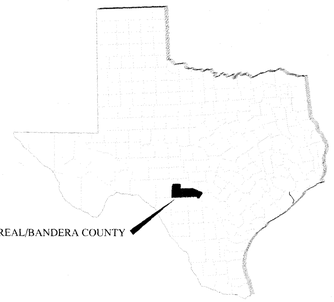


COUNTY LOCATION MAP

NTS

NORTH

BUILDING CODE SUMMARY

A. INTERNATIONAL CODE COUNCIL ADOPTIONS*

1.	BUILDING CODE	INTERNATIONAL BUILDING CODE 2015
2.	STRUCTURAL CODE	INTERNATIONAL BUILDING CODE 2015
3.	PLUMBING CODE	INTERNATIONAL PLUMBING CODE 2015
4.	MECHANICAL CODE	INTERNATIONAL MECHANICAL CODE 2015
5.	GAS CODE	INTERNATIONAL FUEL GAS CODE 2015
6.	RESIDENTIAL CODE	INTERNATIONAL RESIDENTIAL CODE 2015
7.	EXISTING BUILDINGS	INTERNATIONAL EXISTING BUILDINGS CODE 2015

* International Fire Code omitted in lieu of TPWD's implementation of National Fire Protection Association codes. International Energy Conservation Code 2015 omitted in lieu of Energy Standard for Buildings, ASHRAE/IESNA Standard 90.1 (2013).

B. NATIONAL FIRE PROTECTION ASSOCIATION

1.	ELECTRIC CODE	NATIONAL ELECTRIC CODE NFPA-70 2017
2.	FIRE CODE	NFPA - 1 2015
3.	LIFE SAFETY CODE	NFPA - 101 2015

C. STATE ENERGY CONSERVATION OFFICE (SECO)/TEXAS COMPTROLLERS OFFICE

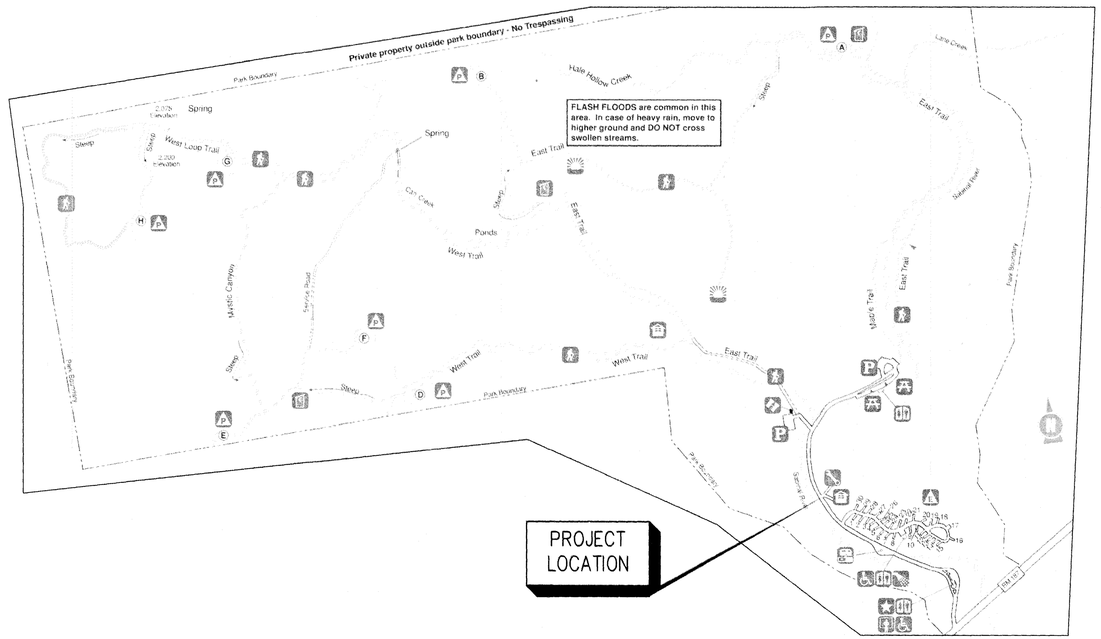
1. ENERGY CODES FOR STATE BUILDINGS - Energy Conservation Design Standards: Texas Administrative Code, Title 34, Part 1,Ch.19, Subchapter C
   a. COMPLIANCE WITH THE ENERGY CONSERVATION DESIGN STANDARD OF THE AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE) /ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA), ENERGY STANDARD FOR BUILDINGS, ASHRAE/IESNA STANDARD 90.1 (2013)
   See SECO website for State Funded Buildings, New Construction and Major Renovation Requirements and SECO Compliance Certification Forms
2. WATER CONSERVATION STANDARDS FOR STATE BUILDINGS - Energy Conservation Design Standards: Texas Administrative Code, Title 34, Part 1,Ch.19, Subchapter C
   a. COMPLIANCE WITH THE WATER CONSERVATION DESIGN STANDARDS FOR STATE BUILDINGS AND INSTITUTIONS OF HIGHER EDUCATION FACILITIES, STATE ENERGY CONSERVATION OFFICE (SECO), 2016
   See SECO website for Texas Water Conservation Design Standards, Requirements and SECO Compliance Certification / Reporting Form

D. ACCESSIBILITY CODES

1. US DEPT. OF JUSTICE, 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN
2. ARCHITECTURAL BARRIERS ACT ACCESSIBILITY GUIDELINES; OUTDOOR DEVELOPED AREAS, NOVEMBER 25, 2013
3. ARCHITECTURAL BARRIERS ACT ACCESSIBILITY GUIDELINES; OUTDOOR DEVELOPED AREAS, NOVEMBER 25, 2013

E. PLAYGROUND SAFETY CODE

1. ASTM F1487-17, STANDARD CONSUMER SAFETY PERFORMANCE SPECIFICATIONS FOR PLAYGROUND EQUIPMENT FOR PUBLIC USE
2. ASTM F2223-15, STANDARD GUIDE FOR ASTM STANDARDS ON PLAYGROUND SURFACING



SITE LOCATION MAP

NTS

NORTH

PROJECT

LOST MAPLES STATE PARK

LAW ENFORCEMENT MODULAR BUILDING

PROJECT NO: MR 8555 DATE: April 11, 2019

INDEX OF DRAWINGS

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SCOPE OF WORK

PROVIDE UTILITIES TO NEW MODULAR BUILDING AT LOST MAPLES STATE PARK.

UTILITIES INCLUDE NEW ELECTRICAL SERVICE, CONNECTION TO EXISTING DOMESTIC WATER SERVICE, CONNECTION TO EXISTING SANITARY SEWER, CONNECTION TO EXISTING TELEPHONE SERVICE, AND CONNECTION TO EXISTING DATA SYSTEM.

RELEASE FOR SOLICITATION

Oct. 8, 2019
PROJECT MANAGER, INFRASTRUCTURE DIVISION — DATE

10/9/19
P&D BRANCH HEAD, INFRASTRUCTURE DIVISION — DATE

TEXAS PARKS & WILDLIFE

TEXAS PARKS AND WILDLIFE

INFRASTRUCTURE DIVISION

4200 SMITH SCHOOL ROAD · AUSTIN, TEXAS 78744-3292

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92613
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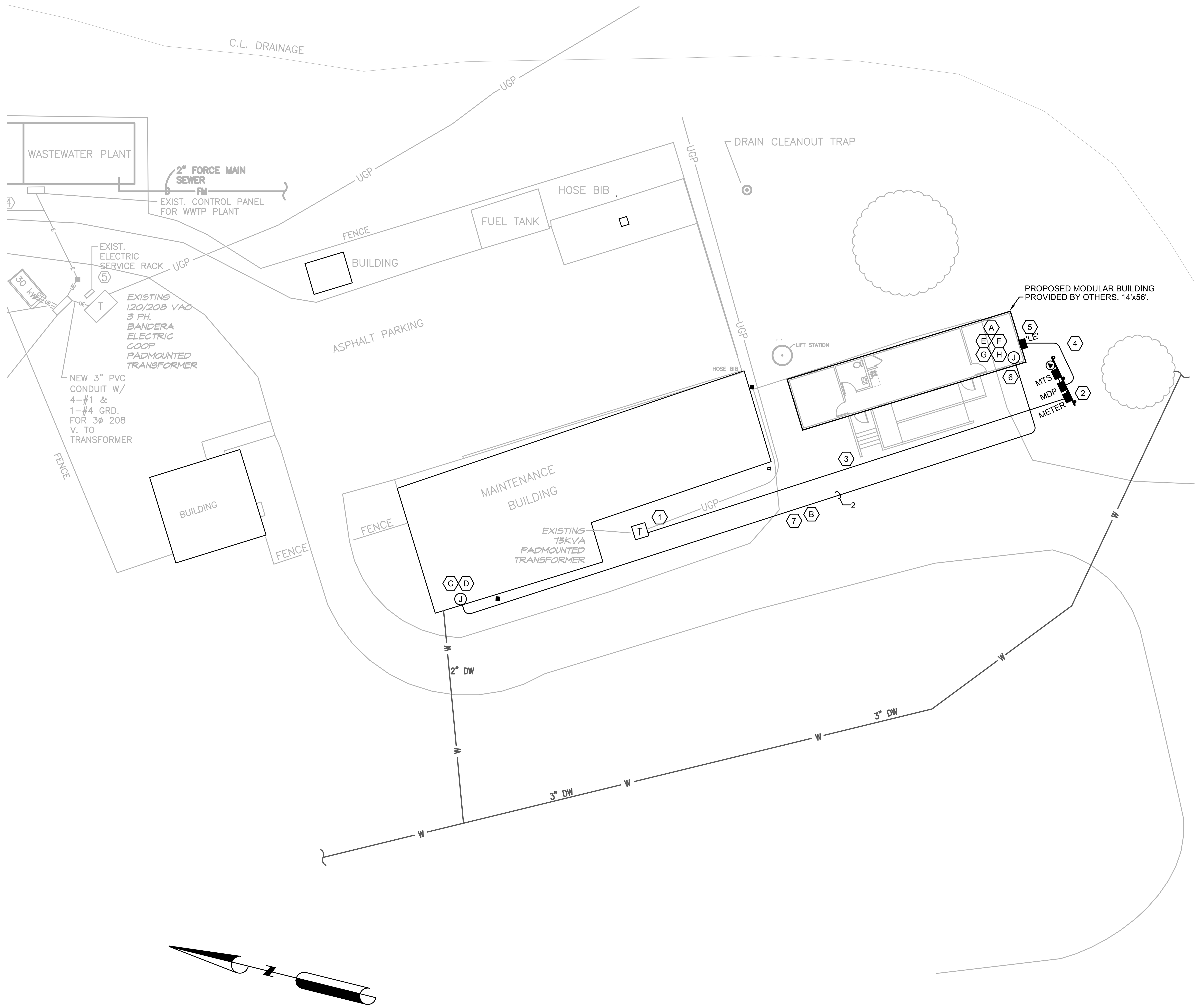

1 LOST MAPLES SITE PLAN - ELECTRICAL

1/16" = 1'-0"

GENERAL NOTES - APPLIES TO ALL ELECTRICAL SHEETS

1. THE FINAL LOCATION OF ELECTRICAL ITEMS ON THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO GIVE COMPLETE AND ACCURATE DETAILS IN REGARD TO LOCATION. EXACT LOCATION SHOULD BE DETERMINED BY ACTUAL MEASUREMENTS ON SITE AND CONTRACTOR COORDINATION, AND WILL IN ALL CASES BE SUBJECT TO THE APPROVAL OF TEXAS PARKS AND WILDLIFE OWNER REPRESENTATIVE. CONTRACTOR SHALL COORDINATE THE FINAL ACTUAL LOCATIONS IN THE FIELD WITH THE DESIGNATED TEXAS PARKS AND WILDLIFE OWNER REPRESENTATIVE. THE FINAL LOCATION OF THE TRAILER AND ALL DIMENSIONS ARE APPROXIMATE. NO ADDITIONAL COMPENSATION WILL BE GIVEN OR CONSIDERED FOR REASONABLE CHANGES IN THE FINAL LOCATIONS.
2. THE ELECTRICAL DISTRIBUTION SYSTEM SIZING IS BASED ON EQUIPMENT DATA FROM THE SPECIFIED SUPPLIER OR A TYPICAL SUPPLIER. THE CONTRACTOR IS FULLY RESPONSIBLE FOR PROVIDING THE CORRECTLY SIZED ELECTRICAL SYSTEM TO MATCH THE REQUIREMENTS OF THE NEW EQUIPMENT.
3. THE ELECTRICAL SYSTEM SHALL BE GROUNDED IN ACCORDANCE WITH ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE. ALL ELECTRICAL SYSTEMS RECEPTACLES, CABINETS, JUNCTION BOXES, MOTOR FRAMES, MISCELLANEOUS EQUIPMENT, ETC. SHALL BE GROUNDED BY A GREEN-WIRE GROUND CONDUCTOR.
4. PROVIDE NEW LABELS FOR ALL DISCONNECTS, ELECTRICAL DEVICES, VOICE DATA OUTLETS AND PANEL SCHEDULES TO MATCH AS BUILT CONDITIONS.
5. SUBMIT FOR REVIEW FINAL ASBUILT DRAWINGS TO REFLECT ALL MODIFICATIONS TO THE EXISTING AND PROPOSED ELECTRICAL SHEETS.
6. ALL DUPLEX/QUAD OUTLETS SHALL BE MOUNTED AS INDICATED ON DRAWING, TO CENTER OF OUTLET. GROUND TERMINAL SHALL POINT DOWN. MOUNT 44" A.F.F. UNLESS OTHERWISE NOTED.
7. DO NOT SPLICE CONDUCTORS BETWEEN LOAD CENTERS UNLESS OTHERWISE NOTED.
8. WHERE CALLED FOR, USE 2 OR 3 POLE BREAKERS. TYING SINGLE POLE BREAKERS TOGETHER TO CREATE A 2 OR 3 POLE BREAKER IS PROHIBITED. THE USE OF TANDEM BREAKERS IN LOAD CENTERS IS PROHIBITED.
9. THE BIDDER SHALL VISIT THE SITE OF THE PROPOSED WORK AND SHALL FULLY INFORM THEMSELVES REGARDING THE FACILITIES. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR WORK OR MATERIALS OMITTED FROM BIDDER'S CONTRACT PROPOSAL DUE TO THEIR FAILURE TO INFORM THEMSELVES BY SUCH INVESTIGATION.
10. THE ELECTRICAL CONTRACTOR SHALL GUARANTEE AGAINST DEFECTS IN ANY OR ALL MATERIALS, EQUIPMENT, OR WORKMANSHIP COVERED BY THE ELECTRICAL SPECIFICATIONS, EXCEPT SUCH MATERIALS, EQUIPMENT, OR WORKMANSHIP FURNISHED BY OTHERS AND SHALL MAKE GOOD, REPAIR, OR REPLACE, AT THEIR OWN EXPENSE, ANY DEFECTIVE WORK, MATERIAL OR PART WHICH MAY BECOME EVIDENT WITHIN A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE OF THE WORK. NECESSARY SERVICE AND ADJUSTMENT DURING THE EARLY STAGES OF OPERATION AFTER OCCUPANCY SHALL BE PROVIDED BY THE CONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER.
11. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS TOOLS AND EQUIPMENT NECESSARY TO ACCOMPLISH THE REQUIRED EXCAVATION AND TRENCHING. CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES PRIOR TO STARTING EXCAVATION OR TRENCHING. COSTS OF REPAIRING DAMAGE TO EXISTING UNDERGROUND UTILITIES OR FACILITIES SHALL REPAIRED AT CONTRACTORS EXPENSE. CONTRACTOR SHALL MAKE REPAIRS TO ANY UTILITY THAT IS DAMAGED DURING EXCAVATION OR TRENCHING. CONTRACTOR IS ENCOURAGED TO CALL811 DIG.
12. ALL UNPAVED SURFACES DISTURBED BY CONSTRUCTION SHALL BE GRADED TO MATCH THE EXISTING CONTOURS OF THE AREA. GRASS SEEDING & REESTABLISHING GRASS FOR DISTURBED UNPAVED AREAS SHALL BE REQUIRED.
13. ORGANIC MATERIAL FROM PRUNING OPERATIONS MAY BE PULVERIZED, CHIPPED OR OTHERWISE MADE INTO SUITABLE MULCH THAT CAN BE DISTRIBUTED AT LOCATIONS WITHIN THE PARK AS ALLOWED BY THE PARK MANAGER. ALTERNATELY, CONTRACTOR MAY DISPOSE OF THIS MATERIAL AT AN OFFSITE LOCATION. IN ALL CASES PRIOR PERMISSION SHALL BE GRANTED BY OWNER REPRESENTATIVE BEFORE DISTURBING TREES, SHRUBS OR BUSHES.
14. ANY EARTHWORK MATERIALS BROUGHT INTO THE PARK FROM OUTSIDE OF THE PARK SHALL ONLY BE PLACED OR STORED ON PAVED SURFACES OR OTHER AREAS APPROVED BY TPWD PERSONNEL.
15. TRASH AND DEBRIS SHALL BE REMOVED FROM THE PARK PROPERTY.
16. SOIL PILES CREATED BY THE EARTHWORK OPERATIONS SHALL ONLY BE PLACED OR STORED ON PAVED SURFACES OR OTHER AREAS APPROVED BY TPWD PERSONNEL. ANY EXCESS SOIL AND TOPSOIL FROM EARTHWORK OPERATIONS THAT IS NOT NEEDED IN THE PARK SHALL BE DISPOSED OF AT AN OFFSITE LOCATION BY THE CONTRACTOR.
17. PROVIDE EXOTHERMIC WELDS ON ALL GROUNDING ELECTRODE CONNECTIONS.
18. PROVIDE GROUNDING BUSHINGS ON ALL SERVICE ENTRANCE AND BRANCH FEEDER CIRCUIT ENTRANCE AND TELECOMMUNICATIONS ENCLOSURE CONDUIT ENTRIES, PROVIDE PLASTIC NYLON BUSHING INSULATORS ON ALL OTHER CONDUIT ENTRIES.
19. ALL LOCATIONS SHOWN ON DRAWINGS ARE APPROXIMATE, FIELD VERIFY ALL DIMENSIONS PRIOR TO BID.
20. GROUND IN THIS AREA IS SOLID LIMESTONE IN MANY PLACES. REMOVAL OF ROCK IS TO BE ANTICIPATED FROM MOST TRENCHING.
21. CLEAN UP OF ASPHALT ARE SHALL BE REQUIRED AFTER TRENCHING. REPAIR ARE TO MATCH EXISTING.

ELECTRICAL SITE PLAN KEYED NOTES - ⬡

1. PROVIDE A NEW SECONDARY UNDERGROUND POWER FEED FROM THE EXISTING UTILITY PAD MOUNTED TRANSFORMER. PROVIDE AN UNDERGROUND CONNECTION FROM THE SECONDARY OF THE PAD MOUNTED TRANSFORMER TO THE RACK MOUNTED METER ENCLOSURE. CONTRACTOR SHALL ESTABLISH A NEW SERVICE PER THE UTILITY PROVIDER'S PUBLISHED REQUIREMENTS. THE CONTRACTOR SHALL COORDINATE WITH BANDERA ELECTRIC PRIOR TO COMMENCING WORK OR ORDERING ELECTRICAL EQUIPMENT. BANDERA ELECTRIC WILL PROVIDE THE TERMINATIONS TO THE TRANSFORMER. THE CONTRACTOR SHALL MAINTAIN THE UTILITY CLEARANCE REQUIREMENTS AND FURNISH AND INSTALL ALL ITEMS SHOWN IN THE PROJECT WITH EXCEPTION TO THE ACTUAL SERVICE CONDUCTOR TERMINATIONS ON THE SECONDARY SIDE OF THE TRANSFORMER. THE OWNER SHALL PAY THE UTILITY PROVIDER FOR ALL ASSOCIATED FEES. THE CONTRACTOR SHALL CONTACT AND COORDINATE WITH UTILITY PROVIDERS.
2. PROVIDE CHANNEL STRUT RACK AND RACK MOUNTED NEW MAIN SERVICE DISTRIBUTION LOAD CENTER "MDP", METER CABINET, MANUAL TRANSFER SWITCH, AND 240V, 50A, TWIST LOCK RECEPTACLE FOR A TEMPORARY GENERATOR CONNECTION. SEE ONE-LINE RISER DIAGRAM ON SHEET LM-E3.0.
3. PROVIDE A NEW 3" CONDUIT IN TRENCH FROM EXISTING PAD MOUNTED TRANSFORMER TO PROPOSED NEW UNDERGROUND SERVICE METER CABINET.
4. PROVIDE A NEW 2" CONDUIT IN TRENCH FROM PROPOSED NEW LOAD CENTER "MDP" TO PROPOSED NEW MODULAR BUILDING LOAD CENTER (PANEL LE).
5. EXTEND THE 2" CONDUIT RISER UP THE SIDE OF MODULAR BUILDING. SECURE AND SUPPORT THE CONDUIT RISER TO THE BUILDING. PROVIDE A CAST IRON WET LISTED CONDULET CONDUIT BODY LB SHAPE TO INTERSECT, TRANSITION AND CONNECT TO THE 2" EMT CONDUIT STUBBED OUT THE SIDE OF THE MODULAR BUILDING. FINAL LOCATION OF ELECTRICAL PANEL AND ACTUAL CONDUIT CONNECTION POINT SHALL BE FIELD DETERMINED. IF THE LOAD CENTER IS SURFACE MOUNTED ON THE EXTERIOR OF THE BUILDING, EXTEND THE CONDUIT UP TO THE BOTTOM OF THE LOAD CENTER ENCLOSURE, SECURE AND SUPPORT THE CONDUIT TO THE BUILDING UNDER THE LOAD CENTER.
6. PROVIDE A 3'x3'x3/4" FIRE RATED PLYWOOD FOR TELECOMMUNICATIONS BACKBOARD. COORDINATE THE EXACT LOCATION WITH TPWD IT PROVIDER PRIOR TO CONSTRUCTION. PROVIDE A ISOLATED GROUNDING BUSBAR SURFACE MOUNTED TO THE BOTTOM OF THE TELECOMMUNICATIONS BACKBOARD WITH 1-#6 AWG ISOLATED GROUND IN EMT CONDUIT ROUTED TO THE BUILDING MAIN SERVICE ENTRANCE GROUND ROD. FINAL LOCATION OF GROUNDING BUSBAR AND BACKBOARD LOCATION SHALL BE FIELD DETERMINED. CONTRACTOR SHALL ALLOW FOR MINOR FIELD ADJUSTMENTS IN FINAL GROUNDING BUS BAR AND TELECOMMUNICATIONS BACKBOARD LOCATION. BACKBOARD WILL BE PROVIDED WITH MODULAR BUILDING
7. PROVIDE A NEW 2" CONDUIT WITH LONG SWEEP ELBOWS IN TRENCH FROM EXISTING IT/OFFICE ROOM IN THE EXISTING MAINTENANCE BUILDING TO THE NEW TELECOMMUNICATIONS BACKBOARD IN THE NEW MODULAR BUILDING. PROVIDE DOUBLE GANG JUNCTION BOXES AT BOTH LOCATIONS WITH PULL STRING FOR DATA CABLING. PROVIDE A JUNCTION BOX AT EXISTING BUILDING AND COIL UP 15 FEET OF CAT5E CABLE INSIDE JUNCTION BOX. REFER TO DATA AND IT SYSTEM NOTE BELOW FOR THE DATA AND IT REQUIREMENTS.

DATA AND IT SYSTEM NOTE: ⬡

A. INSTALL 24-PORT SURFACE MOUNTED PATCH PANEL ON BACKBOARD. MANUFACTURER TO BE PANDUIT AND CONTRACTOR TO BE CERTIFIED PANDUIT INSTALLER. LE BUILDING WILL HAVE (12) EMPTY PULL BOXES. ALL (12) PULL BOXES WILL REQUIRE (2) RJ45 JACKS AND (2) CAT5E CABLES. INSTALL (24) HORIZONTAL CAT-5 CABLE RUNS FROM PATCH PANEL TO (12) WALL BOXES IN MODULAR BUILDING. PROVIDE (2) CABLES PER WALL BOX. (4) WALL BOXES ARE IN EACH OFFICE, AND (4) WALL BOXES ARE IN CORRIDOR. BOXES ARE TO BE FIELD LOCATED WITH TPWD DESIGNATED OWNER REPRESENTATIVE. ROUTE CABLES IN EXISTING 3/4" CONDUITS IN WALLS THAT TERMINATE ABOVE THE CEILING (2 CABLES PER CONDUIT), AND ABOVE DROP CEILING WITH J-HOOKS AND VELCRO STRAPS. INSTALL IN CONDUIT ON WALL FROM PATCH PANEL THROUGH DROP CEILING. PROVIDE DUAL RJ-45 JACKS FOR EACH WALL BOX AND COPPERPLATE WITH LABEL SLOT. LABEL PATCH PORT AND EACH CORRESPONDING CABLE ON BOTH ENDS. PROVIDE CONTINUITY TEST REPORT.

B. PULL 2-DIRECT BURIAL/OUTDOOR RATED SHIELDED CAT5E, SOLID 24 AWG BLACK ETHERNET CABLES WITH RJ-45 ETHERNET PLUGS TERMINATED ON BOTH ENDS.

C. SET A 12 X 12 X 6 RAINTIGHT PULL BOX AT THE EXISTING MAINTENANCE BUILDING WITH 10 FEET OF CABLE COILED UP INSIDE THE PULL BOX SURFACE MOUNTED ON THE EXTERIOR OF THE EXISTING BUILDING LOCATED ADJACENT TO AN EXISTING SWITCH. COIL UP 5 FEET OF SLACK CABLE ON BACKING BOARD AT SURGE PROTECTOR

D. PENETRATED THRU THE BACK SIDE OF THE PULL BOX WITH A SHORT NIPPLE OPEN ENDED CONDUIT WITH A NYLON BUSHING. SEAL THE WALL PENETRATION WITH SILICON SEALANT.

E. TERMINATE THE CAT5E CABLES ON THE CONTRACTOR PROVIDED 2-PORT LIGHTING AND SURGE PROTECTOR MANUFACTURED BY L-COM MODEL # CMSP-CAT6T-2.

F. SURFACE MOUNT THE 2-PORT LIGHTING AND SURGE PROTECTOR TO THE 3'X3' BACKBOARD PAINTED WITH FIRE RETARDANT PAINT. BACKBOARD WILL BE PROVIDED WITH MODULAR BUILDING.

G. THE CONTRACTOR WILL PROVIDE AND RUN A #6 COPPER WIRE FROM THE 2-PORT LIGHTING AND SURGE PROTECTOR GROUND LUG TO THE GROUND BUSS BAR MOUNTED TO THE BACKBOARD.

H. CONTRACTOR SHALL PROVIDED A GROUND BUSS BAR AND BOND IT TO THE GROUND ROD AT THE MODULAR BUILDING WITH A #6 COPPER WIRE.

I. SPLICES ARE PROHIBITED BETWEEN THE FACEPLATE RJ45 JACK AND THE PATCH PANEL.

Digitally Signed

STATE OF TEXAS
MICHAEL S. GATH
90903
LICENSED
PROFESSIONAL ENGINEER

Michael Gath, PE (TX)
2019.04.12 11:06:38-05'00'

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FIRM REGISTRATION # F-2497
WWW.EEACE.COM · EEA PROJECT # 20184023A

LOST MAPLES STATE PARK
L.E. MODULAR OFFICE BUILDING UTILITIES
PROJECT: MR8555

DATE: 4-11-2019
DESIGNED BY: EEA
DRAWN BY: EEA
REVIEWED BY: EEA
REVISED:

REVISED:

REVISED:

SHEET TITLE
ELECTRICAL PLAN

SHEET NAME
LM-E1.0

NEW PANEL MDP

EEA PROJECT NAME: Lost Maples Modular Building
EEA PROJECT NUMBER: 20184023A

4/11/2019 15:20

PANEL OPTIONS:

BUS RATING: 200A
MAIN: 200A MCB
VOLTAGE: 240/120V1PH,3W
LOCATION: REFER TO PLAN
FED FROM: REFER TO ONE LINE
FEEDER SIZE: REFER TO ONE LINE

AIC RATING: 22kA
BUSSING: COPPER
MOUNTING: SURFACE
NEMA ENCLOSURE: NEMA 3R

CB OPT: ST - SHUNT TRIP
K - KIRK KEY INTERLOCK
GF - GROUND FAULT CIRCUIT INTERRUPTER
FR - FULLY RATED
L - LOCKABLE
EP - EQUIPMENT GROUND FAULT (30mA)

LOAD (VA)						CKT		CB	CB AMP/	Ø	CB AMP/	CB		CKT	LOAD (VA)					
LIGHT	RECPT	CONT	MISC	MOTOR	KITCH	NO.	LOAD SERVED	OPT	POLE		POLE	OPT	LOAD SERVED	NO.	LIGHT	RECPT	CONT	MISC	MOTOR	KITCH
	180					1	SERVICE OUTLET - GFCI		20/1	A	125/2		MTS / PANEL LE	2	0	1800	0	0	5004	0
						3	SPARE		20/1	B	-			4	1392	1620	1752	0	5004	0
						5	SPARE		20/1	A	20/1		SPARE	6						
						7	SPARE		20/1	B	20/1		SPARE	8						
						9	SPARE		20/1	A	20/1		SPARE	10						
						11	SPARE		20/1	B	20/1		SPARE	12						
						13	SPARE		20/1	A	20/1		SPARE	14						
						15	SPARE		20/1	B	20/1		SPARE	16						
						17	SPACE		-	A	-		SPACE	18						
						19	SPACE		-	B	-		SPACE	20						
						21	SPACE		-	A	-		SPACE	22						
						23	SPACE		-	B	-		SPACE	24						
						25	SPACE		-	A			SPACE	26						
						27	BUSS MOUNTED SPD		-	B	-		SPACE	28						
						29	TYPE 2		-	A	-		SPACE	30						

PHASE LOADING

LIGHT	RECPT	CONT	MISC	MOTOR	KITCH	TOTAL		CONNECTED AMPS PER PHASE
0	1980	0	0	5004	0	6984	PHASE A	**58 A**
1392	1620	1752	0	5004	0	9768	PHASE B	**81 A**
1392	3600	1752	0	10008	0		TOTAL	
				1008		LARGEST MOTOR LOAD		

PANEL TOTALS

	LIGHT	RECPT	CONT	MISC	MOTOR	KITCH
CONNECTED KVA TOTALS	1.39	3.60	1.75	0.00	10.01	0.00
DEMAD FACTOR	1.25	(1)	1.25	1	(2)	0.65
DEMAD KVA TOTALS	1.74	3.60	2.19	0.00	10.26	0.00
TOTAL CONNECTED KVA	16.75	FOOTNOTES:				
TOTAL DEMAND KVA	17.79	(1) = PER NEC ARTICLE 220.44				
PHASE TO PHASE VOLTAGE	240	(2) = PER NEC ARTICLE 220.50				
TOTAL PANEL DEMAND AMPERAGE	**74**					

EXISTING PANEL LE

EEA PROJECT NAME: Lost Maples Modular Building
EEA PROJECT NUMBER: 20184023A

4/11/2019 15:20

PANEL OPTIONS:

BUS RATING: 125A
MAIN: 125A MCB
VOLTAGE: 240/120V1PH,3W
LOCATION: REFER TO PLAN
FED FROM: REFER TO ONE LINE
FEEDER SIZE: REFER TO ONE LINE

AIC RATING: 10kA
BUSSING: COPPER
MOUNTING: SURFACE
NEMA ENCLOSURE: NEMA 3R

CB OPT: ST - SHUNT TRIP
SS - SOLID STATE
GF - GROUND FAULT CIRCUIT INTERRUPTER
FR - FULLY RATED
L - LOCKABLE
EP - EQUIPMENT GROUND FAULT (30mA)

LOAD (VA)						CKT		CB	CB AMP/	Ø	CB AMP/	CB		CKT	LOAD (VA)					
LIGHT	RECPT	CONT	MISC	MOTOR	KITCH	NO.	LOAD SERVED	OPT	POLE		POLE	OPT	LOAD SERVED	NO.	LIGHT	RECPT	CONT	MISC	MOTOR	KITCH
				5004		1	HVAC		60/2	A	20/1		OPEN OFFICE RECEPTS 2	2		360				
				5004		3	AUX HEAT 5KW		-	B	20/1		LIGHTING	4	1392					
	360					5	OPEN OFFICE RECEPTS 1		20/1	A	20/1		DEDICATED RECEPT	6		180				
		1752				7	WATER HEATER		20/1	B	20/1		OFFICE 1 RECEPTS 1	8		540				
	720					9	OFFICE 2 RECEPTS 1		20/1	A	20/1		VANITY GFCI	10		180				
	180					11	OFFICE 1 RECEPTS 2		20/1	B	20/1		OFFICE 3 RECEPTS 2	12		540				
						13	SPARE		20/1	A	20/1		SPARE	14						
	180					15	COFFEE BAR GFCI		20/1	B	20/1		WP/GFCI RECEPTS	16		180				
						17	SPARE		20/1	A	20/1		SPARE	18						
						19	SPARE		20/1	B	20/1		SPARE	20						
						21	SPARE		20/1	A	20/1		SPARE	22						
						23	SPARE		20/1	B	20/1		SPARE	24						
						25	SPACE		-	A			SPACE	26						
						27	SPACE		-	B	-		SPACE	28						
						29	SPACE		-	A	-		SPACE	30						
						31	SPACE		-	B	-		SPACE	32						
						33	**UL LISTED SPD TYPE 2**		-	A	-		SPACE	34						
						35	**BUSS MOUNTED DEVICE**		-	B	-		SPACE	36						

PHASE LOADING

LIGHT	RECPT	CONT	MISC	MOTOR	KITCH	TOTAL		CONNECTED AMPS PER PHASE
0	1800	0	0	5004	0	6804	PHASE A	**57 A**
1392	1620	1752	0	5004	0	9768	PHASE B	**81 A**
1392	3420	1752	0	10008	0		TOTAL	
				1008		LARGEST MOTOR LOAD		

PANEL TOTALS

	LIGHT	RECPT	CONT	MISC	MOTOR	KITCH
CONNECTED KVA TOTALS	1.39	3.42	1.75	0.00	10.01	0.00
DEMAD FACTOR	1.25	(1)	1.25	1	(2)	0.65
DEMAND KVA TOTALS	1.74	3.42	2.19	0.00	10.26	0.00
TOTAL CONNECTED KVA	16.57	FOOTNOTES:				
TOTAL DEMAND KVA	17.61	(1) = PER NEC ARTICLE 220.44				
PHASE TO PHASE VOLTAGE	240	(2) = PER NEC ARTICLE 220.50				
TOTAL PANEL DEMAND AMPERAGE	**73**					

SPECIAL NOTE

PANEL LE SHALL BE PROVIDED WITH THE OWNER SUPPLIED TRAILER.

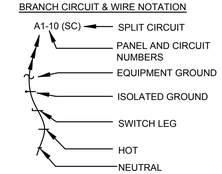
ELECTRICAL CONTRACTOR SHALL INSTALL A NEW TYPE 2 SPD DEVICE INTO THE EXISTING PANEL LE.

ELECTRICAL SYMBOLS AND LEGEND

THE DRAWING PLAN SET USES THE ELECTRICAL SYMBOLS AND LEGEND TO DEFINE QUALITY CONTROL, TERMINATIONS, SWITCHES, RECEPTACLES, LIGHTING CONTROLS, LOAD CENTERS, ELECTRICAL EQUIPMENT, ABBREVIATIONS AND LINE TYPES THAT MAY BE CALLED OUT IN THE DRAWING PLAN SET. REFER TO ALL ELECTRICAL SHEETS TO IDENTIFY ALL REQUIREMENTS.

- DUPLEX RECEPTACLE
- DISCONNECT SWITCH
- DISTRIBUTION PANEL OR LOAD CENTER
- JUNCTION BOX
- 120V 1PH CONNECTION
- 208V 1PH CONNECTION
- 208V 3PH CONNECTION
- 240V 1PH CONNECTION
- 240V 3PH CONNECTION

BRANCH CIRCUIT & WIRE NOTATION



LISTED ABBREVIATIONS

BOF	BOTTOM OF FIXTURE
GFI	GROUND FAULT INTERUPT
WP	IN-USE WEATHERPROOF DEVICE OR ENCLOSURE
RGS	RIGID GALVANIZED STEEL CONDUIT
PVC	POLY VINYL CLORIDE CONDUIT
EMT	ELECTRICAL METALIC TUBING CONDUIT
AFR	ABOVE FINISHED ROOF
AFF	ABOVE FINISHED FLOOR
BFG	BELOW FINSIHED GRADE
AFG	ABOVE FINISHED GRADE
SCH.	SCHEDULE
TYP.	TYPICAL

UGE — UNDERGROUND ELECTRICAL
UVD — UNDERGROUND VOICE DATA
UTS — UNDERGROUND TELEPHONE SERVICE

MAXIMUM FAULT CURRENT / REQUIRED LABELING

PROVIDE LABEL STATING EQUIPMENT SHALL BE DE-ENERGIZED, PRIOR TO PERFORMING MAINTENANCE OR REMOVAL OF DEAD FRONT. PROVIDE LABEL STATING MAXIMUM FAULT CURRENT WITH DATE.

MAXIMUM SHORT CIRCUIT CURRENT BASED ON POINT TO POINT CALCULATIONS. ASSUMING INFINITE BUSS WITH ALL PHASES BOLTED TOGETHER AND AT THE MAXIMUM UL LISTED TOLERANCE OF ± 10% IMPEDANCE TOLERANCE

EXISTING TRANSFORMER IS ASSUMING A 75 KVA / 120/240 1Ø / ASSUMING 3% TRANSFORMER IMPEDANCE.

SINGLE PHASE TRANSFORMER FULL LOAD CURRENT = TRANSFORMER KVA*1000/VOLTAGE = 75*1000/240= 313 AMPS.

SHORT CIRCUIT CURRENT (ISC LINE TO LINE)= TRANSFORMER FULL LOAD CURRENT / TRANSFORMER IMPEDANCE (Z).= 313/.03 =10,433 AMPS AT TRANSFORMER LUGS.

ASSUMING NO SIGNIFICANT MOTOR CONTRIBUTIONS. ASSUME MAXIMUM WORST CASE FULL LOAD AMPS OF TRANSFORMER FAULT CURRENT = 313 AMPS MULTIPLY BY FOUR = 313*4 =1252 AMPS

ASSUMING NO GENERATOR CONTRIBUTION

MAXIMUM WORST CASE FAULT CURRENT WITH MOTOR CONTRIBUTIONS AND ASSUMED NO GENERATOR CONTRIBUTIONS = 10,433 + 1,252 = 11,685 AMPS

COORDINATE WITH UTILITY PROVIDER TO VERIFY ACTUAL TRANSFORMER IMPEDANCE. AND TO ENSURE UTILITY PROVIDER REQUIREMENTS.

Digitally Signed

STATE OF TEXAS
MICHAEL S. GATH
90393
LICENSED PROFESSIONAL ENGINEER

Michael Gath, PE (TX)
2019.04.11 16:05:52-05'00'

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LOST MAPLES STATE PARK
L.E. MODULAR OFFICE BUILDING UTILITIES
PROJECT: MR8555

DATE: 4-11-2019
DESIGNED BY: EEA
DRAWN BY: EEA
REVIEWED BY: EEA
REVISED:
REVISED:
REVISED:

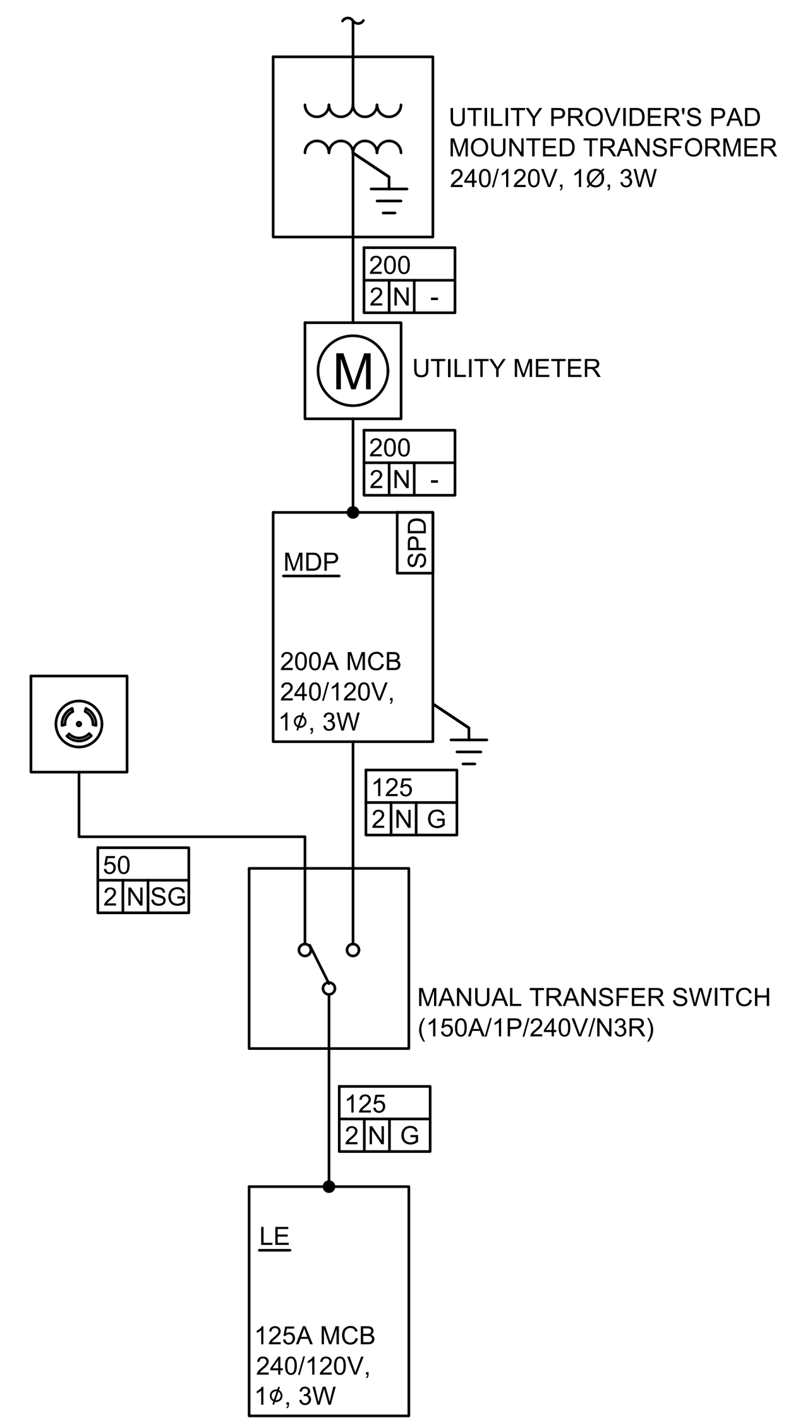
SHEET TITLE
ELECTRICAL SCHEDULES

SHEET NAME
LM-E2.0

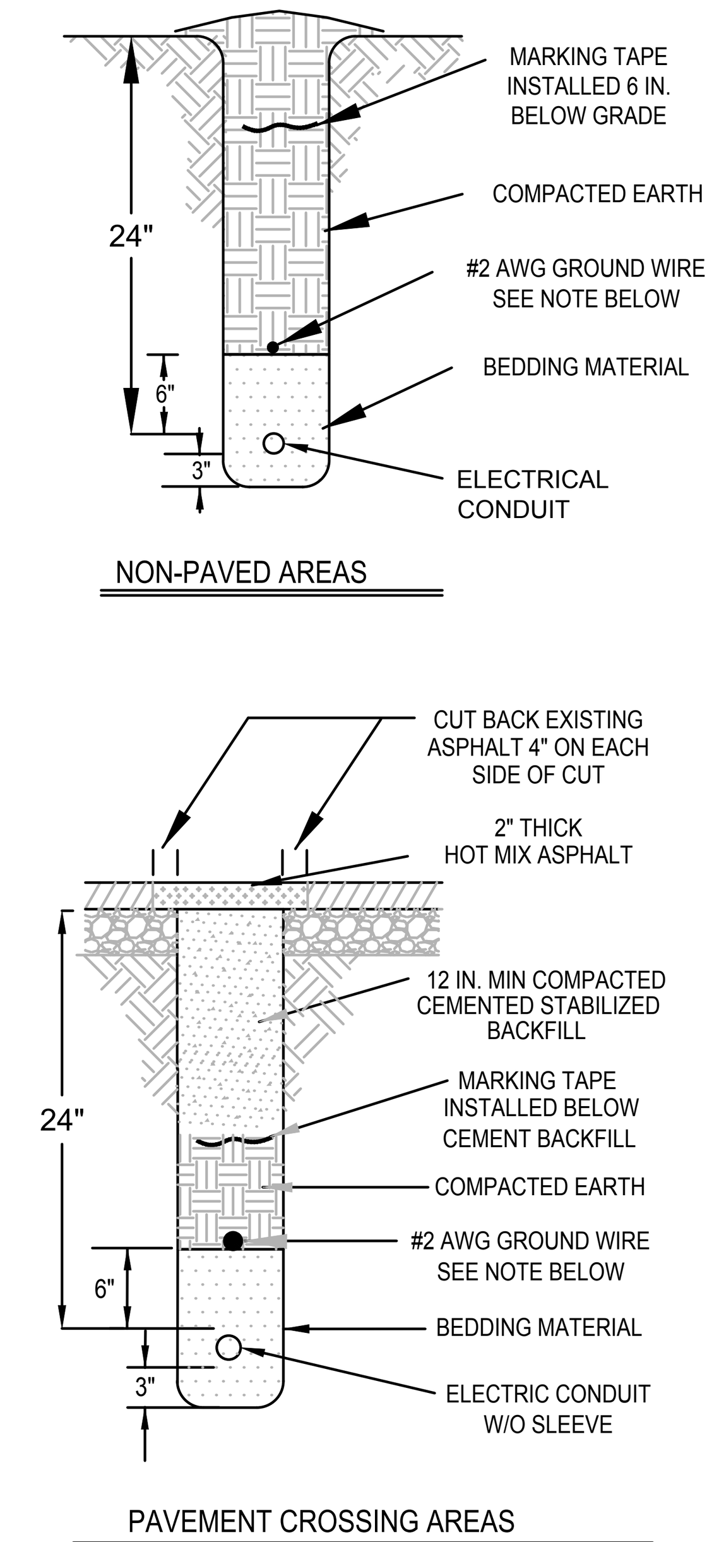
CONDUIT AND CONDUCTOR SCHEDULE

ONE LINE TAGS	NO. OF SETS	SIZE OF CONDUCTORS	SIZE OF GROUND (G)	SIZE OF SERVICE GROUND (SG)	CONDUIT SIZE
20		#12	#12	#8	3/4"
30		#10	#10	#8	3/4"
40		#8	#10	#8	1"
50		#6	#10	#8	1"
60		#4	#10	#8	1-1/4"
70		#4	#8	#8	1-1/4"
80		#3	#8	#8	1-1/4"
90		#2	#8	#8	1-1/2"
100 (SEE NOTE 3)		#1	#8	#6	1-1/2"
110		#1	#6	#6	1-1/2"
125		#1/0	#6	#6	2"
150		#1/0	#6	#6	2"
175		#2/0	#6	#4	2"
200		#3/0	#6	#4	2"
225		#4/0	#4	#2	2-1/2"
250		250kcmil	#4	#2	3"
300		350kcmil	#4	#2	3"
350		500kcmil	#3	#1/0	3-1/2"
optional size for 350	(2)	#2/0	#3	#1/0	3-1/2"
400		600kcmil	#3	#1/0	3-1/2"
optional size for 400	(2)	#3/0	#3	#1/0	2-1/2"
500	(2)	250kcmil	#2	#1/0	3"
600	(2)	350kcmil	#1	#2/0	3"
700	(2)	500kcmil	#1/0	#2/0	3-1/2"
optional size for 700	(3)	250kcmil	#1/0	#2/0	3-1/2"
800	(4)	#3/0	#1/0	#2/0	2-1/2"
optional size for 800	(3)	300kcmil	#1/0	#2/0	3"
1000	(3)	400kcmil	#2/0	#3/0	3-1/2"
optional size for 1000	(4)	250kcmil	#2/0	#3/0	3"
1200	(4)	350kcmil	#3/0	#4/0	3"
1600	(5)	400kcmil	#4/0	250kcmil	4"
2000	(6)	400kcmil	250kcmil	300kcmil	4"
2500	(7)	500kcmil	250kcmil	300kcmil	4"
3000	(9)	500kcmil	250kcmil	300kcmil	4"

NOTES
1. ALL FEEDERS ARE 4 WIRE PLUS GROUND, UNLESS NOTED OTHERWISE.
2. OPTIONAL SIZES MAY BE USED WHERE SPECIFIED CONDUIT AND CONDUCTORS ARE NOT FEASIBLE.
3. FOR EQUIP. WITH 75 C TERMINATIONS, 100A OR BELOW MAY BE SIZED PER 75C COLUMN IN TABLE 310.15(B)(16) (RE: 110.14(C)(1)(3)
4. ALL CONDUCTORS ARE COPPER UNLESS NOTED OTHERWISE.
5. COPPER CONDUCTORS SHALL BE USED FOR ANY EQUIPMENT THAT REQUIRES IT.
6. SERVICE GROUND (SG) SIZED PER TABLE 250.102(C)(1)



3 PROPOSED ONE-LINE DIAGRAM
SCALE: NOT TO SCALE



1. TRENCHING NOTES
2. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS TOOLS AND EQUIPMENT NECESSARY TO ACCOMPLISH THE REQUIRED TRENCHING. CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES PRIOR TO STARTING EXCAVATION. COSTS OF REPAIRING DAMAGE TO EXISTING UNDERGROUND UTILITIES OR FACILITIES SHALL BE BORNE BY THE CONTRACTOR.
3. TRENCHES SHALL BE EXCAVATED TO THE DEPTHS AND LINES PLACED AS SHOWN ON THESE DETAILS. THE WIDTH OF ANY TRENCHES SHALL BE BETWEEN SIX AND TWELVE INCHES. WHERE ROOTS OR STUMPS ARE ENCOUNTERED THEY SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR. LARGE ROOTS SHALL BE CUT OFF FLUSH WITH THE SIDES OF THE TRENCH USING A PRUNING SAW OR PRUNING LOPERS.
4. THE CONTRACTOR SHALL STAKE EACH PROPOSED ROUTE THAT CROSSES PAVED AREAS. ALL PAVEMENT TO BE CUT SHALL BE CUT WITH A PAVEMENT SAW FOR THE FINAL CUT BACKS PRIOR TO PATCHING THE PAVEMENT.
5. BEDDING MATERIAL SHALL BE BEDDED AROUND ALL CONDUITS & WATER LINES. BEDDING MATERIAL SHALL BE SAND OR OTHER SUITABLE BEDDING MATERIAL THAT PASSES A 3/8" SIEVE TEST. THE COMPACTED EARTH FILL MATERIAL SHALL BE FREE OF MUD, CLAY LUMPS, VEGETATION, DEBRIS AND ROCKS EXCEEDING 6" IN IN THEIR GREATEST DIMENSION. THE "FINES" RESULTING FROM THE USE OF A TRENCHING MACHINE MAY ONLY BE USED AS COMPACTED EARTH BACKFILL UNLESS SPECIFICALLY APPROVED BY THE TPWD ENGINEER.
6. THE BEDDING MATERIAL SHALL BE WATER-TAMPED AROUND ALL LINES BY FLOODING THE TRENCH WITH WATER AND ALLOWING THE MATERIAL TO SETTLE IN AS THE WATER RECEDES AND IS ABSORBED. AFTER THIS FLOODING THE BEDDING MATERIAL DEPTHS ABOVE AND BELOW THE LINES SHALL STILL ADHERE TO THE DETAIL DIMENSIONS. THE COMPACTED EARTH BACKFILL SHALL BE COMPACTED IN 6" LIFTS. HAND TAMPING SHALL BE DONE WITH A MECHANICAL TAMPER. THE TOP OF THE BACKFILLED TRENCH SHALL BE SLIGHTLY MOUNDED ABOVE THE SURROUNDING GRADE TO ALLOW FOR SETTLEMENT.
7. THE CEMENT STABILIZED BACKFILL FOR THE PAVEMENT REPAIRS SHALL BE COMPOSED OF A 3-SACK MIX OF PORTLAND CEMENT AND SAND. THIS BACKFILL SHALL BE 12" THICK MINIMUM.
8. FOR PATCHING THE PAVEMENT CROSSINGS, THE PAVEMENT EDGE SHALL BE A STRAIGHT, CLEAN EDGE AT LEAST 4" BACK FROM THE WALL OF THE TRENCH ON EITHER SIDE OF THE TRENCH UNLESS A LARGER CUT BACK IS REQUIRED BY THE LOCAL TxDOT REPRESENTATIVE. EACH PAVEMENT REPAIR SHALL BE PRIMED OVER THE ENTIRE SURFACE WITH TYPE MC-3000 ASPHALT OR THE EQUIVALENT EMULSION MATERIAL NORMALLY USED FOR PAVEMENT REPAIRS. THE EDGES OF THE EXISTING PAVEMENT SHALL ALSO BE TACKED WITH TYPE MC-3000 OR THE EQUIVALENT EMULSION MATERIAL. THESE TACKED & PRIMED AREAS SHALL BE ALLOWED TO CURE LONG ENOUGH TO ALLOW THE EXCESS MATERIAL TO SOAK IN BUT THE TACK AND PRIME MATERIAL SHALL STILL BE "STICKY" SO THAT THE COLD LAID ASPHALT ADHERES TO THE SURFACES. INSTALL A MINIMUM OF 2" THICK LAYER OF HOT MIXED, COLD LAID ASPHALTIC CONCRETE TO COMPLETE THE PAVEMENT REPAIR. PLACE AND COMPACT ENOUGH ASPHALT TO INSURE A LEVEL OR SLIGHTLY MOUNDED SURFACE ABOVE THE EXISTING PAVEMENT ON EACH SIDE OF EACH PAVEMENT REPAIR. THE ASPHALT SHALL BE COMPACTED WITH A VIBRATING ROLLER OR A MECHANICAL HAND TAMPER.
9. ELECTRICAL MARKING TAPE SHALL BE BURIED AT THE DEPTHS SHOWN IN TRENCHES CARRYING ELECTRIC CONDUIT.
10. WHERE MORE THAN ONE CONDUIT IS INSTALLED IN A TRENCH, THE CONDUITS SHALL BE SEPARATED BY A MINIMUM OF 2" OF BEDDING MATERIAL AND THE TRENCH WIDTH SHALL BE ADJUSTED AS NECESSARY TO ACCOMMODATE MULTIPLE CONDUITS.
11. CONTRACTOR SHALL TRENCH UNDER ALL KNOWN UNDERGROUND UTILITIES CROSSINGS BY HAND WITHOUT DAMAGING EXISTING PIPES AND CONDUITS. CONTRACTOR SHALL INSTALL CONDUITS UNDER THE EXISTING PIPING TO MEET MINIMUM COVER. CONTRACTOR SHALL FIELD INVESTIGATE PRIOR TO PLACING BID.

1. THE PAVEMENT CROSSING DETAIL APPLIES TO OPEN CUT TRENCHES ACROSS ANY PAVED SURFACE IN THE CAMPGROUNDS.
2. NOTE: NO SUB-SURFACE BORINGS HAVE BEEN DONE IN THE WORK AREA. THE CONTRACTOR IS RESPONSIBLE FOR TRENCHING AND EXCAVATING IN ALL MATERIALS ENCOUNTERED.
3. VISUAL EVIDENCE AND PRIOR TPWD WORK IN THE AREA INDICATES THAT ROCKY CONDITIONS MAY BE ENCOUNTERED BY THE CONTRACTOR WHILE PERFORMING THE TRENCHING AND EXCAVATING ON THIS PROJECT.

AT EACH ELECTRICAL SERVICE POINT:

INSTALL A BARE, #2 AWG COPPER WIRE IN A ONE CONTINUOUS LENGTH IN THE TRENCH FOR APPROXIMATELY 100' IN ONE OF THE NEW LOAD CONDUIT TRENCHES THAT ROUTE AWAY FROM THE SERVICE. INSTALL THIS WIRE AT THE TOP OF THE BEDDING MATERIAL LAYER OF THE BACKFILL. DO NOT BRING THIS WIRE UP INTO ANY PULLBOX OR CAMPSITE POWER OUTLET. THIS WIRE WILL ONLY BE CONNECTED TO THE NEW GROUND ROD AT EACH SERVICE LOCATION. THE PURPOSE OF THIS WIRE IS TO PROVIDE A LOW RESISTANCE GROUND PATH IN ADDITION TO THE GROUND ROD. SEE 03/E3.0.

AS AN ALTERNATE TRENCH METHOD IF SOLID ROCK OR LARGE ROCK SHELVES ARE ENCOUNTERED AT A SHALLOW DEPTH THAT WILL NOT ALLOW THE CONDUIT TO BE PLACED AT 24" DEEP WITHOUT USING A ROCK SAW:

1. THE CONTRACTOR MAY INSTALL PVC CONDUIT AT A MINIMUM OF 8" DEEP AND CAP THE CONDUIT WITH 4" OF RED CONCRETE. LAY THE MARKING TAPE ON TOP OF THE CONCRETE CAP. BEDDING MATERIAL WILL STILL BE REQUIRED UNDER THE PVC CONDUIT.

OR:

2. THE CONTRACTOR MAY INSTALL RIGID METAL CONDUIT AT A MINIMUM OF 8" DEEP AND CORROSION PROTECT THE CONDUIT BY WRAPPING THE CONDUIT WITH CORROSION PROTECTION TAPE ALONG THE CONDUIT'S ENTIRE LENGTH OR BY USING PVC COATED RIGID METAL CONDUIT. BEDDING MATERIAL WILL STILL BE REQUIRED AS NOTED ON THE DETAIL. PLACE THE MARKING TAPE ON TOP OF THE BEDDING MATERIAL.

ANY PVC CONDUIT BURIED SHALLOWER THAN 18" WILL REQUIRE A 4" RED CONCRETE CAP.

THE TRENCH GROUND WIRE DESCRIBED ABOVE SHALL NOT BE INSTALLED IN THESE SHALLOW TRENCHES. PLACE THE TRENCH GROUND WIRE IN AN ALTERNATE TRENCH THAT IS INSTALLED FROM THE SAME SERVICE POINT.

1 TRENCHING & EXCAVATION DETAILS & NOTES-ELECTRICAL
SCALE: NOT TO SCALE

KEYED NOTE "⬡"

1. PROVIDE NEW NAMEPLATE LABELS FOR ALL NEW AND EXISTING ELECTRICAL PANELS, LOAD CENTERS AND DISCONNECTS. REFER TO ELECTRICAL PLAN SHEET E1.0 AND SHEET E3.0 TO IDENTIFY ALL ELECTRICAL EQUIPMENT LOCATIONS.
2. FURNISH AND INSTALL ADHESIVE OSHA SAFETY SIGNS ON THE FRONT OF ALL NEW AND EXISTING LOAD CENTERS, PANELBOARDS, AND DISCONNECTS ON THE FRONT OF THE ENCLOSURE. TWO BILINGUAL SIGNS THAT ARE PRINTED IN ENGLISH AND SPANISH ARE REQUIRED. ONE SIGN SHALL READ "DANGER! HIGH VOLTAGE" AND THIS SIGN SHALL HAVE A WHITE BACKGROUND WITH RED AND BLACK LETTERING, BE AT LEAST 3-1/2" WIDE BY 5" HIGH, BE SUITABLE FOR OUTDOOR LOCATIONS AND BE EQUAL TO SETON #07989. THE SECOND SIGN SHALL BE AN ARC FLASH WARNING SIGN AND THIS SIGN SHALL HAVE A WHITE BACKGROUND WITH ORANGE AND BLACK LETTERING, BE AT LEAST 6" WIDE BY 3-1/2" HIGH, BE SUITABLE FOR OUTDOOR LOCATIONS, AND SHALL BE EQUAL TO SETON #84624 OR #94311. REFER TO ELECTRICAL PLAN SHEET E1.0 AND ONE-LINE DIAGRAM SHEET E3.0 TO IDENTIFY ALL ELECTRICAL EQUIPMENT LOCATIONS.
3. CONTRACTOR SHALL PROVIDE A UL-LISTED TYPE 2 SPD, SURGE PROTECTIVE DEVICE IN EACH ELECTRICAL LOAD CENTER AND PANELBOARD SHOWN ON THE RISER DIAGRAM. THE PROVIDED SURGE PROTECTIVE DEVICES SHALL BE A QUICK PLUG ON THE BUSS DEVICE TO MATCH THE PROVIDED AND EXISTING LOAD CENTERS.
4. SET EACH POST 2 FEET DEEP IN 4,000 PSI SACKCRETE PER UTILITY PROVIDER REQUIREMENTS WRAP POST IN CONTACT WITH CONCRETE OR EARTH WITH 3M SCOTCH 50 TAPE. (TYPICAL FOR BOTH POST) SPAN POST TO POST WITH 1-1/2" GALVANIZED CHANNEL STRUT IN 3 PLACES TO SUPPORT ENCLOSURES AND CONDUITS. GROUND SMOOTH AND PAINT CUTS WITH COLD GALVANIZING PAINT, 2" MAX EXTENSION TYPICAL AND PROVIDE RGS CAPS ON EACH POST.
5. PROVIDE PVC FEMALE CONDUIT ADAPTER TO RGS CONDUIT FOR ALL UNDERGROUND CONDUIT TO TRANSITION TO RGS ELBOWS AND RGS RISERS UP TO THE BOTTOM OF EACH ENCLOSURE, TYPICAL.
6. PROVIDE RGS ELBOWS AND RISERS UP TO THE BOTTOM OF EACH ENCLOSURE. DOUBLE WRAP ALL RGS CONDUIT IN CONTACT WITH EARTH OR CEMENT WITH CORROSION RESISTANT 3M SCOTCH 50 TAPE, TYPICAL.
7. SUPPORT AND SECURE ALL CONDUIT UNDER EACH ENCLOSURE.
8. 240V, 50A, 3W+G RECEPTACLE IN NEMA 3R ENCLOSURE. HUBBELL CS6375 OR EQUAL.
9. 240V, 125A, MANUAL TRANSFER SWITCH IN NEMA 3R ENCLOSURE.

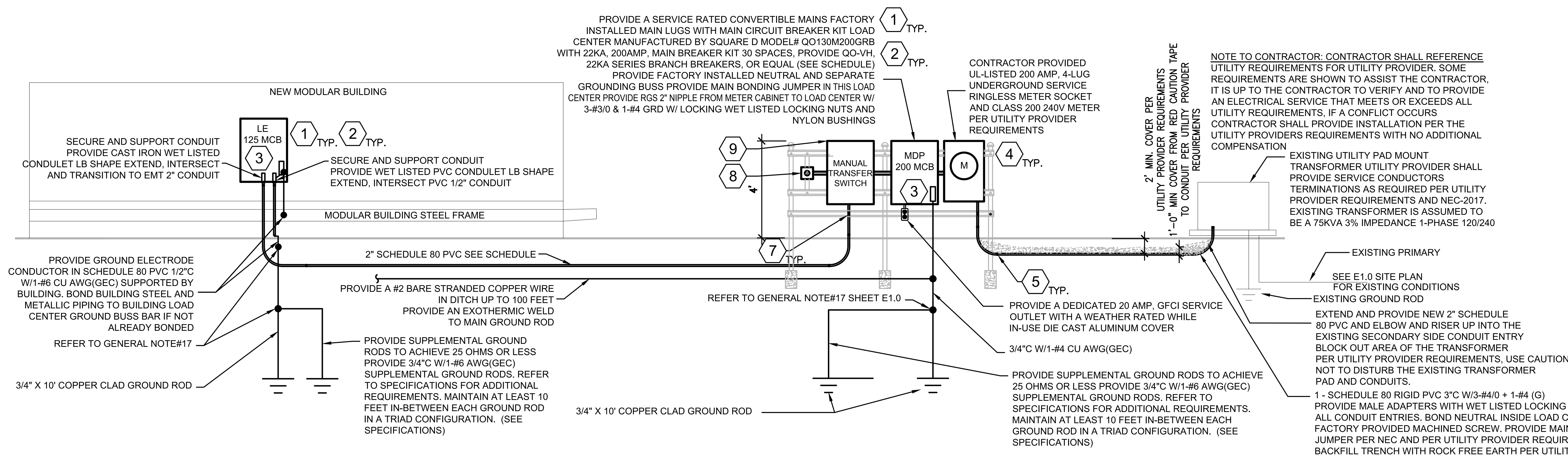
FEEDER TAG LEGEND

400
3 N G
- FEEDER AMPERAGE, SEE TABLE ABOVE
- GROUND REQUIRED WITH ALL CIRCUITS. SG = SERVICE GROUND.
- "N"=NEUTRAL REQUIRED ("-"=NOT REQUIRED)
- #=QUANTITY OF PHASE CONDUCTORS

NOTE:
PROVIDE AN ENGRAVED, LAMINATED NAMEPLATE FOR EACH NEW OR EXISTING DISCONNECT, PANELBOARD, CIRCUIT BREAKER ENCLOSURE, TRANSFORMER, OR OTHER ELECTRICAL
ENCLOSURE. STATE THE DEVICES NAME, VOLTAGE, & PHASE ON THE NAMEPLATE. IF REQUIRED, STATE THAT THE DEVICE IS FED FROM THE EMERGENCY DISTRIBUTION SYSTEM. ALSO, STATE WHERE THE DEVICE FEEDS FROM.

FOR EXAMPLE, EMERGENCY PANEL N-1H-E, NAMEPLATE WOULD READ:
EMERGENCY PANEL N-1H-E
120/240 VOLT, 1-PHASE
FEEDS FROM EMERGENCY PANEL ME

FOR RECEPTACLE FACE PLATES, USE SMALL PRINTED LABELS OR OTHER SIMILAR LABELING WITH IDENTIFYING INFORMATION.



2 PROPOSED ELECTRICAL RISER DIAGRAM
SCALE: NOT TO SCALE

Digitally Signed
STATE OF TEXAS
MICHAEL S. GATH
90903
LICENSED PROFESSIONAL ENGINEER
Michael Gath, PE (TX)
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LOST MAPLES STATE PARK
L.E. MODULAR OFFICE BUILDING UTILITIES
PROJECT: MR8555

DATE: 4-11-2019
DESIGNED BY: EEA
DRAWN BY: EEA
REVIEWED BY: EEA
REVISED:
REVISED:
REVISED:

SHEET TITLE
ELECTRICAL DETAILS

SHEET NAME
LM-E3.0

DIVISION 26 ELECTRICAL SPECIFICATIONS

SECTION 26 00 00 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 CODES AND STANDARDS:

CODES AND STANDARDS: ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 EDITION OF THE NATIONAL ELECTRIC CODE. THE PROJECT ELECTRICAL WORK SHALL BE PERFORMED BY A CONTRACTOR LICENSED WITH TDLR TO PERFORM ELECTRICAL WORK. THE ELECTRICAL WORK SHALL BE PERFORMED UNDER THE DIRECT, ON-SITE SUPERVISION OF A LICENSED, MASTER OR JOURNEYMAN ELECTRICIAN. SUBMIT COPIES OF THE LICENSES FOR ALL OF THE ELECTRICIANS THAT WILL PERFORM THE WORK. SUBMIT THIS INFORMATION AS PART OF THE PROJECT CONSTRUCTION SUBMITTAL INFORMATION.

1.2 MATERIAL SUBMITTALS:

A. SUBMIT UNDER PROVISIONS OF "TERMS AND CONDITIONS" OF THE CONTRACT.

B. MARK ALL SUBMITTAL LITERATURE TO INDICATE THE PRECISE SELECTION OF MATERIALS, DIMENSIONS AND EQUIPMENT SUBMITTED. NOTE THAT IF THE SPECIFIC MODEL OR MATERIAL IS NOT INDICATED IN THE SUBMITTAL, AND THERE IS MORE THAN ONE CHOICE POSSIBLE, THE SUBMITTAL MAY BE REJECTED AND A RESUBMITTAL WILL BE REQUIRED.

C. PROPOSED SUBMITTAL LIST SHALL INCLUDE ALL EQUIPMENT WITH MANUFACTURER OR MODEL NUMBERS CALLED OUT IN THE DRAWINGS. WHERE THE PLANS AND SPECIFICATIONS CALL OUT A MANUFACTURER OR MODEL NUMBER, CONTRACTOR SHALL PROVIDE AND SUBMIT THE EXACT MANUFACTURER AND MODEL NUMBER OR EQUAL PRODUCT PER THE TERMS AND CONDITIONS. REFERENCE THIS SHEET FOR THE REQUIRED SUBMITTALS INDICATED IN THE CONTRACTOR'S PROJECT SUBMITTAL LIST.

PART 2 - PRODUCTS

2.1 METAL RACEWAYS: RIGID STEEL CONDUIT:

A. PROVIDE PVC COATED RIGID STEEL CONDUIT MANUFACTURED BY PLASTI-BOND, ZINC-COATED, THREADED TYPE CONFORMING TO ANSI C80.1 AND UL 6. PROVIDE ZINC COATING FUSED TO INSIDE AND OUTSIDE WALLS. RIGID METAL CONDUIT FITTINGS: CAST MALLEABLE IRON, GALVANIZED OR CADMIUM PLATED. ALL FITTINGS SHALL BE THREADED TYPE. THE USE OF SPLIT COUPLINGS IS UNACCEPTABLE. REFERENCE PLANS FOR CALLED OUT LOCATIONS.

B. PROVIDE RIGID STEEL, ZINC-COATED, THREADED TYPE CONFORMING TO ANSI C80.1 AND UL 6. PROVIDE ZINC COATING FUSED TO INSIDE AND OUTSIDE WALLS. RIGID METAL CONDUIT FITTINGS: CAST MALLEABLE IRON, GALVANIZED OR CADMIUM PLATED. ALL FITTINGS SHALL BE THREADED TYPE. THE USE OF SPLIT COUPLINGS IS UNACCEPTABLE. REFERENCE PLANS FOR CALLED OUT LOCATIONS.

C. PROVIDE ELECTRICAL METALLIC TUBING (EMT) CONFORMING TO ANSI C80.3 AND UL 6 WITH ZINC GALVANIZED COATING FUSED TO INSIDE AND OUTSIDE WALLS. EMT FITTINGS SHALL BE COMPRESSION TYPE, STEEL OR CAST. DO NOT USE SET-SCREW TYPE EMT FITTINGS. REFERENCE PLANS FOR CALLED OUT LOCATIONS.

2.2 NONMETALLIC CONDUIT:

A. PVC HEAVY WALL CONDUIT: SCHEDULE 80, 90 C, UL RATED, CONSTRUCT OF POLYVINYL CHLORIDE AND CONFORMING TO NEMA TC-2, FOR DIRECT BURIAL, OR NORMAL ABOVE GROUND USE, UL-LISTED AND IN CONFORMITY WITH NEC ARTICLE 352. FITTINGS FOR NON-METALLIC CONDUIT SHALL CONFORM TO NEMA TC3 AND SHALL BE SPECIFICALLY MANUFACTURED FOR ELECTRICAL CONDUIT. WATER PIPE FITTINGS WILL NOT BE ACCEPTED. REFERENCE PLANS FOR CALLED OUT LOCATIONS.

2.4 UNDERGROUND WARNING TAPE:

A. PROVIDE A DETECTIBLE CAUTION TAPE FOR THE LENGTH OF THE TRENCH. CAUTION TAPE SHALL BE MANUFACTURED BY PRO-LINE'S DETECTABLE MARKING TAPE CONSISTS OF A MINIMUM 5.0 MIL OVERALL THICKNESS. CONSTRUCTION IS 0.8 MIL CLEAR VIRGIN POLYPROPYLENE FILM, REVERSE PRINTED AND LAMINATED TO A 0.35 SOLID ALUMINUM FOIL CORE AND THEN LAMINATED TO A 3.75 MIL CLEAR VIRGIN POLYETHYLENE FILM. TAPE SHALL BE PRINTED WITH APWA RED COLOR-CODED, PATENTED "DIAGONALLY STRIPED" DESIGN WITH BIG, BOLD, BLACK LETTERING TO IDENTIFY THE ELECTRICAL BURIED UTILITY LINE.

2.5 CONDUCTOR MATERIALS AND ACCESSORIES:

A. GENERAL USE SINGLE CONDUCTOR WIRE SHALL BE COPPER, TYPE THHN/THWN-2, XHHW WHEN UNDERGROUND, UL LISTED FOR GENERAL USE AT A MAXIMUM OF 600 VOLTS AND A MAXIMUM TEMPERATURE OF 75 DEGREES C SUITED FOR DRY AND WET LOCATIONS AND GASOLINE PRESENT LOCATIONS. NUMBER 8 AWG AND LARGER SHALL BE STRANDED.

B. WIRE COLOR CODING FOR ALL NEW WIRING:

SYSTEM - 240/120 VAC, SINGLE PHASE

PHASE A	PHASE B	NEUTRAL	GROUND
BLACK	RED	WHITE	GREEN

WIRE COLORS SHALL BE INTEGRAL PIGMENTATION COLOR CODING FOR #8 AWG AND SMALLER WIRES, INCLUDING GROUND WIRES. FOR #6 AWG AND LARGER WIRES, COLORED PHASE TAPE SHALL BE APPLIED TO THE WIRE FOR IDENTIFICATION. TAPE SHALL BE APPLIED IN A SPIRAL, HALF-LAP MANNER OVER EXPOSED CONDUCTOR PORTIONS OF THE NEW AND EXISTING SERVICE AND FEEDER WIRING IN ATS SWITCHES, GENERATORS, SERVICE PEDESTALS, JUNCTION BOXES, LOAD CENTERS, PANELBOARDS, AND OTHER ENCLOSURES.

2.6 GROUNDING MATERIAL: SEE GROUND ELECTRODE TESTING IN THIS SPECIFICATION, PART 3.5.

A. NEW GROUND ELECTRODES: 3/4" X 10' LONG COPPER-BONDED GROUND RODS OR OTHER SPECIALLY DESIGNED GROUNDING SYSTEMS AS DESIGNATED BY THE ENGINEER.

B. GROUNDING ELECTRODE CONDUCTOR (GEC) CONNECTIONS: ALL GEC CONNECTIONS TO NEW GROUND ELECTRODES SHALL BE EXOTHERMIC TYPE CONNECTIONS. USING MECHANICAL OR COMPRESSION CLAMPS WILL NOT BE ALLOWED FOR CONNECTIONS TO NEW GROUND ELECTRODES.

Project Submittal Register

EEA CONSULTING ENGINEERS

EEA Project Manager: Scott Barron
EEA Project Number: 20184023A

Spec Section #	Spec Section Description	Submittal Description	Item
Pre-Construction			
-	Conductors and Cables 600V and Less	Product Data	Wire, wire connectors,
-	Grounding and Bonding	Product Data	Rod Electrodes, Mechanical ground connectors, Exothermic welding kit
-	Hangers and Supports	Product Data	Conduit supports, formed steel channel,
-	Raceway and Boxes	Product Data	Conduit, pull boxes, handholes
-	Identification	Product Data	Nameplates, Underground Warning Tape
-	Panelboards	Product Data	Panelboards / load Center
-		Shop Drawings	Panelboard bill of material
-	Surge Protection Devices	Product Data	SPD
-	Wiring Devices	Product Data	Receptacles
-	Misc. Electrical	Product Data	Concrete pad, C-Channel racking, and manual transfer switch

PART 3 - EXECUTION

3.1 INSTALLATION OF CONDUITS:

A. MECHANICALLY FASTEN TOGETHER METAL CONDUITS, ENCLOSURES, AND RACEWAYS FOR CONDUCTORS TO FORM CONTINUOUS ELECTRICAL CONDUCTOR.

B. CONDUITS SHALL HAVE OPENINGS TEMPORARILY PLUGGED TO EXCLUDE FOREIGN MATERIALS AND BE RIGIDLY SUPPORTED SO AS TO PREVENT UNDUE STRESS OR STRAIN ON THE COUPLINGS, CONNECTORS OR FITTINGS.

C. ON ALL METAL CONDUITS, BUSHINGS SHALL BE OF THE INSULATED TYPE. RMC CONDUIT SHALL BE ATTACHED TO ENCLOSURES WITH DOUBLE LOCKNUTS AND BUSHINGS.

D. ALL CONDUIT SYSTEMS MUST BE INSTALLED COMPLETE BEFORE CONDUCTORS ARE PULLED IN AND BE ELECTRICALLY CONTINUOUS THROUGHOUT.

E. USE SCHEDULE RGS CONDUIT FOR ALL NEW RISERS INTO THE ENCLOSURES UNLESS OTHERWISE INDICATED.

F. CONDUIT ENTRIES INTO THE TOPS OF ENCLOSURES SHALL USE WEATHER-PROOF HUBS. CONDUIT ENTRIES IN THE SIDES OR BACKS OF ENCLOSURES SHALL USE SEALING LOCKNUTS.

3.2 UNDERGROUND CONDUIT INSTALLATION:

A. ALL NEW UNDERGROUND CONDUIT AND CONDUIT IN CONTACT WITH EARTH OR CONCRETE SHALL BE SCHEDULE 80 PVC CONDUIT WITH PLASTI-BOND UL-LISTED PVC COATED RGS 90 ELBOWS CONDUIT STUB-UPS AND RISERS EXTENDED PVC COATED RGS UP TO THE BOTTOM OF EACH ENCLOSURE UNLESS NOTED OTHERWISE. SEAL ALL THREADS AND COUPLINGS ON PVC COATED RGS CONDUIT WITH PLASTI-BOND GRAY SEALANT TOUCH UP COMPOUND DESIGNED TO REPAIR MINOR DAMAGE TO THE PVC FACTORY COATING.

B. FOR UNDERGROUND CONDUIT SEE THE TRENCH DETAIL AND NOTES ON THE DRAWINGS. RUN CONDUIT IN STRAIGHT LINES EXCEPT WHERE A CHANGE OF DIRECTION IS NECESSARY. PROVIDE NOT LESS THAN 3 INCHES CLEARANCE FROM THE CONDUIT TO EACH SIDE OF THE TRENCH. AS EACH CONDUIT RUN IS COMPLETE, ASSURE THAT THE CONDUIT INTERIOR IS FREE FROM DIRT OR DEBRIS. THEN IMMEDIATELY INSTALL CONDUIT PLUGS OR OTHERWISE COVER END OF CONDUIT TO PREVENT ENTRY OF FOREIGN MATERIAL UNTIL WIRE IS PULLED INTO CONDUIT. EXCEPT AT CONDUIT RISERS; ACCOMPLISH CHANGES IN DIRECTION OF RUNS EXCEEDING A TOTAL OF 10 DEGREES, EITHER VERTICAL OR HORIZONTAL, WITH LONG SWEEP BENDS. MANUFACTURED BENDS SHALL HAVE A MINIMUM RADIUS OF 18 INCHES FOR USE WITH CONDUITS OF LESS THAN 3 INCHES IN DIAMETER.

C. ALL UNDERGROUND ELECTRICAL CONDUITS SHALL BE PERMANENTLY IDENTIFIED WITH A COLORED, ELECTRICAL IDENTIFICATION TAPE OVER THE CONDUIT SYSTEMS BEFORE BACKFILLING TRENCHES. ALL TAPE SHALL BE INSTALLED WITH THE WRITING FACE UP.

3.3 CONDUCTOR INSTALLATION:

A. SINGLE CONDUCTOR WIRING SHALL BE INSTALLED IN CONDUIT, A RACEWAY, BOX OR OTHER ENCLOSURE. NO CONDUCTORS OR CABLES SHALL BE INSTALLED IN CONDUITS, DUCT, OR RACEWAYS UNTIL THE RACEWAY OR CONDUIT SYSTEM HAS BEEN COMPLETED. WHEN INSTALLING CONDUCTORS, THE CONTRACTOR SHALL USE WIRE-PULLING COMPOUND WHEN INSTALLING ALL WIRING AND SHALL EXERCISE DUE CARE TO PREVENT DAMAGE TO CONDUCTORS OR INSULATION AND REPLACE ALL DAMAGED CABLE. TYPE THWN WIRING WITH THE OUTER NYLON JACKET DAMAGED WILL NOT BE ACCEPTED.

B. NO NEUTRAL WIRE OR GROUND WIRE SHALL BE TRIMMED OR SPLIT TO FIT SMALLER SIZED LUGS. IF OVERSIZED LUGS ARE INSTALLED ON A NEUTRAL OR GROUND BUSS TO ACCOMMODATE THE LARGER WIRE SIZES, WIRE SHALL BE ROUTED INTO THESE LUGS USING THE PROPER BENDING RADIUS AND TERMINATION METHODS.

C. ALL WIRING SHALL BE TERMINATED ON MAIN BREAKER LUGS, BRANCH BREAKER LUGS, SWITCH LUGS, NEUTRAL BAR/BUSS, OR GROUND BAR/BUSS. NO NEW CONDUCTOR SPLICES SHALL BE MADE IN AUTOMATIC TRANSFER SWITCHES, GENERATORS, CIRCUIT BREAKER ENCLOSURES, LOAD CENTERS, OR OTHER ELECTRICAL ENCLOSURES UNLESS SPECIFICALLY ALLOWED ON THE DRAWINGS.

3.4 IDENTIFICATION AND MARKINGS:

A. ON THE NEW AUTOMATIC TRANSFER SWITCHES, NEW LOAD CENTERS, EXISTING LOAD CENTERS, AND EXISTING CIRCUIT BREAKER ENCLOSURES INSTALL AN ENGRAVED, PLASTIC NAMEPLATE ON THE FRONT DOOR OF THE ENCLOSURE THAT STATES THE NAME, PHASE AND VOLTAGE OF THE EQUIPMENT. THE NAMEPLATES SHALL BE BLACK WITH WHITE LETTERS WITH A MINIMUM LETTER HEIGHT OF 1/4". THE NAMEPLATES SHALL BE INSTALLED ON THE DOOR WITH CORROSION RESISTANT RIVETS OR SCREWS THAT ARE SHORT ENOUGH TO PREVENT ANY CONTACT WITH LIVE PARTS INSIDE THE ENCLOSURE. FOR EXAMPLE EQUIPMENT NAMES ON THE NAMEPLATES SHOULD BE "LC" FOR LOAD CENTERS.

B. ON THE EXISTING OR NEW LOAD CENTERS AT THE ELECTRIC SERVICE POINTS: INSTALL AN ENGRAVED, PLASTIC NAMEPLATE ON THE INTERIOR COVER OF THE ENCLOSURE NEXT TO EACH LOAD BREAKER THAT STATES WHAT LOAD IS CONTROLLED BY THE BREAKER. THE NAMEPLATES SHALL BE BLACK WITH WHITE LETTERS WITH A MINIMUM LETTER HEIGHT OF 1/4". THE NAMEPLATES SHALL BE INSTALLED ON THE INTERIOR COVER WITH CORROSION RESISTANT RIVETS OR SCREWS THAT ARE SHORT ENOUGH TO PREVENT ANY CONTACT WITH LIVE PARTS INSIDE THE ENCLOSURE.

C. EACH NEW CONDUCTOR GROUP IN LOAD CENTERS, CIRCUIT BREAKER ENCLOSURES, AUTOMATIC TRANSFER SWITCHES, GENERATOR ELECTRICAL ENCLOSURE, OR OTHER ENCLOSURES SHALL HAVE A PERMANENT, LEGIBLE WIRE MARKING LABEL WITH SUITABLE NUMBERS TO SHOW THE DESTINATION OF THE WIRING. THIS DESIGNATION SHALL CALL OUT THE DESTINATION OF THE NEW WIRING SUCH AS "TO ATS-1" OR "TO METER" OR "TO GENERATOR" OR "TO LOAD CENTER".

3.5 GROUND SYSTEM TESTS:

ALL ELECTRICAL, OPERATIONAL, AND GROUND SYSTEM TESTS SHALL BE WITNESSED BY TPWD CONSTRUCTION PERSONNEL.

A. EACH NEW GROUND ELECTRODE WILL BE TESTED BY A TPWD ELECTRICAL INSPECTOR AFTER INSTALLATION USING A GROUND ROD RESISTANCE TESTER EQUAL TO AEMC MODEL #6416 OR USING A FALL-OF-POTENTIAL GROUND RESISTANCE TESTER. THE MAXIMUM RESISTANCE FOR EACH GROUND ELECTRODE SYSTEM SHALL BE LESS THAN 25 OHMS. AFTER THESE GROUND ELECTRODE RESISTANCE TESTS, IF A GROUND ELECTRODE OR COMBINATION OF GROUND ELECTRODES HAS A RESISTANCE HIGHER THAN 25 OHMS, THE CONTRACTOR SHALL ADD A SUPPLEMENTAL GROUNDING TO THE GROUND SYSTEM TO LOWER THIS RESISTANCE BY INSTALLING AND INTERCONNECTING A ADDITIONAL GROUND ELECTRODES. THE ADDITIONAL ELECTRODES SHALL BE INSTALLED WITH A MINIMUM OF 10' AWAY FROM EACH ELECTRODE IN A TRIAD CONFIGURATION AND CONNECTED USING A BARE, #6 AWG, COPPER WIRE, EMBED IN COMPACTED BACKFILL SOIL. THE CONTRACTOR SHALL ACCOUNT FOR A MINIMUM OF THREE GROUND ELECTRODES THE PRIMARY ELECTRODE AND TWO SUPPLEMENTAL GROUND ELECTRODES IN THEIR BID, AFTER THE THIRD GROUND ELECTRODE IS INSTALLED RETEST FOR DOCUMENTATION IF THE RESISTANCE REMAINS HIGHER THAN 25 OHMS, CONTACT THE ENGINEER TO VERIFY IF ANY ADDITIONAL ACTION IS REQUIRED. ALL READINGS SHALL BE DOCUMENTED AND SUBMITTED TO THE ENGINEER FOR REVIEW.

B. AFTER CORRECTIVE MEASURES ARE COMPLETE FOR A GROUND SYSTEM, THE GROUND SYSTEM INSTALLATION SHALL BE RE-TESTED BY THE TPWD ELECTRICAL INSPECTOR WITH A GROUND ELECTRODE TESTER TO VERIFY THE RESISTANCE OF THE SYSTEM. GROUND ELECTRODE RESISTANCE TEST RESULTS WILL BE DOCUMENTED BY THE TPWD ELECTRICAL INSPECTOR AS PART OF ONE OF THE INSPECTION REPORTS FOR THE PROJECT. THESE TEST RESULTS SHALL INCLUDE GROUND SYSTEM RESISTANCE VALUES AND THE WEATHER AND SOIL CONDITIONS PRESENT DURING THE TESTS.

C. THE CONTRACTOR SHALL ALSO PERFORM VOLTAGE TESTS AFTER ALL ELECTRICAL EQUIPMENT HAS BEEN CONNECTED AND READY TO USE TO ASSURE THAT THE PROPER VOLTAGE IS AVAILABLE AT EACH EXISTING OR NEW LOAD CENTER, BREAKER, AUTOMATIC TRANSFER SWITCH, GENERATOR, OR OTHER ELECTRICAL ITEM.

3.6 ALL ELECTRICAL, OPERATIONAL, AND CONDUCTOR INSULATION TEST SHALL BE WITNESSED BY TPWD CONSTRUCTION PERSONNEL.

A. TEST INSTALLATION AFTER NEW WIRING IS COMPLETED AND WHEN EQUIPMENT IS CONNECTED AND READY FOR USE.

B. RESISTANCE BETWEEN CONDUCTORS AND BETWEEN EACH CONDUCTOR AND GROUND SHALL BE TESTED FOR ALL SERVICE ENTRANCE CONDUCTORS AND BRANCH FEEDER CONDUCTORS FOR ALL CONDUCTORS #6 AND LARGER. CONDUCTORS SHALL PASS A 500 VOLT MEGGER TEST PRIOR TO PLACING IN SERVICE WITH A MINIMUM ACCEPTABLE INSULATION RESISTANCE EQUAL TO OR GREATER THAN 100 MEG OHMS.

TELECOMMUNICATION NOTES

PART 1 - GENERAL

1.1 CODES, STANDARDS AND REFERENCES

A. TIA / EIA-455 SERIES (FIBER OPTIC TEST STANDARDS)
B. TIA/EIA-568-A SERIES (CABLING STANDARD)
C. TIA/EIA-569-A SERIES (PATHWAYS AND SPACES STANDARD)
D. TIA/EIA-606 SERIES (ADMINISTRATION STANDARD)
E. ANSI/TIA/EIA-607 SERIES (GROUNDING AND BONDING)
F. ANSI/TIA/EIA-758 (CUSTOMER OWNED OUTSIDE PLANT (OSP)
G. TIA/EIA BULLETIN TSB67
H. LOCAL AREA NETWORK ETHERNET STANDARD, IEEE 802.3 SERIES
I. THE BICSI TELECOMMUNICATIONS DISTRIBUTION METHODS MANUAL

1.2 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: INSTALLATION CONTRACTORS MUST BE MANUFACTURER TRAINED AND CERTIFIED RESELLERS. THE INSTALLATION CONTRACTOR MUST BE ENGAGED IN THE NORMAL BUSINESS OF INSTALLING TELECOMMUNICATIONS CABLING SYSTEMS AND LICENSED TO OPERATE IN THE STATE OF TEXAS. ALL INSTALLATION TECHNICIANS MUST BE FAMILIAR WITH THE CODES, STANDARDS AND PROCEDURES REQUIRED BY THIS DOCUMENT AND MUST BE TRAINED AND CERTIFIED FOR INSTALLATIONS. THE INSTALLING CONTRACTOR MUST BE A PANDUIT-CERTIFIED INSTALLATION CONTRACTOR.

B. STRUCTURED CABLING SYSTEM WARRANTY AND CERTIFICATION: TPWD REQUIRES A WARRANTY ON THE INSTALLATION OF STRUCTURED CABLING SYSTEM OF AT LEAST ONE YEAR FROM BUILDING ACCEPTANCE. IN ADDITION, TPWD REQUIRES THAT 100% OF THE CABLES AND TERMINATION EQUIPMENT INSTALLED BE TESTED AND CERTIFIED AT THE DESIGNED AND INTENDED PERFORMANCE LEVEL AND THAT SUCH TEST RESULTS BE DELIVERED TO TPWD CONSTRUCTION MANAGER / INSPECTOR PRIOR TO ACCEPTANCE OF THE WORK PERFORMED.

C. CABLE TESTING AND CERTIFICATION: COMPLETE END TO END TEST RESULTS MUST BE SUBMITTED FOR REVIEW AS PART OF THE INSTALLATION INSPECTION. THESE TEST RESULTS MUST BE THE ACTUAL NATIVE MACHINE TEST RESULTS DOWNLOADED FROM THE TEST SET, ONTO CD OR FLASHDRIVE, AND ALSO PROVIDED IN PAPER FORM. TEST RESULTS MUST CONTAIN THE NAMES AND SIGNATURES OF THE TECHNICIANS PERFORMING THE TESTS.

D. ALL SPICES ARE PROHIBITED UNLESS TERMINATION IS REQUIRED AT THE BACKBOARD OR FACEPLATE.

PART 2 - PRODUCTS AND EXECUTION

2.1 UNDERGROUND CONDUIT

A. ALL CONDUIT SHALL BE SCH 40 RIGID NONMETALLIC CONDUIT, PVC AND MUST MEET THE REQUIREMENTS OF NEMA TC 6. ALL CONDUIT SECTIONS SHALL BE GLUED WITH PVC PIPD GLUE TO FORM A WATERTIGHT JOINT.
B. ALL CONDUIT SHALL BE INSTALLED WITH A SLIGHT DRAIN SLOPE (.125" / FT) AWAY FROM BUILDINGS TO PREVENT THE ACCUMULATION OF WATER IN THE CONDUIT OR INGRESS TO THE BUILDINGS.
C. ANSI/TIA/EIA569-A BEND RADIUS REQUIREMENTS SHALL BE USED FOR ALL TELECOMMUNICATIONS CONDUIT. THE BEND RADIUS OF THE SWEEPS MUST BE A MINIMUM OF 10 TIMES THE INTERNAL CONDUIT DIAMETER. BENDING CONDUIT IN THE FIELD USING MANUAL OR MECHANICAL METHODS IS NOT ACCEPTABLE. STANDARD ELECTRICAL ELBOWS SHALL NOT BE USED.
D. ALL CONDUIT SHALL BE PLUGGED WITH WATERTIGHT PLUGS AT BOTH ENDS TO PREVENT THE INTRUSION OF WATER, GASSES AND RODENTS THROUGHOUT THE CONSTRUCTION PROJECT.
E. ALL CONDUITS SHALL HAVE ¼" POLYPROPYLENE PULL ROPES INSTALLED. THE PULL ROPES MUST BE RE-PULLED EACH TIME AN ADDITIONAL CABLE IS INSTALLED.
F. ALL CONDUITS MUST BE TESTED WITH A MANDREL TO PROVE COMPLIANCE WITH THE BEND RADIUS REQUIREMENTS THROUGHOUT THE CONDUIT RUN. WITHIN 5 DAYS OF RELEASING THE CONDUIT FOR THE INSTALLATION OF CABLE, THE CONDUIT INSTALLATION CONTRACTOR SHALL PROVE ALL CONDUITS TO BE CLEAN AND DRY.

2.2 FIBER OPTIC CABLING

A. WHERE THE TOTAL CABLE DISTANCE WILL NOT EXCEED 6,561 FEET, 50/125 MICRON GRADED INDEX MULTIMODE FIBER-OPTIC CABLE WILL BE USED.
B. FIBER-OPTIC CABLES SHALL HAVE A MINIMUM 20 FOOT SERVICE LOOP AT THE TERMINATING ENDS AND ALL APPROVED SPLICE POINTS.
C. ALL STRANDS OF FIBER-OPTIC CABLE MUST BE TERMINATED IN A PATCH PANEL WITH ST TYPE CONNECTORS AND TESTED PER 1.1A.

2.3 HORIZONTAL DISTRIBUTION CABLING

A. HORIZONTAL DISTRIBUTION CABLING AND CABLE BETWEEN THE TWO MODULAR OFFICE BUILDINGS TO BE CAT5E.
B. HORIZONTAL DISTRIBUTION CABLES SHALL BE INSTALLED WITH A SERVICE LOOP AT THE TELECOMMUNICATIONS OUTLET END OF THE CABLE. THE SERVICE LOOP SHALL HAVE AT LEAST 6.5' OF SLACK CABLE. THE SERVICE LOOP SHALL BE LOCATED IN THE MOST EFFICIENT LOCATION FOR FUTURE SERVICE.
C. THE PATCH PANEL WILL HAVE A 110 TYPE PUNCH DOWN ON THE REAR OF THE PANEL AND THE JACKS WILL BE PRE-WIRED TO THE PUNCH DOWN USING THE EIA/TIA 568-A CONFIGURATION STANDARD.
D. ALL HORIZONTAL DISTRIBUTION CABLES TO BE TERMINATED TO AN RJ45 JACK INSTALLED IN TELECOMMUNICATIONS OUTLETS USING THE EIA/TIA 568-A CONFIGURATION STANDARD.

2.4 LABELING

A. EACH PATCH PANEL IN A RACK WILL BE LABELED SEQUENTIALLY WITH A LETTER OF THE ALPHABET, STARTING AT A.
B. EACH PORT IN A PATCH PANEL SHALL BE LABELED SEQUENTIALLY FROM 1, STARTING WITH THE TOP AND LEFT MOST PORT. IF LABELS ARE NOT ALREADY PART OF THE PATCH PANEL, LABELS SHALL BE AFFIXED ABOVE EACH PORT.
C. CABLES SHALL BE LABELED AT EACH END, CLEARLY MARKING THE CONNECTION THE CABLE ESTABLISHES.
D. LABLES APPLIED DIRECTLY TO A CABLE SHALL HAVE A CLEAR VINYL WRAPPING APPLIED OVER THE LABEL AND AROUND THE CABLE TO PERMANENTLY AFFIX THE LABEL.
E. WHERE POSSIBLE, LABELS SHALL BE AFFIXED ABOVE A JACK IN A PATCH PANEL. WHERE IT IS NOT POSSIBLE TO DO SO, PRE-LABELED NUMBERED PATCH PANELS MUST BE USED AND A CROSS-REFERENCE MAP MUST BE PROVIDED SHOWING WHICH CABLES ARE CONNECTED TO WHICH JACKS IN A PATCH PANEL.
F. LABELS SHALL ALWAYS BE ATTACHED TO THE FACEPLATES ON TELECOMMUNICATIONS OUTLETS IN SUCH A FASHION AS TO REDUCE THE CHANCES OF THE LABEL BEING SEPARATED FROM THE FACEPLATE.
G. ALL LABELS SHALL BE MACHINE PRINTED.
H. LABELS FOR TELLECOMMUNICATIONS CABLES SHALL USE THE FOLLOWING FORM: Tcc-pjj WHERE cc IS THE ORIGINATING TELECOMMUNICATIONS CLOSET NUMBER, p IS THE PATCH PANEL IDENTIFIER, AND jj IS THE JACK NUMBER IN THE PATCH PANEL (INCLUDING LEADING ZEROES IF NECESSARY)

Digitally Signed

STATE OF TEXAS
MICHAEL S. GATH
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LICENSED
PROFESSIONAL ENGINEER

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LOST MAPLES STATE PARK
L.E. MODULAR OFFICE BUILDING UTILITIES
PROJECT: MR8555

DATE: 4-11-2019
DESIGNED BY: EEA
DRAWN BY: EEA
REVIEWED BY: EEA
REVISED:

REVISED:

REVISED:

SHEET TITLE
ELECTRICAL SPECIFICATIONS

SHEET NAME
LM-E4.0

DIVISION 22 PLUMBING SPECIFICATIONS

SECTION 22 00 00 - BASIC PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 CODES AND STANDARDS:

CODES AND STANDARDS: ALL PLUMBING WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2015 INTERNATIONAL PLUMBING CODE. THE PROJECT PLUMBING WORK SHALL BE PERFORMED BY A CONTRACTOR LICENSED WITH TDLR TO PERFORM PLUMBING WORK. THE PLUMBING WORK SHALL BE PERFORMED UNDER THE DIRECT, ON-SITE SUPERVISION OF A LICENSED, MASTER PLUMBER. SUBMIT COPIES OF THE LICENSES FOR ALL OF THE PLUMBERS THAT WILL PERFORM THE WORK. SUBMIT THIS INFORMATION AS PART OF THE PROJECT CONSTRUCTION SUBMITTAL INFORMATION.

1.2 MATERIAL SUBMITTALS:

A. SUBMIT UNDER PROVISIONS OF "TERMS AND CONDITIONS" OF THE CONTRACT.

B. MARK ALL SUBMITTAL LITERATURE TO INDICATE THE PRECISE SELECTION OF MATERIALS, DIMENSIONS AND EQUIPMENT SUBMITTED. NOTE THAT IF THE SPECIFIC MODEL OR MATERIAL IS NOT INDICATED IN THE SUBMITTAL, AND THERE IS MORE THAN ONE CHOICE POSSIBLE, THE SUBMITTAL MAY BE REJECTED AND A RESUBMITTAL WILL BE REQUIRED.

C. PROPOSED SUBMITTAL LIST SHALL INCLUDE ALL EQUIPMENT WITH MANUFACTURER OR MODEL NUMBERS CALLED OUT IN THE DRAWINGS. WHERE THE PLANS AND SPECIFICATIONS CALL OUT A MANUFACTURER OR MODEL NUMBER, CONTRACTOR SHALL PROVIDE AND SUBMIT THE EXACT MANUFACTURER AND MODEL NUMBER OR EQUAL PRODUCT PER THE TERMS AND CONDITIONS. REFERENCE THIS SHEET FOR THE REQUIRED SUBMITTALS INDICATED IN THE CONTRACTOR'S PROJECT SUBMITTAL LIST.

1.3 GENERAL MATERIALS AND EQUIPMENT REQUIREMENTS:

A. NOTE THAT NO ASBESTOS-BEARING, SOLVENT BASED (EXCEPT FOR PVC PIPING MATERIALS, AS SPECIFIED), OR LEAD CONTAINING MATERIALS SHALL BE USED ON THIS PROJECT. IF ANY PROHIBITED MATERIALS ARE INSTALLED, ALL OF THE MATERIAL, INCLUDING THE UNDERLYING MATERIAL, SHALL BE REMOVED AND DISPOSED OF AS REQUIRED BY LOCAL, STATE, AND FEDERAL REQUIREMENTS.

B. EXECUTE ALL WORK HEREINAFTER SPECIFIED OR INDICATED ON ACCOMPANYING DRAWINGS. PROVIDE ALL EQUIPMENT NECESSARY AND USUALLY FURNISHED IN CONNECTION WITH SUCH WORK AND SYSTEMS WHETHER OR NOT MENTIONED SPECIFICALLY HEREIN OR ON THE DRAWINGS.

C. FIT THE MATERIAL AND APPARATUS SPECIFIED IN THESE SPECIFICATIONS INTO THE BUILDING AND CAREFULLY LAY OUT THE WORK AT THE SITE TO CONFORM WITH THE STRUCTURAL CONDITIONS, TO AVOID ALL OBSTRUCTIONS, TO CONFORM TO THE DETAILS OF THE INSTALLATION AND THEREBY TO PROVIDE AN INTEGRATED INSTALLATION OPERATING AS A COMPLETE SET OF SYSTEMS.

D. VERIFICATION OF DIMENSIONS: COORDINATE THE PROPER RELATION OF THE WORK TO THE BUILDING STRUCTURE AND TO THE WORK OF ALL TRADES. VISIT THE PREMISES AND BECOME THOROUGHLY FAMILIARIZED WITH ALL DETAILS OF THE WORK AND WORKING CONDITIONS, VERIFY ALL DIMENSIONS IN THE FIELD, AND ADVISE THE DESIGN ENGINEER OF ANY DISCREPANCY BEFORE PERFORMING ANY WORK. ADJUSTMENTS TO THE WORK REQUIRED IN ORDER TO FACILITATE A COORDINATED INSTALLATION SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER OR THE DESIGN ENGINEER.

E. THE PLUMBING AND ASSOCIATED DRAWINGS ARE NECESSARILY DIAGRAMMATIC BY THEIR NATURE, AND ARE NOT INTENDED TO SHOW EVERY CONNECTION IN DETAIL OR EVERY PIPE OR CONDUIT IN ITS EXACT LOCATION. THESE DETAILS ARE SUBJECT TO THE REQUIREMENTS OF STANDARDS REFERENCED ELSEWHERE IN THESE SPECIFICATIONS, AND STRUCTURAL AND ARCHITECTURAL CONDITIONS. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE STRUCTURAL AND FINISH CONDITIONS AND SHALL COORDINATE THE SEPARATE TRADES IN ORDER TO AVOID ANY INTERFERENCE BETWEEN THE VARIOUS PHASES OR TRADES OF WORK. WORK SHALL BE ORGANIZED AND LAID OUT SO THAT IT WILL BE CONCEALED IN FURRED CHASES AND SUSPENDED CEILINGS, ETC., IN FINISHED PORTIONS OF THE BUILDING, UNLESS SPECIFICALLY NOTED TO BE EXPOSED. ALL WORK SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO THE LINES OF THE BUILDING UNLESS NOTED OTHERWISE.

F. WHEN THE DRAWINGS DO NOT GIVE EXACT DETAILS AS TO THE ELEVATION OF PIPE, CONDUIT AND DUCTS, THE CONTRACTOR SHALL PHYSICALLY ARRANGE THE SYSTEMS TO FIT IN THE SPACE AVAILABLE AT THE ELEVATIONS INTENDED WITH PROPER GRADES FOR THE FUNCTIONING OF THE SYSTEM INVOLVED. PIPING, EXPOSED CONDUIT AND THE DUCT SYSTEMS ARE GENERALLY INTENDED TO BE INSTALLED TRUE AND SQUARE TO THE BUILDING CONSTRUCTION, AND LOCATED AS HIGH AS POSSIBLE AGAINST THE STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE DRAWINGS DO NOT SHOW ALL REQUIRED OFFSETS, CONTROL LINES, PILOT LINES AND OTHER LOCATION DETAILS. WORK SHALL BE CONCEALED IN ALL FINISHED AREAS.

G. NAMEPLATES: EACH MAJOR COMPONENT OF EQUIPMENT SHALL HAVE THE MANUFACTURER'S NAME, ADDRESS, AND CATALOG NUMBER ON A PLATE SECURELY ATTACHED TO THE ITEM OF EQUIPMENT. ALL DATA ON NAMEPLATES SHALL BE LEGIBLE AT THE TIME OF FINAL INSPECTION. UNDER NO CIRCUMSTANCES SHALL ANY NAMEPLATE BE PAINTED OVER FOR ANY REASON. IF A NEW OR EXISTING NAMEPLATE IS PAINTED OVER, THE NAMEPLATE SHALL BE RESTORED TO AS NEW CONDITION, OR REPLACED WITH A NEW NAMEPLATE PROVIDED BY THE MANUFACTURER.

H. ALL EQUIPMENT SHALL BE INSTALLED IN A MANNER TO PERMIT ACCESS TO ALL MAINTAINABLE SURFACES. ALL VALVES, MOTORS, DRIVES, FILTERS, AND OTHER ACCESSORY ITEMS SHALL BE INSTALLED IN A POSITION TO ALLOW REMOVAL FOR SERVICE WITHOUT DISASSEMBLY OF ANOTHER PART.

I. ALL EQUIPMENT AND PIPING SHALL BE INSTALLED IN A MANNER TO PROVIDE THE GREATEST AMOUNT OF CLEARANCE FOR ACCESS AND MAINTENANCE OF SYSTEMS AND EQUIPMENT. INSTALLATION OF PIPING AND EQUIPMENT WHICH BLOCKS PERSONNEL ACCESS TO ALL PARTS OF CHASES OR MECHANICAL SPACES IS PROHIBITED.

1.4 PROTECTIONS:

A. THE CONTRACTOR SHALL AT ALL TIMES TAKE SUCH PRECAUTIONS AS MAY BE NECESSARY TO PROPERLY PROTECT ALL MATERIALS AND EQUIPMENT FROM DAMAGE FROM THE TIME OF DELIVERY UNTIL THE COMPLETION OF THE WORK. THIS SHALL INCLUDE THE ERECTION OF ALL REQUIRED TEMPORARY SHELTERS AND SUPPORTS TO ADEQUATELY PROTECT ANY ITEMS STORED IN THE OPEN ON THE SITE FROM THE WEATHER, THE GROUND AND SURROUNDING WORK; THE CRIBBING OF ANY ITEMS ABOVE THE FLOOR OF THE CONSTRUCTION; AND THE COVERING OF ITEMS IN THE INCOMPLETE BUILDING WITH TARPAULINS OR OTHER PROTECTIVE COVERING; THE INSTALLATION OF ELECTRIC HEATERS IN ELECTRICAL SWITCHGEAR AND SIMILAR EQUIPMENT TO PREVENT MOISTURE DAMAGE. FAILURE ON THE PART OF THE CONTRACTOR TO COMPLY WITH THE ABOVE WILL BE SUFFICIENT CAUSE FOR THE REJECTION OF THE ITEMS IN QUESTION.

B. TAKE PARTICULAR CARE NOT TO DAMAGE THE BUILDING STRUCTURE OR EXISTING UTILITIES IN PERFORMING WORK. ALL FINISHED FLOORS AND FINISHED SURFACES SHALL BE COVERED TO PREVENT ANY DAMAGE BY WORKERS OR THEIR TOOLS AND EQUIPMENT DURING THE CONSTRUCTION OF THE BUILDING.

PART 2 - PRODUCTS

2.1 REFERENCE SHEET P0.0 PLUMBING GENERAL NOTES AND SHEET P2.0 PLUMBING SCHEDULES AND DETAILS FOR PLUMBING PRODUCTS:

PART 3 - EXECUTION

3.1 INSTALLATION METHODS:

A. SUPPORT: ALL PIPING SHALL BE ADEQUATELY AND PROPERLY SUPPORTED FROM THE BUILDING STRUCTURE BY MEANS OF HANGER RODS OR CLAMPS FASTENED TO THE BUILDING STRUCTURE AS HEREIN SPECIFIED. SUFFICIENT SUPPORT SHALL BE PROVIDED AND INSTALLED TO RESTRAIN THE MOVEMENT OF EQUIPMENT, PIPING, DUCTWORK AND CONDUITS FROM LATERAL MOVEMENT DURING OPERATION.

B. ALL PIPE, CONDUITS, ETC., SHALL BE CUT ACCURATELY TO MEASUREMENTS ESTABLISHED FROM THE ACTUAL BUILDING CONDITIONS AND SHALL BE WORKED INTO PLACE WITHOUT SPRINGING OR FORCING. ALL DUCTS, PIPES AND CONDUITS RUN EXPOSED IN MACHINERY AND EQUIPMENT ROOMS SHALL BE INSTALLED PARALLEL TO THE BUILDING LINES, EXCEPT THAT PIPING SHALL BE SLOPED TO OBTAIN THE PROPER PITCH. PIPING, DUCTS AND CONDUITS RUN IN FURRED CEILINGS, ETC., SHALL BE SIMILARLY INSTALLED, UNLESS NOTED OTHERWISE. CONDUITS IN FURRED CEILINGS AND IN OTHER CONCEALED SPACES SHALL BE NEATLY GROUPED AND RACKED. ALL CONDUIT AND PIPE OPENINGS SHALL BE MAINTAINED IN A SEALED CONDITION UNTIL THE SYSTEMS ARE CLOSED WITH FINAL CONNECTIONS.

C. ALL SANITARY WASTE LINES SHALL RUN STRAIGHT AND TRUE AND BE PROPERLY SUPPORTED WITH BED OF SAND TO PROVIDE A UNIFORM PITCH IN SLOPE WITHOUT ANY DIPS OR BACK-PITCHED LOCATIONS.

DIVISION 31 EARTHWORK SPECIFICATIONS

SECTION 31 20 00 - EARTH MOVING

PART 1 - GENERAL

1.1 HISTORICAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES:

A. CONTRACTOR MAY ENCOUNTER HISTORICAL, ARCHEOLOGICAL, OR CULTURAL RESOURCES WITHIN THE WORK AREA.

B. RESOURCES INCLUDE BUT NOT LIMITED TO ANY HUMAN SKELETAL REMAINS OR BURIAL, ARTIFACTS, SHELL, MIDDEN, BONE, CHARCOAL, OR OTHER DEPOSITS, PAVING, WALL OR OTHER CONSTRUCTED FEATURE AND ANY INDICATION OF AGRICULTURAL OR OTHER HUMAN ACTIVITIES.

C. TPWD STAFF WILL CLOSELY MONITOR ALL TRENCHING AND HORIZONTAL DIRECTIONAL DRILLING DURING EXCAVATION. CONTRACTOR SHALL INFORM TPWD PERSONNEL OF HIS SCHEDULE AT LEAST SEVEN DAYS PRIOR TO INITIATION OF THE WORK TO ALLOW FOR SCHEDULING OF PERSONNEL TO OVERSEE THE WORK.

D. NO WORK SHALL COMMENCE UNTIL TPWD STAFF IS ON SITE TO OBSERVE THE EXCAVATION WORK. CONTRACTOR SHALL ADHERE TO ANY INSTRUCTIONS OR DIRECTIONS AS GIVEN BY TPWD REPRESENTATIVE.

E. IF DURING THE COURSE OF CONSTRUCTIONS ACTIVITIES, ANY RESOURCES ARE DISCOVERED, ALL ACTIVITIES THAT MAY DAMAGE OR ALTER SUCH RESOURCES SHALL BE TEMPORARILY SUSPENDED AND THE CONTRACTOR SHALL NOTIFY THE OWNER DESIGNATED REPRESENTATIVE AND SITE STAFF IMMEDIATELY. THE CONTRACTOR SHALL NOT RESUME ACTIVITIES IN THE IMMEDIATE AREA UNTIL OTHERWISE DIRECTED BY THE OWNER DESIGNATED REPRESENTATIVE.

Project Submittal Register

EEA CONSULTING ENGINEERS

EEA Project Manager: Scott Barron
EEA Project Number: 20184023A

Pre-Construction			
Spec Section #	**Spec Section Description**	**Submittal Description**	**Item**
-	Pipes and Tubes for Plumbing Equipment	Product Data	Galvanized steel pipe and fittings, Sch. 80 PVC pipe and fittings, Sch. 40 DWV pipe and fittings, copper pipe and fittings
-	Pipe Insulation and Jacket	Product Data	Piping insulation and jacketing
-	General Duty Valves for Plumbing Piping	Product Data	Valves and valve boxes
-	Misc. Plumbing	Product Data	Recycled plastic bollard, hose bib, corrosion protection tape, detectable caution tape, casings, and end seals, pipe supports, effluent pump

GENERAL PLUMBING NOTES

1. NOTE THAT CONSTRUCTION DRAWINGS ARE DIAGRAMMATIC BY THEIR NATURE, AND ARE NOT INTENDED TO SHOW EVERY CONNECTION IN DETAIL OR EVERY PIPE OR CONDUIT IN ITS EXACT LOCATION. FEATURES AND COMPONENTS NOT SHOWN ARE SUBJECT TO THE REQUIREMENTS OF STANDARDS REFERENCED ELSEWHERE IN THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL COORDINATE THE VARIOUS TRADES IN ORDER TO AVOID INTERFERENCE BETWEEN THE VARIOUS SEGMENTS OF THE PROJECT. CONTRACTOR SHALL COORDINATE THE FINAL ACTUAL LOCATIONS IN THE FIELD WITH THE TEXAS PARKS AND WILDLIFE OWNER REPRESENTATIVE. THE FINAL LOCATION OF THE TRAILER AND ALL DIMENSIONS ARE APPROXIMATE. NO ADDITIONAL COMPENSATION WILL BE GIVEN OR CONSIDERED FOR REASONABLE CHANGES IN THE FINAL LOCATIONS.
2. ALL WORK SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO THE BUILDING LINES UNLESS NOTED OTHERWISE.
3. ALL DOMESTIC WATERLINES ON SITE FROM THE SOURCE TO THE BUILDINGS SHALL BE PVC SCHEDULE 80 ASTM D1785 PRESSURE SOLVENT WELDED PIPE.
4. COPPER SWEAT CONNECTIONS SHALL BE USED IN THE ASSEMBLY OF COPPER PIPING. USE ONLY SILVER OR ANTIMONY SOLDER, LEAD SOLDER IS PROHIBITED.
5. USE DIELECTRIC UNIONS AT ALL CONNECTIONS BETWEEN COPPER AND GALVANIZED, IRON, OR STEEL PIPING.
6. ALL WATER PIPING SHALL SLOPE A MINIMUM OF 1/8" PER FOOT (1%) TO DRAIN TO POST MOUNTED HOSE BIBBS TO ALLOW FOR WINTERIZATION.
7. ALL WASTE PIPING SHALL BE PVC SCHEDULE 40 ASTM D2665 WITH INJECTION MOLDED DRAIN WASTE VENT FITTINGS ASTM D2665.
8. ALL HORIZONTAL WASTE AND VENT PIPING SHALL SLOPE NOT LESS THAN 1/4" PER FOOT (2%), TOWARD THE DIRECTION OF WASTE FLOW FOR ALL PIPE SIZES 2-1/2" AND SMALLER.
9. ALL HORIZONTAL WASTE AND VENT PIPING SHALL SLOPE NOT LESS THAN OF 1/8" PER FOOT (1%), TOWARD THE DIRECTION OF WASTE FLOW FOR ALL PIPE SIZES 3" AND LARGER.
10. PROVIDE INSULATION FOR ALL ABOVE GRADE COLD WATER PIPING AND SANITARY WASTE WATER LINES. INSULATION SHALL START BELOW GRADE. INSULATE ALL EXPOSED WATER PIPING WITH BLACK FLEXIBLE CLOSED-CELL ELASTOMERIC THERMAL INSULATION IN TUBULAR FORM AND PRE-FORMED FITTINGS WITH SELF-SEAL SYSTEM REINFORCED WITH LAP SEAL TAPE AP ARMAFLEX BLACK LAP SEAL MANUFACTURED BY ARMAFLEX OR EQUAL. DOUBLE WRAP ALL PIPE INSULATION WITH 2" ROLLS OF ALUMINUM PIPE INSULATION TAPE, MANUFACTURED BY K-FLEX USA. MODEL# 800-TAPE-AL-2-GB-100 OR EQUAL.
11. PROVIDE A DETECTIBLE CAUTION TAPE FOR THE LENGTH OF THE TRENCH. CAUTION TAP SHALL BE MANUFACTURED BY PRO-LINE'S DETECTABLE MARKING TAPE CONSISTS OF A MINIMUM 5.0 MIL OVERALL THICKNESS. CONSTRUCTION IS 0.8 MIL CLEAR VIRGIN POLYPROPYLENE FILM, REVERSE PRINTED AND LAMINATED TO A 0.35 SOLID ALUMINUM FOIL CORE AND THEN LAMINATED TO A 3.75 MIL CLEAR VIRGIN POLYETHYLENE FILM. TAPE SHALL BE PRINTED WITH APWA GREEN FOR SEWER AND BLUE FOR WATER, PATENTED "DIAGONALLY STRIPED" DESIGN WITH BIG, BOLD, BLACK LETTERING TO IDENTIFY THE BURIED SEWER AND WATER LINE.
12. SUPPORT ALL SUSPENDED ABOVE GRADE PIPING UNDER MODULAR BUILDING ON 4 FOOT CENTERS. USE CHANNEL STRUT AND BRACES/TRAPEZES MADE OF GALVANIZED CHANNEL STRUT OR GALVANIZED ADJUSTABLE CLEVIS HANGERS AND PER MANUFACTURER RECOMMENDATIONS.
13. ALL SANITARY DRAINAGE, VENT PIPING, FUEL PIPING, HOT AND COLD WATER SHALL BE PRESSURE TESTED BY THE CONTRACTOR AT WHICH TIME THE OWNER'S REPRESENTATIVE SHALL WITNESS THE PRESSURE TEST. REFERENCE INTERNATIONAL PLUMBING CODE-2015 FOR PRESSURE TESTING REQUIREMENTS.
14. PERFORM THE FOLLOWING ADJUSTMENTS BEFORE OPERATION:

14.1. CLOSE DRAIN VALVES HYDRANTS AND HOSE BIBBS.
14.2. OPEN SHUTOFF VALVES TO FULLY OPEN POSITION.
14.3. ADJUST BALANCING VALVES IN HOT WATER CIRCULATION RETURN PIPING
14.4. REMOVE PLUGS USED DURING TESTING OF PIPING AND FOR TEMPORARY SEALING OF PIPING.
14.5. REMOVE AND CLEAN STRAINER SCREENS.
14.6. CLOSE DRAIN VALVES AND REPLACE DRAIN PLUGS.

15. CLEAN AND DISINFECT POTABLE DOMESTIC WATER PIPING AS FOLLOWS:

15.1. PURGE NEW PIPING AND PARTS BEFORE USING.
15.2. USE PURGING AND DISINFECTING PROCEDURES PER AWWA C651 OR AWWA C562.
15.3. PREPARE AND SUBMIT REPORTS OF PURGING AND DISINFECTING ACTIVITIES TO OWNER.

PLUMBING SYMBOLS

BALL VALVE IN VALVE BOX	
CLEANOUT	CO
CONNECTION POINT	
ELBOW, TURN-UP	
ELBOW, TURN-DOWN	
HOSE BIBB	HB

PIPING TYPE

DOMESTIC COLD WATER	CW
WASTE WATER	WW

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LOST MAPLES STATE PARK
L.E. MODULAR OFFICE BUILDING UTILITIES
PROJECT: MR8555

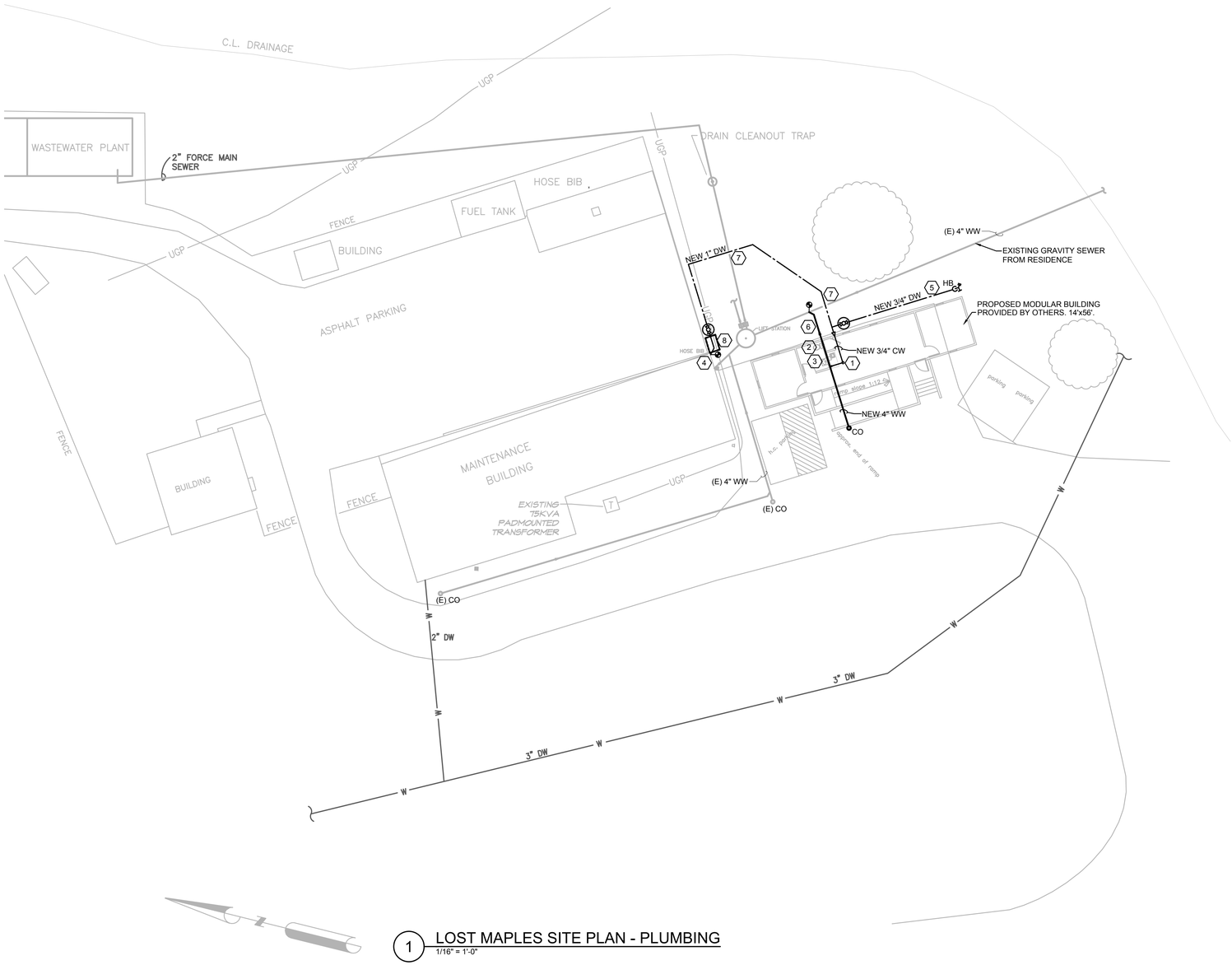
DATE: 4-11-2019
DESIGNED BY: EEA
DRAWN BY: EEA
REVIEWED BY: EEA
REVISED:

REVISED:

REVISED:

SHEET TITLE
PLUMBING GENERAL NOTES & SYMBOLS

SHEET NAME
LM-P0.0



1 LOST MAPLES SITE PLAN - PLUMBING
1/16" = 1'-0"

GENERAL PLUMBING NOTES

1. REFER TO SHEET P0.0 FOR GENERAL PLUMBING NOTES AND SPECIFICATIONS. REFER TO SHEET P2.0 FOR DETAILS.
2. ALL LOCATIONS SHOWN ON DRAWINGS ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS PRIOR TO BID.
3. GROUND IN THIS AREA IS SOLID LIMESTONE IN MANY PLACES REMOVAL OF ROCK IS TO BE ANTICIPATED FOR MOST PIPE TRENCHING.
4. IF THE MODULAR BUILDING IS ALREADY SET IN PLACE THE CONTRACTOR SHALL SUPPORT AND SUSPEND ALL PIPING PROVIDED UNDER THE BUILDING ON 4 FOOT CENTERS. USE CHANNEL STRUT AND BRACES/TRAPEZES MADE OF GALVANIZED CHANNEL STRUT SUPPORTED OF THE STEEL FRAME AND WOOD FLOOR JOIST OR PROVIDE GALVANIZED STEEL SPLIT RING HANGERS WITH ALL THREAD GALVANIZED STEEL TOP PLATE, SIDE BEAM AND ALL THREAD JOIST BEAM HANGERS. INSTALL PER INDUSTRY STANDARDS PER MANUFACTURER RECOMMENDATIONS. USE CAUTION NOT TO TEAR OR RIP THE MODULAR BUILDING PLASTIC VAPOR BARRIER SYSTEM PROVIDED ON THE BOTTOM SIDE OF THE MODULAR BUILDING.
5. CONTRACTOR SHALL REMOVE EXISTING MODULAR BUILDING SKIRTING AND UNDERPINNING AS REQUIRED TO MAKE THE NECESSARY CONNECTIONS. THE CONTRACTOR SHALL REINSTALL ALL REMOVED SKIRTING AND UNDERPINNING. IF THE CONTRACTOR CAUSE ANY DAMAGE TO THE EXISTING MODULAR BUILDING INCLUDING BUT NOT LIMITED TO THE FINISHES, THE CONTRACTOR SHALL BE REQUIRED TO FIX OR REPLACE THE DAMAGED ITEMS.
6. CLEAN UP OF ASPHALT AREA SHALL BE REQUIRED AFTER TRENCHING. REPAIR AREA TO MATCH EXISTING.

PLUMBING SITE PLAN KEYED NOTES - (X)

1. EXTEND INSULATED WATERLINE FROM BELOW GRADE. TRANSITION FROM PVC SCHEDULE 80 ASTM D1785 SCHEDULE 80 PVC PRESSURE SOLVENT WELDED PIPE TO HARD DRAWN COPPER TYPE "L" TO CONNECT TO THE MODULAR BUILDING 3/4" WATER INLET STUBBED THRU THE MODULAR BUILDING FLOOR. SUPPORT INSULATED WATER LINE WITH CHANNEL STRUT SPANNED FROM MODULAR BUILDING STEEL STRUCTURAL FRAME. SEE GENERAL NOTES FOR INSULATION REQUIREMENTS.
2. PROVIDE A 4"X4"X3" DWV PVC REDUCING WYE AND 1/8 BEND ON ITS BACK IN MAIN 4" LINE. EXTEND AND CONNECT THE 3" SANITARY DRAIN TO THE MODULAR BUILDING 3" WASTE LINE DROPPING DOWN THROUGH MODULAR BUILDING FLOOR. COORDINATE FINAL LOCATION WITH ACTUAL FINAL FIELD CONDITIONS. SEE GENERAL NOTES FOR INSULATION REQUIREMENTS.
3. PROVIDE A 4"X4"X2" DWV PVC REDUCING WYE AND 1/8 BEND ON ITS BACK IN MAIN 4" LINE. EXTEND AND REDUCE THE 2" SANITARY DRAIN TO CONNECT TO THE MODULAR BUILDING 1-1/2" WASTE LINE DROPPING DOWN THROUGH MODULAR BUILDING FLOOR. COORDINATE FINAL LOCATION WITH ACTUAL FINAL FIELD CONDITIONS. SEE GENERAL NOTES FOR INSULATION REQUIREMENTS.
4. PROVIDE A NEW 1" WATER LINE CONNECTION TO EXISTING 1-1/2" WATER LINE BELOW GRADE . PROVIDE A NEW 1" VALVE BOX AND 1" BALL VALVE. EXTEND NEW WATER LINE UNDERGROUND UP TO THE MODULAR BUILDING. RISE UP THROUGH SLAB AND EXTEND TO EXISTING BUILDING WATER LINE CONNECTION POINT WHERE THE WATER LINE DROPS DOWN THRU THE MODULAR BUILDING FLOOR, TRANSITION IN SIZE AND PIPE MATERIAL AS NECESSARY TO REMAKE THE CONNECTION. SEE GENERAL NOTES FOR INSULATION REQUIREMENTS. SECURE NEW PIPING TO MODULAR BUILDING FRAME.
5. PROVIDE A NEW WATER RISER WITH HOSE BIBB EXTEND A NEW 3/4" WATER LINE AND VALVE BOX WITH A 3/4" BALL VALVE. SEE SHEET P2.0/DETAILS 1 & 4.
6. ROUTE NEW 4" SANITARY AS INDICATED TO CONNECT TO EXISTING SANITARY AS INDICATED.
7. SANITARY SEWER/POTABLE WATER CROSSING. ROUTE 1" DW LINE AWAY FROM LIFT STATION TO MAXIMIZE AVAILABLE CLEARANCE BETWEEN POTABLE WATER LINE AND PUMPED SANITARY SEWER LINE. SLEEVE POTABLE WATER LINE AT CROSSING. REFER TO DETAIL 2/P2.0.
8. DEMOLISH EXISTING CONCRETE RAMP FOR INSTALLATION OF NEW WATER PIPING. PROVIDE NEW PRECAST CONCRETE RAMP TO MATCH EXISING DIMENSIONS AND SLOPE AFTER COMPLETION OF NEW PIPING.

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SHEET TITLE
PLUMBING PLAN

SHEET NAME
LM-P1.0

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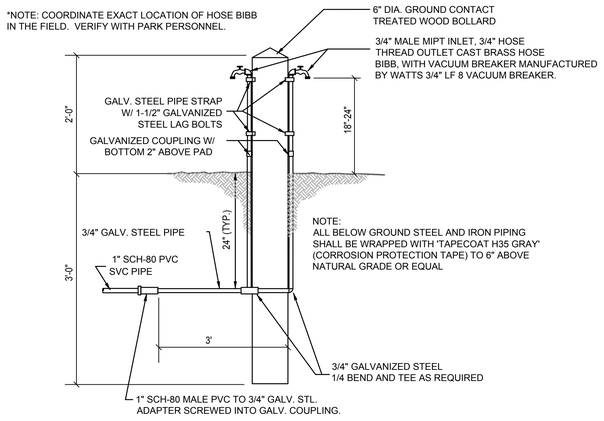
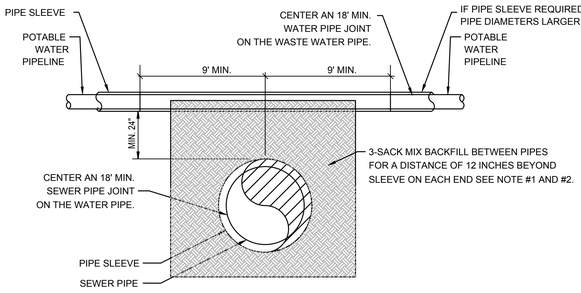


1 WATER RISER WITH HOSE BIBBS
SCALE: NOT TO SCALE

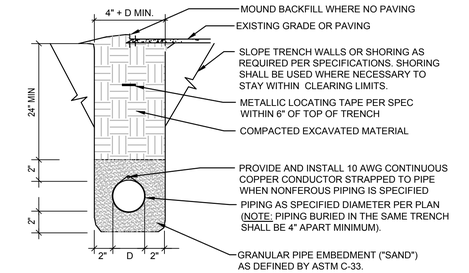
NOTE:

1. WHERE A WATER LINE CROSSES A SEWER. THE WATER LINE SHALL BE INSTALLED ABOVE THE SEWER LINE WITH A MINIMUM OF 24" SEPARATION VERTICAL DISTANCE. CENTER THE WASTEWATER AND WATER PIPE AT THE PIPE CROSSING. THE WATER AND WASTEWATER PIPE SHALL BE PERPENDICUALR AT EACH CROSSING. THE WASTEWATER PIPE SHALL BE EMBEDDD IN 3-SACK MIX CEMENT STABLILIZED SAND MIXTURE. THE CEMENT BEDDING SHALL EXTEND 12 INCHES BEYOND THE END OF THE PIPE JOINTS WITH 6 INCHES ABOVE AND 4 INCHES BELOW THE WASTEWATER PIPE. THE INSTALLATION SHALL COMPLY WITH THE TEXAS ADMINISTRATION CODE CHAPTER 290.44 AND PER IPC-2015 SECTION 603 AND ASSOCIATED TABLES AND REQUIRED DIMENSIONS SHOWN BELOW, THE STRICTER CODE REQUIREMENT SHALL PREVAIL. NO SLEEVE IS REQUIRED IF THE 24" VERTICAL SEPARATION IS MAINTAINED.

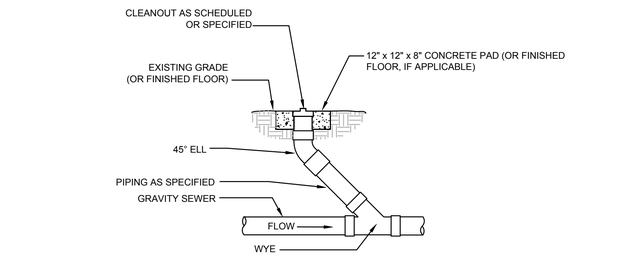
2. IF THE 24" VERTICAL SEPARATION IS NOT OBTAINABLE BETWEEN THE WASTWATER AND WATER LINE ENCASE THE WATER AND WASTE WATER LINE. CENTER THE SLEEVES ON THE CROSSING. THE SLEEVES SHALL BE AT LEAST TWO NOMINAL PIPE DIAMETERS LARGER THAN THE CARRIER PIPE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED SPACERS WITH A MINIMUM OF 5 FEET SEPARATEION BETWEEN EACH SPACER. SEAL THE ENDS OF EACH SLEEVE WITH WATER TIGHT NON-SHRINK CEMENT GROUT. THE WASTEWATER PIPE SHALL BE EMBEDDD IN 3-SACK MIX CEMENT STABLILIZED SAND MIXTURE. THE CEMENT BEDDING SHALL EXTEND 12 INCHES BEYOND THE END OF THE PIPE JOINTS WITH 6 INCHES ABOVE THE WATER PIPE SLEEVE AND 4 INCHES BELOW THE WASTEWATER SLEEVE PIPE. FILL EACH SLEEVE SHALL BE FILLED WITH WASHED SAND IN ACCORDANCE TO TEXAS ADMINISTRATION CODE CHAPTER 290.44



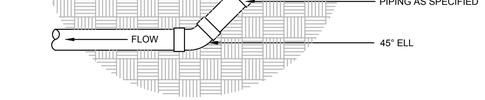
2 TYPICAL POTABLE PIPE CROSSING
SCALE: NOT TO SCALE



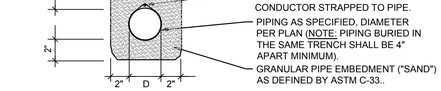
3 WATER PIPING TRENCH
SCALE: NOT TO SCALE



4 VALVE BOX & BALL VALVE IN SOIL
SCALE: NOT TO SCALE



5 END OF LINE CLEAN OUT
SCALE: NOT TO SCALE



6 SEWER PIPING TRENCH
SCALE: NOT TO SCALE

7 ONE WAY CLEAN OUT
SCALE: NOT TO SCALE

PLUMBING FIXTURE SCHEDULE

EQUIPMENT CONNECTIONS LISTED BELOW:					MANUFACTURER MODEL# WITH DESCRIPTION
SYMBOL	COLD	HOT	WASTE	VENT	
HB	3/4"	N/A	N/A	N/A	ARROWHEAD MODEL#302, 3/4" MALE MIPT INLET, ¾" HOSE THREAD OUTLET CAST BRASS HOSE BIBB, WITH VACUUM BREAKER MANUFACTURED BY WATTS ¾" LF 8 VACUUM BREAKER. INSTALL 18" A.F.F.
CO	N/A	N/A	4"	N/A	NIBCO MODEL#C4816HD4 4" PVC DRAIN WASTE VENT SPIGOT ADAPTER WITH PVC CLEANOUT PLUG. PROVIDE 3" THICK CAST IN PLACE CONCRETE PAD 12" X 12" DIMENSION.

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LM-P2.0

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