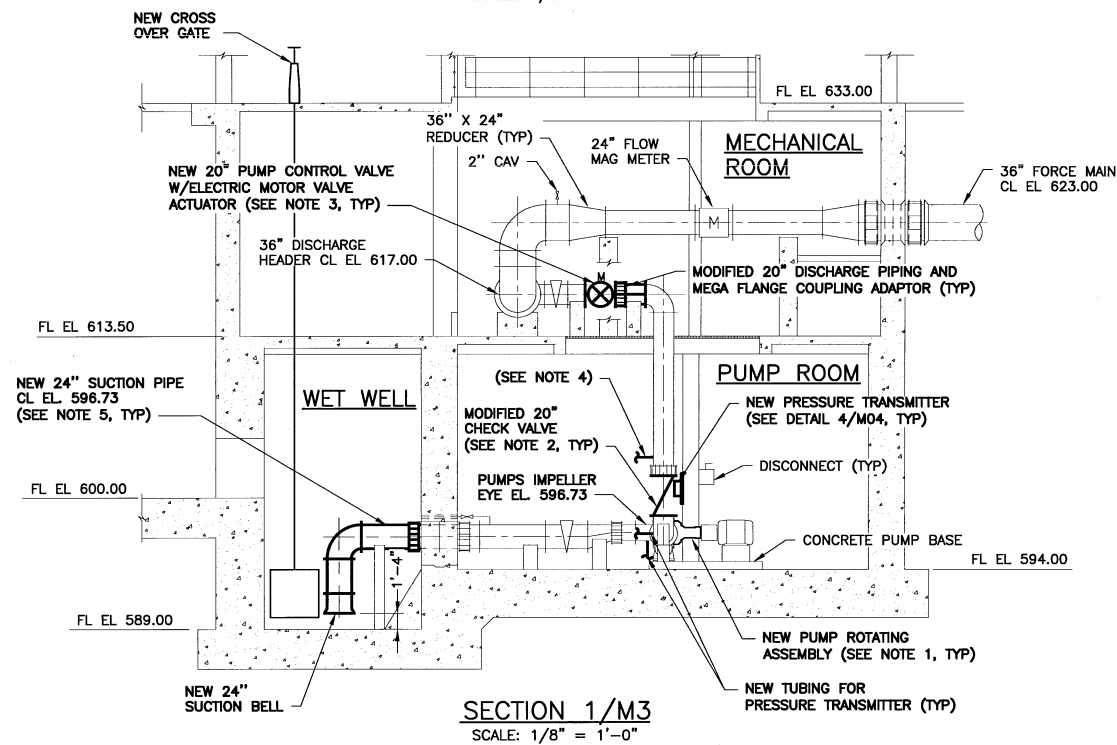


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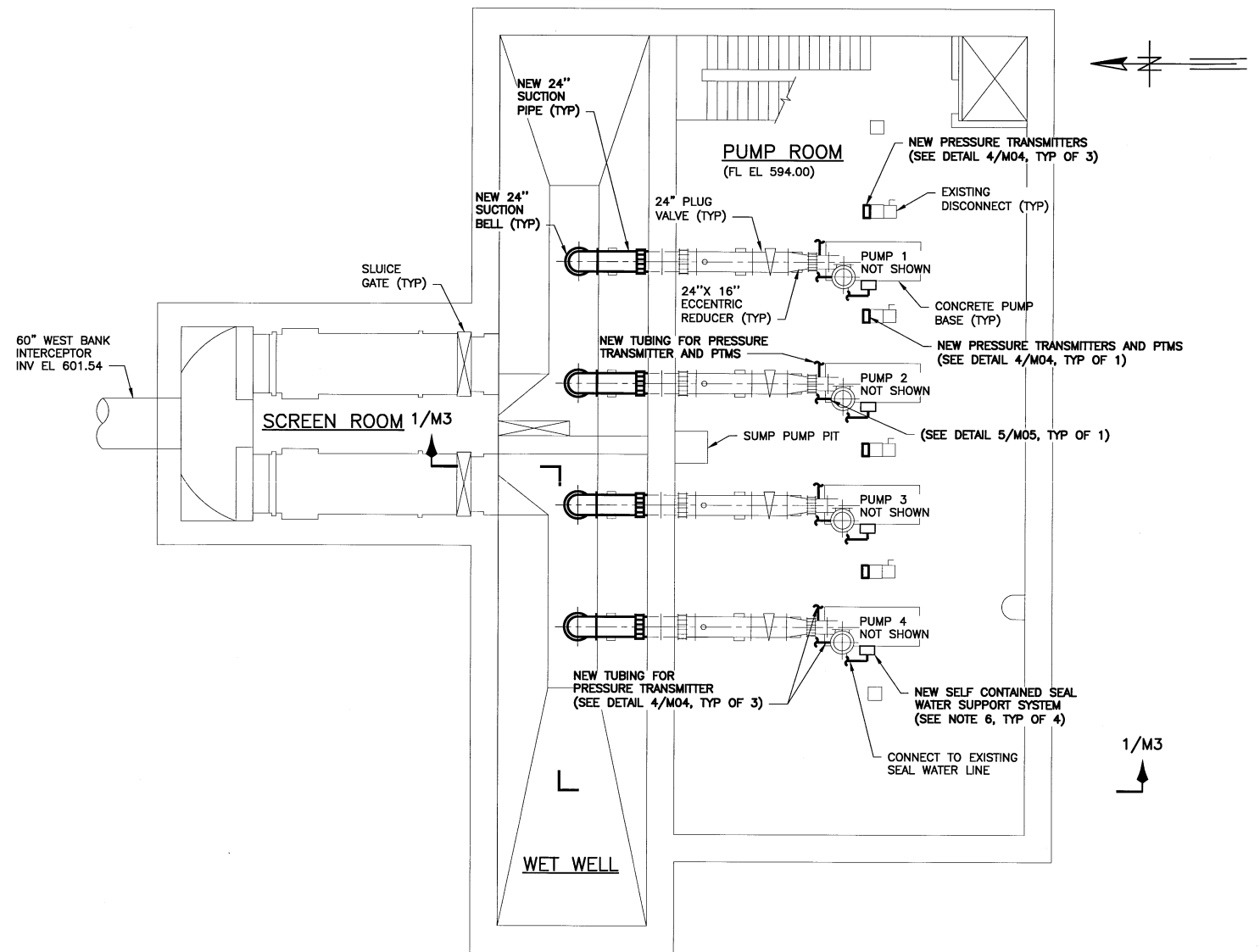
PLAN @ FL EL 613.50

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



SECTION 1/M3

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



PLAN @ FL EL 594.00

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

#### NOTES:

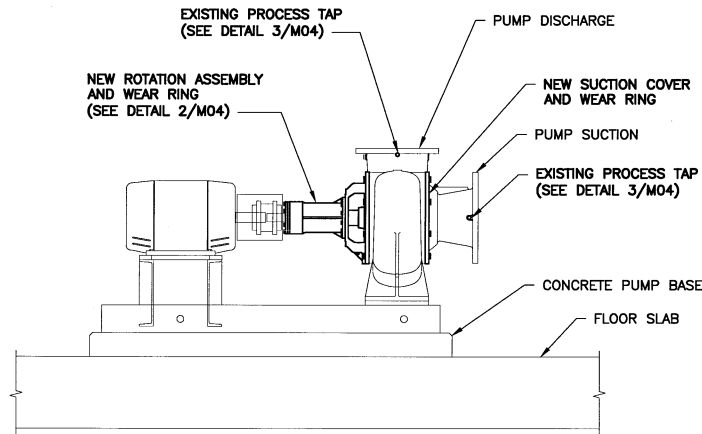
1. REPLACE ROTATING ASSEMBLY AND SUCTION COVER AND WEAR RING, SEE DETAIL 1/M04 FOR THE PUMP ROTATING ASSEMBLY. INCREASE IMPELLER SIZE FROM 19.38-INCH TO 20-INCH FOR PUMP NO. 2 PRIOR TO REPLACING THE REMAINING THREE PUMP IMPELLERS. CONTRACTOR TO PERFORM 90-DAY PILOT TESTING TO EVALUATE PERFORMANCE OF THE 20-INCH IMPELLER INCLUDING VIBRATION, CAVITATION, AND TRANSIENT PRESSURE MONITORING AS DEFINED IN SPECIFICATION SECTION 01 29 50. ACCEPTANCE OF RESULTS WILL DETERMINE THE SIZE OF THE IMPELLER FOR THE REMAINING PUMP ASSEMBLIES. SEE DETAIL 2/M04. CONTRACTOR TO RECONNECT EXISTING SEAL WATER SYSTEM AND MECHANICAL VIBRATION SWITCHES.
2. CONVERT THE EXISTING SURGE BUSTER STYLE CHECK VALVE TO A SWING-FLEX CHECK VALVE BY REMOVING EXISTING DISC ACCELERATOR. REPLACE THE EXISTING INDICATORS PER THE MANUFACTURER'S RECOMMENDATIONS.
3. NEW PUMP CONTROL VALVE SHALL BE PROVIDED PRIOR TO REPLACING THE PUMP ROTATING ASSEMBLY FOR EACH PUMP. EACH PUMP DISCHARGE CONTROL VALVE STARTUP AND SHUTDOWN SEQUENCE SHALL BE COMMISSIONED BY THE CONTRACTOR BY PROVIDING RELAYS AND TIMERS WITHIN THE PUMPS VFD AS SHOWN ON CONTACT DRAWING E06. UPON STARTUP THE PUMP DISCHARGE CONTROL VALVE SHALL OPEN UP TO 5 DEGREES PRIOR TO THE PUMP TURNING ON. ONCE THE VALVE HAS OPENED TO 5 DEGREES THEN THE PUMP SHALL RAMP UP TO 43 HZ WITHIN 45 SECONDS WHILE THE VALVE OPENS FROM 5 TO 90 DEGREES (FULLY OPEN). UPON SHUTDOWN THE PUMP DISCHARGE CONTROL VALVE SHALL CLOSE SIMULTANEOUSLY WITH THE PUMP FROM 90 TO 0 DEGREES (FULLY CLOSED). FINAL SET POINTS SHALL BE FIELD DETERMINED BASED ON NOT EXCEED A VIBRATION LESS THEN THE ALARM SET POINT OF 0.21 IN/SEC RMS.
4. PROVIDE NEW TAP AND TUBING FOR PRESSURE TRANSIENT MONITORING SYSTEM 6-INCHES DOWNSTREAM OF CHECK VALVE FOR PUMP NO. 2. REFERENCE DETAIL 4/M04.
5. REPLACE EXISTING SUCTION PIPING, FITTINGS AND COUPLINGS FOR EACH OF THE PUMPS. CONTRACTOR TO POUR BACK CONCRETE PIPE SUPPORTS IF DAMAGED FOR A COMPLETE REPLACEMENT IN KIND.
6. PROVIDE A NEW PUMP SEAL WATER SUPPORT SYSTEM (PSWSS) FOR EACH OF THE FOUR PUMPS. THE PSWSS SHALL BE AESSEALS MODEL SW RANGE OR APPROVED EQUAL. PROVIDE 304 SS UNISTRUT FRAME TO SUPPORT PSWSS AT APPROPRIATE HEIGHT ABOVE THE PUMPS CENTER LINE. COORDINATE LOCATIONS WITH ENGINEER AND OWNER PRIOR TO INSTALLATION. CONNECT SEAL WATER SUPPORT SYSTEM TO THE EXISTING SEAL WATER SYSTEM AS SHOWN.

8 0 8 16 FT 1/8"=1'-0"

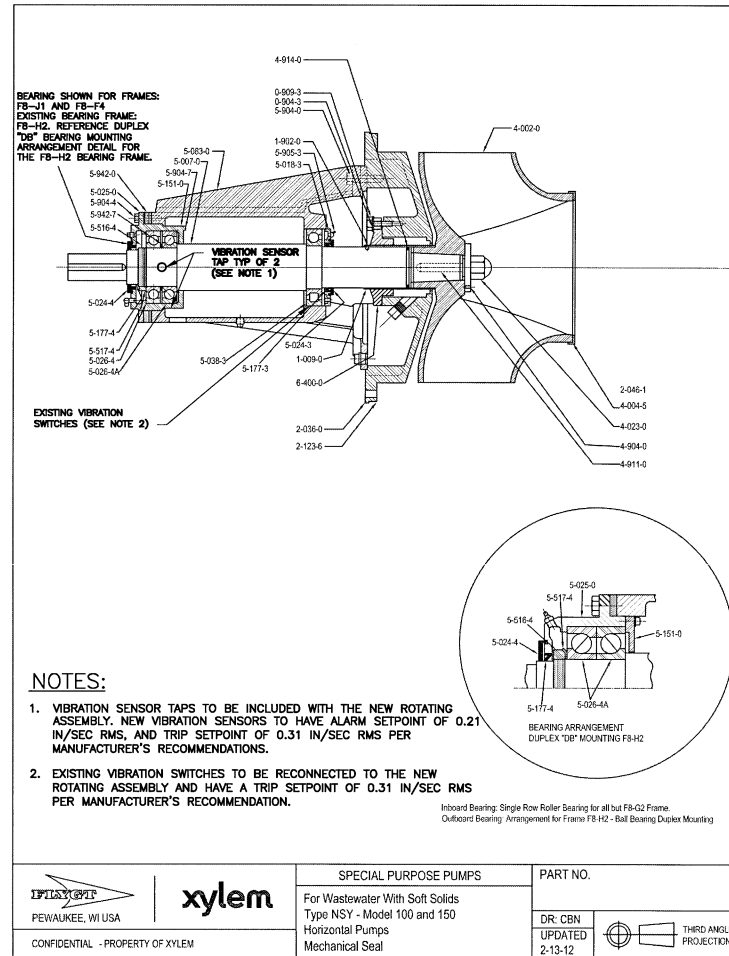


05/09/2022				TULSA, OKLAHOMA 74103			
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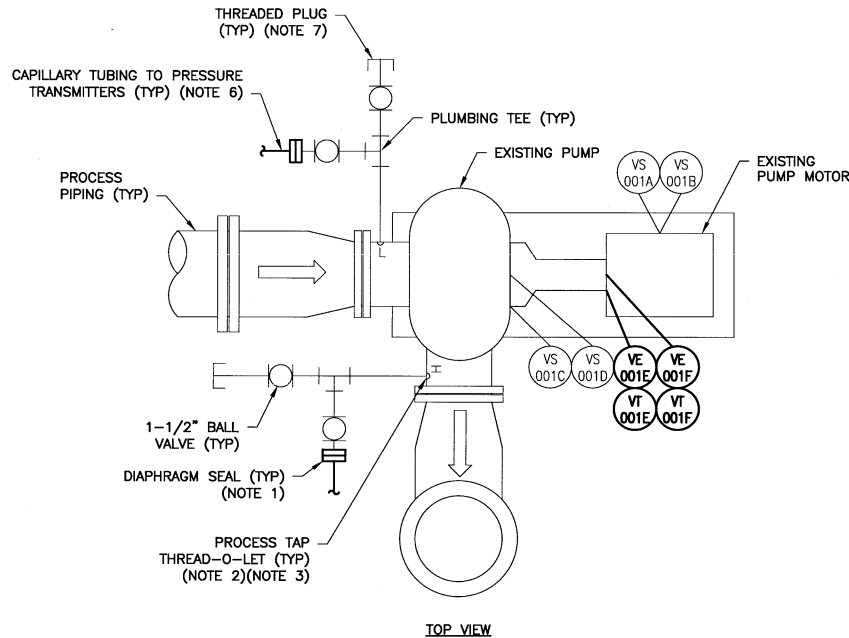
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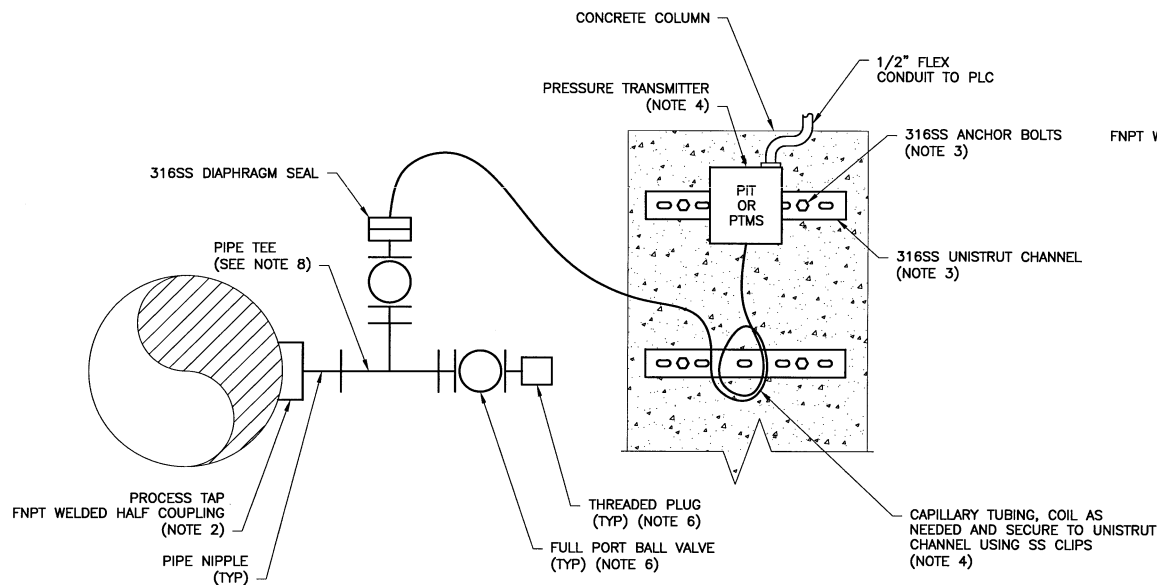
DETAIL 1/M04 - ROTATING ASSEMBLY REPLACEMENT  
NOT TO SCALE



DETAIL 2/M04 - ROTATING ASSEMBLY  
NOT TO SCALE



DETAIL 3/M04 - PUMP INSTRUMENTATION DIAGRAM  
NOT TO SCALE

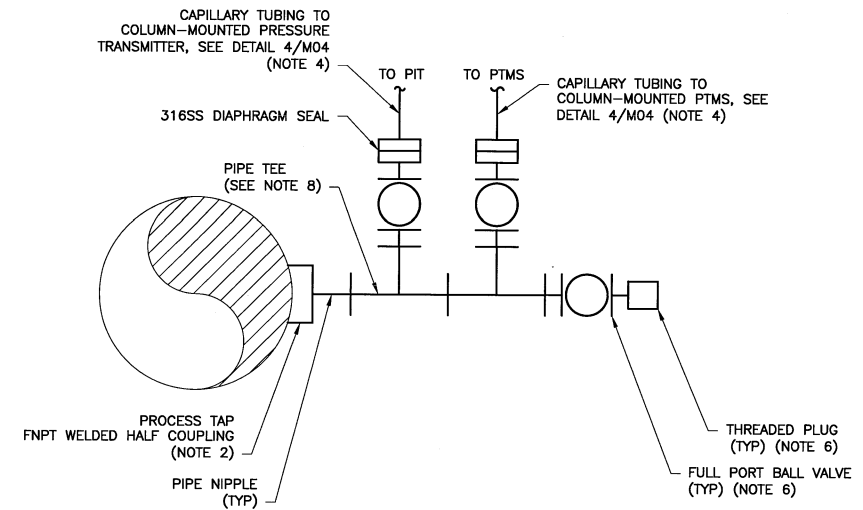


DETAIL 4/M04 - REMOTE MOUNTED PRESSURE TRANSMITTER  
NOT TO SCALE

SPECIAL PURPOSE PUMPS  
For Wastewater with Soft Solids - Type NSY  
Horizontal Direct Coupled Pumps - Model 100 and 150  
Typical - Parts and Materials - Split Mechanical Seal

Catalog Number	Part Name	Material Options	
		Standard All Cast Iron	Optional
0-904-3	Screw, Gland	Steel	
0-909-3	Washer, Gland	Steel	
1-009-0	Sieve, Shaft	ASTM A304 SS	
1-902-0	Shaft Sleeve Set Screw	Steel	
2-036-0	Cover, Stuff Box	Cast Iron - Class 30	
2-045-1	Plate, Wear (Stuff Box Cover) (1)	ASTM A10 S.S.	
2-123-6	Gasket (Stuff Box Cover)	Sheet Packing	
4-002-0	Impeller, Enclosed	2-3% Ni-Cast Iron	
4-034-5	Ring, Wear (Impeller) (1)	ASTM A10 S.S.	
4-023-0	Nut, Impeller	18-8 S.S.	
4-904-0	Set Screw, Locking	316SS	
4-911-0	Key, Impeller	Steel	
4-914-0	O-Ring	Buna N	
5-007-0	Shaft - Tapered (Imp. End)	ASTM A140	
5-015-3	Cover, Bearing (Inboard)	Cast Iron - Class 30	
5-024-3	Deflector (Inboard)	Synthetic Rubber	
5-024-4	Deflector (Outboard)	Synthetic Rubber	
5-025-0	Housing, Bearing (Outboard)	Cast Iron - Class 30	
5-025-4A	Bearing, Ball (Outboard) (2)	SKF or Equal	
5-038-3	Bearing, Roller (Inboard)	Rollway or Equal	
5-083-0	Frame	Cast Iron - Class 30	
5-151-0	Plate, Retaining	Steel	
5-177-3	Seal Grease (Inboard)	Garlock or Equal	
5-177-4	Seal Grease (Outboard)	Garlock or Equal	
5-177-5	Nut, Bearing	Steel	
5-177-6	Washer, Lock, Bearing	Steel	
5-904-0	Screw, Casing to Frame	Steel	
5-904-4	Screw, Soc. Hst. Bearing Housing	Steel	
5-904-7	Screw, Soc. Hst. Retainer Plate	Steel	
5-905-3	Fitting, Grease (Inboard)	Steel	
5-942-0	Shim, Adjusting	Plastic	
5-942-7	Shim - Upper Bearing	Steel	
6-400-0	Seal, Double Mechanical	AESAL CDP/CDPN SEAL	

DETAIL 2/M04 - PARTS AND MATERIALS LIST  
NOT TO SCALE



DETAIL 5/M04 - PRESSURE TRANSMITTER & PRESSURE TRANSIENT MONITORING SYSTEM TRANSDUCERS FOR S104-LFT1-RSP02  
NOT TO SCALE



NOTES:

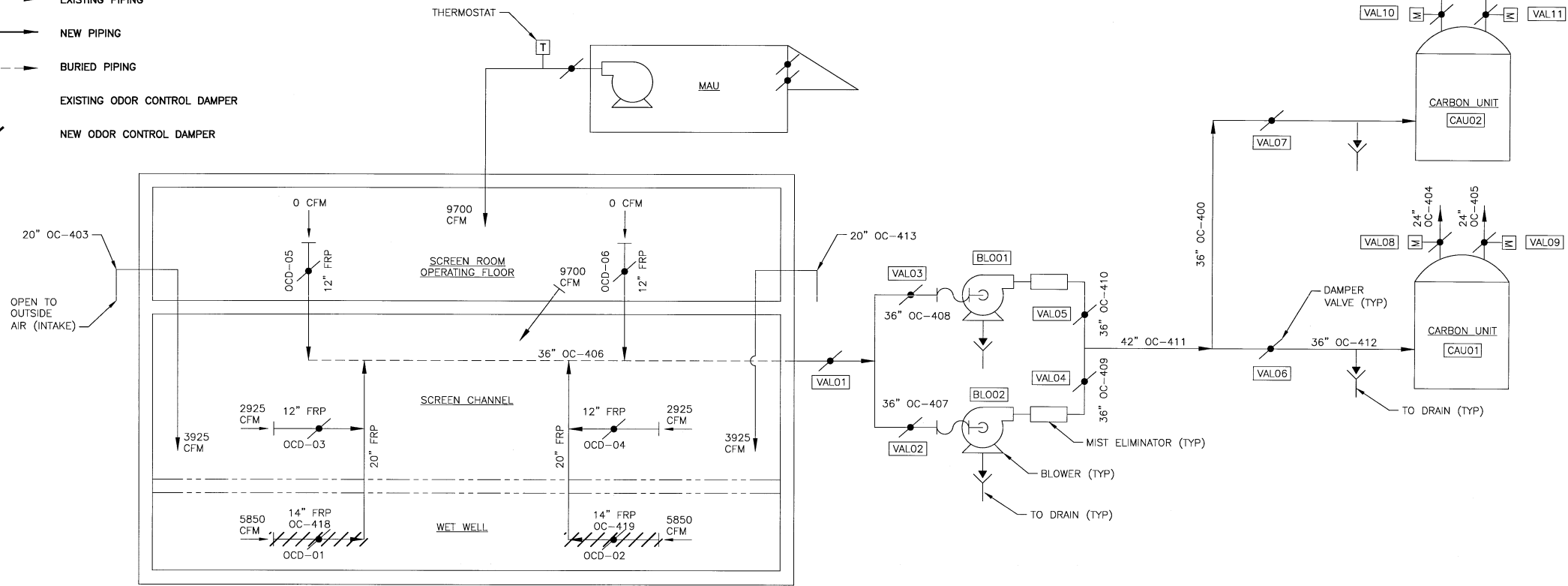
- FOLLOW MANUFACTURER'S RECOMMENDED INSTALLATION PRACTICES.
- REUSE EXISTING PROCESS TAPS TO THE GREATEST EXTENT POSSIBLE. IF NEW PROCESS TAPS ARE REQUIRED, PROCESS TAP SHALL BE 316 SS 1-1/2". TAP PROCESS PIPING USING A WELDED FNPT THREADED FITTING. FOR HORIZONTAL PIPING, PROCESS TAP SHALL BE INSTALLED IN LOWER HALF OF THE PIPE.
- FOR PUMP RSP-2, NEW PIPE NIPPLE, TEE FITTINGS, BALL VALVES, PIPE NIPPLES, PLUGS AND DIAPHRAGM SEAL SHALL BE PROVIDED TO INSTALL NEW PRESSURE TRANSMITTERS AND PRESSURE TRANSIENT MONITORING SYSTEM. SEE DRAWING NO.3 FOR ADDITIONAL DETAIL.
- SUPPORT AND ANCHOR UNISTRUT AS REQUIRED. INSTRUMENTATION SHALL BE EITHER WALL MOUNTED OR FLOOR STAND MOUNTED.
- MOUNT TRANSMITTER TO UNISTRUT WITH MANUFACTURER STAINLESS STEEL HARDWARE. MOUNT INSTRUMENT 36" TO 60" ABOVE FINISHED FLOOR.
- 1/2" X .062 POLYETHYLENE CAPILLARY TUBING. RUN TUBING THROUGH UNDERGROUND CONDUIT AS SHOWN IN ELECTRICAL CONTRACT DRAWINGS. COIL EXCESS CAPILLARY TUBING.
- WHEN PLUG IS REMOVED, VALVES CAN BE MECHANICALLY RODDED TO CLEAN INTO THE PROCESS PIPING.
- ALL PIPING AND FITTINGS SHALL BE 1-1/2", CONSTRUCTED OF SCHEDULE 40, TYPE 316L STAINLESS STEEL, AND ASSEMBLED WITH ALL THREADED NPT 150 CAST STAINLESS STEEL PIPE FITTINGS.



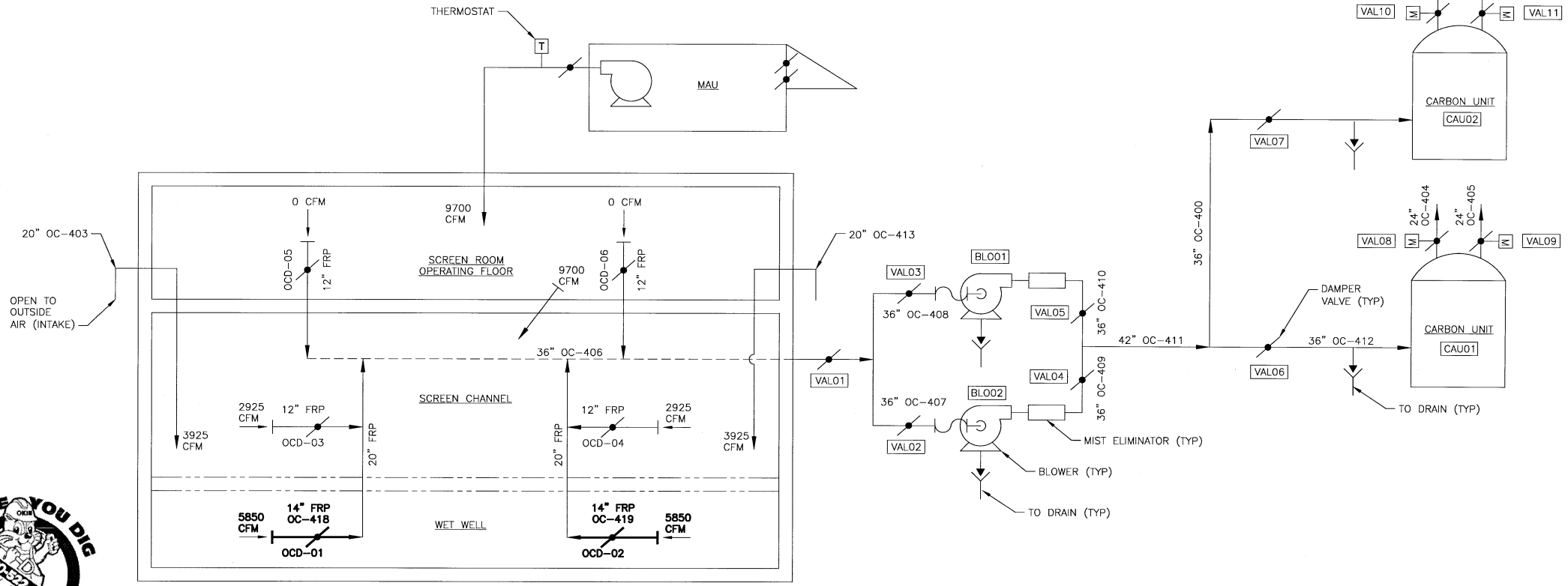
MECHANICAL PIPING & EQUIPMENT DETAILS	
PROJECT NO. ES 2009-07	
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION - PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS	
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT	
PLANS AND ESTIMATES PREPARED BY: GREELEY AND HANSEN 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103	
REVISION	BY DATE
AS SHOWN	DESIGNED TG -
SURVEY	
PROFILE SCALE	PROJ. MGR. TG -
HORIZONTAL:	LEAD ENGR. JDD 5/22
VERTICAL:	FIELD MGR. JDD 5/22
	RECOMMENDED HAS 5/22
	DESIGN MANAGER
FILE: 0141C2M04	DRAWING: M04
ATLAS PAGE NO: -	DATE: MAY 2022
	SHEET 11 OF 33 SHEETS

LEGEND

- EXISTING STRUCTURE WALL
- PROXY WALL (ROOMS CONNECTED; NO PHYSICAL WALL)
- LIMITS OF DEMOLITION
- EXISTING PIPING
- NEW PIPING
- BURIED PIPING
- EXISTING ODOR CONTROL DAMPER
- NEW ODOR CONTROL DAMPER



EXISTING ODOR CONTROL SYSTEM DIAGRAM  
NOT TO SCALE



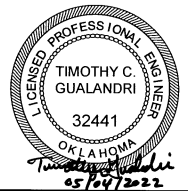
NEW ODOR CONTROL SYSTEM DIAGRAM  
NOT TO SCALE

EXISTING AND NEW ODOR CONTROL PIPING SCHEDULE

MARK	TYPE	JOINT	SIZE	LINE DESCRIPTION	COLOR
OC-400	FRP	PE/PE	36"	EXHAUST TO CAU-02	GREEN
OC-401	FRP	PE/PE	24"	EXHAUST FROM CAU-02 TO ATMOSPHERE	WHITE
OC-402	FRP	PE/PE	24"	EXHAUST FROM CAU-02 TO ATMOSPHERE	WHITE
OC-403	FRP	PE/PE	20"	INTAKE TO WETWELL	GREEN
OC-404	FRP	PE/PE	24"	EXHAUST FROM CAU-01 TO ATMOSPHERE	WHITE
OC-405	FRP	PE/PE	24"	EXHAUST FROM CAU-01 TO ATMOSPHERE	WHITE
OC-406	FRP	PE/PE	36"	INTAKE HEADER TO OCF-01 & OCF-02	GREEN
OC-407	FRP	PE/PE	36"	INTAKE TO OCF-02	GREEN
OC-408	FRP	PE/PE	36"	INTAKE TO OCF-01	GREEN
OC-409	FRP	PE/PE	36"	EXHAUST FROM OCF-02	GREEN
OC-410	FRP	PE/PE	36"	EXHAUST FROM OCF-01	GREEN
OC-411	FRP	PE/PE	42"	EXHAUST HEADER FROM OC-409 & OC-410	GREEN
OC-412	FRP	PE/PE	36"	EXHAUST TO CAU-01	GREEN
OC-413	FRP	PE/PE	20"	INTAKE TO WETWELL	GREEN
OC-414	FRP	PE/PE	12"	EXHAUST FROM SCREEN ROOM OPERATING FLOOR TO OCF-406	GREEN
OC-415	FRP	PE/PE	12"	EXHAUST FROM SCREEN ROOM OPERATING FLOOR TO OCF-406	GREEN
OC-416	FRP	PE/PE	12"	EXHAUST FROM SCREEN CHANNEL TO OCF-406	GREEN
OC-417	FRP	PE/PE	12"	EXHAUST FROM SCREEN CHANNEL TO OCF-406	GREEN
OC-418	FRP	PE/PE	14"	EXHAUST FROM WET WELL TO OCF-406	GREEN
OC-419	FRP	PE/PE	14"	EXHAUST FROM WET WELL TO OCF-406	GREEN

EXISTING AND NEW DAMPER SCHEDULE

MARK	LOCATION	SIZE	FITTINGS	OPERATOR	CAPACITY
OCD-01	EAST WET WELL	14"	FLANGE	ELECTRICAL OPERATOR, 120V	5850 CFM
OCD-02	WEST WET WELL	14"	FLANGE	ELECTRICAL OPERATOR, 120V	5850 CFM
OCD-03	EAST SCREEN CHANNEL	12"	FLANGE	GEARED OPERATOR W/HANDWHEEL	2925 CFM
OCD-04	WEST SCREEN CHANNEL	12"	FLANGE	GEARED OPERATOR W/HANDWHEEL	2925 CFM
OCD-05	SCREEN ROOM OPERATING FLOOR	12"	FLANGE	GEARED OPERATOR W/HANDWHEEL	0 CFM
OCD-06	SCREEN ROOM OPERATING FLOOR	12"	FLANGE	ELECTRICAL OPERATOR, 120V	0 CFM



MECHANICAL  
ODOR CONTROL DIAGRAMS AND SCHEDULES  
PROJECT NO. ES 2009-07  
EAST 53RD STREET AND RIVERSIDE DRIVE:  
CHERRY CREEK LIFT STATION - PUMP  
RESTORATION AND FORCE MAIN IMPROVEMENTS  
CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

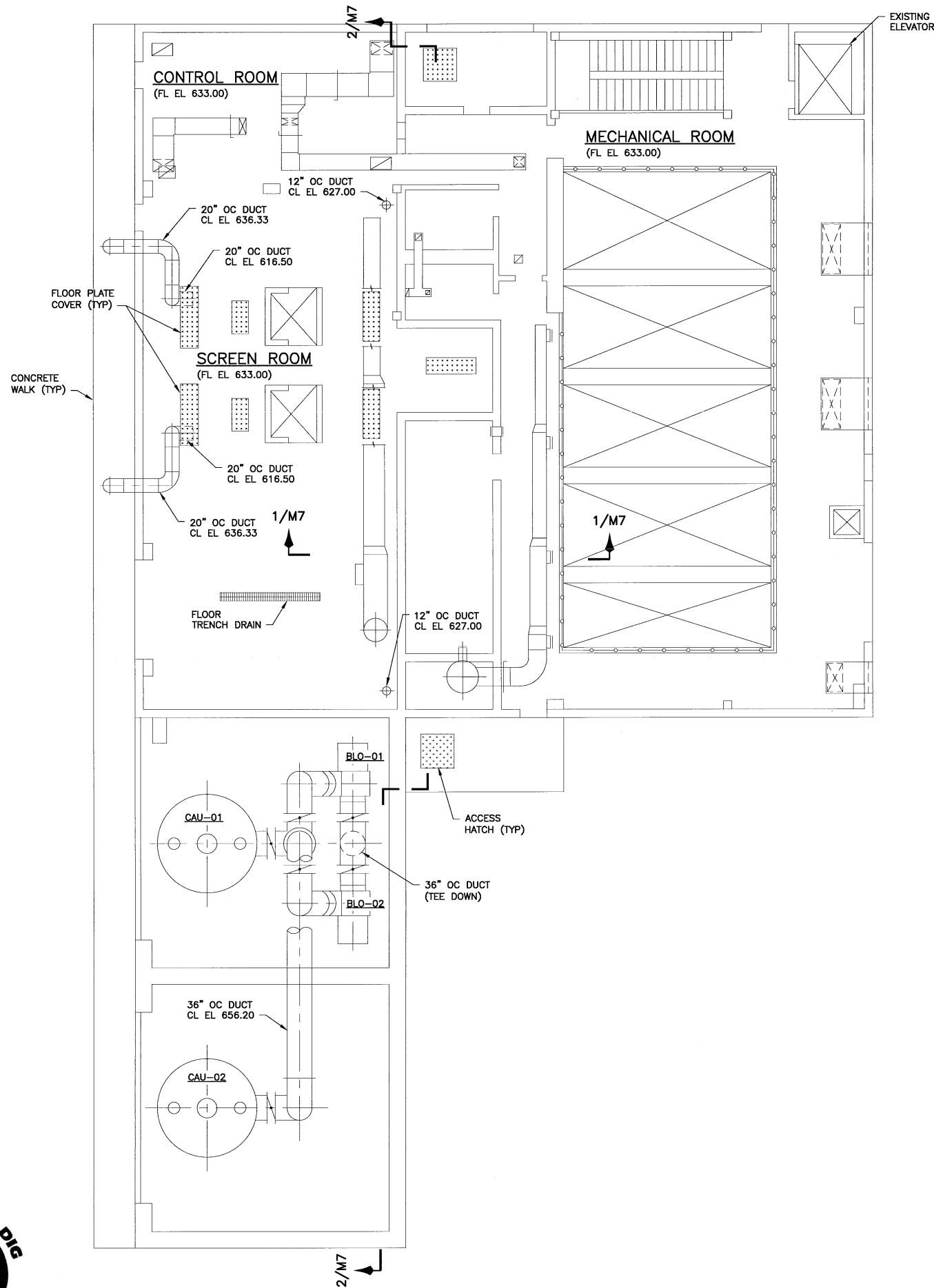
PLANS AND ESTIMATES PREPARED BY: GREELEY AND HANSEN  
321 S. BOSTON AVENUE, SUITE 300  
TULSA, OKLAHOMA 74103

REVISION	BY	DATE	PLAN SCALE:	DRAWN	RM	APPROVED:
			AS SHOWN	DESIGNED	TG	
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						DATE: MAY 2022
						SHEET 12 OF 33 SHEETS

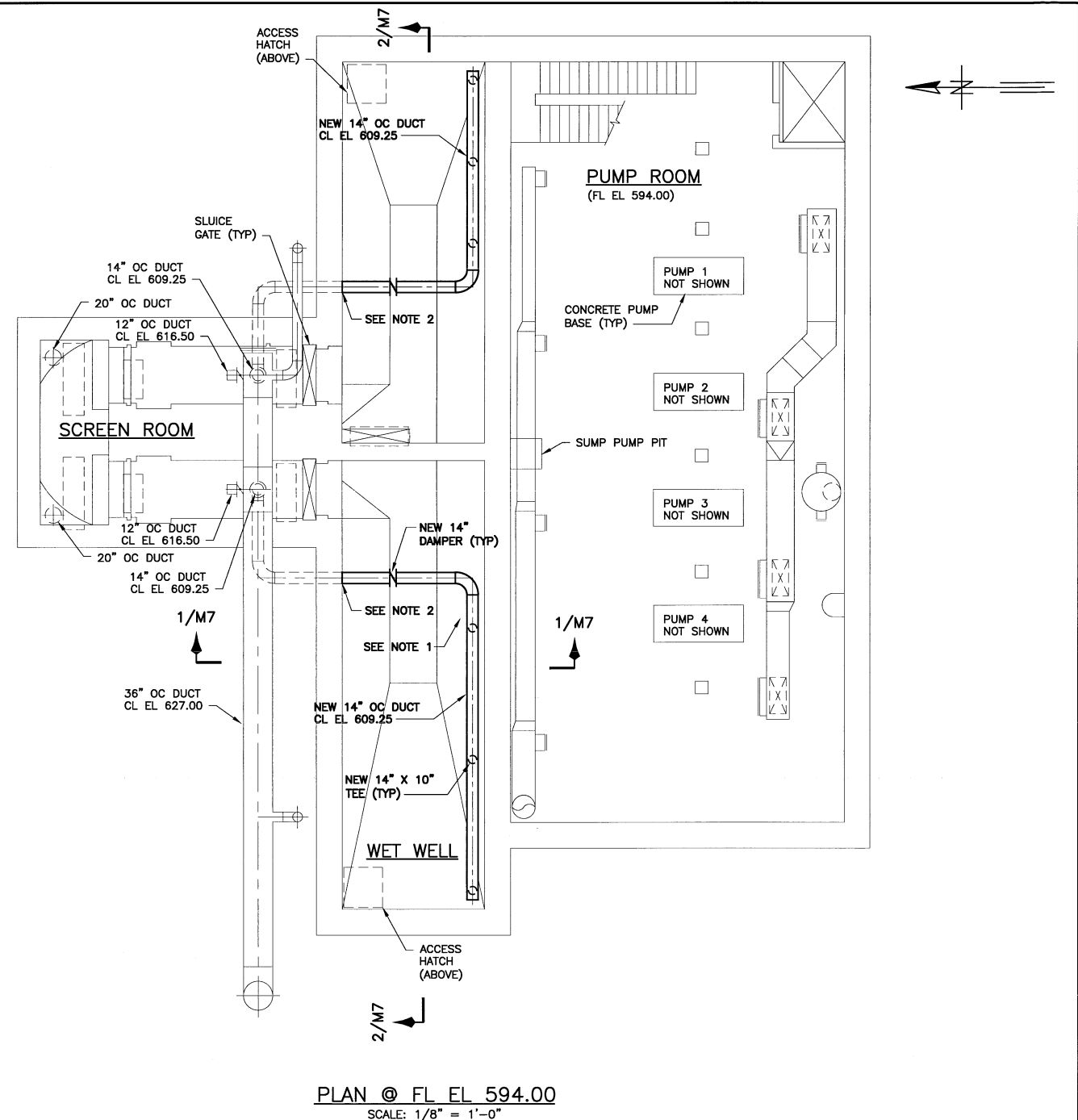




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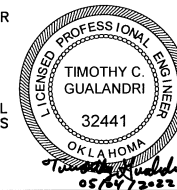
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PLAN @ FL EL 594.00  
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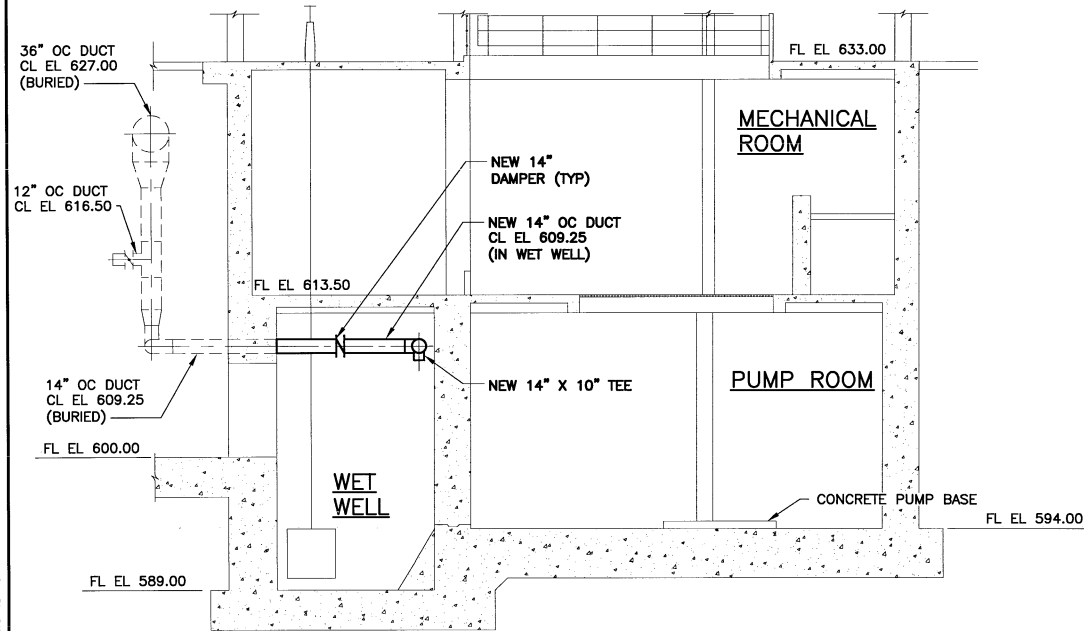
NOTES:

1. REPAIR ALL SURFACE CONDITIONS INCLUDING PROTECTIVE COATINGS FROM EXISTING PIPE SUPPORTS AND DAMAGE FROM INSTALLATION OF NEW PIPE SUPPORTS. ALL LINER REPAIRS SHALL BE IN ACCORDANCE WITH THE LINER MANUFACTURER'S RECOMMENDATIONS.
2. CONTRACTOR TO CONNECT TO EXISTING FRP ODOR CONTROL PIPING AT THE WALL PENETRATION AS SHOWN. IF REQUIRED, CONTRACTOR TO PROVIDE WALL SLEEVE FOR CONNECTING TO EXISTING ODOR CONTROL PIPING. REPAIR THE EXISTING LINER OR CONCRETE WALL IF REQUIRED. ALL INNER REPAIRS SHALL BE IN ACCORDANCE WITH THE LINER MANUFACTURES RECOMMENDATIONS.

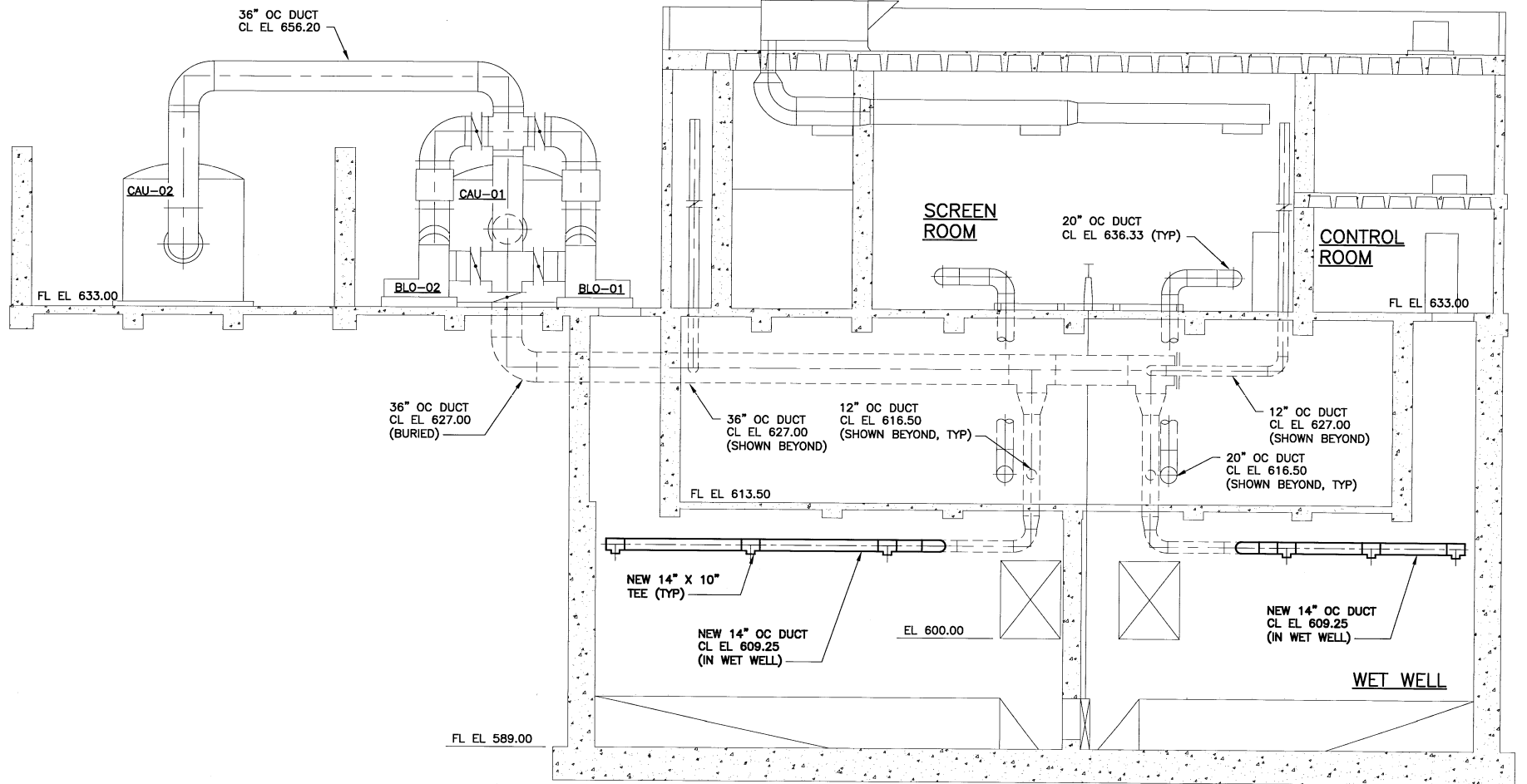


MECHANICAL-CHERRY CREEK LIFT STATION ODOR CONTROL PLANS									
PROJECT NO. ES 2009-07									
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION – PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS									
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT									
PLANS AND ESTIMATES PREPARED BY:				 <b>GREELEY AND HANSEN</b> 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103					
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ATLAS PAGE NO: —					SHEET 13 OF 33 SHEETS				

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SECTION 1/M6  
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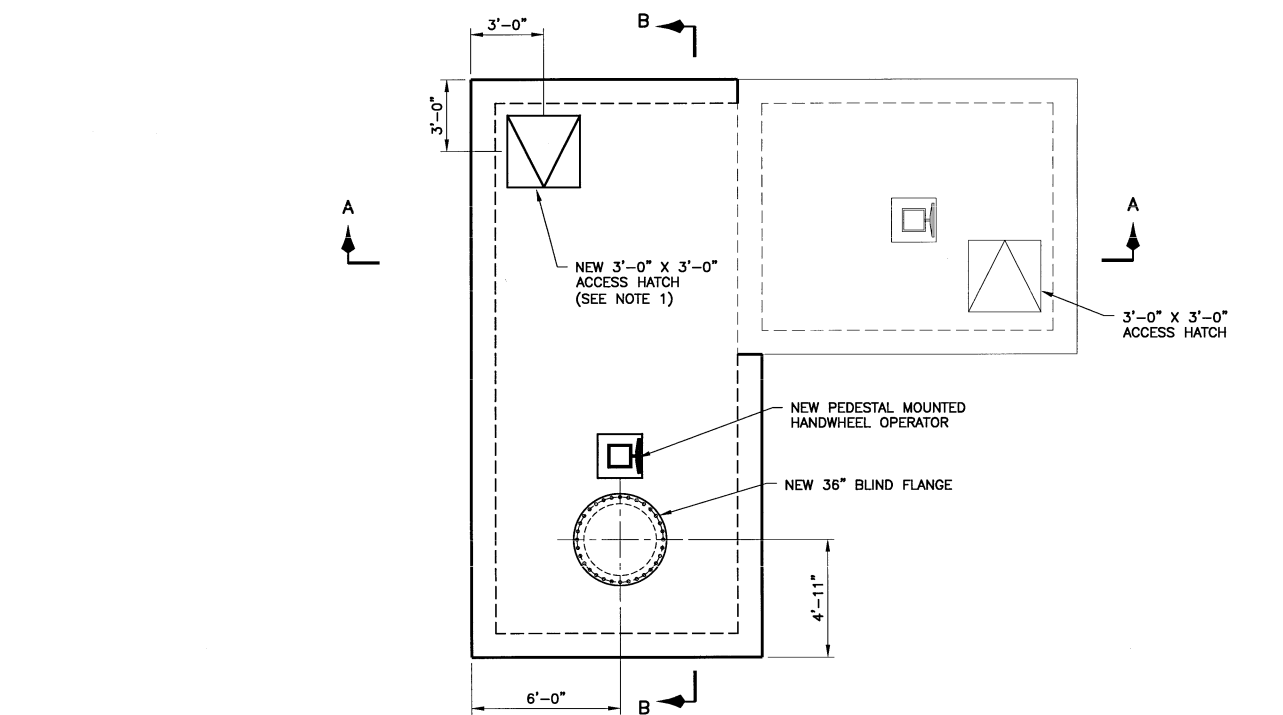


SECTION 2/M6  
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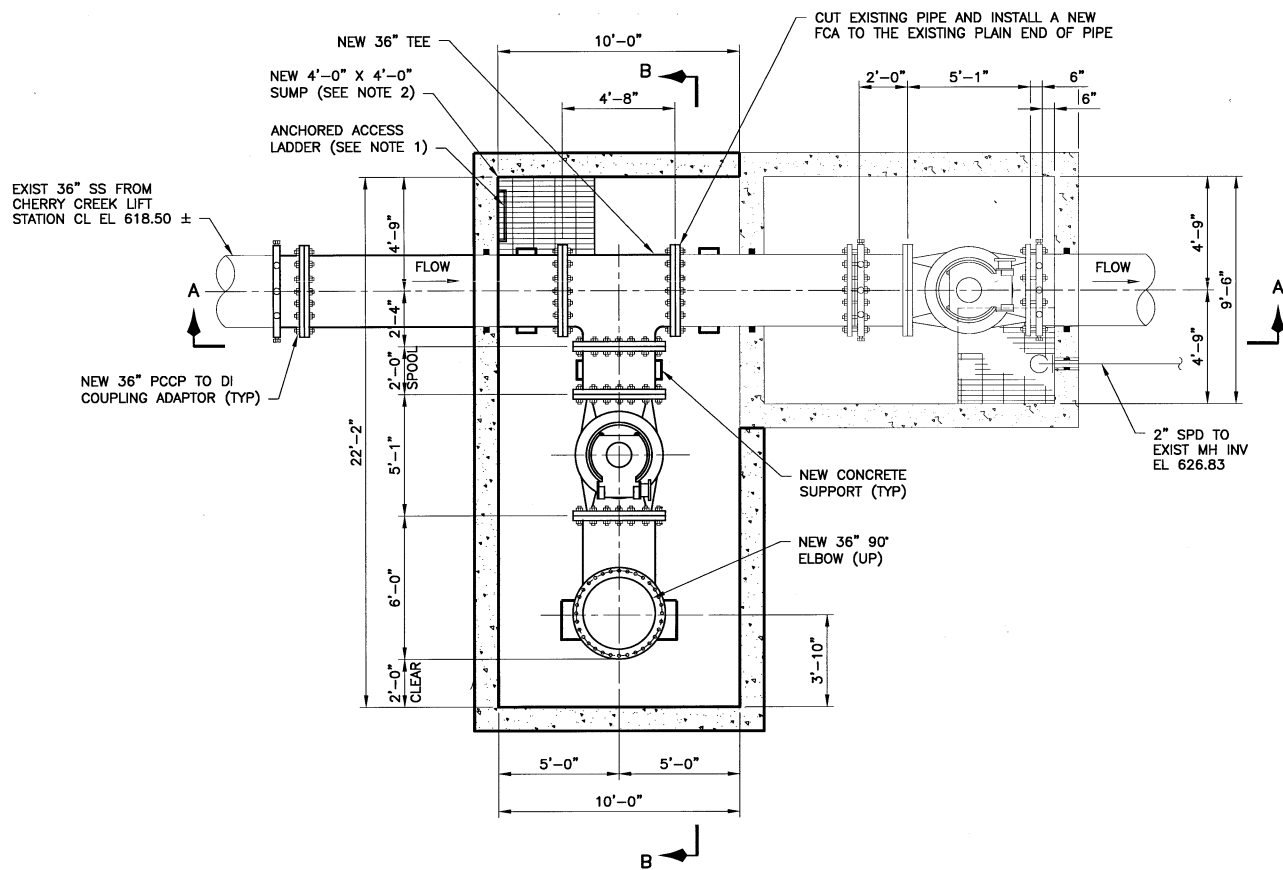


MECHANICAL-CHERRY CREEK LIFT STATION ODOR CONTROL SECTIONS			
PROJECT NO. ES 2009-07			
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION - PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS			
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT			
PLANS AND ESTIMATES PREPARED BY:		GREELEY AND HANSEN 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103	
REVISION	BY	DATE	APPROVED:
PLAN SCALE:	DRAWN	RM	
AS SHOWN	DESIGNED	TG	
	SURVEY		
PROFILE SCALE:	PROJ. MGR.	TG	
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	FIELD MGR.	RW 5/12	
VERTICAL:	RECOMMENDED	ADS 5-2-2	
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ATLAS PAGE NO: -		SHEET 14 OF 33 SHEETS	

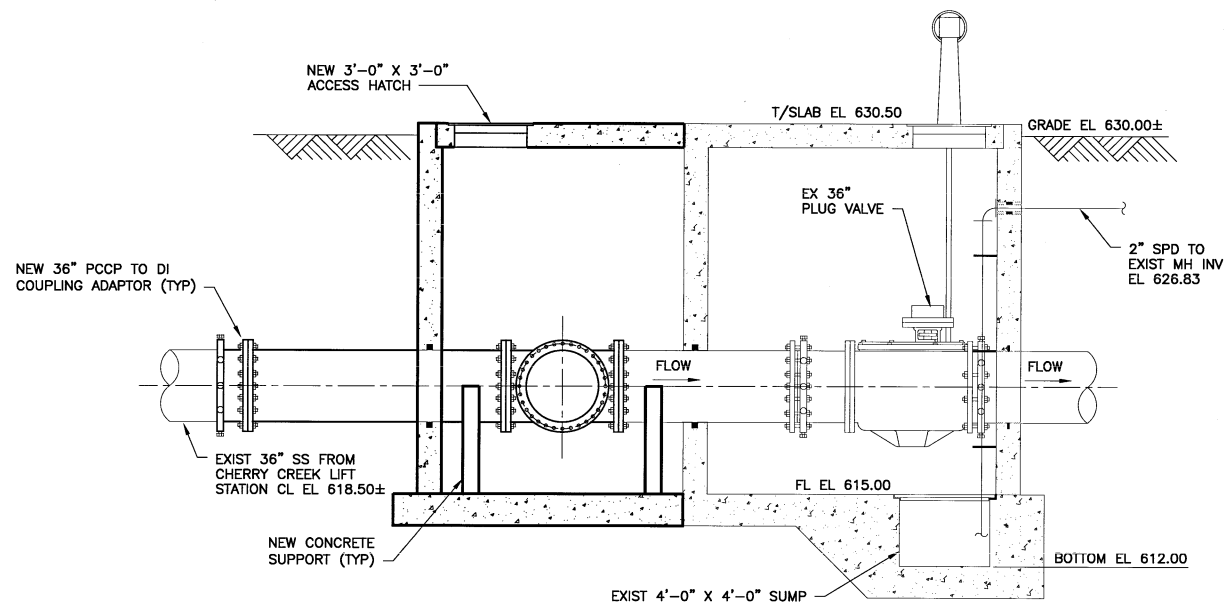
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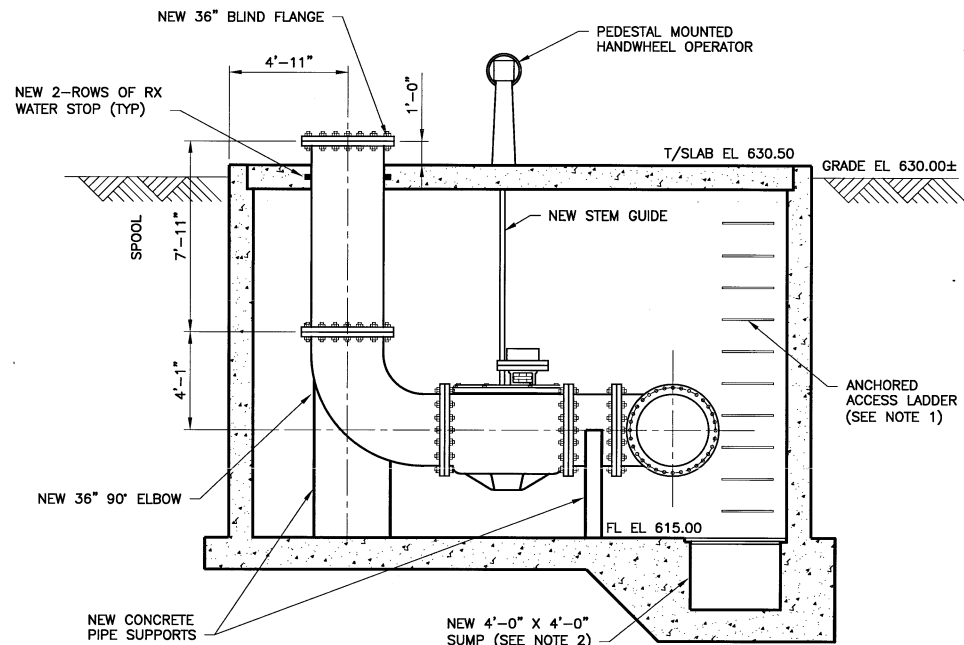
TOP VIEW  
SCALE: 1/4" = 1'-0"



PLAN VIEW  
SCALE: 1/4" = 1'-0"



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





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

NOTES:

- ACCESS HATCH AND LADDER SHALL BE MADE OF STAINLESS STEEL AS SPECIFIED IN SPECIFICATION SECTION 08 31 00.
- ALL GRATING SHALL BE FIBER REINFORCED POLYMER (FRP) AS SPECIFIED IN SPECIFICATION SECTION 06 82 00.

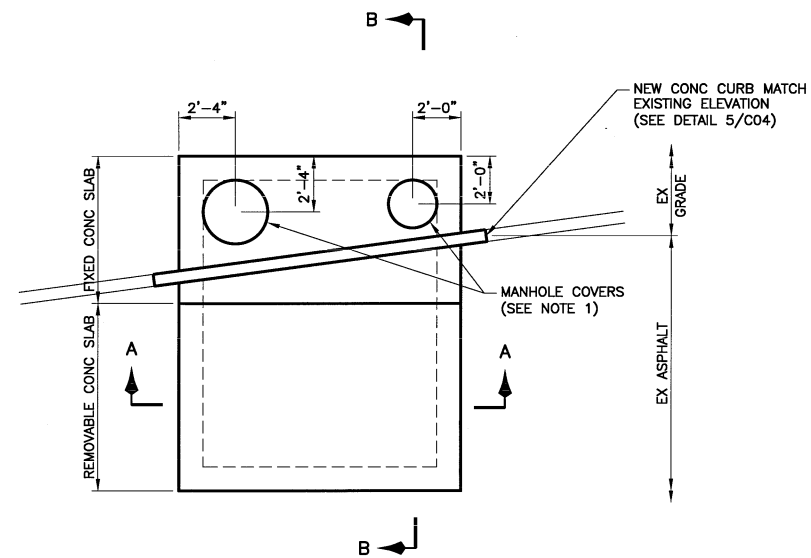
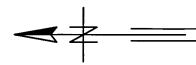
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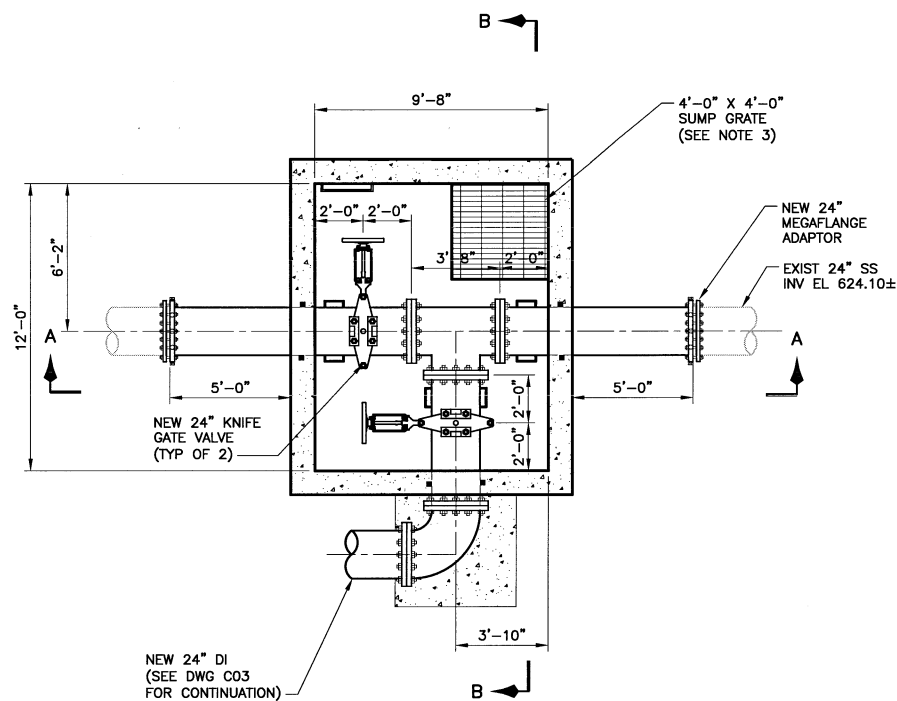
MECHANICAL MODIFIED VALVE VAULT NO. 6						
PROJECT NO. ES 2009-07						
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION – PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS						
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT						
PLANS AND ESTIMATES PREPARED BY:  GREELEY AND HANSEN 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103						
REVISION	PLAN SCALE:	DRAWN	RM	–	APPROVED:	
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		SURVEY				
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		RECOMMENDED	HAS 5/22		DATE: MAY 2022	
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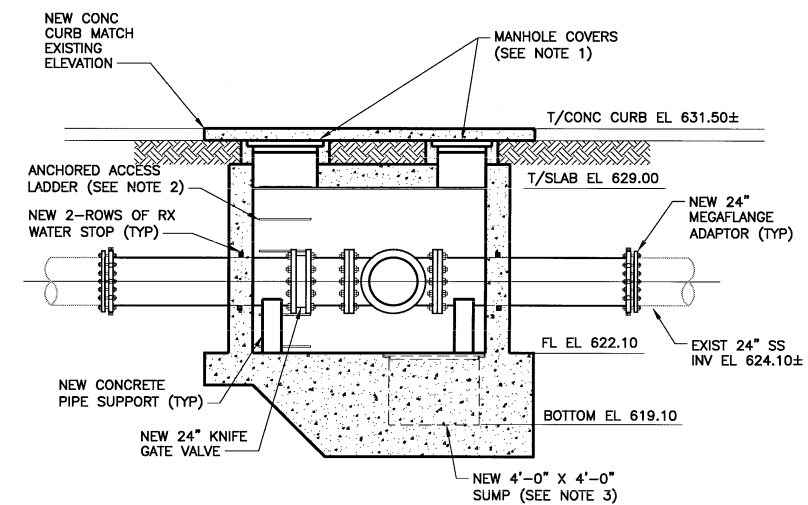




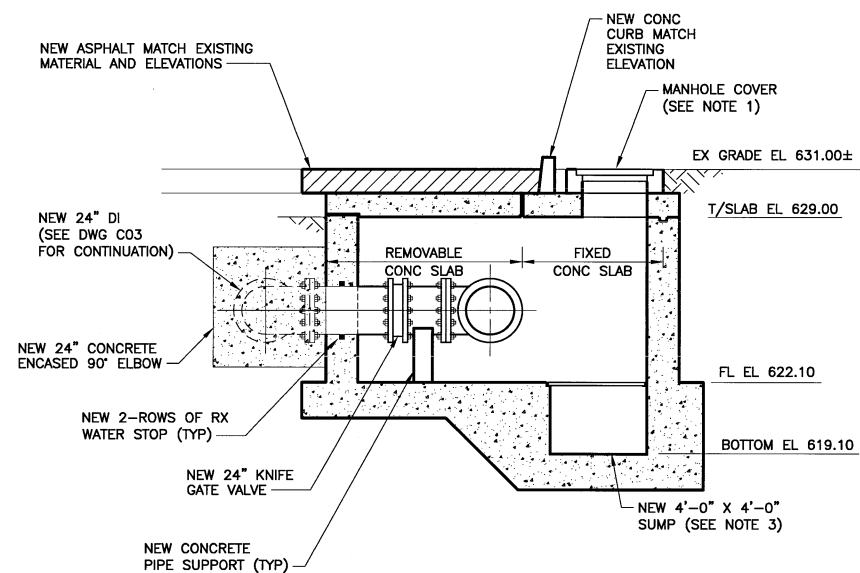
TOP VIEW  
SCALE: 1/4" = 1'-0"



PLAN VIEW  
SCALE: 1/4" = 1'-0"



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



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

NOTES:

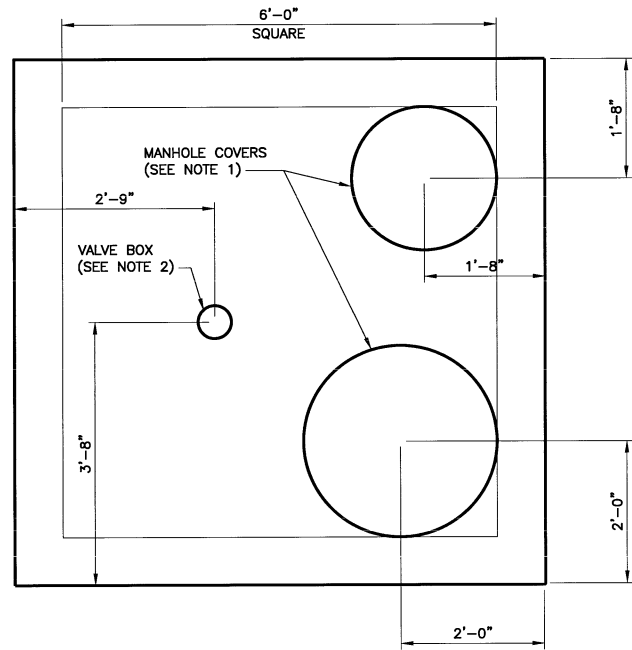
1. PROVIDE A 24-INCH AND 32-INCH SANITARY SEWER MANHOLE LID AND FRAME AS SHOWN. CONTRACTOR TO SUPPLY A 3200 SERIES COMPOSITE UTILITY ACCESS COVER WITH QUARTER TURN PADDLE LOCKS MANUFACTURED BY EJ GROUP INC., OR ENGINEER APPROVED EQUIVALENT. PROVIDE 3/8" DIA STAINLESS STEEL BOLTS, NUTS, AND WASHERS WITH A MINIMUM OF FOUR (4) BOLTS PER FRAME AND BUTTRESS SEAL AROUND THE FRAME. CONTRACTOR TO PROVIDE SUBMITTAL INFORMATION BASED ON SPECIFICATION SECTION 01 33 00.
2. ACCESS HATCH AND LADDER SHALL BE MADE OF STAINLESS STEEL AS SPECIFIED IN SPECIFICATION SECTION 08 31 00.
3. ALL GRATING SHALL BE FIBER REINFORCED POLYMER (FRP) AS SPECIFIED IN SPECIFICATION SECTION 06 82 00.



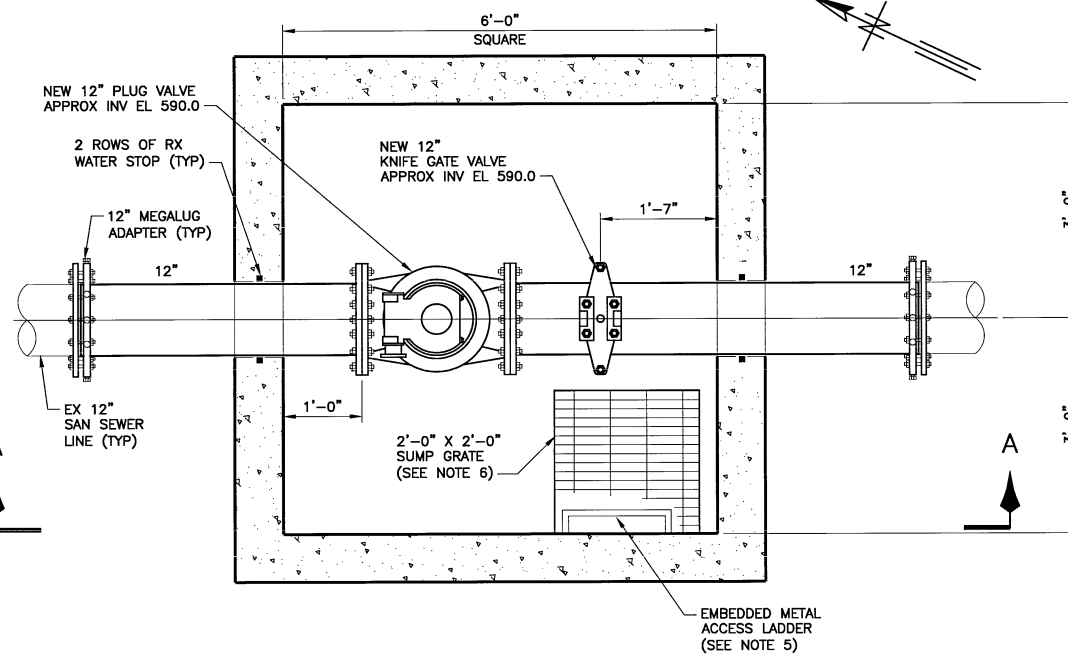
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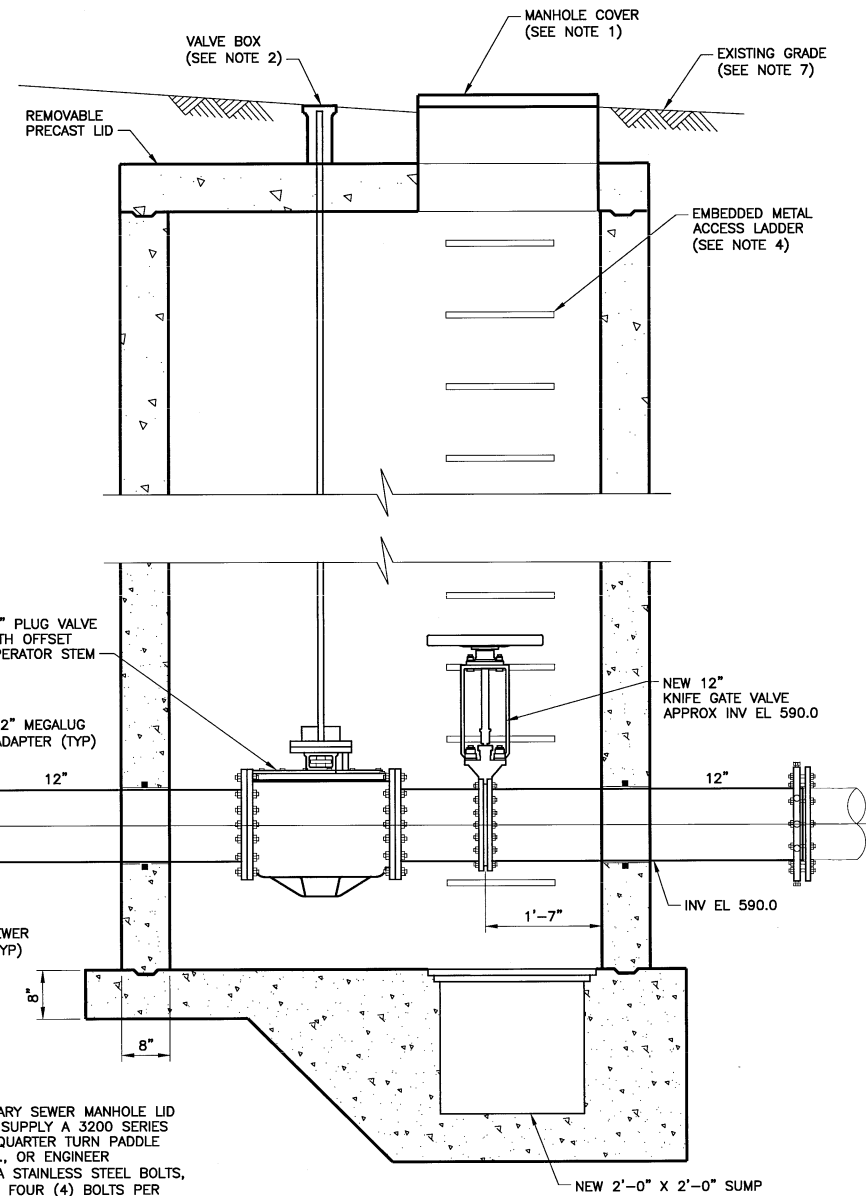
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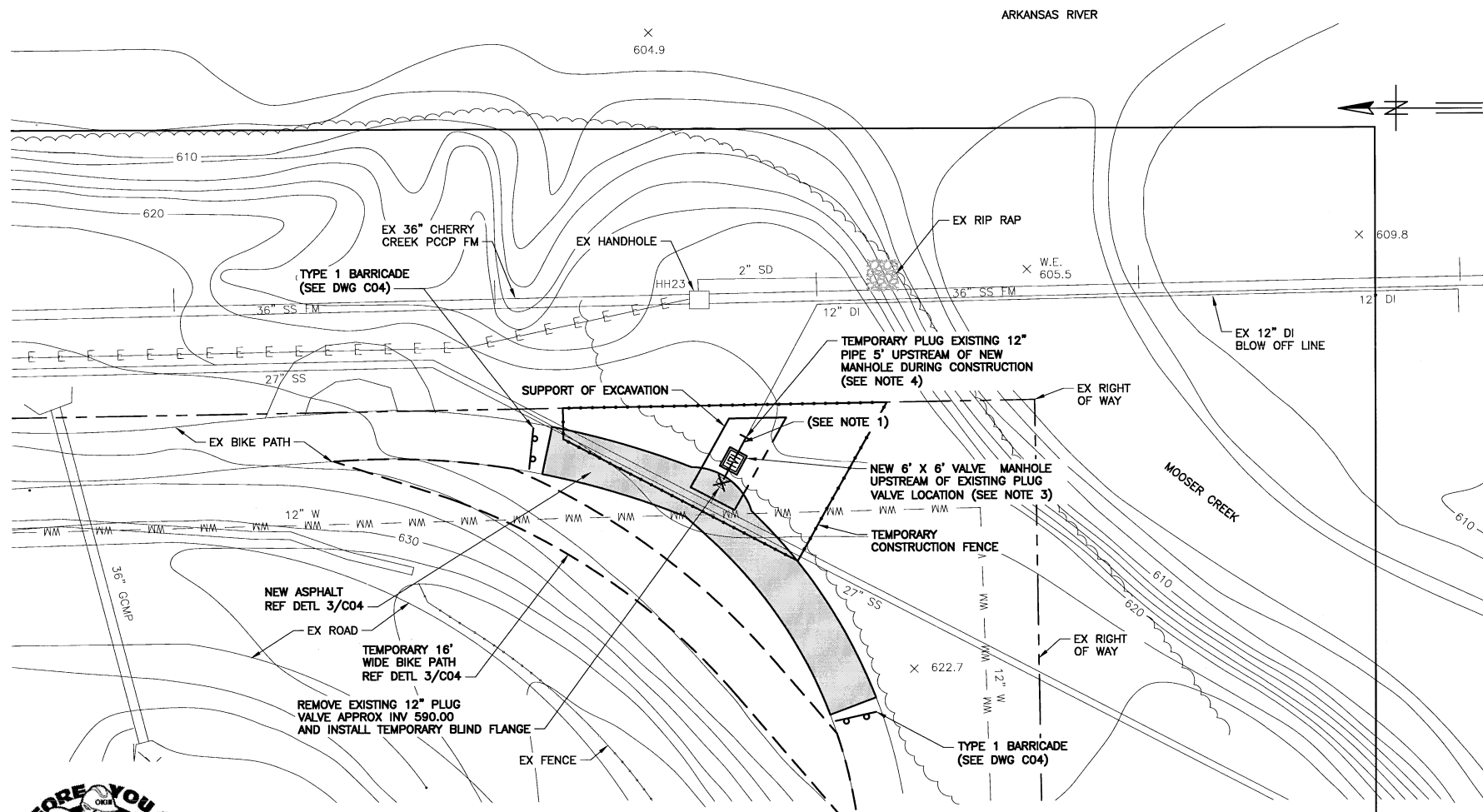
PLAN VIEW  
SCALE: 3/4" = 1'-0"



TOP VIEW  
SCALE: 3/4" = 1'-0"



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



SITE PLAN  
SCALE: 1" = 30'

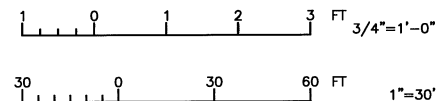
NOTES:

1. PROVIDE A 24-INCH AND 32-INCH SANITARY SEWER MANHOLE LID AND FRAME AS SHOWN. CONTRACTOR TO SUPPLY A 3200 SERIES COMPOSITE UTILITY ACCESS COVER WITH QUARTER TURN PADDLE LOCKS MANUFACTURED BY EJ GROUP INC., OR ENGINEER APPROVED EQUIVALENT. PROVIDE 3/8" DIA STAINLESS STEEL BOLTS, NUTS, AND WASHERS WITH A MINIMUM OF FOUR (4) BOLTS PER FRAME AND A BITUMASTIC SEAL AROUND THE FRAME. CONTRACTOR TO PROVIDE SUBMITTAL INFORMATION BASED ON SPECIFICATION SECTION 01 33 00.
2. PROVIDE VALVE BOX PER CITY OF TULSA STANDARD DETAIL 313, EXCEPT FOR THE WORDS "SANITARY" SHOULD BE USED ON THE VALVE COVER.
3. LOCATE NEW VALVE MANHOLE A MINIMUM OF 5 FEET FROM THE EXISTING BIKE TRAIL.
4. PROVIDE HOT TAPPING SERVICES TO PREVENT DRAINING OR OPERATIONAL DISRUPTION TO THE 36-INCH CHERRY CREEK FORCE MAIN MEETING THE REQUIREMENTS OF SPECIFICATION SECTION 40 05 22.
5. ACCESS LADDER SHALL BE MADE OF STAINLESS STEEL AS SPECIFIED IN SPECIFICATION SECTION 08 31 00.
6. ALL GRATING SHALL BE FIBER REINFORCED POLYMER (FRP) AS SPECIFIED IN SPECIFICATION SECTION 06 82 00.
7. APPROXIMATE ROCK ELEVATION AT 595.00±. CONTRACTOR TO FIELD VERIFY.
8. CONTRACTOR TO EXTEND SUPPORT OF EXCAVATION 3 FEET ABOVE GRADE ALONG THE NORTH, SOUTH, AND WEST SIDES FOR ADDITIONAL PROTECTION TO BIKE PATH USERS.
9. CONTROL POINT 2016-29 HAVING A N COORDINATE OF 402237.795 AND E COORDINATE OF 2561331.440 HAS A VERTICAL ELEVATION OF 637.25 (NAVD 88) AND CAN BE LOCATED EAST OF THE PARKING LOT ENTRANCE BEHIND THE SOUTH CURB AT THE SSWWTP ADMINISTRATION BUILDING.



MECHANICAL	
NEW CHERRY CREEK FM 12" DRAIN VALVE MH	
PROJECT NO. ES 2009-07	
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION - PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS	
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT	
PLANS AND ESTIMATES PREPARED BY:	GREELEY AND HANSEN 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103

REVISION	BY	DATE	PLAN SCALE:	DRAWN	RM	APPROVED:
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				SURVEY		
			PROFILE SCALE:	PROJ. MGR.	TG	
			HORIZONTAL:	LEAD ENGR.	AS 5/22	
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				DESIGN MANAGER	AS 5/22	
FILE: 0141C2M10			DRAWING: M10			DATE: MAY 10 2022
ATLAS PAGE NO: -						SHEET 17 OF 33 SHEETS



DESIGN PARAMETERS

1.	BUILDING CODE	2018 IBC
	LOCAL AMENDMENTS	NONE
	RISK CATEGORY	III
2.	LIVE LOADS	
	A. FLOORS	150 PSF
	B. PRECAST REMOVABLE SLAB	HS 20.44
	C. STAIRS	100 PSF
3.	ROOF SNOW LOAD	
	A. GROUND SNOW LOAD, Pg	10 PSF
	B. FLAT ROOF SNOW LOAD, Pf	11 PSF
	C. SNOW EXPOSURE CATEGORY, Ce	1.0
	D. SNOW LOAD IMPORTANCE FACTOR, I	1.1
	E. THERMAL FACTOR, Ct	1.0
4.	WIND DESIGN DATA	
	A. BASIC WIND SPEED (3 SECOND GUST), V <sub>BLT</sub>	116 MPH
	B. BASIC WIND SPEED (3 SECOND GUST), V <sub>ASD</sub>	90 MPH
	C. WIND EXPOSURE CATEGORY	C
5.	EARTHQUAKE DESIGN CRITERIA	
	A. SEISMIC IMPORTANCE FACTOR, I <sub>e</sub>	1.25
	B. MAPPED SPECTRAL RESPONSE ACCELERATION, S <sub>s</sub>	13.2%
	C. MAPPED SPECTRAL RESPONSE ACCELERATION, S <sub>1</sub>	7.2%
	D. SITE CLASS	D
	E. SPECTRAL RESPONSE COEFFICIENT, S <sub>ds</sub>	0.141
	F. SPECTRAL RESPONSE COEFFICIENT, S <sub>d1</sub>	0.115
	G. SEISMIC DESIGN CATEGORY	B
6.	LATERAL EARTH PRESSURE	
	A. NON-SATURATED	70 PSF/FT
	B. SATURATED	100 PSF/FT
	C. SURCHARGE	125 PSF

GENERAL NOTES

GENERAL

1	STRUCTURAL ELEMENTS ARE NON-SELF SUPPORTING AND REQUIRE INTERACTION WITH OTHER ELEMENTS FOR STABILITY AND RESISTANCE TO LATERAL FORCES. FRAMING AND WALLS SHALL BE TEMPORARILY BRACED BY THE CONTRACTOR UNTIL PERMANENT BRACING, FLOOR AND ROOF DECKS, AND WALLS HAVE BEEN INSTALLED AND CONNECTIONS BETWEEN THESE ELEMENTS HAVE BEEN MADE.
2	THE SPECIFICATIONS AND STRUCTURAL DRAWINGS REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE THE METHOD OF CONSTRUCTION, UNLESS NOTED OTHERWISE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND OPERATION OF CONSTRUCTION AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO.
3	THE SIZE AND LOCATION OF EQUIPMENT PADS AND PENETRATIONS THROUGH THE STRUCTURE FOR MECHANICAL, ELECTRICAL, AND PLUMBING WORK SHALL BE VERIFIED BY THE CONTRACTOR. PENETRATIONS SHALL BE SUBJECT TO APPROVAL BY THE STRUCTURAL ENGINEER. REFER TO MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR OPENING LOCATIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS.
4	USE ONLY DIMENSIONS INDICATED ON THE DRAWINGS. DO NOT SCALE DRAWINGS OR USE ANY DIMENSIONS TAKEN FROM ELECTRONIC DRAWING FILES.
5	ASSUME EQUAL SPACING IF NOT INDICATED ON DRAWINGS.
6	THE SPECIFICATIONS ARE AN INTEGRAL PART OF THE CONTRACT DOCUMENTS AND SHALL BE USED IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS. WHERE REQUIREMENTS INDICATED ON THE STRUCTURAL DRAWINGS DIFFER FROM THE SPECIFICATIONS, NOTIFY THE STRUCTURAL ENGINEER.
7	ARCHITECTURAL, MECHANICAL AND ELECTRICAL COMPONENTS AND SYSTEMS SHALL BE DESIGNED AND CONSTRUCTED TO RESIST SEISMIC FORCES AS DETERMINED IN CHAPTER 13 OF ASCE 7.

FOUNDATIONS

1	FOOTING DESIGNS ARE BASED ON AN ASSUMED STABLE, NON-EXPANSIVE SOIL WITH AN ALLOWABLE BEARING PRESSURE OF 2500 PSF. THE OWNER SHALL HIRE A REGISTERED GEOTECHNICAL ENGINEER LICENSED IN THE STATE THE PROJECT IS LOCATED TO DETERMINE THAT IT MEETS THE MINIMUM CRITERIA.
2	THE SOILS SUPPORTING THE FOUNDATION AND SLAB SHALL BE PREPARED AND COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS FROM THE GEOTECHNICAL ENGINEER AND VERIFY CONFORMANCE OF EXCAVATION, SCARIFYING, PROOF-ROLLING, FILL CLASSIFICATION, MAXIMUM PARTICLE SIZE, LIQUID LIMIT, PLASTICITY INDEX AND PLACEMENT PROCEDURES.
3	A QUALIFIED AND REGISTERED GEOTECHNICAL ENGINEER, LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED AND WORKING FOR THE TESTING LABORATORY, SHALL DETERMINE CONFORMANCE OF THE FOUNDATION BEARING STRATA WITH THE FOUNDATION DESIGN CRITERIA ABOVE, AND ALL OTHER CONTRACT DOCUMENTS. TESTING LABORATORY SHALL NOTIFY CONTRACTOR, ARCHITECT AND CONSULTING ENGINEER OF ANY CONDITIONS NOT IN ACCORDANCE WITH FOUNDATION DESIGN CRITERIA OR CONTRACT DOCUMENTS.
4	THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT QUANTITIES OF CUT AND FILL FOR ESTIMATING AND CONSTRUCTION. SUBGRADE SHALL BE PREPARED AS NOTED IN THE STRUCTURAL EARTH MOVING SPECIFICATION.
5	USE ONLY STRUCTURAL FILL MATERIAL AS NOTED IN THE STRUCTURAL EARTH MOVING SPECIFICATION FOR FILL BELOW BUILDING AND FIVE FEET BEYOND THE EDGES OF THE BUILDING.
6	EXTERIOR FOOTINGS SHALL BEAR AT OR BELOW MINIMUM BEARING DEPTH. MINIMUM BEARING DEPTH IS 24 INCHES BELOW ADJACENT FINISHED GRADE. THICKENED SLAB EDGE FOR STOOPS, CANOPIES, ETC. SHALL EXTEND 24 INCHES BELOW GRADE UNLESS NOTED OTHERWISE.
7	FOUNDATION WALLS SHALL HAVE ADEQUATE TEMPORARY BRACING INSTALLED BY THE CONTRACTOR BEFORE BACKFILL IS PLACED AGAINST THEM. TEMPORARY BRACING SHALL NOT BE REMOVED UNTIL WALL IS PERMANENTLY BRACED.
8	FOOTINGS SHALL BE POURED AGAINST UNDISTURBED SOIL, UNLESS NOTED OTHERWISE.
9.	AVOID DAMAGE TO UNDERGROUND UTILITIES SUCH AS WATER MAINS, SANITARY SEWERS, BURIED CABLES, ETC., WHICH MIGHT EXTEND ACROSS OR ADJOIN SITE.

CONCRETE

1	MINIMUM COMPRESSIVE STRENGTH (f'c) AT THE END OF 28 DAYS SHALL BE AS FOLLOWS: A. ALL STRUCTURAL CONCRETE 4500 PSI MINIMUM MODULUS OF RUPTURE (fr) AT THE END OF 28 DAYS FOR 6" SLAB-ON-GRADE SHALL BE 550PSI. REFER TO SPECIFICATIONS FOR MAXIMUM WATER/CEMENT RATIOS, MINIMUM CEMENT CONTENTS AND OTHER MIX DESIGN REQUIREMENTS. CONCRETE SHALL BE NORMAL WEIGHT (145 PCF), UNLESS NOTED OTHERWISE.
2	EXTERIOR CONCRETE AND CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL BE AIR-ENTRAINED. REFER TO SPECIFICATIONS FOR AIR CONTENT.
3	MATERIALS OR ADMIXTURES SHALL NOT CONTAIN ANY CALCIUM CHLORIDE.
4	REINFORCING STEEL SHALL MEET THE FOLLOWING: A. DEFORMED BARS ASTM A615, GRADE 60 B. WELDABLE DEFORMED BARS ASTM A706, GRADE 60 C. WELDED WIRE FABRIC ASTM A185 D. STEEL FIBERS ASTM A820
5	WHERE DOWELS ARE INDICATED BUT NOT SIZED, PROVIDE DOWELS THAT MATCH SIZE AND LOCATION OF MAIN REINFORCING STEEL AND LAP SPLICE WITH THE MAIN REINFORCING STEEL. REINFORCING BARS SHALL BE SPLICED AS NOTED IN THE REINFORCING LAP SCHEDULE.
6	REFER TO ACI 318 LATEST EDITION FOR CONCRETE COVER, ACI 315 LATEST EDITION FOR DETAILING PRACTICES AND FABRICATION, AND ACI 301 LATEST EDITION FOR STANDARD PRACTICE FOR MIXING AND PLACING CONCRETE.
7	"C.J." INDICATES SAW CUT CONTRACTION JOINT OR DOWELED CONSTRUCTION JOINT IN SLAB-ON-GRADE. REFERENCE SPECIFICATIONS FOR ACCEPTED SAW CUT METHODS. SLAB POURS SHALL BE SEPARATED BY A DOWELED CONSTRUCTION JOINT. CONTRACTION/CONSTRUCTION JOINTS SHALL BE LOCATED AS SHOWN ON PLANS OR AS DIRECTED BY THE STRUCTURAL ENGINEER.
8	PROVIDE CORNER BARS THAT MATCH AND LAP CONTINUOUS REINFORCEMENT SIZE AND QUANTITY AT INTERSECTIONS AND CORNERS OF WALLS AND FOUNDATIONS.
9	PROVIDE #3 Z-BAR SPACERS AT 24 INCHES ON CENTER EACH WAY FOR CONCRETE WALLS HAVING REINFORCING STEEL IN BOTH FACES.
10	ANCHORS INSTALLED IN HARDENED CONCRETE SHALL ONLY BE USED WHERE SPECIFIED ON THE CONTRACT DRAWING. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER-OF-RECORD PRIOR TO INSTALLING POST-INSTALLED ANCHORS IN PLACE OF MISSING OR MISPLACED CAST-IN-PLACE ANCHORS. CARE SHALL BE TAKEN IN PLACING POST-INSTALLED ANCHORS TO AVOID CONFLICTS WITH EXISTING REINFORCING. HOLES SHALL BE DRILLED, DRY AND CLEANED AND ANCHORS INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED WRITTEN INSTRUCTIONS AND APPLICABLE ESR REPORT. REFERENCE DETAILS FOR ANCHOR SIZE AND EMBEDMENT. SUBSTITUTION REQUESTS FOR PRODUCTS OTHER THAN THOSE SPECIFIED ON THE CONTRACT DRAWINGS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER-OF-RECORD ALONG WITH CALCULATIONS THAT ARE SIGNED AND SEALED BY THE QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION AND LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED. THE CALCULATIONS SHALL DEMONSTRATE THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING THE PERTINENT EQUIVALENT PERFORMANCE VALUES (MINIMUM) OF THE SPECIFIED PRODUCT USING THE APPROPRIATE DESIGN PROCEDURE AND/OR STANDARD(S) AS REQUIRED BY THE BUILDING CODE. ALLOWABLE SUBSTITUTIONS FOR POST-INSTALLED ANCHORS IN CONCRETE ARE: A. HILTI HIT RE 500-SD EPOXY ADHESIVE (ICC-ES ESR-2322). B. HILTI HIT HY 150 MAX-SD ADHESIVE (ICC-ES ESR-3013). C. HILTI KWIK BOLT TZ EXPANSION ANCHOR (ICC-ES ESR-1917). D. SIMPSON STRONG-TIE SET-XP EPOXY ADHESIVE (ICC-ES ESR-2508). E. SIMPSON STRONG-TIE AT-XP ADHESIVE (APMO UES ER-263). F. SIMPSON STRONG-TIE STRONG BOLT WEDGE ANCHOR (ICC-ES ESR-1771) - INTERIOR APPLICATIONS ONLY. G. SIMPSON STRONG-TIE STRONG BOLT 2 WEDGE ANCHOR (ICC-ES ESR-3037) - EXTERIOR APPLICATIONS.

STRUCTURAL STEEL

1	STRUCTURAL STEEL SHALL MEET THE FOLLOWING MINIMUM YIELD STRESS (Fy):  YIELD ASTM SPECIFICATION A W, WT SHAPES: 50 KSI A992 B BARS, PLATES, CHANNELS, ANGLES: 36 KSI A36 C SQUARE, RECTANGULAR HSS: 46 KSI A500, GRADE B D ROUND HSS: 42 KSI A500, GRADE B E STRUCTURAL STEEL PIPE: 36 KSI A53, GRADE B F ANCHOR RODS: 36 KSI F1554 G ALL-THREAD RODS: 36 KSI A36 H HEADED STUD ANCHORS: 65 KSI TENSILE A108, GRADES 1010-1020 STRESS
2	BOLTS FOR STEEL BEAM AND COLUMN CONNECTIONS SHALL BE 3/4-INCH DIAMETER ASTM A325-N HIGH-STRENGTH BOLTS UNLESS NOTED OTHERWISE. ALL BOLTED CONNECTIONS ARE BEARING TYPE UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE TIGHTENED SNUG TIGHT UNLESS NOTED OTHERWISE.
3	WELDING SHALL MEET ANSI / AWS D1.1, STRUCTURAL WELDING CODE LATEST REVISION. ELECTRODES SHALL BE 70 KSI, LOW HYDROGEN
4	SOME OF THE EXISTING PIPES ON ADJACENT PIPE RACKS CONTAIN HIGHLY FLAMMABLE GASSES. CONTRACTOR SHALL TAKE APPROPRIATE PRECAUTIONS DURING ALL PHASES OF THIS CONSTRUCTION, ESPECIALLY WHEN WELDING OR USING OTHER IGNITION SOURCES NEAR THE PIPING.
5	PROVIDE DOUBLE NUTS AND DOUBLE WASHERS FOR STEEL COLUMN ANCHOR BOLTS TO ALLOW FOR ADJUSTMENT IN BASE PLATE ELEVATION. PROVIDE 1 1/2 INCH NON-SHRINK GROUT UNDER BASE PLATE AFTER ERECTION. USE 2 1/2 INCHES NON-SHRINK GROUT WHEN COLUMN ANCHOR BOLTS ARE 1 1/4 INCH DIAMETER OR LARGER. NON-SHRINK GROUT SHALL BE NON-METALLIC WITH A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI AT 28 DAYS.
6	ALL CONNECTIONS, NOT FULLY DETAILED ON THE STRUCTURAL DRAWINGS SHALL BE DESIGNED AND DETAILED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED, EMPLOYED OR RETAINED BY THE STEEL FABRICATOR. THE DESIGN AND DETAILING SHALL COMPLY WITH ALL APPLICABLE CODES AND SPECIFICATION SECTIONS.
7	THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCLUDING THE COSTS FOR ALL MISCELLANEOUS STEEL IN THEIR BID REGARDLESS OF WHETHER THOSE ITEMS ARE INDICATED ON THE STRUCTURAL DRAWINGS. THESE COSTS SHALL INCLUDE BUT ARE NOT LIMITED TO MISCELLANEOUS STEEL ITEMS SHOWN ON ARCHITECTURAL, CIVIL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS.
8	ALL PAINT SHALL BE APPLIED IN ACCORDANCE WITH THE PAINT MANUFACTURER'S RECOMMENDATIONS. ALL PAINT SYSTEMS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. TOUCH UP ALL AREAS OF PAINT DAMAGED DURING TRANSPORTATION OR ERECTION.
9	WALKWAYS, PLATFORMS, GRATING, LADDERS, STAIRWAYS, STAIR TREADS, HANDRAILS & ANCHOR BOLTS SHALL BE HOT DIP GALVANIZED (TWO OUNCES) AFTER FABRICATION PER ASTM A123, ASTM A153 & ASTM A385. FIELD TOUCH UP SHALL BE DONE USING AN ORGANIC ZINC-RICH COLD GALVANIZING COMPOUND.

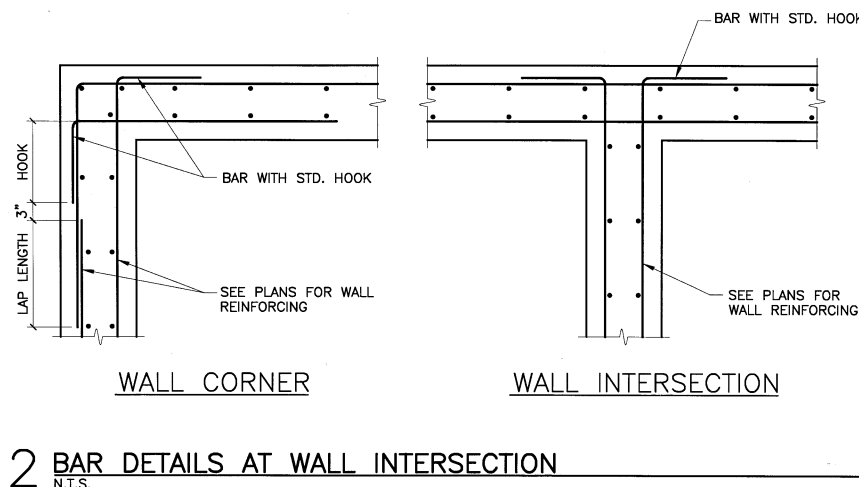
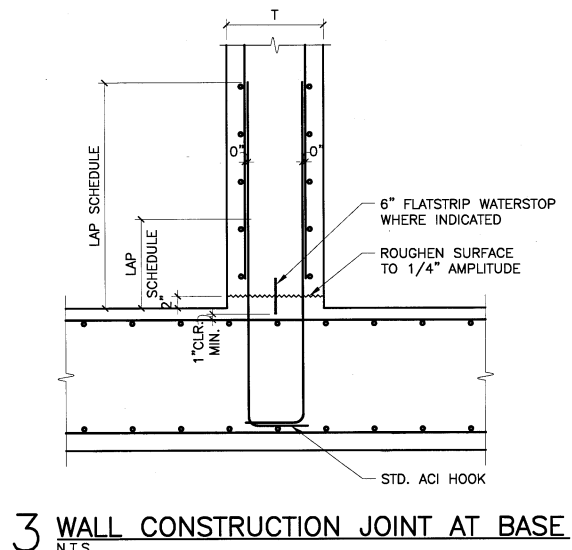
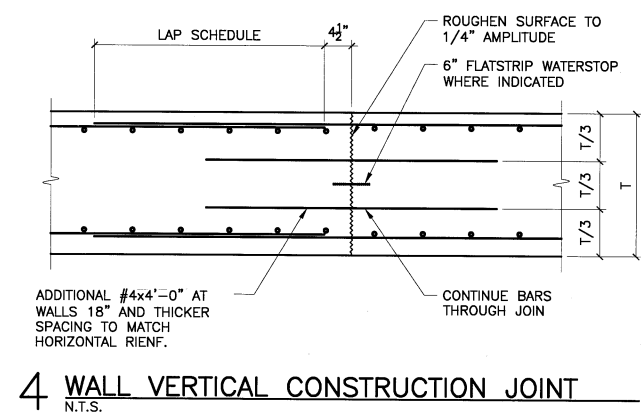
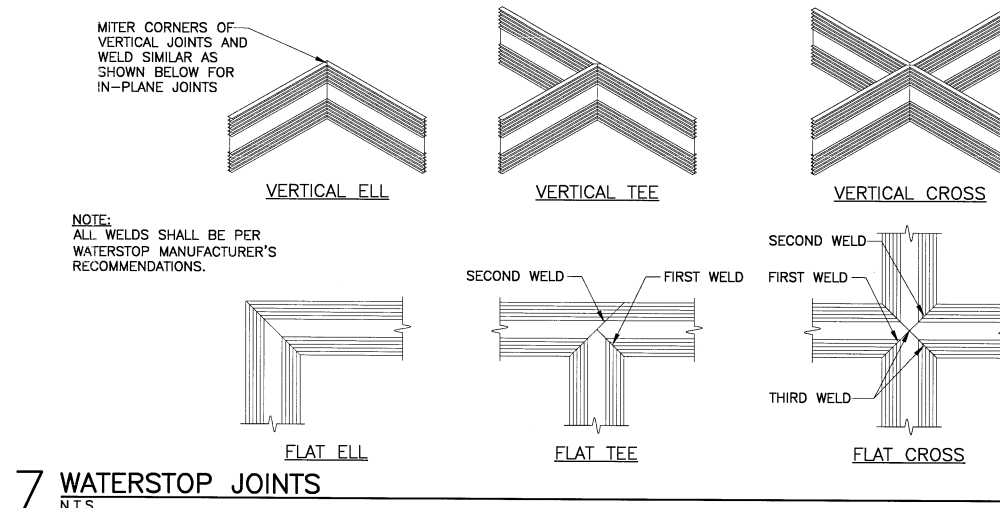
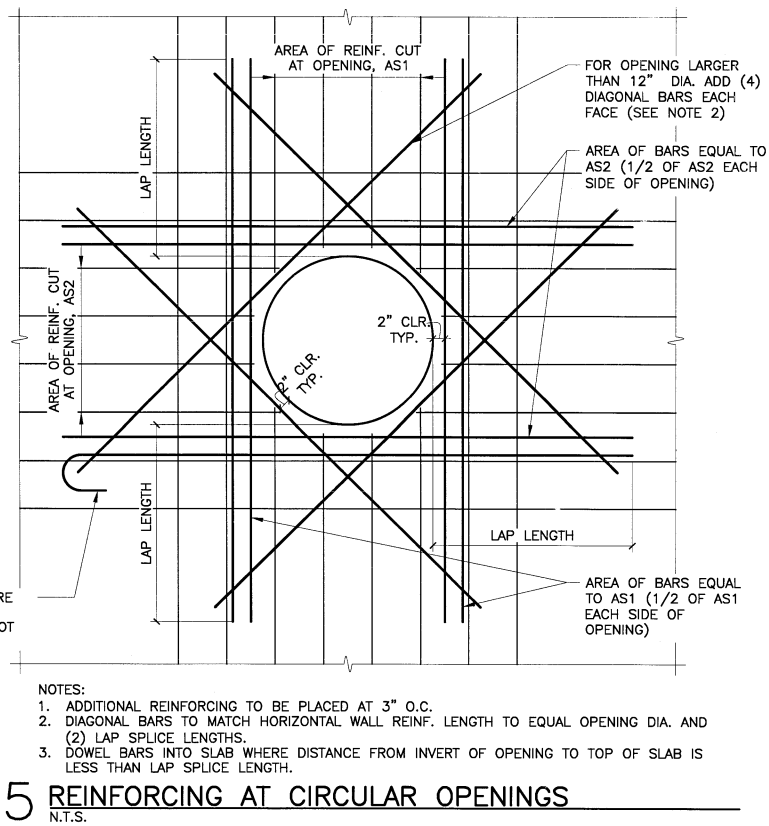
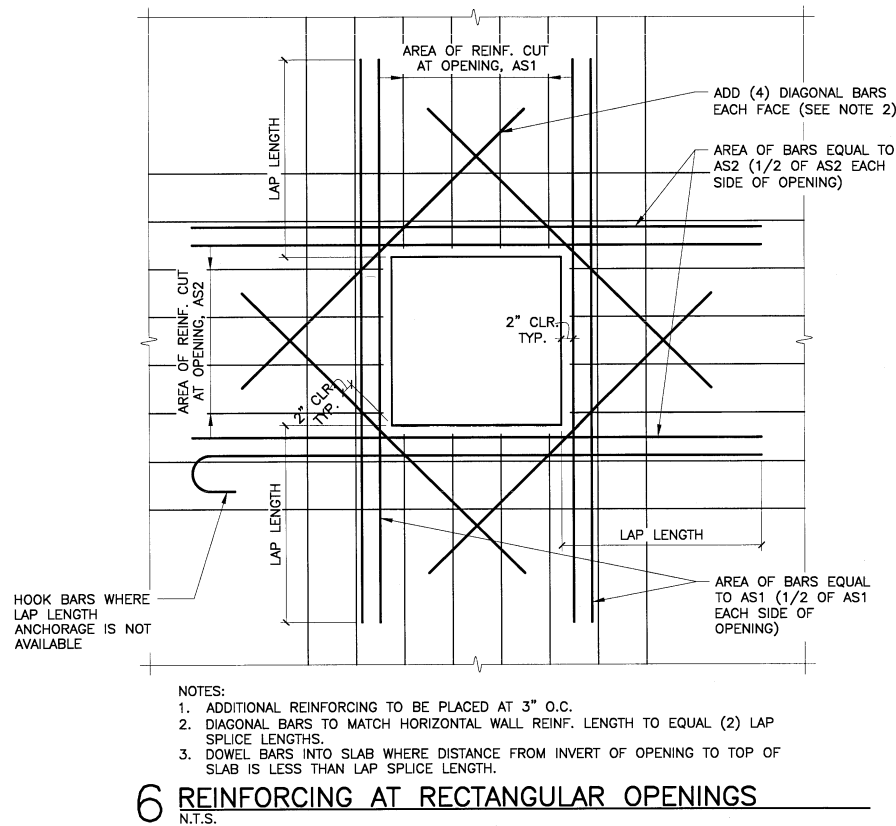
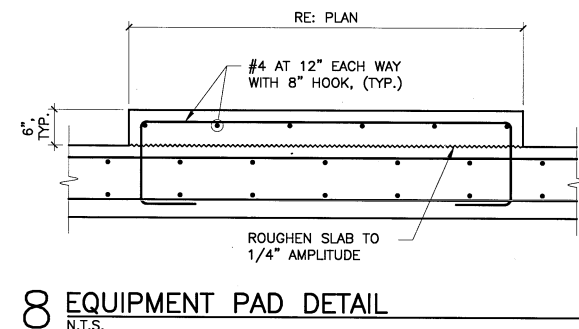
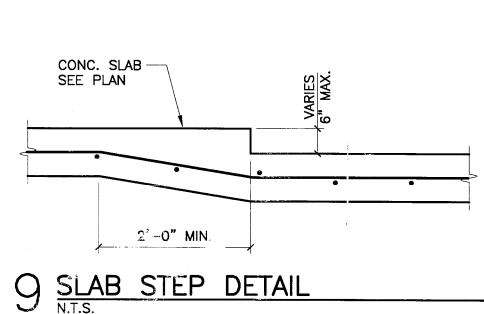
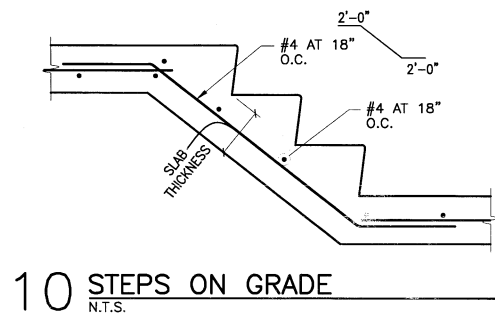
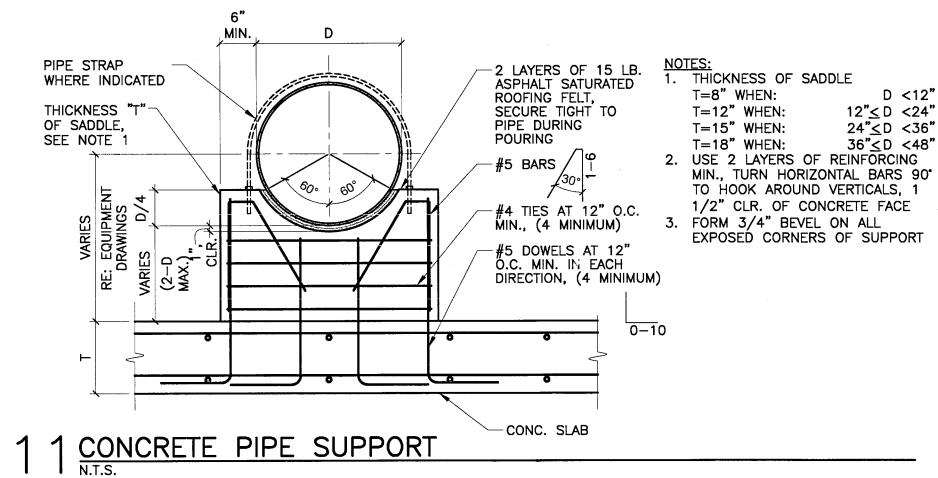
ABBREVIATIONS			
A.B.	ANCHOR BOLTS	LLV	LONG LEG VERTICAL
ACI	AMERICAN CONCRETE INSTITUTE	LONG.	LONGITUDINAL
AL.	ALANCE	L.P.	LOW POINT
BAL.	BALANCE	MAX.	MAXIMUM
B.L.	BLOCK LINTEL	M.B.M.	METAL BUILDING MANUFACTURER
BLDG.	BUILDING	MECH.	MECHANICAL
B.O.	BOTTOM OF	MFR.	MANUFACTURER
B.O.S.	BOTTOM OF STEEL	MIN.	MINIMUM
BRG.	BEARING	MISC.	MISCELLANEOUS
C.J.	CONTRACTION JOINT	NO.	NUMBER
C.L.	CENTER LINE	N.T.S.	NOT TO SCALE
CLR.	CLEAR	N.S.	NEAR SIDE
COL.	COLUMN	O.C.	ON CENTER
CONC.	CONCRETE	O.D.	OUTSIDE DIAMETER
CONST.	CONSTRUCTION	O.H.	OPPOSITE HAND
CONT.	CONTINUOUS	PCF	POUNDS PER CUBIC FOOT
D.B.A.	DEFORMED BAR ANCHOR	PLF	POUNDS PER LINEAR FOOT
DIA.	DIAMETER	PSF	POUNDS PER SQUARE FOOT
DWG.	DRAWING	PSI	POUNDS PER SQUARE INCH
E.F.	EACH FACE	QTY.	QUANTITY
E.J.	EXPANSION JOINT	RE:	REFER
ELEV.	ELEVATION	REINF.	REINFORCING
E.O.S.	EDGE OF STEEL	REQD.	REQUIRED
EQ.	EQUAL	R.O.	ROUGH OPENING
E.W.	EACH WAY	SCHED.	SCHEDULE
EXIST.	EXISTING	S.D.S.	SELF-DRILLING SCREWS
FDN.	FOUNDATION	SIM.	SIMILAR
F.F.E.	FINISHED FLOOR ELEV.	S.O.G.	SLAB ON GRADE
F.S.	FAR SIDE	SPECS.	SPECIFICATIONS
FTG.	FOOTING	STD.	STANDARD
GA.	GAGE	STL.	STEEL
GALV.	GALVANIZED	T&B	TOP AND BOTTOM
G.B.	GRADE BEAM	T.O.C.	TOP OF CONCRETE
HORIZ.	HORIZONTAL	T.O.F.	TOP OF FOOTING
H.P.	HIGH POINT	T.O.P.	TOP OF PIER
H.S.A.	HEADED STUD ANCHOR	T.O.S.	TOP OF STEEL
IBC	INTERNATIONAL BUILDING CODE	TRANS.	TRANSVERSE
INFO.	INFORMATION	TYP.	TYPICAL
JT.	JOINT	U.N.O.	UNLESS NOTED OTHERWISE
KSI	KIPS PER SQUARE INCH	VERT.	VERTICAL
LBS.	POUNDS	W.P.	WORK POINT
LLH	LONG LEG HORIZONTAL	WT.	WEIGHT

IBC 2018 REQUIRED SPECIAL INSPECTIONS			
CONCRETE CONSTRUCTION (IBC TABLE 1705.3)		CONTINUOUS	PERIODIC
1.	INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT.	----	X
2.	INSPECTION OF REINFORCING BAR WELDING IN ACCORDANCE WITH TABLE 1705.3 ITEM 2.	X	----
3.	INSPECT ANCHORS CAST IN CONCRETE.	----	X
4.	INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS.	X	----
5.	VERIFY USE OF REQUIRED DESIGN MIX.	----	X
6.	PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	----
7.	INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	----
8.	VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	----	X
9.	INSPECT PRESTRESSED CONCRETE FOR:		
A	APPLICATION OF PRESTRESSING FORCES; AND	X	----
B	GROUTING OF BONDED PRESTRESSING TENDONS.	X	----
10.	INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.	----	X
11.	VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	----	X
12.	INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	----	X
SOILS (IBC TABLE 1705.6)		CONTINUOUS	PERIODIC
1.	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	----	X
2.	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	----	X
3	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	----	X
4.	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	----
5.	PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	----	X
*	CONTINUOUS SPECIAL INSPECTION: SPECIAL INSPECTION BY THE SPECIAL INSPECTOR WHO IS PRESENT WHEN AND WHERE THE WORK TO BE INSPECTED IS BEING PERFORMED.		
*	PERIODIC SPECIAL INSPECTION: SPECIAL INSPECTION BY THE SPECIAL INSPECTOR WHO IS INTERMITTENTLY PRESENT WHERE THE WORK TO BE INSPECTED HAS BEEN OR IS BEING PERFORMED.		



OKCA #1460  
Exp. Date: 06/30/23

STRUCTURAL GENERAL NOTES			
PROJECT NO. ES 2009-07			
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION - PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS			
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT			
PLANS AND ESTIMATES PREPARED BY:		wallace design collective	
PLAN SCALE:	DRAWN	LA	11/21
NOT TO SCALE	DESIGNED	KR	11/21
	SURVEY		
PROFILE SCALE	PROJ. MGR.		
HORIZONTAL:	LEAD ENGR.	AM 5/6/22	
	FIELD MGR.	Pin 5/8/22	
VERTICAL:	RECOMMENDED	HAS 5-22	
	DESIGN MANAGER		
FILE: S01.DWG	DRAWING: S01	APPROVED:  DATE: 5/11/2022	
ATLAS PAGE NO:	SHEET 18 OF 33		



**CONCRETE REINFORCING LAP SCHEDULE**

BAR SIZE	LAP LENGTH (F <sub>c</sub> =4500psi)	
	TOP BARS (NOTE 1)	OTHER
#3	18"	15"
#4	24"	18"
#5	30"	24"
#6	36"	28"
#7	42"	33"
#8	48"	38"
#9	60"	46"
#10	74"	58"

NOTES:  
1. "TOP BARS" ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF FRESH CONCRETE CAST BELOW THE SPLICE.  
2. MINIMUM CLEAR COVER = 2".  
3. MINIMUM BAR SPACING = 6".

**1 REINFORCING LAP SCHEDULE**  
N.T.S.

OKCA #1480  
Exp. Date: 06/30/23

**STRUCTURAL TYPICAL DETAILS**

PROJECT NO. ES 2009-07

EAST 53RD STREET AND RIVERSIDE DRIVE:  
CHERRY CREEK LIFT STATION - PUMP  
RESTORATION AND FORCE MAIN IMPROVEMENTS

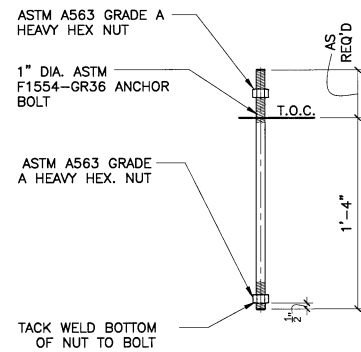
CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: *Wallace design collective*

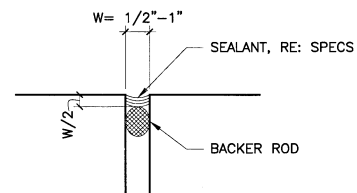
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			VERTICAL:	FIELD MGR.	5/22		
				RECOMMENDED	5/22		
				DESIGN MANAGER			

FILE: S02.DWG DRAWING: S02  
ATLAS PAGE NO: SHEET 19 OF 33

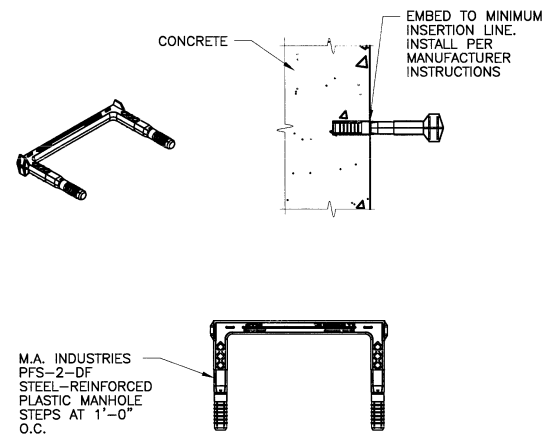




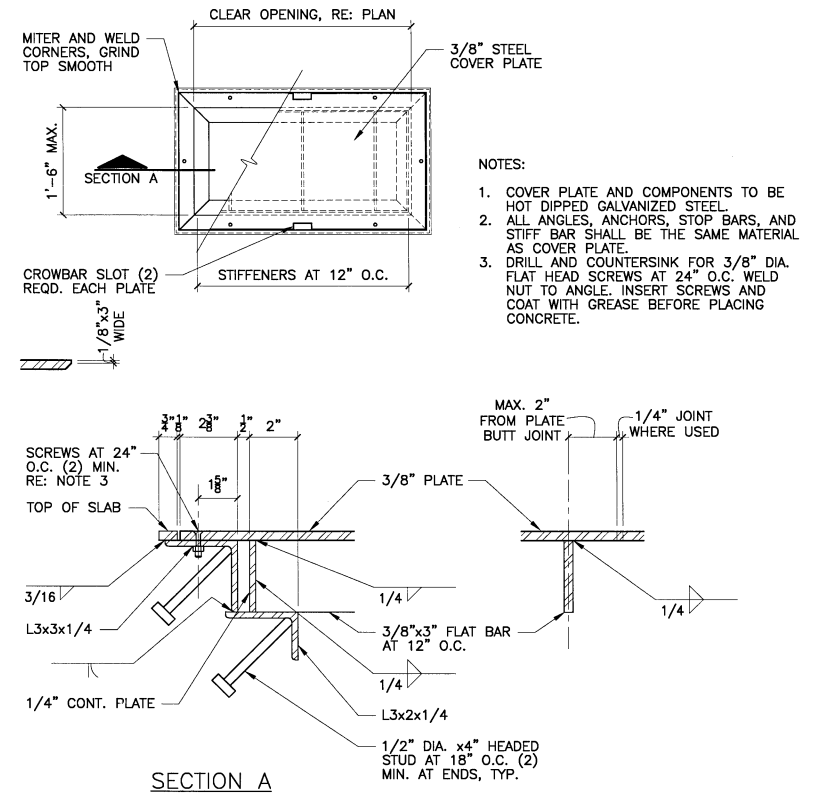
7 ANCHOR BOLT DETAIL  
N.T.S.



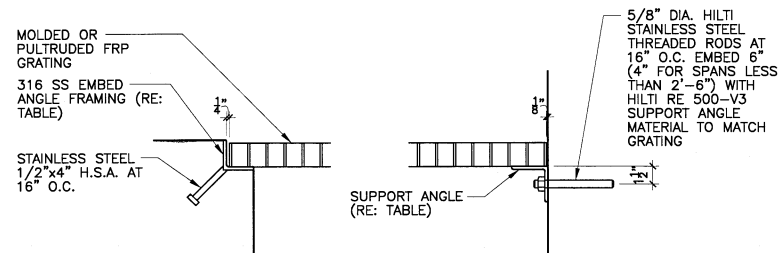
6 SEALANT DETAIL  
3/4" = 1'-0"



5 MANHOLE STEP DETAIL  
1 1/2" = 1'-0"



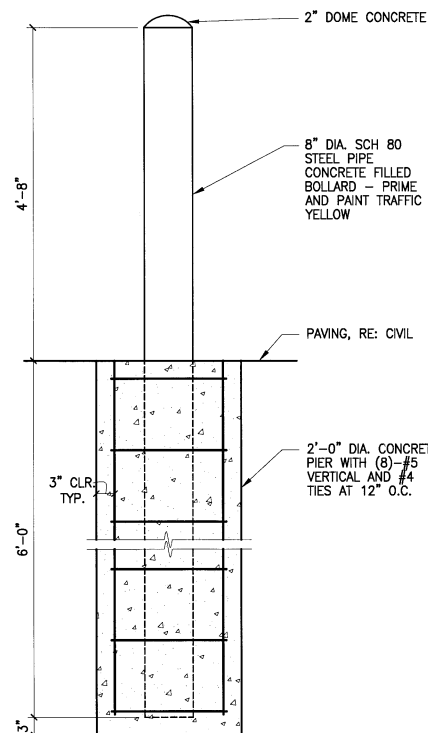
4 STEEL COVER PLATE DETAILS  
3/4" = 1'-0"



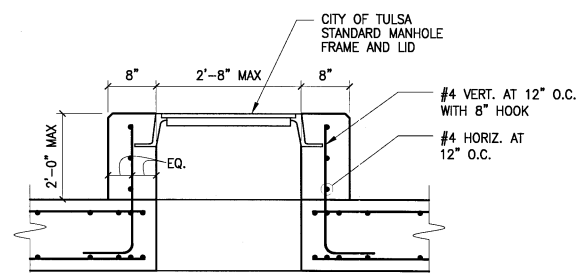
GRATING TABLE				
MAXIMUM SPAN	GRATING DEPTH	GRATING TYPE	EMBED ANGLE	SUPPORT ANGLE
2'-0"	1 1/2"	MOLDED 1 1/2" SQ.	L1 3/4x1 3/4x1/4	L3x3x1/4
2'-6"	2"	MOLDED 2" SQ.	L2 1/2x2 1/2x1/2	L3x3x1/4
4'-0"	1 1/2"x0.6"	PULTRUDED I-BAR	L1 3/4x1 3/4x1/4	L3x3x1/4

- NOTES:
- GRATING SHOWN ARE FOR FOOT TRAFFIC AND LIGHT VEHICULAR TRAFFIC ONLY (WHEEL LOAD = 2,000 MAX.)
  - BAND ALL EDGES WITH 3/16x DEPTH OF BEARING BARS.
  - FOR PULTRUDED I-BAR GRATING, THE BEARING BAR WIDTH IS PROVIDED FOR THE I-BAR FLANGE

3 GRATING ANGLE FRAMING DETAIL  
1 1/2" = 1'-0"



2 BOLLARD DETAIL  
3/4" = 1'-0"



1 MANHOLE RISER DETAIL  
N.T.S.



5/5/2022 OKCA #1460  
Exp. Date: 06/30/23

STRUCTURAL  
TYPICAL DETAILS

PROJECT NO. ES 2009-07

EAST 53RD STREET AND RIVERSIDE DRIVE:  
CHERRY CREEK LIFT STATION - PUMP  
RESTORATION AND FORCE MAIN IMPROVEMENTS

CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

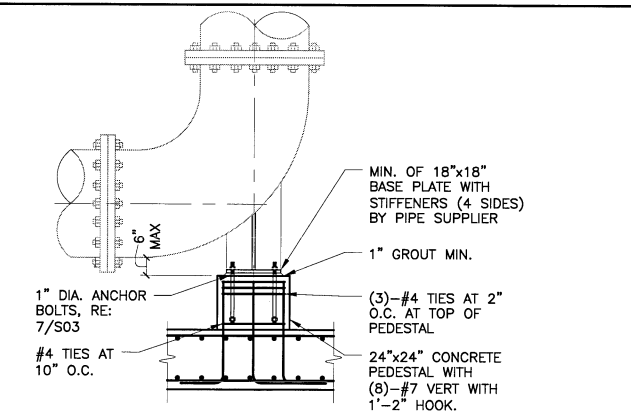
PLANS AND ESTIMATES PREPARED BY:

wallace design collective

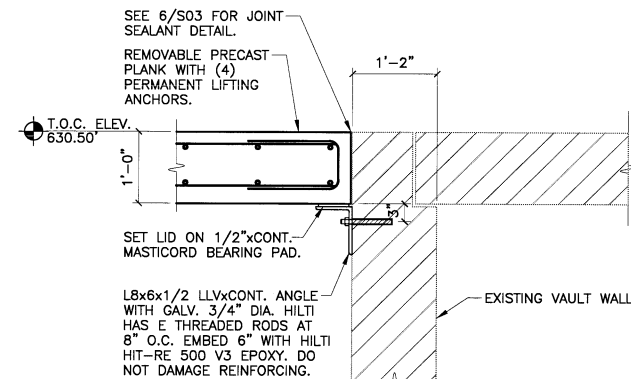
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				FIELD MGR.	7/24/22		
			VERTICAL:	RECOMMENDED	HAS 5-22		
				DESIGN MANAGER			
			FILE: S03.DWG	DRAWING: S03			
			ATLAS PAGE NO:				

MAY 2022

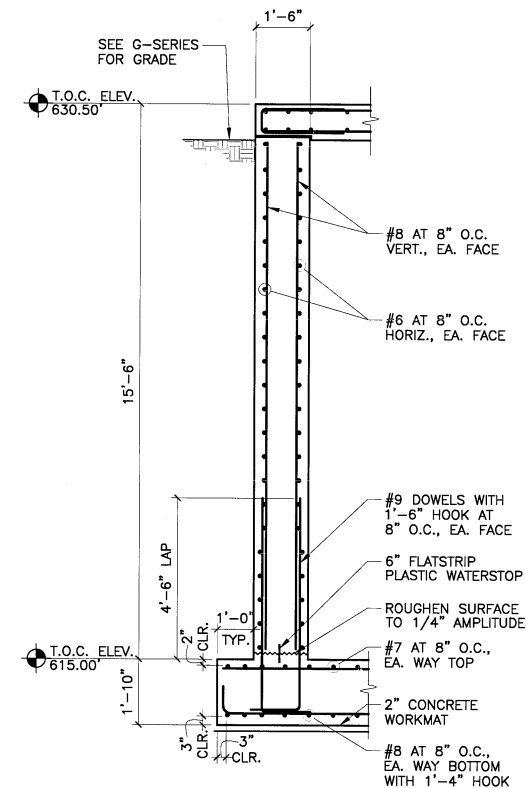
SHEET 20 OF 33



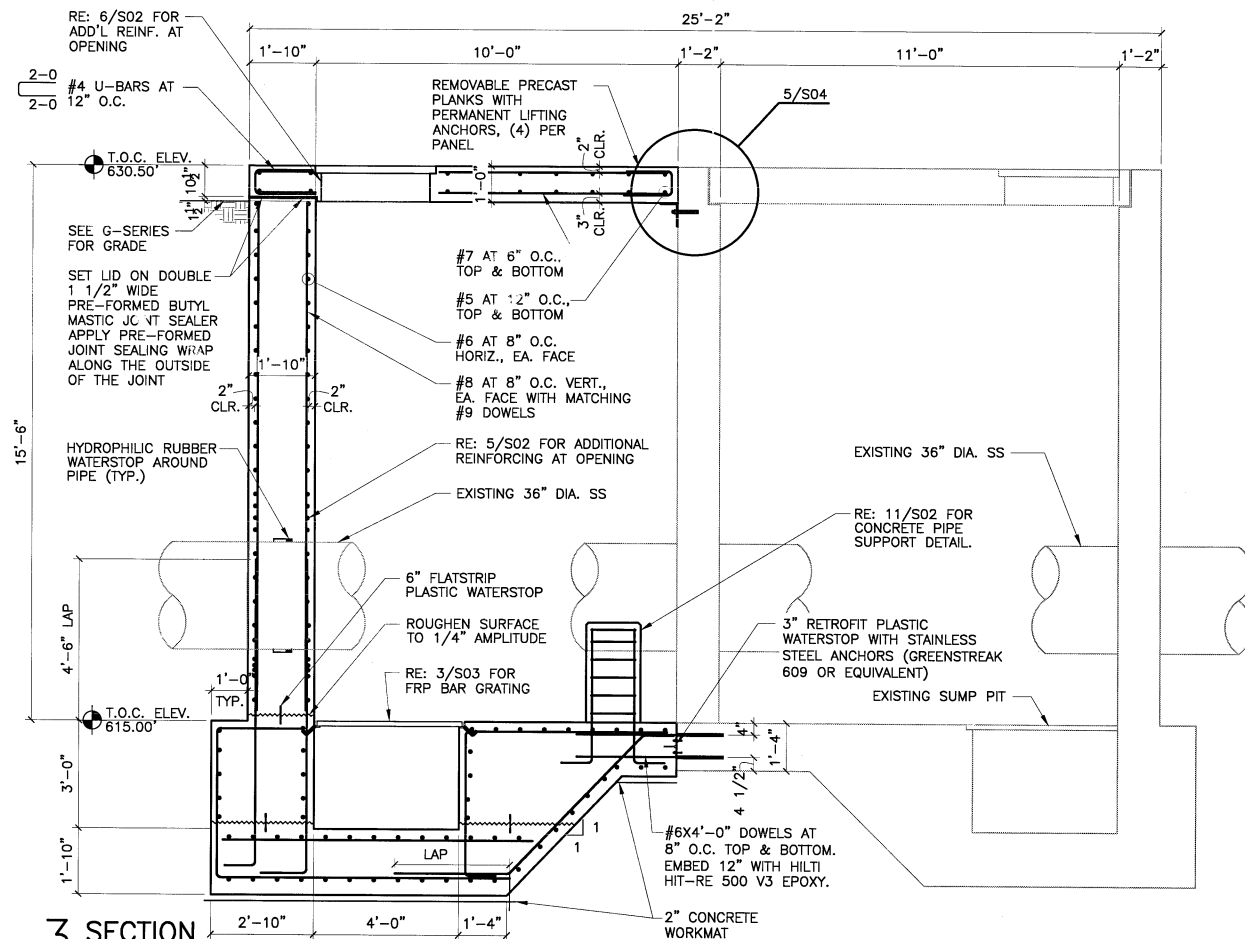
**6 ELBOW SUPPORT DETAIL**  
3/8" = 1'-0"



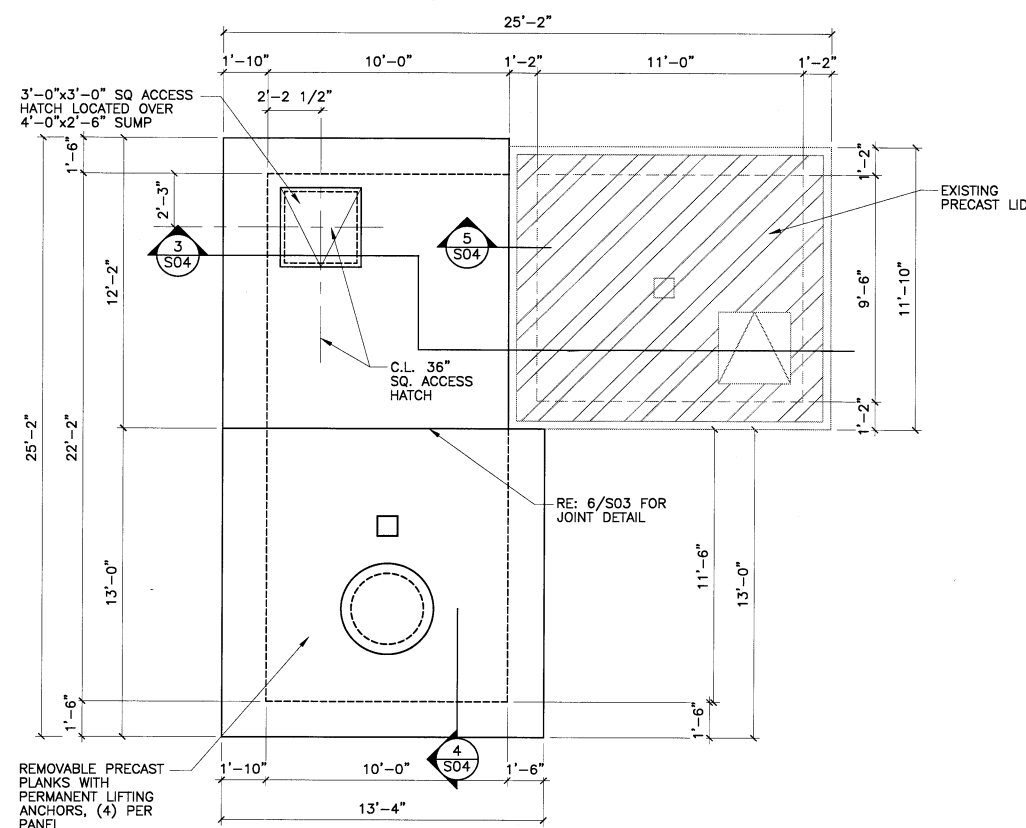
**5 PRECAST BEARING AT EXISTING WALL**  
3/8" = 1'-0"



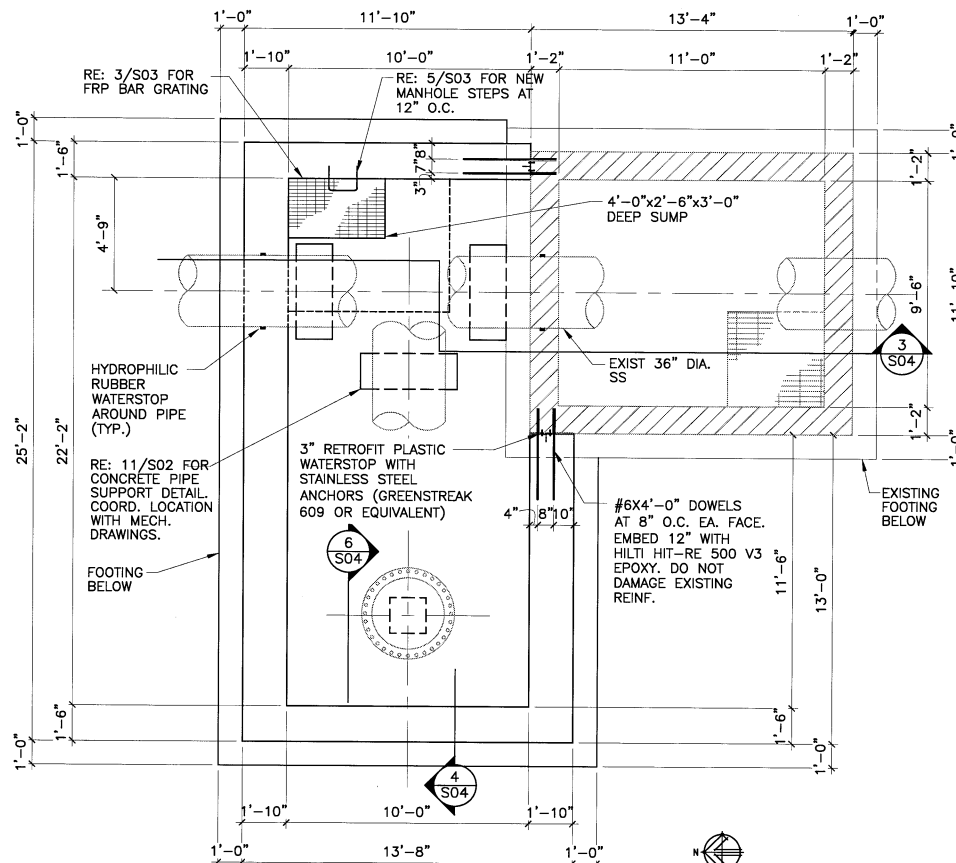
**4 SECTION**  
3/8" = 1'-0"



**3 SECTION**  
3/8" = 1'-0"



**2 TOP PLAN**  
1/4" = 1'-0"



**1 SECTIONAL PLAN**  
1/4" = 1'-0"

NOTE:  
DURING EXCAVATION AND CONSTRUCTION OF THE JUNCTION BOX EXPANSION, THE EXISTING STRUCTURE WILL REQUIRE TEMPORARY BRACING UNTIL ALL CONSTRUCTION IS COMPLETE AND THE BACKFILL IS IN PLACE.

**NOTES:**

- ALL INTERIOR WALL SURFACES AND UNDER TOP SLAB SHALL HAVE CHEMICAL RESISTANT EPOXY COATING SYSTEM APPLIED PER SPECIFICATIONS.
- BACKFILL SHALL NOT BE PLACED AGAINST WALLS UNTIL ALL CONCRETE HAS REACHED IT'S DESIGN STRENGTH.
- FOR ADDITIONAL REINFORCEMENT AROUND PIPE PENETRATIONS, SEE DETAILS 5 AND 6 ON SHEET S02.
- ALL CONSTRUCTION JOINTS MUST BE APPROVED BY THE ENGINEER. CONTRACTOR SHALL SUBMIT ALL PROPOSED CONSTRUCTION JOINT LOCATIONS TO THE ENGINEER FOR APPROVAL.



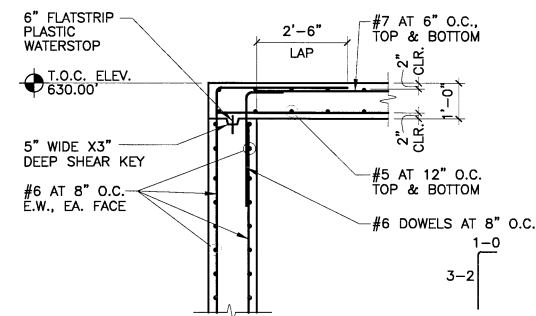
**STRUCTURAL - MODIFIED VALVE VAULT NO. 6  
PLANS AND SECTIONS**

PROJECT NO. ES 2009-07  
EAST 53RD STREET AND RIVERSIDE DRIVE:  
CHERRY CREEK LIFT STATION - PUMP  
RESTORATION AND FORCE MAIN IMPROVEMENTS

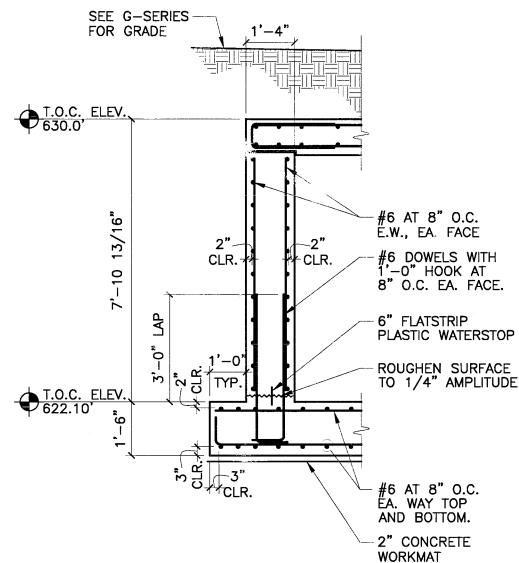
CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: **wallace design collective**

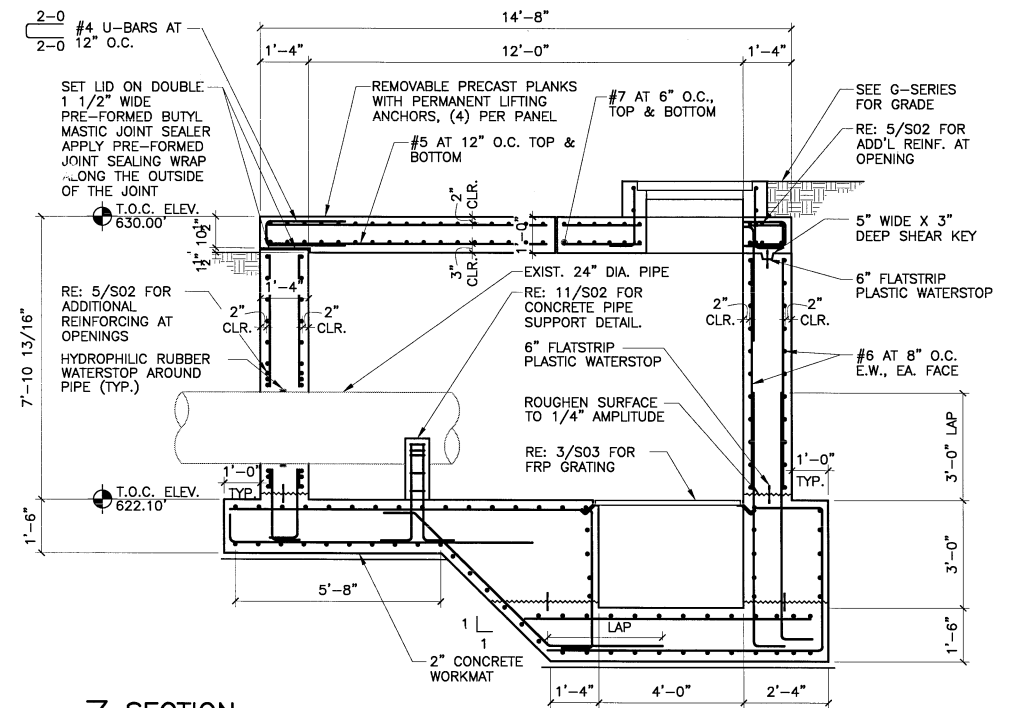
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			PROFILE SCALE	PROJ. MGR.			
			HORIZONTAL:	LEAD ENGR.	AD 5/22		
				FIELD MGR.	AD 5/22		
			VERTICAL:	RECOMMENDED	AD 5-22		
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			FILE: S04.DWG	DRAWING: S04		MAY 2022	
			ATLAS PAGE NO:			SHEET 21 OF 33	



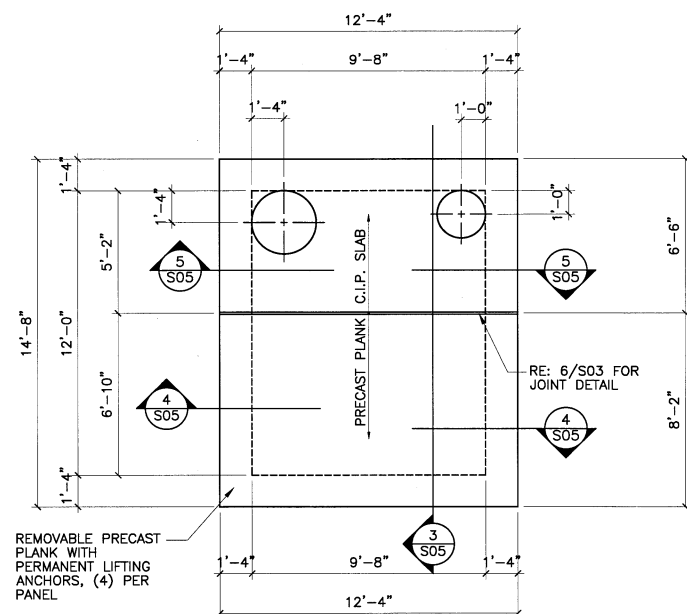
5 SECTION  
3/8" = 1'-0"



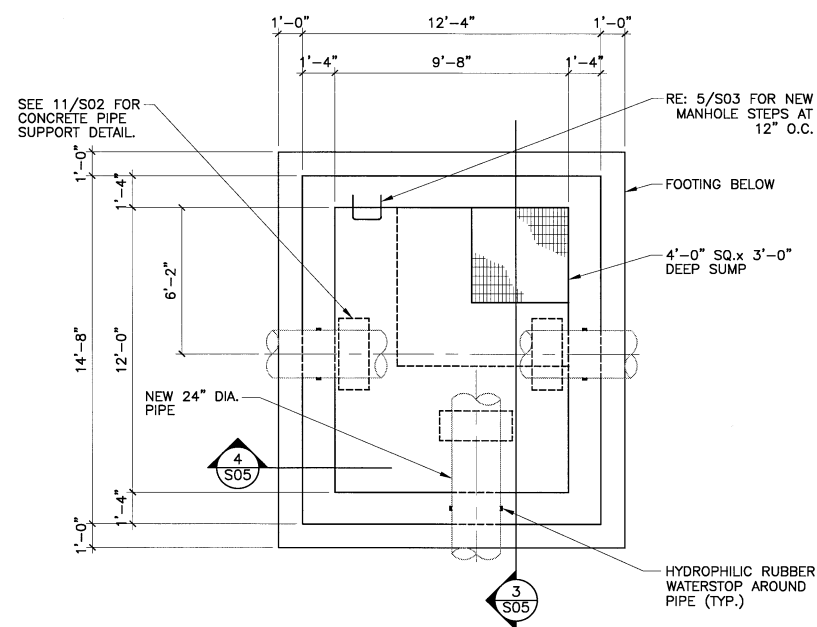
4 SECTION  
3/8" = 1'-0"



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



2 TOP PLAN  
1/4" = 1'-0"



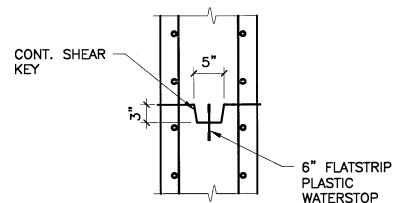
1 SECTIONAL PLAN  
1/4" = 1'-0"

NOTES:

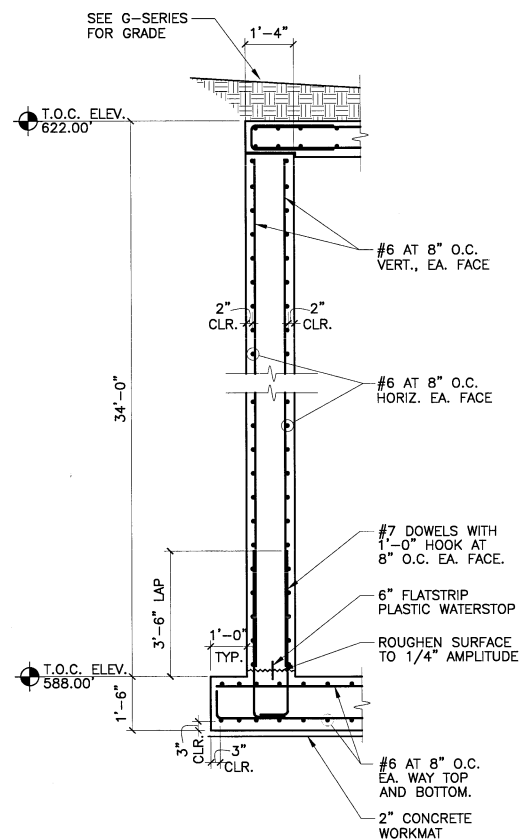
1. ALL INTERIOR WALL SURFACES AND UNDER TOP SLAB SHALL HAVE CHEMICAL RESISTANT EPOXY COATING SYSTEM APPLIED PER SPECIFICATIONS.
2. BACKFILL SHALL NOT BE PLACED AGAINST WALLS UNTIL ALL CONCRETE HAS REACHED IT'S DESIGN STRENGTH.
3. FOR ADDITIONAL REINFORCEMENT AROUND PIPE PENETRATIONS, SEE DETAILS 5 AND 6 ON SHEET S02.
4. ALL CONSTRUCTION JOINTS MUST BE APPROVED BY THE ENGINEER. CONTRACTOR SHALL SUBMIT ALL PROPOSED CONSTRUCTION JOINT LOCATIONS TO THE ENGINEER FOR APPROVAL.



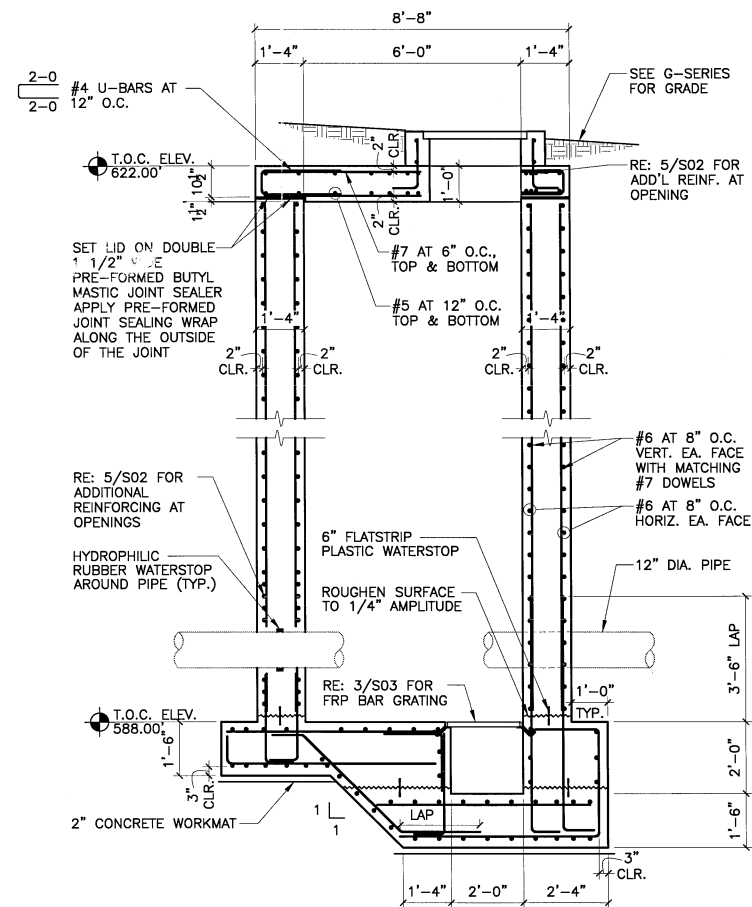
STRUCTURAL - NEW VALVE VAULT NO.8 PLANS AND SECTIONS			
PROJECT NO. ES 2009-07			
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION - PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS			
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT			
PLANS AND ESTIMATES PREPARED BY:		wallace design collective	
REVISION	BY	DATE	APPROVED:
1	LA	11/21	
2	KR	11/21	
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5 OPTIONAL WALL HORIZ. CONST. JOINT  
3/4" = 1'-0"



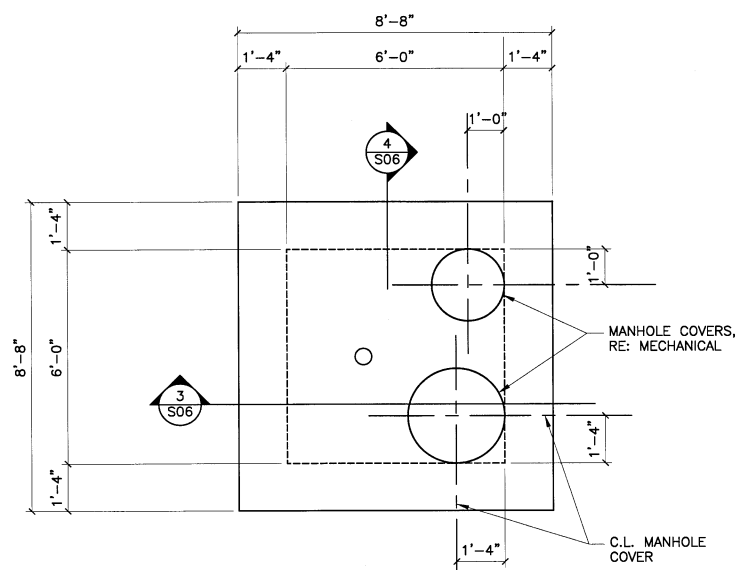
4 SECTION  
3/8" = 1'-0"



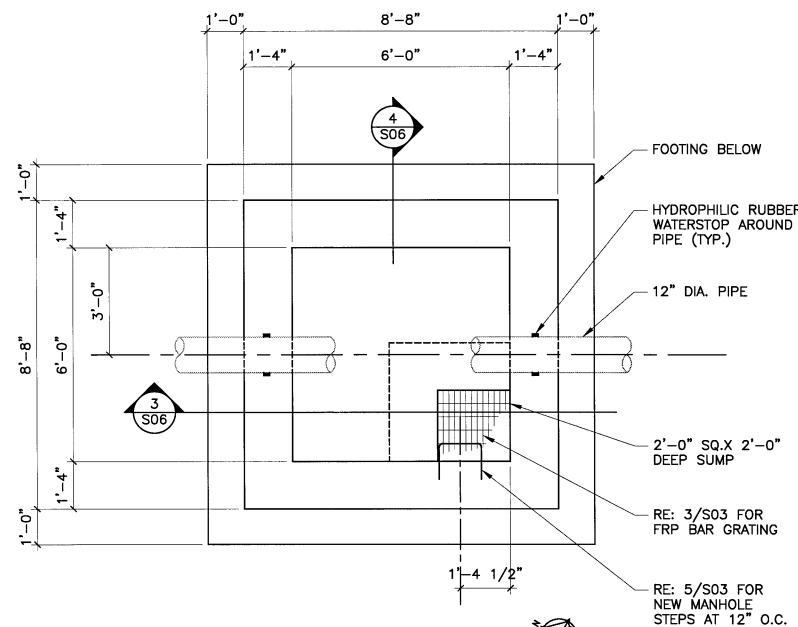
3 SECTION  
3/8" = 1'-0"

**NOTES:**

1. ALL INTERIOR WALL SURFACES AND UNDER TOP SLAB SHALL HAVE CHEMICAL RESISTANT EPOXY COATING SYSTEM APPLIED PER SPECIFICATIONS.
2. BACKFILL SHALL NOT BE PLACED AGAINST WALLS UNTIL ALL CONCRETE HAS REACHED IT'S DESIGN STRENGTH.
3. FOR ADDITIONAL REINFORCEMENT AROUND PIPE PENETRATIONS, SEE DETAILS 5 AND 6 ON SHEET S02.
4. ALL CONSTRUCTION JOINTS MUST BE APPROVED BY THE ENGINEER. CONTRACTOR SHALL SUBMIT ALL PROPOSED CONSTRUCTION JOINT LOCATIONS TO THE ENGINEER FOR APPROVAL.



2 TOP PLAN  
3/8" = 1'-0"



1 SECTIONAL PLAN  
3/8" = 1'-0"



STRUCTURAL - NEW DRAIN VALVE MANHOLE  
PLANS AND SECTIONS

PROJECT NO. ES 2009-07

EAST 53RD STREET AND RIVERSIDE DRIVE:  
CHERRY CREEK LIFT STATION - PUMP  
RESTORATION AND FORCE MAIN IMPROVEMENTS

CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: *Wallace Design Collective*

REVISION	BY	DATE	PLAN SCALE:	DRAWN	LA	11/21	APPROVED:
			NOT TO SCALE	DESIGNED	KR	11/21	
			SURVEY				
			PROFILE SCALE	PROJ. MGR.			
			HORIZONTAL:	LEAD ENGR.	<i>5/22</i>		
			VERTICAL:	FIELD MGR.	<i>5/22</i>		
				RECOMMENDED	<i>5/22</i>		
				DESIGN MANAGER			
			FILE: S06.DWG	DRAWING: S06			
			ATLAS PAGE NO:				

*MA*  
ENGINEER

MAY 2022  
SHEET 23 OF 33



1. THE PURPOSE OF THIS WORK IS TO CONDUCT A VISUAL INSPECTION AND STRUCTURAL CONDITION ASSESSMENT OF ALL CONCRETE SURFACES IN THE TANK ROOM LOCATED OVER THE WET WELL AT THE CHERRY CREEK LIFT STATION, TO LOCATE THE DEFINED DETERIORATION TO BE REPAIRED, AND TO VERIFY THE DETERIORATION TYPE AND QUANTITIES TO BE REPAIRED. MARK THE BOUNDARIES OF THE ACTUAL REPAIRS TO BE PERFORMED AND ESTIMATE THE QUANTITIES OF REPAIR FOR REVIEW AND APPROVAL BY THE OWNER AND ENGINEER BEFORE BEGINNING THE REPAIRS.
2. THE CONFIGURATIONS AND DIMENSIONS OF THE STRUCTURES WERE OBTAINED FROM ORIGINAL CONSTRUCTION DRAWINGS AND LIMITED SITE MEASUREMENTS. THE CONTRACTOR SHALL FIELD VERIFY AS NECESSARY FOR HIS PURPOSES. THE TYPE OF ORIGINAL CONSTRUCTION AND SLAB INFORMATION, INCLUDING SLAB REINFORCEMENT, IS PROVIDED FROM THE ORIGINAL DOCUMENTS WHERE IT WAS AVAILABLE ON THOSE DOCUMENTS.

1. OBTAIN (3) - 6" DIA. CORE SAMPLES OF THE TANK ROOM FLOOR SLAB FOR PETROGRAPHIC ANALYSIS TO EVALUATE DEPTH AND EXTENT OF DELAMINATION, CRACKING AND MICROCRACKING, DEPTH OF CARBONATION, AND CHEMICAL ANALYSIS TO DETERMINE CHLORIDE AND SULFATE CONTENT. PETROGRAPHIC ANALYSIS SHALL BE PERFORMED BY A QUALIFIED LAB PER THE REQUIREMENTS OF ASTM C856. CORE SAMPLES SHALL BE TAKEN AT LOCATIONS INDICATED ON 2/S07. REPAIR SLAB AT CORE HOLE LOCATIONS PER 4/S08. RESULTS OF THE ANALYSIS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO PROCEEDING WITH CONCRETE REPAIRS. IF ANALYSIS INDICATES DELAMINATION OR DAMAGE TO A DEPTH GREATER THAN 5", FULL DEPTH REPAIRS MAY BE REQUIRED.

A. GENERAL

1. AT AREAS REQUIRING FULL DEPTH REPAIR, SHORE THE STRUCTURE TEMPORARILY AS NECESSARY TO PERFORM THE REPAIRS. WHERE SHORING IS NEEDED, SUBMIT A SHORING PLAN FOR APPROVAL PRIOR TO BEGINNING WORK, WITH CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF OKLAHOMA. SUBMIT A PLAN TO THE OWNER AND ENGINEER THAT PROVIDES FOR TEMPORARY SAFE SUPPORT OF ALL STRUCTURAL LOADS BY SHORING. UNLESS OTHERWISE APPROVED, SHORING LOADS SHALL BE TAKEN DOWN TO GROUND LEVEL. IF SHORING LOADS ARE NOT PROVIDED FOR IN THE DRAWING, THE CONTRACTOR OR HIS ENGINEER MUST SUBMIT A SHORING LOADS REQUIRED. SHORING PLANS SHALL PROVIDE THE LOCATION AND SPECIFIC SHORING MEMBERS TO BE UTILIZED, INCLUDING THEIR RATED CAPACITIES. SHIM TOP AND BOTTOM BEARING PLATS AS REQUIRED FOR UNIFORM BEARING. DO NOT REMOVE SHORING UNTIL STRUCTURAL REPAIRS OF THE SUPPORTED ELEMENT(S) ARE COMPLETE AND REPAIR MATERIALS HAVE REACHED DESIGN STRENGTH.

## B. SURFACE PREPARATION FOR CONCRETE REPAIRS

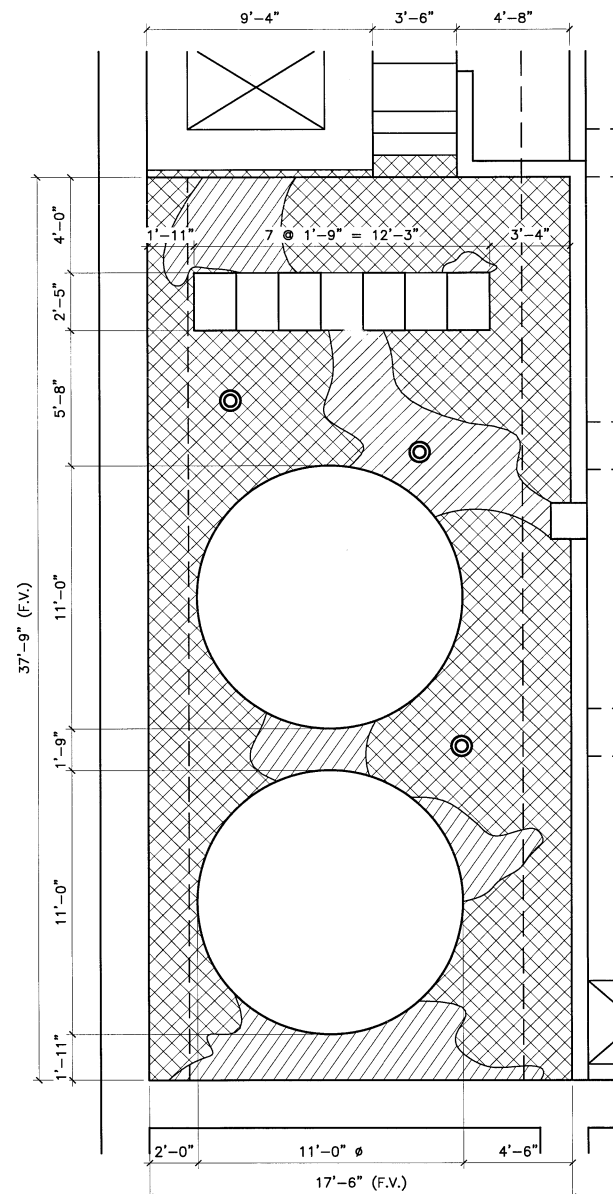
1. PERFORM SURFACE PREPARATION FOR CONCRETE REPAIRS IN COMPLIANCE WITH INTERNATIONAL CONCRETE REPAIR INSTITUTE (ICRI) TECHNICAL GUIDELINE NO. 310.1R-2008, "GUIDE FOR SURFACE PREPARATION FOR THE REPAIR OF DETERIORATED CONCRETE RESULTING FROM REINFORCING STEEL CORROSION." REMOVE ALL UNSOUND OR DELAMINATED CONCRETE PROVIDING A MINIMUM CSP 4 SUBSTRATE PROFILE AND 3/4-INCH CLEARANCE ALL AROUND CORRODED REINFORCING STEEL.
2. BLAST CLEAN TO REMOVE ALL OXIDATION AND SCALE FROM EXPOSED REINFORCING STEEL TO WHITE METAL IN ACCORDANCE WITH ICRI NO. 310.1R - 2008. COAT ALL EXISTING EXPOSED REINFORCEMENT WITH REBAR ANTI-CORROSION COATING JUST PRIOR TO PLACING REPAIR MATERIAL.
3. PERFORM SURFACE PREPARATION FOR SURFACE SEALERS AND COATINGS IN COMPLIANCE WITH ICRI TECHNICAL GUIDELINE NO. 310.2-997 "SELECTING AND SPECIFYING CONCRETE SURFACE PREPARATION FOR SEALERS, COATINGS, AND POLYMER OVERLAYS." THE CONCRETE SURFACE PROFILE PROVIDED SHALL COMPLY WITH RECOMMENDATIONS OF THE ICRI, OF THE PRODUCT MANUFACTURER, AND WITH ICRI SURFACE PROFILE CHIPS.

### C. SURFACE SPALLS AND DELAMINATION ON PARTIAL DEPTH SLAB REPAIRS AND POP OUT REPAIRS

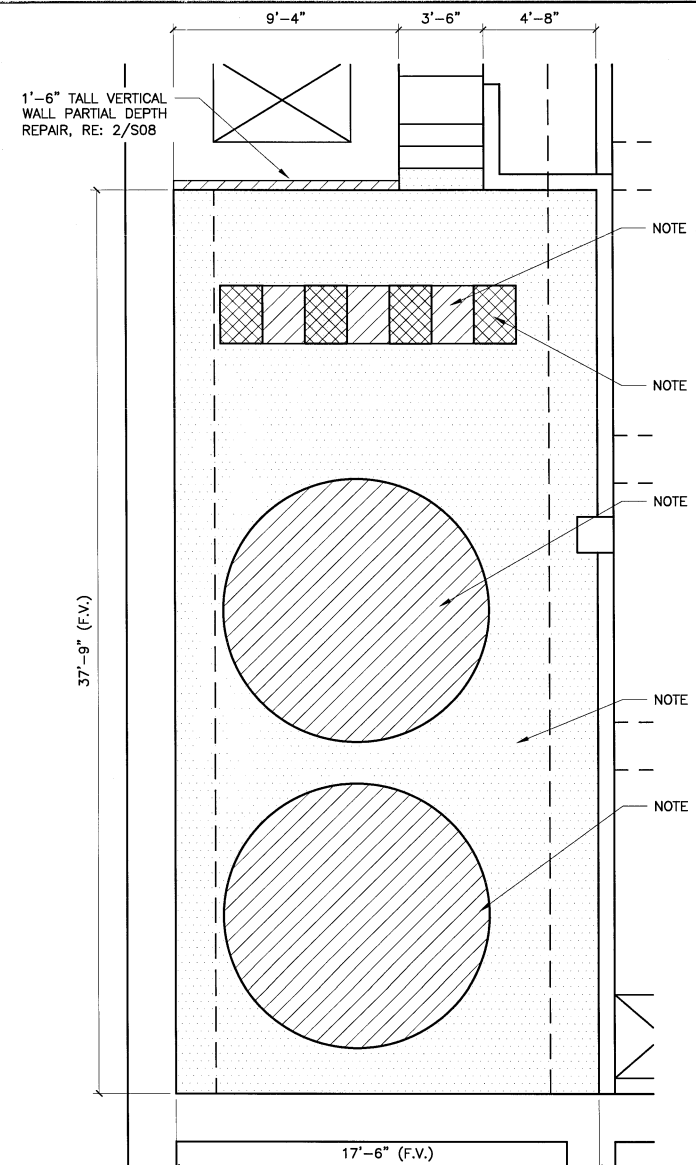
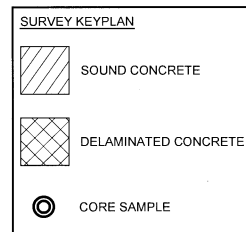
1. REPAIR SLAB SPALLS, DELAMINATIONS AND OTHER DAMAGE ACCORDING TO THESE NOTES, DRAWING DETAILS AND SPECIFICATION 03013.1.
2. MARK OFF THE AREA OF DAMAGE FOR REPAIR. (THIS MAY INCLUDE PART OR ALL OF A PRIOR PATCH/REPAIR).
3. SAWCUT 3/8-INCH DEEP AROUND THE AREA OF DAMAGE. KEEP SAWCUT LINES STRAIGHT. DO NOT OVERTURN ENDS.
4. EXCEPT FOR REPAIRS WHERE TOTAL REMOVAL MAY BE REQUIRED, REMOVE DETERIORATED MATERIAL UNTIL SOUND CONCRETE IS REACHED. REMOVE TO A MINIMUM DEPTH OF 3/4-INCH ON ALL VERTICAL SURFACES AND ON THE UNDERSIDE OR BOTTOM OF SLABS. REMOVE TO A MINIMUM DEPTH OF 1-INCH ON THE TOP OF SLAB SURFACE REPAIRS. USE ELECTRIC CHIPPING GUNS, OR MAXIMUM OF 15-POUND HAMMERS OR LIGHTER. AVOID METHODS OF DEMOLITION THAT PROPAGATE CRACKS IN CONCRETE, SUCH AS HOLDING A HAMMER VERTICAL OR AGAINST REBAR. (HIGH PRESSURE WATER REMOVAL, OR HYDROBLAST, MAY BE AN ACCEPTABLE ALTERNATIVE METHOD OF DEMOLITION IF APPROVED BY OWNER).
5. REMOVE CONCRETE TO A MINIMUM OF 3/4-INCH CLEAR ALL AROUND CORRODED REINFORCEMENT AND TO ONE (1) INCH BEYOND CORROSION ON REBAR.
6. REMOVE CORROSION ON REINFORCING BAR TO WHITE METAL.
7. REMOVE DUST AND DEBRIS FROM AREA OF PATCH WITH HIGH SUCTION VACUUM, FOLLOWED BY HIGH PRESSURE AIR.
8. SAND BLAST OR SHOT BLAST CONCRETE REPAIR SURFACES.
9. FOR CEMENTITIOUS PATCH REPAIRS, FLUSH THE CONCRETE SURFACE WITH CLEAN WATER TO CREATE A SATURATED SURFACE DRY CONDITION. FOR PATCH MATERIALS USING AN EPOXY BONDING AGENT, PROVIDE A CLEAN DRY SURFACE.
10. APPLY BONDING AGENT / REBAR ANTI CORROSION COATING AND CORROSION INHIBITOR TREATMENT TO FULLY COAT ALL REINFORCEMENT AND PATCH CONCRETE SURFACES. FOR POLYMER RESIN AND FAST CURE REPAIR MATERIALS, ALLOW THE ANTI-CORROSION COATING TO FULLY DRY BEFORE INSTALLING THE PATCH MATERIALS, OR USE AN EPOXY BONDING AGENT TO FULLY COAT THE EXPOSED REINFORCEMENT. THE BONDING AGENT USED MUST BE COMPATIBLE WITH THE PATCHING AND CORROSION INHIBITOR TREATMENT MATERIAL(S) USED.
11. APPLY THE BALANCE OF REPAIR MORTAR, WORKING THE MATERIAL INTO THE EDGES OF PATCH WITH FIRM PRESSURE. DO NOT LEAVE ANY VOIDS.
12. FINISH THE SURFACE OF REPAIR TO MATCH THE EXISTING FINISH.
13. WET CURE NEW CEMENTITIOUS REPAIR MATERIALS UNLESS THE PRE-MANUFACTURED REPAIR MORTAR SPECIFICALLY ALLOWS MEMBRANE CURING.
14. AFTER THE MATERIAL IS FULLY CURED, AND AFTER THE REMOVAL OF CURING COMPOUND AND OTHER MATERIALS THAT MIGHT PREVENT SURFACE PENETRATION, COMPLETE THE REPAIR WITH A TWO-COAT APPLICATION OF SURFACE APPLIED CORROSION INHIBITOR AS NOTED BELOW. AFTER 24 HOURS DRYING TIME AND TIME FOR PENETRATION, CLEAN SURFACE TO ALLOW GOOD BOND OF ANY SUBSEQUENT COATINGS OR SEALERS.

D. FULL DEPTH SLAB REPAIRS (IF REQUIRED FOLLOWING INSPECTION OF UNDERSIDE OF TANK FLOOR)

1. REPAIR SLAB SPALLS, DELAMINATIONS AND OTHER DAMAGE ACCORDING TO THESE NOTES, DRAWING DETAILS AND SPECIFICATION 030131.
2. SLAB DAMAGE THAT EXCEEDS 70% OF THE THICKNESS OF THE SLAB SHALL BECOME A FULL DEPTH REPAIR FOR THE AREA OF DAMAGE. THIS MAY BE ONLY A PORTION OF A LARGER PARTIAL DEPTH SLAB REPAIR AREA.
3. FORM FULL DEPTH AREAS AND SHORE AS REQUIRED BY THE SIZE OF THE REPAIR AREA.
4. SIMILAR TO THE PARTIAL DEPTH REPAIR ABOVE, MARK OUT THE DAMAGE, LOCATE AND PROTECT ALL REINFORCING BARS IN THE SLAB.
5. REPAIR AREAS: SLAB SPALLS: REMOVE ALL DETERIORATION AND CORROSION TO SOUND MATERIALS; BLAST CLEAN THE REPAIR AREA, INCLUDING SIDES OF REPAIR AREA; REPAIR CORRODED REBAR IF REQUIRED; APPLY BONDING AGENT AND REBAR ANTI-CORROSION COATING AND CORROSION INHIBITOR TREATMENT; INSTALL REPAIR MORTAR TO PROPER FINISH AND PROFILE; CURE THE PATCH; FINISH WITH SURFACE APPLIED CORROSION INHIBITOR.
6. REPAIR CORRODED REINFORCEMENT: ASH HAS A MEASURED AREA OF LOSS GREATER THAN 10% BY WELDING A SPLICE BAR TO THE CORRODED REBAR ACCORDING TO 5/08.
- DO NOT CUT OUT EXISTING REINFORCEMENT, EVEN IF IT HAS LOST SIGNIFICANT AREA TO CORROSION.



TANK ROOM - SURVEY  
OF DELAMINATED AREA

$$\frac{1}{4}'' = 1'-0''$$


1 PLAN AT TANK ROOM

$$1/4'' = 1' - 0''$$

PLAN NOTES

1. REMOVE EXISTING 6" DEEP HOUSEKEEPING PAD UNDER BOTH TANKS. HAUL AWAY CONCRETE FROM BUILDING.
2. REMOVE EXISTING CONCRETE PEDESTALS (4 TOTAL). HAUL AWAY CONCRETE FROM BUILDING.
3. REMOVE EXISTING 4" DEEP HOUSEKEEPING PAD UNDER EQUIPMENT. HAUL AWAY CONCRETE FROM BUILDING.
4. REMOVE DELAMINATED CONCRETE OVER ENTIRE TANK ROOM TO AN ESTIMATED AVERAGE DEPTH OF 5". HAUL AWAY.
5. SEE REPAIR NOTES C.5, 6, 7, AND 8 FOR ADDITIONAL INFO.
6. ADD A TOP REINFORCING MAT OF #8 AT 12" O.C. EACH WAY WITH 2" TOP CLEAR COVER.
7. SEE NOTES C.8, 9, 10, 11, 12, 13, AND 14 FOR APPLICATION OF REPAIR CONCRETE.



KCA #1460  
Exp. Date: 06/30/23

## STRUCTURAL - CHERRY CREEK LIFT STATION WET WELL CONCRETE REPAIR NOTES AND DETAILS



PROJECT NO. ES 2009-07

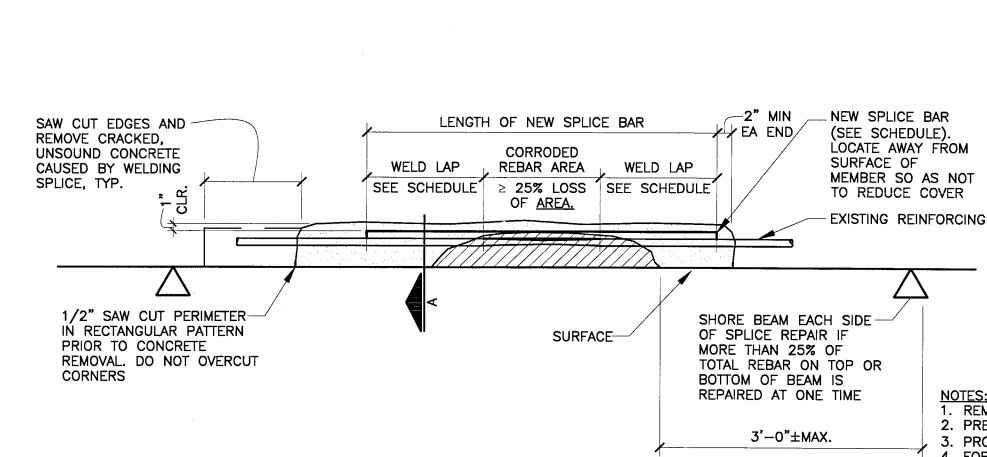
EAST 53RD STREET AND RIVERSIDE DRIVE:  
CHERRY CREEK LIFT STATION – PUMP  
RESTORATION AND FORCE MAIN IMPROVEMENTS

CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

PLANS AND ESTIMATES PREPARED BY:

wallace  
design  
collective

REVISION	BY	DATE	PLAN SCALE:	DRAWN	LA	11/21	APPROVED:
			NOT TO SCALE	DESIGNED	KR	11/21	 APPROVED: _____ ENGINEER
				SURVEY			
			PROFILE SCALE	PROJ. MGR.			
			HORIZONTAL:	LEAD ENGR.	ADD	5/22	
				FIELD MGR.	EW	5/22	
			VERTICAL:	RECOMMENDED	HRS	5-22	
				DESIGN MANAGER			 ENGINEER
			FILE: S07.DWG	DRAWING: S07			MAY 2022
			ATLAS PAGE NO:				SHEET 28 OF 33



NEW SPLICE BAR (A706)

EXIST. REBAR AROUND ENTIRE PERIMETER

SECTION A

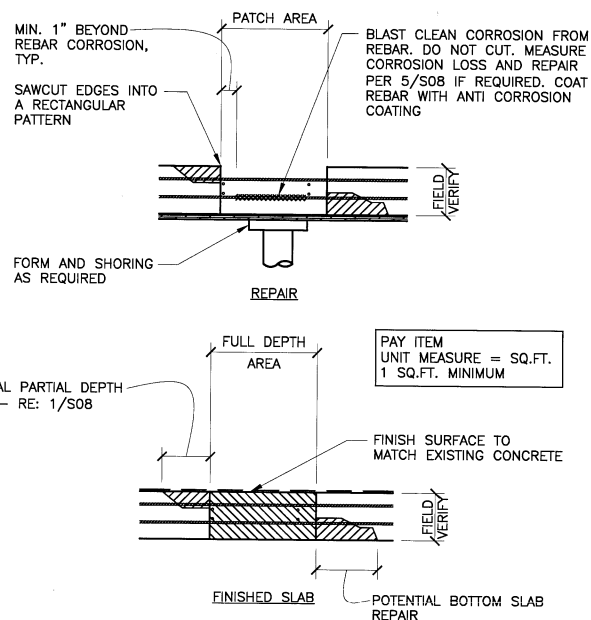
REBAR	SPLICE BAR DIA. (A706, GR. 60)	MIN. WELD LAP, 'L' *
#3, #4	1/2"	2" (NOTE 4)
#5, #6	3/4"	3" (NOTE 4)
#7	3/4"	4"
#8	1"	5"
#9	1"	6 1/2"
#10	1"	8"

\* DOUBLE LENGTH 'L' IF CAN ONLY WELD ONE SIDE

- NOTES:
1. REMOVE ALL LOOSE SCALE TO WHITE METAL PRIOR TO MEASURING BAR DIAMETER.
  2. PREHEAT EXIST. REBAR TO 200 °F PRIOR TO WELDING.
  3. PROVIDE THIS REPAIR ONLY WHERE AUTHORIZED BY OWNER/ENGINEER.
  4. FOR SAME BID PRICE, CONTRACTOR MAY SUBSTITUTE A DOUBLE BARREL MECHANICAL SPLICE IN PLACE OF WELD SPLICE FOR #3 TO #6 BARS IF 1" COVER IS PROVIDED. AREA OF EXISTING REINFORCING AT MECHANICAL SPLICE MUST EQUAL OR EXCEED 90% OF ORIGINAL BAR AREA.

## 5 REBAR WELD SPLICE DETAIL

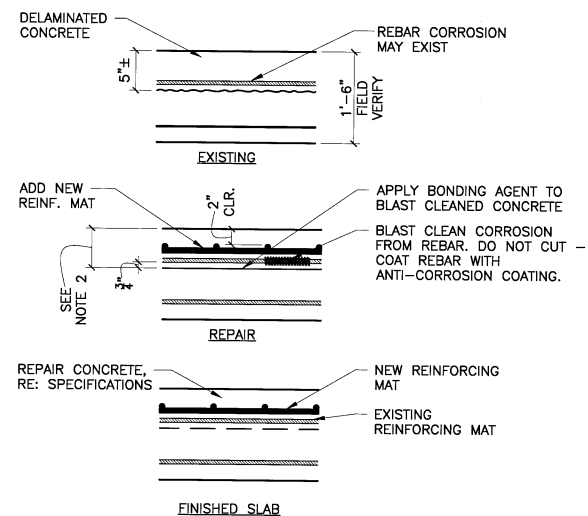
NTS



- SHEET NOTES:
1. SEE GENERAL NOTES AND REPAIR NOTES ON SHEET S07.
  2. IF THE DEPTH OF REPAIR EXCEEDS HALF THE THICKNESS OF THE SLAB, OR EXCEEDS 6 INCHES, CHANGE THAT PORTION OF THE PATCH TO A FULL DEPTH STRUCTURAL SLAB REPAIR.

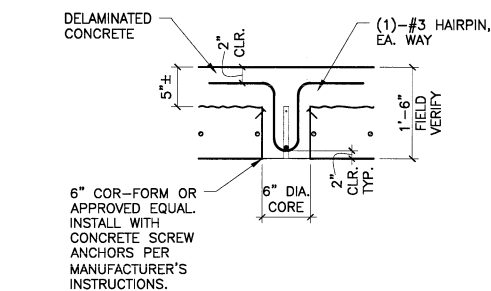
## 3 STRUCTURAL SLAB - FULL DEPTH CONCRETE REPAIR

NTS



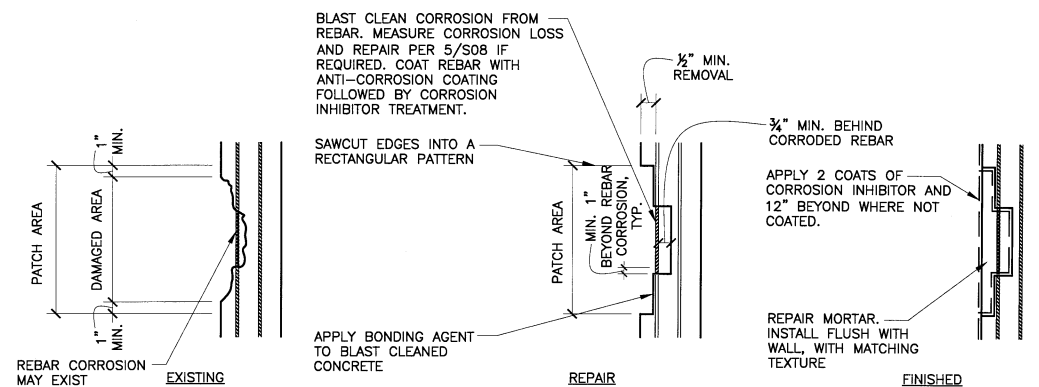
## 1 STRUCTURAL SLAB REPAIR - PARTIAL DEPTH

NTS



## 4 STRUCTURAL SLAB - CORE HOLE REPAIR

NTS



## 2 VERTICAL SURFACE/WALL/COLUMN/BEAM FACE PATCH - PARTIAL DEPTH

NTS



OKCA #1480  
Exp. Date: 06/30/23

### STRUCTURAL - CHERRY CREEK LIFT STATION WET WELL CONCRETE REPAIR NOTES AND DETAILS

PROJECT NO. ES 2009-07

EAST 53RD STREET AND RIVERSIDE DRIVE:  
CHERRY CREEK LIFT STATION - PUMP  
RESTORATION AND FORCE MAIN IMPROVEMENTS

CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

PLANS AND ESTIMATES PREPARED BY:

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REVISION	BY	DATE	PLAN SCALE:	DRAWN	LA	11/21	APPROVED:
			NOT TO SCALE	DESIGNED	KR	11/21	
				SURVEY			
			PROFILE SCALE	PROJ. MGR.			
			HORIZONTAL:	LEAD ENGR.	ADD 5/5/22		
			VERTICAL:	FIELD MGR.	2/20/5/22		
				RECOMMENDED	HAS 5/2/22		
				DESIGN MANAGER			
			FILE: S08.DWG	DRAWING: S08			
			ATLAS PAGE NO:				

MAY 2022


































SHEET 25 OF 33

## POWER, LIGHTING AND MISCELLANEOUS PLAN SYMBOLS

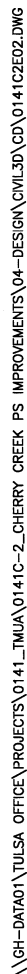
SYMBOL	DESCRIPTION
	NORMALLY OPEN (SHOWN) OR NORMALLY CLOSED RESET TIMER CONTACT (X-X-O - DENOTES TIMER SEQUENCE FOR RESET-TIMING-TIMED OUT PERIODS. X INDICATES CONTACT CLOSED)
	NORMALLY OPEN CONTACT WITH TIME DELAY CLOSING (ON DELAY)
	NORMALLY CLOSED CONTACT WITH TIME DELAY CLOSING (OFF DELAY)
	NORMALLY OPEN CONTACT WITH TIME DELAY OPENING (ON DELAY)
	NORMALLY CLOSED CONTACT WITH TIME DELAY OPENING (OFF DELAY)
	LS LIMIT SWITCH
	FS FLOAT SWITCH
	PS OR VS PRESSURE OR VACUUM SWITCH
	FLS FLOW SWITCH
	TS TEMPERATURE SWITCH
	TQ TORQUE SWITCH
	Latching Relay with Clearing Contacts
	SELECTOR SWITCH
	NORMALLY OPEN PUSHBUTTON
	NORMALLY CLOSED PUSHBUTTON
	PUSHBUTTON STATION (ONE, TWO OR THREE UNIT)
	INDICATING LIGHT (A-AMBER, B-BLUE, G-GREEN, R-RED, W-WHITE)
	THERMAL OVERLOAD ELEMENT (OL)
	ON-OFF SWITCH
	RESISTOR
	FUSE
	BATTERY
	HEATING ELEMENT
	MAINTAINED CONTACT PUSHBUTTON WITH MUSHROOM HEAD OPERATOR
	SELECTOR SWITCH X INDICATES CONTACT CLOSED IN CORRESPONDING SWITCH POSITION
	CURRENT SENSOR TRIP SWITCH
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
	OVERLOAD RELAY CONTACT
	SOLENOID VALVE

SYMBOL	DESCRIPTION
(27)	<p>PROTECTIVE RELAYS:</p> <p>25 — SYNCHRONIZING CHECK</p> <p>27 — UNDERVOLTAGE</p> <p>32 — REVERSE POWER</p> <p>43 — SELECTOR SWITCH</p> <p>47 — PHASE SEQUENCE</p> <p>49 — THERMAL</p> <p>50 — INSTANTANEOUS OVERCURRENT</p> <p>51 — AC TIME OVERCURRENT</p> <p>52 — AC CIRCUIT BREAKER</p> <p>59 — OVERVOLTAGE</p> <p>60 — VOLTAGE OR CURRENT BALANCE</p> <p>62 — TIME DELAY</p> <p>64 — GROUND</p> <p>67 — DIRECTIONAL OVERCURRENT</p> <p>86 — LOCKOUT</p> <p>87 — DIFFERENTIAL CURRENT</p> <p>DBX — DEAD BUS AUXILIARY</p> <p>G — DEVICE IN GROUND CIRCUIT</p> <p>GSR — GROUND SENSING</p> <p>IR — INTERPOSING</p> <p>LOR — LOCKOUT</p> <p>N — DEVICE IN NEUTRAL CIRCUIT</p> <p>PSR — PHASE SENSING</p> <p>X — AUXILIARY</p>
(DPS)	<p>CONTROL DEVICES:</p> <p>DPS — DIFFERENTIAL PRESSURE SWITCH</p> <p>FS — FLOAT SWITCH</p> <p>FLS — FLOW SWITCH</p> <p>LLS — LEVEL SWITCH</p> <p>LS — LIMIT SWITCH</p> <p>PS — PRESSURE SWITCH</p> <p>RDS — REVERSING DRUM SWITCH</p> <p>ST — SHUNT TRIP</p> <p>SV — SOLENOID VALVE</p> <p>T — THERMOSTAT</p> <p>TQ — TORQUE SWITCH</p> <p>TS — TEMPERATURE SWITCH</p> <p>VIB — VIBRATION SWITCH</p> <p>VS — VACUUM SWITCH</p> <p>XS — TAMPER SWITCH</p>
(A)	<p>METER, INSTRUMENT OR INSTRUMENT SWITCHES:</p> <p>A — AMMETER</p> <p>AS — AMMETER SWITCH</p> <p>AT — CURRENT TRANSDUCER</p> <p>CS — BREAKER CONTROL SWITCH</p> <p>DT — DUTY TRANSFER SWITCH</p> <p>MPS — MICROPROCESSOR METERING SYSTEM</p> <p>MMS — MICROPROCESSOR PROTECTION RELAY</p> <p>MSH — MOTOR SPACE HEATER</p> <p>PF — POWER FACTOR METER</p> <p>POT — POTENTIOMETER</p> <p>SI — SPEED INDICATOR</p> <p>SS — SELECTOR SWITCH</p> <p>TM — ELAPSED TIME METER</p> <p>TMR — TIMER</p> <p>V — VOLTMETER</p> <p>VAR — VARMETER</p> <p>VART — VARS TRANSDUCER</p> <p>VS — VOLTMETER SWITCH</p> <p>VT — VOLTAGE TRANSDUCER</p> <p>W — WATTMETER</p> <p>WH — WATTHOUR METER</p> <p>WHD — WATTHOUR DEMAND METER</p> <p>WT — WATTS TRANSDUCER</p> <p>ZT — POSITION TRANSMITTER</p>

AFD – ADJUSTABLE FREQUENCY DRIVE  
AFF – ABOVE FINISHED FLOOR  
ATS – AUTOMATIC TRANSFER SWITCH  
BKR – BREAKER  
BOD – BOTTOM OF DUCT  
CKT – CIRCUIT  
CP – CONTROL PANEL  
CPT – CONTROL POWER TRANSFORMER  
DP – DISTRIBUTION PANELBOARD  
DTC – DATA TERMINAL CABINET  
EO – ELECTRICALLY OPERATED  
FO – FIBER OPTIC  
GFI – GROUND FAULT INTERRUPTER  
GND – GROUND  
GRS – GALVANIZED RIGID STEEL  
JB – JUNCTION BOX  
LCP – LIGHTING CONTROL PANEL  
LP – LIGHTING PANELBOARD  
LT – LIGHTING TRANSFORMER  
MCC – MOTOR CONTROL CENTER  
MH – MOUNTING HEIGHT  
MTS – MICRO-PROCESSOR BASED TRANSFER LOGIC CONTROLLER  
PB – PULL BOX  
PLC – PROGRAMMABLE LOGIC CONTROLLER  
PVC – POLYVINYL CHLORIDE  
RTU – REMOTE TERMINAL UNIT  
SP – SPACE  
TB – TERMINAL BOX  
TCP – TEMPERATURE CONTROL PANEL  
TTC – TELEPHONE TERMINAL CABINET  
WP – WEATHERPROOF  
XP – EXPLOSION-PROOF

SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE 2 POLE, 3 WIRE, 208 VOLT, 20A, OR AS NOTED
	FLOOR OUTLET BOX WITH DUPLEX RECEPTACLE 2 POLE, 3 WIRE, 120 VOLT, 20A, OR AS NOTED
	SINGLE RECEPTACLE - SINGLE PHASE (RATING AS NOTED)
	SINGLE RECEPTACLE - THREE PHASE (RATING AS NOTED)
	CLOCK WITH RECEPTACLE
	SINGLE POLE SWITCH UNLESS NOTED OTHERWISE 2P - TWO POLE MS - MOTOR STARTING 3 - THREE WAY PL - WITH PILOT LIGHT 4 - FOUR WAY T - THERMAL OVERLOAD D - DIMMER SWITCH TS - TIME SWITCH M - MOMENTARY CONTACT
	INTERCOM TELEPHONE OUTLET
	INTERCOM TELEPHONE FLOOR OUTLET
	PUBLIC TELEPHONE OUTLET
	PUBLIC TELEPHONE FLOOR OUTLET
	SPEAKER
	BI-DIRECTIONAL SPEAKER
	INTERCOMMUNICATION SPEAKER
	INTERCOMMUNICATION SPEAKER VOLUME CONTROL
	CLOSED CIRCUIT TELEVISION CAMERA
	ALARM HORN
	ALARM BELL
	FIRE ALARM CONTROL PANEL
	FIRE ALARM ANNUNCIATOR PANEL
	MANUAL PULL STATION
	SMOKE DETECTOR
	HEAT DETECTOR
	PHOTOELECTRIC BEAM SMOKE DETECTOR TRANSMITTER
	PHOTOELECTRIC BEAM SMOKE DETECTOR RECEIVER
	AUDIBLE/VISUAL INDICATING DEVICE WITH HORN
	AUDIBLE/VISUAL INDICATING DEVICE WITH BELL
	VISUAL INDICATING DEVICE
	SPRINKLER SYSTEM FLOW SWITCH
	SPRINKLER SYSTEM TAMPER SWITCH
	MAGNETIC DOOR SWITCH
	PASSIVE INFRARED MOTION DETECTOR
	INFRARED BEAM MOTION DETECTION TRANSMITTER
	INFRARED BEAM MOTION DETECTION RECEIVER

REVISION	BY	DATE	PLAN SCALE:	DRAWN	RM	-	APPROVED:
			AS SHOWN	DESIGNED	NV	-	
				SURVEY			
			PROFILE SCALE	PROJ. MGR.	TG	-	
			HORIZONTAL:	LEAD ENGR.	<i>AD</i>	<i>5/22</i>	
				FIELD MGR.	<i>BD</i>	<i>5/22</i>	
			VERTICAL:	RECOMMENDED	<i>HAS 5-22</i>		
				DESIGN MANAGER			
			FILE: 0141C2E01	DRAWING: E01	DATE: <i>5/24</i> 2022		
			ATLAS PAGE NO: -	SHEET 26 OF 33 SHEETS			

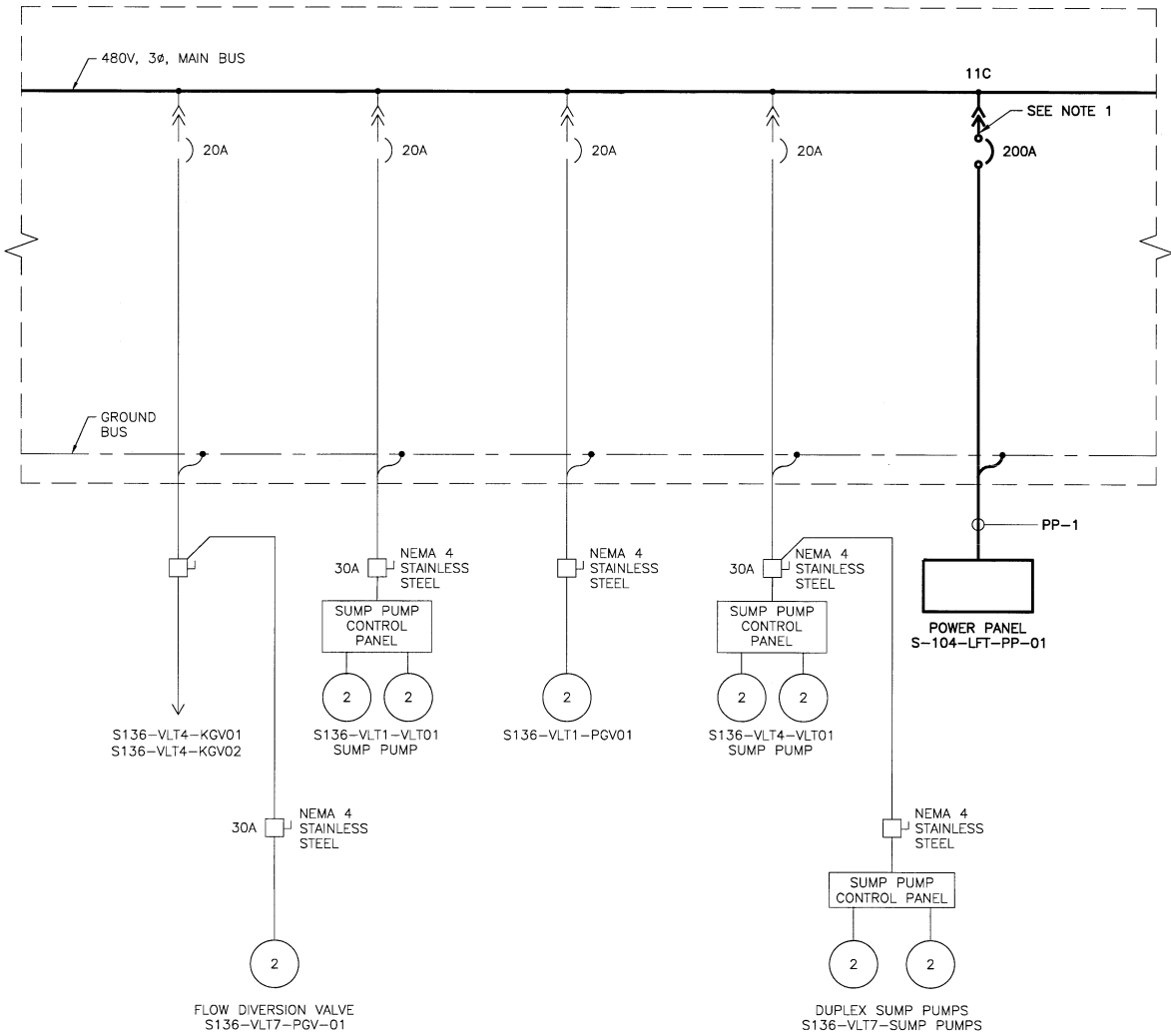


- AREA OF WORK



TULSA, OKLAHOMA 74103							
REVISION	BY	DATE	PLAN SCALE:	DRAWN	RM	—	APPROVED:  <

\\GH-DATA01\TULSA OFFICE\PROJECTS\0141\_TJUA\0141C-2\_CHERRY CREEK PS IMPROVEMENTS\04-DESIGN\CIVIL\3D\CD\0141C2E03.DWG

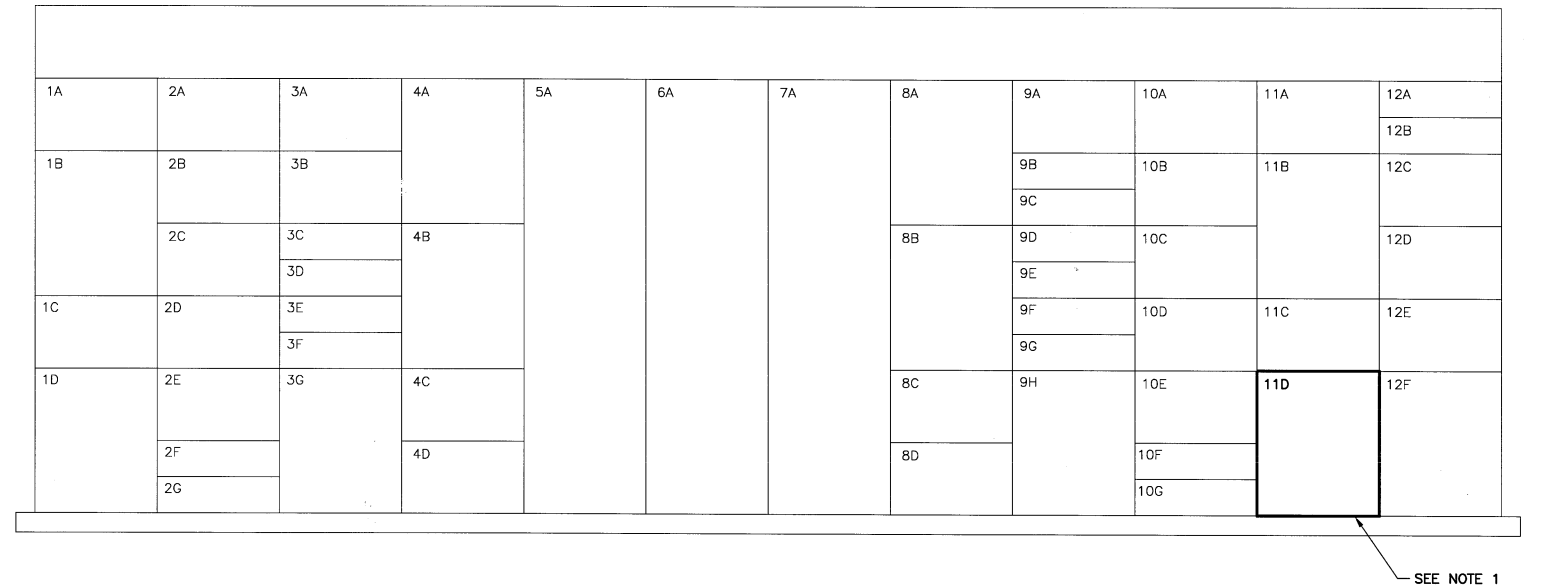


**S104-LFT-MCC-01**  
**PARTIAL ONE LINE DIAGRAM**

NEMA 12 SURFACE MOUNT  
3 PHASE 4 WIRE

225 AMP FRAME 200 AMP MAIN			
1	15 AMP/3 POLE	15 AMP/3 POLE	2
3	BLV01	BLV02	4
5			6
7	15 AMP/3 POLE	15 AMP/3 POLE	8
9	BLV03	BLV04	10
11			12
13	15 AMP/3 POLE	15 AMP/3 POLE	14
15	(SPARE)	(SPARE)	16
17			18
19	15 AMP/3 POLE	15 AMP/3 POLE	20
21	(SPARE)	(SPARE)	22
23			24

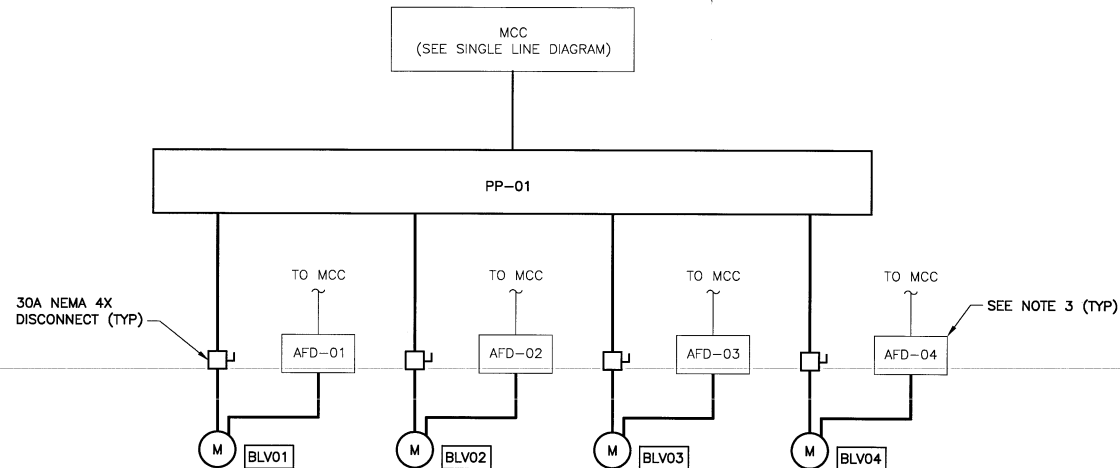
**S-104-LFT-PP-01**



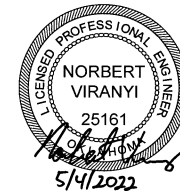
**S104-LFT-MCC-01**  
**ELEVATION**


**NOTES:**

1. PROVIDE NEW CIRCUIT BREAKER AND DOOR IN AVAILABLE SPACE.
2. ALL VALVES PREFACED BY S104-LFT1-XXXXX.
3. MODIFY AFD CONTROL CIRCUIT TO OPEN/CLOSE CONTROL VALVE BASED ON PLC AND PUMP SPEED. SEE DRAWING E06 FOR REVISED SCHEMATIC.

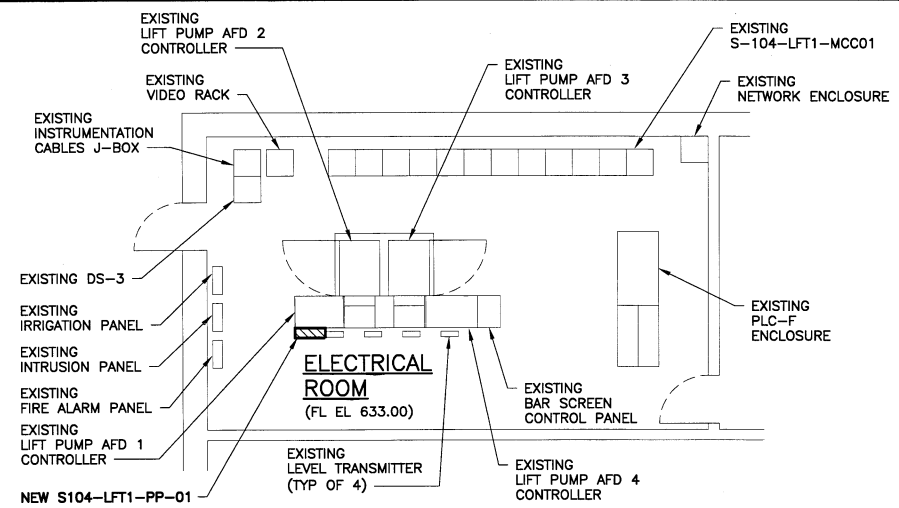


**PP-01 RISER**

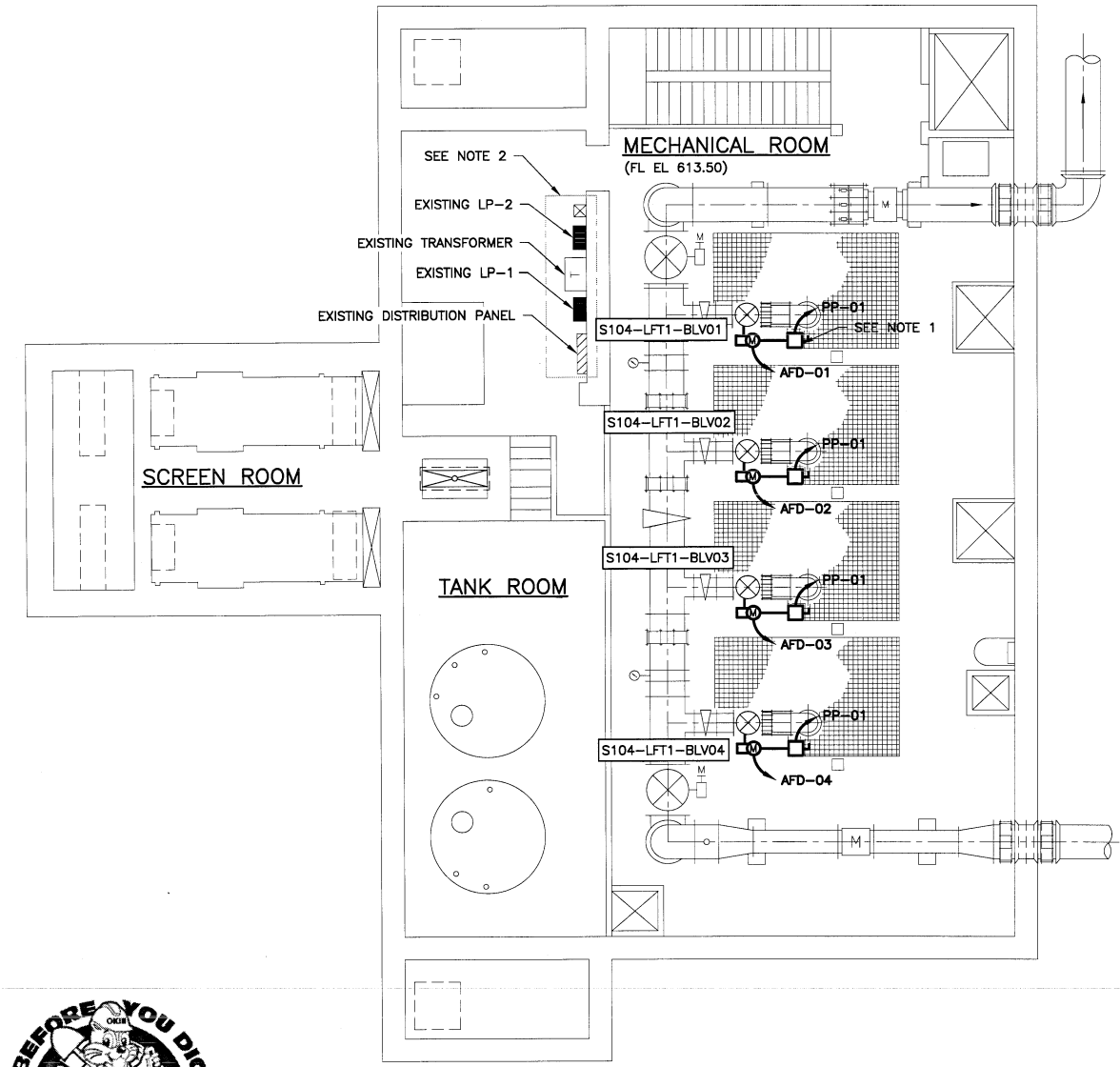
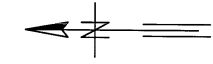


TULSA, OKLAHOMA 74103						
REVISION	BY	DATE	PLAN SCALE:	DRAWN	RM	APPROVED:
			AS SHOWN	DESIGNED	NV	
				SURVEY		
			PROFILE SCALE	PROJ. MGR.	TG	
			HORIZONTAL:	LEAD ENGR.	<i>NV 5/22</i>	
				FIELD MGR.	<i>NV 5/22</i>	
			VERTICAL:	RECOMMENDED	<i>HAS 5-22</i>	
				DESIGN MANAGER		
			FILE: 0141C2E03	DRAWING: E03	DATE: <i>MAY 2022</i>	ENGINEER
			ATLAS PAGE NO: —			SHEET 28 OF 33 SHEETS

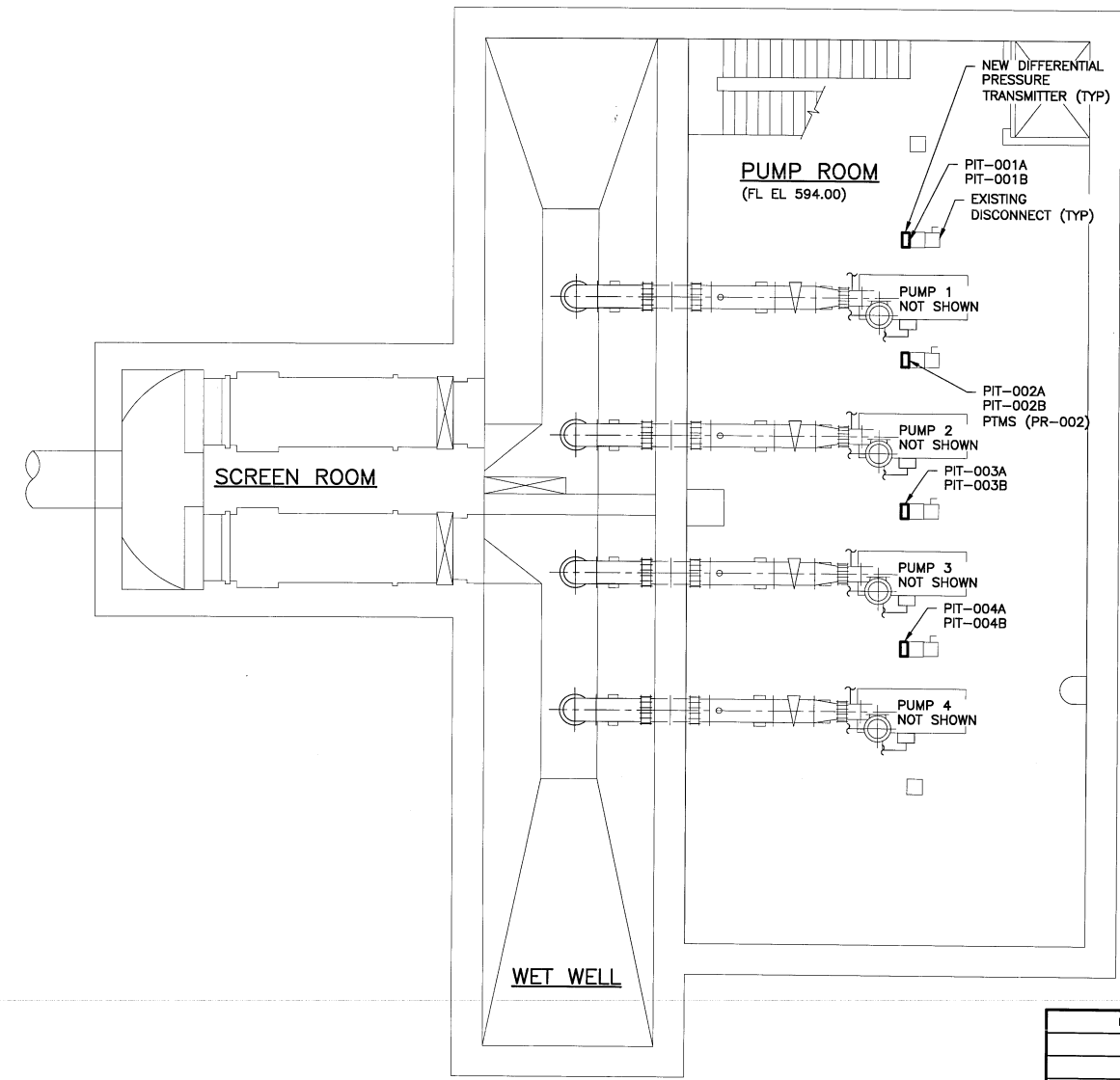




**CHERRY CREEK LIFT STATION CONTROL ROOM**  
**ENLARGED POWER PLAN @ FL EL 633.00**  
 SCALE: 1/8" = 1'-0"



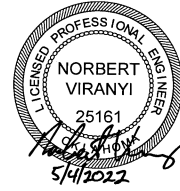
**PLAN @ FL EL 613.50**  
 SCALE: 1/8" = 1'-0"



**PLAN @ FL EL 594.00**  
 SCALE: 1/8" = 1'-0"

**NOTES:**

1. MOUNT DISCONNECT SWITCH ON LIGHTWEIGHT CHANNEL FRAME, ANCHORED TO GRATING.
2. THIS EQUIPMENT LOCATED ABOVE, AT ELEVATION 633.0



**ELECTRICAL-CHERRY CREEK LIFT STATION**  
**PLANS EL 594.00, EL 613.50 & EL 633.00**  
**PROJECT NO. ES 2009-07**  
**EAST 53RD STREET AND RIVERSIDE DRIVE:**  
**CHERRY CREEK LIFT STATION - PUMP**  
**RESTORATION AND FORCE MAIN IMPROVEMENTS**  
**CITY OF TULSA, OKLAHOMA**  
**ENGINEERING SERVICES DEPARTMENT**

PLANS AND ESTIMATES PREPARED BY: **GREELEY AND HANSEN**  
 321 S. BOSTON AVENUE, SUITE 300  
 TULSA, OKLAHOMA 74103

REVISION	BY	DATE	PLAN SCALE:	DRAWN	RM	APPROVED:
			AS SHOWN	DESIGNED	NV	
				SURVEY		
			PROFILE SCALE:	PROJ. MGR.	TG	
			HORIZONTAL:	LEAD ENGR.	ADD 3/22	
				FIELD MGR.	RM 5/22	
			VERTICAL:	RECOMMENDED	HAS 5.22	
				DESIGN MANAGER		
			FILE: 0141C2E04	DRAWING: E04		DATE: MAY 2022
			ATLAS PAGE NO: -			SHEET 29 OF 33 SHEETS



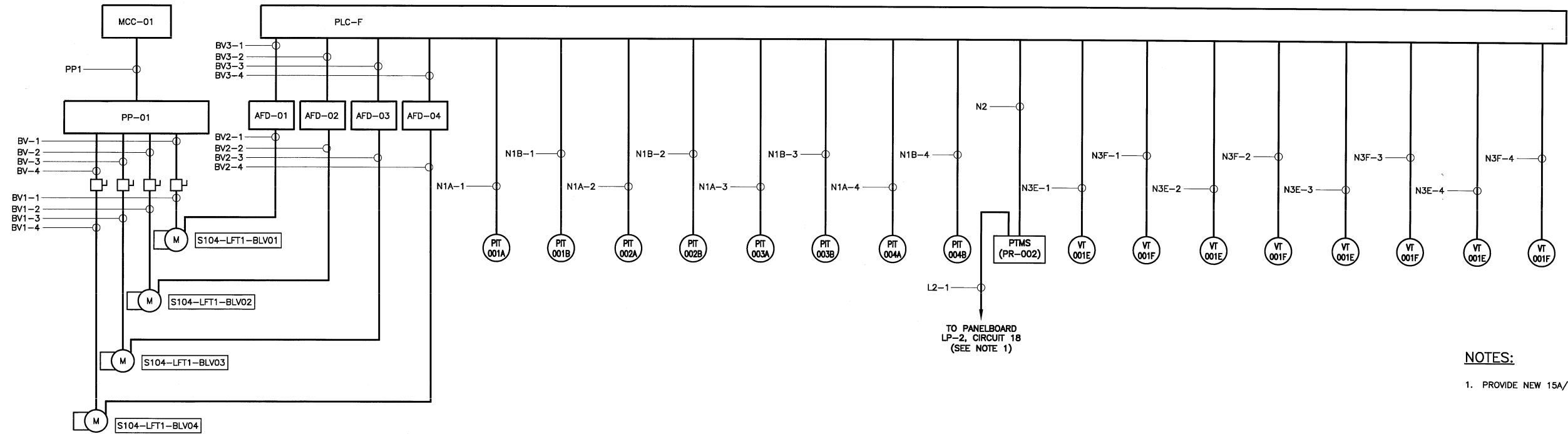
\\GH-DATA01\TULSA OFFICE\PROJECTS\0141-TMUA\0141C-2-CHERRY CREEK PS IMPROVEMENTS\04-DESIGN\CIVIL\3D\CD\0141C2E04.DWG

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### CABLE CONDUIT SCHEDULE

CONDUIT		CONDUCTOR		FROM	TO	REMARKS
NAME	SIZE	QUANTITY AND SIZE				
PP-1	2"	3#3/0, 1#6		MCC-1	PP-01	
BV-1	3/4"	3#12, 1#12G		PP-01	BLV01 DISCONNECT	TYP FOR BV-2, BV-3, BV-3
BV1-1	3/4"	3#12, 1#12G		BLV01 DISCONNECT	BLV01	TYP FOR BV1-2, BV1-3, BV1-3
BV2-1	3/4"	12#14, 1#12G		BLV01	AFD-01	TYP FOR BV2-2, BV2-3, BV2-3
BV3-1	3/4"	12#14, 1#14G		AFD-01	PLC-F	TYP FOR BV3-2, BV3-3, BV3-3
N1A-1	3/4"	2/C #16 TWSH, 1 #12 G		PIT-00*A	PLC-F	TYP FOR N1A-2, N1A-3, N1A-4
N1B-1	3/4"	2/C #16 TWSH, 1 #12 G		PIT-00*B	PLC-F	TYP FOR N1B-2, N1B-3, N1B-4
N2	3/4"	2 #14, 1 #12 G		PTMS (PR-002)	PLC-F	
N3E-1	3/4"	2/C #16 TWSH, 1 #12 G		VT-001E	PLC-F	TYP FOR N3E-2, N3E-3, N3E-4
N3F-1	3/4"	2/C #16 TWSH, 1 #12 G		VT-001F	PLC-F	TYP FOR N3F-2, N3F-3, N3F-4
L2-1	3/4"	2#12, 1#12G		PANELBOARD LP-2	PTMS (PR-002)	

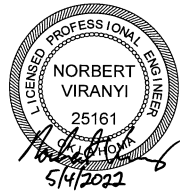


### BLOCK DIAGRAM

NOT TO SCALE

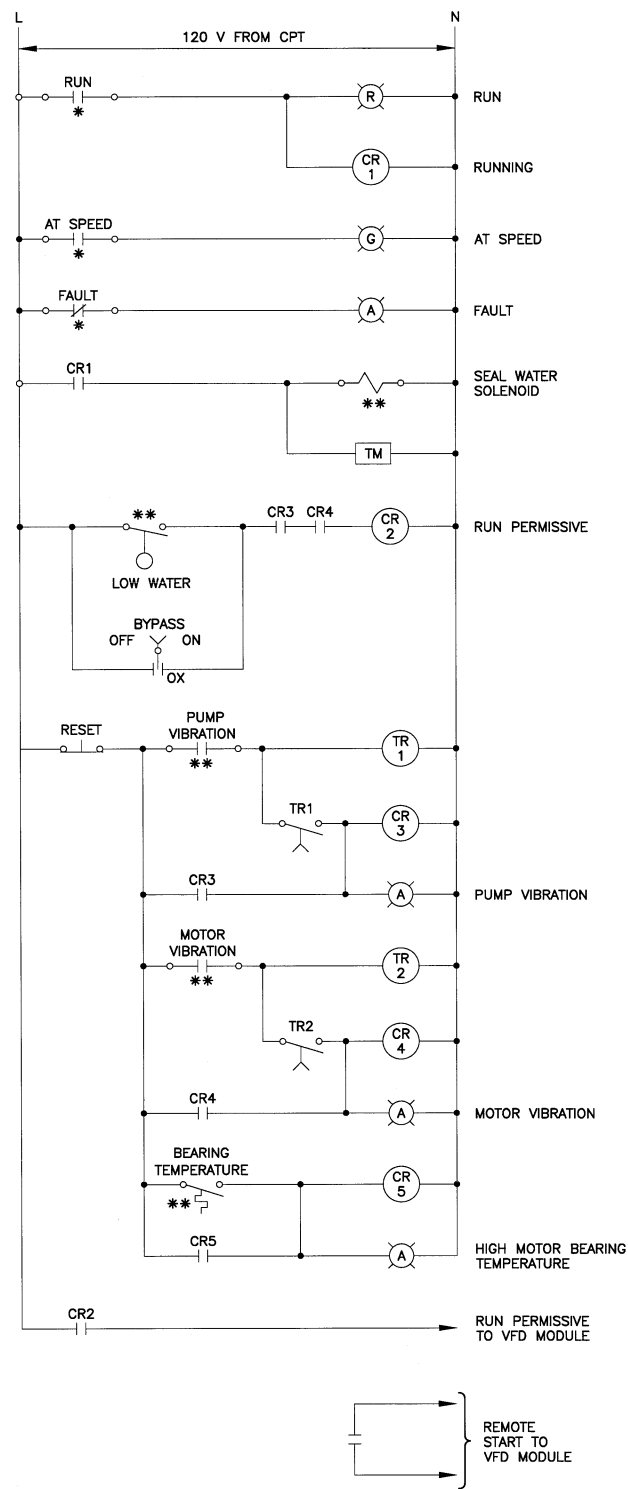
### NOTES:

1. PROVIDE NEW 15A/1P CIRCUIT BREAKER IN EXISTING SPACE.



ELECTRICAL ELECTRICAL SCHEDULE AND DETAILS	
PROJECT NO. ES 2009-07	
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION - PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS	
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT	
PLANS AND ESTIMATES PREPARED BY: <b>GREELEY AND HANSEN</b> 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103	
REVISION	BY DATE
PLAN SCALE:	DRAWN RM -
AS SHOWN	DESIGNED NV -
	SURVEY
PROFILE SCALE	PROJ. MGR. TG -
HORIZONTAL:	LEAD ENGR. <b>5/4/2022</b>
VERTICAL:	FIELD MGR. <b>5/4/2022</b>
	RECOMMENDED <b>5/4/2022</b>
	DESIGN MANAGER <b>5/4/2022</b>
FILE: 0141C2E05	DRAWING: E05
ATLAS PAGE NO: -	DATE: <b>5/4/2022</b>
	SHEET 30 OF 33 SHEETS

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### EXISTING VFD SCHEMATIC

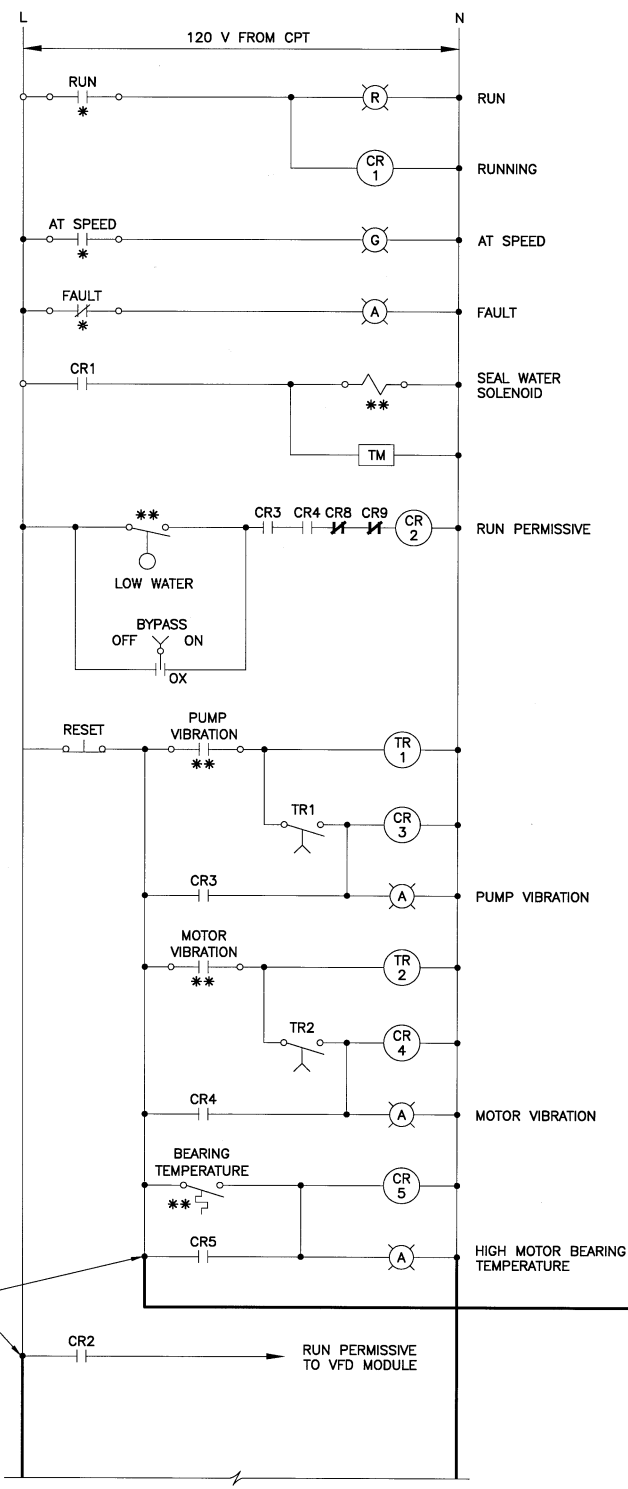
NOT TO SCALE  
(SEE NOTE 1)

#### NOTES:

1. SCHEMATIC IS FOR REFERENCE, ONLY TO DEPICT INTERLOCK AND PERMISSIVE FUNCTIONS. VERIFY ALL EXISTING WIRING AND CONTROL DEVICES IN FIELD BEFORE MODIFICATIONS.

\* DEVICE AT VFD MODULE  
\*\* EXTERNAL DEVICE

CONNECT TO EXISTING CIRCUIT



FOR CONTINUATION SEE ABOVE RIGHT

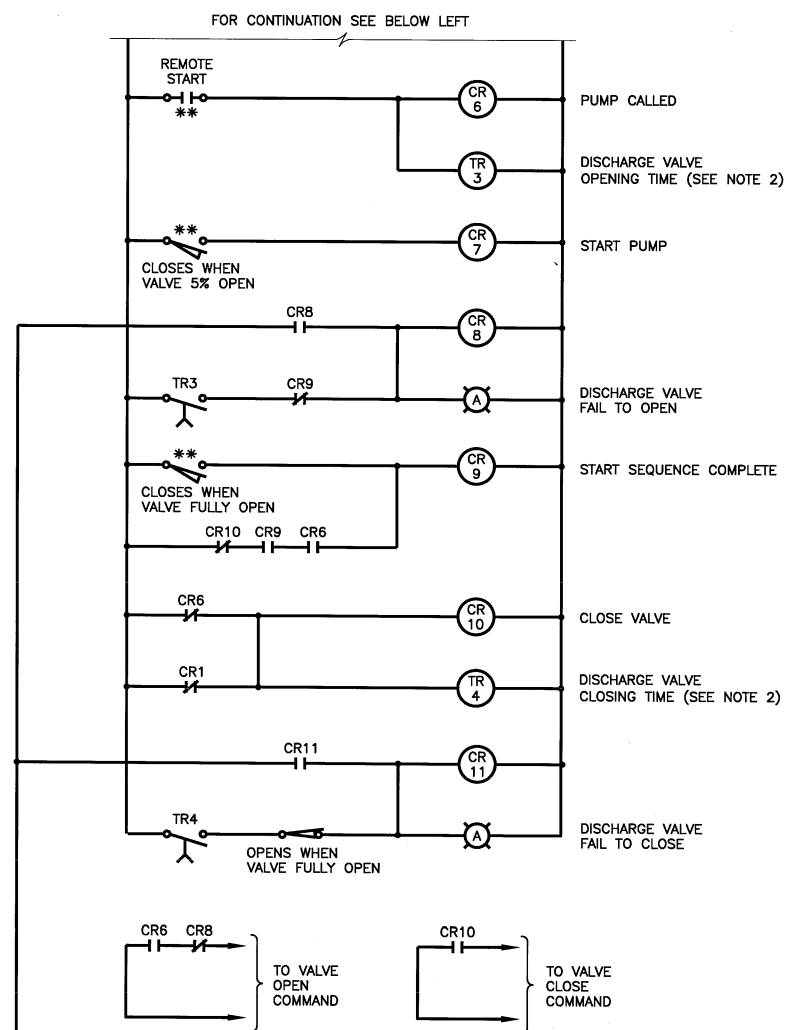
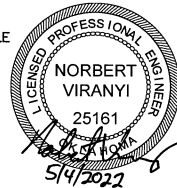
### MODIFIED VFD SCHEMATIC

NOT TO SCALE  
(SEE NOTE 1)

#### NOTES:

1. SCHEMATIC IS FOR REFERENCE, ONLY TO DEPICT INTERLOCK AND PERMISSIVE FUNCTIONS. VERIFY ALL EXISTING WIRING AND CONTROL DEVICES IN FIELD BEFORE MODIFICATIONS. EXISTING VFD'S ARE NOT IDENTICAL.
2. COORDINATE WITH PUMP AND VALVE OPERATING SEQUENCE. ADJUST ALL TIMER DELAYS DURING SYSTEM STARTUP AS REQUIRED TO SUIT VALVE OPENING TIME AND VFD RAMP UP/DOWN TIMES.
3. PROVIDE ENCLOSURE FOR NEW CONTROL AND TIMER RELAYS. MOUNTED TO SIDE OF EXISTING VFD ENCLOSURE. ENCLOSURE SHALL BE HINGED COVER NEMA 12, WITH INTERIOR PANEL AND DIN RAILS FOR RELAYS AND TERMINAL BLOCKS.
4. SUBMIT INDIVIDUAL SCHEMATIC DIAGRAMS FOR ALL VFDs WITH MODIFICATIONS FOR APPROVAL, AND TO REFLECT AS-BUILT CONDITION.

\* DEVICE AT VFD MODULE  
\*\* EXTERNAL DEVICE



ELECTRICAL VFD SCHEMATICS	
PROJECT NO. ES 2009-07	
EAST 53RD STREET AND RIVERSIDE DRIVE: CHERRY CREEK LIFT STATION - PUMP RESTORATION AND FORCE MAIN IMPROVEMENTS	
CITY OF TULSA, OKLAHOMA ENGINEERING SERVICES DEPARTMENT	
PLANS AND ESTIMATES PREPARED BY: <b>GREELEY AND HANSEN</b> 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103	
REVISION	BY DATE
AS SHOWN	DESIGNED TK
PROFILE SCALE	PROJ. MGR. TG
HORIZONTAL:	LEAD ENGR. <b>AD 5/22</b>
VERTICAL:	FIELD MGR. <b>Tom 5/22</b>
RECOMMENDED DESIGN MANAGER <b>HAS 5-22</b>	
FILE: 0141C2E06	DRAWING: E06
ATLAS PAGE NO. -	DATE: <b>MAY 2022</b>
SHEET 31 OF 33 SHEETS	



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PSL  
XXX

INSTRUMENT -- FIELD MOUNTED

HMS  
XXX

INSTRUMENT -- PANEL MOUNTED

FR  
XXX

AR  
XXX

SINGLE INSTRUMENT HOUSING  
CONTAINING TWO (OR MORE)  
INSTRUMENT FUNCTIONS  
(CIRCLES TOUCHING)

FY  
XXX

INSTRUMENT RELAY MOUNTED IN  
REAR OF PANEL (BROKEN LINE).  
ACTIVATES AND DEACTIVATES  
CONTROL AND/OR ALARM SWITCHES  
AT PREST SIGNAL VALUES. SEE  
BELOW FOR FUNCTION TYPES (X).

Δ

DIFFERENCE

>

HIGH SELECTOR

<

LOW SELECTOR

S/I

FREQUENCY/CURRENT CONVERTER

I/I

CURRENT/CURRENT REPEATER (ISOLATOR)

AV

AVERAGE

%

RATIO

AE  
XXX

ANALYSIS INSTRUMENT  
SEE BELOW FOR FUNCTION TYPES (Y)

CH<sub>4</sub>

METHANE

Cl<sub>2</sub>

CHLORINE

CO<sub>2</sub>

CARBON DIOXIDE

COM  
B

COMBUSTIBLES

DO

DISSOLVED OXYGEN

FeCl<sub>3</sub>

FERRIC CHLORIDE

F

FLUORIDE

H<sub>2</sub>S

HYDROGEN SULFIDE

H<sub>3</sub>PO<sub>4</sub>

PHOSPHORIC ACID

H<sub>2</sub>SO<sub>4</sub>

SULFURIC ACID

Na<sub>2</sub>S<sub>2</sub>O<sub>5</sub>

SODIUM METHA-BISULFATE

NaClO

SODIUM HYPOCHLORITE

NH<sub>3</sub>

AMMONIA

O<sub>2</sub>

OXYGEN

ORP

OXIDATION REDUCTION POTENTIAL

pH

HYDROGEN ION CONCENTRATION (-LOG )

PO<sub>4</sub>

PHOSPHATE

#

INTERLOCK  
# = SEE SCHEDULE FOR DESCRIPTION

SOFTWARE INTERLOCK

DEVICE NET

INTELLIGENT NETWORK

CONTROLLER

YL  
XXX

LED INDICATING LIGHT  
SEE BELOW FOR COLOR DESIGNATIONS (Z)

A = AMBER

= WARNING

B = BLUE

= LOCK OUT RELAY TRIPPED

G = GREEN

= ON/RUNNING/OPEN

R = RED

= OFF/STOPPED/CLOSED

R = RED

= ALARM/FAULT

W = WHITE

= POWER AVAILABLE

HS  
XXX

XYZ

HAND SELECTOR SWITCH

HMS  
XXX

XYZ

PUSHBUTTON

SEE BELOW FOR HAND SELECTOR SWITCH  
AND PUSHBUTTON FUNCTIONS (XYZ)

ACK

ACKNOWLEDGE

AM

AUTO-MANUAL

CO

CLOSE-OPEN

COA

CLOSE-OPEN-AUTO

ES

EMERGENCY STOP

ETM

ELAPSED TIME METER

FR

FOWARD-REVERSE

FOR

FOWARD-OFF-REVERSE

HOA

HAND-OFF-AUTO

HOC

HAND-OFF-COMPUTER

LA

LOCAL-AUTO

LOC

LOCAL-OFF-COMPUTER

LOR

LOCAL-OFF-REMOTE

LOS

STOP W/LOCKOUT

LR

LOCAL-REMOTE

MOA

MANUAL-OFF-AUTO

OOA

ON-OFF-AUTO

O/O

ON-OFF

OSC

OPEN-STOP-CLOSE

POT

SPEED POTENTOMETER

PIT

PUSH-TO-TEST

RS

RESET

ROL

RAISE-OFF-LOWER

R/O

RUN-OFF

S

STOP

S/R/S

START-RUN-STOP

SS

START-STOP

SS/L

START-STOP W/ LOCKOUT

1-2

SELECT DEVICE 1-2

SIL

SILENCE ALARM

P&ID

PROCESS AND INSTRUMENTATION  
DIAGRAM

ACP

ACCESS CONTROL PANEL

FOPP

FIBER OPTIC PATCH PANEL

FIRST LETTER

MEASURED OR  
INITIATING VARIABLE

MODIFIER

SUCCESSING LETTERS

READOUT OR PASSIVE  
FUNCTION

OUTPUT  
FUNCTION

MODIFIER

A

ANALYSIS

ALARM

B

BURNER FLAME

CLOSE, STOP, DECREASE  
CONTROL

OFF

C

CONDUCTIVITY  
(ELECTRICAL)

COMPUTER

D

DENSITY (MASS) OR  
SPECIFIC GRAVITY

DIFFERENTIAL

OPEN, START,  
INCREASE

E

VOLTAGE (EMF)

PRIMARY ELEMENT

F

FLOW RATE

RATIO (FRACTION)

FORWARD

FAIL

G

GAUGING  
(DIMENSIONAL)

GLASS, GAUGE,  
GATE

H

HAND (MANUALLY  
INITIATED)

HIGH, OPEN

I

CURRENT  
(ELECTRICAL)

INDICATE

J

POWER

SCAN

K

TIME OR TIME  
SCHEDULE

TIME RATE OF CHANGE

CONTROL STATION

L

LEVEL

LIGHT (PILOT)

LOW, CLOSED

M

MOISTURE OR  
HUMIDITY

MANUAL

MOTOR

MIDDLE OR  
INTERMEDIATE

N

INTRUSION

ON, OPERATE, RUNNING  
OVERLOAD

O

ORIFICE  
(RESTRICTION)

P

PRESSURE OR VACUUM

POINT (TEST  
CONNECTION)

PUMP

Q

QUANTITY

INTEGRATE OR  
TOTALIZE

R

RADIOACTIVITY

RECORD OR PRINT

REVERSE

S

SPEED, FREQUENCY,  
MOTION

SAFETY

SWITCH

STOP

T

TEMPERATURE

U

MULTIVARIABLE

MULTIFUNCTION

MULTIFUNCTION

V

VIBRATION

VALVE, DAMPER OR  
LOUVER

W

WEIGHT, FORCE,  
TORQUE

WELL

X

UNCLASSIFIED

X AXIS

UNCLASSIFIED

UNCLASSIFIED

UNCLASSIFIED

Y

EVENT STATUS

Y AXIS

UNCLASSIFIED

RELAY OR COMPUTE

Z

POSITION

Z AXIS

UNCLASSIFIED

DRIVE, ACTUATE OR  
UNCLASSIFIED FINAL  
CONTROL ELEMENTS

MISC INSTRUMENT SYMBOLS

STROBE LIGHT/ROTATING BEACON  
SEE BELOW FOR COLOR DENOMINATIONS (#)

A - AMBER

W - WHITE

R - RED

G - GREEN

ALARM OR WARNING HORN

MAGNETIC FLOW METER

THERMAL MASS FLOW METER

INSERTION TYPE FLOW METER

VENTURI METER

VORTEX SHEDDING FLOW METER

DIAPHRAGM SEAL

ISOLATOR RING

RADAR LEVEL SENSOR

ULTRASONIC LEVEL SENSOR

SUBMERSIBLE LEVEL SENSOR

VALVE SYMBOLS

DIAPHRAGM SEAL (N.O.)

DIAPHRAGM SEAL (N.C.)

GATE VALVE

KNIFE GATE VALVE

GLOBE VALVE

PLUG VALVE

BUTTERFLY VALVE (N.O.)

BUTTERFLY VALVE (N.C.)

BALL VALVE (N.O.)

BALL VALVE (N.C.)

CHECK VALVE

PINCH VALVE

HOSE/COUPLING CONNECTION

3-WAY VALVE

RELIEF VALVE

PRESSURE REGULATING VALVE

BACK-PRESSURE REGULATING  
VALVE

SOLENIOD VALVE

4-WAY SOLENIOD VALVE

NEEDLE VALVE

LINE SYMBOLS

MAIN PROCESS LINE

AUXILLARY LINE

ELECTRIC (ELECTRONIC) SIGNAL  
LINE

DATA LINK (CAT6)

DATA LINK (FIBER OPTIC)

DATA LINK (SERIAL)

PNEUMATIC SIGNAL

CAPILLARY LINE

HYDRAULIC SIGNAL

INSTRUMENT AIR SUPPLY

PROCESS FLOW  
LINE CONTINUED  
ON ANOTHER DRAWING:  
\* - DRAWING REFERENCE  
N - INTERFACE ID

PROCESS SIGNAL  
LINE CONTINUED  
ON ANOTHER DRAWING:  
\* - DRAWING REFERENCE  
N - INTERFACE ID

ON PAGE CONNECTOR  
(LINE CONTINUED ON THE SAME DRAWING)

PROCESS FLOW LINE CONTINUED  
OUTSIDE SCOPE OF DRAWINGS

AUXILIARY SYSTEM FLOW

SCHEMATIC SYMBOLS

CIRCUIT BREAKER

NORMALLY OPEN CONTACT

NORMALLY CLOSED CONTACT

TEMPERATURE SWITCH

NORMALLY OPEN PUSHBUTTON

NORMALLY CLOSED PUSHBUTTON

HEATING ELEMENT

FUSE

CONTROL RELAY

INDICATING LIGHT  
(A-AMBER, B-BLUE,  
G-GREEN, R-RED, W-WHITE)

FLOAT SWITCH

PROCESS AND EQUIPMENT

PULSATION DAMPENER  
ACCUMULATION

DAMPER

ELECTRIC MOTOR ACTUATOR

DIAPHRAGM ACTUATOR

SOLENOID ACTUATOR

CYLINDER ACTUATOR  
XX: FO FAIL OPEN  
FC FAIL CLOSED  
FLP FAIL LAST POSTION

ROTMETER (FLOW INDICATOR)

CALIBRATION COLUMN

ELECTRIC MIXER

PROCESS MIXER

PARSHALL FLUME

GATE  
XX: SG SLUICE GATE  
SLG SLIDE GATE

CAMERA

CENTRIFUGAL PUMP  
VS VARIABLE SPEED

CENTRIFUGAL FAN/BLOWER/COMPRESSOR  
VS VARIABLE SPEED

PD BLOWER/COMPRESSOR (ROTARY)  
VS VARIABLE SPEED

PD BLOWER/COMPRESSOR (RECIPROCATING)  
VS VARIABLE SPEED

PROGRESSIVE CAVITY PUMP  
VS VARIABLE SPEED

CHEMICAL METERING PUMP  
VS VARIABLE SPEED

SUBMERSIBLE PUMP  
VS VARIABLE SPEED

INPUT/OUTPUT (I/O) TAGGING AND LABELING

DISCRETE INPUT

ANALOG INPUT

DATA LINK INPUT

DISCRETE OUTPUT

ANALOG OUTPUT

DATA LINK OUTPUT

INSTRUMENTATION & CONTROLS  
SYMBOL LEGEND

PROJECT NO. ES 2009-07

EAST 53RD STREET AND RIVERSIDE DRIVE:  
CHERRY CREEK LIFT STATION -- PUMP  
RESTORATION AND FORCE MAIN IMPROVEMENTS

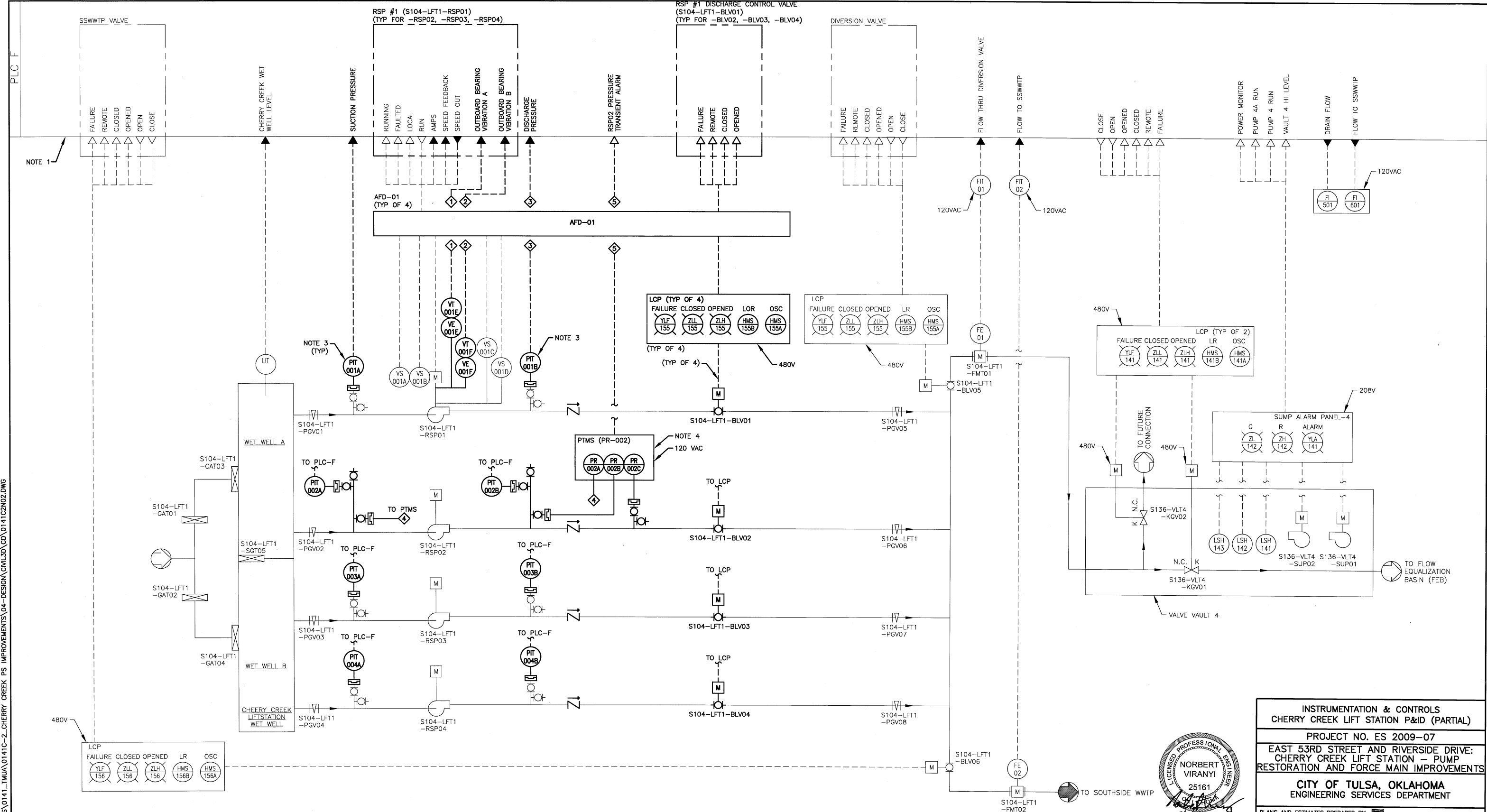
CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

PLANS AND ESTIMATES PREPARED BY:

REVISION	BY	DATE	PLAN SCALE:	DRAWN	RM	APPROVED:
			AS SHOWN	DESIGNED	NV	
			PROFILE SCALE	SURVEY		
			HORIZONTAL:	PROJ. MGR.	TG	
			VERTICAL:	LEAD ENGR.	MD 5/22	
				FIELD MGR.	PW 5/22	
				RECOMMENDED:	HAS 5-22	
				DESIGN MANAGER		
			FILE: 0141C2N01	DRAWING: N01	DATE: 04/2022	
			ATLAS PAGE NO: --		SHEET 32 OF 33 SHEETS	

BEFORE YOU DIG  
CALL OKIE

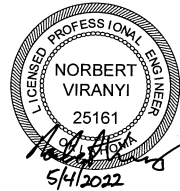
\\G:\DATA\01\TULSA OFFICE\PROJECTS\0141\_TMA\0141C-2 CHERRY CREEK PS IMPROVEMENTS\04-DESIGN\CIVIL\DWG\0141C2N02.DWG



NOTES:

1. MODIFY EXISTING PLC TO ACCEPT NEW I/O.
2. CONNECT TO EXISTING ACTUATOR FOR MONITORING AND CONTROL. FIELD VERIFY CONNECTION.
3. PROVIDE NEW PRESSURE TRANSMITTER ON THE SUCTION AND DISCHARGE PIPING FOR EACH ROTATING SEWAGE PUMP. REUSE EXISTING PROCESS PIPING TAPS IF POSSIBLE. PROVIDE NEW DIAPHRAGM SEALS WITH THREADED CONNECTIONS AND INSTALL ON EXISTING PROCESS PIPING TAPS. SEE DRAWING M04 FOR INSTALLATION DETAILS.
4. PROVIDE SURGE WAVE GUARDIAN PRESSURE TRANSIENT MONITORING SYSTEM (PTMS) TO MEASURE PRESSURE AT SUCTION OF PUMP RSP-2, DISCHARGE OF PUMP RSP-2, AND DOWNSTREAM OF PUMP RSP-2 DISCHARGE CHECK VALVE. PRESSURE TRANSIENT MONITORING SYSTEM SHALL BE PROVIDED IN A NEMA 4X ENCLOSURE. PROVIDE DIAPHRAGM SEALS AND CAPILLARY TUBING TO CONNECT PTMS TO PROCESS TAPS. SEE DRAWING M04 FOR INSTALLATION DETAILS.

CHERRY CREEK LIFT STATION P&ID



INSTRUMENTATION & CONTROLS  
CHERRY CREEK LIFT STATION P&ID (PARTIAL)

PROJECT NO. ES 2009-07

EAST 53RD STREET AND RIVERSIDE DRIVE:  
CHERRY CREEK LIFT STATION - PUMP  
RESTORATION AND FORCE MAIN IMPROVEMENTS

CITY OF TULSA, OKLAHOMA  
ENGINEERING SERVICES DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: <b>GREELEY AND HANSEN</b> 321 S. BOSTON AVENUE, SUITE 300 TULSA, OKLAHOMA 74103				APPROVED:			
PLAN SCALE:	DRAWN	RM	-	AS SHOWN	DESIGNED	NV	-
PROFILE SCALE:	SURVEY						
HORIZONTAL:	PROJ. MGR.	TG	-				
VERTICAL:	LEAD ENGR.	APJ 5/6/22					
	FIELD MGR.	Pam 5/1/22					
	RECOMMENDED	APB 5-22					
	DESIGN MANAGER						
FILE: 0141C2N02				DRAWING: N02			
ATLAS PAGE NO: -				DATE: MAY 11, 2022			
				SHEET 33 OF 33 SHEETS			