Meramec State Park Water And Wastewater Improvements Sullivan, Missouri

CM Archer Group, P.C. dba:



OWNER & CONTINUING **AUTHORITY:**

STATE OF MISSOURI MICHAEL L. PARSON,

GOVERNOR

Corporate Authority: CM Archer Group, P.C.: E: 2003023612-D, LS: 2004017577-D, A-2016017179 310 East 6th Street; Rolla, Missouri 65401 ■ Phone: 573-364-6362 Fax: 573-364-4782 ■ www.archer-elgin.com

DIVISION OF STATE PARKS

MISSOURI DEPARTMENT OF NATURAL RESOURCES

PROJECT

OFFICE OF ADMINISTRATION

DIVISION OF FACILITIES MANAGEMENT, MANAGEMENT:

DESIGN AND CONSTRUCTION

PROJECT NUMBER:

DESIGNER:

X2306-03

SITE NUMBER: FACILITY NUMBER: 5214

7815214051 7815214072

Archer-Elgin

SHEET INDEX:

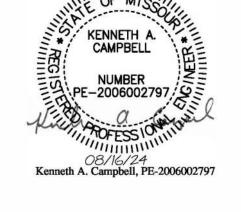
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54 - ME-504 GENERAL ELECTRICAL DETAILS

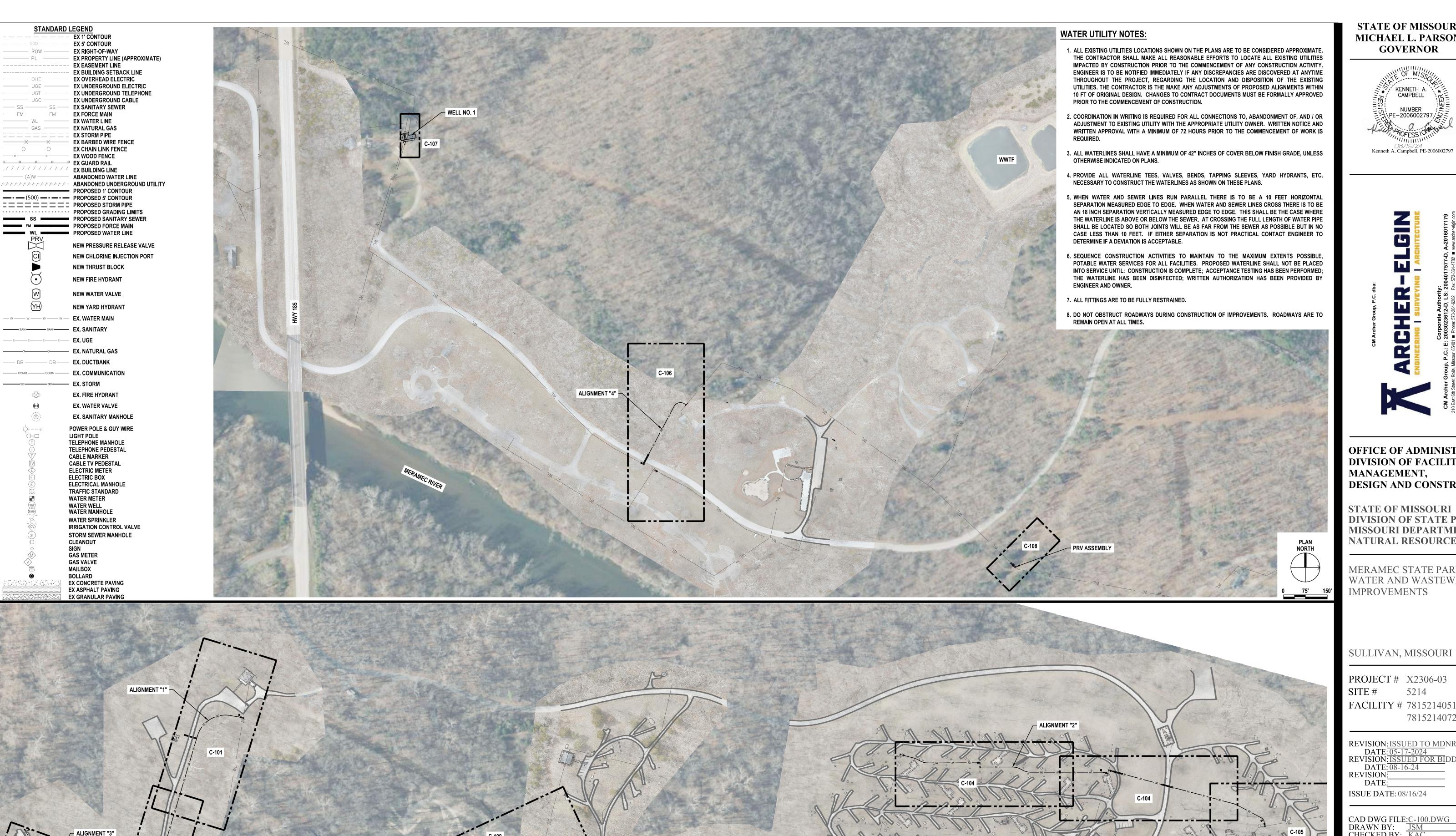
55 - ME-505 GENERAL ELECTRICAL DETAILS

56 - ME-506 CHEMICAL FEED PUMP DETAILS



SHEET NUMBER:

G-0011 OF 56 SHEETS AUGUST 16, 2024



MERAMEC RIVER

ALIGNMENT "1"

STATE OF MISSOURI MICHAEL L. PARSON, **GOVERNOR**



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MISSOURI

PROJECT # X2306-03 5214

FACILITY # 7815214051 7815214072

REVISION: ISSUED TO MDNR
DATE: 05-17-2024
REVISION: ISSUED FOR BIDDING
DATE: 08-16-24

ISSUE DATE: 08/16/24

CAD DWG FILE:C-100.DW DRAWN BY: JSM
CHECKED BY: KAC
DESIGNED BY: KAC

SHEET TITLE:

OVERALL PLAN AND KEY SHEET-WATER

SHEET NUMBER:

	GENERAL ABBREV	<u>IATIONS</u>	
ABI	ALTERNATE BID ITEM	HDPE	HIGH DENSITY POLYETHYLENE PIPE
ACI	AMERICAN CONCRETE INSTITUTE	IBC	INTERNATIONAL BUILDING CODE
AASHTO	AMERICAN SOCIETY OF STATE HIGHWAY &	JB	JUNCTION BOX
	TRANSPORTATION OFFICIALS	LF	LINEAR FEET
ADA	AMERICANS WITH DISABILITIES ACT	LS	LIFT STATION
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	MAX	MAXIMUM
ALT	ALTERNATE	MIN	MINIMUM
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS	MISC	MISCELLANEOUS
Al	AREA INLET	MEP	MECHANICAL ELECTRICAL PLUMBING
BOC	BACK OF CURB	ML	MATCH LINE
BM	BENCHMARK	MH	MANHOLE
BLDG	BUILDING	MUTCD	MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
CI	CURB INLET	MODOT	MISSOURI DEPARTMENT OF TRANSPORTATION
CIP	CAST IN PLACE	NTS	NOT TO SCALE
CL	CENTERLINE	N/A	NOT APPLICABLE
CMP	CORRUGATED METAL PIPE	NIC	NOT IN CONTRACT
CMU	CONCRETE MASONRY UNIT	PH	PHASE
CO	CLEANOUT	PSF	POUNDS PER SQUARE FOOT
COL	COLUMN	PSI	POUNDS PER SQUARE INCH
CONC	CONCRETE	PVC	POUNDS PER SQUARE INCH POLYVINYL CHLORIDE PIPE
CONT	CONTINUOUS		
DIA	DIAMETER	REQ'D	REQUIRED
DWG	DRAWING	R	RADIUS
DIP	DUCTILE IRON PIPE	ROW	RIGHT-OF-WAY
DS	DOWNSPOUT	RCP SAN	REINFORCED CONCRETE PIPE SANITARY
EA	EACH	SCH	SCHEDULE
EJ	EXPANSION JOINT	SHT	SHEET
EL	ELEVATION	STA	STATION
ELEC	ELECTRIC OR ELECTRICAL	TCC	TOP CONCRETE CURB
EQ	EQUAL	TYP	TYPICAL
EX	EXISTING	TBM	TEMPORARY BENCHMARK
EXP	EXPOSED	TOC	TOP OF CURB
EXPAN	EXPANSION	TOF	TOP OF FOOTING
EXT	EXTERIOR	TOW	TOP OF WALL
EW	EACH WAY	TYP	TYPICAL
EP	EDGE OF PAVEMENT		
FFE	FINISHED FLOOR ELEVATION	VCP	VITRIFIED CLAY PIPE
FDC	FIRE DEPARTMENT CONNECTION	WWF	WELDED WIRE FABRIC
FES	FLARED END SECTION		
FG	FINISHED GRADE		
FH	FIRE HYDRANT		
FL	FLOW LINE		

FENCE

FORCE MAIN

GRATED INLET

FEET

STANDARD	LEGEND	
POWER POLE & GUY WIRE LIGHT POLE AREA LIGHT FLOOD LIGHT TELEPHONE MANHOLE TELEPHONE PEDESTAL CABLE MARKER CABLE TV PEDESTAL ELECTRIC METER ELECTRIC BOX ELECTRICAL MANHOLE TRAFFIC CONTROL BOX TRAFFIC STANDARD WATER METER WATER WELL WATER MANHOLE WATER SPRINKLER IRRIGATION CONTROL VALVE STORM SEWER MANHOLE CLEANOUT SIGN GAS DRIP GAS METER GAS VALVE MAILBOX BOLLARD PARKING METER EX CONCRETE PAVING EX ASPHALT PAVING EX GRANULAR PAVING	ROW — PL — OHE — UGE — UGT — UGC — SS — SS — FM — FM — STM — GAS — — — (500) — — — — SS — FM — WL — (500) — — — — SS — FM — WL — CH-P-P-P-P-P-P-P-P-P-P-P-P-P-P-P-P-P-P-P	EX RIGHT-OF-WAY EX PROPERTY LINE (APPROXIMATE) EX EASEMENT LINE EX BUILDING SETBACK LINE EX OVERHEAD ELECTRIC EX UNDERGROUND ELECTRIC EX UNDERGROUND TELEPHONE EX UNDERGROUND CABLE EX SANITARY SEWER EX FORCE MAIN EX WATER LINE EX CHILLED WATER LINE EX STEAM LINE EX NATURAL GAS EX STORM PIPE EX BARBED WIRE FENCE EX WOOD FENCE EX WOOD FENCE EX GUARD RAIL EX BUILDING LINE ABANDONED WATER LINE ABANDONED UNDERGROUND UTILITY PROPOSED 1' CONTOUR PROPOSED 5' CONTOUR PROPOSED STORM PIPE PROPOSED SANITARY SEWER PROPOSED WATER LINE NEW THRUST BLOCK NEW FIRE HYDRANT NEW WATER VALVE EX. WATER MAIN EX. SANITARY EX. UGE EX. NATURAL GAS
	SDSD	EX. STORM

EX. FIRE HYDRANT

EX. WATER VALVE

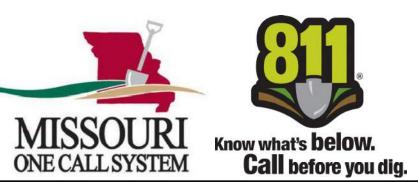
EX. SANITARY MANHOLE

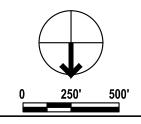
SEWER UTILITY NOTES:

- 1. ALL EXISTING UTILITIES LOCATIONS SHOWN ARE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL MAKE ALL REASONABLE EFFORTS TO LOCATE ALL EXISTING UTILITIES IMPACTED BY CONSTRUCTION PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY. ENGINEER IS TO BE NOTIFIED IMMEDIATELY IF ANY DISCREPANCIES REGARDING THE LOCATION AND DISPOSITION OF THE EXISTING UTILITIES DISCOVERED AT ANY TIME THROUGHOUT THE PROJECT. CONTRACTOR SHALL MAKE ANY ADJUSTMENTS OF THE PROPOSED ALIGNMENT WITHIN 10 FT OF ORIGINAL DESIGN. CHANGES TO CONTRACT DOCUMENTS MUST BE FORMALLY APPROVED BY THE OWNER PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- 2. ALL TRENCHES UNDER PAVED AREAS SHALL BE BACKFILLED WITH GRANULAR MATERIAL AND COMPACTED TO MEET COMPACTION REQUIREMENTS FOR THE PARKING LOT. GRANULAR MATERIAL SHALL BE PLACED AND COMPACTED TO A LEVEL EQUAL TO THE TRENCH DEPTH AT THE TIME OF THE UTILITY INSTALLATION.
- 3. ALL UTILITIES LOCATED ON THE MERAMEC STATE PARK SITE ARE OWNED AND OPERATED BY THE STATE OF MISSOURI - MISSOIURI STATE PARK. COORDINATE ALL CONNECTIONS TO EXISTING UTILITIES AND / OR ABANDONMENT OF EXISTING UTILITIES WITH THE APPROPRIATE UTILITY COMPANY. A MINIMUM OF 72 HOURS PRIOR TO THE COMMENCEMENT OF WORK.
- 4. ALL FORCE MAIN UTILITIES SHALL HAVE A MINIMUM OF 42" INCHES OF COVER BELOW FINISH GRADE, UNLESS OTHERWISE INDICATED ON PLANS.
- 5. PROVIDE ALL FITTINGS (TEES, BENDS, ETC), VALVES, BENDS, AIR VALVES, METERS, ETC. NECESSARY TO CONSTRUCT THE FORCE MAIN AS SHOWN ON THESE PLANS. THRUST BLOCKING SHALL BE PROVIDED AT ALL BURRIED BEND AND TEE FITTINGS.
- 6. COORDINATE ADJUSTMENTS TO EXISTING UTILITIES WITH APPROPRIATE UTILITY COMPANY AS WORK
- 7. ALL WATERLINE AND SANITARY SEWER CROSSINGS SHALL HAVE A MINIMUM 18 INCH VERTICAL SEPARATION AND 10 FEET HORIZONTAL SEPARATION. THE CONTRACTOR SHALL NOTE THAT THE DEPTHS OF EXISTING UTILITIES HAVE BEEN PLOTTED FROM INFORMATION PROVIDED BY VARIOUS UTILITY COMPANIES AND IS TO BE CONSIDERED APPROXIMATE. IF THE MINIMUM SEPARATIONS CANNOT BE CONSTRUCTED AS SHOWN, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND APPROPRIATE MODIFICATIONS WILL BE ISSUED.
- 8. VERIFY LOCATIONS OF ALL EXISTING UTILITIES TO BE CROSSED AND IDENTIFY POTENTIAL CONFLICTS PRIOR TO STARTING CONSTRUCTION.
- 9. SEQUENCE CONSTRUCTION ACTIVITIES TO MAINTAIN TO THE MAXIMUM EXTENTS POSSIBLE, SANITARY SEWER SERVICE FOR THE MERAMEC STATE PARK FACILITIES. PROPOSED FORCE MAIN SHALL NOT BE PLACED INTO SERVICE UNTIL: CONSTRUCTION IS COMPLETE; ACCEPTANCE TESTING HAS BEEN PERFORMED; WRITTEN AUTHORIZATION HAS BEEN PROVIDED BY ENGINEER AND OWNER.

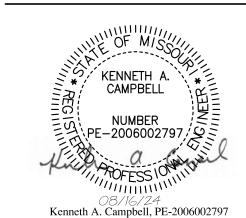








STATE OF MISSOURI MICHAEL L. PARSON, **GOVERNOR**



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OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MO

PROJECT # X2306-03 SITE# 5214 FACILITY # 7815214051

7815214072

REVISION: <u>DNR SUBMITT</u>AL DATE: 6-21-24 REVISION: <u>ISSUED FOR BI</u>DDING DATE: 08-16-24 **REVISION:**

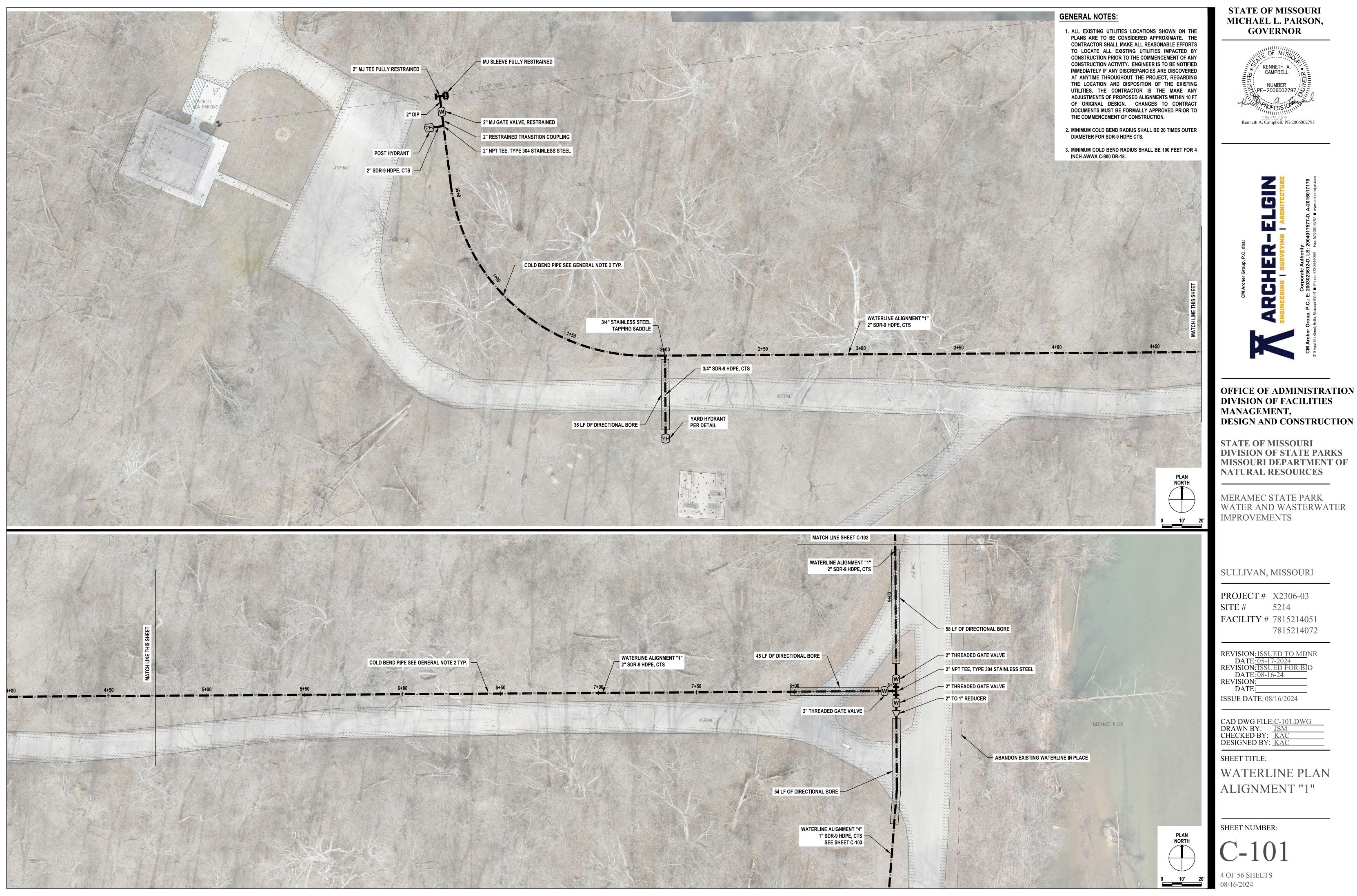
ISSUE DATE: 08/16/2024

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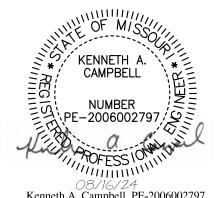
OVERALL PLAN AND KEY SHEET WASTEWATER

SHEET NUMBER:





MICHAEL L. PARSON,





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES **DESIGN AND CONSTRUCTION**

STATE OF MISSOURI **DIVISION OF STATE PARKS** MISSOURI DEPARTMENT OF

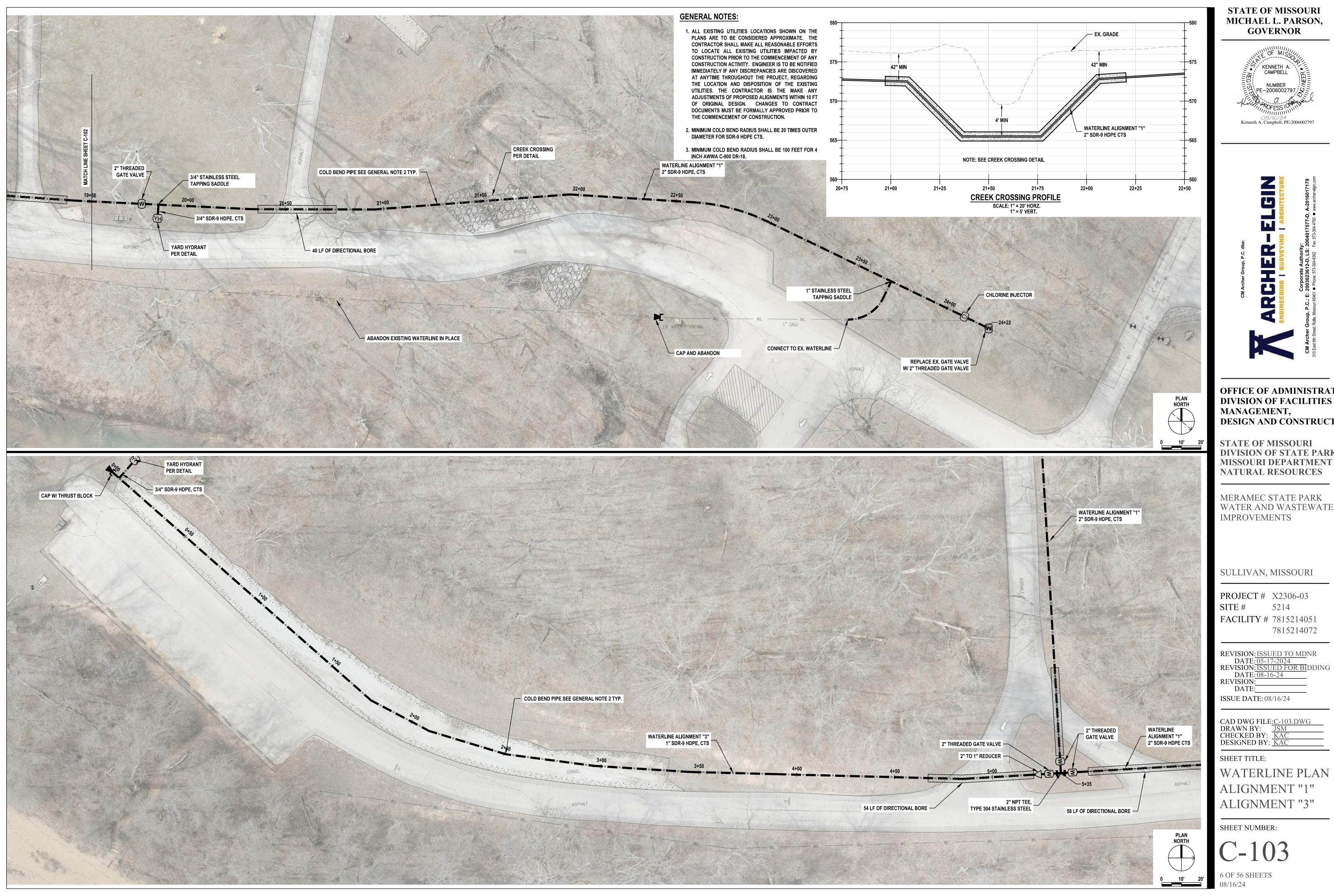
MERAMEC STATE PARK WATER AND WASTEWATER

7815214072

REVISION: ISSUED TO MDNR
DATE: 05-17-2024
REVISION: ISSUED FOR BIDDING
DATE: 08-16-24

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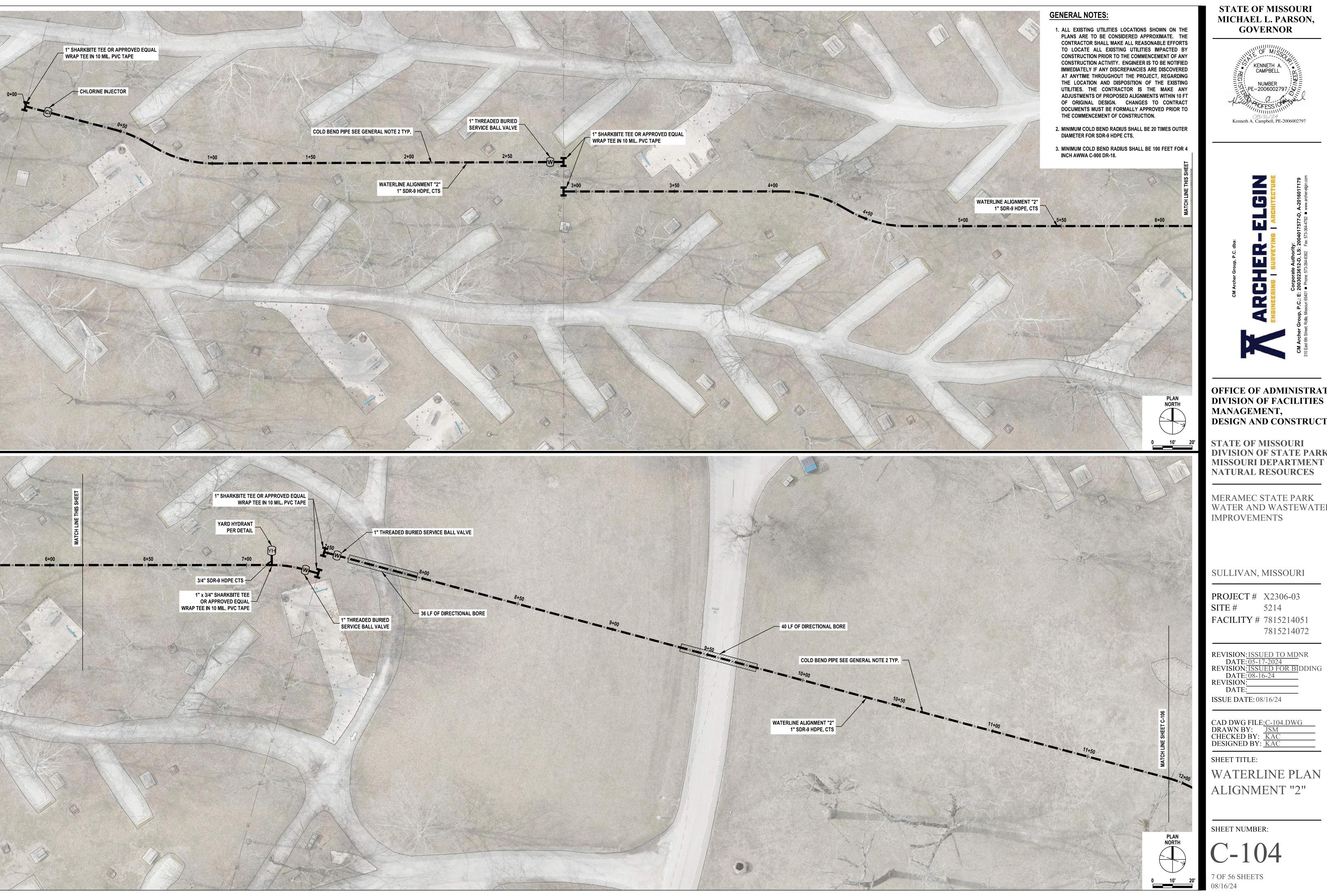
WATERLINE PLAN

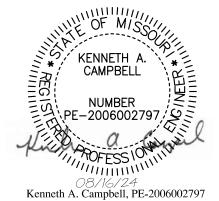


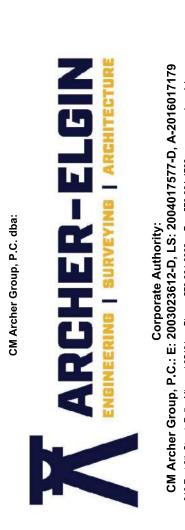
OFFICE OF ADMINISTRATION DIVISION OF FACILITIES **DESIGN AND CONSTRUCTION**

DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF

WATER AND WASTEWATER







OFFICE OF ADMINISTRATION DIVISION OF FACILITIES **DESIGN AND CONSTRUCTION**

STATE OF MISSOURI **DIVISION OF STATE PARKS** MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER

SULLIVAN, MISSOURI

PROJECT # X2306-03 5214

FACILITY # 7815214051

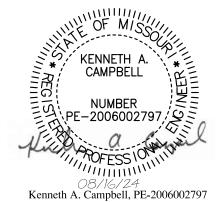
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WATERLINE PLAN ALIGNMENT "2"



GENERAL NOTES:

1. ALL EXISTING UTILITIES LOCATIONS SHOWN ON THE PLANS ARE TO BE CONSIDERED APPROXIMATE. THE



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK
WATERLINE IMPROVEMENTS

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FACILITY # 7815214051 7815214072

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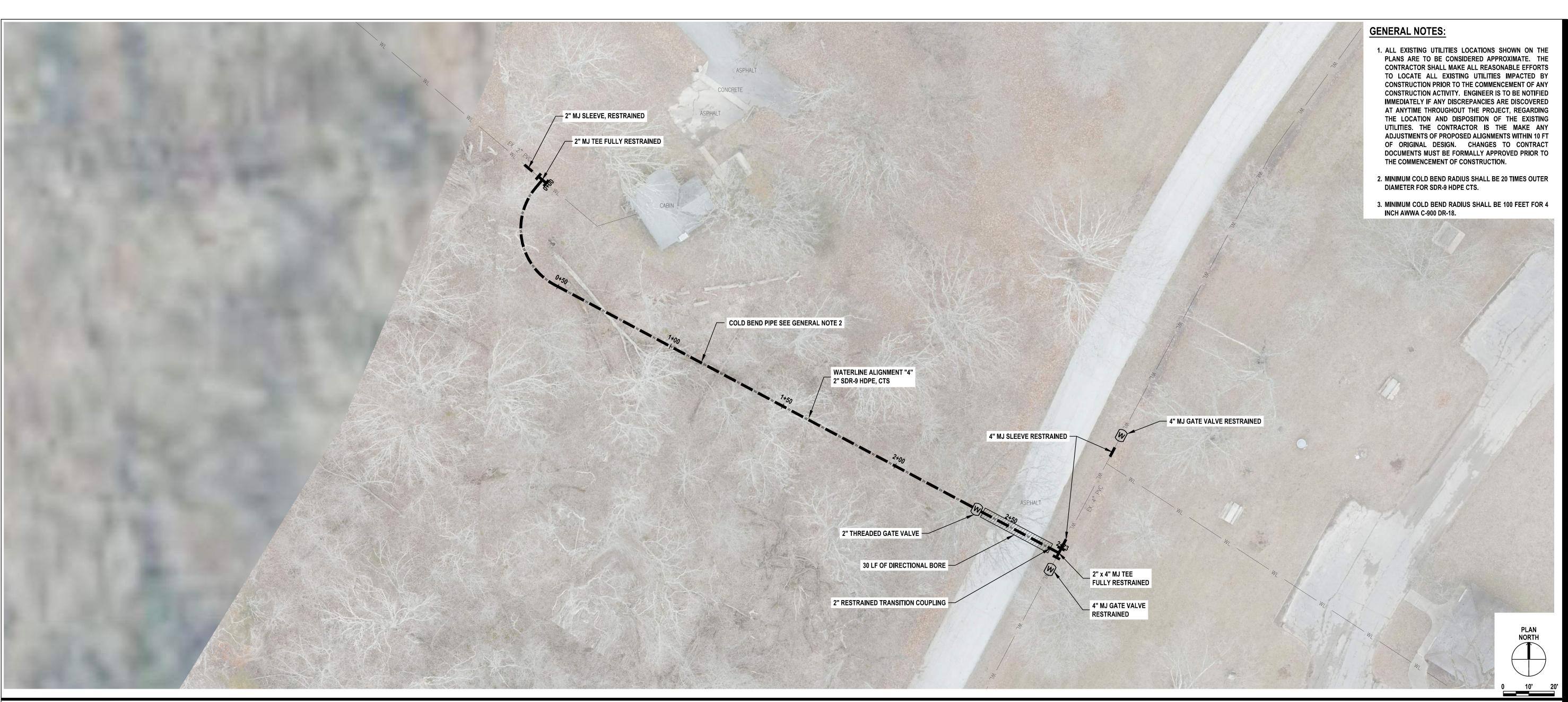
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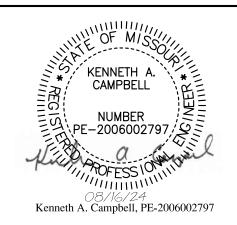
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DRAWN BY: JSM
CHECKED BY: KAC
DESIGNED BY: KAC

SHEET TITLE:

WATERLINE PLAN ALIGNMENT "2" AND

SHEET NUMBER:







OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MISSOURI

PROJECT # X2306-03 SITE # 5214

FACILITY # 7815214051

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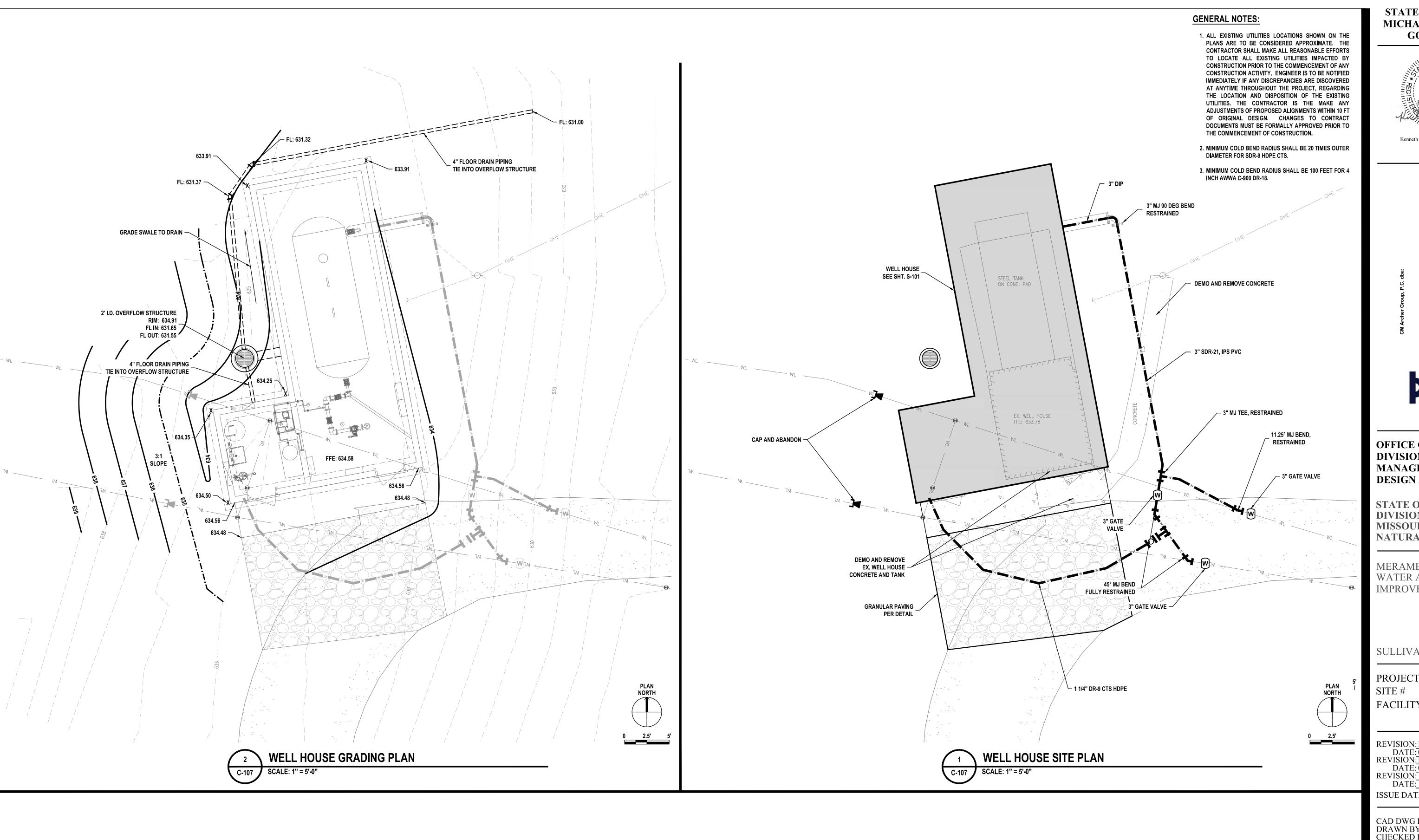
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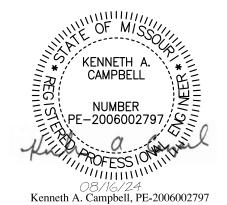
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DRAWN BY: JSM
CHECKED BY: KAC
DESIGNED BY: KAC

SHEET TITLE:

WATERLINE PLAN **ALIGNMENT "4"**

SHEET NUMBER:





ARCHER

OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTERWATER **IMPROVEMENTS**

SULLIVAN, MISSOURI

PROJECT # X2306-03 5214

FACILITY # 7815214051 7815214072

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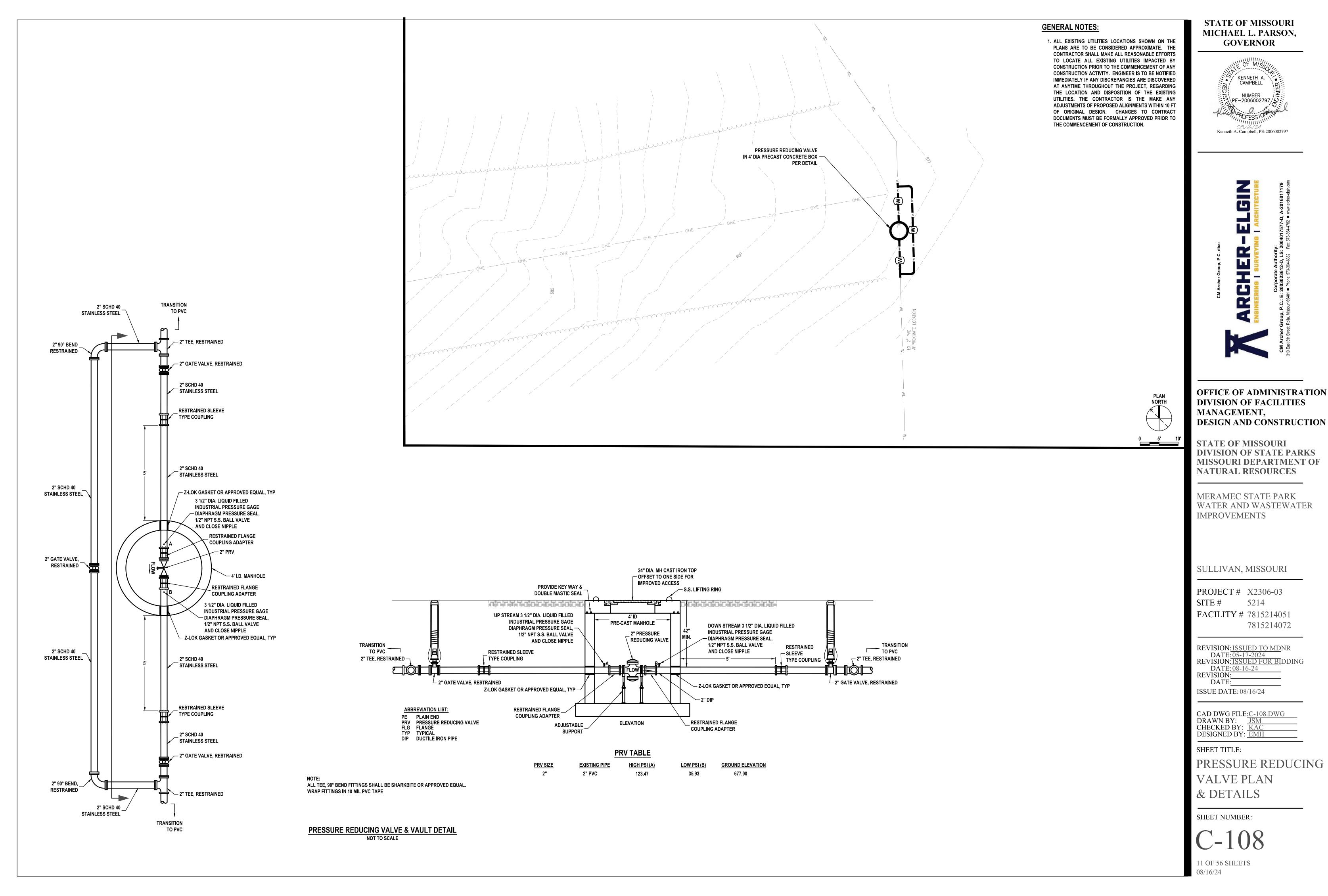
ISSUE DATE: 08/16/24

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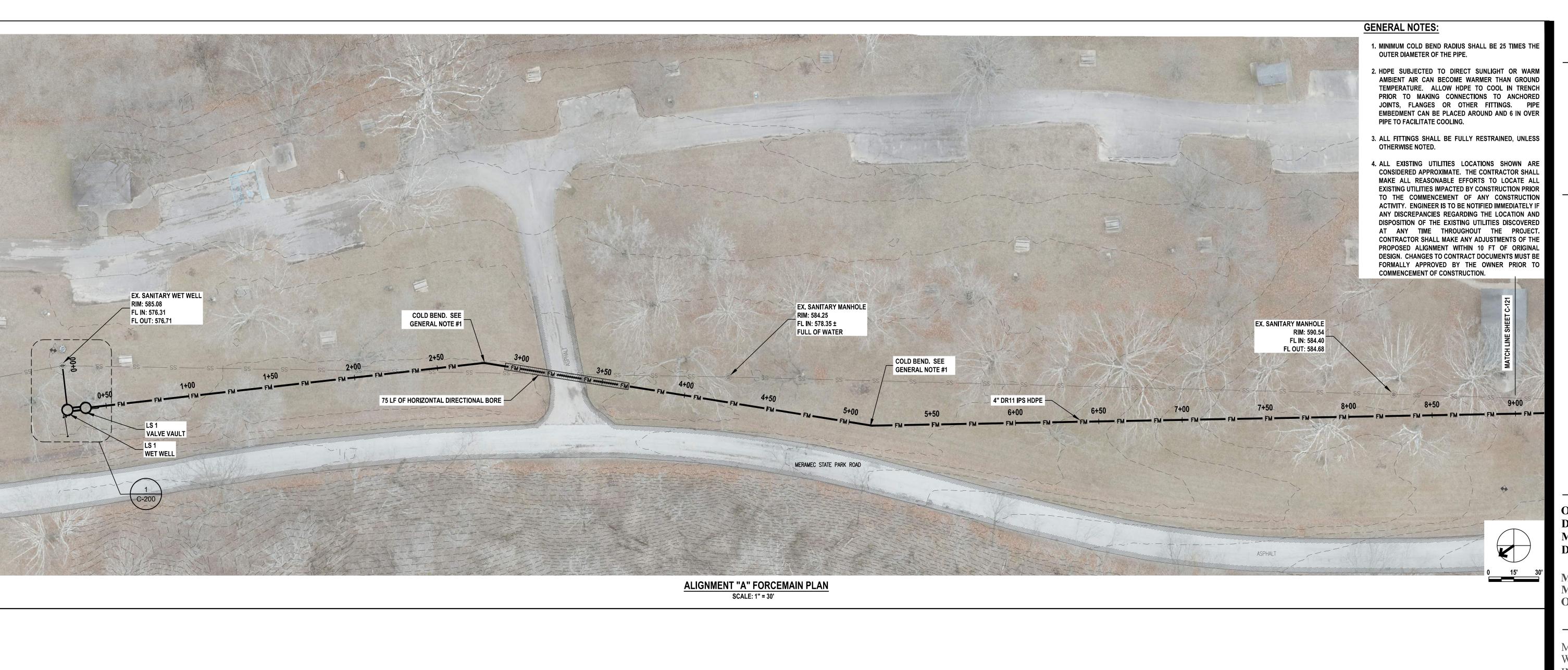
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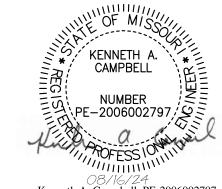
WELLHOUSE SITE PLAN GRADING PLAN

SHEET NUMBER:



OFFICE OF ADMINISTRATION





Kenneth A. Campbell, PE-2006002797



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MO

PROJECT # X2306-03 5214

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REVISION: DNR SUBMITTAL DATE: 6-21-24 **REVISION:**

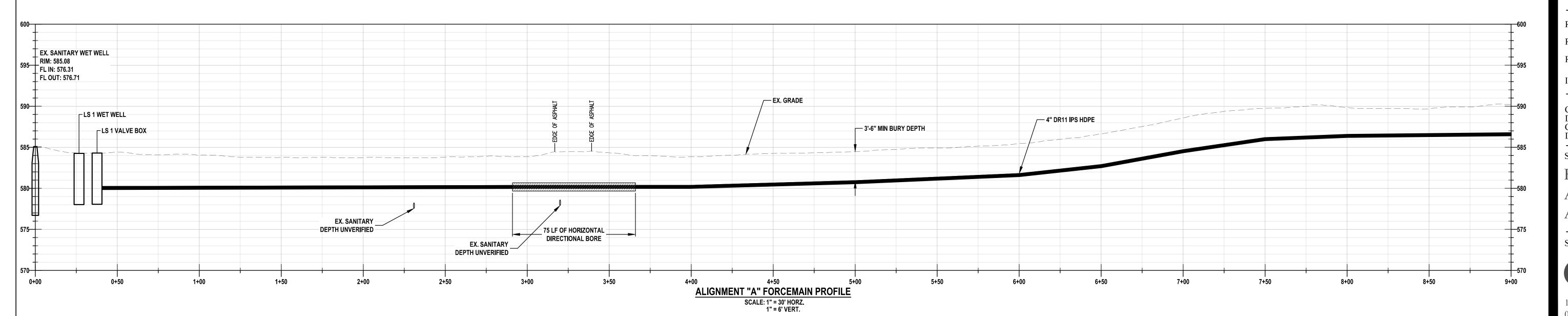
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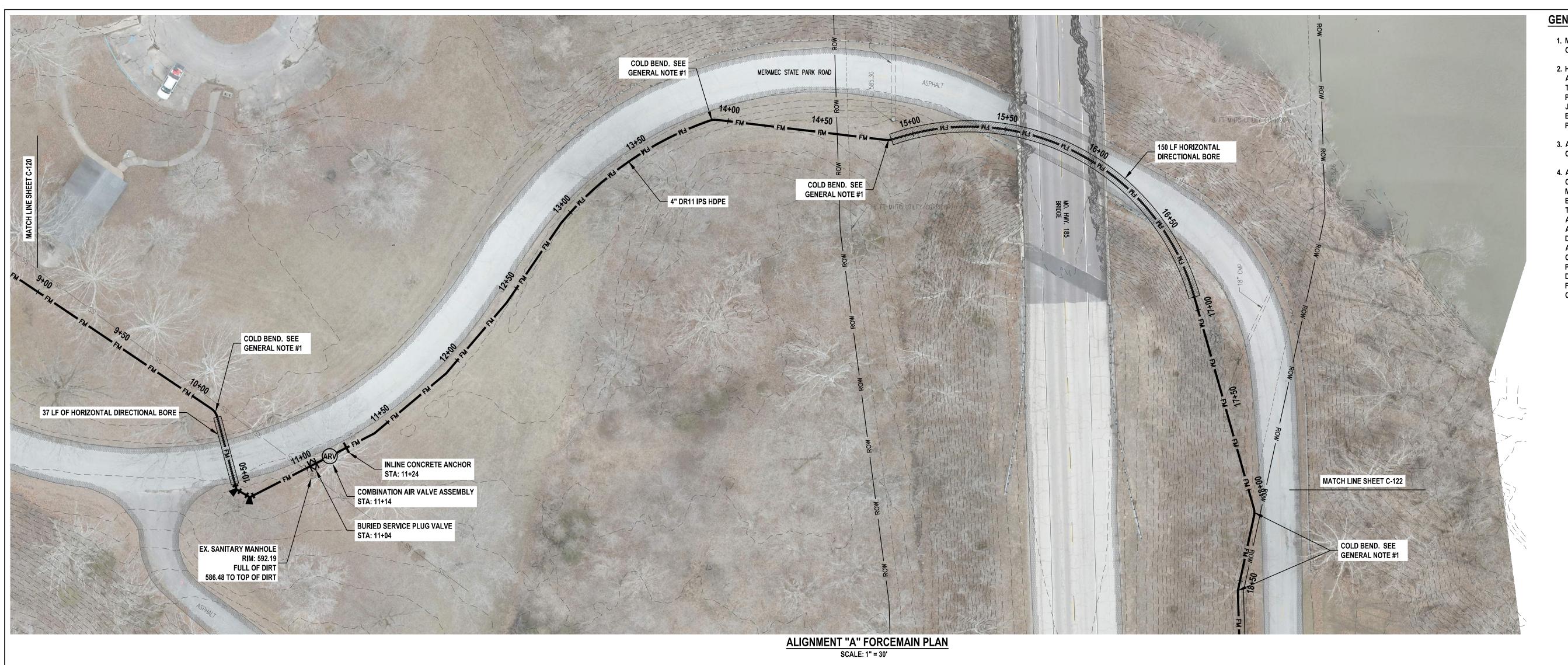
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FOREMAIN PLAN AND PROFILE **ALIGNMENT "A"**

SHEET NUMBER:

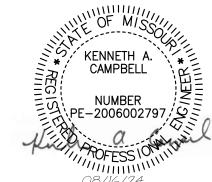




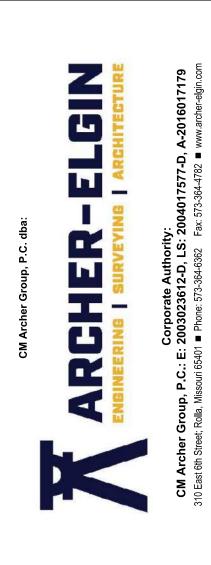
GENERAL NOTES:

- 1. MINIMUM COLD BEND RADIUS SHALL BE 25 TIMES THE OUTER DIAMETER OF THE PIPE.
- 2. HDPE SUBJECTED TO DIRECT SUNLIGHT OR WARM AMBIENT AIR CAN BECOME WARMER THAN GROUND TEMPERATURE. ALLOW HDPE TO COOL IN TRENCH PRIOR TO MAKING CONNECTIONS TO ANCHORED JOINTS, FLANGES OR OTHER FITTINGS. PIPE EMBEDMENT CAN BE PLACED AROUND AND 6 IN OVER PIPE TO FACILITATE COOLING.
- 3. ALL FITTINGS SHALL BE FULLY RESTRAINED, UNLESS OTHERWISE NOTED.
- 4. ALL EXISTING UTILITIES LOCATIONS SHOWN ARE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL MAKE ALL REASONABLE EFFORTS TO LOCATE ALL EXISTING UTILITIES IMPACTED BY CONSTRUCTION PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY. ENGINEER IS TO BE NOTIFIED IMMEDIATELY IF ANY DISCREPANCIES REGARDING THE LOCATION AND DISPOSITION OF THE EXISTING UTILITIES DISCOVERED AT ANY TIME THROUGHOUT THE PROJECT. CONTRACTOR SHALL MAKE ANY ADJUSTMENTS OF THE PROPOSED ALIGNMENT WITHIN 10 FT OF ORIGINAL DESIGN. CHANGES TO CONTRACT DOCUMENTS MUST BE FORMALLY APPROVED BY THE OWNER PRIOR TO COMMENCEMENT OF CONSTRUCTION.

STATE OF MISSOURI MICHAEL L. PARSON, GOVERNOR



Kenneth A. Campbell, PE-2006002797



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

SULLIVAN, MO

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FACILITY # 7815214051 7815214072

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DATE: 6-21-24
REVISION: ISSUED FOR BIDDING
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REVISION:
DATE:
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CAD DWG FILE:C-121
DRAWN BY: JSM
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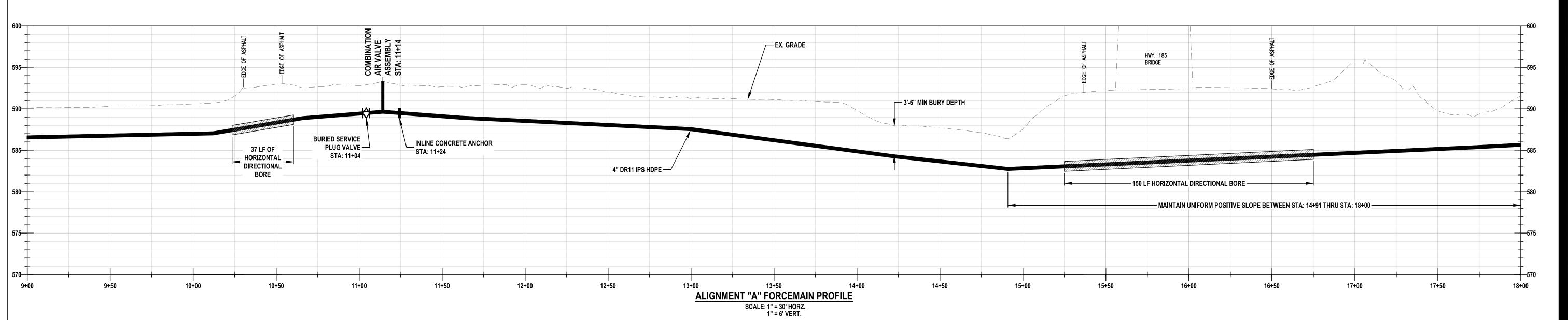
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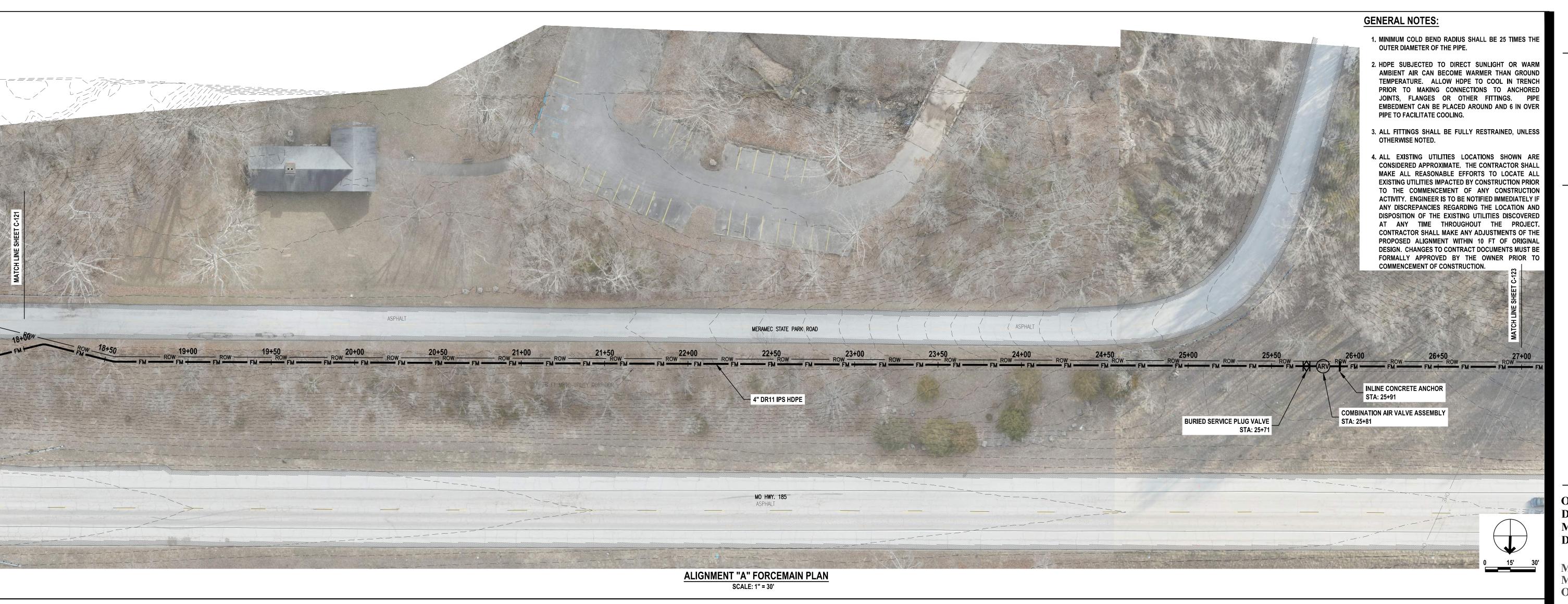
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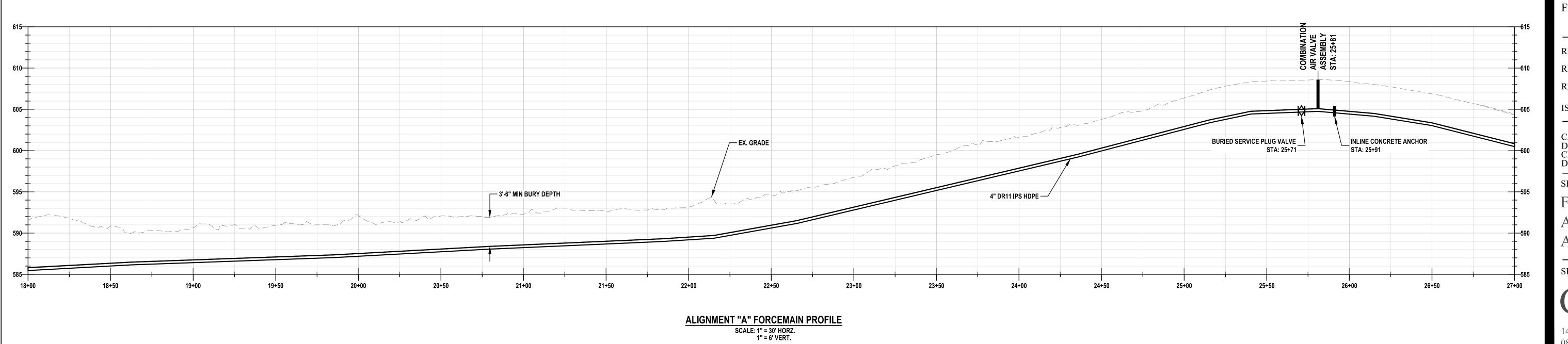
FORCEMAIN PLAN
AND PROFILE
ALIGNMENT "A"

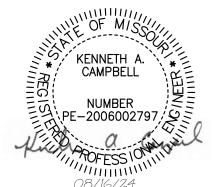
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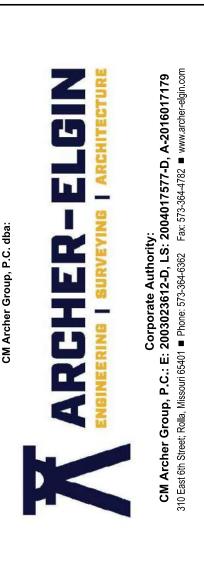








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OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

SULLIVAN, MO

PROJECT # X2306-03 SITE # 5214 FACILITY # 7815214051

REVISION: DNR SUBMITTAL
DATE: 6-21-24
REVISION: ISSUED FOR BIDDING
DATE: 08-16-24
REVISION:

7815214072

REVISION: DATE: ISSUE DATE: 08/16/24

CAD DWG FII F:C-122

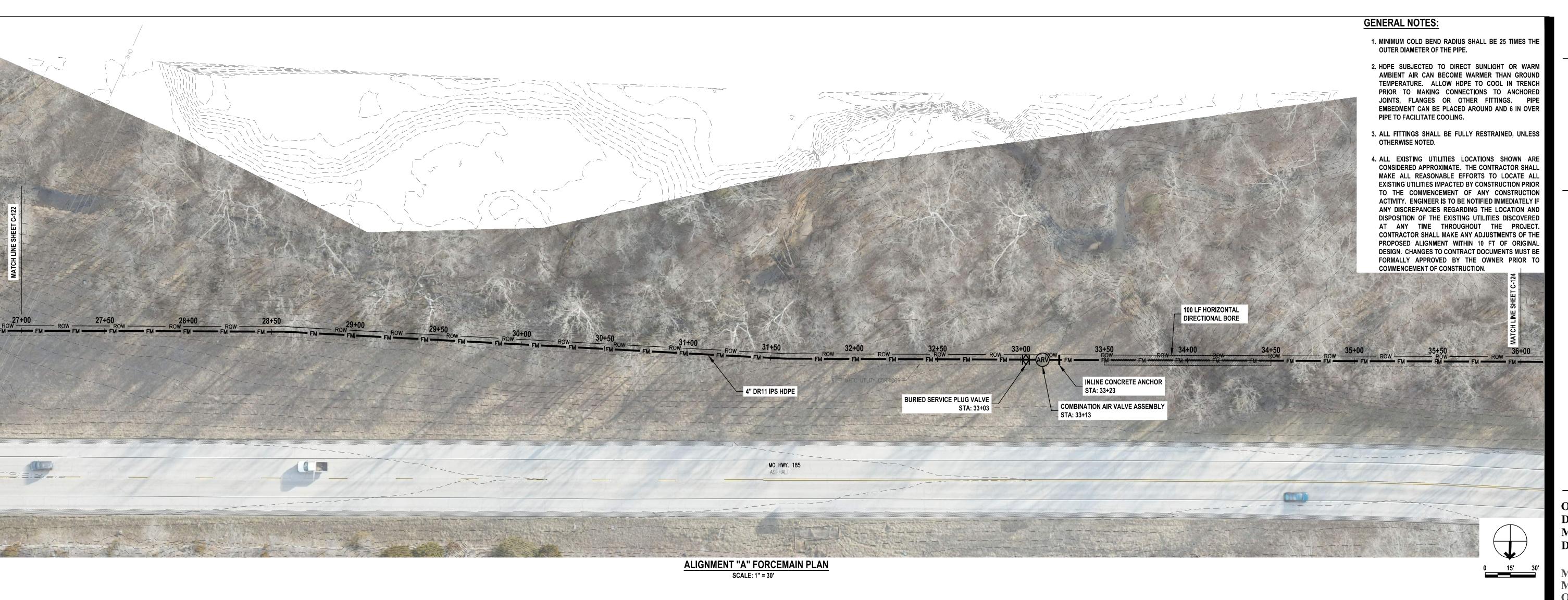
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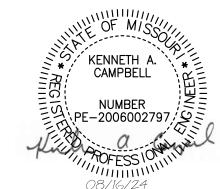
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FORCEMAIN PLAN
AND PROFILE
ALIGNMENT "A"

SHEET NUMBER:

C-122





Wenneth A. Campbell, PE-2006002797



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

SULLIVAN, MO

PROJECT # X2306-03 SITE # 5214

FACILITY # 7815214051 7815214072

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ISSUE DATE: 08/16/24

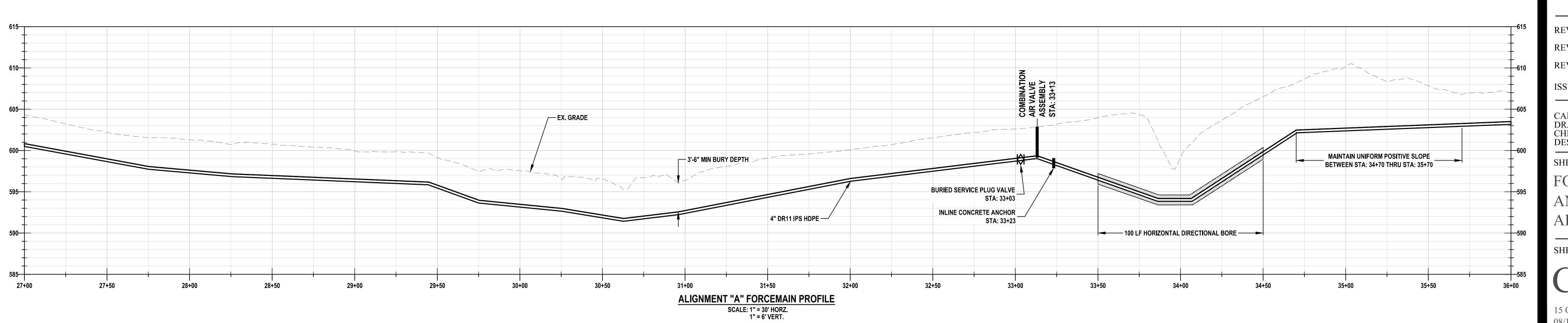
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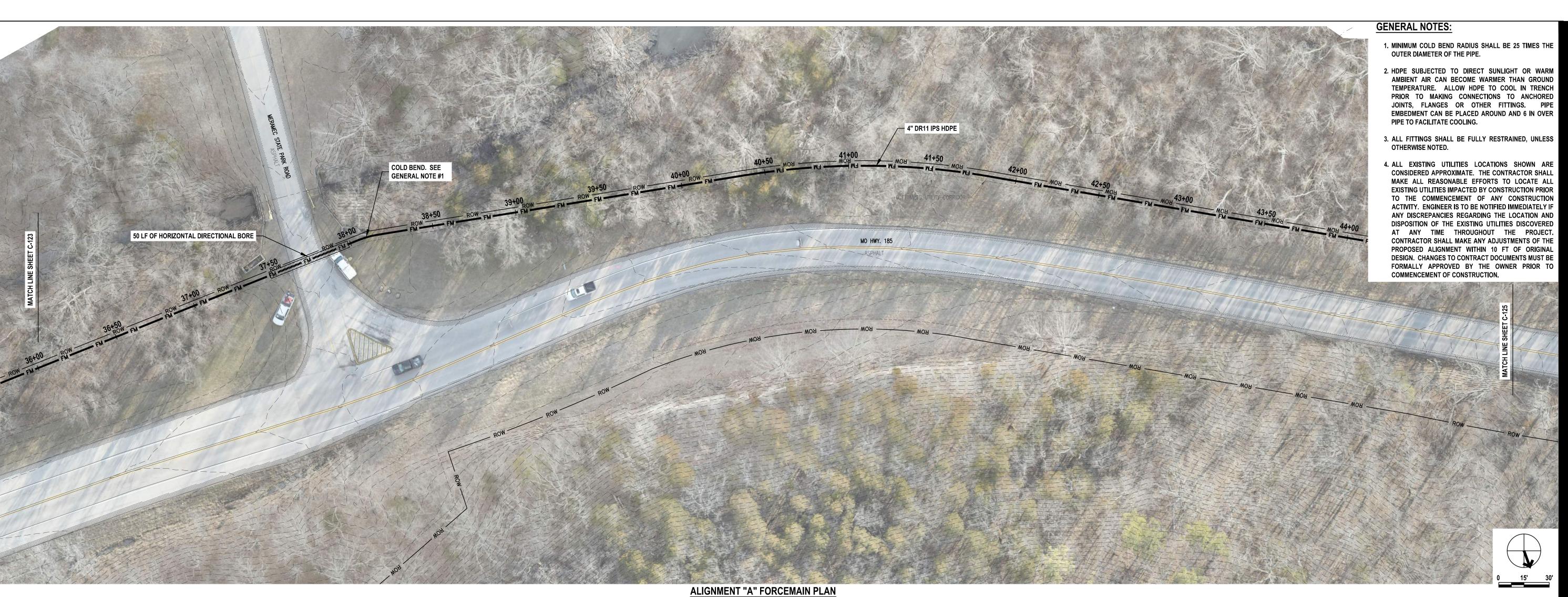
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FORCEMAIN PLAN
AND PROFILE
ALIGNMENT "A"

SHEET NUMBER:

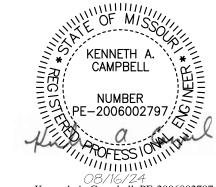
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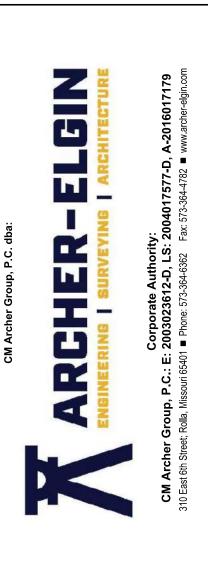


SCALE: 1" = 30'

STATE OF MISSOURI MICHAEL L. PARSON, **GOVERNOR**



Kenneth A. Campbell, PE-2006002797



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MO

PROJECT # X2306-03 5214

FACILITY # 7815214051 7815214072

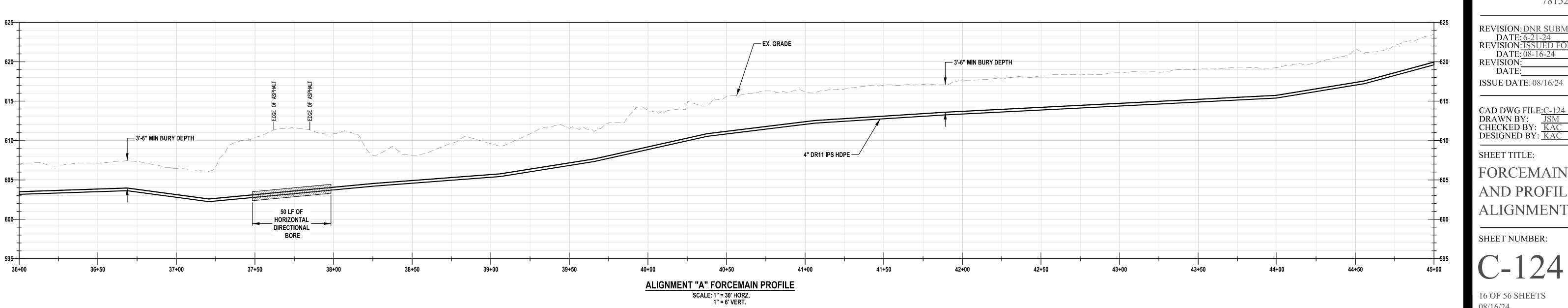
REVISION: <u>DNR SUBMITT</u>AL DATE: 6-21-24 REVISION: <u>ISSUED FOR BIDDING</u> DATE: 08-16-24 REVISION:

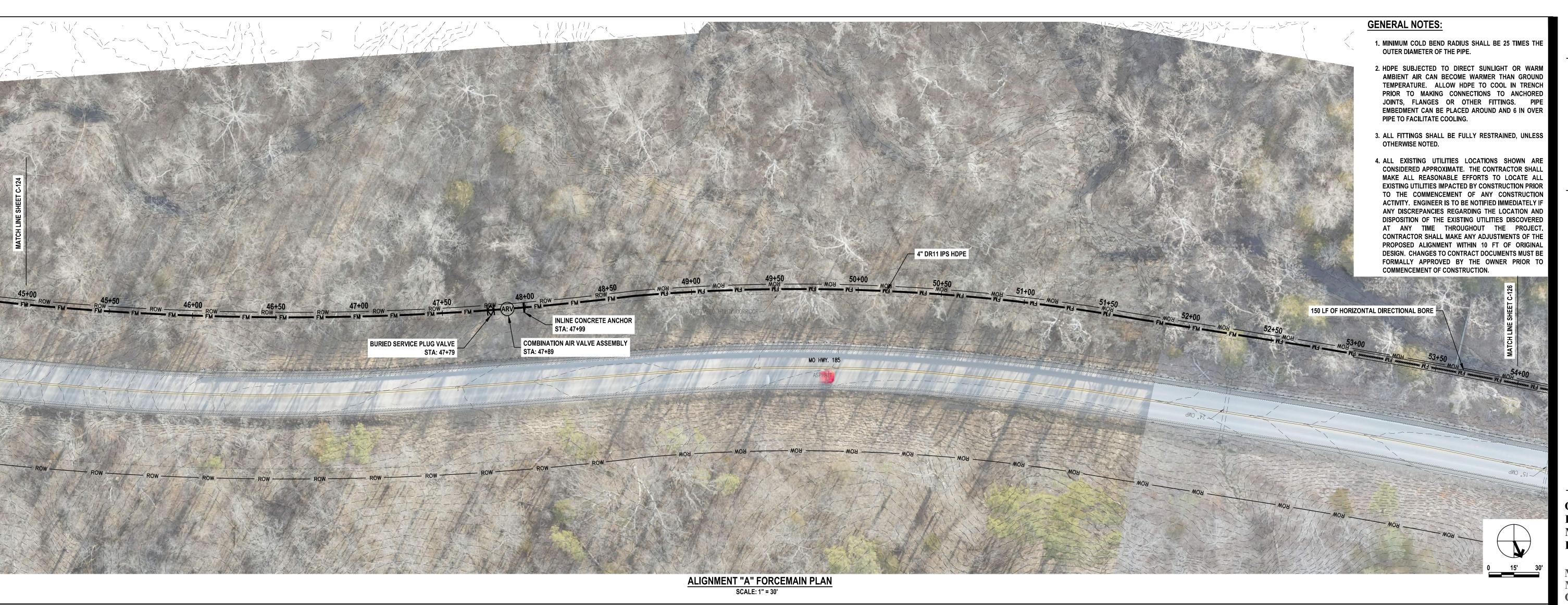
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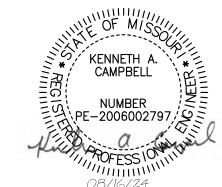
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FORCEMAIN PLAN AND PROFILE **ALIGNMENT "A"**

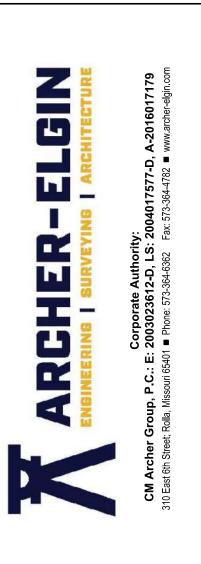
SHEET NUMBER:







Kenneth A. Campbell, PE-2006002797



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

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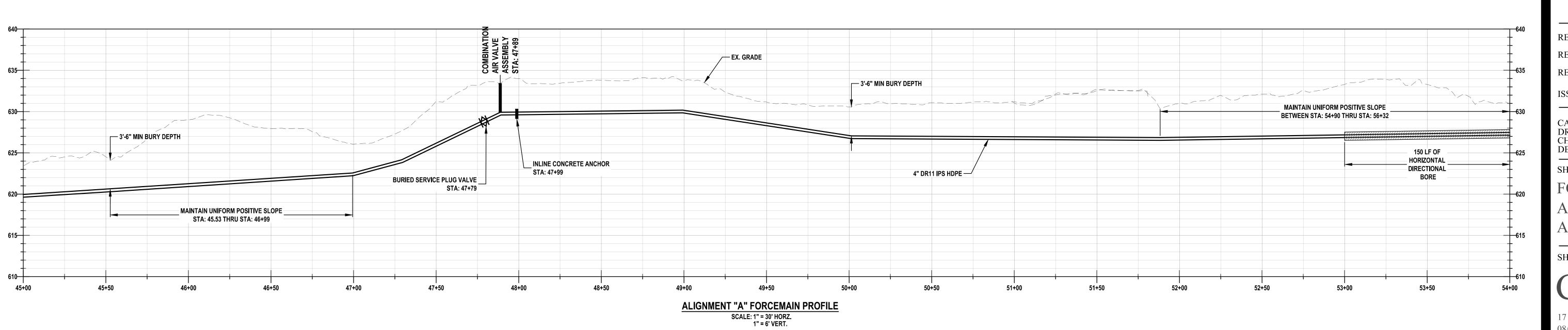
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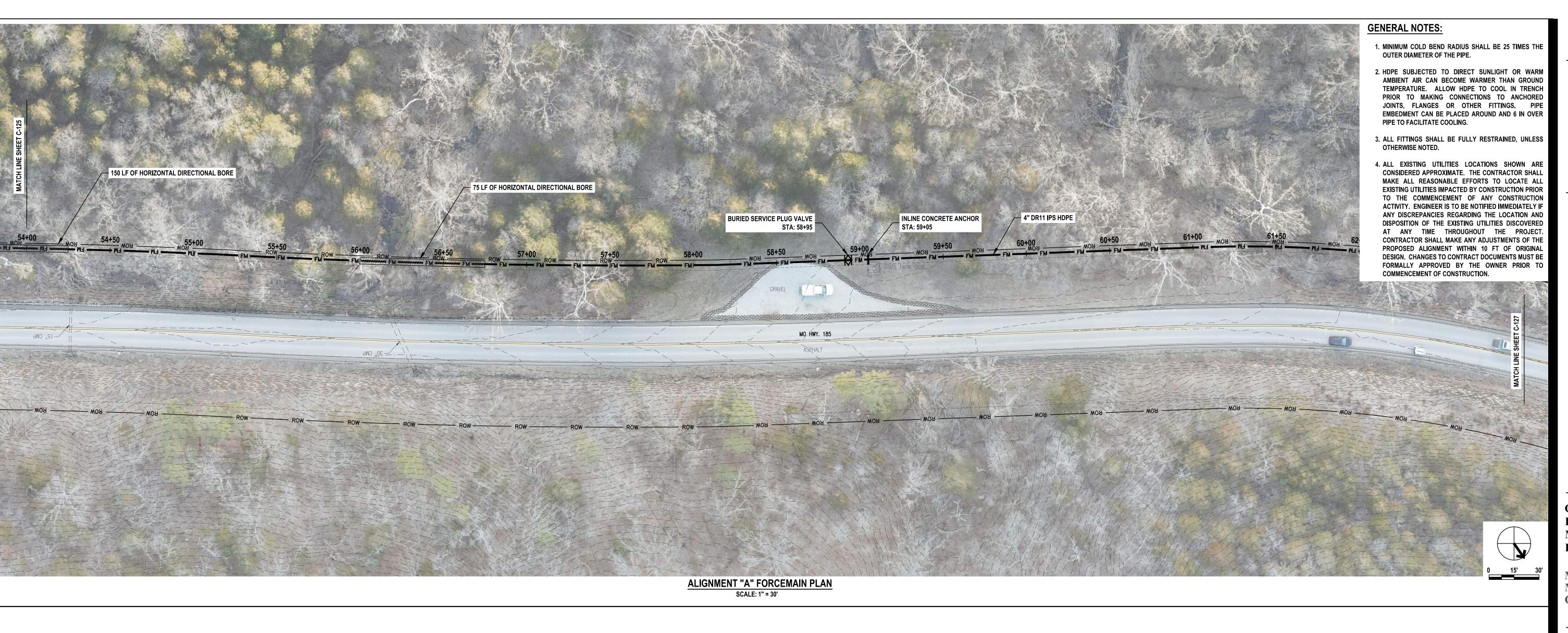
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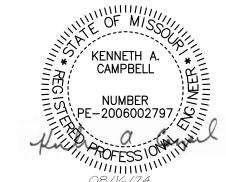
FORCEMAIN PLAN AND PROFILE ALIGNMENT "A"

SHEET NUMBER:

C-125







Kenneth A. Campbell, PE-2006002797

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Corporate Authority:

CM Archer Group, P.C.: E: 2003023612-D, LS: 2004017577-D, A-2016017179

310 East 6th Street; Rolla, Missouri 65401

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OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

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DATE: 6-21-24
REVISION: ISSUED FOR BIDDING
DATE: 08-16-24
REVISION:

DATE: ISSUE DATE: 06/21/2024

CAD DWG FILE:C-126

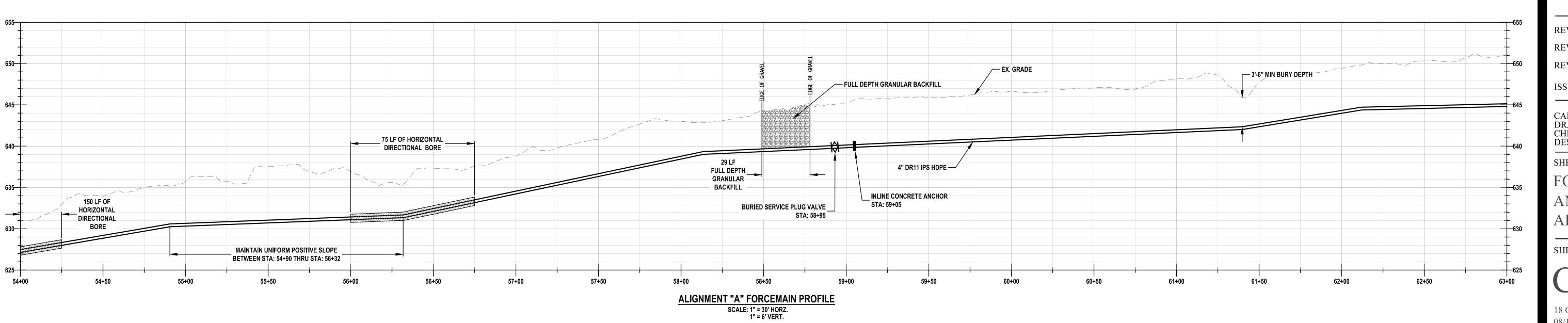
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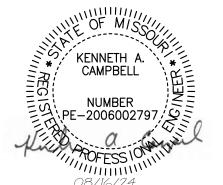
FORCEMAIN PLAN AND PROFILE ALIGNMENT "A"

SHEET NUMBER:

C-126







Kenneth A. Campbell, PE-2006002797

ARCHITECTURE

Corporate Authority:

CM Archer Group, P.C.: E: 2003023612-D, LS: 2004017577-D, A-2016017179

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MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

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SULLIVAN, MO

PROJECT # X2306-03 SITE # 5214

FACILITY # 7815214051 7815214072

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DATE: 6-21-24
REVISION: ISSUED FOR BIDDING
DATE: 08-16-24
REVISION:

DATE: ISSUE DATE: 08/16/24

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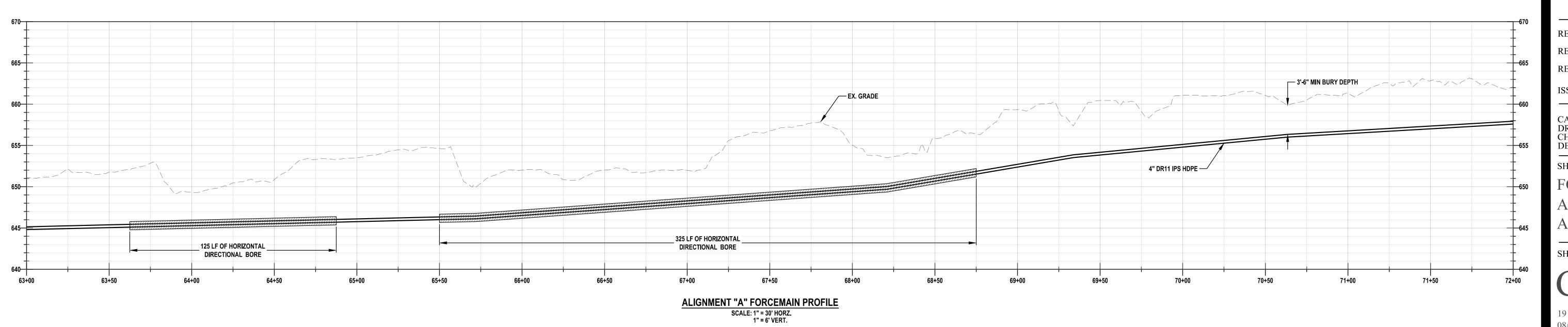
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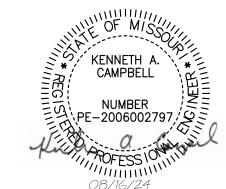
FORCEMAIN PLAN
AND PROFILE
ALIGNMENT "A"

SHEET NUMBER:

C-127







08/16/24 Kenneth A. Campbell, PE-2006002797

ARCHITECTURE

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MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

PROJECT LOCATION

PROJECT # X2306-03 SITE # 5214

FACILITY # 7815214051 7815214072

REVISION: <u>DNR SUBMITT</u>AL
DATE: 6-21-24
REVISION: <u>ISSUED FOR BIDDING</u>
DATE: 08-16-24
REVISION:

ISSUE DATE: 08/16/2024

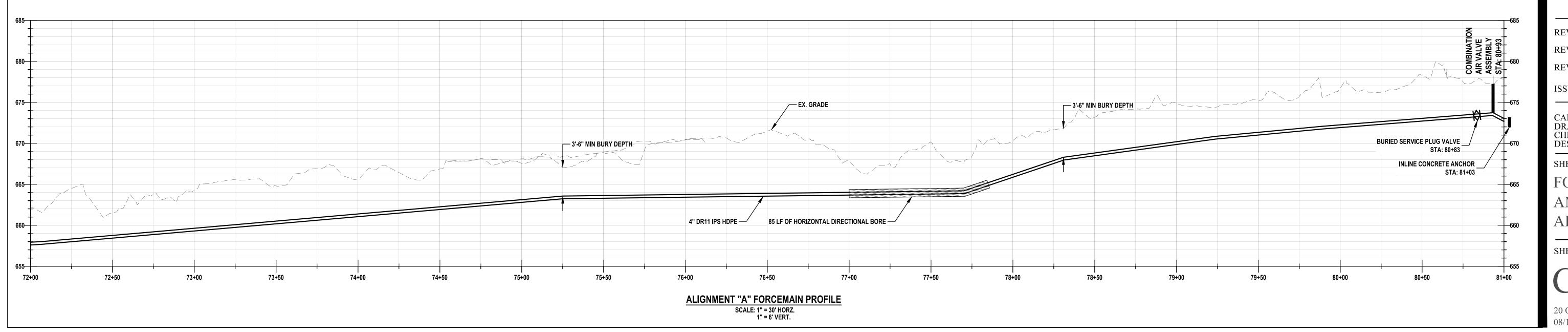
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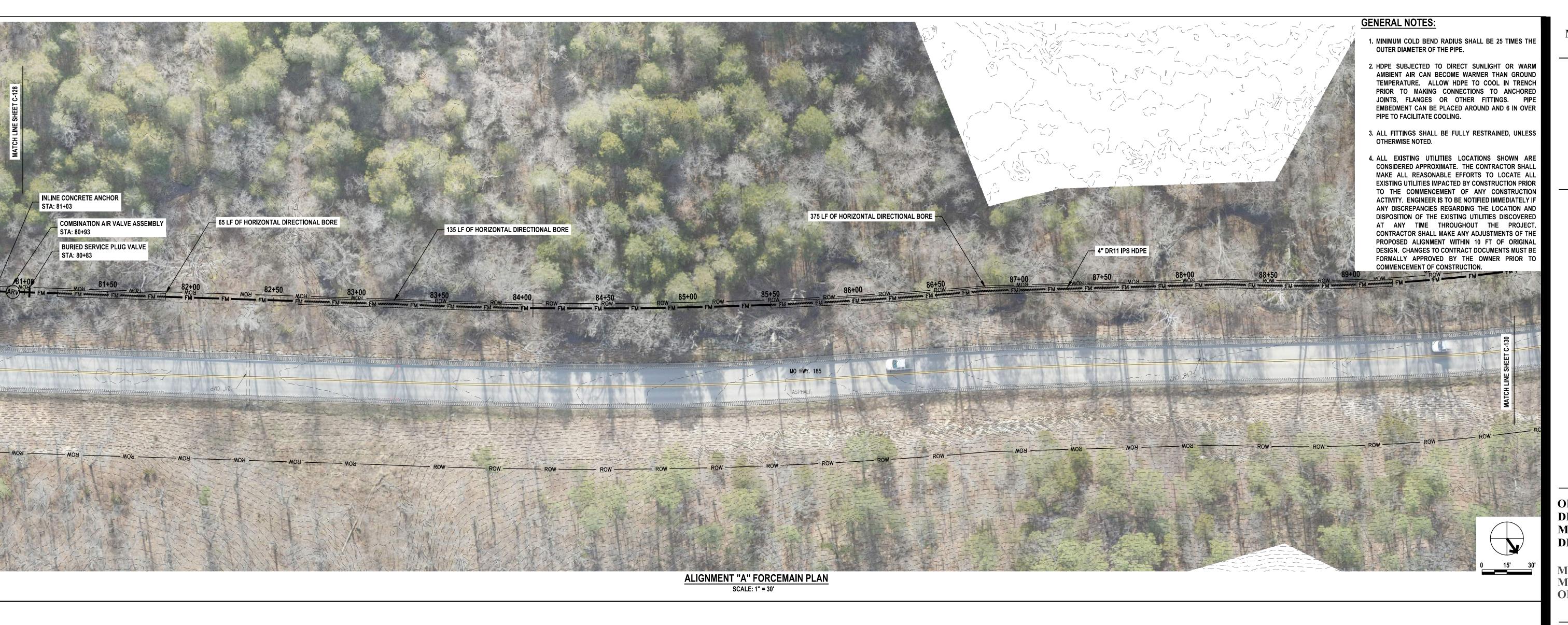
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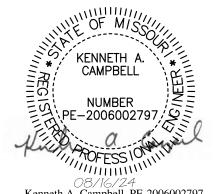
FORCEMAIN PLAN
AND PROFILE
ALIGNMENT "A"

SHEET NUMBER:

C-128
20 OF 56 SHEETS







Kenneth A. Campbell, PE-2006002797



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

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SULLIVAN, MO

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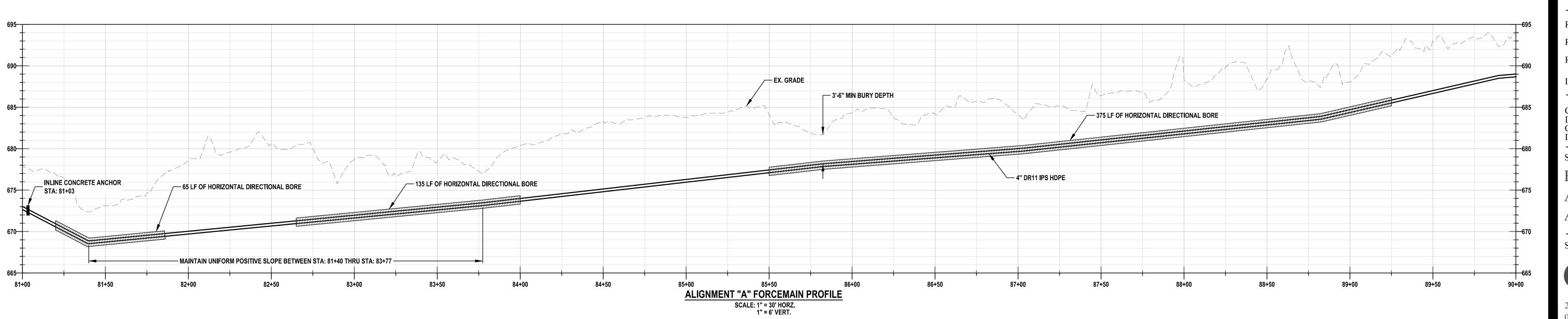
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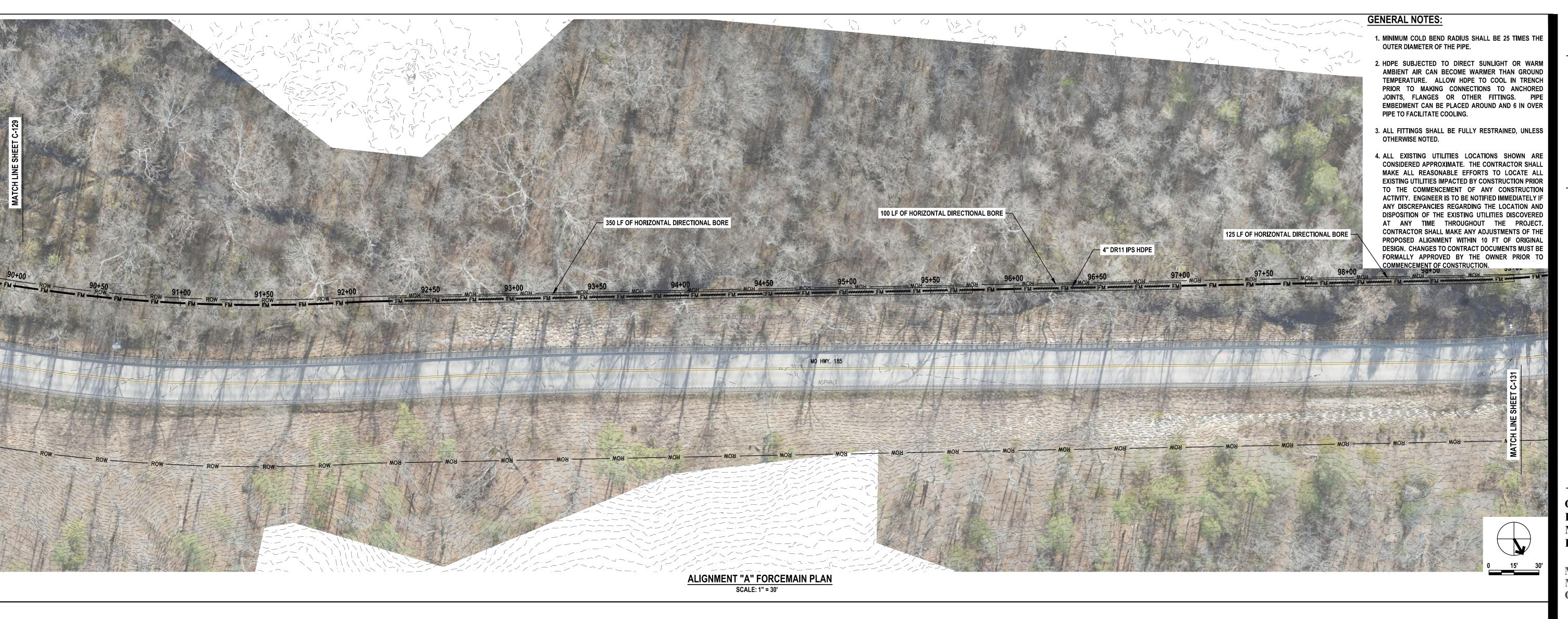
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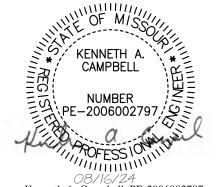
SHEET TITLE:

FORCEMAIN PLAN AND PROFILE **ALIGNMENT "A"**

SHEET NUMBER:







Kenneth A. Campbell, PE-2006002797

ARCHERNA | SURVEYING | ARCHITECTURE | Corporate Authority:

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MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

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FACILITY # 7815214051 7815214072

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REVISION: <u>ISSUED FOR BIDDING</u> DATE: 08-16-24
REVISION:

DATE: ISSUE DATE: 08/16/24

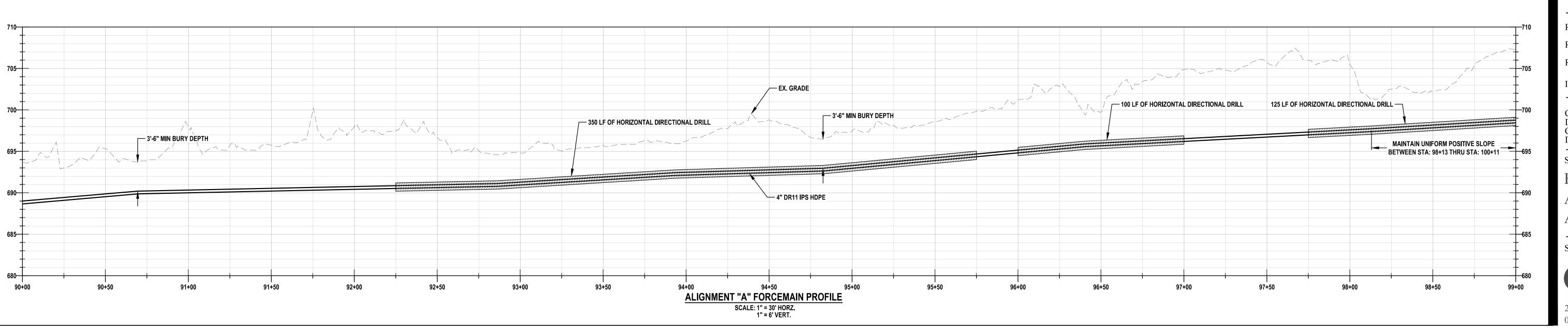
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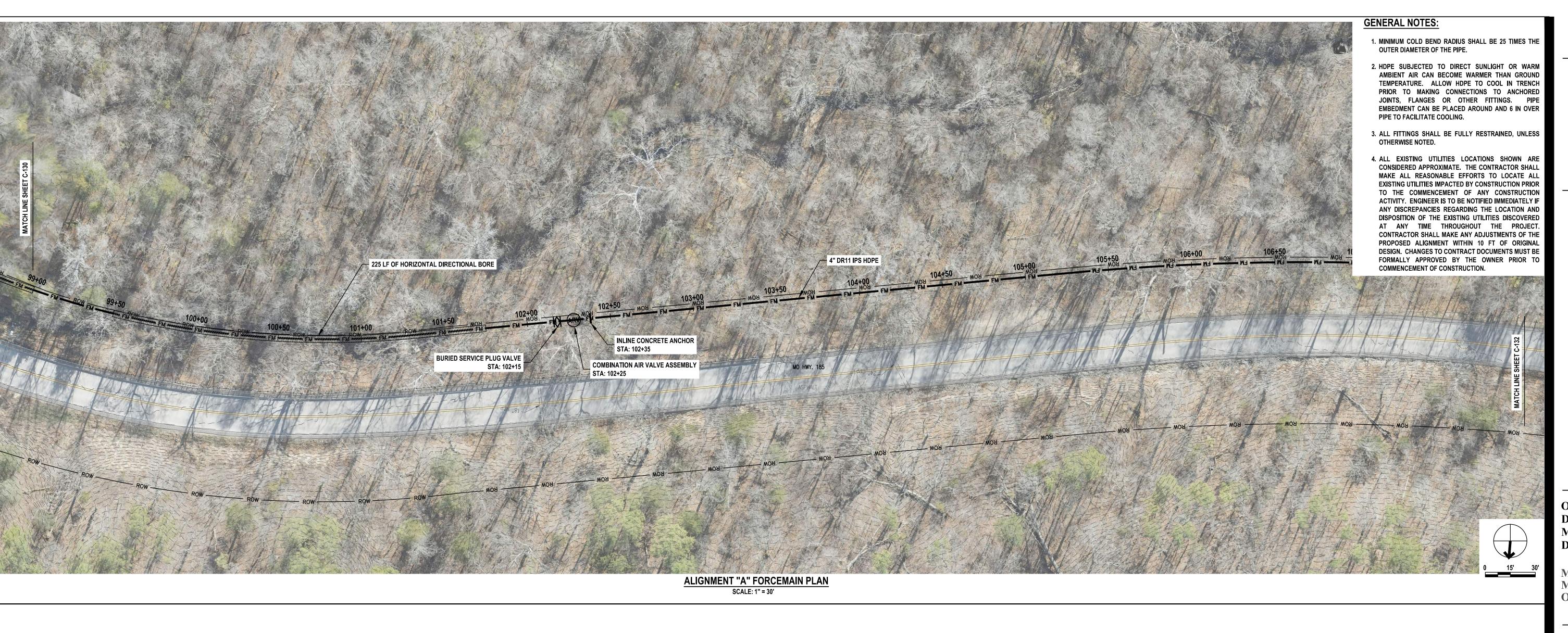
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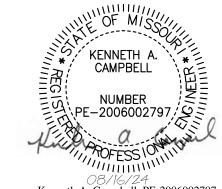
FORCEMAIN PLAN
AND PROFILE
ALIGNMENT "A"

SHEET NUMBER:

C-130







Kenneth A. Campbell, PE-2006002797

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ISSUE DATE: 0816/24

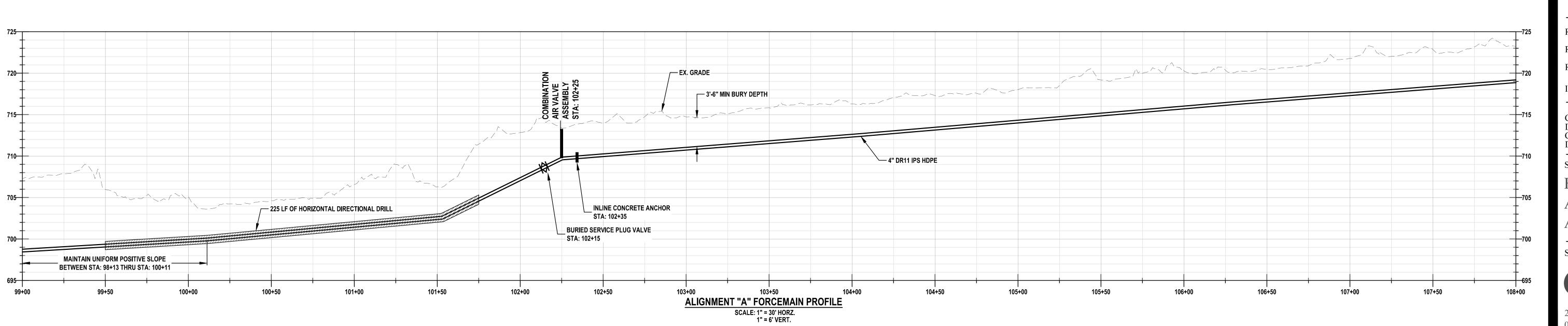
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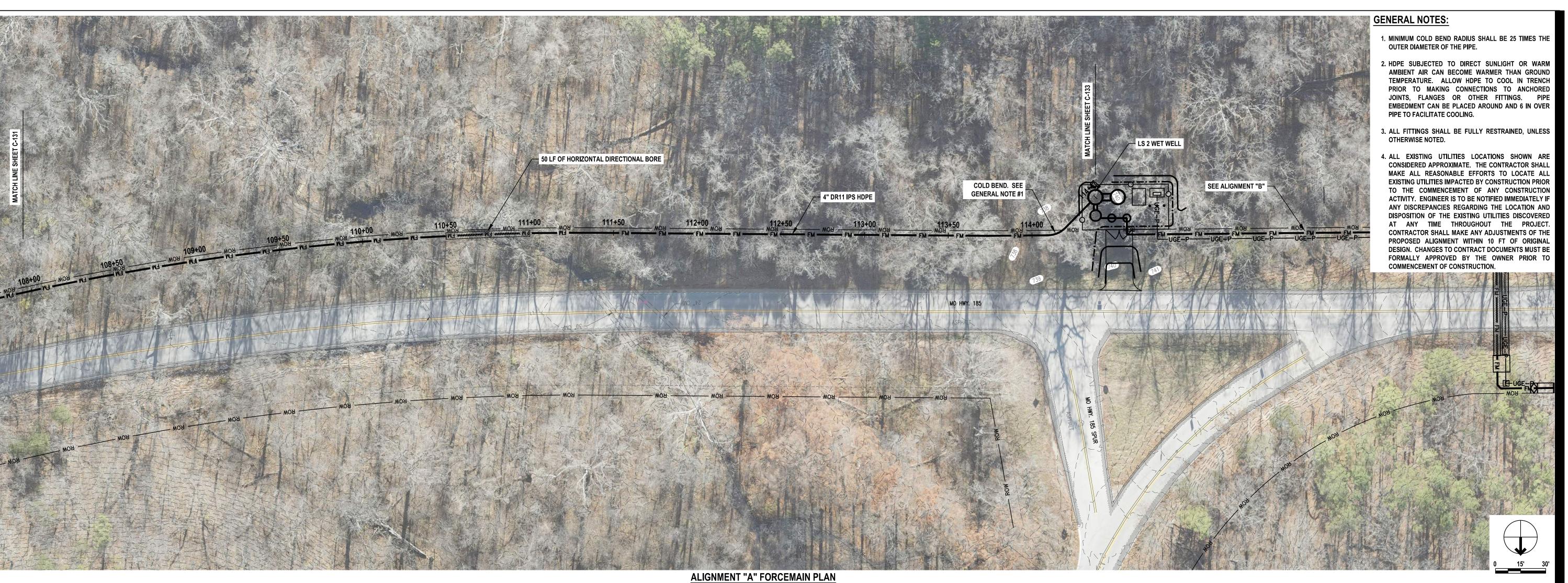
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FORCEMAIN PLAN
AND PROFILE
ALIGNMENT "A"

SHEET NUMBER:

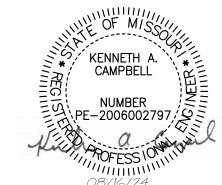
C-131





SCALE: 1" = 30'

STATE OF MISSOURI MICHAEL L. PARSON, GOVERNOR



Kenneth A. Campbell, PE-2006002797



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

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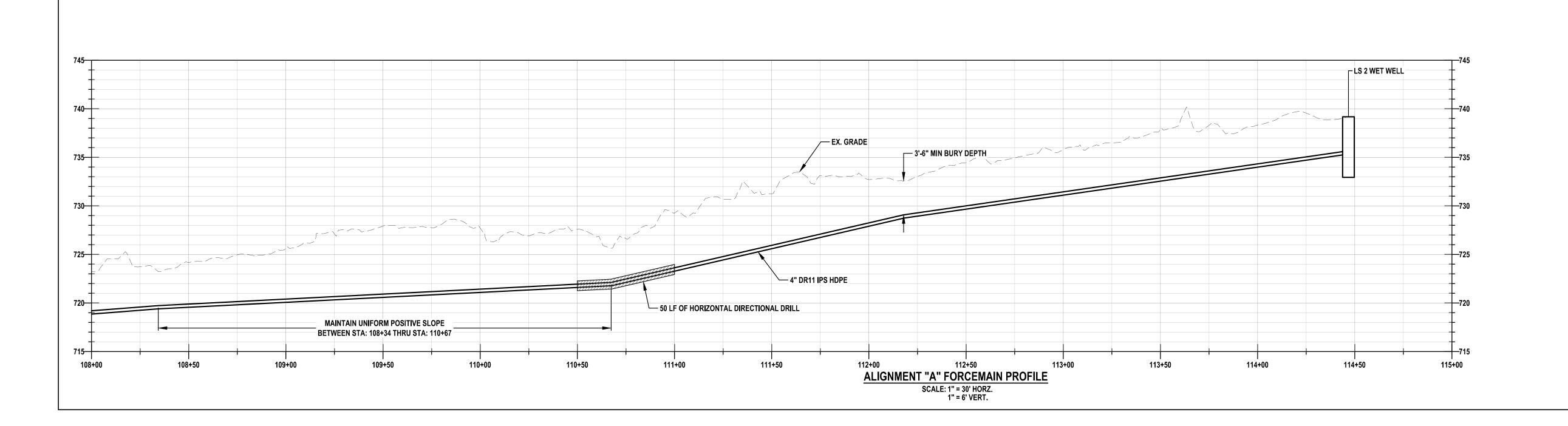
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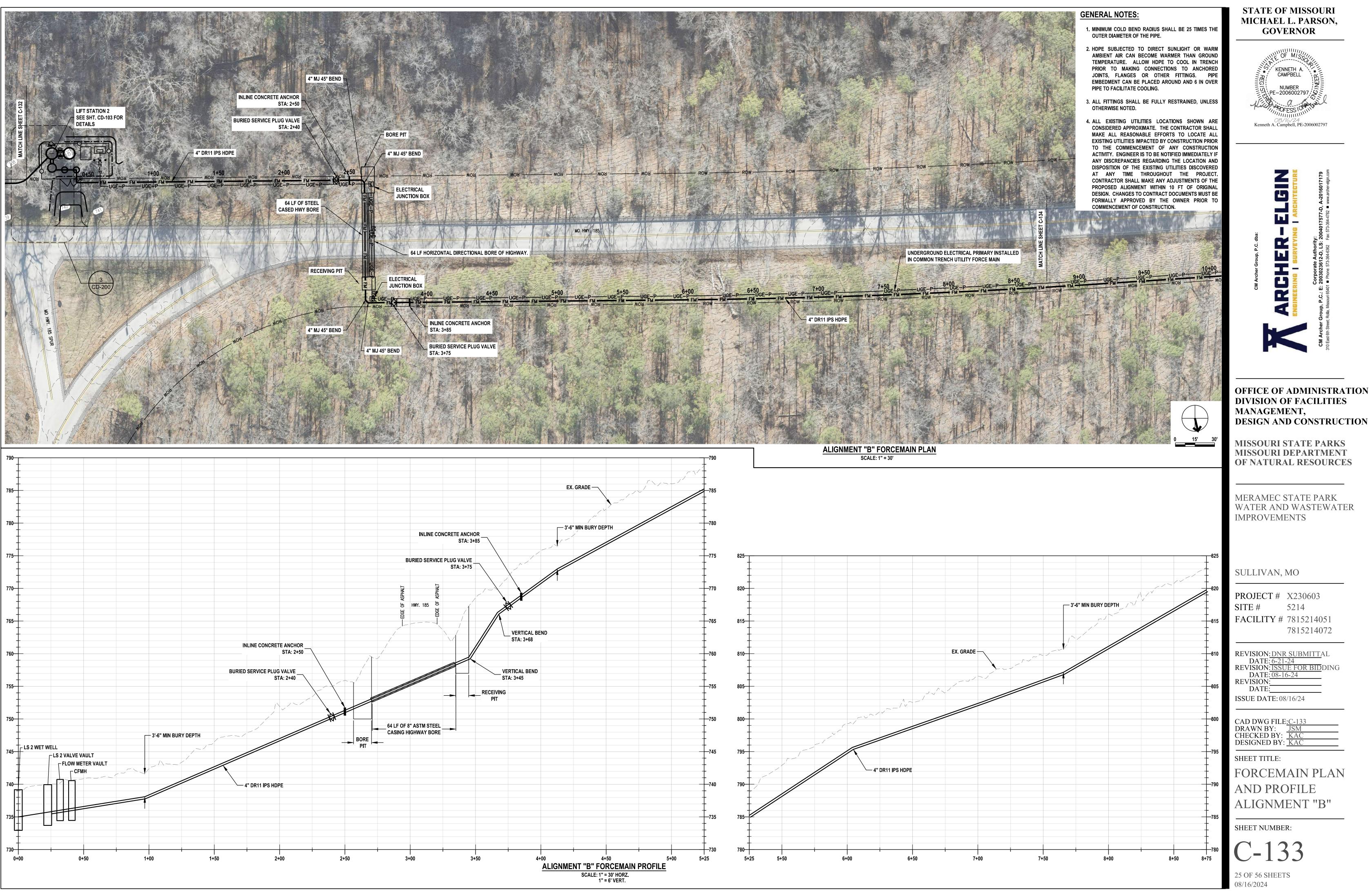
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FORCEMAIN PLAN AND PROFILE ALIGNMENT "A"

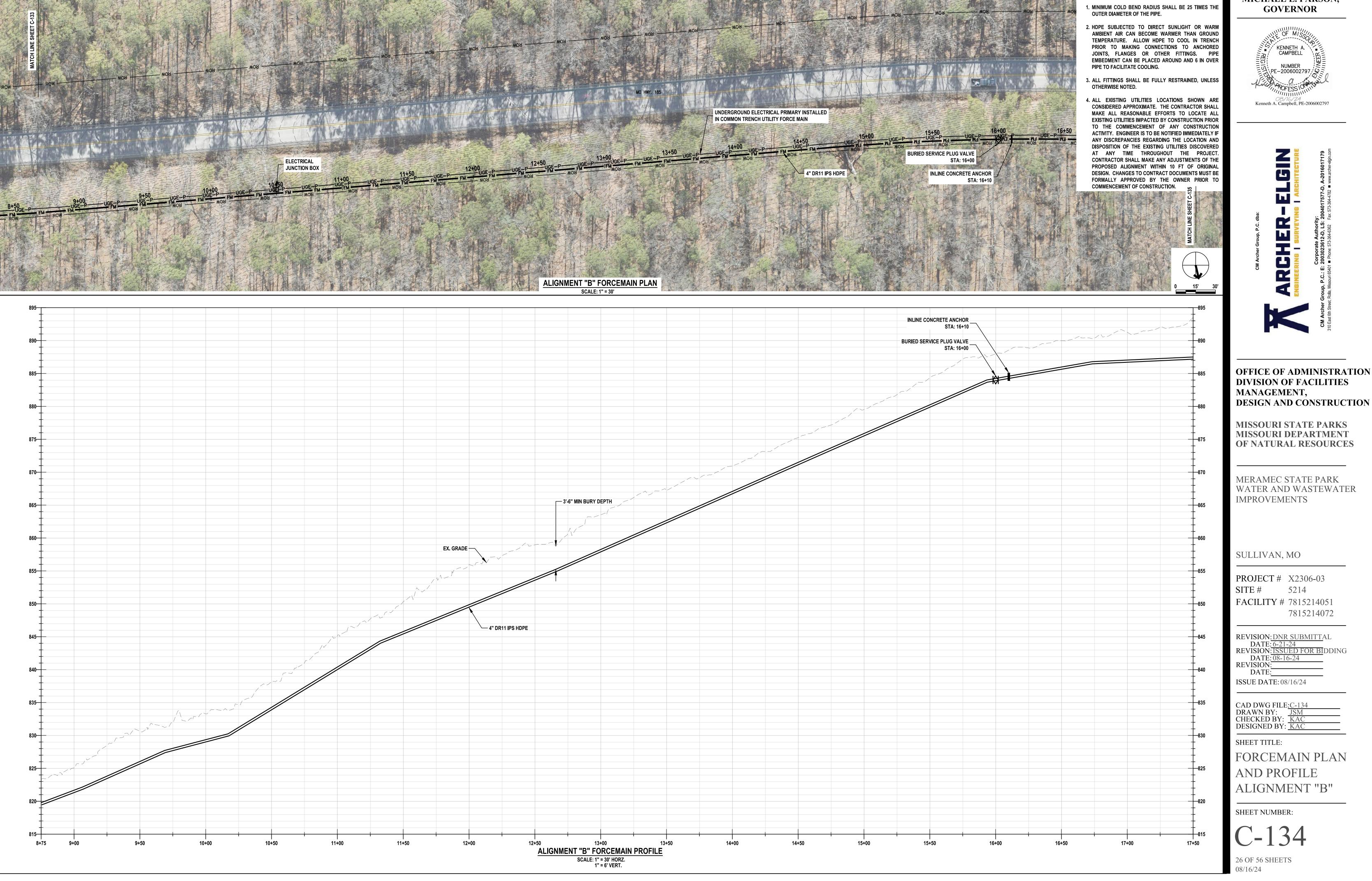
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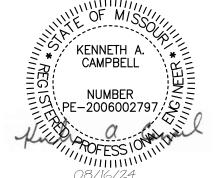




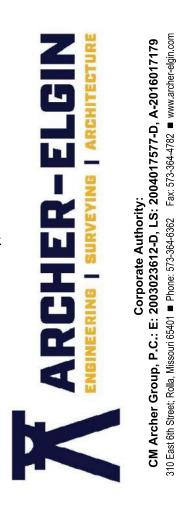
OFFICE OF ADMINISTRATION



GENERAL NOTES:



Kenneth A. Campbell, PE-2006002797



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES

MISSOURI STATE PARKS MISSOURI DEPARTMENT

MERAMEC STATE PARK WATER AND WASTEWATER

PROJECT # X2306-03

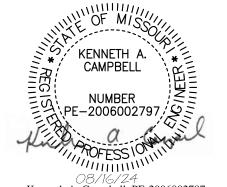
FACILITY # 7815214051 7815214072

REVISION: DNR SUBMITTAL
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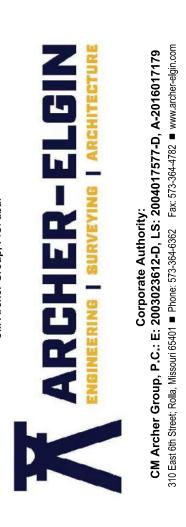
FORCEMAIN PLAN AND PROFILE **ALIGNMENT "B"**

GENERAL NOTES: 1. MINIMUM COLD BEND RADIUS SHALL BE 25 TIMES THE OUTER DIAMETER OF THE PIPE. 2. HDPE SUBJECTED TO DIRECT SUNLIGHT OR WARM AMBIENT AIR CAN BECOME WARMER THAN GROUND TEMPERATURE. ALLOW HDPE TO COOL IN TRENCH PRIOR TO MAKING CONNECTIONS TO ANCHORED JOINTS, FLANGES OR OTHER FITTINGS. PIPE EMBEDMENT CAN BE PLACED AROUND AND 6 IN OVER PIPE TO FACILITATE COOLING. 3. ALL FITTINGS SHALL BE FULLY RESTRAINED, UNLESS OTHERWISE NOTED. 4. ALL EXISTING UTILITIES LOCATIONS SHOWN ARE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL DESIGN. CHANGES TO CONTRACT DOCUMENTS MUST BE FORMALLY APPROVED BY THE OWNER PRIOR TO COMMENCEMENT OF CONSTRUCTION. UNDERGROUND ELECTRICAL PRIMARY INSTALLED IN COMMON TRENCH UTILITY FORCE MAIN 4" DR11 IPS HDPE MANAGEMENT, **IMPROVEMENTS ALIGNMENT "B" FORCEMAIN PLAN** 1" = 30' SULLIVAN, MO ISSUE DATE: 08/16/24 SHEET TITLE: **ALIGNMENT "B"** SHEET NUMBER: 22+00 ALIGNMENT "B" FORCEMAIN PROFILE SCALE: 1" = 30' HORZ. 1" = 6' VERT.

STATE OF MISSOURI MICHAEL L. PARSON, **GOVERNOR**



Kenneth A. Campbell, PE-2006002797



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER

PROJECT # X2306-03

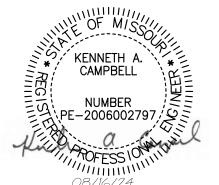
FACILITY # 7815214051 7815214072

REVISION: <u>DNR SUBMITT</u>AL DATE: 6-21-24 REVISION: <u>ISSUED FOR BI</u>DDING

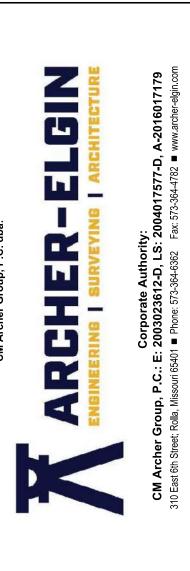
CAD DWG FILE:C-135
DRAWN BY: JSM
CHECKED BY: KAC
DESIGNED BY: KAC

FORCEMAIN PLAN AND PROFILE





08/16/24 Kenneth A. Campbell, PE-2006002797



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

SULLIVAN, MO

PROJECT # X2306-03 SITE # 5214 FACILITY # 7815214051

7815214072

REVISION: DNR SUBMITTAL
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CAD DWG FILE:JSM
DRAWN BY: KAC
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DESIGNED BY: KAC

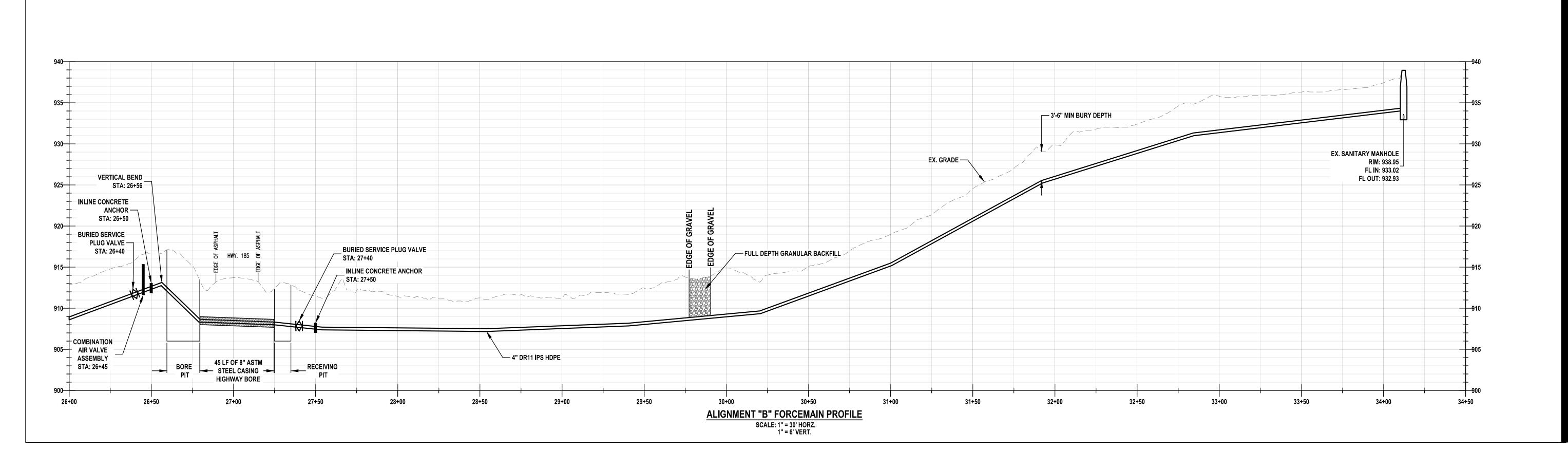
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FORCEMAIN PLAN
AND PROFILE
ALIGNMENT "B"

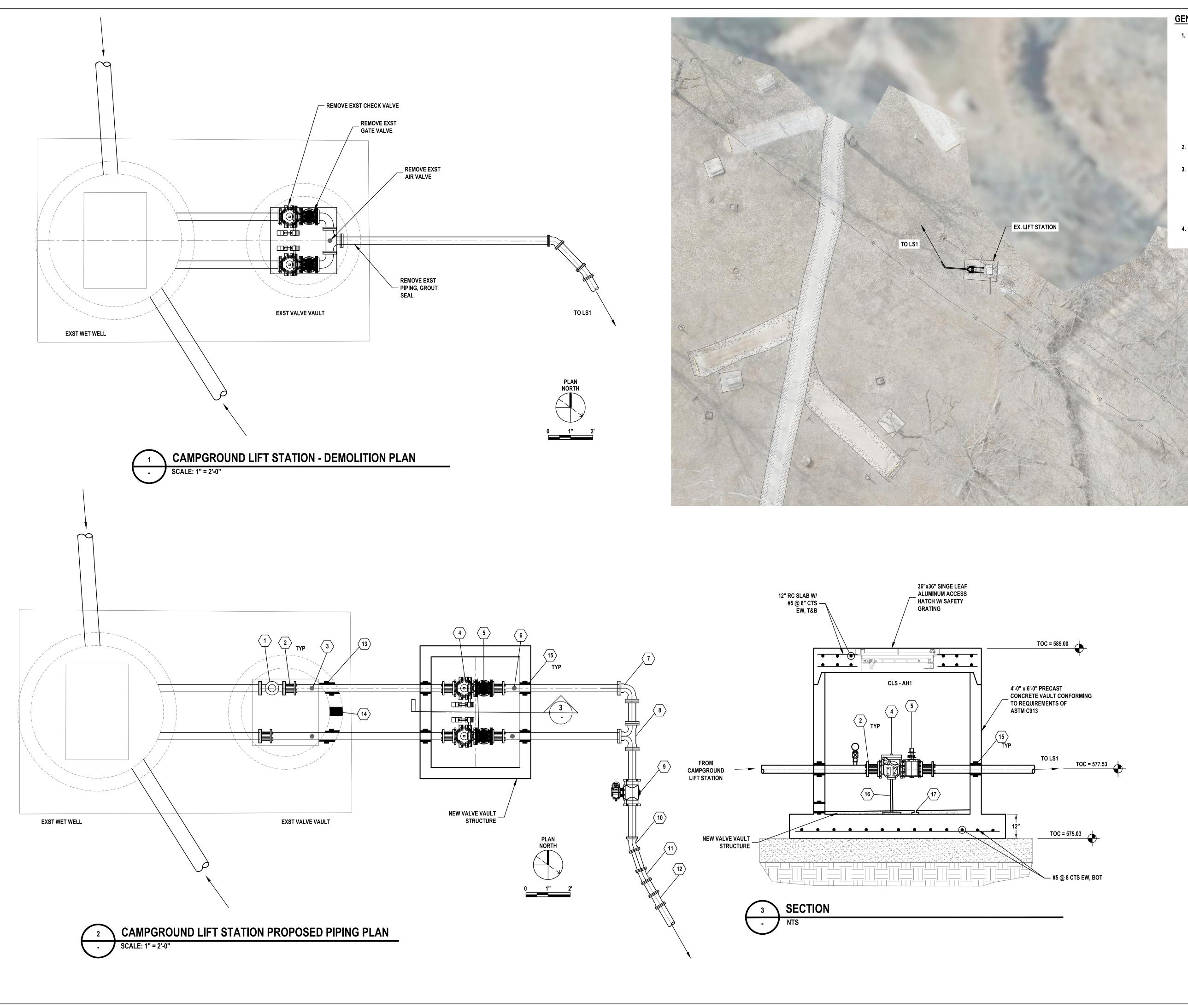
SHEET NUMBER:

C-136

28 OF 56 SHEETS 08/16/24



SCALE: 1" = 30'



GENERAL NOTES:

- 1. ALL EXISTING UTILITIES LOCATIONS SHOWN ON THE PLANS ARE TO BE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL MAKE ALL REASONABLE EFFORTS TO LOCATE ALL EXISTING UTILITIES IMPACTED BY CONSTRUCTION PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY. ENGINEER IS TO BE NOTIFIED IMMEDIATELY IF ANY DISCREPANCIES ARE DISCOVERED AT ANYTIME THROUGHOUT THE PROJECT, REGARDING THE LOCATION AND DISPOSITION OF THE EXISTING UTILITIES. THE CONTRACTOR IS THE MAKE ANY ADJUSTMENTS OF PROPOSED ALIGNMENTS WITHIN 10 FT OF ORIGINAL DESIGN. CHANGES TO CONTRACT DOCUMENTS MUST BE FORMALLY APPROVED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- 2. MINIMUM COLD BEND RADIUS SHALL BE 30 TIMES OUTER DIAMETER OF PIPE.
- 3. HDPE PIPE SUBJECT TO DIRECT SUNLIGHT OR WARM AMBIENT AIR CAN BECOME WARMER THAN GROUND TEMPERATURE. ALL HDPE TO COOL IN TRENCH PRIOR RO MAKING CONNECTIONS TO ANCHORED JOINTS, FLANGES OR OTHER FITTINGS. PIPE EMBEDMENT CAN BE PLACED AROUND AND 6 INCHES OVER PIPE TO FACILITATE COOLING.
- 4. PERFORM PROPOSE IMPROVEMENTS DURING "OFF-SEASON" WHEN ALL RESTROOM FACILITIES ARE CLOSED.

KEY NOTES: $\langle \# \rangle$

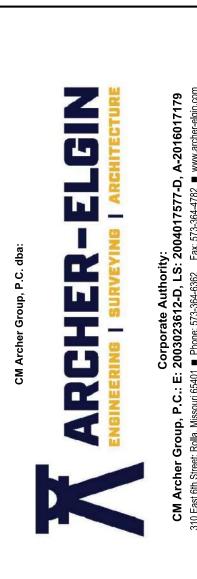
1. QUICK CONNECT ASSEMBLY CONSISTING OF 4" x 3" FLG TEE, 3" SPOOL PIECE, 3" PLUG VALVE 3" CAMLOCK STYLE QUICK CONNECT W/ DUST COVER.

PLAN NORTH

- 2. FLANGED COUPLING ADAPTER RESTRAINED
- 3. COMBINATION AIR VALVE ASSEMBLY PER DETAIL
- 4. 4" FLG SWING CHECK VALVE
- 5. 4" FLG PLUG VALVE HANDLE HPE OPERATED
- 6. PRESSURE GAUGE ASSEMBLY CONSISTING OF OMEGA PGH -160 PSI/1/2 100-SS -1/4 GG STAINLESS STEEL, LIQUID FILLED INDUSTRIAL PRESSURE GAUGE OR APPROVED EQUAL PRESSURE GAUGE ASSEMBLY SHALL INCLUDE STAINLESS STEEL TAPPING SADDLE, STAINLESS STEEL DIAPHRAGM PRESSURE SEAL AND STAINLESS STEEL BALL VALUE
- 7. 4" MJ 90 DEG BEN, RESTRAINED
- 8. 4" MJ TEE, RESTRAINED
- 9. 4" MJ PLUG VALVE, BURRED SERVICE OPERATOR, RESTRAINED
- 10. 4" MJ 22.5 DEG BEND RESTRAINED
- 11. 4" MJ 11.25 DEG BEND RESTRAINED
- 12. 4" MJ SLEEVE COUPLING RESTRAINED
- 13. LINK SEAL IN CORE DRILLED CONCRETE
- 14. GROUT SEAL WITH HYDRAULIC CEMENT
- 15. Z. LOK PIPE SEAL OR APPROVED EQUAL
- 16. PIPE STANT
- 17. 12" DIA SUMP PIT & COVER, M.A. INDUSTRIES OR APPROVED EQUAL

STATE OF MISSOURI MICHAEL L. PARSON, GOVERNOR





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK
WATERLINE IMPROVEMENTS

SULLIVAN, MISSOURI

PROJECT # X2306-03 SITE # 5214

FACILITY # 7815214051 7815214072

REVISION: ISSUED TO MDNR
DATE: 05-17-2024
REVISION: ISSUED FOR BIDDING
DATE: 08/16/24

REVISION: DATE:

ISSUE DATE: 08/16/24

CAD DWG FILE:C-109.DWG
DRAWN BY: JSM
CHECKED BY: KAC
DESIGNED BY: EMH

SHEET TITLE:

LIFT STATION PLAN

SHEET NUMBER:

C-150

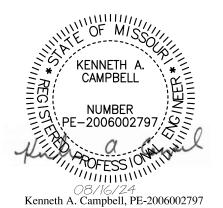


GENERAL NOTES:

- LAGOON CLOSURE SHALL BE PERFORMED IN CONFORMANCE TO DIVISION 32, SPECIFICATION SECTION 320505, AFTER SUCCESSFUL TESTING AND START-UP OF THE LS1 AND LS2 FACILITIES.
- 2. NO GRADING OR DISTURBANCE OF LAND SHALL OCCUR OUTSIDE THE FENCED AERA WITHOUT EXPRESSED AUTHORIZATION FROM THE OWNER.
- 3. IMPLEMENT NECESSARY EROSION CONTROL BEST MANAGEMENT PRACTICES AS REQUIRED IN DIVISION 31 SPECIFICATIONS
- 4. ALL EXISTING PROCESS PIPING (GRAVITY SEWER, PROCESS AERATION, ETC.) SHALL BE DEMOLISHED.
- 5. DEMOLISH EXISTING SITE ELECTRIC SERVICE.
 COORDINATE ABANDONMENT OF EXISTING ELECTRIC
 SERVICE WITH LOCAL ELECTRIC SERVICE PROVIDER.

TO BE DEMOLISHED

STATE OF MISSOURI MICHAEL L. PARSON, GOVERNOR



CM Archer Group, P.C. dba:

REPERFECTION

Corporate Authority:

CM Archer Group, P.C.: E: 2003023612-D, LS: 2004017577-D, A-2016017179

310 Fast 6th Street Rolls Miscouri 65401 a Phone: 573-364-6782 a www.archer-eligin com

OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK
WATER AND WASTEWATER
IMPROVEMENTS

SULLIVAN, MO

PROJECT # X2303-01 SITE # 5214

FACILITY # 7815214051 7815214072

REVISION: ISSUED FOR BIDDING
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CAD DWG FILE: CD, 20

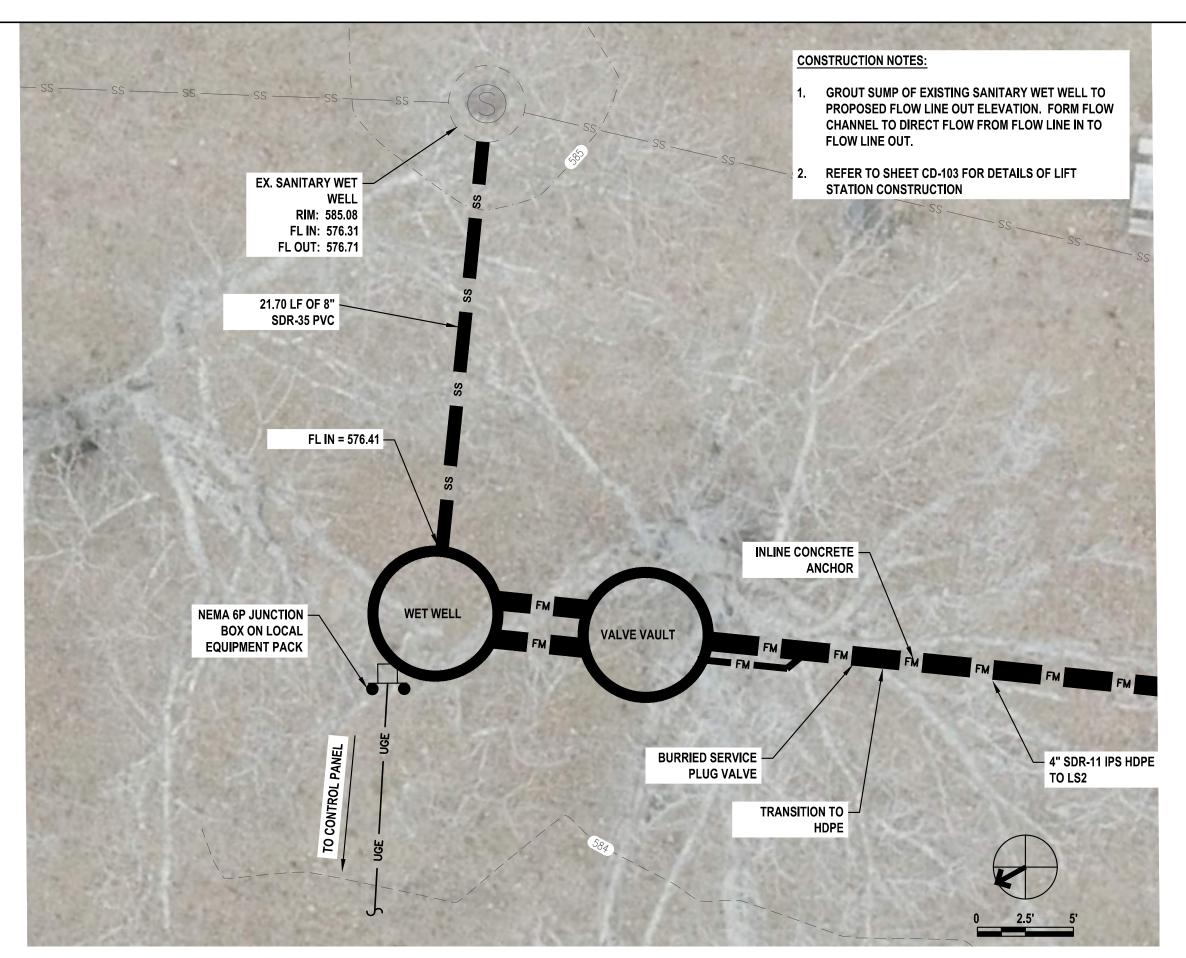
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CHECKED BY: KAC
DESIGNED BY: KAC

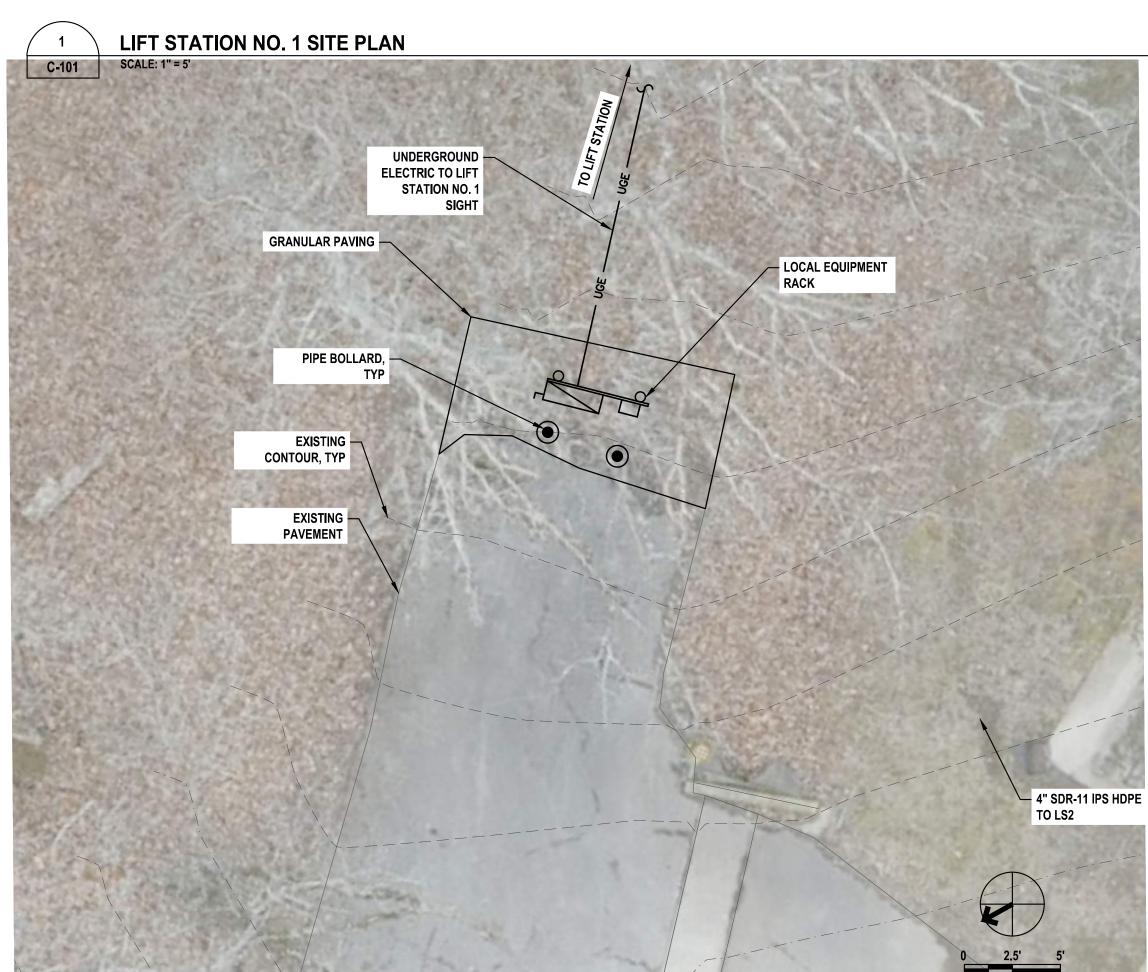
SHEET TITLE:

MERAMEC SP WWTF LAGOON CLOSURE PLAN

SHEET NUMBER:

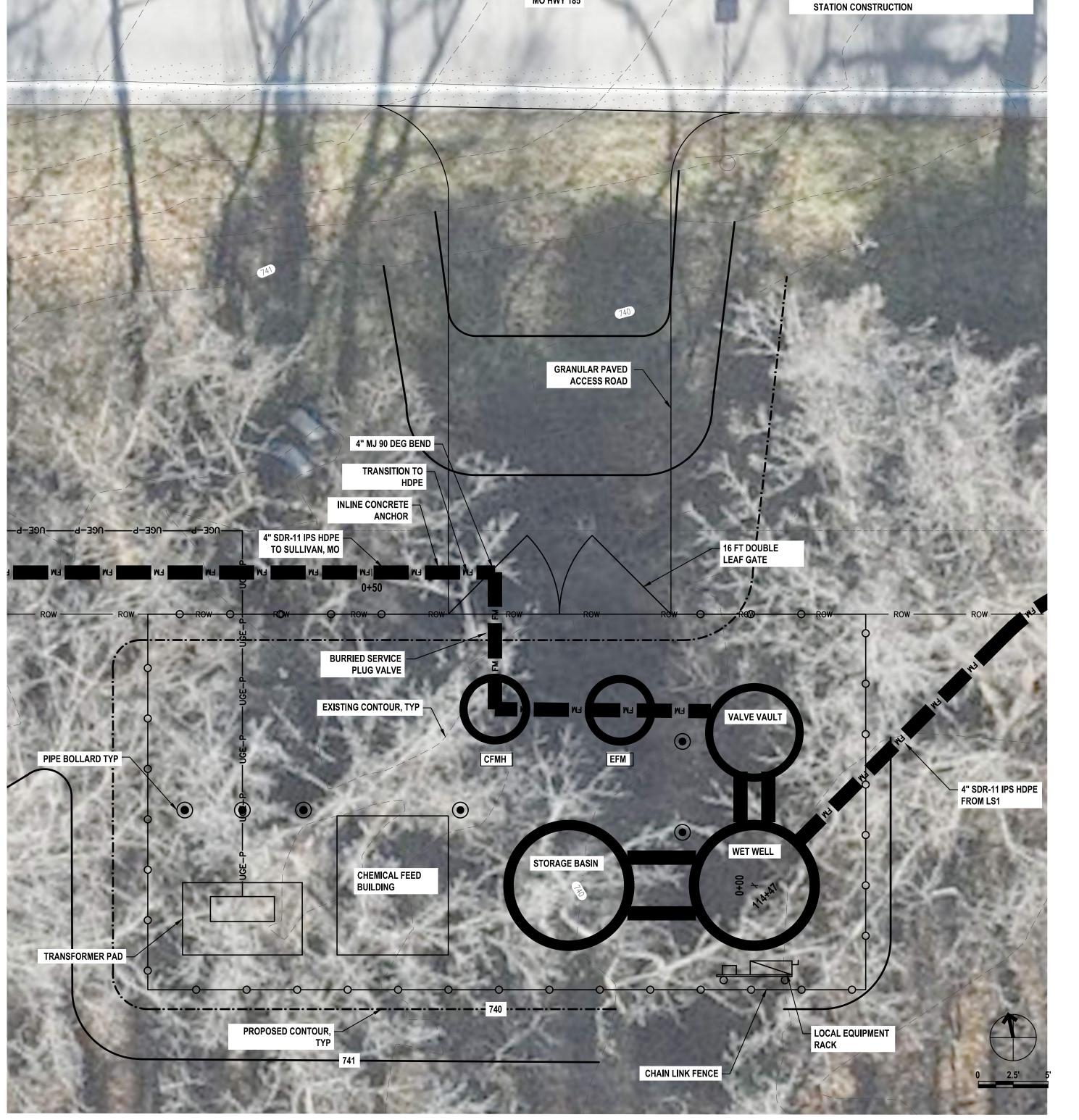
C-201







LIFT STATION NO. 1 SITE PLAN - CONTROL & ELECTRICAL ENCLOSURE SCALE: 1" = 5'



CONSTRUCTION NOTES:

REFER TO SHEET CD-104 FOR DETAILS OF LIFT

LIFT STATION NO. 2 SITE PLAN C-115

STATE OF MISSOURI MICHAEL L. PARSON, **GOVERNOR**



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MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MO

PROJECT # X2303-01 SITE# 5214 FACILITY # 7815214051

7815214072

REVISION: ISSUED FOR BIDDING DATE: 08-16-24 **REVISION:**

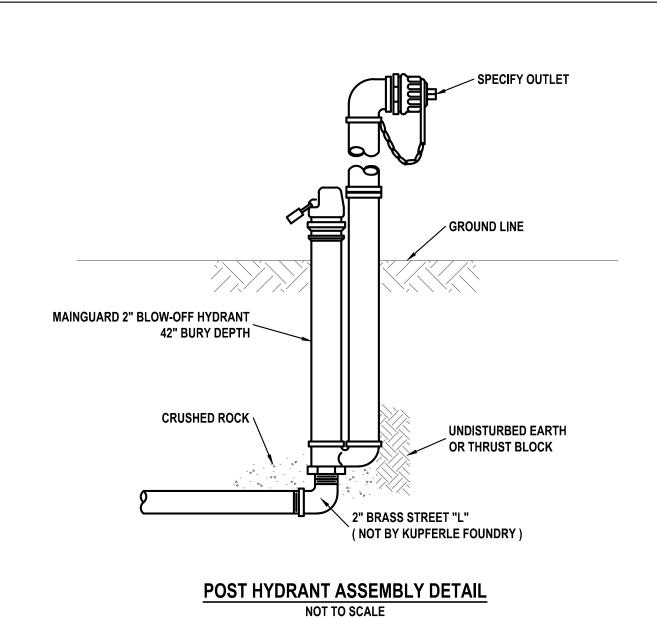
ISSUE DATE: 08/16/24

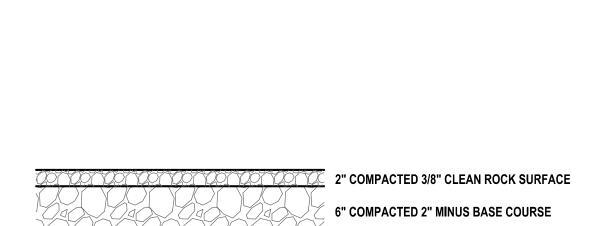
CAD DWG FILE:C-301 DRAWN BY: WJT CHECKED BY: KAC DESIGNED BY: KAC

SHEET TITLE:

LIFT STATION SITE AND GRADING PLAN

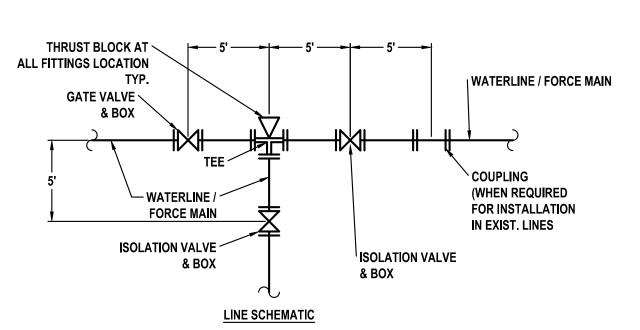
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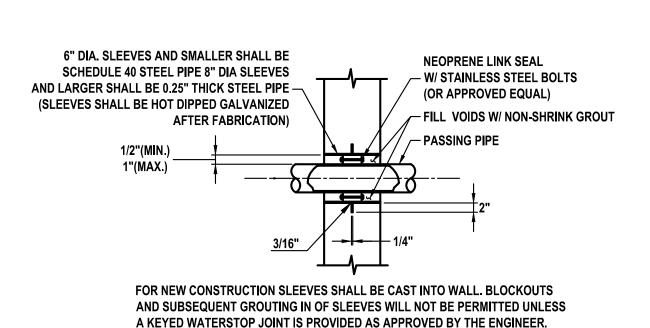
COMPACTED SUB-GRADE

GRANULAR PAVING DETAIL



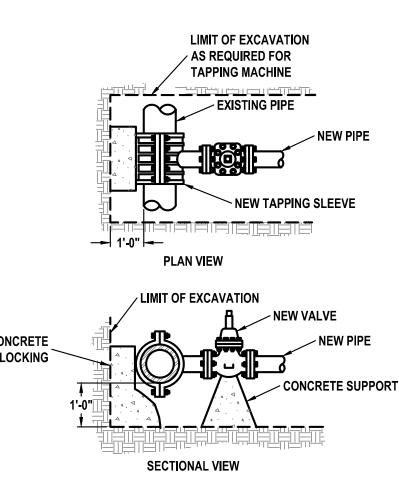
SEE PLAN SHEETS FOR REQUIRED FITTING TYPES AND VALVE INSTALLATIONS FOR SPECIFIC CONNECTIONS, BRANCHES AND CONNECTIONS TO EXISTING SYSTEMS. NOT ALL FITTINGS AND/OR VALVES SHOWN IN THE SCHEMATIC MAY BE REQUIRED AT ALL LOCATIONS.

TYPICAL VALVE / FITTING LOCATION DETAIL



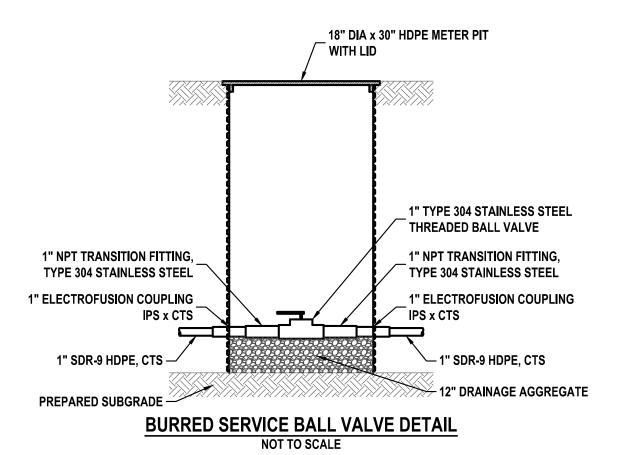
SLEEVE INSTALLATION DETAIL

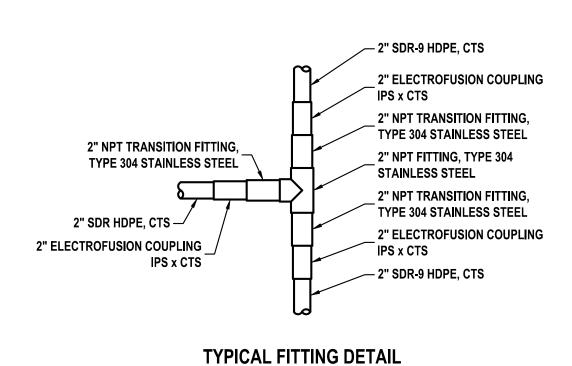
NOT TO SCALE

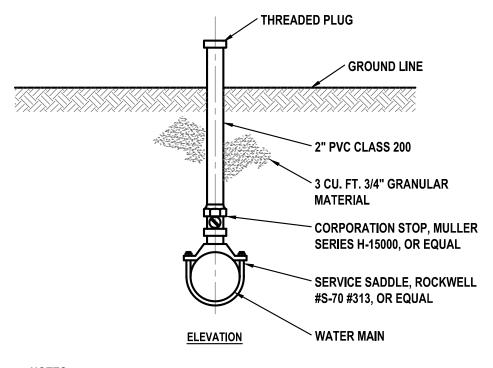


TAPPING SLEEVE AND VALVE INSTALLATION DETAIL

NOT TO SCALE







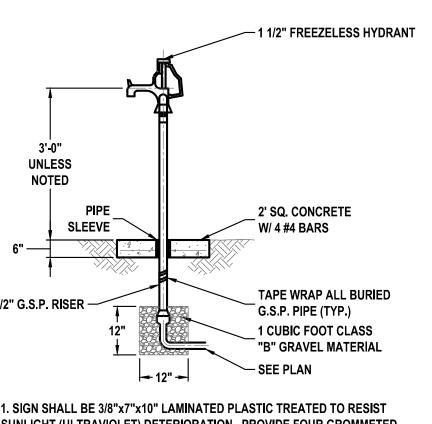
NOTES:

1. CHLORINE INJECTION PORT TO BE LOCATED WITHIN 10-FEET DOWNSTREAM FROM THE BEGINNING OF THE NEW MAIN.

2. CALCIUM HYPOCHLORITE SOLUTION SHALL BE INJECTED INTO PORT DURING CLEANING AND DISINFECTION OF LINE USING THE CONTINUOUS FEED METHOD. SEE SECTION 330506 OF SPECIFICATIONS.

CHLORINE INJECTION PORT DETAIL

NOT TO SCALE

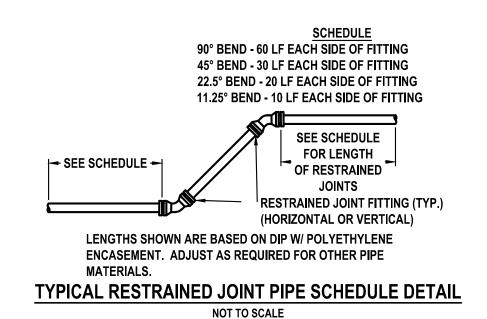


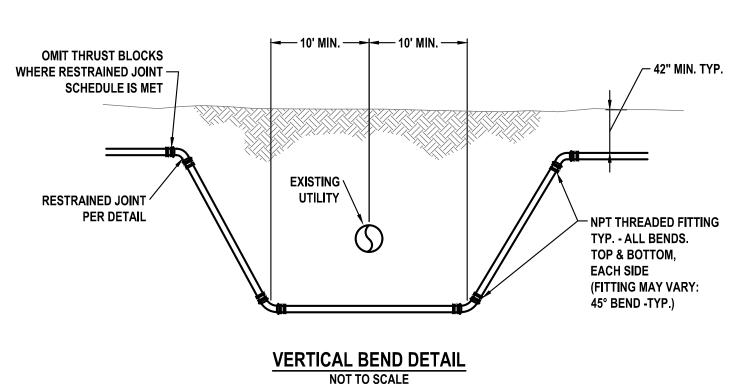
1. SIGN SHALL BE 3/8"x7"x10" LAMINATED PLASTIC TREATED TO RESIST SUNLIGHT (ULTRAVIOLET) DETERIORATION. PROVIDE FOUR GROMMETED HOLE FOR 1/4" U-BOLTS.

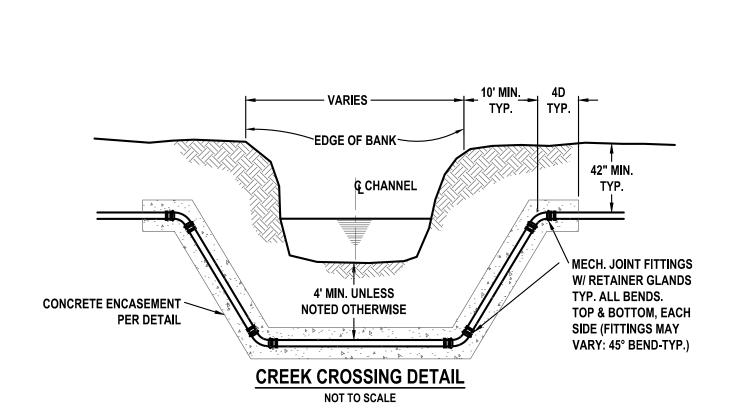
2. SIGN SHALL CONFORM WITH O.S.H.A. REGULATION 1910.145.

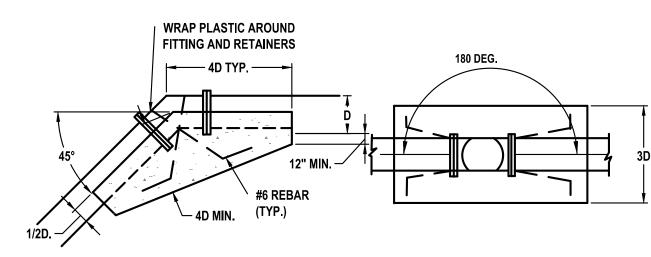
3. SIGN IS SHOWING ROTATED 90° FROM TRUE POSITION. MOUNT SIGN TO PERMIT EAST READING.

YARD HYDRANT DETAIL





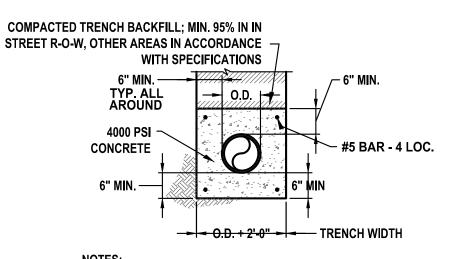




NOTE: THREADED FITTINGS AT ALL VERTICAL BENDS.

VERTICAL BEND THRUST BLOCK

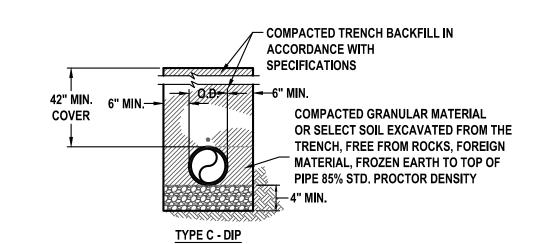
NOT TO SCALE

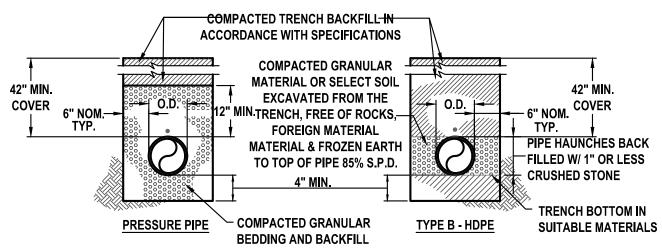


1. BLOCK UP PIPE TO PROVIDE MINIMUM CLEARANCE INDICATED.
2. CONTRACTOR SHALL INSTALL TIE DOWNS TO PREVENT F FLOATING.
3. PROVIDE 3" MIN. COVER FOR REINFORCING STEEL.

CONCRETE ENCASEMENT DETAIL

NOT TO SCALE



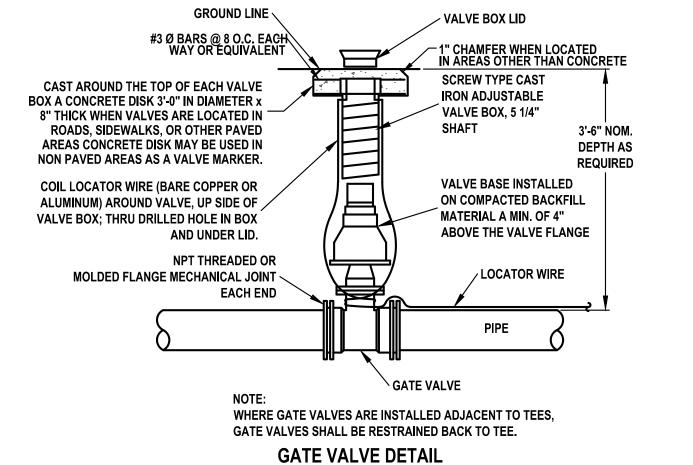


PRESSURE PIPING NOTE:

- 1. NO BEDDING REQUIRED FOR HDPE IN SUITABLE SOILS.
- 2. SUITABLE SOILS ARE MATERIALS FREE OF ROCKS OR FOREIGN MATERIALS GREATER THAN 1-1/2"Ø.
- 3. PLACE TRACER WIRE ALONG TOP OF ALL PRESSURE PIPING.
- 4. INSTALL UNDER GROUND WARNING MARKING TAPE INSTALL 18" BELOW FINISHED GRADE.

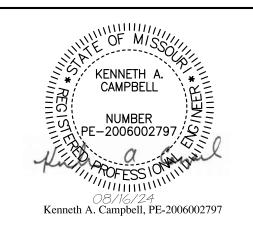
 OUT OF TRAFFIC PIPE INSTALLATION DETAIL

 NOT TO SCALE



NOT TO SCALE

STATE OF MISSOURI MICHAEL L. PARSON, GOVERNOR





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

SULLIVAN, MISSOURI

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REVISION:

7815214072

DATE: ISSUE DATE: 08/18/24

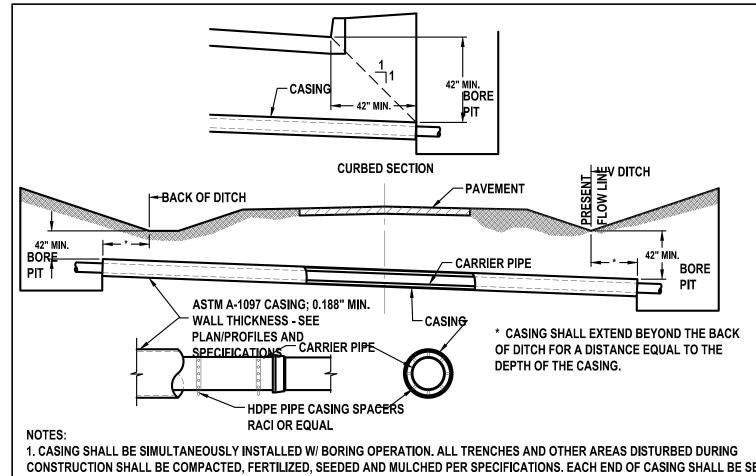
CAD DWG FILE:C-501.DWG
DRAWN BY: JSM
CHECKED BY: KAC
DESIGNED BY: KAC

SHEET TITLE:

CIVIL DETAILS-WATER

SHEET NUMBER:

C-501



CONSTRUCTION SHALL BE COMPACTED, FERTILIZED, SEEDED AND MULCHED PER SPECIFICATIONS. EACH END OF CASING SHALL BE SEALED WITH PULL-ON RUBBER END SEALS WITH STAINLESS STEAL BANDS, CCI OR EQUAL. ANNULAR SPACE BETWEEN CARRIER PIPE & CASING SHALL BE VOID.

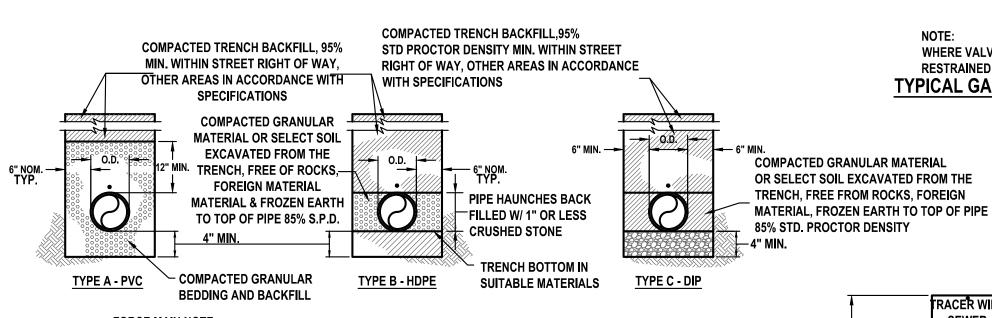
2. UNDERGROUND UTILITY CROSSINGS WILL BE CONTINUOUSLY ENCASED UNDER THROUGH ROADWAYS, THE MEDIAN, RAMPS AND SHOULDER AREAS WITH THE CASING EXTENDING TO THE TOE OF THE FILL SLOPES OR TO THE DITCH LINE. IN CURB SECTIONS, THE ENCASEMENT WILL EXTEND OUTSIDE THE OUTER CURB OF THE ROADWAYS A DISTANCE EQUAL TO THE DEPTH OF THE ENCASEMENT AT THE CURB LINE.

UTILITY VERTICAL DEPTH / ENCASEMENT REQUIREMENTS ON MoDOT R / W							
		DEP	THS				
UTILITY	SIZE	PARRLLEL		MIN. REQUIRED ENCASEMENT MATERIAL			
CABLE TV (COAXIAL NON-FIBER)	N/A	24"	30"	DUCT (ENCLOSURE TUBULAR CASING OR RACEWAY)			
ELECTRIC	N/A	30"	30"	DUCT (ENCLOSURE TUBULAR CASING OR RACEWAY)			
COPPER CABLE	N/A	24"	30"	DUCT (ENCLOSURE TUBULAR CASING OR RACEWAY)			
FIBER OPTIC CABLE	N/A	30"	42"	SMOOTH WALL, WELDED STEEL PIPE			
FIBER OPTIC CABLE	N/A	30"	72"	POLYETHYLENE (PE) PLASTIC AND TRACEABLE			
NATURAL GAS PIPELINE OF (PE) PLASTIC	> 6"	30"	30"	SMOOTH WALL, WELDED STEEL PIPE			
NATURAL GAS PIPELINE OF (PE) PLASTIC	> 6"	30"	72"	SMOOTH WALL, WELDED STEEL PIPE			
NATURAL GAS PIPELINE OF (PE) PLASTIC	6"	30"	72"	NONE, TRACEABLE			
SEWER	N/A	30"	30"	NONE OTHERWISE SMOOTH WALL, WELDED STEEL PIPE			
WATER	2"	42"	42"	NONE, IF COPPER, TYPE K			
WATER	> 2"	42"	42"	SMOOTH WALL, WELDED STEEL PIPE			
WELDED STEEL PIPELINES	N/A	30"	30"	NONE			

) MATERIAL MADE OF VITRIFIED CLAY, REINFORCED CONCRETE OR CAST IRON, EXCEPT WHEN INSTALLATION PROCEDURES WOULD PRODUCE VIODS IN THE ROADBED, HEAVY FILLS OR INSTALLATION UNDER PRESSURE

IN ACCORDANCE WITH ACCEPTED PIPELINE CONSTRUCTION STANDARDS CONDUITS PERMITTED OR ENCASEMENT SHALL BE NEW MATERIAL OR EQUIVALENT AND SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST REVISION OF THE MHTC STANDARD SPECIFICATIONS FOR REINFORCED CONCRETE PIPE CULVERT CAST IRON OR DUCTILE IRON PIPE CORRUGATED METAL SECTIONAL PLATE CULVERT PIPE VITRIFIED CLAY CULVERT PIPE CORRUGATED METAL CULVERT PIPE ONLY WHERE DESIGN PRACTICES WOULD PERMIT ITS USE AS A CROSSROAD CULVERT

TYPICAL HIGHWAY CROSSING BORE / ENCASEMENT DETAILS NOT TO SCALE



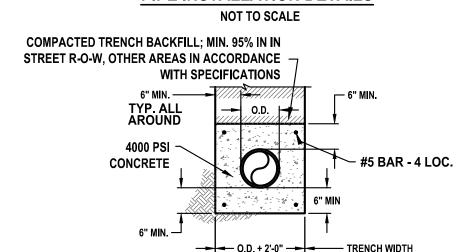
FORCE MAIN NOTE:

1. NO BEDDING REQUIRED FOR HDPE IN SUITABLE SOILS.

2. SUITABLE SOILS ARE MATERIALS FREE OF ROCKS OR FOREIGN MATERIALS GREATER THAN 1-1/2"Ø.

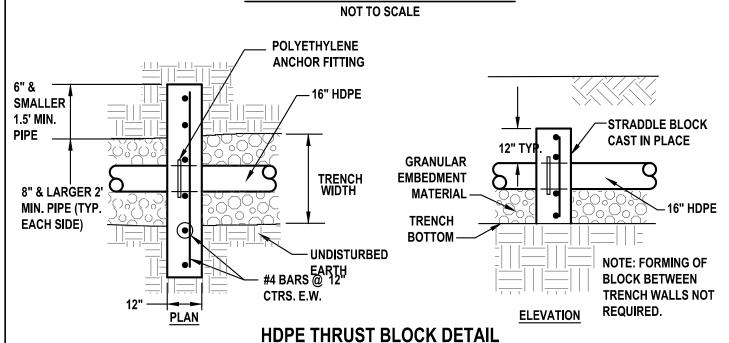
3. PLACE TRACER WIRE ALONG TOP OF ALL FORCE MAIN PIPING.

PIPE INSTALLATION DETAILS

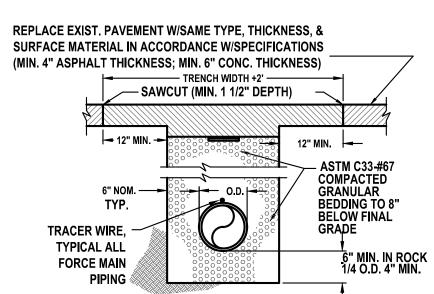


1. BLOCK UP PIPE TO PROVIDE MINIMUM CLEARANCE INDICATED. 2. CONTRACTOR SHALL INSTALL TIE DOWNS TO PREVENT F FLOATING. 3. PROVIDE 3" MIN. COVER FOR REINFORCING STEEL

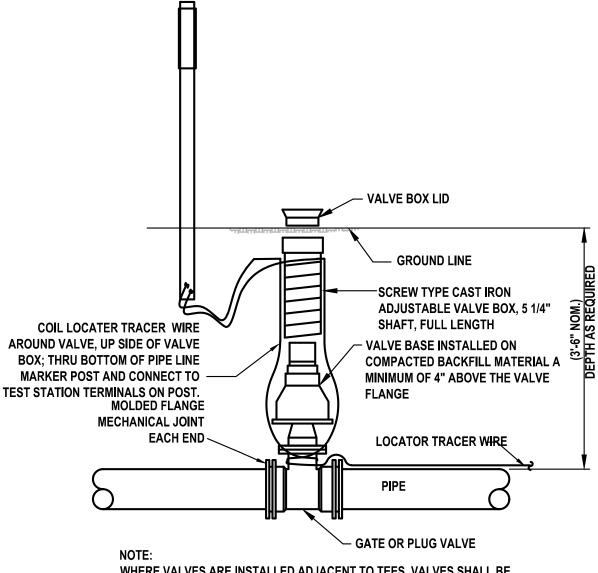
CONCRETE ENCASEMENT DETAIL



NOT TO SCALE



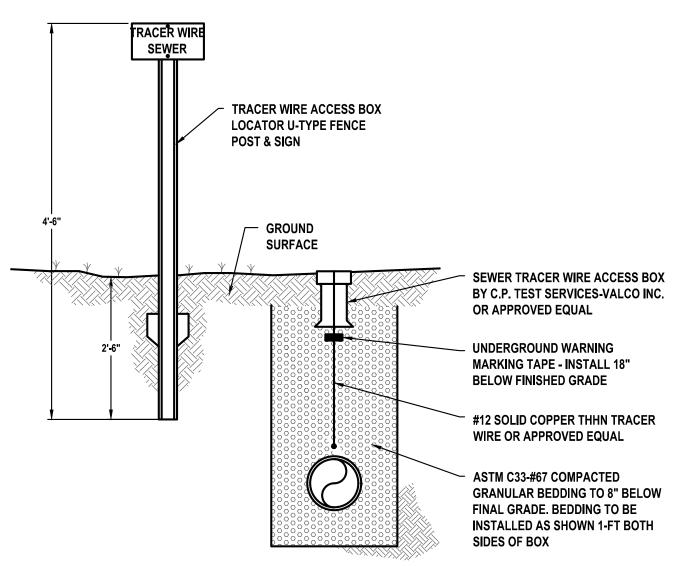
UNDER STREET AND DRIVEWAYS BEDDING AND RESTORATION DETAIL



WHERE VALVES ARE INSTALLED ADJACENT TO TEES, VALVES SHALL BE RESTRAINED BACK TO TEE.

TYPICAL GATE AND PLUG VALVE INSTALLATION DETAIL **NOT TO SCALE**

COMPACTED GRANULAR MATERIAL



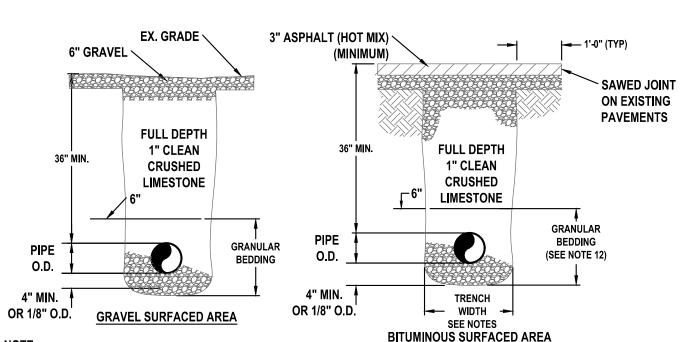
I. COLLAR & COVER OF ACCESS BOX SHALL BE COMPRISED OF ASTM A48, CLASS 25 CAST IRON.

THE ACCESS BOX BODY SHALL BE COMPRISED OF ASTM D 1788 ABS PLASTIC. THE COVER SHALL HAVE THE WORD "SEWER" EMBOSSED INTO IT FOR EASY IDENTIFICATION OF THE UTILITY TYPE. THE COVER SHALL HAVE A STANDARD AWWA SIZE PENTAGONAL BOLT FOR ACCESS RESTRICTION TO BOX.

5. THE COVER SHALL HAVE TWO STAINLESS STEEL TERMINAL BOLTS FOR CONNECTION OF TRACER WIRE TO THE COVER.

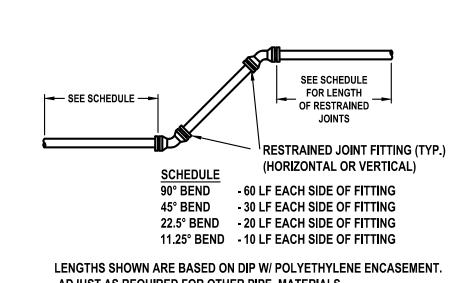
- CONTRACTOR TO PROVIDE NECESSARY PROTECTION FROM GALVANIC REACTION. SIGN POST SHALL BE 10-GUAGE STEEL U-CHANNEL WITH ASTM A 123 HOT-DIPPED GALVANIZED FINISH.
- LOCATER POSTS & ACCESS BOXES SHALL BE SPACED AT 200 FEET.
- CONTRACTOR SHALL COORDINATE LOCATION OF ACCESS BOX, MARKER POSTS, AND SIGNAGE WITH CITY. 9. TRACER WIRE SHALL BE INSTALLED AT TOP OF PIPE ALONG ENTIRE LENGTH OF FORCEMAIN.
- 10. UNDERGROUND WARNING MARKING TAPE SHALL BE INSTALLED WITH ALL NEW SEWER PIPING.
- A. TAPE SHALL BE LABELED "BURIED SEWER LINE BELOW" (BY TERRA TAPE, PRO-LINE SAFETY PRODUCTS OR B. TAPE SHALL BE PLACED 18" BELOW FINAL GRADE AND SHALL BE INSTALLED IN THE SEWER LINE TRENCH.
- 11. PRICE BID FOR FORCE MAIN SHALL INCLUDE THE COST OF MARKING TAPE.

TRACER WIRE ACCESS BOX DETAIL NOT TO SCALE



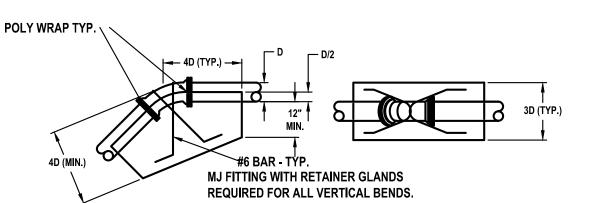
EMBEDMENT MATERIAL DIAMETER FOR PLASTIC PIPE SHALL BE NO GREATER THAN 1/2" INCH FOR 4-INCH DIAMETER PIPE, 3/4" INCH FOR 6 AND 8-INCH DIAMETER PIPE, AND 1-INCH FOR PIPE DIAMETERS 10-INCHES AND GREATER.

TRENCHING BACKFILL METHODS NOT TO SCALE



ADJUST AS REQUIRED FOR OTHER PIPE MATERIALS.

RESTRAINED JOINT PIPE SCHEDULE / DETAIL

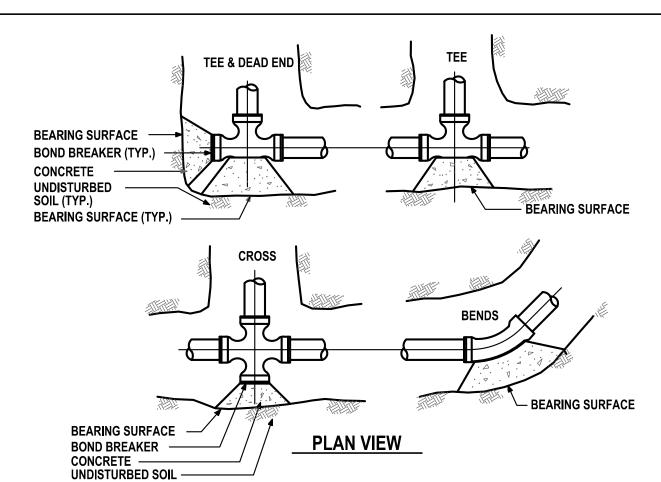


1. THRUST BLOCKS ARE BASED ON A WORKING PRESSURE OF 200 P.S.I., PLUS 0% SURGE, & 2000 P.S.F. ALLOWABLE SOIL BEARING PRESSURE.

2. FOR PIPE SIZES NOT SHOWN USE DIMENSIONS FOR NEXT LARGER SIZE.

3. USE 3/8" PLYWOOD SEPARATOR BETWEEN BLOCKS AND PLUGS TO PROVIDE FOR FUTURE REMOVAL

4. WRAP ALL FITTINGS W/6 MIL POLY PRIOR TO PLACEMENT OR CONCRETE THRUST BLOCKING. **VERTICAL BEND THRUST BLOCK DETAIL** NOT TO SCALE



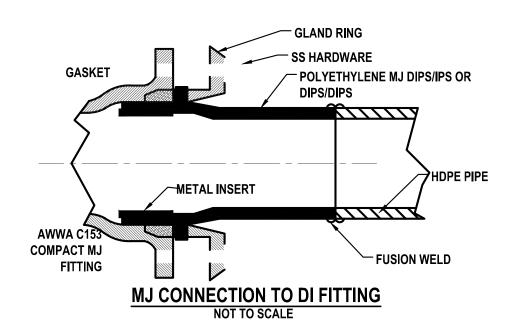
MINIMUM THRUST BLOCK BEARING SURFACE IN SQUARE FEET						
PIPE SIZE	TEES & DEAD ENDS	90° BEND	45° BEND	22-1/2° BEND		
6"	2.5	3.6	2.0	2.0		
8"	4.4	6.2	3.4	2.0		
10"	7.2	10.2	5.5	2.8		
12"	10.3	14.5	7.9	4.0		
14"	13.9	19.6	10.7	5.4		
16"	18.0	25.4	13.8	7.0		

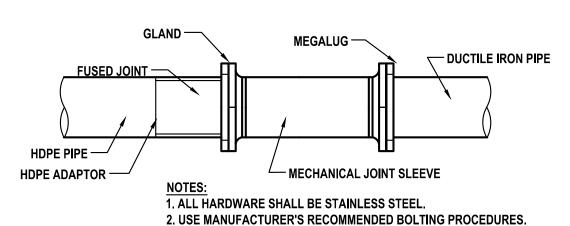
2. BEARING SURFACE BASED ON BEARING STRENGTH OF 3000 P.S.F. AND MAIN PRESSURE OF 200 P.S.I.. FOR MAINS **GREATER THAN 16" OR VERTICAL THRUSTS SHOW AREA** REQUIREMENT ON STANDARD DETAILS.

1. THRUST BLOCKS MUST BE CAST IN PLACE CONCRETE

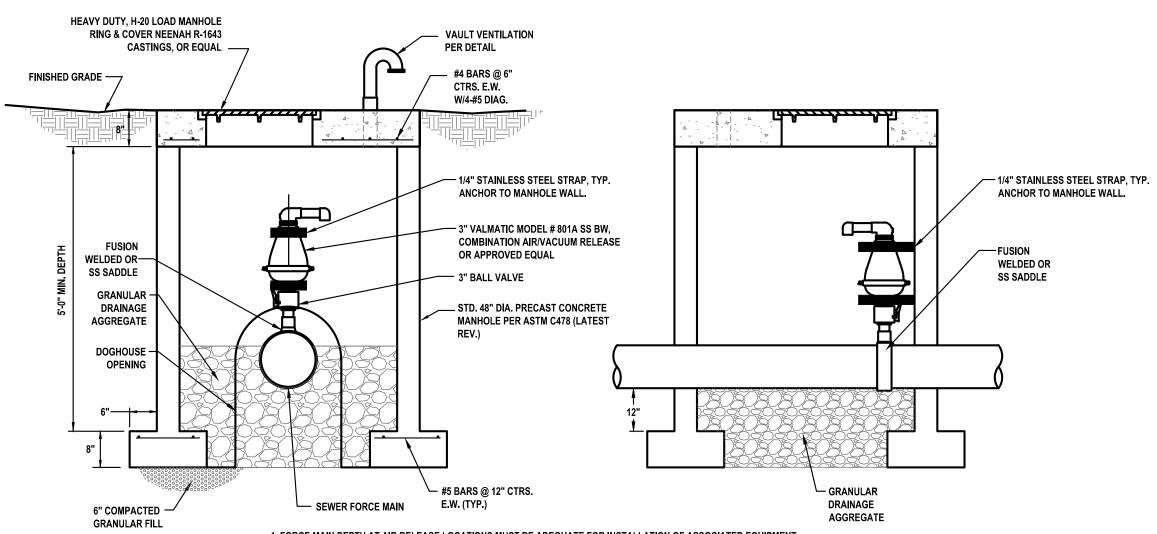
3. BOND BREAKER TO BE MINIMUM OF 8 MIL POLYETHYLENE PLASTIC.

THRUST BLOCK DETAIL





SOLID DI SLEEVE CONNECTIONS TO HDPE PIPE DETAIL

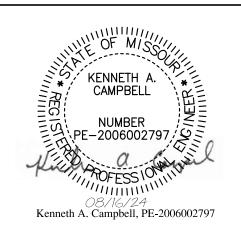


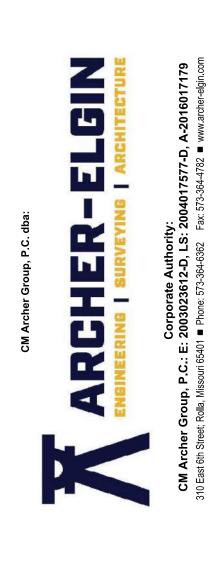
1. FORCE MAIN DEPTH AT AIR RELEASE LOCATIONS MUST BE ADEQUATE FOR INSTALLATION OF ASSOCIATED EQUIPMENT. 2. SEWAGE AIR RELEASE VALVE AND ALL ACCESSORIES SHALL BE BY THE MANUFACTURER. 3. SEWER MAIN TO BE 12" MINIMUM ABOVE BOTTOM OF MANHOLE BACKFILL WITH GRANULAR BEDDING TO PIPE SPRING LINE. 4, CON SHIELD ANTI MICROBIAL ADDITIVE OR APPROVED EQUAL SHALL BE INCLUDED IN THE CONCRETE MIX IN THE AMOUNT & MANNER RECOMMENDED BY THE MANUFACTURER OF THE ADDITIVE THE ADDITIVE SHALL BE ADDED INTO THE CONCRETE MIX WATER TO INSURE EVEN DISTRIBUTION OF THE ADDITIVE THROUGHOUT THE CONCRETE MIXTURE. CON SHIELD COLOR IDENTIFIER-INDICATOR SHALL BE APPLIED TO THE INTERIOR OF EACH STRUCTURE IN ACCORDANCE W/ THE MANUFACTURER'S SPECIFICATIONS. 5. CONTRACTOR SHALL SUPPORT VALVE WITH STAINLESS STEEL STRAPS ANCHORED TO MANHOLE WALL.

FORCE MAIN COMBINATION AIR & VACUUM RELEASE VALVE ASSEMBLY DETAIL

NOT TO SCALE

STATE OF MISSOURI MICHAEL L. PARSON, **GOVERNOR**





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MO

PROJECT # X2306-03 5214 FACILITY # 7815214051

REVISION: DNR SUBMITTAL DATE: 6-21-24 REVISION: ISSUED FOR BIDDING DATE: 08-16-24 **REVISION:** DATE:

ISSUE DATE: 08/16/24

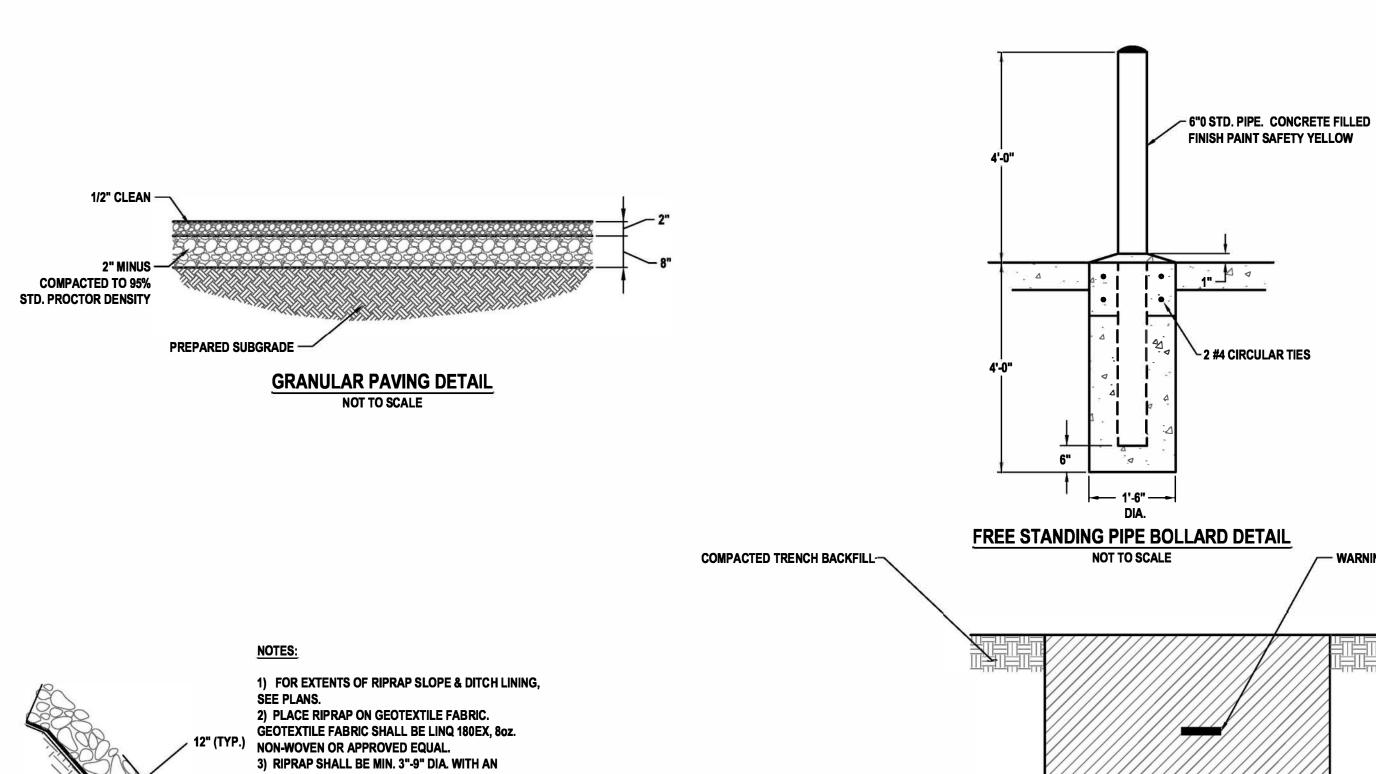
7815214072

CAD DWG FILE:JSM DRAWN BY: CHECKED BY: DESIGNED BY: KAC

SHEET TITLE:

CIVIL DETAILS WASTEWATER

SHEET NUMBER:



4) RIPRAP SHALL BE CRUSHED LIMESTONE (NO

5) ALL BRUSH AND ROOTS SHALL BE REMOVED BEFORE INSTALLATION OF GEOTEXTILE FABRIC.

RIPRAP LINED DITCH & SLOPE LINING

TYPICAL SECTION

LOOKING DOWNSTREAM

NOT TO SCALE

OR FLATTER

FILTER FABRIC

RIPRAP (MIN. 3"-9"

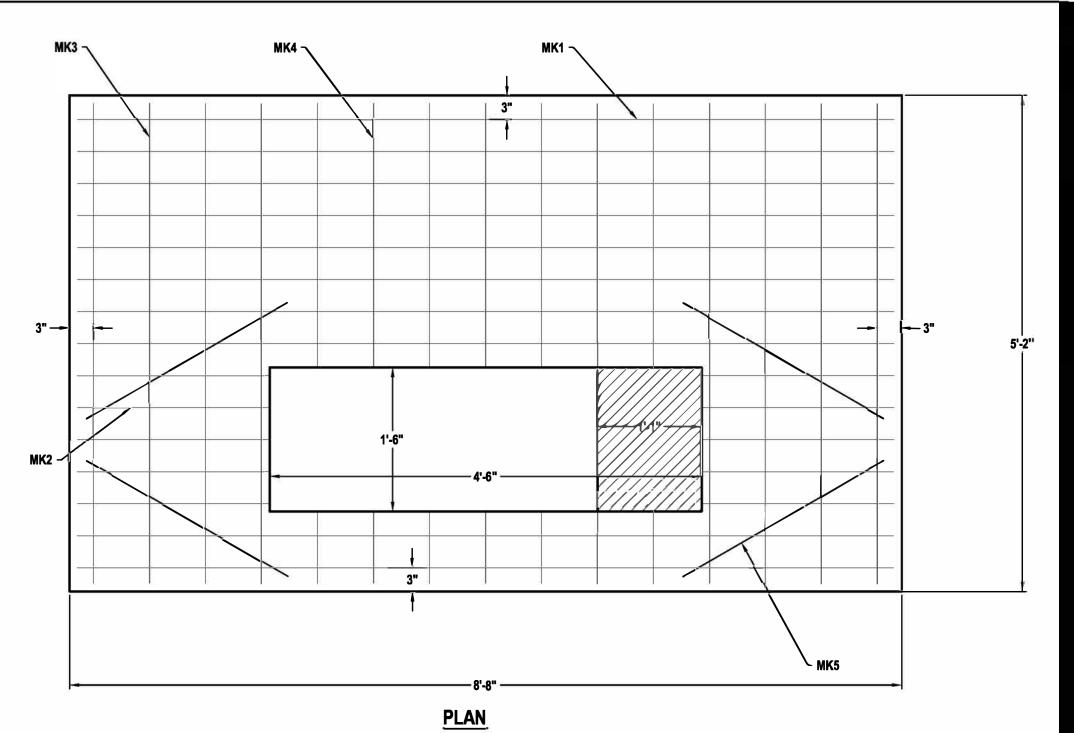
/ AVERAGE DIA. =

COMPACTED TRENCH BACKFILL NOT TO SCALE WARNING TAPE 12" BELOW FINISHED GRADE COMPACTED GRANULAR BEDDING FORCE MAIN PIPE INSTALLATION PER DETAIL PRIMARY CONDUCTORS

COMBINED UTILITY TRENCH DETAIL NOT TO SCALE

NOTES:

- 1. THE LOCAL ELECTRIC UTILITY WITH FURNISH AND INSTALL THE PRIMARY CABLE & CONDUIT.
- 2. THE TRENCH BOTTOM SHALL BE LEVEL AND FREE OF ANY SHARP OR LARGE OBJECTS GREATER THAN 1" IN DIAMETER.
- 3. KEEP THE TRENCH CLEAN, OPEN, & ACCESSIBLE UNTIL THE LOCAL ELECTRIC UTILITY INSTALLS THE CABLE. IN THE EVENT OF A CAVE- IN OR STANDING WATER, CLEAN OR RE-DIG THE TRENCH.
- 4. BACKFILL OVER CONDUIT SHALL BE CLEAN AND FREE OF ANY LARGE DEBRIS OR OBJECTS.
- 5. DITCH MARKING TAPE SHALL BE INSTALLED 12" BELOW FINISHED GRADE.
- 6. END TRENCH 10" FROM ENERGIZED TRANSFORMER PAD OR PEDESTAL. LOCAL ELECTRIC UTILITY WILL SPECIFY TRENCH LOCATION. USE CAUTION NEAR EQUIPMENT TO AVOID CABLE DIG-IN. CONTACT THE LOCAL ELECTRIC UTILITY SUPERINTENDENT OF CONSTRUCTION FOR FURTHER INFORMATION.
- 7. END TRENCH 6" FROM BASE OF POLE OR STAKED LOCATION. LOCAL ELECTRIC UTILITY WILL SPECIFY TRENCH LOCATION. USE CAUTION NEAR EXISTING RISER POLES TO AVOID CABLE DIG-IN. CONTACT THE LOCAL ELECTRIC UTILITY SUPERINTENDENT OF CONSTRUCTION FOR FURTHER INFORMATION.



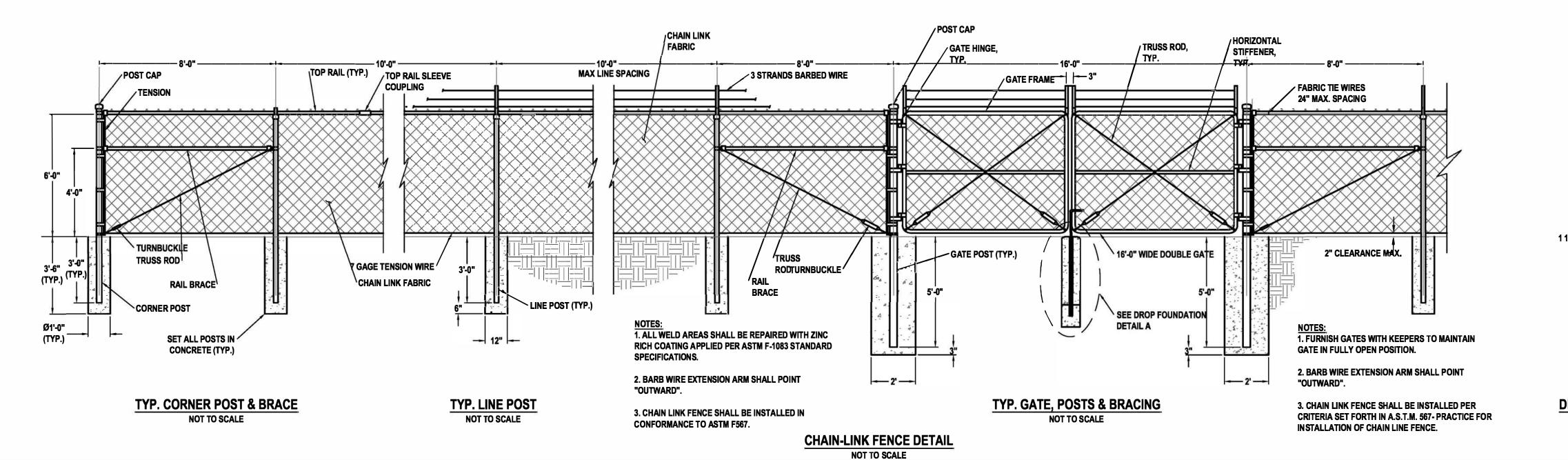
SECTION

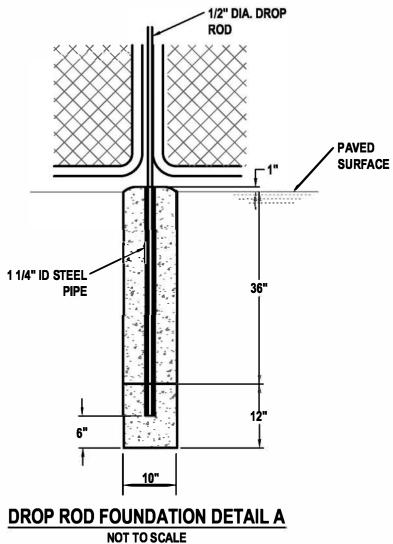
DIMENSIONS IN INCHES				REINFORCING BARS					
Α	В	С	D	E	MK1	MK2	MK3	MK4	MK5
104	100	10	54	8	12 #4 98" LONG	6 #4 19" LONG	6 #4 94" LONG	7 #4 66" LONG	4 #4 29" LONG

TRANSFORMER PAD DETAIL NOT TO SCALE

:S:

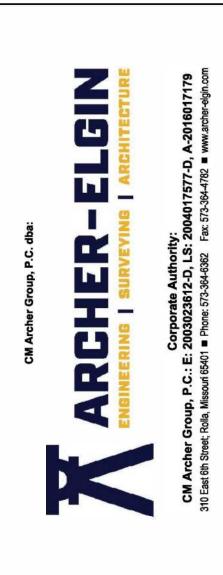
- 1. CONCRETE TESTING, 3,000 POUNDS MIN. PER SQUARE INCH; 4% TO 6% ENTRAINED AIR, 3/4" MAXIMUM SIZE AGGREGATE.
- 2. REINFORCING STEEL, ATSM- A615 GRADE 60, PLACE APPROX. 6" O.C. EACH WAY AND SECURELY TIED TOGETHER.
- 3. MINIMUM CONCRETE COVER OVER REINFORCING STEEL 2 INCHES UNLESS NOTED.
- 4. WOOD FLOAT FINISH, LEAVING NO DEPRESSIONS.





STATE OF MISSOURI MICHAEL L. PARSON, GOVERNOR





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

SULLIVAN, MO

PROJECT # X2306-03 SITE # 5214

FACILITY # 7815214051 7815214072

REVISION: DNR SUBMITTAL

DATE: 6-21-24
REVISION: ISSUE FOR BID DING
DATE: 08-16-24
REVISION:
DATE: _____

ISSUE DATE: 08/16/24

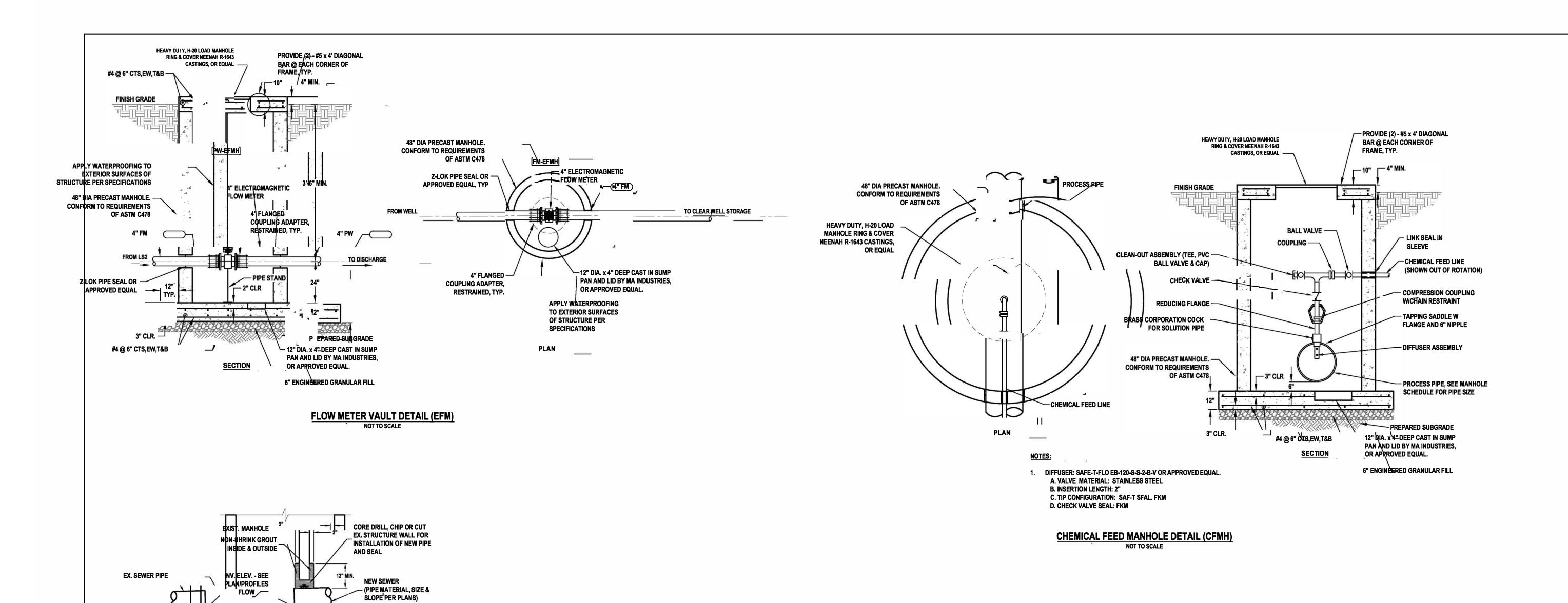
CAD DWG FILE:CD-503
DRAWN BY: JSM
CHECKED BY: KAC
DESIGNED BY: KAC

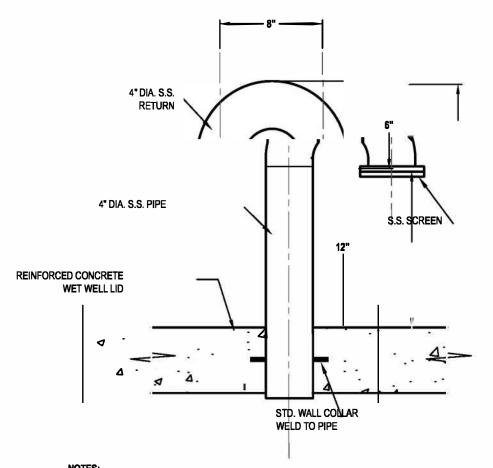
SHEET TITLE:

CIVIL DETAILS

SHEET NUMBER:

C-503





ROUT INVERET

CONNECTION TO EXISTING MANHOLE DETAIL

NOT TO SCALE

CONCRETE MANHOLE ADAPTORS

WATER STOP WITH S.S. BAND

(PIPE 4" - 12" DIA. OR PVC ELASTOMERIC

(PIPES OVER 12" DIA.) FERNCO OR EQUAL

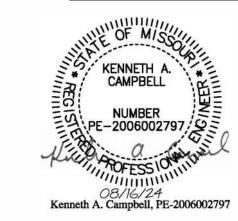
NOTES:

1. ALL VENTILATION PIPING SHALL BE STAINLESS STEEL.

2. APPLY BITUMINOUS COMPOUND TO EXTERIOR OF S.S. PIPE EMBEDDED IN/IN CONTACT 3. SCREEN SHALL CONSIST OF T-304 S.S. WIRE MESH, 40x40, WIRE DIA = 0.01" SANDWICHED BETWEEN S.S. CLASS 150, ASME B16.5 FLANGES. ALL HARDWARE SHALL BE STAINLESS

PUMP STATION WET WELL VENTILATION DETAIL NOT TO SCALE

STATE OF MISSOURI MICHAEL L. PARSON, **GOVERNOR**





OFFICE OF ADMINISTRATION **DIVISION OF FACILITIES** MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MO

PROJECT # X2306-03 5214 FACILITY # 7815214051

REVISION: DNR SUBMITTAL DATE: 6 21-24 REVISION: ISSUED FOR BIDDING DATE: 08-16-24 **REVISION:**

7815214072

DATE: ISSUE DATE: 08/16/24

CAD DWG FILE:CD-504 DRAWN BY: CHECKED BY: KAC DESIGNED BY: KAC

SHEET TITLE:

CIVIL DETAILS

SHEET NUMBER:

PROJECT NAME: **MERAMEC STATE PARK WATER & WASTEWATER IMPROVEMENTS SULLIVAN, MISSOURI**

SEC 12, T40W R2W DESCRIPTION:

STATE OF MISSOURI, MISSOURI STATE PARKS <u>DEVELOPER NAME</u>

P.O. BOX 176 JEFFERSON CITY, MISSOURI 65102

PROJECT DESCRIPTION: PROJECT INVOLVES THE CLEARING, GRADING AND CONSTRUCTION ASSOCIATED WITH THE IMPLEMENTATION OF IMPROVEMENTS TO THE EXISTING WELL, WWTF AND WATER DISTRIBUTION SYSTEM. CONSTRUCTION ACTIVITIES WILL INCLUDE: CLEARING AND GRADING OF SITE; INSTALLATION OF UTILITIES, INCLUDING ELECTRIC, SANITARY STORM & WATER; CONCRETE PLACEMENT; PAVING; EQUIPMENT INSTALLATION; ETC. THE APPROPRIATE BEST MANAGEMENT PRACTICES WILL BE IMPLEMENTED TO PRESERVE EXISTING VEGETATION, LIMIT FLOODING OF SITE, PROVIDE FOR SOIL STABILIZATION AND LIMIT SEDIMENT LADEN STORM WATER LEAVING THE SITE.

RUNOFF COEFFICIENT: C = 0.40 (AVERAGE)

POST DEVELOPMEN

RUNOFF COEFFICIENT: C = 0.40 (AVERAGE)TOTAL AREA OF SITE: 6,896 ACRES

DISTURBED AREA: 7.8 ACRES

RECEIVING STREAM:

OUTFALL NO. 1: MERAMEC RIVER **OUTFALL NO. 2: ELM SPRING BRANCH**

SWPPP COORDINATOR:

MODNR REGIONAL OFFICE: 7545 S. LINDBERG

SUITE 210 ST. LOUIS MO 63125

MODNR PHONE:

SEQUENCE OF MAJOR ACTIVITIES

- POST A COPY OF THE PUBLIC NOTICE AT THE MAIN ENTRANCE TO THE SITE(S).
- DESIGNATE A SWPPP COORDINATOR WHO WILL BE RESPONSIBLE FOR OVERSIGHT OF ALL EROSION AND SEDIMENT CONTROL BMPS.
- BEGIN AND MAINTAIN A LOG BOOK DETAILING REGULAR INSPECTIONS AND MAINTENANCE OF BMPS.
- NOTIFY ALL CONTRACTORS PERFORMING WORK AT THE SITE ABOUT THE PRESENCE OF THE SWPPP AND ALL CONDITIONS AND REQUIREMENTS CONTAINED HEREIN.
- STABILIZE ANY BARE AREAS WITH SEED AND MULCH. INSTALL SILT FENCING OUTSIDE OF AREAS TO BE FILLED AND AROUND BORROW
- CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE.
- MAINTAIN VEGETATIVE BUFFER AROUND ALL DRAINAGE CHANNELS.
- PERFORM ALL CLEARING, GRUBBING, EXCAVATION AND GRADING FOR
- INSTALL SILT FENCING AT TOE OF FILL SLOPES. . EXCAVATE FOR PRIMARY UTILITIES (I.E. STORM SEWER, SANITARY SEWER, ETC.)
- 12. STABILIZE ANY DENUDED AREAS AND STOCKPILES WITHIN 14 DAYS OF LAST CONSTRUCTION ACTIVITY IN THAT AREA.
- . COMPLETE GRADING AND INSTALL PERMANENT SEEDING AND LANDSCAPING. 4. REMOVE SILT FENCING ONCE PERMANENT VEGETATION IS ESTABLISHED.

GENERAL NOTES

- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE. INCLUDING SAFETY OF ALL PERSONNEL AND PROPERTY DURING THE DURATION OF THE PROJECT. THIS REQUIREMENT WILL NOT BE LIMITED TO NORMAL WORK HOURS.
- THE LOCATIONS OF ALL UTILITIES INDICATED IN THE DRAWINGS HAVE BEEN DETERMINED BASED ON AVAILABLE INFORMATION. THEIR LOCATIONS SHOULD BE CONSIDERED APPROXIMATE. FURTHERMORE, ADDITIONAL UTILITIES MIGHT BE PRESENT THAT ARE NOT CURRENTLY SHOWN. THE CONTRACTOR SHALL CONTACT ALL NECESSARY UTILITY COMPANIES TO DETERMINE THE EXACT LOCATION OF ALL BURIED UTILITY LINES. PRIOR TO ANY SITE EXCAVATIONS. ALSO, STATE LAW (RSMO CHAPTER 319) REQUIRES A BURIED CABLE LOCATOR SERVICE TO BE CONTACTED PRIOR TO **EXCAVATION. CALL 1-800-DIG-RITE.**
- THE CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGE AND SUBSEQUENT REPAIR TO ANY UNDERGROUND UTILITIES ON THE SITE OR IMMEDIATE AREA. DURING THE COURSE OF CONSTRUCTION.
- CONTRACTOR SHALL RELOCATE/REPLACE EXISTING ITEMS AS NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS, INCLUDING, BUT NOT LIMITED TO, PROPERTY PINS, MAILBOXES, SHRUBS, FENCES, LANDSCAPING, UTILITIES, ETC. ANY PROPERTY PINS/MONUMENTS THAT ARE DISTURBED OR DESTROYED DURING CONSTRUCTION SHALL BE REPLACED UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF MISSOURI.
- THE CONTRACTOR SHALL RESTORE OFF-SITE AREAS DAMAGED BY CONSTRUCTION TO A CONDITION EQUAL TO OR BETTER THAN THE CONDITION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

EROSION CONTROL NOTES

- THE CONTRACTOR SHALL DEVELOP AND SUBMIT A SWPPP TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE SWPPP SHALL CONFORM TO THE REQUIREMENTS OF DIVISION 2. SPECIFICATION SECTION 02370 AND AS STATE HEREIN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MANAGING STORM WATER RUNOFF AND EROSION DURING THE COURSE OF CONSTRUCTION. THE EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPS) SHOWN ON THE PLANS SHALL BE CONSIDERED THE MINIMAL ACCEPTABLE BMPS FOR THE PROJECT. THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL BMPS AS DEEMED NECESSARY TO ADEQUATELY RETAIN SEDIMENT ON-SITE. ANY MODIFICATIONS TO THE PLANS SHALL BE DOCUMENTED USING THE APPROPRIATE FORMS, WHICH SHALL BE KEPT IN THE LOG BOOK. THE LOG BOOK SHALL BE KEPT ON THE JOB SITE AND SHALL BE AVAILABLE IMMEDIATELY FOR REVIEW BY GOVERNING **AUTHORITIES, AT THEIR REQUEST.**
- ALL BMPS SHALL BE INSPECTED ONCE A WEEK AND IMMEDIATELY AFTER EACH SIGNIFICANT RAIN EVENT (0.5-INCHES IN 24-HOURS). ALL APPROPRIATE MEASURES MUST BE TAKEN TO REPAIR BMPS IF DAMAGE IS OBSERVED DURING THE INVESTIGATIONS.
- THE APPROPRIATE INSPECTION AND MAINTENANCE FORMS MUST BE FILLED OUT DURING EACH INSPECTION. THE INSPECTION AND MAINTENANCE FORMS MUST BE SAVED IN THE LOG BOOK FOR THE PROJECT. THE LOG BOOK SHALL BE KEPT ON THE JOB SITE AND SHALL BE AVAILABLE IMMEDIATELY FOR REVIEW BY GOVERNING AUTHORITIES, AT THEIR REQUEST. THE INSPECTION AND MAINTENANCE FORMS MAY BE FOUND IN SPECIFICATION SECTION 02370, LOCATED IN THE PROJECT MANUAL.
- THE CONTRACTOR SHALL ESTABLISH A MINIMUM OF ONE TEMPORARY CONSTRUCTION ENTRANCE PER DEVELOPMENT SITE TO PROVIDE SITE ACCESS. ALL VEHICULAR ACCESS TO THE SITE(S) SHALL OCCUR VIA THE TEMPORARY CONSTRUCTION ENTRANCE.

EROSION CONTROL NOTES (CONT)

- NO AREA SHALL BE LEFT DENUDED FOR LONGER THAN 14 CONSECUTIVE DAYS. AREAS LEFT DENUDED FOR LONGER THAN 14 CONSECUTIVE DAYS WITHOUT HEAVY CONSTRUCTION TRAFFIC OR WORK SHALL BE TEMPORARILY SEEDED AND MULCHED SO AS TO LIMIT EROSION.
- 6. ALL TEMPORARY DIVERSION BERMS, DIVERSION DITCHES AND SOIL STOCKPILE AREAS SHALL BE SEEDED AND MULCHED IMMEDIATELY AFTER GRADING.
- WHERE POSSIBLE, THE CONTRACTOR SHALL MAINTAIN AND PROTECT EXISTING TREES AND VEGETATION.
- AFTER THE SITE HAS BEEN SEEDED AND PERMANENT VEGETATION HAS BEEN ESTABLISHED, THE CONTRACTOR SHALL REMOVE EACH BMP AS INDICATED ON EACH BMP DETAIL SHEET. EXCESS DEBRIS AND SEDIMENT SHALL BE REMOVED FROM EACH BMPS AND WASTED ON THE SITE IN SUCH A MANNER AS TO ELIMINATE ANY MOVEMENT OF THE MATERIAL OFF OF THE SITE.

EROSION CONTROL MAINTENANCE

- SILT FENCING SHALL BE INSPECTED DAILY DURING PERIODS OF RAINFALL, IMMEDIATELY AFTER EACH SIGNIFICANT RAINFALL EVENT, AND WEEKLY DURING PERIODS OF NO RAINFALL. REPAIRS TO SILT FENCES SHALL BE DONE IMMEDIATELY. SEDIMENT SHALL BE REMOVED FROM THE SILT FENCES WHEN THE SEDIMENT REACHES ONE-HALF THE HEIGHT OF THE SILT FENCE. LIMIT TO 1/4 ACRE PER 100-FT OF FENCE.
- EARTHEN BERMS SHALL BE REGULARLY INSPECTED, AND INSPECTED AFTER EACH RAINFALL EVENT. REPAIRS TO EARTHEN BERMS SHALL BE MADE IMMEDIATELY. IF THE EARTHEN BERM SHOWS SIGNS OF EROSION. AND IT IS DETERMINED THAT MATERIAL MUST BE ADDED TO FIX THE BERM, THE MATERIAL SHALL BE PROPERLY PLACED. COMPACTED AND RESEEDED. THE BERM SHALL BE RESEEDED AND STABILIZED, AS NEEDED, TO MAINTAIN ITS SOUNDNESS WHETHER OR NOT THERE HAS BEEN ANY RAINFALL.
- THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE INSPECTED REGULARLY, AFTER EVERY RAINFALL EVENT, AND DURING HIGH VOLUMES OF TRAFFIC. REPAIRS TO THE CONSTRUCTION ENTRANCE SHALL BE MADE IMMEDIATELY. ALL SEDIMENTS, AND ALL OTHER MATERIALS, TRACKED OFF SITE SHALL BE REMOVED IMMEDIATELY.
- DRAINAGE SWALES SHALL BE INSPECTED REGULARLY AND AFTER EVERY RAINFALL EVENT. REPAIRS TO DRAINAGE SWALES SHALL BE MADE IMMEDIATELY. IF THE FLOW CHANNEL AND/OR OUTLETS SHOW SIGNS OF DEFICIENCY, THE DAMAGED AREA(S) SHALL BE RESTABILIZED AND RESEEDED, AS NEEDED, TO PREVENT FURTHER DAMAGE.

MATERIALS MANGEMENT PRACTICES

- ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS. IF POSSIBLE, MATERIALS SHALL BE STORED UNDER A ROOF OR OTHER ENCLOSURE.
- PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE MANUFACTURER'S LABEL. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER. WHENEVER POSSIBLE, ALL OF THE PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER. THE MANUFACTURER'S RECOMMENDATIONS FOR THE PROPER USE AND DISPOSAL OF THEIR PRODUCTS SHALL BE FOLLOWED. THE CONSTRUCTION MANGER SHALL INSPECT THE ON-SITE MATERIALS DAILY TO ENSURE THE PROPER USE AND DISPOSAL.
- HAZARDOUS PRODUCTS SHALL BE KEPT IN ORIGINAL CONTAINERS UNLESS THEY ARE NOT REUSEABLE. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED. ALL FEDERAL, STATE AND CITY REGULATIONS SHALL BE FOLLOWED WHEN DISPOSING OF ANY HAZARDOUS WASTE.

SPILL CONTROL PRACTICES

- 1. ALL ON-SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND SHALL RECEIVE REGULAR PREVENTATIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE.
- 2. CONCRETE TRUCKS SHALL ONLY WASH-OUT OR DISCHARGE SURPLUS CONCRETE, OR DRUM-WASH WATER, AT DEDICATED CONCRETE TRUCK WASH-OUT AREAS. NO EXCESS CONCRETE OR DRUM WASH WATER SHALL BE RELEASED
- PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED.
- ALL ASPHALTIC SUBSTANCES USED ON-SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURERS RECOMMENDATIONS.
- 5. FERTILIZERS SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC CONTAINER TO AVOID SPILLS.
- ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY. THE MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE RELAYED TO SITE PERSONNEL AND THEY SHALL BE MADE AWARE OF THE LOCATION OF THE CLEANUP SUPPLIES. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE STORED ON-SITE. IN CASE OF A SPILL. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND CLEANUP PERSONNEL SHALL WEAR THE APPROPRIATE CLOTHING TO PREVENT INJURY FROM CONTACT WITH THE HAZARDOUS SUBSTANCE. SPILLS OF TOXIC AND HAZARDOUS MATERIAL. REGARDLESS OF THE SIZE OF THE SPILL. SHALL BE REPORTED TO THE APPROPRIATE STATE AND LOCAL GOVERNMENT AGENCIES IMMEDIATELY AFTER DISCOVERY.

SIGNIFICANT MATERIAL INVENTORY

THE FOLLOWING IS A LIST OF MATERIALS THAT MIGHT BE FOUND ON THE JOBSITE DURING CONSTRUCTION.

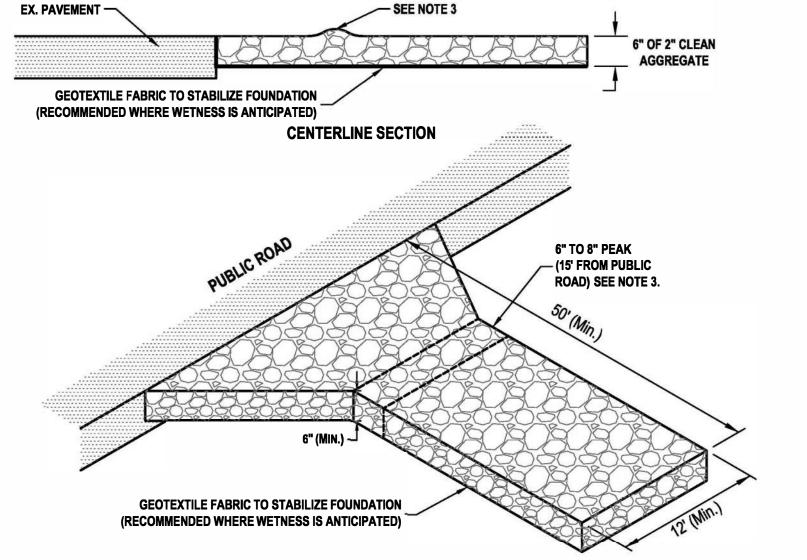
TRADE NAME/MATERIAL	CHEMICAL/PHYSICAL DESCRIPTION	STORM WATER POLLUTANTS
Erosion	Solid Particles	Soil, sediment
Fertilizer	Liquid or solid grains	Nitrogen, phosphorus
Pesticides (insecticides, fungicides, herbicides, rodenticides)	Various colored to colorless liquid, powder, pellets, or grains	Chlorinated hydrocarbons, organophosphates, carbonates, arsenic
Asphalt	Black solid	Oil, petroleum distillates
Concrete	White solid	Limestone, sand
Plaster	White granules or powder	Calcium Sulphate, calcium carbonate, sulfuric acid
Glue, adhesives	White or yellow liquid	Polymers, epoxies
Paints	Various colored liquid	Metal oxides, Stoddard solvent, talc, calclum carbonate, arsenic
Curing compounds	Creamy white liquid	Naphtha
Wood preservatives	Clear amber or dark brown liquid	Stoddard solvent, petroleum distillates, arsenic, copper, chromium.
Hydraulic oil/fluids	Brown oily petroleum hydrocarbon	Mineral oil
GasolineDiesel	Colorless, pale brown or pink petroleum	Benzene, ethyl benzene, toluene, xylene, MTBE
Fuel	hydrocarbon	Petroleum distillate, oil & grease, naphthalene, xvienes
Antifreeze/coolant	Clear, blue-green to yellow liquid Clear green/yellow liquid	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)

- THE PERMITTEE SHALL RETAIN A COPY OF THE GENERAL PERMIT, THE SWPPP, THE INSPECTION LOG, RESULTS OF ANY REQUIRED MONITORING AND ANALYSIS ON HAND AT ALL TIMES. THE AFOREMENTIONED INFORMATION SHOULD BE AVAILABLE FOR REVIEW BY LOCAL AGENCY OR **GOVERNMENT REPRESENTATIVE, DURING NORMAL BUSINESS HOURS.**
- 2. THE PERMITTEE SHALL PROVIDE A COPY OF THE SWPPP AND GENERAL PERMIT TO THOSE INDIVIDUALS WHO ARE RESPONSIBLE FOR THE INSTALLATION. OPERATION AND MAINTENANCE OF ANY BMP. A COPY OF THE SWPPP MUST BE PRESENT AT THE JOB SITE AT ALL TIMES.

- STRIP TOPSOIL ONLY FROM THOSE AREAS THAT WILL BE DISTURBED BY EXCAVATION, FILLING, ROAD BUILDING, OR COMPACTION BY EQUIPMENT. A 4-6 INCH STRIPPING DEPTH IS COMMON, BUT DEPTH VARIES DEPENDING ON THE SITE. DETERMINE DEPTH OF STRIPPING BY TAKING SOIL CORES AT SEVERAL LOCATIONS WITHIN EACH AREA TO BE STRIPPED. TOPSOIL DEPTH GENERALLY VARIES ALONG A GRADIENT FROM HILLTOP TO TOE OF THE SLOPE. PUT SEDIMENT BASINS, DIVERSIONS, AND OTHER CONTROLS INTO PLACE BEFORE STRIPPING.
- SELECT STOCKPILE LOCATION TO AVOID SLOPES AND NATURAL DRAINAGEWAYS, AVOIDING TRAFFIC ROUTES. ON LARGE SITES, RE-SPREADING IS EASIER AND MORE ECONOMICAL WHERE TOPSOIL IS STOCKPILED IN SMALL PILES LOCATED NEAR AREAS WHERE THEY WILL BE USED.
- 3. INSPECT AND MAINTAIN ALL BMPS LOCATED DOWN HILL OF AREA BEING GRADED, AS INDICATED. ADDITIONAL BMPS SHOULD BE CONSTRUCTED IF IT IS OBSERVED THAT THE PROPOSED BMPS ARE NOT EFFECTIVELY LIMITING SEDIMENT TRANSPORT FROM THE SITE. TYPICAL BMPS THAT MIGHT BE UTILIZED INCLUDE, BUT ARE NOT LIMITED TO:
- SEDIMENT BARRIERS USE SILT FENCES, STRAW BALE SEDIMENT TRAPS OR OTHER BARRIERS WHERE NECESSARY TO RETAIN SEDIMENT
- TEMPORARY SEEDING PROTECT TOPSOIL STOCKPILES BY TEMPORARILY SEEDING AS SOON AS POSSIBLE, NO MORE THAN 14 CALENDAR DAYS AFTER THE FORMATION OF THE STOCKPILE
- PERMANENT VEGETATION IF STOCKPILES WILL NOT BE USED WITHIN 12 MONTHS, THEY MUST BE STABILIZED WITH PERMANENT VEGETATION TO CONTROL EROSION AND WEED GROWTH

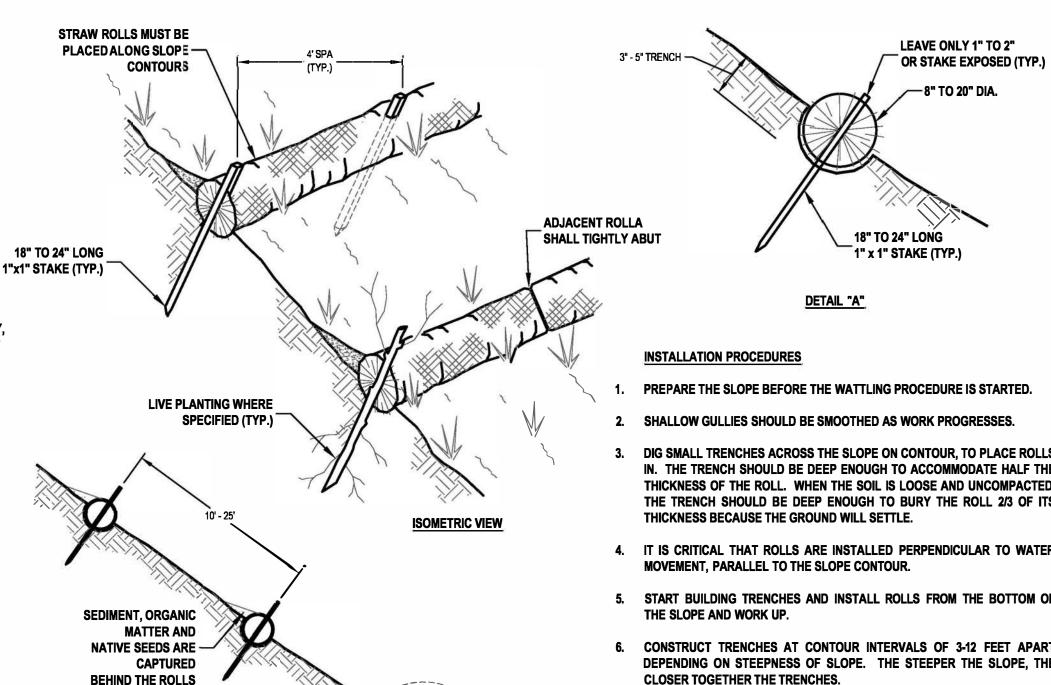
ADDITIONAL SITE MANAGEMENT BMPS

- 1. THE FOLLOWING IS A LIST OF ADDITIONAL SITE MANAGEMENT BMPS THAT WILL BE INCORPORATED TO PREVENT CONTAMINATION OF STORM WATER RUNOFF.
- PROVIDE TRASH CONTAINERS ONSITE AND PERFORM REGULAR SITE CLEAN UP FOR PROPER DISPOSAL OF SOLID WASTE. SOLID WASTE SHALL INCLUDE, BUT NOT BE LIMITED TO, SCRAP BUILDING MATERIALS, PRODUCT/MATERIAL PACKAGING, FOOD AND DRINK CONTAINERS.
- PROVIDE CONTAINERS FOR THE DISPOSAL OF WASTE PAINTS, SOLVENTS, CLEANING COMPOUNDS, ETC.
- 1.3. STORE CONSTRUCTION MATERIALS AWAY FROM DRAINAGE COURSES AND LOW AREAS.
- INSTALL CONTAINMENT BERMS AND DRIP PANS AT PETROLEUM PRODUCT AND LIQUID STORAGE TANKS
- CONCRETE TRUCKS SHALL NOT DISCHARGE SURPLUS CONCRETE OR WASH WATER ON THE GROUND OR INTO DITCHES ON SITE. DEDICATED CONCRETE TRUCK WASH-OUT AREAS WILL BE DESIGNED TO ENSURE CONCRETE PARTICLES WILL NOT BE RELEASED FROM THE CONSTRUCTION SITE.
- OTHER EROSION CONTROL MEASURES MAY BE IMPLEMENTED WITH THE WRITTEN CONSENT OF THE ENGINEER
- 3. ALL EROSION CONTROL MEASURES MUST MEET LOCAL REQUIREMENTS AND THE "PROTECTING WATER QUALITY, A FIELD GUIDE TO EROSION. SEDIMENT AND STORM WATER BEST MANAGEMENT PRACTICES FOR DEVELOPMENT SITES IN MISSOURI AND KANSAS" (BMP). THE BMP IS AVAILABLE FROM THE MISSOURI DEPARTMENT OF NATURAL RESOURCES AND CAN BE DOWNLOADED FROM THE DNR WEBSITE AT HTTP:/WWW.DNR.MO.GOV/ENV/WPP/WPCP-GUIDE.HTM.



- 1. AVOID LOCATING ON STEEP SLOPES OR AT CURVES ON PUBLIC ROADS. IF POSSIBLE, LOCATE WHERE PERMANENT ROADS WILL EVENTUALLY BE CONSTRUCTED.
- 2. REMOVE ALL VEGETATION AND OTHER UNSUITABLE MATERIAL FROM THE FOUNDATION AREA, GRADE AND CROWN FOR POSITIVE DRAINAGE.
- 3. IF ACCESS ROAD IS SLOPED TOWARD STREET, CONTRACTOR SHALL CREATE 6" TO 8" PEAK 15 FOOT FROM PUBLIC ROADWAY. CONTRACTOR SHALL GRADE PEAK TO DIVERT WATER AWAY FROM PUBLIC ROAD AND INTO NEAREST DRAINAGE SYSTEM.

TEMPORARY CONSTRUCTION ENTRANCE DETAIL



NOTE:

TYPICAL SECTION

- 1. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
- 2. SPACING SHALL DEPEND ON SOIL TYPE AND SLOPE GRADE.
- 3. WATTLES AT THE TOE OF SLOPES GREATER THAN 5:1 (H:V) MAY REQUIRE THE USE OF 20-INCH DIAMETER UNITS OR INSTALLATION ACHIEVING THE SAME PROTECTION (E.G., STACKED SMALLER DIAMETER STRAW WATTLES, ETC).

- PREPARE THE SLOPE BEFORE THE WATTLING PROCEDURE IS STARTED.
- 2. SHALLOW GULLIES SHOULD BE SMOOTHED AS WORK PROGRESSES.
- 3. DIG SMALL TRENCHES ACROSS THE SLOPE ON CONTOUR, TO PLACE ROLLS IN. THE TRENCH SHOULD BE DEEP ENOUGH TO ACCOMMODATE HALF THE THICKNESS OF THE ROLL. WHEN THE SOIL IS LOOSE AND UNCOMPACTED, THE TRENCH SHOULD BE DEEP ENOUGH TO BURY THE ROLL 2/3 OF ITS
- 4. IT IS CRITICAL THAT ROLLS ARE INSTALLED PERPENDICULAR TO WATER
- 5. START BUILDING TRENCHES AND INSTALL ROLLS FROM THE BOTTOM OF
- 6. CONSTRUCT TRENCHES AT CONTOUR INTERVALS OF 3-12 FEET APART DEPENDING ON STEEPNESS OF SLOPE. THE STEEPER THE SLOPE, THE
- 7. LAY THE ROLL ALONG THE TRENCHES FITTING IT SNUGLY AGAINST THE SOIL. MAKE SURE NO GAPS EXIST BETWEEN THE SOIL AND THE STRAW
- 8. USE A STRAIGHT BAR TO DRIVE HOLES THROUGH THE WATTLE AND INTO THE SOIL FOR THE WILLOW OR WOODEN STAKES.

9. DRIVE THE STAKE THROUGH PREPARED HOLE INTO SOIL. LEAVE ONLY 1

OR 2 INCHES OF STAKE EXPOSED ABOVE ROLL. 10. INSTALL STAKES AT LEAST EVERY 4 FEET APART THROUGH THE WATTLE. ADDITIONAL STAKES MAY BE DRIVEN ON THE DOWNSLOPE SIDE OF THE

TRENCHES ON HIGHLY EROSIVE OR VERY STEEP SLOPES.

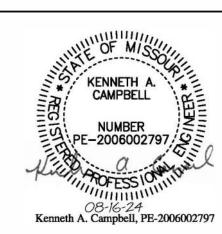
STORM EVENT (0.5-INCHES IN 24-HOURS).

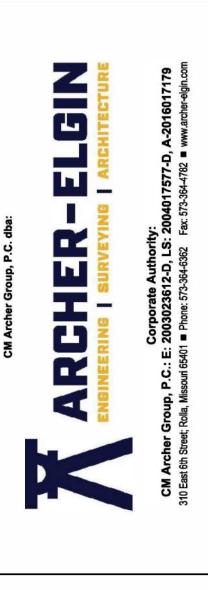
- **INSPECTION & MAINTENANCE PROCEDURES** 1. INSPECT SEDIMENTATION BASINS WEEKLY AND AFTER EACH SIGNIFICANT
- 2. ALL DAMAGES CAUSED BY SOIL EROSION OR CONSTRUCTION EQUIPMENT SHALL BE REPAIRED BEFORE THE END OF EACH WORKING DAY.
- 3. REMOVE SEDIMENT WHEN THE SEDIMENT STORAGE ZONE IS HALF FULL. THIS SEDIMENT SHALL BE PLACED IN SUCH A MANNER THAT IT WILL NOT ERODE FROM THE SITE. THE SEDIMENT SHALL NOT BE DEPOSITED DOWNSTREAM FROM THE EMBANKMENT OR IN OR ADJACENT TO A STREAM OR FLOODPLAIN.
- 4. WHEN TEMPORARY STRUCTURES HAVE SERVED THEIR INTENDED PURPOSE AND THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED. THE EMBANKMENT AND RESULTING SEDIMENT DEPOSIT SHALL BE LEVELED OR OTHERWISE DISPOSED OF IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.

STRAW WATTLE DETAIL

NOT TO SCALE

STATE OF MISSOURI MICHAEL L. PARSON **GOVERNOR**





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

STATE OF MISSOURI **DIVISION OF STATE PARKS** MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER & WASTEWATER **IMPROVEMENTS**

SULLIVAN, MISSOURI

PROJECT # X2306-03

5215 FACILITY # 7815214051 7815214072

REVISION: ISSUED TO MDNR DATE: 06-17-24 REVISION: ISSUED FOR BIDDING DATE: 08-16-24 **REVISION:**

CAD DWG FILE:C-501.DWG DRAWN BY:

ISSUE DATE: 08-16-24

DESIGNED BY: EMH SHEET TITLE:

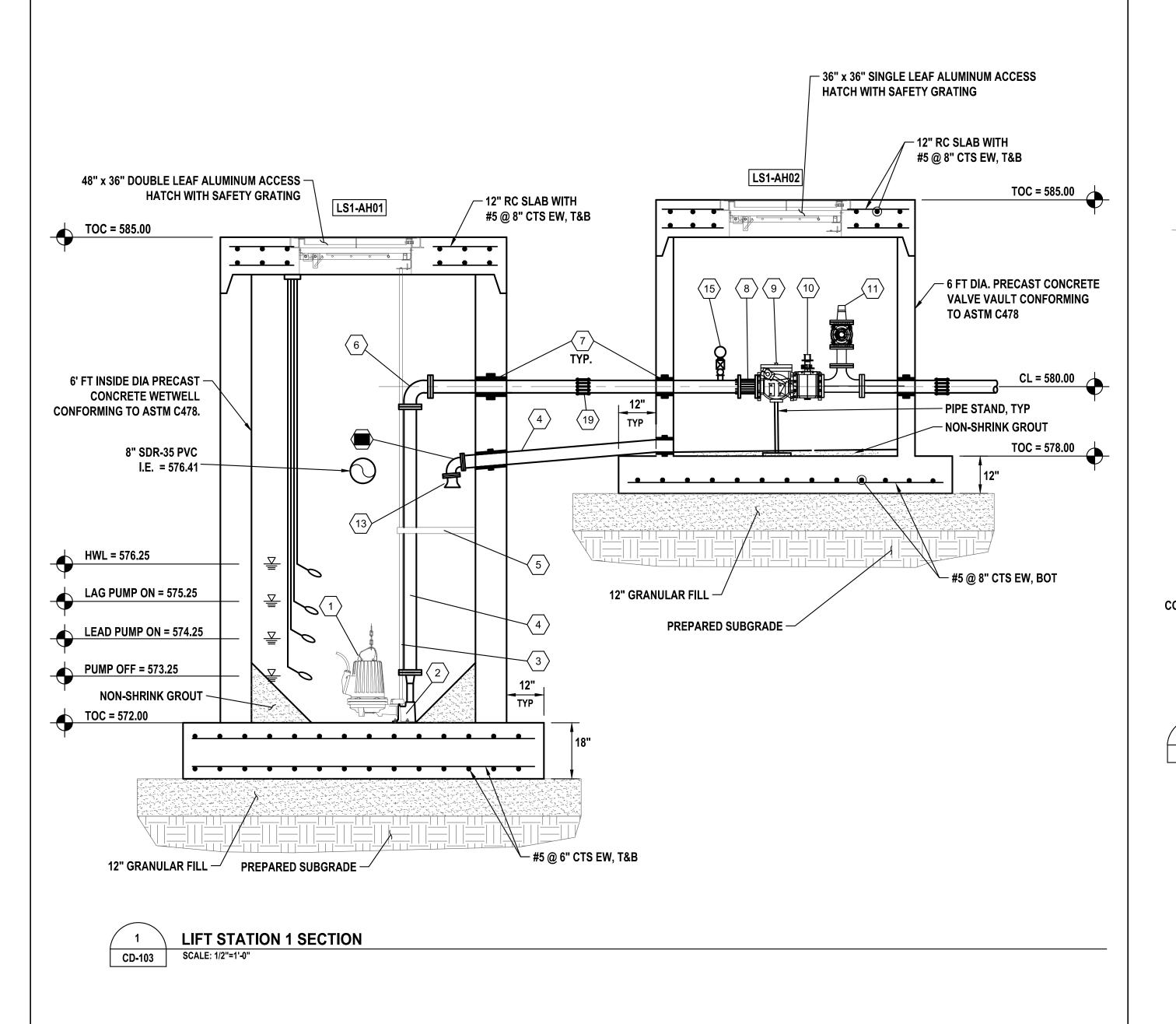
CHECKED BY: K

DATE:

EROSION CONTROL DETAILS

SHEET NUMBER:

36 OF 56 SHEETS 08-16-24



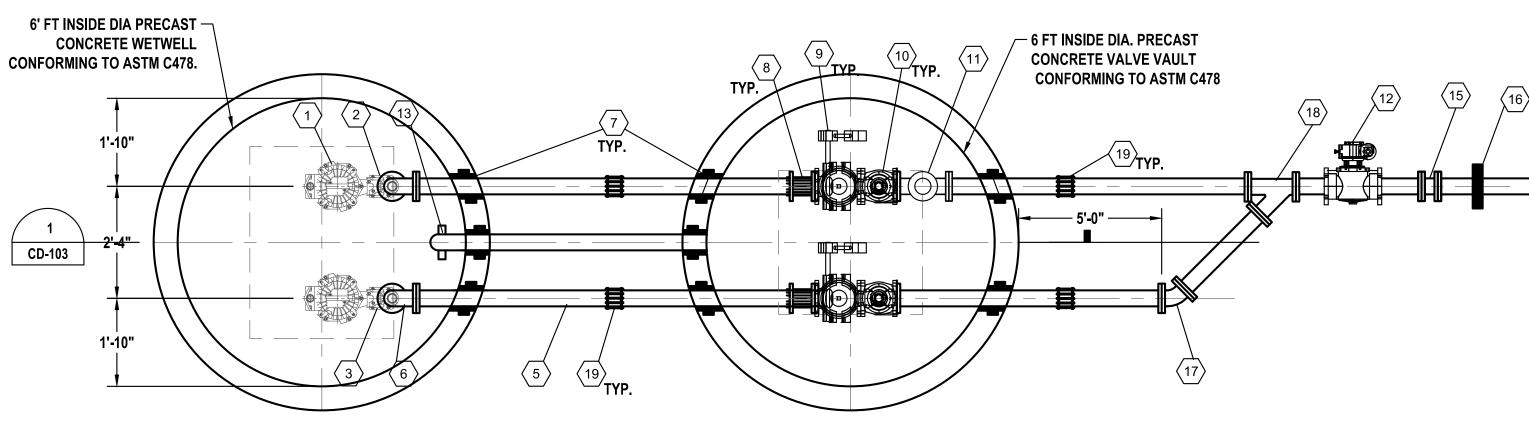
2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 2'-0" 10. 4 11. 6" 12. 6" 11. 6" 11. 6" 12. 0" 12. 4 13. 4 14. 5 15. 1 16. 1 17. 4 18. 1 19. 5 2'-0" 19. 6 10. 4 11. 6" 10. 4 11. 6" 12. 4" x 36" DOUBLE LEAF ALUMINUM ACCESS HATCH WITH SAFETY EW T&B ACCESS HATCH WITH SAFETY

GRATING

LIFT STATION 1 PLAN

SCALE: 1/2"=1'-0"

CD-103



GRATING

2 LIFT STATION 1 PLAN
CD-103 SCALE: 1/2"=1'-0"

GENERAL NOTES:

- ALL PIPING SHALL BE FULLY RESTRAINED, UNLESS OTHERWISE NOTED.
- 2. APPLY A TWO-COMPONENT AROMATIC POLYUREA COATING TO THE INTERIOR WALL AND FLOOR OF THE WETWELL STRUCTURE, PROVIDING A MONOLITHIC LINING OF THE WETWELL. THE COATING SYSTEM SHALL BE INSTALLED AFTER THE PLACEMENT OF NONSHRINK GROUT IN THE FLOOR AND ANY JOINTS IN THE STRUCTURE, BUT BEFORE THE INSTALLATION OF PROCESS PIPING AND EQUIPMENT, WITH THE EXCEPTION OF ANCHORAGE BOLTS FOR PUMP DISCHARGE ELBOW.
- 3. ALL HARDWARE (ANCHOR BOLTS, GUIDE RAILS, GUIDE RAIL BRACKETS, J-HOOKS, KELLUM GRIPS, ETC., SHALL BE TYPE 316L STAINLESS STEEL.
- 5. PRESSURE GAUGE ASSEMBLIES SHALL BE OMEGA PGH-160PSI/1/2 -100-SS- 1/4CG STAINLESS STEEL, LIQUID FILLABLE INDUSTRIAL PRESSURE GAUGE OR APPROVED EQUAL. PRESSURE GAUGE ASSEMBLY SHALL INCLUDE A DIAPHRAGM PRESSURE SEAL AND BALL VALVE.

KEY NOTES: (#)

- 1. SUBMERSIBLE GRINDER PUMP
- 2. DISCHARGE ELBOW
- 3. GUIDERAIL BRACKET, LOWER
- 4. 4" DIP
- 5. NOT USED
- 6. NOT USED
- 7. A-LOK PIPE SEAL OR APPROVED EQUAL
- 8. 4" FLG. COUPLING ADAPTOR
- 9. 4" CUSHION SWING CHECK VALVE
- 10. 4" LEVER OPERATED ECCENTRIC CHECK VALVE
- 11. QUICK CONNECT ASSEMBLY. CONSIST OF 4"x3" FLG. TEE, 3" SPOOL PIECE, 3" PLUG VALVE, 3" CAM-LOK STYLE QUICK CONNECT W/ DUST COVER
- 12. 4" MJ ECCENTRIC PLUG VALVE, BURIED SERVICE
- 13. 4" DUCKBILL CHECK VALVE
- 14. PUMP STATION VENTILATION PER DETAIL
- 15. INLINE CONCRETE ANCHOR
- 16. 4" MJ 45 DEG BEND
- 17. 4" MJ WYE
- 18. NOT USED
- 19. RESTRAINED FLEXIBLE COUPLING

DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

OFFICE OF ADMINISTRATION

STATE OF MISSOURI

MICHAEL L. PARSON,

GOVERNOR

´ KENNETH A.

CAMPBELL

NUMBER PE-2006002797/S

Kenneth A. Campbell, PE-2006002797

5

ARCHER

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

SULLIVAN, MO

PROJECT # X2306-03 SITE # 5214 FACILITY # 7815214051

REVISION: DNR SUBMITTAL
DATE: 6-21-24
REVISION: ISSUED FOR BIDDING
DATE: 08/16/24

7815214072

REVISION:
DATE:
ISSUE DATE: 08/16/2024

CAD DWG FILE:CD-102

CHECKED BY: KAC
DESIGNED BY: KAC

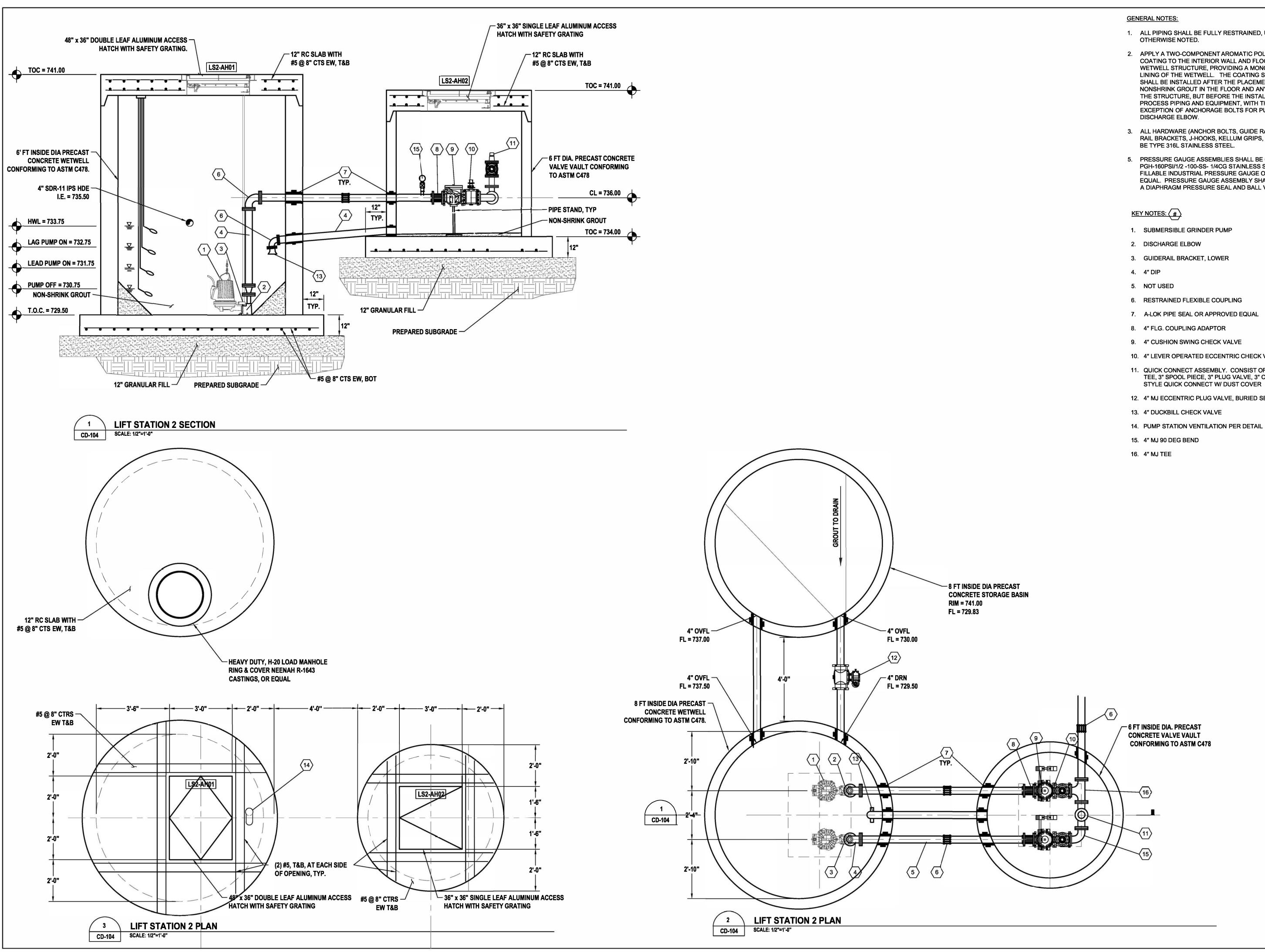
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DRAWN BY:

LIFT STATION 1
PLAN AND
DETAILS

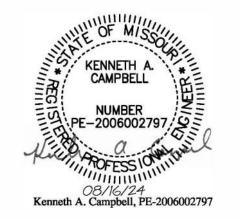
SHEET NUMBER:

|CD-101|



- 1. ALL PIPING SHALL BE FULLY RESTRAINED, UNLESS
- 2. APPLY A TWO-COMPONENT AROMATIC POLYUREA COATING TO THE INTERIOR WALL AND FLOOR OF THE WETWELL STRUCTURE, PROVIDING A MONOLITHIC LINING OF THE WETWELL. THE COATING SYSTEM SHALL BE INSTALLED AFTER THE PLACEMENT OF NONSHRINK GROUT IN THE FLOOR AND ANY JOINTS IN THE STRUCTURE, BUT BEFORE THE INSTALLATION OF PROCESS PIPING AND EQUIPMENT, WITH THE EXCEPTION OF ANCHORAGE BOLTS FOR PUMP
- 3. ALL HARDWARE (ANCHOR BOLTS, GUIDE RAILS, GUIDE RAIL BRACKETS, J-HOOKS, KELLUM GRIPS, ETC., SHALL
- 5. PRESSURE GAUGE ASSEMBLIES SHALL BE OMEGA PGH-160PSI/1/2 -100-SS- 1/4CG STAINLESS STEEL, LIQUID FILLABLE INDUSTRIAL PRESSURE GAUGE OR APPROVED EQUAL. PRESSURE GAUGE ASSEMBLY SHALL INCLUDE A DIAPHRAGM PRESSURE SEAL AND BALL VALVE.

- 7. A-LOK PIPE SEAL OR APPROVED EQUAL
- 10. 4" LEVER OPERATED ECCENTRIC CHECK VALVE
- 11. QUICK CONNECT ASSEMBLY. CONSIST OF 4"x3" FLG. TEE, 3" SPOOL PIECE, 3" PLUG VALVE, 3" CAM-LOK
- 12. 4" MJ ECCENTRIC PLUG VALVE, BURIED SERVICE
- 14. PUMP STATION VENTILATION PER DETAIL





OFFICE OF ADMINISTRATION **DIVISION OF FACILITIES** MANAGEMENT, **DESIGN AND CONSTRUCTION**

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MO

PROJECT # X2306-03 5214 FACILITY # 7815214051

REVISION: DNR SUBMITTAL DATE: 6-21-24 REVISION: ISSUED FOR BIDDING DATE: 08/16/24

7815214072

ISSUE DATE: 08/16/24

CAD DWG FILE:<u>CD-103</u> DRAWN BY: <u>JSM</u> CHECKED BY: K DESIGNED BY: KAC

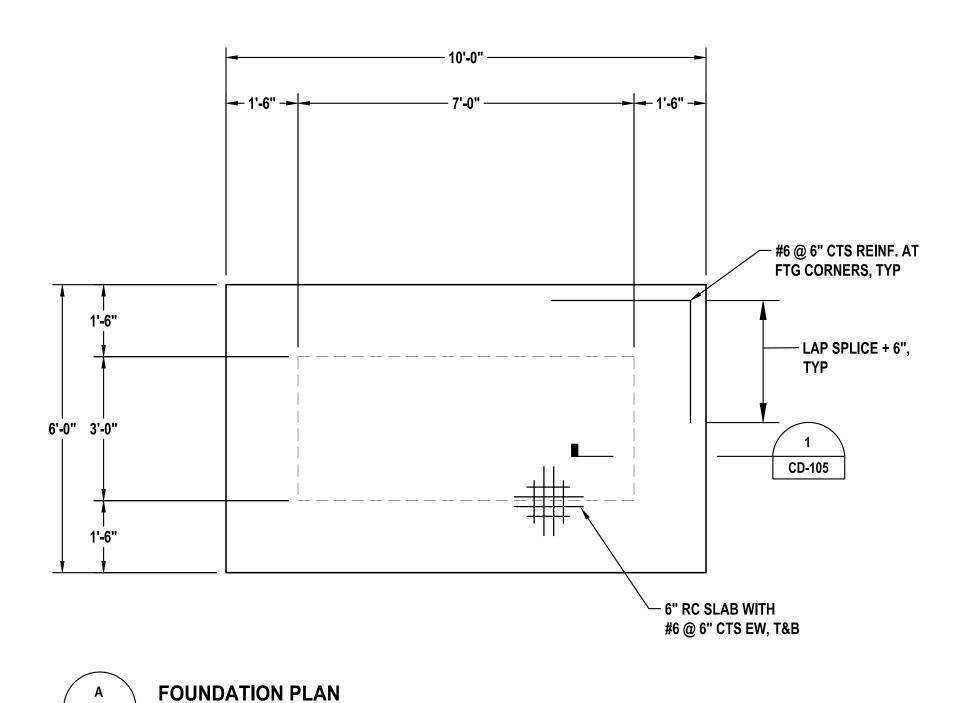
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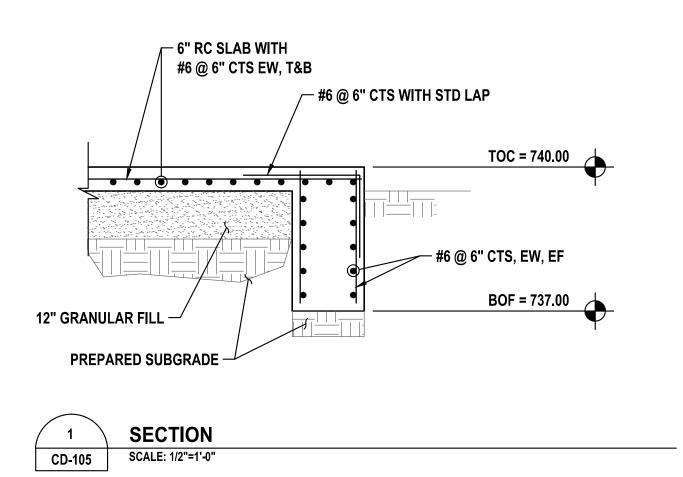
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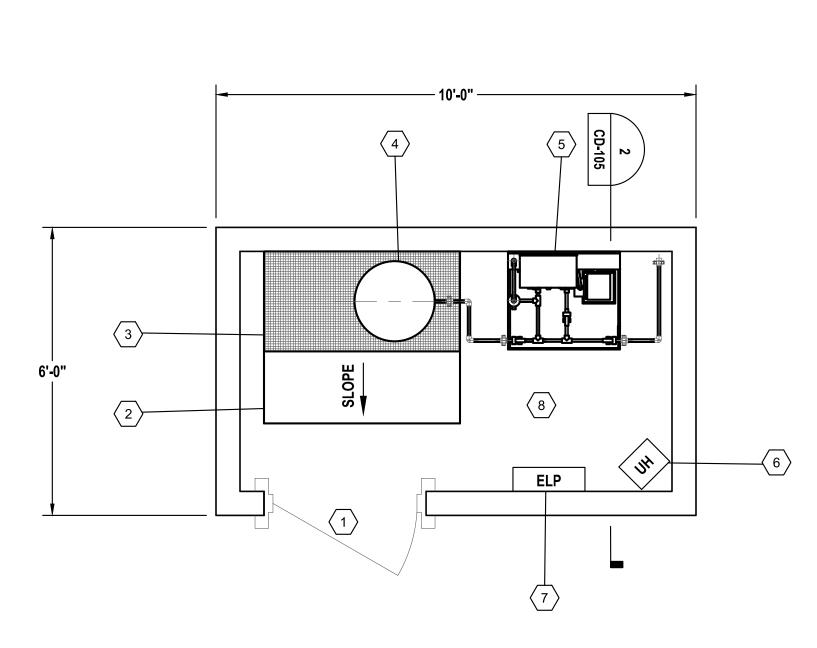
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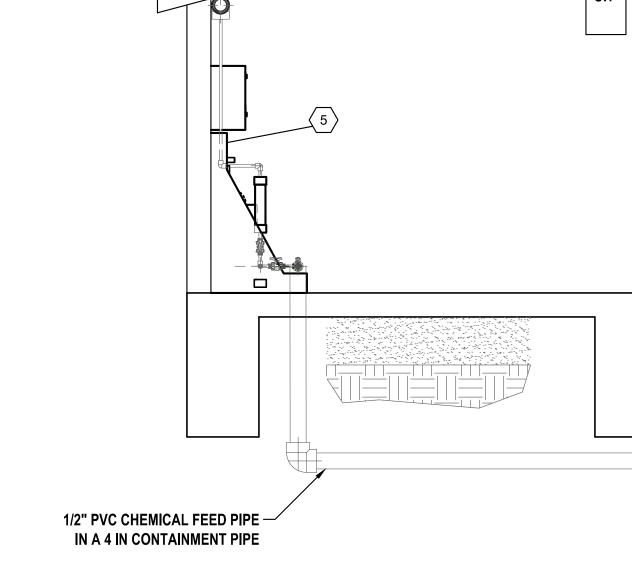
LIFT STATION 2 PLAN AND **DETAILS**

SHEET NUMBER:









SECTION

SCALE: 1/2"=1'-0"

CD-105

FLOOR PLAN CD-105 SCALE: 1/2"=1'-0"

SCALE: 1/2"=1'-0"

GENERAL NOTES:

- 1. CHEMICAL INJECTOR SHALL CONSIST OF A SAF-T-FLO EB120-S-S-2-B-V RETRACTIBLE INJECTOR QUILL, OR APPROVED EQUAL.
- 2. SEE SPECIFICATION SECTION 43 25 16 FOR DETAILS RELATING TO CHEMICAL METERING PUMP SKID ASSEMBLY.
- 3. PROCESS PIPING AND SPECIALTIES SHALL BE IN CONFORMANCE WITH DIVISION 33 SPECIFICATIONS.
- 3.A. EXPOSED CALCIUM NITRATE SOLUTION LINES, FITTINGS AND VALVES SHALL CONSIST OF SCHD. 80 PVC.
- 3.B. BURRIED CALCIUM NITRATE SOLUTION LINES SHALL CONSIST OF BRAIDED PVC TUBE ENCLOSED WITHIN SCHD 40 PVC CONTAINMENT PIPING. CHEMICAL SOLUTION LINE SHALL BE INSTALLED IN ONE CONTINUOUS RUN BETWEEN THE CHEMICAL FEED BUILDING AND THE CHEMICAL FEED MANHOLE (CFMH).
- 4. ALL CHEMICAL FEED ROOM PIPING SHALL BE CLEARLY IDENTIFIED AS INDICATED IN SECTION 330597.
- 5. CONTRACTOR WILL BE RESPONSIBLE FOR BENCH SCALE TESTING OF PUMPED LIQUID RECIEVED AT LS2 FOR THE DETERMINATION OF FINAL REQUIRED CHEMICAL FEED DOSING.
- 6. ALL PIPING JOINTS, FITTINGS & VALVES SHALL BE RESTRAINED.
- 7. ALL NUTS, BOLTS & OTHER FASTENERS SHALL BE TYPE 316L STAINLESS STEEL. ALL HARDWARE SHALL BE TYPE 316L STAINLESS STEEL, UNLESS OTHERWISE NOTED
- 8. CONTRACTOR SHALL BE RESPONSIBLE FOR PIPING LAYOUT AND DIMENSIONS.

KEY NOTES: (#)

- 1. 3'-0" x 6'-8" MAN DOOR, NOM.
- 2. RAMP FOR SPILL CONTAINMENT DECK
- 3. SPILL CONTAINMENT DECK, 60 GAL MIN CAPACITY
- 4. 55 GALLON DRUM, CALCIUM NITRATE SOLUTION
- 5. CHEMICAL METERING SKID
- 6. ELECTRICAL LOAD PANEL
- 7. UNIT HEATER
- 8. PREMANUFACTURED CHEMICAL FEED BUILDING

STATE OF MISSOURI MICHAEL L. PARSON, **GOVERNOR**





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

MISSOURI STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER IMPROVEMENTS

SULLIVAN, MO

PROJECT # X2306-03 5214

FACILITY # 7815214051 7815214072

REVISION: <u>DNR SUBMITT</u>AL DATE: 6-21-24
REVISION: <u>ISSUED FOR BIDDING</u> DATE: 08/16/24 **REVISION:**

DATE: ISSUE DATE: 08/16/24

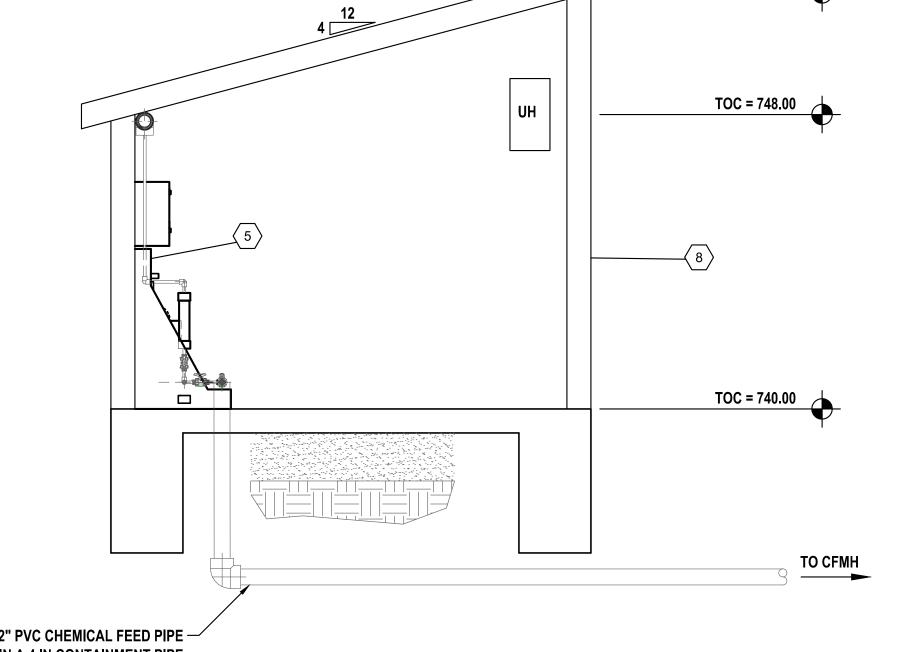
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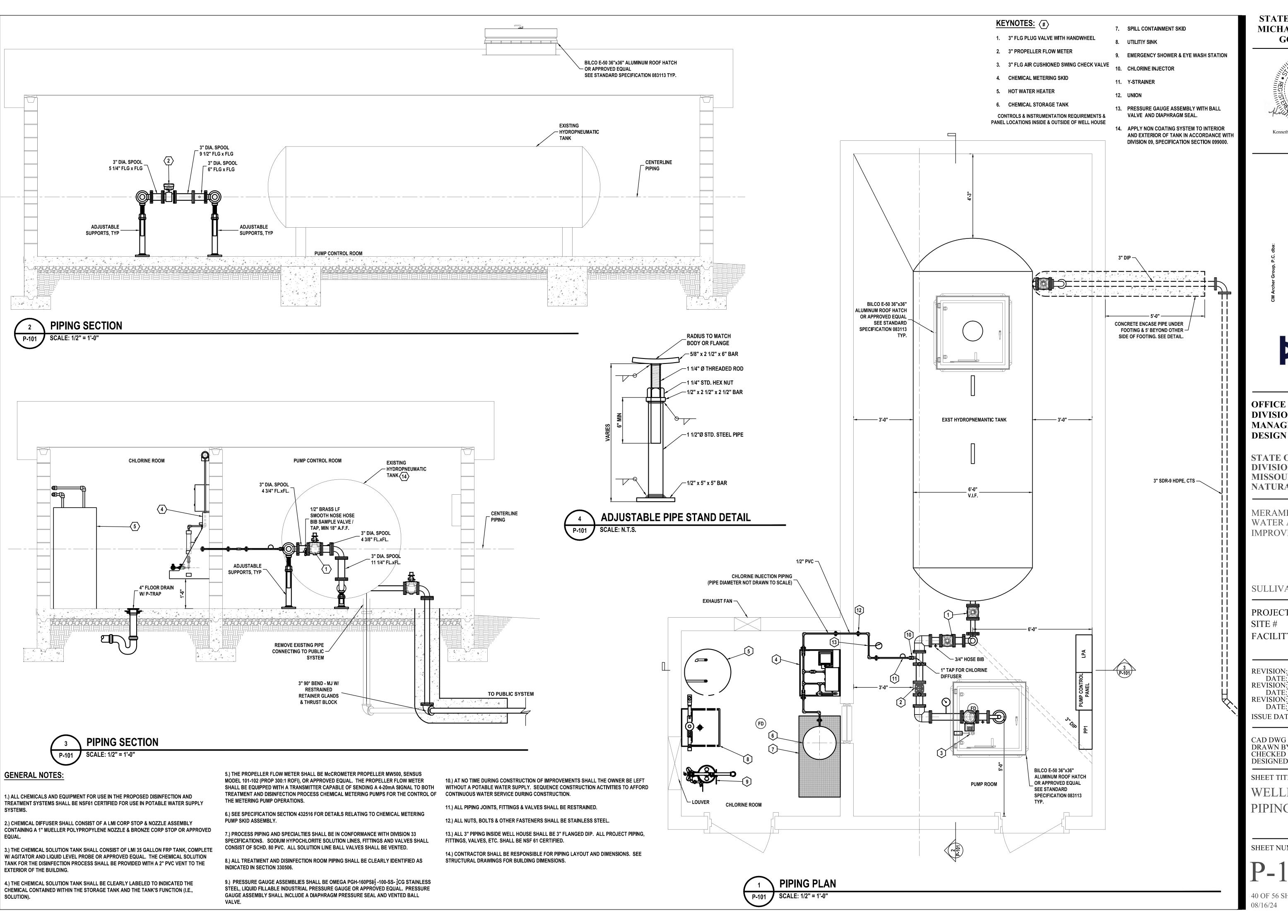
CHEMICAL FEED BUILDING DETAILS

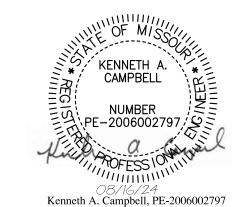
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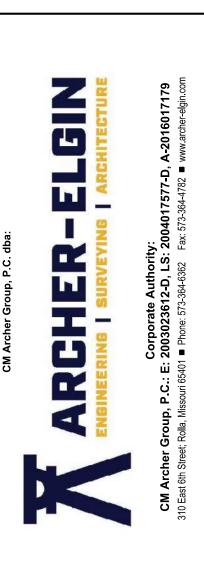
39 OF 54 SHEETS



TOC = 750.67







OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

STATE OF MISSOURI **DIVISION OF STATE PARKS** MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MISSOURI

PROJECT # X2306-03

FACILITY # 7815214051 7815214072

REVISION: ISSUED TO MDNR DATE: 05-17-2024 **REVISION:** ISSUED FOR BIDDING DATE: 08/16/24

ISSUE DATE: 08/16/24

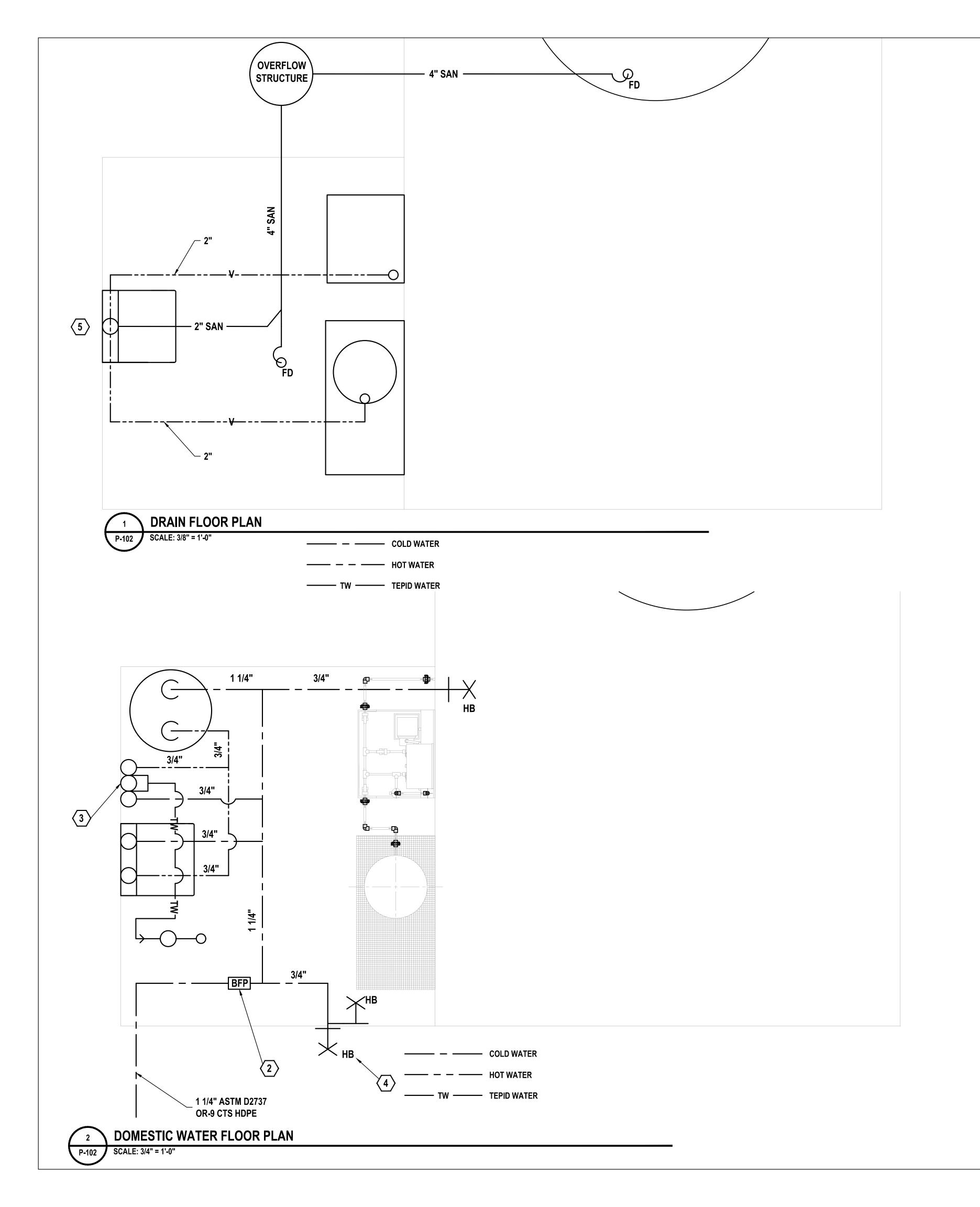
CAD DWG FILE:P-101.DWG DRAWN BY:

CHECKED BY: DESIGNED BY: KAC

SHEET TITLE:

WELLHOUSE PIPING PLAN

SHEET NUMBER:



GENERAL NOTES:

1.) ALL COMPONENT OF WATER SUPPLY SYSTEM SHALL BE NSF61 CERTIFIED.

2.) COMBINATION EYE WASH AND EMERGENCY SHOWER SHALL BE FLOOR MOUNTED SINGLE UNIT. SHOWER PORTION SHALL HAVE A 10 IN DIA STAINLESS STEEL SHOWER HEAD RATED AT 20 GPM WITH 1 IN IPS CHROME PLATED BRASS STAY-OPEN BALL VALVE AND 29 IN STAINLESS STEEL PULL ROD. THE EYE WASH PORTION SHALL HAVE FOUR SPRAY STAINLESS STEEL BOWL 1/2 IN STAY OPEN BALL VALVE AND LEVEL ACTUATOR. PROVIDE ANSI COMPLIANT IDENTIFICATION SIGN. GUARDIAN MODEL G199 OR APPROVED EQUAL.

3.) THERMOSTATIC MIXING VALVE TO SERVE EMERGENCY SHOWER AND EMERGENCY EYEWASH SHALL BE EXPOSED AND WALL MOUNTED. GUARDIAN G3800LF OR APPROVED EQUAL. OPERATING PARAMETERS:

- A. FLOW CONTROL RANGE 3 TO 44 GPM
- B. MAIN FLOW AT 30 PSI: 20 GPM
- C. MAIN FLOW AT MAX PRESSURE DROP 10PSIG: 25 GPM D. OUTPUT TEMPERATURE RANGE: 60 TO 90 DEG F.
- E. HW SUPPLY TEMPERATURE: 90 DEG
- F. SUPPLY PRESSURE RANGE: 40 TO 80 PSIG G. MIXING VALVE BYPASS: COLD WATER BYPASS IF VALVE SHOULD FAIL.

4.) POTABLE HOT WATER HEATER SHALL BE PROVIDED TO THERMOSTATIC MIXING VALVE FROM AN ELECTRIC STORAGE TYPE WATER HEATER. THE WATER HEATER SHALL HAVE AN ELECTRIC HEATING ELEMENT OF 3 KW, AND A 119 GPM

5.) PLUMBING:

STORAGE TANK.

A. POTABLE WATER SERVICE SHALL BE PROTECTED BY REDUCED PRESSURE FLOW PREVENTER APPROVED BY LOCAL PUBLIC UTILITY BUREAU AND STATE DEPARTMENT OF NATURAL RESOURCES UNIT SHALL HAVE TWO CHECK VALVES TEST COCKS PRESSURE DIFFERENTIAL RELIEF VALVE ISOLATION VALVES ASSEMBLED AS A UNIT, HORIZONTALLY MOUNTED.

B. ALL POTABLE WATER PIPING AND WATER SERVICE INSIDE BUILDING SHALL BY COPPER, TYPE L, WITH SOLDIER JOINTS, AND WROUGHT COPPER OR CAST BRASS FITTINGS.

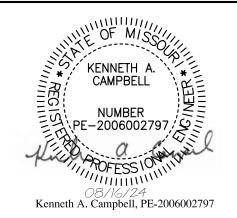
C. UTILITY SINK: FLOOR MOUNTED UTILITY SINK: MOLDED STONE SINGLE COMPARTMENT SINK APPROXIMATELY 20 IN x 17 IN x 13 IN. PROVIDE FOUR WHITE BAKED ENAMEL LEGS. SINGLE 2 IN DRAIN WITH GRID COVER. FIAT MODEL FL-1 OR APPROVED EQUAL.

D. HOSE BIB: ANTI SIPHON, VACUUM BREAKER PROJECTED WALL FAUCET WITH 3/4 IN HOSE THREAD, METAL WHEEL HANDLE, 3/4 IN INLET ROUGH BRASS FINISH. WOODFORD MODEL 24 OR APPROVED EQUAL.

KEYNOTES: (#)

- 1. BACKFLOW PREVENTER MOUNTED ABOVE UTILITY SINK
- 2. THERMOSSTATIC MIXING VALVE
- 3. 3/4" HOSE BIB, INSTALL 36 IN ABOVE FINISHED FLOOR
- 4. 4" VENT UP TO VENT THROUGH ROOF

STATE OF MISSOURI MICHAEL L. PARSON, **GOVERNOR**





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MISSOURI

PROJECT # X2306-03 5214 SITE#

FACILITY # 7815214051 7815214072

REVISION: ISSUED TO MDNR
DATE: 05-17-2024
REVISION: ISSUED FOR BIDDING DATE: 08/16/24 REVISION: DATE:

ISSUE DATE: 08/16/24

CAD DWG FILE:P-101.DWG DRAWN BY: CHECKED BY: KAC DESIGNED BY: KAC

SHEET TITLE:

WELLHOUSE PIPING PLAN

SHEET NUMBER:

GENERAL REQUIREMENTS:

- A. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY IN AND AROUND THE SITE AND FOR THE STRENGTH AND STABILITY OF ALL PARTIALLY COMPLETED STRUCTURES. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ADEQUATE TEMPORARY BRACING AND SHORING AS REQUIRED FOR THE STABILITY OF THE STRUCTURE AND STRUCTURAL COMPONENTS DURING ALL PHASES OF CONSTRUCTION AND FABRICATION. THE CONTRACTOR SHALL, AT HIS DISCRETION, EMPLOY A DULLY LICENSED AND REGISTERED PROFESSIONAL ENGINEER TO DESIGN ALL TEMPORARY BRACING, SHORING, AND OTHER WORKS NECESSARY TO COMPLETE THE WORK DESCRIBED IN THESE DOCUMENTS.
- B. CONSTRUCTION AND OTHER LOADS ARE TO BE KEPT WITHIN THE LIMITS OF THE DESIGN LOADS.

GENERAL NOTES:

- A. MECHANICAL UNITS SUPPORTED BY ROOF STRUCTURE ARE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER.
- B. DURING ERECTION OF THE BUILDING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY BRACING TO WITHSTAND ALL LOADS TO WHICH THE STRUCTURE MAY BE SUBJECTED, INCLUDING LATERAL LOADS, STOCKPILES OF MATERIAL AND EQUIPMENT. SUCH BRACING SHALL BE LEFT IN PLACE AS LONG AS REQUIRED FOR SAFETY AND UNTIL ALL FRAMING INCLUDING ROOF

FOUNDATION DESIGN:

- A. FOUNDATION DESIGN HAS BEEN BASED ON AN ASSUMED SOIL BEARING CAPACITY OF 1,500 P.S.F.
- B. FOOTINGS SHALL BE PLACED ON THE NATURAL UNDISTURBED SOIL, OR COMPACTED STRUCTURAL FILL, BELOW FROST DEPTH.
- C. REPORT ANY FINDINGS TO ENGINEER FOR RE-EVALUATION OF FOUNDATION DESIGN IF ASSUMED ALLOWABLE BEARING PRESSURE IS NOT PRESENT IN FOUNDATION LOCATIONS.

FOUNDATION AND EARTHWORK:

- D. MINIMUM DEPTH TO BOTTOM OF FOOTINGS SHALL BE 2'-6" BELOW LOWEST ADJACENT FINISHED GRADE FOR EXTERIOR FOOTINGS AND 1'-0" BELOW FINISHED FLOOR FOR INTERIOR FOOTINGS. UNLESS OTHERWISE NOTED.
- QUALITY ASSURANCE: AN ACCEPTABLE TESTING LABORATORY SHALL BE SELECTED AND PAID FOR BY THE CONTRACTOR TO PERFORM ALL REQUIRED LABORATORY AND FIELD SOIL TESTING NECESSARY TO DEMONSTRATE COMPLIANCE WITH THE COMPACTION REQUIREMENTS.
- 1-INCH MINUS (TYPE 1) AGGREGATE: AGGREGATE SHALL BE LIMESTONE OR DOLOMITE. THE AGGREGATE SHALL NOT CONTAIN MORE THAN 15-PERCENT DELETERIOUS ROCK AND SHALE. SAND MAY BE ADDED ONLY FOR THE PURPOSE OF REDUCING THE PLASTICITY INDEX OF THE FRACTION PASSING THE NO. 40 SIEVE IN THE FINISHED PRODUCT. ANY SAND, SILT AND CLAY AND ANY DELETERIOUS ROCK AND SHALE SHALL BE UNIFORMLY DISTRIBUTED THROUGHOUT THE MATERIAL. THE FRACTION PASSING THE NO. 40 SIEVE SHALL HAVE A MAXIMUM PLASTICITY INDEX OF SIX. THE AGGREGATE SHALL HAVE THE FOLLOWING GRADATION:

SIEVE	PERCENT BY WEIGH
PASSING 1-INCH	100
PASSING 1/2-INCH	60 TO 90
PASSING NO. 4	35 TO 60
PASSING NO. 30	10 TO 35

- G. BACKFILL MATERIALS: SHALL INCLUDE SUITABLE APPROVED MATERIALS FROM THE EXCAVATION AND/OR BORROW AREA(S). SHALL BE FRIABLE SANDY OR SILTY CLAY CONTAINING FINE MATERIAL SUFFICIENT TO PROVIDE A DENSE MASS FREE OF VOIDS AND CAPABLE OF SATISFACTORY COMPACTION. SHALL BE FREE OF ROOTS AND OTHER ORGANIC MATTER, REFUSE, CINDER, ICE, SNOW, FROZEN EARTH OR OTHER UNSUITABLE MATTER. DO NOT USE MATERIAL CONTAINING GRAVEL, STONES, OR SHALE PARTICLES GREATER IN DIMENSION THAN ONE-HALF THE DEPTH OF THE LAYER TO BE COMPACTED.
- EXCAVATION: EXCAVATE AREA ADEQUATE TO PERMIT ERECTION AND REMOVAL OF FORMS. TRIM EXCAVATION TO NEAT LINES WHERE CONCRETE IS TO BE PLACED AGAINST THE EARTH. EXCAVATE BY HAND ANY AREAS WHERE SPACE AND ACCESS WILL NOT PERMIT THE USE OF MACHINES. NOTIFY THE ENGINEER IMMEDIATELY WHEN EXCAVATION HAS REACHED THE DEPTH INDICATED. DO NOT PROCEED FURTHER UNTIL EXCAVATION IS APPROVED. RESTORE THE BOTTOM OF THE EXCAVATION TO PROPER ELEVATIONS IN AREAS OVEREXCAVATED WITH CONCRETE.
- COMPACTION FOR EMBANKMENT, BACKFILLING, AND SUBGRADE: PERFORM WETTING OR DRYING OF COMPACTED MATERIAL AS REQUIRED TO OBTAIN THE SPECIFIED DENSITY. MOISTURE CONTENT AT THE TIME OF PLACEMENT SHALL NOT BE LESS THAN THE OPTIMUM NOR MORE THAN 4-PERCENT ABOVE THE OPTIMUM AS DETERMINED BY ASTM D698. DO NOT PLACE SNOW, ICE OR FROZEN EARTH IN COMPACTED SOIL AND DO NOT PLACE COMPACTED SOIL ON A FROZEN SURFACE. REMOVE WASTE MATERIALS FROM SOILS TO BE COMPACTED. AN ACCEPTABLE TESTING LABORATORY SHALL BE SELECTED AND PAID FOR BY THE CONTRACTOR TO PERFORM ALL LABORATORY AND FIELD TESTING NECESSARY TO DEMONSTRATE COMPLIANCE WITH COMPACTION REQUIREMENTS. PERFORM TESTING IN ACCORDANCE WITH ASTM D698 WHERE "STANDARD PROCTOR" HAS BEEN INDICATED. THE SOIL DENSITY TESTING FREQUENCY SHALL BE AS FOLLOWS:
- I.A. FOR COMPACTED SUBGRADE, DENSITY TESTS REPRESENTATIVE OF EACH 500-SQURE YARDS OF SUBGRADE OR PER **EXCAVATION SHALL BE TAKEN.**
- FOR STRUCTURAL BACKFILL, DENSITY TESTS REPRESENTATIVE OF EACH 100-CUBC YARDS OF FILL OR PER EXCAVATION SHALL BE TAKEN
- BACKFILLING: PLACE BACKFILL TO THE ELEVATIONS INDICATED. IN AREAS REQUIRING 95-PERCENT COMPACTION, PLACE BACKFILL IN LIFTS NOT TO EXCEED EIGHT (8) INCHES (UNCOMPACTED DEPTH). PLACE TWELVE (12) INCH MAXIMUM LIFTS IN OTHER AREAS. OBTAIN COMPACTION SPECIFIED BY NORMAL METHODS AND EQUIPMENT. BACKFILL FAILING TO MEET

SPECIFIED DENSITIES SHALL BE REMOVED OR SCARIFIED AND RECOMPACTED TO MEET SPECIFIED DENSITIES.

- J.A. STRUCTURES: COMPACT BACKFILL TO 95-PERCENT OF THE MAXIMUM DENSITY (ASTM D698) UNDER ALL STRUCTURES AND IN EXCAVATIONS ADJACENT TO STRUCTURES. BACKFILL ONLY AFTER CONCRETE HAS OBTAINED 70-PERCENT OF ITS INTENDED DESIGN STRENGTH. BACKFILL ADJACENT STRUCTURES ONLY AFTER A SUFFICIENT PORTION OF THE STRUCTURE HAS BEEN COMPLETED TO RESIST THE IMPOSED SOIL LOADS. REMOVE ALL FORMS AND DEBRIS FROM THE EXCAVATION PRIOR TO BACKFILL. BACKFILL WITHIN 1-FT OF THE STRUCTURE SHALL BE FREE OF GRAVEL, ROCK OR SHALE PARTICLES LARGER THAN 4-INCHES IN DIAMETER. BRING LIFTS UP SIMULTANEOUSLY ON ALL SIDES OF STRUCTURES, EXERCISE CAUTION IN THE USE OF HEAVY EQUIPMENT IN AREAS ADJACENT TO STRUCTURE TO AVOID HIGH LATERAL STRESSES ON THE STRUCTURE. USE ONLY LIGHT EQUIPMENT TO PLACE BACKFILL WITHIN TWENTY (20) FEET OF THE STRUCTURE. WHERE STRUCTURAL EXCAVATION HAS BEEN THROUGH ROCK, BACKFILL WITH COMPACTED GRANULAR FILL TO TOP OF ROCK FORMATION, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
- K. SUBGRADE PREPARATION: EXCAVATE OR PLACE EMBANKMENT AS REQUIRED TO CONSTRUCT SUBGRADES TO ELEVATIONS INDICATED. REMOVE ALL UNSUITABLE MATERIAL AND REPLACE WITH APPROVED EMBANKMENT MATERIAL. PERFORM ALL WETTING, DRYING, SHAPING AND COMPACTION REQUIRED TO PREPARE A SUITABLE SUBGRADE. ROUGHEN SUBGRADE BY DISCING OR SCARIFYING AND WET OR DRY THE TOP EIGHT (8) INCHES AS REQUIRED. COMPACT THE TOP EIGHT (8) INCHES OF SUBGRADE TO 95-PERCENT OF ITS STANDARD PROCTOR DENSITY. PROOFROLL SUBGRADE AFTER MOISTURE CONDITIONING AND COMPACTION TO IDENTIFY SOFT OR DISTURBED AREAS. USE FULLY LOADED TANDEM AXLE DUMP TRUCK OR EQUIPMENT PROVIDING AN EQUIVALENT LOADING FOR PROOF ROLLING. UNDERCUT AND REPLACE SOFT AREAS IDENTIFIED BY PROOFROLLING WITH STRUCTURAL BACKFILL IF SO DIRECTED BY THE ENGINEER.

WOOD CONSTRUCTION:

- MATERIALS (FOLLOWING INDICATE MINIMUM GRADES U.N.O.):
- 1.1. FRAMING LUMBER: (BLOCKING, BRACING) SOUTHERN PINE NO. 2, UNO ROOF DECK: 19/32" OSB SHEATHING WITH MINIMUM 32/16 SPAN RATING, WITH METAL CLIPS, JOINTS TO BE STAGGERED OR
- BLOCKED AND NAILED WITH 10d NAILS AT 6" O.C. AT ALL PANEL EDGES. FASTEN PANEL TO INTERMEDIATE FRAMING WITH 10d NAILS 12" O.C. U.N.O.
- EXTERIOR WALL SHEATHING: 7/16" STRUCTURAL 1 OSB, HORIZONTAL JOINTS TO BE STAGGERED OR BLOCKED AND NAILED WITH 10d NAILS 6" O.C. AT ALL PANEL EDGES AND 12" OC AT INTERMEDIATE FRAMING MEMBERS.
- 2. FRAMING NOTES:
- 2.1. BEAMS & POSTS MADE-UP OF MULTIPLE PIECE MEMBERS SHALL BE NAILED TOGETHER 18" ON CENTER EACH SIDE. STAGGERED SPACING, USING 10d NAILS FOR 2 PIECE MEMBERS AND 20d NAILS FOR 3 AND 4 PIECE MEMBERS.

REINFORCED CONCRETE:

- A. CONCRETE SHALL BE PROPORTIONED TYPE I/II OR TYPE 1L CEMENT.
- B. STRUCTURAL CONCRETE FOR USE IN FOOTING SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,500-PSI. ALL OTHER STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
- C. SLUMP: 2" 4". NO WATER SHALL BE ADDED ON SITE WHICH WILL INCREASE SLUMP ABOVE 4".
- D. AIR CONTENT: FOR NORMAL WEIGHT CONCRETE EXPOSED TO FREEZING AND THAWING OR DEICING CHEMICALS SHALL HAVE A MINIMUM ENTRAINED AIR CONTENT BETWEEN 5 AND 7-PERCENT. ALL OTHER NORMAL WEIGHT CONCRETE SHALL HAVE AN AIR C. **CONTENT LESS THAN OR EQUAL TO 3 PERCENT**
- E. ADMIXTURES CONTAINING CHLORIDE SALTS SHALL NOT BE USED.
- REINFORCEMENT PLACEMENT: PLACE IN ACCORDANCE WITH THE CONTRACT DRAWINGS, CHAPTERS 7 AND 12 OF ACI 318 AND THE MANUAL OF STANDARD PRACTICE OF THE CONCRETE REINFORCING STEEL INSTITUTE. CLEAN REINFORCEMENT OF LOOSE RUST AND MILL SCALE, EARTH, ICE AND OTHER MATERIALS WHICH REDUCE OR DESTROY BOND WITH CONCRETE ACCURATELY POSITION, SUPPORT AND SECURE REINFORCEMENT AGAINST DISPLACEMENT BY FORMWORK, CONSTRUCTION, OR CONCRETE PLACEMENT OPERATIONS. TIE SECURELY WITH 16-GAGE OR LARGER ANNEALED IRON WIRE. LOCATE AND SUPPORT REINFORCING BY METAL CHAIRS, RUNNERS, BOLSTERS, SPACERS, AND HANGERS, AS REQUIRED.
- G. CONCRETE COVERAGE FOR REINFORCING STEEL (ACI 318)

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH:	3"
CONCRETE EXPOSED TO EARTH OR WEATHER:	2"
CONCRETE NOT EXPOSED TO WEATHER OR IN CONTRACT WITH GROUND:	
SLABS, WALLS, JOISTS (#11 BAR AND SMALLER)	1-1/2"
BEAMS, COLUMNS	1-1/2"

- H. JOINTS:
- CONSTRUCTION JOINTS: LOCATE AND INSTALL JOINTS WHICH ARE NOT INDICATED OR SPECIFIED IN CONFORMANCE WITH ACI 318. OBTAIN ENGINEER'S APPROVAL OF JOINTS LOCATED BY CONTRACTOR PRIOR TO PREPARATION OF REINFORCING STEEL DRAWINGS. PLACE CONSTRUCTION JOINTS PERPENDICULAR TO MAIN REINFORCEMENT. CONTINUE REINFORCEMENT ACROSS CONSTRUCTION JOINTS.CLEAN AND BREAK LAITANCE OR OTHER FOREIGN MATERIAL FROM BONDING SURFACES. TIGHTEN FORMS REMAINING IN PLACE (WHERE APPLICABLE) TO PREVENT SEEPAGE BETWEEN FORMS AND HARDENED CONCRETE.
- H.B. <u>ISOLATION JOINTS IN SLABS-ON-GRADE</u>: CONSTRUCT ISOLATION JOINTS IN SLABS ON-GRADE AT POINTS OF CONTRACT BETWEEN SLABS ON GROUND AND VERTICAL SURFACES, SUCH AS COLUMN PEDESTALS, FOUNDATION WALLS, EQUIPMENT FOUNDATIONS AND ELSEWHERE AS INDICATED.
- CONTRACTION (CONTROL) JOINTS: MAINTAIN TRUE ALIGNMENT WITH STRAIGHTEDGE AND LOCATE AS INDICATED. JOINTS SHALL BE GROOVED EXCEPT WHERE SAWED JOINTS ARE INDICATED. INSTALL GROOVED JOINTS DURING FINISHING PROCESS. WIDTH OF GROOVE SHALL NOT EXCEED 1/4" AND DEPTH SHALL BE AT LEAST 1". SAWED JOINTS SHALL BE INSTALLED AS SOON AS THE CONCRETE SURFACE IS FIRM ENOUGH TO RESIST TEARING OR DAMAGE BY THE POWER BLADE AND BEFORE RANDOM SHRINKAGE CRACKS CAN OCCUR. MAKE JOINTS APPROXIMATELY 1/8" WIDE WITH DEPTH AS INDICATED. SEAL JOINT WITH THE SAME TYPE SEALANT SPECIFIED FOR EXPANSION JOINT
- INSTALLATION OF EMBEDDED ITEMS: SET AND BUILD INTO WORK ANCHORAGE DEVICES AND OTHER EMBEDDED ITEMS REQUIRED FOR OTHER WORK THAT IS ATTACHED TO, OR SUPPORTED BY, CAST-IN-PLACE CONCRETE. PROVIDE FOR ACCURATE INSTALLATION OF EMBEDDED ITEMS. SECURELY FIX FLOOR DRAINS, PRESSURE RELIEF VALVES, ETC IN PLACE TO PREVENT FLOTATION WHILE PLACING CONCRETE. UNIFORMLY AND ACCURATELY SLOPE FLOOR SLAB TOWARD THE DRAINS. PROTECT PIPE SLEEVES FROM MOISTURE DURING COLD WEATHER. PROTECT ANCHOR BOLT THREADS FROM CONCRETE
- COLD WEATHER PLACEMENT OF CONCRETE: WHEN THE TEMPERATURE IS 40°F OR IS LIKELY TO FALL BELOW 40°F DURING A 24-HOUR PERIOD AFTER CONCRETE PLACEMENT, FOLLOW THE RECOMMENDATIONS OF ACI 306 TO PREVENT LOSS OF CONCRETE STRENGTH OR QUALITY. MINIMUM TEMPERATURE FOR CONCRETE AS MIXED SHALL BE INDICATED ON LINES 2, 3 AND 4 OF TABLE 1.4.1 OF ACI 306. MAXIMUM TEMPERATURE FOR CONCRETE AS MIXED SHALL BE 10°F GREATER THAN THE CORRESPONDING MINIMUM TEMPERATURE. PLACE AND MAINTAIN CONCRETE SO THAT ITS TEMPERATURE IS NEVER LESS THAN THE TEMPERATURE INDICATED ON LINE 1 OF TABLE 1.4.1 OF ACI 306. MAINTAIN THE REQUIRED TEMPERATURE FOR THE TIME DURATION INDICATED ON TABLE 1.4.2 OF ACI 306, MONITOR TEMPERATURES OF CONCRETE AT CORNERS OR EDGES OF FORMWORK AS APPLICABLE. DO NOT EXPOSE CONCRETE TO CARBON MONOXIDE OR CARBON DIOXIDE FUMES FROM HEATERS OR ENGINES. OIL OR COKE BURNING SALAMANDERS WILL NOT BE PERMITTED. PERSONNEL SHALL BE PRESENT AT ALL TIMES TO MAINTAIN SAFE, CONTINUOUS OPERATION OF HEATING SYSTEM. CONTROL TEMPERATURE AND HUMIDITY OF PROTECTED CONCRETE SO THAT EXCESSIVE DRYING OF CONCRETE SURFACES DOES NOT OCCUR. CALCIUM CHLORIDE WILL NOT BE PERMITTED AS A CONCRETE ACCELERATOR OR TO THAW FROZEN SUBGRADE PRIOR TO CONCRETE PLACEMENT.
- K. HOT-WEATHER PLACING OF CONCRETE: WHEN THE TEMPERATURE IS 90°F OR ABOVE, OR IS LIKELY TO RISE ABOVE 90°F WITHIN A 24-HOUR PERIOD AFTER THE CONCRETE PLACEMENT OR WHEN THERE IS ANY COMBINATION OF HIGH AIR TEMPERATURE, LOW RELATIVE HUMIDITY AND WIND VELOCITY WHICH WOULD IMPAIR CONCRETE STRENGTH OR QUALITY, FOLLOW THE RECOMMENDATIONS OF ACI 305. CONCRETE SHALL HAVE A MAXIMUM TEMPERATURE OF 85°F DURING PLACEMENT. DAMPEN SUBGRADE AND FORMS WITH COOL WATER IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE. COVER REINFORCING STEEL WITH WATER-SOAKED BURLAP IF IT BECOMES TOO HOT, SO THAT STEEL TEMPERATURE WILL NOT EXCEED THE AMBIENT AIR TEMPERATURE. PROTECT FRESHLY PLACED CONCRETE IMMEDIATELY AFTER PLACEMENT SO THAT THE RATE OF EVAPORATION AS DETERMINED BY ACI 305 DOES NOT EXCEED 0.2 POUND PER SQUARE FOOT PER HOUR. PROTECT CONCRETE WITH SUITABLE INSULATION, IF RAPIDLY DECREASING NIGHTTIME TEMPERATURES OCCUR, WHICH WOULD CAUSE THERMAL SHOCK TO CONCRETE PLACED DURING WARM DAYTIME TEMPERATURES. PROTECT THE CONCRETE WITH TEMPORARY WET COVERING DURING ANY APPRECIABLE DELAY BETWEEN PLACEMENT AND FINISHING.
- L. ALL EXPOSED EDGES AND CORNERS SHALL BE CHAMFERED 3/4".
- M. CONCRETE CURING AND PROTECTION: PROTECT FRESHLY PLACED CONCRETE FROM PREMATURE DRYING AND EXCESSIVE COLD OR HOT TEMPERATURES. START INITIAL CURING AS SOON AS FREE WATER HAS DISAPPEARED FROM CONCRETE SURFACE AFTER PLACING AND FINISHING. WEATHER PERMITTING, KEEP CONTINUOUSLY MOIST FOR NOT LESS THAN 7 DAYS. BEGIN FINAL CURING PROCEDURES IMMEDIATELY FOLLOWING INITIAL CURING AND BEFORE CONCRETE HAS DRIED. CONTINUE FINAL CURING FOR AT LEAST 7 DAYS IN ACCORDANCE WITH ACI 301 PROCEDURES. AVOID DRYING AT END OF FINAL CURING PERIOD.
 - CURING METHODS: CURE ALL CONCRETE BY ONE OF THE FOLLOWING METHODS UNLESS SPECIFIED OTHERWISE:
- M.A. LEAVE IN FORMS FOR A MINIMUM OF 7 DAYS. KEEP FORMWORK WET TO PREVENT DRYING OF CONCRETE SURFACES.
- M.B. USE SATURATED BATS, SOAKER HOSES, OR SPRINKLER FOR A MINIMUM OF 7 DAYS. KEEP CONCRETE CONTINUOUSLY WET.
- M.C. USING 1 COAT OF A LIQUID MEMBRANE-FORMING COMPOUND CONFORMING TO ASTM C309, TYPE 1. APPLY IMMEDIATELY AFTER REMOVAL OF FORMS (WHICH HAVE BEEN CONTINUOUSLY WET); OR IN CASE OF A SLAB, AFTER THE CONCRETE HAS BEEN FINISHED AND IS HARDENED SUFFICIENTLY TO WALK ON.
- M.D. USING POLYETHYLENE SHEETS APPLIED IN FULL CONTRACT WITH SURFACES.
- N. PLACEMENT: PER ACI STANDARD 614.
- O. TESTS:

SLUMP:	SLUMP SHALL BE TESTED 1 PER 25 YDS OR EACH PLACEMENT CONCRETE TO BE MIXED PER ASTM C94
COMPRESSIVE STRENGTH:	FOUR (4) CYLINDERS FOR EACH POUR, FOR EACH 150 CU. YDS. OR EACH 5000 SQ. FEET OF SURFACE AREA, WHICHEVER IS LESS. CYLINDERS SHALL BE BROKEN AS FOLLOWS: 1 AT 7 DAYS, 2 AT 28 DAYS AND 1 AT 56-DAYS (AS NECESSARY)
AIR ENTRAINMENT:	SHALL BE TESTED 1 PER 25 YDS OR EACH PLACEMENT

REINFORCING STEEL:

- REINFORCING BARS: ASTM A 615, GRADE 60, DEFORMED EXCEPT AS OTHERWISE SPECIFIED. COLUMN TIES AND STIRRUPS OF ANY SIZE SHALL CONFORM TO ASTM A 615, GRADE 60, UNLESS OTHERWISE INDICATED.
- B. <u>FABRICATION OF REINFORCING BARS:</u> FABRICATE WITH COLD BENDS CONFORMING TO THE RECOMMENDED DIMENSIONS SHOWN IN ACI 318. FIELD FABRICATION WILL BE ALLOWED ONLY IF THE CONTRACTOR HAS EQUIPMENT TO PROPERLY FABRICATE STEEL. ATTACH METAL OR PLASTIC TAGS WITH IDENTIFYING MARK CORRESPONDING TO MARK NUMBER ON
- SUPPORTS FOR REINFORCEMENT: PROVIDE SUPPORTS FOR REINFORCEMENT INCLUDING BOLSTERS, CHAIRS, SPACERS AND OTHER DEVICES FOR SPACING, SUPPORTING AND FASTENING REINFORCING BARS AND WELDED WIRE FABRIC IN PLACE. USE WIRE BAR-TYPE SUPPORTS COMPLYING WITH CRSI SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED. METAL ACCESSORIES SHALL BE PLASTIC COATED (CRSI, CLASS 1) OR STAINLESS STEEL PROTECTED (CRSI, CLASS 2) WHERE LEGS WILL BE EXPOSED IN FINISHED CONCRETE SURFACES. DO NOT USE ROCKS, BROKEN BRICKS, WOOD BLOCKS, CONCRETE FRAGMENTS, OR REINFORCING BARS DRIVEN INTO THE GROUND FOR SUPPORT OF STEEL REINFORCEMENT.

FOR SLABS ON-GRADE, USE SUPPORTS WITH SAND PLATES OR HORIZONTAL RUNNERS WHERE BASE MATERIAL WILL NOT SUPPORT CHAIR LEGS. PRECAST CONCRETE BLOCK BAR SUPPORTS MAY BE USED. BLOCKS SHALL BE MADE WITH A MINIMUM OF 9 SACKS OF CEMENT PER CUBIC YARD AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI IN 7 DAYS. EACH BLOCK SHALL HAVE A MINIMUM OF 9 SQUARE INCHES OF BEARING AREA. SPACE AS REQUIRED BY THE PARTICULAR CONDITION OF WEIGHT, BEARING SURFACE AND RIGIDITY OF THE STEEL REINFORCEMENT.

- D. AT SPLICES IN CONCRETE, LAP BARS A MINIMUM OF 48 DIAMETERS UNLESS OTHERWISE NOTED. DO NOT WELD OR USE MECHANICAL SPLICING DEVICES UNLESS SPECIFICALLY APPROVED BY ENGINEER.
- E. UNLESS SPECIFICALLY LOCATED ON PLAN OR DETAILS, COORDINATE COLD JOINT LOCATIONS WITH ENGINEER.
- F. AT CORNERS, MAKE HORIZONTAL BARS CONTINUOUS OR PROVIDE CORNER BARS.
- AROUND OPENINGS AND STEPS IN CONCRETE. PROVIDE (2)-#5'S EXTENDING 2'-0" BEYOND EDGE OF OPENING OR STEP. EXTEND REINFORCING STEEL A MINIMUM OF 24" THROUGH COLD JOINTS.

REINFORCEMENT DEVELOPMENT LENGTH FOR CONCRETE

BAR	LENGTH OF LAF FOR REINFORCI		END AND	MBEDMENT FOR HORAGE OF ING IN INCHES
SIZE	* TOP BARS	OTHERS	* TOP BARS	OTHERS
3	18	14	14	12
4	24	18	18	14
5	30	23	23	18
6	40	31	31	23
7	54	42	42	32
8	71	54	54	42
9	90	69	69	53

* TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST IN THE MEMBER BELOW THE BAR. HORIZONTAL BARS IN WALLS SHALL BE PROVIDED WITH LAPS AS REQUIRED FOR TOP BARS. EXCEPT AS OTHERWISE INDICATED ON THE PLANS, EMBEDMENT LENGTHS FOR END ANCHORAGES AND LAPPED SPLICES SHALL NOT BE LESS THAN SHOWN ABOVE.

NO SPLICES SHALL BE MADE EXCEPT WHERE SHOWN ON THE DESIGN DRAWINGS OR AS SPECIFIED OR AUTHORIZED BY THE ENGINEER.

REINFORCED MASONRY:

- A. EXTERIOR MASONRY UNITS SHALL COMPLY W/ ASTM C90 REQUIREMENTS
- B. LIGHTWEIGHT MASONRY UNITS WILL NOT BE USED FOR EXTERIOR WALL CONSTRUCTION. C. MORTAR SHALL BE TYPE S.
- D. GROUT USED FOR VERTICAL REINFORCING AND HORIZONTAL BOND BEAMS SHALL CONFORM TO ASTM C476 REQUIREMENTS. E. DO NOT INSTALL MASONRY MATERIALS IF TEMPERATURE IS BELOW 40° UNLESS ALL MATERIALS ARE HEATED AND AN AIR
- TEMPERATURE OF AT LEAST 40° IS MAINTAINED ON BOTH SIDES OF THE WALL FOR AT LEAST 72 HOURS.
- UNITS SHALL BE INSTALLED IN RUNNING BOND WITH 3/8" JOINTS. G. BOND AND INTERLOCK EACH COURSE AT CORNERS. BOND INTERSECTING WALLS W/ CONTINUOUS REINFORCEMENT.
- H. DO NOT USE UNITS W/ LESS THAN 4" HORIZ, FACE DIMENSION AT CORNERS OR JAMBS.
- LAY UNITS W/ FULL MORTAR COVERAGE ON HORIZONTAL AND VERTICAL FACE SHELLS.
- GROUT CELLS FULL AT VERTICAL REINFORCEMENT LOCATIONS. K. CLEAN UNITS AT END OF EACH DAYS WORK.
- MASONRY DESIGN IS BASED UPON A MINIMUM COMPRESSIVE STRENGTH OF F'M = 2.000 PSI.
- ESTABLISHED IN ACCORDANCE WITH THE UNIT STRENGTH METHOD.
- N. MASONRY UNITS SHALL HAVE A NET AREA COMPRESSIVE STRENGTH OF 2,800 PSI.
- O. GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI AT 28 DAYS.
- P. MASONRY UNITS & MORTAR SHALL CONTAIN INTEGRAL WATER REPELLANT.
- Q. EXTERIOR FACE OF CMU WALLS SHALL RECEIVE A POST-CLEANING FIELD APPLIED WATER REPELLANT.

DESIGN PARAMETERS:

BUILDING CODE A. OCCUPANCY CATEGORY	2018 IBC II (NORMAL)
1. LIVE LOADS ROOF	20 PSF
2. SNOW LOADS A. GROUND SNOW LOAD, Pg B. SNOW EXPOSURE FACTOR, Ce C. SNOW THERMAL FACTOR, Ct D. IMPORTANCE FACTOR, I E. MINIMUM ROOF SNOW LOAD	20 PSF 1.0 1.1 1.0 20 PSF
3. WIND LOADS A. WIND SPEED (ULTIMATE) B. EXPOSURE CATEGORY	106 MPH C
EARTHQUAKE LOADS (ASCE 7-16) A. SPECTRAL RESPONSE ACCELER B. SPECTRAL RESPONSE ACCELER C. IMPORTANCE FACTOR, I D. SEISMIC DESIGN CATEGORY E. SOIL SITE CLASS (ASSUMED)	
F. BASIC STRUCTURAL SYSTEM G. BASIC SEISMIC FORCE RESISTIN H. RESPONSE MODIFICATION COEF I. DEFLECTION AMPLIFICATION FAC	FICIENT, R 5

2.5

J. OVERSTRENGTH FACTOR, OMEGA

SUBMITTALS - MORTAR & GROUT

- PRODUCT DATA: INCLUDE PRODUCT DATA SHEETS FOR EACH NAMED PRODUCT. TEST REPORTS: SUBMIT INDEPENDENT LABORATORY TESTS REPORTS OR INITIAL MORTAR AND GROUT TESTS, INCLUDING DESIGN MIX
- PROPORTIONS, FOR EACH MORTAR AND GROUT.

3. CERTIFICATION: SUBMIT MANUFACTURER'S CERTIFICATION THAT MATERIAL MEET SPECIFICATIONS REQUIREMENTS.

CERTIFICATION: PRIOR TO DELIVERY, SUBMIT CERTIFICATES ATTESTING COMPLIANCE WITH APPLICABLE SPECIFICATIONS FOR GRADES, TYPES, CLASSES AND STRENGTHS OF CONCRETE MASONRY UNITS.

- 1. PORTLAND CEMENT: ASTM C150, TYPE I, II OR III. PROVIDE NATURAL COLOR OR WHITE CEMENT AS REQUIRED TO PRODUCE REQUIRED
- MORTAR COLOR. MASONRY CEMENT: NOT ALLOWED.
- MORTAR CEMENT: ALLOWED AND MUST MEET ALL REQUIREMENTS OR THIS SECTION. HYDRATED LIME: ASTM C207, TYPE S.
- SAND: ASTM C144. STANDARD MASONRY TYPE: CLEAN. DRY PROTECTED AGAINST DAMPNESS. FREEZING AND FOREIGN MATTER. AGGREGATE FOR GROUT: ASTM C404, MAXIMUM SIZE 3/8 INCH.
- WATER: CLEAN AND POTABLE, FREE OF ORGANIC MATTER. HOLLOW LOAD BEARING UNITS: ASTM C90 WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OVER NET AREA OR 1900 PSI, UNLESS NOTED
- OTHERWISE ON THE CONTRACT DOCUMENTS.
- A. NOMINAL FACE DIMENSIONS: 8"x16" AND 12"x16" B. SPECIAL SHAPES: FURNISH REQUIRED SIZES, SHAPES, LINTELS, PILASTERS, BOND BEAMS, AND MISCELLANEOUS SHAPES
- SHOWN ON DRAWINGS OR REQUIRED TO COMPLETE BOND.
- C. SPECIAL FEATURES: FURNISH REQUIRED FACE FINISHES SHOWN ON DRAWINGS.
- JOINT REINFORCEMENT AND ANCHORS: A. JOINT REINFORCEMENT: PROVIDE HORIZONTAL REINFORCEMENT IN MORTAR JOINTS AS SHOWN ON STRUCTURAL DRAWINGS.
- B. ANCHORS: INSTALL ANCHORS AND TIES AS SHOWN ON DRAWINGS. 10. STEEL REINFORCEMENT: PLACE STEEL REINFORCEMENT, GROUTED SPACES AND BOND BEAMS AS WORK PROGRESSES, AS FOLLOWS: A.A. ACCURATELY POSITION AND SECURE AGAINST DISPLACEMENT FROM LOCATIONS SHOWN. HORIZONTAL REINFORCEMENT MAY BE PLACED AS WORK PROGRESSES, ALL VERTICAL REINFORCING SHALL BE IN PLACE PRIOR TO GROUTING AND SHALL BE HELD IN

PLACE BY MEANS OF BAR POSITIONERS AS SHOWN ON DRAWINGS. BAR POSITIONERS SHALL MEET THE FOLLOWING:

- 1. BAR POSITIONERS FOR VERTICAL WALL BARS: MINIMUM 9 GAGE, GALVANIZED WIRE. AA WIRE PRODUCTS CO., DALLAS, TX (214) 637-1511.
- 3. DUR-O-WALL, INC., ARLINGTON HEIGHTS, IL (708) 577-6400. 4. MASONRY REINFORCING CORPORATION OF AMERICA; CHARLOTTE, NC (704) 525-3761
- B. PROVIDE CLEAR DISTANCE BETWEEN VERTICAL BARS NOT LESS THAN 1 1/2 TIMES BAR DIAMETER, NOR LESS THAN 1 1/2 INCHES. 11. PROVIDE NOT LESS THAN 1/4 INCH THICKNESS OR GROUT BETWEEN MASONRY UNITS AND REINFORCEMENTS.
- 12. PROVIDE MINIMUM WIDTH OF COLLAR JOINTS CONTAINING BOTH HORIZONTAL AND VERTICAL REINFORCEMENT OF 1/2 INCH LARGER THAN SUM OF DIAMETERS OR HORIZONTAL AND VERTICAL REINFORCEMENT.
- 13. MAKE SPLICES IN BARS AS SHOWN ON DRAWINGS, LAPPED SPLICES FOR REINFORCEMENT SHALL NOT BE LESS THAN 48 BAR DIAMETERS. PROVIDE LAP SPLICES OF GREATER LENGTHS WHEN INDICATED ON THE DRAWINGS, WELDED OR MECHANICAL SPLICES SHALL DEVELOP THE STRENGTH OR THE REINFORCEMENT.

1. MASONRY DESIGN IS BASED UPON A COMPRESSIVE STRENGTH OF F'm = 2,000 PSI. ESTABLISHED IN ACCORDANCE WITH THE UNIT STRENGTH METHOD (AC1530-95, TABLE 2). 2. MORTAR MIX:

- A. PROPORTION AND MIX MORTAR IN ACCORDANCE WITH ASTM C270, TYPE S. 1. MINIMUM COMPRESSIVE STRENGTH OF 1800 PSI IN 28 DAYS.
- 2. MAXIMUM AIR CONTENT 12%.
- B. POINTING MORTAR: ASTM C270, TYPE S, WITH A MAXIMUM OF 2% AMMONIUM STEARATE OR CALCIUM STEARATE PER CEMENT WEIGHT. C. MORTAR COLOR FOR EXPOSED TO VIEW MASONRY AS REQUIRED TO PRODUCE MORTAR AS ESTABLISHED BY SAMPLE WALL OR OWNER.
- A. PROPORTION AND MIX MORTAR IN ACCORDANCE WITH ASTM C476.
- B. MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI IN 28 DAYS.
- C. USE FINE OR COURSE GROUT AS APPROPRIATE FOR GROUT POUR HEIGHT AND WIDTH OF GROUT SPACE. CONFORM TO ACI 530.1, TABLE 5 FOR
- GROUT SPACE REQUIREMENTS. 4. MIXING PROCEDURES - MORTAR AND GROUT:
- A. MEASURE MATERIALS BY VOLUME, USE APPROVED CONTAINER OF EQUIVALENT WEIGHT. B. THOROUGHLY MIX INGREDIENTS IN ACCORDANCE WITH SPECIFIED STANDARD IN QUANTITIES NEEDED FOR IMMEDIATE USE.
- C. FOR FACING WORK ADD MORTAR COLOR AS SELECTED, AND WHITE CEMENT TO PRODUCE MORTAR AS ESTABLISHED BY SAMPLE. D. IF MORTAR BEGINS TO STIFFEN FROM EVAPORATION OR ABSORPTION OF A PART OF MIXING WATER, RETEMPER BY ADDING WATER AND
- E. GROUT SHALL HAVE A SLUMP OF 8 TO 10 INCHES, AT TIME OF PLACEMENT.
- F. USE MORTAR AND GROUT WITHIN 2 1/2 HOURS OF INITIAL MIXING. G. DO NOT USE MORTAR OR GROUT AFTER IT HAS BEGUN TO SET.
- FIELD QUALITY CONTROL

1. MASONRY MORTAR TESTING:

H. DO NOT USE ANTIFREEZE COMPOUNDS.

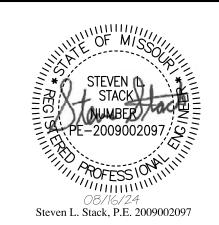
A. CONDUCT STRENGTH TESTS IN ACCORDANCE WITH THE FOLLOWING

- 1. SPREAD MORTAR ON THE MASONRY UNITS 1/2 INCH TO 5/8 THICK AND ALLOW TO STAND FOR ONE MINUTE. 2. REMOVE MORTAR AND PLACE IN A 2 INCH BY 4 INCH CYLINDER IN TWO LAYERS, COMPRESSING THE MORTAR INTO THE CYLINDERS USING
- A FLAT END STICK OR FINGERS, LIGHTLY TAP MOLD ON OPPOSITE SIDES, LEVEL OFF AND IMMEDIATELY COVER MOLDS AND KEEP THEM DAMP UNTIL TAKEN TO THE LABORATORY. 3. AFTER 48 HOURS SET, HAVE THE LABORATORY REMOVE MOLDS AND PLACE THEM IN THE FOG ROOM UNTIL TESTED IN DAMP CONDITIONS. B. EXECUTE ONE MORTAR TEST SPECIMEN FOR EACH 5.000 SQUARE FEET OF MASONRY WALL CONSTRUCTED AND A MINIMUM OF ONE
- MORTAR TEST SPECIMEN FOR EACH DAY THAT MASONRY CONSTRUCTION IS PERFORMED. TEST SPECIMENS AT 28 DAYS. C. STRENGTH OF MORTAR WILL BE CONSIDERED SATISFACTORY IF EACH MORTAR TEST EQUALS OR EXCEEDS 1500 PSI (THIS
- CORRESPONDS WITH TYPE S, 1800 PSI MORTAR MIX AS SPECIFIED) D. IN ADDITION TO REQUIRED INFORMATION PREVIOUSLY IN THIS SECTION, RECORD THE FOLLOWING INFORMATION ON MORTAR **COMPRESSION REPORTS:**
- 1. MIX DESIGN OR MIX DESIGNATION 2. TEXT SAMPLE NUMBER
- 3. SPECIFIC WALL AREAS COVERED BY TEST.
- 4. DESCRIPTION OF UNITS USED TO FORM SAMPLE. 5. TESTED COMPRESSIVE STRENGTH.2. MASONRY GROUT TESTING:
- 2, MASONRY GROUT TESTING A. CONDUCT STRENGTH TESTS IN ACCORDANCE WITH ASTM C1019.
- 1. TAKE TWO STRENGTH SAMPLES FOR EACH 5.000 SQUARE FEET OF MASONRY WALL SURFACE FOR EACH TYPE OF GROUT PLACED EACH DAY.
- 2. CREATE TEST SAMPLES BY FORMING WITH WOOD SURFACE ON BOTTOM AND CONCRETE BLOCK ON SIDES. THE SAMPLES SHALL BE 3 INCHES SQUARE AND 8 INCHES HIGH. 3. INITIAL CURE DURING FIRST 48 HOURS. PROTECT SAMPLES FROM LOSS OF MOISTURE BY COVERING WITH WET CLOTH AND KEEPING MOIST.
- PROTECT FROM FREEZING AND VARIATIONS IN TEMPERATURE. RECORD MAXIMUM AND MINIMUM TEMPERATURES BY USING A MAX/MIN THERMOMETER. 4. REMOVE MASONRY UNITS THAT FORM SAMPLES AFTER 48 HOURS AND TRANSPORT GROUT SAMPLES TO LABORATORY. KEEP SAMPLES PROTECTED FROM VIBRATION, FREEZING AND MOISTURE LOSS DURING TRANSPORTATION.

5. TESTS SAMPLES WITH TEST METHOD ASTM C39 AT 28 DAYS. COMPRESSIVE STRENGTH SHALL BE ADEQUATE IF IT EQUALS F'm AS DEFINED ON

- DRAWINGS BUT NOT LESS THAN 2,000 PSI. B. CONDUCT SLUMP TEST AT TIME COMPRESSIVE TEST SAMPLES ARE TAKEN IN ACCORDANCE WITH ASTM C143. C. IN ADDITION TO REQUIRED INFORMATION NOTED PREVIOUSLY IN THIS SECTION, RECORD THE FOLLOWING INFORMATION ON GROUT
- COMPRESSION REPORTS:
- 1. MIX DESIGN OR MIX DESIGNATION.
- 2. TEST SAMPLES NUMBER. 3. SPECIFIC WALL AREAS COVERED BY TEST.
- 4. DESCRIPTION OF SAMPLES DIMENSIONS, AMOUNT OUT OF PLUMB IN PERCENT. 5. DESCRIPTION OF UNITS USED TO FORM SAMPLES. 6. CURING HISTORY WITH MAX/MIN TEMPERATURE, AGE WHEN TRANSPORTED TO LAB, AND AGE WHEN TESTED.
- 7, TESTED COMPRESSIVE STRENGTH,
- 8. DESCRIPTION OF FAILURE.
- D. CONCRETE UNIT MASONRY TESTING: 1. CONDUCT STRENGTH TESTS IN ACCORDANCE WITH ASTM AC140.
- 2. SELECT 3 UNITS FROM EACH LOT OF 10,000 UNITS OR LESS, 6 UNITS FOR EACH LOT OF 10,000 TO 100,000 UNITS.
- FOR LOTS GREATER THAN 100,000 SELECT 3 UNITS FOR EVERY 50,000 UNITS. 3. STRENGTH OF CONCRETE MASONRY UNITS WILL BE CONSIDERED SATISFACTORY IF CALCULATED TEST COMPRESSIVE
- STRENGTH CONFORMS TO REQUIREMENTS OF ASTM C90 FOR HOLLOW UNITS AND SOLID UNITS. E. MASONRY WALL INSPECTIONS: 1. INSPECT WALL FOR COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS. REPORT ON THE FOLLOWING.
- A. PLACEMENT OF CONCRETE MASONRY UNITS JOINT SPACE, LEVEL PLUMB. B. HORIZONTAL REINFORCING, SPACING AND LAP.
- C. VERTICAL BARS D. LIFT HEIGHTS, PLACEMENT AND VIBRATION OF GROUT.
- 2. INSPECT OPENINGS FOR COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS. REPORT ON THE FOLLOWING:
- A. TYPES OF CONCRETE MASONRY UNITS USED. B. VERTICAL REINFORCING SIZES AND PLACEMENT AT DOOR JAMBS.
- C. PLACEMENT AND VIBRATION OF GROUT IN LINTELS AND JAMBS.

STATE OF MISSOURI MICHAEL L. PARSON **GOVERNOR**





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, **DESIGN AND CONSTRUCTION**

STATE OF MISSOURI **DIVISION OF STATE PARKS** MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MISSOURI

PROJECT # X2306-03

FACILITY # 7815214051

REVISION: ISSUED TO MDNR DATE: 05-17-2024 REVISION: ISSUED FOR BIDDING

DATE: 08/16/24

ISSUE DATE: 08/16/24

CAD DWG FILE:S-001.DWG

DESIGNED BY: SLS

DRAWN BY:

CHECKED BY:

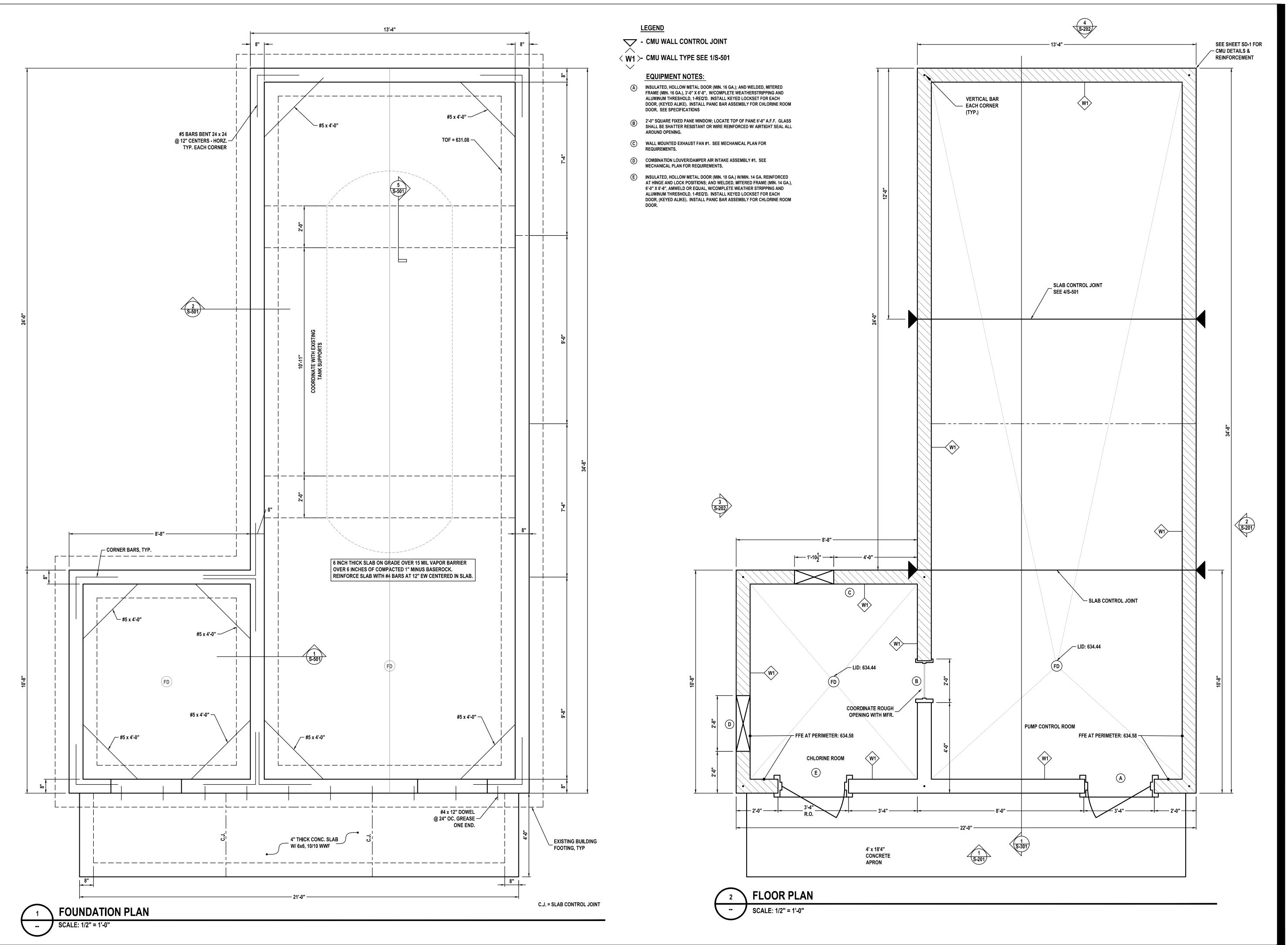
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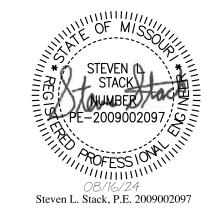
DATE:

SHEET TITLE:

NOTES

SHEET NUMBER:







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STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK
WATER AND WASTEWATER
IMPROVEMENTS

SULLIVAN, MISSOURI

PROJECT # X2306-03 SITE # 5214 FACILITY # 7815214051

7815214072

REVISION: ISSUED TO MDNR
DATE: 05-17-2024
REVISION: ISSUED FOR BIDDING

REVISION: ISSUED FOR BIDD DATE: 08/16/24 REVISION: DATE:

CAD DWG FILE:S-001.DWG

ISSUE DATE: 08/16/24

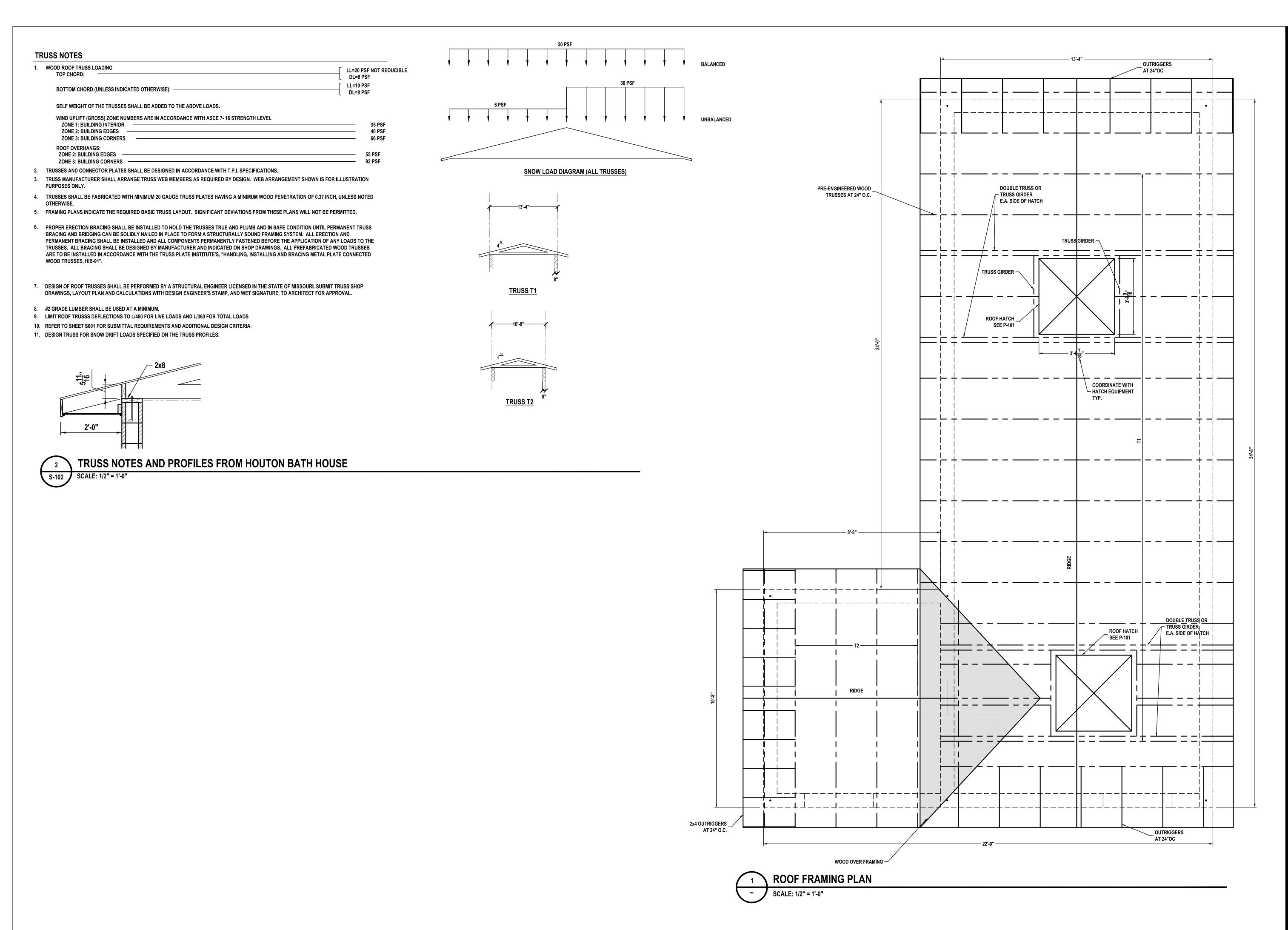
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DESIGNED BY: SLS

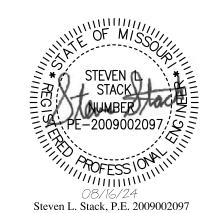
SHEET TITLE:

WELL HOUSE STRUCUTRAL PLANS

SHEET NUMBER:

S-101







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7815214072

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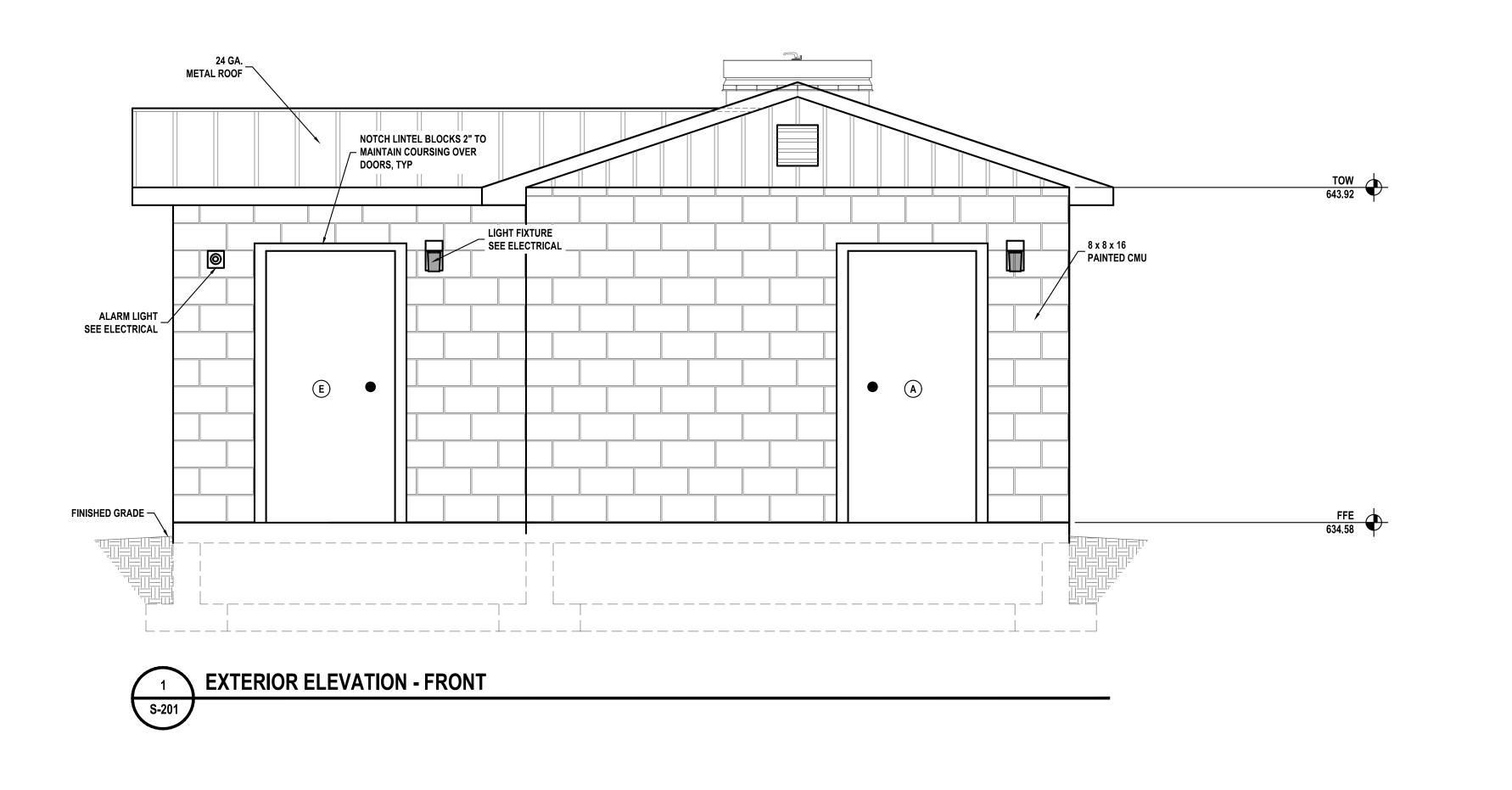
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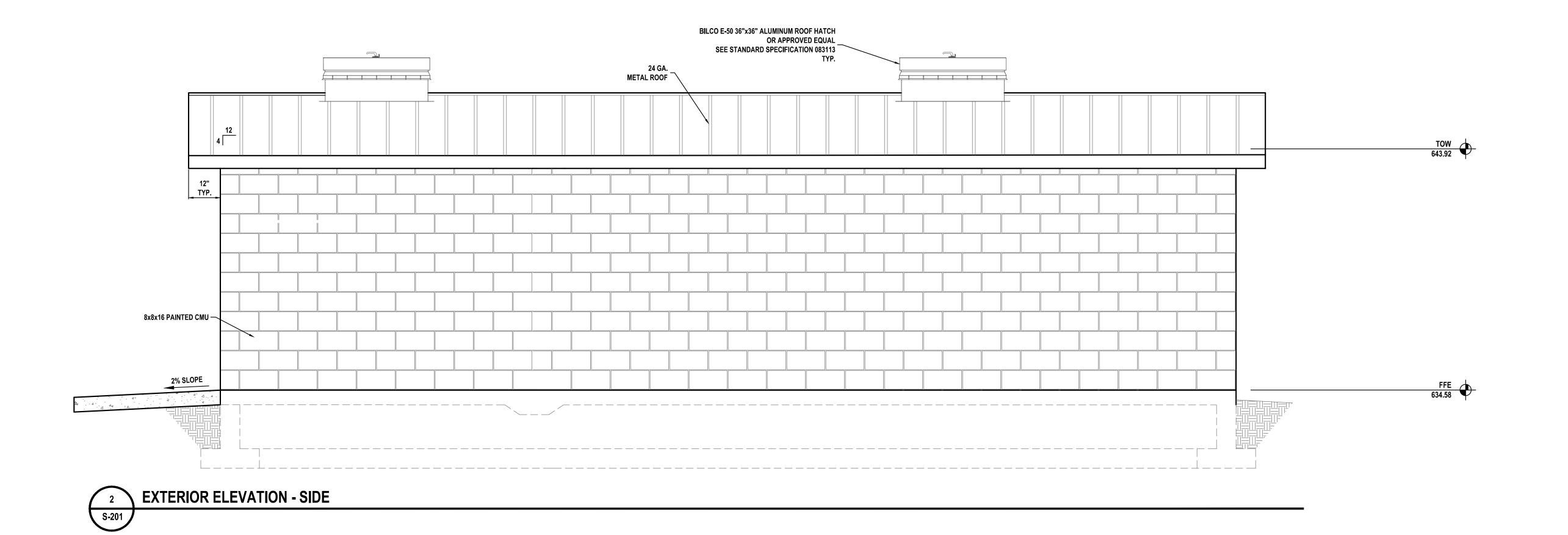
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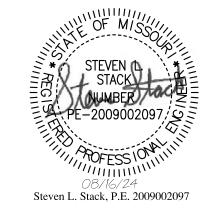
WELL HOUSE STRUCUTRAL PLANS

SHEET NUMBER:

S-102







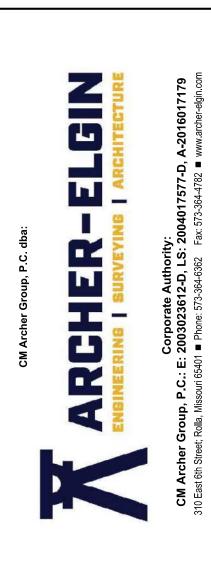
(A) INSULATED, HOLLOW METAL DOOR (MIN. 16 GA.); AND WELDED, MITERED FRAME (MIN. 16 GA.), 3'-0" X 6'-8", W/COMPLETE WEATHERSTRIPPING AND

(E) INSULATED, HOLLOW METAL DOOR (MIN. 18 GA.) W/MIN. 14 GA. REINFORCED AT HINGE AND LOCK POSITIONS; AND WELDED, MITERED FRAME (MIN. 14 GA.),

6'-0" X 6'-8", AMWELD OR EQUAL, W/COMPLETE WEATHER STRIPPING AND

ALUMINUM THRESHOLD, 1-REQ'D. INSTALL KEYED LOCKSET FOR EACH DOOR, (KEYED ALIKE). INSTALL PANIC BAR ASSEMBLY FOR CHLORINE ROOM

ALUMINUM THRESHOLD, 1-REQ'D. INSTALL KEYED LOCKSET FOR EACH DOOR, (KEYED ALIKE). INSTALL PANIC BAR ASSEMBLY FOR CHLORINE ROOM



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ISSUE DATE: 08/1624

CAD DWG FILE:S-001.DW

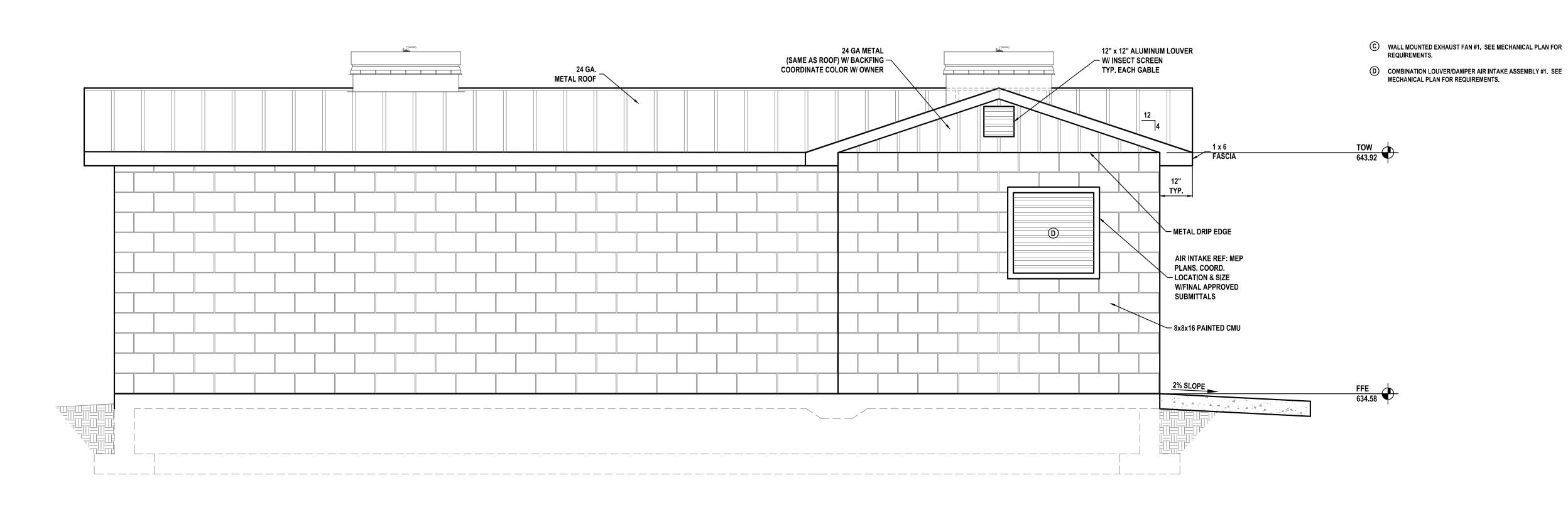
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DRAWN BY: JSM
CHECKED BY: KAC
DESIGNED BY: SLS

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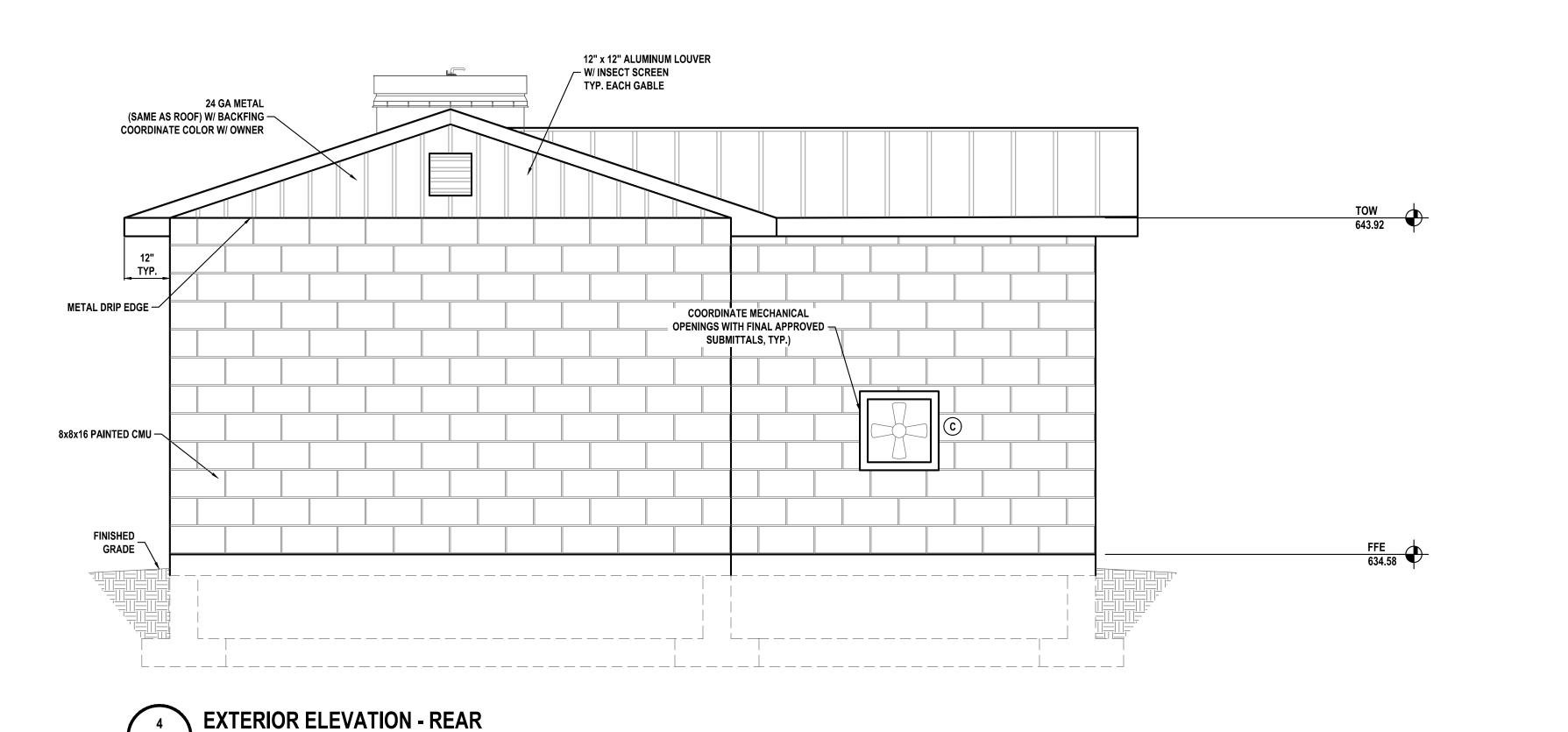
WELL HOUSE EXTERIOR ELEVATIONS

SHEET NUMBER:

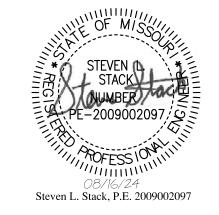
S-20

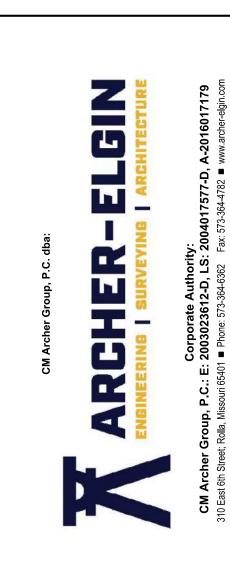


EXTERIOR ELEVATION - SIDE



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7815214072

REVISION: DATE: ISSUE DATE: 08/16/24

CAD DWG FILE:S-202.DWG
DRAWN BY: JSM
CHECKED BY: KAC

SHEET TITLE:

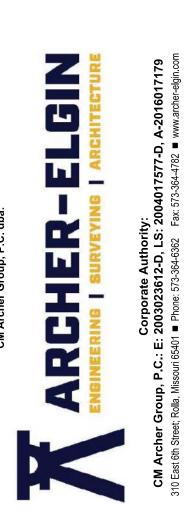
WELL HOUSE EXTERIOR ELEVATIONS

DESIGNED BY: SLS

SHEET NUMBER:

S-202

STATE OF MISSOURI



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES DESIGN AND CONSTRUCTION

DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF

WATER AND WASTEWATER

08/16/24



1. GROUT ALL REINFORCED CELLS AND THOSE CELLS NOTED ON THE PLANS.

2. DO NOT PLACE GROUT UNTIL THE INSTALLED MASONRY HAS ATTAINED SUFFICIENT STRENGTH TO RESIST DISPLACEMENT OF MASONRY UNITS AND BREAKING OF MORTAR BOND (NORMALLY THE FOLLOWING MORNING). LIMIT GROUT POURS TO AREA WHICH CAN BE COMPLETED WITH NO MORE THAN ONE HOUR INTERUPTION OF POURING OPERATION.

3. LAP SPLICE THE REINFORCING.

4. POUR GROUT USING A CONTAINER WITH SPOUT, BY CHUTE OR BY PUMPING. MECHANICALLY VIBRATE DURING PLACEMENT. RECONSOLIDATE GROUT LIFTS EXCEEDING 12" IN HEIGHT BY MECHANICAL VIBRATION AFTER INITIAL SETTLEMENT AND WATER LOSS HAS OCCURED (ABOUT 30 MINUTES LATER). ADD GROUT AS NECESSARY TO TERMINATE LIFT 1 1/2" BELOW TOP OF GROUTED COURSE.

5. REPEAT SEQUENCE AS NECESSARY TO COMPLETE ANY GIVEN WALL PANEL.

GROUT ALL CELLS WITHIN 12" IN EACH DIRECTION OF EMBEDDED

AT WALL INTERSECTIONS AND CORNERS PROVIDE TYPICAL VERTICAL WALL REINFORCEMENT IN THE COMMON (CORNER) CELL, MATCH IT WITH #5 DOWEL INTO THE FOOTING. PROVIDE CORNER BARS TO MATCH AND LAP WITH BOND BEAM REINFORCING.

REFER TO MASONRY SCHEDULE FOR JAMB & LINTEL SIZES.

AT LINTEL, ALL HEAD JOINTS SHALL BE FULLY MORTARED.

LOCATE REBAR IN CENTER OF WALL FOR SINGLE REINFORCED CELLS.

ALL CMU SHALL BE NORMAL WEIGHT.

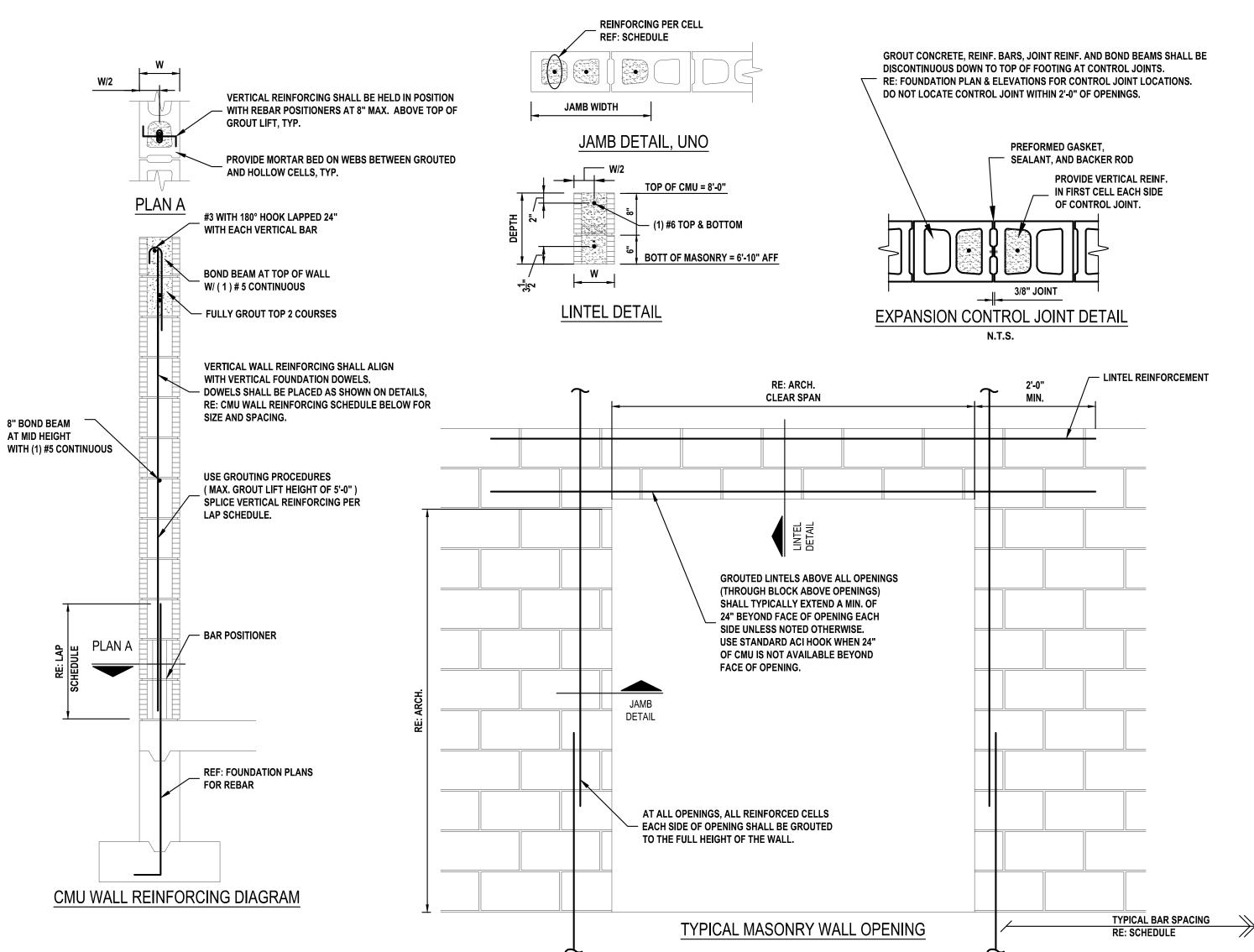
MASONRY REINFORCING LAP SCHEDULE BAR SIZE 8" BLOCK 19" 25" 31" 52"

		LINTEL		JAMB		
WALL	CLEAR SPAN	DEPTH	REINFO	RCING	WIDTH	REINFORCING
SIZE	CLEAR SPAN	DEPIR	ТОР	воттом	חוטוייי	PER CELL
8"	0" TO 3-4"	14"	•	(1)#6	8"	(1) # 5
8"	3'-5" TO 6'-8"	14"	(1)#6	(1)#6	8"	(1) # 5

1. AT LINTEL, ALL HEAD JOINTS SHALL BE FULLY MORTARED.

	CMU WALL REINF. SCHEDULE								
MARK	WALL SIZE	DOWELS	VERT. BARS	REMARKS					
W-1>	8"	(1) #5 @ 32" O.C.	(1) #5 @ 32" O.C.	HORIZ #5@ MID HEIGHT OF WALL					

REFER TO CMU WALL REINFORCING DIAGRAM FOR HORIZONTAL REINFORCEMENT

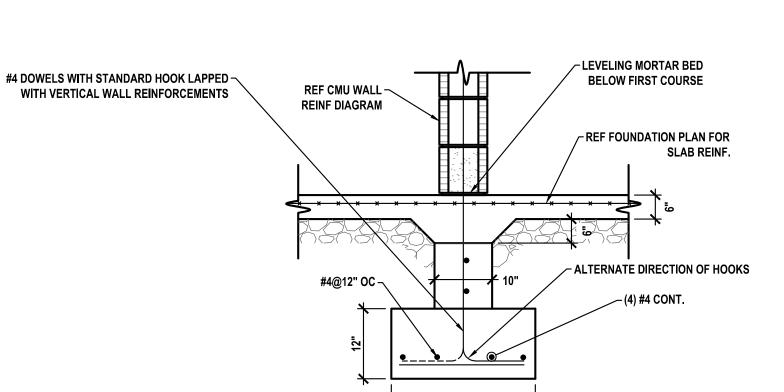


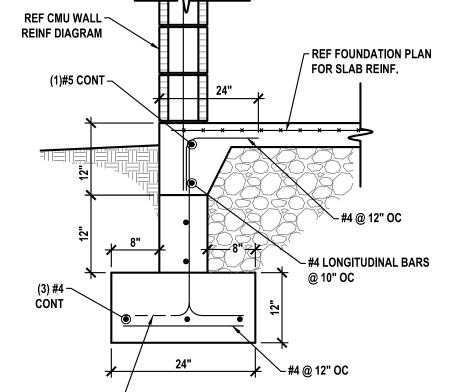


SCALE: NTS

S-501

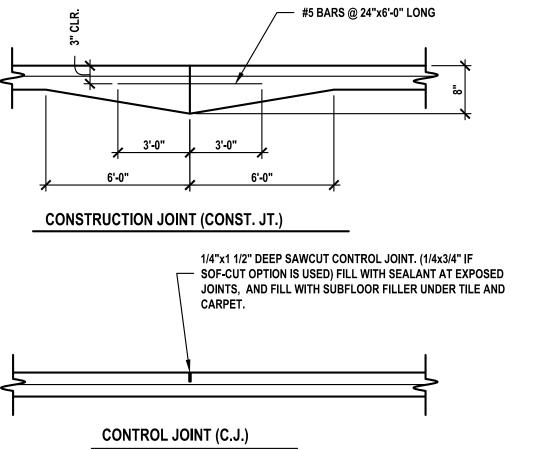


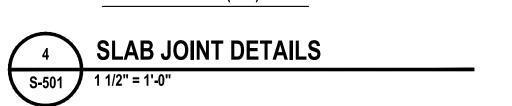


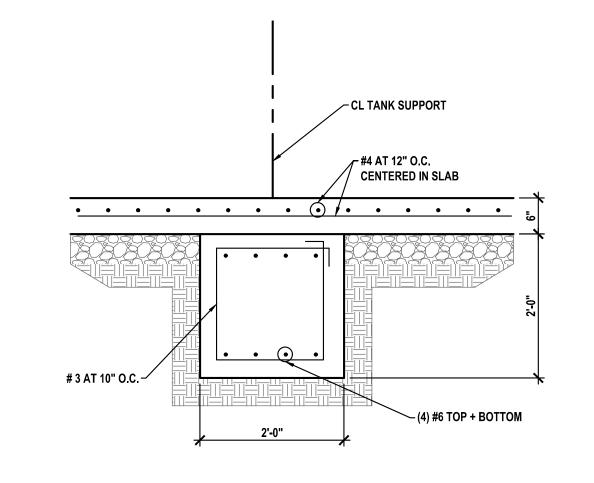


INTERIOR WALL FOOTING

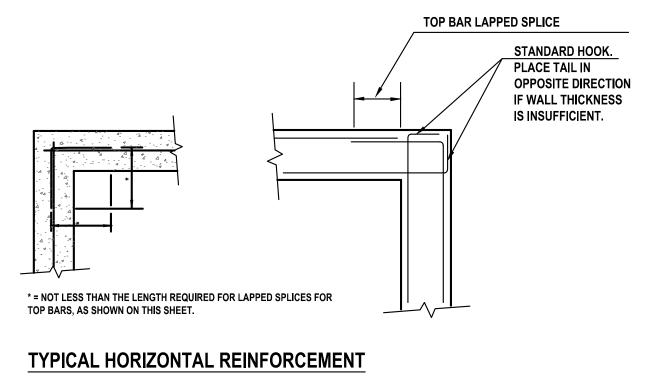


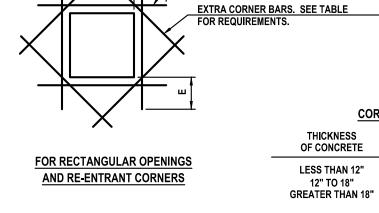






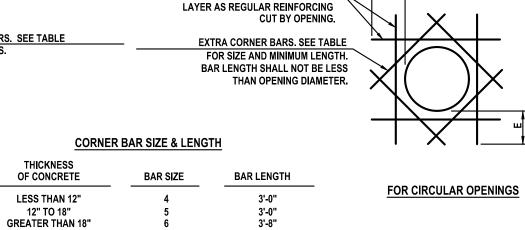






LAYER AS REGULAR REINFORCING

CUT BY OPENING.



EXTRA BARS EQUAL IN AREA TO AND IN SAME DIRECTION AND

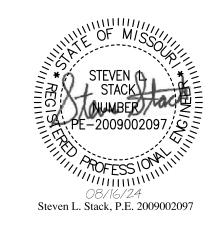
E = THE REQUIRED END ANCHORAGE LENGTH FOR TOP BARS AS SHOWN ON THIS SHEET.

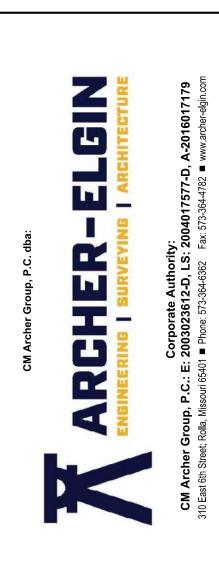
TYPICAL EXTRA REINFORCEMENT AT OPENINGS

S-501 SCALE: NTS

REINFORCEMENT AT OPENINGS AND CORNERS

STATE OF MISSOURI MICHAEL L. PARSON, **GOVERNOR**





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STATE OF MISSOURI **DIVISION OF STATE PARKS** MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER AND WASTEWATER **IMPROVEMENTS**

SULLIVAN, MISSOURI

PROJECT # X2306-03 5214 FACILITY # 7815214051

REVISION: ISSUED TO MDNR DATE: 05-17-2024 REVISION: ISSUED FOR BIDDING DATE: 08/16/24 **REVISION:** DATE:

7815214072

CAD DWG FILE:S-501.DWG

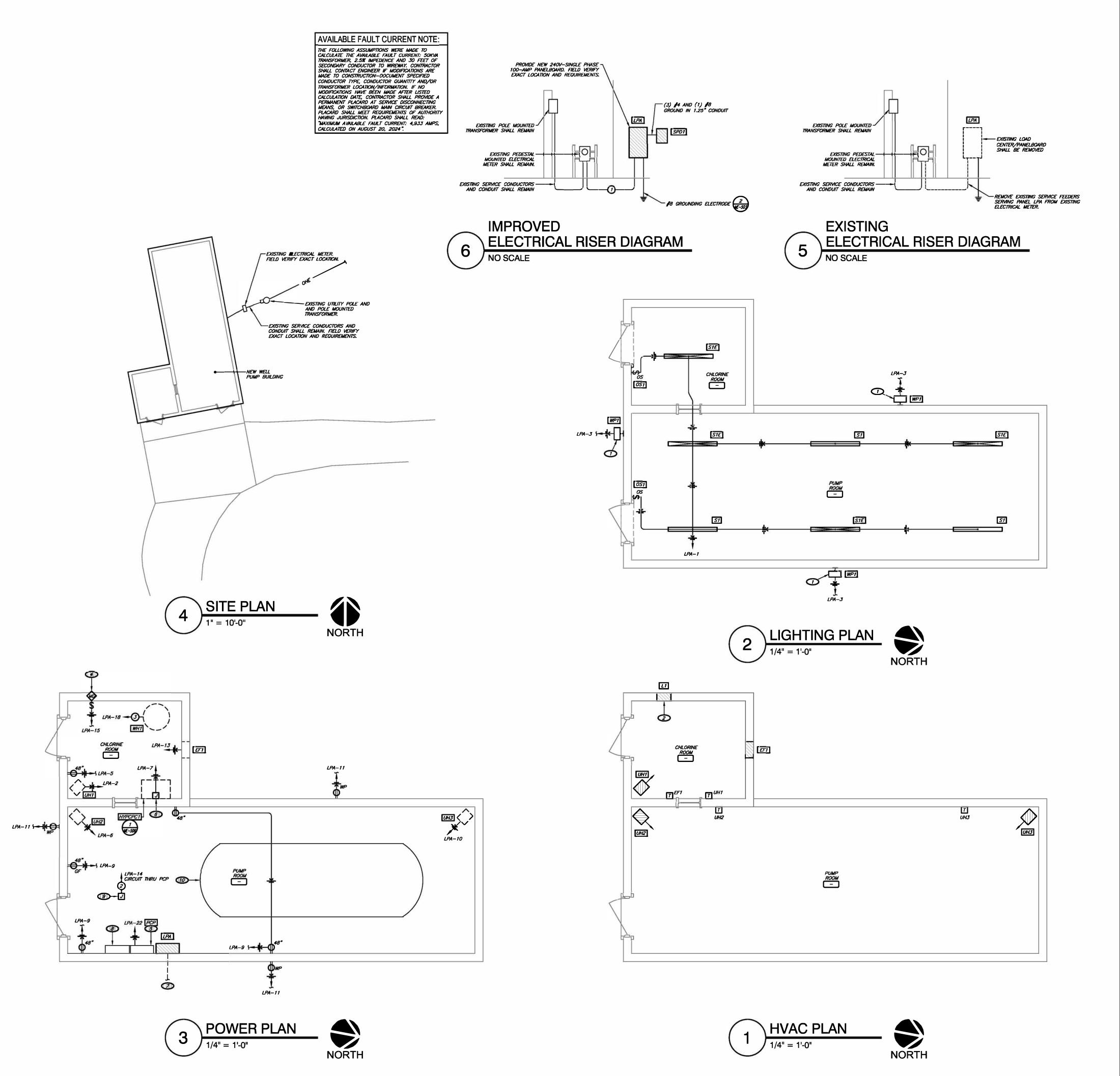
ISSUE DATE: 08/16/24

DRAWN BY: CHECKED BY: KA DESIGNED BY: SLS

SHEET TITLE:

GENERAL STRUCTURAL **DETAILS**

SHEET NUMBER:

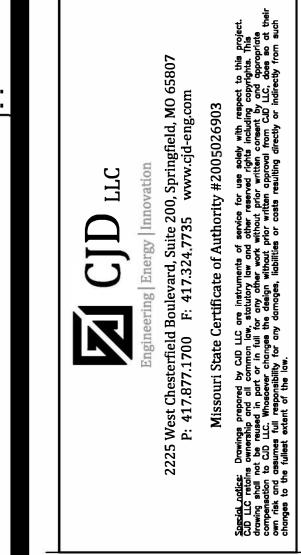


KEYNOTES:

- INSTALL LIGHT FIXTURE 8' ABOVE FLOOR FINISH.
- 2 INSTALL LOUVER SO THAT BOTTOM FLANGE IS NOT LOWER THAN 48" AFF.
- 3 INSTALL EXHAUST FAN SO THAT BOTTOM FLANGE IS NOT LOWER THAN 48" AFF.
 4 PROVIDE POWER FOR MOTORIZED DAMPER IN LOUVER, INTERLOCK MOTORIZED DAMPE
- PROVIDE POWER FOR MOTORIZED DAMPER IN LOUVER. INTERLOCK MOTORIZED DAMPER WITH EXHAUST FAN IN SAME ROOM. DAMPER SHALL OPEN UPON OPERATION OF EXHAUST FAN. FIELD VERIFY EXACT LOCATION AND REQUIREMENTS.
- TELOCATE EXISTING PUMP CONTROL PANEL TO LOCATION SHOWN. FIELD COORDINATE EXACT PANEL LOCATION WITH OWNER/ARCHITECT PRIOR TO CIRCUITING.
- 6 PROVIDE JUNCTION BOX WITH DISCONNECT BREAKER AND CONTROL WIRING TERMINAL BLOCK (FOR FUTURE SCADA SYSTEM) FOR CHEMICAL METERING SKID.
- SEE SITE PLAN FOR CONTINUATION.
- RELOCATE EXISTING MOTOR STARTER TO LOCATION SHOWN. FIELD COORDINATE EXACT LOCATION AND REQUIREMENTS WITH EQUIPMENT LAYOUT.
- PROVIDE (1) NEMA-3R JUNCTION BOX ON VERTICAL RISER TO WELL PUMP. ROUTE CONDUCTORS FOR WELL PUMP THROUGH JUNCTION BOX AND DOWN TO PUMP. SEAL ALL JUNCTION BOX CONNECTIONS AND CONDUIT. FIELD VERIFY EXACT LOCATION AND REQUIREMENTS.
- D EXISTING HYDRO-PNEUMATIC TANK SHALL REMAIN.

CONDUIT & CONDUCTOR SCHEDULE:

- (3) #3 AND (1) #8 GROUND IN 1.5" CONDUIT
- (3) #6 AND (1) #8 GROUND IN 1" CONDUIT
 (3) (2) #8 AND (1) #10 GROUND IN 0.75" CONDUIT
- ONDOIT & CONDUCTOR SCHEDULL



STATE OF MISSOURI

MICHAEL L. PARSON, GOVERNOR

OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER & WASTEWATER IMPROVEMENTS

SULLIVAN, MISSOURI

PROJECT # X2306-03 SITE # 5214

FACILITY # 7815214051 7815214072

REVISION:_____ DATE:____

DATE<u>:</u>_____

REVISION:

REVISION:

ISSUE DATE: 08/16/2024
CAD DWG FILE:ME-101.DWG
DRAWN BY: CJH
CHECKED BY: CF
DESIGNED BY: CJD

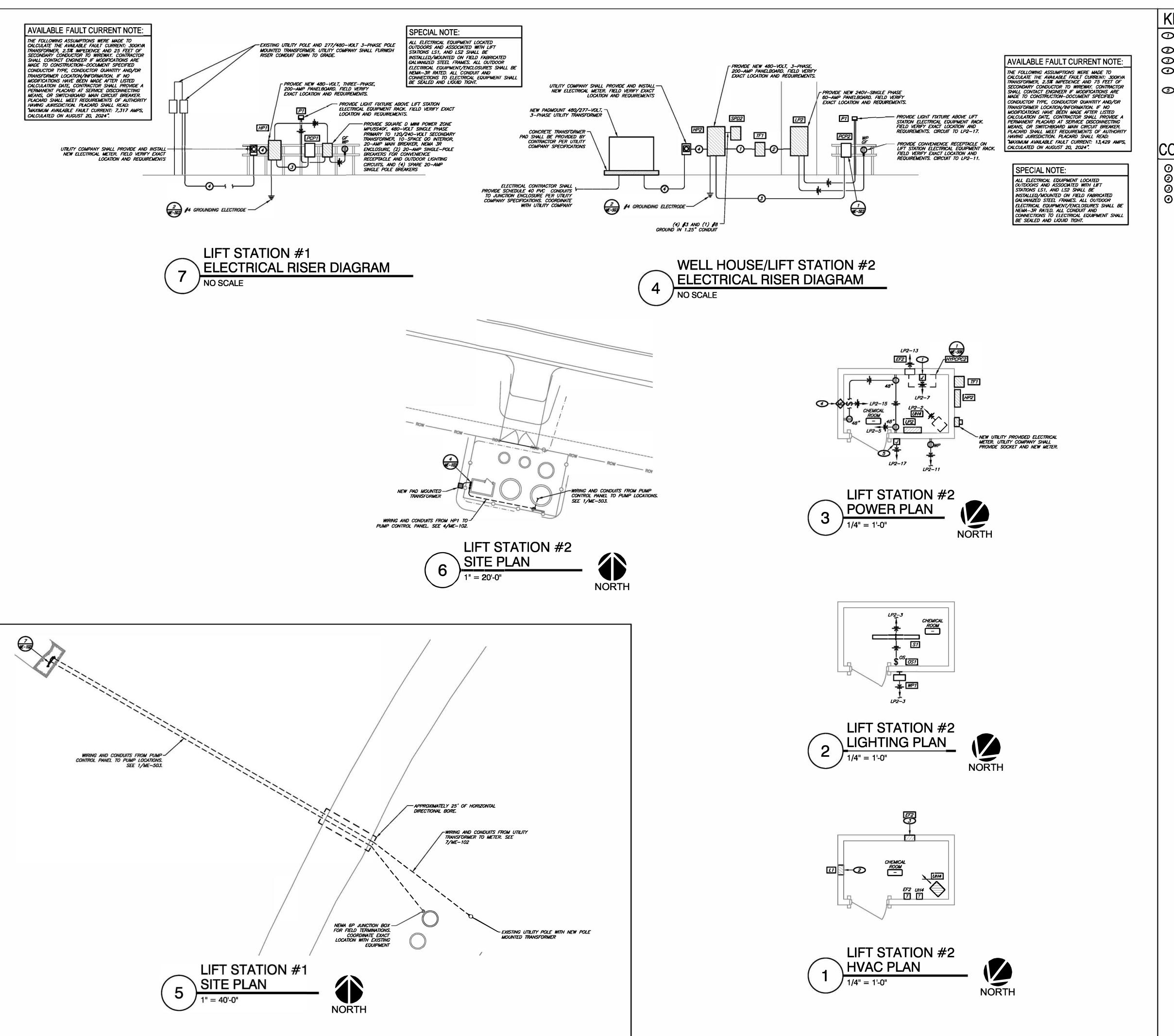
SHEET TITLE:

WELL HOUSE

MEP PLANS

SHEET NUMBER:

ME-101



KEYNOTES:

- PROVIDE JUNCTION BOX WITH DISCONNECT BREAKER AND CONTROL WIRING TERMINAL BLOCKS (FOR FUTURE SCADA SYSTEM) FOR CHEMICAL METERING SKID.
- INSTALL LOUVER SO THAT BOTTOM FLANGE IS NOT LOWER THAN 48" AFF.
- 3 INSTALL EXHAUST FAN SO THAT BOTTOM FLANGE IS NOT LOWER THAN 60" AFF.
- PROVIDE POWER FOR MOTORIZED DAMPER IN LOUVER. INTERLOCK MOTORIZED DAMPER WITH EXHAUST FAN IN SAME ROOM. DAMPER SHALL OPEN UPON OPERATION OF EXHAUST FAN. FIELD VERIFY EXACT LOCATION AND REQUIREMENTS.
- PROVIDE POWER TO OWNER SUPPLIED EMERGENCY LIGHT. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH OWNER.

CONDUIT AND CONDUCTOR SCHEDULE:

- (3) \$10 AND (1) \$10 GROUND IN 0.75" CONDUIT
- (2) #8 AND (1) #10 GROUND IN 0.75" CONDUIT

 (4) #3 AND (1) #8 GROUND IN 1.25" CONDUIT
- (4) #3/0 AND (1) #6 GROUND IN 2" CONDUIT

RYAN S.

PLONESO

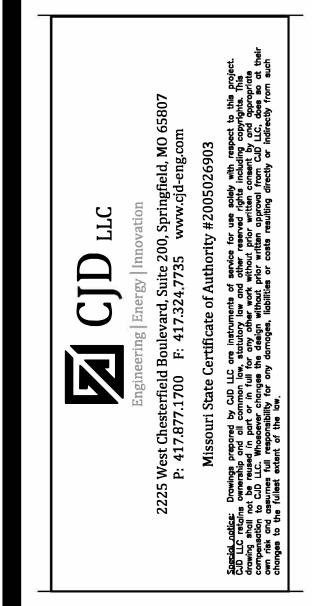
NUMBER

PE-2004017193

STATE OF MISSOURI

MICHAEL L. PARSON,

GOVERNOR



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

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7815214072

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ISSUE DATE: 08/16/2024

CAD DWG FILE:ME-102.DWG
DRAWN BY: CJH
CHECKED BY: CF
DESIGNED BY: CJD

SHEET TITLE:

LIFT STATIONS

MEP PLANS

SHEET NUMBER:

ME-102

	TRANSFORMER SCHEDULE									
MARK	RA	TING	140111177110	TEMP RISE	RISE PRIMARY		SEC	ONDARY	WEIGHT	NOTES &
MARK	KVA	PHASE	MOUNTING	(°C)	VOLTAGE	CONNECTION	VOLTAGE	CONNECTION	(LBS.)	ACCESSOR
TF1	15	3	WALL	150	480	DELTA	240/120	DELTA	235	4,5,6
1. COF 2. ELE 3. LUG 4. WAL	PPER WIN	ATIC SHIEL	.D							

6. NEMA 4X ENCLOSURE

	UNIT HEATER SCHEDULE											
MARK	MANUFACTURER	MODEL#	CFM	ESP	HTG CA	APACITY	VOLTAGE/	FLA	МОСР	WEIGHT (LBS)	NOTES &	
WIATAK	MANOTACTORER	WODEL #	(MIN)	("WC)	LOW (kW)	HIGH (kW)	PHASE	, 5,			ACCESSORIES	
UH1	REZNOR	EUH-TSL	125	NA	NA	3.0	240/1	12.8	15	49	1 THRU 6	
UH2	REZNOR	EUH-TSL	125	NA	NA	3.0	240/1	12.8	15	49	1 THRU 6	
UH3	REZNOR	EUH-TSL	125	NA	NA	3.0	240/1	12.8	15	49	1 THRU 6	
UH4	REZNOR	EUH-TSL	125	NA	NA	3.0	240/1	12.8	15	49	1 THRU 6	
ACCES	SORIES.											

. FULL FAN SAFETY GUARD.

- 24 VOLT CONTROL TRANSFORMER
- . REMOTE SINGLE STAGE HEATING ONLY THERMOSTAT. . ADJUSTABLE HORIZONTAL AND VERTICAL LOUVERS.
- . HANGER KIT.
- PROVIDE FACTORY INSTALLED DISCONNECT SWITCH FROM MANUFACTURER.

	LOUVER SCHEDULE										
MARK	MANUFACTURER	MODEL#	SERVICE	CFM	DELTA P (STATIC)	WIDTH X HEIGHT (IN)	DEPTH (IN)	FREE AREA MIN (SQ.FT.)	VELOCITY (FPM)	NOTES	
L1	POTTORFF	SFD-445	INTAKE	300	0.11"	14" x 14"	4"	0.4	715	1,2,3,4,5	
NOTES:				P*	*						

1. BIRD SCREEN 2. DRAINABLE BLADE

- 3. FLANGE FRAME
- 4. FACTORY PAINTED BAKED ENAMEL FINISH. COLOR AS SELECTED BY ARCHITECT.
- i. PROVIDE 120-VOLT, TWO-POSITION MOTORIZED DAMPER. INTERLOCK WITH EF1 TO OPEN WHEN EXHAUST FAN IS IN OPERATION.

	FAN SCHEDULE									
IMARKI MANUEACTURER MODEL# AREA SERVED SERVICE CEM									NOTES AND ACCESSORIES	
EF1	соок	ACWD - 70W17DEC	CHLORINE ROOM	EXHAUST	100	0.15"	50 W	120/1	1,2,3,4	
EF2	соок	ACWD - 70W17DEC	CHLORINE ROOM	EXHAUST	100	0.15"	50 W	120/1	1,2,3,4	
NOTES	AND ACCESSORIES:									

. PROVIDE FACTORY MOUNTED DISCONNECTING MEANS. 2. PROVIDE GRAVITY BACKDRAFT DAMPER. PROVIDE FAN SPEED CONTROLLER INSTALLED NEAR FAN MOTOR.

. PROVIDE WITH THERMOSTAT SET TO 75 DEG (ADJUSTABLE).

	SURGE PROTECTION DEVICE SCHEDULE									
MARK	MARK MANUFACTURER MODEL SURGE RATING VOLTAGE MODES OF PROTECTION MCOV NEMA ENCLOSURE OPTIONS									
SPD1	CURRENT TECHNOLOGY	#TG 150	150kA PER MODE	120/240V 1PH, 3W	L-N,L-G,N-G,L-L	550V	NEMA 3R	1,2,4		
SPD2	CURRENT TECHNOLOGY	#TG 150	150kA PER MODE	277/480V 3PH, 4W	L-N,L-G,N-G,L-L	550V	NEMA 4X	1,2,4		
	SORIES/NOTES: EGRAL DISCONNECT	•)		<u>VIATIONS:</u> NE TO NEUTRAL			

2. STATUS L.E.D.s

3. STANDARD MONITORING

4. ADVANCED MONITORING: PRIMARY MONITORING PLUS EVENT COUNTER DISPLAY, AUDIBLE ALARM WILED 5. STANDALONE ENCLOSURE - TVSS SHALL NOT BE INTEGRAL TO SWITCHGEAR

L-G LINE TO GROUND N-G - NEUTRAL TO GROUND L-L - LINE TO LINE

- SILVER PLATED COPPER BUS BARS - TIN PLATED ALUMINUM BUS BARS

- TRANSIENT VOLTAGE SURGE SUPPRESSION

- 200% RATED NEUTRAL BUS BAR

DDDOVED M	ANI IEACTI IDEDO:	SIEMENS SOLIADI	- 0
PPROVED M	ANUFACTURERS: S	SIEMENS, SQUARE	D

	OCC	UPAN	CY SEN	ISOR S	CHE	DUL	E			
MARK	LOAD					SE	NSOR			
MARK	EQUIPMENT SERVED	VOLTAGE	MANUF	MODEL#	VOLTAGE	TYPE	TIME DELAY	MOUNTING	INTERLOCK	ACCESS.
OS1	CHLORINE/PUMP ROOM LIGHTS	120	HUBBELL	AD2000	120	US/IR	15 MiN.	WALL BOX	-	3
2. WHERE SWITCHING 3. WALL SWITCH SHALL	ADD-A-RELAY, SUCH THAT PARALLEL SENSORS SHALL IS IS SHOWN, WIRE OCCUPANCY SENSOR CONTROL IN L BE CAPABLE OF MANUAL ON-OFF CONTROL ENSORS ARE SHOWIN IN A SINGLE ROOM/SPACE AND	SERIES WITH LO	CAL LIGHTSWITCHING					ABBREVIATIONS. PIR - PASSIVE INFR US - ULTRASONIC IR/US -DUAL TECHI	- CARED	
	. <u>IES TO ALL SENSORS):</u> PE MAY BE SHOWN IN MULTIPLE LOCATIONS ON ELECTI	RICAL PLANS						APPROVED MAN	UFACTURERS:	

I	2.	EQUIPMENT SUBMITTAL: PRIOR TO APPROVAL, WITH OCCUPANCY SENSOR SPECIFICATION INFORMATION, CONTRACTOR SHALL SUBMIT PLAN (PROVIDED BY MANUFACTURER'S REPRESENTATIVE) WITH OCCUPANCY SENSOR LOCATIONS, OCCUPANCY SENSOR 1YPE, MOUNTING HEIGHT AND SENSOR COVERAGE FOR EACH SPACE.
ı	3.	WHERE SWITCHING IS SHOWN, WIRE OCCUPANCY SENSOR CONTROL IN SERIES WITH LOCAL LIGHT SWITCHING.
ı	4.	PROVIDE CONTROL UNIT(S)/POWER PACK(S) AS REQUIRED.

FINISH/COLOR SHALL MATCH ALL OTHER DEVICES.

OLTAGE:	120/240	POLES:	:			24		MOUNTIN	IG:		SUF	RFACE	LOCATION:	PUMP ROOF
HASE / WIF	RE: 1/3	KAIC AI	MPS (R	MS):		MIN 12		ENCLOS	JRE:		N	EMA 1	MANUFACTURER:	SQUARE
MPS:	100	MCB/N	ALO:	-	100-A	мр мсв		FED FRO	M:		٨	IETER	MODEL:	Q
NCLOSURE	E ACCESSORIES: CH		Ser				,	PANELBO	ARD AC	ESSORIES		C-	CL, GB, TPB	-66
CIRC. NO.	EQUIPMENT SERVED		C/B AMPS	C/B POLES	C/B ACC.	LOAD (VA)	PHASE L	DADS (VA) B	LOAD (VA)	C/B ACC.	C/B POLES	C/B AMPS	EQUIPMENT SERVED	CIRC NO.
1	INTERIOR LIGHTING		20	1	_	210	1746		1536	HACR	2	15	UNIT HEATER UH1	2
3	EXTERIOR LIGHTING		20	1	-	135		1671	1536	-			"	4
5	CHLORINE ROOM RECEPTACLES		20	1	GFCI	180	1716		1536	HACR	2	15	UNIT HEATER UH2	6
7	CHEMICAL METER SKID		20	1	GFCI	1200		2736	1536	-				8
9	PUMP ROOM RECEPTACLES		20	1	GFCI	360	1896		1536	HACR	2	15	UNIT HEATER UH3	10
11	EXTERIOR RECEPACTLES		20	1	GFCI	540		2076	1536	-			•	12
13	EXHAUST FANS EF1		20	1	HACR	68.8	1817		1748	GFCI	2	60	WELL PUMP	14
15	MOTORIZED DAMPERS		20	1	-	180		1928	1748	-			•	16
17	EXTERIOR EMERGENCYLIGHT		20	1	-	180	3230		3050	HLF	2	40	WATER HEATER	18
19	AIR COMPRESSOR RECEPTACLE		20	1	-	180		3230	3050	-			н	20
21	SURGE PROTECTION DEVICE		80	2	-	5	185		180	-	1	20	PUMP CONTROL PANEL	22
23	(#)		+	. 1	-	5		5	76	-	_		SPACE	24

- EQUIPMENT GROUND BAR KIT

GROUND BAR INSULATOR KIT

- SERVICE ENTRANCE RATING

PREPARED CIRCUIT BREAKER SPACE

NEUTRAL BONDING KIT

	LIGHTING FIXTURE SCHEDULE												
MARK	MANUFACTURER	MODEL#	FINISH	MOUNTING		LAMPS		FIXTURE	VOLTAGE	APPROVED	NOTES		
WANK	WANDIACIONEN	WIODEL #	FINISH	WOONTING	TYPE	CODE	QTY.	WATTS	VOLTAGE	MANUFACTURERS	NOTES		
S1	WILLIAMS	96-4-L40/835-DRV-UNV	WHITE	SURFACE	LED	WITH FIXTURE	-	30	120	SUBMIT FOR APPROVAL	1		
S1E	WILLIAMS	96-4-L40/835-EM/10W-DRV-UNV	WHITE	SURFACE	LED	WITH FIXTURE	-	30	120	SUBMIT FOR APPROVAL	1,3		
WP1	WILLIAMS	WPCS-L44-840-BZ-EM/6W-PC-DIM-UNV	BRONZE	WALL	LED	WITH FIXTURE	-	45	120	SUBMIT FOR APPROVAL	2,3,6		
P1	HUBBELL	RFL3-40-5K	BLACK	POLE	LED	WITH FIXTURE	-	35	120	SUBMIT FOR APPROVAL	2,4,5,6		

PROVIDE ALL ACCESSORIES AS REQUIRED FOR PENDANT/SUSPENDED INSTALLATION. REFER TO ARCHITECTURAL DRAWING FOR MOUNTING HEIGHT.

- HINGED DOOR WITHIN HINGED DOOR

- EXTENDED GUTTER LEFT HAND SIDE

- EXTENDED GUTTER TOP

FL - FLUSH LOCK(S)

FIXTURE SHALL BE LISTED FOR OUTDOOR USE AND SHALL BE LISTED FOR DAMP OR WET LOCATION AS REQUIRED. PROVIDE INTERNAL BATTERY FOR 90 MINUTES OF EMERGENCY OPERATION.

- GROUND-FAULT INTERRUPTING - HACR RATING

- HANDLE LOCK-OFF

- HANDLE LOCK-ON

- SHUNT TRIP

GFCI HACR HLF

HLN SR

- 4. FIFL D VERIFY EXACT LOCATION AND INSTALLATION HEIGHT WITH OWNER AND ARCHITECT PRIOR TO ROUGH-IN. PROVIDE 15' BRUSHED ALUMINUM POLE. APPROPRIATELY SIZED POLE TOPE TENON MOUNTING AND SPLIPFIT HARDWARE.
- FIXTURE SHALL BE CAPABLE OF OPERATING AT TEMPERATURES FROM 0 TO 110 DEGREES F

ELECTRICAL SYMBOLS:

EXIT LIGHT; WALL / CEILING MOUNTED EMERGENCY LIGHT EXIT/EMERGENCY LIGHT

FLUORESCENT OR LED LIGHT FIXTURE

FLUORESCENT OR LED LIGHT FIXTURE WITH DUAL LEVEL SWITCHING \boxtimes FLUORESCENT OR LED LIGHT FIXTURE WITH EMERGENCY BALLAST

UNSWITCHED "NIGHT LIGHT" FIXTURE WALL-MOUNT LIGHT FIXTURE

20AMP, SINGLE POLE, 120/277V SWITCH 20AMP, THREE-WAY, 120/277V SWITCH 20AMP, FOUR-WAY, 120/277V SWITCH 20AMP, DOUBLE POLE, 120/277V SWITCH

120V ELECTRONIC TIMER SWITCH WALL BOX OCCUPANCY SENSOR SWITCH

OCCUPANCY SENSOR FOR LIGHTING CONTROL; WALL/CEILING MOUNTED POWER PACK FOR LIGHTING CONTROL; CEILING MOUNTED SIMPLEX RECEPTACLE; 2P, JW, 20A, 125V 14-30 SIMPLEX RECEPTACLE; NEMA CONFIGURATION AS INDICATED

DUPLEX RECEPTACLE; 2P, 3W, 20A, 125V DUPLEX RECEPTACLE; MOUNTED @ 42" ABOVE FINISHED FLOOR DUPLEX RECEPTACLE; INSTALLED FLUSH WITH CHILNG

DUPLEX RECEPTACLE; MOUNTED 6" ABOVE COUNTERTOP BACKSPLASH DUPLEX RECEPTACLE W/ GROUND FAULT INTERRUPTER DUPLEX RECEPTACLE; SWITCHED

DUPLEX RECEPTACLE; TAMPER RESISTANT DUPLEX RECEPTACLE; WEATHERPROOF OOUBLE DUPLEX RECEPTACLE WITH COMMON FACEPLATE

RECEPTACLE MOUNTED IN FLUSH FLOOR BOX. REFER TO SPECIFICATIONS RECEPTACLE MOUNTED IN FS TYPE BOX ON RIGID CONDUIT JUNCTION BOX; WALL / CEILING MOUNTED _____ [*LP1*] LIGHTING & POWER PANELBOARD

ELECTRICAL EQUIPMENT. SEE SCHEDULE FOR TAGGED EQUIPMENT DS1 DISCONNECT SWITCH

CONDUIT CONCEALED IN CEILING OR WALL ---- CONDUIT CONCEALED IN FLOOR SLAB - - CONDUIT ROUTED EXPOSED AT STRUCTURE P1-1 HOME RUN WITH PANEL AND CIRCUIT DESIGNATION

#18 CONDUCTORS AND QUANTITY FEEDER PER SCHEDULE

HVAC SYMBOLS:

FLEXIBLE DUCTWORK

CEILING RETURN/EXHAUST GRILLE

TEMPERATURE AVERAGING SENSOR

DUCTWORK (WIDTH/HEIGHT) WITH DAMPER

DOUBLE WALL INSULATED SPIRAL DUCT

CEILING SUPPLY DIFFUSER

TEMPERATURE SENSOR

SPACE CO2 SENSOR SPACE HUMIDITY SENSOR

FLEXIBLE CONNECTION

FIRE DAMPER

RADIATION DAMPER

SMOKE DAMPER MOTORIZED DAMPER

FIRE AND SMOKE DAMPER

ZONE CONTROL DAMPER

DIFFUSER TYPE AND CFM

ZONE BYPASS CONTROL DAMPER

RECTANGULAR TO ROUND TAKE-OFF

GENERAL MECHANICAL NOTES:

GENERAL MECHANICAL NOTES APPLY TO ALL MECHANICAL SHEETS.

- CJD ENGINEERING LLC, BEING THE AUTHOR OF THESE CONSTRUCTION DOCUMENTS RESERVES THE RIGHT OF FINAL INTERPRETATION AS TO THEIR INTENT AND MEANING, ANY ADDITIONAL WORK OR COSTS RESULTING FROM THE CONTRACTOR'S OWN INTERPRETATION AS TO THE INTENT OR MEANING WITHOUT CONSULTATION WITH CJD ENGINEERING LLC SHALL BE THE RESPONSIBILITY OF
- THE INTENT OF THE WORK INDICATED ON THESE CONSTRUCTION DOCUMENTS IS TO PROVIDE A FULLY FUNCTIONING SYSTEM IN COMPLETE WORKING ORDER. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND THE CONTRACTOR'S SUPPLIERS TO INCLUDE ALL ACCESSORIES, COMPONENTS, PARTS, ETC. THAT MAY NOT BE INDICATED ON THESE CONSTRUCTION DOCUMENTS TO PROVIDE BUILDING CODE COMPLIANT SYSTEMS AND EQUIPMENT THAT OPERATE SATISFACTORILY AS DESCRIPTION AND INTERPRET
- DRAWINGS ARE NOT SET UP SPECIFICALLY ACCORDING TO TRADE AND EACH CONTRACTOR AND SUB-CONTRACTOR OR TRADE IS REQUIRED TO REVIEW THE CONSTRUCTION DOCUMENTS AS A WHOLE AND PROVIDE ANY MISC. ITEMS, MATERIALS, WORK, ETC. REQUIRED TO COMPLETE THE WORK AS SHOWN ON ALL DOCUMENTS. THIS REQUIREMENT APPLIES TO ALL TRADES. STRUCTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING REQUIREMENTS AND RELATED WORK ARE INDICATED THROUGHOUT THE DOCUMENTS AND SHOULD BE REVIEWED WITH EACH FOR OVERALL SCOPE OF
- ALL MECHANICAL WORK SHALL BE PERFORMED BY LICENSED PLUMBING AND MECHANICAL CONTRACTORS AND SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF THE 2018 INTERNATIONAL
- BUILDING, PLUMBING, FUEL GAS AND MECHANICAL CODES, AND ALL APPLICABLE LOCAL CODES AS ADOPTED BY LOCAL AUTHORITIES.
- THE CONTRACTOR SHALL INCLUDE ALL PERMIT AND INSPECTION FEES IN BID. THE PLANS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. REFER TO CIVIL, STRUCTURAL, AND ARCHITECTURAL DRAWINGS AND EXISTING CONDITIONS FOR DIMENSIONS. FIELD VERIFY ALL DIMENSIONS.
- PIPING AND DUCTWORK LAYOUTS ARE DIAGRAMMATIC. FIELD COORDINATE EXACT LOCATIONS AND ROUTINGS WITH STRUCTURE, LIGHT FIXTURES, CONDUITS, ETC. FINAL RESULT SHALL BE EQUIVALENT TO THAT INDICATED ON DRAWINGS.
- COOPERATE CLOSELY WITH ALL OTHER TRADES TO EXPEDITE CONSTRUCTION AND AVOID INTERFERENCES AND CONFLICTS. BEFORE ANY PIPING, DUCTWORK, CONDUIT, ETC. IS INSTALLED, IT SHALL BE COORDINATED CAREFULLY BETWEEN ALL TRADES. MAINTAIN ALL CLEARANCES REQUIRED BY PLUMBING AND HVAC EQUIPMENT. COORDINATE WITH ELECTRICAL CONTRACTOR TO MAINTAIN ALL CLEARANCES REQUIRED FOR EQUIPMENT. DO NOT ROUTE PIPING, DUCTWORK, ETC. ABOVE ELECTRICAL PANELS.
- DRAWINGS REPRESENT FINAL RESULT. REMOVE, RELOCATE, MODIFY EXISTING EQUIPMENT, DUCTWORK, PIPING, ETC. AS REQUIRED. FIELO VERIFY EXISTING CONDITIONS AND EXACT REQUIREMENTS. NO EXTRAS WILL BE PAID DUE TO UNANTICIPATED EXISTING CONDITIONS.
- IF CONTRACTOR WISHES TO INCORPORATE PRODUCTS OTHER THAN THOSE NAMED IN SPECIFICATIONS IN HIS BID OR PRODUCTS BY MANUFACTURERS OTHER THAN THOSE LISTED AS APPROVED MANUFACTURERS, THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST FOR REVIEW AND APPROVAL OF PROPOSED SUBSTITUTIONS TO CJD ENGINEERING LLC NOT LESS THAN FIVE WORKING DAYS PRIOR TO BID DATE. APPROVAL OR ACCEPTANCE OF PROPOSED SUBSTITUTION O MANUFACTURERS OR ITEMS IS FOR THE PURPOSES OF BIDDING ONLY AND DOES NOT RELIEVE THE PROPOSED SUBSTITUTION FROM THE SUBMITTAL/SHOP DRAWING REVIEW AND DOES NOT CONSTITUTE PRIOR APPROVAL OF PROPOSED SUBSTITUTIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COSTS OF LARGER WIRING, CONDUIT, ENCLOSURES, CONTROL AND OVERCURRENT PROTECTIVE DEVICES, ETC. RESULTING FROM SUBSTITUTION OF EQUIPMENT OTHER THAN THAT WHICH WAS THE BASIS OF DESIGN AT NO COST TO OWNER OR A/E.
- THE CONTRACTOR SHALL PROVIDE ELECTRONIC SHOP DRAWINGS/SUBMITTALS OF ALL FIXTURES AND EQUIPMENT FURNISHED UNDER THIS CONTRACT.
- THE CONTRACTOR SHALL PERFORM A PRELIMINARY FUNCTIONAL TEST AND BALANCE FOR ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT. THE CONTRACTOR SHALL THEN OBTAIN THE SERVICES OF AN INDEPENDENT FIRM CERTIFIED WITH ASSOCIATED AIR BALANCING COUNCIL OR NATIONAL ENVIRONMENTAL BALANCING BUREAU TO PERFORM THE HVAC SYSTEM TESTING AND BALANCING IN ACCORDANCE WITH AABC OR NEBB NATIONAL STANDARDS.
- THE CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT, ACCESSORIES, AND MATERIAL FURNISHED BY HIM FOR A PERIOD OF ONE YEAR FROM FINAL ACCEPTANCE AGAINST ALL DEFECTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING COSTS TO CUT, PATCH AND REPAIR EXISTING WALL, FLOOR AND CEILING CONSTRUCTION AS REQUIRED TO INSTALL NEW PLUMBING FIXTURES, DUCTWORK, EQUIPMENT, PIPING, ETC. ARE INCLUDED IN THE BID PRICE.
- ALL SHUTOFF VALVES ON DOMESTIC WATER SHALL BE BRONZE FULL-PORT BALL VALVE TYPE. 2. P—TRAPS SHALL INCLUDE INTEGRAL CLEANOUT.
- EQUIVALENT EXHAUST FANS BY ACME, COOK, GREENHECK, PENN, OR OTHERS WITH PRIOR
- EQUIVALENT LOUVER BY RUSKIN, ARCHITECTURAL LOUVERS, OR OTHERS WITH PRIOR APPROVAL.
- EQUIVALENT UNIT HEATERS BY MARLEY, MODINE, OR OTHERS WITH PRIOR APPROVAL.
- PROVIDE ALL ACCESSORIES, COMPONENTS, ETC. REQUIRED FOR COMPLETE INSTALLATION OF
- 2. PROVIDE UNISTRUTS AND ACCESSORIES AS REQUIRED FOR SUPPORT OF PIPING, EQUIPMENT, ETC. CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS TO EQUIPMENT. PROVIDE ADAPTERS, FITTINGS, ETC. FOR ALL EQUIPMENT AS REQUIRED. COORDINATE SPECIFIC REQUIREMENTS WITH EQUIPMENT SUPPLIERS. REFER TO SPECIAL EQUIPMENT DRAWINGS FOR ADDITIONAL INFORMATION.
- ALL THERMOSTATS, SENSORS, DAMPER CONTROLS, ASSOCIATED ACCESSORIES, AND FINAL WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.
- INSTALL ALL ROOF EQUIPMENT, PIPE, CONDUIT AND DUCTWORK SUPPORTS, CURBS AND PENETRATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF THE ROOFING SYSTEM MANUFACTURER.
- PROVIDE SLEEVES AT PIPE PENETRATIONS OF EXTERIOR OR FOUNDATION WALLS. SEAL PENETRATIONS WEATHERTIGHT.
- ALL EXPOSED PIPING, DUCTWORK AND EQUIPMENT SHALL BE PRIMED AND PAINTED. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIREMENTS AND COORDINATE WITH GENERAL CONTRACTOR.

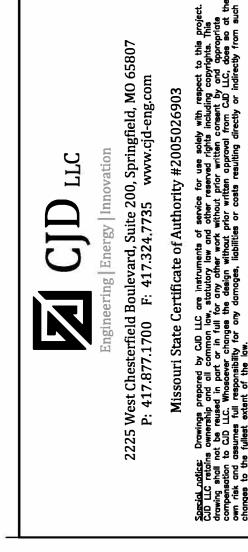
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- THE INTENT OF THE WORK INDICATED ON THESE CONSTRUCTION DOCUMENTS IS TO PROVIDE A FULLY FUNCTIONING SYSTEM IN COMPLETE WORKING ORDER. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND THE CONTRACTORS SUPPLIERS TO INCLUDE ALL ACCESSORIES, COMPONENTS, PARTS, ETC. THAT MAY NOT BE INDICATED ON THESE CONSTRUCTION DOCUMENTS TO PROVIDE BUILDING CODE COMPLIANT SYSTEMS AND EQUIPMENT THAT OPERATE SATISFACTORILY AS DESIGNED AND INTENDED.
- ALL ELECTRICAL WORK SHALL BE PERFORMED BY LICENSED CONTRACTORS IN ACCORDANCE WITH THE 2018 INTERNATIONAL BUILDING CODES, THE 2017 NATIONAL ELECTRICAL CODE, AND ALL LOCAL CODES AS ADOPTED BY THE AUTHORITIES HAVING JURISDICTION.
- THE CONTRACTOR SHALL INCLUDE ALL PERMIT AND INSPECTION FEES IN BID. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING HIS BID. NO EXTRAS WILL BE PAID DUE TO UNANTICIPATED EXISTING CONDITIONS. PLANS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. REFER TO CIVIL, STRUCTURAL AND ARCHITECTURAL DRAWINGS AND EXISTING CONDITIONS FOR DIMENSIONS. FIELD VERIFY ALL DIMENSIONS.
- EQUIPMENT AND CONDUIT/CONDUCTOR LAYOUTS ARE DIAGRAMMATIC. FIELO COORDINATE EXACT LOCATIONS AND ROUTINGS WITH STRUCTURE, PIPING, DUCTWORK, LIGHT FIXTURES, ETC. FINAL RESULT SHALL BE EQUIVALENT TO THAT INDICATED ON DRAWINGS.
- COOPERATE CLOSELY WITH ALL OTHER TRADES TO EXPEDITE CONSTRUCTION AND AVOID INTERFERENCES AND CONFLICTS. BEFORE ANY PIPING, DUCTWORK, CONDUIT, ETC. IS INSTALLED,
- MAINTAIN ALL CLEARANCES REQUIRED BY ELECTRICAL EQUIPMENT. COORDINATE WITH PLUMBING, HVAC, AND SPRINKLER CONTRACTORS TO MAINTAIN ALL CLEARANCES REQUIRED FOR EQUIPMENT. DO NOT ROUTE PIPING, DUCTWORK, ETC. ABOVE ELECTRICAL PANELS. DRAWINGS REPRESENT FINAL RESULT. REMOVE, RELOCATE, MODIFY EXISTING EQUIPMENT, DUCTWORK, PIPING, ETC. AS REQUIRED. FIELD VERIFY EXISTING CONDITIONS AND EXACT REQUIREMENTS.
- COORDINATE INFORMATION OUTLET, RECEPTACLE, AND OTHER DEVICE LOCATIONS WITH OWNER AND WITH OTHER TRADES PRIOR TO ROUGH—IN.
- INFORMATION OUTLET (DATA AND TELEPHONE) DEVICES, WALL PLATES, AND ASSOCIATED WIRING SHALL BE SUPPLIED AND INSTALLED BY OTHERS UNDER A SEPARATE CONTRACT WITH THE OWNER.
- THE CONTRACTOR SHALL PROVIDE ELECTRONIC SHOP DRAWINGS/SUBMITTALS OF ALL FIXTURES AND EQUIPMENT FURNISHED UNDER THIS CONTRACT.
- IF CONTRACTOR WISHES TO INCORPORATE PRODUCTS OTHER THAN THOSE NAMED IN SPECIFICATIONS IN HIS BID OR PRODUCTS BY MANUFACTURERS OTHER THAN THOSE LISTED AS APPROVED MANUFACTURERS, THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST FOR REVIEW AND APPROVAL OF PROPOSED SUBSTITUTIONS TO CID ENGINEERING LLC NOT LESS THAN FIVE WORKING DAYS PRIOR TO BID DATE. APPROVAL OR ACCEPTANCE OF PROPOSED SUBSTITUTION OF MANUFACTURERS OR ITEMS IS FOR THE PURPOSES OF BIDDING ONLY AND DOES NOT RELIEVE THE PROPOSED SUBSTITUTION FROM SUBMITTAL/SHOP DRAWING REVIEW AND DOES NOT CONSTITUTE PRIOR APPROVAL OF PROPOSED SUBSTITUTIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COSTS OF LARGER WIRING, CONDUIT, ENCLOSURES, CONTROL AND OVERCURRENT PROTECTIVE DEVICES, ETC. RESULTING FROM SUBSTITUTION OF EQUIPMENT OTHER THAN THAT WHICH WAS THE BASIS OF DESIGN AT NO
- THE CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT, ACCESSORIES, AND MATERIAL FURNISHED BY HIM FOR A PERIOD OF ONE YEAR FROM FINAL ACCEPTANCE AGAINST ALL DEFECTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING COSTS TO CUT, PATCH AND REPAIR EXISTING WALL, FLOOR AND CEILING CONSTRUCTION AS REQUIRED TO INSTALL NEW FIXTURES, CONDUIT, WIRING, ETC. ARE INCLUDED IN THE BID PRICE.
- LIGHT SWITCHES SHALL BE EQUIVALENT TO HUBBELL 1220 SERIES, 20-AMP, 120/277-VOLT, IN COLOR SELECTED BY THE ARCHITECT/INTERIOR DESIGNER, OR APPROVED EQUAL
- DUPLEX RECEPTACLES SHALL BE EQUIVALENT TO HUBBELL 5300 SERIES (OR APPROVED EQUAL), 20A, 125V, NEMA CONFIGURATION 5-20R, IN COLOR SELECTED BY OWNER.
- ALL RECEPTACLES THROUGHOUT UNITS SHALL BE TAMPER-RESISTANT TYPE, TO COMPLY WITH N.E.C. ELECTRICAL DEVICE WALL PLATES SHALL BE HIGH IMPACT NYLON PLASTIC IN COLOR AS SELECTED BY THE ARCHITECT/INTERIOR DESIGNER.
- FEEDER AND BRANCH CIRCUIT WIRING SHALL BE COPPER, 600V WITH THHN/THWN INSULATION.
 BRANCH CIRCUIT WIRING SHALL BE \$12 AWG MINIMUM. HOMERUNS FOR BRANCH CIRCUITS
 OVER 75 FEET LONG SHALL BE \$10 AWG; OVER 100 FEET LONG, \$8 AWG UNLESS INDICATED
- EQUIVALENT WIRING DEVICES BY BRYANT, COOPER, HUBBELL, LEVITON, OR AS APPROVED BY
- EQUIVALENT PANELBOARDS, LIGHTING CONTACTORS AND DISCONNECT SWITCHES BY CUTLER HAMMER, GENERAL ELECTRIC, SIBMENS, SQUARE D, OR AS APPROVED BY OWNER. EQUIVALENT LIGHTING CONTROLS: WATTSTOPPER, LEVITON, TORK.
- EXECUTION PROVIDE ALL ACCESSORIES, COMPONENTS, ETC. REQUIRED FOR COMPLETE INSTALLATION OF SPECIFIED EQUIPMENT.
- PROVIDE UNISTRUTS AND ACCESSORIES AS REQUIRED FOR SUPPORT OF PIPING, EQUIPMENT, COORDINATE LIGHTING AND CEILING DEVICE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING
- ALL WIRING SHALL BE INSTALLED IN EMT CONDUIT AND SHALL BE CONCEALED UNLESS
 OTHERWISE NOTED. PVC CONDUIT WILL BE ALLOWED BELOW SLAB. ALL TRANSITIONS FROM PVC
 TO STEEL CONDUIT SHALL BE MADE BELOW GRADE. MINIMUM CONDUIT SIZE FOR LIGHTING AND POWER BRANCH CIRCUITS ABOVE GRADE SHALL BE 1/2". MINIMUM CONDUIT SIZE FOR LIGHTING AND POWER BRANCH CIRCUITS BELOW GRADE SHALL BE 3/4". CONTRACTOR SHALL HAVE THE OPTION TO USE METALLIC CLAD (M/C) CABLE FOR CONCEALED BRANCH CIRCUIT WIRING.
- ALL EXPOSED WIRING SHALL BE INSTALLED IN EMT CONDUIT.
- MINIMUM CONDUIT SIZE FOR INFORMATION OUTLETS SHALL BE 3/4". CONDUIT STUBS SHALL EXTEND TO AN ACCESSIBLE CEILING AND BE TERMINATED WITH INSULATING BUSHINGS. ALL LIGHTING AND POWER CIRCUITS SHALL HAVE A GROUNDING CONDUCTOR.
- ALL RECEPTACLES, TELECOMMUNICATIONS OUTLETS, AND TELEVISION OUTLETS SHALL BE INSTALLED AT 18" AFF TO CENTER UNLESS NOTED OTHERWISE. ALL SWITCHES SHALL BE INSTALLED AT 48" AFF TO CENTER UNLESS NOTED OTHERWISE.
- PROVIDE TYPED CIRCUIT DIRECTORIES FOR ALL PANELBOARDS. DIRECTORY INFORMATION SHALL INCLUDE CIRCUIT NUMBER AND EQUIPMENT SERVED. 10. PROVIDE SLEEVES AT CONDUIT PENETRATIONS OF EXTERIOR OR FOUNDATION WALLS, SEAL PENETRATIONS WEATHERTIGHT.
- SEAL ALL PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES AS NECESSARY TO RESTORE FIRE-RESISTANCE RATING OF ASSEMBLY, REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR RATED ASSEMBLIES, FIRESTOPPING MATERIALS AND REQUIREMENTS. CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS TO SPECIAL EQUIPMENT. PROVIDE ADAPTERS, FITTINGS, ETC. FOR ALL EQUIPMENT AS REQUIRED. COORDINATE SPECIFIC REQUIREMENTS WITH EQUIPMENT SUPPLIERS. REFER TO SPECIAL EQUIPMENT DRAWINGS FOR
- ELECTRICAL CONTRACTOR SHALL PROVIDE ROUGH—IN FOR THERMOSTATS AND SENSORS PROVIDE SINGLE—GANG BOX WITH 0.75" CONDUIT TO ABOVE ACCESSIBLE CEILING OR TO ASSOCIATED EQUIPMENT. THERMOSTATS, SENSORS, AND WIRING SHALL BE PROVIDED BY
- MECHANICAL CONTRACTOR. REFER TO HVAC PLANS FOR THERMOSTAT AND CONTROL LOCATIONS.
- REMOVE EXISTING LIGHT FIXTURES, SWITCHES, RECEPTACLES, TELEPHONE JACKS, DATA JACKS, FIRE ALARM DEVICES, ETC. IN REMOVED WALL AND CEILINGS. OTHER LIGHT FIXTURES, SWITCHES, RECEPTACLES, TELEPHONE, DATA, FIRE ALARM DEVICES, ETC. SHALL REMAIN UNLESS INDICATED OTHERWISE. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL NOTES AND EXTENTS OF DEMOLITION.
- SALVAGE AND PROTECT DEMOLISHED LIGHT FIXTURES FOR RE—USE. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL MATERIALS BEING REMOVED. ITEMS WHICH ARE TO REMAIN THE PROPERTY OF THE OWNER SHALL BE MOVED BY THE CONTRACTOR TO AN AREA IN THE BUILDING AS DIRECTED BY THE OWNER. ALL OTHER ITEMS SHALL BE REMOVED FROM THE PREMISES AND LEGALLY DISPOSED OF BY THE CONTRACTOR.
- REMOVE CONDUIT, SUPPORTS, AND CONDUCTORS, ETC. ASSOCIATED WITH DEMOLISHED ITEMS EXCEPT WHERE NEW DEVICES ARE INSTALLED IN PLACE OF EXISTING. REMOVE EXISTING UNUSED CONDUIT, BOXES, SUPPORTS, CONDUCTORS, ETC. ABANDONED WITHIN THE AREA OF CONSTRUCTION.
- MODIFY EXISTING CONDUIT AND WIRING AS REQUIRED TO MAINTAIN CONTINUITY OF EXISTING CIRCUITS.

STATE OF MISSOURI MICHAEL L. PARSON **GOVERNOR**





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT. **DESIGN AND CONSTRUCTION**

STATE OF MISSOURI **DIVISION OF STATE PARKS** MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER & WASTEWATER **IMPROVEMENTS**

SULLIVAN, MISSOURI

PROJECT # X2306-03 5214

FACILITY # 7815214051

	7815214072
REVISION: DATE:	
REVISION:	<u> </u>

ISSUE DATE: 08/16/2024

CAD DWG <u>FILE:ME-501.DWG</u> DRAWN BY: CHECKED BY:

SHEET TITLE:

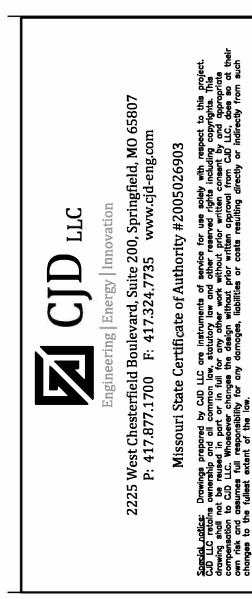
DESIGNED BY: CJD

WELL HOUSE NOTES/SCHEDULES

SHEET NUMBER:

OR)100AF	LOW - VOLTAGE CIRCUIT BREAKER (CB). RATINGS AND NO. OF POLES AS SHOWN.	KVA	NON-MOTOR LOAD WITH DESIGN KVA, KW, OR	7	NORMALLY OPEN LEVEL SWITCH,	★ X X X	DOUBLE-FACED CEILING OR WALL-MOUNTED	СР	CONTROL PANEL
80AT 3P	WHEN SPECIFIC TYPE IS REQUIRED, X INDICATES TYPE.		AMI	~T°	CLOSE ON RISING LEVEL NORMALLY CLOSED LEVEL SWITCH,		EXIT LIGHT; DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS SINCE FACED CELLING OR WALL MOUNTED EXIT	EUH OR UH	ELECTRIC UNIT HEATER
	TYPES: MCCB - MOLDED CASE	СРТ	CONTROL POWER TRANSFORMER (CPT)	0 ~ 0	OPEN ON RISING LEVEL	$\bigotimes_{x}^{x} + \bigotimes_{x}^{x}$	SINGLE-FACED CEILING OR WALL-MOUNTED EXIT LIGHT; DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS		FLOW SENSOR/TUBE FLOW TRANSMITTER/METER
	ICCB - INSULATED CASE LVP - LOW - VOLTAGE POWER MCP - MOTOR CIRCUIT PROTECTOR			7	NORMALLY OPEN PRESSURE SWITCH, CLOSE ON INCREASING PRESSURE	•———— ×	AREA OR ROADWAY LIGHT — POLE—MOUNTED	LS	LEVEL FLOAT SWITCH
lii	(RATING PER CONNECTED LOAD)	\rightarrow \leftarrow	VOLTAGE TRANSFORMER (VT OR PT)	To	NORMALLY CLOSED PRESSURE SWITCH, OPEN ON INCREASING PRESSURE	×γ	LIGHTING FIXTURE SUBSCRIPTS:	LE	OR LIMIT SWITCH LIQUID LEVEL SENSOR AND/OR
Ú	SEPARATELY MOUNTED CIRCUIT BREAKER; SEE ELECTRICAL ONE — LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION		CURRENT TRANSFORMER (CT)	%	NORMALLY OPEN LIMIT SWITCH, CLOSE ON REACHING LIMIT		 X - INDICATES FIXTURE TYPE PER LIGHTING FIXTURE SCHEDULE Y - INDICATES CIRCUIT NUMBER FROM 		TRANSDUCER LEVEL TRANSMITTER
	GROUND FAULT PROTECTION	4		0~70	NORMALLY CLOSED LIMIT SWITCH,		PANELBOARD z - INDICATES CONTROLLING SWITCH (IF	45	NORMALLY OPEN
<u> </u>	MEDIUM - VOLTAGE CIRCUIT BREAKER	WH	UTILITY WATT-HOUR METER PER UTILITY REQUIREMENTS	DD	OPEN ON REACHING LIMIT	ĻΥ	REQUIRED)		NORMALLY CLOSED
 -				\(\)	FIELD WIRING EXTERNAL TO CONTROL PANEL INTERLOCK; X INDICATES TYPE	, X	TOGGLE SWITCH SUBSCRIPTS:		LIFT STATION PUMP SURGE PROTECTION DEVICE
<u> </u>	FUSE, SIZE, AND NUMBER OF FUSES AS NOTED FUSED CUTOUT, CURRENT RATING, FUSE SIZE,	DMP	DIGITAL METERING PACKAGE		TYPES: E — ELECTRICAL		X - INDICATES TYPE NONE - SINGLE POLE 3 - THREE-WAY		TO BE REMOVED
	AND NUMBER OF POLES AS NOTED	RTM	RUN TIME METER	OFF	M - MECHANICAL K -		4 - FOUR-WAY HP - TOGGLE SWITCH, HORSEPOWER RATED		TO BE MODIFIED TO BE CONFIRMED
] -	FUSIBLE SWITCH, CURRENT RATING, FUSE SIZE, AND QUANTITY AS NOTED	<u> </u>	GROUND	HAND A AUTO	KEY 3 POSITION SELECTOR SWITCH, MAINTAINED CONTACTS;		K - KEY SWITCH LV - LOW VOLTAGE M - MOMENTARY	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
	NON-FUSED SWITCH, CURRENT RATING, AND NUMBER OF POLES AS NOTED	_			UNLESS OTHERWISE NOTED, 2-POSITION SIMILAR		TE - MANUAL MOTOR STARTER WITH THERMAL ELEMENT B - BU OT LIGHT	RVSS	REDUCED VOLTAGE, SOLID
	DISCONNECT OR DRAWOUT CONNECTION	<u>-</u>	LIGHTNING ARRESTER	0 0	NORMALLY OPEN PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED		 P - PILOT LIGHT L - LIGHTED HANDLE Y - INDICATES CONTROLLING SWITCH (IF REQUIRED) 	FVNR	STATE MOTOR STARTER FULL VOLTAGE NON-REVERSING
VFD X	MAGNETIC MOTOR STARTER OR VFD WHERE	SPD	LOW VOLTAGE SURGE PROTECTIVE DEVICE	مـلـه	NORMALLY CLOSED PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED	(oc)	TYPES: PIR - PASSIVE INFRARED (CEILING MOUNTED)	HOA	MOTOR STARTER HAND-OFF-AUTO SELECTOR SWI
	X = WIRING DIAGRAM # A = MAGNETIC NEMA STARTER SIZE B = STARTER TYPE		ELECTRICAL CONNECTION	x	INDICATING LIGHT, X INDICATES LENS COLOR		US - ULTRASONIC (CEILING MOUNTED)	LOR	LOCAL-OFF-REMOTE SELECTOR
				\sim	PUSH TO TEST INDICATING LIGHT, X INDICATES	⊢⑤	SPECIAL-PURPOSE RECEPTACLE AS DEFINED ON PLANS		
	INDICATES UNDERGROUND CIRCUIT, SEE DUCTBANK SCHEDULE	→ OR → OR —	NO ELECTRICAL CONNECTION	 ○	LENS COLORS:		PLUG-IN RECEPTACLE STRIP, QUANTITY AND SPACING OF RECEPTACLES AS NOTED OR SPECIFIED		
Í	DISCONNECT OR SAFETY SWITCH,	SV OR O	SOLENOID VALVE		R — RED Y — YELLOW G — GREEN W — WHITE	\blacksquare	TELECOMMUNICATIONS OUTLET OR JUNCTION BOX		
	3P NON-FUSED UNLESS NOTED OTHERWISE XX-INDICATES CURRENT RATING	X	CONTROL (DELAY COLL Y INDICATES TYPE	T	B — BLUE A — AMBER TRANSFORMER	₩X	QUAD-DUPLEX RECEPTACLE, TWO NEMA 5-20R UNDER COMMON COVER PLATE	SITE UTILITY SYMBOLS UGPE	UNDERGROUND PRIMARY CONDU
I	DISCONNECT OR SAFETY SWITCH, 3P FUSED UNLESS NOTED OTHERWISE XX-INDICATES CURRENT RATING	Ŷ	CONTROL/RELAY COIL; X INDICATES TYPE, Y INDICATES LOOP NO. WHEN USED TYPES:	ss	SELECTOR SWITCH	\bowtie^{X}_{Y}	DUPLEX RECEPTACLE, NEMA 5-20R		AND CONDUCTORS
t.	YY-FUSE RATING		CR — CONTROL RELAY DP — DEFINITE PURPOSE RELAY	РВ	PUSHBUTTON	⊢⊖×	SIMPLEX RECEPTACLE, NEMA 5-20R	UGSE	UNDERGROUND SECONDARY CO AND CONDUCTORS
J	SEPARATELY MOUNTED COMBINATION MOTOR STARTER OR CONTROLLER; SEE ELECTRICAL ONE — LINE DIAGRAM OR SCHEDULE FOR		LC — LIGHTING CONTACTOR M — MOTOR STARTER PC — PHOTO CELL	IC	INSTRUMENTATION/CONTROL DEVICE	Y	SUBSCRIPTS:	——— OHPE ———	OVERHEAD PRIMARY ELECTRICA
	DESCRIPTION		TC - TIME CLOCK TR - TIMING RELAY		TERMINATION BLOCK (TB) XX = TB DESIGNATION		X — INDICATES TYPE GFCI — GROUND FAULT CIRCUIT INTERRUPTER Y — INDICATES CIRCUIT NUMBER FROM	——— OHSE ———	CONDUCTORS
	THERMAL OVERLOAD ELEMENT	$\dashv\vdash$	NORMALLY OPEN CONTACT (N.O.)		YY = TB NUMBER		PANELBOARD WP — WEATHERPROOF WHILE IN USE	——— OHSE ———	OVERHEAD SECONDARY ELECTR CONDUCTORS
	THERMAL OVERLOAD RELAY CONTACT	-\	NORMALLY CLOSED CONTACT (N.C.)		CONTROL PANEL INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT		CONDUIT TURNING UP CONDUIT TURNING DOWN	ugc	UNDERGROUND COMMUNIACATIO
\searrow		\sim	NORMALLY OPEN TIME DELAY RELAY CONTACT WITH TIME DELAY ON CLOSING AFTER COIL IS		CONTROL PANEL WITH DISCONNECT SWITCH INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT		HOME RUN TO PANEL, 2 #12, 1 #12G IN	———онс ———	OVERHEAD COMMUNICATIONS C
R HP	MOTOR WITH DESIGN HORSEPOWER	0-1-0	ENERGIZED NORMALLY CLOSED TIME DELAY RELAY CONTACT	<u> </u>	JUNCTION OR PULL BOX		3/4"C UNLESS OTHERWISE NOTED	5.1.5	OVERTICAL COMMONICATIONS C.
	(WHEN INDICATED)		WITH TIME DELAY ON OPENING AFTER COIL IS ENERGIZED		PANELBOARD (250V TO 600V) PANELBOARD (LESS THAN 250V)		CIRCUIT RUN BETWEEN DEVICES EXPOSED IN		
		\sim	NORMALLY OPEN TIME DELAY RELAY CONTACT WITH TIME DELAY ON OPENING AFTER COIL IS DE-ENERGIZED		ELECTRICAL EQUIPMENT ENCLOSURE: SWITCHBOARD,		NON-ARCHITECTURALLY FINISHED AREAS; CONCEALED IN ARCHITECTURALLY FINISHED AREAS. CONDUIT AND CONDUCTOR SIZES SHALL		
)	MOTOR STARTER INTERGRAL WITH MOTOR OR	0_0	NORMALLY CLOSED TIME DELAY RELAY CONTACT WITH TIME DELAY ON CLOSING AFTER COIL IS		MOTOR CONTROL CENTER, CONTROL PANEL, OR OTHER EQUIPMENT AS INDICATED		BE THE SAME AS THE HOMERUN FOR THE CIRCUIT.		
/	PROVIDED WITH MOTOR/DRIVEN EQUIPMENT	↓	DE-ENERGIZED	PC	PHOTOCELL		CONDUIT RUN BETWEEN DEVICES CONCEALED IN NON-ARCHITECTURALLY FINISHED AREAS OR		
	GENERATOR	200	NORMALLY OPEN TEMPERATURE SWITCH; CLOSE ON RISING TEMPERATURE	Z X Y	CEILING/PENDANT-MOUNTED LUMINAIRE - HID, LED, COMPACT FLUORESCENT, OR INCANDESCENT		UNDER FLOOR SLAB. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT.	GENERAL NOTES: 1. THIS IS A STANDARD	ELECTRICAL SYMBOLOGY SHEET.
/ nl	TRANSFER SWITCH, CURRENT RATING, AND	050	NORMALLY CLOSED TEMPERATURE SWITCH; OPEN ON RISING TEMPERATURE	HZ X	WALL-MOUNTED LUMINAIRE - HID, LED, COMPACT FLUORESCENT, OR INCANDESCENT	111.11	CIRCUIT HASH MARKS (WHEN INDICATED); LONG, SHORT, SINGLE DOT, AND DOUBLE DOT	ALL SYMBOLS MAY BE U	USED ON THIS PROJECT.
ΔTS	NUMBER OF POLES AS NOTED ATS -	0,0	NORMALLY OPEN FLOW SWITCH;	Z O X	CEILING/PENDANT-MOUNTED FLUORESCENT OR		REPRESENT PHASE, NEUTRAL, EQUIPMENT GROUND, AND ISOLATED EQUIPMENT GROUND,	EXISTING COMPONENTS	OING OF WORK IS USED TO INDIC OR TO DE-EMPHASIZE PROPOSEI ILIGHT SELECTED TRADE WORK. F
	AUTOMATIC MTS - MANUAL		CLOSE ON INCREASING FLOW	Z Y	LED FIXTURE WALL-MOUNTED FLUORESCENT OR LED FIXTURE	×	RESPECTIVELY. #12 IN 3/4" CONDUIT UNLESS OTHERWISE INDICATED.	TO CONTEXT OF EACH S	SHEET FOR USAGE.
0	TRANSFORMER	o	NORMALLY CLOSED FLOW SWITCH; OPEN ON INCREASING FLOW	× Y	CEILING/PENDANT-MOUNTED FLUORESCENT		CONDUIT STUBBED OUT AND CARRED	3. SEE P&ID LEGEND S EQUIPMENT SYMBOLS, E SYSTEM ABBREVIATIONS.	HEET FOR PROJECT-SPECIFIC QUIPMENT ABBREVIATIONS, AND
25.	\triangle 3-PHASE, 3-WIRE DELTA CONNECTION	PLC			FIXTURE NORMAL/EMERGENCY WALL-MOUNTED FLUORESCENT FIXTURE	GYYL	CONDUIT STUBBED OUT AND CAPPED		
	Y 3-PHASE, 4-WIRE GROUNDED WYE CONNECTION		PLC DIGITAL OUTPUT	X Y	NORMAL/EMERGENCY	EXX)	UNDERGROUND DUCT BANK WITH SEGMENT TAG — CABLE AND CONDUIT SIZE AS SPECIFIED IN DUCK BANK SCHEDULE ON THE SHEETS		
	SWITCHBOARD OR PANELBOARD; NAME,	PLC	PLC DIGITAL INPUT	Y X	EMERGENCY LIGHT FIXTURE, 2 ATTACHED HEADS AS SHOWN		XX - INDICATES SEGMENT ID#		
<u> </u>	VOLTAGE, PHASE, NUMBER OF WIRES WHEN INDICATED			Υ×	EMERGENCY LIGHT, REMOTE MOUNTED HEAD		GROUND CABLE		
120V 4W						•	GROUND ROD		





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STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER & WASTEWATER IMPROVEMENTS

SULLIVAN, MISSOURI

PROJECT # X2306-03 SITE # 5214 FACILITY # 7815214051

7815214031 7815214072

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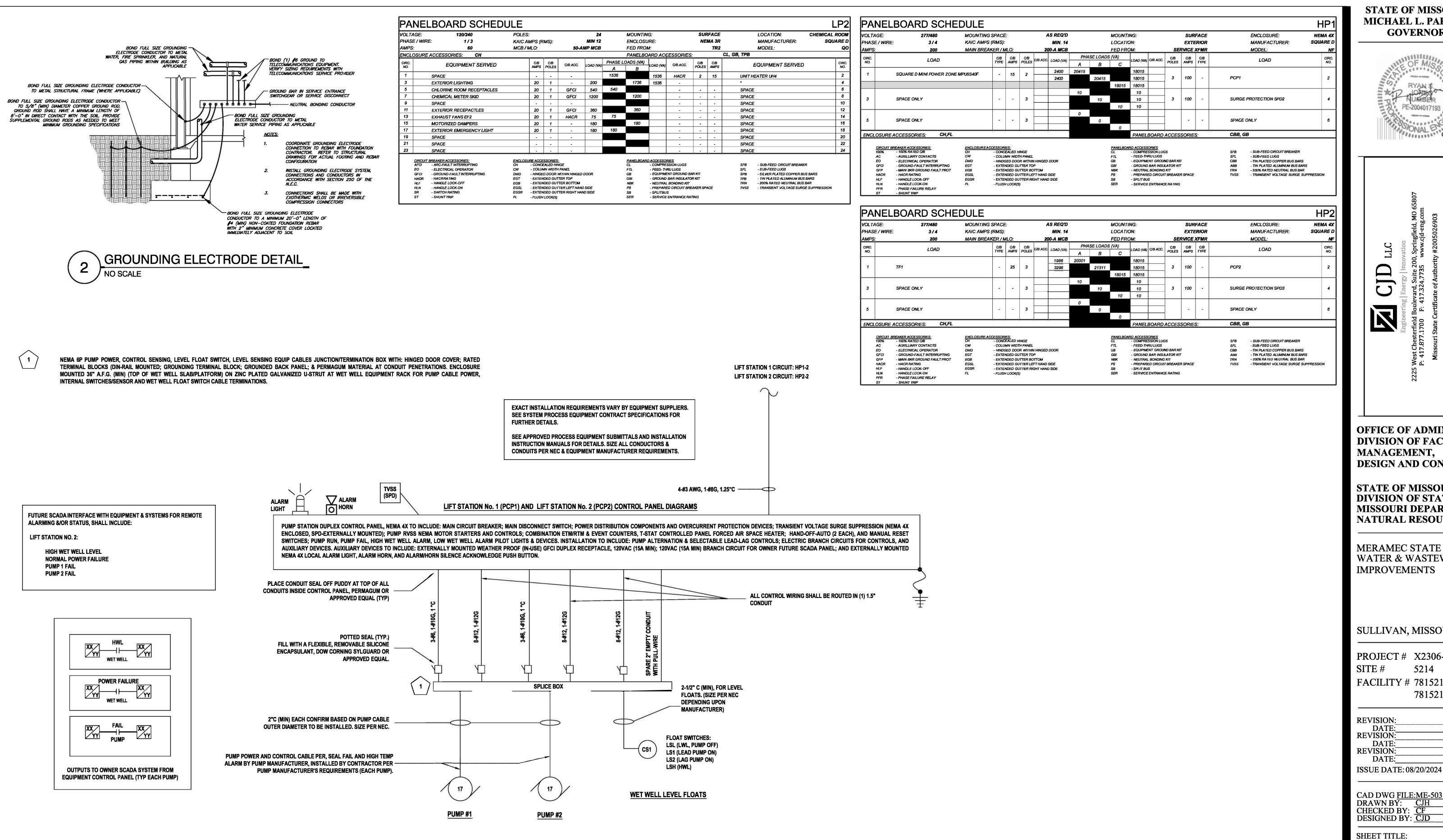
CAD DWG FILE:ME-502.DWG
DRAWN BY: CJH
CHECKED BY: CF
DESIGNED BY: CJD

SHEET TITLE:

ELECTRICAL CONTROL LEGEND

SHEET NUMBER:

ME-502



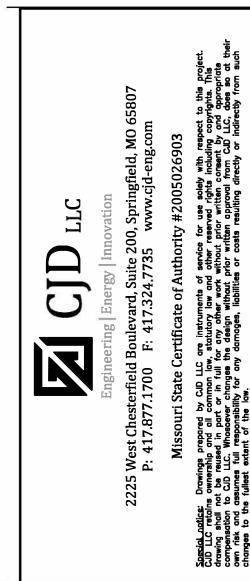
SANITARY SEWER LIFT STATION No. 1 AND No. 2 CONTROL PANEL (PCP1, PCP2)

LIFT STATION PROPOSED RISER DIAGRAM (TYP)

- 1. MAXIMUM OF 2 (TWO) PUMPS OPERATING AT ONE TIME.
- 2. SEE LIFT STATION APPROVED EQUIPMENT COMPONENT, CONDUIT, AND CONDUCTORS INTERCONNECTION DRAWINGS FOR DETAILS. SIZE ALL CONDUCTORS AND CONDUITS PER NEC &
- **EQUIPMENT MANUFACTURER REQUIREMENTS.**
- 3. ALL EQUIPMENT RACK MOUNTED ENCLOSURES SHALL BE NEMA 4X, UNLESS OTHERWISE NOTED.
- 4. SEE ELECTRIC DETAIL SHEET (CD-104) FOR FURTHER DETAILS.

STATE OF MISSOURI MICHAEL L. PARSON. **GOVERNOR**





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PROJECT # X2306-03 5214

FACILITY # 7815214051 7815214072

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CAD DWG FILE:ME-503.DWG

DRAWN BY: CJ CHECKED BY: CF DESIGNED BY: CJD

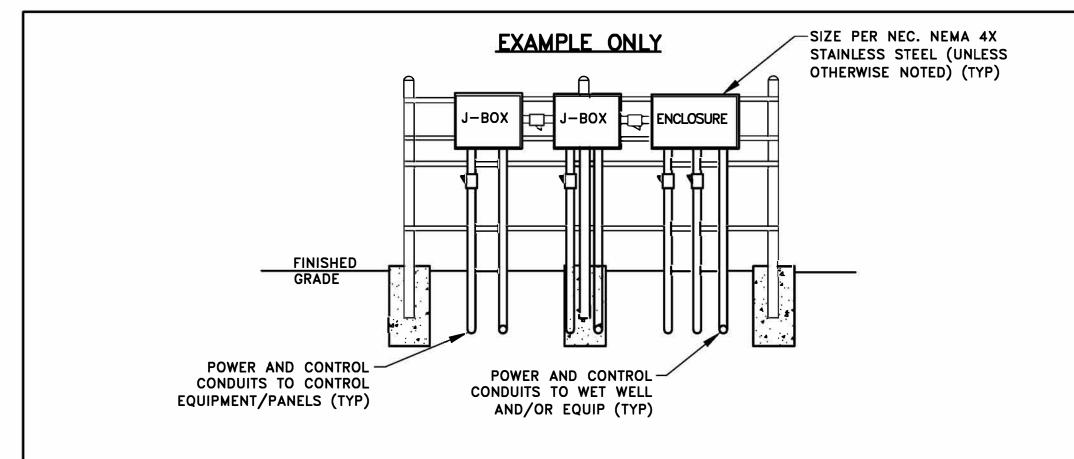
SHEET TITLE:

STATION NOTES/SCHEDULES

SHEET NUMBER:

GENERAL UNDERGROUND ELECTRIC CONDUIT SYSTEM NOTES:

- 1. ALL UNDERGROUND CONDUIT SYSTEMS SHALL BE CONSTRUCTED AS INDICATED AND PER CONTRACT SPECIFICATIONS.
- 2. TOP OF ELECTRICAL DIRECT BURIED CONDUIT SYSTEM SHALL BE MINIMUM 36 INCHES BELOW FINISH GRADE FOR UGE-PRIMARY AND 30 INCHES FOR UGE-SECONDARY AND EQUIPMENT BRANCH CIRCUITS (UNLESS OTHERWISE NOTED) TO TOP OF HIGHEST CONDUIT IN EXCAVATION.
- 3. CONDUIT INSTALLATIONS FOR UGE-PRIMARY AND UGE-SECONDARY MAY BE COMBINED IN SAME TRENCH EXCAVATION. CONTRACTOR SHALL INSURE CONDUITS OF DIFFERENT SYSTEMS (VOLTAGE) MAINTAIN A MINIMUM OF 12 INCH HORIZONTAL SPACING AND APPROPRIATE DEPTH TO TOP OF CONDUIT, AS INDICATED ABOVE AND OTHER DETAILS FOR ALL CONDITIONS.
- 4. CONDUIT MATERIALS (TYP):
- A. UNDERGROUND PRIMARY: HDPE SDR 13.5, BLACK WITH RED STRIPE, OR SCHED 40 PVC, UNLESS OTHERWISE NOTED.
- B. UNDERGROUND SECONDARY, FEEDERS, BRANCH CIRCUITS, AND CONTROL: SCHEDULE 40 PVC UNLESS OTHERWISE NOTED.
- C. PROCESS ANALOG/SIGNAL & COMMUNICATION (SUCH AS 4-2mA) CABLE SYSTEMS: PVC COATED RIGID STEEL OR THICK WALLED ALUMINUM.
- D. ALL PORTIONS OF EXPOSED DUCTS/CONDUIT SYSTEMS EXTENDING ABOVE GRADE AND/OR CONCRETE PADS, SHALL BE HOT-DIPPED, ZINC COATED, GALVANIZED RIGID STEEL OR THICK WALL ALUMINUM, UNLESS OTHERWISE NOTED.
- E. PAD MOUNTED EQUIPMENT TERMINATION LOCATIONS: CONDUIT ELBOWS (LARGE RADIUS SWEEPS) SHALL BE SCHEDULE 40 PVC AND EXTEND 6 INCHES (MINIMUM) ABOVE COMPACTED AGGREGATE BACKFILL IN RESPECTIVE ENCLOSURE COMPARTMENTS.
- 5. CONDUIT SYSTEM INSTALLATION:
- E. ASSEMBLE DUCTS ON SPACERS TO MAINTAIN HORIZONTAL AND VERTICAL SEPARATION OF MINIMUM OF TWO (2) INCHES BETWEEN DUCTS. DUCT SPACERS SHALL BE LOCATED AT INTERVALS NOT GREATER THAN FIVE (5) FEET.
- F. JOINTS OF ADJACENT DUCTS SHALL BE STAGGERED.
- G. METAL CONDUIT JOINTS SHALL BE MADE WATERTIGHT BY APPLICATION OF WATERPROOF PAINT, BITUMASTIC NO. 50 OR APPROVED EQUAL.
- H. AFTER CONSTRUCTING UNDERGROUND DUCTS AND MANHOLES AND BEFORE PULLING ANY CABLE, PULL A TEST MANDREL, FOLLOWED BY A CLEANING MOP, THROUGH EACH DUCT.
- I. IMMEDIATELY AFTER CLEANING, INSTALL PULLING ROPE IN EACH DUCT. PLUG OR CAP EACH END OF ALL DUCTS AFTER CLEANING UNTIL FINAL CONNECTIONS ARE MADE. INSTALL CAPS ON ALL SPARE CONDUITS.
- J. CABLE/CONDUCTOR PULLING IN ROPE SHALL BE CONSTRUCTED OF NYLON WITH MINIMUM BREAKING STRENGTH OF 3000 POUNDS AND MEET CABLE MANUFACTURER'S REQUIREMENTS.
- 6. EXCAVATION AND TRENCHING SHALL BE AS INDICATED. BACKFILL SHALL BE MINIMUM 90 PERCENT COMPACTION, UNLESS OTHERWISE NOTED. PLACE CLEAN COMPACTED BACKFILL MATERIAL ALONG SIDES AND ABOVE DUCT BANK.
- 7. AUTHORIZED DIRECT BURIED LOCATIONS, PLACE CLEAN (REMOVE ALL ROCKS LARGER THAN 2" IN DIAMETER AND DEBRIS) COMPACTED BACKFILL MATERIAL ABOVE CONDUIT BEDDING MATERIAL.
- 8. INSTALL SIX (6) INCH WIDE RED ALUMINUM FOIL TYPE MARKER TAPE SIX INCHES ABOVE THE CONCRETE DUCTBANK AND 8" (MINIMUM) BELOW FINISH GRADE FOR DIRECT BURIED THE ENTIRE UNDERGROUND CIRCUIT LENGTH. THE MARKER TAPE MUST BE THE FULL LENGTH OF THE CONCRETE AND CONDUIT SYSTEM.

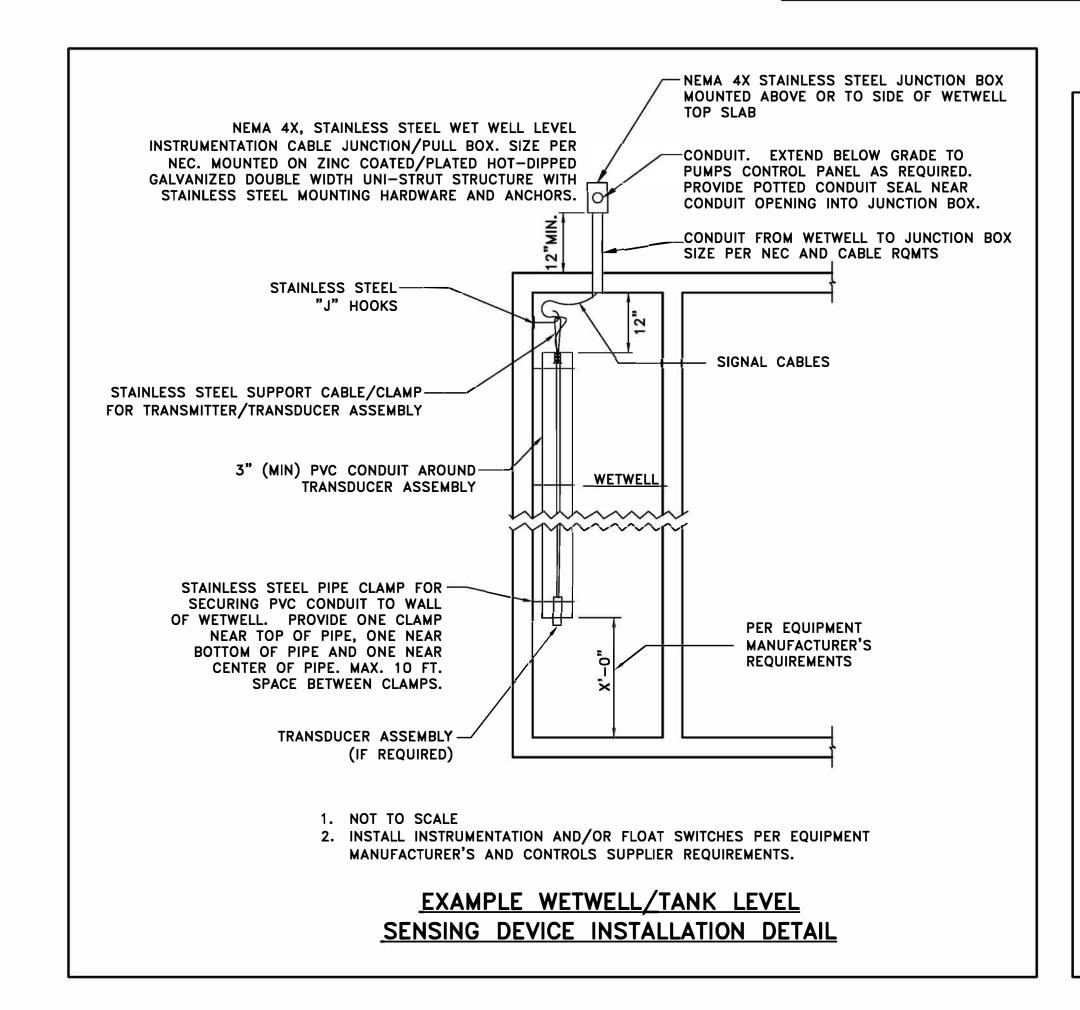


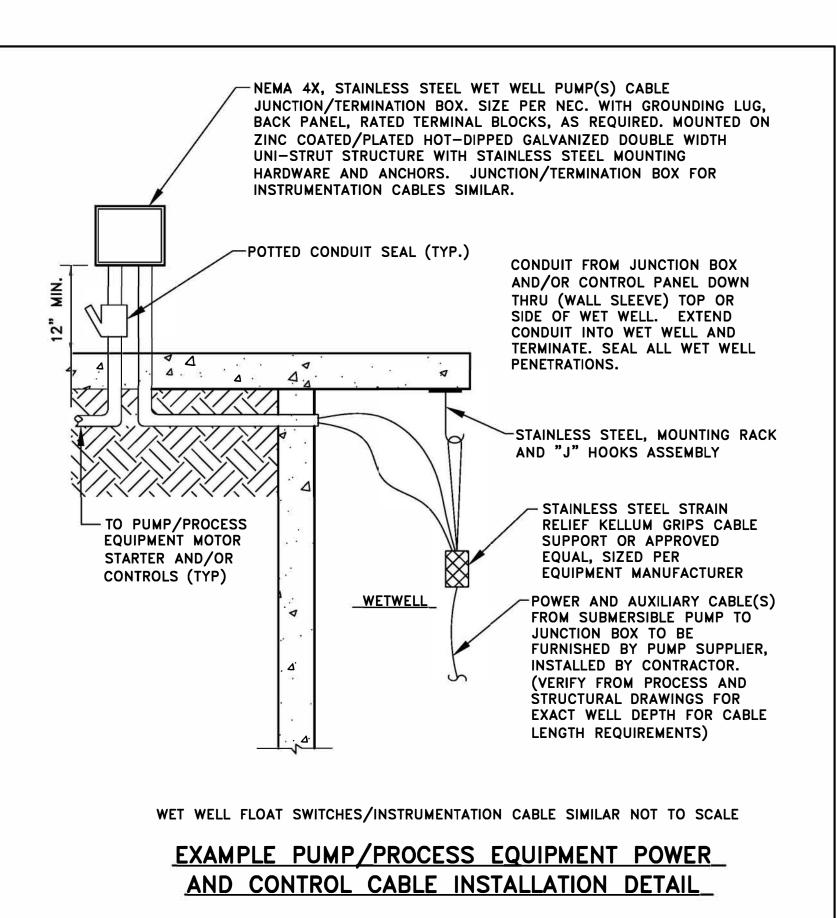
NOTES

- FINAL EQUIPMENT RACK LAYOUT AND DETAILS TO BE SUBMITTED BY CONTRACTOR FOR CITY APPROVAL PRIOR TO INSTALLATION.
 ACTUAL JUNCTION BOX &/OR CONTROL ENCLOSURES MOUNTING REQUIREMENTS TO BE DETERMINED BY CONTRACTOR BASED ON EQUIPMENT TO BE SUPPLIED AND INSTALLED. ENCLOSURE AND DEVICE SPACING ON RACK SHALL BE PER NEC TO MEET PROPER WORK
- 3. SEE PROCESS & SERVICE ONE-LINE/RISER DIAGRAMS AND SPECIFICATIONS FOR SUPPORTING STRUCTURE AND GROUNDING REQUIREMENTS.
- 4. ELECTRICAL EQUIPMENT RACKS SHALL BE LOCATED A MINIMUM OF 10' FROM NEAREST ROADWAY AND/OR PARKING AREA. ELECTRICAL EQUIPMENT RACK SHALL CONSIST OF: THREE (3) ZINC COATED OR PLATED HOT-DIPPED GALVANIZED, CAPPED, 4" DIA. BY 8' LONG STEEL POSTS AND MINIMUM FOUR (4) 6' ZINC COATED OR PLATED HOT DIPPED GALVANIZED RIGID SLOTTED STRUTS OR UNI-STRUT. PLACE POLES IN 12" DIA. BY 42" DEEP CONCRETE ENCASEMENT (SONOTUBE OR EQUAL), SPACE 3' APART, AND WITH CONCRETE CROWN. SPACE HORIZONTAL STRUTS AS REQUIRED TO INSTALL AND SUPPORT ALL INDICATED ELECTRICAL EQUIPMENT. GROUND RACK TO SITE GROUNDING SYSTEM.

NOT TO SCALE, NOT ALL CONDUITS INDICATED FOR CLARITY

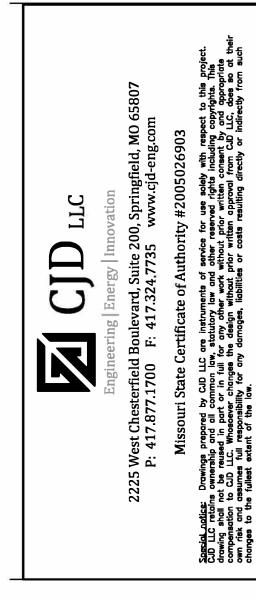
EXAMPLE EQUIPMENT RACK LAYOUT (TYPICAL)





STATE OF MISSOURI MICHAEL L. PARSON, GOVERNOR





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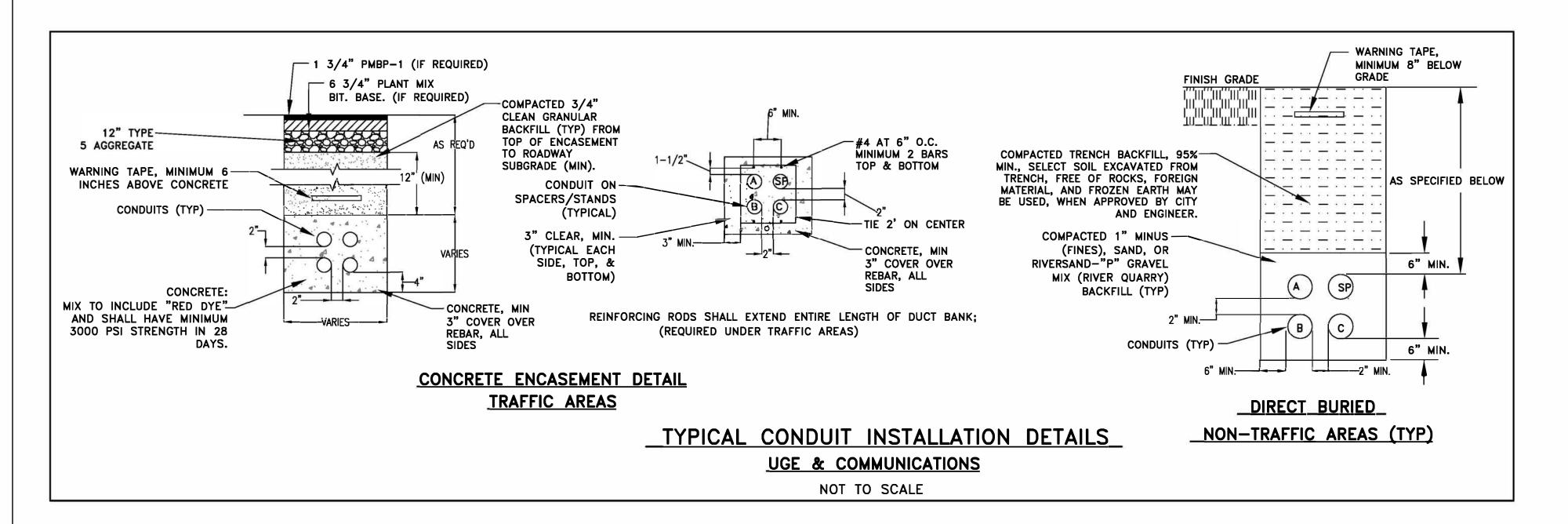
CAD DWG FILE:ME-504.DWG
DRAWN BY: CJH
CHECKED BY: CF
DESIGNED BY: CJD

SHEET TITLE:

GENERAL ELECTRICAL DETAILS

SHEET NUMBER:

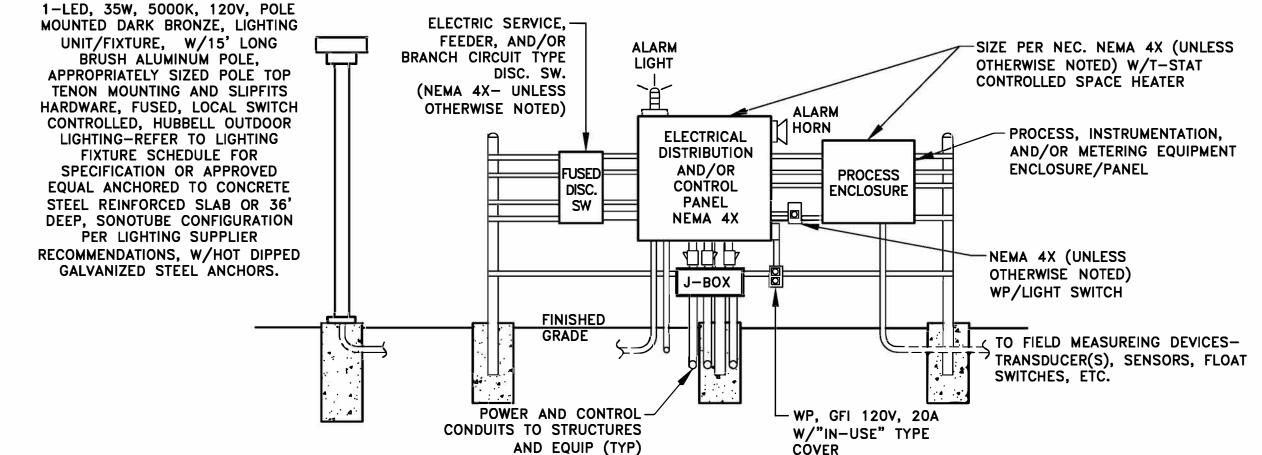
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CONDUIT SYSTEMS AND DUCT BANK NOTES:

- 1. ALL UNDERGROUND CONDUIT SYSTEMS AND DUCT BANKS SHALL BE CONSTRUCTED AS INDICATED. CONCRETE STEEL REINFORCED DUCT BANKS, AS A MINIMUM, SHALL BE CONSTRUCTED IN ALL TRAFFIC/LARGE EQUIPMENT AREAS AND ADJACENT TO CONCRETE STRUCTURES.
- 2. CONDUITS ENCASED IN CONCRETE SHALL BE SCHEDULE 40 PVC, ANSI/NEMA TC-6, TYPE-1.
- 3. ALL PORTION OF DUCTS/CONDUIT SYSTEMS EXTENDING BEYOND CONCRETE SHALL BE HOT-DIPPED GALVANIZED RIGID STEEL. ALL RISER ELBOWS SHALL BE RIGID GALVANIZED CONDUIT. PROVIDE LONG RADIUS SWEEPS (ELBOWS) FOR ALL TERMINATION RISERS.
- 4. EXTEND THE 3 INCH CONCRETE ENVELOPE ABOVE FINISH FLOOR OR GRADE FROM WHICH DUCT EMERGES AND FINISH SO THAT MOISTURE DRAINS AWAY FROM THE CONDUIT. EXTEND THE CONDUIT ABOVE THE CONCRETE A SUFFICIENT LENGTH TO THREAD AND INSTALL BUSHINGS.
- 5. CONTRACTOR SHALL USE POLYETHYLENE DUCT SPACERS OF THE INTERLOCKING TYPE TO PROVIDE THE INDICATED SPACING
- 6. ALL DUCT JOINTS SHALL BE WATERTIGHT BY APPLICATION OF JOINT SEALER COMPOUND FURNISHED BY DUCT MANUFACTURER. ALL RIGID STEEL CONDUIT JOINTS SHALL BE MADE WATERTIGHT BY APPLICATION OF WATERPROOF PAINT, KOPPERS' BITUMASTIC NO. 50 OR APPROVED EQUAL.
- 7. REINFORCING SHALL BE MINIMUM #4 REBAR ON SIX (6) CENTERS TOP, BOTTOM, AND SIDES. MINIMUM TWO (2) REBARS TOP AND BOTTOM. REBAR SHALL EXTEND ENTIRE LENGTH OF DUCT BANK AND BE PROVIDED WITH MINIMUM OF THREE (3) INCHES OF CONCRETE COVER. NO REINFORCING STEEL OR OTHER FERROUS MATERIAL SHALL BE INSTALLED BETWEEN INDIVIDUAL DUCTS.
- 8. SECURELY TIE OVERALL AT TWO FEET CENTERS OR CLOSER INTERVALS.
- 9. SECURE DUCT BANK ASSEMBLY TO ANCHORS AFTER ASSEMBLY TO PREVENT FLOATATION WHEN PLACING CONCRETE.
- 10. EXCAVATION AND TRENCHING SHALL BE PER SITE PREPARATION AND EXCAVATION SPECIFICATIONS. BACKFILL SHALL BE MINIMUM 90 PERCENT COMPACTION.
- 11. CONCRETE SHALL BE AT 3000-PSI STRENGTH (MINIMUM) AT 28 DAYS. CONCRETE SHALL HAVE RED COLORING ADDED TO CONCRETE MIX.
- 12. SUPPORT CABLE(S) AND CONDUCTORS IN MANHOLES ON PIERCE NO. 2225 HEAVY CABLE RACKS (OR APPROVED EQUAL) WITH SUITABLE STAINLESS STEEL OR ALUMINUM HOOKS AND PORCELAIN INSULATORS.
- 13. PROVIDE DUCTS, TERMINATING IN HANDHOLDS, MANHOLES, AND OR PULL BOXES WITH MANHOLE DUCTBELLS OF SAME MATERIAL AS THE DUCT TERMINATIONS.
- 14. PLACE CLEAN COMPACTED BACKFILL MATERIAL ALONG SIDES AND ABOVE DUCT BANK.

NOT TO SCALE, NOT ALL CONDUITS INDICATED FOR CLARITY



NOTES

- 1. FINAL EQUIPMENT RACK LAYOUT AND DETAILS TO BE SUBMITTED TO OWNER & ENGINEER BY CONTRACTOR FOR PRIOR TO INSTALLATION.
- 2. ACTUAL PROCESS EQUIP CONTROL PANEL MOUNTING REQUIREMENTS TO BE DETERMINED BY EQUIPMENT SUPPLIER. SUBMIT PROPOSED LAYOUT FOR REVIEW & APPROVAL.
- 3. LIGHT FIXTURE POLE ASSEMBLY SHALL HAVE HIGH STRENGTH BOLTS, WASHERS, AND NUTS SHALL CONFORM TO AASHTO M164, OR HIGH STRENGTH BOLTS CONFORMING TO ASTM A193 AND GRADES B5, B6, B7, OR B16 AND NUTS CONFORMING TO ASTM A194, SHALL BE PERMITTED. ALL STEEL SHALL BE AASHTO M183. ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED. ALL STEEL COMPONENTS SHALL BE HOT DIPPED GALVANIZED.
- 4. SEE SERVICE ONE-LINE & RISER DIAGRAMS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION & GROUNDING REQUIREMENTS.
- 5. ELECTRICAL EQUIPMENT RACKS SHALL BE LOCATED A MINIMUM OF 10' FROM NEAREST ROADWAY AND/OR PARKING AREA. ELECTRICAL EQUIPMENT RACK SHALL CONSIST OF THREE (3) ZINC COATED OR PLATED, HOT-DIPPED GALVANIZED, CAPPED, 4" DIA. BY 8' LONG STEEL POSTS AND MINIMUM FOUR (4) 6' ZINC COATED OR ZINC PLATED, HOT DIPPED GALVANIZED RIGID SLOTTED STRUTS OR UNISTRUT. PLACE POLES IN 12" DIA. BY 48" DEEP CONCRETE ENCASEMENT (SONOTUBE OR EQUAL), SPACE 3' APART, AND WITH CONCRETE CROWN. SPACE HORIZONTAL STRUTS AS REQUIRED TO INSTALL AND SUPPORT ALL INDICATED ELECTRICAL EQUIPMENT. GROUND RACK TO SITE GROUNDING SYSTEM.
- 6. CONTRACTOR SHALL SUPPLY ONE SPARE POLE MOUNTED AREA LED FIXTURE FOR EACH TYPE INSTALLED.

ELECTRICAL EQUIPMENT RACK LAYOUT (EXAMPLE ONLY)

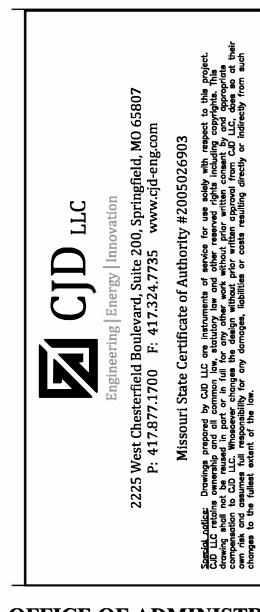
GROUNDING NOTES:

- 1. INSTALL & TEST SYSTEM PER LATEST REVISION OF NEC AND AS REQUIRED PER CONTRACT DOCUMENTS.
- 2. #4/0 BARE GROUNDING CONDUCTOR SYSTEM (COPPER). PLACE MIN. 30 IN. BELOW GRADE IN UNDISTURBED OR NEW COMPACTED SOIL. ALL CONNECTIONS SHALL BE EXOTHERMIC WELD. ALL GROUNDING SYSTEMS BY CONTRACTOR
- 3. INTERCONNECT 30 INCH (MIN) BURIED GROUNDING SYSTEM BY EXOTHERMIC CADWELD. GROUNDING SYSTEM SHALL INCLUDE CONTINUOUS #4/0 BARE CU GROUND CONNECTED TO: NEW SERVICE ENTRANCE EQUIPMENT; REMOTE/INTERIOR/EXTERIOR PROCESS EQUIPMENT RACKS SUPPORTING DISCONNECT SWITCHES & JUNCTION/TERMINATION ENCLOSURES; STRUCTURAL (BUILDING ANCHORING STEEL (MIN. TWO LOCATIONS); AND STRUCTURAL FOUNDATION REINFORCING STEEL (MIN. TWO LOCATIONS).
- 4. GROUND RODS (MINIMUM ONE EACH) SHALL BE INSTALLED AT EACH EQUIPMENT LOCATION, ELECTRIC & CONTROLS EQUIPMENT RACKS, SERVICE ENTRANCE, AND GENERATOR SET/SERVICE CONNECTION POINT LOCATION.
- 5. ALL EXTERIOR COMPONENTS SHALL BE CONNECTED BY EXOTHERMIC WELD.
- 6. APPLY ONE COAT OF COAL TAR COATING AT 15 mils (MIN) DRY FILM THICKNESS TO ALL EXOTHERMIC-WELDED CONNECTIONS TO BE BURIED.
- 7. TEST GROUNDING SYSTEM PER CONTRACT SPECIFICATIONS AND ADD ADDITIONAL GROUNDING ROD SYSTEM AS REQUIRED TO MEET MINIMUM OF 5 OHMS MEASUREMENT. SUBMIT FINAL APPROVED TEST REPORT IN FACILITY IMPROVEMENTS PROJECT O&M MANUAL.

NEW/EXISTING GROUNDING SYSTEM REQUIREMENTS

STATE OF MISSOURI MICHAEL L. PARSON, GOVERNOR





OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

STATE OF MISSOURI DIVISION OF STATE PARKS MISSOURI DEPARTMENT OF NATURAL RESOURCES

MERAMEC STATE PARK WATER & WASTEWATER IMPROVEMENTS

SULLIVAN, MISSOURI

PROJECT # X2306-03 SITE # 5214 FACILITY # 7815214051

7815214072

REVISION:
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CAD DWG FILE ME-505 DW

ISSUE DATE: 08/16/2024

CAD DWG FILE:ME-505.DWG
DRAWN BY: CJH
CHECKED BY: CF
DESIGNED BY: CJD

SHEET TITLE:

GENERAL
ELECTRICAL
DETAILS

SHEET NUMBER:

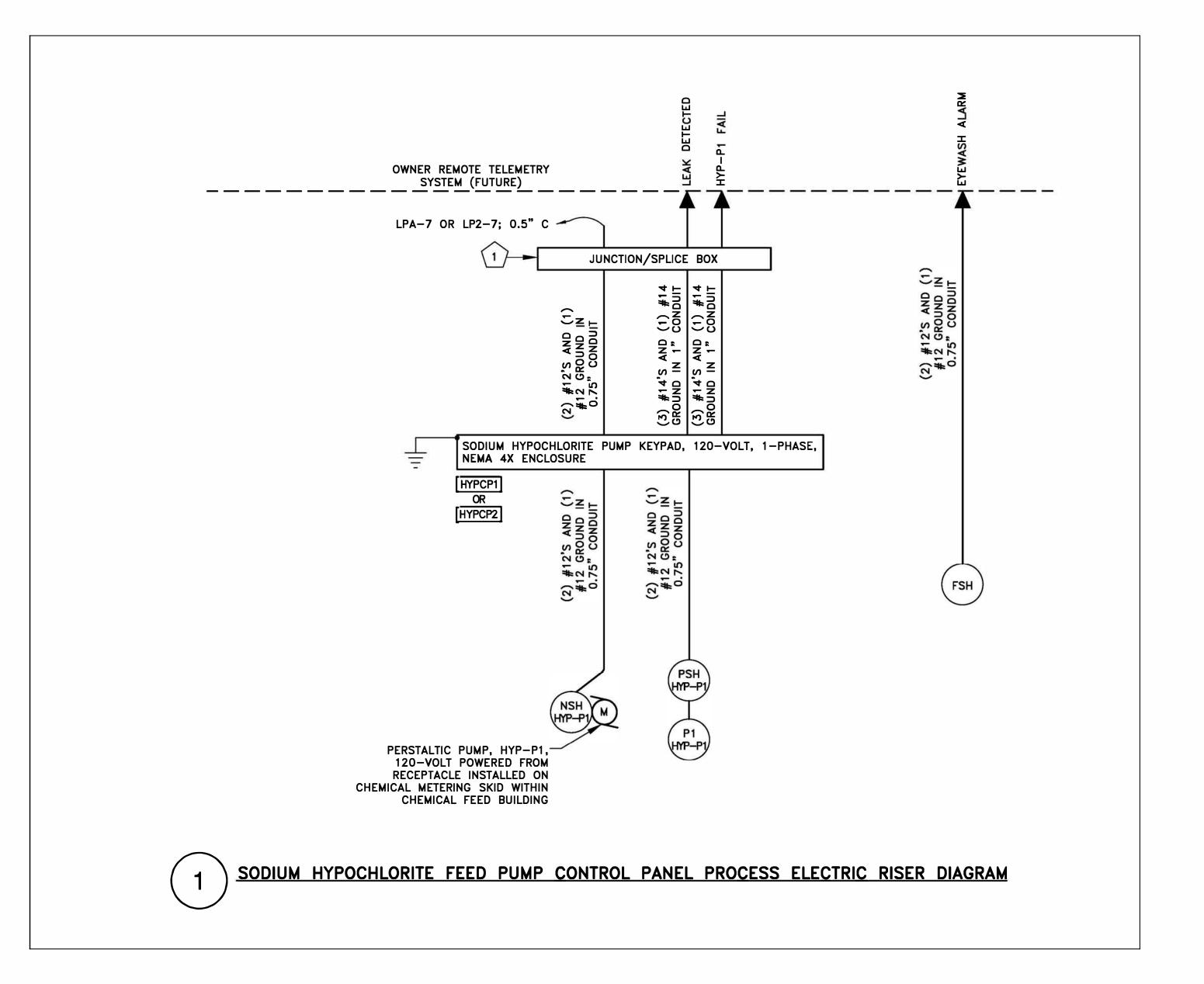
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GENERAL ELECTRICAL NOTES:

- 1. POTTED CONDUIT SEALS ARE REQUIRED FOR ALL ELECTRICAL INTERCONNECTIONS WITH PROCESS EQUIPMENT.
- 2. STAINLESS STEEL KELLUM-TYPE STRAIN RELIEF GRIPS OR APPROVED EQUAL ARE REQUIRED FOR ALL CABLES INSTALLED IN WETWELLS.
- PVC COATED RIGID METAL CONDUIT REQUIRED FOR ALL INSTRUMENTATION CONDUIT.
- 4. RIGID METAL CONDUIT REQUIRED FOR ALL ABOVE GRADE CONDUIT INSTALLATIONS. ALL BELOW GRADE PVC CONDUIT SHALL BE TRANSITIONED TO RIGID METAL CONDUIT BELOW GRADE (OR CONCRETE FLOOR) AT SWEEP/BEND PRIOR TO PASSING ABOVE GRADE/THROUGH CONCRETE AT CONCRETE.

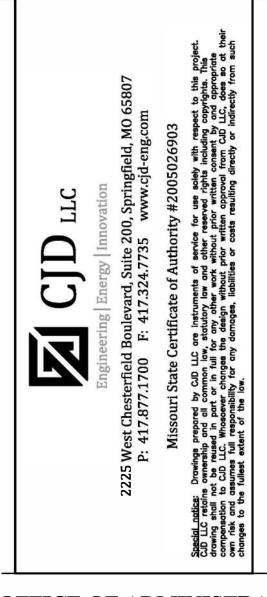
KEYNOTES:

NEMA 3R JUNCTION/TERMINATION AND PULLBOX WITH: HINGED DOOR COVER, RATED TERMINAL BLOCKS (DIN-RAIL MOUNTED), GROUNDING TERMINAL BLOCK; GROUNDED BACK PANEL AND PERMAGUM MATERIAL AT CONDUIT PENETRATIONS. ENCLOSURE MOUNTED ON STAINLESS STEEL OR ZINC PLATED GALVANIZED.



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DRAWN BY: CJH
CHECKED BY: CF
DESIGNED BY: CJD

SHEET TITLE:

CHEMICAL FEED PUMP DETAILS

SHEET NUMBER:

ME-506