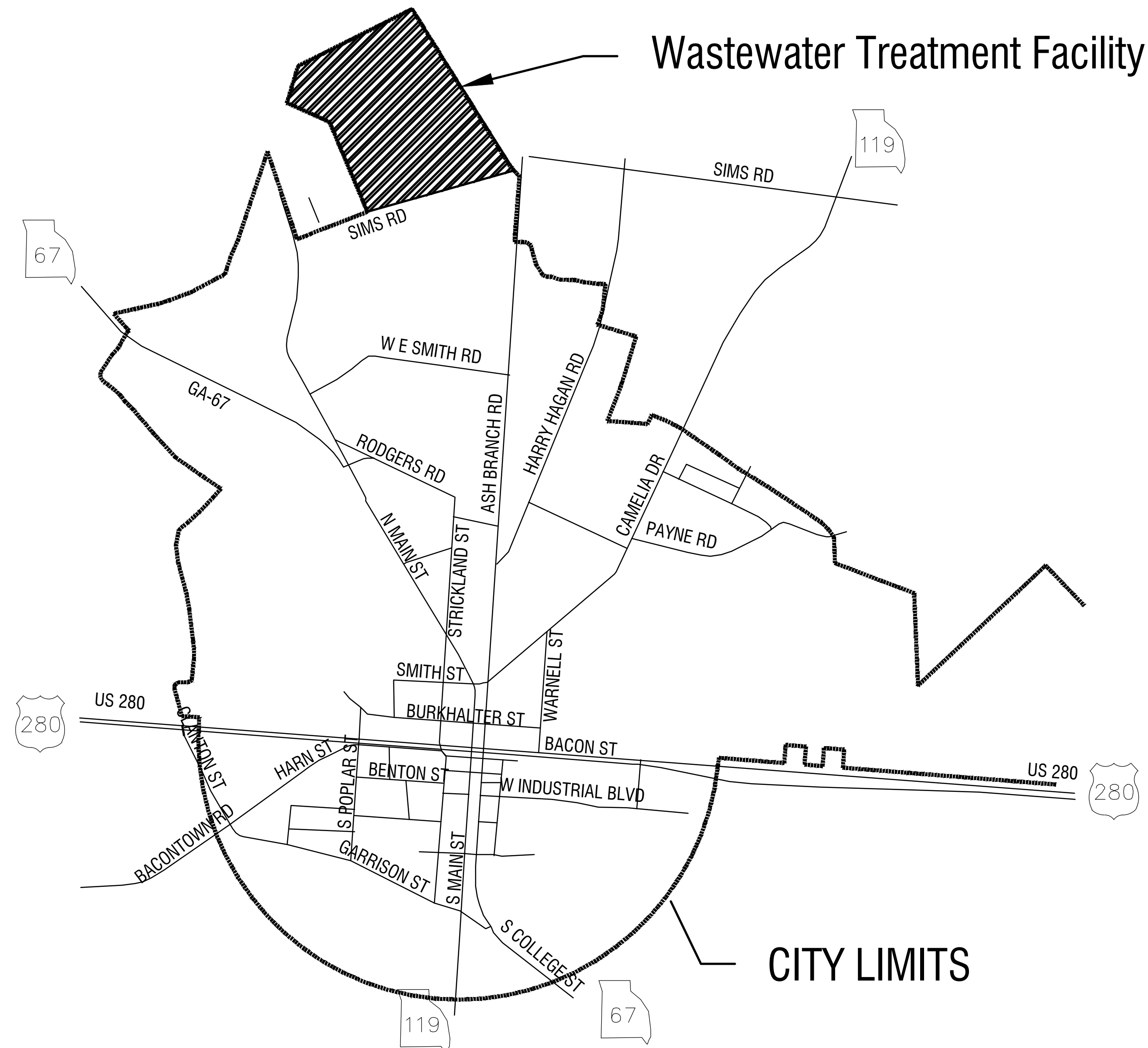


LAND APPLICATION SYSTEM EXPANSION FOR CITY OF PEMBROKE BRYAN COUNTY, GEORGIA DATE: SEPTEMBER 23, 2022

SHEET INDEX

1.	EXISTING CONDITIONS	101
2.	SITE PLAN 1	102
3.	SITE PLAN 2	103
4.	SPRAY FIELD 1	201
5.	SPRAY FIELD 2	202
6.	SPRAY FIELD 3	203
7.	SPRAY FIELD 4	204
8.	SPRAY FIELD 5	205
9.	SPRAY FIELD 6	206
10.	TREATMENT PONDS	301
11.	STORAGE POND	302
12.	POND DETAILS	303
13.	GENERAL DETAILS	401
14.	SOIL MAP	501
15.	HYDROLOGY PLAN	502



VICINITY MAP
Not To Scale



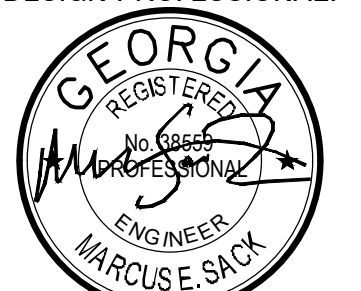
Know what's below.
Call before you dig.

Owner:
City of Pembroke
160 N Main St
Pembroke, GA 31321
(912) 653-4413
streets@pembrokega.net

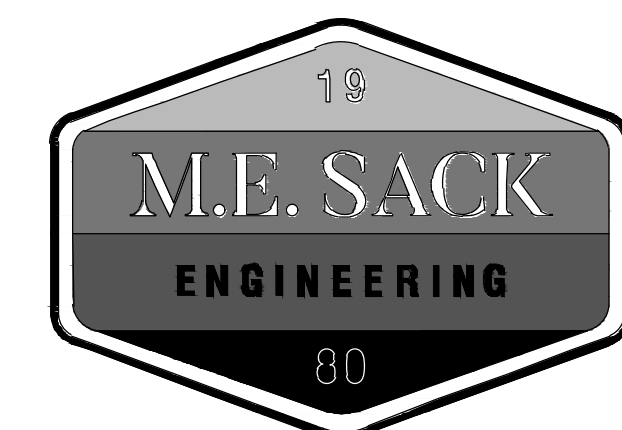
GPS COORDINATES OF CO:
W: 81°37'22.4"
N: 32°10'08.2"
DATUM: NAVD88

24 HOUR CONTACT:
Keith Cook
City of Pembroke
160 N Main St
Pembroke, GA 31321
(912) 653-4413
streets@pembrokega.net

DESIGN PROFESSIONAL:



DATE: October 17, 2023



515 NORTH MAIN STREET
P.O. BOX 649
HINESVILLE, GA 31313
TEL: (912) 368-5212

GENERAL NOTES

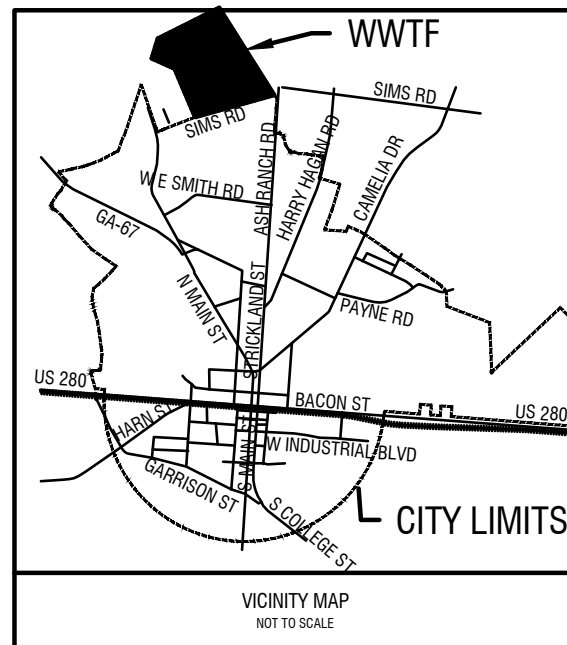
1. ALL EXISTING UTILITIES SHOWN ARE LOCATED FROM BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL FIELD LOCATION AND PROTECTION OF EXISTING UTILITIES. OVERHEAD LINES ARE NOT SHOWN FOR CLARITY.
2. ALL DISTURBED AREAS TO BE REVEGETATED IMMEDIATELY AFTER CONSTRUCTION, IN ACCORDANCE WITH THE MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA.
3. ALL EROSION AND SEDIMENTATION CONTROL STRUCTURES SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF ANY PROPERTY CORNERS, RIGHT OF WAY MONUMENTS, SIGNS OR OTHER STRUCTURES DISTURBED DURING CONSTRUCTION.
5. ALL TRAFFIC AND SIGNAGE CONTROL SHALL BE IN ACCORDANCE WITH THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES, MUTCD, CURRENT EDITION.

JOB NO. 2020-48

REVISION NO.	DATE	DESCRIPTION
1.	01/26/2023	SPRAY FIELD 6 ADJUSTMENT
2.	05/04/2023	EPD COMMENTS
3.	05/31/2023	SPRAY FIELDS ADJUSTMENT

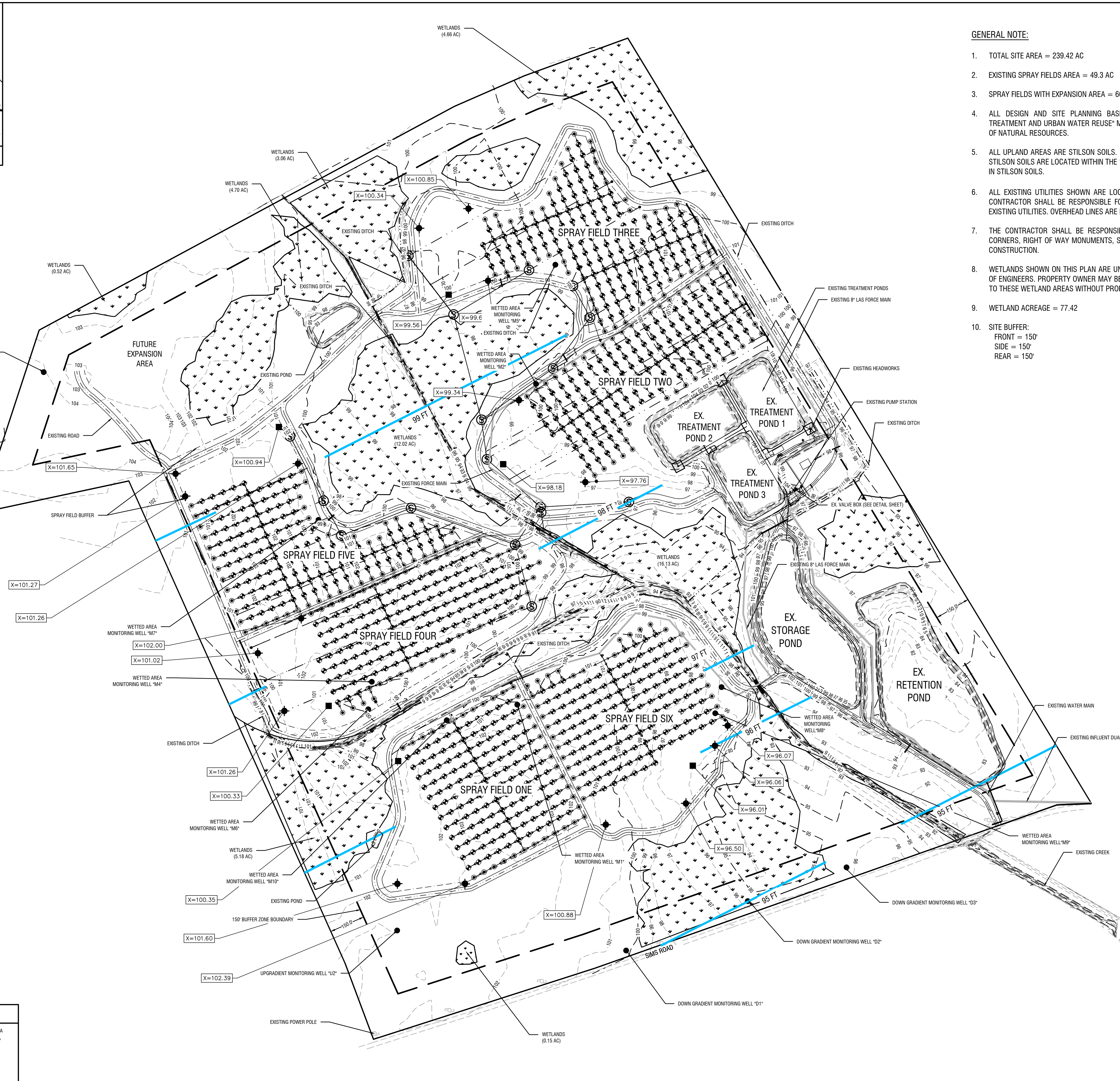
COVER SHEET

PLOT DATE: October 17, 2023



LEGEND

- LOWEST ELEVATION WITHIN PROPOSED SPRAY FIELD AREA
- 2022 SURVEY SPOT ELEVATION WITHIN PROPOSED SPRAY FIELD AREA
- GA DNR F1-10 STUDY LINES
- FLOOD LINE ELEVATION - CROSS SECTION



GENERAL NOTE:

1. TOTAL SITE AREA = 239.42 AC
2. EXISTING SPRAY FIELDS AREA = 49.3 AC
3. SPRAY FIELDS WITH EXPANSION AREA = 66.4 AC
4. ALL DESIGN AND SITE PLANNING BASED ON THE "CRITERIA FOR SLOW RATE LAND TREATMENT AND URBAN WATER REUSE" MANUAL PUBLISHED BY THE GEORGIA DEPARTMENT OF NATURAL RESOURCES.
5. ALL UPLAND AREAS ARE STILSON SOILS. TRANSITION AREAS BETWEEN PELHAM SOILS AND STILSON SOILS ARE LOCATED WITHIN THE 100' BUFFER AREAS. ALL LAS FIELDS ARE LOCATED IN STILSON SOILS.
6. ALL EXISTING UTILITIES SHOWN ARE LOCATED FROM BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL FIELD LOCATION AND PROTECTION OF EXISTING UTILITIES. OVERHEAD LINES ARE NOT SHOWN FOR CLARITY.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF ANY PROPERTY CORNERS, RIGHT OF WAY MONUMENTS, SIGNS OR OTHER STRUCTURES DISTURBED DURING CONSTRUCTION.
8. WETLANDS SHOWN ON THIS PLAN ARE UNDER THE JURISDICTION OF THE U.S. ARMY CORPS OF ENGINEERS. PROPERTY OWNER MAY BE SUBJECT TO PENALTY BY LAW FOR DISTURBANCE TO THESE WETLAND AREAS WITHOUT PROPER AUTHORIZATION.
9. WETLAND ACREAGE = 77.42
10. SITE BUFFER:
FRONT = 150'
SIDE = 150'
REAR = 150'

EXISTING LAND APPLICATION SYSTEM

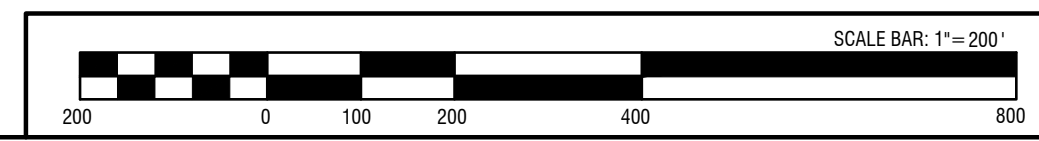
LOADING RATE = 2.2 INCHES/WK
 INSTANTANEOUS APPLICATION RATE = 0.25 INCHES/HR
 6 FIELDS 15 OPERATION: 1 STANDBY
 RANGING IN SIZE OF CURRENT FIELDS FROM 8.20 AC TO 8.29 AC
 DISCHARGE TO EACH FIELD = 906 GALLONS PER MINUTE
 AVERAGE IRRIGATION PERIOD = 9.0 HRS/DAY
 MAXIMUM IRRIGATION PERIOD = 10.0 HRS/DAY
 CURRENT TOTAL FLOW = 350,000 GPD

EXISTING SPRAY FIELD ACREAGE

SPRAY FIELD ONE = 8.20 ACRES
 SPRAY FIELD TWO = 8.20 ACRES
 SPRAY FIELD THREE = 8.20 ACRES
 SPRAY FIELD FOUR = 8.21 ACRES
 SPRAY FIELD FIVE = 8.29 ACRES
 SPRAY FIELD SIX = 8.29 ACRES

EXISTING IRRIGATION SYSTEM

SPRAY FIELD	EX. NO. OF FULL TURN HEADS	EX. NO. OF HALF TURN HEADS
SPRAY FIELD 1	132	38
SPRAY FIELD 2	127	45
SPRAY FIELD 3	124	51
SPRAY FIELD 4	127	45
SPRAY FIELD 5	127	49
SPRAY FIELD 6	132	32



REVISIONS:

1.	SF 6 ADJUSTMENT
2.	EPD COMMENTS
3.	SPRAY FIELDS ADJ.

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DESIGN PROFESSIONAL:
 MARCUS E. SACK
 GSWCC LEVEL II # 70248
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 MARCUS@MESACK.COM

515 NORTH MAIN STREET
 P.O. BOX 648
 HINESVILLE, GA 31313
 TEL: (912) 988-5212

GEORGIA REGISTERED PROFESSIONAL ENGINEER
 MARCUS E. SACK

DATE: October 17, 2023

M.E. SACK ENGINEERING

MUNICIPALITY:
CITY OF PEMBROKE

COUNTY:
BRYAN

Owner:
City of Pembroke
160 N Main St
Pembroke, GA 31321
(912) 653-4413
streets@pembrokega.net

24 HOUR CONTACT:
Keith Cook
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Pembroke, GA 31321
(912) 653-4413
streets@pembrokega.net

LAND APPLICATION SYSTEM EXPANSION

EXISTING CONDITIONS

101

FILE NO: 2020-48
 PLOT DATE: October 17, 2023

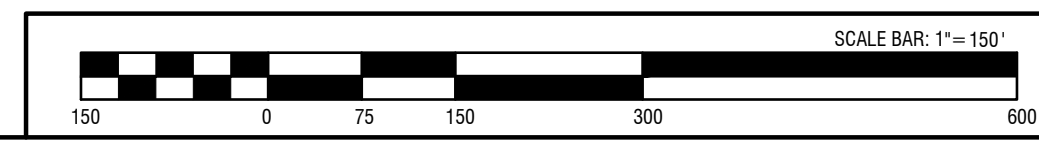


LAND APPLICATION SYSTEM EXPANSION
 LOADING RATE = 2.2 INCHES/WK
 INSTANTANEOUS APPLICATION RATE = 0.25 INCHES/HR
 6 FIELDS (3 OPERATION, 1 STANDBY)
 RANGING IN SIZE OF CURRENT FIELDS FROM 8.20 AC TO 11.28 AC
 RANGING IN SIZE OF EXPANDED FIELDS FROM 10.81 AC TO 11.28 AC
 DISCHARGE TO EACH FIELD = 1.215 GALLONS PER MINUTE
 AVERAGE IRRIGATION PERIOD = 9.6 HRS/DAY

EXPANDED SPRAY FIELD ACREAGE
 SPRAY FIELD ONE = 11.17 ACRES
 SPRAY FIELD TWO = 10.81 ACRES
 SPRAY FIELD THREE = 11.28 ACRES
 SPRAY FIELD FOUR = 10.93 ACRES
 SPRAY FIELD FIVE = 11.14 ACRES
 SPRAY FIELD SIX = 11.07 ACRES

PROPOSED IRRIGATION SYSTEM

SPRAY FIELD	No. OF FULL TURN HEADS	No. OF HALF TURN HEADS	MAX FLOW CAPACITY
SPRAY FIELD 1	159	53	1248 GPM
SPRAY FIELD 2	158	54	1238 GPM
SPRAY FIELD 3	151	67	1228 GPM
SPRAY FIELD 4	154	64	1238 GPM
SPRAY FIELD 5	150	70	1230 GPM
SPRAY FIELD 6	161	51	1248 GPM



REVISIONS:

1.	SF 6 ADJUSTMENT
2.	EPD COMMENTS
3.	SPRAY FIELDS ADJ.

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DESIGN PROFESSIONAL:
 MARCUS E. SACK
 GSWCC LEVEL II # 70248
 EXPIRES: 06/14/2023
 MARCUS@MESACK.COM

515 NORTH MAIN STREET
 P.O. BOX 649
 HINESVILLE, GA 31313
 TEL: (912) 868-5212

GEORGIA REGISTERED ENGINEER
 M.E. SACK
 DATE: October 17, 2023

MUNICIPALITY:
 CITY OF PEMBROKE

COUNTY:
 BRYAN

Owner:
 City of Pembroke
 160 N Main St
 Pembroke, GA 31321
 (912) 653-4413
 streets@pembrokega.net

24 HOUR CONTACT:
 Keith Cook
 160 N Main St
 Pembroke, GA 31321
 (912) 653-4413
 streets@pembrokega.net

LAND APPLICATION SYSTEM EXPANSION

SITE PLAN 1

102

FILE NO: 2020-48
 PLOT DATE: October 17, 2023

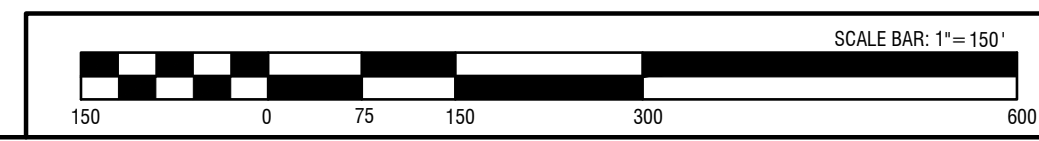


LAND APPLICATION SYSTEM EXPANSION
 LOADING RATE = 2.2 INCHES/WK
 INSTANTANEOUS APPLICATION RATE = 0.25 INCHES/HR
 6 FIELDS (5 OPERATION, 1 STANDBY)
 RANGING IN SIZE OF CURRENT FIELDS FROM 8.20 AC TO 8.29 AC
 RANGING IN SIZE OF EXPANDED FIELDS FROM 10.81 AC TO 11.28 AC
 DISCHARGE TO EACH FIELD = 1,215 GALLONS PER MINUTE
 AVERAGE IRRIGATION PERIOD = 9.6 HRS/DAY

EXPANDED SPRAY FIELD ACREAGE
 SPRAY FIELD ONE = 11.17 ACRES
 SPRAY FIELD TWO = 10.81 ACRES
 SPRAY FIELD THREE = 11.28 ACRES
 SPRAY FIELD FOUR = 10.93 ACRES
 SPRAY FIELD FIVE = 11.14 ACRES
 SPRAY FIELD SIX = 11.07 ACRES

PROPOSED IRRIGATION SYSTEM

SPRAY FIELD	No. OF FULL TURN HEADS	No. OF HALF TURN HEADS	MAX FLOW CAPACITY
SPRAY FIELD 1	159	53	1240 GPM
SPRAY FIELD 2	158	54	1230 GPM
SPRAY FIELD 3	151	67	1228 GPM
SPRAY FIELD 4	154	64	1230 GPM
SPRAY FIELD 5	150	70	1230 GPM
SPRAY FIELD 6	161	51	1248 GPM



REVISIONS:

1.	SF 6 ADJUSTMENT
2.	EPD COMMENTS
3.	SPRAY FIELDS ADJ.

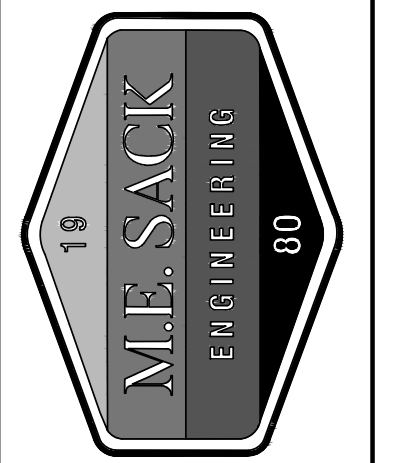
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 HINESVILLE, GA 31313
 TEL: (912) 868-5212



DATE: October 17, 2023



MUNICIPALITY:
 CITY OF PEMBROKE

COUNTY:
 BRYAN

Owner:
 City of Pembroke
 160 N Main St
 Pembroke, GA 31321
 (912) 653-4413
 streets@pembrokega.net

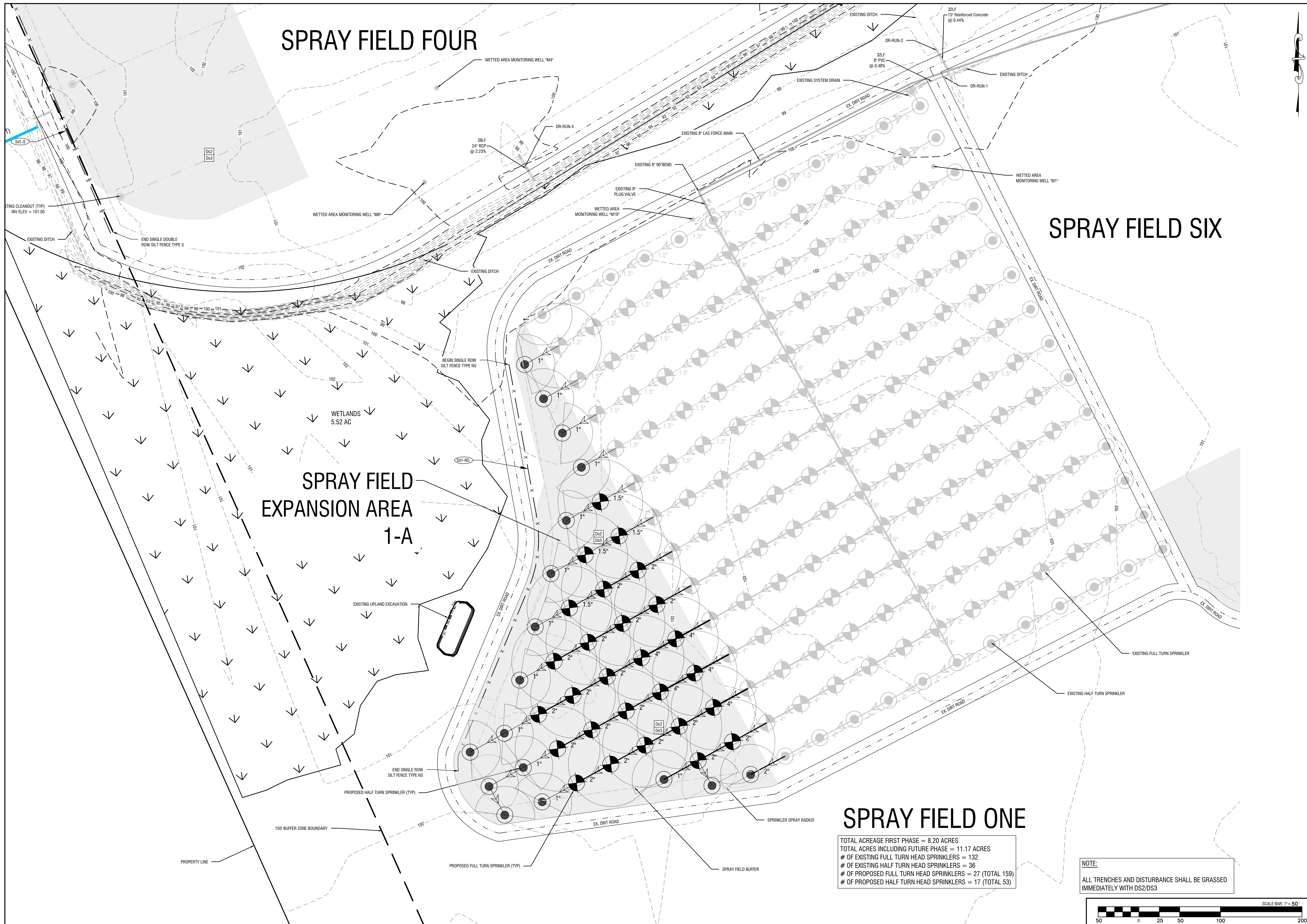
24 HOUR CONTACT:
 Keith Cook
 160 N Main St
 Pembroke, GA 31321
 (912) 653-4413
 streets@pembrokega.net

LAND APPLICATION SYSTEM EXPANSION

SITE PLAN 2

103

FILE NO: 2020-48
 PLOT DATE: October 17, 2023



SPRAY FIELD FOUR

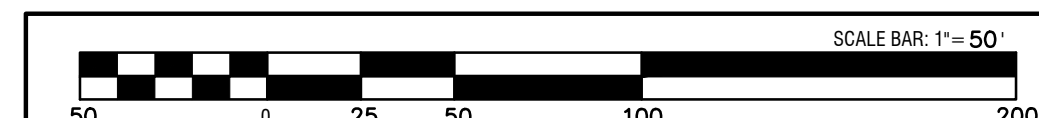
SPRAY FIELD SIX

SPRAY FIELD EXPANSION AREA 1-A

SPRAY FIELD ONE

TOTAL ACREAGE FIRST PHASE = 8.20 ACRES
 TOTAL ACRES INCLUDING FUTURE PHASE = 11.17 ACRES
 # OF EXISTING FULL TURN HEAD SPRINKLERS = 132
 # OF EXISTING HALF TURN HEAD SPRINKLERS = 36
 # OF PROPOSED FULL TURN HEAD SPRINKLERS = 27 (TOTAL 159)
 # OF PROPOSED HALF TURN HEAD SPRINKLERS = 17 (TOTAL 53)

NOTE:
 ALL TRENCHES AND DISTURBANCE SHALL BE GRASSED IMMEDIATELY WITH DS2/DS3



REVISIONS:	
1.	SF 6 ADJUSTMENT
2.	EPD COMMENTS
3.	SPRAY FIELDS ADJ.
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515 NORTH MAIN STREET P.O. BOX 648 HINESVILLE, GA 31313 TEL: (912) 868-5212	
DATE: October 17, 2023	
MUNICIPALITY: CITY OF PEMBROKE	
COUNTY: BRYAN	
Owner: City of Pembroke 160 N Main St Pembroke, GA 31321 (912) 653-4413 streets@pembrokega.net	
24 HOUR CONTACT: Keith Cook 160 N Main St Pembroke, GA 31321 (912) 653-4413 streets@pembrokega.net	
LAND APPLICATION SYSTEM EXPANSION	
SPRAY FIELD 1	
<h1>201</h1>	
FILE NO: 2020-48 PLOT DATE: October 17, 2023	



SPRAY FIELD THREE

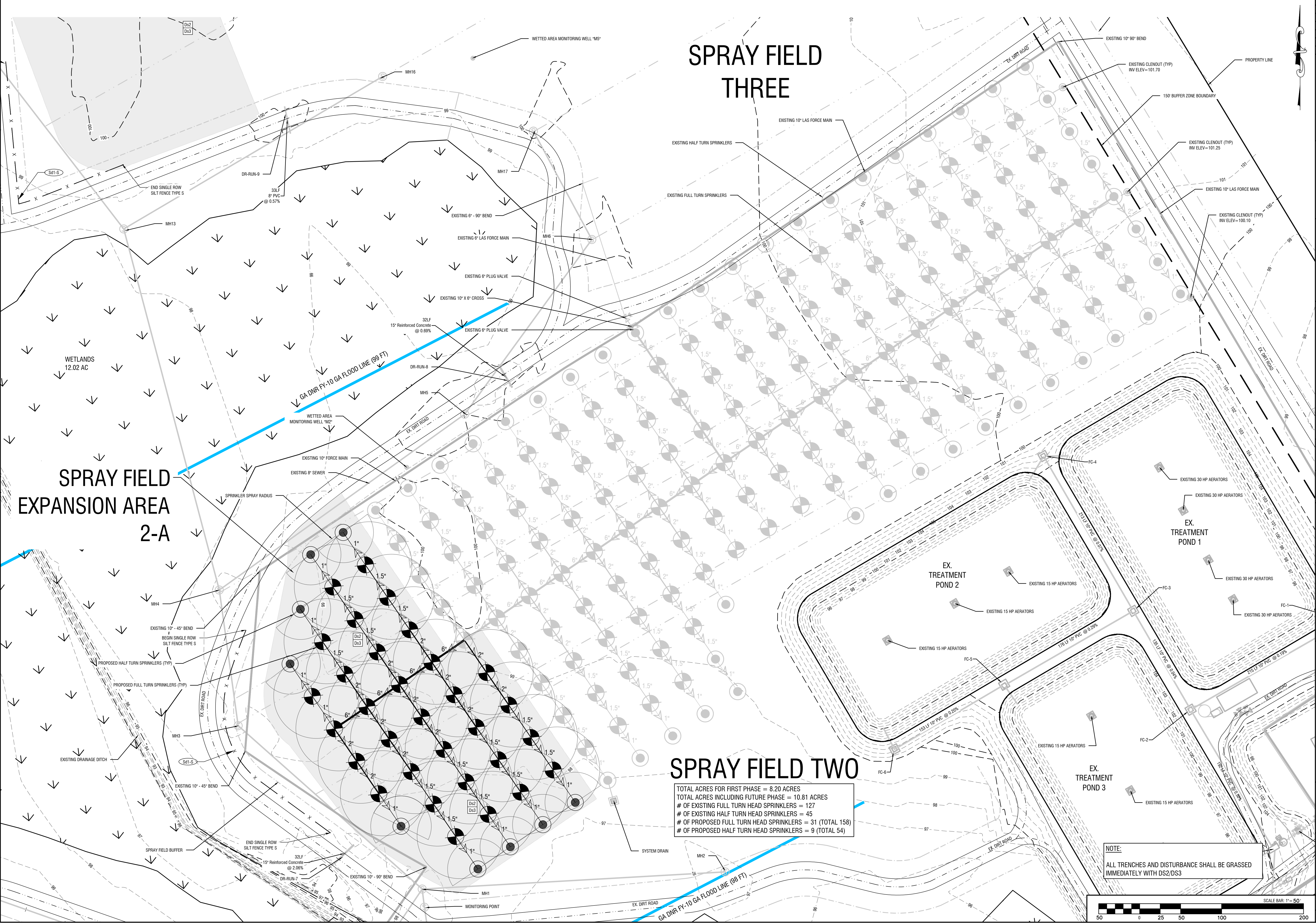
SPRAY FIELD TWO

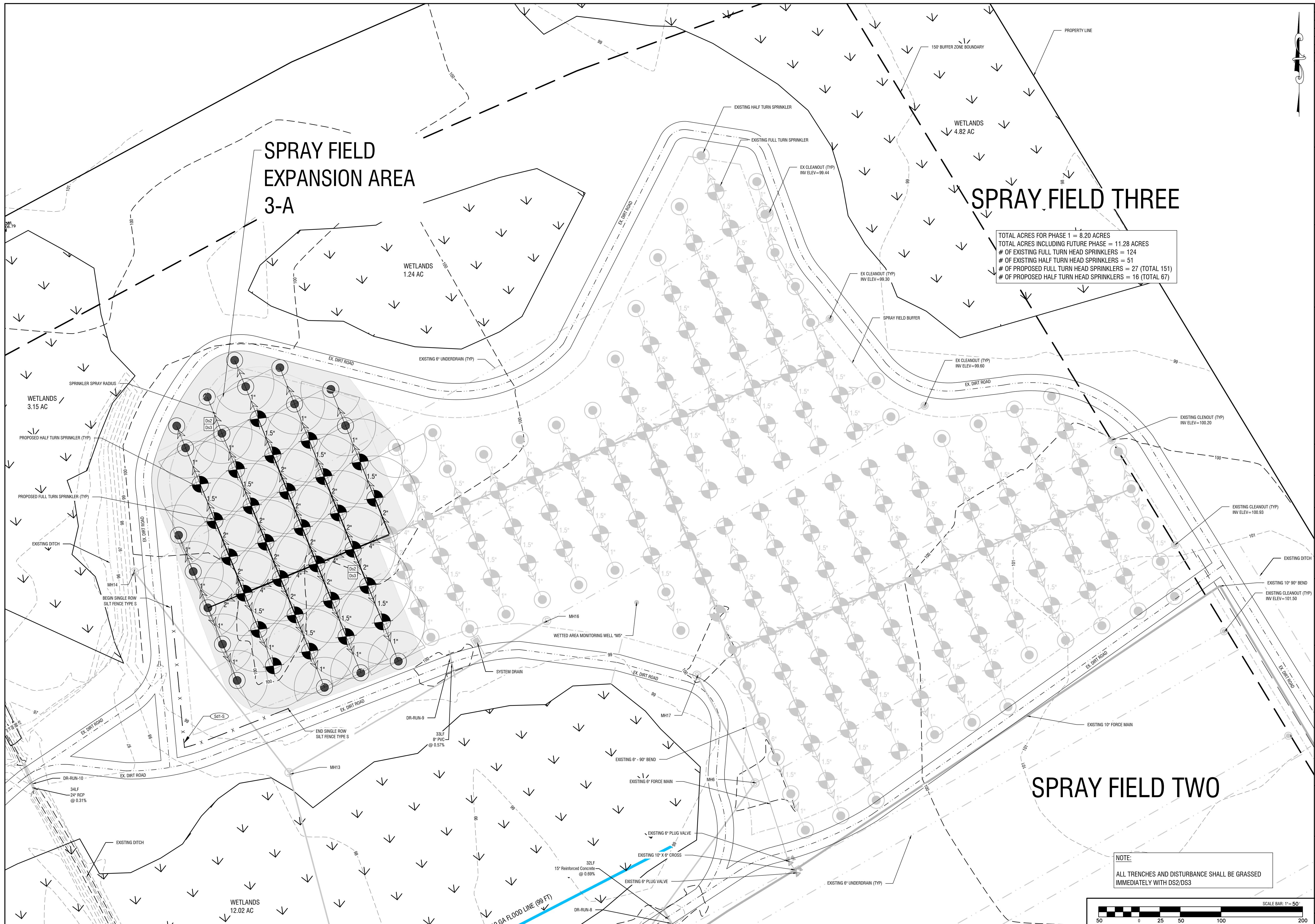
TOTAL ACRES FOR FIRST PHASE = 8.20 ACRES
 TOTAL ACRES INCLUDING FUTURE PHASE = 10.81 ACRES
 # OF EXISTING FULL TURN HEAD SPRINKLERS = 127
 # OF EXISTING HALF TURN HEAD SPRINKLERS = 45
 # OF PROPOSED FULL TURN HEAD SPRINKLERS = 31 (TOTAL 158)
 # OF PROPOSED HALF TURN HEAD SPRINKLERS = 9 (TOTAL 54)

NOTE:
 ALL TRENCHES AND DISTURBANCE SHALL BE GRASSED IMMEDIATELY WITH DS2/DS3



REVISIONS:	
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2.	EPD COMMENTS
3.	SPRAY FIELDS ADJ.
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515 NORTH MAIN STREET P.O. BOX 649 HINESVILLE, GA 31313 TEL: (912) 868-5212	
	
DATE: October 17, 2023	
	
MUNICIPALITY: CITY OF PEMBROKE	
COUNTY: BRYAN	
Owner: City of Pembroke 160 N Main St Pembroke, GA 31321 (912) 653-4413 streets@pembrokega.net	
24 HOUR CONTACT: Keith Cook 160 N Main St Pembroke, GA 31321 (912) 653-4413 streets@pembrokega.net	
LAND APPLICATION SYSTEM EXPANSION	
SPRAY FIELD 2	
202	
FILE NO: 2020-48	
PLOT DATE: October 17, 2023	



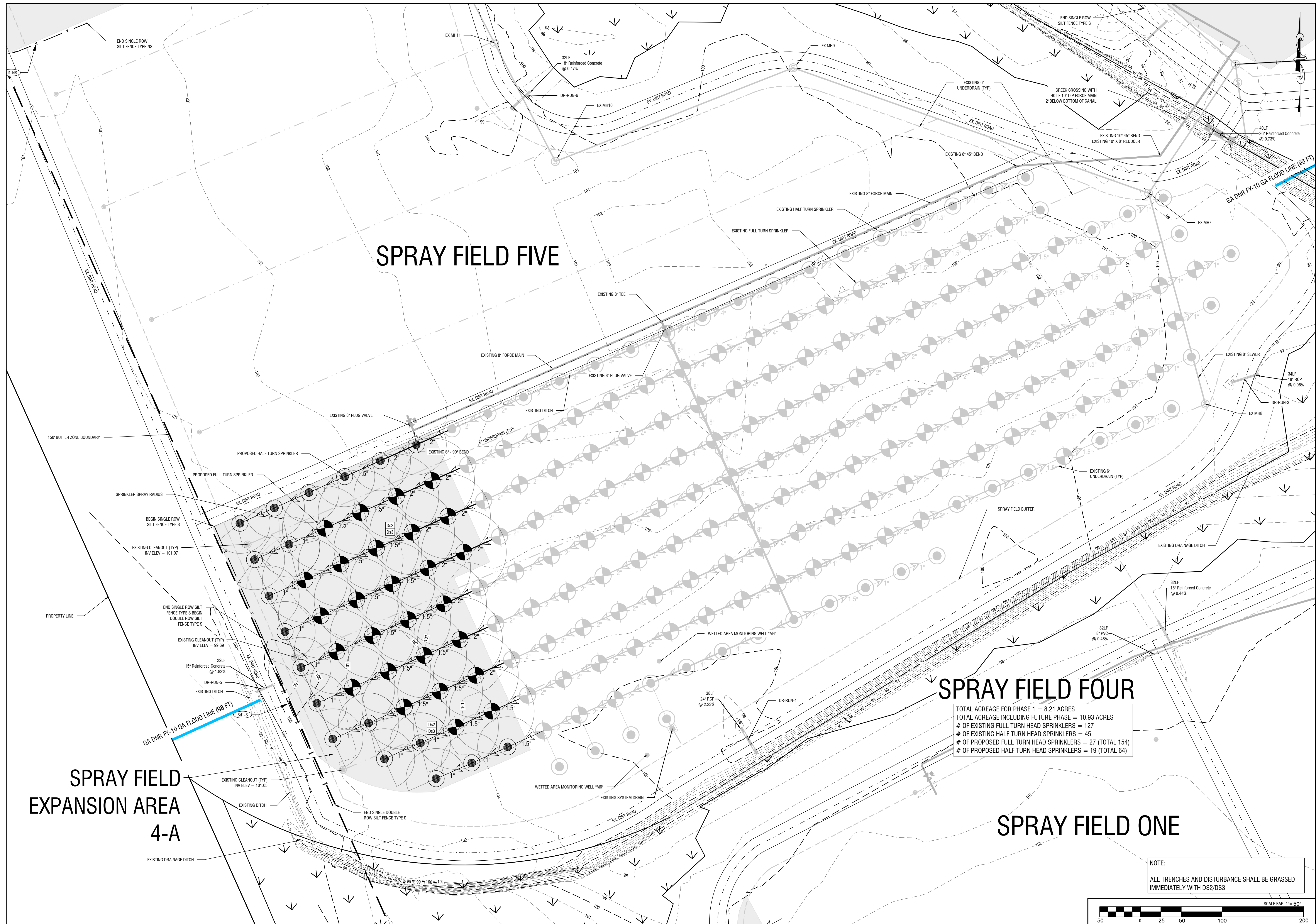


TOTAL ACRES FOR PHASE 1 = 8.20 ACRES
 TOTAL ACRES INCLUDING FUTURE PHASE = 11.28 ACRES
 # OF EXISTING FULL TURN HEAD SPRINKLERS = 124
 # OF EXISTING HALF TURN HEAD SPRINKLERS = 51
 # OF PROPOSED FULL TURN HEAD SPRINKLERS = 27 (TOTAL 151)
 # OF PROPOSED HALF TURN HEAD SPRINKLERS = 16 (TOTAL 67)

NOTE:
 ALL TRENCHES AND DISTURBANCE SHALL BE GRASSED
 IMMEDIATELY WITH DS2/DS3



REVISIONS: 1. SF 6 ADJUSTMENT 2. EPD COMMENTS 3. SPRAY FIELDS ADJ.	
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DATE: October 17, 2023	
MUNICIPALITY: CITY OF PEMBROKE	
COUNTY: BRYAN	
Owner: City of Pembroke 160 N Main St Pembroke, GA 31321 (912) 653-4413 streets@pembrokega.net	
24 HOUR CONTACT: Keith Cook 160 N Main St Pembroke, GA 31321 (912) 653-4413 streets@pembrokega.net	
LAND APPLICATION SYSTEM EXPANSION	
SPRAY FIELD 3	
203	
FILE NO: 2020-48 PLOT DATE: October 17, 2023	



SPRAY FIELD FIVE

SPRAY FIELD FOUR

SPRAY FIELD ONE

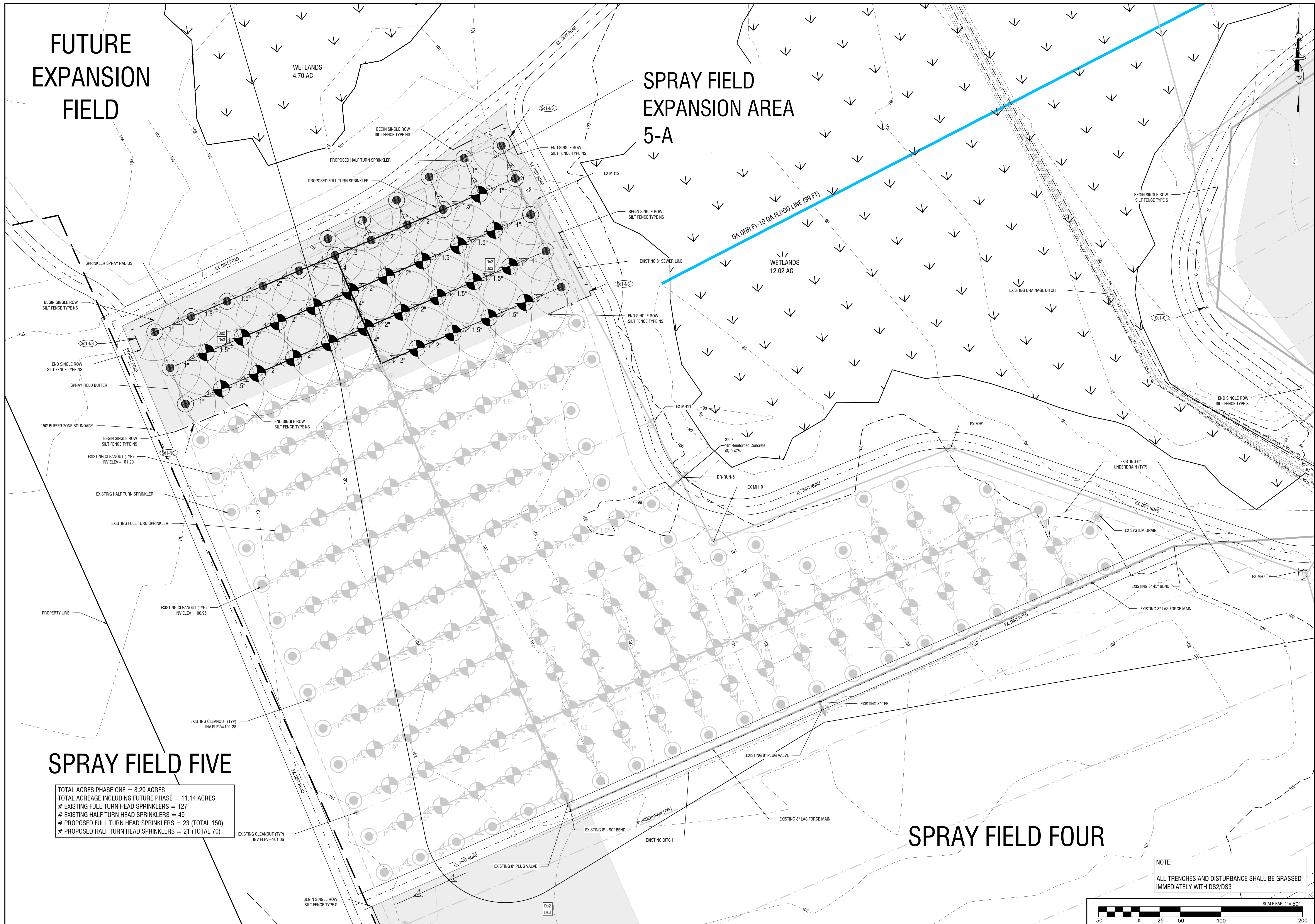
SPRAY FIELD EXPANSION AREA 4-A

TOTAL ACREAGE FOR PHASE 1 = 8.21 ACRES
 TOTAL ACREAGE INCLUDING FUTURE PHASE = 10.93 ACRES
 # OF EXISTING FULL TURN HEAD SPRINKLERS = 127
 # OF EXISTING HALF TURN HEAD SPRINKLERS = 45
 # OF PROPOSED FULL TURN HEAD SPRINKLERS = 27 (TOTAL 154)
 # OF PROPOSED HALF TURN HEAD SPRINKLERS = 19 (TOTAL 64)

NOTE:
 ALL TRENCHES AND DISTURBANCE SHALL BE GRASSED IMMEDIATELY WITH DS2/DS3



REVISIONS:	
1.	SF 6 ADJUSTMENT
2.	EPD COMMENTS
3.	SPRAY FIELDS ADJ.
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DATE: October 17, 2023	
MUNICIPALITY: CITY OF PEMBROKE	
COUNTY: BRYAN	
Owner: City of Pembroke 160 N Main St Pembroke, GA 31321 (912) 653-4413 streets@pembrokega.net	
24 HOUR CONTACT: Keith Cook 160 N Main St Pembroke, GA 31321 (912) 653-4413 streets@pembrokega.net	
LAND APPLICATION SYSTEM EXPANSION	
SPRAYFIELD 4	
204	
FILE NO: 2020-48	PLDT DATE: October 17, 2023



FUTURE EXPANSION FIELD

SPRAY FIELD EXPANSION AREA 5-A

SPRAY FIELD FIVE

SPRAY FIELD FOUR

TOTAL ACRES PHASE ONE = 8.29 ACRES
 TOTAL ACRES INCLUDING FUTURE PHASE = 11.14 ACRES
 # EXISTING FULL TURN HEAD SPRINKLERS = 127
 # EXISTING HALF TURN HEAD SPRINKLERS = 49
 # PROPOSED FULL TURN HEAD SPRINKLERS = 23 (TOTAL 150)
 # PROPOSED HALF TURN HEAD SPRINKLERS = 21 (TOTAL 70)

REVISIONS:

1.	SF 6 ADJUSTMENT
2.	EPD COMMENTS
3.	SPRAY FIELDS ADJ.

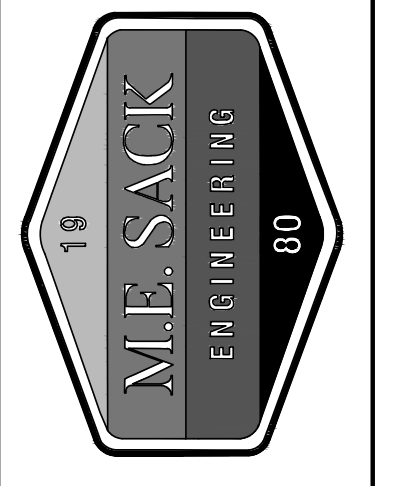
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 TEL: (912) 868-5212



DATE: October 17, 2023



MUNICIPALITY:
 CITY OF PEMBROKE

COUNTY:
 BRYAN

Owner:
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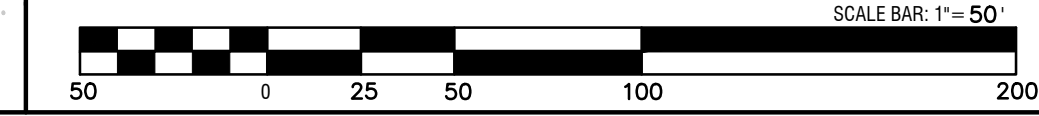
LAND APPLICATION SYSTEM EXPANSION

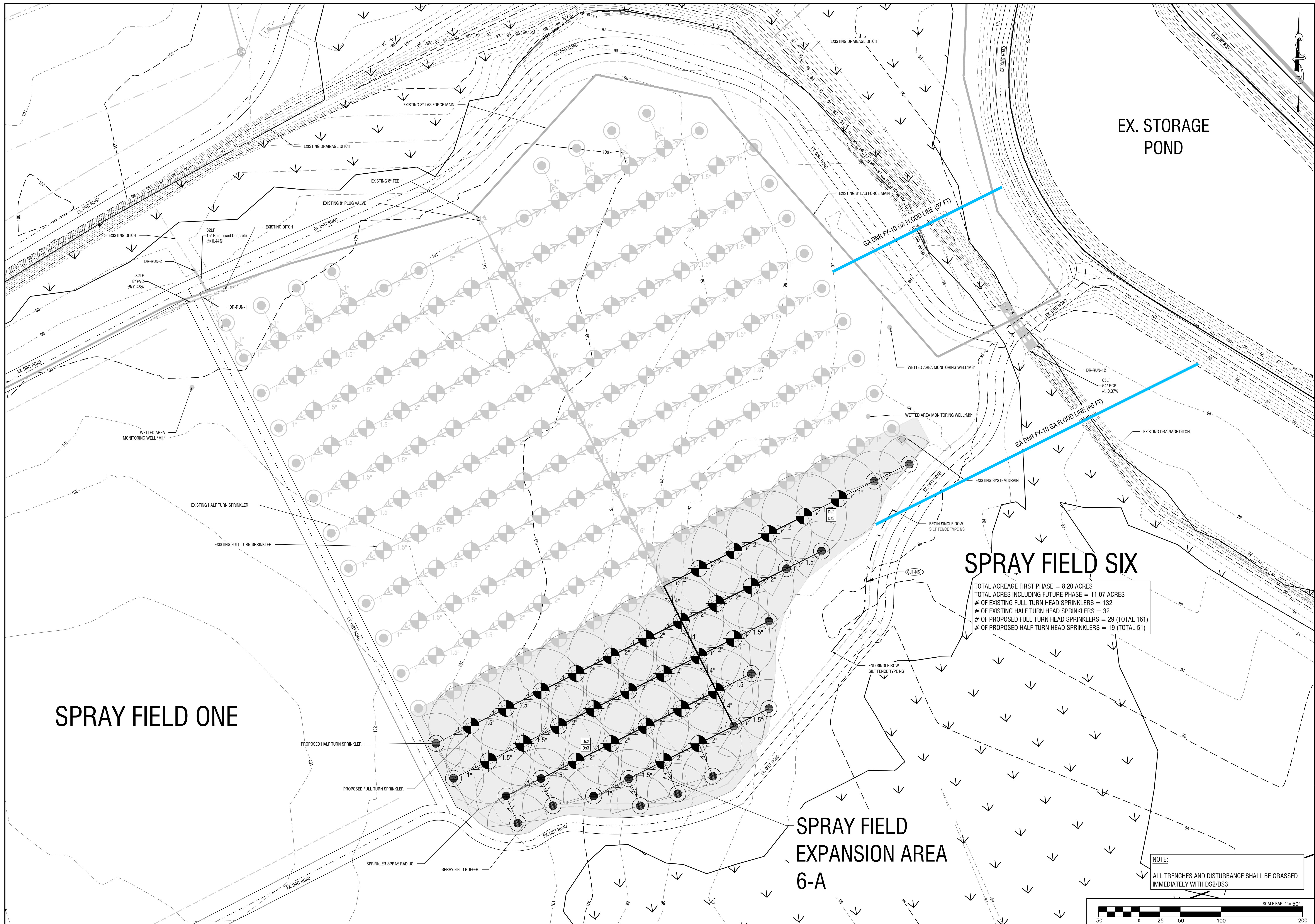
SPRAY FIELD 5

205

FILE NO: 2020-48
 PLOT DATE: October 17, 2023

NOTE:
 ALL TRENCHES AND DISTURBANCE SHALL BE GRASSED IMMEDIATELY WITH DS2/DS3





REVISIONS:

1.	SF 6 ADJUSTMENT
2.	EPD COMMENTS
3.	SPRAY FIELDS ADJ.

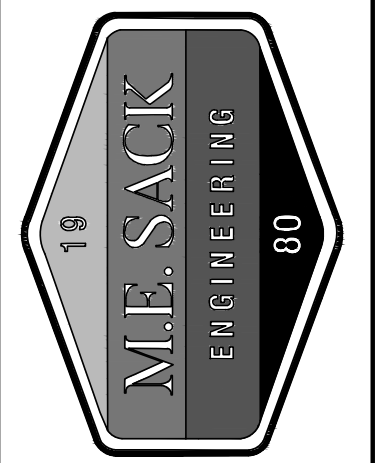
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LAND APPLICATION
 SYSTEM EXPANSION

SPRAY FIELD 6

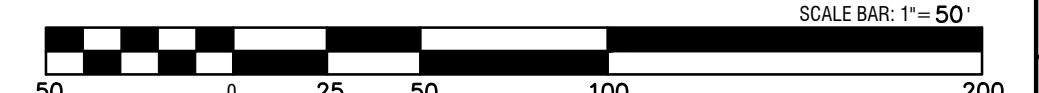
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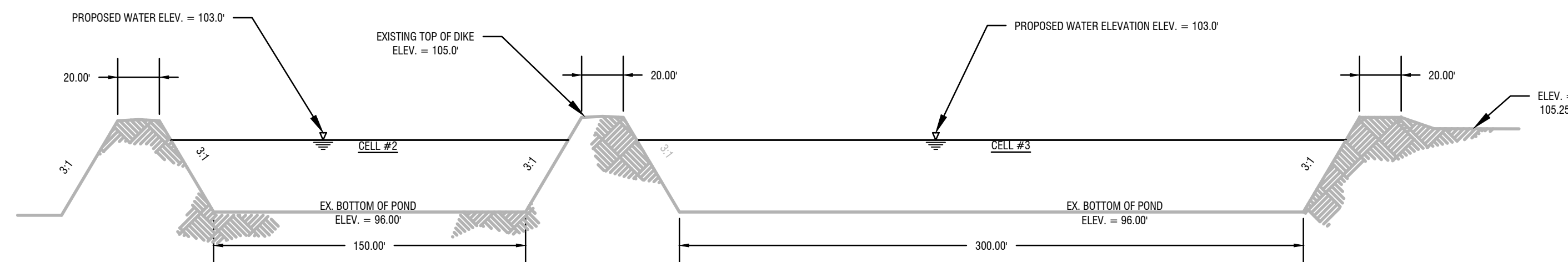
FILE NO: 2020-48
 PLOT DATE: October 17, 2023

SPRAY FIELD SIX

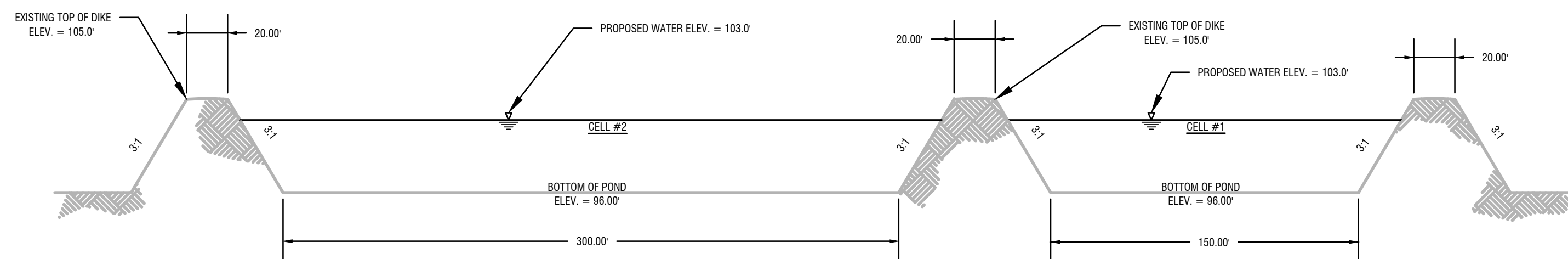
TOTAL ACREAGE FIRST PHASE = 8.20 ACRES
 TOTAL ACRES INCLUDING FUTURE PHASE = 11.07 ACRES
 # OF EXISTING FULL TURN HEAD SPRINKLERS = 132
 # OF EXISTING HALF TURN HEAD SPRINKLERS = 32
 # OF PROPOSED FULL TURN HEAD SPRINKLERS = 29 (TOTAL 161)
 # OF PROPOSED HALF TURN HEAD SPRINKLERS = 19 (TOTAL 51)

NOTE:
 ALL TRENCHES AND DISTURBANCE SHALL BE GRASSED IMMEDIATELY WITH DS2/DS3





SECTION C-C
N.T.S.



SECTION B-B
N.T.S.

AERATORS			
POND	HP REQUIRED	STANDY	TOTAL
POND 1	3-30HP	1-30HP	4-10HP
POND 2	2-15HP	1-15HP	3-15HP
POND 3	2-15HP	1-15HP	3-15HP

HYDRAULIC RETENTION TIME		
POND	VOLUME	HRT AT ADF
POND 1	2.90 MG	5.81 DAYS
POND 2	2.90 MG	5.81 DAYS
POND 3	2.90 MG	5.81 DAYS
TOTAL		17.43 DAYS

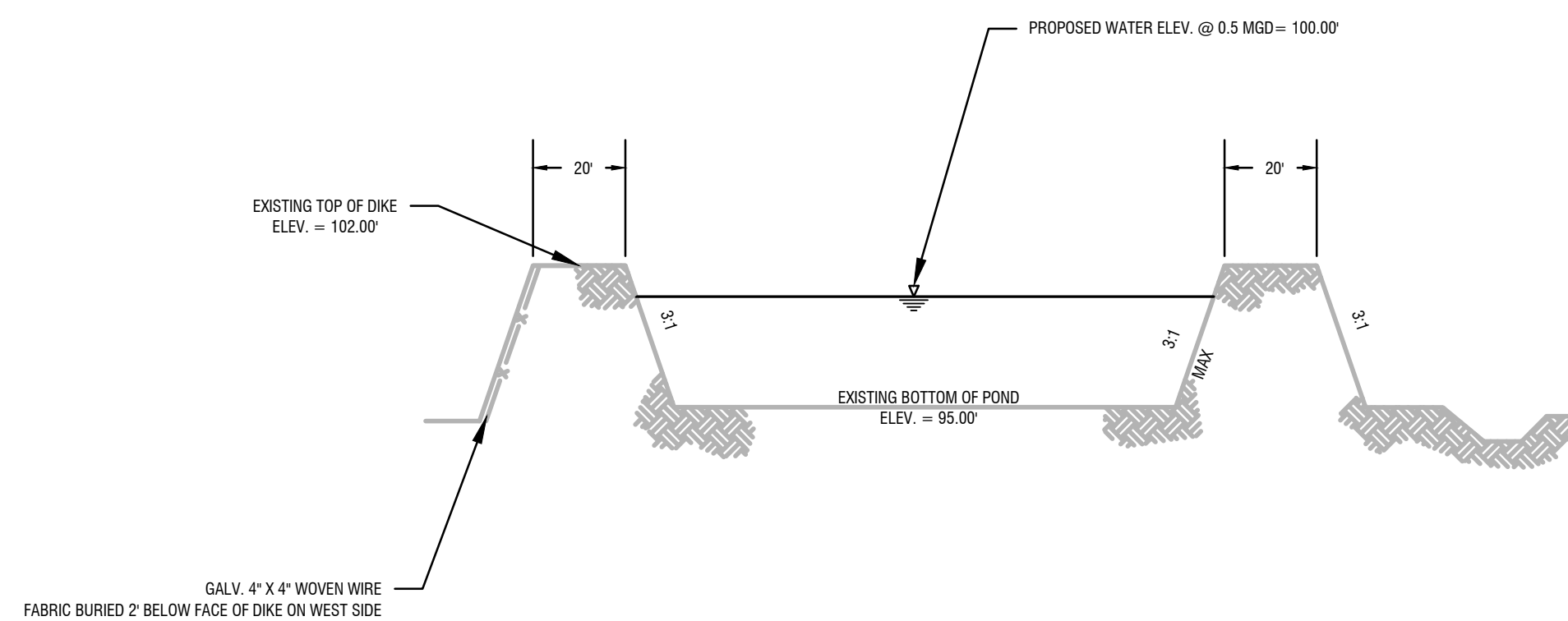
NOTE:
POND HRT CALCULATED AT
AVERAGE DAILY FLOW OF 0.50 MGD

POND AERATOR DESIGN

POND #1 COMPLETE MIX
USE 30HP/MIL GAL
30x2.9 = 87HP

POND #2 PARTIAL MIX
USE 10HP/MIL GAL
10x2.9 = 29HP

POND #3 PARTIAL MIX
USE 10HP/MIL GAL
10x2.9 = 29HP



SECTION A-A
N.T.S.

NOTES:

- 1) ALL PONDS HAVE TO REMAIN UNDISTURBED AND UNCHANGED.
- 2) STORAGE AND TREATMENT PONDS FREEBOARD IS NOW 2' PER EPD REQUIREMENTS.

REVISIONS:	
1.	SF 6 ADJUSTMENT
2.	EPD COMMENTS
3.	SPRAY FIELDS ADJ.

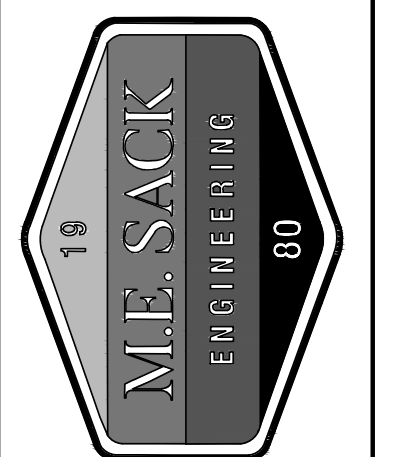
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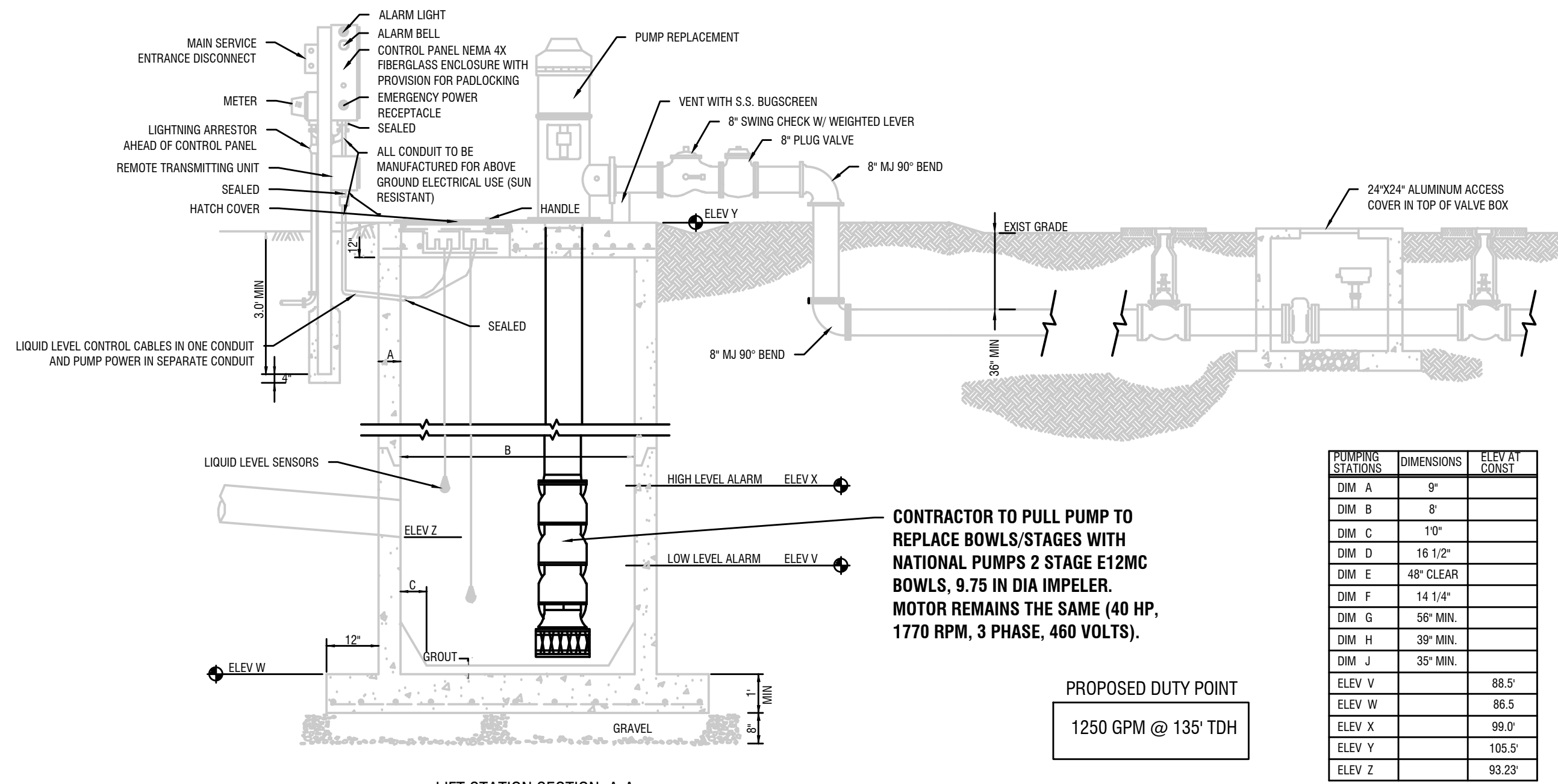
LAND APPLICATION
SYSTEM EXPANSION

POND DETAILS

303

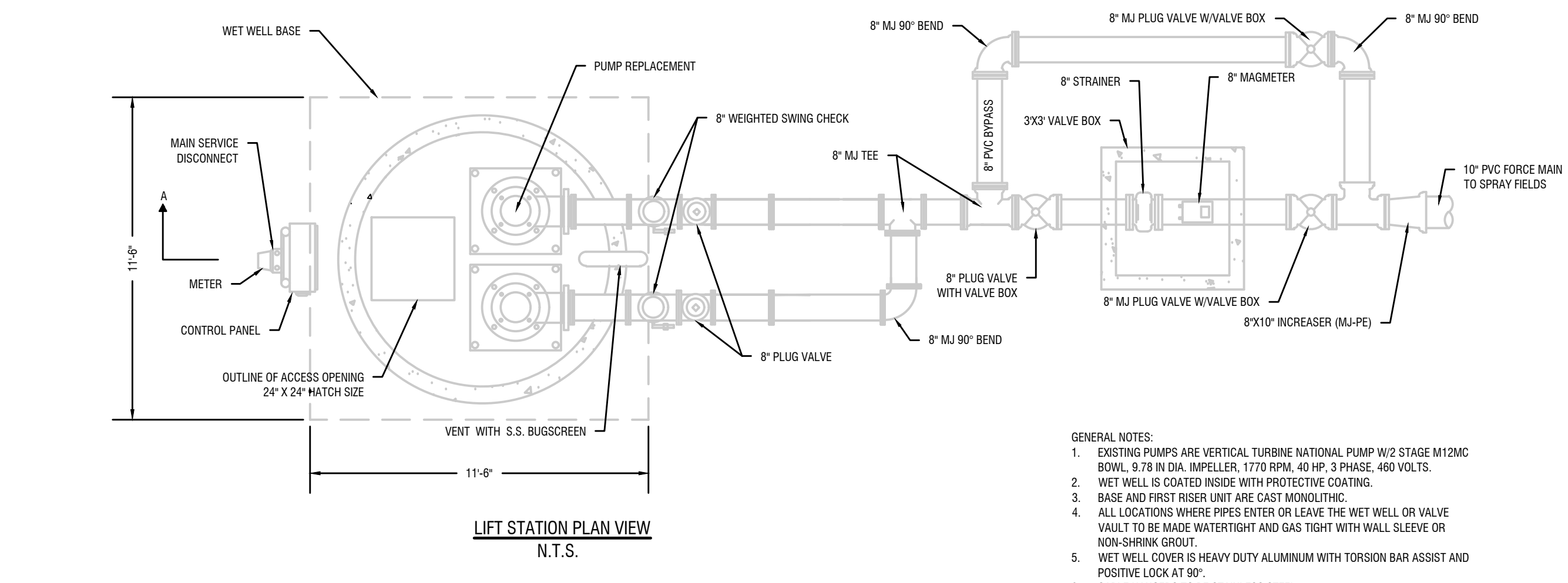
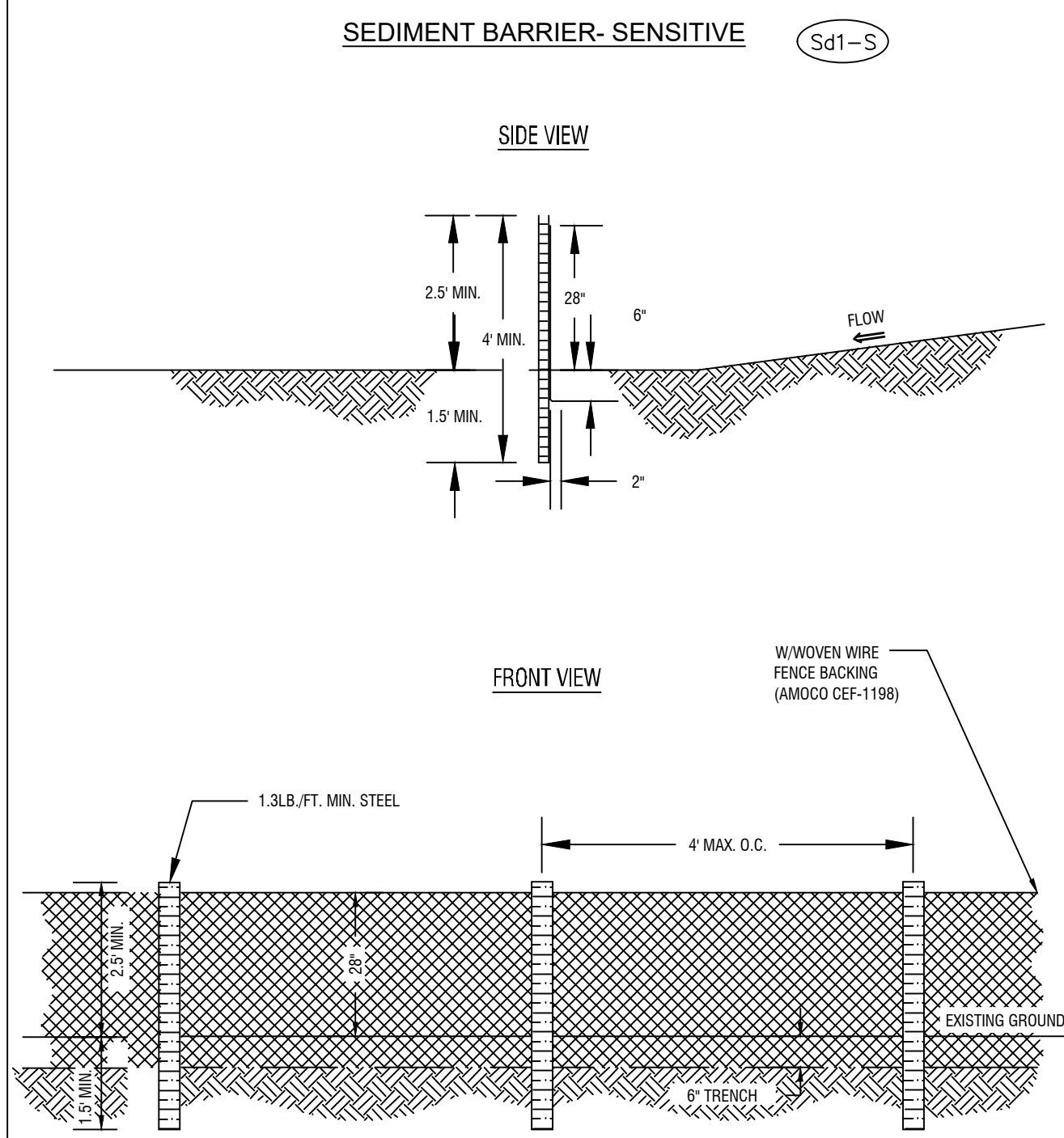
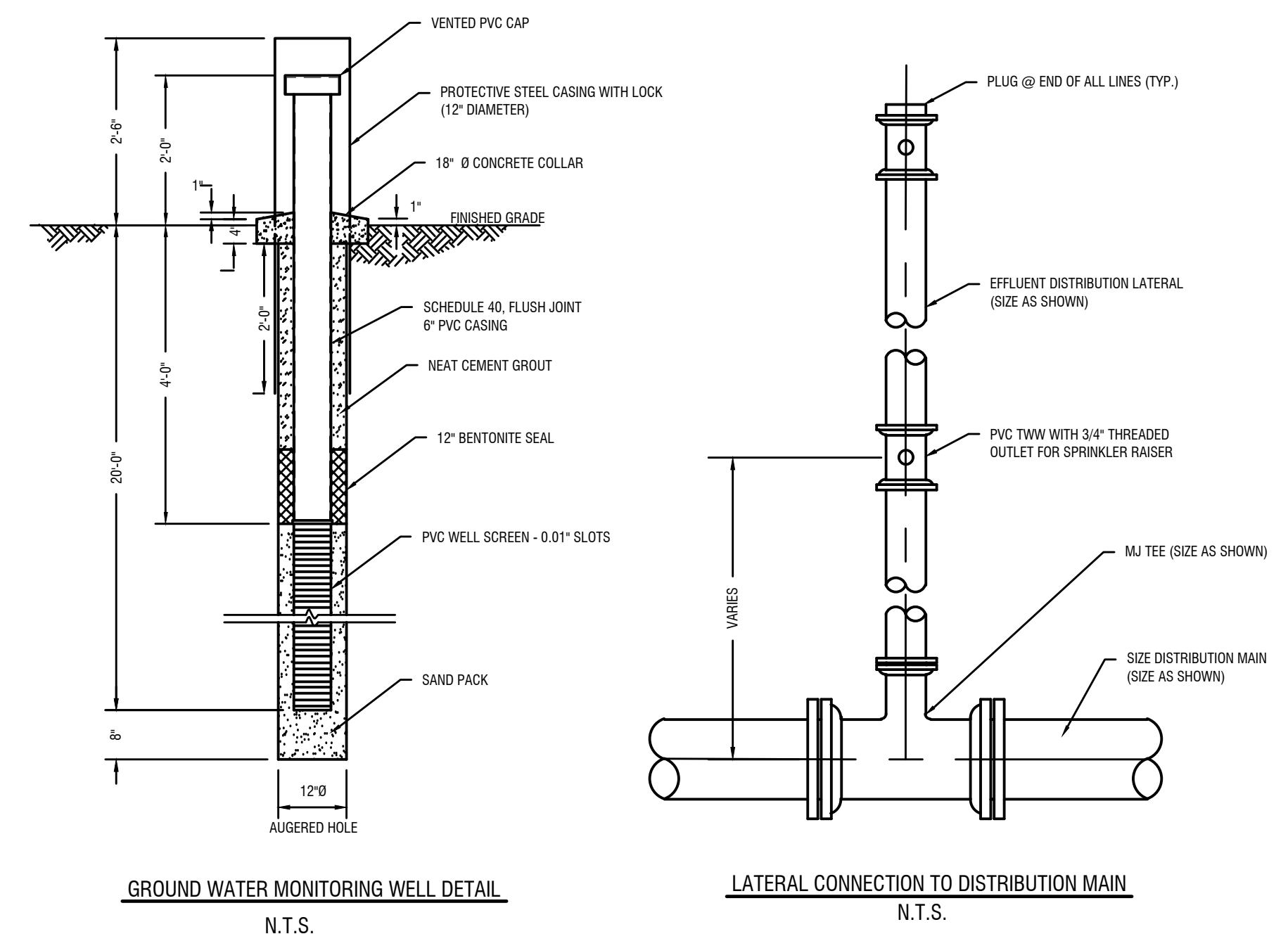
FILE NO: 2020-48

PLOT DATE: October 17, 2023

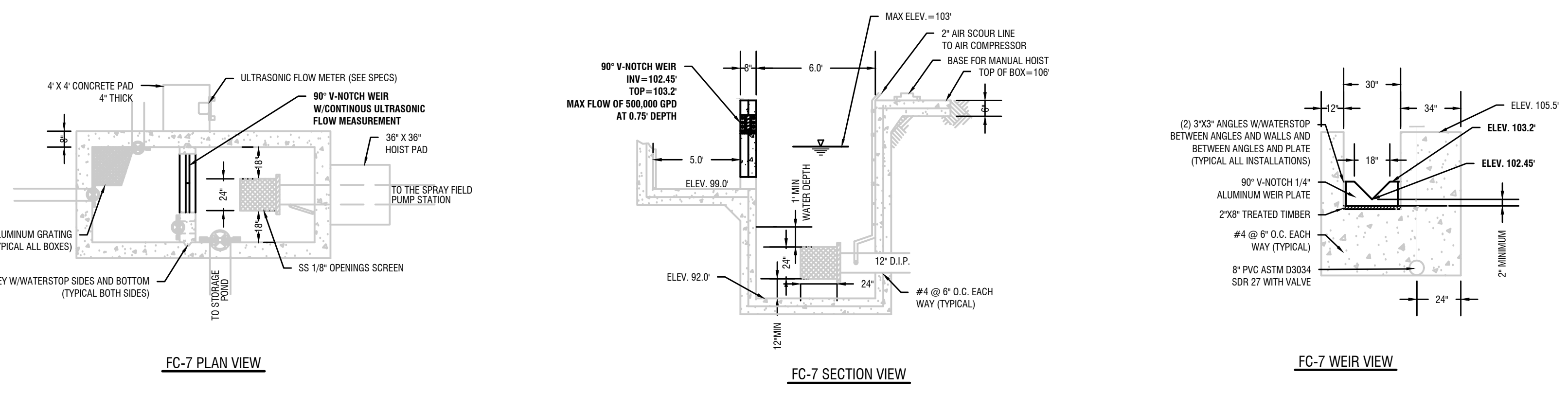
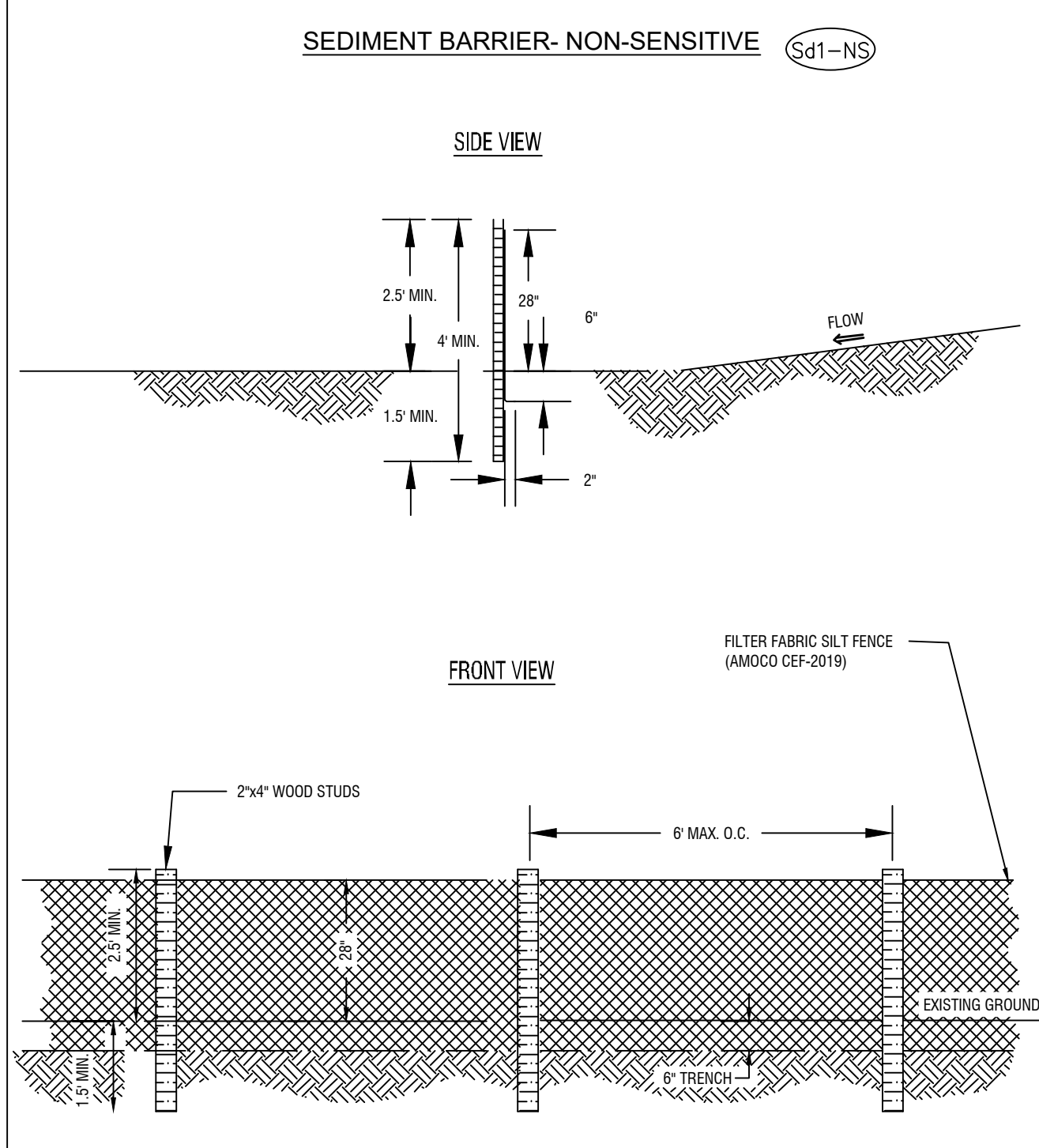
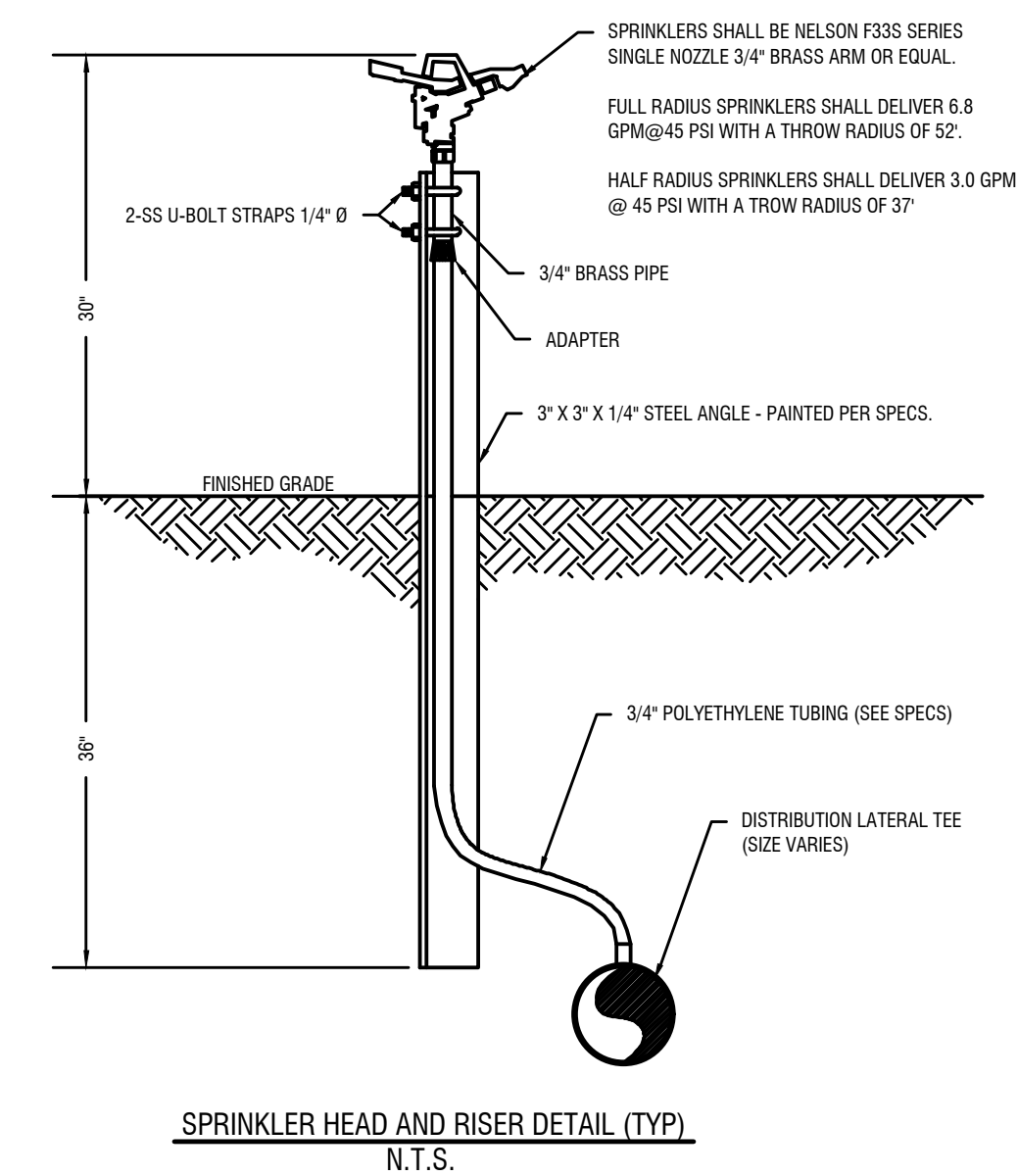


CONTRACTOR TO PULL PUMP TO REPLACE BOWLS/STAGES WITH NATIONAL PUMPS 2 STAGE E12MC BOWLS, 9.75 IN DIA IMPELLER. MOTOR REMAINS THE SAME (40 HP, 1770 RPM, 3 PHASE, 460 VOLTS).

PROPOSED DUTY POINT
1250 GPM @ 135' TDH



- GENERAL NOTES:
- EXISTING PUMPS ARE VERTICAL TURBINE NATIONAL PUMP W/2 STAGE M12MC BOWL, 9.75 IN DIA. IMPELLER, 1770 RPM, 40 HP, 3 PHASE, 460 VOLTS.
 - WET WELL IS COATED INSIDE WITH PROTECTIVE COATING.
 - BASE AND FIRST RISER UNIT ARE CAST MONOLITHIC.
 - ALL LOCATIONS WHERE PIPES ENTER OR LEAVE THE WET WELL OR VALVE VAULT TO BE MADE WATERTIGHT AND GAS TIGHT WITH WALL SLEEVE OR NON-SHRINK GROUT.
 - WET WELL COVER IS HEAVY DUTY ALUMINUM WITH TORSION BAR ASSIST AND POSITIVE LOCK AT 90°.
 - CABLE HANGERS TO BE STAINLESS STEEL.



FERTILIZER REQUIREMENTS

TYPE OF SPECIES	YEAR	ANALYSIS OR EQUIVALENT	RATE	N TOP DRESSING RATE	LIME APPLICATION
Cool Season Grasses	First	6-12-12	1500 lbs/ac	50-100 lbs/ac 1"2"	2000 lbs/ac
	Maintenance	10-12-12	400 lbs/ac	30	
Cool Season Grasses and Legumes	First	6-12-12	1500 lbs/ac	0-50 lbs/ac 1"	2000 lbs/ac
	Maintenance	10-12-12	400 lbs/ac	--	
Ground Covers	First	10-10-10	1500 lbs/ac	--	--
	Maintenance	10-10-10	400 lbs/ac	--	
Pine Seedlings	First	20-10-5	one 21-gram pallet per seeding placed in the closing hole	--	--
	Maintenance	0-10-10	700 lbs/ac 4"	--	
Shrub Leavedea	First	0-10-10	700 lbs/ac	--	--
	Maintenance	0-10-10	700 lbs/ac 4"	--	
Temporary Cover Crops Seeded Clom	First	10-10-10	500 lbs/ac	30 lbs/ac 5"	--
	Maintenance	6-12-12	1500 lbs/ac	50-100 lbs/ac 2"6"	2000 lbs/ac
Warm Season Grasses	First	6-12-12	1500 lbs/ac	50-100 lbs/ac 2"6"	2000 lbs/ac
	Maintenance	10-12-12	400 lbs/ac	30 lbs/ac	
Warm Season Grasses and Legumes	First	6-12-12	1500 lbs/ac	50 lbs/ac 6"	2000 lbs/ac
	Maintenance	0-10-12	400 lbs/ac	--	

Ds2 SPECIES AND PLANTING SCHEDULE

SPECIES	BROADCAST RATES 1" PER ACRE	PLS 2" PER 1000 SF	RESOURCE AREA 3"	PLANTING DATES BY RESOURCE AREAS*												REMARKS	
				J	F	M	A	M	J	J	A	S	O	N	D		
RYEBASS, ANNUAL ALONE	40 lbs	0.9 lbs	M-L P														227,000 SEED PER POUND. DENSE COVER. VERY COMPETITIVE AND IS NOT USED IN MIXTURES.

Ds3 SPECIES AND PLANTING SCHEDULE

SPECIES	BROADCAST RATES 1" PER ACRE	PLS 2" PER 1000 SF	RESOURCE AREA 3"	PLANTING DATES BY RESOURCE AREAS*												REMARKS	
				J	F	M	A	M	J	J	A	S	O	N	D		
BERMUDA COMMON HULLED SEED ALONE	10 lbs	0.2 lbs	P														1,787,000 SEED PER POUND. QUICK COVER. LOW GROWING AND SOD FORMING. FULL SUN. GOOD FOR ATHLETIC FIELDS.
BERMUDA COMMON UNHULLED SEED ALONE	6 lbs	0.1 lbs	P														PLANT WITH WINTER ANNUALS. PLANT WITH TALL FESCUE.
BERMUDA COMMON UNHULLED SEED WITH OTHER PERENNIALS	40 CU FT	0.9 CU FT	M-L P														A CUBIC FT. CONTAINS APPROXIMATELY 850 SPRIGS. A BUSHEL CONTAINS 1.25 C.F. OR APPROXIMATELY 800 SPRIGS. SAME AS ABOVE.
BERMUDA SPRIGS COASTAL COMMON, MIDLAND, OR TIFT 44 COASTAL COMMON, TIFT 44			P														SOUTHERN COASTAL PLAIN ONLY

REVISIONS:

1.	SF 6 ADJUSTMENT
2.	EPD COMMENTS
3.	SPRAY FIELDS ADJ.

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GEORGIA REGISTERED PROFESSIONAL ENGINEER
MARCUS E. SACK
DATE: October 17, 2023

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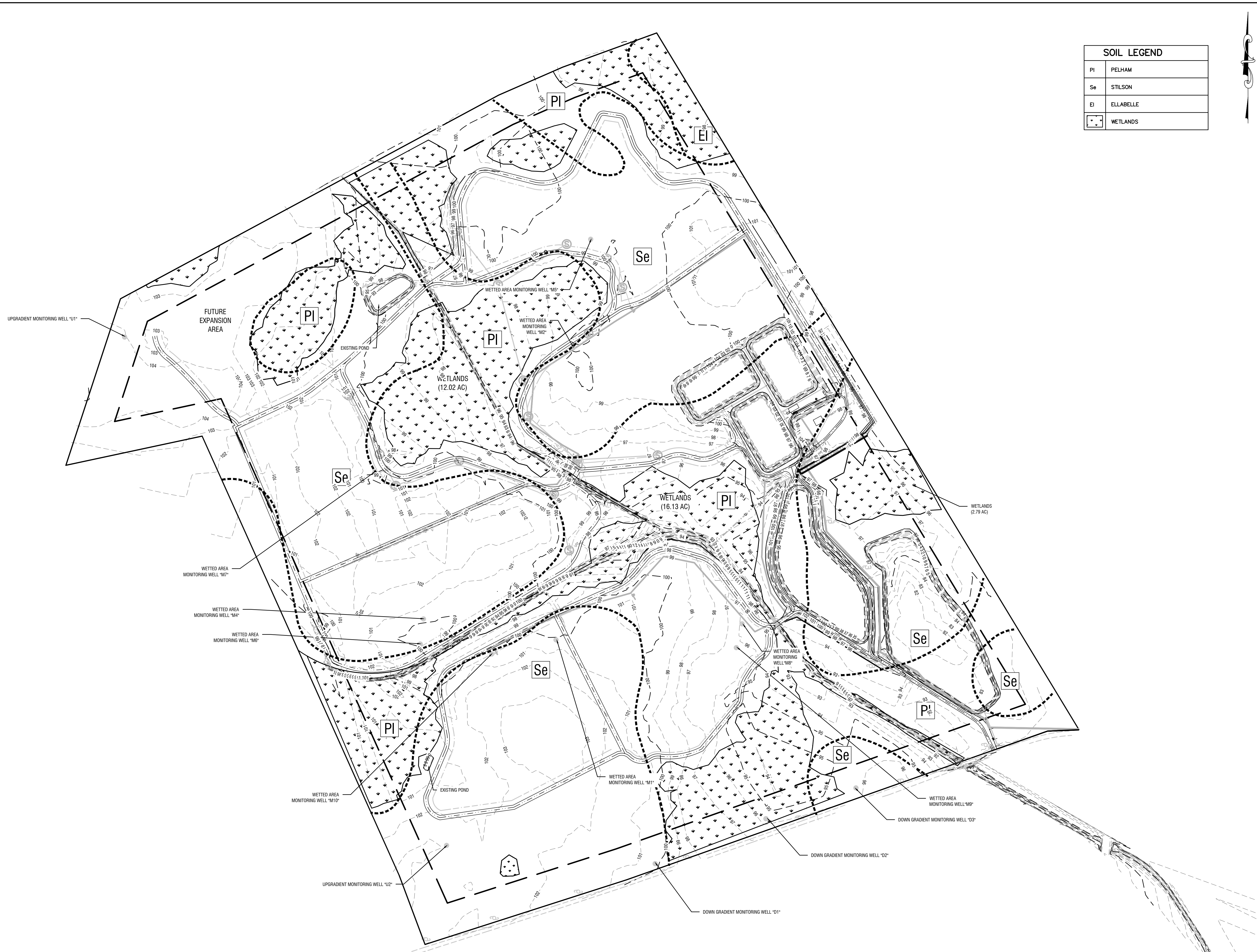
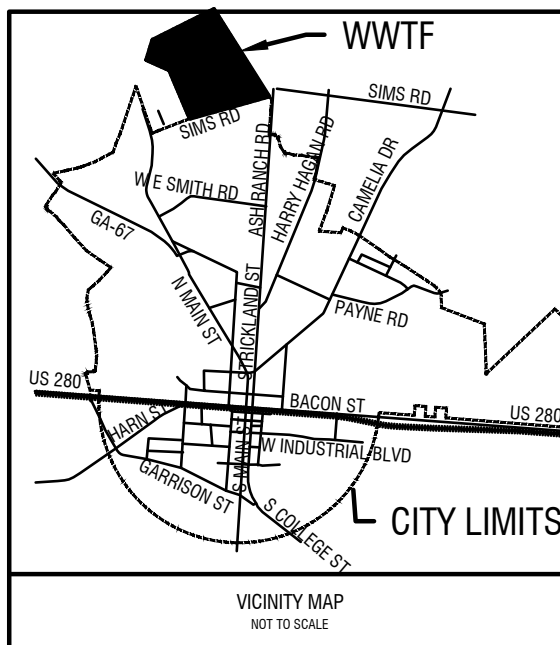
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LAND APPLICATION SYSTEM EXPANSION

GENERAL DETAILS

401

FILE NO: 2020-48
PLOT DATE: October 17, 2023

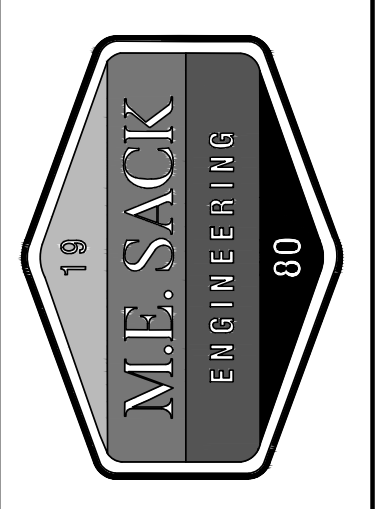


SOIL LEGEND	
PI	PELHAM
Se	STILSON
EI	ELLABELLE
	WETLANDS

REVISIONS:	
1.	SF 6 ADJUSTMENT
2.	EPD COMMENTS
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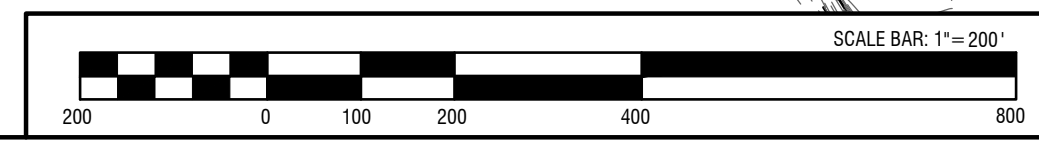
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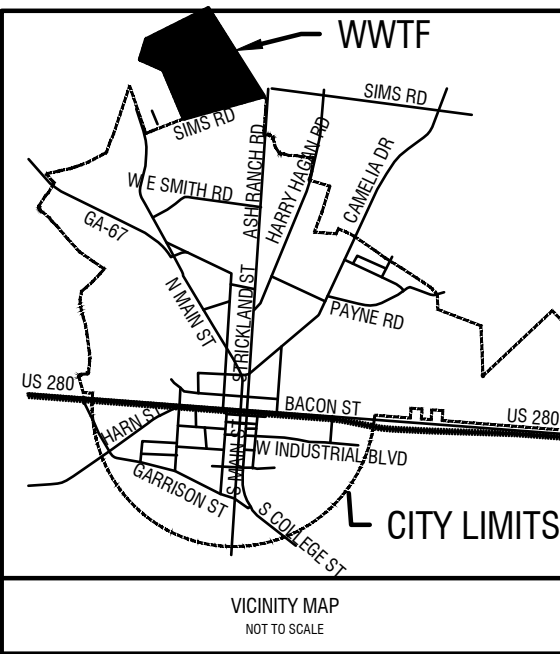
**LAND APPLICATION
SYSTEM EXPANSION**

SOIL MAP

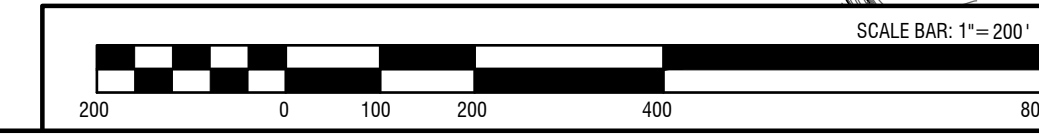
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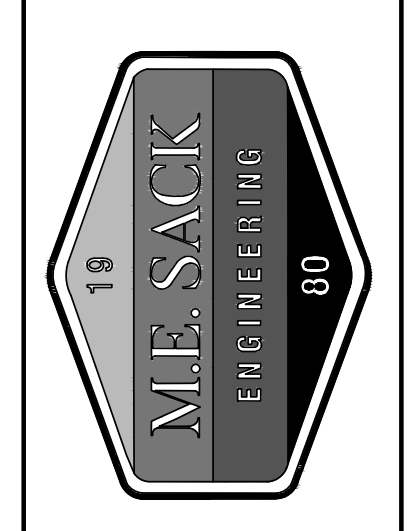
LEGEND	
■	LOWEST ELEVATION WITHIN PROPOSED SPRAY FIELD AREA
●	2022 SURVEY SPOT ELEVATION WITHIN PROPOSED SPRAY FIELD AREA
—	GA DNR FY-10 GA STUDY LINES
—	FLOOD LINE ELEVATION - CROSS SECTION



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LAND APPLICATION SYSTEM EXPANSION

HYDROLOGY PLAN

502

FILE NO: 2020-48
PLOT DATE: October 17, 2023

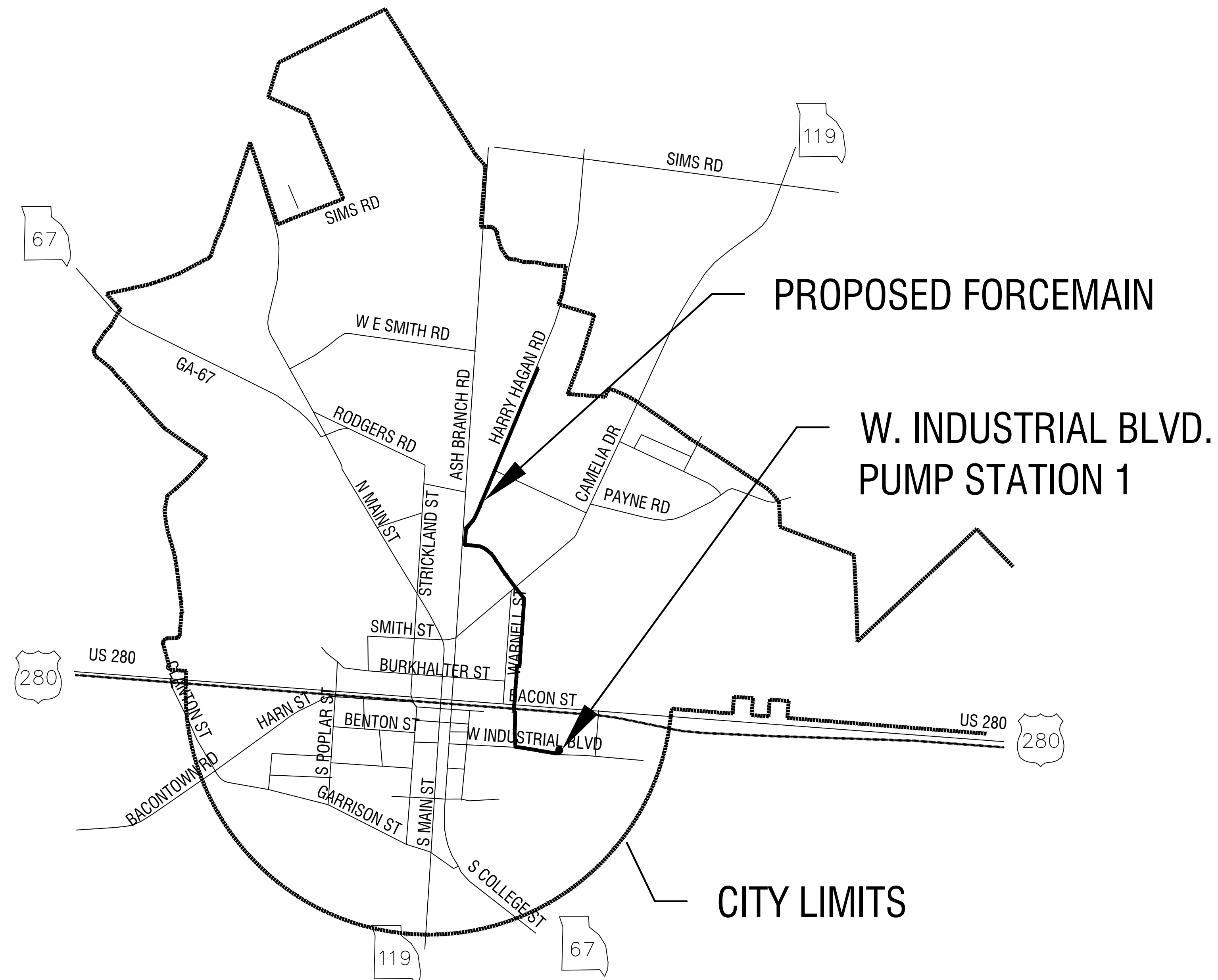
PUMP STATION IMPROVEMENTS FOR CITY OF PEMBROKE BRYAN COUNTY, GEORGIA DATE: DECEMBER 14, 2022

SHEET INDEX

1. EXISTING OVERALL CONDITIONS	C101	27. FINAL ESPC 3	C315
2. PUMP STATION EXISTING CONDITIONS	C102	28. FINAL ESPC 4	C316
3. SITE PLAN 1 (PUMP STATION 1)	C201	29. FINAL ESPC 5	C317
4. SITE PLAN 2	C202	30. FINAL ESPC 6	C318
5. SITE PLAN 3	C203	31. EROSION CONTROL NOTES	C319
6. SITE PLAN 4	C204	32. EROSION CONTROL DETAILS	C400
7. SITE PLAN 5	C205	33. GENERAL DETAILS	C401
8. SITE PLAN 6	C206	34. ELECTRICAL LEGEND, NOTES AND DETAILS	E001
9. SITE PLAN 7	C207	35. ELECTRICAL SPECIFICATIONS 1	E002
10. SITE PLAN 8	C208	36. ELECTRICAL SPECIFICATIONS 2	E003
11. PUMP STATION DETAILS 1	C209	37. ELECTRICAL SITE DEMO PLAN	E101
12. PUMP STATION DETAILS 2	C210	38. ELECTRICAL SITE PLAN	E201
13. INITIAL ESPC 1	C301	39. ELECTRICAL DETAILS	E202
14. INITIAL ESPC 2	C302		
15. INITIAL ESPC 3	C303		
16. INITIAL ESPC 4	C304		
17. INITIAL ESPC 5	C305		
18. INITIAL ESPC 6	C306		
19. INTERMEDIATE ESPC 1	C307		
20. INTERMEDIATE ESPC 2	C308		
21. INTERMEDIATE ESPC 3	C309		
22. INTERMEDIATE ESPC 4	C310		
23. INTERMEDIATE ESPC 5	C311		
24. INTERMEDIATE ESPC 6	C312		
25. FINAL ESPC 1	C313		
26. FINAL ESPC 2	C314		

DRAWING LEGEND

DESCRIPTION	PROPOSED	EXISTING
SANITARY SEWER	SS	SS
UNDERGROUND WATER LINE	W	W
FORCE MAIN	FM	FM
STORM DRAINAGE PIPE		
UNDERGROUND TELEPHONE LINE	T	T
UNDERGROUND TELEPHONE CONDUIT	TC	TC
UNDERGROUND GAS LINE	12" G	12" G
DITCH CENTERLINE	X-90.00	X-90.00
SPOT ELEVATION	TC-90.00	TC-90.00
TOP OF CURB ELEVATION		
FIRE HYDRANT		
SEWER MANHOLE		
WATER VALVE		
TELEPHONE MANHOLE		
LIGHT POLE		
SIGN		
WATER METER		
BENCHMARK		
CONCRETE MONUMENT FOUND		
GUY POLE		
IRON PIN FOUND		
IRON PIN SET		
TELEPHONE PEDESTAL		
POWER POLE		
HANDICAP SPACE		
SEDIMENT BASIN MARKER W/NOTCH		



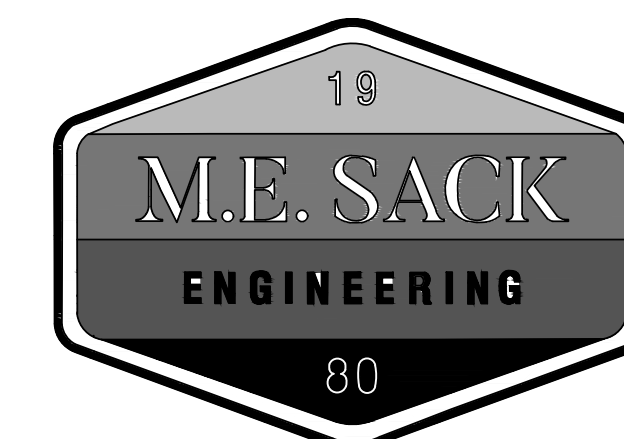
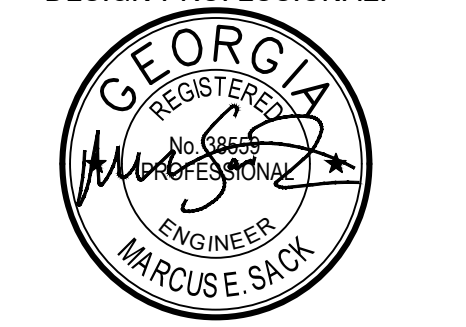
Know what's below.
Call before you dig.

Owner:
City of Pembroke
160 N Main St
Pembroke, GA 31321
(912) 653-4413
streets@pembrokega.net

GPS COORDINATES OF CO:
N 32° 07' 57.36"
E -81° 36' 52.19"
DATUM: NAVD88

24 HOUR CONTACT:
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GENERAL NOTES

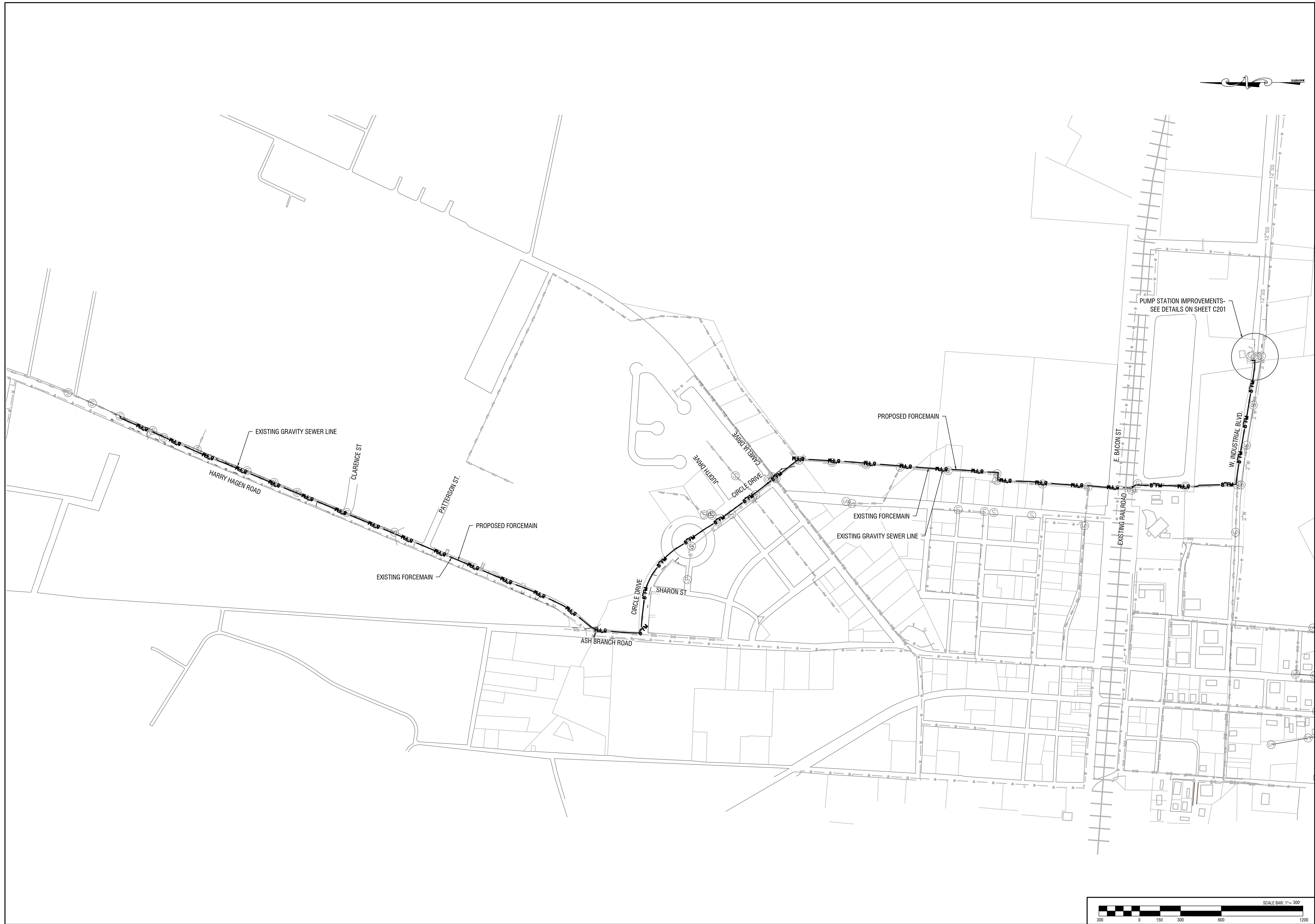
- ALL EXISTING UTILITIES SHOWN ARE LOCATED FROM BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL FIELD LOCATION AND PROTECTION OF EXISTING UTILITIES. OVERHEAD LINES ARE NOT SHOWN FOR CLARITY.
- ALL DISTURBED AREAS TO BE REVEGETATED IMMEDIATELY AFTER CONSTRUCTION, IN ACCORDANCE WITH THE MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA.
- ALL EROSION AND SEDIMENTATION CONTROL STRUCTURES SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF ANY PROPERTY CORNERS, RIGHT OF WAY MONUMENTS, SIGNS OR OTHER STRUCTURES DISTURBED DURING CONSTRUCTION.
- ALL TRAFFIC AND SIGNAGE CONTROL SHALL BE IN ACCORDANCE WITH THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES, MUTCD, CURRENT EDITION.

REVISION NO.	DATE	DESCRIPTION
1.	10/2/23	GSWCC REVISIONS

JOB NO. 2020-48

COVER SHEET

PLOT DATE: October 17, 2023

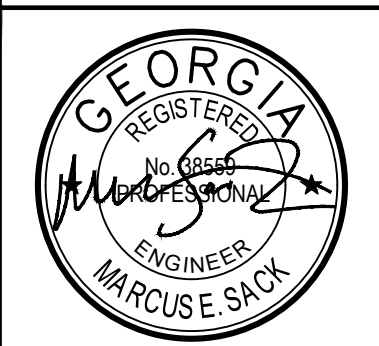


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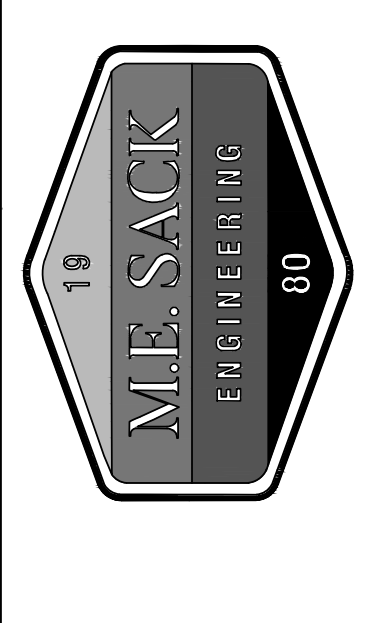
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DATE: October 17, 2023



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COUNTY:
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Owner:
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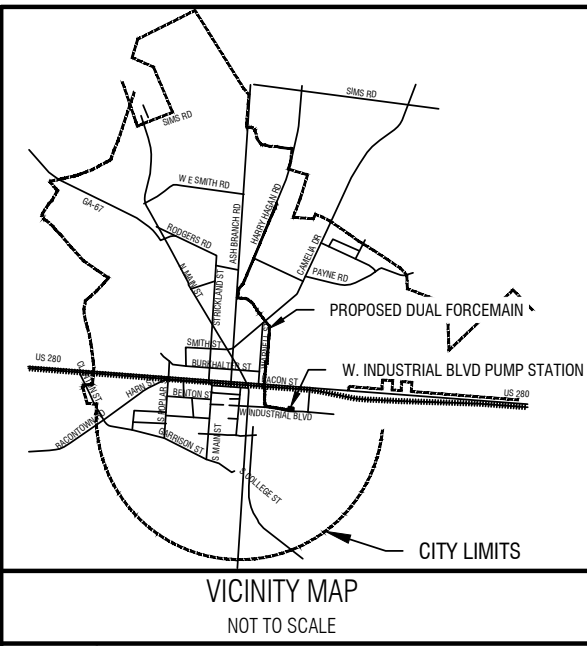
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PUMP STATION IMPROVEMENTS

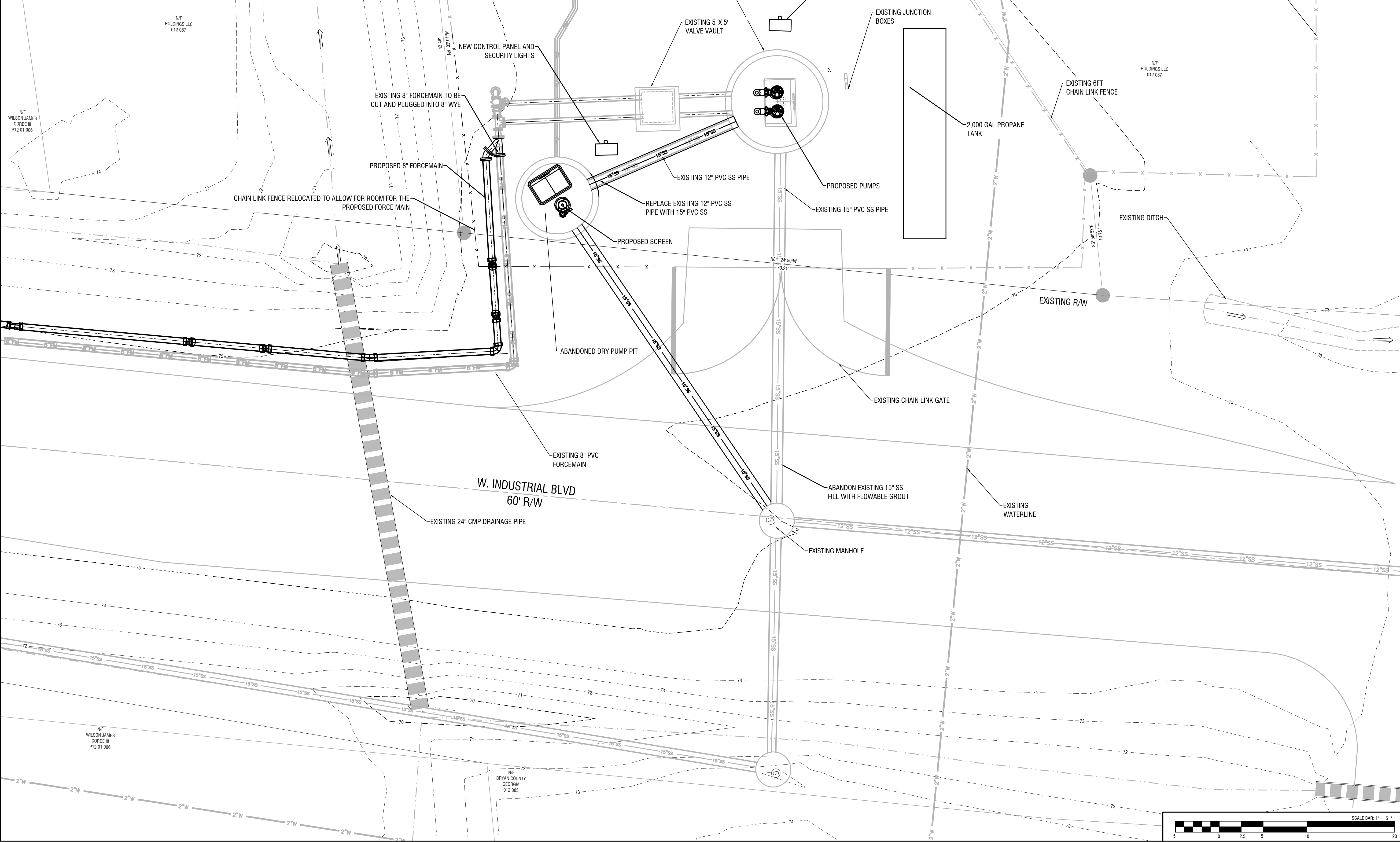
OVERALL SITE PLAN

C101

FILE NO: 2020-48
 PLOT DATE: October 17, 2023



NOTES:
 1) PRIOR TO INSTALLATION OF NEW WELL MUST BE CLEANED AND INSPECTED BY A LICENSED ELECTRICAL CONTRACTOR TO MAINTAIN ELECTRICAL SAFETY.
 2) CONTRACTOR TO MAINTAIN ELECTRICAL SAFETY RESPONSIBILITY FOR THE WELL PIT.

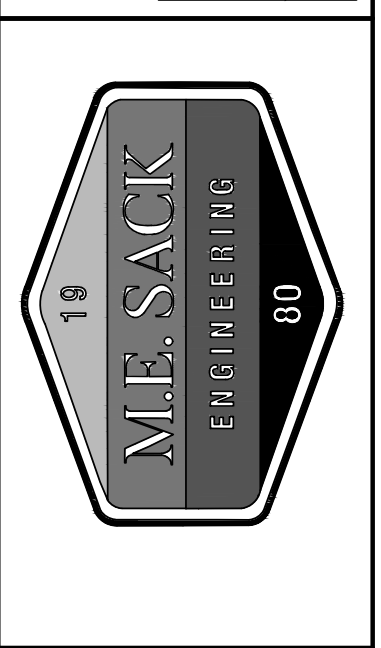
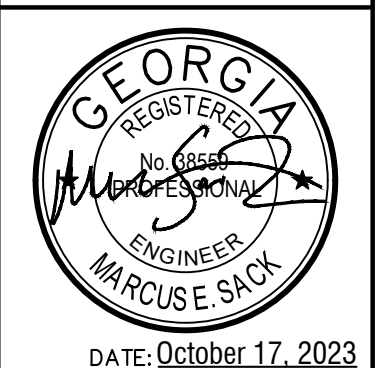


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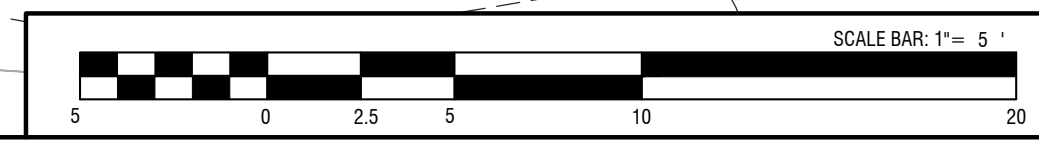
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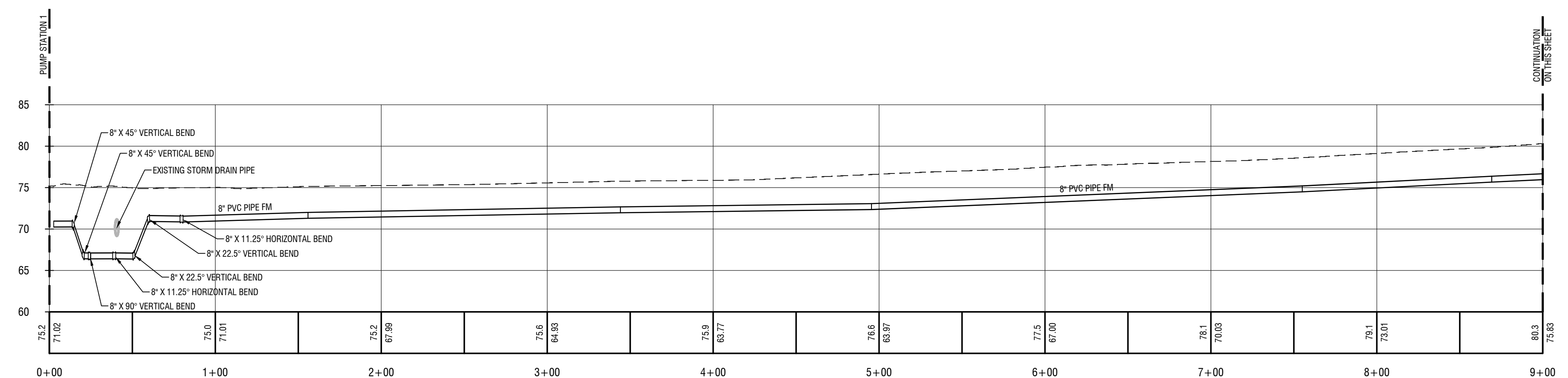
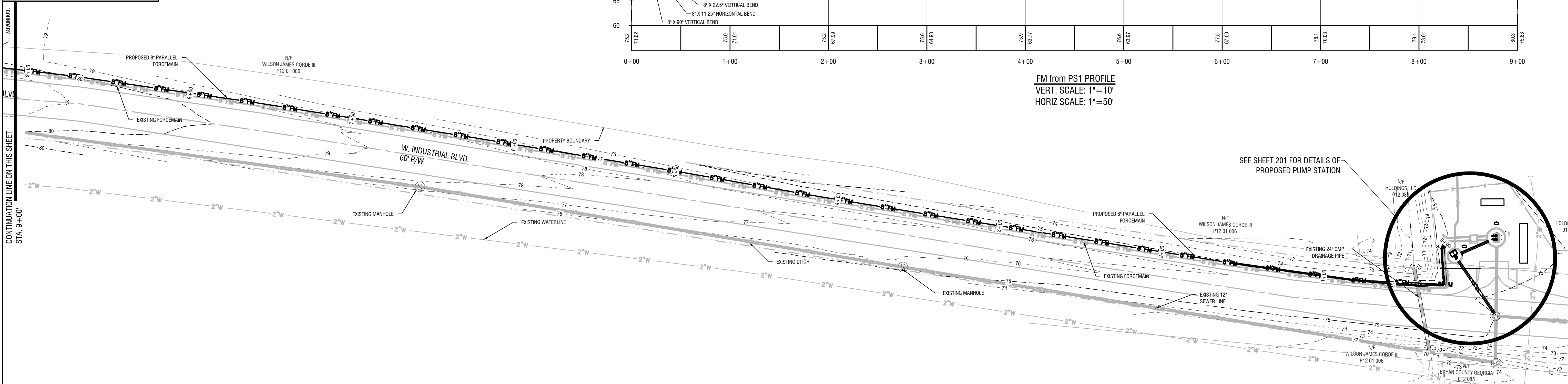
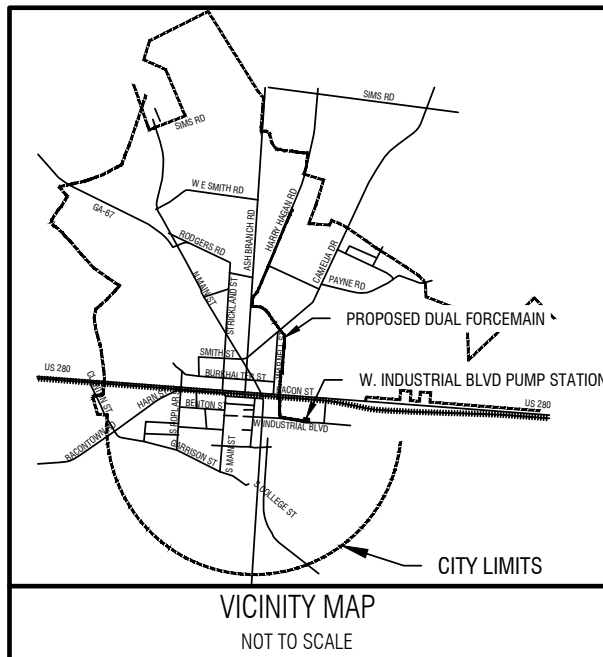
PUMP STATION IMPROVEMENTS

SITE PLAN 1

C201

FILE NO: 2020-48
 PLOT DATE: October 17, 2023





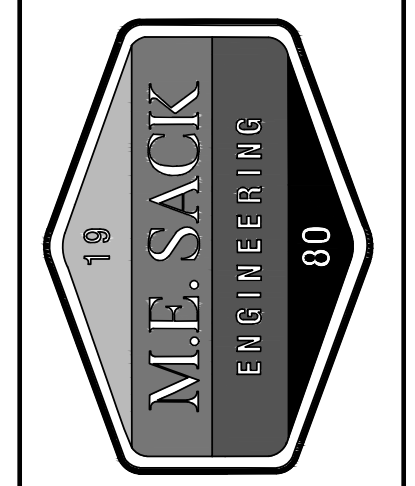
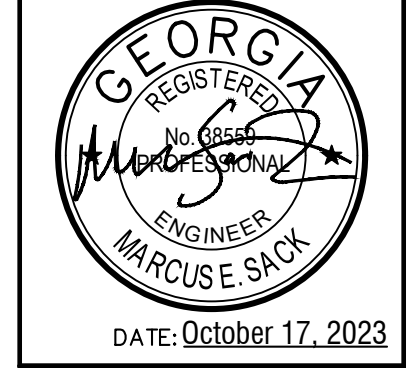
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VERT. SCALE: 1"=10'
HORIZ SCALE: 1"=50'

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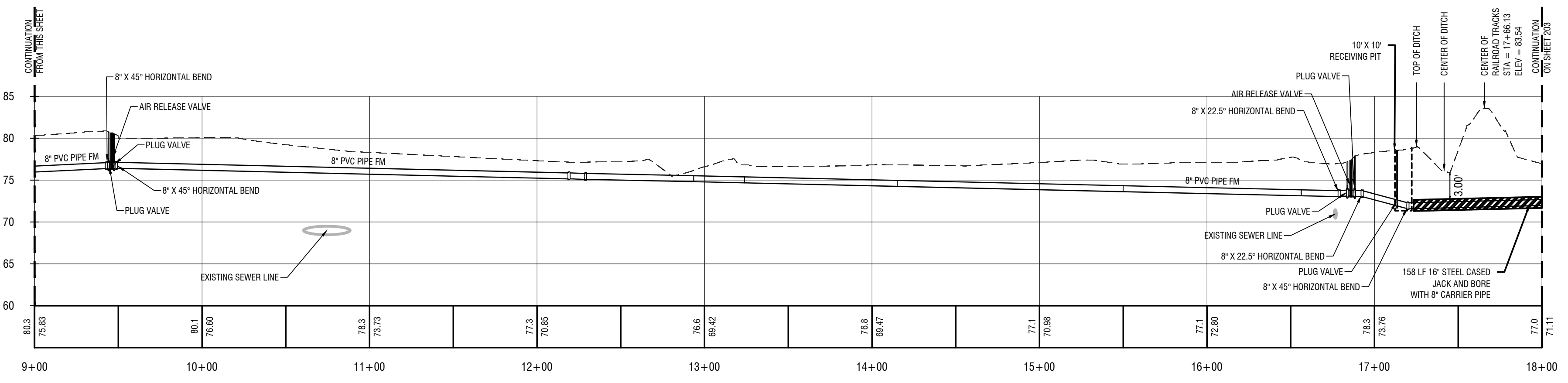


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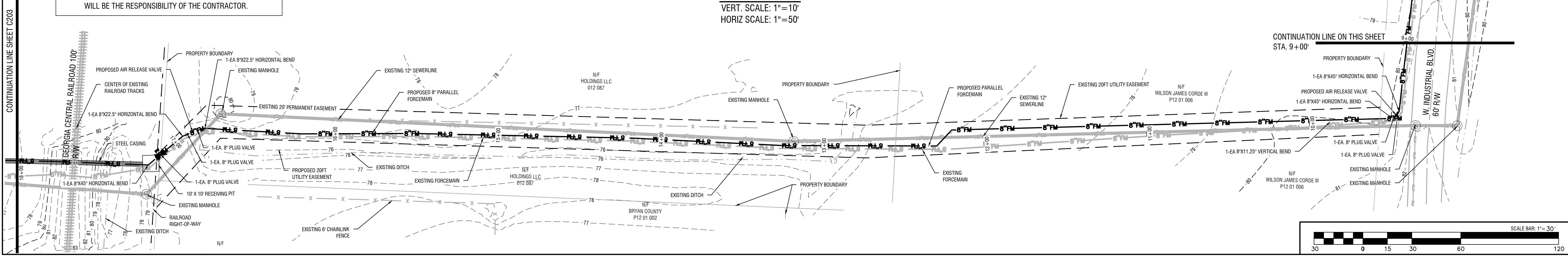
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FM from PS1 PROFILE
VERT. SCALE: 1"=10'
HORIZ SCALE: 1"=50'

- NOTE:
- IN ACCORDANCE WITH GDOT GUIDELINES AND TO ENSURE THE BOREHOLE REMAINS OPEN WITH LITTLE OR NO DEFORMATION, THE PORTION OF THE FORCE MAIN BETWEEN ENTRY POINT AND EXIT POINT SHALL BE ENCASED IN 16" STEEL CASING WITH 8" PVC CARRIER PIPE.
 - IN ACCORDANCE WITH CSX SPECIFICATIONS TEST BORINGS SHALL BE MADE IN ACCORDANCE WITH CURRENT ASTM DESIGNATION D1586 EXCEPT THAT SAMPLING MUST BE CONTINUOUS FROM THE GROUND SURFACE TO 5 FEET BELOW THE PROPOSED INVERT UNLESS ROCK IS ENCOUNTERED BEFORE THIS DEPTH. WHERE ROCK IS ENCOUNTERED, IT IS TO BE CORED USING A SERIES "M" DOUBLE TUBE CORE BARREL WITH A DIAMOND BIT, CAPABLE OF RETRIEVING A ROCK CORE AT LEAST 1 5/8" IN DIAMETER. INDIVIDUAL CORE RUNS ARE NOT TO EXCEED 5 FEET IN LENGTH.
 - ALL BORINGS SHALL BE SEALED, FOR THEIR FULL DEPTH, WITH A 4-3-1 BENTONITE-CEMENT-SAND GROUT AFTER ACCURATE GROUND WATER READINGS HAVE BEEN TAKEN AND RECORDED.
 - SOIL SAMPLES TAKEN FROM AUGER VANES OR RETURN WASHWATER ARE NOT ACCEPTABLE.

NOTE:
1. ALL TRAINING, CLASSES, AND TRAINING EXPENSES REQUIRED FOR RAILROAD RIGHT-OF-WAY ENTRY AND CONSTRUCTION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

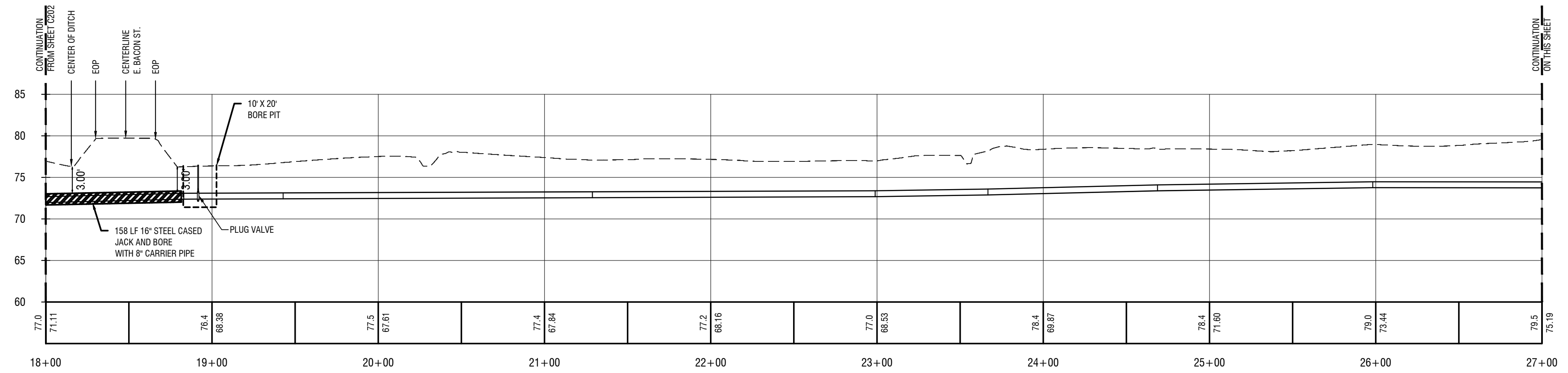
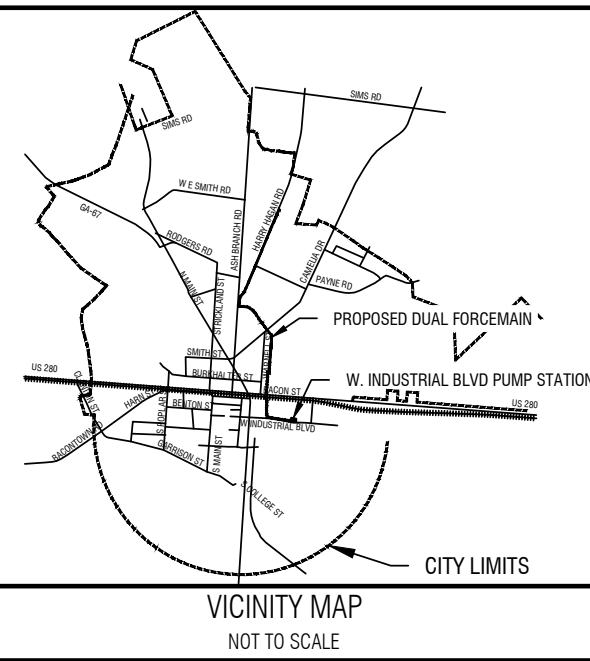


PUMP STATION IMPROVEMENTS

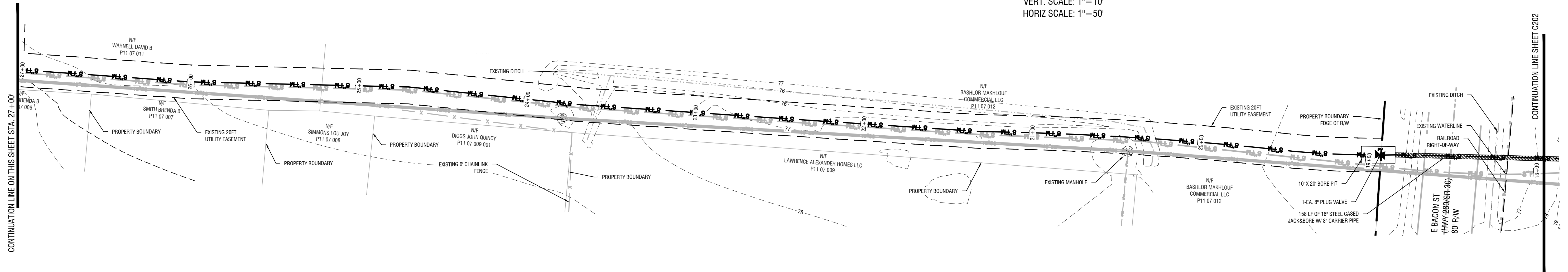
SITE PLAN 2

C202

FILE NO: 2020-48
PLOT DATE: October 17, 2023

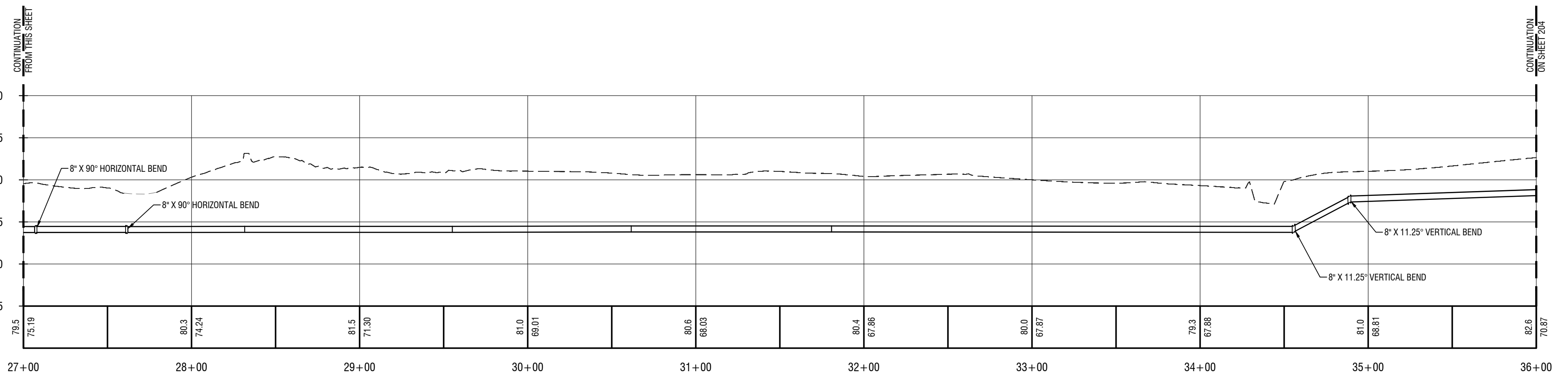


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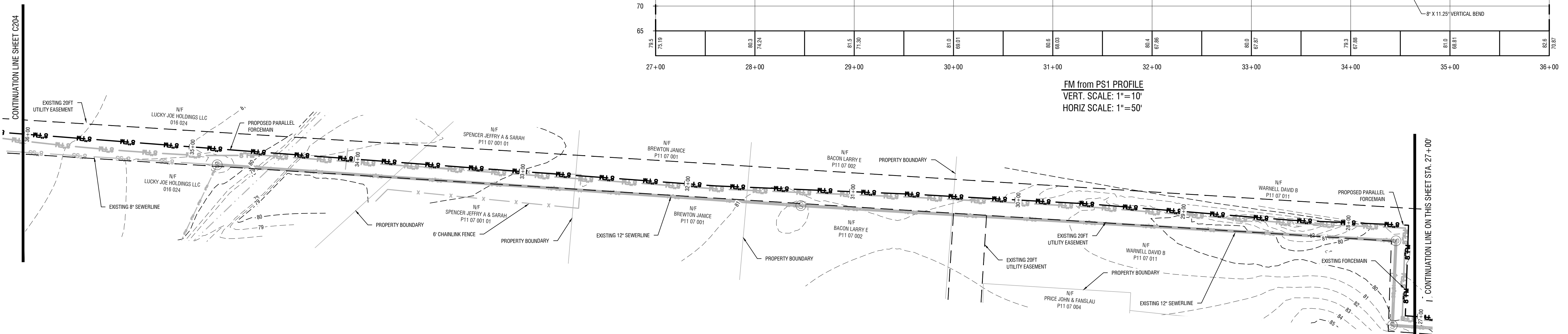


CONTINUATION LINE ON THIS SHEET STA. 27+00'

CONTINUATION LINE SHEET C202

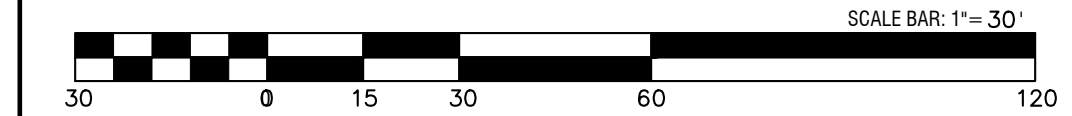


FM from PS1 PROFILE
VERT. SCALE: 1"=10'
HORIZ SCALE: 1"=50'



CONTINUATION LINE SHEET C204

CONTINUATION LINE ON THIS SHEET STA. 27+00'



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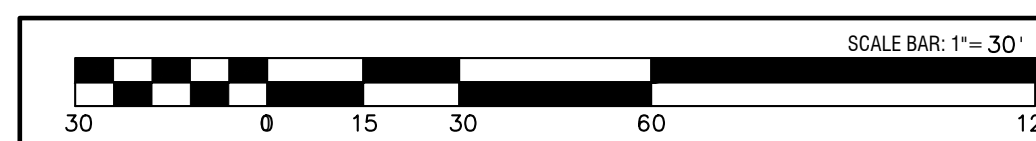
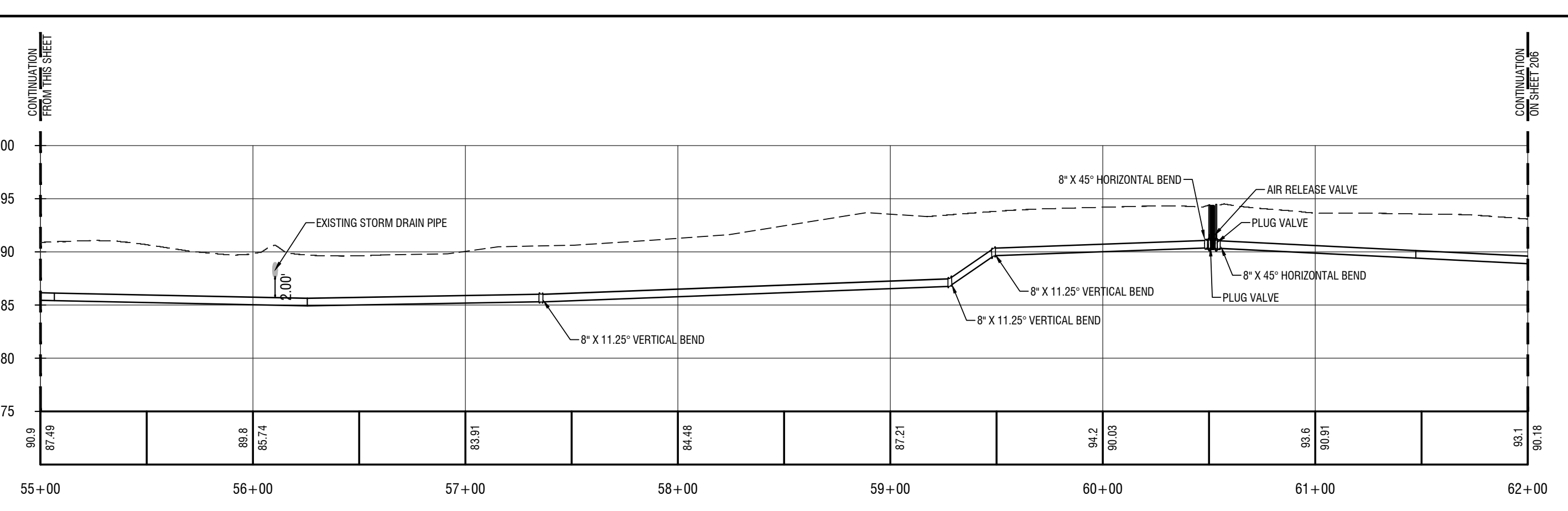
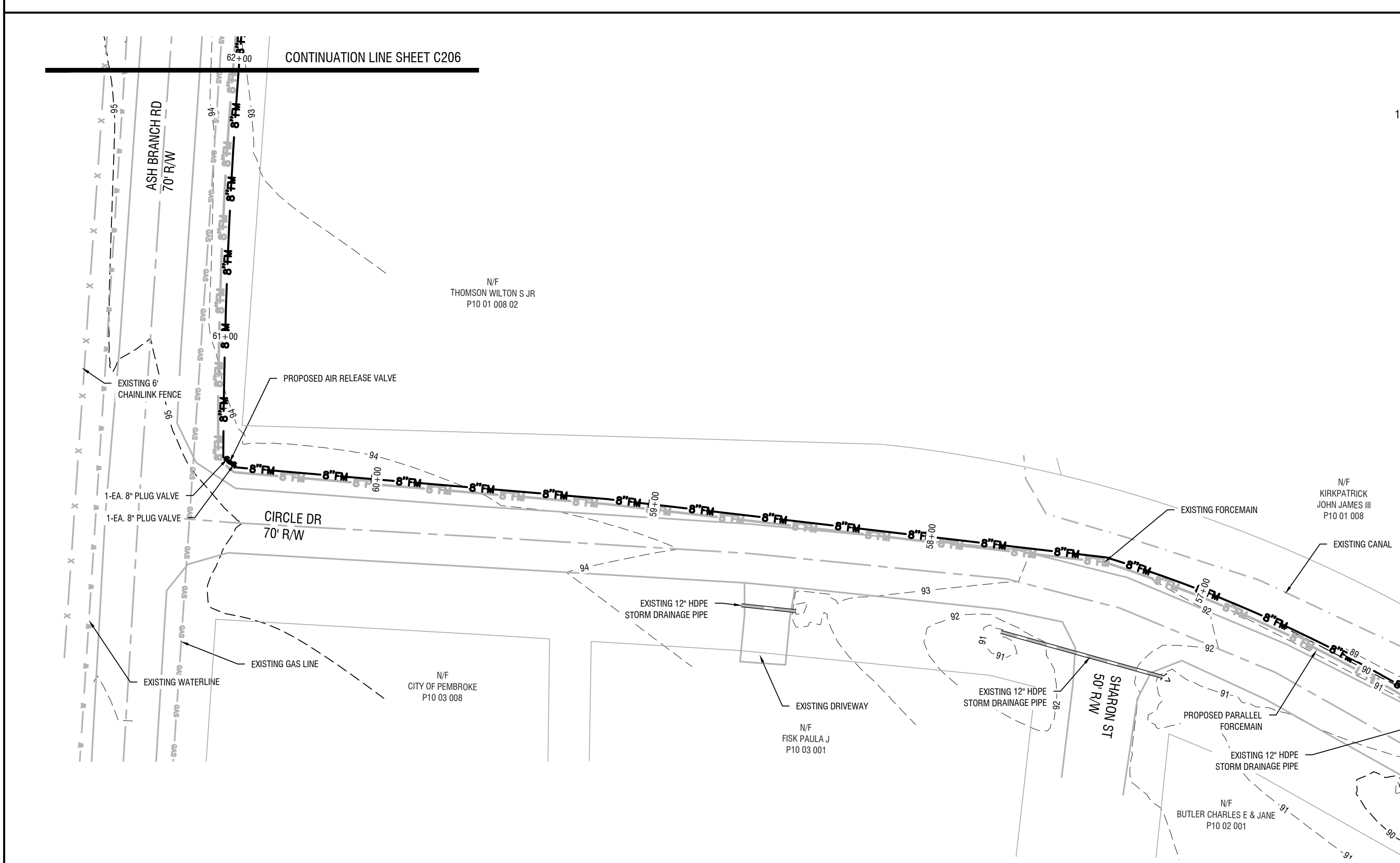
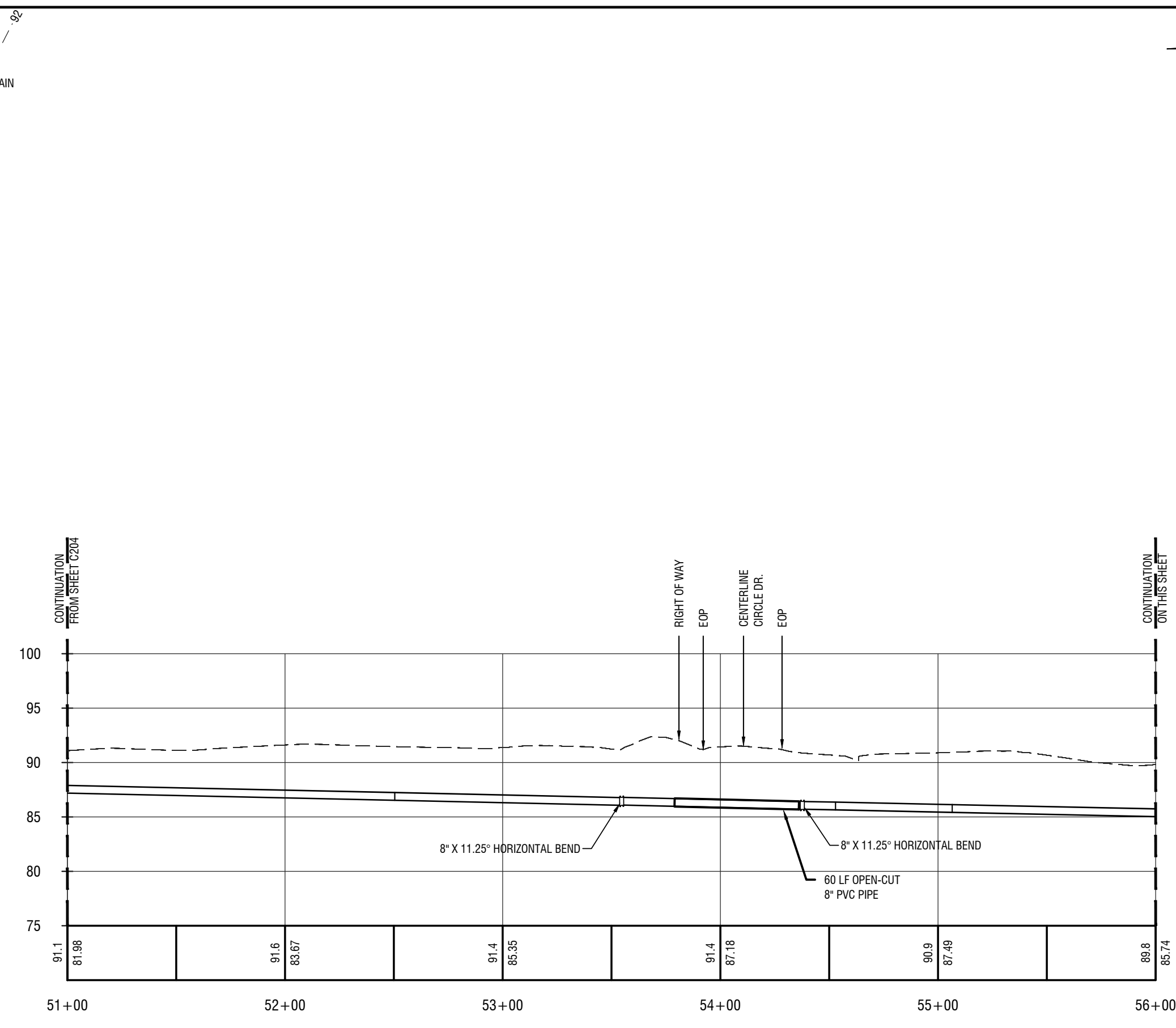
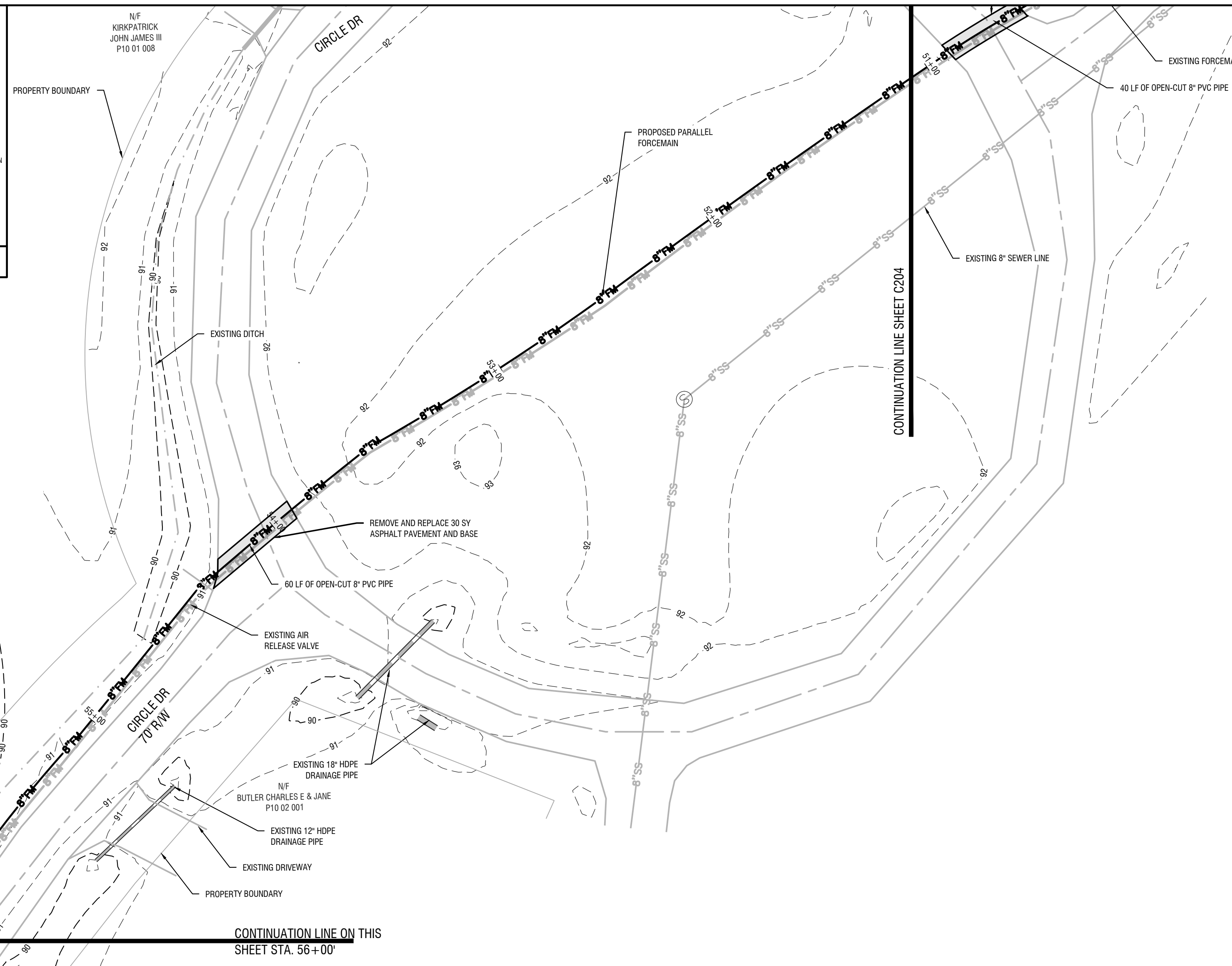
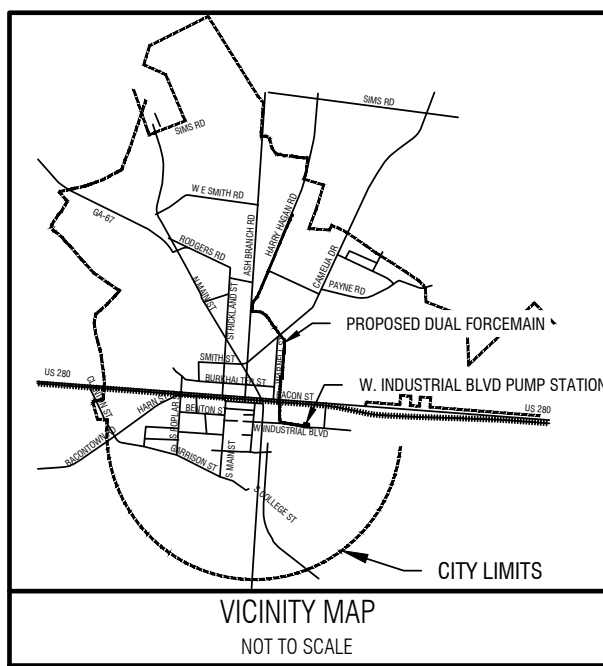
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PUMP STATION IMPROVEMENTS

SITE PLAN 3

C203

FILE NO: 2020-48
PLOT DATE: October 17, 2023



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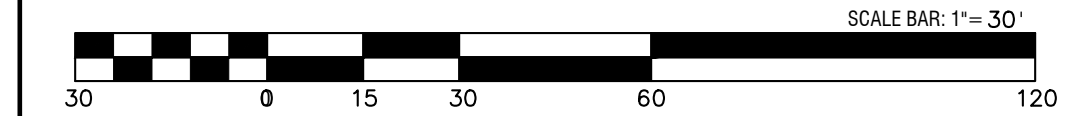
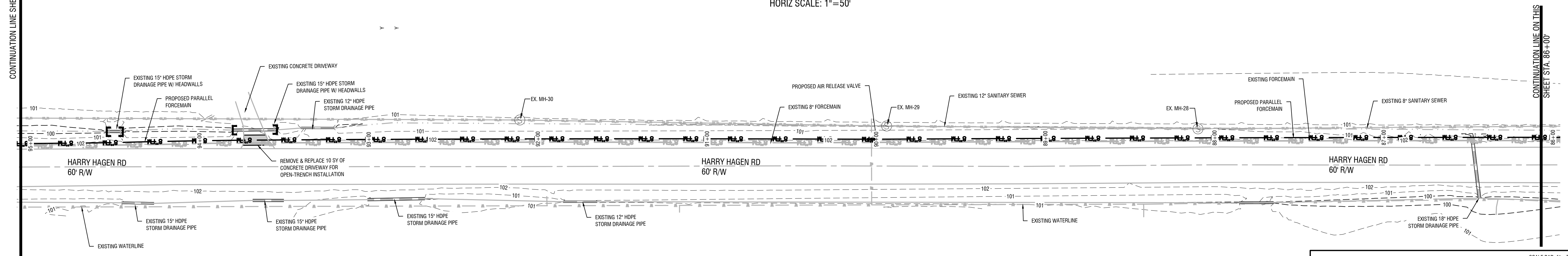
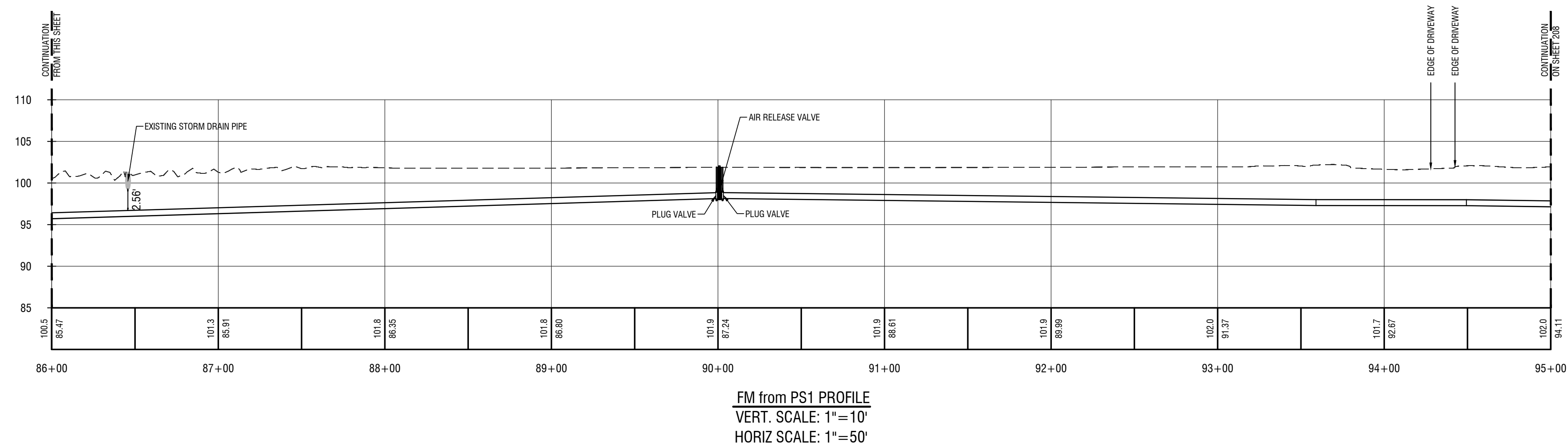
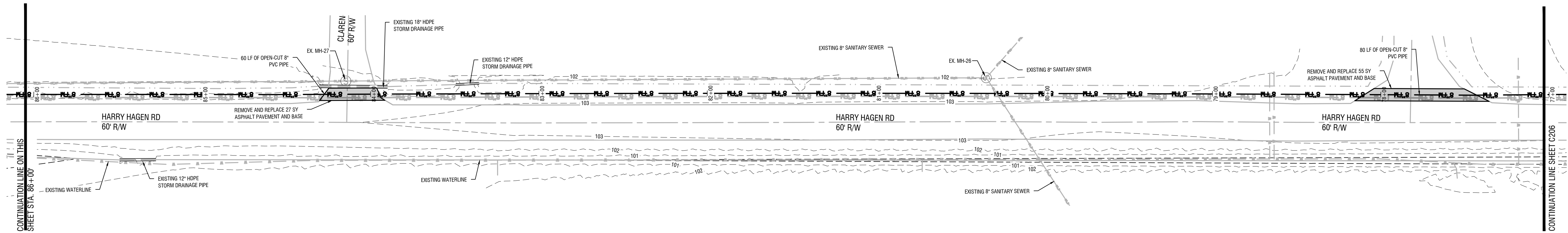
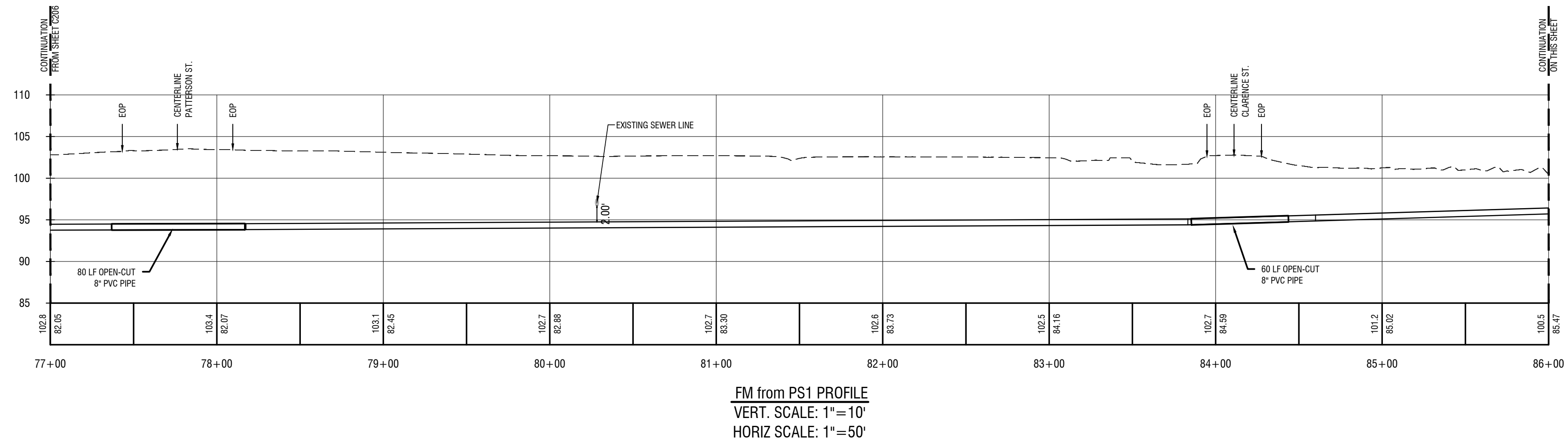
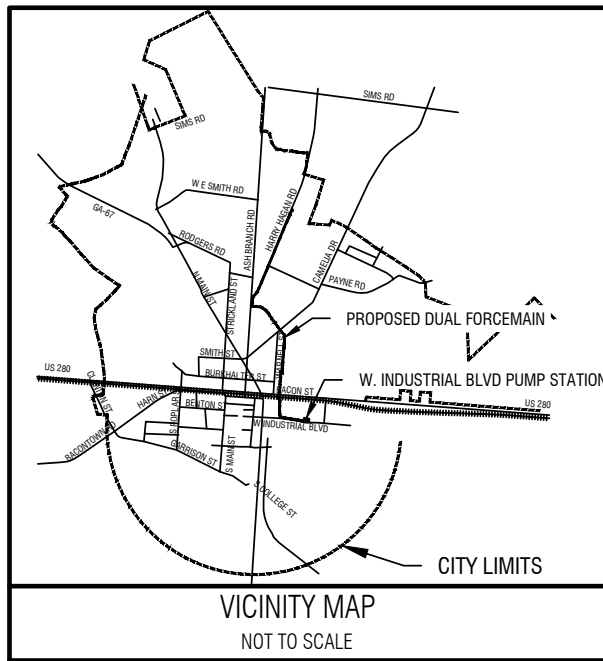
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PUMP STATION IMPROVEMENTS

SITE PLAN 5

C205

FILE NO: 2020-48
PLOT DATE: October 17, 2023



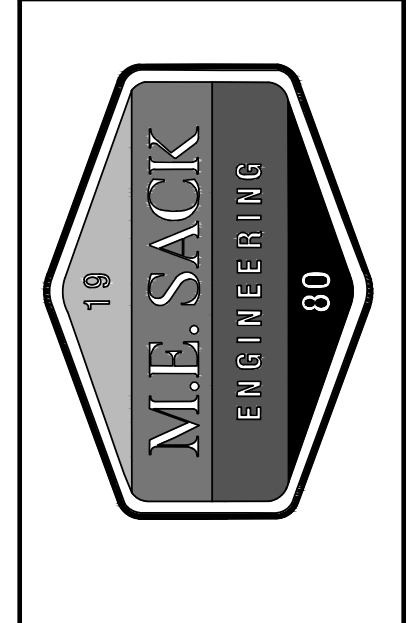
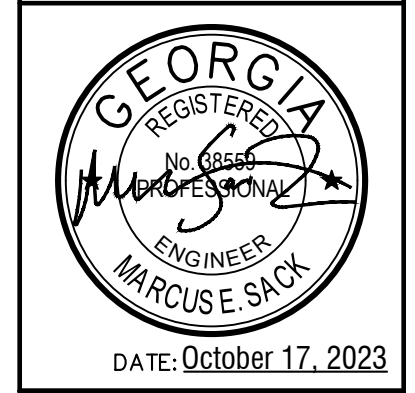
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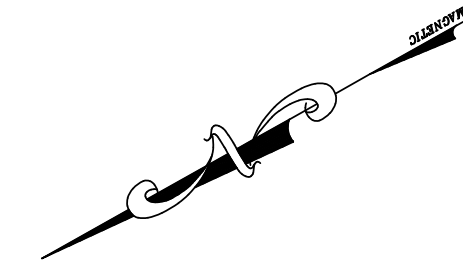
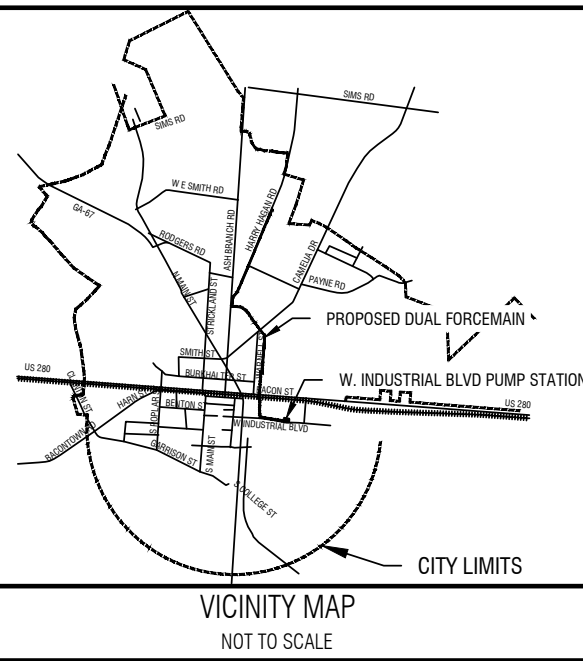
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PUMP STATION IMPROVEMENTS

SITE PLAN 7

C207

FILE NO: 2020-48
 PLOT DATE: October 17, 2023



REVISIONS:

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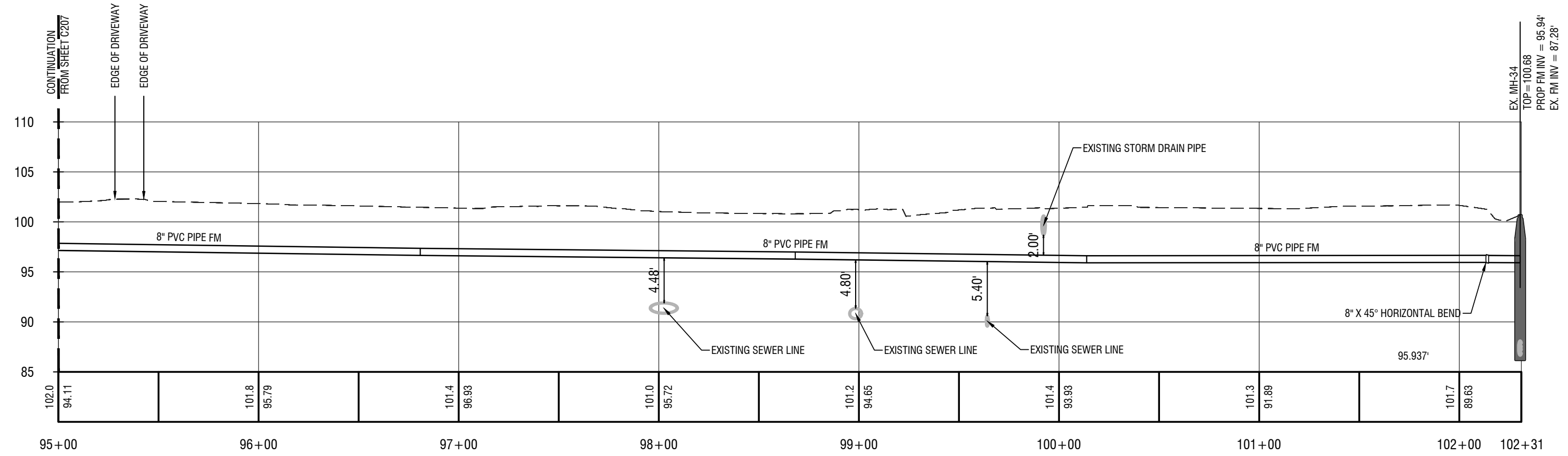
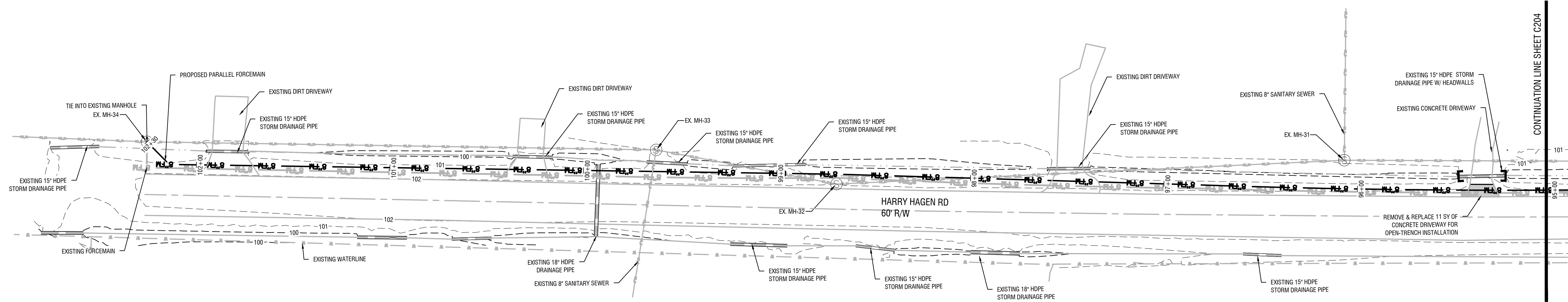
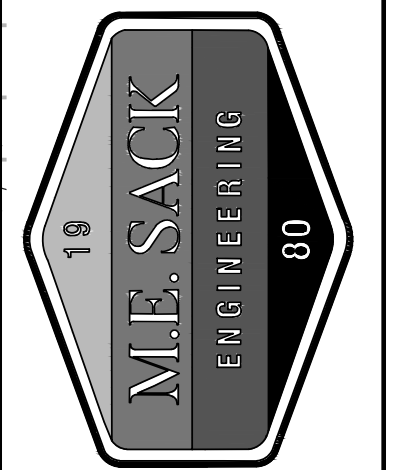
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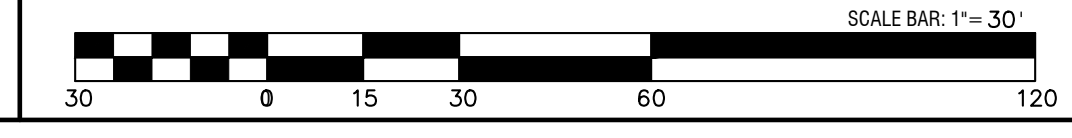
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DATE: October 17, 2023



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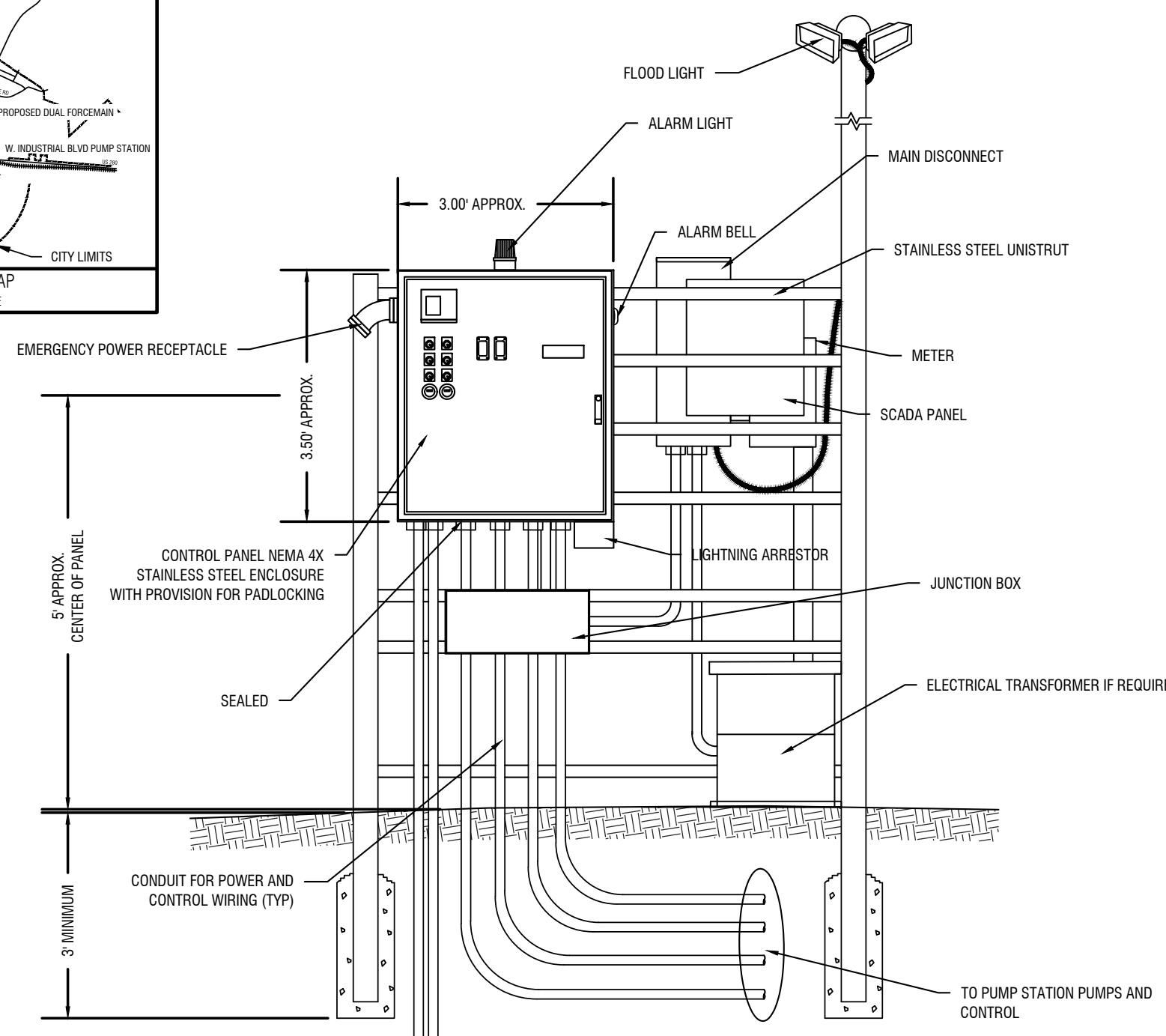
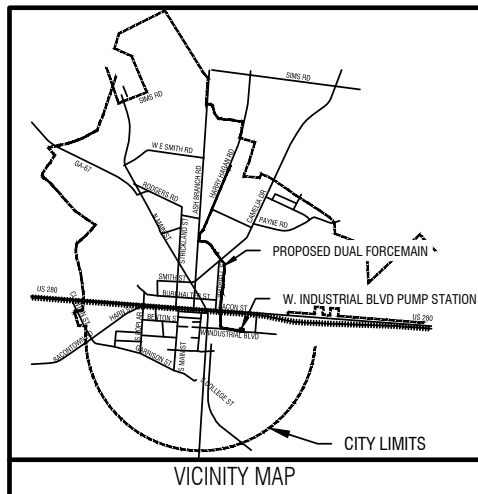
PUMP STATION
IMPROVEMENTS

SITE PLAN 8

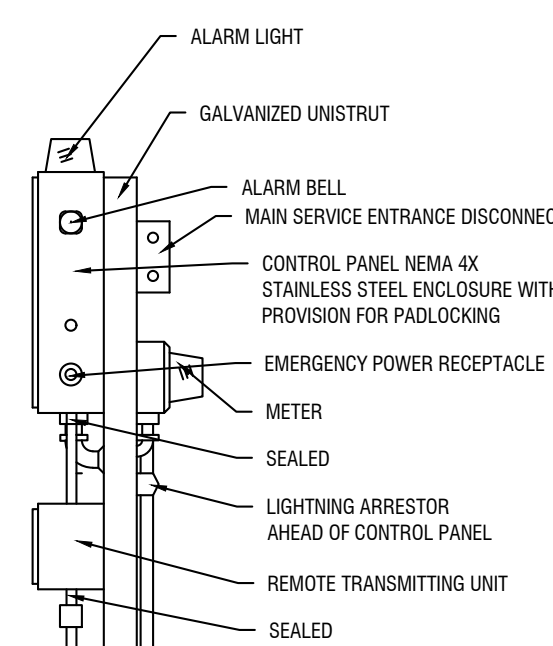
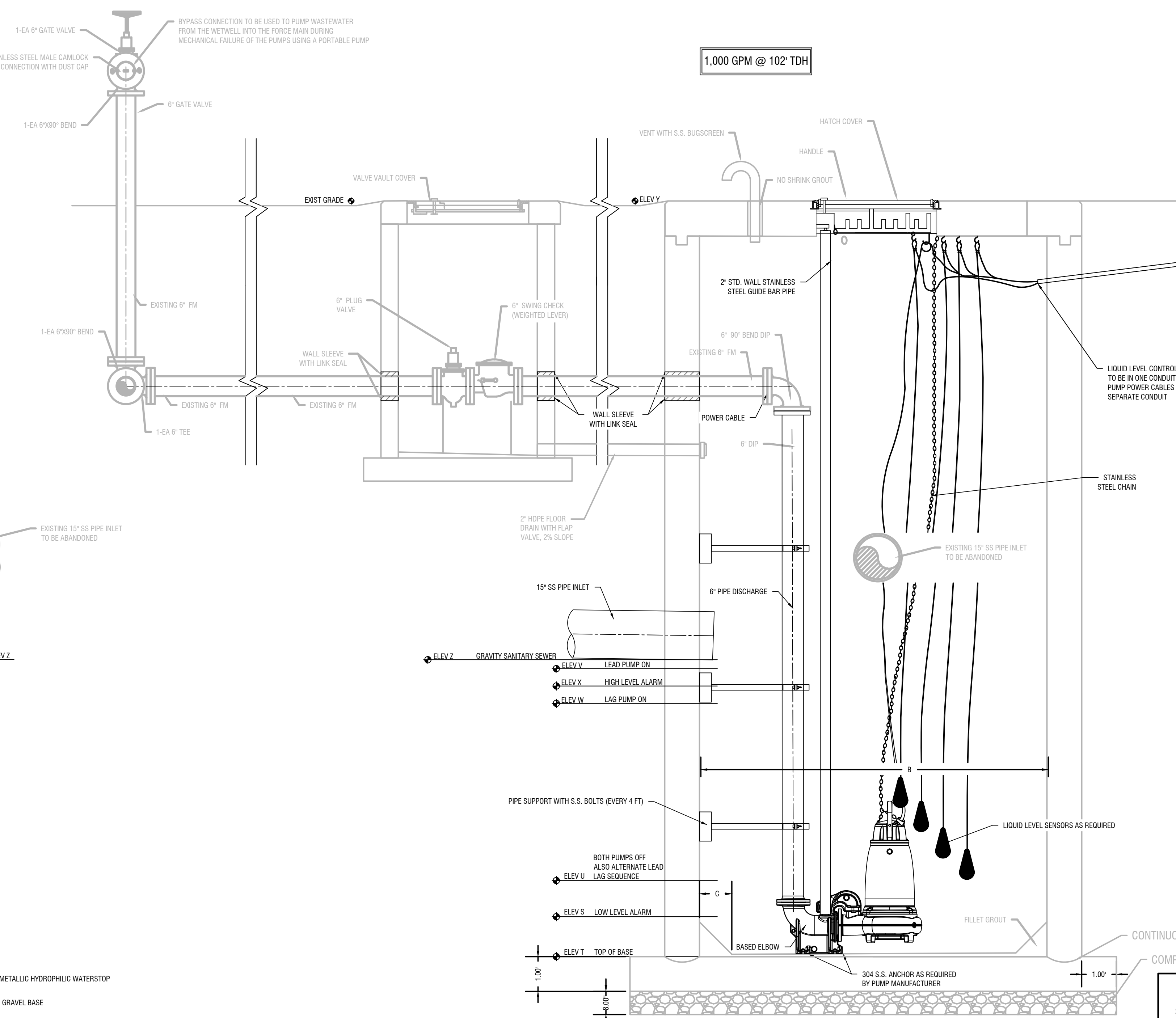
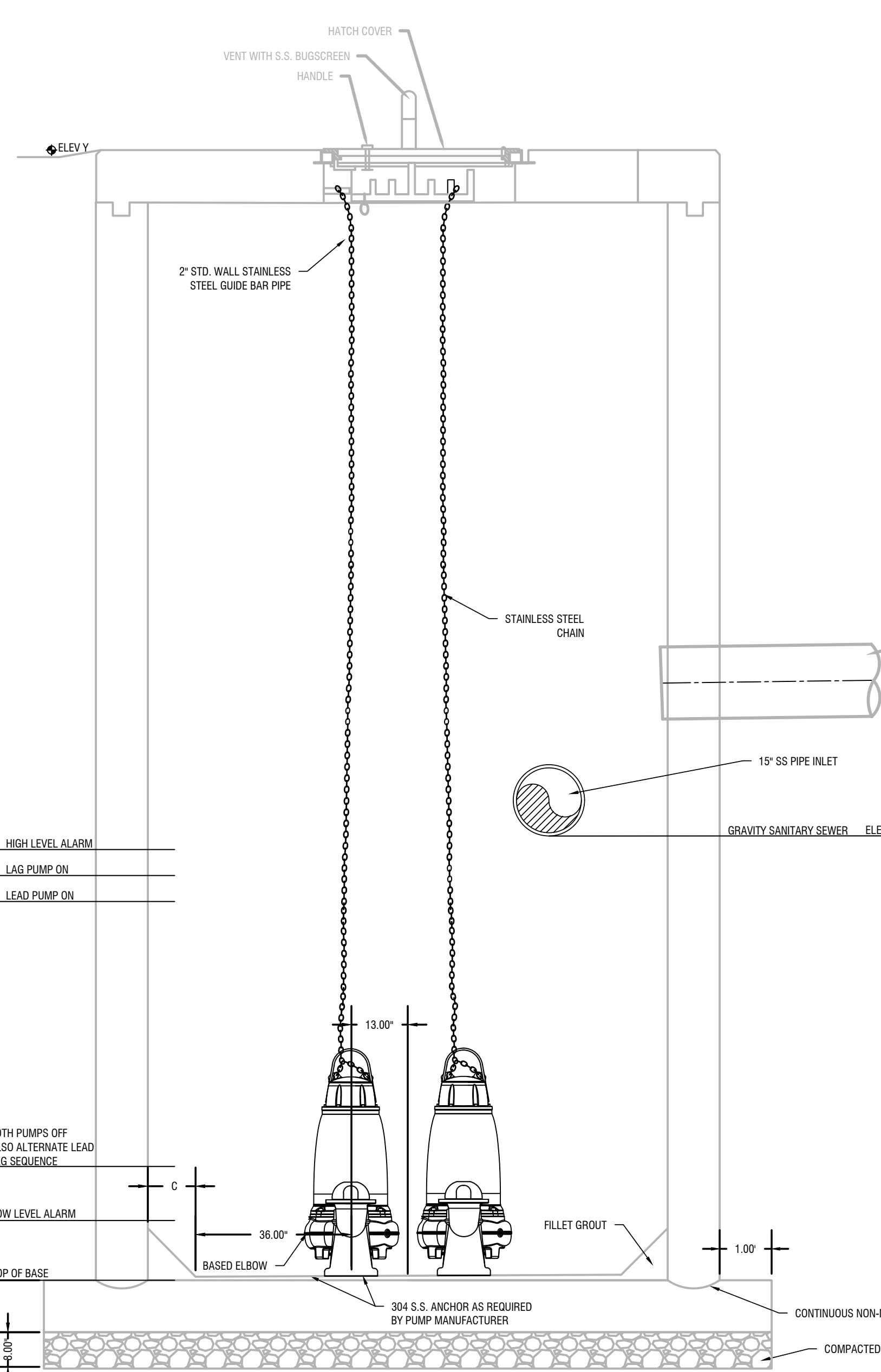
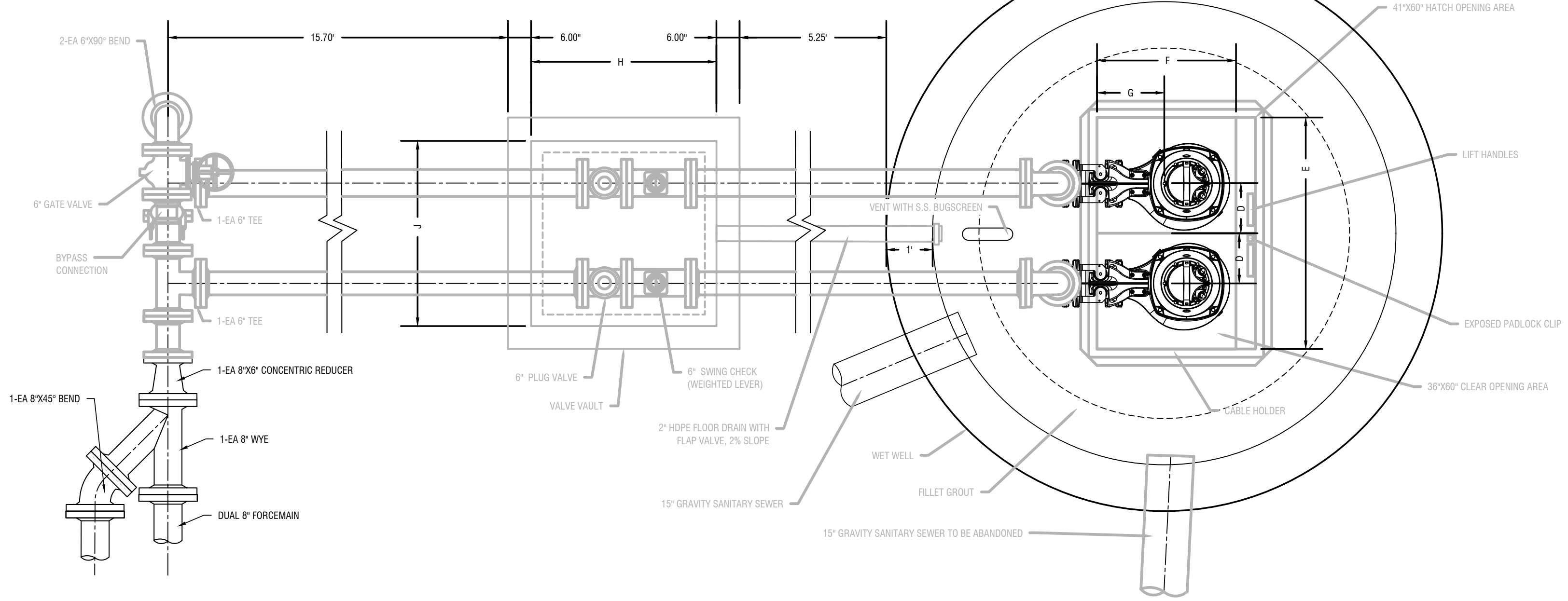
C208

FILE NO: 2020-48

PLOT DATE: October 17, 2023



CONTROL PANEL ELEVATION VIEW
NTS



1,000 GPM @ 102' TDH

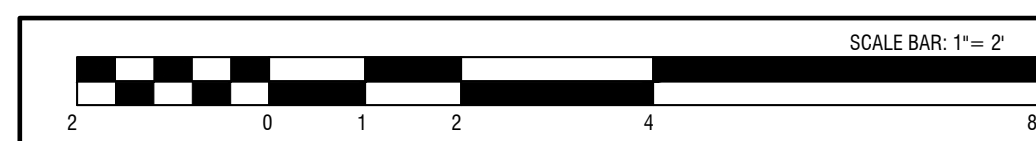
LIFT STATION DATA

PUMPING STATIONS	DIMENSIONS	ELEV AT CONST
DIM A	12"	
DIM B	10"	
DIM C	12"	
DIM D	12"	
DIM E	60" CLEAR	
DIM F	36" CLEAR	
DIM G	13"	
DIM H	48"	
DIM J	48"	
ELEV S		54.90
ELEV Y		53.75
ELEV U		55.94
ELEV V		61.04
ELEV W		61.54
ELEV X		62.04
ELEV Y		75.50
ELEV Z		62.30

FLOW VELOCITY

FLOW RATE	VELOCITY
GPM	ft/s
600	1.9
700	2.2
800	2.6
900	2.9
1,000	3.2

GENERAL NOTES:
 CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS BEFORE STARTING WORK.
 PUMPS SHALL BE FLYGT NP 3202, 185 WITH 460 IMPELLER OR APPROVED EQUAL, 45 HP, 3 PHASE, 480 VOLTS, 1750 RPM, 60 HERTZ, PUMP LIFTING DEVICE SHALL BE 304 SS CHAIN.
 CABLE HANGERS SHALL BE STAINLESS STEEL.
 ELECTRICAL CONDUIT SIZE SHALL BE LARGE ENOUGH TO ALLOW FOR PERIODIC REMOVAL AND REPLACEMENT OF ELECTRICAL CABLES.
 ALL CONDUITS INTO THE CONTROL PANEL MUST BE SEALED.
 ALL LOCATIONS WHERE PIPES ENTER OR LEAVE THE WET WELL OR VALVE VAULT SHALL BE WATER TIGHT AND GAS TIGHT WITH WALL SLEEVE OR NON-SHRINK GROUT.
 CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING, INSTALLING, PROGRAMMING, COMMISSIONING AND ENGINEERING ALL COMPONENTS OF THE PUMP CONTROLLER/SCADA SYSTEM.
 VALVE VAULT SHALL BE SIZED TO PERMIT EASY REMOVAL OF CHECK VALVE.
 VALVE VAULT SHALL HAVE SEALED FLOOR W/DRAIN TO WET WELL.
 THE CONTRACTOR SHALL PROVIDE AND INSTALL A PUMP CONTROLLER EQUIVALENT TO THE MULTISTART PUMP STATION MANAGEMENT SYSTEM MANUFACTURED BY FLYGT



REVISIONS:

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DATE: October 17, 2023

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CITY OF PEMBROKE

COUNTY:
BRYAN

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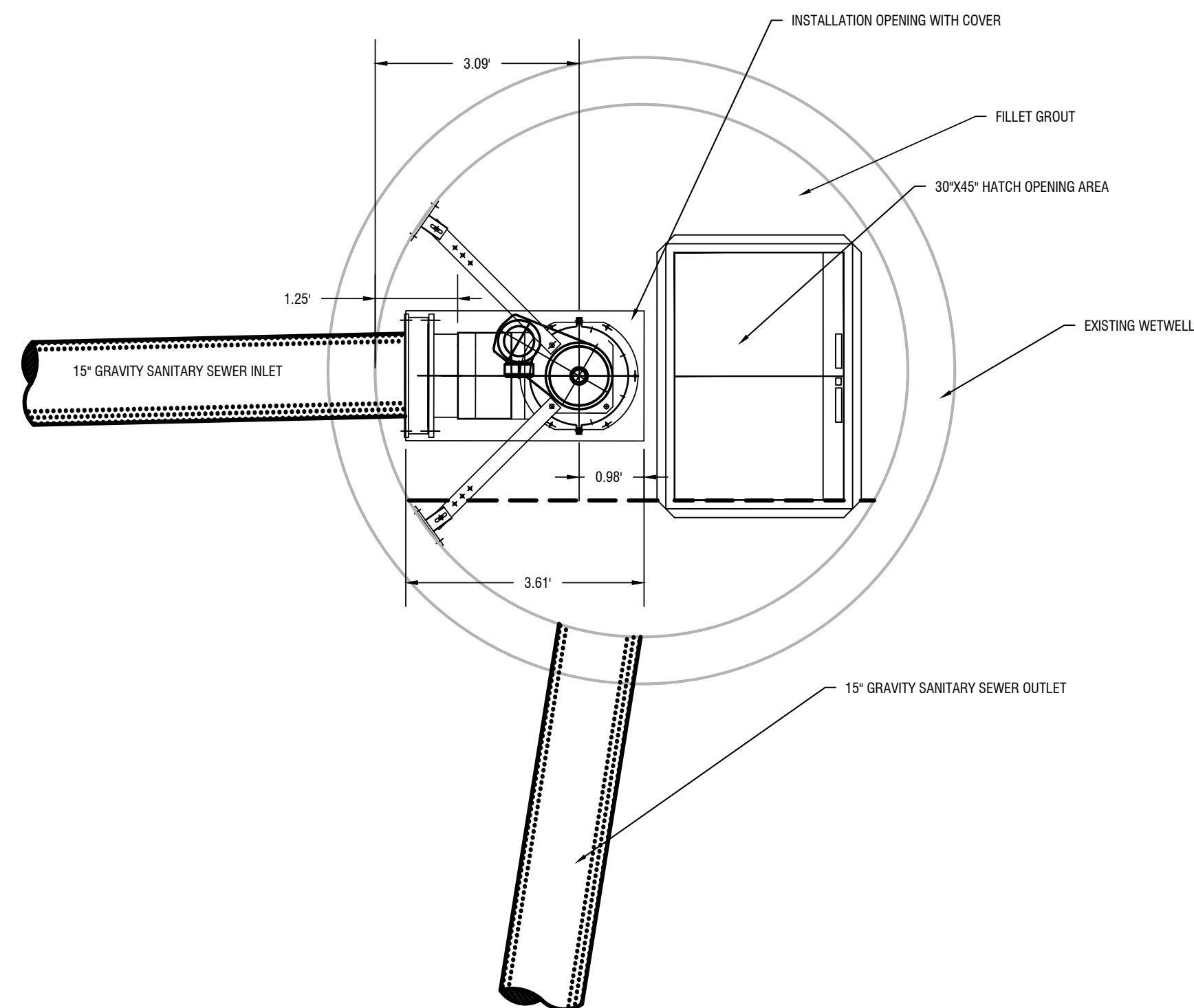
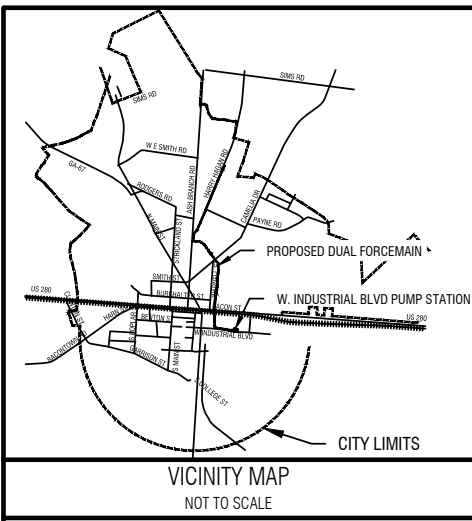
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PUMP STATION IMPROVEMENTS

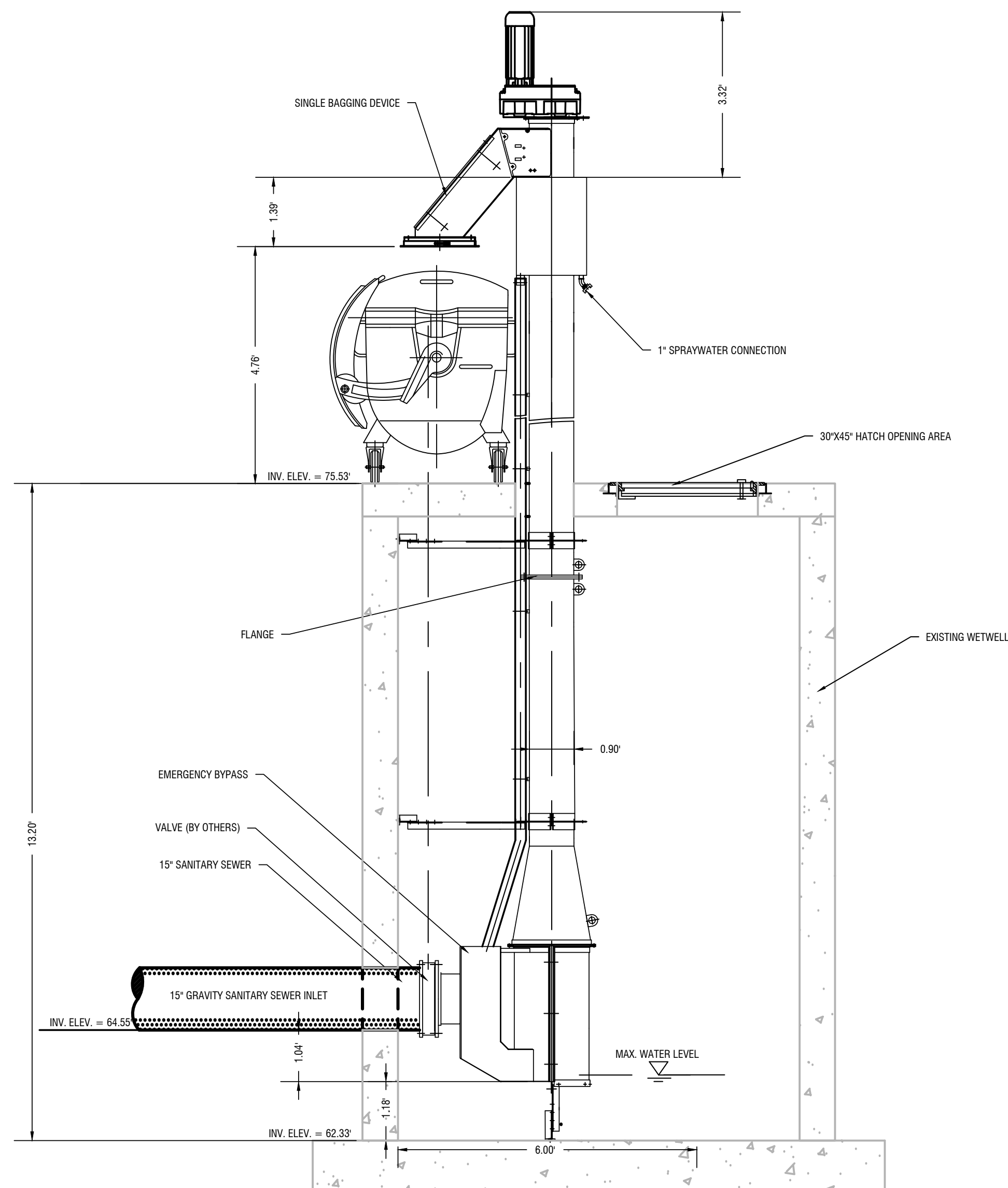
PUMP STATION DETAILS

C209

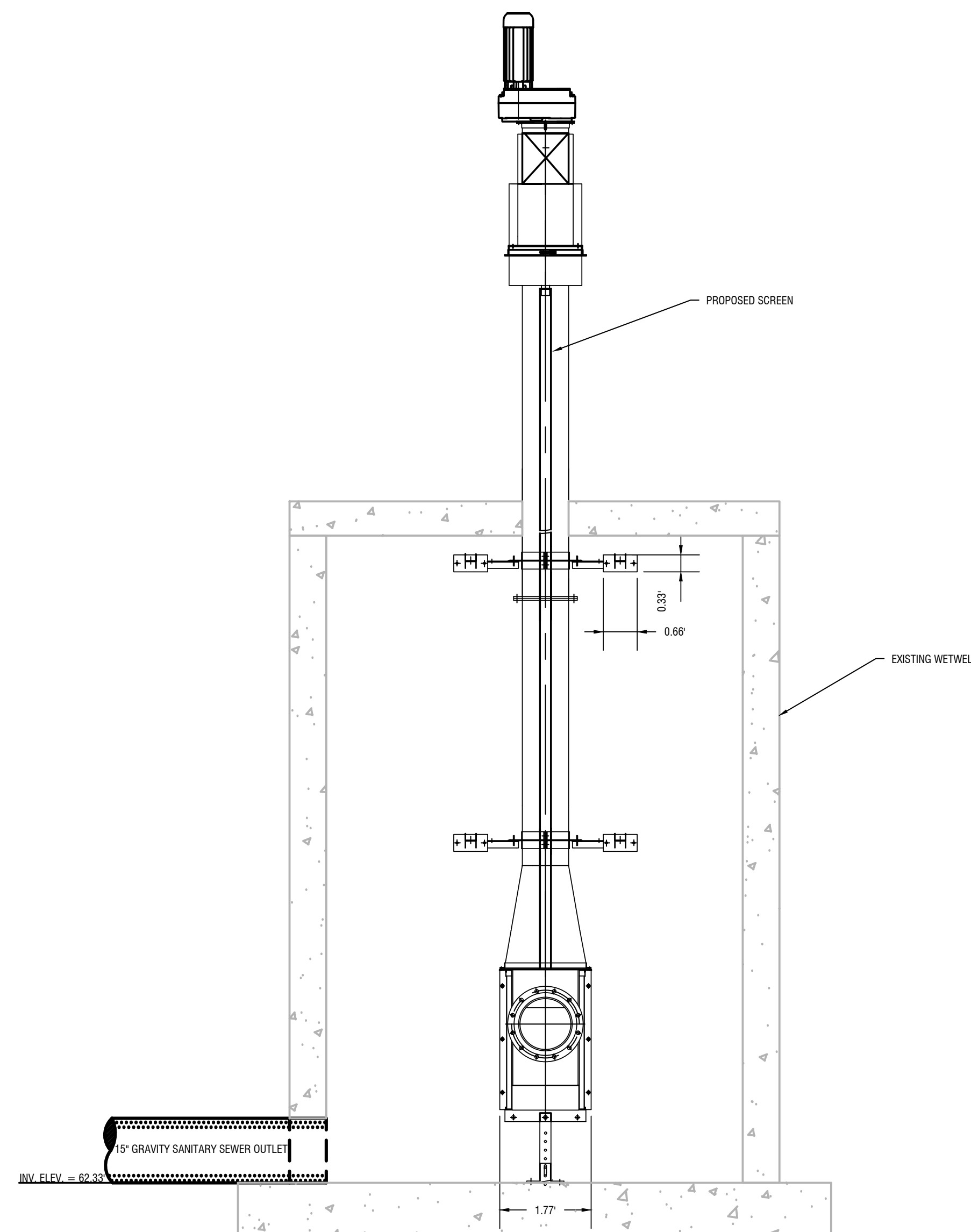
FILE NO: 2020-48
 PLOT DATE: October 17, 2023



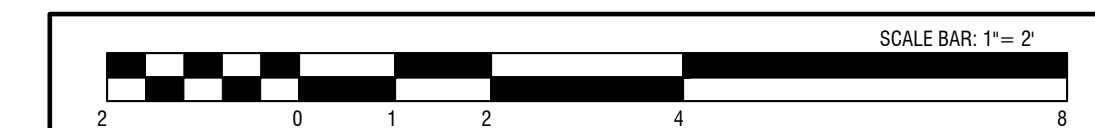
SEWAGE SCREEN PLAN VIEW
NTS



SCREEN ELEVATION VIEW
NTS



SCREEN SIDE VIEW
NTS

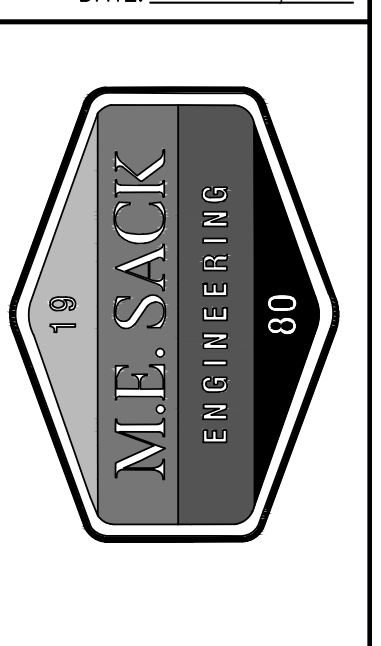
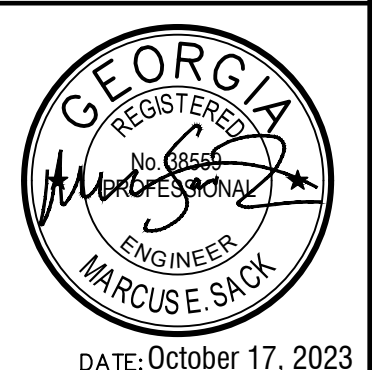


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**PUMP STATION
IMPROVEMENTS**

**PUMP STATION
DETAILS**

C210

FILE NO: 2020-48
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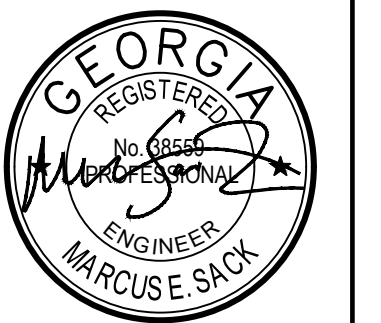
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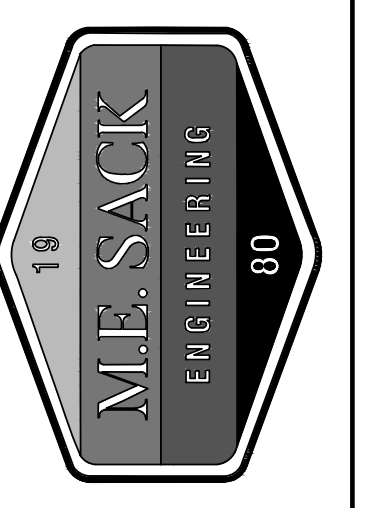
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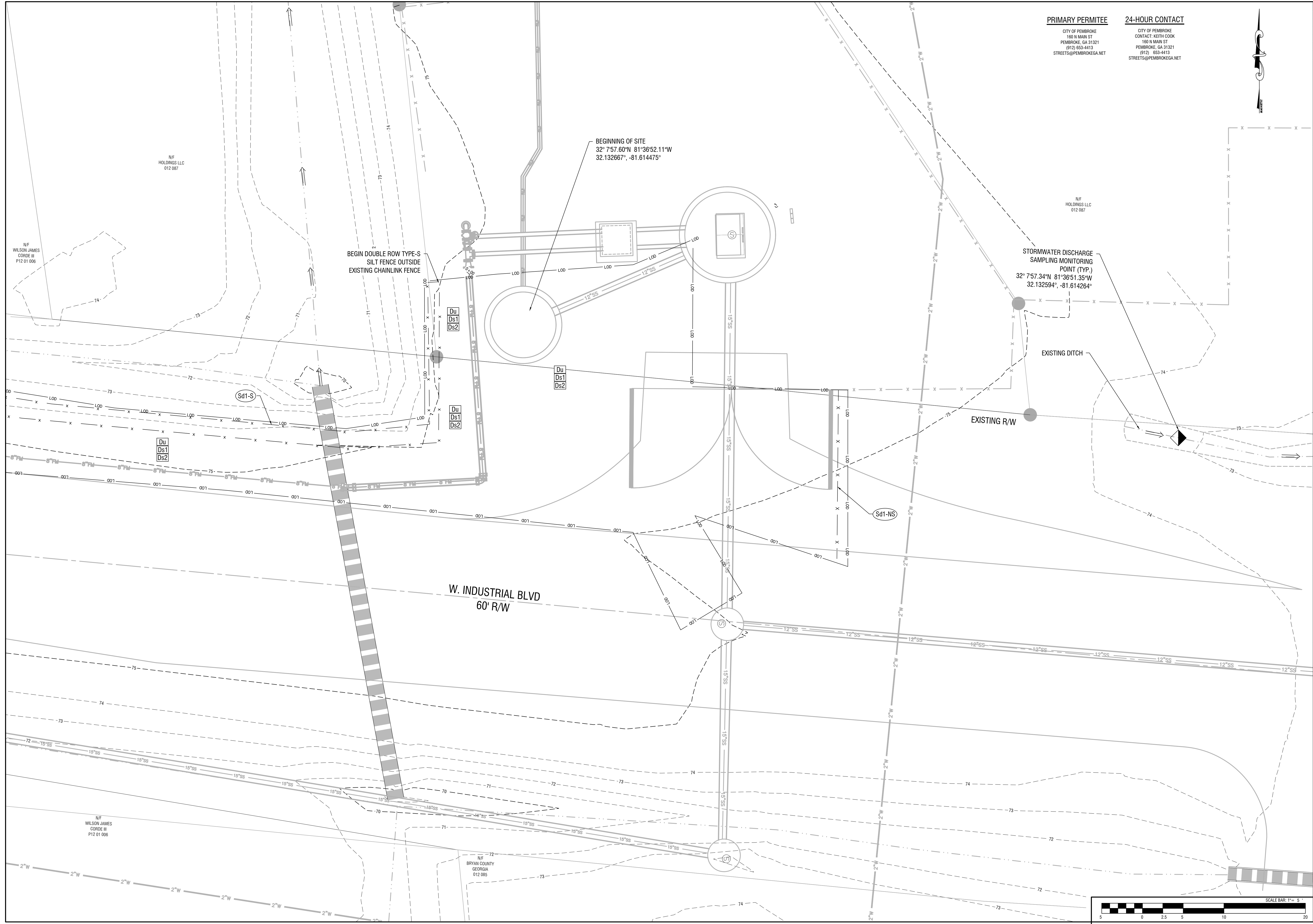
PUMP STATION IMPROVEMENTS

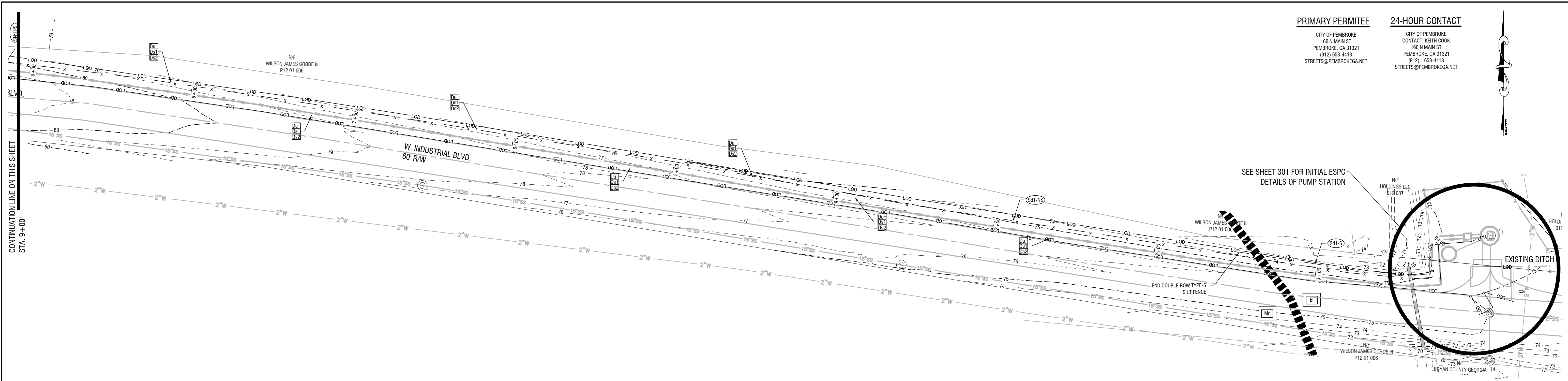
INITIAL ESPC 1

C301

FILE NO: 2020-48

PLOT DATE: October 17, 2023





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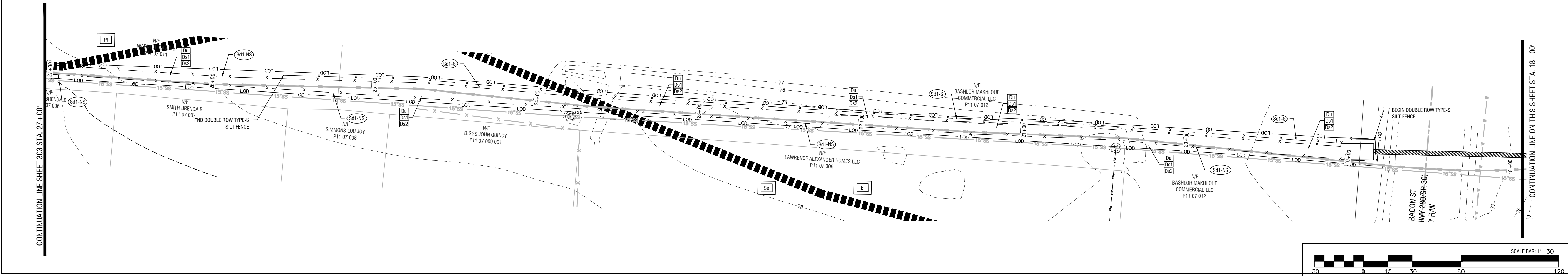
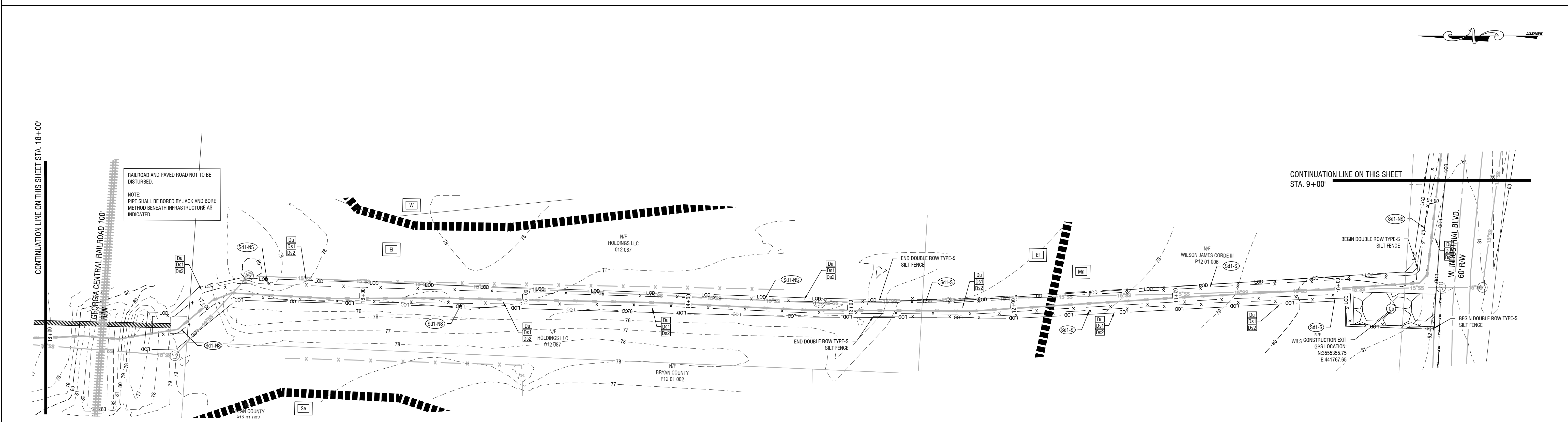
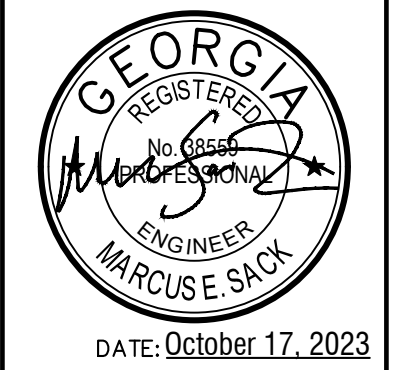
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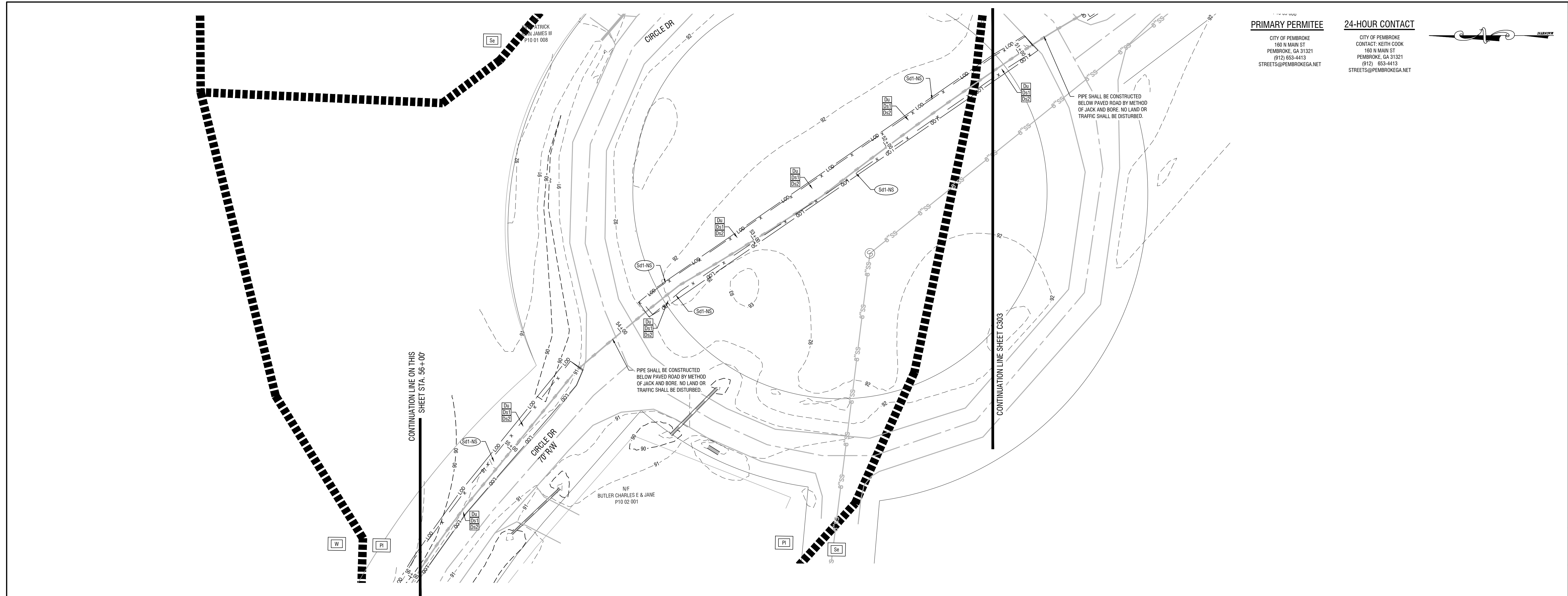
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PUMP STATION IMPROVEMENTS

INITIAL ESPC 2

C302

FILE NO: 2020-48
 PLOT DATE: October 17, 2023



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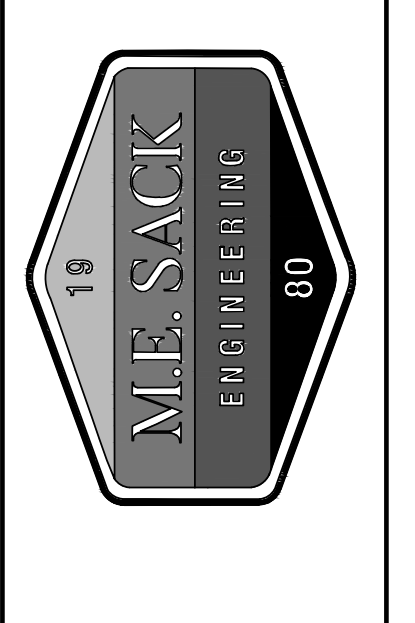
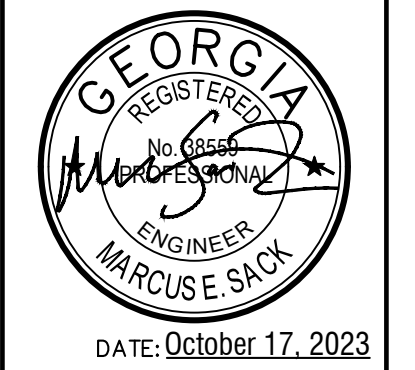
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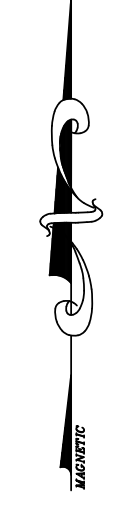
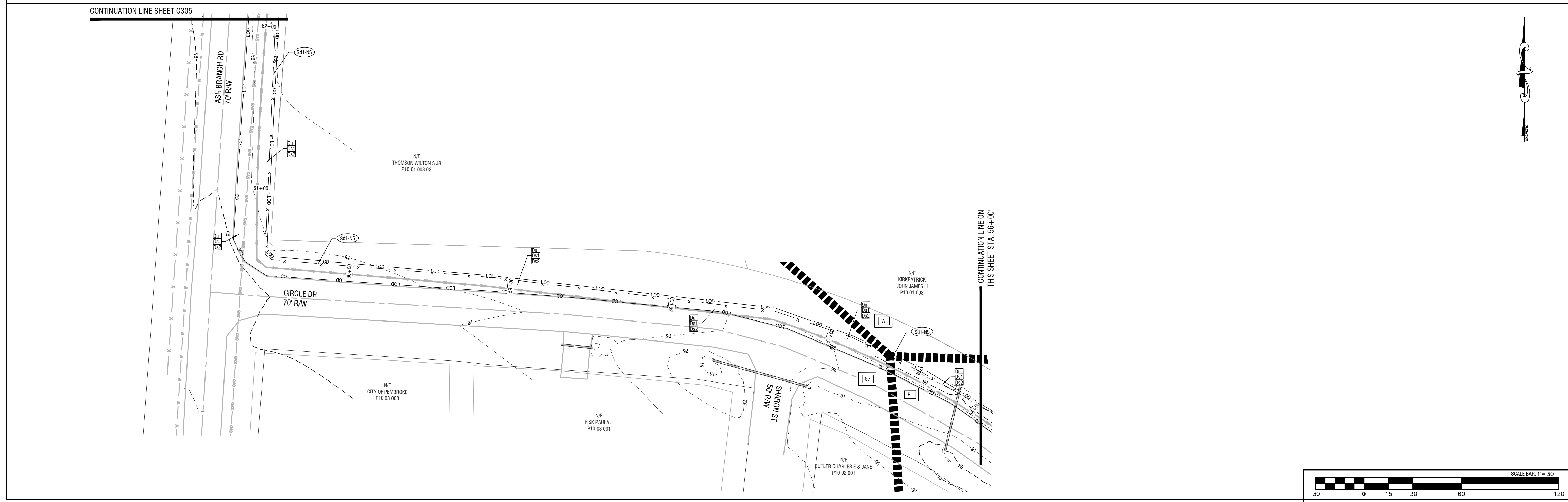
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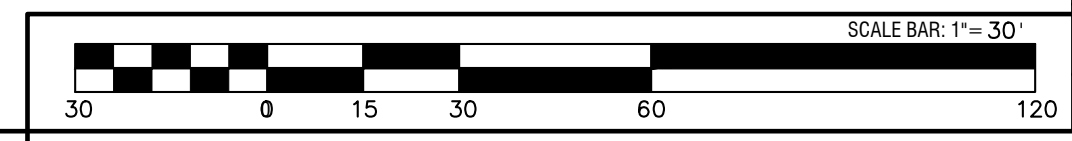
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PUMP STATION IMPROVEMENTS

INITIAL ESPC 4

C304

FILE NO: 2020-48
PLOT DATE: October 17, 2023



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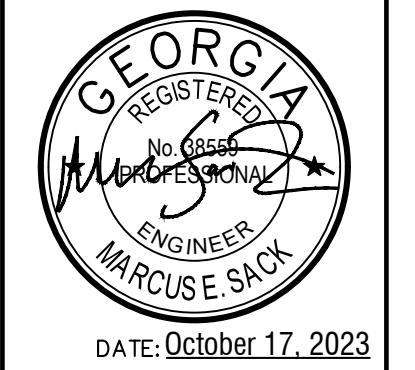
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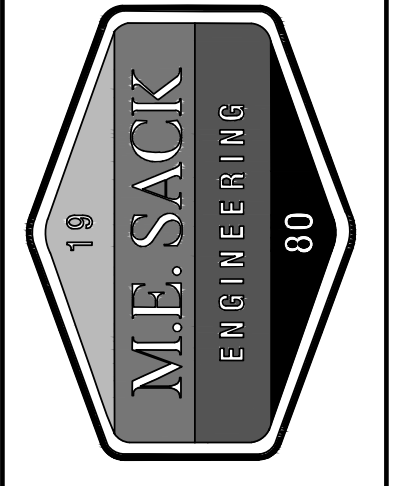
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PUMP STATION IMPROVEMENTS

INITIAL ESPC 5

C305

FILE NO: 2020-48

PLOT DATE: October 17, 2023

SOIL LEGEND

EI	ELLABELLE LOAMY SAND
PI	PELHAM LOAMY SAND
Se	STILSON LOAMY SAND
Mn	MASCOTTE SAND
CI	OLUSTEE FINE SAND
As	ALBANY FINE SAND
W	WATER
Da	DOTHAN LOAMY SAND
Fs	FUQUAY LOAMY SAND

SILT STORAGE CALCULATION

ESTIMATED EROSION = 2.85 AC. X 67 C.Y./AC. = 191 C.Y. STORAGE CAPACITY REQUIRED.

Sd1-S STORAGE AVAILABLE = 1491 LF X .17 C.Y./LF = 253 C.Y.

Sd1-NS STORAGE AVAILABLE = 12618 LF X .17 C.Y./LF = 2145 C.Y.

TOTAL AVAILABLE SEDIMENT STORAGE = 2399 C.Y.

REQUIRED SEDIMENT STORAGE = 191 C.Y.

IS THE AVAILABLE STORAGE GREATER THAN THE TOTAL REQUIRED STORAGE?
 YES NO

NOTES:
 ALL CONSTRUCTION SHALL TAKE PLACE WITHIN EXISTING RIGHT OF WAYS OR UTILITY EASEMENTS.
 ALL BUILDING MATERIALS AND PRODUCTS WILL BE STORED WITHIN THE RIGHT OF WAY AND EASEMENTS FOLLOWING MOBILIZATION.

FORCEMAIN CONSTRUCTION ACTIVITY DESCRIPTION

EACH PHASE WILL OCCUR IN SECTIONS BETWEEN THE BORING SITES AS THE FORCEMAIN IS INSTALLED. THE INITIAL PHASE SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND THE FINAL PHASE WILL ONLY BE COMPLETED AFTER CONSTRUCTION IN THAT PHASE AREA.

INITIAL PHASE - CONSISTS OF INSTALLING CONSTRUCTION EXIT, PERIMETER BMPs, DUST CONTROL, AND BMPs ON EXISTING STRUCTURES. CLEARING AND GRUBBING WILL BEGIN WITHIN THE LIMITS OF DISTURBANCE WHERE INDICATED.

INTERMEDIATE PHASE - MOBILIZATION OF BORING EQUIPMENT TO SITES. CONSISTS OF BORE PIT EXCAVATION AND UTILIZATION, EXCAVATE AND PLACE PROPOSED PIPE BETWEEN BORE PITS, MAINTAIN CHECK DAM STRUCTURES AND SILT FENCING, USE DUST CONTROL, MULCHING, AND TEMPORARY GRASSING WHERE INDICATED.

FINAL PHASE - REFILLING EXCAVATED AREAS, MOBILIZATION OF BORING EQUIPMENT FROM SITES. ONCE PERMANENT GRASSING IS ESTABLISHED TEMPORARY MEASURES CAN BE REMOVED INCLUDING: SILT FENCE, CHECK DAMS.

CHECK DAM STRUCTURES

1. CFS IN THE CHANNEL/DITCH THAT THE CHECK DAM IS BEING USED IN: 0.80 CFS
2. ABOVE 2.0 CFS: YES NO
3. IF YES, LIST BMP BEING USED IN CONJUNCTION WITH CHECK DAMS: NOT APPLICABLE

FORCEMAIN EXISTING CONDITIONS:

THE SITE IS WITHIN THE RIGHT OF WAY OF THE CITY OF PEMBROKE RUNNING PARALLEL TO EXISTING UTILITIES. THE SINGLE EXISTING FORCEMAIN EXTENDS FROM AN EXISTING PUMP STATION TO BE IMPROVED ALONG W. INDUSTRIAL ST. ACROSS CAMELIA, JUDITH, AND CIRCLE DRIVE, THEN NORTH ALONG HARRY HAGAN ROAD UNTIL IT CONNECTS TO AN EXISTING MANHOLE. THIS MANHOLE RUNS GRAVITY SEWER LINES TO THE CITY'S WASTEWATER TREATMENT PLANT FOR TREATMENT.

TOTAL SITE INFORMATION:

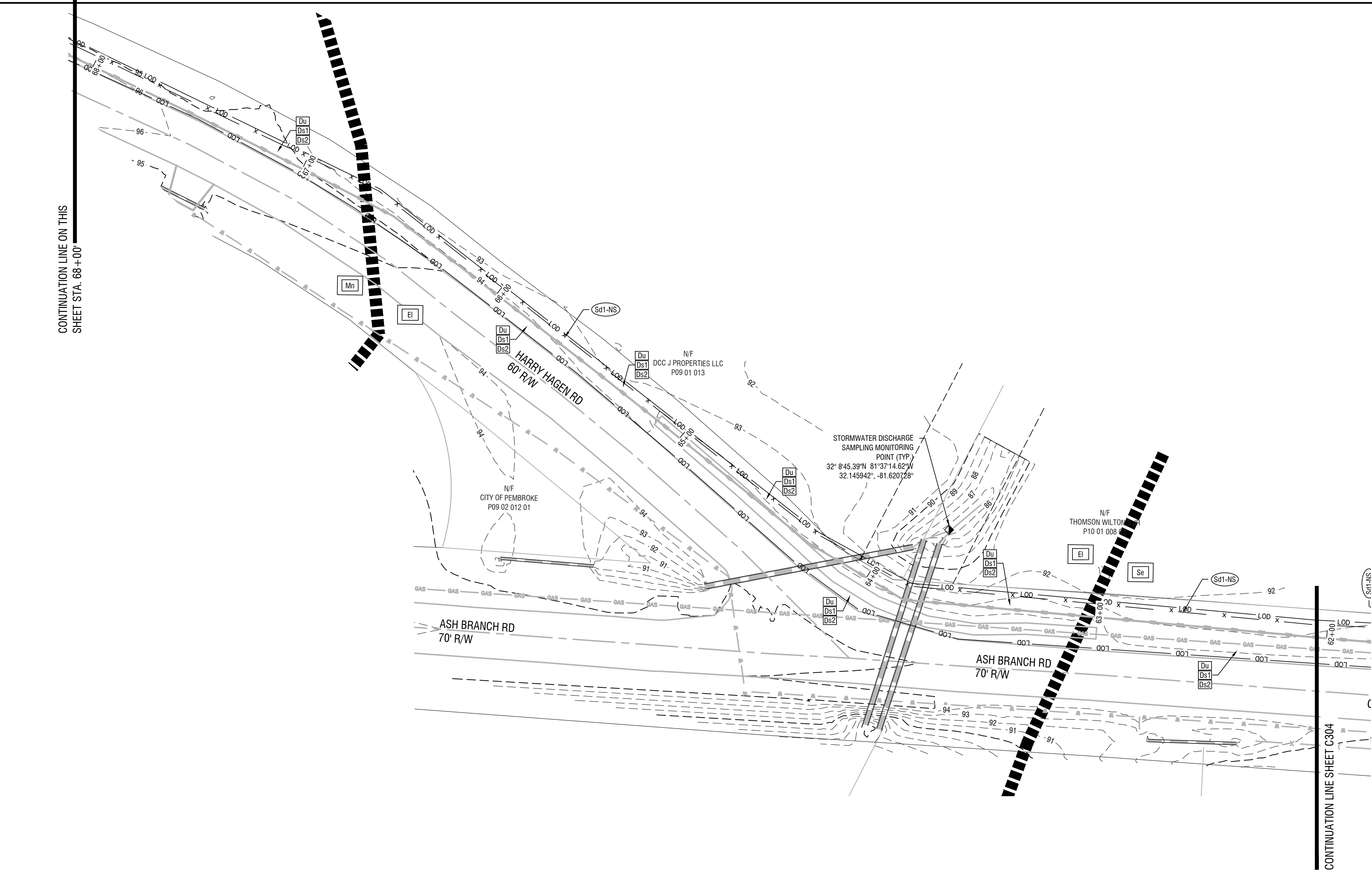
TOTAL SITE AREA = 4.88 AC
 TOTAL DISTURBED AREA = 2.85 AC

HYDROLOGY:

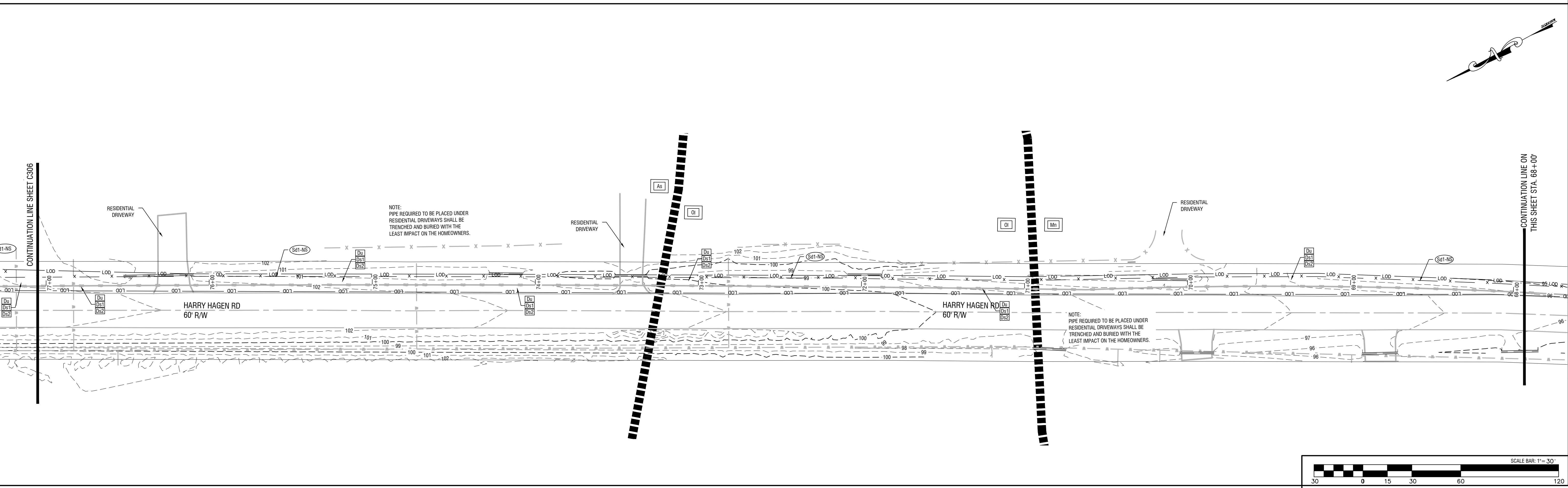
NO HYDROLOGY REPORT COMPLETED FOR LINEAR PROJECT AS NO CHANGES TO IMPERVIOUS AREAS WERE MADE.

NOTE:
 PARALLEL FORCEMAIN ADDITION REQUIRED WITHIN 200FT WETLAND BUFFER. SENSITIVE SILT FENCE SHALL BE PLACED AS BMP BETWEEN SUBCATCHMENT BASIN DRAINING TO DITCH AND WETLAND. WETLAND CONTAINED WITHIN SINGLE PROPERTY WITH RIGHT OF WAY ALLOWANCE WHERE FORCEMAIN CONSTRUCTION SHALL TAKE PLACE.

EVERY DAY AREAS DISTURBED BY CONSTRUCTION WILL BE BACKFILLED, COMPACTED, GRASSED, AND HAYED.

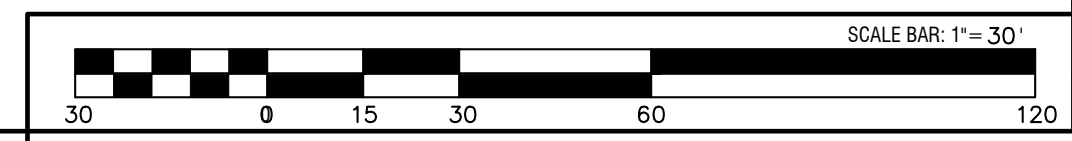


CONTINUATION LINE SHEET C304



CONTINUATION LINE SHEET C306

CONTINUATION LINE ON THIS SHEET STA. 68+00



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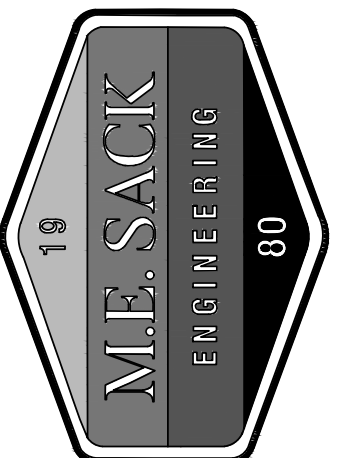
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 streets@pembrokega.net

24 HOUR CONTACT:
 Keith Cook
 160 N Main St
 Pembroke, GA 31321
 (912) 653-4413
 streets@pembrokega.net

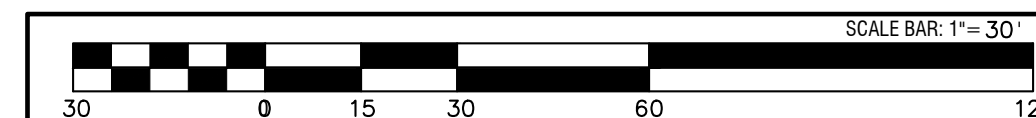
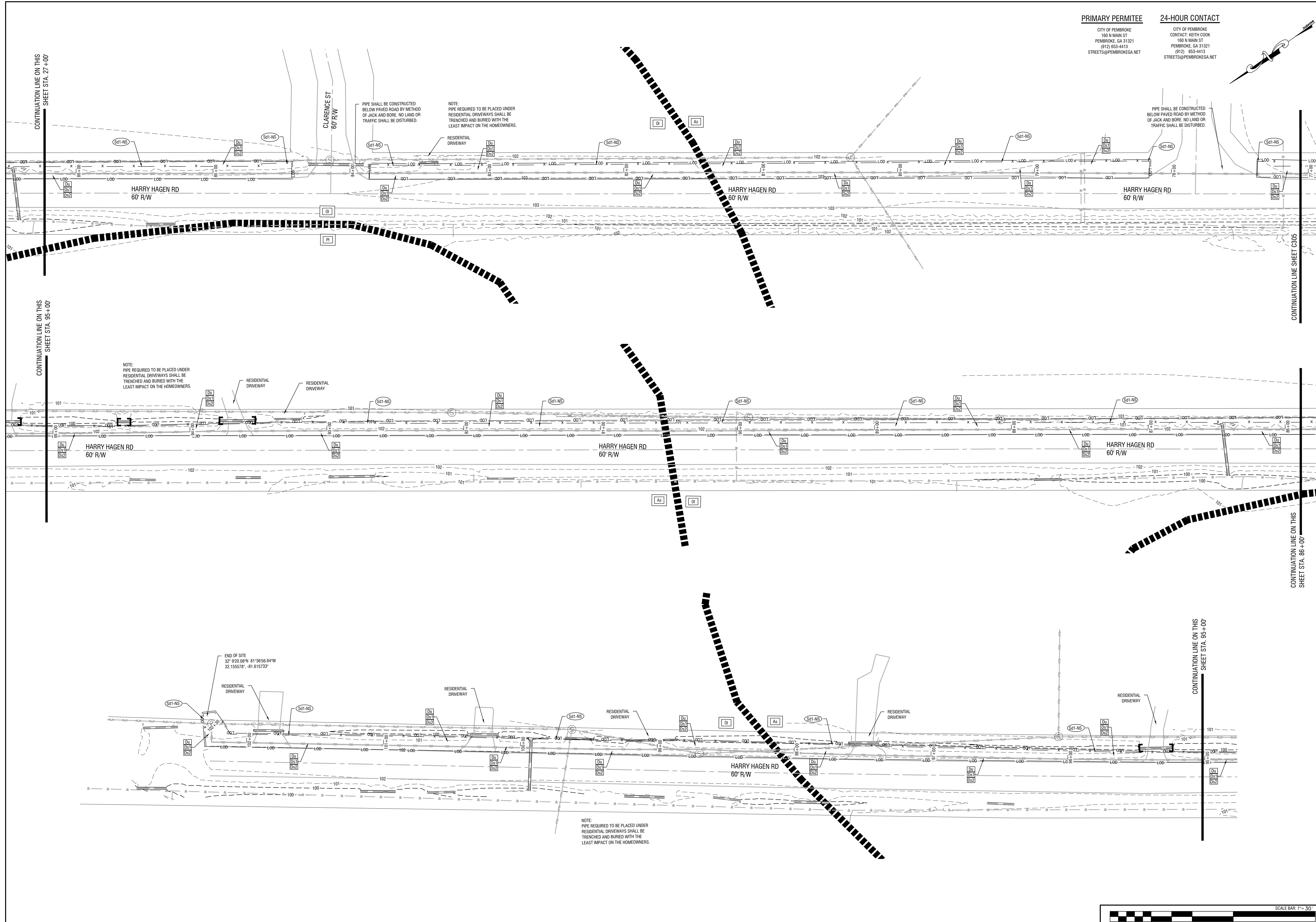
PUMP STATION IMPROVEMENTS

INITIAL ESPC 6

C306

FILE NO: 2020-48

PLOT DATE: October 17, 2023



CONTINUATION LINE ON THIS SHEET STA. 27+00'

CONTINUATION LINE ON THIS SHEET STA. 95+00'

CONTINUATION LINE SHEET C305

CONTINUATION LINE ON THIS SHEET STA. 86+00'

CONTINUATION LINE ON THIS SHEET STA. 95+00'

PIPE SHALL BE CONSTRUCTED BELOW PAVED ROAD BY METHOD OF JACK AND BORE. NO LAND OR TRAFFIC SHALL BE DISTURBED.

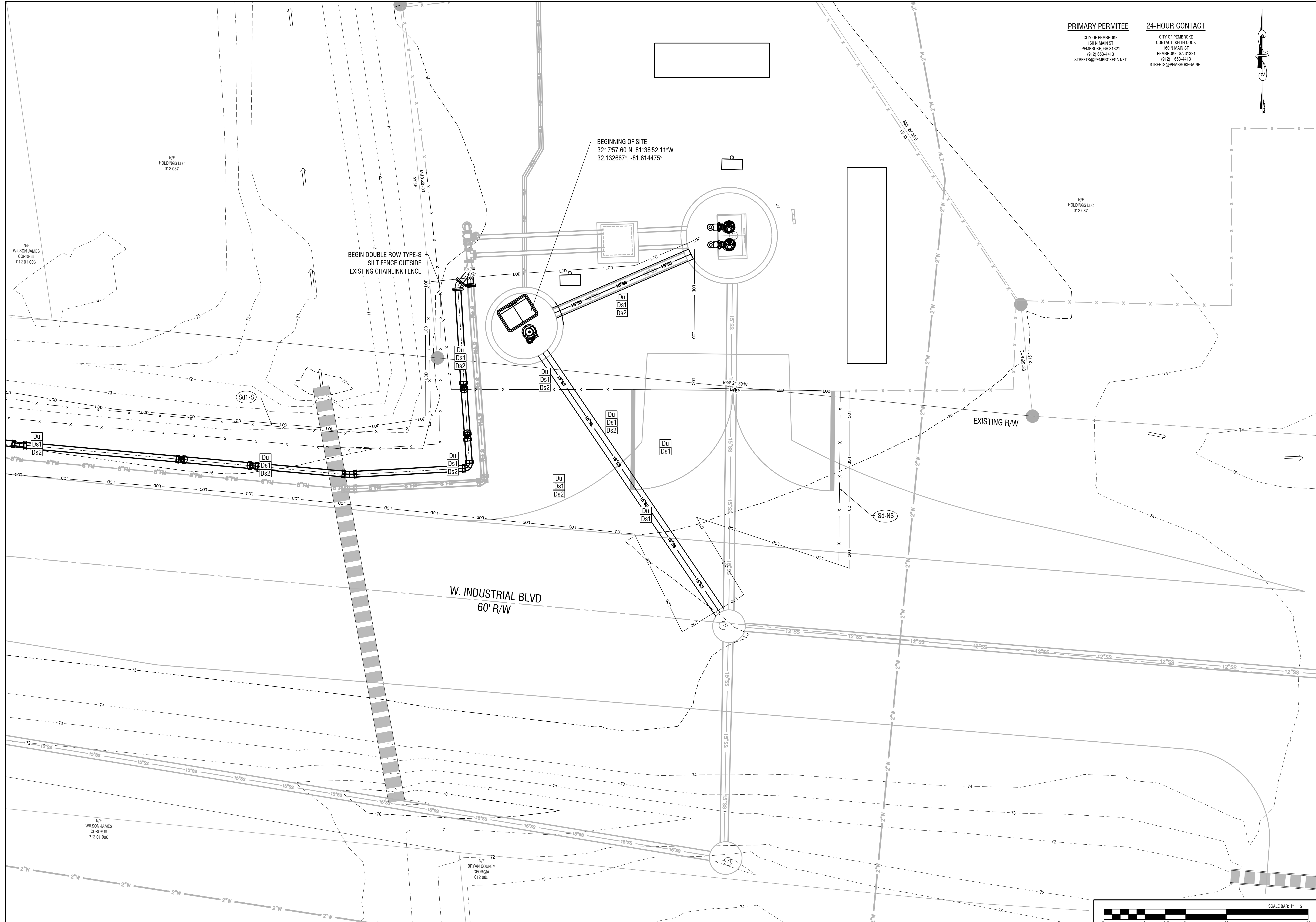
NOTE: PIPE REQUIRED TO BE PLACED UNDER RESIDENTIAL DRIVEWAYS SHALL BE TRENCHED AND BURIED WITH THE LEAST IMPACT ON THE HOMEOWNERS.

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END OF SITE
 32° 9'20.08\"/>



PRIMARY PERMITEE
 CITY OF PEMBROKE
 160 N MAIN ST
 PEMBROKE, GA 31321
 (912) 653-4413
 STREETS@PEMBROKEGA.NET

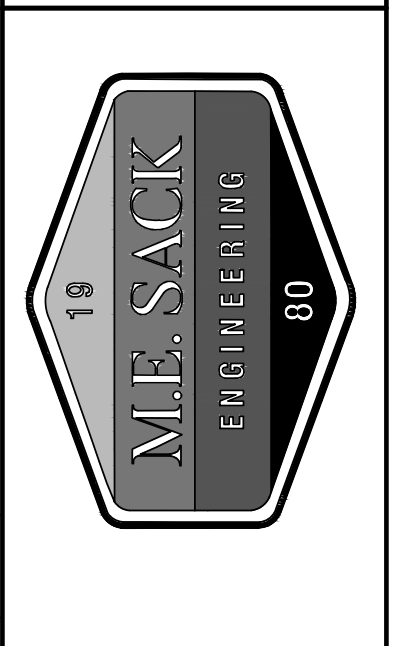
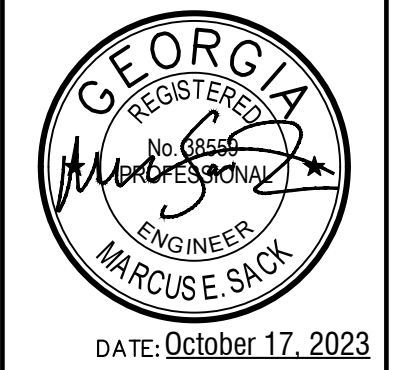
24-HOUR CONTACT
 CITY OF PEMBROKE
 CONTACT: KEITH COOK
 160 N MAIN ST
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 STREETS@PEMBROKEGA.NET

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MUNICIPALITY:
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COUNTY:
 BRYAN

Owner:
 City of Pembroke
 160 N Main St
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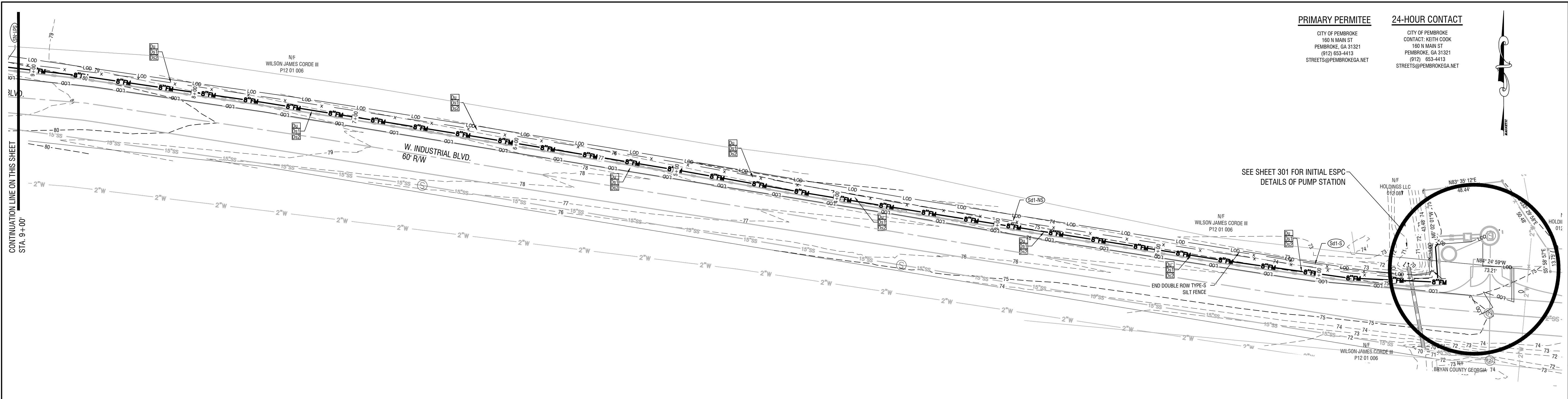
24 HOUR CONTACT:
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**PUMP STATION
 IMPROVEMENTS**

**INTERMEDIATE
 ESPC 1**

C307

FILE NO: 2020-48
 PLOT DATE: October 17, 2023



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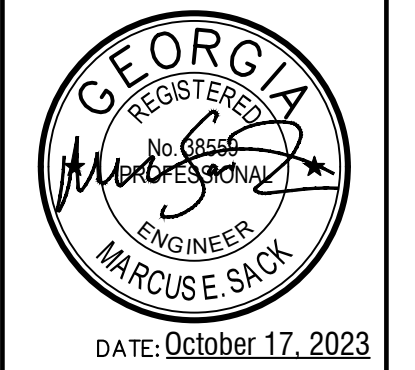
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REVISIONS:

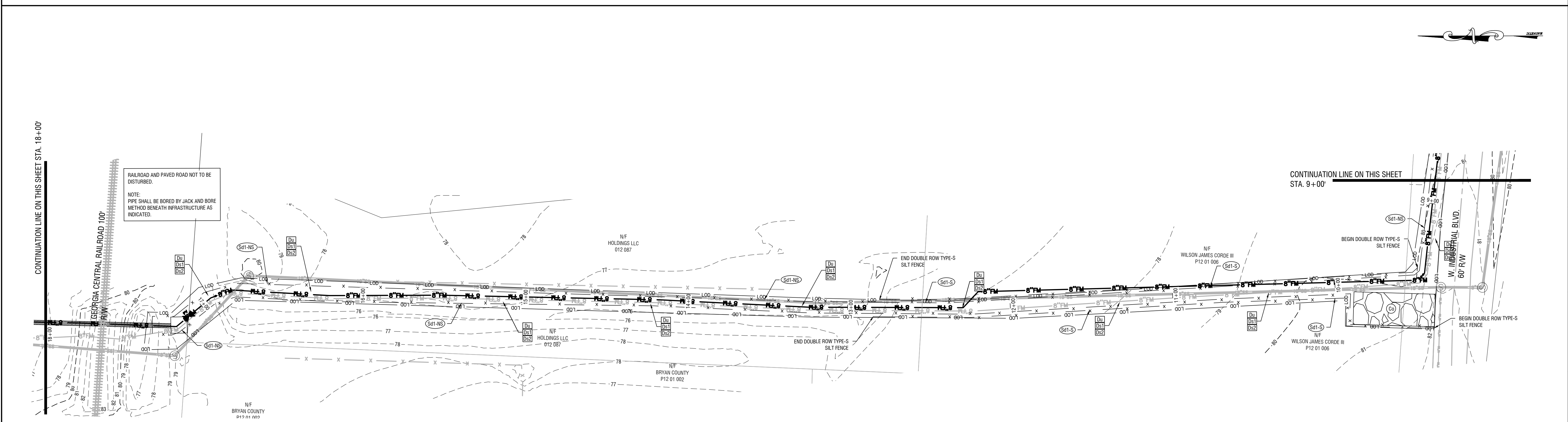
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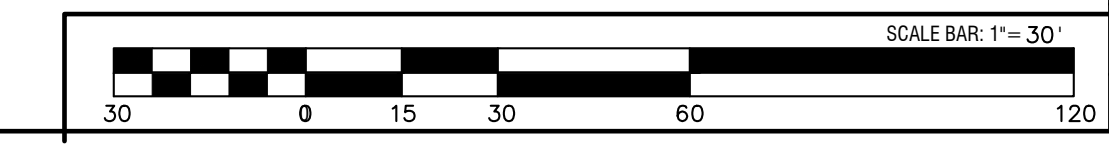
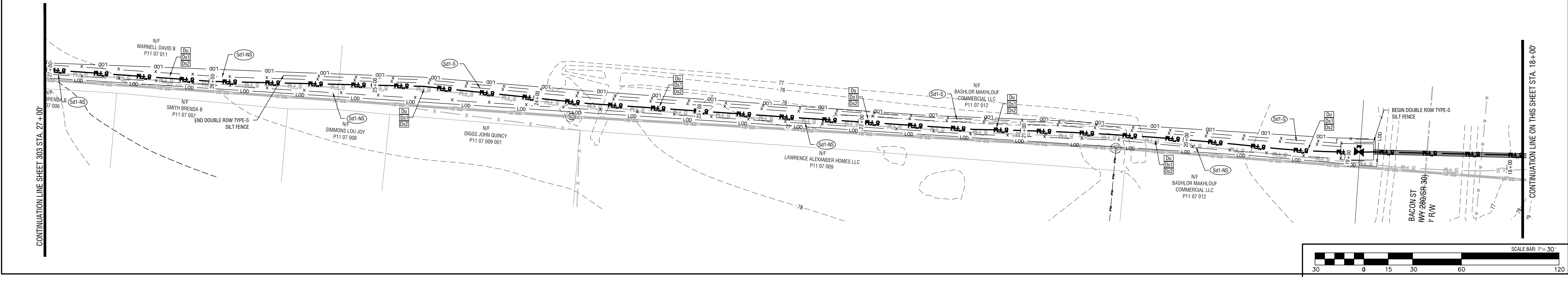
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 HINESVILLE, GA 31313
 TEL: (912) 359-8212



DATE: October 17, 2023



CONTINUATION LINE ON THIS SHEET STA. 9+00'



MUNICIPALITY:
CITY OF PEMBROKE

COUNTY:
BRYAN

Owner:
City of Pembroke
160 N Main St
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streets@pembrokega.net

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PUMP STATION IMPROVEMENTS

INTERMEDIATE ESPC 2

C308

FILE NO: 2020-48
 PLOT DATE: October 17, 2023

PRIMARY PERMITEE

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CONTACT: KEITH COOK
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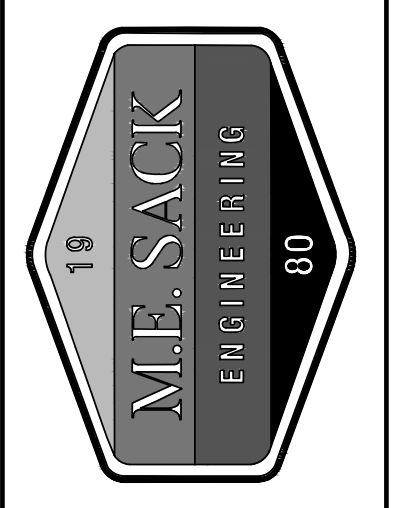
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DATE: October 17, 2023



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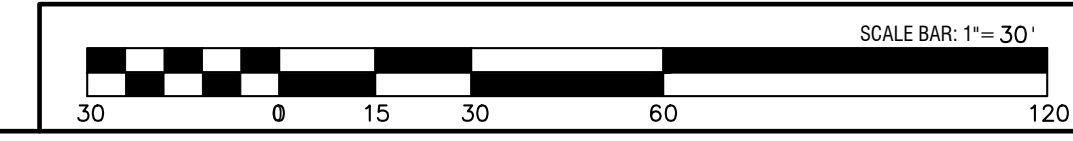
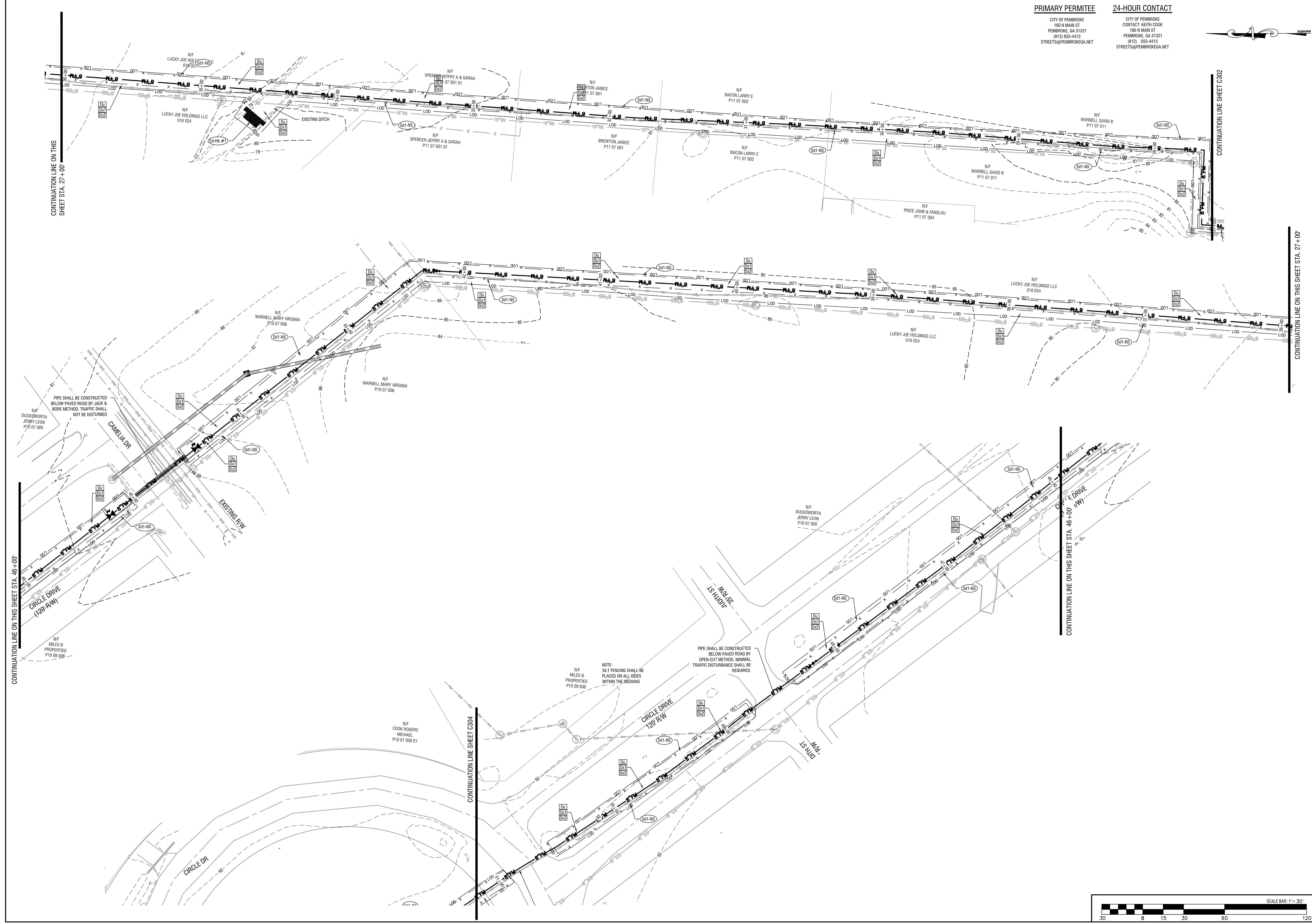
PUMP STATION IMPROVEMENTS

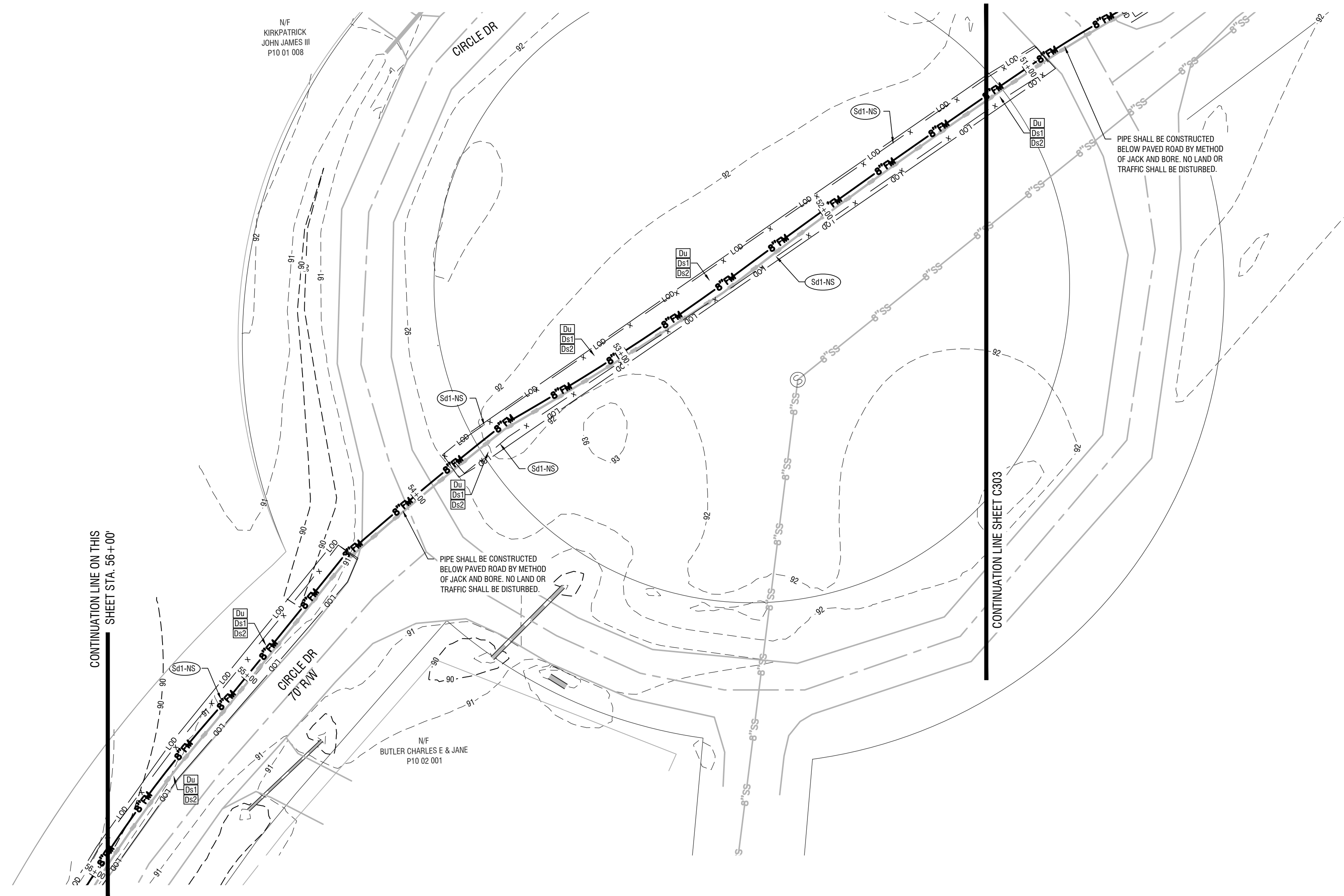
INTERMEDIATE
ESPC 3

C309

FILE NO: 2020-48

PLOT DATE: October 17, 2023





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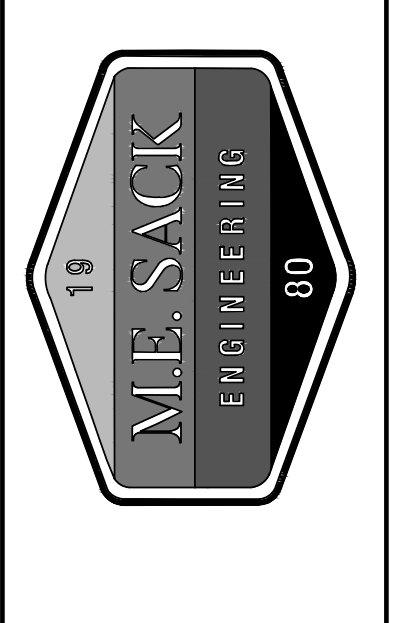
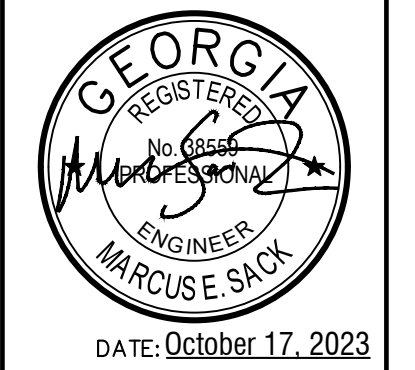
24-HOUR CONTACT
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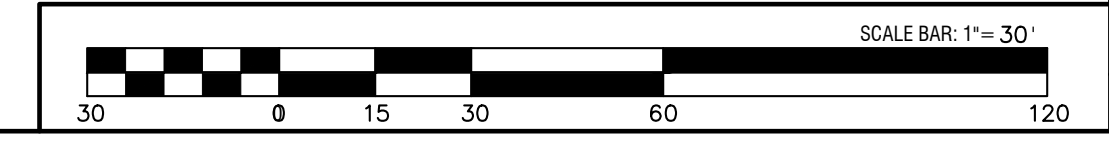
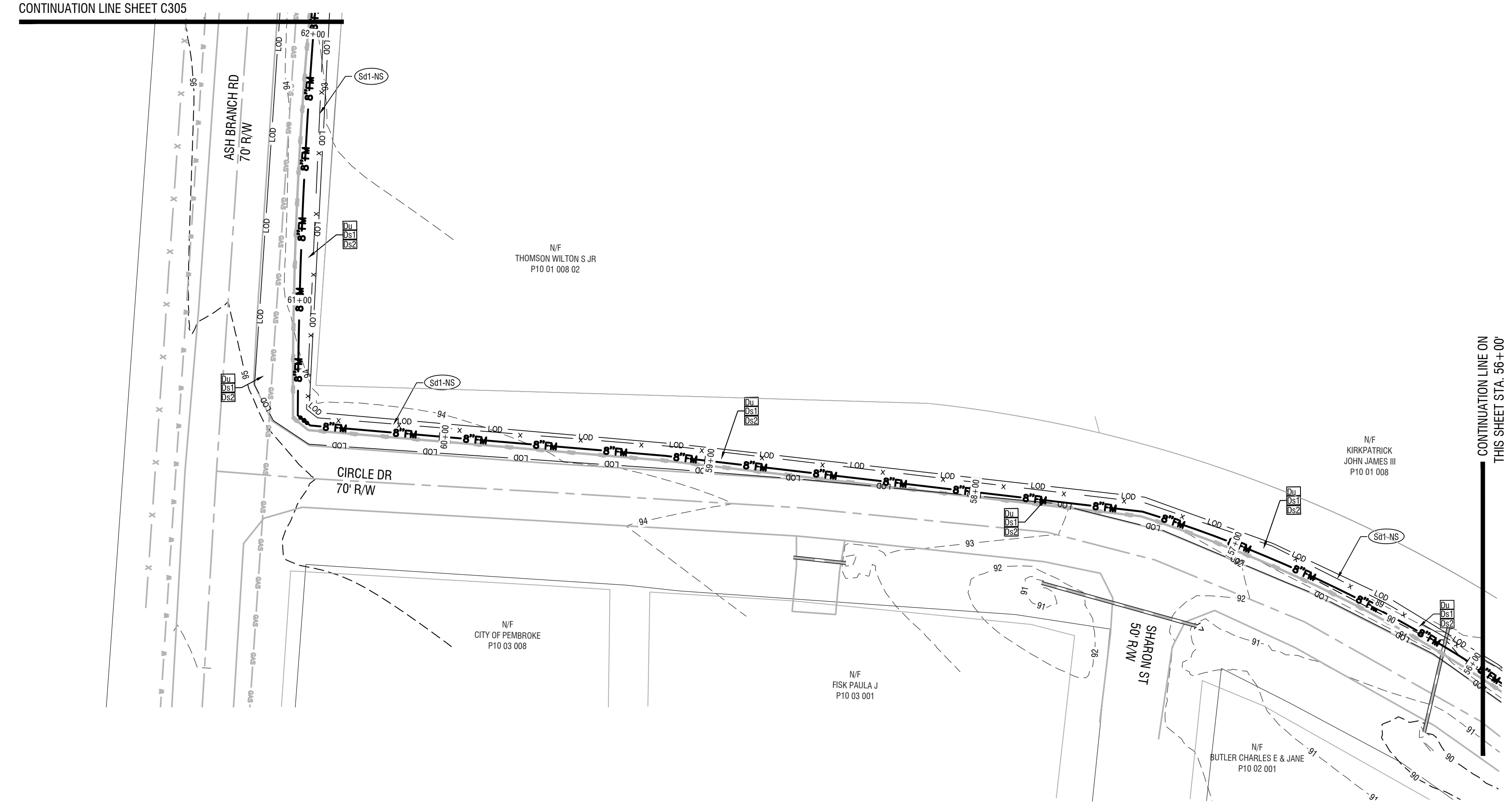
24 HOUR CONTACT:
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PUMP STATION IMPROVEMENTS

INTERMEDIATE ESPC 4

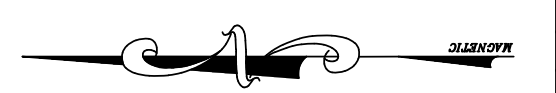
C310

FILE NO: 2020-48
 PLOT DATE: October 17, 2023



PRIMARY PERMITEE
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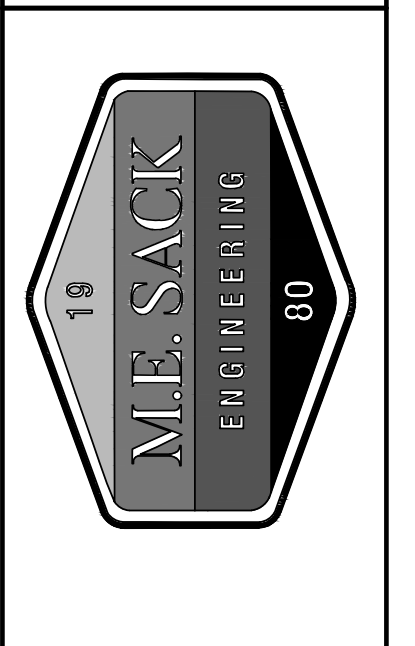
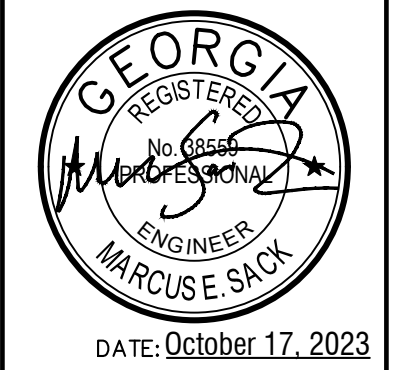
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COUNTY:
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PUMP STATION IMPROVEMENTS

INTERMEDIATE ESPC 5

C311

FILE NO: 2020-48
 PLOT DATE: October 17, 2023

SOIL LEGEND

EI	ELLABELLE LOAMY SAND
PI	PELHAM LOAMY SAND
Se	STILSON LOAMY SAND
Mn	MASCOTTE SAND
Cl	OLUSTEE FINE SAND
As	ALBANY FINE SAND
W	WATER
Da	DOTHAN LOAMY SAND
Fs	FUQUAY LOAMY SAND

SILT STORAGE CALCULATION

ESTIMATED EROSION = 2.85 AC. X 67 C.Y./AC. = 191 C.Y. STORAGE CAPACITY REQUIRED.

Sd1-S STORAGE AVAILABLE = 1491 LF X .17 C.Y./LF = 253 C.Y.

Sd1-NS STORAGE AVAILABLE = 12618 LF X .17 C.Y./LF = 2145 C.Y.

TOTAL AVAILABLE SEDIMENT STORAGE = 2399 C.Y.

REQUIRED SEDIMENT STORAGE = 191 C.Y.

IS THE AVAILABLE STORAGE GREATER THAN THE TOTAL REQUIRED STORAGE?
 YES NO

NOTES:
 ALL CONSTRUCTION SHALL TAKE PLACE WITHIN EXISTING RIGHT OF WAYS OR UTILITY EASEMENTS.
 ALL BUILDING MATERIALS AND PRODUCTS WILL BE STORED WITHIN THE RIGHT OF WAY AND EASEMENTS FOLLOWING MOBILIZATION.

FORCEMAIN CONSTRUCTION ACTIVITY DESCRIPTION

EACH PHASE WILL OCCUR IN IN SECTIONS BETWEEN THE BORING SITES AS THE FORCEMAIN IS INSTALLED. THE INITIAL PHASE SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND THE FINAL PHASE WILL ONLY BE COMPLETED AFTER CONSTRUCTION IN THAT PHASE AREA.

INITIAL PHASE - CONSISTS OF INSTALLING CONSTRUCTION EXIT, PERIMETER B MPS, DUST CONTROL, AND B MPS ON EXISTING STRUCTURES. CLEARING AND GRUBBING WILL BEGIN WITHIN THE LIMITS OF DISTURBANCE WHERE INDICATED.

INTERMEDIATE PHASE - MOBILIZATION OF BORING EQUIPMENT TO SITES. CONSISTS OF BORE PIT EXCAVATION AND UTILIZATION, EXCAVATE AND PLACE PROPOSED PIPE BETWEEN BORE PITS, MAINTAIN CHECK DAM STRUCTURES AND SILT FENCING, USE DUST CONTROL, MULCHING, AND TEMPORARY GRASSING WHERE INDICATED.

FINAL PHASE - REFILLING EXCAVATED AREAS. MOBILIZATION OF BORING EQUIPMENT FROM SITES. ONCE PERMANENT GRASSING IS ESTABLISHED TEMPORARY MEASURES CAN BE REMOVED INCLUDING: SILT FENCE, CHECK DAMS.

CHECK DAM STRUCTURES

1. CFS IN THE CHANNEL/DITCH THAT THE CHECK DAM IS BEING USED IN: 0.80 CFS
2. ABOVE 2.0 CFS: YES ___ NO ___ X ___
3. IF YES, LIST BMP BEING USED IN CONJUNCTION WITH CHECK DAMS: NOT APPLICABLE

FORCEMAIN EXISTING CONDITIONS:

THE SITE IS WITHIN THE RIGHT OF WAY OF THE CITY OF PEMBROKE RUNNING PARALLEL TO EXISTING UTILITIES. THE SINGLE EXISTING FORCEMAIN EXTENDS FROM AN EXISTING PUMP STATION TO BE IMPROVED ALONG W. INDUSTRIAL ST. ACROSS CAMELIA, JUDITH, AND CIRCLE DRIVE, THEN NORTH ALONG HARRY HAGAN ROAD UNTIL IT CONNECTS TO AN EXISTING MANHOLE. THIS MANHOLE RUNS GRAVITY SEWER LINES TO THE CITY'S WASTEWATER TREATMENT PLANT FOR TREATMENT.

TOTAL SITE INFORMATION:

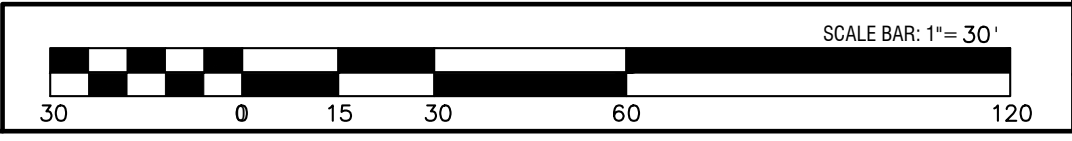
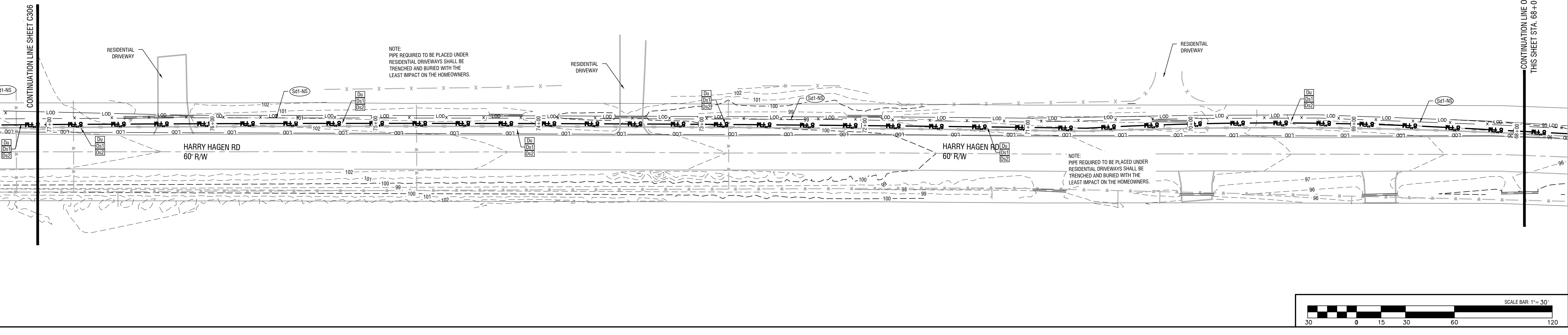
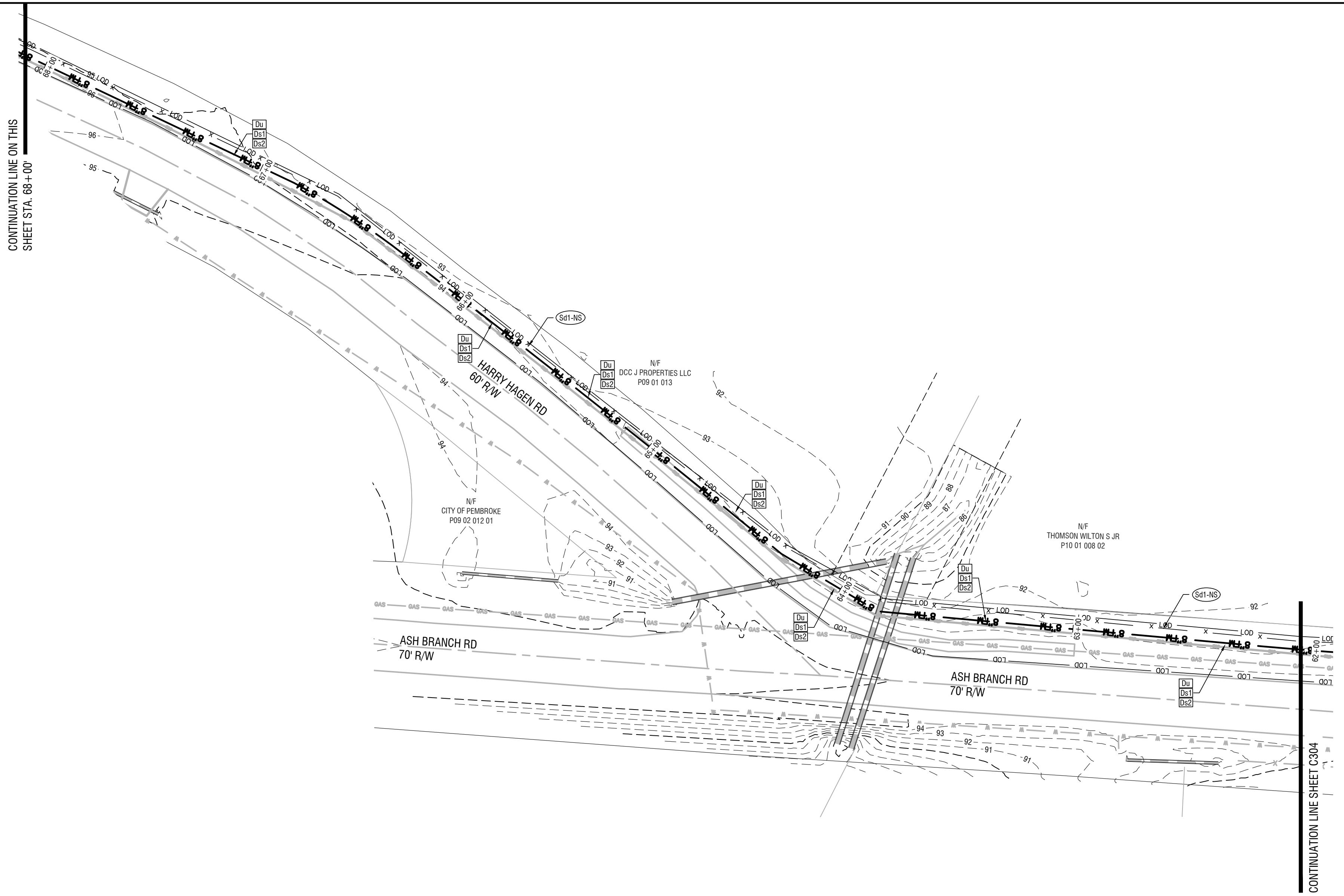
TOTAL SITE AREA = 4.88 AC
 TOTAL DISTURBED AREA = 2.85 AC

HYDROLOGY:

NO HYDROLOGY REPORT COMPLETED FOR LINEAR PROJECT AS NO CHANGES TO IMPERVIOUS AREAS WERE MADE.

NOTE:
 PARALLEL FORCEMAIN ADDITIVE REQUIRED WITHIN 200FT WETLAND BUFFER. SENSITIVE SILT FENCE SHALL BE PLACED AS BMP BETWEEN SUBCATCHMENT BASIN DRAINING TO DITCH AND WETLAND. WETLAND CONTAINED WITHIN SINGLE PROPERTY WITH RIGHT OF WAY ALLOWANCE WHERE FORCEMAIN CONSTRUCTION SHALL TAKE PLACE.

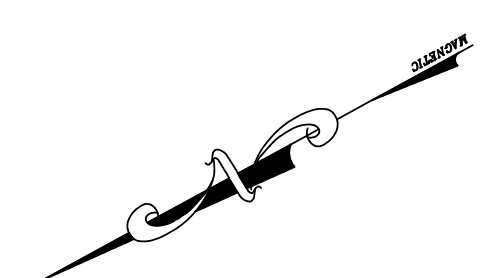
EVERY DAY AREAS DISTURBED BY CONSTRUCTION WILL BE BACKFILLED, COMPACTED, GRASSED, AND HAYED.



PRIMARY PERMITEE **24-HOUR CONTACT**

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160 N MAIN ST
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(912) 653-4413
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CITY OF PEMBROKE
CONTACT: KEITH COOK
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REVISIONS:	
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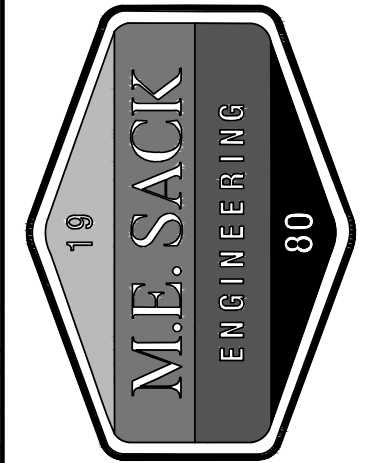
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DATE: October 17, 2023



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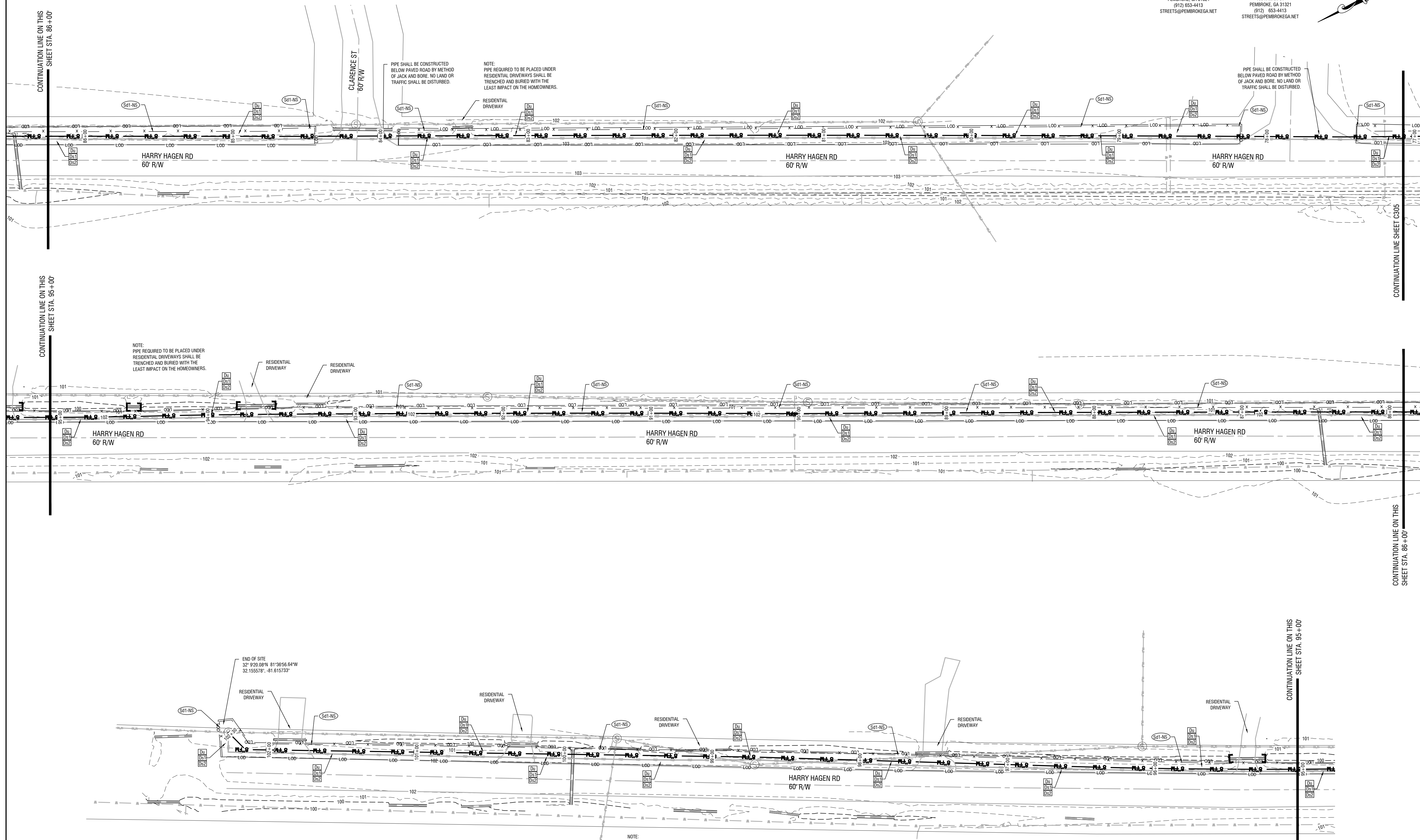
PUMP STATION IMPROVEMENTS

INTERMEDIATE
ESPC 6

C312

FILE NO: 2020-48

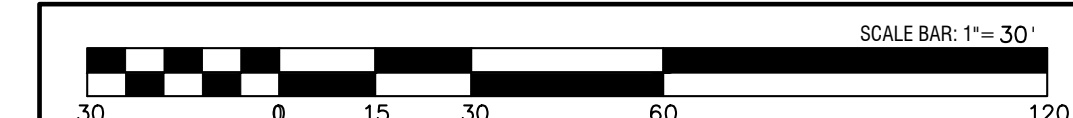
PLOT DATE: October 17, 2023



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END OF SITE
32° 9'20.08" N 81° 36'56.64" W
32.155578' - 81.615733'



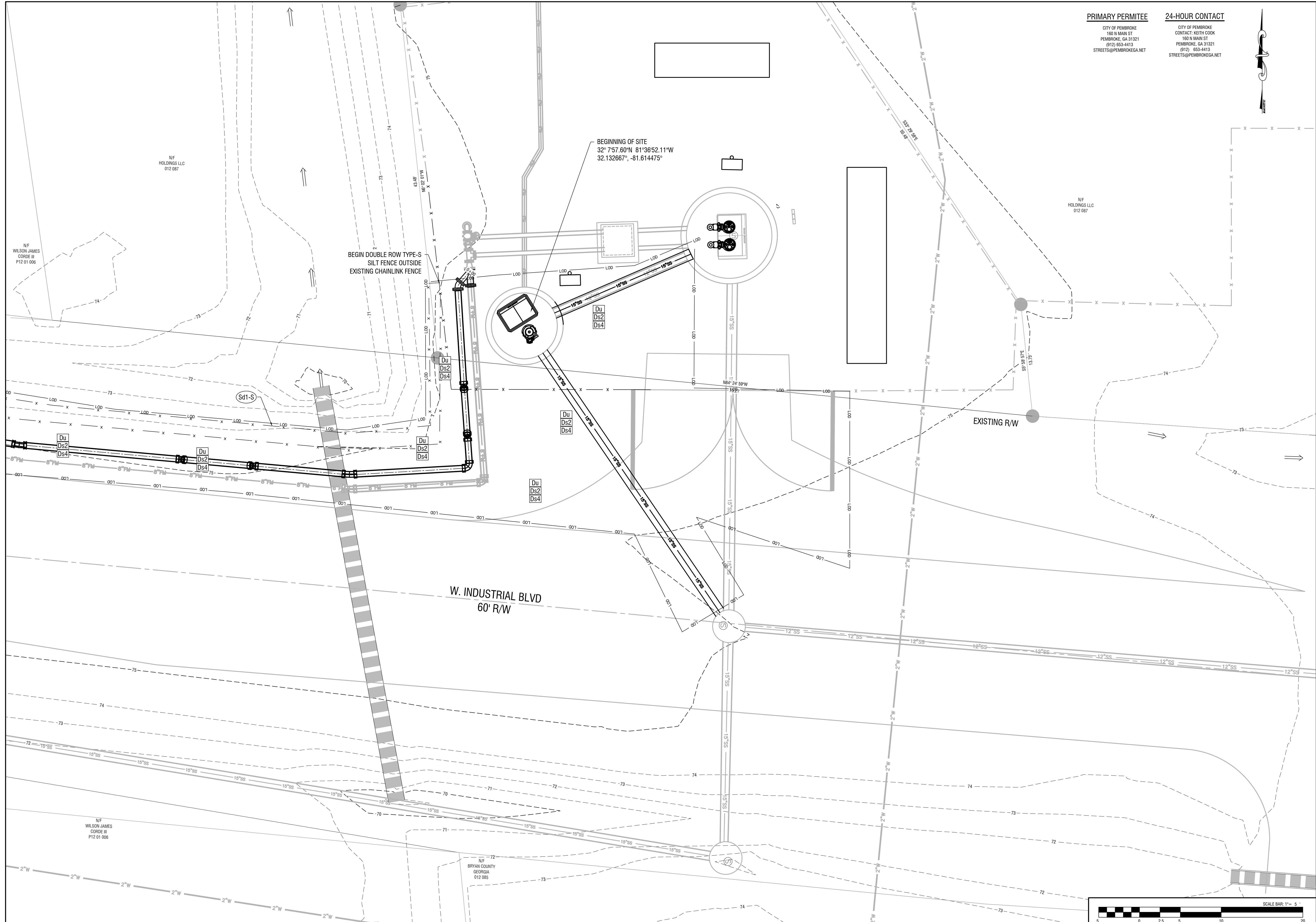
CONTINUATION LINE ON THIS SHEET STA. 86+00

CONTINUATION LINE ON THIS SHEET STA. 95+00

CONTINUATION LINE SHEET C305

CONTINUATION LINE ON THIS SHEET STA. 86+00

CONTINUATION LINE ON THIS SHEET STA. 95+00



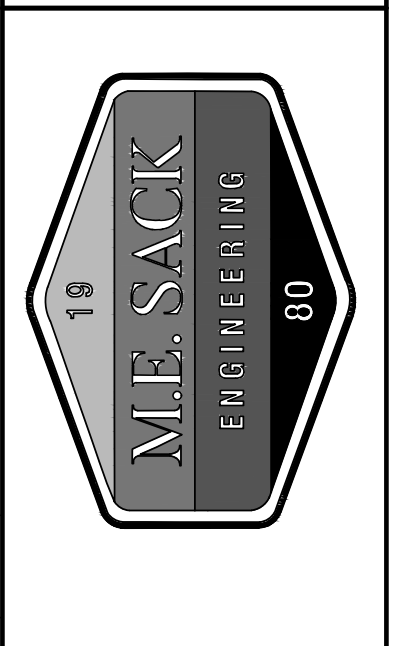
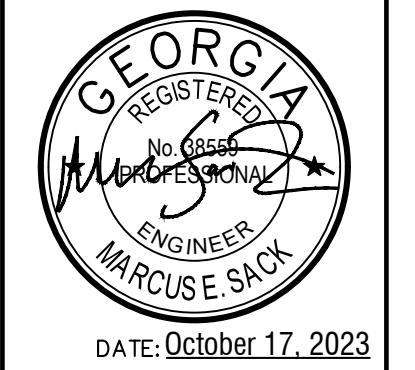
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 CITY OF PEMBROKE
 CONTACT: KEITH COOK
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MUNICIPALITY:
CITY OF PEMBROKE

COUNTY:
BRYAN

Owner:
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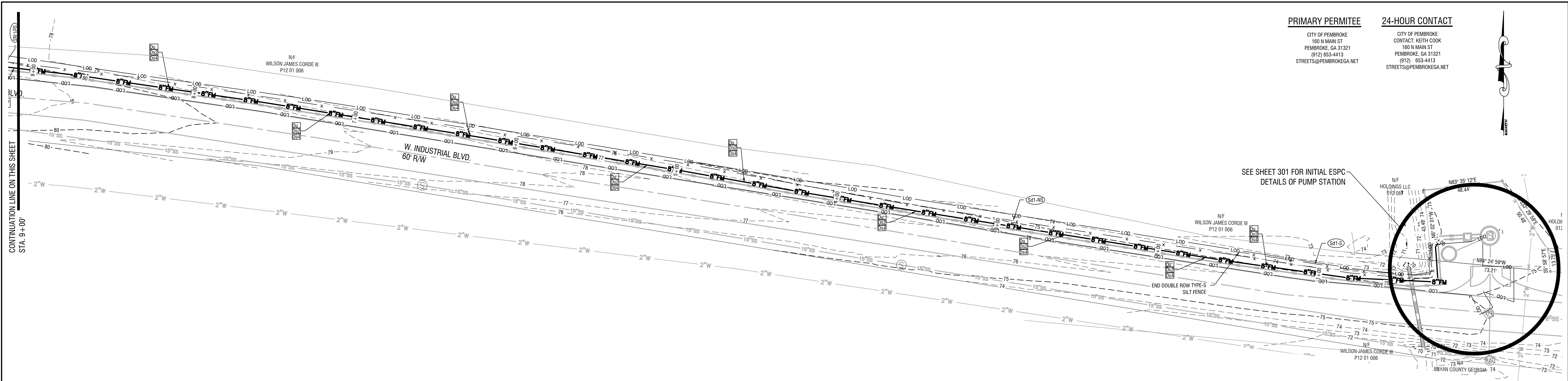
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PUMP STATION IMPROVEMENTS

FINAL ESPC 1

C313

FILE NO: 2020-48
 PLOT DATE: October 17, 2023



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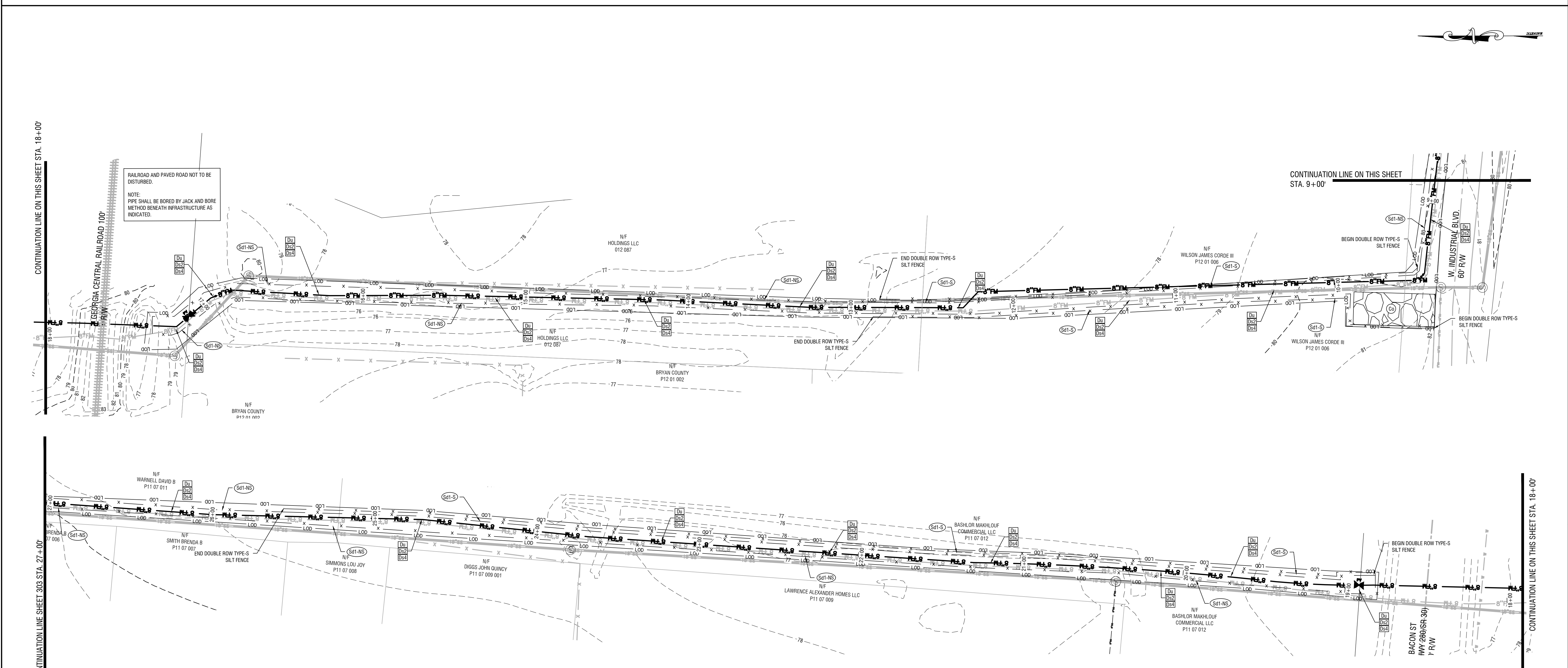
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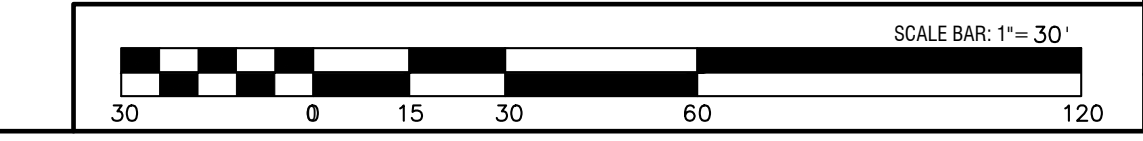
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GEORGIA REGISTERED ENGINEER
 M.E. SACK
 DATE: October 17, 2023



CONTINUATION LINE ON THIS SHEET
 STA. 9+00'



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PUMP STATION IMPROVEMENTS

FINAL ESPC 2

C314

FILE NO: 2020-48
PLOT DATE: October 17, 2023

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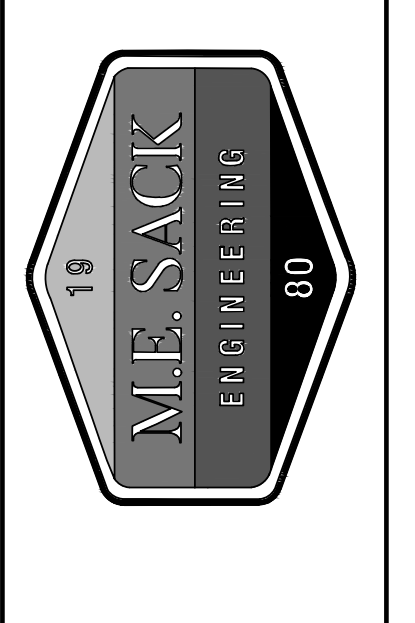
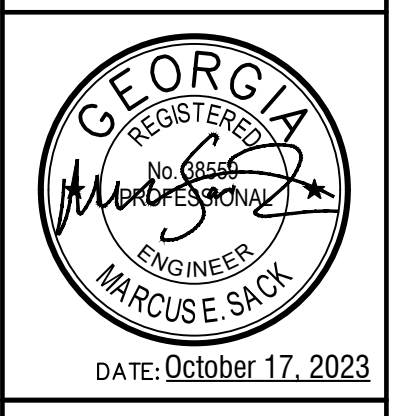
24-HOUR CONTACT
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 CONTACT: KEITH COOK
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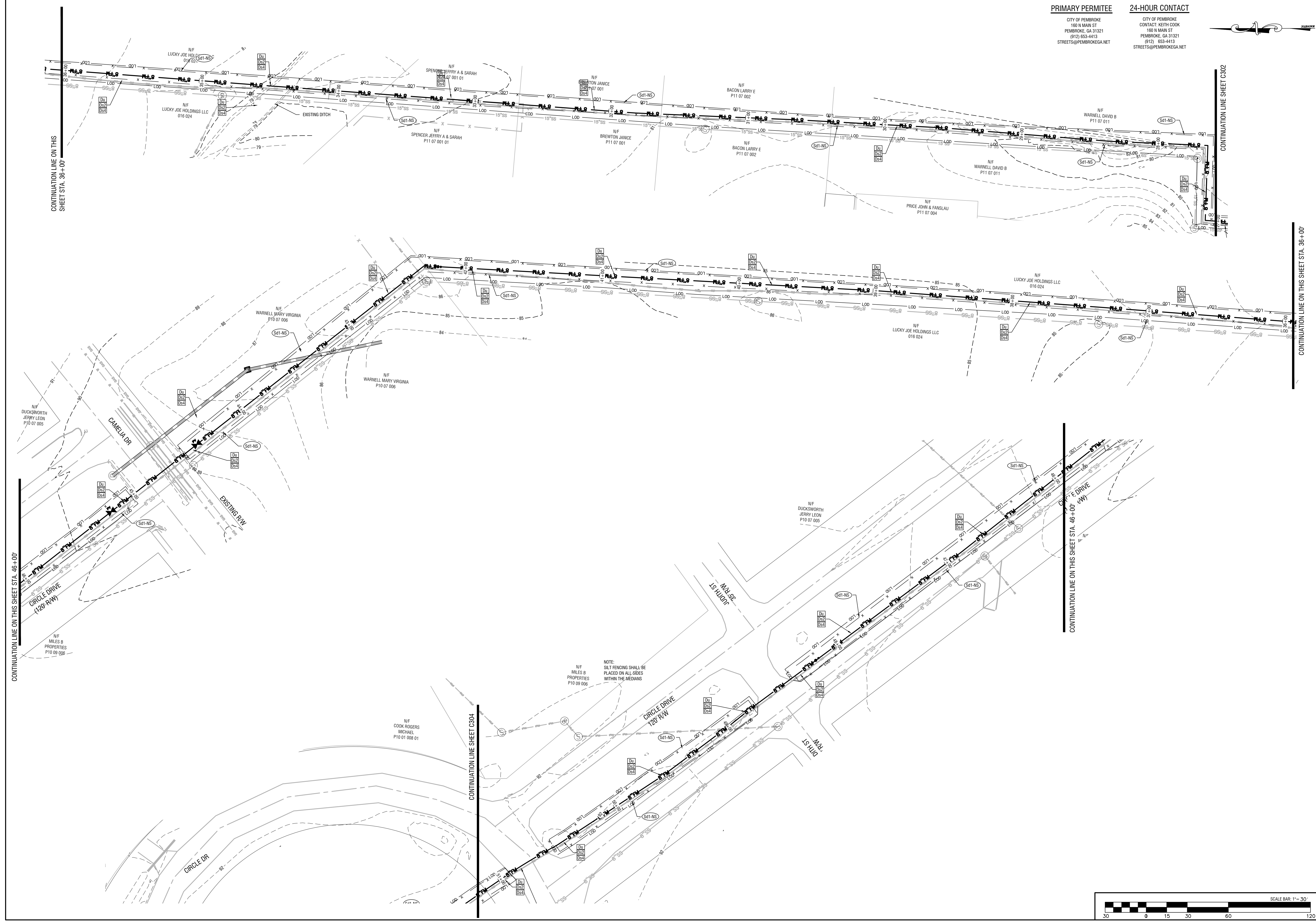
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PUMP STATION IMPROVEMENTS

FINAL ESPC 3

C315

FILE NO: 2020-48
PLOT DATE: October 17, 2023



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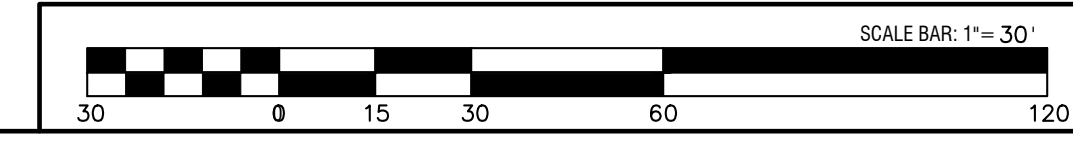
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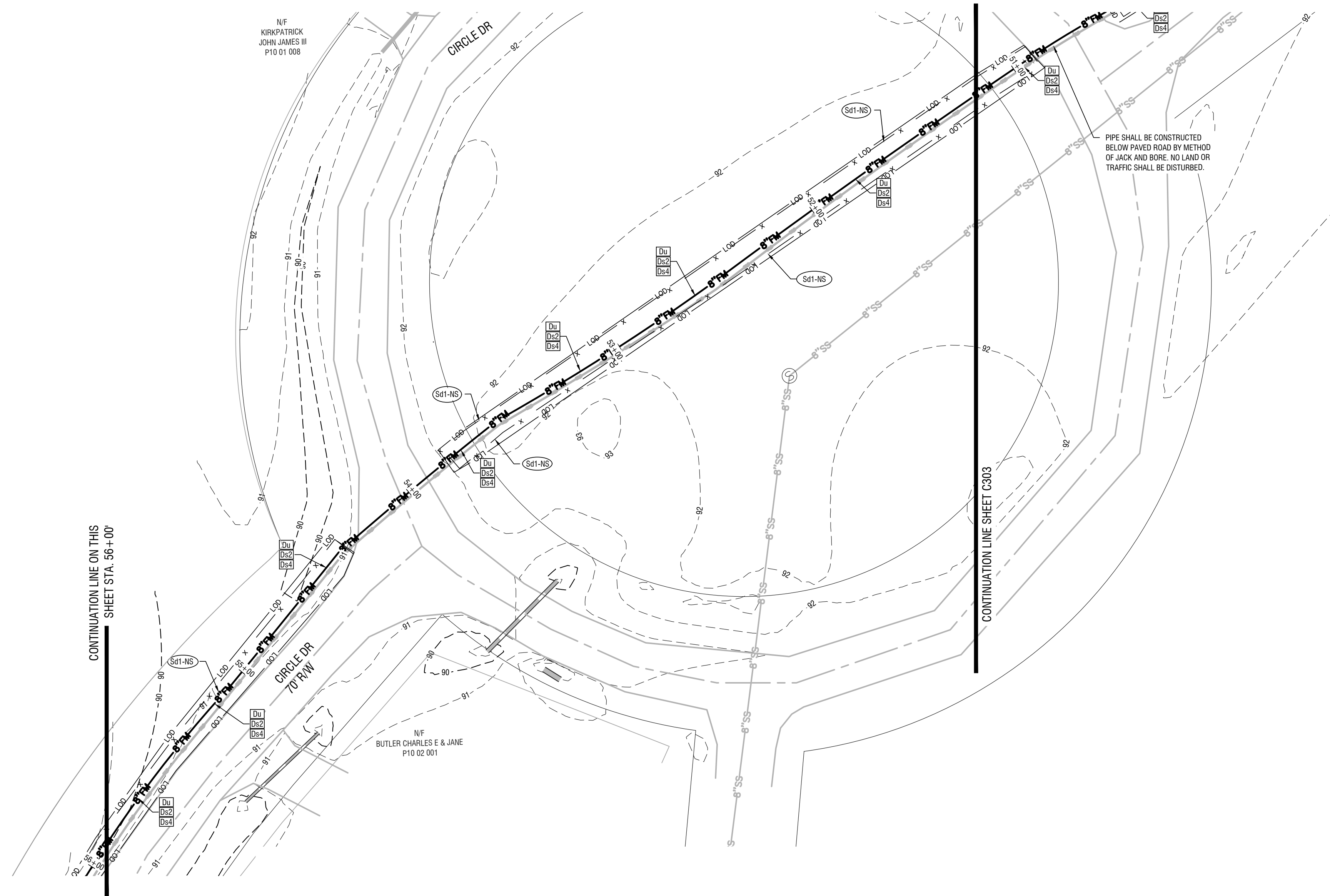
CONTINUATION LINE ON THIS SHEET STA. 36+00

CONTINUATION LINE ON THIS SHEET STA. 46+00

CONTINUATION LINE ON THIS SHEET STA. 46+00

CONTINUATION LINE SHEET C304





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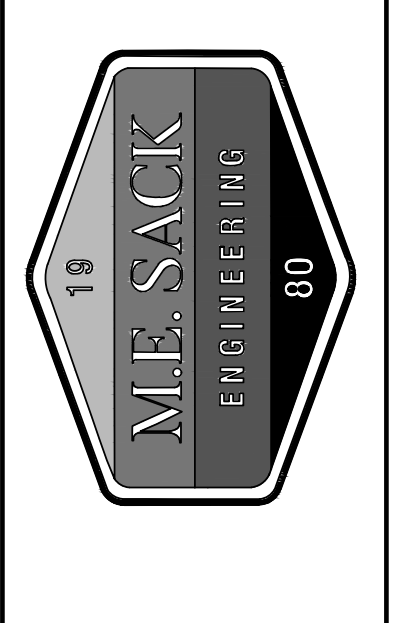
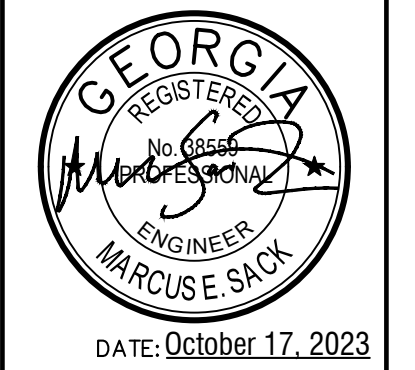
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 CONTACT: KEITH COOK
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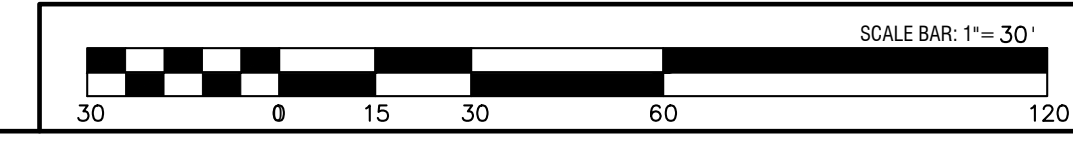
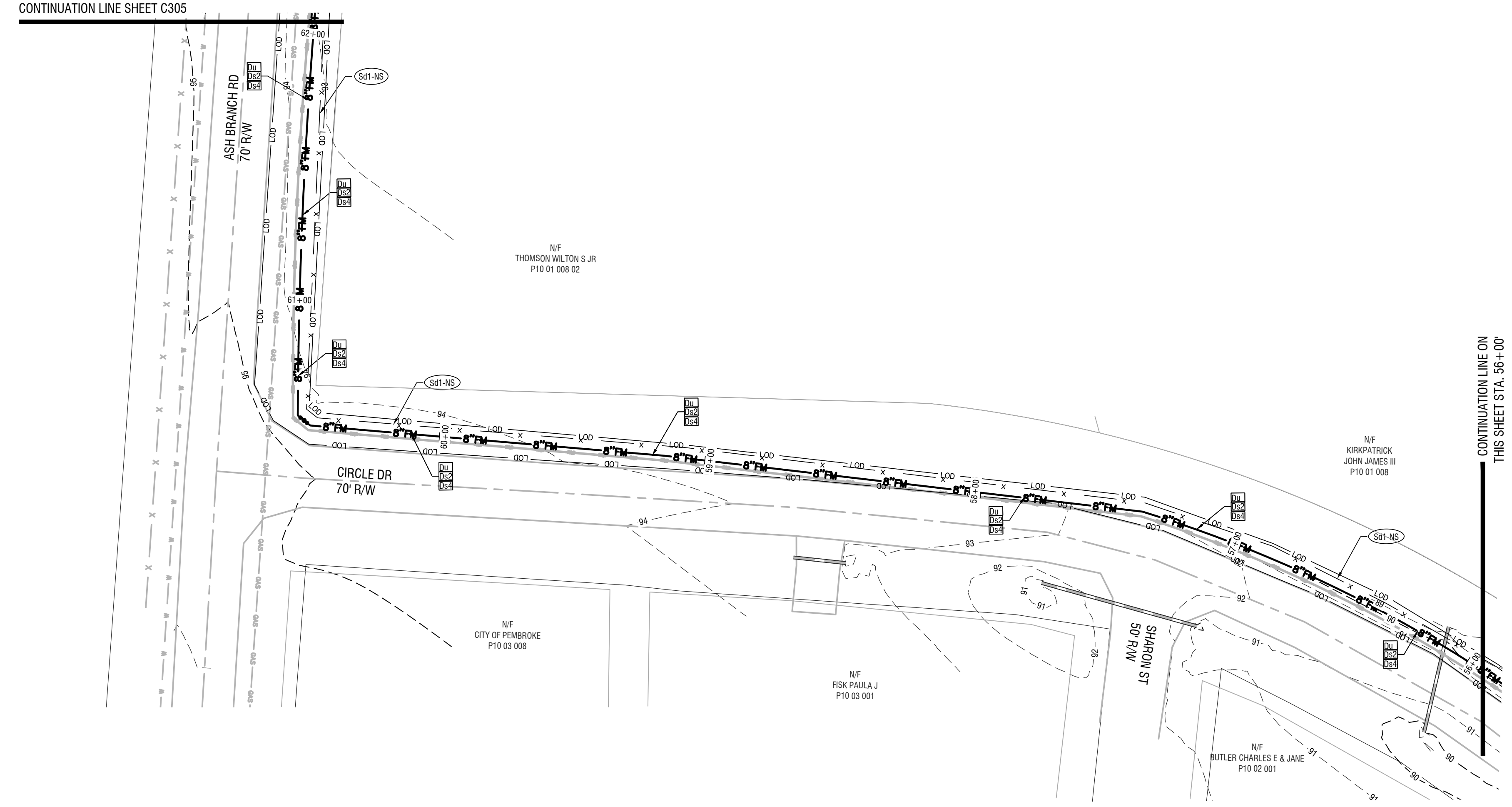
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PUMP STATION IMPROVEMENTS

FINAL ESPC 4

C316

FILE NO: 2020-48
 PLOT DATE: October 17, 2023



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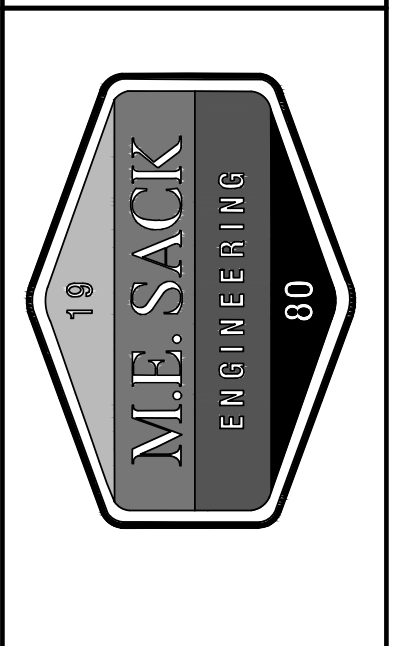
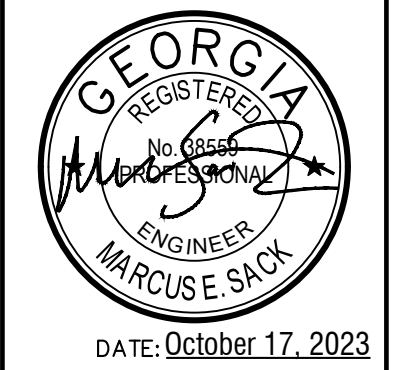


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PUMP STATION IMPROVEMENTS

FINAL ESPC 5

C317

FILE NO: 2020-48
 PLOT DATE: October 17, 2023

SOIL LEGEND

EI	ELLABELLE LOAMY SAND
PI	PELHAM LOAMY SAND
Se	STILSON LOAMY SAND
Mn	MASCOTTE SAND
Cl	OLUSTEE FINE SAND
As	ALBANY FINE SAND
W	WATER
Da	DOTHAN LOAMY SAND
Fs	FUQUAY LOAMY SAND

SILT STORAGE CALCULATION

ESTIMATED EROSION = 2.85 AC. X 67 C.Y./AC. = 191 C.Y. STORAGE CAPACITY REQUIRED.

Sd1-S STORAGE AVAILABLE = 1491 LF X .17 C.Y./LF = 253 C.Y.

Sd1-NS STORAGE AVAILABLE = 12618 LF X .17 C.Y./LF = 2145 C.Y.

TOTAL AVAILABLE SEDIMENT STORAGE = 2399 C.Y.

REQUIRED SEDIMENT STORAGE = 191 C.Y.

IS THE AVAILABLE STORAGE GREATER THAN THE TOTAL REQUIRED STORAGE?
YES NO

NOTES:
 ALL CONSTRUCTION SHALL TAKE PLACE WITHIN EXISTING RIGHT OF WAYS OR UTILITY EASEMENTS.
 ALL BUILDING MATERIALS AND PRODUCTS WILL BE STORED WITHIN THE RIGHT OF WAY AND EASEMENTS FOLLOWING MOBILIZATION.

FORCEMAIN CONSTRUCTION ACTIVITY DESCRIPTION

EACH PHASE WILL OCCUR IN IN SECTIONS BETWEEN THE BORING SITES AS THE FORCEMAIN IS INSTALLED. THE INITIAL PHASE SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND THE FINAL PHASE WILL ONLY BE COMPLETED AFTER CONSTRUCTION IN THAT PHASE AREA.

INITIAL PHASE - CONSISTS OF INSTALLING CONSTRUCTION EXIT, PERIMETER B MPS, DUST CONTROL, AND B MPS ON EXISTING STRUCTURES. CLEARING AND GRUBBING WILL BEGIN WITHIN THE LIMITS OF DISTURBANCE WHERE INDICATED.

INTERMEDIATE PHASE - MOBILIZATION OF BORING EQUIPMENT TO SITES. CONSISTS OF BORE PIT EXCAVATION AND UTILIZATION, EXCAVATE AND PLACE PROPOSED PIPE BETWEEN BORE PITS, MAINTAIN CHECK DAM STRUCTURES AND SILT FENCING, USE DUST CONTROL, MULCHING, AND TEMPORARY GRASSING WHERE INDICATED.

FINAL PHASE - REFILLING EXCAVATED AREAS, MOBILIZATION OF BORING EQUIPMENT FROM SITES. ONCE PERMANENT GRASSING IS ESTABLISHED TEMPORARY MEASURES CAN BE REMOVED INCLUDING: SILT FENCE, CHECK DAMS.

CHECK DAM STRUCTURES

1. CFS IN THE CHANNEL/DITCH THAT THE CHECK DAM IS BEING USED IN: 0.80 CFS
2. ABOVE 2.0 CFS: YES ___ NO ___ X
3. IF YES, LIST BMP BEING USED IN CONJUNCTION WITH CHECK DAMS: NOT APPLICABLE

FORCEMAIN EXISTING CONDITIONS:

THE SITE IS WITHIN THE RIGHT OF WAY OF THE CITY OF PEMBROKE RUNNING PARALLEL TO EXISTING UTILITIES. THE SINGLE EXISTING FORCEMAIN EXTENDS FROM AN EXISTING PUMP STATION TO BE IMPROVED ALONG W. INDUSTRIAL ST. ACROSS CAMELIA, JUDITH, AND CIRCLE DRIVE, THEN NORTH ALONG HARRY HAGAN ROAD UNTIL IT CONNECTS TO AN EXISTING MANHOLE. THIS MANHOLE RUNS GRAVITY SEWER LINES TO THE CITY'S WASTEWATER TREATMENT PLANT FOR TREATMENT.

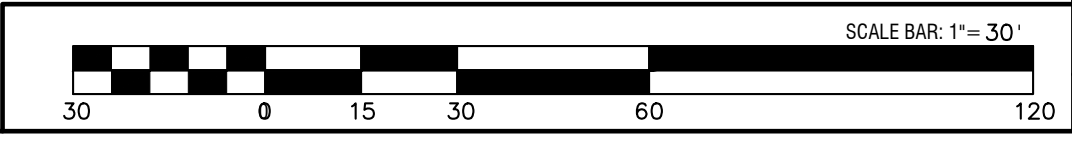
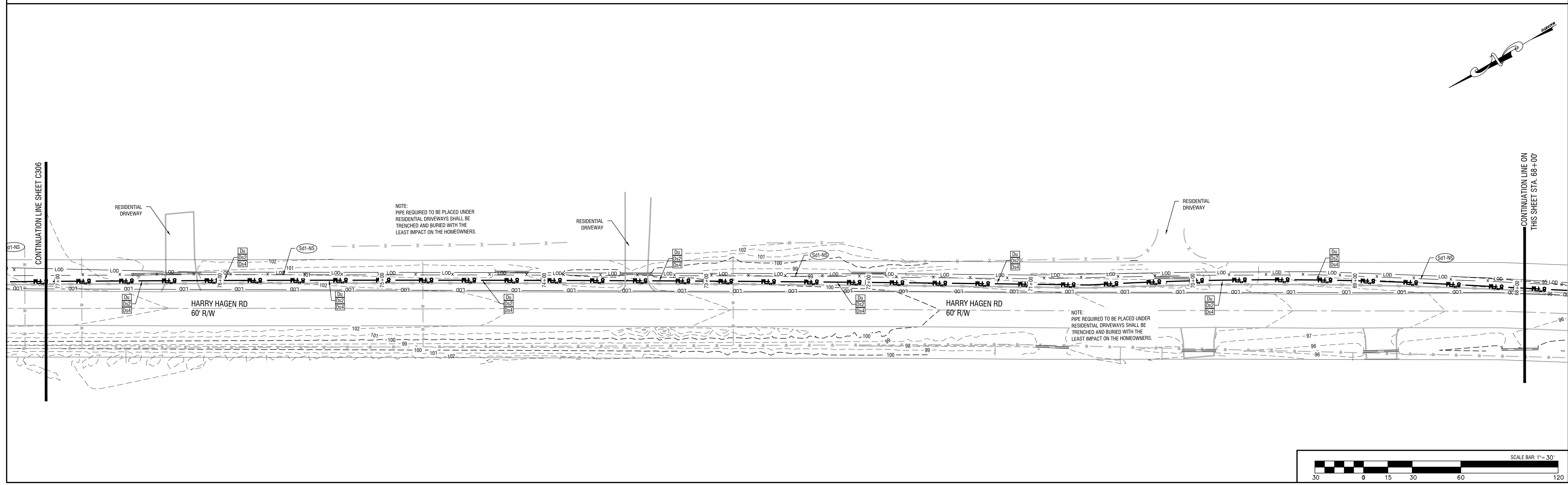
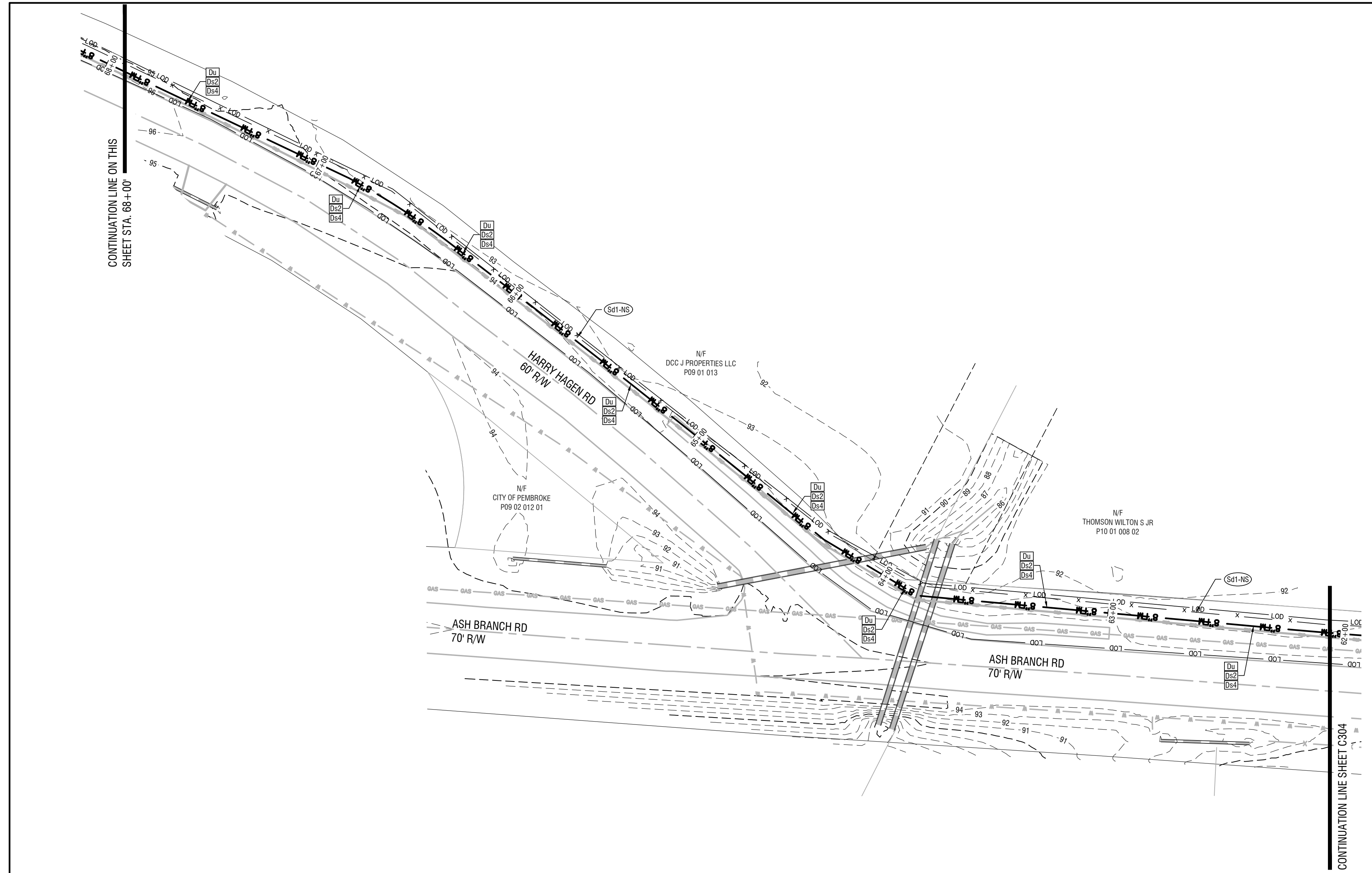
TOTAL SITE INFORMATION:

TOTAL SITE AREA = 4.88 AC
 TOTAL DISTURBED AREA = 2.85 AC

HYDROLOGY:

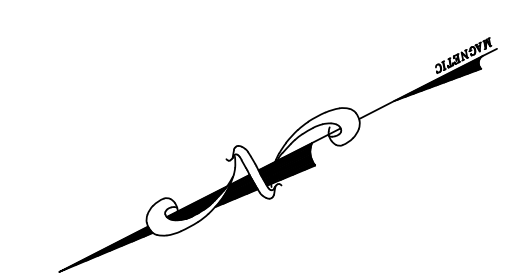
NO HYDROLOGY REPORT COMPLETED FOR LINEAR PROJECT AS NO CHANGES TO IMPERVIOUS AREAS WERE MADE.

NOTE:
 PARALLEL FORCEMAIN ADDITION REQUIRED WITHIN 200FT WETLAND BUFFER. SENSITIVE SILT FENCE SHALL BE PLACED AS BMP BETWEEN SUBCATCHMENT BASIN DRAINING TO DITCH AND WETLAND. WETLAND CONTAINED WITHIN SINGLE PROPERTY WITH RIGHT OF WAY ALLOWANCE WHERE FORCEMAIN CONSTRUCTION SHALL TAKE PLACE.
 EVERY DAY AREAS DISTURBED BY CONSTRUCTION WILL BE BACKFILLED, COMPACTED, GRASSED, AND HAYED.



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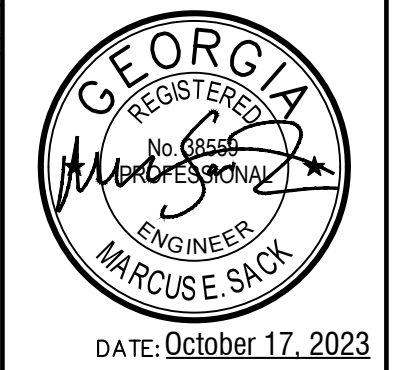


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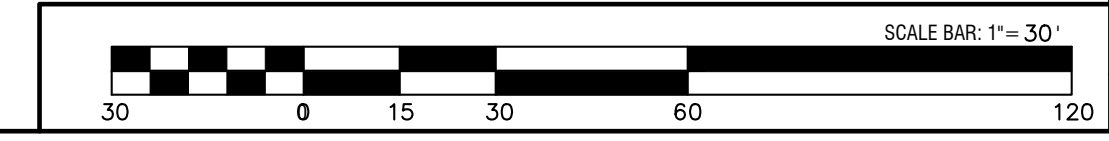
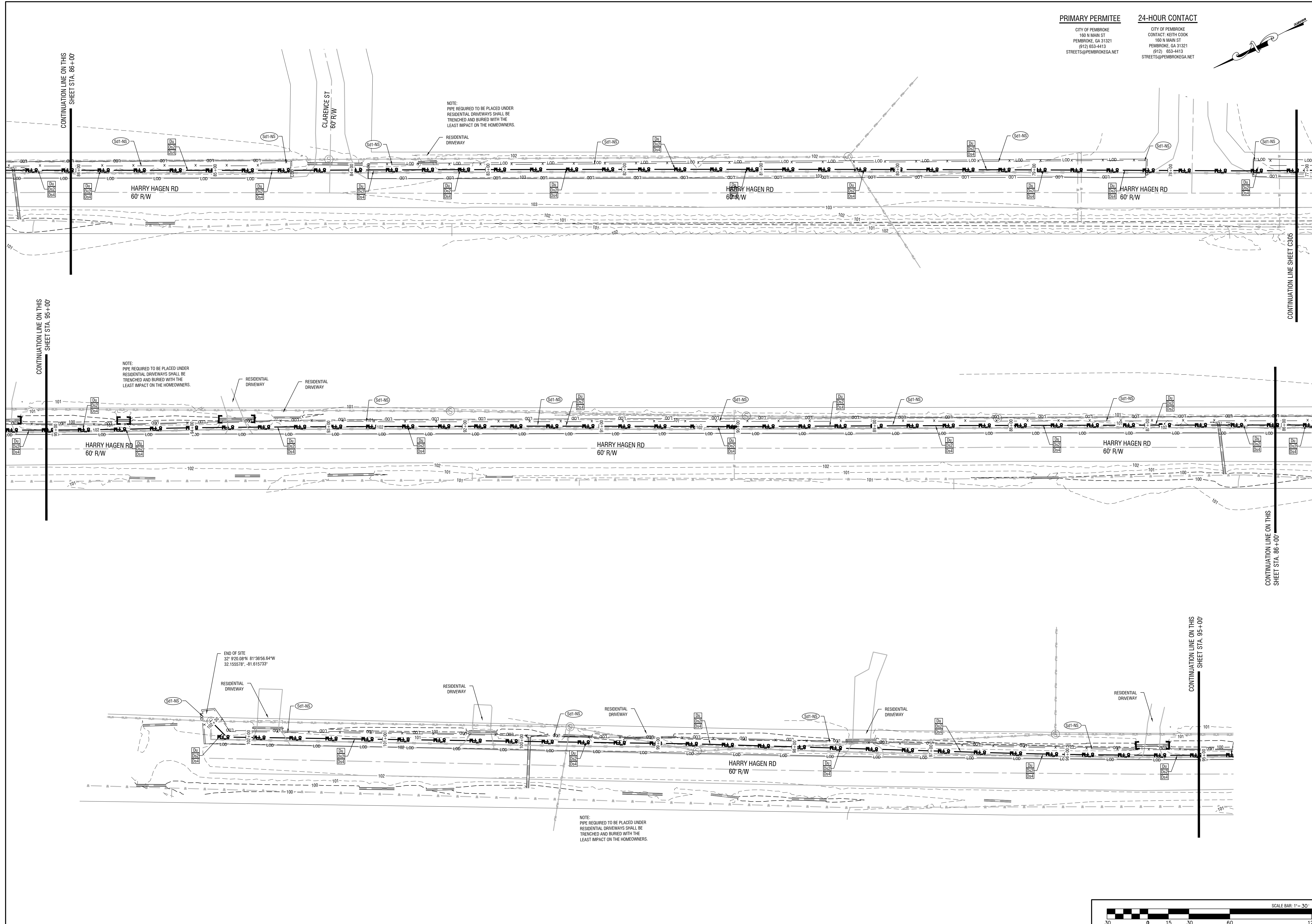
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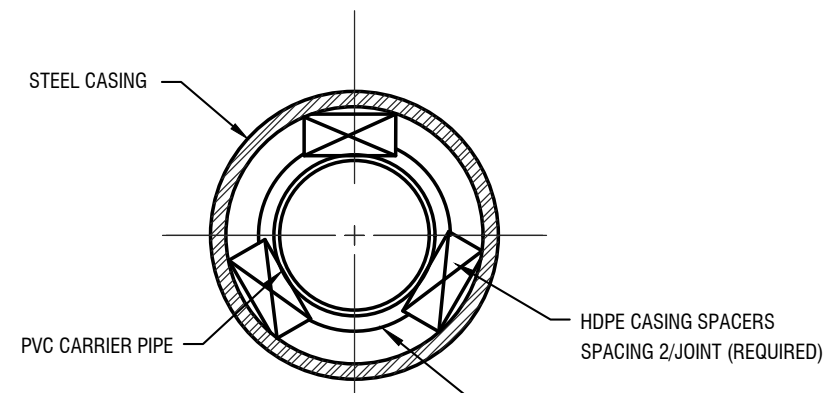
PUMP STATION IMPROVEMENTS

FINAL ESPC 6

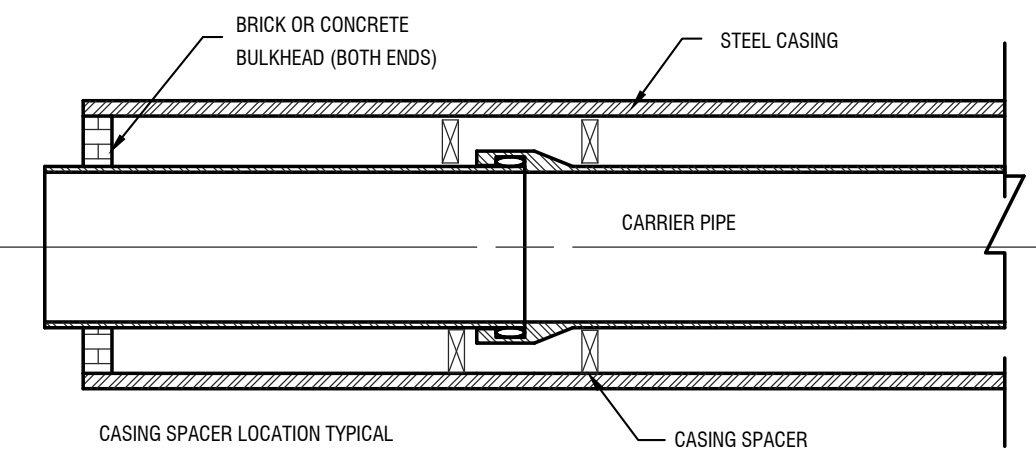
C318

FILE NO: 2020-48
 PLOT DATE: October 17, 2023

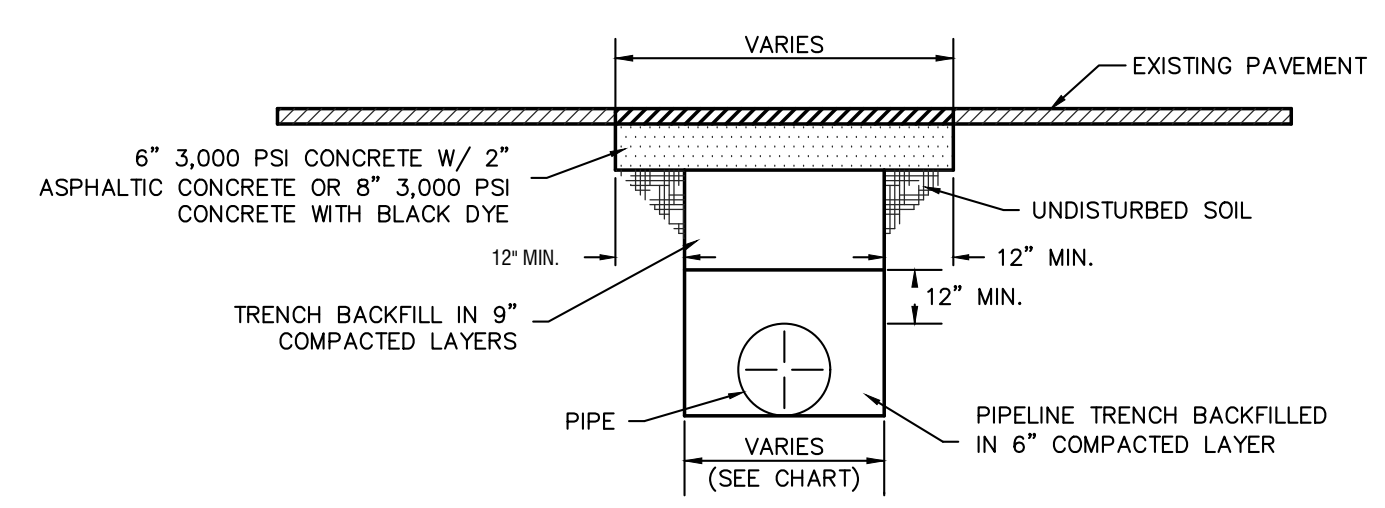




SECTION



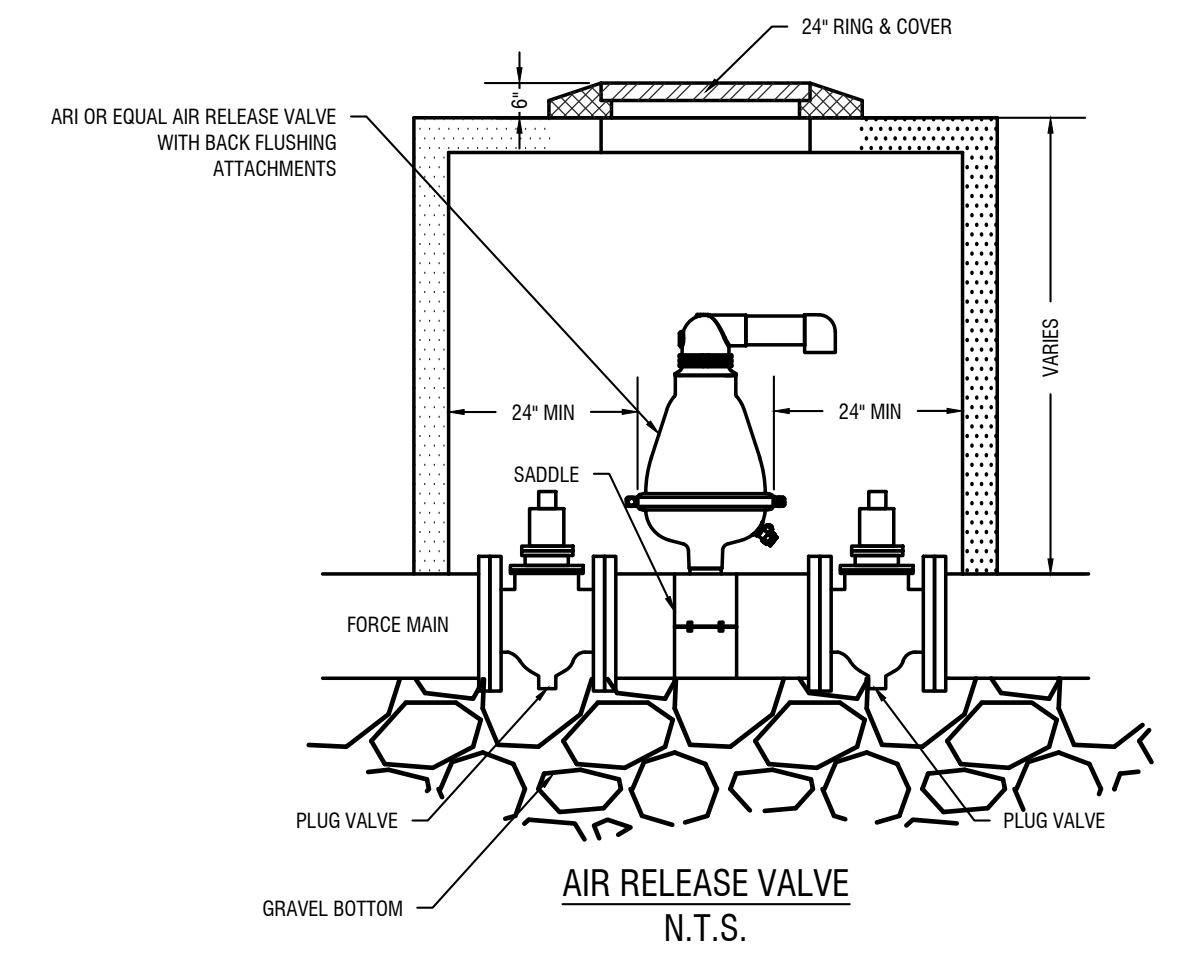
ELEVATION CASING DETAILS
N.T.S.



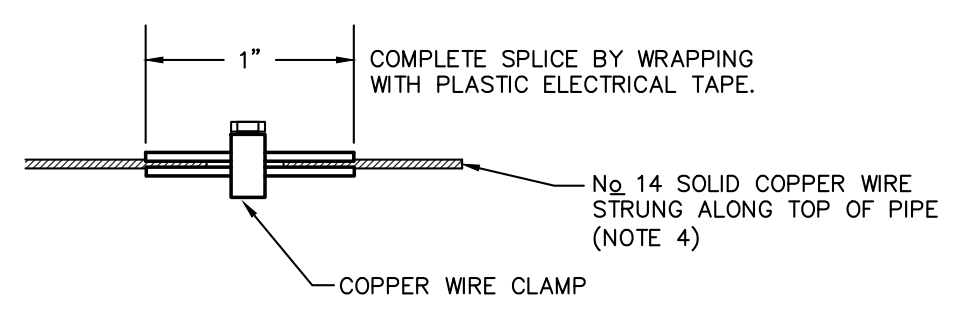
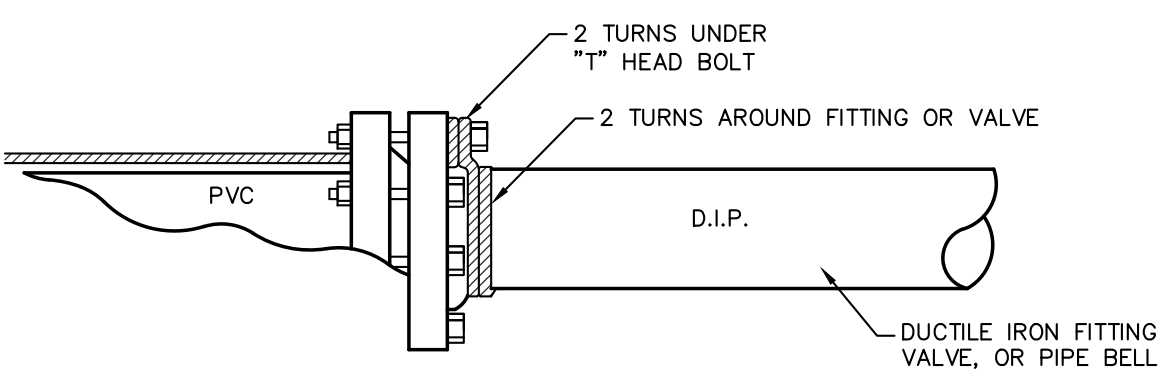
PIPE DIAMETER	MAXIMUM TRENCH WIDTH 0 - 6' CUT DEPTH	MAXIMUM PAYMENT WIDTH 0 - 6' CUT DEPTH
6" TO 15"	16" + DIA.	40" + DIA.
18" TO 21"	20" + DIA.	44" + DIA.
24" TO 30"	24" + DIA.	48" + DIA.
33" TO 42"	36" + DIA.	60" + DIA.
48"+	36" + DIA.	60" + DIA.

NOTE
MAXIMUM PAYMENT WIDTH FOR CUT DEPTH OVER 6 FEET
SHALL BE 8 FEET UNLESS NOTED OTHERWISE ON PLANS.

PAVEMENT REMOVAL & REPLACEMENT
N.T.S.



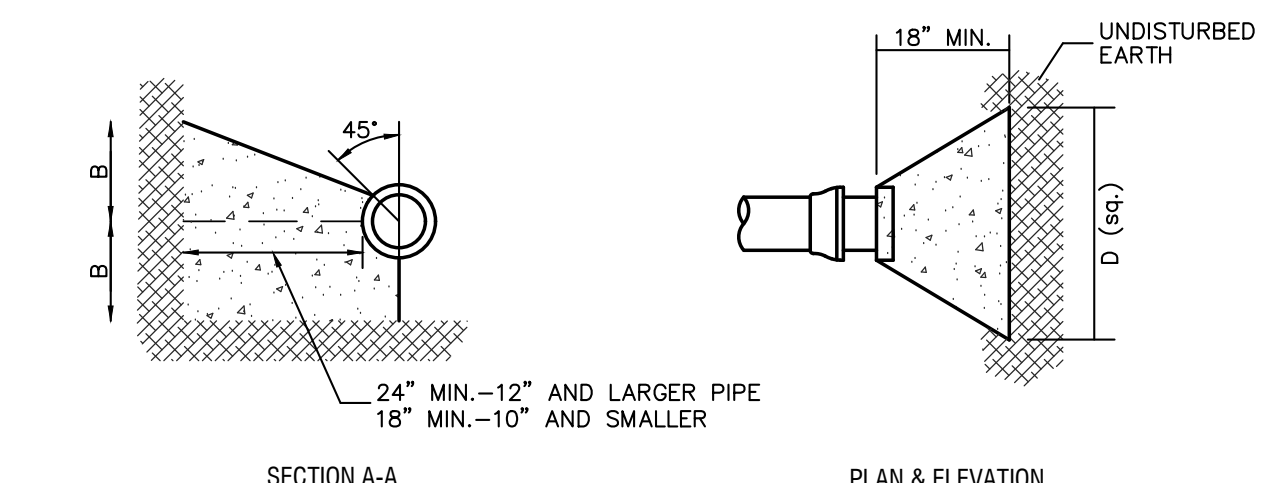
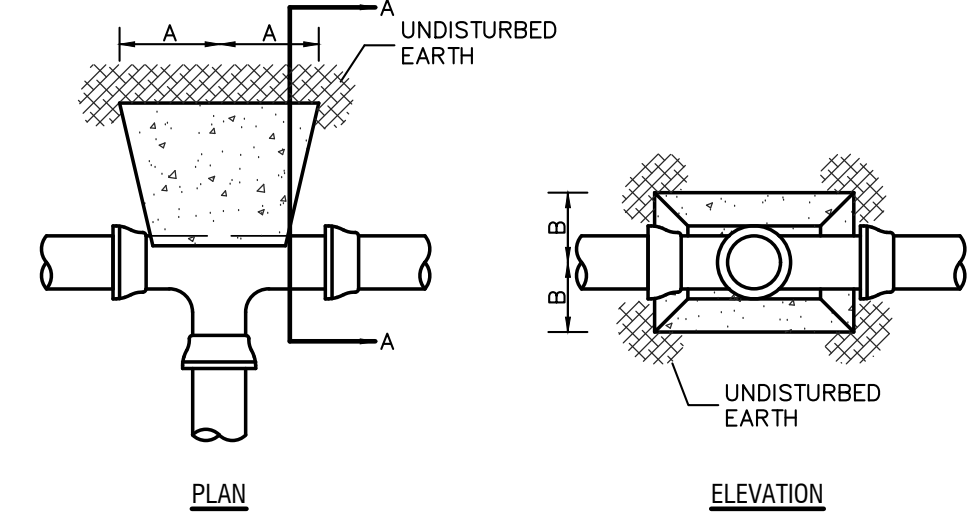
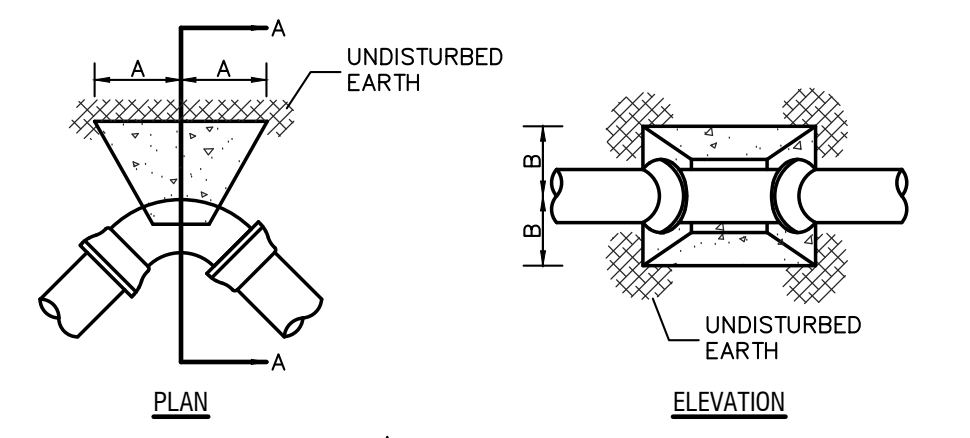
AIR RELEASE VALVE
N.T.S.



NOTES

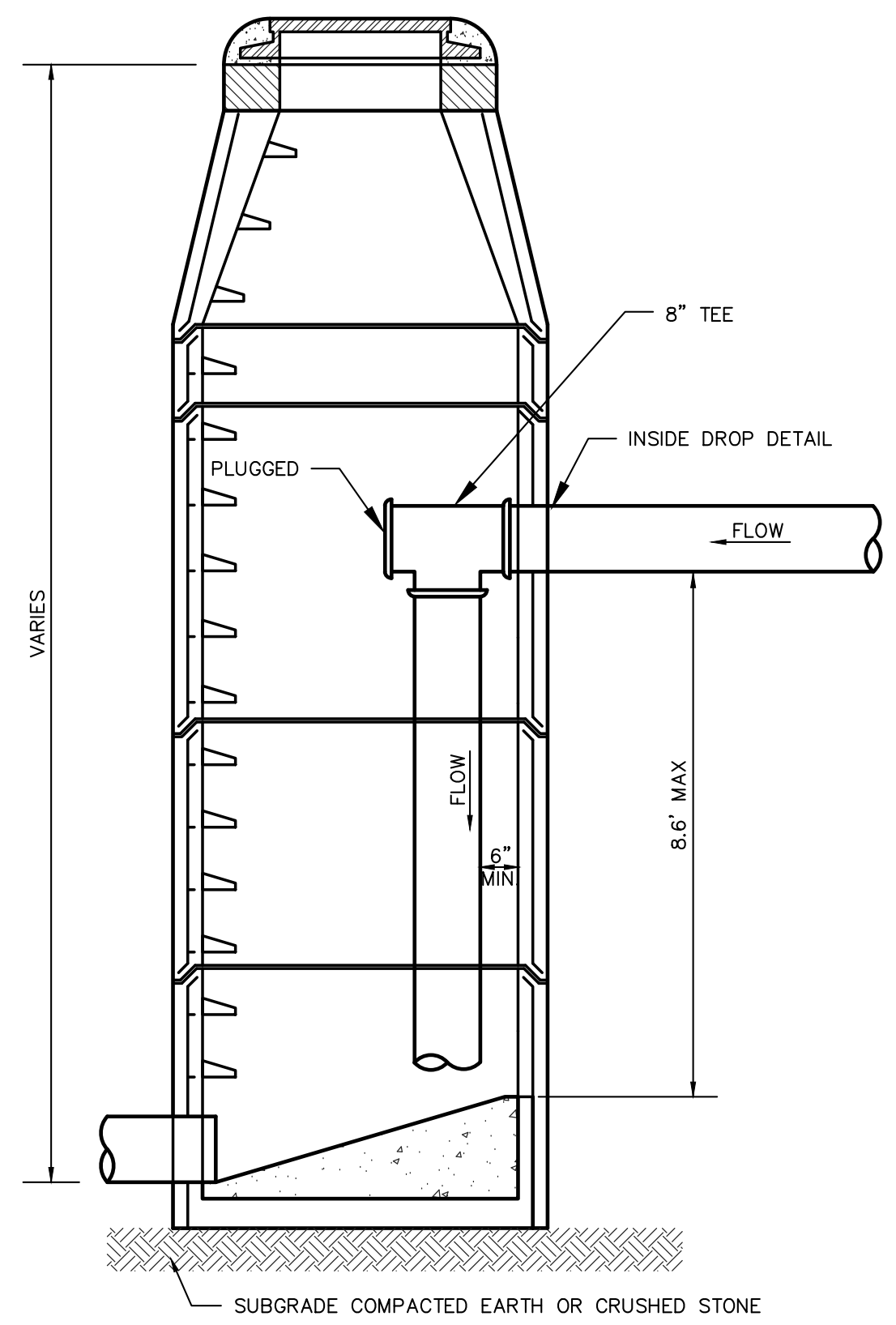
- USE No. 14 AWG SOLID PLASTIC COATED COPPER WIRE.
- STRIP 2" OF COATING AND WRAP WIRE 2 TURNS UNDER "T" HEAD BOLT ON TOP OF DUCTILE IRON FITTING (VALVE). NEXT WRAP WIRE 2 TURNS AROUND BELL OF FITTING (VALVE) AND WIND WITH A CONTINUOUS LENGTH WITH AT LEAST 4 WRAPS PER LENGTH OF PVC PIPE TO NEXT DUCTILE IRON FITTING. TERMINATE AT FITTING IN SIMILAR MANNER AS NOTED ABOVE.
- ALL SPLICES MUST BE MADE BY USING COPPER WIRE SPLICE "U" BOLT ASSEMBLIES AND THEN WRAPPING WITH ELECTRICAL TAPE.
- IN LIEU OF "WRAPPING" TRACER WIRE AROUND PVC PIPE, WIRE MAY BE STRUNG ALONG TOP OF PIPE PROVIDED IT IS TAPED TO THE PIPE EVERY 5 FEET TO INSURE POSITION USING BACKFILL.

TRACER WIRE INSTALLATION DETAIL FOR PVC PIPE
N.T.S.

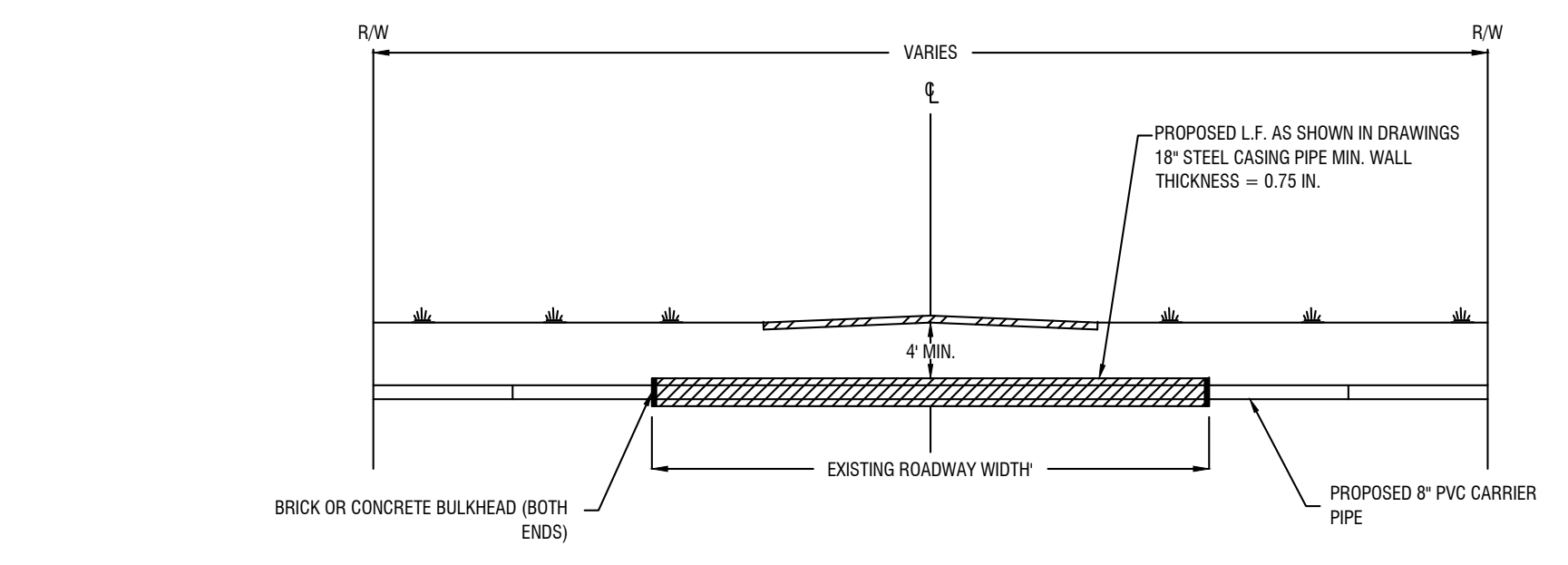


TYPE	SIZE	1/4 BENDS		1/8 BENDS		1/16 BENDS		TEES		PLUGS	
		A	B	A	B	A	B	A	B		C
TYPE 1 4,000 PSF SOIL	6"	8"	10"	6"	8"	3"	8"	8"	8"	10"	15"
	8"	12"	12"	8"	10"	5"	9"	9"	12"	12"	20"
TYPE 1 2,000 PSF SOIL	6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"
	8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"

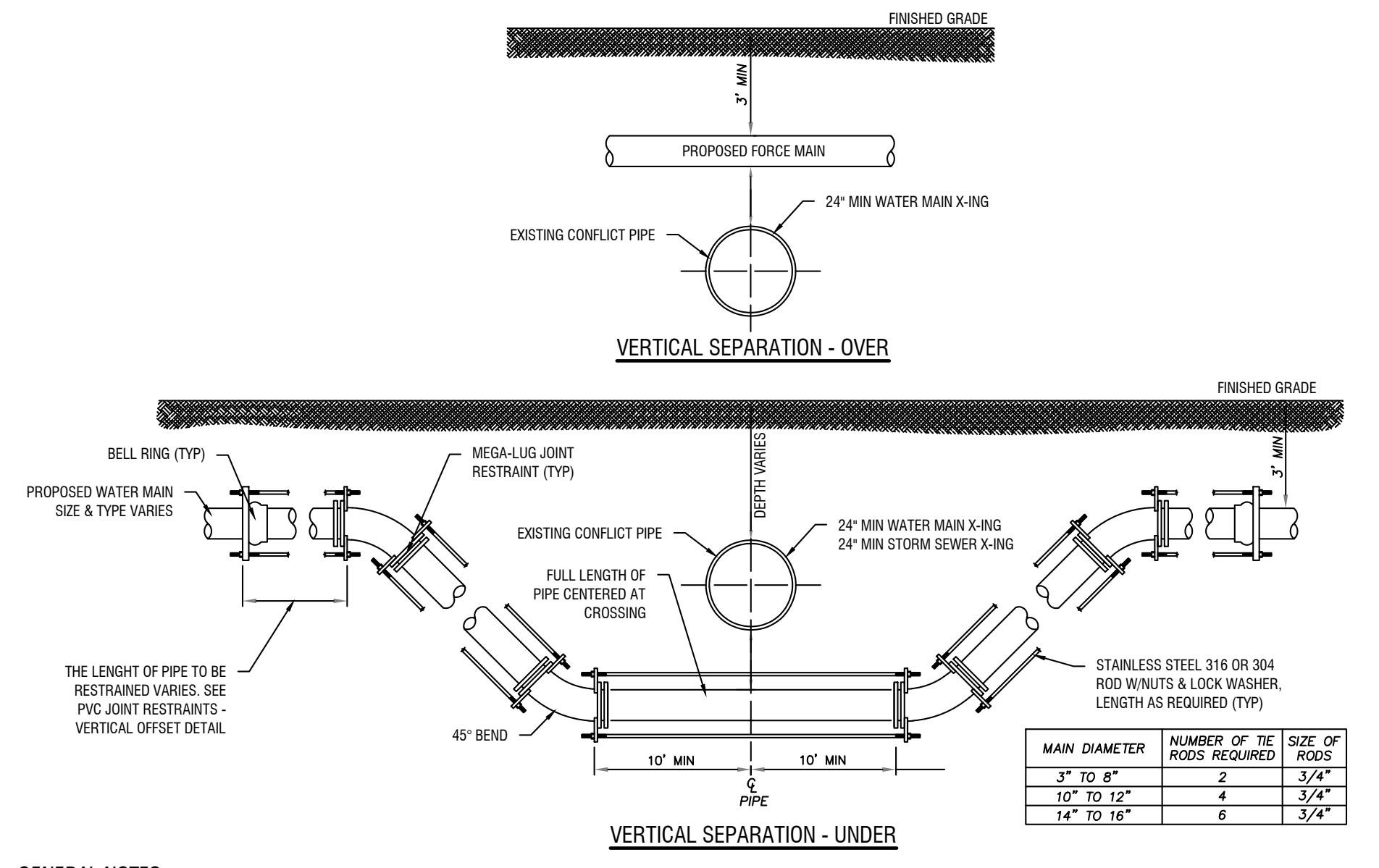
STANDARD THRUST BLOCKS FOR WATER MAIN AND FORCE MAINS
TO BE USED IN CONJUNCTION WITH JOINT RESTRAINT
N.T.S.



FORCEMAIN TIE INTO EXISTING MANHOLE
N.T.S.



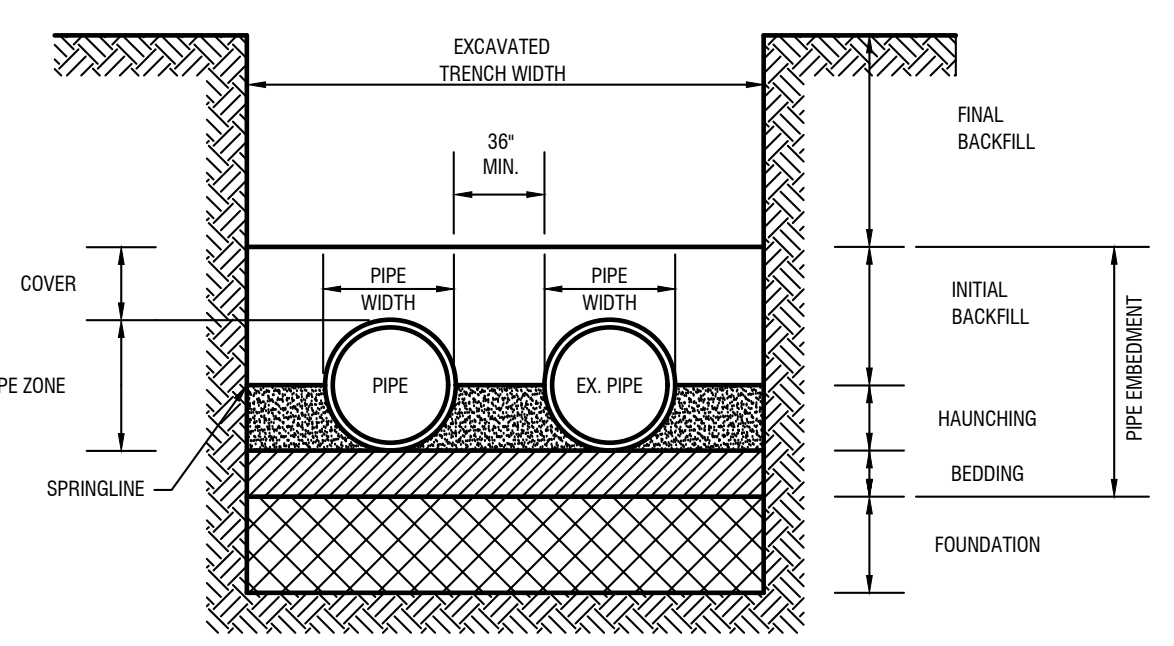
TYPICAL ROADWAY SERVICE BORE DEPTH
N.T.S.



GENERAL NOTES:
WATER MAINS AND WATER SERVICE LINES CROSSING HOUSE SEWERS, STORM SEWERS OR SANITARY SEWER SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL SEPARATION OF AT LEAST 24" BETWEEN THE BOTTOM OF THE WATER MAIN AND THE TOP OF THE SEWER, AT CROSSINGS, ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE AS FAR AS POSSIBLE.
WHEN LOCAL CONDITIONS PREVENT A VERTICAL SEPARATION OF 24", THE SEWER PASSING OVER OR UNDER WATER MAINS SHALL BE CONSTRUCTED OF MATERIALS AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS OF CONSTRUCTION EXTENDING ON EACH SIDE OF THE CROSSING UNTIL, AT LEAST, 10' SEPARATES THE TWO PIPES AND SHALL BE PRESSURE TESTED TO ASSURE WATER-TIGHTNESS PRIOR TO BACKFILLING. THE LENGTH OF WATER PIPE MUST BE CENTERED AT THE POINT OF CROSSING SO THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
ADEQUATE STRUCTURAL SUPPORT FOR THE SEWERS TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING ON AND BREAKING THE WATER MAINS.
IN CASE THAT A SEWER LATERAL PASSES ABOVE WATER MAIN, THE SEWER LATERAL MUST BE ENCASED IN A CARRIER PIPE CONSTRUCTED OF WATER MAIN MATERIALS, EXTENDING EACH SIDE OF THE CROSSING UNTIL AT LEAST 10 FEET SEPARATES THE TWO PIPES.
WATER SERVICE LINES SHOULD GO OVER ANY SANITARY SEWER LINE AND MAINTAIN THE 24" VERTICAL SEPARATION.

MAIN DIAMETER	NUMBER OF THE RODS REQUIRED	SIZE OF RODS
3" TO 8"	2	3/4"
10" TO 12"	4	3/4"
14" TO 16"	6	3/4"

UTILITY SEPARATION DETAIL
N.T.S.



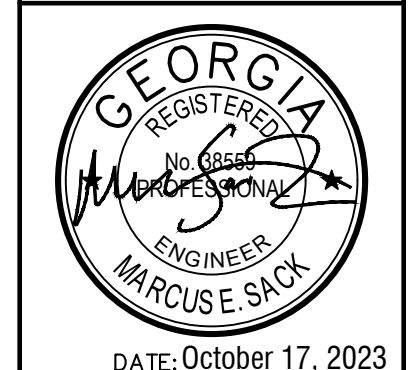
PARALLEL FORCEMAIN PIPE BEDDING DETAIL
N.T.S.

REVISIONS:

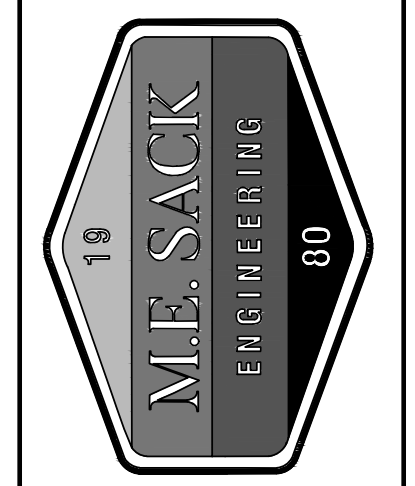
T.	GSWCC REVISIONS

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DATE: October 17, 2023



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COUNTY:
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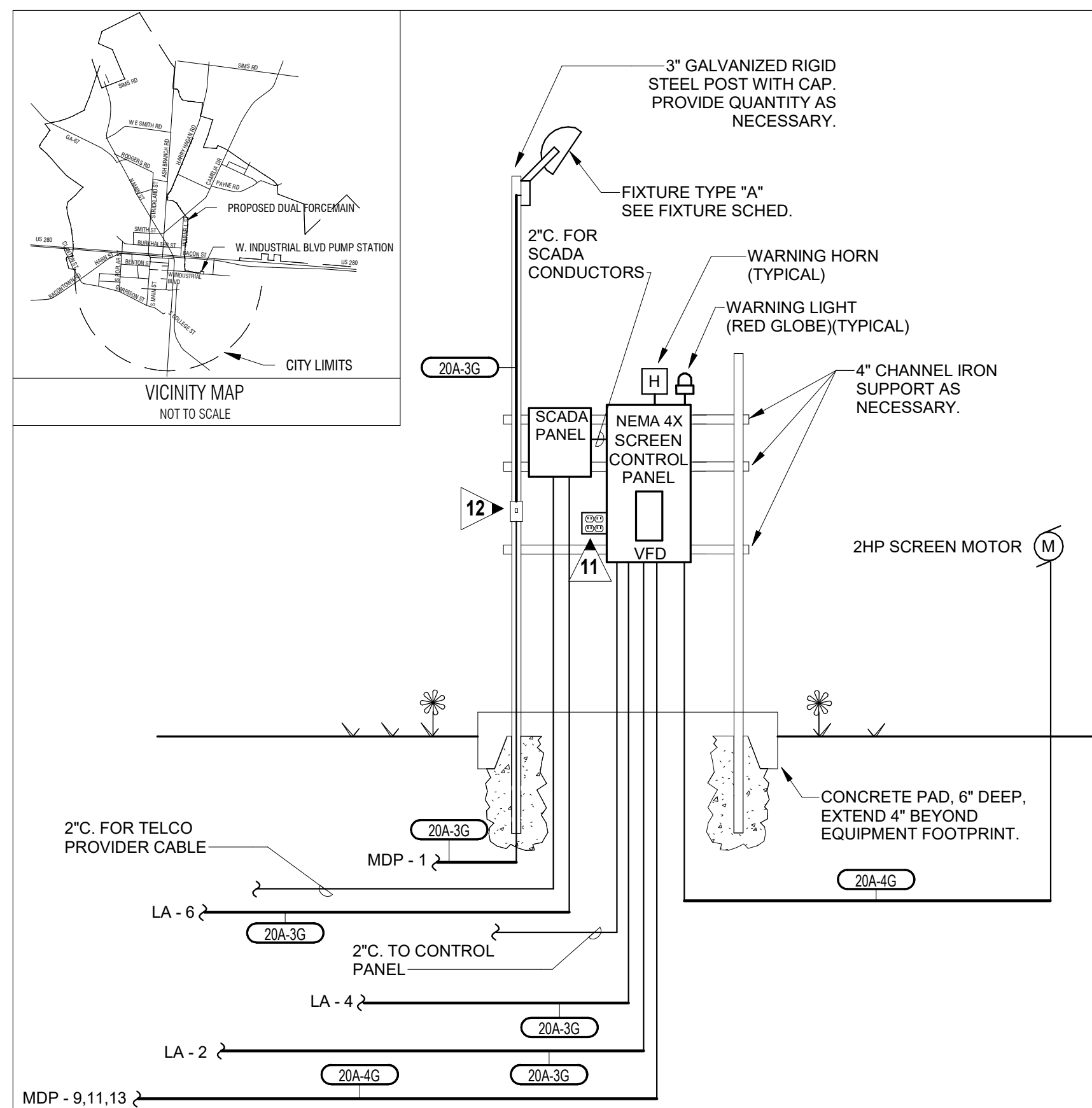
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PUMP STATION
IMPROVEMENTS

GENERAL
DETAILS

C401

FILE NO: 2020-48
PLOT DATE: October 17, 2023



2 POWER RISER DIAGRAM - SCREEN
E001 NO SCALE

LIGHTING FIXTURE SCHEDULE						
TYPE	DESCRIPTION	WATTS	LUMENS	COLOR TEMP	MANUFACTURERS	
A	L.E.D. FLOODLIGHT, BLACK FINISH TENON MOUNTED ON TOP OF 12" ABOVE GRADE RACK POST.	50	6800	5000 K	LITHONIA, STONCO, LUMARK	

KEYED NOTES:

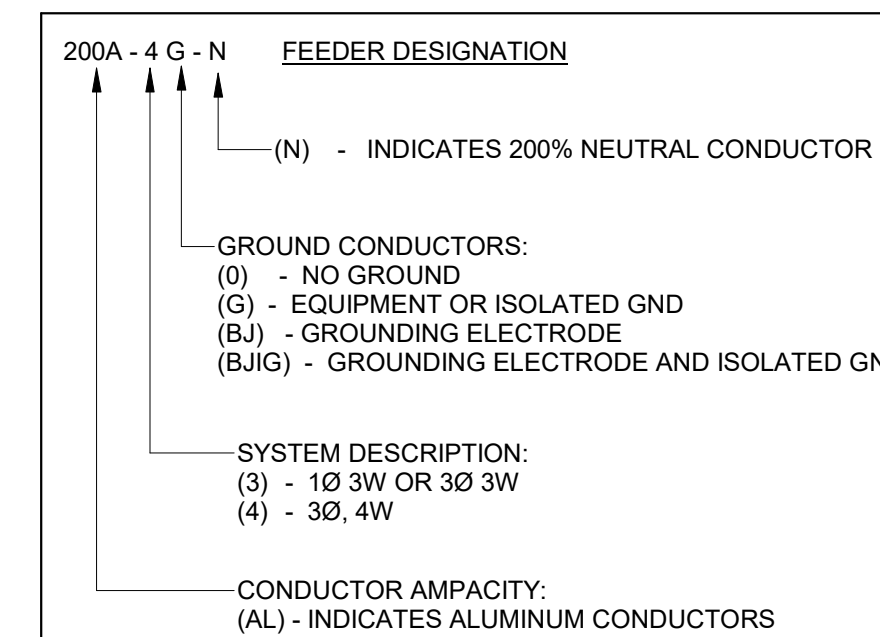
- 1 SEE SCREEN POWER RISER DIAGRAM FOR ADDITIONAL CONNECTIONS.
- 2 CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING INSTALLING, TESTING, AND COMMISSIONING THE NEW PROPANE PAD MOUNTED GENERATOR SHOWN. GENERATOR SHALL BE SIZED AS INDICATED AND SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
 A. WEATHER ENCLOSED CRITICAL SILENCER.
 B. LOCKABLE EMERGENCY STOP SWITCH.
 C. RUN RELAY.
 D. 1500 WATT, 120 VOLT BLOCK HEATER.
 E. ALL ENGINE FLUIDS ADDED.
 F. RODENT GUARDS.
 G. NFPA 110 LITERATURE.
 H. 5 YEAR COMPREHENSIVE LIMITED WARRANTY.
 CONTRACTOR SHALL FULLY INSTALL AND TEST GENERATOR FOR FULL OPERATION AND COMMISSIONING. INSTRUCT OWNER TO OPERATION OF SUCH AND TURN OVER ALL O&M, AND WARRANTY MANUALS.
- 3 CONTRACTOR TO PROVIDE CONCRETE PAD SIZED ACCORDINGLY FOR PROPANE GENERATOR SHOWN. SEE 3/E202.
- 4 NEW UTILITY POLE MOUNTED TRANSFORMERS TO BE PROVIDED AND INSTALLED BY GEORGIA POWER.
- 5 NEW WEATHERHEAD TO BE PROVIDED AND INSTALLED BY DIVISION 26. 10' OF SLACK CONDUCTORS SHALL BE PROVIDED FOR GEORGIA POWER TO CONNECT TO POLE MOUNTED UTILITY TRANSFORMER.
- 6 METER BASE MOUNTED ON 4" CHANNEL IRON.
- 7 400 AMP DISCONNECT FUSED DOWN TO 225 AMPS. DISCONNECT SHALL BE NEMA 4X RATED.
- 8 225 AMP, 3 POLE, NEMA 4X, SOLID NEUTRAL TIME DELAYED AUTOMATIC TRANSFER SWITCH.
- 9 PANEL SHALL HAVE A TRANSIENT VOLTAGE SURGE SUPPRESSOR AS INDICATED BY THE NUMBERED T.V.S.S. SYMBOL ON PANEL. SEE T.V.S.S. SCHEDULE TO COORDINATE APPROPRIATELY RATED T.V.S.S.
- 10 15KVA NEMA 4X RATED TRANSFORMER. 480V PRIMARY/120-208V SECONDARY. TRANSFORMER SHALL BE OF THE BRAND GEAR BEING PROVIDED.
- 11 QUAD GFCI RECEPTACLE IN A DIE-CAST WEATHERPROOF JUNCTION BOX WITH WEATHERPROOF INTERMATIC, DIE-CAST, "IN-USE" COVER.
- 12 PROVIDE DIE-CAST WEATHERPROOF JUNCTION BOX WITH LIGHT SWITCH AND WEATHERPROOF COVER TO CONTROL TYPE "A" LIGHT FIXTURE.
 PURPOSED REMOTE GENERATOR "EPO" PUSHBUTTON LOCATION. PROVIDE PAD LOCKABLE NEMA 4X BOX WITH HINGED GASKETED COVER. COORDINATE FINAL LOCATION WITH OWNER PRIOR TO ROUGH-IN. PROVIDE RED PHENOLIC PLATE WITH ENGRAVED WHITE LETTERING THAT READS "GENERATOR SHUT-OFF PUSHBUTTON."

GENERAL NOTES:

1. RACK IS SHOWN FOR DIAGRAMMATIC PURPOSES ONLY. CONTRACTOR SHALL SIZE RACK PER EQUIPMENT DIMENSIONS ALONG WITH OWNER FURNISHED EQUIPMENT. CONTRACTOR MAY ELECT TO MOUNT EQUIPMENT BACK TO BACK DUE TO SPACE CONSTRAINTS.
2. ALL ELECTRICAL ENCLOSURES SHALL BE NEMA 4X RATED.
3. ALL EXPOSED CONDUIT SHALL BE GALVANIZED RIGID STEEL.
4. COORDINATE EXACT LOCATION OF PUMPS WITH PUMP PROVIDER PRIOR TO ROUGH IN.
5. ALL CONDUCTORS SHALL BE COPPER.
6. DO NOT SCALE DRAWINGS TO LOCATE EQUIPMENT OR OUTLETS.
7. MOUNTING HEIGHTS AS INDICATED ON THE DRAWINGS SHALL BE FROM THE FINISHED FLOOR TO THE CENTER LINE OF THE OUTLET BOX.
8. THE ELECTRICAL DRAWINGS ARE ONLY A PART OF THE CONTRACT DOCUMENTS. ALL OF THE DRAWINGS AND SPECIFICATIONS MUST BE REVIEWED FOR THEIR INTERRELATIONSHIP AND REQUIRED COORDINATION BETWEEN DISCIPLINES.
9. ALL RECEPTACLES AND SWITCHES SHALL BE OUTDOOR RATED AND WEATHER PROOF.

LEGEND	
	LIGHTING AND POWER
	CONDUIT RUN CONCEALED UNDERGROUND.
	PANELBOARD, SEE SCHEDULE.
	DISCONNECT SWITCH, SIZE AS NOTED ON DRAWINGS. FUSED PER MANUFACTURER'S NAME PLATE DATA OF EQUIPMENT SERVED.

FEEDER SCHEDULE	
DESIGNATION	CONDUIT & CONDUCTORS
2G	3/4" PVC - 1#2G
20A-3G	3/4" C - 2#12, 1#12G
20A-4G	3/4" C - 3#12, 1#12G
30A-3G	1" C - 3#10, 1#10G
60A-4G	1.25" C - 4#6, 1#10G
80A-3G	1.25" C - 3#4, 1#6G
220A-4G	2" C - 4#3/0, 1#6G
225A-4	2.5" C - 4#4/0
225A-4G	2.5" C - 4#4/0, 1#4G



T.V.S.S. SCHEDULE		
TYPE	DESCRIPTION	NOTES
1	DISTRIBUTION PANEL (277/480 VOLTS, 3 PHASE) - 100,000 AMP RATED	1
2	DISTRIBUTION PANEL (120/208 VOLTS, 3 PHASE) - 80,000 AMP RATED	1

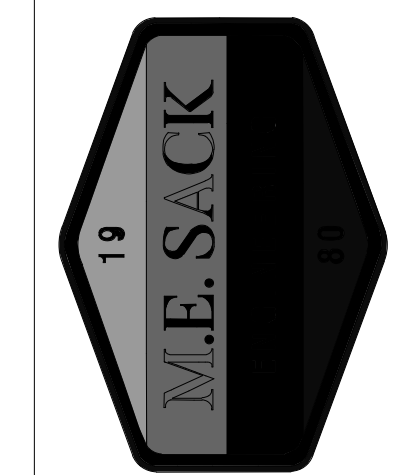
SCHEDULE NOTES:
1. SEE SPECIFICATIONS FOR DETAILS.

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GEORGIA REGISTERED PROFESSIONAL ENGINEER
NO. 038816
MARCUS E. SACK
DATE: AUGUST 14, 2023



MUNICIPALITY:
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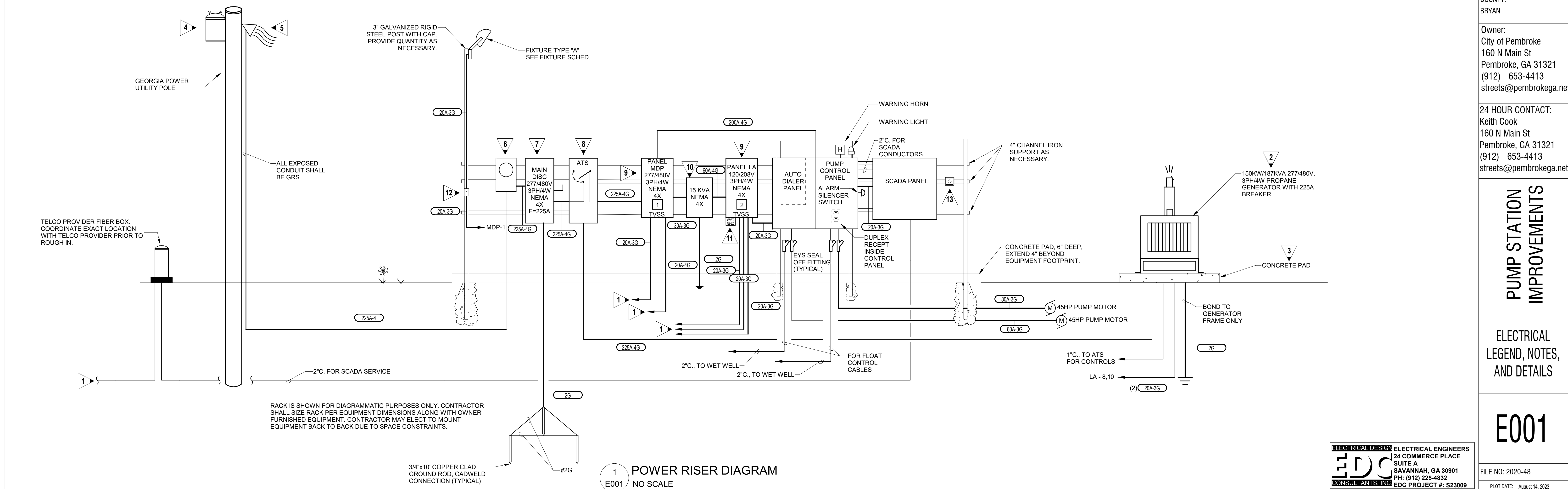
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PUMP STATION IMPROVEMENTS

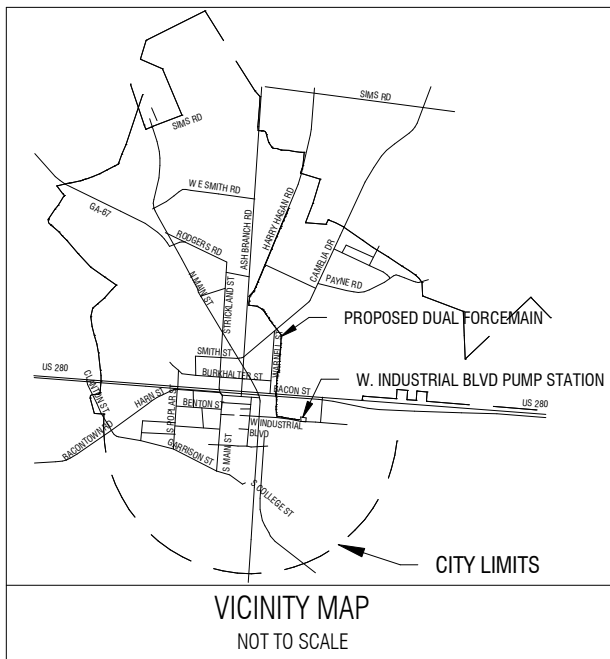
ELECTRICAL LEGEND, NOTES, AND DETAILS

E001

FILE NO: 2020-48
PLOT DATE: August 14, 2023



1 POWER RISER DIAGRAM
E001 NO SCALE



SPECIFICATIONS:

SECTION 16000 - GENERAL

1.01 WORK INCLUDED

- A. THIS DIVISION OF THE SPECIFICATIONS (16000) COVERS THE COMPLETE EXTERIOR ELECTRICAL SYSTEM FOR ALL WORK SHOWN ON THE DRAWINGS AS SPECIFIED HEREIN PROVIDING ALL MATERIAL, LABOR AND EQUIPMENT REQUIRED FOR THE INSTALLATION OF THE ELECTRICAL SYSTEMS COMPLETE AND IN OPERATING CONDITION.
- B. INCLUDE IN THE ELECTRICAL WORK ALL THE NECESSARY SUPERVISION AND THE ISSUING OF ALL COORDINATING INFORMATION TO ANY OTHER TRADES WHO ARE SUPPLYING WORK TO ACCOMMODATE THE ELECTRICAL INSTALLATIONS.
- C. THE DRAWINGS FOR ELECTRICAL WORK UTILIZE SYMBOLS AND SCHEMATIC DIAGRAMS WHICH HAVE NO DIMENSIONAL SIGNIFICANCE. THE WORK SHALL THEREFORE, BE INSTALLED TO FULFILL THE DIAGRAMMATIC INTENT EXPRESSED ON THE ELECTRICAL DRAWINGS.
- D. SUBMIT FOR APPROVAL BY THE ENGINEER ALL MATERIALS AND EQUIPMENT TO BE INCORPORATED IN THE ELECTRICAL WORK.
- E. SUBMIT ONLY SHOP DRAWINGS WHICH COMPLY WITH THE CONTRACT DOCUMENTS.
- F. MARK EACH INDIVIDUAL SUBMITTAL ITEM TO SHOW SPECIFICATION SECTION WHICH PERTAINS TO THE ITEM.
- G. WHEN SHOP DRAWINGS ARE REVIEWED, SOME ERRORS MAY BE DETECTED BUT OTHERS MAY BE OVERLOOKED. THIS DOES NOT GRANT THE CONTRACTOR PERMISSION TO PROCEED IN ERROR, REGARDLESS OF ANY INFORMATION CONTAINED IN THE SHOP DRAWINGS, THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS SHALL BE FOLLOWED AND ARE NOT WAIVED OR SUPERSEDED IN ANY WAY BY THE SHOP DRAWING REVIEW.
- H. ONE COMPLETE SET OF ELECTRICAL DRAWINGS SHALL BE RESERVED FOR AS-BUILT DRAWINGS. ANY APPROVED DEVIATION FROM THE CONTRACT DRAWINGS SHALL BE RECORDED ON THESE DRAWINGS.
- I. COMPLETED AS-BUILT DRAWINGS SHALL BE PRESENTED TO THE ARCHITECT PRIOR TO FINAL INSPECTION.
- J. PROVIDE AT THE TIME OF FINAL INSPECTION THREE SETS OF MAINTENANCE AND OPERATING INSTRUCTION FOR: LIGHTING AND POWER PANELBOARD, FUSES, WIRING DEVICES
- K. ALL ELECTRICAL WORK SHALL MEET OR EXCEED THE LATEST REQUIREMENTS OF THE FOLLOWING CODES AND/OR OTHER AUTHORITIES EXERCISING JURISDICTION OVER THE ELECTRICAL CONSTRUCTION WORK AND THE PROJECT.
- THE NATIONAL ELECTRICAL CODE (NFPA 70) - 2020 EDITION
 - THE NATIONAL ELECTRICAL SAFETY CODE (ANSI C-2)
 - THE LIFE SAFETY CODE (NFPA 101) - 2018 EDITION
 - THE INTERNATIONAL BUILDING CODE - 2018 EDITION
 - REGULATIONS OF THE LOCAL UTILITY COMPANY WITH RESPECT TO METERING AND SERVICE ENTRANCE.
 - MUNICIPAL AND STATE ORDINANCES GOVERNING ELECTRICAL WORK.
- L. ALL REQUIRED PERMITS AND INSPECTION CERTIFICATES SHALL BE OBTAINED, AND MADE AVAILABLE AT THE COMPLETION OF THE WORK. PERMITS, INSPECTIONS, AND CERTIFICATION FEES SHALL BE PAID FOR AS A PART OF THE ELECTRICAL WORK.
- M. THIS CONTRACTOR SHALL SCHEDULE HIS WORK AND IN EVERY WAY POSSIBLE COOPERATE WITH ALL OTHER CONTRACTORS ON THE JOB TO AVOID DELAYS, INTERFERENCES, AND UNNECESSARY WORK. HE SHALL NOTIFY THEM OF ALL OPENINGS, HANGERS, EXCAVATIONS, ETC., SO THAT PROPER PROVISIONS SHALL BE MADE FOR HIS WORK.
- N. THIS CONTRACTOR SHALL DO ALL CUTTING AND EXCAVATING NECESSARY FOR THE COMPLETE INSTALLATION OF HIS WORK, BUT HE SHALL NOT CUT THE WORK OF ANY OTHER CONTRACTOR WITHOUT FIRST CONSULTING THE ARCHITECT. HE SHALL REPAIR ANY WORK DAMAGED BY HIM OR HIS WORKMEN, EMPLOYING THE SERVICES OF THE CONTRACTOR WHOSE WORK IS DAMAGED. SAW CUT EXISTING SLAB AS REQUIRED FOR ROUTING CONDUITS AND FLOOR BOXES NOTED TO BE INSTALLED IN EXISTING FLOORS. RESTORE TO ORIGINAL FINISH.
- O. RACEWAYS, FIXTURES, DEVICES, AND OTHER ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER AND IN ACCORDANCE WITH RECOGNIZED GOOD PRACTICE FOR A FIRST CLASS INSTALLATION.
- P. THE ENGINEER OR HIS REPRESENTATIVE SHALL HAVE THE AUTHORITY TO REJECT ANY WORKMANSHIP NOT COMPLYING WITH THE CONTRACT DOCUMENTS.
- Q. THE ELECTRICAL CONTRACTOR SHALL PERSONALLY OR THROUGH AN AUTHORIZED LICENSED AND COMPETENT ELECTRICIAN, CONSTANTLY SUPERVISE THE WORK FROM BEGINNING TO COMPLETE AND FINAL INSPECTION.
- R. CONSULT OWNER AND UTILITY COMPANIES FOR UNDERGROUND LINES BEFORE ANY UNDERGROUND WORK IS STARTED. CONTRACTORS SHALL BE RESPONSIBLE FOR ANY DAMAGE.
- S. ALL EMPTY CONDUITS SHALL HAVE A PULL STRING INSTALLED. ALL FLUSH RECESSED BOXES SHALL HAVE BLANK PLATES INSTALLED.
- T. THE CONTRACTOR SHALL PERFORM ALL EXCAVATION TO INSTALL CONDUIT STRUCTURES AND EQUIPMENT SPECIFIED IN THIS DIVISION OF THE SPECIFICATIONS.
- U. TRENCH EXCAVATION. THE BOTTOM OF THE TRENCHES SHALL BE GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. OVER DEPTHS SHALL BE BACKFILLED WITH LOOSE, GRANULAR, MOIST EARTH, TAMPED. REMOVED UNSTABLE SOIL THAT IS NOT CAPABLE OF SUPPORTING THE CONDUIT AND REPLACE WITH SPECIFIED MATERIAL.
- V. BACKFILLING. THE TRENCHES SHALL BE BACKFILLED WITH THE EXCAVATED MATERIALS APPROVED FOR BACKFILLING, CONSISTING OF EARTH, LOAM, SANDY CLAY, AND GRAVEL OR SOFT SHALE. FREE FROM LARGE CLODS OF EARTH OR STONES, DEPOSITED IN 6" LAYERS AND TAMPED UNTIL THE CONDUIT HAS A COVER OF NOT LESS THAN THE ADJACENT EXISTING GROUND BUT NOT GREATER THAN 2" ABOVE EXISTING GROUND.
- W. ALL EQUIPMENT REQUIRING ELECTRICAL POWER CONNECTIONS SHALL BE CONNECTED UNDER THIS DIVISION OF THESE SPECIFICATIONS.
- X. ELECTRICAL CIRCUITS TO EQUIPMENT FURNISHED UNDER OTHER SECTIONS OF THESE SPECIFICATIONS ARE BASED ON DESIGN LOADS. IF ACTUAL EQUIPMENT FURNISHED HAS LOADS OTHER THAN DESIGN LOADS ELECTRICAL CIRCUITS AND PROTECTIVE DEVICES SHALL BE REVISED TO BE COMPATIBLE WITH EQUIPMENT FURNISHED AT NO ADDITIONAL COST TO THE OWNER. ANY REVISIONS MUST HAVE PRIOR APPROVAL BY THE ARCHITECT.
- Y. REMOVE OIL, DIRT, GREASE AND FOREIGN MATERIALS FROM ALL RACEWAYS, FITTINGS, BOXES, PANELBOARD TRIMS AND CABINETS TO PROVIDE A CLEAN SURFACE FOR PAINTING, TOUCH-UP SCRATCHED OR MARRED SURFACES OF LIGHTING FIXTURES, PANELBOARD AND CABINET TRIMS, MOTOR CONTROL CENTER, SWITCHBOARD OR EQUIPMENT ENCLOSURES WITH PAINT FURNISHED BY THE EQUIPMENT MANUFACTURERS SPECIFICALLY FOR THAT PURPOSE.
- Z. THE ELECTRICAL SERVICE AND TELEPHONE/CATV SERVICE FOR THIS PROJECT HAS BEEN COORDINATED BETWEEN THE ENGINEER AND THE UTILITY COMPANY. HOWEVER, BEFORE INSTALLING SERVICE CONDUIT (UNDERGROUND OR MAST), CONTRACTOR SHALL CONTACT UTILITY COMPANY AND VERIFY VOLTAGE, LOCATION AND TYPE OF SERVICE. PRIOR TO ROUGH-IN, COORDINATE AN ON-SITE MEETING WITH EACH UTILITY COMPANY TO REVIEW EXACT REQUIREMENTS. SUBMIT LETTER OF COORDINATION TO ENGINEER FOR REVIEW.
- AA. ALL SYSTEMS AND COMPONENT PARTS SHALL BE GUARANTEED FOR ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE COMPLETE PROJECT. DEFECTS FOUND DURING THIS GUARANTEED PERIOD SHALL BE PROMPTLY CORRECTED AT NO ADDITIONAL COST TO THE OWNER.

SECTION 16010 - LIGHTING AND POWER PANELBOARDS

- A. COMPLETE PANELBOARD SHOP DRAWINGS SHALL BE SUBMITTED, LISTING AS A MINIMUM THE FOLLOWING ITEMS: VOLTAGE RATING, BUS ASSEMBLY RATING, MAIN BREAKER RATING BY CAPACITY, NUMBER OF POLES AND INTERRUPTING RATINGS IN RMS SYMMETRICAL AMPERES, SURFACE OR FLUSH MOUNTING, LISTING OF BRANCH BREAKERS BY CAPACITY NUMBER OF POLES AND INTERRUPTING RATING IN RMS SYMMETRICAL AMPERES, SCHEDULE SIMILAR TO THAT SHOWN ON THE DRAWINGS, DEPICTING BRANCH BREAKER ARRANGEMENT AND BREAKER SIZES AND GIVING FULL EXPLANATION FOR ANY DIFFERENCE BETWEEN THE TWO., LUG SIZES AS REQUIRED FOR FEEDERS SHOWN ON DRAWINGS.
- B. FOR THE PURPOSE OF SELECTING QUALITY AND TYPES OF PANELS, EQUIPMENT AS MANUFACTURED BY SQUARE "D" COMPANY HAS BEEN SPECIFIED. FOLLOWING MANUFACTURERS MEETING THESE SPECIFICATIONS ARE ACCEPTABLE: G. E., SIEMENS, CUTLER HAMMER
- C. FURNISH AND INSTALL CIRCUIT BREAKER LIGHTING AND POWER PANELBOARDS AS INDICATED IN THE PANELBOARD SCHEDULE AND WHERE SHOWN ON THE PLANS. PANELBOARDS SHALL BE OF THE DEAD-FRONT SAFETY TYPE, EQUIPPED WITH THERMAL MAGNETIC MOLDED CASE CIRCUIT BREAKERS WITH FRAME AND TRIP RATING AS SHOWN IN THE SCHEDULE.
- D. CIRCUIT BREAKERS SHALL BE HACR RATED, QUICK-MAKE, QUICK-BREAK, THERMAL-MAGNETIC, TRIP-INDICATING, AND HAVE COMMON TRIP ON ALL MULTI-POLE BREAKERS. TRIP INDICATION SHALL BE CLEARLY SHOWN BY THE BREAKER HANDLE TAKING POSITION BETWEEN ON AND OFF, WHEN THE BREAKER IS TRIPPED. BRANCH CIRCUIT BREAKERS FEEDING CONVENIENCE OUTLETS SHALL HAVE SENSITIVE INSTANTANEOUS TRIP SETTING OF NOT MORE THAN 10 TIMES THE TRIP RATING OF THE BREAKERS. CONNECTION TO BUS IN ALL PANELS SHALL BE BOLTED. ALL BREAKERS SHALL BE 20 AMPERE TRIP, UNLESS OTHERWISE SHOWN. ALL BREAKERS SHALL BE MINIMUM FOR 120/208 VOLTS 25,000 A.I.C. SYM. UNLESS OTHERWISE NOTED.
- E. A STEEL CIRCUIT DIRECTORY FRAME PERMANENTLY ATTACHED (SPOT WELDED) AT FACTORY (NOT GLUED), AND CARD WITH A CLEAR PLASTIC COVERING SHALL BE PROVIDED ON THE INSIDE OF THE DOOR. THE DIRECTORY CARD SHALL PROVIDE A SPACE AT LEAST 1/4" HIGH X 3" LONG FOR EACH CIRCUIT.
- F. ALL PANELS SHALL BE EQUIPPED WITH A COPPER EQUIPMENT GROUNDING BAR. THE BAR SHALL HAVE LUGS OF SUFFICIENT SIZE TO HANDLE ALL GROUNDING CONDUCTORS.
- G. WIRING IN PANELBOARDS SHALL BE NEATLY GROUPED AND SECURED WITH TY-WRAPS.
- H. ELECTRICAL PANELS SHALL NOT BE USED AS WIREWAYS OR JUNCTION BOXES FOR CONTROL CONDUCTORS.

SECTION 16020 - RACEWAYS

- A. ACCEPTABLE MANUFACTURERS OF RIGID STEEL CONDUIT ARE: ALLIED TUBE AND CONDUIT CO., WHEATLAND TUBE CO., REPUBLIC CONDUIT.
- B. ACCEPTABLE MANUFACTURER'S OF POLYVINYL CHLORIDE (PVC) CONDUIT ARE: CERTAINTEED, GEORGIA PIPE, CARLON, CAN-TEX.
- C. ALL METALLIC CONDUIT SHALL BE STEEL, OF STANDARD PIPE DIMENSIONS, SMOOTH INSIDE AND OUT, AND SHALL BE GALVANIZED. WHERE THE WORD "CONDUIT" IS USED HEREINAFTER IT SHALL MEAN EITHER RIGID STEEL CONDUIT, LIQUID TIGHT FLEXIBLE STEEL CONDUIT OR SCHEDULE 40 PLASTIC CONDUIT. INTERMEDIATE GRADE CONDUIT IS NOT ACCEPTABLE.
- D. GALVANIZED RIGID STEEL CONDUIT SHALL BE USED IN ALL AREAS WHERE IT WILL BE EXPOSED TO PHYSICAL DAMAGE. SCHEDULE 40 PLASTIC CONDUIT SHALL BE USED UNDERGROUND AND IN SLAB-ON-GRADE. IN NO CASE SHALL PLASTIC CONDUIT BE EXPOSED TO RIGID STEEL CONDUIT WHEN TURNING UP EXPOSED. ANY EXPOSED CONDUIT SHALL BE GALVANIZED RIGID STEEL ONLY.
- E. GALVANIZED RIGID STEEL CONDUIT COUPLINGS AND CONNECTIONS:
- INSTALL STANDARD, CONDUIT-THREADED FITTINGS.
 - FOR CONNECTION TO SHEET METAL BOXES, CABINETS AND OTHER SHEET METAL ENCLOSURES, INSTALL LOCKNUTS ON THE INSIDE AND OUTSIDE OF THE ENCLOSURE FOR EACH CONNECTION. SEE SECTION 16110 OF THESE SPECIFICATIONS.
- F. INSTALLATION OF PLASTIC CONDUIT:
- SHALL BE A MINIMUM OF 2'-0" BELOW FINISHED GRADE WHEN NOT COVERED BY CONCRETE.
 - SHALL HAVE PROPERLY SIZED BOND WIRE INSTALLED WITH ALL CIRCUITS.
 - BENDS AND TURNS SHALL BE KEPT TO A BARE MINIMUM.
 - ALL CONDUIT AND FITTINGS SHALL BE SOLVENT WELDED.
 - PLASTIC CONDUIT MAY BE TURNED UP CONCEALED IN MASONRY AND GYPSUM BOARD WALLS. PVC CONDUIT SHALL BE ALLOWED TO BE ROUTED CONCEALED IN WALLS TO A MAXIMUM HEIGHT OF 48" A.F.F.
 - DO NOT INSTALL CONDUIT IN SLAB. ALL CONDUIT SHALL BE INSTALLED A MINIMUM OF 6" BELOW SLAB. CONDUITS SHALL NOT BE BUNCHED TOGETHER. MAINTAIN 1" CLEARANCE BETWEEN CONDUITS.
 - ALL 90° ELBOWS USED FOR FEEDER CONDUITS ROUTED TO SERVICE TRANSFORMERS, MAIN SWITCHGEAR AND PANELBOARDS SHALL BE GALVANIZED RIGID STEEL. 90° PVC ELBOWS FOR FEEDER CONDUITS SHALL NOT BE PERMITTED.
- G. INSULATED BUSHINGS:
- INSTALL NYLON INSULATED BUSHINGS ON THE END OF ALL RIGID CONDUIT.
 - THE INSULATING MATERIAL SHALL BE DESIGNED FOR RUGGED, LONG SERVICE.
 - BUSHINGS WHICH CONSIST OF ONLY INSULATING MATERIAL WILL NOT BE ACCEPTED.
 - FITTINGS WHICH INCORPORATE INSULATED BUSHINGS WILL BE CONSIDERED FOR APPROVAL IN LIEU OF FITTINGS WITH SEPARATE BUSHINGS.
- H. ALL COUPLINGS AND CONNECTIONS IN LOCATION WHERE WATER OR OTHER LIQUID OR VAPOR MIGHT CONTACT THE CONDUIT SHALL ALSO BE WATERTIGHT.
- I. CLOSE EMPTY CONDUIT AS COMPLETE RUNS BEFORE PULLING IN THE CABLES AND WIRES.

SECTION 16030 - CONDUCTORS

- A. ACCEPTABLE MANUFACTURERS ARE: GENERAL, SOUTHWIRE, ESSEX OR APPROVED EQUAL
- B. ALL WIRING SHALL BE MANUFACTURED IN THE UNITED STATES.
- C. RATINGS AND SIZES:
- SHALL BE NOT LESS THAN INDICATED ON THE DRAWINGS AND NOT LESS THAN REQUIRED BY THE NEC.
 - MINIMUM SIZE SHALL BE NO. 12 AWG COPPER PROVIDED THE MAXIMUM VOLTAGE DROP IN THE CONTROL CIRCUITS WILL NOT ADVERSELY AFFECT THE OPERATION OF THE CONTROLS.
 - CONDUCTOR SIZES INDICATED ON THE DRAWINGS ARE FOR COPPER CONDUCTORS.
- D. CONDUCTORS AND GROUND WIRES:
- SHALL BE COPPER.
 - SIZE NO. 8 AWG AND LARGER SHALL BE STRANDED.
 - SIZE NO. 10 AWG AND SMALLER SHALL BE SOLID.
- E. CONDUCTOR INSULATION: CONDUCTOR INSULATION SHALL BE THE NEC TYPE THHN.
- F. WIRE SHALL BE FACTORY COLOR CODED IN SIZE NO. 6 AND SMALLER. COLOR SHALL BE BY INTEGRAL PIGMENTATION WITH A SEPARATE COLOR FOR EACH PHASE, NEUTRAL AND GROUNDING CONDUCTOR. COLOR CODE PER PHASE SHALL BE CONTINUOUS THROUGHOUT THE PROJECT.
- G. ALL WIRING SHALL BE IN CONDUIT UNLESS SPECIFICALLY NOTED OTHERWISE.
- H. OUTER JACKETS SHALL FOLLOW N.E.C. REQUIREMENT.
- DEDICATED NEUTRALS SHALL BE PROVIDED FOR ALL MULTI-WIRE BRANCH CIRCUITS AND OUTER JACKET SHALL BE PROVIDED WITH APPROPRIATE COLORED TRACER. WHITE WITH BLACK TRACER. COLORS SHALL BE PERMANENT AND SHALL WITHSTAND CLEANINGS.

SECTION 16110 - GROUNDING

- A. THE WORK REQUIRED UNDER THIS SECTION OF THE SPECIFICATIONS CONSISTS OF FURNISHING, INSTALLATION AND CONNECTIONS OF THE SECONDARY GROUNDING SYSTEMS. THE ELECTRICAL SYSTEM SHALL BE A 3 PHASE, 4 WIRE GROUND WYE DELTA SYSTEM SUPPLEMENTED WITH EQUIPMENT GROUNDING SYSTEM. EQUIPMENT GROUNDING SYSTEM SHALL BE ESTABLISHED WITH EQUIPMENT GROUNDING CONDUCTORS; THE USE OF METALLIC RACEWAYS FOR EQUIPMENT GROUNDING IS NOT ACCEPTABLE.
- B. ALL MATERIALS SHALL BE UL LISTED AND BEAR A UL LABEL.
- C. GROUNDING ELECTRODE CONDUCTOR SHALL BE BARE OR GREEN INSULATED COPPER CONDUCTOR SIZED AS INDICATED ON THE DRAWINGS.
- D. EQUIPMENT GROUNDING CONDUCTORS SHALL BE GREEN INSULATED TYPE THHN CONDUCTORS SIZED AS INDICATED ON THE DRAWINGS. WHERE SIZE IS NOT INDICATED ON THE DRAWINGS, CONDUCTOR SIZE SHALL BE DETERMINED FROM THE NATIONAL ELECTRICAL CODE TABLE OF SIZES OF EQUIPMENT GROUNDING CONDUCTORS.
- E. BONDING JUMPERS SHALL BE FLEXIBLE COPPER BONDING. JUMPERS SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE TABLE ON SIZES OF EQUIPMENT GROUNDING ELECTRODE CONDUCTORS.
- F. EACH RECEPTACLE AND SWITCH DEVICE SHALL BE FURNISHED WITH A GROUNDING SCREW CONNECTED TO THE METALLIC DEVICE FRAME. BOND EQUIPMENT GROUNDING CONDUCTOR TO EACH OUTLET BOX. FOR ISOLATED GROUND RECEPTACLES, BOND EQUIPMENT GROUNDING CONDUCTOR TO BOX, AND ISOLATED GROUND CONDUCTOR TO DEVICE GROUNDING SCREW.
- G. GROUND RODS SHALL BE 3/4" X 10'-0" COPPER CLAD STEEL. CONNECTION TO ALL GROUND RODS SHALL BE BY EXOTHERMIC WELD.
- H. GROUND ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL SYSTEM, I.E., WIREWAYS, EQUIPMENT ENCLOSURES AND FRAMES, JUNCTION AND OUTLET BOXES, MACHINE FRAMES AND OTHER CONDUCTIVE ITEMS IN CLOSE PROXIMITY WITH ELECTRICAL CIRCUITS, TO PROVIDE A LOW IMPEDANCE PATH FOR POTENTIAL GROUNDING FAULTS.
- I. SERVICE ENTRANCE AND SEPARATELY DERIVED ELECTRICAL SYSTEMS, GROUNDING ELECTRODE SYSTEM.
- THE NEUTRAL CONDUCTOR OF THE ELECTRICAL SERVICE SERVING THE PREMISES WIRING SYSTEM SHALL BE GROUND TO THE GROUND BUS BAR IN THE SERVICE EQUIPMENT, THE GROUND ROD SYSTEM, AND OTHER GROUNDING ELECTRODES SPECIFIED HEREIN OR INDICATED ON THE DRAWINGS. GROUNDING ELECTRODE CONDUCTORS SHALL BE INSTALLED IN RIGID, NON-METALLIC CONDUIT TO POINT OF GROUND CONNECTION, UNLESS SUBJECT TO PHYSICAL DAMAGE IN WHICH CASE THEY SHALL BE INSTALLED IN GALVANIZED RIGID STEEL. WHERE METALLIC CONDUIT IS PERMITTED, BOND CONDUIT AT BOTH ENDS TO GROUNDING ELECTRODE CONDUCTOR WITH A UL BONDING BUSHING.
- J. BONDING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
- K. INSTALL GROUND RODS WHERE INDICATED ON THE DRAWINGS WITH THE TOP OF THE GROUND RODS 12" BELOW FINISHED GRADE.
- L. GROUNDING CONDUCTORS SHALL BE PROVIDED IN ALL BRANCH CIRCUIT RACEWAYS AND CABLES. GROUNDING CONDUCTORS SHALL BE THE SAME AWG SIZE AS BRANCH CIRCUIT CONDUCTORS.
- M. A GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FLEXIBLE CONDUIT INSTALLATIONS. FOR BRANCH CIRCUITS, GROUNDING CONDUCTOR SHALL BE SIZED TO MATCH BRANCH CIRCUIT CONDUCTORS.
- N. A FEEDER SERVING SEVERAL PANELBOARDS SHALL HAVE A CONTINUOUS GROUNDING CONDUCTOR WHICH SHALL BE CONNECTED TO EACH RELATED CABINET GROUNDING BAR.
- O. UPON COMPLETION OF THE GROUND ROD INSTALLATION, GROUNDING RESISTANCE READING SHALL BE TAKEN BEFORE CONNECTION IS MADE TO THE BUILDING COLD WATER PIPING SYSTEM. GROUND RESISTANCE READINGS SHALL NOT BE TAKEN WITHIN FORTY-EIGHT HOURS OF RAINFALL. RESULTS OF GROUND RESISTANCE READINGS SHALL BE FORWARDED, IN WRITING, IMMEDIATELY TO THE ENGINEER AND OWNER.

SECTION 16120 - EQUIPMENT IDENTIFICATION

- A. LAMINATED PLASTIC PLATES WITH 3/16" HIGH WHITE LETTER ETCHED ON BLACK BACKGROUND.
- B. PLATES SHALL BE PERMANENTLY MOUNTED UTILIZING POP RIVETS OR A PERMANENT MASTIC/EPOXY.
- C. PAINTED, STENCILED OR INDENTED TAPE IDENTIFICATION IS NOT ACCEPTABLE.
- D. ALL ELECTRICAL APPARATUS SUCH AS WIRING TROUGHS, PANELBOARDS, INDIVIDUAL CIRCUIT BREAKERS, TRANSFORMERS AND DISCONNECT SWITCHES SHALL HAVE LAMINATED PLASTIC IDENTIFICATION PLATES. IDENTIFICATION SHALL MATCH LABELING SHOWN ON PLANS.
- E. A "STEEL" CIRCUIT DIRECTORY FRAME PERMANENTLY ATTACHED AT FACTORY (NOT GLUED), AND A DIRECTORY CARD WITH A PLASTIC COVERING SHALL BE PROVIDED ON THE INSIDE OF EACH PANEL DOOR. THE DIRECTORY SHALL BE TYPED TO IDENTIFY THE LOAD FED BY EACH CIRCUIT AND THE AREAS SERVED. SPACES OR ROOM NUMBERS SHOWN ON THE DRAWINGS ARE NOT NECESSARILY THE FINAL NUMBERS TO BE ASSIGNED TO THESE AREAS. THE CONTRACTORS SHALL BEFORE COMPLETION OF THE PROJECT OBTAIN FROM THE ARCHITECT FINAL SPACE OR ROOM NUMBERS SO THAT IT CAN BE TYPED ONTO DIRECTORY.
- F. CIRCUIT BREAKERS AND DISCONNECTS SHALL IDENTIFY DESIGNATION OF THE EQUIPMENT SERVED, CIRCUIT AND PANEL FROM WHICH IT IS SERVED AS WELL AS VOLTAGE/PHASE OF CIRCUIT.
- G. ON ALL PANELBOARDS THE EXTERIOR IDENTIFICATION PLATE SHALL MATCH THAT ON THE DRAWINGS AND THE PANEL AND CIRCUIT NUMBER SERVING THE PANEL SHALL BE DESIGNATED WITHIN THE PANEL.

SECTION 16190 ENGINE GENERATOR SET

- A. PROVIDE LABOR AND MATERIAL NECESSARY TO INSTALL A PROPANE GAS STANDBY ENGINE-GENERATOR SET OF THE LATEST COMMERCIAL TYPE AND DESIGN AS SPECIFIED HEREIN.
- B. THE CONTRACTOR SHALL FURNISH INFORMATION SHOWING MANUFACTURERS' MODEL NUMBER, DIMENSIONS, AND WEIGHTS FOR THE ENGINE, GENERATOR, AND MAJOR AUXILIARY EQUIPMENT.
- C. THE FOLLOWING MANUFACTURERS MEETING THESE SPECIFICATIONS ARE ACCEPTABLE: ONAN, CATERPILLAR/OLYMPIAN, DETROIT PROPANE/WILLIAMS, KOHLER AND GENERAC.
- D. THE CONTRACTOR SHALL SUBMIT COPIES OF PERTINENT DRAWINGS AND SCHEMATIC DIAGRAMS FOR APPROVAL AND SHALL INCLUDE THE FOLLOWING:
- ENGINE GENERATOR SET INCLUDING PLANS AND ELEVATIONS OR RISER VIEWS CLEARLY INDICATING ENTRANCE POINTS FOR EACH OF THE INTERCONNECTIONS REQUIRED.
 - ENGINE GENERATOR/EXCITER CONTROL CUBICLE.
 - FUEL CONSUMPTION RATE CURVES AT VARIOUS LOADS, VENTILATION AND COMBUSTION CFM REQUIREMENTS.
 - EXHAUST MUFFLERS AND VIBRATION ISOLATORS.
 - BATTERY CHARGER, BATTERY, AND BATTERY RACKS.
 - AUTOMATIC LOAD TRANSFER SWITCH.
 - ACTUAL ELECTRICAL DIAGRAMS INCLUDING SCHEMATIC DIAGRAMS AND INTERCONNECTION WIRING DIAGRAMS FOR ALL EQUIPMENT TO BE PROVIDED.
 - LEGENDS FOR ALL DEVICES ON ALL DIAGRAMS.
 - SEQUENCE OF OPERATION EXPLANATIONS FOR ALL PORTIONS OF ALL SCHEMATIC WIRING DIAGRAMS.

REVISIONS:

NO.	DATE	DESCRIPTION

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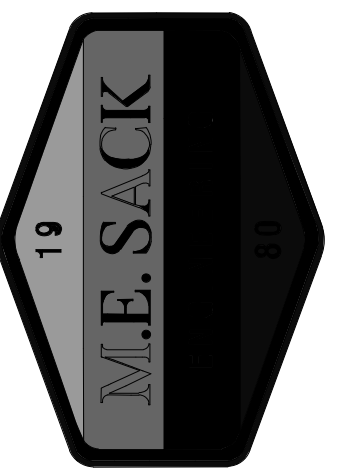
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DATE: AUGUST 14, 2023



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PUMP STATION
IMPROVEMENTS

ELECTRICAL
SPECIFICATIONS

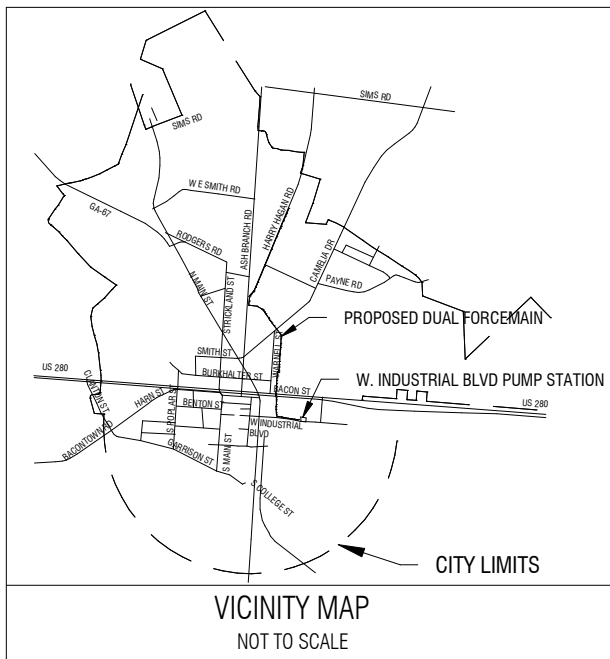
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FILE NO: 2020-48

PLOT DATE: August 14, 2023



ELECTRICAL DESIGN ELECTRICAL ENGINEERS
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EDC PROJECT #: S23009



SPECIFICATIONS:

E. ENGINE: THE ENGINE SHALL BE 1800 RPM, WATER-COOLED IN LINE OR VEE TYPE FOUR-STROKE CYCLE COMPRESSION IGNITION PROPANE GAS. THE ENGINE SHALL BE EQUIPPED WITH LUBE OIL INTAKE AIR FILTERS, LUBE OIL COOLER, ENGINE DRIVEN WATER PUMP, AND UNIT MOUNTED INSTRUMENTS, WATER TEMPERATURE GAUGE, LUBRICATION OIL PRESSURE GAUGE, AND BATTERY CHARGING AMMETER.

1. GOVERNOR - A GEAR DRIVEN HYDRAULIC GOVERNOR SHALL MAINTAIN FREQUENCY REGULATION NOT TO EXCEED 3% (1.8 HERTZ) FROM NO LOAD TO FULL RATED LOAD.
2. MOUNTING - THE UNITS SHALL BE MOUNTED ON A STRUCTURAL STEEL SUB-BASE AND SHALL BE PROVIDED WITH SUITABLE SPRING-TYPE ISOLATORS.
3. SAFETY DEVICES - SAFETY SHUT-OFF FOR HIGH WATER TEMPERATURE, LOW OIL PRESSURE, OVER-SPEED, AND ENGINE OVER-CRANK SHALL BE PROVIDED.
4. GUARDS - GUARDS SHALL BE PROVIDED OVER ALL EXPOSED MOVING PARTS AS REQUIRED BY OSHA.

F. THE GENERATOR SHALL BE RATED FOR CONTINUOUS STAND-BY SERVICE. SEE ELECTRICAL RISER DIAGRAM FOR EXACT SIZE.

G. THE GENERATOR SHALL BE A THREE PHASE, 60 HERTZ, SINGLE BEARING, ROTATING FIELD, SYNCHRONOUS TYPE BUILT TO NEMA STANDARDS. A VOLTAGE REGULATOR SHALL BE PROVIDED TO MATCH THE CHARACTERISTICS OF THE GENERATOR AND ENGINE. VOLTAGE REGULATION SHALL BE + - 2% FROM NO LOAD TO FULL RATED LOAD. READILY ACCESSIBLE VOLTAGE DROP, VOLTAGE LEVEL, AND VOLTAGE GAIN CONTROLS SHALL BE PROVIDED. VOLTAGE LEVEL ADJUSTMENTS SHALL BE A MINIMUM OF + - 5%. GENERATOR AND EXCITER SHALL BE INHERENTLY CAPABLE OF PARALLEL OPERATION WITH OTHER POWER SOURCES OF EQUIVALENT ELECTRICAL CHARACTERISTICS, AND STATOR SHALL INCLUDE A TWELVE LEAD, RE-CONNECTABLE BUS BAR SYSTEM FOR EASY LOAD CONNECTION. ENTIRE GENERATOR ASSEMBLY SHALL BE UL2200 LISTED.

H. RADIATOR - A RADIATOR WITH BLOWER TYPE FAN SHALL BE SIZED TO MAINTAIN SAFE OPERATION 110 DEGREES F AMBIENT TEMPERATURE. AIR FLOW RESTRICTION FROM THE RADIATOR SHALL NOT EXCEED 0.5" HO. THE ENGINE COOLING SYSTEM SHALL BE PRE-TREATED BY THE SYSTEM SUPPLIER FOR THE INHIBITION OF INTERNAL CORROSION, AND FREEZING.

I. HOUSING SHALL CONSIST OF A WEATHER PROOF ENCLOSURE TO COMPLETELY ENCLOSE THE ENGINE GENERATOR AND ACCESSORIES. HOUSING SHALL PROTECT THE ENGINE GENERATOR FROM THE ENVIRONMENT, YET BE CONDUCTIVE TO EASY MAINTENANCE. HOUSING SHALL HAVE REMOVABLE SWING OUT DOORS ON EACH SIDE AND LOCKABLE REAR DOOR FOR ACCESS TO METERS AND CONTROLS. SIDE DOORS SHALL HAVE A MEANS TO PAD LOCK. CONSTRUCTION OF HOUSING SHALL BE OF A MINIMUM 14 GAUGE SHEET STEEL AND PAINTED MANUFACTURERS STANDARD COLOR.

J. EXHAUST MUFFLER SHALL BE MOUNTED ON TOP OF HOUSING. THE EXHAUST MUFFLER SHALL BE A CRITICAL GRADE MUFFLER. MUFFLER SHALL BE FACTORY INSTALLED SO THAT ITS WEIGHT IS NOT SUPPORTED BY THE ENGINE. A FLEXIBLE EXHAUST FITTING SHALL BE SUPPLIED AND INSTALLED BETWEEN THE MUFFLER AND EXHAUST MANIFOLD. ALL ACCESSORIES SHALL BE FACTORY INSTALLED. THIS INCLUDES FLANGES, MUFFLER, TAIL PIPE AND RAIN CAP.

K. AUTOMATIC STARTING SYSTEM:

1. STARTING MOTOR - A DC ELECTRIC STARTING SYSTEM WITH POSITIVE ENGAGEMENT SHALL BE FURNISHED. THE MOTOR VOLTAGE SHALL BE AS RECOMMENDED BY THE ENGINE MANUFACTURER.
2. AUTOMATIC CONTROL - FULLY AUTOMATIC GENERATOR SET START-STOP CONTROLS IN THE GENERATOR CONTROL PANEL SHALL BE PROVIDED. CONTROLS SHALL PROVIDE SHUTDOWN FOR LOW OIL PRESSURE, HIGH WATER TEMPERATURE, OVER SPEED, OVER CRANK. CONTROLS SHALL INCLUDE A 30 SECOND SINGLE CRANKING CYCLE LIMIT WITH LOCKOUT.
3. JACKET WATER HEATER - A UNIT MOUNTED THERMAL CIRCULATION TYPE WATER HEATER INCORPORATING A THERMOSTATIC SWITCH SHALL BE FURNISHED TO MAINTAIN ENGINE JACKET WATER TO 70 DEGREES F. THE HEATER SHALL BE 120 VOLT, SINGLE PHASE, 60 HERTZ. PROVIDE PRESSURE SWITCH ACTUATED BY OIL PRESSURE TO SHUT DOWN HEATER WHEN OIL PRESSURE REACHES RUNNING PRESSURE.
4. BATTERY CHARGING ALTERNATOR - A BELT DRIVEN BATTERY CHARGING ALTERNATOR RATED 24 VOLTS, 35 AMP DC SHALL BE PROVIDED WITH TRANSISTORIZED VOLTAGE REGULATOR.
5. BATTERIES - A LEAD - ACID STORAGE BATTERY SET OF THE HEAVY DUTY PROPANE STARTING TYPE SHALL BE PROVIDED. BATTERY VOLTAGE SHALL BE COMPATIBLE WITH THE STARTING SYSTEM. THE BATTERY SET SHALL BE RATED NO LESS THAN 220 AMP-HOURS. NECESSARY CABLES AND CLAMPS SHALL BE PROVIDED.
6. BATTERY RACKS - BATTERY RACKS SHALL BE PROVIDED FOR EACH BATTERY AND SHALL CONFORM TO NEC 480 - 7 (A) (1). THEY SHALL BE CONSTRUCTED OF METAL AND SO TREATED AS TO BE RESISTANT TO DETERIORATING ACTION BY BATTERY ELECTROLYTE. FURTHER, CONSTRUCTION SHALL BE SUCH THAT NONCONDUCTING INSULATION MATERIAL DIRECTLY SUPPORTS THE CELLS.
7. BATTERY CHARGER - A CURRENT LIMITING BATTERY CHARGER SHALL BE FURNISHED TO AUTOMATICALLY RECHARGE BATTERIES. CHARGERS SHALL FLOAT AT 2.17 VOLTS PER CELL. IT SHALL INCLUDE OVERLOAD PROTECTION, SILICON DIODE FULL WAVE RECTIFIERS, VOLTAGE SURGE SUPPRESSOR, DC AMMETER, DC VOLT- METER, AND FUSED AC INPUT. AC INPUT VOLTAGE SHALL BE 120 VOLTS, SINGLE PHASE. AMPERAGE OUTPUT SHALL BE NO LESS THAN 6 AMPERES.

M. TYPE A GENERATOR MOUNTED NEMA 4X TYPE VIBRATION ISOLATED 14 GAUGE STEEL CONTROL PANEL SHALL BE PROVIDED. PANEL SHALL CONTAIN, BUT NOT BE LIMITED TO, THE FOLLOWING EQUIPMENT:

1. FREQUENCY METER, 3 1/2 INCH, DIAL TYPE.
2. VOLTMETER, 3 1/2 INCH, 2% ACCURACY.
3. AMMETER, 3 1/2 INCH, 2% ACCURACY.
4. AMMETER - VOLTMETER PHASE SELECTOR SWITCH.
5. AUTOMATIC STARTING CONTROLS AS SPECIFIED.
6. VOLTAGE LEVEL ADJUSTMENT RHEOSTAT.
7. DRY CONTACTS FOR REMOTE ALARM WIRED TO TERMINAL STRIPS.
8. INDIVIDUAL FAULT INDICATOR LIGHTS FOR LOW OIL PRESSURE, HIGH WATER TEMPERATURE, OVER SPEED, AND OVER CRANK.
9. THREE POSITION FUNCTION SWITCH MARKED, RUN-STOP AND REMOTE.
10. RUNNING TIME METER, OIL PRESSURE, BATTERY CHARGING AMMETER, AND WATER TEMPERATURE GAUGES.

N. TYPE A MAIN LINE, MOLDED CASE CIRCUIT BREAKER MOUNTED UPON AND SIZED TO THE OUTPUT OF THE GENERATOR SHALL BE INSTALLED AS A LOAD CIRCUIT INTERRUPTING AND PROTECTION DEVICE. IT SHALL OPERATE BOTH MANUALLY FOR NORMAL SWITCHING FUNCTIONS AND AUTOMATICALLY DURING OVERLOAD AND SHORT CIRCUIT CONDITIONS. THE TRIP UNIT FOR EACH POLE SHALL HAVE ELEMENTS PROVIDING INVERSE TIME DELAY DURING OVERLOAD CONDITIONS AND INSTANTANEOUS MAGNETIC TRIPPING FOR SHORT CIRCUIT PROTECTION. THE CIRCUIT BREAKER SHALL MEET STANDARDS ESTABLISHED BY UNDERWRITERS LABORATORIES NATIONAL ELECTRIC MANUFACTURER'S ASSOCIATION, AND NATIONAL ELECTRICAL CODE.

O. AUTOMATIC LOAD TRANSFER SWITCH:

1. THE AMPERAGE RATING OF THE AUTOMATIC LOAD TRANSFER SWITCH SHALL BE AS INDICATED IN THE ELECTRICAL RISER DIAGRAM.
2. EACH AUTOMATIC TRANSFER SWITCH SHALL BE MECHANICALLY HELD ON BOTH THE EMERGENCY AND THE NORMAL SIDE, AND RATED FOR CONTINUOUS DUTY IN AN UNVENTILATED ENCLOSURE. THE SWITCH SHALL BE DOUBLE THROW WITH THE MAIN CONTACTS RIGIDLY AND MECHANICALLY INTERLOCKED TO INSURE ONLY TWO POSSIBLE POSITIONS: NORMAL OR EMERGENCY. A MANUAL OPERATOR MUST BE PROVIDED TO ENABLE MANUAL OPERATION.
3. RATING AND PERFORMANCE: THE AUTOMATIC LOAD TRANSFER CONTROL SHALL BE RATED FOR CONTINUOUS DUTY WHEN ENCLOSED IN A NON-VENTILATED NEMA 1 ENCLOSURE. IT SHALL BE RATED FOR ALL CLASSES OF LOAD INCLUDING INDUCTIVE AND NON-INDUCTIVE AT 600 VOLTS AND TUNGSTEN LAMP LOAD AT 250 VOLTS. THE TRANSFER SWITCH PORTION OF THE CONTROL SHALL BE DESIGNED, BUILT, AND TESTED TO CLOSE ON AN INRUSH CURRENT UP TO AND INCLUDING TWENTY (20) TIMES THE CONTINUOUS RATINGS OF THE SWITCH WITHOUT WELDING OR EXCESSIVE BURNING OF THE CONTACTS. THE TRANSFER SWITCH SHALL BE CAPABLE OF SWITCHING LOAD UP TO AND INCLUDING FIFTEEN (15) TIMES THE CONTINUOUS RATING OF THE SWITCH AND CAPABLE OF ENDURING SIX THOUSAND (6000) CYCLES OF OPERATION, AT RATED CURRENT, AT A RATE OF SIX (6) CYCLES PER MINUTE, WITHOUT FAILURE. ONE CYCLE SHALL CONSIST OF ONE COMPLETE OPENING AND CLOSURE OF BOTH SETS OF CONTACTS ON AN INRUSH CURRENT OF TEN (10) TIMES THE CONTINUOUS RATING OF THE SWITCH. THE TRANSFER SWITCH SHALL HAVE TIME DELAY IN NEUTRAL TRANSITION (TDN).
4. TRANSFER SWITCH SHALL BE NEMA 4X RATED AND LISTED UNDER U.L. 1008, AND APPROVED BY CANADIAN STANDARDS ASSOCIATION. SWITCHES UTILIZING REVERSING CONTRACTOR MECHANISMS AS A MEANS TO TRANSFER LOAD ARE DISALLOWED AND WILL NOT BE CONSIDERED.
5. ACCESSORIES TO TRANSFER SWITCHES: ALL AUTOMATIC LOAD TRANSFER SWITCHES SHALL INCLUDE THE FOLLOWING ACCESSORIES:
 - a. ENGINE STARTING CONTACTS TO PROVIDE FOR GENERATOR STARTING FROM EACH UNIT INDEPENDENT OF THE OTHER.
 - b. FULL PHASE PROTECTION. THREE PHASE RELAYS SHALL BE FIELD ADJUSTABLE. CLOSE DIFFERENTIAL TYPE WITH 92-95% PICKUP AND 82-85% DROP OUT. RELAYS ARE TO BE CONNECTED ACROSS LIVE LINES.
 - c. TEST SWITCH, TO SIMULATE A POWER OUTAGE.
 - d. ADJUSTABLE TIME DELAY ON ENGINE STARTING TO OVER-RIDE MOMENTARY OUTAGES AND NUISANCE VOLTAGE DIPS.
 - e. ADJUSTABLE TIME DELAY ON TRANSFER OF LOAD TO EMERGENCY SOURCE. ADJUSTABLE TIME DELAY TO OPEN TRANSFER SWITCH CONTACT TO ALLOW MOTOR LOADS TO DECAY.
 - f. ADJUSTABLE TIME DELAY ON RETRANSFER TO LOAD TO NORMAL WITH 5 MINUTE COOL-DOWN TIMER WHEREIN THE GENERATOR SET RUNS UNLOADED AFTER TRANSFER TO LINE.
 - g. PLANT EXERCISER TO START AND RUN THE GENERATOR SET WITH OR WITHOUT LOAD EACH 168 HOURS FOR A 30 MINUTE INTERVAL. SELECTOR SWITCH WILL BE PROVIDED FOR WITH LOAD OR WITHOUT LOAD TESTING.
 - h. ONE AUXILIARY CONTACT CLOSED ON EMERGENCY AND ONE AUXILIARY CONTACT OPEN ON EMERGENCY.
 - i. PILOT LIGHTS TO INDICATE THE NORMAL AND EMERGENCY POSITION OF THE TRANSFER SWITCH.
 - j. ISOLATED (UNGROUNDING NEUTRAL BAR).
 - k. DISCONNECT PLUG.
 - l. TIME DELAY NEUTRAL, PROGRAMMED TRANSITION, OR IN PHASE MONITOR.

P. TRANSIENT VOLTAGE SURGE PROTECTION SHALL BE PROVIDED PROTECTING ALL LOW VOLTAGE CIRCUITS SERVING THE TRANSFER SWITCH AND THE ANNUNCIATOR. EDCO OR EQUAL.

Q. TESTING

1. PRIOR TO ACCEPTANCE OF THE INSTALLATION, EQUIPMENT SHALL BE TESTED TO SHOW IT IS FREE OF ANY DEFECTS AND WILL START AUTOMATICALLY AND BE SUBJECTED TO FULL LOAD TESTING THROUGH THE USE OF EXISTING LOADS AND, DRY TYPE LOAD BANKS SUPPLIED FOR THIS PURPOSE AT THE JOB SITE BY THE GENERATOR SET SUPPLIER.
2. LOAD BANK TESTING SHALL BE DONE IN THE PRESENCE OF THE OWNER'S ENGINEER OR HIS APPOINTED REPRESENTATIVE ONLY AFTER THE UNIT IS PERMANENTLY INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. IF TESTING IS COMPLETED WITHOUT BENEFIT OF ENGINEERS PRESENCE, TESTING SHALL BE DONE AGAIN IN HIS PRESENCE. TESTING SHALL BE FOR A PERIOD OF FOUR (4) HOURS UNDER FULL LOAD.

R. PRIOR TO THE FINAL INSPECTION, DELIVER 4 COPIES OF THE FOLLOWING ITEMS TO THE ENGINEER:

1. A CERTIFICATE BY THE MANUFACTURER OF THE ENGINE-GENERATOR SET THAT THE AUXILIARY ELECTRICAL POWER SYSTEM HAS BEEN PROPERLY INSTALLED, ADJUSTED AND TESTED.
2. CERTIFIED COPIES OF ALL OF THE FACTORY AND CONSTRUCTION SITE TEST DATA SHEETS AND REPORTS FOR THE ENGINE-GENERATOR SET AND MAJOR AUXILIARIES.
3. COMPLETE OPERATING AND MAINTENANCE MANUALS FOR THE ENGINE, GENERATOR SET AND AUXILIARIES INCLUDING WIRING DIAGRAMS, TECHNICAL DATA SHEETS AND INFORMATION FOR ORDERING REPLACEABLE PARTS:
 - a. INCLUDE COMPLETE INTERCONNECTION DIAGRAMS WHICH INDICATE ALL COMPONENTS OF THE SYSTEM.
 - b. INCLUDE COMPLETE DIAGRAMS OF THE INTERNAL WIRING FOR EACH OF THE ITEMS OF EQUIPMENT.
 - c. THE DIAGRAMS SHALL HAVE THEIR TERMINALS IDENTIFIED TO FACILITATE INSTALLATION, OPERATION AND MAINTENANCE.

S. LAMINATE OR MOUNT UNDER PLEXIGLAS A SET OF OPERATING INSTRUCTIONS FOR THE SYSTEM AND INSTALL IT UNDER A NEAT FRAME, ADJACENT TO TRANSFER SWITCH.

T. THE COMPLETE STANDBY ELECTRICAL SYSTEM FURNISHED UNDER THIS SECTION SHALL BE GUARANTEED AGAINST DEFECTIVE PARTS AND WORKMANSHIP UNDER TERMS OF THE MANUFACTURER'S AND DEALER'S STANDARD WARRANTY, BUT, IN NO EVENT SHALL IT BE FOR A PERIOD OF LESS THAN FIVE (5) YEARS OR 3000 HOURS FROM DATE OF FINAL TESTING AND ACCEPTANCE OF THE SYSTEM AND SHALL INCLUDE LABOR, PARTS AND TRAVEL TIME FOR NECESSARY REPAIRS AT THE JOB SITE. WARRANTY INFORMATION SHALL BE SUBMITTED ALONG WITH CONSTRUCTION SITE TEST DATA SHEETS. THIS INFORMATION SHALL LIST STARTING AND ENDING DATES AND WHO IS TO BE CONTACTED FOR WARRANTY SERVICE.

SECTION 16160 TRANSIENT VOLTAGE SURGE SUPPRESSORS

- A. FOR THE PURPOSE OF SELECTING QUALITY AND TYPE OF TVSS UNITS, EQUIPMENT AS MANUFACTURED BY CURRENT TECHNOLOGY INC. HAS BEEN SPECIFIED. THE FOLLOWING MANUFACTURERS MEETING THESE SPECIFICATIONS ARE ACCEPTABLE: SURGE SUPPRESSION, INC., LIEBERT, CLIPPER POWER SYSTEMS
- B. THE MANUFACTURER SHALL PROVIDE A LIMITED FIVE-YEAR WARRANTY, FROM THE DATE OF INSTALLATION, AGAINST FAILURE WHEN INSTALLED IN COMPLIANCE WITH APPLICABLE NATIONAL/LOCAL ELECTRICAL CODES AND THE MANUFACTURER'S RECOMMENDED INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- C. THESE SPECIFICATIONS DESCRIBE THE ELECTRICAL AND MECHANICAL REQUIREMENTS FOR A HIGH-ENERGY SUPPRESSION FILTER SYSTEM UTILIZING TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS) FOR APPLICATION IN CATEGORY C (MAIN SERVICE ENTRANCE) AND CATEGORY B (DISTRIBUTION PANELS) AREAS AS DEFINED BY THE IEEE C62.41 STANDARD.
- D. BASED ON ANSI/IEEE C62.41-1991'S STANDARD #20 MICROSECOND CURRENT WAVEFORM, AND IN ACCORDANCE WITH NEMA PUBLICATION NO. LS 1-1992, THE TESTED SINGLE-PULSE SURGE CURRENT CAPACITY, IN AMPS, OF THE UNIT SHALL BE NO LESS THAN THE FOLLOWING: MAIN SERVICE PANEL TOTAL RATING: 100,000 VA, DISTRIBUTION PANELS TOTAL RATING:80,000 VA.
- E. TVSS SHALL BE INTERNALLY MOUNTED IN PANEL.

SECTION 16220 - CONSTRUCTION REVIEWS INSPECTION AND TESTING

- A. THE ENGINEER OR HIS REPRESENTATIVE SHALL OBSERVE AND REVIEW THE INSTALLATION OF ALL ELECTRICAL SYSTEMS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.
- B. BEFORE COVERING OR CONCEALING ANY CONDUIT BELOW GRADE OR SLAB, IN WALL OR ABOVE CEILING, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT HE CAN REVIEW THE INSTALLATION.
- C. AT THE TIME OF THE CONTRACTOR'S FINAL INSPECTION, ALL SYSTEMS SHALL BE CHECKED AND TESTED FOR PROPER INSTALLATION AND OPERATION BY THE CONTRACTOR IN THE PRESENCE OF THE ARCHITECT OR HIS REPRESENTATIVE.
- D. THE CONTRACTOR SHALL FURNISH THE PERSONNEL, TOOLS AND EQUIPMENT REQUIRED TO INSPECT AND TEST ALL SYSTEMS.
- E. FOLLOWING IS A LIST OF ITEMS THAT THE CONTRACTOR MUST DEMONSTRATE TO THE ARCHITECT OR HIS REPRESENTATIVE AS COMPLYING WITH THE PLANS AND SPECIFICATIONS. PLEASE NOTE THAT THIS LIST DOES NOT NECESSARILY REPRESENT ALL ITEMS TO BE COVERED IN THE FINAL INSPECTION, BUT SHOULD GIVE THE CONTRACTOR AN IDEA OF WHAT IS TO BE REVIEWED.
 - a. SERVICE GROUND, SHOW CONNECTION TO GROUND ROD.
 - b. DEMONSTRATE THAT MAIN SERVICE EQUIPMENT IS PROPERLY BONDED.
 - c. DEMONSTRATE THAT ALL PANELS HAVE BREAKERS AS SPECIFIED, GROUND BAR, COPPER BUS, TYPED DIRECTORY FOR CIRCUIT IDENTIFICATION AND THAT THEY ARE FREE OF TRASH.
 - d. DEMONSTRATE THAT ALL CONDUITS ARE SUPPORTED AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.
 - e. DEMONSTRATE THAT ALL OUTLET BOXES ARE SUPPORTED AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.
 - f. DEMONSTRATE THAT ALL DEVICES ARE PROPERLY SECURED TO BOXES, THAT DEVICE PLATES ARE PROPERLY ALIGNED AND ARE NOT BEING USED TO SECURE DEVICE.
 - g. UTILIZING A WOODHEAD NO. 1750 TESTING DEVICE, DEMONSTRATE THAT ALL 125 VOLT RECEPTACLES ARE PROPERLY CONNECTED.

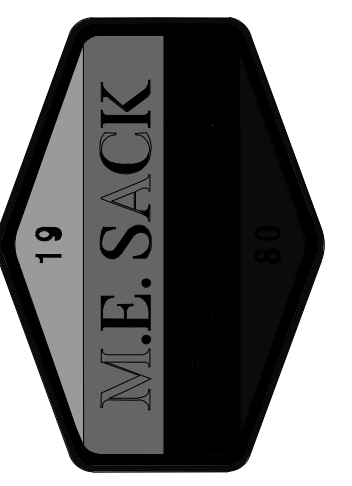
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**PUMP STATION
IMPROVEMENTS**

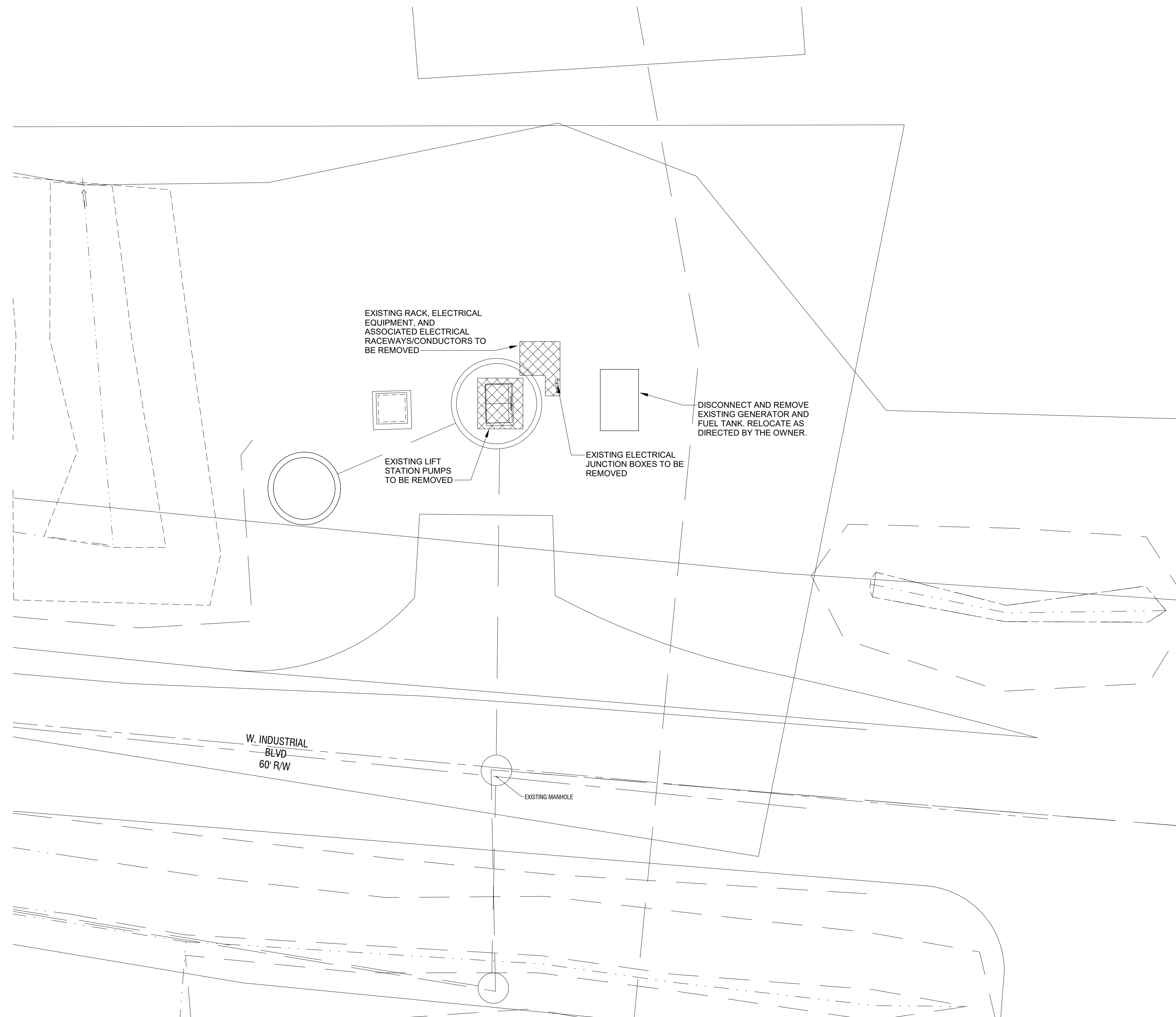
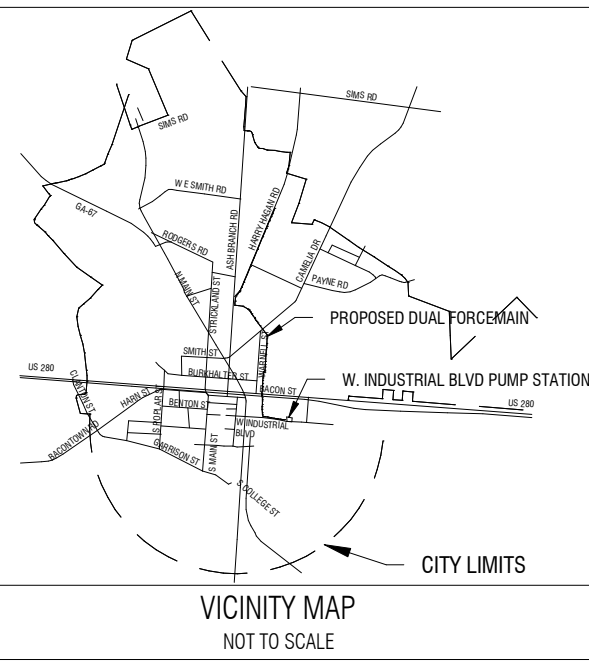
**ELECTRICAL
SPECIFICATIONS**

E003

FILE NO: 2020-48

PLOT DATE: 07/19/23





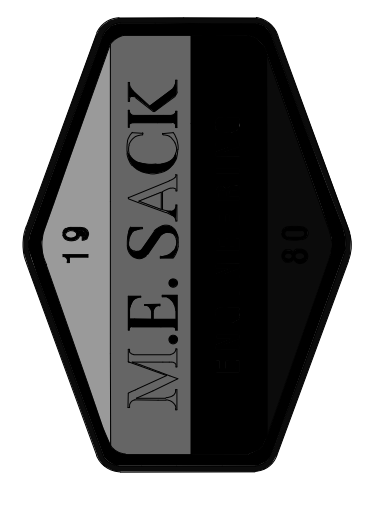
1 PUMP STATION EXISTING CONDITIONS
E101 SCALE: 1/8" = 1'-0"

- DEMOLITION NOTES:**
- DO NOT SCALE DRAWINGS TO LOCATE EQUIPMENT.
 - THE ELECTRICAL SITE PLAN DOES NOT SHOW ALL THE EXISTING UTILITIES OR EXISTING UNDERGROUND EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH ALL TRADES AND LOCATE ALL EXISTING UNDERGROUND SERVICES WITH EXISTING CONDITIONS. CONTRACTOR IS TO CLEARLY INDICATE LOCATIONS OF EXISTING UTILITIES PRIOR TO THE START OF EXCAVATING. ELECTRICAL CONTRACTOR SHALL ROUTE NEW UNDERGROUND UTILITIES ABOVE OR BELOW EXISTING UTILITIES AND EQUIPMENT AS ALLOWED PER N.E.C. REQUIREMENTS.
 - THE CONTRACTOR SHALL FIELD VERIFY EXACT ROUTINGS OF EXISTING RACEWAYS BEFORE STARTING ANY WORK AND NOTIFY THE CIVIL ENGINEER OF ANY KNOWN DISCREPANCIES.
 - THE CONTRACTOR SHALL REMOVE ALL EXISTING ELECTRICAL EQUIPMENT, CONDUITS, CONDUCTORS, ETC. NOT INTENDED FOR REUSE.
 - ALL EXISTING EQUIPMENT REMOVED FROM SERVICE AND NOT INTENDED FOR REUSE SHALL REMAIN THE PROPERTY OF OWNER AND SHALL BE STORED OR DISPOSED OF AS DIRECTED BY THE OWNER.

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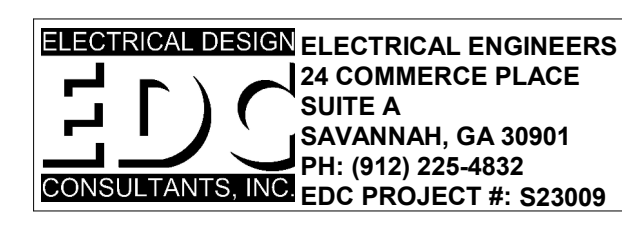
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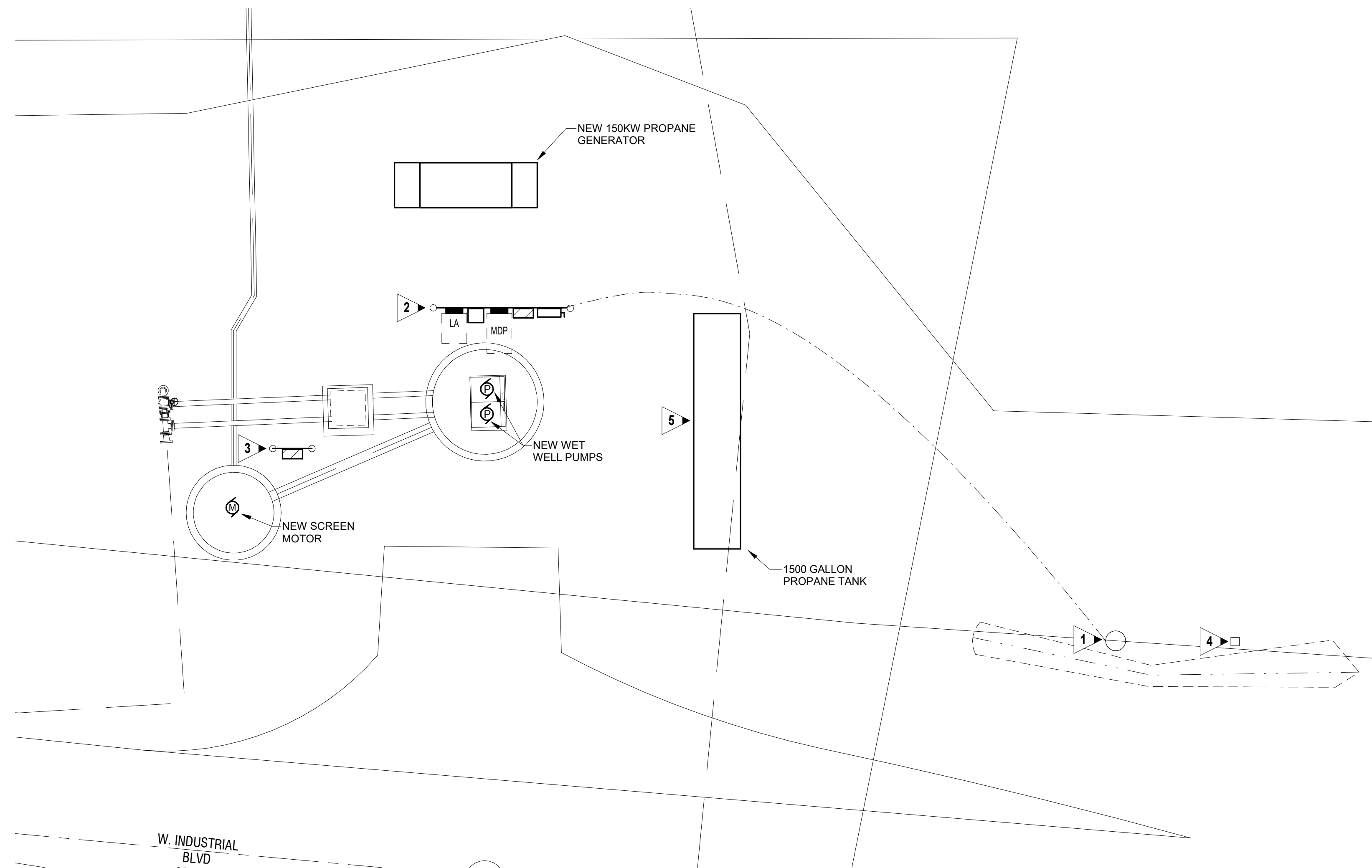
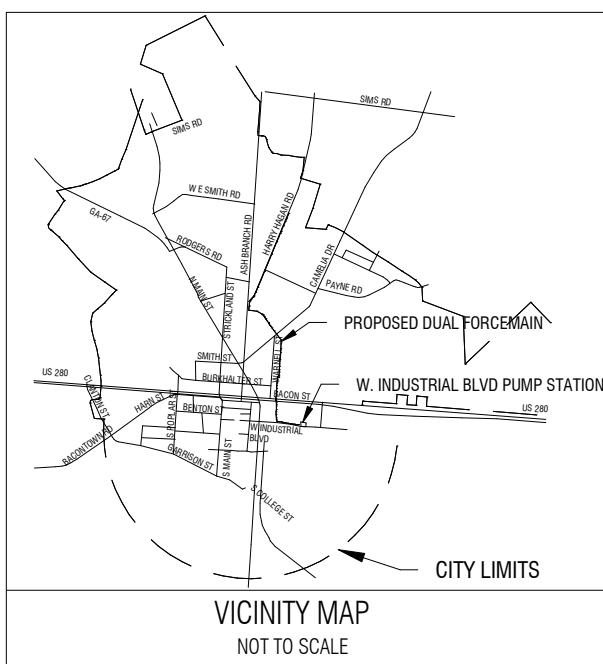
PUMP STATION
IMPROVEMENTS

ELECTRICAL SITE
DEMOLITION PLAN

E101

FILE NO: 2020-48
PLOT DATE: August 14, 2023





1 ELECTRICAL SITE PLAN
E201 SCALE: 1/8" = 1'-0"

SITE SPECIFIC NOTES:

- DO NOT SCALE DRAWINGS TO LOCATE EQUIPMENT.
- THE ELECTRICAL SITE PLAN DOES NOT SHOW ALL THE EXISTING UTILITIES OR EXISTING UNDERGROUND EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH ALL TRADES AND LOCATE ALL EXISTING UNDERGROUND SERVICES WITH EXISTING CONDITIONS. CONTRACTOR IS TO CLEARLY INDICATE LOCATIONS OF EXISTING UTILITIES PRIOR TO THE START OF EXCAVATING. ELECTRICAL CONTRACTOR SHALL ROUTE NEW UNDERGROUND UTILITIES ABOVE OR BELOW EXISTING UTILITIES AND EQUIPMENT AS ALLOWED PER N.E.C. REQUIREMENTS.
- THE ELECTRICAL SITE PLAN DOES NOT SHOW ALL LANDSCAPING OR PLANTING ARRANGEMENTS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EXISTING CONDITIONS AND CIVIL DRAWINGS TO AVOID CONFLICTS WITH LANDSCAPING FEATURES AND PLANTING REQUIREMENTS.
- ELECTRICAL SITE PLAN DOES NOT SHALL ALL EQUIPMENT OR EXACT DETAILS. REFER TO POWER RISER DIAGRAMS FOR DETAILED INFORMATION REGARDING FEEDERS, PANELS, QUANTITY, PLACEMENT, CONNECTIONS, ETC.

KEYED NOTES:

- APPROXIMATE LOCATION OF GEORGIA POWER UTILITY POLE.
- SEE DETAIL 1/E001 FOR DETAILED RACK LAYOUT.
- SEE DETAIL 2/E001 FOR DETAILED RACK LAYOUT.
- APPROXIMATE LOCATION OF TELCO PROVIDER FIBER BOX.
- NEW PROPANE TANK PROVIDED AND INSTALLED BY CUSTOMER'S PROPANE VENDOR. PROPANE VENDOR TO SIZE TANK FOR 72 HOUR RUN TIME AT 100%.

PANELBOARD: MDP													
LOCATION: SURFACE NEMA 1				VOLTAGE: 480Y/277 V, 3 ø 4 W.									
MOUNTING: SURFACE NEMA 1				A.I.C. RATING: 25,000 AMPS SYMMETRICAL									
MAIN DEVICE: 225.0 A MAIN CB				SPECIAL: NEMA 4X									
BUS AMPS: 225 AMPS				FED FROM:									
LOAD NAME	NOTE	BKR	P	CKT	A	B	C	CKT	P	BKR	NOTE	LOAD NAME	
LIGHTS		20 A	1	1	0.1	0.1		2	1	20 A		LIGHTS	
PUMP CONTROL PANEL		200 A	3	3	44.3	1.4		4		25 A		T-PS	
	5			44.3	0.7	6							
	7			44.3	0.3	8							
SCREEN CONTROL PANEL		30 A	3	9	0.8	0.0		10		30 A		SPARE	
	11			0.8	0.0	12							
	13			0.8	0.0	14							
SPARE		20 A	1	15	0.0	0.0		16	1	20 A		SPARE	
SPARE		20 A	1	17	0.0	0.0		18	1	20 A		SPARE	
SPARE		20 A	1	19	0.0	0.0		20	1	20 A		SPARE	
SPARE		20 A	1	21	0.0	0.0		22	1	20 A		SPARE	
SPARE		20 A	1	23	0.0	0.0		24	1	20 A		SPARE	
SPACE	--	--	--	25	0.0	0.0		26					
SPACE	--	--	--	27	0.0	0.0		28					
SPACE	--	--	--	29	0.0	0.0		30					
TOTAL LOAD:					46 kVA	46 kVA	46 kVA						
TOTAL AMPS:					165 A	167.9 A	165 A						
LOAD CLASSIFICATION	CONNECTED	DEMAND	ESTIMATED	PANEL TOTALS									
RECEPTACLES	720 VA	100.00%	720 VA										
MTR	135271 VA	124.77%	168771 VA	CONNECTED LOAD: 137921 VA									
LITES	256 VA	125.00%	319 VA	ESTIMATED DEMAND: 171480 VA									
				CONNECTED CURRENT: 165.9 A									
				EST. DEMAND CURRENT: 206.3 A									
NOTES:													

PANELBOARD: LA													
LOCATION: SURFACE NEMA1				VOLTAGE: 208Y/120 V, 3 ø 4 W.									
MOUNTING: SURFACE NEMA1				A.I.C. RATING: 10,000 AMPS SYMMETRICAL									
MAIN DEVICE: 60.0 A MAIN CB				SPECIAL: NEMA 4X									
BUS AMPS: 60 AMPS				FED FROM: T-PS									
LOAD NAME	NOTE	BKR	P	CKT	A	B	C	CKT	P	BKR	NOTE	LOAD NAME	
PUMP CONTROL		20 A	1	1	0.5	0.5		2	1	20 A		SCREEN CONTROL	
PUMP CTRL RCPT.		20 A	1	3		0.4	0.4		4	1	20 A	SCREEN RCPT.	
PUMP LV		20 A	1	5			0.2	0.2	6	1	20 A	SCREEN LV	
WP QUAD		20 A	1	7	0.4	0.0			8	1	20 A	JACKET HEATER	
SPARE		20 A	1	9		0.0	0.0		10	1	20 A	BATTERY CHARGER	
SPARE		20 A	1	11			0.0	0.0	12	1	20 A	SPARE	
SPARE		20 A	1	13	0.0	0.0			14	1	20 A	SPARE	
		20 A	1	15		0.0	0.0		16	1	20 A	SPARE	
T.V.S.S.		40 A	3	17			0.0	0.0	18	1	20 A	SPARE	
				19	0.0	0.0			20	1	20 A	SPARE	
TOTAL LOAD:					1 kVA	1 kVA	0 kVA						
TOTAL AMPS:					12 A	6.5 A	3 A						
LOAD CLASSIFICATION	CONNECTED	DEMAND	ESTIMATED	PANEL TOTALS									
RECEPTACLES	720 VA	100.00%	720 VA	CONNECTED LOAD: 2420 VA									
				ESTIMATED DEMAND: 2420 VA									
				CONNECTED CURRENT: 6.7 A									
				EST. DEMAND CURRENT: 6.7 A									
NOTES:													

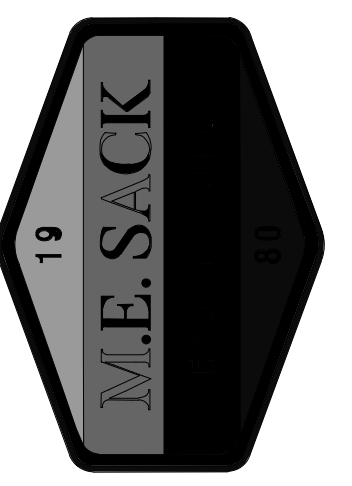
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GEORGIA REGISTERED PROFESSIONAL ENGINEER
NO. 038816
MARCUS E. SACK
DATE: AUGUST 14, 2023



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PUMP STATION IMPROVEMENTS

ELECTRICAL SITE PLAN

E201

FILE NO: 2020-48
PLOT DATE: August 14, 2023

ELECTRICAL DESIGN CONSULTANTS, INC. ELECTRICAL ENGINEERS
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SAVANNAH, GA 30901
PH: (912) 225-4832
EDC PROJECT #: S23009

