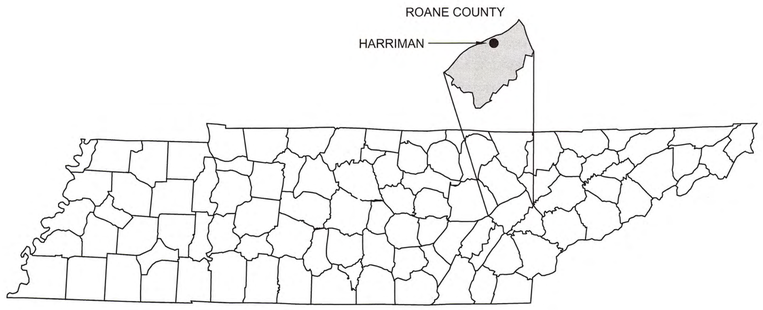
MAYS PUMP STATION IMPROVEMENTS AND SEWER REHABILITATION

CITY OF HARRIMAN, TENNESSEE

CONTRACT NO. S11-01
CDBG PROJECT # GG-11-34964-00



ENGINEERS - ARCHITECTS - PLANNERS

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DWG. No. INDEX OF DRAWINGS

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GRW Engineers, Inc.
Engineers, Architects, Planners
ENGINEER'S REPRESENTATIVE: D. Morris
CONSTRUCTION COMPANY: PORTLAND UTILITIES CONST. CO.
DATE: 3/20/2012

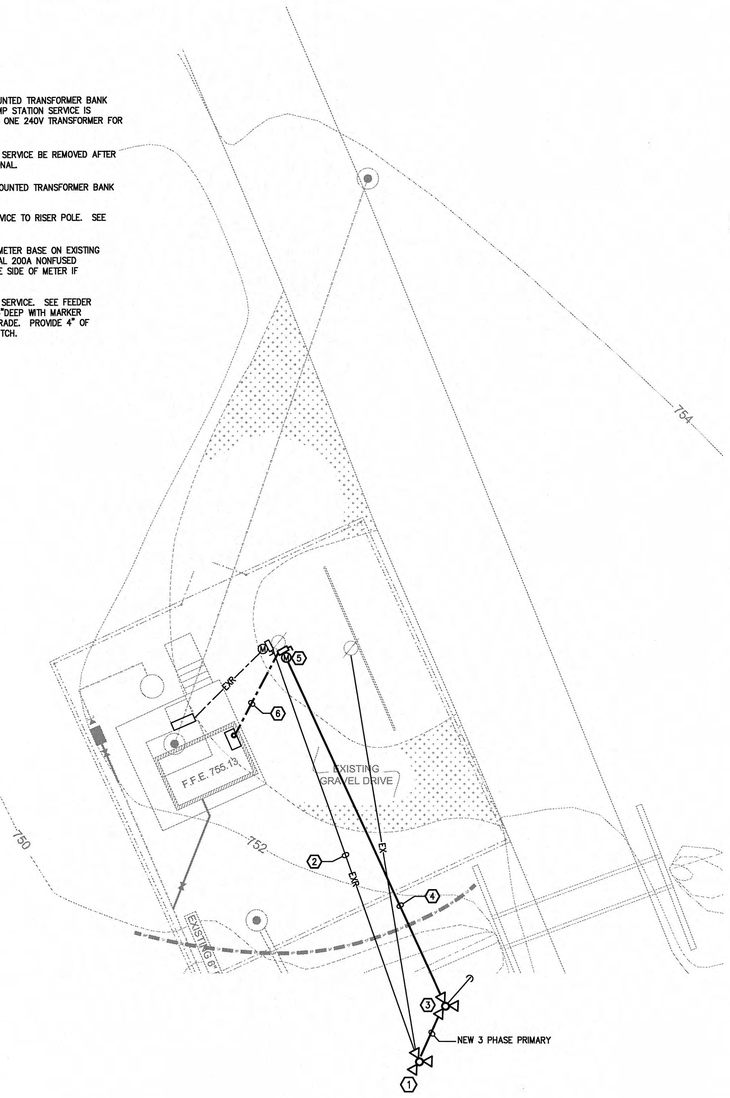
MAY, 2011

GRW PROJECT NO. 3947-02

FILE NAME: I:\3947-Harriman Utility\02-Mays PS Cherry MBW\working Drawings\RECORD Drawings\01_C-0-0_Cover Sheet.dwg
PRINTED: 3/12/2012 @ 2:01PM

DRAWING NOTES:

1. LOCATION OF EXISTING POLE MOUNTED TRANSFORMER BANK TO BE REMOVED AFTER NEW PUMP STATION SERVICE IS INSTALLED COMPLETE. MAINTAIN ONE 240V TRANSFORMER FOR LIGHTING CIRCUIT.
2. EXISTING OVERHEAD SECONDARY SERVICE BE REMOVED AFTER NEW PUMP STATION IS OPERATIONAL.
3. LOCATION OF NEW 480V POLE MOUNTED TRANSFORMER BANK INSTALLED BY UTILITY COMPANY.
4. NEW OVERHEAD SECONDARY SERVICE TO RISER POLE. SEE FEEDER DIAGRAM.
5. NEW SERVICE DISCONNECT AND METER BASE ON EXISTING RISER POLE. PROVIDE ADDITIONAL 200A NONFUSED NEMA 4XSS DISCONNECT ON LINE SIDE OF METER IF REQUIRED BY UTILITY COMPANY.
6. NEW UNDERGROUND SECONDARY SERVICE. SEE FEEDER DIAGRAM. BURY MINIMUM OF 36"DEEP WITH MARKER TAPE AT 12" BELOW FINISHED GRADE. PROVIDE 4" OF ROCK BEDDING IN BOTTOM OF DITCH.



PUMP STATION SITE PLAN - ELECTRICAL

SCALE: 1" = 10'

ELECTRICAL SPECIFICATIONS

1. THE ELECTRICAL CONTRACT WORK SHALL INCLUDE ALL ELECTRICAL MATERIALS AND INSTALLATION TO RESULT IN A BUILDING READY AND SUITABLE FOR USE AS INTENDED BY OWNER. THE CONTRACTOR SHALL REFER TO ALL PLANS INCLUDING THE SITE, ARCHITECTURAL, AND MECHANICAL PLANS.

1.2 ALL ELECTRICAL INSTALLATIONS SHALL BE MADE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND ITS SUPPLEMENTS IN FORCE AT THE TIME OF BID OPENING, AND ALL MATERIALS EMPLOYED SHALL BE UL LISTED AND APPROVED AND BEAR THE UL OFFICIAL LABELS WHERE SUCH LABELING IS CUSTOMARY. IN THE EVENT THAT LOCAL CODES ARE MORE RIGID THAN THE NATIONAL CODE, BOTH CODES SHALL THEN BE CONSIDERED AS JOINTLY GOVERNING AND THE REQUIREMENTS OF THE MOST RIGID SHALL THEN PREVAIL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SELECTION AND APPLICATION OF MATERIALS AND METHODS OF THEIR INSTALLATION. PRINCIPAL FEATURES ARE AS FOLLOWS:

A. SERVICE ENTRANCE TO NEW PUMP STATION.

1.3 POWER SERVICE

A. POWER SERVICE SHALL BE 277/480-VOLTS, 3-PHASE, 4-WIRE. CONTRACTOR SHALL CONSULT WITH THE LOCAL POWER UTILITY AND COMPLY WITH ALL THEIR INSTRUCTIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR PAYING ALL FEES AND CONSTRUCTION CONTRIBUTIONS REQUIRED BY THE POWER AND TELEPHONE COMPANIES.

1.4 DISTRIBUTION EQUIPMENT

A. DISTRIBUTION EQUIPMENT AND BRANCH CIRCUIT PANELBOARDS SHALL BE MOLDED CASE CIRCUIT BREAKER EQUIPMENT HAVING THE NECESSARY INTERRUPTING RATINGS BUT NOT LESS THAN 10,000 AIC. GROUND FAULT SENSING AND AUTOMATIC INTERRUPTING SHALL BE FURNISHED ON ANY OUTDOOR POWER CIRCUITS AND AS OTHERWISE REQUIRED. EQUIPMENT SHALL BE SQUARE-D OR EQUAL.

1.5 GROUNDING

A. PROVIDE CODE GROUNDING FOR ANY SYSTEM ADDITIONS.

1.6 TYPES OF WIRING AND RACEWAYS

A. THE TYPES AND GRADES OF MATERIALS TO BE EMPLOYED IN THE WIRING SYSTEMS ARE SUBJECT TO BUILDING STRUCTURAL CONDITIONS AND THE GOVERNING CODES. THE WIRING SHALL BE GALVANIZED CONDUIT AND GALVANIZED STEEL AND DEVICE BOXES. ALL CONDUCTORS SHALL BE COPPER.

B. UNLESS PARTICULARLY STATED OTHERWISE, ALL WIRING SHALL BE RUN CONCEALED AND OUTLETS SHALL BE FLUSH MOUNTED IN WALLS AND CEILINGS.

C. ALL CONDUITS INSTALLED UNDERGROUND, IN CONCRETE SLABS, OR EXTERIOR OF BUILDINGS, MAY BE PLASTIC "PVC" EXCEPT WHEN EXPOSED, THEY SHALL BE SUITABLE GALVANIZED STEEL.

D. WIRING SYSTEMS WITH OUTLET DEVICES AND BOXES, SHALL BE GROUNDED AS REQUIRED BY THE GOVERNING CODES.

1.7 MATERIALS

A. BASIC MATERIALS AND DEVICES REQUIRED IN THE WIRING SYSTEMS SHALL BE UL APPROVED STANDARDS. IN THE EVENT THAT UL STANDARD IS REVISED, SUPPLEMENTED, OR MODIFIED, ETC., THE LATEST REQUIREMENTS SHALL THEN GOVERN.

B. AT THE REQUEST OF THE OWNER OR HIS DESIGNATED REPRESENTATIVE, THE CONTRACTOR SHALL SUBMIT A LIST OF MATERIALS PROPOSED TO BE USED IN THE CONSTRUCTION OR PROVIDE SAMPLES, ETC., FULLY ESTABLISHING THE TYPE, GRADE, AND QUALITY OF EACH DEVICE OR ITEM OF MATERIAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ONLY SUCH DEVICES AND MATERIALS AS OBVIOUSLY MEET GOVERNING REQUIREMENTS.

1.8 WORK QUALITY

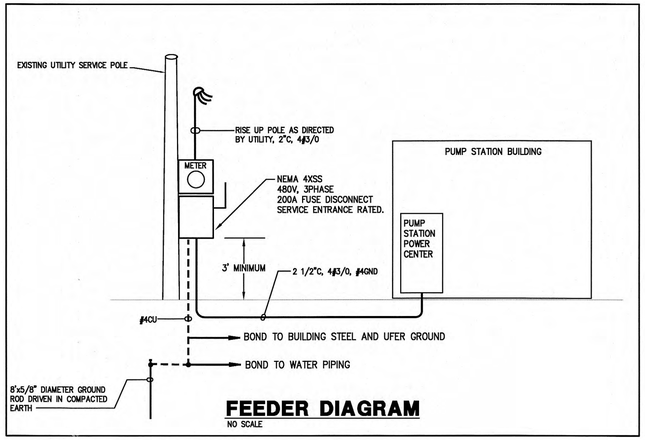
A. ALL ELECTRICAL WORK SHALL BE SPECIFIED TO BE PERFORMED IN A WORKMANLIKE AND PROFESSIONAL MANNER BY WORKMEN SKILLED IN THE TRADE REQUIRED. THE WORK SHALL RESULT IN A FINISHED AND OPERATING SYSTEM.

1.9 GUARANTEE

A. THE ELECTRICAL CONTRACTOR SHALL GUARANTEE ALL WORK TO BE FREE OF GROUNDS AND SHORT CIRCUITS AND SHALL REPAIR OR REPLACE ALL DEFECTIVE WORK WITHIN A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY THE OWNER.

1.10 CODES, PERMITS, FEES

A. THE ELECTRICAL CONTRACTOR SHALL PAY FOR AND SECURE ALL NECESSARY PERMITS. THE ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND CONFORMING TO ALL LOCAL, STATE AND NATIONAL GOVERNING CODES. NOTE: THE PROJECT COMES UNDER STATE OF TENNESSEE ELECTRICAL INSPECTOR.



FEEDER DIAGRAM

NO SCALE

SITE UTILITIES NOTE

PRIOR TO STARTING SERVICE ENTRANCE WORK, THE CONTRACTOR SHALL CONTACT THE LOCAL POWER COMPANY & SHALL DETERMINE ALL REQUIREMENTS. PROVIDE NECESSARY LABOR AND MATERIALS UNDER THE CONTRACT TO INSTALL EACH SERVICE ENTRANCE COMPLETE. CONTRACTOR SHALL PAY ALL FEES & CONTRIBUTIONS TO CONSTRUCTION REQUIRED BY THE LOCAL POWER COMPANY.

WWR ENGINEERS INC
5417 Ball Camp Pike
Knoxville, Tn 37921
Phone: (865) 588-2431
Fax: (865) 588-2434
West, Welch, Reed Engineers, Inc.

WWR PROJECT# 111033

THIS DRAWING IS GENERALLY DIAGRAMMATIC AND, EXCEPT WHERE SPECIFICALLY DIMENSIONED OR DETAILED, INDICATES THE GENERAL ARRANGEMENT OF THE WORK. THE CONTRACTOR SHALL INSTALL HIS WORK TO CONFORM AS NEARLY AS POSSIBLE TO THE LOCATIONS AND ARRANGEMENTS SHOWN, WITH ONLY SUCH MINOR ADJUSTMENTS AS NECESSARY TO COORDINATE THE WORK WITH ALL OTHER TRADES TO AVOID INTERFERENCES.

RONALD ALAN CARTER
REGISTERED ENGINEER
No. 106402
STATE OF TENNESSEE

GRW PROJECT NO. 3947-02

CLIENT PROJECT NO. XXXXX

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ENGINEERS - ARCHITECTS - PLANNERS
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STATE SUBMITTAL

PUMP STATION SITE PLAN - ELECTRICAL

MAYS PUMP STATION IMPROVEMENTS & SEWER REHAB
CITY OF HARRIMAN, TENNESSEE

DESIGNED:	DRAWN:	REVIEWED:	APPROVED:
RAC	RAC	RAC	RAC

REVISIONS

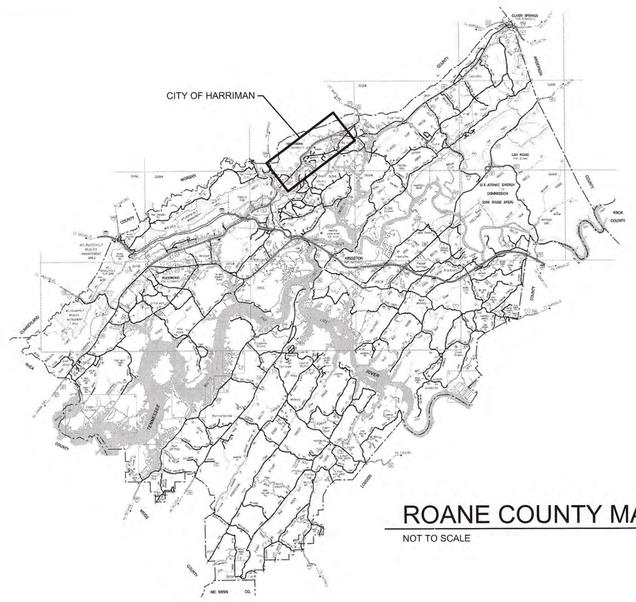
NO.	DESCRIPTION	DATE	BY

THIS MARK SHOULD MEASURE EXACTLY 1" WHEN PLOTTED — SCALE CHECK:

DATE: APRIL 2011

SCALE: 1" = 10'

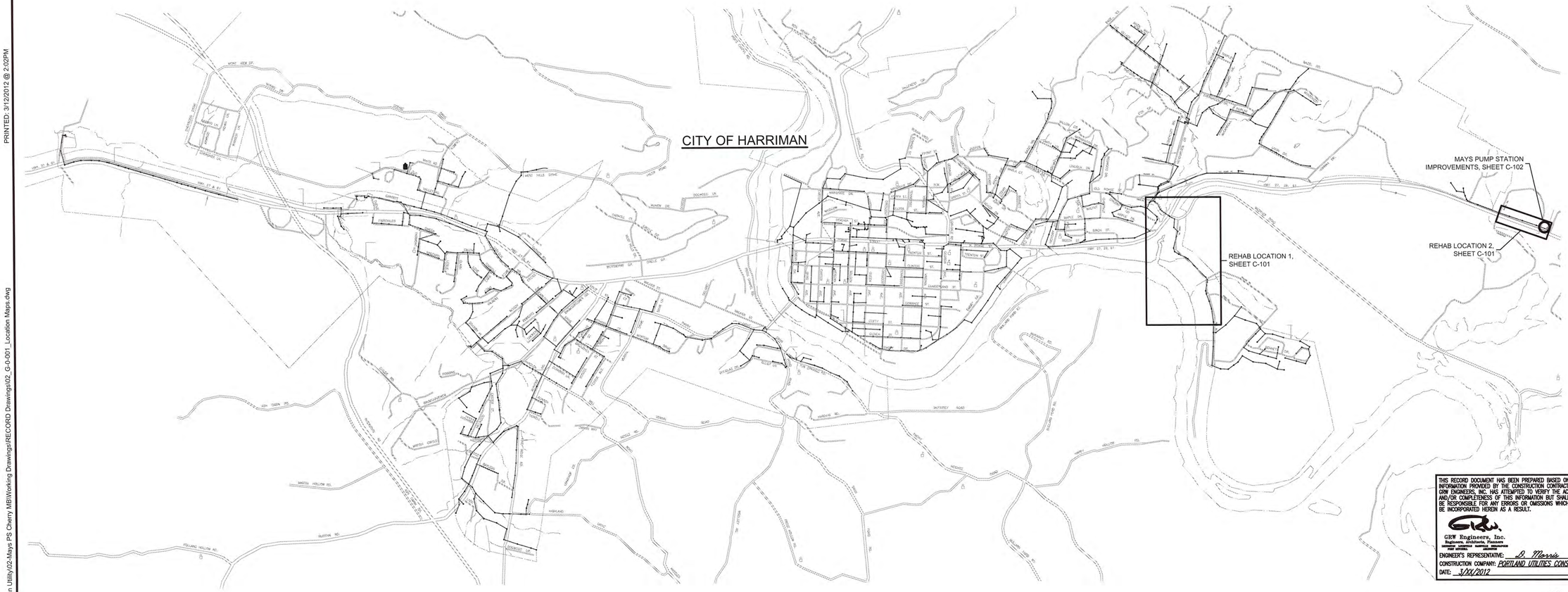
SHEET NO. E-1



ROANE COUNTY MAP

NOT TO SCALE

PLAN NORTH



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GRW Engineers, Inc.
Engineers, Architects, Planners
Nashville, Tennessee

ENGINEER'S REPRESENTATIVE: *B. Morris*
CONSTRUCTION COMPANY: *PORTLAND UTILITIES CONST. CO.*
DATE: *3/XX/2012*

LOCATION MAP

NOT TO SCALE

PLAN NORTH

ROBERT G. THREADGILL
REGISTERED ENGINEER
AGRICULTURE
No. 012645
STATE OF TENNESSEE

STATE SUBMITTAL

GRW PROJECT NO. 3947-02

CLIENT PROJECT NO. XXXXX

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COUNTY AND LOCATION MAPS

MAYS PUMP STATION IMPROVEMENTS & SEWER REHAB
CITY OF HARRIMAN, TENNESSEE

DESIGNED:	ACH
DRAWN:	CAJ
REVIEWED:	ACH
APPROVED:	RGT

REVISIONS

NO.	DESCRIPTION	DATE	BY
SCALE CHECK	THIS MARK SHOULD MEASURE EXACTLY 1" WHEN PLOTTED		

DATE: MAY 2011

SCALE: 1" = 200'-0"

SHEET NO.

G-0-001

PRINTED: 3/12/2012 @ 2:02PM

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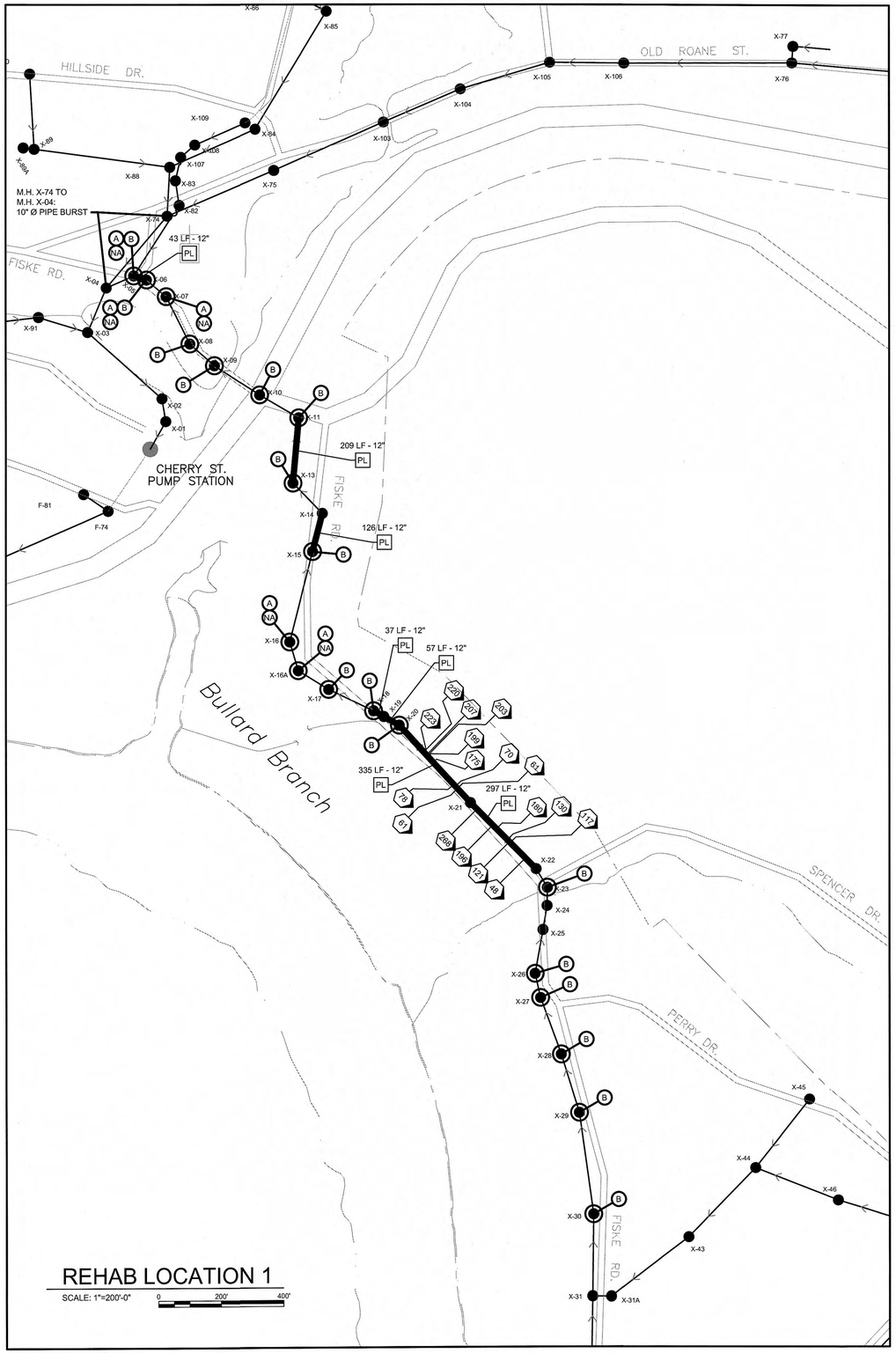

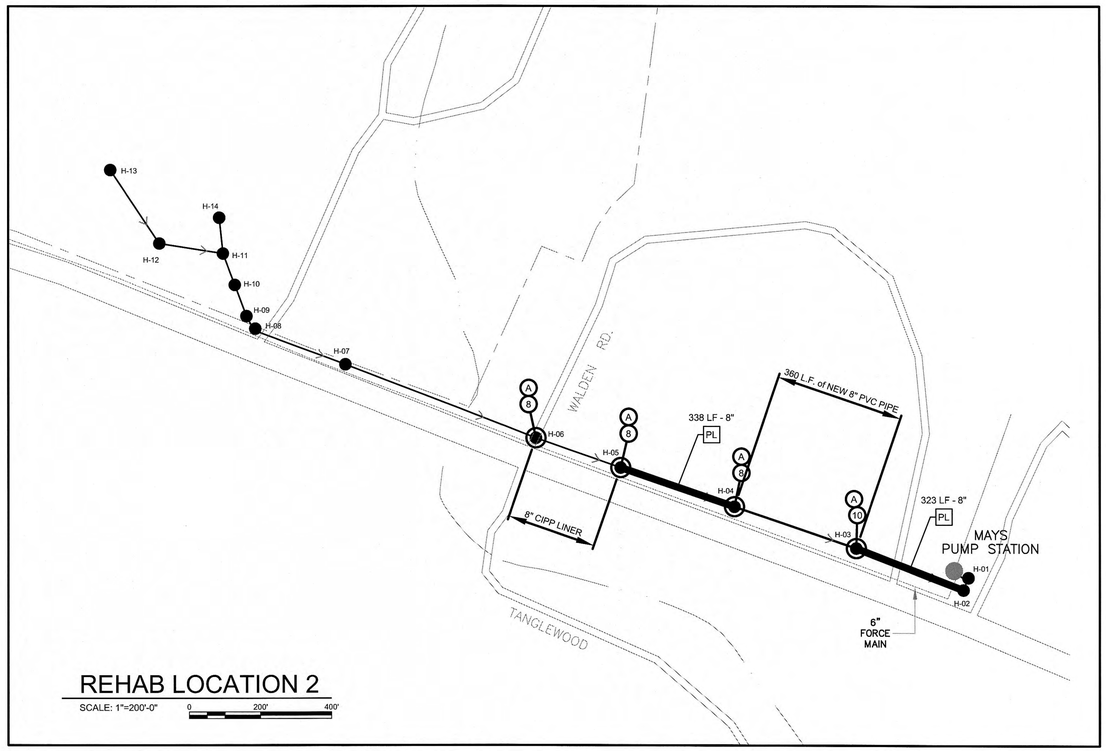

MANHOLE REHABILITATION

MH #	DEPTH (FT)	MH DIA. (FT)	REHAB TYPE
X-30	N/A	4	REPLACE LID
X-29	N/A	4	REPLACE LID
X-28	N/A	4	REPLACE LID
X-27	N/A	4	REPLACE LID
X-26	N/A	4	REPLACE LID
X-23	N/A	4	REPLACE LID
X-20	N/A	4	REPLACE LID
X-18	N/A	4	REPLACE LID
X-17	N/A	4	REPLACE LID
X-16A	N/A	4	REPLACE LID, RAISE TO GRADE, & CEMENTITIOUS COATING
X-16	N/A	4	REPLACE LID, RAISE TO GRADE, & CEMENTITIOUS COATING
X-15	N/A	4	REPLACE LID
X-13	N/A	4	REPLACE LID
X-11	N/A	4	REPLACE LID
X-10	N/A	4	REPLACE LID
X-09	N/A	4	REPLACE LID
X-08	N/A	4	REPLACE LID
X-07	N/A	4	CEMENTITIOUS COATING
X-06	N/A	4	REPLACE LID & CEMENTITIOUS COATING
X-05	N/A	4	REPLACE LID & CEMENTITIOUS COATING
H-06	8	4	CEMENTITIOUS COATING
H-05	8	4	CEMENTITIOUS COATING
H-04	8	4	CEMENTITIOUS COATING
H-03	10	4	CEMENTITIOUS COATING

CURED-IN-PLACE LINER REHABILITATION

UPSTREAM MH	DEPTH (FT)	DOWNSTREAM MH	DEPTH (FT)	SEGMENT LENGTH (L.F.)	PIPE DIA.	SERVICE CONNECTIONS
X-22	N/A	X-21	N/A	297	12"	48' L 117' R 121' L 130' R 180' R 196' L 268' L
X-21	N/A	X-20	N/A	335	12"	61' R 61' L 78' L 175' R 199' R 203' R 207' R 220' R 223' R
X-20	N/A	X-19	N/A	57	12"	-
X-19	N/A	X-18	N/A	37	12"	-
H-05	8	H-04	8	338	8"	-
H-04	8	H-03	10	358	8"	-
H-03	10	H-02	N/A	323	8"	-

REHAB KEYNOTES

207 SERVICE CONNECTIONS AND DISTANCE TO MANHOLE

100 LF - 8"
PL PIPE LINING BY CURED-IN-PLACE METHOD WITH TRENCHLESS OR EXCAVATABLE SERVICE RENEWAL / LENGTH SIZE

MANHOLE REHAB KEYNOTES

A CEMENTITIOUS COATING
B REPLACE LID

MANHOLE DEPTHS (FEET)

6 0.0 - 6.0
8 6.1 - 8.0
10 8.1 - 10.0
12 10.1 - 12.0
14 12.1 - 14.0
16 14.1 - 16.1
NA UNKNOWN

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GRW Engineers, Inc.
Engineers, Architects, Planners

ENGINEER'S REPRESENTATIVE: B. Morris
CONSTRUCTION COMPANY: PORTLAND UTILITIES CONST. CO.
DATE: 3/20/2012

PLAN NORTH

ROBERT G. THREADGILL JR.
REGISTERED ENGINEER
AGRICULTURE
SIGNATURE
No. 012645
STATE OF TENNESSEE

STATE SUBMITTAL

GRW PROJECT NO. 3947-02

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SEWER SYSTEM REHABILITATION PLANS

MAYS PUMP STATION IMPROVEMENTS & SEWER REHAB
CITY OF HARRIMAN, TENNESSEE

DESIGNED: ACH
DRAWN: CAJ
REVIEWED: ACH
APPROVED: RGT

REVISIONS

NO.	DESCRIPTION	DATE	BY

SCALE CHECK: THIS MARK SHOULD MEASURE EXACTLY 1" WHEN PLOTTED

DATE: MAY 2011

SCALE: 1" = 200'-0"

SHEET NO.

C-0-102

PRINTED: 3/12/2012 @ 2:03PM
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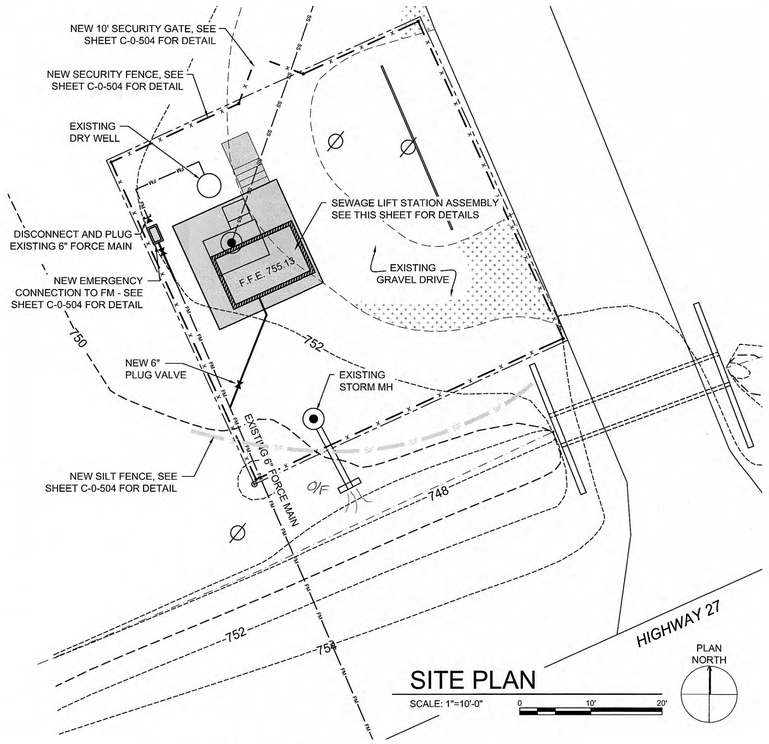
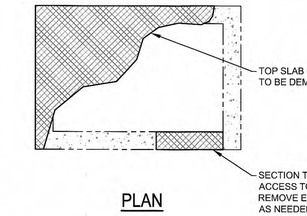
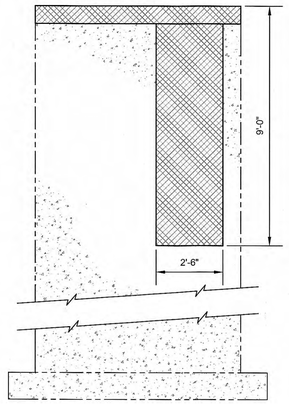


SITE PLAN

SCALE: 1"=10'-0"



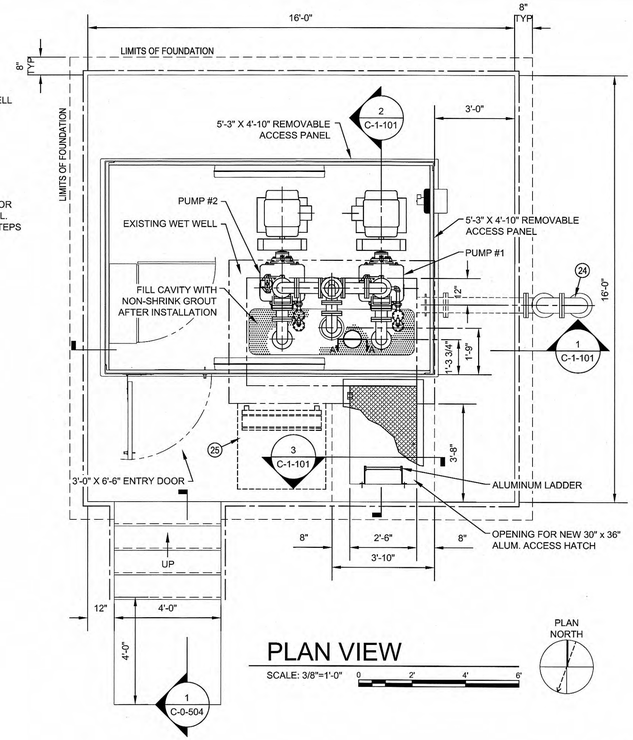
PLAN



SECTION

EXISTING WET WELL

SCALE: 3/8"=1'-0"



PLAN VIEW

SCALE: 3/8"=1'-0"

PLAN NORTH

KEYNOTES

1. PUMP
2. MOTOR
3. MOTOR STAND ASSEMBLY
4. 4" Ø DISCHARGE CHECK VALVE
5. 4" Ø DISCHARGE PLUG VALVE
6. AIR RELEASE VALVE
7. STATION BASE ASSEMBLY
8. BELT GUARD ASSEMBLY
9. STATION ENCLOSURE ASSEMBLY
10. EXHAUST FAN
11. FLUORESCENT LIGHT FIXTURE
12. MOTOR CONTROL PANEL
13. INTAKE VENT ASSEMBLY
14. 4" Ø 90° FLANGED ELBOW
15. 4" Ø FLANGED SPOOL
16. 4" x 6" Ø FLANGED INCREASER
17. 4" Ø RESTRAINED JOINT FLANGE ADAPTER
18. 6" Ø RESTRAINED JOINT FLANGE ADAPTER
19. 6" Ø 90° FLANGED ELBOW
20. 4" Ø COUPLING
21. 6" Ø WALL PIPE
22. 4" Ø 90° FLANGED BASE ELBOW
23. 4" Ø FLANGED LONG RADIUS ELBOW
24. D.I.P. VENT PIPE, 2 - 6" Ø 90° ELBOWS W/ S.S. INSECT SCREEN
25. EXISTING CONTROL PANEL TO BE TEMPORARILY RELOCATED DURING CONSTRUCTION AND DEMOLITION AFTER NEW PUMP STATION START UP.

LEGEND

- NEW STRUCTURE / PIPING / POURED IN PLACE CONC.
- NEW GROUT
- NEW GRAVEL BACKFILL
- EXISTING CONCRETE
- TO BE DEMOLISHED

GENERAL NOTES

A. ALL ANCHOR BOLTS AND FASTNERS USED IN PUMP STATION SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED.

B. COORDINATE PIPING LOCATION WITH EQUIPMENT SUPPLIED.

C. ALL ENTRANCES INTO PUMP BUILDING FROM WET WELL SHALL BE SEALED GAS TIGHT.

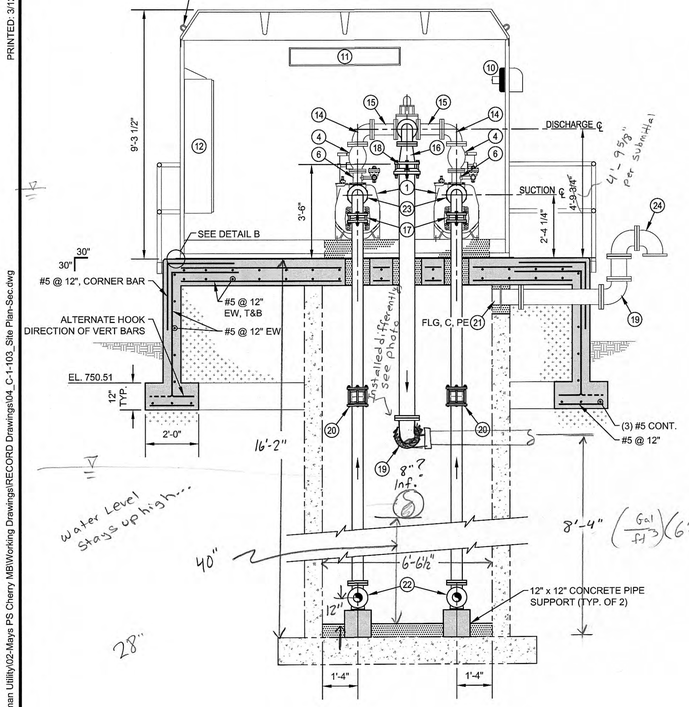
D. SEE TYPICAL STRUCTURAL DETAILS FOR ADDITIONAL REINFORCING AT OPENINGS. SEE GENERAL STRUCTURAL NOTES FOR CONCRETE PROTECTION OF REINFORCING.

E. PROVIDE CORNER BARS AT ALL CAST-IN-PLACE CONCRETE WALL INTERSECTIONS. SEE SECTION 1 FOR SIZE AND SPACING

F. SLABS TO BE CAST ON A 6" LAYER (MIN.), OF CLEAN, CRUSHED AND COMPACTED #57 STONE. SURROUND CONCRETE VAULT WALLS WITH A MIN. OF 4" CRUSHED #57 STONE.

G. CONTRACTOR TO CLEAN WET WELL PRIOR TO CONSTRUCTION.

H. CONTRACTOR TO MAINTAIN WARNING TAPE AND TEMPORARY FENCING AROUND OPEN WET WELL.



1 SECTION

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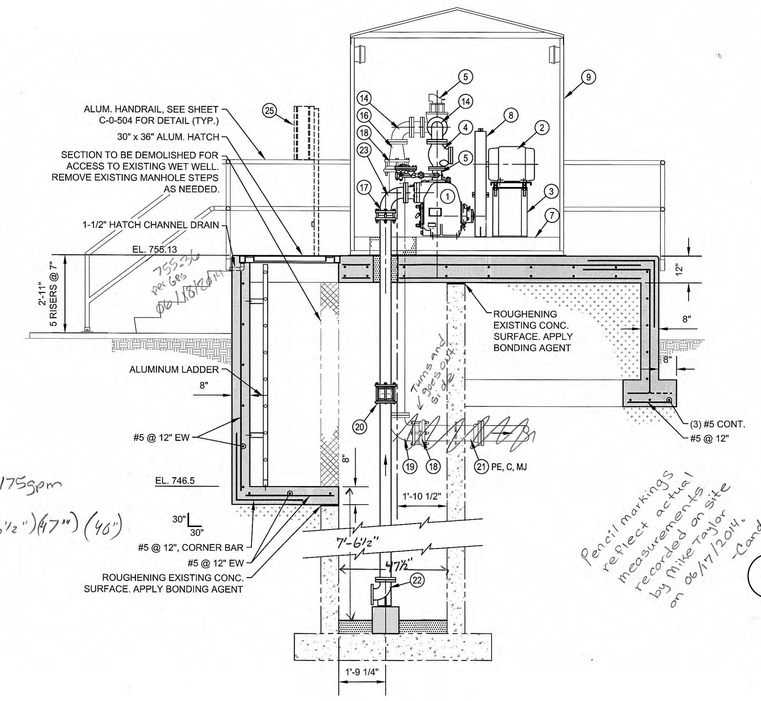

2 SECTION

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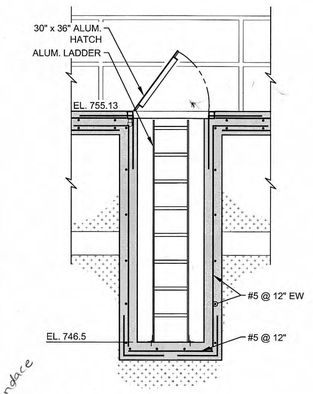
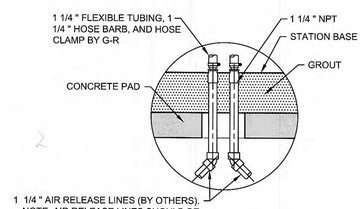


3 SECTION

SCALE: 3/8"=1'-0"

Pencil markings reflect actual measurements recorded on site by Mike Taylor on 06/17/2014. -Candace



SECTION 'A-A'

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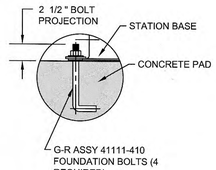

DETAIL B

NOT TO SCALE

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GRW Engineers, Inc.
Engineers, Architects, Planners

ENGINEER'S REPRESENTATIVE: D. Morris
CONSTRUCTION COMPANY: PORTLAND UTILITIES CONST. CO.
DATE: 3/XX/2012

ROBERT G. THREADGILL, JR. REGISTERED ENGINEER AGRICULTURE NO. 012545 STATE OF TENNESSEE

STATE SUBMITTAL

GRW PROJECT NO. 3947-02

CLIENT PROJECT NO. XXXXX

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NEW W.A.S. PUMP STATION PLANS AND SECTIONS

MAYS PUMP STATION IMPROVEMENTS & SEWER REHAB
CITY OF HARRIMAN, TENNESSEE

DESIGNED:	CAJ
DRAWN:	CAJ
REVIEWED:	RGT
APPROVED:	RGT

REVISIONS

NO.	DESCRIPTION	DATE	BY

SCALE CHECK: THIS MARK SHOULD MEASURE EXACTLY 1" WHEN PLOTTED

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SCALE: AS SHOWN

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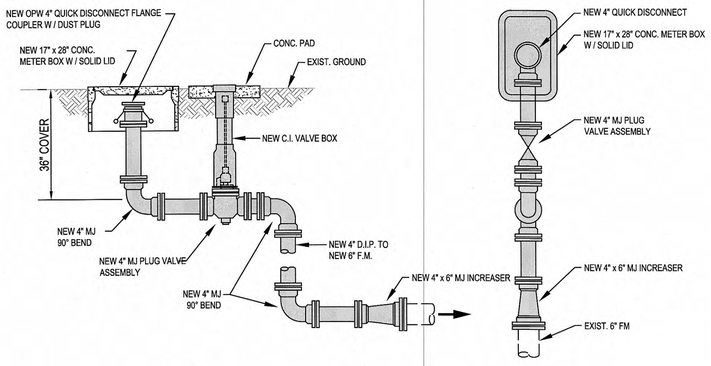
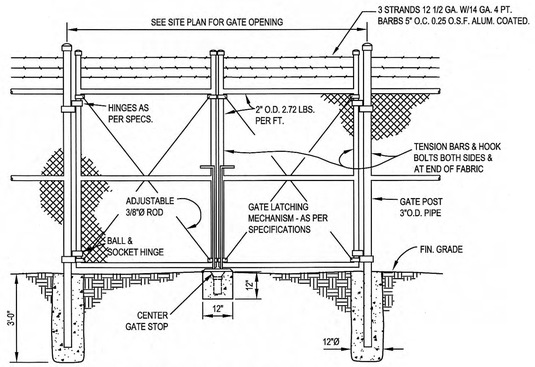
PRINTED: 3/12/2012 @ 2:05PM

FILE NAME: I:\3947-Harriman Utility\02-Mays PS Cherry MBWorking Drawings\RECORD Drawings\04_C-1-103_Site Plan-Sec.dwg



EMERGENCY CONNECTION DETAIL

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



ALL POSTS & OTHER APPURTENANCES SHALL BE HOT DIP GALVANIZED W/MIN. 2.0 O.S.F. ZINC. ALL FITTINGS SHALL BE MALLABLE CAST IRON OR PRESSED STEEL.

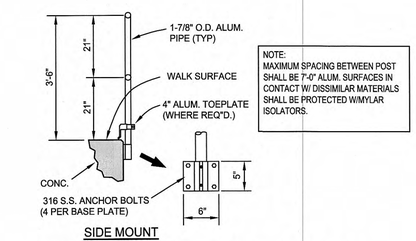
GATE DETAIL

NOT TO SCALE

SILT FENCE SPECIFICATIONS

TYPE FENCE		A	B	C
TENSILE STRENGTH (LBS. MIN.) (1) (ASTM D-4632)		WARP - 120 FILL - 100	WARP - 120 FILL - 100	WARP - 260 FILL - 180
ELONGATION (% MAX.) (ASTM D-4632)		40	40	40
AOS (APPARENT OPENING SIZE) SIZE) (ASTM D-4751)	(MAX. SIEVE	#30	#30	#30
FLOW RATE (GAL/MIN/SQ. FT.)	(GDT-87)	25	25	70
ULTRAVIOLET STABILITY (2) AFTER 300 HOURS WEATHERING IN ACCORDANCE WITH ASTM D-4355)	(ASTM D-4632	80	80	80
BURSTING STRENGTH (PSI MIN.) (ASTM D-3786 DIAPHRAGM BURSTING STRENGTH TESTER)		175	175	175
MINIMUM FABRIC WIDTH (INCHES)		36	22	36

(1) MINIMUM ROLL AVERAGE OF FIVE SPECIMENS.
(2) PERCENT OF REQUIRED INITIAL MINIMUM TENSILE STRENGTH.

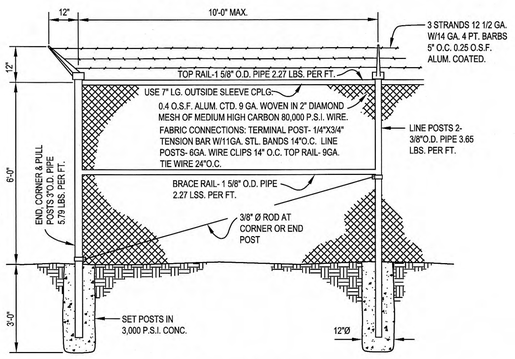


NOTE:
MAXIMUM SPACING BETWEEN POST SHALL BE 7'-0" ALUM. SURFACES IN CONTACT W/ DISSIMILAR MATERIALS SHALL BE PROTECTED W/MYLAR ISOLATORS.

SIDE MOUNT

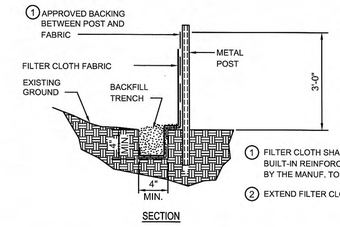
TYPICAL HANDRAIL DETAIL

NOT TO SCALE



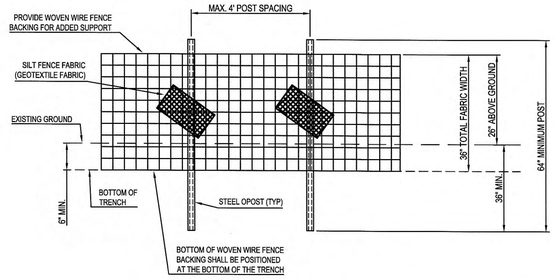
FENCE DETAIL

NOT TO SCALE



SECTION

1. FILTER CLOTH SHALL HAVE APPROVED BACKING OR A BUILT-IN REINFORCED STRUCTURE AS RECOMMENDED BY THE MANUF. TO SUPPORT THE FILTER CLOTH.
2. EXTEND FILTER CLOTH AND BACKING INTO THE TRENCH.



ELEVATION

SILT FENCE DETAIL

NOT TO SCALE

STRUCTURAL NOTES

CONCRETE PROTECTION FOR REINFORCEMENT SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE:

CONDITION	CLEAR COVER OVER BARS
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
CONCRETE EXPOSED TO EARTH OR WEATHER	
#6 THROUGH #18 BARS	2"
#5 BAR, W31 OR D31 WIRE AND SMALLER	1 1/2"
CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	
SLABS, WALLS, AND JOISTS	
#14 AND #18 BARS	1 1/2"
#11 BAR AND SMALLER	3/4"

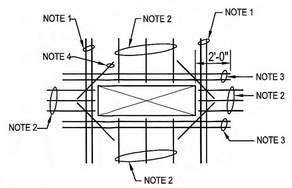
NOTES:
1. MAIN REINFORCING INTERRUPTED BY OPENING TO BE LOCATED EQUALLY ON EACH SIDE OF OPENING.

2. ADD MAIN STEEL OR TEMPERATURE REINFORCING AS SCHEDULED OPPOSITE THE OPENING.

3. ADD (2) #5 TOP & BOTTOM ON EACH SIDE OF OPENING UNLESS OTHERWISE NOTED ON PLAN.

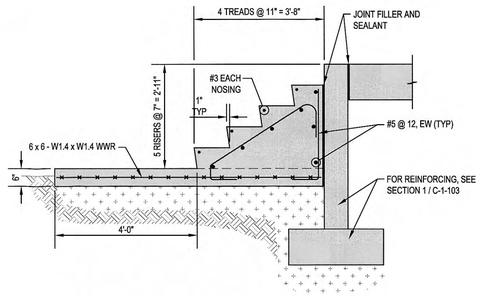
4. ADD DIAGONAL BARS (#4 TOP & BOTTOM x 3'-0").

5. IF OPENING DIMENSION IS < 16" - SPREAD SCHEDULED REINFORCING & ADD CORNER BARS.



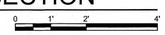
REINFORCING AT FLOOR OPENINGS

NOT TO SCALE



1 STAIR SECTION

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



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GRW Engineers, Inc.
Engineers, Architects, Planners

ENGINEER'S REPRESENTATIVE: D. Morris
CONSTRUCTION COMPANY: PORTLAND UTILITIES CONST. CO.
DATE: 3/XX/2012

ROBERT G. THREADGILL
REGISTERED ENGINEER
AGRICULTURE
NO. 012645
STATE OF TENNESSEE

STATE SUBMITTAL

GRW PROJECT NO. 3947-02
CLIENT PROJECT NO. XXXXX

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STANDARD DETAILS

MAYS PUMP STATION IMPROVEMENTS & SEWER REHAB
CITY OF HARRIMAN, TENNESSEE

DESIGNED:	DRAWN:	REVIEWED:	APPROVED:
CAJ	CAJ	RGT	RGT

REVISIONS

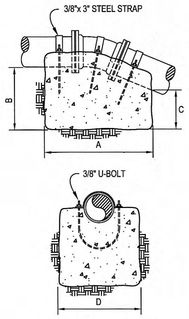
NO.	DESCRIPTION	DATE	BY

SCALE CHECK: THIS MARK SHOULD MEASURE EXACTLY 1" WHEN PLOTTED

DATE: MAY 2011
SCALE: AS SHOWN
SHEET NO.

C-0-504

PRINTED: 3/12/2012 @ 2:06PM
FILE NAME: I:\3947-Harriman Utility\02-Mays PS Cherry MBW\Working Drawings\RECORD Drawings\05_C-0-504 Std Details.dwg



90° BEND							
SIZE	16"	12"	10"	8"	6"	4"	2"
A	85	67	60	54	42	34	30
B	85	67	60	54	42	34	18
C	80	63	56	50	38	30	16
D	76	66	60	48	48	36	24

45° BEND							
SIZE	16"	12"	10"	8"	6"	4"	2"
A	72	60	50	46	35	30	24
B	72	60	50	46	35	28	24
C	68	56	46	42	30	24	18
D	72	60	60	48	48	36	24

22 1/2 ° BEND							
SIZE	16"	12"	10"	8"	6"	4"	2"
A	58	50	42	38	30	24	18
B	58	48	42	38	30	24	18
C	54	44	38	34	26	20	14
D	60	48	48	36	36	30	24

11 1/4 ° BEND							
SIZE	16"	12"	10"	8"	6"	4"	2"
A	42	36	30	29	24	20	18
B	42	36	30	29	24	20	18
C	38	32	26	24	20	16	14
D	60	48	48	36	30	24	24

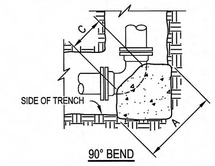
DIMENSIONS ARE IN INCHES

NOTES:

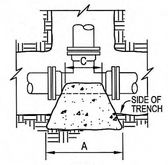
1. THRUST BLOCKS DESIGNED FOR 150 PSI PRESSURE. FOR GREATER PRESSURE QUANITIES WILL HAVE TO BE RECALCULATED.
2. THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
3. IF EXACT SIZE PIPE BLOCKING IS NOT SHOWN, USE NEXT LARGER SIZE.
4. THRUST BLOCKING TO BE POURED IN PLACE - CLASS "C" CONCRETE.

VERTICAL CONCRETE ANCHOR

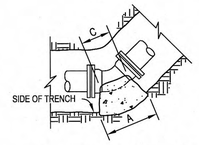
NOT TO SCALE



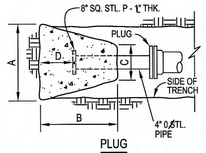
90° BEND



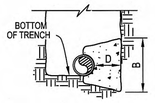
TEE



45° - 22 1/2° - 11 1/4° BEND



PLUG



TYPICAL SECTION

NOTES:

1. THRUST BLOCKS DESIGNED FOR 200 PSI PRESSURE AND 2000 PSF SOIL BEARING. FOR GREATER PRESSURE OR LESS SOIL BEARING, QUANTITIES WILL HAVE TO BE RECALCULATED.
2. THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
3. IF EXACT SIZE PIPE BLOCKING IS NOT SHOWN, USE NEXT LARGER SIZE.
4. THRUST BLOCKING TO BE POURED IN PLACE CLASS C CONC.

90° BEND							
SIZE	16"	12"	10"	8"	6"	4"	2"
A	84	60	51	42	32	24	18
B	72	60	51	42	32	24	18
C	30	18	16	12	12	9	9
D	34	30	24	17	13	9	9

45° BEND							
SIZE	16"	12"	10"	8"	6"	4"	2"
A	58	43	38	32	24	18	12
B	58	43	38	32	24	18	12
C	24	16	14	12	12	8	8
D	24	18	15	12	9	6	6

22 1/2 ° BEND							
SIZE	16"	12"	10"	8"	6"	4"	2"
A	42	32	27	24	18	12	9
B	42	32	27	24	18	12	9
C	18	16	14	12	10	8	8
D	18	13	11	9	6	4	4

11 1/4 ° BEND							
SIZE	16"	12"	10"	8"	6"	4"	2"
A	30	24	21	17	12	9	9
B	30	24	21	17	12	9	9
C	18	16	14	12	10	8	8
D	12	9	8	6	5	4	4

PLUG							
SIZE	16"	12"	10"	8"	6"	4"	2"
A	66	52	43	34	27	20	18
B	66	52	43	34	27	20	18
C	12	12	12	12	12	12	12
D	44	32	22	15	11	11	11

TEE							
SIZE	MAIN	16"	12"	12" - 12"Ø8"	12" - 6"Ø2"		
	BRANCH	16"	12"Ø8" - 8"Ø2"	10"Ø8" - 6"Ø2"	6"Ø2"		
A		66	52	43	34	43	26	26
B		66	52	43	34	43	26	26
C		30	12	12	12	12	12	12
D		30	26	21	14	21	13	13

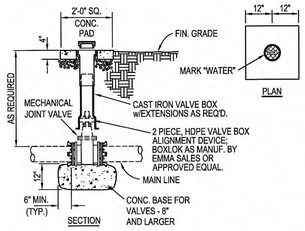
DIMENSIONS ARE IN INCHES

THRUST BLOCKING DETAIL

NOT TO SCALE

NOTES:

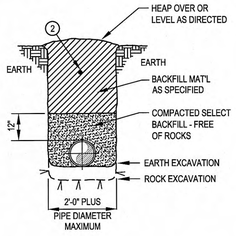
1. VALVES IN ROADWAY DO NOT REQUIRE A CONCRETE PAD.
2. VALVES SHALL BE RESTRAINED WITH MEGALUG TYPE RESTRAINT SYSTEM.



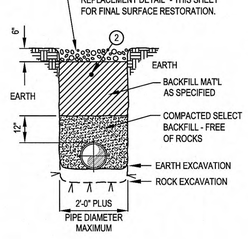
VALVE SETTING DETAIL

NOT TO SCALE

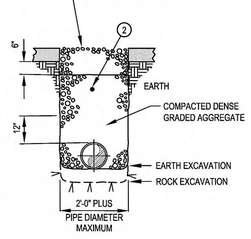
NOTE:
① SEE SPECIFICATIONS FOR DEPTH REQUIREMENT OF PIPE.
② LOCATOR WIRE, IF REQUIRED. SEE "DETECTABLE WIRE DETAIL" FOR CORRECT PLACEMENT.



METHOD "A"
(IN OPEN TERRAIN)



METHOD "B"
(UNDER SIDEWALKS & UNPAVED DRIVEWAYS)

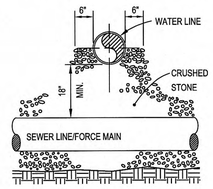


METHOD "C"
(UNDER PAVED STREETS, ROADS & DRIVEWAYS)

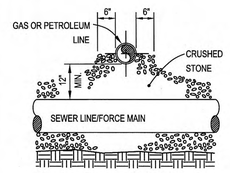
PRESSURE PIPE BEDDING AND BACKFILLING DETAILS

NOT TO SCALE

NOTE:
SEWER LINES AT WATER MAIN CROSSING SHALL BE ARRANGED SO THAT THE SEWER JOINTS WILL BE AS FAR AS POSSIBLE FROM WATER MAIN JOINTS



SEWER LINE/FORCE MAIN UNDER WATER LINE



SEWER LINE/FORCE MAIN UNDER GAS TRANSMISSION LINE

PIPE CROSSING FOR SEWER LINE/FORCE MAIN

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GRW Engineers, Inc.
Engineers, Architects, Planners
ENGINEER'S REPRESENTATIVE: D. Morris
CONSTRUCTION COMPANY: PORTLAND UTILITIES CONST. CO.
DATE: 3/XX/2012

ROBERT G. THREADGILL
REGISTERED ENGINEER
AGRICULTURE
DATE
NO. 012645
STATE OF TENNESSEE

STATE SUBMITTAL

GRW PROJECT NO. 3947-02

CLIENT PROJECT NO. XXXXX

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CITY OF HARRIMAN, TENNESSEE

DESIGNED:	CAJ
DRAWN:	CAJ
REVIEWED:	RGT
APPROVED:	RGT

REVISIONS

NO.	DESCRIPTION	DATE	BY

SCALE CHECK: THIS MARK SHOULD MEASURE EXACTLY 1" WHEN PLOTTED

DATE: MAY 2011

SCALE: AS SHOWN

SHEET NO.

C-0-505

FILE NAME: I:\3947-Harriman Utility\02-Mays PS Cherry MB\Working Drawings\RECORD Drawings\06_C-0-505 Std FM Details.dwg

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