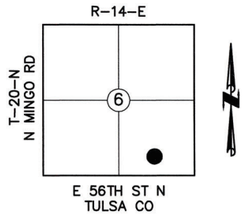
CONSTRUCTION PLANS FOR
NORTHSIDE WWTP 13.2 KV SWITCHGEAR IMPROVEMENTS
TMUA PROJECT NO. ES 2020-05

WATER AND SEWER DEPARTMENT
CITY OF TULSA, OKLAHOMA

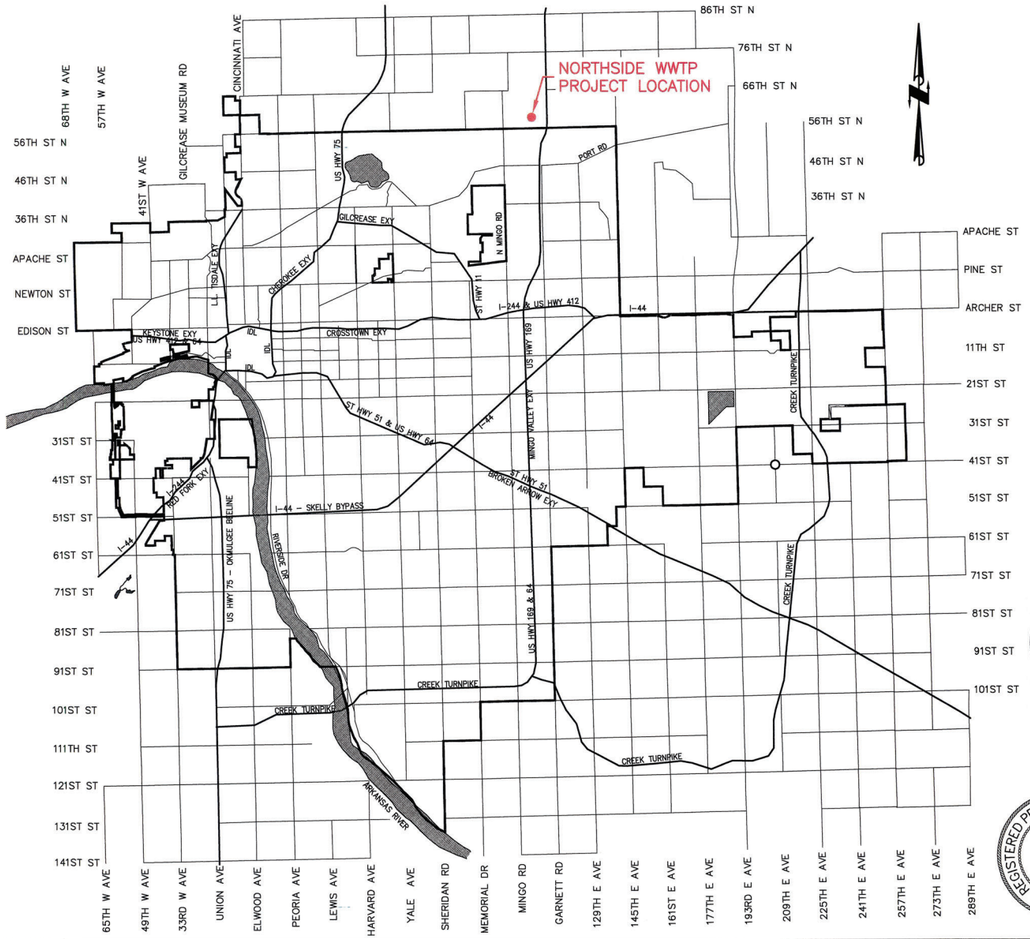
INDEX TO DRAWINGS

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	LOCATION MAP & PAY ITEM SUMMARY
3	GENERAL NOTES
4	MISCELLANEOUS DETAILS
E0	ELECTRICAL POWER ONE-LINE LEGEND
E1.1	ELECTRICAL SITE PLAN PSO COORDINATION
E1.2	ELECTRICAL SITE PLAN ADD ALT #1
E1	ELECTRICAL SITE PLAN
E2	ELECTRICAL AREA DEMOLITION
E3	ELECTRICAL AREA PLAN VIEW
E4	ELECTRICAL POWER ONE-LINE DEMOLITION
E5	ELECTRICAL POWER ONE-LINE NEW
E6	ELECTRICAL 13.2 KV SWITCHGEAR FACTORY LAYOUT
E7	ELECTRICAL ATS FACTORY LAYOUT
E8	ELECTRICAL EXISTING GEAR AND NAMEPLATES
E9	ELECTRICAL DETAILS



NORTHSIDE WWTP
LOCATION MAP

PROJECT LOCATION — CITY LIMITS



PLANS PREPARED BY

Brown Engineers of Arkansas, LLC
17200 CHENAL PKWY, STE 300 PMB 324
LITTLE ROCK, AR 72223
501-448-0100, FAX 866-846-4197
(C.A. No. 4933, EXP. 6-30-24)

Holloway, Updike and Bellen, Inc.
Muskogee – Broken Arrow, Oklahoma
2001 N WILLOW AVE, BROKEN ARROW, OK. 74012
918-251-0717, FAX 918-251-0754
(C.A. No. 219, EXP. 6-30-25)

BEFORE YOU DIG... CALL OKIE 1-800-522-6543

UTILITY COORDINATION BOX		
	NUMBER	NOTIFIED
WATER DESIGN	(918)-596-9566	
WASTEWATER DESIGN	(918)-596-9564	
TRANSPORTATION DESIGN	(918)-596-9636	
TRAFFIC ENGINEERING DESIGN	(918)-596-9741	
STORMWATER DESIGN	(918)-596-9498	
COT IT NETWORK SERVICES	(918)-596-7070	
OKLAHOMA GAS & ELECTRIC		
OKLAHOMA NATURAL GAS CO.	(918)-831-8261	
THERMAL SYSTEM, INC (TRIGEN)		
COX COMMUNICATIONS	(918)-669-4866	
PUBLIC SERVICE CO.	(918)-599-2757	
VALOR TELECOM		
SOUTHWESTERN BELL TELEPHONE	(918)-596-6702	
AT&T		
SPRINT		

APPROVED BY:

WATER AND SEWER DIRECTOR — DATE 11.2.2023

REGISTERED PROFESSIONAL ENGINEER — BRUCE W. BROWN 20995 — OKLAHOMA

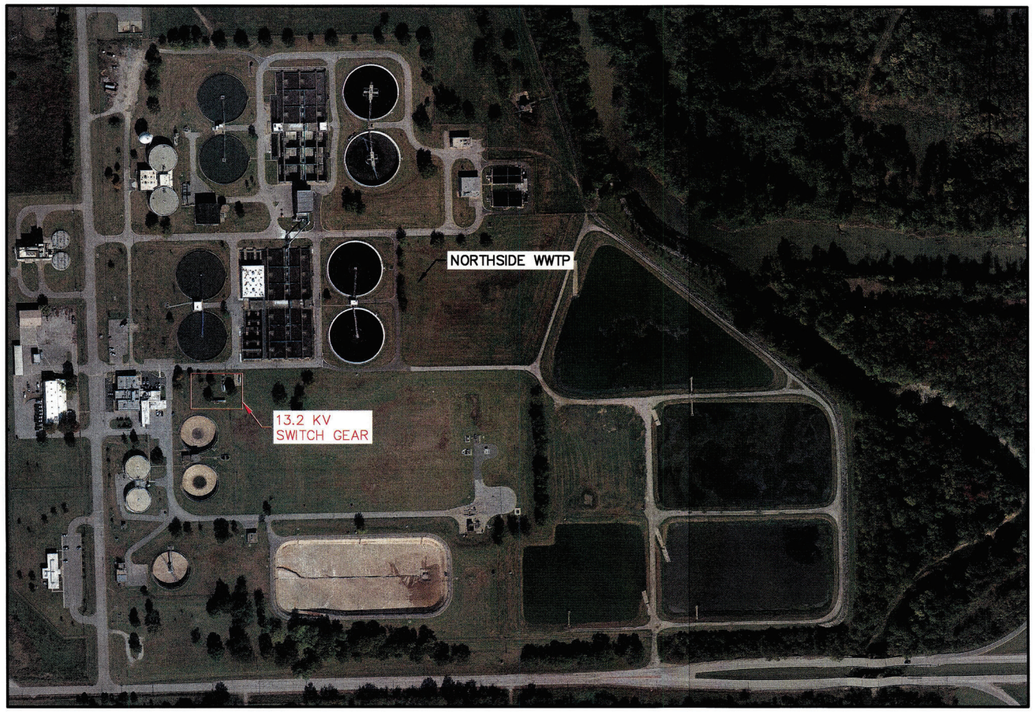
BRUCE BROWN, P.E.
BROWN ENGINEERS, LLC. — DATE 9/14/2023

REGISTERED PROFESSIONAL ENGINEER — LOYD STEPHEN TOLAR 20679 — OKLAHOMA

STEPHEN TOLAR, P.E., S.E.
HOLLOWAY, UPDIKE & BELLEN INC. — DATE 10-4-2023

NORTHSIDE WWTP 13.2KV SWITCHGEAR IMPROVEMENTS - ES 2020-05

Z:\Projects\2021\21TMUASWITCH\Design\Production Plans\Cover.dwg, 9/14/2023 9:32:26 AM



1/2 NORTHSIDE WWTP
SCALE: NTS

SUMMARY OF PAY ITEMS - 13.2 KV SWITCH GEAR IMPROVEMENTS					
ITEM NUMBER	SPEC NUMBER	ITEM DESCRIPTION	PAY NOTE	UNIT	QUANTITY
1	COT 303	MOBILIZATION		EA	1
2	SPECIAL	13.2 KV SWITCH GEAR REPLACEMENT	1	EA	1
3	SPECIAL	AUTOMATIC TRANSFER SWITCH REPLACEMENT	2	EA	1
4	SPECIAL	ATO BYPASS FEEDER INSTALLATION	4	EA	1
5	SPECIAL	CONCRETE SIDEWALK	5	SY	130
6	SPECIAL	8" PIPE BOLLARD	6	EA	12
7	ALLOW	ELECTRICAL, MECHANICAL & PLUMBING ALLOWANCE	7	EA	1
		ADDITIVE ALTERNATE NO. 1			
8	SPECIAL	LOOP SWITCH DEMOLITION	8	EA	1
		ADDITIVE ALTERNATE NO. 2			
9	SPECIAL	SOUTH DISTRIBUTION TRANSFORMER REPLACEMENT (N001-OPS1-TRN01)	3	EA	1
		ADDITIVE ALTERNATE NO.3			
10	SPECIAL	SOUTH DISTRIBUTION TRANSFORMER REPLACEMENT (N001-OPS1-TRN02)	3	EA	1

PAY ITEM NOTES – ELECTRICAL UPGRADES

1. INCLUDES ALL COSTS ASSOCIATED WITH INSTALLATION OF THE NEW 13.2 KV SWITCH GEAR.
2. INCLUDES ALL COSTS ASSOCIATED WITH INSTALLATION OF THE AUTOMATIC TRANSFER SWITCH.
3. INCLUDES ALL COSTS ASSOCIATED WITH INSTALLATION OF SOUTH DISTRIBUTION TRANSFORMERS.
4. INCLUDES ALL COSTS ASSOCIATED WITH INSTALLATION OF ATO BYPASS FEEDER INCLUDING FOUR–WAY PAD MOUNT GEAR, METERING CABINET AND FUSED DISCONNECT.
5. INCLUDES ALL COSTS FOR CONCRETE SIDEWALK INSTALLED IN ACCORDANCE WITH DETAIL 1, SHEET 4. SIDEWALK IS NOT SHOWN ON PLANS. INSTALLATION WILL BE DIRECTED BY OWNER AFTER ELECTRICAL GEAR INSTALLATION.
6. INCLUDES ALL COST FOR 8" PIPE BOLLARDS INSTALLED IN ACCORDANCE WITH DETAIL 2, SHEET 4 BOLLARD LOCATIONS ARE NOT SHOWN ON PLANS. INSTALLATION WILL BE DIRECTED BY OWNER AFTER ELECTRICAL GEAR INSTALLATION.
7. ALLOWANCE SHALL BE USED FOR THE COSTS OF MATERIALS, LABOR, INSTALLATION, OVERHEAD AND PROFIT IN ACCORDANCE GC–26, FOR ADDITIONAL MECHANICAL, ELECTRICAL AND PLUMBING WORK THAT IS NOT IDENTIFIED IN THE CONSTRUCTION DOCUMENTS/PLANS. REFER TO SPECIFICATION SECTION SP1.1 – ALLOWANCE FOR REQUIREMENTS.
8. INCLUDES ALL COSTS ASSOCIATED WITH DEMOLITION OF LOOP SWITCHES AND APPURTENANCES AS SHOWN ON DRAWINGS.

CONSTRUCTION SEQUENCING REQUIREMENTS:

1. MAIN SWITCHGEAR SHALL BE REPLACED IN TWO SEPARATE PHASES, ONE HALF OF THE GEAR IN EACH PHASE, SO AS TO ENABLE PLANT TO REMAIN ENERGIZED THROUGH ONE SIDE OF THE GEAR WHILE THE OTHER SIDE IS BEING REPLACED.
2. ATO REPLACEMENT SHALL NOT OCCUR UNTIL AFTER BOTH HALVES OF THE SWITCHGEAR HAVE BEEN REPLACED AND THE "ATO BYPASS" FEEDER FROM PSO HAS BEEN INSTALLED. COORDINATE ATO AND METER REPLACEMENT WITH PSO.
3. ANY PLANT OUTAGES SHALL BE FULLY COORDINATED WITH PLANT STAFF AT LEAST 7 DAYS IN ADVANCE.

LICENSED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20578
9-19-23
OKLAHOMA

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV
SWITCH GEAR IMPROVEMENTS
TMUA PROJECT NO. ES 2020–05

LOCATION MAP &
SUMMARY OF QUANTITES

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

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
(918)258-0707, FAX (918)251-0764

PLAN SCALE: 1"=X'	DRAWN	JME		APPROVED:
	DESIGNED	LST		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.		10/23	
HORIZONTAL: 1"=X'	LEAD ENGR.		10-23-23	
	FIELD MGR.		10/23	
VERTICAL: 1"=X'				DESIGN ENGINEERING MANAGER
HUB PROJECT NO: 21TMUASWITCH				DATE: AUGUST 2023
ATLAS PAGE NO:				SHEET 2 OF 4 SHEETS

Z:\Projects\2021\21TMUASWITCH\Design\Production Plans\LOCATION MAP & PAY ITEM SUMMARY.dwg, 9/19/2023 6:11:01 PM

GENERAL NOTES

1. THE CONTRACTOR SHALL CALL OKIE AT 1–800–522–6543 PRIOR TO ANY EXCAVATION TO DETERMINE LOCATION OF EXISTING UTILITIES.
2. THE CONTRACTOR SHALL, AT HIS EXPENSE, UNCOVER AND DETERMINE THE DEPTH OF PIPE LINES AND OTHER UTILITIES WHICH, IN HIS OPINION, COULD INTERFERE WITH THE CONSTRUCTION.
3. THE CITY OF TULSA ENGINEERING SERVICES DEPARTMENT STANDARD SPECIFICATIONS AND STANDARD DETAIL, MARCH 2022, ARE HEREBY ADOPTED AS PART OF THESE SPECIFICATIONS WHERE REFERENCE IS MADE. SAID SPECIFICATIONS WILL BE HEREINAFTER REFERRED TO AS THE "STANDARD SPECIFICATIONS".
4. CONTRACTOR SHALL HAVE ONE (1) EXECUTED COPY OF THE CONTRACT DOCUMENTS, SPECIFICATIONS AND DRAWINGS AT THE JOBS SITE AT ALL TIMES.
5. CONTRACTOR SHALL MAINTAIN SANITARY FACILITIES FOR THE CONSTRUCTION WORKERS AND OTHER ON–SITE VISITORS AT THE PROJECT SITE AT ALL TIMES.
6. CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION SITE AT ALL TIMES. TRASH, SPENT PALLETS, CONTAINER REMNANTS, BINDINGS, ETC. SHALL BE PICKED UP WHEN NO LONGER IN USE AND DEPOSITED IN TRASH CONTAINERS.
7. ALL STAINLESS STEEL SHALL BE MINIMUM TYPE 316L SUITABLE FOR SANITARY APPLICATIONS, UNLESS OTHERWISE NOTED.
8. ALL DIMENSIONS SHOWN WITH ± SHALL BE CONFIRMED BY THE CONTRACTOR ACCORDING TO ACTUAL FIELD CONDITIONS OR EQUIPMENT REQUIREMENTS.
9. ANY EXISTING ITEMS, EQUIPMENT, STRUCTURES OR SURFACES DISTURBED OR DAMAGED BY CONTRACTOR SHALL BE REPAIRED OR REPLACED TO ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST TO THE OWNER.
10. CONTRACTOR SHALL VERIFY EXISTING UTILITIES IN THE VICINITY OF PROPOSED CONSTRUCTION PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF DISCREPANCIES FROM DRAWINGS.
11. CONTRACTOR SHALL CONFIRM ALL DIMENSIONS WITH EQUIPMENT SUPPLIERS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF DISCREPANCIES.
12. THE IMPROVEMENTS SET FORTH IN THE PLANS SHALL NOT PROHIBIT ON–SITE TRAFFIC AND/OR RELATED TASKS REQUIRED IN THE TREATMENT AND DISCHARGE OF WASTEWATER.
13. ALL CONSTRUCTION TO BE IN STRICT ACCORDANCE WITH CURRENT CITY OF TULSA ENGINEERING SERVICES DEPARTMENT STANDARDS AND SPECIFICATIONS.
14. ALL WORKMANSHIP SHALL BE NEAT, PLUMB, SQUARE AND CONSTRUCTED IN A PROFESSIONAL MANNER.
15. ALL ELECTRICAL CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH ALL N.E.C. AND CITY OF TULSA ELECTRICAL CODES. ELECTRICAL, MECHANICAL, AND PLUMBING INSPECTIONS ARE REQUIRED AT BOTH ROUGH AND FINAL STAGES OF THE PROJECT. CONTRACTOR IS RESPONSIBLE FOR ALL PERMIT COORDINATION AND COSTS.
16. COMPILE ALL PRODUCT AND DATA SHEETS, OF ANY AND ALL EQUIPMENT INSTALLED IN EACH LOCATION, TO FORM A USABLE O&M MANUAL. PROVIDE THE CITY OF TULSA (3) THREE HARD COPIES AND ONE DIGITAL COPY IN PDF FORMAT OF THESE O&M MANUALS (10) TEN DAYS PRIOR TO THE REQUESTED FINAL ACCEPTANCE DATE. MANUALS SHALL BE TABBED AND AN INDEX SHEET PROVIDED TO ALLOW OWNER TO QUICKLY FIND INDIVIDUAL SECTIONS AND EQUIPMENT. COPIES OF ALL ELECTRICAL AND EQUIPMENT TESTING INFORMATION SHALL BE INCLUDED IN THE O&M MANUALS.
17. ALL BURIED CONSTRUCTION, INCLUDING BUT NOT LIMITED TO PIPE AND CONDUIT, SHALL BE PHOTOGRAPHED PRIOR TO COVER. EQUIPMENT DATA TAGS SHALL ALSO BE PHOTOGRAPHED WITH EQUIPMENT. SUBMIT IN A DIGITAL JPEG FORMAT ON JUMP DRIVE AS PART OF CONTRACTORS CONSTRUCTION PHOTOGRAPHIC RECORD.
18. WHERE RED COLOR IS USED ON PLAN SHEETS IT DENOTES PROPOSED OR NEW WORK.
19. THE OWNER DOES NOT HAVE EQUIPMENT TO ACTIVATE SWITCHES OVER 480 VOLTS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SWITCHING ABOVE 480V. COORDINATE ALL WORK WITH OWNER.

EQUIPMENT INFORMATION - 13.2 KV SWITCH GEAR IMPROVEMENTS			
DESCRIPTION	STATUS	EQUIPMENT ID	PLAN DRAWING NO.
13.2 KV SWITCH GEAR	PROPOSED	NOO1 - OPS1- MDP01	E1-E9
TRANSFORMER NO.1	PROPOSED	NOO1 - OPS1 - TRN01	E1-E9
TRANSFORMER NO. 2	PROPOSED	NOO1 - OPS1 - TRN02	E1-E9
AUTOMATIC TRANSFER SWITCH	PROPOSED	NOO1 - OPS1 - ATS02	E1-E9

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV
SWITCH GEAR IMPROVEMENTS
TMUA PROJECT NO. ES 2020–05

GENERAL NOTES

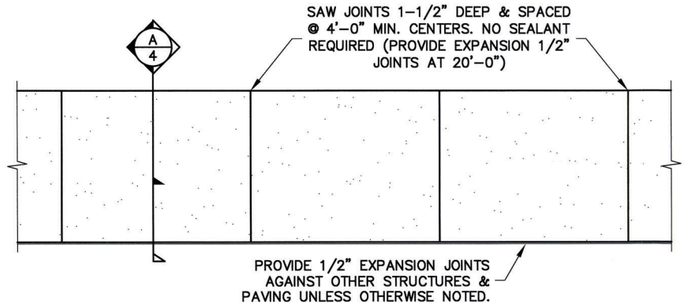
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
(918)205-0707, FAX (918)205-0704

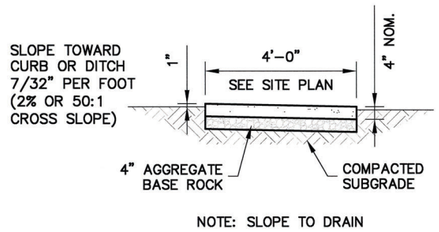
PLAN SCALE: 1"=X'	DRAWN	JME	APPROVED:
	DESIGNED	LST	
	SURVEY		
PROFILE SCALE:	PROJ. MGR.		10/23
HORIZONTAL: 1"=X'	LEAD ENGR.		10/23
	FIELD MGR.		10/23
VERTICAL: 1"=X'			DESIGN ENGINEERING MANAGER
HUB PROJECT NO: 21TMUASWITCH			DATE: AUGUST 2023
ATLAS PAGE NO:			SHEET 3 OF 4 SHEETS

LICENSED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20676
OKLAHOMA
9-19-23

Z:\Projects\2021\21TMUASWITCH\Design\Production Plans\General Notes.dwg, 9/19/2023 6:11:04 PM

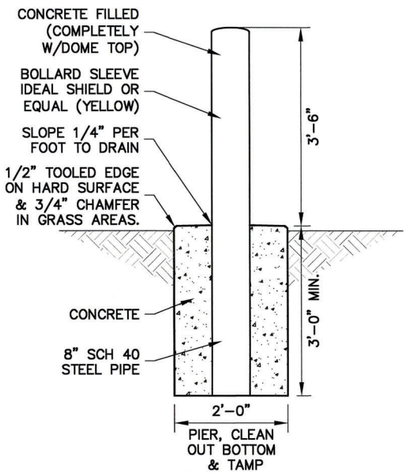


1/4 PLAN @ SIDEWALK/MOW STRIP
SCALE: 1/2" = 1'–0"



NOTE: SLOPE TO DRAIN

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



2/4 DETAIL @ 8" PIPE BOLLARD
SCALE: 3/4" = 1'–0"

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020–05

MISCELLANEOUS DETAILS

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

PLANS AND ESTIMATES PREPARED BY:
HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012
(918)259-0777, FAX (918)251-0754

PLAN SCALE: 1"=X'	DRAWN	JME	APPROVED:
	DESIGNED	LST	
	SURVEY		
PROFILE SCALE:	PROJ. MGR.		10/23
HORIZONTAL: 1"=X'	LEAD ENGR.		10-23-23
	FIELD MGR.		10/23
VERTICAL: 1"=X'			DESIGN ENGINEERING MANAGER
HUB PROJECT NO: 21TMUASWITCH			DATE: AUGUST 2023
ATLAS PAGE NO:			SHEET 4 OF 4 SHEETS

LICENSED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20570
10-9-23
OKLAHOMA

Z:\Projects\2021\21TMUASWITCH\Design\Production Plans\Miscellaneous_Details.dwg, 9/19/2023 6:11:07 PM

SWITCHING AND PROTECTIVE DEVICES:

- ELECTRICALLY–OPERATED, DRAWOUT TYPE, METAL CLAD CIRCUIT BREAKER.
- ELECTRICALLY–OPERATED, NON–DRAWOUT MV OR HV CIRCUIT BREAKER.
- ELECTRICALLY–OPERATED, DRAWOUT TYPE, METAL CLAD CIRCUIT BREAKER.
- DRAW–OUT TYPE, AIR CIRCUIT BREAKER; TRIP RATING IN AMPERES. AS SHOWN.
- DISCONNECT SWITCH
- DISCONNECTING DEVICE, DISCONNECTING CONTACT
- COMBINATION DISCONNECT AND MOTOR STARTER, SIZE AS NOTED. FUSED TYPE SHOWN.
- MOTOR OVERLOAD
- FUSED CUTOUT
- FUSED DISCONNECT SWITCH, SIZE AS SHOWN
- NORMALLY CLOSED SWITCH
- NORMALLY OPEN SWITCH
- CIRCUIT BREAKER, TRIP RATING SHOWN, 3–POLE UNLESS NOTED. MOTOR CIRCUIT PROTECTOR, IF IN COMBINATION MOTOR STARTER.
- FUSE, CURRENT LIMITING, RATING AS SHOWN
- MOTOR STARTER, SIZE AS SHOWN OR REQUIRED. FVNR UNLESS NOTED
- HAND–OFF–AUTO STARTER CONTROLS
- ATS/BP/IS * — ATS, RATING IN AMPS AS SHOWN
- 3/4" x 10' COPPER CLAD GROUND ROD

LINETYPES:

- ------- EXISTING OR BY OTHERS
- ——— FURNISH AND INSTALL
- REMOVE

LOADS AND RELATED DEVICES:

- FURNISH AND INSTALL NEMA 4X STAINLESS STEEL CONTINUOUS HINGE, OIL TIGHT 1/4 TURN SEMI FLUSH LATCH JUNCTION BOX. TERMINATE PUMP CABLES ON POWER DISTRIBUTION TERMINAL BLOCKS, PROVIDE STRAIN RELIEF ON PUMP CABLES.
- SINE WAVE OUTPUT FILTER — NEMA 1, SHORT TERM OVERLOADING 200%, 480V TEMPERATURE RISE 115°C, SIZE AT 125% FLA
- 4X — NEMA RATING; LOW HARMONIC ACTIVE FRONT END VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECT; 100HP — VFD HORSEPOWER RATING
- 4X — NEMA RATING; 6 PULSE VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECT; 100HP — VFD HORSEPOWER RATING
- 4X — INPUT LINE/LOAD REACTOR NEMA RATING; 5% — REACTOR IMPEDANCE
- 4X — NEMA RATING; dv/dt OUTPUT FILTER
- VARIABLE FREQUENCY DRIVE OR REDUCED VOLTAGE SOFT START, AS SHOWN
- OR — RESISTOR
- LIGHTNING/SURGE ARRESTER
- TRANSFORMER, RATINGS AS SHOWN
- M, * HP — ELECTRIC MOTOR, HORSEPOWER SHOWN
- SA OR SPD — SURGE ARRESTOR OR SURGE PROTECTIVE DEVICE
- G, * kW — GENERATOR, RATING SHOWN
- PANEL * — MAIN–LUGS ONLY PANEL, SWITCHBOARD, OR MCC NAMED AS SHOWN.
- PANEL * — MAIN–CIRCUIT BREAKER PANEL, SWITCHBOARD, OR MCC NAMED AS SHOWN.
- MINI POWER ZONE, * kVA, 480:240/120V 1PH — MINI POWER ZONE. SIZED AND NAMED AS SHOWN
- FIXED, FILTERED POWER FACTOR CORRECTION

ABBREVIATIONS:

OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
ZSI	ZONE SELECTIVE INTERLOCKING OF ALL BREAKERS IN PANEL
P–LSI(G)	PROGRAMMABLE BREAKER MICROLOGIC OR EQUAL WITH ADJUSTMENTS LISTED: L = LONG–TIME, S = SHORT TIME, I = INSTANTANEOUS, G = GROUND FAULT, P = POWER METERING WITH ETHERNET CONNECTIVITY
MM	ENERGY REDUCING MAINTENANCE SWITCHING WITH LOCAL STATUS TO COMPLY WITH NEC 240.87
AVT	ABSENCE OF VOLTAGE TESTER (PANDUIT VERISAFE VS–AVT–C08–L10 OR APPROVED EQUAL)
MDP	MAIN DISTRIBUTION PANEL
ATS	AUTOMATIC TRANSFER SWITCH
MTS	MANUAL TRANSFER CENTER
MCC	MOTOR CONTROL CENTER
PNL	PANEL
TRN	TRANSFORMER
N.O.	NORMALLY OPEN
N.C.	NORMALLY CLOSED
R.O.	NORMALLY RACKED OUT
R.I.	NORMALLY RACKED IN
PESD	PERMANENT ELECTRICAL SAFETY DEVICE (GRACEPORT SAFESIDE P–S10S21–M3RX OR APPROVED EQUAL)

METER AND RELAY DEVICES:

- * — CURRENT TRANSFORMER, CURRENT RATIO AS SHOWN
- * — POTENTIAL OR CONTROL TRANSFORMER, QUALITY AND CONFIGURATION AS SHOWN
- PM — POWER METER. KW–HR, W, VA, VAR, V, I, HZ, PF, WITH MIN/MAX RECORDING AND TIME STAMPING
- TB — TEST BLOCK
- AS — AMMETER SWITCH
- VS — VOLTMETER SWITCH
- T — POTENTIAL TRANSFER SWITCH
- A — AMMETER
- V — VOLTMETER
- W — WATTMETER
- WH — WATTHOUR METER
- M — UTILITY METER
- R — PROTECTIVE RELAY, ANSI FUNCTIONS AS SHOWN

CONDUCTORS:

- SHIELDED VFD CABLE TYPE TC–ER (XHHW–2), 600 VOLT 3 CONDUCTOR WITH 3 SYMMETRICAL GROUND CONDUCTORS AND OVERALL COPPER SHIELD
- CONNECTION TO GROUND BUS
- INTERCEPT CONDUIT. PULL NEW FEEDER THE ENTIRE LENGTH OF CIRCUIT.
- CABLE TERMINATION. ALL TERMINATIONS SHALL BE PERFORMED BY PERSONNEL WITH 5 YEARS OF PREVIOUS EXPERIENCE IN HIGH VOLTAGE TERMINATIONS AND SHALL BE CERTIFIED BY THE TERMINATION KIT MANUFACTURER.
- WEATHERHEAD
- XXX — DUCT BANK CIRCUIT DESIGNATION SEE DUCT BANK CONDUIT AND CABLE SCHEDULE

KEYED INTERLOCKS:

- K — KIRK KEY INTERLOCK
- K1 — CLOSE TWO OUT OF THREE
- DIRECTION OF KEY TRANSFER.
- A1, A2, A3 — KEY INTERCHANGE NUMBER.
- INTERLOCK WITH KEY HELD. DEVICE IN POSITION AS SHOWN.
- INTERLOCK WITH KEY REMOVED. DEVICE IN POSITION AS SHOWN.
- L–O — INTERLOCK USED TO LOCK DEVICE OPEN. (WITH KEY REMOVED)
- L–O — INTERLOCK USED TO LOCK DEVICE OPEN. (WITH KEY HELD)
- L–C — INTERLOCK USED TO LOCK DEVICE CLOSED. (WITH KEY REMOVED)
- L–C — INTERLOCK USED TO LOCK DEVICE CLOSED. (WITH KEY HELD)
- INTERLOCK WITH BOLT EXTENDED. DEVICE IN POSITION AS SHOWN.
- INTERLOCK WITH BOLT WITHDRAWN. DEVICE IN POSITION AS SHOWN.
- E — KEY REMOVABLE WITH BOLT EXTENDED.
- W — KEY REMOVABLE WITH BOLT WITHDRAWN.
- MULTI–LOCK INTERLOCK
- "APARTMENT LOCK" WILL ACCEPT TWO DIFFERENT KEYS. BUT ONLY ONE KEY AT A TIME.
- ACCESS DOOR INTERLOCK (DETACHABLE LATCH)
- A3 — KEY INTERCHANGE NUMBER (SHOWING KEY HELD).

2 OF 3 — QUANTITY OF KEYS / QUANTITY OF TUMBLERS

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020–05

ELECTRICAL POWER ONE–LINE LEGEND

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

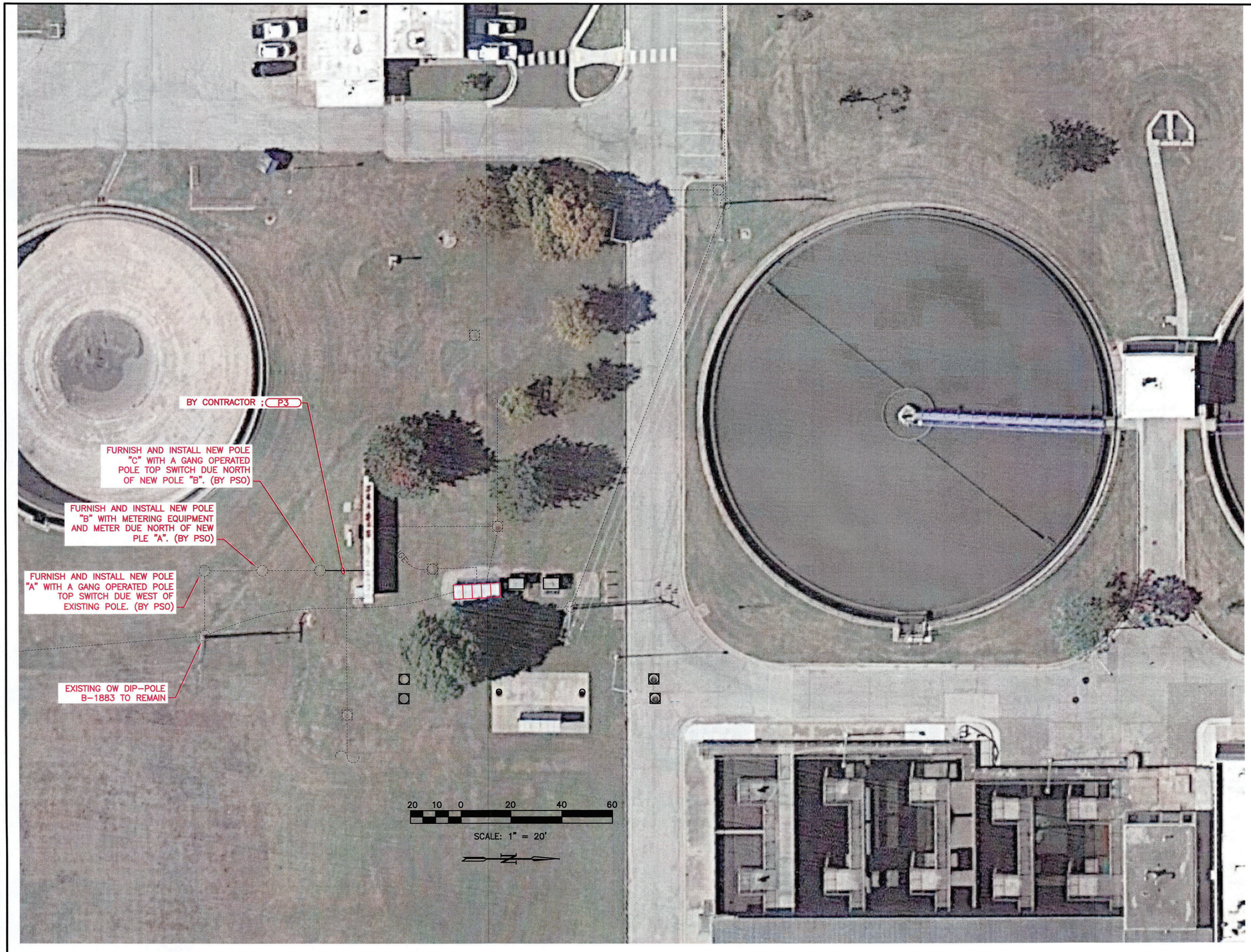
PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc. 2001 N WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0764

PLAN SCALE: AS SHOWN	DRAWN	CD		APPROVED:
	DESIGNED	NS		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.		10/23	
HORIZONTAL:	LEAD ENGR.		10-23-23	
	FIELD MGR.		10/23	
VERTICAL:				DESIGN ENGINEERING MANAGER
HUB PROJECT NO: 21TMUASWITCH				DATE: AUGUST 2023
ATLAS PAGE NO:				SHEET E0 OF 12 SHEETS

REGISTERED PROFESSIONAL ENGINEER — BRUCE W. BROWN — 20995 — OKLAHOMA — 12-25-2023

BROWN ENGINEERS 501-448-0100

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E0_LEGEND.DWG
10/18/2023 12:11 PM



SUPPLEMENTAL LEGEND:

- OHE — OVERHEAD ELECTRIC
- UGE — UNDERGROUND ELECTRIC
- ELECTRICAL MANHOLE
- POLE MOUNT FUSES

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020-05

ELECTRICAL SITE PLAN PSO COORDINATION

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

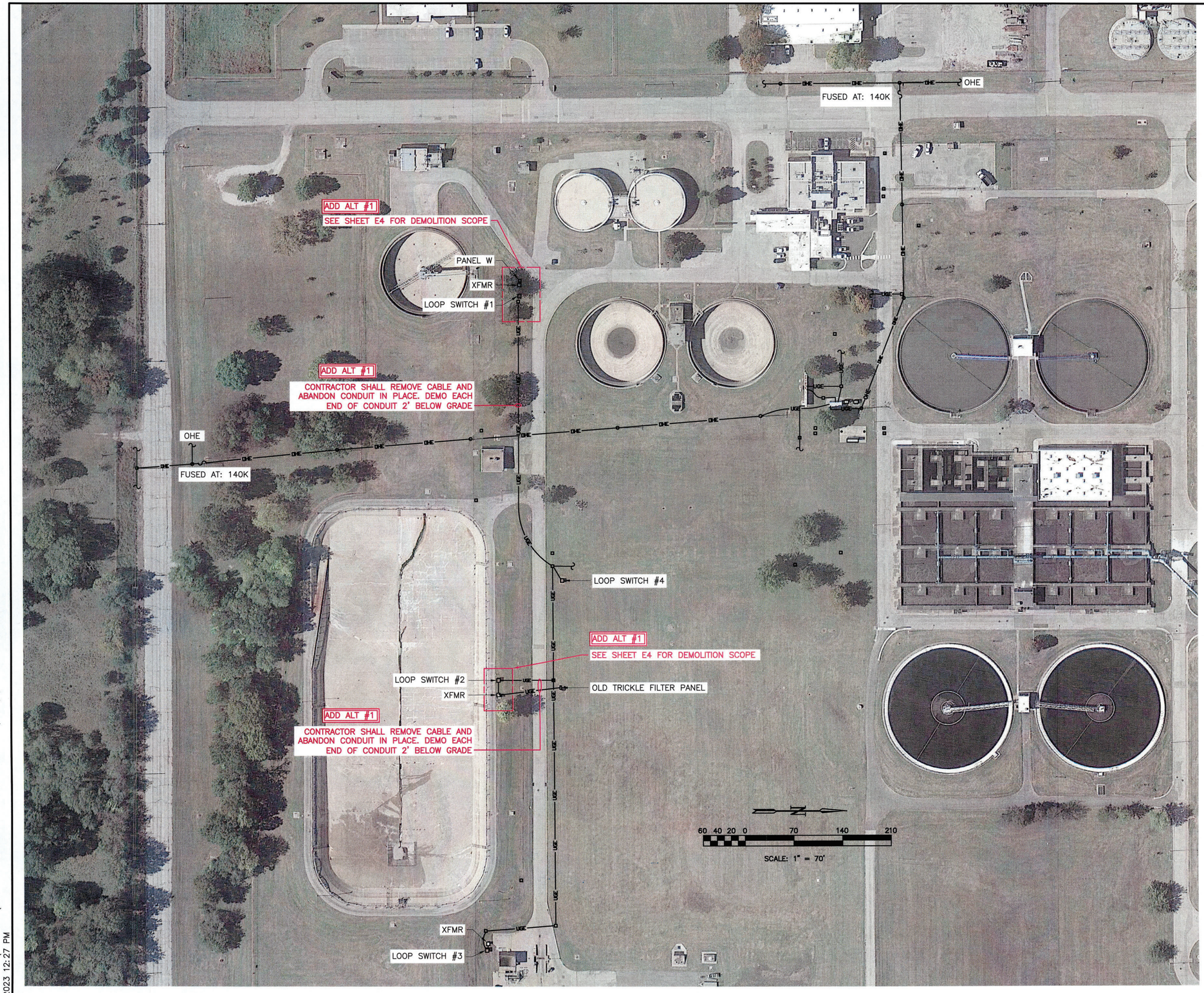
PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
(918)251-0717, FAX (918)251-0764

PLAN SCALE: AS SHOWN	DRAWN	CD		APPROVED:
	DESIGNED	NS		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.		10/23	
HORIZONTAL:	LEAD ENGR.		10-23-23	
	FIELD MGR.		10/23	
VERTICAL:				DESIGN ENGINEERING MANAGER
HUB PROJECT NO: 21TMUASWITCH				DATE: AUGUST 2023
ATLAS PAGE NO:				SHEET E1.1 OF 12 SHEETS

REGISTERED PROFESSIONAL ENGINEER BRUCE W. BROWN 20995 OKLAHOMA

BROWN ENGINEERS 501-448-0100

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E01.1_PSO COORDINATION SCOPE.DWG
10/18/2023 12:25 PM



SUPPLEMENTAL LEGEND:

- OHE — OVERHEAD ELECTRIC
- UGE — UNDERGROUND ELECTRIC
- ELECTRICAL MANHOLE
- POLE MOUNT FUSES

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020-05

ELECTRICAL SITE PLAN ADD ALT #1

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

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
(918)251-0707, FAX (918)251-0764

PLAN SCALE: AS SHOWN	DRAWN	CD	
	DESIGNED	NS	
	SURVEY		
PROFILE SCALE:	PROJ. MGR.	[illegible]	10/23
HORIZONTAL:	LEAD ENGR.	[illegible]	10-23-23
	FIELD MGR.	[illegible]	10/23
VERTICAL:			

APPROVED:

DESIGN ENGINEERING MANAGER

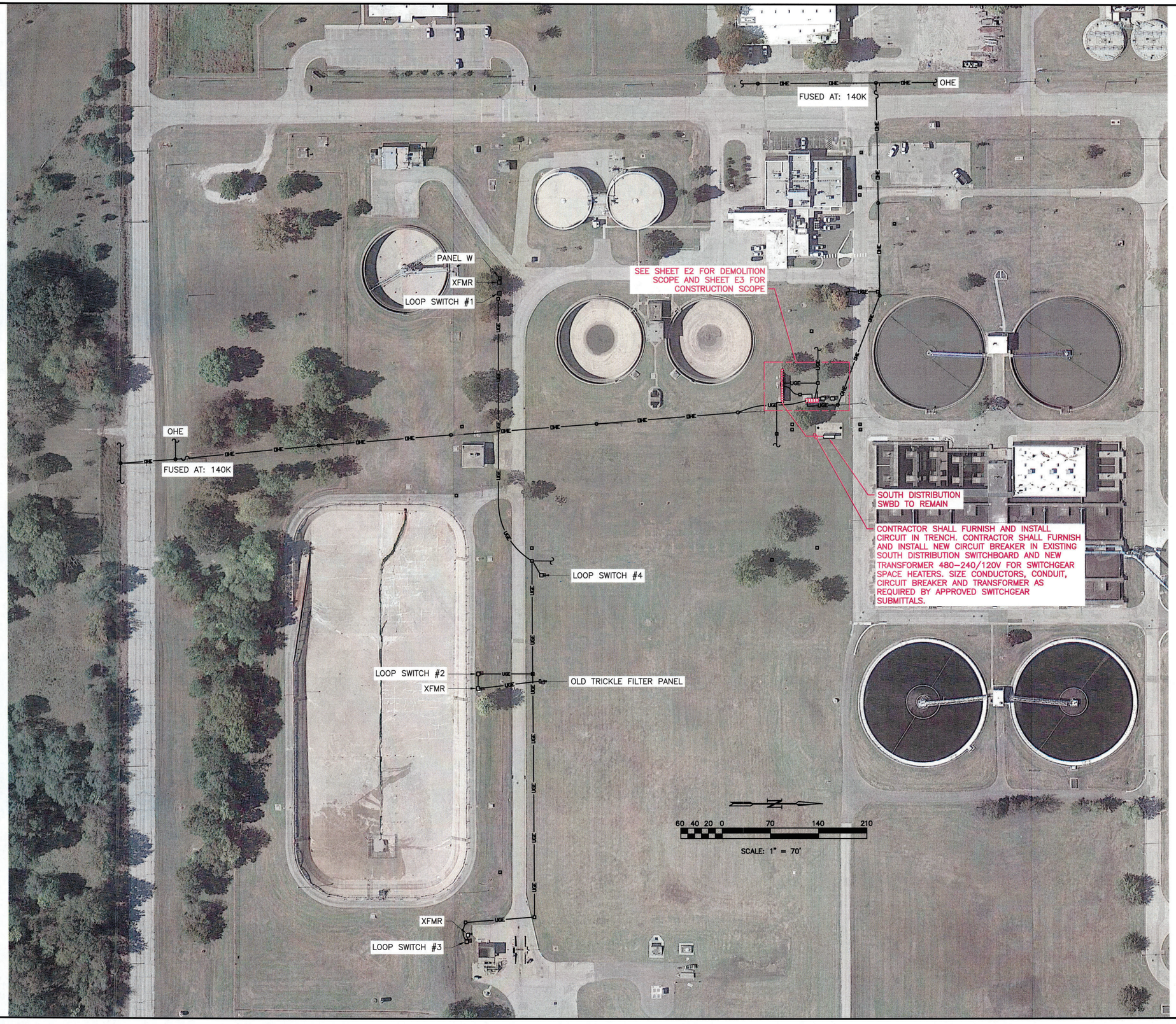
HUB PROJECT NO: 21TMUASWITCH — DATE: AUGUST 2023

ATLAS PAGE NO: — SHEET E1.2 OF 12 SHEETS

REGISTERED PROFESSIONAL ENGINEER BRUCE W. BROWN 20995 OKLAHOMA 8-25-23

BROWN ENGINEERS 501-448-0100

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E01.2_SITE PLAN ALT 1 SCOPE.DWG
10/18/2023 12:27 PM



SUPPLEMENTAL LEGEND:

- OHE — OVERHEAD ELECTRIC
- UGE — UNDERGROUND ELECTRIC
- ELECTRICAL MANHOLE
- POLE MOUNT FUSES

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020–05

ELECTRICAL SITE PLAN

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

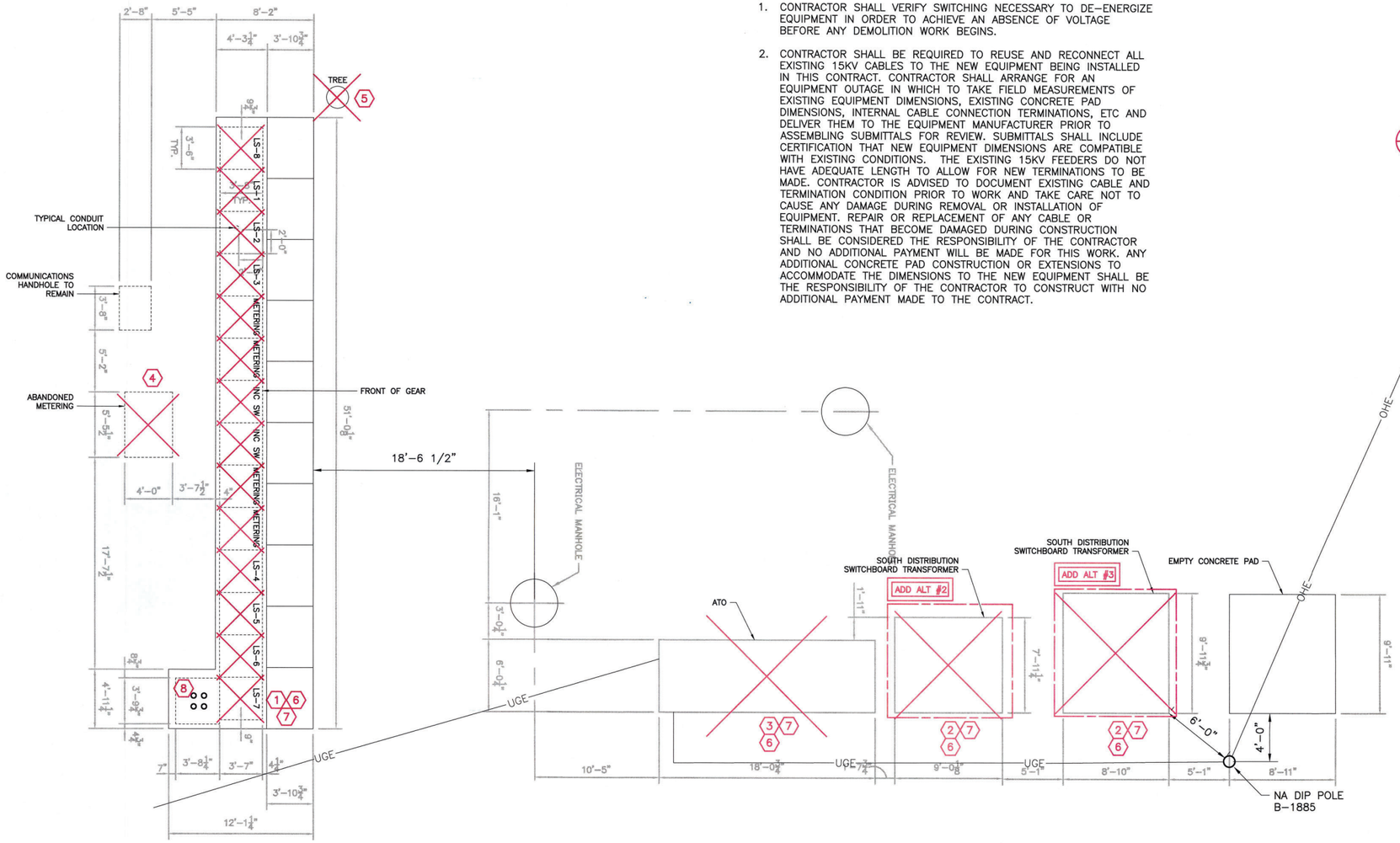
PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012
(918)251-0717, FAX (918)251-0764

PLAN SCALE: AS SHOWN	DRAWN	CD		APPROVED:
	DESIGNED	NS		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.	MM	10/23	
HORIZONTAL:	LEAD ENGR.	NS	10/23-23	
	FIELD MGR.	CDA	10/23	
VERTICAL:				DESIGN ENGINEERING MANAGER
HUB PROJECT NO: 21TMUASWITCH				DATE: AUGUST 2023
ATLAS PAGE NO:				SHEET E1 OF 12 SHEETS

REGISTERED PROFESSIONAL ENGINEER — BRUCE W. BROWN — 21995 — OKLAHOMA — 8-25-2023

BROWN ENGINEERS 501-448-0100

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E01_PLAN.DWG
10/18/2023 12:24 PM



1 / E2 **EXISTING PLAN, MAIN SWITCHGEAR**
SCALE: 3/16" = 1'-0"

72" 48" 24" 0 4' 8' 12' 16'

SCALE: 3/16" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR SHALL VERIFY SWITCHING NECESSARY TO DE-ENERGIZE EQUIPMENT IN ORDER TO ACHIEVE AN ABSENCE OF VOLTAGE BEFORE ANY DEMOLITION WORK BEGINS.
2. CONTRACTOR SHALL BE REQUIRED TO REUSE AND RECONNECT ALL EXISTING 15KV CABLES TO THE NEW EQUIPMENT BEING INSTALLED IN THIS CONTRACT. CONTRACTOR SHALL ARRANGE FOR AN EQUIPMENT OUTAGE IN WHICH TO TAKE FIELD MEASUREMENTS OF EXISTING EQUIPMENT DIMENSIONS, EXISTING CONCRETE PAD DIMENSIONS, INTERNAL CABLE CONNECTION TERMINATIONS, ETC AND DELIVER THEM TO THE EQUIPMENT MANUFACTURER PRIOR TO ASSEMBLING SUBMITTALS FOR REVIEW. SUBMITTALS SHALL INCLUDE CERTIFICATION THAT NEW EQUIPMENT DIMENSIONS ARE COMPATIBLE WITH EXISTING CONDITIONS. THE EXISTING 15KV FEEDERS DO NOT HAVE ADEQUATE LENGTH TO ALLOW FOR NEW TERMINATIONS TO BE MADE. CONTRACTOR IS ADVISED TO DOCUMENT EXISTING CABLE AND TERMINATION CONDITION PRIOR TO WORK AND TAKE CARE NOT TO CAUSE ANY DAMAGE DURING REMOVAL OR INSTALLATION OF EQUIPMENT. REPAIR OR REPLACEMENT OF ANY CABLE OR TERMINATIONS THAT BECOME DAMAGED DURING CONSTRUCTION SHALL BE CONSIDERED THE RESPONSIBILITY OF THE CONTRACTOR AND NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS WORK. ANY ADDITIONAL CONCRETE PAD CONSTRUCTION OR EXTENSIONS TO ACCOMMODATE THE DIMENSIONS TO THE NEW EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONSTRUCT WITH NO ADDITIONAL PAYMENT MADE TO THE CONTRACT.



1 / E2

KEYED PLAN

KEYED NOTES:

1. CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING 13.2KV SWITCHGEAR CAREFULLY TO PROTECT AND PRESERVE EXISTING CONDUCTORS AND 15KV CABLE TERMINATIONS FOR RE-USE WITH NEW SWITCHGEAR. CONCRETE PAD TO REMAIN.

ADD ALT #2
ADD ALT #3

2. CONTRACTOR SHALL DEMOLISH AND REMOVE BOTH EXISTING SOUTH DISTRIBUTION SWITCHBOARD TRANSFORMERS CAREFULLY TO PROTECT AND PRESERVE EXISTING CONDUCTORS AND 15KV CABLE TERMINATIONS FOR RE-USE WITH NEW TRANSFORMERS. CONCRETE PAD TO REMAIN.

3. CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING ATO AND METER CAREFULLY TO PROTECT AND PRESERVE EXISTING CONDUCTORS AND 15KV CABLE TERMINATIONS FOR RE-USE WITH NEW ATO AND METER. CONCRETE PAD TO REMAIN.
4. CONTRACTOR SHALL DEMOLISH AND REMOVE ABANDONED METERING GEAR AND ASSOCIATED CONDUCTORS. DEMOLISH CONDUITS TO GROUND AND ABANDON UNDERGROUND CONDUITS IN PLACE. DEMOLISH AND REMOVE EXISTING CONCRETE PAD.
5. CONTRACTOR SHALL REMOVE TREE AND TREE STUMP.
6. CONTRACTOR SHALL NOT CUT OR ALTER 15KV CABLE TERMINATIONS DURING DEMOLITION.
7. CONTRACTOR SHALL DISCONNECT AND PRESERVE CONNECTIONS TO GROUNDING ELECTRODE SYSTEM FOR RE-USE.
8. CONTRACTOR SHALL FIELD VERIFY CONDUIT ENTRY POSITIONS FOR LS-7.

PHASED CONSTRUCTION NOTICE:

1. MAIN SWITCHGEAR SHALL BE REPLACED IN TWO SEPERATE PHASES, ONE HALF OF THE GEAR IN EACH PHASE, SO AS TO ENABLE PLANT TO REMAIN ENERGIZED THROUGH ONE SIDE OF THE GEAR WHILE THE OTHER SIDE IS BEING REPLACED.
2. ATO REPLACEMENT SHALL NOT OCCUR UNTIL AFTER BOTH HALVES OF THE SWITCHGEAR HAVE BEEN REPLACED AND THE "ATO BYPASS" FEEDER FROM PSO HAS BEEN INSTALLED. COORDINATE ATO AND METER REPLACEMENT WITH PSO.
3. ANY PLANT OUTAGES SHALL BE FULLY COORDINATED WITH PLANT STAFF AT LEAST 7 DAYS IN ADVANCE.

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020-05

ELECTRICAL AREA DEMOLITION PLAN

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

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
3001 N WILLOW AVE., BROKEN ARROW, OKLAHOMA 74012
(918)258-0707, FAX (918)251-0764

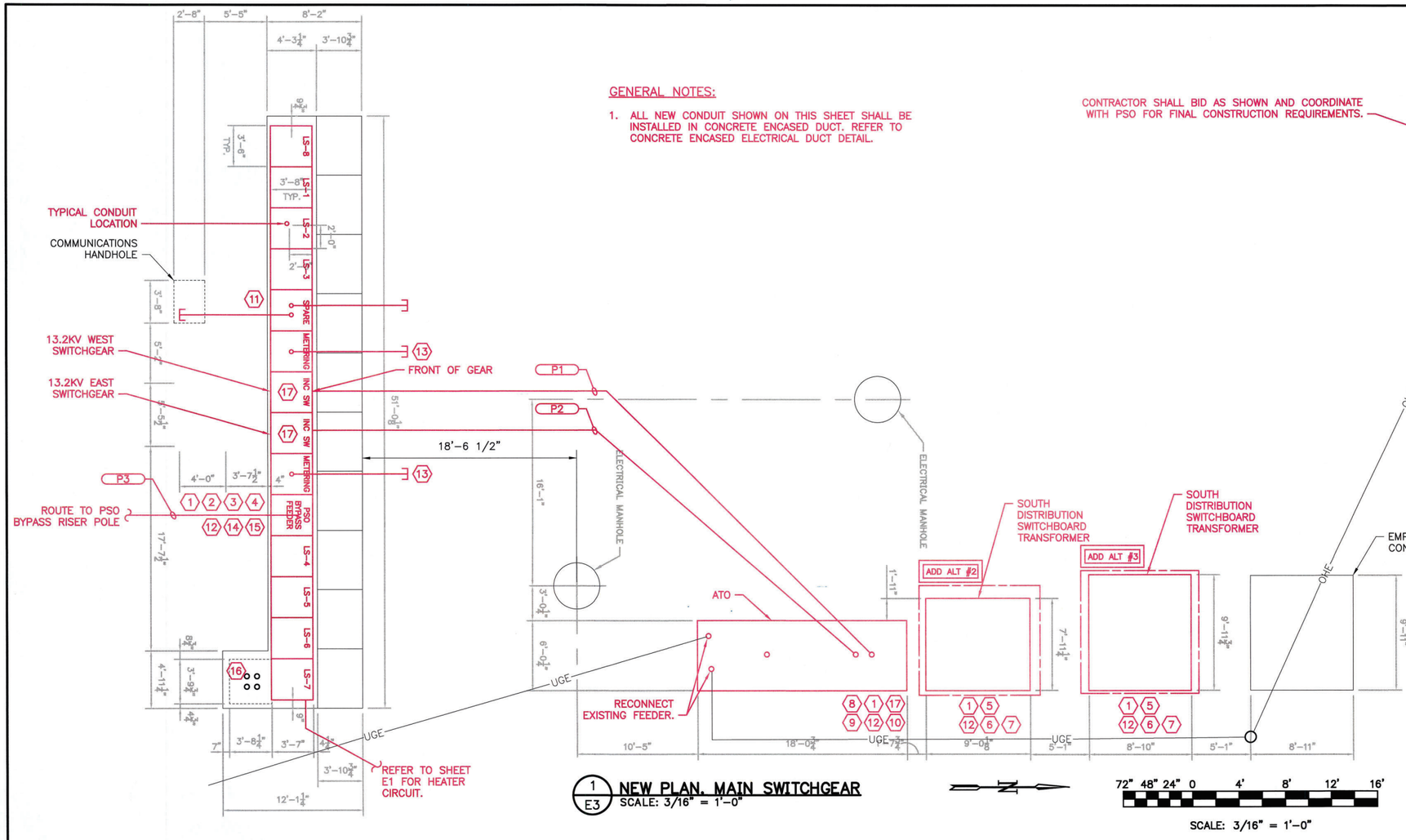
PLAN SCALE: AS SHOWN	DRAWN	CD		APPROVED:
	DESIGNED	NS		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.		10/23	
HORIZONTAL:	LEAD ENGR.		10-23-23	
	FIELD MGR.		10/23	
VERTICAL:				DESIGN ENGINEERING MANAGER

HUB PROJECT NO: 21TMUASWITCH — DATE: AUGUST 2023
ATLAS PAGE NO: — SHEET E2 OF 12 SHEETS

REGISTERED PROFESSIONAL ENGINEER — BRUCE W. BROWN — 20995 — OKLAHOMA — 10-25-2023

BROWN ENGINEERS 501-448-0100

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E02_EXISTING PLAN.DWG
9/6/2023 3:10 PM



1 / E3 **NEW PLAN, MAIN SWITCHGEAR**
SCALE: 3/16" = 1'-0"

72" 48" 24" 0 4' 8' 12' 16'

SCALE: 3/16" = 1'-0"

GENERAL NOTES:

1. ALL NEW CONDUIT SHOWN ON THIS SHEET SHALL BE INSTALLED IN CONCRETE ENCASED DUCT. REFER TO CONCRETE ENCASED ELECTRICAL DUCT DETAIL.

CONTRACTOR SHALL BID AS SHOWN AND COORDINATE WITH PSO FOR FINAL CONSTRUCTION REQUIREMENTS.

DUCT BANK CONDUIT AND CABLE SCHEDULE

	CIRCUIT	DESCRIPTION	SERVICE VOLT.	SERVICE AMPS	ROUTING FROM	ROUTING TO	WIRE & CONDUIT	APPROXIMATE PERCENTAGE FULL
*	P1	13.2KV SWITCHGEAR WEST FEEDER	15KV		ATO	13.2KV SWITCHGEAR WEST	2(3#250MV-105 CU 133%+ 1#1 EG) 5" CONDUIT	30.4%
*	P2	13.2KV SWITCHGEAR EAST FEEDER	15KV		ATO	13.2KV SWITCHGEAR WEST	2(3#250MV-105 CU 133%+ 1#1 EG) 5" CONDUIT	30.4%
*	P3	PSO BYPASS FEEDER	15KV		PSO BYPASS RISER POLE "C"	13.2KV SWITCHGEAR PSO BYPASS FEEDER	2(3#250MV-105 CU 133%+ 1#1 EG) 5" CONDUIT	30.4%

*CONDUCTORS SHALL BE 15kV 133% FULL CONCENTRIC NEUTRAL.

PHASED CONSTRUCTION NOTICE:

1. MAIN SWITCHGEAR SHALL BE REPLACED IN TWO SEPERATE PHASES, ONE HALF OF THE GEAR IN EACH PHASE, SO AS TO ENABLE PLANT TO REMAIN ENERGIZED THROUGH ONE SIDE OF THE GEAR WHILE THE OTHER SIDE IS BEING REPLACED.
2. ATO REPLACEMENT SHALL NOT OCCUR UNTIL AFTER BOTH HALVES OF THE SWITCHGEAR HAVE BEEN REPLACED AND THE "ATO BYPASS" FEEDER FROM PSO HAS BEEN INSTALLED. COORDINATE ATO AND METER REPLACEMENT WITH PSO.
3. ANY PLANT OUTAGES SHALL BE FULLY COORDINATED WITH PLANT STAFF AT LEAST 7 DAYS IN ADVANCE.

KEYED NOTES:

ADD ALT #2 ADD ALT #3

1. CONTRACTOR SHALL BE REQUIRED TO REUSE AND RECONNECT ALL EXISTING 15KV CABLES TO THE NEW EQUIPMENT BEING INSTALLED IN THIS CONTRACT. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS OF EXISTING EQUIPMENT DIMENSIONS, EXISTING CONCRETE PAD DIMENSIONS, INTERNAL CABLE CONNECTION TERMINATIONS, ETC AND DELIVER THEM TO THE EQUIPMENT MANUFACTURER PRIOR TO ASSEMBLING SUBMITTALS FOR REVIEW. SUBMITTALS SHALL INCLUDE CERTIFICATION THAT NEW EQUIPMENT DIMENSIONS ARE COMPATIBLE WITH EXISTING CONDITIONS. THE EXISTING 15KV FEEDERS DO NOT HAVE ADEQUATE LENGTH TO ALLOW FOR NEW TERMINATIONS TO BE MADE. CONTRACTOR IS ADVISED TO DOCUMENT EXISTING CABLE AND TERMINATION CONDITION PRIOR TO WORK AND TAKE CARE NOT TO CAUSE ANY DAMAGE DURING REMOVAL OR INSTALLATION OF EQUIPMENT. REPAIR OR REPLACEMENT OF ANY CABLE OR TERMINATIONS THAT BECOME DAMAGED DURING CONSTRUCTION SHALL BE CONSIDERED THE RESPONSIBILITY OF THE CONTRACTOR AND NOT ADDITIONAL PAYMENT WILL BE MADE FOR THIS WORK. ANY ADDITIONAL CONCRETE PAD CONSTRUCTION OR EXTENSIONS TO ACCOMMODATE THE DIMENSIONS TO THE NEW EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONSTRUCT WITH NO ADDITIONAL PAYMENT MADE TO THE CONTRACT.
2. CONTRACTOR SHALL FURNISH AND INSTALL IN-KIND 13.2KV SWITCHGEAR. SEE SHEET E6. MANUFACTURER SHALL BE S&C OR APPROVED EQUAL. GEAR SHALL BE CD-657332 OR APPROVED EQUAL.
3. CONTRACTOR SHALL FULLY COORDINATE WITH MANUFACTURER TO ENSURE NEW 13.2KV SWITCHGEAR MATCHES WITH EXISTING 13.2KV SWITCHGEAR CONCRETE PAD AND ENSURE EXISTING BAY CONDUIT STUBUPS AND EXISTING CABLE TERMINAL CONNECTIONS MATCH NEW CABLE TERMINAL CONNECTIONS WITH EXISTING CONDUIT STUBUPS EXACTLY AS EXISTING. ENSURE EXISTING CABLES REACH NEW 13.2KV SWITCHGEAR CABLE TERMINALS WITHOUT MODIFICATION AND PRESERVING MINIMUM BEND RADIUS.
4. CONTRACTOR SHALL VERIFY THE NEW 13.2KV SWITCHGEAR MAKES APPROPRIATE CONNECTIONS USING EXISTING CONDUCTORS AND MAKE ALL FINAL FIELD CONNECTIONS USING EXISTING 15KV CABLE TERMINATIONS.
5. CONTRACTOR SHALL FURNISH AND INSTALL IN-KIND SOUTH DISTRIBUTION SWITCHBOARD TRANSFORMERS. ENSURE EXISTING CABLES CAN REACH TRANSFORMER BUSHINGS WITHOUT MODIFICATION AND PRESERVING MINIMUM BEND RADIUS.
6. CONTRACTOR SHALL ENSURE NEW SOUTH DISTRIBUTION SWITCHBOARD TRANSFORMERS ARE COMPATIBLE WITH EXISTING SOUTH DISTRIBUTION TRANSFORMER CONCRETE PADS. MODIFY AS REQUIRED.
7. CONTRACTOR SHALL MAKE ALL FINAL FIELD CONNECTIONS WITH NEW SOUTH DISTRIBUTION SWITCHBOARD TRANSFORMERS USING EXISTING CONDUCTORS TO MATCH EXISTING 15KV CABLE TERMINATIONS.
8. CONTRACTOR SHALL FURNISH AND INSTALL IN-KIND ATO AND METER. SEE SHEET E7. MANUFACTURER SHALL BE S&C OR APPROVED EQUAL. GEAR SHALL BE CDA-782672 OR APPROVED EQUAL.
9. CONTRACTOR SHALL FULLY COORDINATE WITH MANUFACTURER TO ENSURE NEW ATO IS COMPATIBLE WITH EXISTING ATO CONCRETE PAD AND CABLE TERMINATIONS.
10. CONTRACTOR SHALL COORDINATE WITH PSO FOR FINAL ATO AND METER FIELD CONNECTIONS USING EXISTING CONDUCTORS TO MATCH EXISTING 15KV CABLE TERMINATIONS. ENSURE EXISTING CABLES REACH NEW ATO CABLE TERMINALS WITHOUT MODIFICATION AND PRESERVING MINIMUM BEND RADIUS.
11. CONTRACTOR SHALL SAW CUT AND REPAIR EXISTING CONCRETE SLAB AND INSTALL (2)4" SPARE CONDUITS. ROUTE ONE SPARE TO THE NORTH AND ONE SPARE TO THE SOUTH. CAP EACH SPARE 5' FROM PAD. REPAIR CONCRETE AFTER CONDUIT INSTALLATION.
12. CONTRACTOR SHALL RECONNECT GROUND CONDUCTORS TO BOND NEW GEAR TO EXISTING GROUNDING ELECTRODE SYSTEM.
13. CONTRACTOR SHALL SAW CUT AND REPAIR EXISTING CONCRETE PAD AND FURNISH AND INSTALL 2"C SPARE CONDUIT STUBUP FOR FUTURE FIBER CONNECTION.
14. CONTRACTOR SHALL TAKE MEASUREMENTS OF EXISTING 13.2KV SWITCHGEAR CONCRETE PAD INCLUDING BUT NOT LIMITED TO CONDUIT LOCATION AND SIZE OF CONCRETE PAD TO ENSURE NEW SWITCHGEAR IS DESIGNED TO MATCH EXISTING.
15. CONTRACTOR SHALL ONLY CUT 15KV CABLE TERMINATIONS IF THE CONTRACTOR FIELD VERIFIES EXCESS CABLE IN NEW SWITCHING COMPARTMENT THAT MAKES CABLE ROUTING IMPRACTICAL. IN SUCH CASE THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING NEW 15KV CABLE TERMINATIONS AND TESTING THE NEW TERMINATIONS.
16. CONTRACTOR SHALL FIELD VERIFY CONDUIT ENTRY POSITIONS FOR LS-7.
17. CONTRACTOR SHALL SAW CUT AND REPAIR EXISTING CONCRETE PAD FOR NEW CONDUIT INSTALLATION.

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020-05

ELECTRICAL AREA PLAN NEW

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

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc. 2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012 (918)258-0707, FAX (918)258-0764

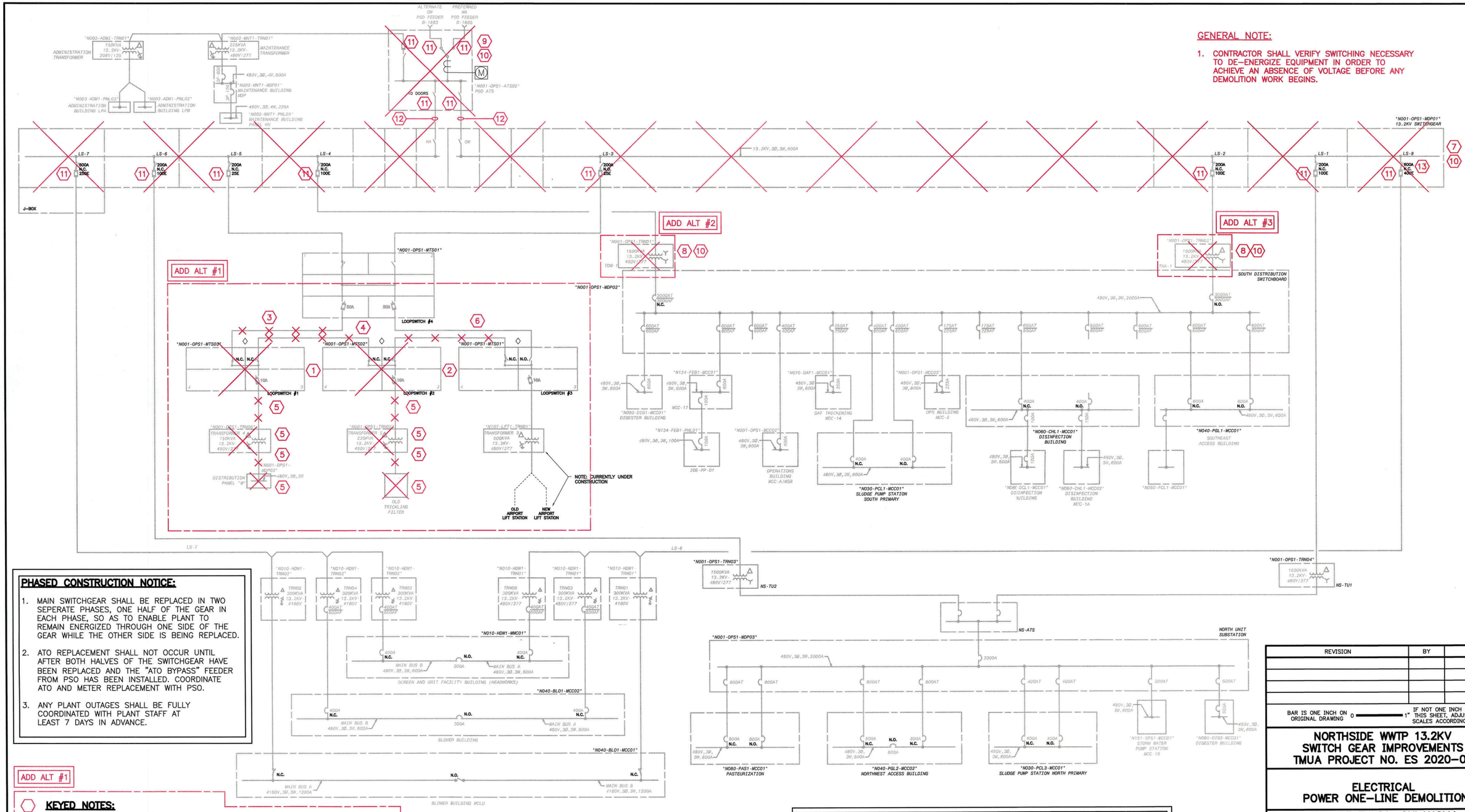
PLAN SCALE: AS SHOWN	DRAWN	CD		APPROVED:
	DESIGNED	NS		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.	MW	10/23	
HORIZONTAL:	LEAD ENGR.	BJB	10-23-23	
	FIELD MGR.	DM	10/23	
VERTICAL:				DESIGN ENGINEERING MANAGER

HUB PROJECT NO: 21TMUASWITCH — DATE: AUGUST 2023
ATLAS PAGE NO: — SHEET E3 OF 12 SHEETS

REGISTERED PROFESSIONAL ENGINEER BRUCE J. WEDEN 20995 OKLAHOMA 10-25-23

BROWN ENGINEERS 501-448-0100

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E03_NEW PLAN.DWG
9/6/2023 3:12 PM



PHASED CONSTRUCTION NOTICE:

1. MAIN SWITCHGEAR SHALL BE REPLACED IN TWO SEPERATE PHASES, ONE HALF OF THE GEAR IN EACH PHASE, SO AS TO ENABLE PLANT TO REMAIN ENERGIZED THROUGH ONE SIDE OF THE GEAR WHILE THE OTHER SIDE IS BEING REPLACED.
2. ATO REPLACEMENT SHALL NOT OCCUR UNTIL AFTER BOTH HALVES OF THE SWITCHGEAR HAVE BEEN REPLACED AND THE "ATO BYPASS" FEEDER FROM PSO HAS BEEN INSTALLED. COORDINATE ATO AND METER REPLACEMENT WITH PSO.
3. ANY PLANT OUTAGES SHALL BE FULLY COORDINATED WITH PLANT STAFF AT LEAST 7 DAYS IN ADVANCE.

ADD ALT #1

KEYED NOTES:

1. CONTRACTOR SHALL DEMOLISH AND REMOVE LOOP SWITCH #1.
2. CONTRACTOR SHALL DEMOLISH AND REMOVE LOOP SWITCH #2.
3. CONTRACTOR SHALL DEMOLISH AND REMOVE ALL CONDUCTORS FROM LOOP SWITCH #4 FEEDING LOOP SWITCH #1 AND ABANDON CONDUITS IN PLACE.
4. CONTRACTOR SHALL DEMOLISH AND REMOVE CONDUCTORS FROM LOOP SWITCH #1 FEEDING LOOP SWITCH #2 AND ABANDON CONDUITS IN PLACE.
5. CONTRACTOR SHALL DEMOLISH AND REMOVE ALL DOWNSTREAM CIRCUITS AND PANELS FROM LOOP SWITCH #1 AND #2 AND ABANDON UNDERGROUND CONDUITS 2" BELOW GRADE. DEMOLISH AND REMOVE ALL ABOVE GROUND CONDUITS.
6. CONTRACTOR SHALL DEMOLISH AND REMOVE CONDUCTORS FROM LOOP SWITCH #2 FEEDING LOOP SWITCH #3 AND ABANDON CONDUITS IN PLACE.
7. CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING 13.2KV SWITCHGEAR CAREFULLY TO PROTECT AND PRESERVE EXISTING CONDUCTORS AND 15KV CABLE TERMINATIONS FOR RE-USE WITH NEW 13.2KV SWITCHGEAR. RETURN FUSES TO OWNER.

ADD ALT #2 ADD ALT #3

8. CONTRACTOR SHALL DEMOLISH AND REMOVE BOTH EXISTING SOUTH DISTRIBUTION SWITCHBOARD TRANSFORMERS CAREFULLY TO PROTECT AND PRESERVE EXISTING CONDUCTORS AND 15KV CABLE TERMINATIONS FOR RE-USE WITH NEW TRANSFORMERS.
9. CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING ATO AND METER CAREFULLY TO PROTECT AND PRESERVE EXISTING CONDUCTORS AND 15KV CABLE TERMINATIONS FOR RE-USE WITH NEW ATO AND METER EXCEPT WHERE SPECIFIED NEW CONDUCTORS.
10. CONTRACTOR SHALL NOT CUT OR ALTER 15KV CABLE TERMINATIONS DURING DEMOLITION.
11. CONTRACTOR SHALL RECORD EXISTING FUSE SIZE, CONNECTED CABLE SIZE AND INSULATION AND PROVIDE THIS INFORMATION TO ENGINEER BEFORE BEGINNING DEMOLITION AND PRIOR TO ANY SUBMITTALS.
12. CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING CONDUCTORS AND CONDUIT.
13. CONTRACTOR SHALL RECORD FUSE SIZE, CONNECTED CABLE SIZE AND INSULATION OF FUSE AND CONDUCTOR IN BAY 8 AND PROVIDE THIS INFORMATION TO ENGINEER BEFORE BEGINNING DEMOLITION AND PRIOR TO ANY SUBMITTALS.

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020-05

ELECTRICAL POWER ONE-LINE DEMOLITION

CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY

WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc. 2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012 (918)221-0717, FAX (918)281-0764

PLAN SCALE: AS SHOWN	DRAWN	CD		APPROVED:
	DESIGNED	NS		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.	DMW	10/23	
HORIZONTAL:	LEAD ENGR.	BJB	10/23	
	FIELD MGR.	TMA	10/23	
VERTICAL:				DESIGN ENGINEERING MANAGER

HUB PROJECT NO: 21TMUASWITCH — DATE: AUGUST 2023

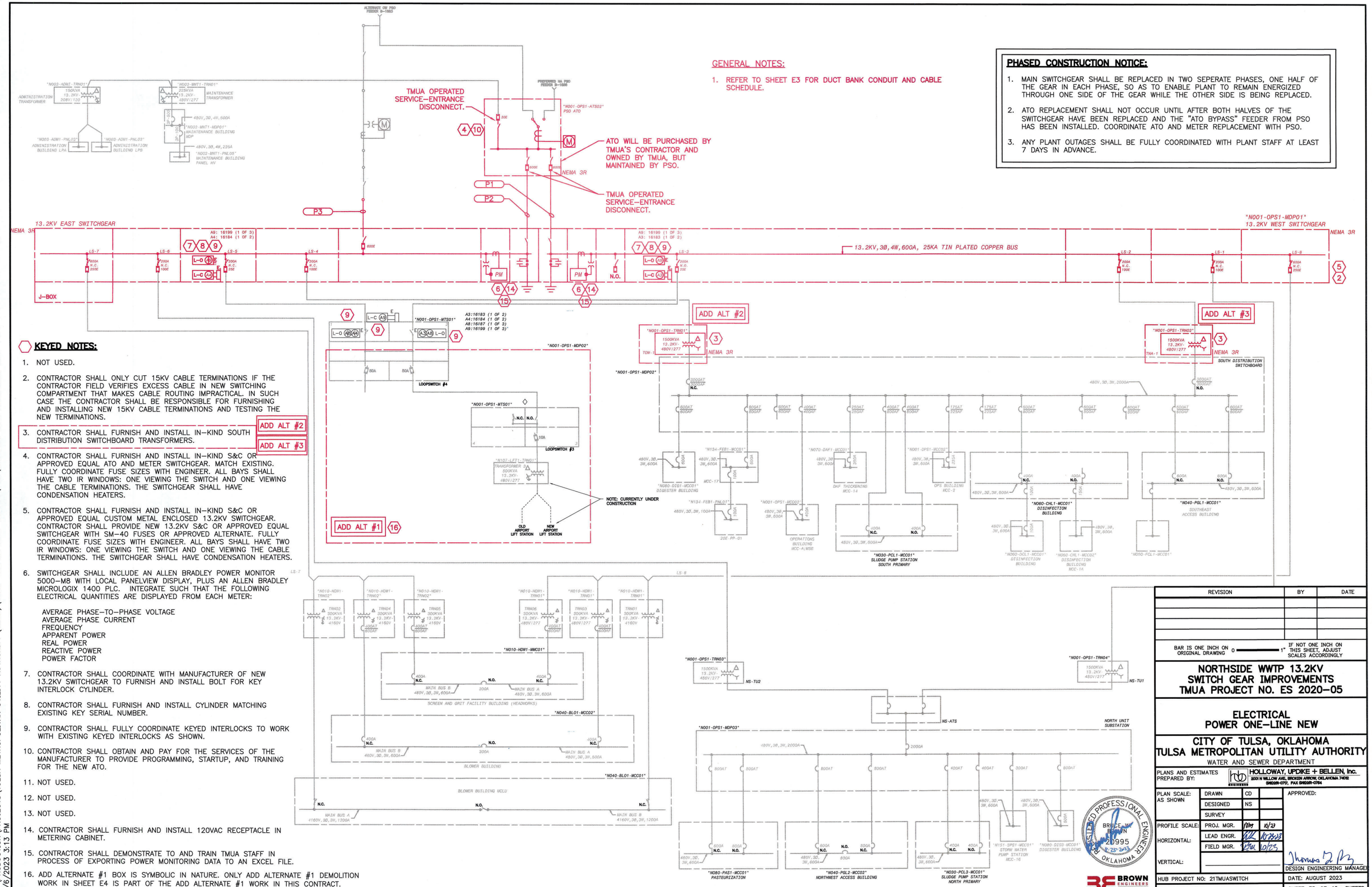
ATLAS PAGE NO: — SHEET E4 OF 12 SHEETS

REGISTERED PROFESSIONAL ENGINEER BRUCE W. BELLEN 20995 OKLAHOMA 8.25.2023

BE BROWN ENGINEERS 501-448-0100

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E04_DEMOLITION NORTHSIDE WWTP PDFD OVERALL BOLD LINES_ALT.DWG
9/6/2023 3:12 PM

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E05_PROPOSED NORTHSIDE WWTP PDFD OVERALL BOLD LINES_ALT.DWG
9/6/2023 3:13 PM



GENERAL NOTES:

1. REFER TO SHEET E3 FOR DUCT BANK CONDUIT AND CABLE SCHEDULE.

PHASED CONSTRUCTION NOTICE:

1. MAIN SWITCHGEAR SHALL BE REPLACED IN TWO SEPERATE PHASES, ONE HALF OF THE GEAR IN EACH PHASE, SO AS TO ENABLE PLANT TO REMAIN ENERGIZED THROUGH ONE SIDE OF THE GEAR WHILE THE OTHER SIDE IS BEING REPLACED.
2. ATO REPLACEMENT SHALL NOT OCCUR UNTIL AFTER BOTH HALVES OF THE SWITCHGEAR HAVE BEEN REPLACED AND THE "ATO BYPASS" FEEDER FROM PSO HAS BEEN INSTALLED. COORDINATE ATO AND METER REPLACEMENT WITH PSO.
3. ANY PLANT OUTAGES SHALL BE FULLY COORDINATED WITH PLANT STAFF AT LEAST 7 DAYS IN ADVANCE.

KEYED NOTES:

1. NOT USED.
2. CONTRACTOR SHALL ONLY CUT 15KV CABLE TERMINATIONS IF THE CONTRACTOR FIELD VERIFIES EXCESS CABLE IN NEW SWITCHING COMPARTMENT THAT MAKES CABLE ROUTING IMPRACTICAL. IN SUCH CASE THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING NEW 15KV CABLE TERMINATIONS AND TESTING THE NEW TERMINATIONS.
3. CONTRACTOR SHALL FURNISH AND INSTALL IN-KIND SOUTH DISTRIBUTION SWITCHBOARD TRANSFORMERS. ADD ALT #2 ADD ALT #3
4. CONTRACTOR SHALL FURNISH AND INSTALL IN-KIND S&C OR APPROVED EQUAL ATO AND METER SWITCHGEAR. MATCH EXISTING. FULLY COORDINATE FUSE SIZES WITH ENGINEER. ALL BAYS SHALL HAVE TWO IR WINDOWS: ONE VIEWING THE SWITCH AND ONE VIEWING THE CABLE TERMINATIONS. THE SWITCHGEAR SHALL HAVE CONDENSATION HEATERS.
5. CONTRACTOR SHALL FURNISH AND INSTALL IN-KIND S&C OR APPROVED EQUAL CUSTOM METAL ENCLOSED 13.2KV SWITCHGEAR. CONTRACTOR SHALL PROVIDE NEW 13.2KV S&C OR APPROVED EQUAL SWITCHGEAR WITH SM-40 FUSES OR APPROVED ALTERNATE. FULLY COORDINATE FUSE SIZES WITH ENGINEER. ALL BAYS SHALL HAVE TWO IR WINDOWS: ONE VIEWING THE SWITCH AND ONE VIEWING THE CABLE TERMINATIONS. THE SWITCHGEAR SHALL HAVE CONDENSATION HEATERS.
6. SWITCHGEAR SHALL INCLUDE AN ALLEN BRADLEY POWER MONITOR 5000-M8 WITH LOCAL PANELVIEW DISPLAY, PLUS AN ALLEN BRADLEY MICROLOGIX 1400 PLC. INTEGRATE SUCH THAT THE FOLLOWING ELECTRICAL QUANTITIES ARE DISPLAYED FROM EACH METER:

   AVERAGE PHASE-TO-PHASE VOLTAGE
   AVERAGE PHASE CURRENT
   FREQUENCY
   APPARENT POWER
   REAL POWER
   REACTIVE POWER
   POWER FACTOR

7. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER OF NEW 13.2KV SWITCHGEAR TO FURNISH AND INSTALL BOLT FOR KEY INTERLOCK CYLINDER.
8. CONTRACTOR SHALL FURNISH AND INSTALL CYLINDER MATCHING EXISTING KEY SERIAL NUMBER.
9. CONTRACTOR SHALL FULLY COORDINATE KEYED INTERLOCKS TO WORK WITH EXISTING KEYED INTERLOCKS AS SHOWN.
10. CONTRACTOR SHALL OBTAIN AND PAY FOR THE SERVICES OF THE MANUFACTURER TO PROVIDE PROGRAMMING, STARTUP, AND TRAINING FOR THE NEW ATO.
11. NOT USED.
12. NOT USED.
13. NOT USED.
14. CONTRACTOR SHALL FURNISH AND INSTALL 120VAC RECEPTACLE IN METERING CABINET.
15. CONTRACTOR SHALL DEMONSTRATE TO AND TRAIN TMUA STAFF IN PROCESS OF EXPORTING POWER MONITORING DATA TO AN EXCEL FILE.
16. ADD ALTERNATE #1 BOX IS SYMBOLIC IN NATURE. ONLY ADD ALTERNATE #1 DEMOLITION WORK IN SHEET E4 IS PART OF THE ADD ALTERNATE #1 WORK IN THIS CONTRACT.

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020-05

ELECTRICAL POWER ONE-LINE NEW

CITY OF TULSA, OKLAHOMA TULSA METROPOLITAN UTILITY AUTHORITY

WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
(918)258-0772, FAX (918)251-0764

PLAN SCALE: AS SHOWN	DRAWN	CD	APPROVED:
	DESIGNED	NS	
	SURVEY		
PROFILE SCALE:	PROJ. MGR.		10/23
HORIZONTAL:	LEAD ENGR.		10/23/23
	FIELD MGR.		10/23
VERTICAL:			DESIGN ENGINEERING MANAGER

HUB PROJECT NO: 21TMUASWITCH — DATE: AUGUST 2023

ATLAS PAGE NO: — SHEET E5 OF 12 SHEETS

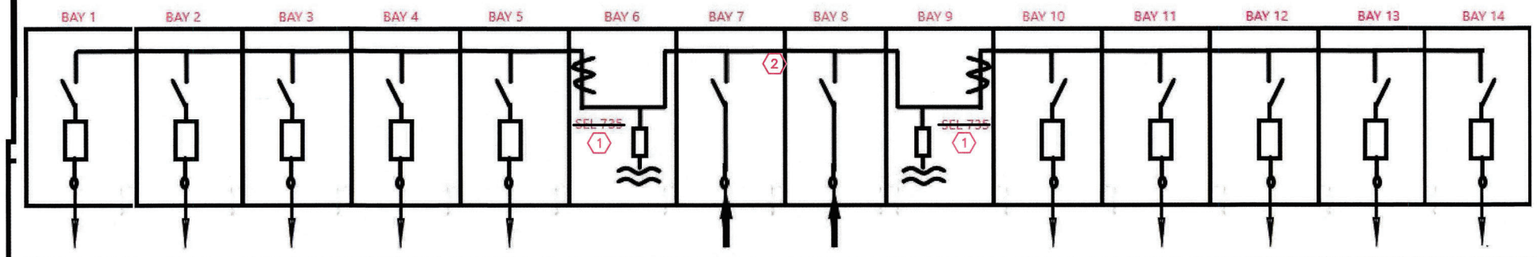
BROWN ENGINEERS 501-448-0100

REGISTERED PROFESSIONAL ENGINEER BRUCE W. BROWN 20995 OKLAHOMA

Project: City of Tulsa TMUA NSWWTP CD-657332
Switchgear: 00-99-KS21-5068
Description: City of Tulsa TMUA NSWWTP CD-657332
Voltage, Nominal: 13.8
Voltage, BIL: 95 **Enclosure Finish:** OUTDOOR CONSTRUCTION - LIGHT GRAY FINISH
System Voltage: 13200 **Main Bus:** 600

PRELIMINARY DIMENSIONS ONLY -- NOT FOR CONSTRUCTION PURPOSES

OPTION 1



1 / E6 **13.2KV SWITCHGEAR FACTORY LAYOUT**
SCALE: NONE

GENERAL NOTES:

FULLY COORDINATE WITH MANUFACTURER TO ENSURE NEW 13.2KV SWITCHGEAR IS AN APPROPRIATE REPLACEMENT FOR EXISTING. MANUFACTURER SHALL BE S&C OR APPROVED EQUAL. IF S&C, PROJECT SHALL BE QUOTED, ORDERED, AND MANAGED BY DOUG OSBORN, OBERLENDER & ASSOCIATES (918) 630-2782, DOSBORN@OBERLENDER.COM.

KEYED NOTES:

1. REFER TO KEYED NOTE 6 ON SHEET E5.
2. 13.2KV SWITCHGEAR BUS SHALL NOT BE CONNECTED AS ONE CONTINUOUS BUS. SEE SHEET E5 FOR CONFIGURATION.

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020-05

ELECTRICAL 13.2KV SWITCHGEAR FACTORY LAYOUT

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

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
(918)251-1717, FAX (918)251-1764

PLAN SCALE: AS SHOWN	DRAWN	CD		APPROVED:
	DESIGNED	NS		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.	BWB	10/23	
HORIZONTAL:	LEAD ENGR.	BWB	10-23-23	
	FIELD MGR.	BWB	10/23	DESIGN ENGINEERING MANAGER
VERTICAL:				

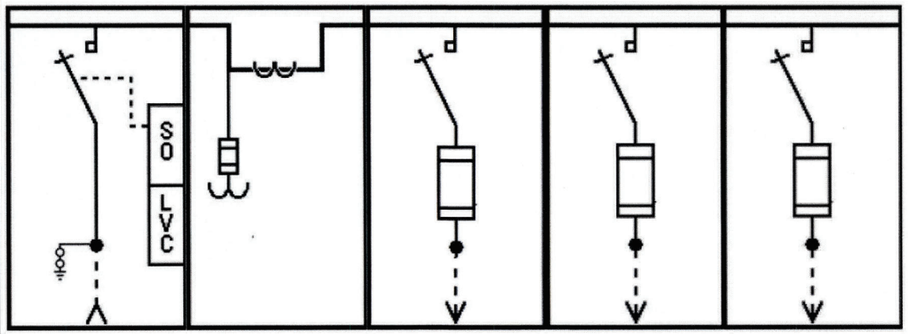
HUB PROJECT NO: 21TMUASWITCH — DATE: AUGUST 2023
ATLAS PAGE NO: — SHEET E6 OF 12 SHEETS

BROWN ENGINEERS 501-448-0100

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E06_13.2KV SWITCHGEAR FACTORY LAYOUT.DWG
10/18/2023 12:36 PM

Project: TMUA NSWWTP - Copy of CDA-782672
Switchgear: 00-99-KS21-5053
Description: TMUA NSWWTP - Copy of CDA-782672
Voltage, Nominal: 13.8
Voltage, BIL: 95 **Enclosure Finish:** OUTDOOR CONSTRUCTION - LIGHT GRAY FINISH
System Voltage: 13.8 **Main Bus:** 600

PRELIMINARY DIMENSIONS ONLY -- NOT FOR CONSTRUCTION PURPOSES



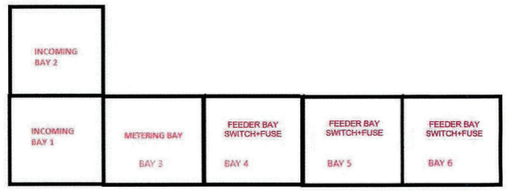
Function: Entrance
Bay 1&2 of 6
Module: CP-21005
Width: 46"
Depth: 88"
Height: 93

Function: Tie-Meterin
Bay 3 of 6
Module: CM-21001
Width: 42"
Depth: 44"
Height: 93

Function: Feeder
Bay 4 of 6
Module: C-21039
Width: 42"
Depth: 44"
Height: 93

Function: Feeder
Bay 5 of 6
Module: C-21047
Width: 42"
Depth: 44"
Height: 93

Function: Feeder
Bay 6 of 6
Module: C-21047
Width: 42"
Depth: 44"
Height: 93



ANCHOR BOLT - PLAN VIEW

S&C ELECTRIC COMPANY
GENERAL OFFICES ● CHICAGO

6601 NORTH RIDGE BOULEVARD
CHICAGO, ILLINOIS, 60626-3997, USA
TELEPHONE: 773-338-1000

DATE: 13/09/2022
PREPARED BY: thikeyan Sundar

SALES PROPOSAL SKETCH
Page 1 of 1

1 / E7 ATO FACTORY LAYOUT
SCALE: NONE

GENERAL NOTES:

FULLY COORDINATE WITH MANUFACTURER TO ENSURE NEW 13.2KV SWITCHGEAR IS AN APPROPRIATE REPLACEMENT FOR EXISTING. MANUFACTURER SHALL BE S&C OR APPROVED EQUAL. IF S&C, PROJECT SHALL BE QUOTED, ORDERED, AND MANAGED BY DOUG OSBORN, OBERLENDER & ASSOCIATES (918) 630-2782, DOSBORN@OBERLENDER.COM.

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS
TMUA PROJECT NO. ES 2020-05

ELECTRICAL
ATS FACTORY LAYOUT

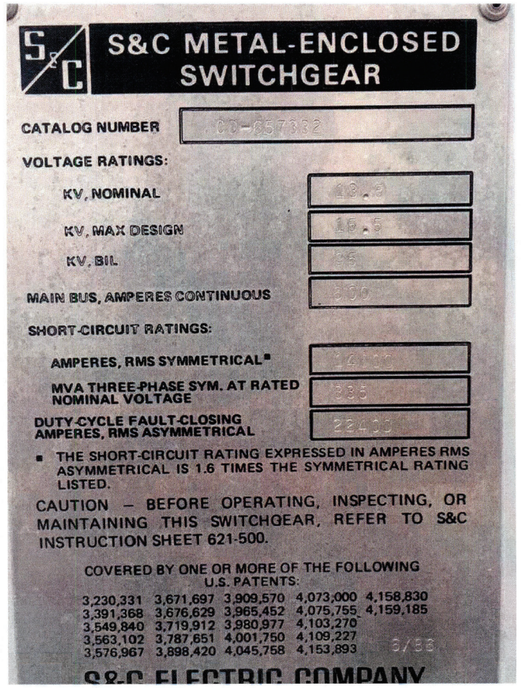
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
WATER AND SEWER DEPARTMENT

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc. 2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012 (918)251-0717, FAX (918)251-0764

PLAN SCALE: AS SHOWN	DRAWN	CD		APPROVED:
	DESIGNED	NS		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.		10/23	
	LEAD ENGR.		10-25-23	
HORIZONTAL:	FIELD MGR.		10/25	
VERTICAL:				DESIGN ENGINEERING MANAGER
HUB PROJECT NO: 21TMUASWITCH				DATE: AUGUST 2023
ATLAS PAGE NO:				SHEET E7 OF 12 SHEETS

BROWN ENGINEERS 501-448-0100

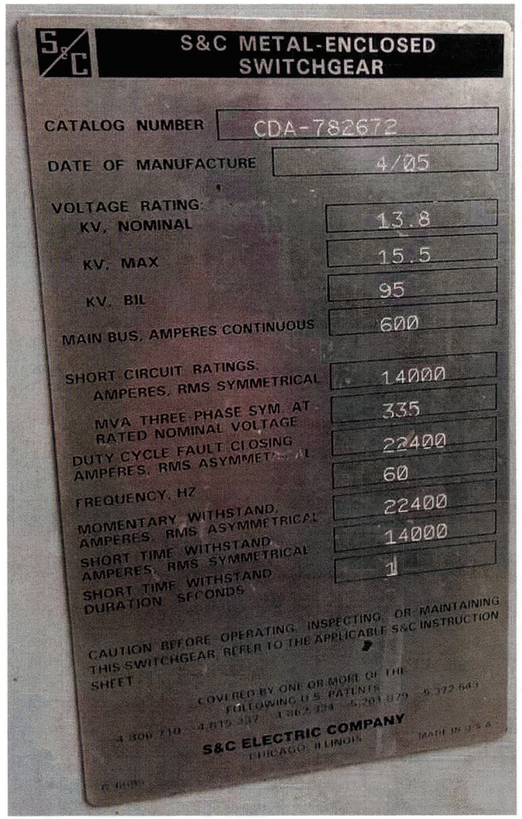
P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E07_ATS FACTORY LAYOUT.DWG
9/6/2023 3:15 PM



1 E8 EXISTING 13.2KV SWITCHGEAR NAMEPLATE
SCALE: NONE



2 E8 EXISTING 13.2KV SWITCHGEAR
SCALE: NONE



3 E8 EXISTING ATO NAMEPLATE
SCALE: NONE



4 E8 EXISTING ATO
SCALE: NONE



5 E8 EXISTING SOUTH DISTRIBUTION TRANSFORMERS
SCALE: NONE

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS
TMUA PROJECT NO. ES 2020-05

ELECTRICAL
EXISTING GEAR AND NAMEPLATES

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

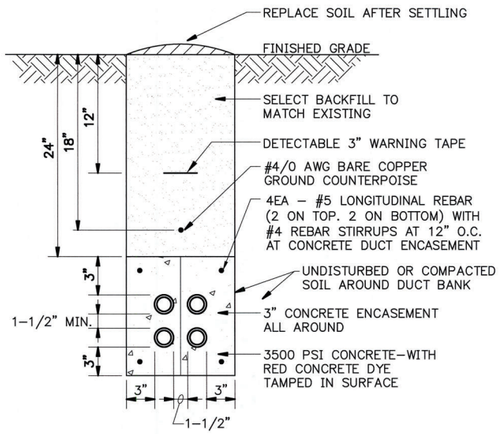
PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
(918)251-0707, FAX (918)251-0764

PLAN SCALE: AS SHOWN	DRAWN	CD		APPROVED:
	DESIGNED	NS		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.		10/23	
HORIZONTAL:	LEAD ENGR.		10/23/23	
	FIELD MGR.		10/23	
VERTICAL:				DESIGN ENGINEERING MANAGER
HUB PROJECT NO: 21TMUASWITCH				DATE: AUGUST 2023
ATLAS PAGE NO:				SHEET E8 OF 12 SHEETS

REGISTERED PROFESSIONAL ENGINEER BRUCE W. BROWN 20995 OKLAHOMA 8.25.2023

BROWN ENGINEERS 501-448-0100

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E08_EXISTING GEAR.DWG
10/18/2023 12:39 PM



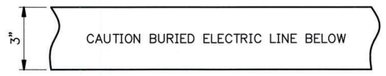
1 / E9 **CONCRETE ENCASED ELECTRICAL DUCT**
SCALE: NONE

ELECTRICAL DUCT NOTES:

1. CONTRACTOR SHALL STAKE THE DUCT INSTALLATION IN PLAN AND ELEVATION FOR NEW ELECTRICAL DUCTS TO AVOID EXISTING UTILITIES.
2. CONTRACTOR SHALL ADJUST THE DEPTH OF THE ELECTRICAL DUCTS AS REQUIRED TO MAINTAIN THE MINIMUM COVER REQUIREMENT INDICATED AND AVOID EXISTING UTILITIES.
3. SIMILAR CONSTRUCTION FOR OTHER DUCT SIZES. SEE DUCT BANK SCHEDULE FOR QUANTITY AND SIZES.
4. INSTALL DUCT CONDUIT SUPPORTS AT 5'–0" O.C. MAXIMUM SPACING (TYPICAL ALL DUCTS).
5. OFFSETS AND BENDS OVER 10 DEGREES AND ELBOWS IN PVC CONDUIT RUNS SHALL BE PVC COATED GALVANIZED RIGID STEEL CONDUIT.
6. NO PVC SHALL EMERGE FROM THE GROUND OR CONCRETE SLAB OR ENCASEMENT, PVC SHALL CONVERT TO PVC COATED GALVANIZED RIGID STEEL CONDUIT PRIOR TO ITS EMERGENCE.
7. INSTALL GROUND RODS AT ENDS OF ELECTRICAL DUCT OR CONNECT TO GROUND RING.
8. INSTALL CONDUCTORS AND CABLES AS NOTED ON DRAWING. INSTALL PULLWIRE IN ALL SPARE DUCTS.
9. MINIMUM COVER REQUIREMENT FOR DUCT BANKS UNDER ROADS, DRIVEWAYS AND PARKING LOTS SHALL BE 24".
10. MINIMUM COVER REQUIREMENTS FOR ELECTRICAL SECONDARY SERVICE DUCT BANKS SHALL BE 30".
11. MINIMUM COVER REQUIREMENTS FOR ELECTRICAL PRIMARY SERVICE DUCT BANKS SHALL BE 36".

GENERAL ELECTRICAL NOTES:

1. ALL POWER OUTAGES TO ANY EQUIPMENT SHALL BE LIMITED TO APPROVED TIMES. FULLY COORDINATE WITH OWNER.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEEK OUT AND PROVIDE ALL PERMITTING REQUIRED FOR THIS PROJECT.
3. CONTRACTOR IS RESPONSIBLE TO OBTAIN INSPECTION BY OWNER PRIOR TO COMPLETION OF PROJECT.
4. IN CASES OF DIFFERENCE BETWEEN THE MINIMUM REQUIREMENTS OF THE VARIOUS LAWS, CODES, AUTHORITIES, AND THE DOCUMENTS: THE WORK SHALL EXCEED THE LESSER REQUIREMENTS WHILE MEETING THE GREATER OR MORE STRINGENT REQUIREMENTS.
5. CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, AND DIMENSIONS FOR ACCURACY, AND CONFIRMING THAT THE WORK IS BUILDABLE AS SHOWN AND MEETS ALL APPLICABLE CODES BEFORE PROCEEDING WITH CONSTRUCTION. IF THERE ARE ANY QUESTIONS REGARDING THESE OR OTHER COORDINATION ISSUES, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER BEFORE PROCEEDING WITH THE WORK IN QUESTION OR RELATED WORK.
6. ALL MATERIALS FURNISHED UNDER THIS CONTRACT SHALL BE NEW.
7. IT IS THE INTENT AND MEANING OF THE CONTRACT DOCUMENTS THAT THE CONTRACTOR SHALL PROVIDE AN ELECTRICAL INSTALLATION THAT IS COMPLETE. ALL ITEMS AND APPURTENANCES NECESSARY, REASONABLY INCIDENTAL, OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM IS NOT SPECIFICALLY CALLED OUT OR SHOWN ON THE CONSTRUCTION DOCUMENTS SHALL BE PROVIDED.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY BRACING AND PROTECTING ALL WORK DURING CONSTRUCTION AGAINST DAMAGES, BREAKAGE, COLLAPSE, AND MISALIGNMENT ACCORDING TO APPLICABLE CODES, STANDARDS, AND GOOD CONSTRUCTION PRACTICES. CONTRACTOR SHALL TAKE PROPER PRECAUTIONS TO PROTECT ALL EXISTING OPERATIONS AND PROPERTY ADJACENT WITH WHICH WORK COMES IN CONTACT, OR OVER OR UNDER WHICH HE MAY TRANSPORT, HOISE, OR MOVE MATERIALS, EQUIPMENT, DEBRIS, ETC., AND SHALL REPAIR SATISFACTORILY ALL DAMAGE CAUSE BY HIM DURING CONSTRUCTION.
9. MAKE ALL PENETRATIONS THROUGH WALLS AT 90 DEGREE ANGLES. SEAL ALL PENETRATIONS AT FIRE AND SMOKE PARTITIONS WITH FIRE SAFING MATERIAL.
10. PROVIDE EXPANSION FITTINGS ON ALL CONDUIT CROSSING EXPANSION JOINTS.
11. CONTRACTOR SHALL INDICATE ALL CHANGES FROM THE ORIGINAL PLANS MADE DURING THE INSTALLATION OF HIS WORK IN RED INK ON A SINGLE SET OF FULL–SIZE PRINTS.
12. THE CONTRACTOR SHALL PROVIDE A TYPED PANEL BOARD DIRECTORY.
13. UPON COMPLETION OF THE WORK, ALL PARTS OF THE ELECTRICAL INSTALLATION SHALL BE TESTED AND PROVED TO BE FREE OF UNWANTED GROUNDS AND OTHER DEFECTS. FINAL TESTS SHALL BE ACCOMPLISHED BY USE OF A MEGGER.
14. UPON COMPLETION OF WORK, THE ELECTRICAL CONTRACTOR SHALL CLEAN ALL ELECTRICAL EQUIPMENT.



GENERAL NOTES:

1. POWER MARKING TAPES SHALL BE DETECTABLE TYPE CONSTRUCTION WITH RED BACKGROUND AND BLACK LETTERING.
2. COMMUNICATION MARKING TAPES SHALL BE DETECTABLE TYPE CONSTRUCTION WITH ORANGE BACKGROUND AND BLACK LETTERING, "TELEPHONE LINE" OR "FIBER OPTIC LINE" RESPECTIVELY.
3. TAPE SHALL BE DETECTABLE, DURABLE, HIGHLY VISIBLE, RESISTANT TO ELEMENTS, MEETING AND/OR EXCEEDING ALL INDUSTRY STANDARDS.

2 / E9 **UNDERGROUND DETECTABLE WARNING TAPE**
SCALE: NONE

REVISION	BY	DATE

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

NORTHSIDE WWTP 13.2KV SWITCH GEAR IMPROVEMENTS TMUA PROJECT NO. ES 2020–05

ELECTRICAL DETAILS

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

PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDIKE + BELLEN, Inc.
2001 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
(918)258-0770, FAX (918)251-0764

PLAN SCALE: AS SHOWN	DRAWN	CD		APPROVED:
	DESIGNED	NS		
	SURVEY			
PROFILE SCALE:	PROJ. MGR.		10/23	
HORIZONTAL:	LEAD ENGR.		10/23	
	FIELD MGR.		10/23	
VERTICAL:				DESIGN ENGINEERING MANAGER

HUB PROJECT NO: 21TMUASWITCH — DATE: AUGUST 2023
ATLAS PAGE NO: — SHEET E9 OF 12 SHEETS

REGISTERED PROFESSIONAL ENGINEER BRUCE W. BROWN 20995 OKLAHOMA

BROWN ENGINEERS 501-448-0100

P:\PRODUCTION\PROJECTS\TULSA METROPOLITAN UTILITY AUTHORITY (TMUA)\TMUA-002 NS WWTP 13.2 KV\DWG\E09_ELEC DETAILS.DWG
10/18/2023 12:40 PM