



**CUY-90-14.90**

**PID 77332/85531**

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**APPENDIX UT-03**

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**NEORSD Walworth Run Relocation  
(Reference Document)**

State of Ohio  
Department of Transportation  
Jolene M. Molitoris, Director

**Innerbelt Bridge  
Construction Contract Group 1 (CCG1)**

# NORTHEAST OHIO REGIONAL SEWER DISTRICT

## WALWORTH RUN INTERCEPTOR REALIGNMENT (WRIR)

WRIR

NORTHEAST OHIO REGIONAL SEWER DISTRICT

BOARD OF TRUSTEES

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MAYOR JACK BACCI  
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JULIUS CIACCIA, JR., EXECUTIVE DIRECTOR

ACCEPTED BY :

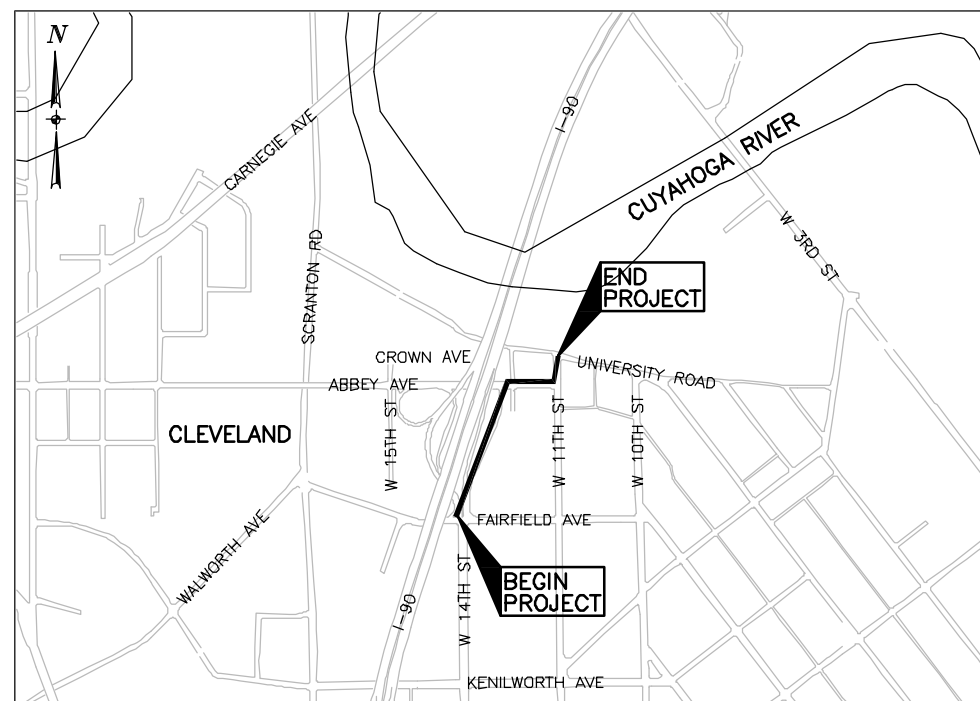
\_\_\_\_\_  
**JULIUS CIACCIA, JR.**  
EXECUTIVE DIRECTOR

\_\_\_\_\_  
DATE

\_\_\_\_\_  
**KELLIE C. ROTUNNO**  
DIRECTOR OF ENGINEERING  
AND CONSTRUCTION

\_\_\_\_\_  
DATE

NORTHEAST OHIO REGIONAL SEWER DISTRICT



LOCATION MAP  
SCALE: 1"=500'

SUBMITTED BY :

\_\_\_\_\_  
DLZ OHIO, INC

\_\_\_\_\_  
DATE



\_\_\_\_\_  
DLZ OHIO, INC.

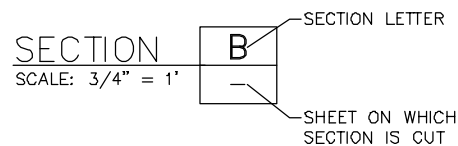
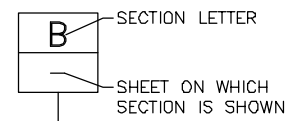
**NOTES**

1. BASIS OF BEARING AND ELEVATION: HORIZONTAL AND VERTICAL CONTROL IS BASED ON THE OHIO NORTH ZONE STATE PLANE COORDINATE SYSTEM NAD 83 AND THE NAVD 88 VERTICAL DATUM.
2. EXISTING STRUCTURES, GRADES, PIPING ETC., ARE SHOWN IN APPROXIMATE LOCATIONS ON THE PLANS. THE INFORMATION SHOWN IS NOT GUARANTEED TO BE CORRECT OR COMPLETE. THE DATA SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
3. THE CONTRACTOR SHALL COORDINATE HIS OPERATIONS WITH THE WORK OF THE UTILITY OWNERS OR OTHERS WHO MAY RELOCATE EXISTING UTILITIES, AND SHALL NOTIFY OWNERS OF THE UTILITIES OF HIS SCHEDULE SUFFICIENTLY IN ADVANCE TO PERMIT THEM TO MAKE THE NECESSARY ALTERATIONS.
4. INFORMATION ON EXISTING UTILITIES AND OTHER SUB-STRUCTURES WAS OBTAINED FROM APPROPRIATE AGENCIES. EXISTING UTILITIES SHALL BE MAINTAINED IN PLACE BY THE CONTRACTOR UNLESS OTHERWISE SHOWN ON THE PLANS OR STATED IN THE SPECIFICATIONS. THE LOCATIONS OF EXISTING UTILITIES AND SUB-STRUCTURES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY EXACT LOCATIONS, ELEVATIONS, AND DIMENSIONS IN THE FIELD PRIOR TO CONSTRUCTION IN THE AREA OF THE SPECIFIC SUB-STRUCTURE.
5. THE LENGTH OF PIPE SHOWN ON THE DRAWINGS IS GIVEN FROM CENTER-TO-CENTER OF STRUCTURE FOR STRUCTURES UP TO 6-FT INSIDE DIAMETER, AND TO THE INSIDE FACE OF STRUCTURE FOR STRUCTURES OVER 6-FT INSIDE DIAMETER.

**LEGEND**

- |   |                             |   |                               |
|---|-----------------------------|---|-------------------------------|
| ⊙ | - EXISTING MANHOLE          | • | - POST (SQUARE)               |
| ⊚ | - EXISTING CATCH BASIN      | ⊙ | - POST (ROUND)                |
| ⊚ | - EXISTING HYDRANT          | ⊙ | - TREE                        |
| ⊙ | - EXISTING/PROPOSED VALVE   | ⊙ | - SHRUB                       |
| ⊙ | - LIGHT POLE                | ⊙ | - BENCH MARK                  |
| ⊙ | - TELEPHONE POLE            | X | - CHISELED BENCH MARK         |
| ⊙ | - POWER POLE                | ⊙ | - EXISTING MONUMENT BOX       |
| ⊙ | - UTILITY POLE              | ⊙ | - IRON PIN/PIPE FOUND         |
| ⊙ | - LIGHT & POWER POLE        | ⊙ | - IRON PIN/PIPE SET           |
| ⊙ | - TELEPHONE & POWER POLE    | ⊙ | - TACKED HUB                  |
| ⊙ | - TELEPHONE & LIGHT POLE    | ⊙ | - DRILL HOLE                  |
| ⊙ | - GUY ANCHOR                | • | - PKNAIL                      |
| ⊙ | - SIGN (1 POST)             | • | - RAILROAD SPIKE              |
| ⊙ | - SIGN (2 POST)             | ⊙ | - ELECTRICAL BOX              |
| ⊙ | - EXISTING SANITARY MANHOLE | ⊙ | - EXISTING ELECTRICAL MANHOLE |
| ⊙ | - STORM INLET/ CATCH BASIN  | ⊙ | - BORING LOCATION             |
| ⊙ | - STORM INLET/ CATCH BASIN  |   |                               |
- 
- |  |          |  |                   |
|--|----------|--|-------------------|
|  | CONCRETE |  | SCREENED GRAVEL   |
|  | GROUT    |  | UNDISTURBED EARTH |

**SECTION CUTS**



**ABBREVIATIONS**

- |  |                           |                                 |
|--|---------------------------|---------------------------------|
| ADH. - ADHESIVE  | E.W. - EACH WAY           | ℙ - PROPERTY LINE/PLATE         |
| AB - ANCHOR BOLT   | EQ - EQUAL                | PROP - PROPOSED                 |
| ADD'L - ADDITIONAL   | EXIST - EXISTING          | PSI - POUNDS PER SQUARE INCH    |
| ALT. - ALTERNATE   | EXP - EXPANSION           | PSF - POUNDS PER SQUARE FOOT    |
| ALUM - ALUMINUM  | EXT - EXTERIOR            | PVC - POLYVINYL CHLORIDE        |
| & - AND  | FDN. - FOUNDATION         | R. - RISER                      |
| ASS'Y - ASSEMBLY   | FIN - FINISH              | RCP - REINFORCED CONCRETE PIPE  |
| ⊙ - AT   | FL - FINISH LINE          | REINF - REINFORCING             |
| BITUM. - BITUMINOUS  | FLR - FLOOR               | REQ'D. - REQUIRED               |
| B/ - BOTTOM OF   | FF - FAR FACE             | REQ'MTS. - REQUIREMENTS         |
| OR BOT/  | FTG - FOOTING             | RO - ROUGH OPENING              |
| ℙ - BASE LINE  | G - GAS                   | RT - RIGHT                      |
| BLDG. - BUILDING   | GA. - GAGE                | R/W - RIGHT-OF-WAY              |
| BLK. - BLOCK   | GR. - GRADE               | SAN - SANITARY SEWER            |
| BOT - BOTTOM   | GRD. - GROUND             | SCHED - SCHEDULE                |
| B PL - BASE PLATE  | HORIZ - HORIZONTAL        | SECT - SECTION                  |
| BRG. - BEARING   | HP - HIGH POINT           | SF - SQUARE FEET                |
| BT PL. - BENT PLATE  | HHP - HIGH HIGH POINT     | SHT. - SHEET                    |
| CCFRMP - CENTRIFUGALLY CAST FIBER-REINFORCED POLYMER MORTAR PIPE | HR. - HANDRAIL            | SIM - SIMILAR                   |
| C/C - CENTER TO CENTER   | HS - HIGH STRENGTH        | SJ - STEEL JOIST                |
| C.J. - CONSTRUCTION JOINT  | I.F. - INSIDE FACE        | SLBB - SHORT LEG BACK-TO-BACK   |
| ⊙ - CENTERLINE   | INT - INTERIOR            | SLV - SHORT LEG VERTICAL        |
| CIRC - CIRCULAR  | INSUL. - INSULATION       | SPA. - SPACES OR SPACING        |
| CLR - CLEAR  | INV. - INVERT             | SPRD. - SPREAD                  |
| CLSM - CONTROLLED LOW-STRENGTH MATERIAL                          | JT - JOINT                | SQ OR □ - SQUARE                |
| CMU - CONCRETE MASONRY UNIT                                      | K. - KIP (1000 POUNDS)    | ST - STORM SEWER                |
| COL - COLUMN   | LL - LIVE LOAD            | STA. - STATION                  |
| COMB. - COMBINED   | LLB - LONG LEG            | ST. STL. - STAINLESS STEEL      |
| CONC - CONCRETE  | LLH - LONG LEG HORIZONTAL | STD - STANDARD                  |
| CONT - CONTINUOUS  | LLV - LONG LEG VERTICAL   | STL. - STEEL                    |
| CONTL. - CONTROL   | LONG. - LONGITUDINAL      | STR. - STRUCTURAL               |
| CPP - CLEVELAND PUBLIC POWER                                     | LP - LOW POINT            | SUP. - SUPPORT                  |
| DEFL - DEFLECTION  | LT - LEFT                 | SWO - STORMWATER OVERFLOW       |
| DEPR. - DEPRESSION   | LW - LIGHT WEIGHT         | T. - TREAD                      |
| DET - DETAIL   | MAS - MASONRY             | T/ - TOP OF                     |
| DI(DIP) - DUCTILE IRON PIPE                                      | MAX - MAXIMUM             | OR TOP/                         |
| DIA - DIAMETER   | MH - MANHOLE              | T&B - TOP AND BOTTOM            |
| ⊙ - DIAMETER   | MID. - MIDDLE             | TEMP - TEMPORARY                |
| DIM - DIMENSION  | MIN - MINIMUM             | THK. - THICK                    |
| DL - DEAD LOAD   | MK. - MARK                | TOM - TOP OF MASONRY            |
| DIST. - DISTANCE   | MO - MASONRY OPENING      | TYP - TYPICAL                   |
| DWL/DWLS - DOWEL(S)  | N/A - NOT APPLICABLE      | U.O.N. - UNLESS OTHERWISE NOTED |
| DWO - DRY WEATHER OUTLET   | N.F. - NEAR FACE          | VCP - VITRIFIED CLAY PIPE       |
| EE - EACH END  | NO. - NUMBER              | VERT - VERTICAL                 |
| E.F. - EACH FACE   | OC - ON CENTER            | W - WATER                       |
| E.J. - EXPANSION JOINT   | O/H E - OVERHEAD EXISTING | W/ - WITH                       |
| E. - EAST  | OPP. - OPPOSITE           | W/ - WEST                       |
| ELEV.(EL.) - ELEVATION   | OPNG - OPENING            | W/M - WATER MAIN                |
| ELEC - ELECTRIC  | +/- - PLUS OR MINUS       | W/O - WITHOUT                   |
| EMBD. - EMBEDDED   | PC - PRECAST              | WP - WORK POINT                 |
|  |                           | WS - WATERSTOP                  |
|  |                           | WWF - WELDED WIRE FABRIC        |

**SHEET INDEX**

SHEET NO.	SHEET TITLE
G-1	LEGEND, SHEET INDEX, AND GENERAL NOTES
G-2	SURVEY CONTROL
<b>MAINTENANCE OF TRAFFIC</b>	
<b>PLAN &amp; PROFILE</b>	
P-1	WALWORTH RUN INTERCEPTOR STA 1+00 TO STA 5+00
P-2	WALWORTH RUN INTERCEPTOR STA 5+00 TO STA 10+00
P-3	WALWORTH RUN INTERCEPTOR STA 10+00 TO STA 15+00
P-4	WEST 15TH ST SEWER CONNECTION
<b>CIVIL</b>	
C-1	NORTHERN SEWER ABANDONMENT PLAN
C-2	SOUTHERN SEWER ABANDONMENT PLAN
C-3	JUNCTION CHAMBER NO. 1 SITE PLAN
C-4	MANHOLE NO. 1 SITE PLAN
C-5	MANHOLE NO. 2 AND JUNCTION CHAMBER NO.2 SITE PLAN
C-6	WATER MAIN RELOCATION PLAN AND NOTES
C-7	WATER MAIN NOTES AND DETAILS
C-8	WATER MAIN DETAILS
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C-10	TRENCH REPAIR DETAILS
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TU-2	JUNCTION CHAMBER NO.1 FINAL SUPPORTS
TU-3	WORK SHAFT JUNCTION CHAMBER NO.2 INITIAL SUPPORTS
TU-4	JUNCTION CHAMBER NO.2 FINAL SUPPORTS
TU-5	WORK SHAFT MANHOLE NO.1 INITIAL SUPPORTS
TU-6	WORK SHAFT MANHOLE NO.2 INITIAL SUPPORTS
TU-7	BREAK-IN, BREAK-OUT, BACKSTOP AND SUMP DETAIL

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

REV. NO.	DATE	ISSUE BY	REMARKS

DESIGNED BY: \_\_\_\_\_  
DRAWN BY: \_\_\_\_\_  
SHEET CHK'D BY: \_\_\_\_\_  
CROSS CHK'D BY: \_\_\_\_\_  
APPROVED BY: \_\_\_\_\_  
DATE: \_\_\_\_\_

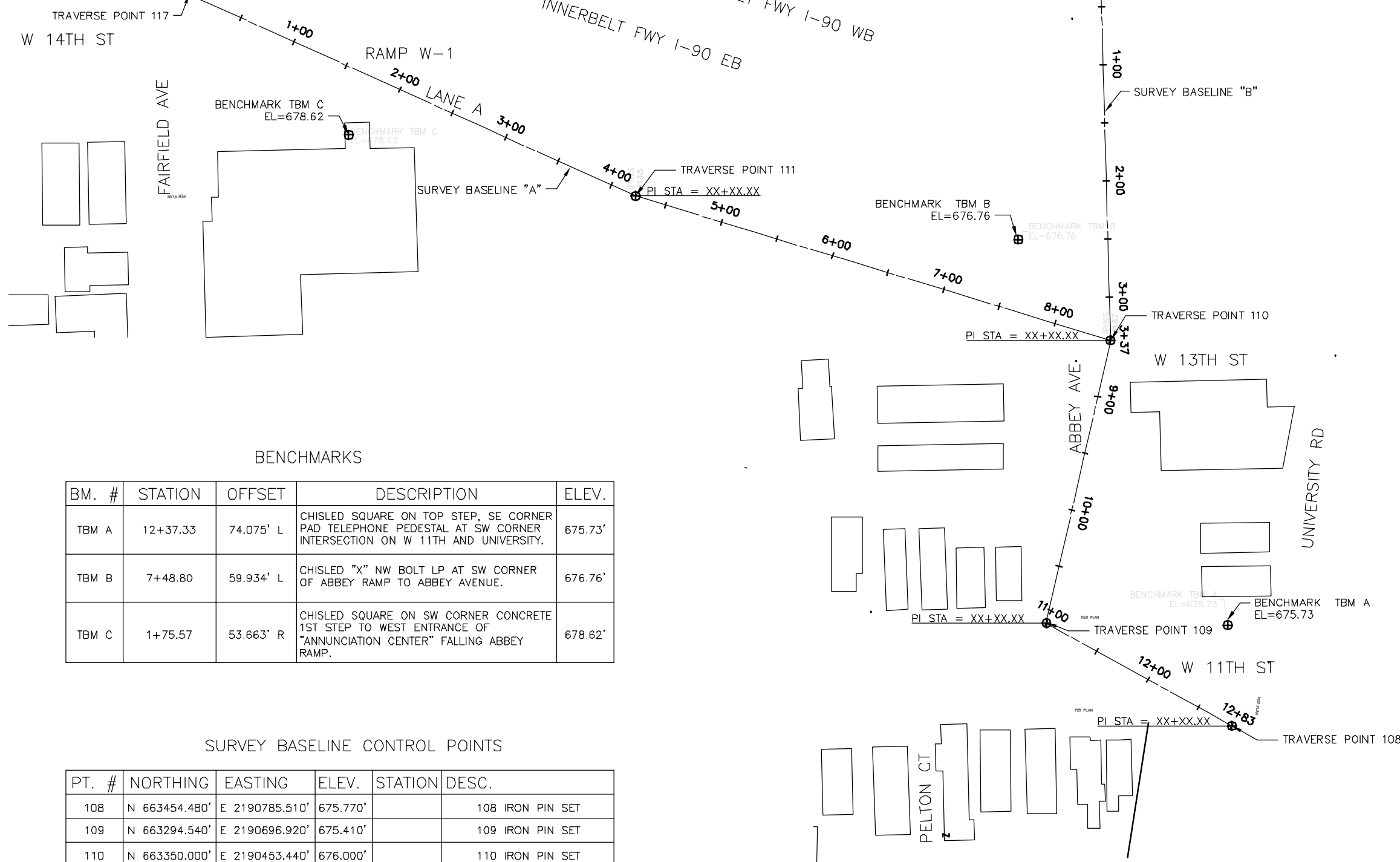
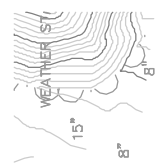


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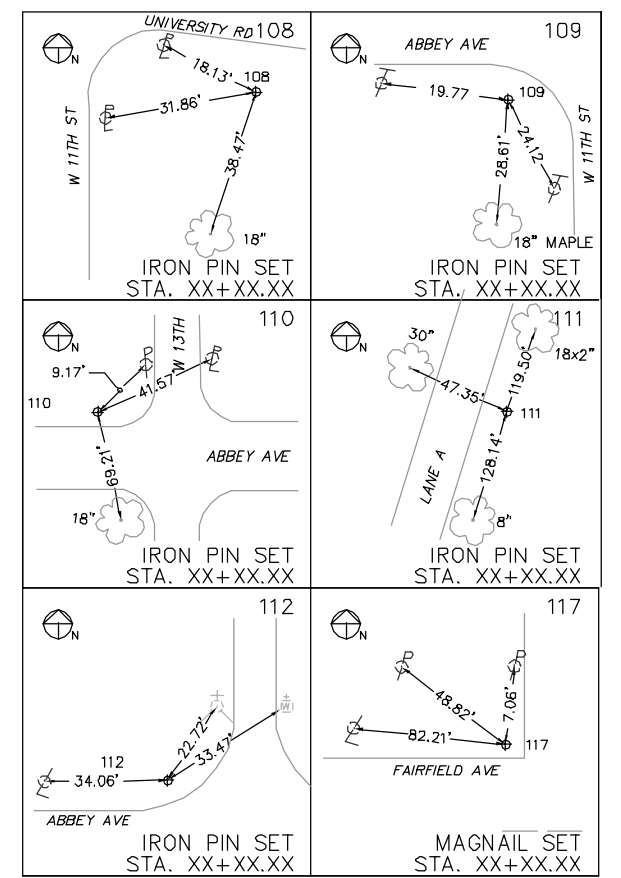
WALWORTH RUN INTERCEPTOR REALIGNMENT

LEGEND, SHEET INDEX, AND GENERAL NOTES

PROJECT NO.:  
SHEET: X  
SCALE: 1"=10'  
SHEET NO.: G-1



SURVEY BASELINE CONTROL POINT LOCATIONS



BENCHMARKS

BM. #	STATION	OFFSET	DESCRIPTION	ELEV.
TBM A	12+37.33	74.075' L	CHISLED SQUARE ON TOP STEP, SE CORNER PAD TELEPHONE PEDESTAL AT SW CORNER INTERSECTION ON W 11TH AND UNIVERSITY.	675.73'
TBM B	7+48.80	59.934' L	CHISLED "X" NW BOLT LP AT SW CORNER OF ABBEY RAMP TO ABBEY AVENUE.	676.76'
TBM C	1+75.57	53.663' R	CHISLED SQUARE ON SW CORNER CONCRETE 1ST STEP TO WEST ENTRANCE OF "ANNUNCIATION CENTER" FALLING ABBEY RAMP.	678.62'

SURVEY BASELINE CONTROL POINTS

PT. #	NORTHING	EASTING	ELEV.	STATION	DESC.
108	N 663454.480'	E 2190785.510'	675.770'		108 IRON PIN SET
109	N 663294.540'	E 2190696.920'	675.410'		109 IRON PIN SET
110	N 663350.000'	E 2190453.440'	676.000'		110 IRON PIN SET
111	N 662940.790'	E 2190329.240'	679.670'		111 IRON PIN SET
112	N 663340.790'	E 2190116.180'	675.230'		112 IRON PIN SET
117	N 662555.680'	E 2190155.420'	675.940'		117 MAGNAIL SET



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 APPROVED BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_

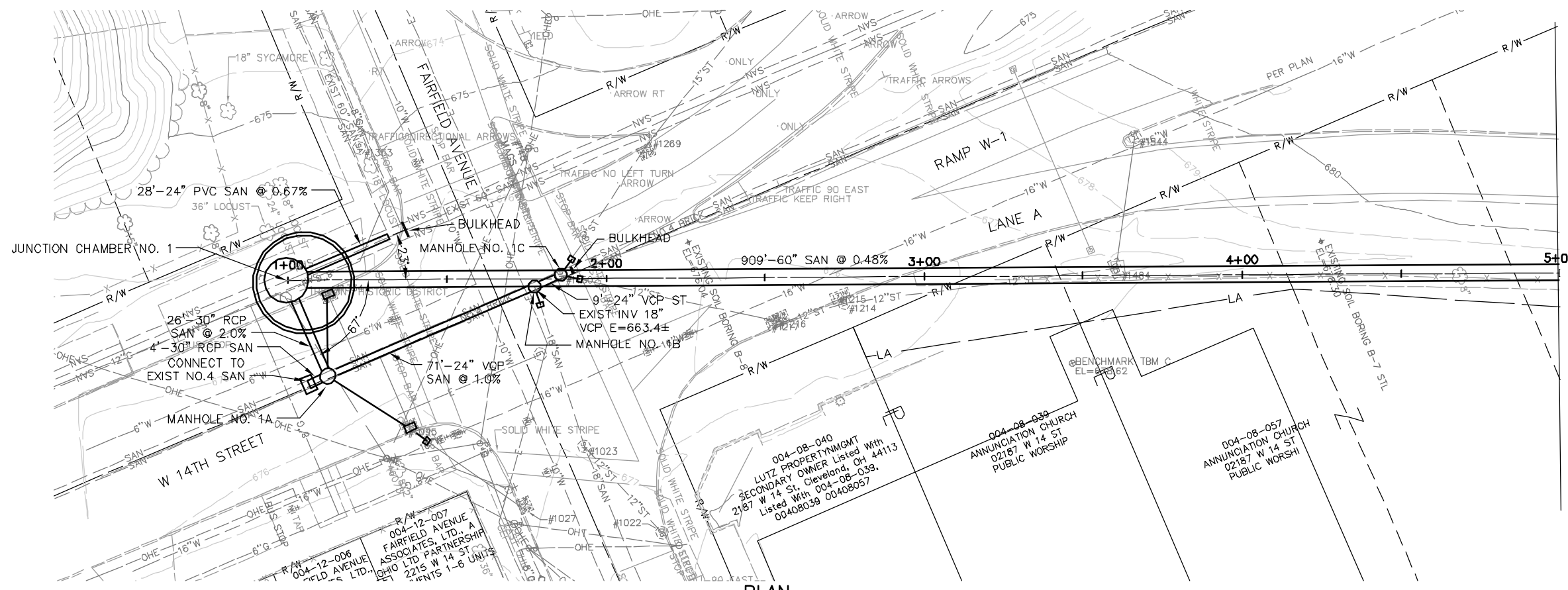


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WALWORTH RUN INTERCEPTOR REALIGNMENT

SURVEY CONTROL

PROJECT NO.: \_\_\_\_\_  
 SHEET: \_\_\_\_\_  
 SCALE: 1"=50'  
 SHEET NO.: G-2



PLAN

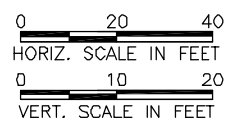
MATCH LINE STA. 5+00

CROSS REFERENCE TABLE	
SHEET NO.	DESCRIPTION
	JUNCTION CHAMBER NO. 1 SITE PLAN
	JUNCTION CHAMBER NO. 1 STRUCTURAL PLANS AND DETAILS



PROFILE

- IGR #1022  
TOC=677.19  
INV 12" RCP SW (TO #1023)=674.19
- SMH #1023  
TOC=676.91  
FAIR-02  
INV 18" VCP E=663.56  
INV 18" VCP W=663.65  
INV 12" CP NE=673.01  
INV 15" VCP NE=666.31
- INCB #1027  
TOC=676.62  
INV 12" VCP NE=672.32
- INCB #1095  
TOC=675.80  
NO PIPES VISIBLE  
MEASUREMENT +/-  
BOTTOM OF STRUCTURE=671.15
- SMH #1150  
TOC=676.18  
INV 12" RCP NE=671.24  
INV 18" RCP NW=667.82  
BOTTOM OF STRUCTURE=661.88
- STMH #1214  
TOC=676.35  
INV 12" RCP N=672.35  
INV 12" RCP S=672.35
- IN #1215  
TOC=675.79  
CURB INLET WINDOW
- INCB #1216  
TOC=675.52  
INV 12" RCP SW (TO #1150)=672.32
- INCB #1217  
TOC=675.53
- INCB #1269  
TOC=675.69  
INV 18" VCP S (TO #1150)=668.04
- INCB #1334  
TOC=675.48  
MEASUREMENT +/-  
BOTTOM OF STRUCTURE=669.88
- SMH #1353  
TOC=675.52  
FAIR-04  
INV 60" BRICK E=625.27  
INV 60" BRICK W=625.12
- IGS #1484  
TOC=676.52  
FILLED TO GRATE  
NO PIPES VISIBLE
- STMH #1544  
TOC=679.26  
FILLED TO GRATE  
NO PIPES VISIBLE



BAR IS ONE INCH ON ORIGINAL DRAWING  
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REV. NO.	DATE	ISSUE BY	REMARKS

DESIGNED BY: \_\_\_\_\_  
 DRAWN BY: \_\_\_\_\_  
 SHEET CHK'D BY: \_\_\_\_\_  
 CROSS CHK'D BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_

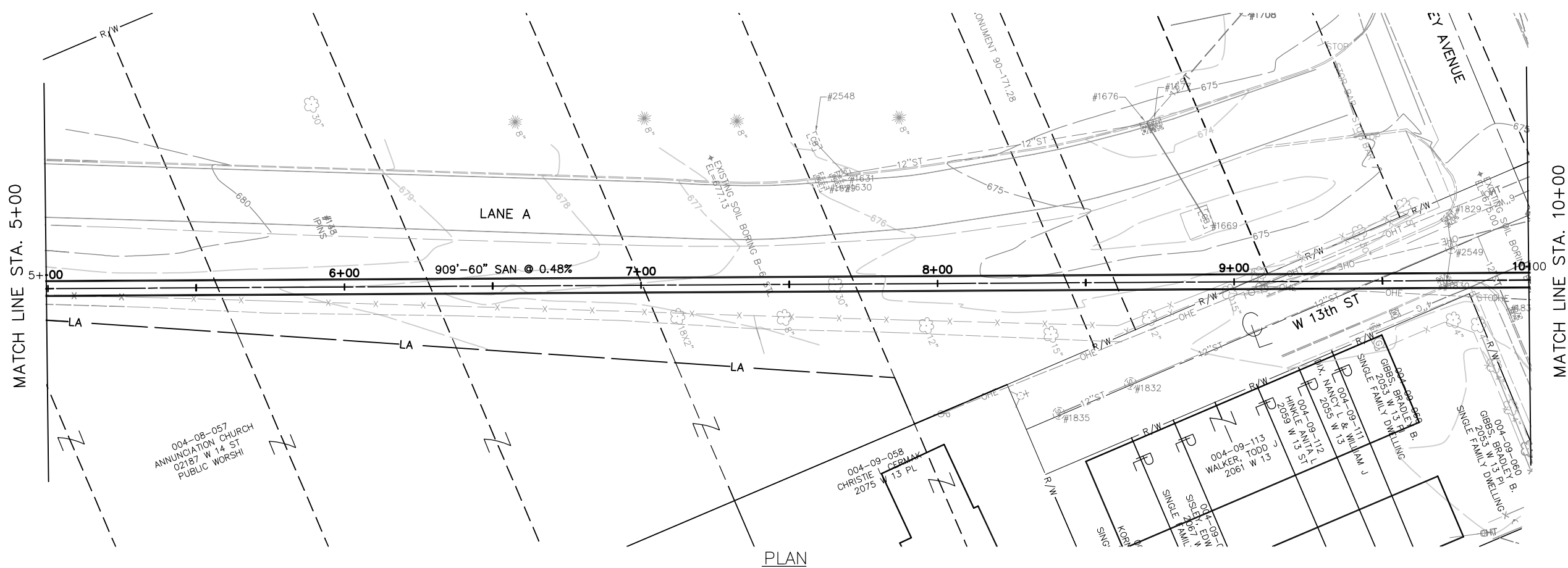
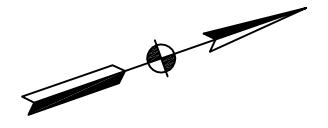


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WALWORTH RUN INTERCEPTOR REALIGNMENT

PROJECT NO.: \_\_\_\_\_  
 SHEET: \_\_\_\_\_  
 SCALE: 1"=20'H; 1"=10'V  
 SHEET NO.: P-1

PLAN & PROFILE  
 STA. 1+00 TO STA. 5+00

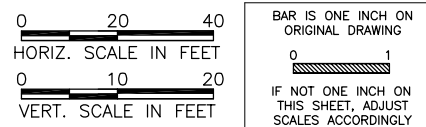
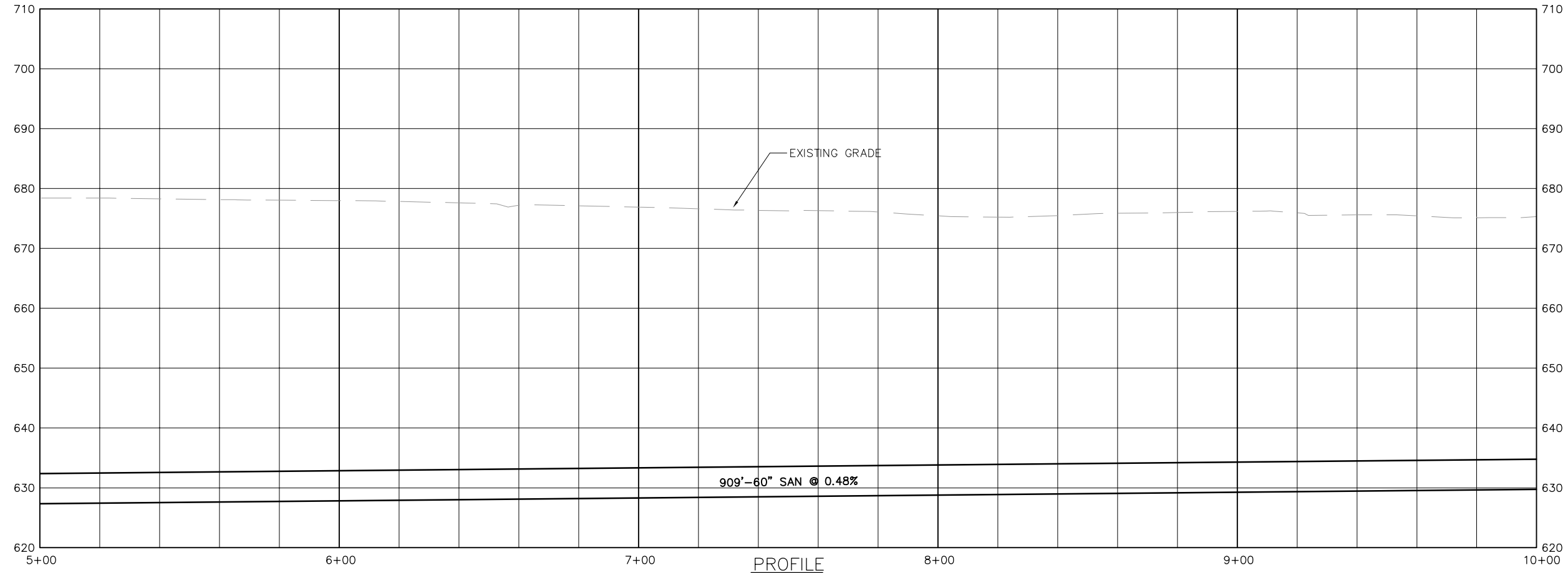


MATCH LINE STA. 10+00

MATCH LINE STA. 5+00

CROSS REFERENCE TABLE	
SHEET NO.	DESCRIPTION

- IN #1629  
TOC=675.88  
CURB INLET WINDOW
- IN #1630  
TOC=675.78  
CURB INLET WINDOW
- STMH #1631  
TOC=676.19  
INV 12" RCP N (TO #1676)=670.99  
INV 12" RCP W (TO #2548)=671.09
- IGS #1669  
TOC=673.26  
NO PIPES VISIBLE
- INCB #1676  
TOC=673.38  
INV 12" RCP E (TO #1669)=668.58  
INV 12" VCP NW (TO #1708)=668.48  
INV 12" RCP SW (TO #1631)=668.68
- INCB #1677  
TOC=673.38
- INCB #1829  
TOC=675.22  
INV 12" VCP SE (TO #2549)=670.57
- INCB #1830  
TOC=675.09  
INV 12" VCP NW (TO #2549)=670.09
- INCB #1831  
TOC=675.11  
NO PIPES VISIBLE  
MEASUREMENT +/-  
BOTTOM OF STRUCTURE=671.91
- IGS #2548  
TOC=675.82  
FILLED TO TOP OF STRUCTURE
- STMH #2549  
TOC=675.42  
INV 12" VCP SE (TO #1830)=669.67  
INV 12" VCP NW (TO #1829)=669.02  
INV 12" VCP S (TO #1832)=664.92  
INV 12" VCP N=664.92



REV. NO.	DATE	ISSUE BY	REMARKS

DESIGNED BY: \_\_\_\_\_  
 DRAWN BY: \_\_\_\_\_  
 SHEET CHK'D BY: \_\_\_\_\_  
 CROSS CHK'D BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_

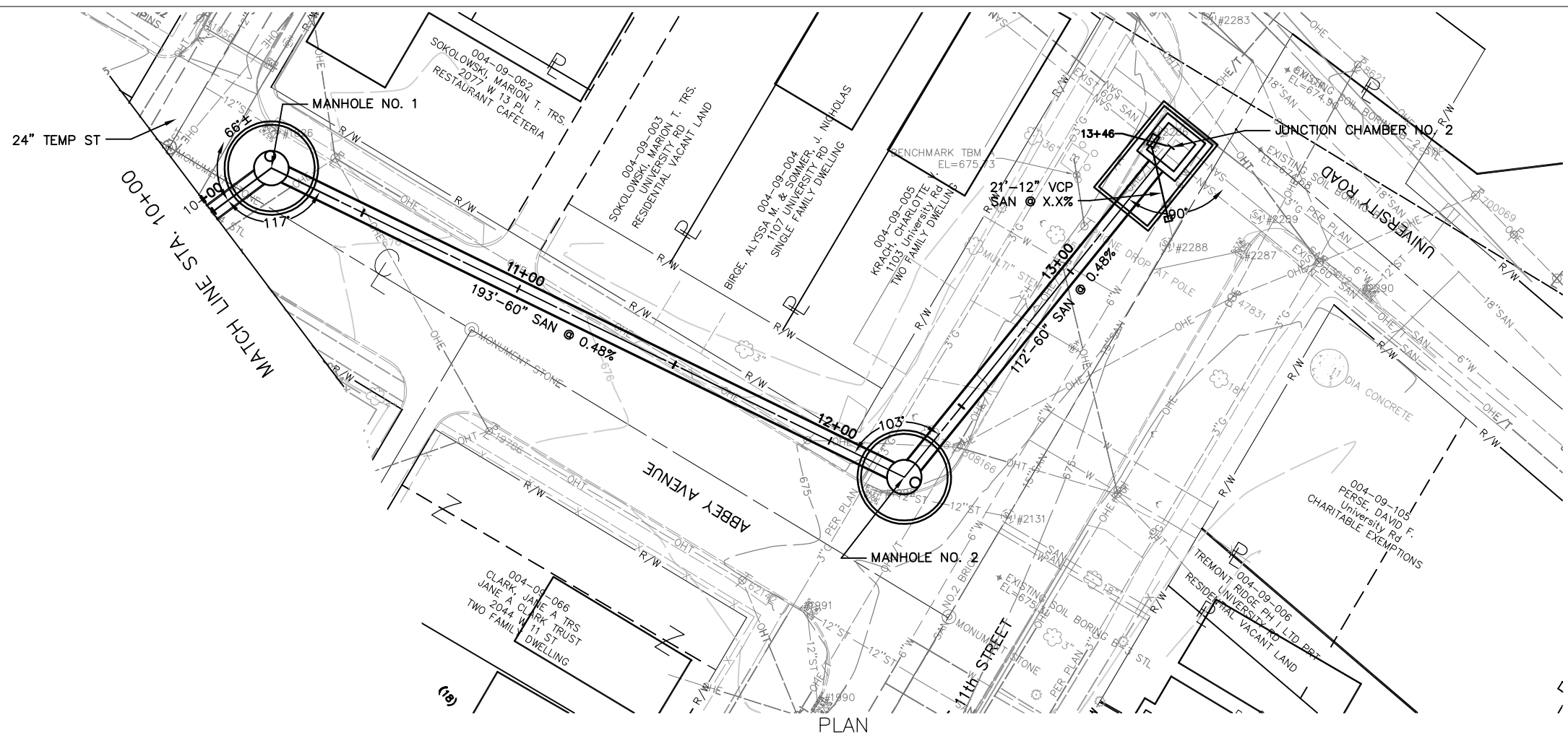


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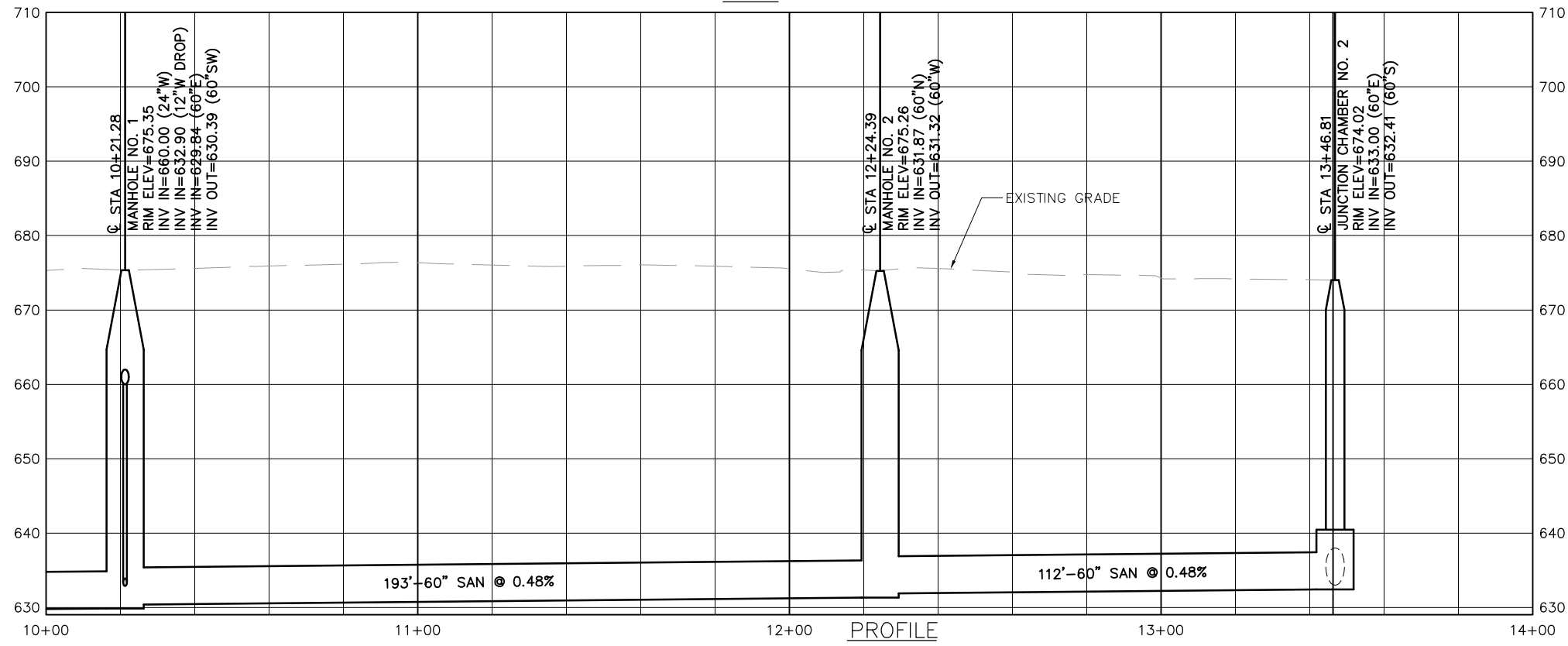
**WALWORTH RUN INTERCEPTOR REALIGNMENT**

**PLAN & PROFILE**  
 STA. 5+00 TO STA. 10+00

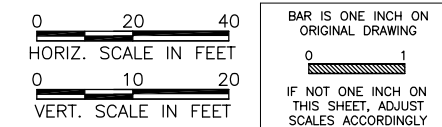
PROJECT NO.: \_\_\_\_\_  
 SHEET: \_\_\_\_\_  
 SCALE: 1"=20'H; 1"=10'V  
 SHEET NO.: P-2



CROSS REFERENCE TABLE	
SHEET NO.	DESCRIPTION
C-2	MH NO. 1 SITE PLAN
C-3	MANHOLE NO. 2 & JUNCTION CHAMBER NO. 2 SITE PLAN



- INCB #1826  
TOC=675.09  
FILLED WITH WATER MEASUREMENT +/-  
BOTTOM OF STRUCTURE=671.09
- INCB #1990  
TOC=674.82  
MEASUREMENT +/-  
BOTTOM OF STRUCTURE=671.82
- INCB #1991  
TOC=674.52  
INV 12" VCP SE (TO #1990)=670.62  
INV 12" VCP E=669.62
- INCB #1992  
TOC=674.61  
INV 12" VCP NE=669.81
- SMH #2131  
TOC=675.35  
DID NOT OPEN - CRACKED LID
- SMH #2283  
TOC=674.64  
UN-03  
INV 18" VCP E (TO #2356)=661.94  
INV 15" VCP W (TO #1799)=661.99  
INV 12" VCP SW=667.99  
INV 12" VCP NW=666.04
- INCB #2286  
TOC=673.69  
FILLED TO TOP OF STRUCTURE
- INCB #2287  
TOC=673.92  
FILLED TO TOP OF STRUCTURE
- SMH #2288  
TOC=674.89  
W11-01  
INV 15" VCP N (TO #2131)=667.59  
INV 15" VCP S (TO #?)=667.39
- SMH #2289  
TOC=674.25  
UN-02  
INV 60" BRICK SE (TO #?)=633.25  
INV 60" BRICK NW (TO #2131)=633.15
- INCB #2290  
TOC=673.93  
NO PIPES VISIBLE MEASUREMENT +/-  
BOTTOM OF STRUCTURE=667.38



REV. NO.	DATE	ISSUE BY	REMARKS

DESIGNED BY: \_\_\_\_\_  
 DRAWN BY: \_\_\_\_\_  
 SHEET CHK'D BY: \_\_\_\_\_  
 CROSS CHK'D BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_

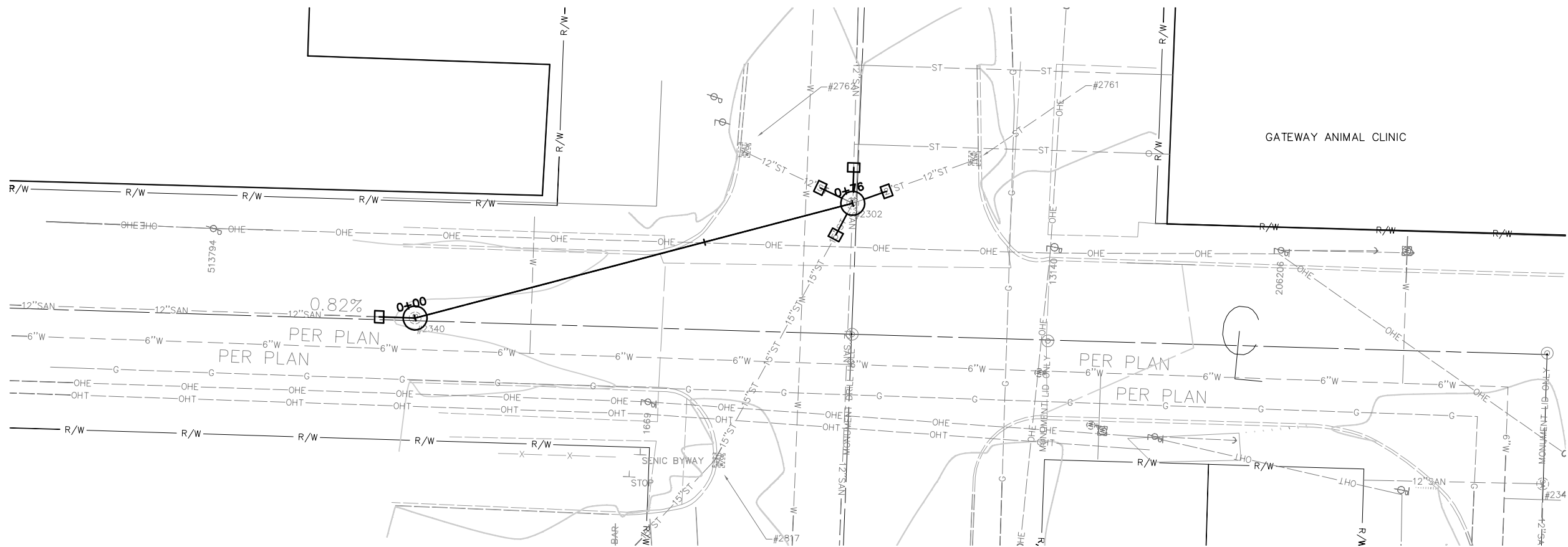


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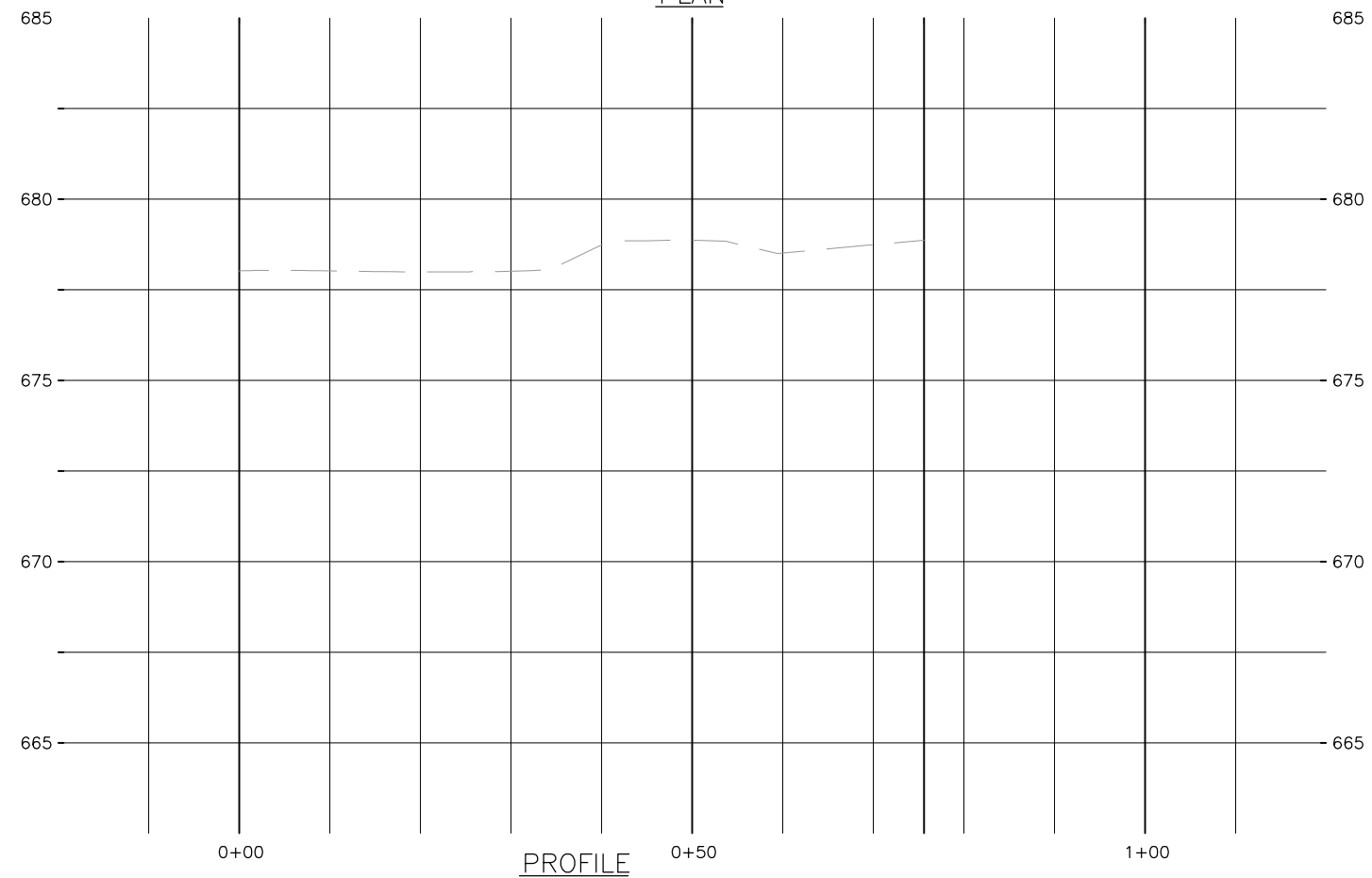
**WALWORTH RUN INTERCEPTOR REALIGNMENT**

**PLAN & PROFILE  
 STA. 10+00 TO STA. 15+00**

PROJECT NO.: \_\_\_\_\_  
 SHEET: \_\_\_\_\_  
 SCALE: 1"=20'H; 1"=10'V  
 SHEET NO.: P-3

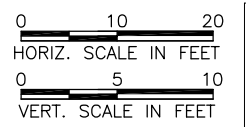


PLAN



PROFILE

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SHEET NO.	DESCRIPTION



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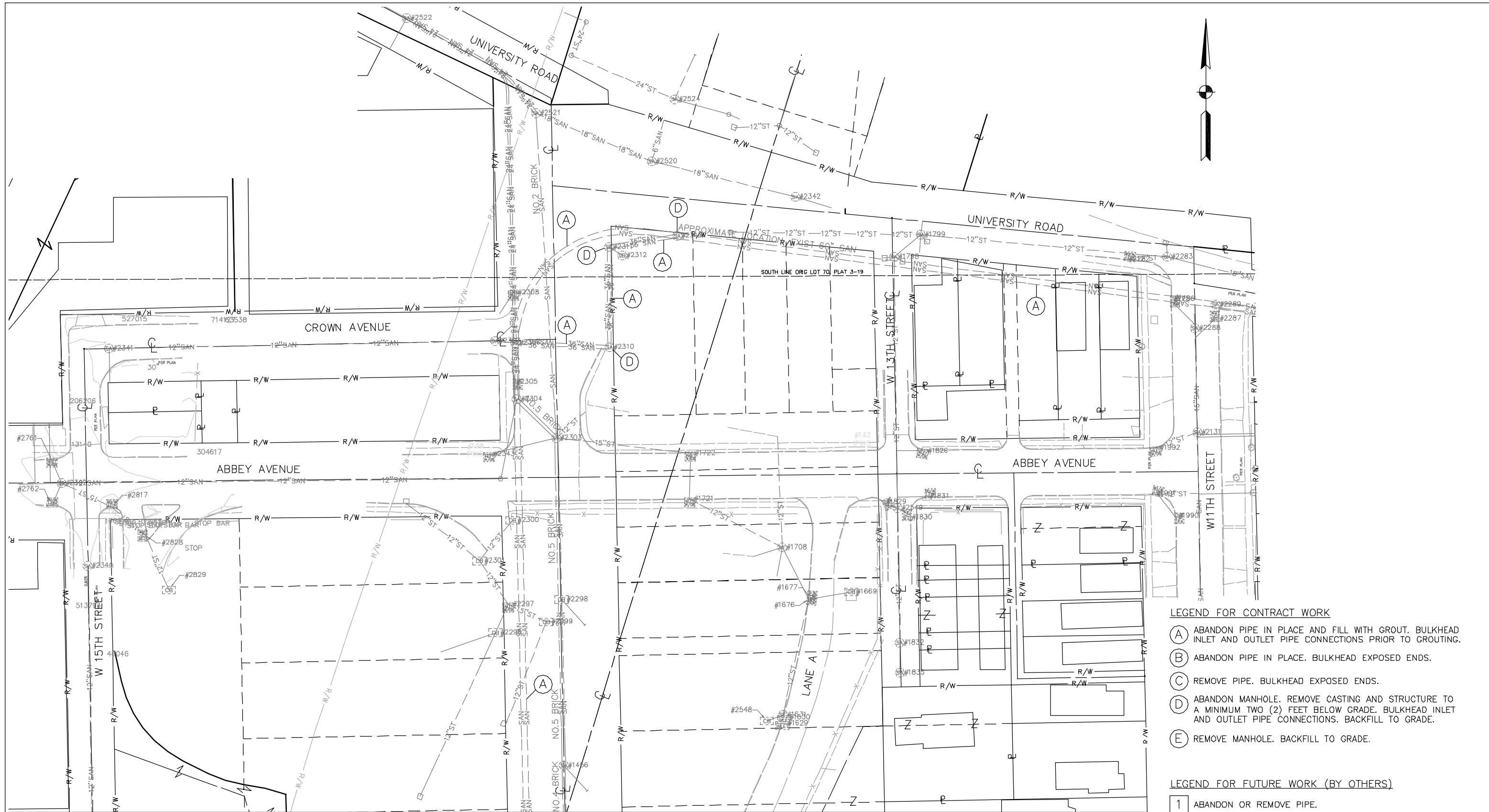
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WALWORTH RUN INTERCEPTOR REALIGNMENT

W15TH ST SEWER CONNECTION PLAN & PROFILE

PROJECT NO.: \_\_\_\_\_  
 SHEET: \_\_\_\_\_  
 SCALE: 1"=10'H; 1"=5'V  
 SHEET NO.: P-4





MATCH LINE SEE SHEET C-5

**PLAN**

**LEGEND FOR CONTRACT WORK**

- (A) ABANDON PIPE IN PLACE AND FILL WITH GROUT. BULKHEAD INLET AND OUTLET PIPE CONNECTIONS PRIOR TO GROUTING.
- (B) ABANDON PIPE IN PLACE. BULKHEAD EXPOSED ENDS.
- (C) REMOVE PIPE. BULKHEAD EXPOSED ENDS.
- (D) ABANDON MANHOLE. REMOVE CASTING AND STRUCTURE TO A MINIMUM TWO (2) FEET BELOW GRADE. BULKHEAD INLET AND OUTLET PIPE CONNECTIONS. BACKFILL TO GRADE.
- (E) REMOVE MANHOLE. BACKFILL TO GRADE.

**LEGEND FOR FUTURE WORK (BY OTHERS)**

- 1 ABANDON OR REMOVE PIPE.
- 2 ABANDON OR REMOVE MANHOLE.

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0 40 80  
 SCALE IN FEET

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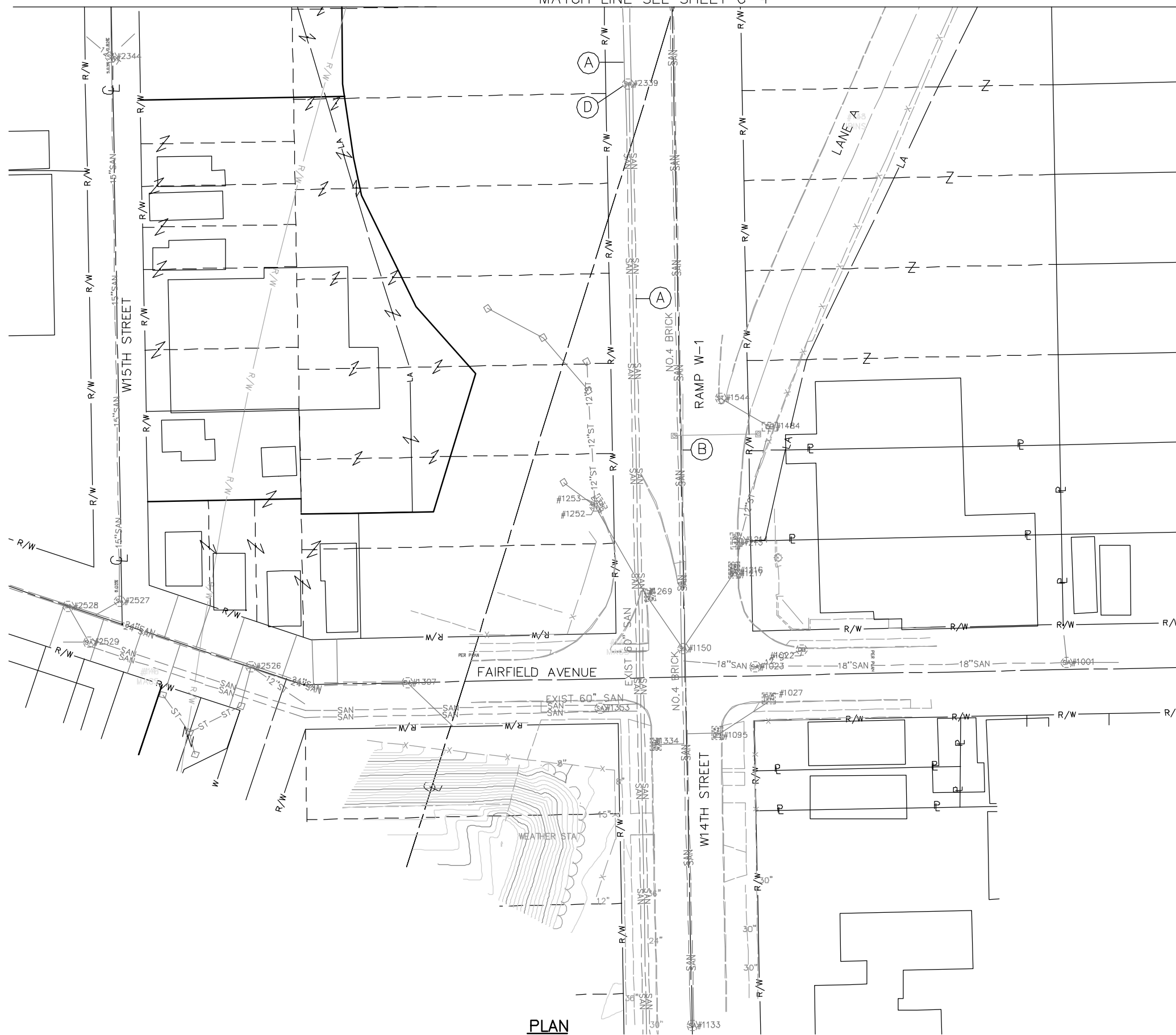
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**WALWORTH RUN INTERCEPTOR REALIGNMENT**

**NORTHERN SEWER ABANDONMENT PLAN**

PROJECT NO.:  
 SHEET: X  
 SCALE: 1"=40'  
 SHEET NO.: C-1

MATCH LINE SEE SHEET C-4



**LEGEND FOR CONTRACT WORK**

- (A) ABANDON PIPE IN PLACE AND FILL WITH GROUT. BULKHEAD INLET AND OUTLET PIPE CONNECTIONS PRIOR TO GROUTING.
- (B) ABANDON PIPE IN PLACE. BULKHEAD EXPOSED ENDS.
- (C) REMOVE PIPE. BULKHEAD EXPOSED ENDS.
- (D) ABANDON MANHOLE. REMOVE CASTING AND STRUCTURE TO A MINIMUM TWO (2) FEET BELOW GRADE. BULKHEAD INLET AND OUTLET PIPE CONNECTIONS. BACKFILL TO GRADE.
- (E) REMOVE MANHOLE. BACKFILL TO GRADE.

**LEGEND FOR FUTURE WORK (BY OTHERS)**

- 1 ABANDON OR REMOVE PIPE.
- 2 ABANDON OR REMOVE MANHOLE.

PLAN



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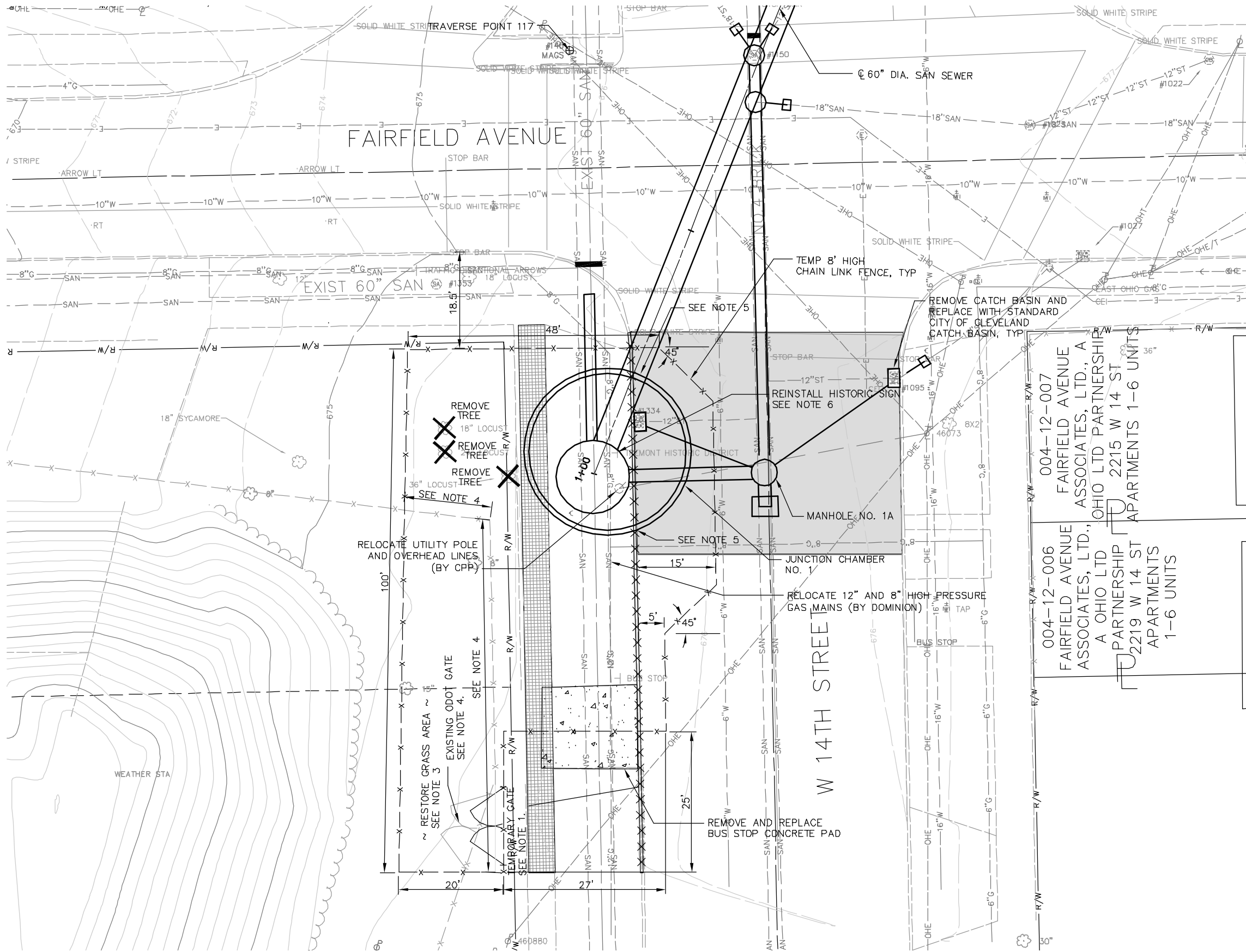


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WALWORTH RUN INTERCEPTOR REALIGNMENT

SOUTHERN SEWER ABANDONMENT PLAN

PROJECT NO.:  
 SHEET: X  
 SCALE: 1"=40'  
 SHEET NO.: C-2



CROSS REFERENCE TABLE	
SHEET NO.	DESCRIPTION

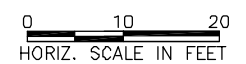
**LEGEND**

- XXX REMOVE AND REPLACE CURB
- [Hatched Box] FULL DEPTH ASPHALT PAVEMENT REPAIR
- [Grid Box] REMOVE AND REPLACE SIDEWALK

**NOTES:**

1. CONTRACTOR SHALL DETERMINE THE WIDTH AND LOCATION OF THE TEMPORARY GATE.
2. CONTRACTOR SHALL REMOVE TEMPORARY FENCING AND GATE AFTER CONSTRUCTION IS COMPLETE.
3. CONTRACTOR SHALL SEED AND MULCH ALL GRASSY AREAS DISTURBED DURING CONSTRUCTION.
4. CONTRACTOR SHALL REMOVE EXISTING ODOT FENCE AND GATE DURING CONSTRUCTION. REPLACE WITH NEW ODOT TYPE CL FENCE UPON COMPLETION OF JUNCTION CHAMBER CONSTRUCTION. PROVIDE ONE 10 FT WIDE CHAIN LINK WALK GATE TO REPLACE EXISTING GATE.
5. CONTRACTOR SHALL CUT HOLES IN THE SHEETING TO ALLOW GUTTER FLOWS TO ENTER THE EXCAVATION. CONTRACTOR SHALL TEMPORARILY PUMP OR FLUME DRAINAGE FLOWS AS REQUIRED.
6. CONTRACTOR SHALL REMOVE THE " TREMONT HISTORIC DISTRICT SIGN" AND FOUNDATION. STORE THE SIGN DURING CONSTRUCTION. INSTALL A NEW FOUNDATION AND REINSTALL THE EXISTING SIGN AT OR NEAR ITS FORMER LOCATION AFTER THE CHAMBER CONSTRUCTION IS COMPLETED.

PLAN



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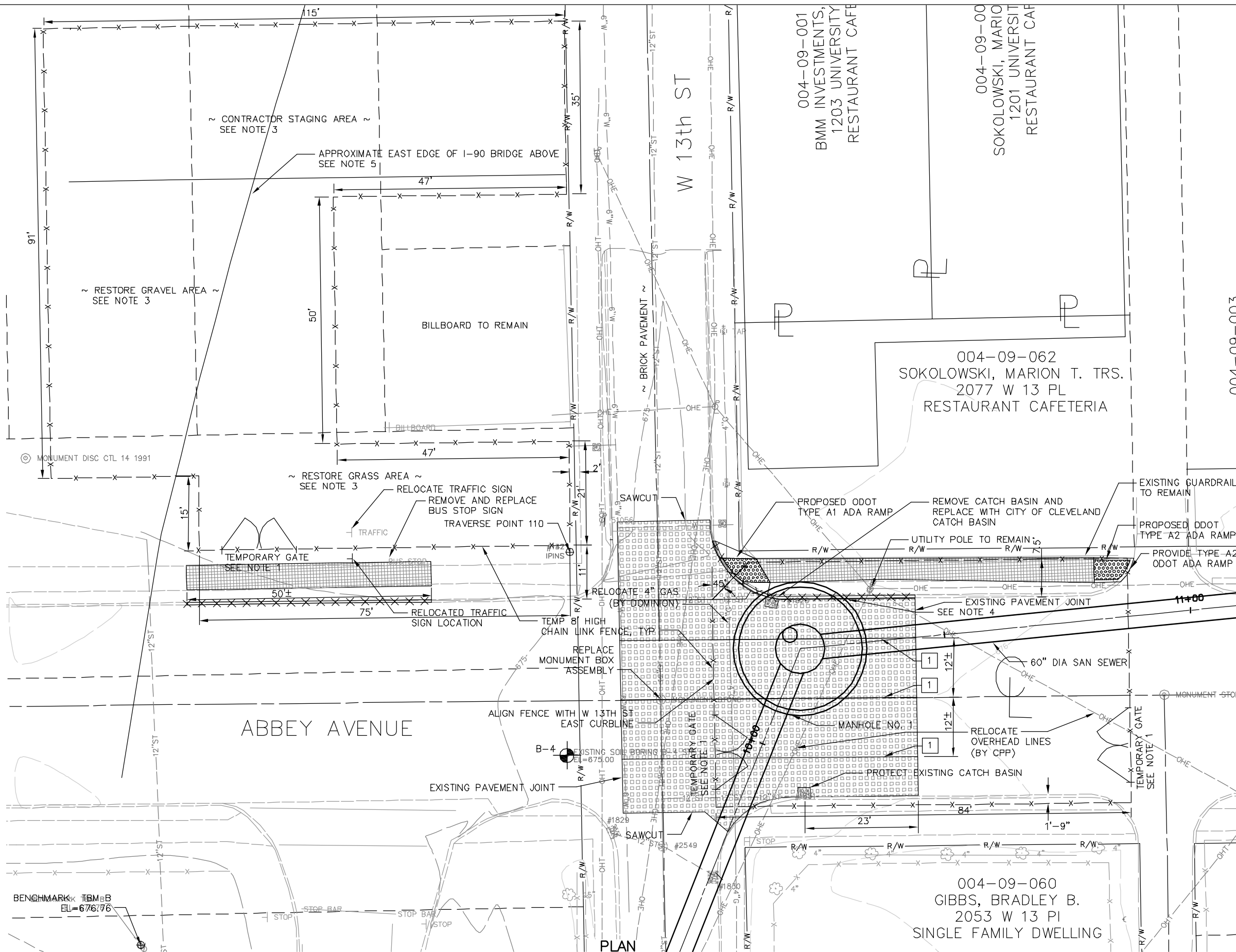
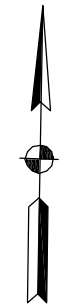


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WALWORTH RUN INTERCEPTOR REALIGNMENT

JUNCTION CHAMBER NO. 1 SITE PLAN

PROJECT NO.: \_\_\_\_\_  
 SHEET: X  
 SCALE: 1"=10'  
 SHEET NO.: C-3



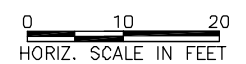
CROSS REFERENCE TABLE	
SHEET NO.	DESCRIPTION

**LEGEND**

- REMOVE AND REPLACE CURB
- FULL DEPTH CONCRETE PAVEMENT REPAIR
- REMOVE AND REPLACE SIDEWALK
- LONGITUDINAL PAVEMENT JOINT

**NOTES:**

1. CONTRACTOR SHALL DETERMINE THE WIDTH AND LOCATION OF THE TEMPORARY GATES.
2. CONTRACTOR SHALL REMOVE TEMPORARY FENCING AND GATES AFTER CONSTRUCTION IS COMPLETE.
3. CONTRACTOR SHALL SEED AND MULCH ALL GRASSY AREAS DISTURBED DURING CONSTRUCTION. CONTRACTOR SHALL RESTORE ALL GRAVEL AREAS DISTURBED DURING CONSTRUCTION.
4. CONTRACTOR SHALL CUT HOLES IN THE SHEETING TO ALLOW GUTTER FLOWS TO ENTER THE EXCAVATION. CONTRACTOR SHALL TEMPORARILY PUMP OR FLUME DRAINAGE FLOWS AS REQUIRED.
5. CONTRACTOR SHALL LIMIT HIS OPERATIONS TO AVOID DAMAGE TO THE EXISTING I-90 BRIDGE. HEADROOM IS RESTRICTED BENEATH THE BRIDGE STRUCTURE.



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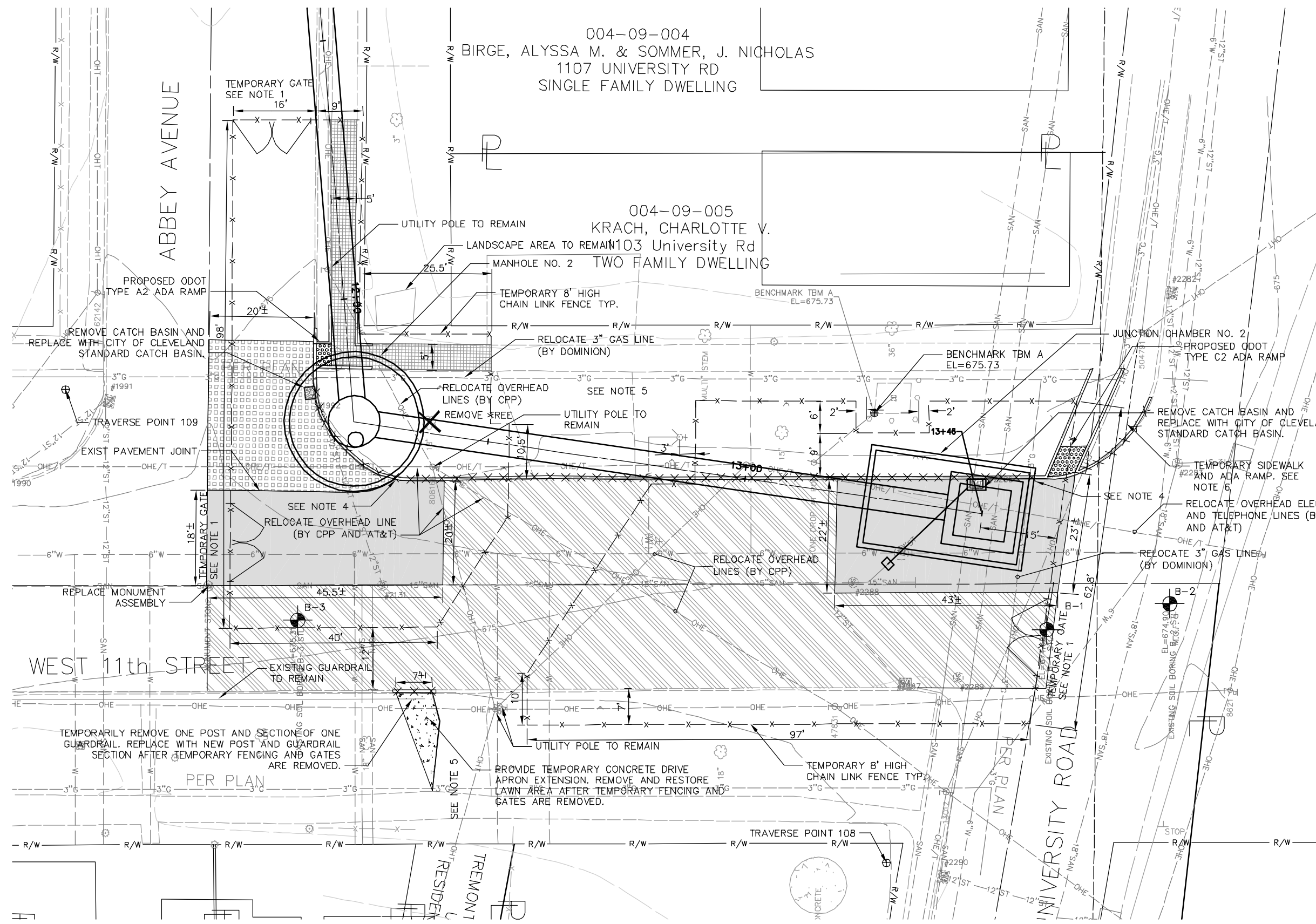
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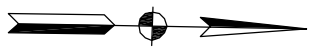
**WALWORTH RUN INTERCEPTOR REALIGNMENT**

**MANHOLE NO. 1 SITE PLAN**  
 PROJECT NO.: \_\_\_\_\_  
 SHEET: X  
 SCALE: 1"=10'  
 SHEET NO.: C-4



004-09-004  
 BIRGE, ALYSSA M. & SOMMER, J. NICHOLAS  
 1107 UNIVERSITY RD  
 SINGLE FAMILY DWELLING

004-09-005  
 KRACH, CHARLOTTE V.  
 103 University Rd  
 TWO FAMILY DWELLING

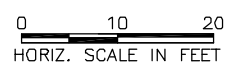


CROSS REFERENCE TABLE	
SHEET NO.	DESCRIPTION

- LEGEND**
- XXXX REMOVE AND REPLACE CURB
  - [Hatched Box] FULL DEPTH ASPHALT PAVEMENT REPAIR
  - [Grid Box] REMOVE AND REPLACE SIDEWALK
  - [Dotted Box] FULL DEPTH CONCRETE PAVEMENT REPAIR
  - [Diagonal Lines Box] MILL AND FILL ASPHALT WEARING COURSE

- NOTES:**
- CONTRACTOR SHALL DETERMINE THE WIDTH AND LOCATION OF THE TEMPORARY GATES.
  - CONTRACTOR SHALL REMOVE TEMPORARY FENCING AND GATES AFTER CONSTRUCTION IS COMPLETE.
  - CONTRACTOR SHALL SEED AND MULCH ALL GRASSY AREAS DISTURBED DURING CONSTRUCTION
  - CONTRACTOR SHALL CUT HOLES IN THE SHEETING TO ALLOW GUTTER FLOWS TO ENTER THE EXCAVATION. CONTRACTOR SHALL TEMPORARILY PUMP OR FLUME DRAINAGE FLOWS AS REQUIRED.
  - CONTRACTOR SHALL MAINTAIN ACCESS TO RESIDENTIAL DRIVEWAYS AT ALL TIMES. DO NOT BLOCK DRIVES DURING CONSTRUCTION.
  - CONTRACTOR SHALL PROVIDE A TEMPORARY CONCRETE SIDEWALK WITH ADA RAMP DURING CONSTRUCTION. THE SIDEWALK AND RAMP SHALL BE REPLACED BY THE PERMANENT SIDEWALK AND ADA RAMP SHOWN.

PLAN



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WALWORTH RUN INTERCEPTOR REALIGNMENT

MANHOLE NO. 2 AND JUNCTION CHAMBER NO. 2 SITE PLAN

PROJECT NO.: \_\_\_\_\_  
 SHEET: \_\_\_\_\_  
 SCALE: 1"=10'  
 SHEET NO.: C-5

**CLEVELAND DIVISION OF WATER NOTES FOR NEW WATER MAIN INSTALLATION**

CONTRACTOR IS TO ABIDE BY THE MOST CURRENT VERSION OF THE CLEVELAND, DIVISION OF WATER NOTES AND DETAILS. THE MOST UP-TO-DATE VERSION CAN BE FOUND AT WWW.CLEVELANDWATER.COM.

**GENERAL:**

- THE INFORMATION SHOWN ON THE CLEVELAND DIVISION OF WATER'S SUMMARY OF WORK/CHARGE LETTER AND STRIP MAPS ARE TAKEN FROM EXISTING AVAILABLE RECORDS, AND THEIR ACCURACY IS NOT GUARANTEED.
- CALL THE INSPECTION AND ENFORCEMENT UNIT AT 216-664-2342 TO SCHEDULE A PRECONSTRUCTION MEETING. THE OPERATION OF ANY VALVE OR ALTERATION OF ANY PART OF THE WATER SYSTEM BY CONTRACTORS OR THEIR EMPLOYEES IS PROHIBITED WITHOUT THE SUPERVISION OF THE CLEVELAND DIVISION OF WATER INSPECTOR.
- THE MUNICIPALITY SHALL REQUIRE THAT THE PROJECT'S PROFESSIONAL ENGINEER OBTAIN ACTUAL FIELD MEASUREMENTS OF THE MAIN DURING INSTALLATION AND SHALL FURNISH THE CWD INSPECTOR WITH RECORD PRINTS IN A FORM ACCEPTABLE TO THE DIVISION OF WATER. THE CLEVELAND DIVISION OF WATER WILL REQUIRE THE DELIVERY AND ACCEPTANCE OF TWO COPIES OF RECORD (AS BUILT) PRINTS, STAMPED BY A PROFESSIONAL ENGINEER, BEFORE THE PRESSURE TEST AND CHLORINATION OF THE MAIN.
- FOR THE PURPOSES OF CHLORINATION AND BACTERIOLOGICAL TESTING OF THE WATER MAINS THE CONTRACTOR SHALL PROVIDE AND INSTALL, AT EACH OF THE CHLORINATION PIT LOCATIONS SHOWN AND AT OTHER LOCATIONS DETERMINED BY THE DIVISION OF WATER, FLUSHING/SAMPLING TAPS OF SIZES TO BE DETERMINED BY THE DIVISION OF WATER. CHLORINATION PITS SHALL BE SIX (6) FOOT SQUARE MEETING OSHA STANDARDS.
- A TWO YEAR WARRANTY, COMMENCING FROM THE DATE OF ACCEPTANCE OF THE FINAL CHLORINATION OF THE WATER MAIN INSTALLATION, SHALL BE PROVIDED BY THE BUILDER/DEVELOPER AND/OR CONTRACTOR FOR ALL WATER MAINS AND SERVICE CONNECTION WORK PERFORMED BY THE CONTRACTOR, INCLUDING RETAPS, SHOULD ANY LEAKS OCCUR AND REPAIRS BE REQUIRED DUE TO DEFECTIVE MATERIAL OR POOR WORKMANSHIP.
- USE BACKFILL MATERIAL AS SPECIFIED AND COMPACT SUFFICIENTLY IN THOSE AREAS WHERE EXISTING MAINS AND WATER SERVICE CONNECTIONS ARE EXPOSED. (SEE DIVISION OF WATER STANDARD DETAIL STD-001).
- ALL MATERIALS, INCLUDING BUT NOT LIMITED TO WATER MAINS, FIRE HYDRANTS, VALVES, CONNECTION MATERIALS AND OTHER WATER APPURTENANCES, SHALL BE NEW AND UNUSED AND SHALL CONFORM TO THE MOST CURRENT DIVISION OF WATER SPECIFICATIONS. ALL MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH DIVISION OF WATER'S STANDARDS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING WATER MAINS AND APPURTENANCES THEREOF WHEN CONNECTING THE NEW WATER MAIN FOR THE HYDROSTATIC TEST. ALL REPAIRS TO DAMAGED EXISTING FACILITIES SHALL BE MADE BY THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE, TO THE SATISFACTION OF THE DIVISION OF WATER. (REFER TO THE THE ALTERNATE TEST DETAIL STD-002 AS NEEDED).
- ALL HYDROSTATIC PRESSURE TESTING SHALL BE DONE BY THE CONTRACTOR IN THE PRESENCE OF THE DIVISION OF WATER'S INSPECTOR. THE HYDROSTATIC TEST PRESSURE SHALL BE 75 PSI ABOVE THE STATIC PRESSURE PREVAILING AT THE SITE, BUT IN NO CASE LESS THAN 150 PSI. THE PRESSURE TEST SHALL BE FOR A DURATION OF TWO (2) HOURS WITH THE PRESSURE BEING MAINTAINED WITHIN 5 PSI OF THE REQUIRED TEST PRESSURE. SHOULD THE PRESSURE TEST FAIL THE CONTRACTOR SHALL FIND AND CORRECT THE DEFICIENCY(IES) TO THE SATISFACTION OF THE DIVISION OF WATER AND REPEAT THE TWO (2) HOUR PRESSURE TEST.
- ALL PIPE, UNLESS OTHERWISE CALLED FOR, SHALL BE DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED HAVING PUSH-ON JOINTS WITH RADIALLY COMPRESSED RUBBER RING GASKET AND INSTALLED AS PER THE MOST CURRENT REVISION OF AWWA C600.
- ALL FITTINGS, UNLESS OTHERWISE CALLED FOR, SHALL BE APPROVED DUCTILE IRON, CLASS 350, CEMENT LINED OR FUSION BONDED EPOXY COATED. ALL FITTINGS AND PIPE CONNECTED TO FITTINGS SHALL BE RESTRAINED USING A "RETAINED" MECHANICAL JOINT CONFORMING TO THE MATERIAL AND PERFORMANCE REQUIREMENTS OF ANSI/AWWA C-110/A21.10 AND ANSI/AWWA C-111/A21.11, OR "COMPACT" FITTINGS IN ACCORDANCE WITH ANSI/AWWA C-153/A21.53. EXCEPT FOR ANCHOR TEES, REDUCERS OR OTHER SPECIAL CIRCUMSTANCES WHEN DIRECTED BY CLEVELAND DIVISION OF WATER, ALL FITTINGS ARE TO HAVE BELL ENDS.
- ALL BOLTS AND NUTS ON ALL "RETAINED" MECHANICAL JOINTS SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".
- WHERE SHOWN ON THE PLANS, OR WHEN OTHERWISE CALLED FOR, PIPE AND FITTINGS SHALL HAVE AN APPROVED "TYPE I" OR "TYPE II" BOLTLESS RESTRAINED PUSH-ON JOINTS TO THE LIMITS SHOWN ON THE DRAWINGS.
- AT THE END OF EACH WORKDAY, THE CONTRACTOR SHALL PLUG ALL OPEN PIPE ENDS WITH WATER TIGHT PLUGS AS PER THE "PREVENTITIVE AND CORRECTIVE MEASURES DURING CONSTRUCTION" SECTION OF THE MOST CURRENT REVISION OF AWWA C-651 AS TO PREVENT THE INFILTRATION OR INTRUSION OF ANY FOREIGN OBJECTS OR MATERIALS. DATE STAMPED DIGITAL PHOTOS SHALL BE PROVIDED FOR EACH WORKDAY DEMONSTRATING THAT PROPER AWWA C-651 METHODS WERE USED TO PLUG ALL OPEN WATER MAIN ENDS. EACH PHOTO SHALL CLEARLY IDENTIFY THE STATION AT WHICH THE PIPE IS PLUGGED. THE STATIONING SHALL BE SHOWN BY THE USE OF A STATION MARKER PLACED AT THE PLUGGED PIPE END.

PHOTOS SHALL BE SUBMITTED ON A DAILY BASIS UNLESS OTHERWISE DEFINED BY THE CWD INSPECTOR OR ENGINEER. ALL PHOTOS TAKEN OVER THE COURSE OF THE PROJECT SHALL BE SUBMITTED BY THE CONTRACTOR AS PART OF THE AS-BUILT SUBMITTAL. AS-BUILTS SHALL BE CONSIDERED INCOMPLETE WITHOUT SAID COLLECTION OF DIGITAL PHOTOS.

**HYDRANTS:**

- IN ALL HYDRANT INSTALLATIONS THE CONTRACTOR SHALL FACE ALL HYDRANT'S 4" (STEAMER) NOZZLE TOWARD THE PAVEMENT PRIOR TO TESTING AND CHLORINATION OF WATER MAINS. CONTRACTOR SHALL CONSULT WITH THE LOCAL MUNICIPALITY'S ENGINEERING OR SERVICE DEPARTMENT TO OBTAIN HYDRANT MODEL AND NOZZLE THREAD REQUIREMENTS IF NOT INDICATED ON THE APPROVED PLANS.
- ALL VALVES SHALL BE AN APPROVED MODEL RESILIENT SEATED GATE VALVES AS PER THE MOST CURRENT VERSION OF AWWA C509 OR C515.

**CONNECTIONS:**

- WATER CONNECTIONS SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY AND ARE NOT PART OF THE WATER MAIN APPROVAL. ADDITIONAL PERMITS FOR SERVICE CONNECTIONS MUST BE OBTAINED FROM THE DIVISION OF WATER PRIOR TO INSTALLATION OF ANY PORTION OF THE SERVICE CONNECTION(S). IT IS THE CONTRACTORS RESPONSIBILITY TO ARRANGE FOR PERMITS FOR ALL SIZE WATER SERVICE CONNECTIONS BEFORE PERFORMING ANY WORK. THE AMOUNT OF THE CHARGES CAN BE OBTAINED FROM THE DIVISION OF WATER, PERMITS AND SALES SECTION AT 216-664-2444 X5203.
- ONE INCH SERVICE CONNECTIONS SHALL BE PERMITTED TO SERVICE HOMES BASED ON THE FOLLOWING CRITERIA:
  - PEAK FLOW DEMANDS DO NOT EXCEED 25 GPM FOR AN INDIVIDUAL HOME/UNIT. INCLUSIVE OF ALL USAGE (FIRE, DOMESTIC AND/OR IRRIGATION) AND
  - LENGTH OF ONE INCH CONNECTION DOES NOT EXCEED 75 FEET AS MEASURED FROM THE MAIN TO THE POINT OF ENTRY INTO THE PROPOSED HOME/UNIT.

**EMERGENCIES:**

- IF A WATER MAIN OR SERVICE CONNECTION BREAK OCCURS DURING CONSTRUCTION AND EMERGENCY ASSISTANCE IS REQUIRED, PLEASE NOTIFY THE DIVISION OF WATER AT 216-664-3060.

**UTILITIES:**

- THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES AT LEAST TWO (2) WORKING DAYS (NOT INCLUDING SATURDAYS AND LEGAL HOLIDAYS) PRIOR TO CONSTRUCTION TO HAVE UTILITIES STAKED, MARKED OR OTHERWISE DESIGNATED IN THE CONSTRUCTION AREA IN SUCH A MANNER AS TO INDICATE THEIR COURSE TOGETHER WITH THE APPROXIMATE DEPTH AT WHICH THEY WERE INSTALLED. THE MARKING OR LOCATION SHALL OCCUR APPROXIMATELY TWO DAYS AHEAD OF THE PLANNED CONSTRUCTION.

OHIO UTILITIES PROTECTION SERVICE (800) 362-2764  
 CITY OF SHAKER HEIGHTS SERVICE DEPARTMENT (216) 491-1490  
 CLEVELAND WATER - ROBERT SMITH (216) 664-2444  
 NORTHEAST OHIO REGIONAL SEWER DISTRICT (216) 881-6600  
 AT&T - ERIC WESTERBURG (216) 476-6142  
 DOMINION EAST OHIO GAS - JOE HINTON (800) 362-7557  
 TIME WARNER CABLE - LARRY BOCK (440) 974-3401  
 AMERICAN FIBER SYSTEMS - BRYCE BASISTA (419) 756-7117  
 THE ILLUMINATING COMPANY - JASON R. STEC (440) 717-6808  
 XO COMMUNICATIONS (800) 421-3872

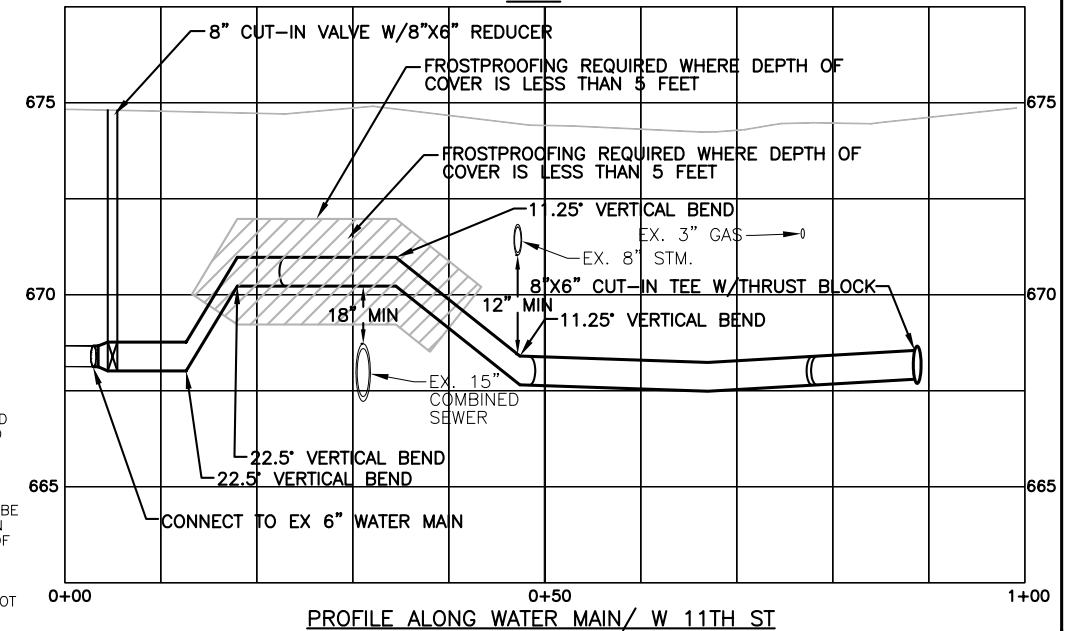
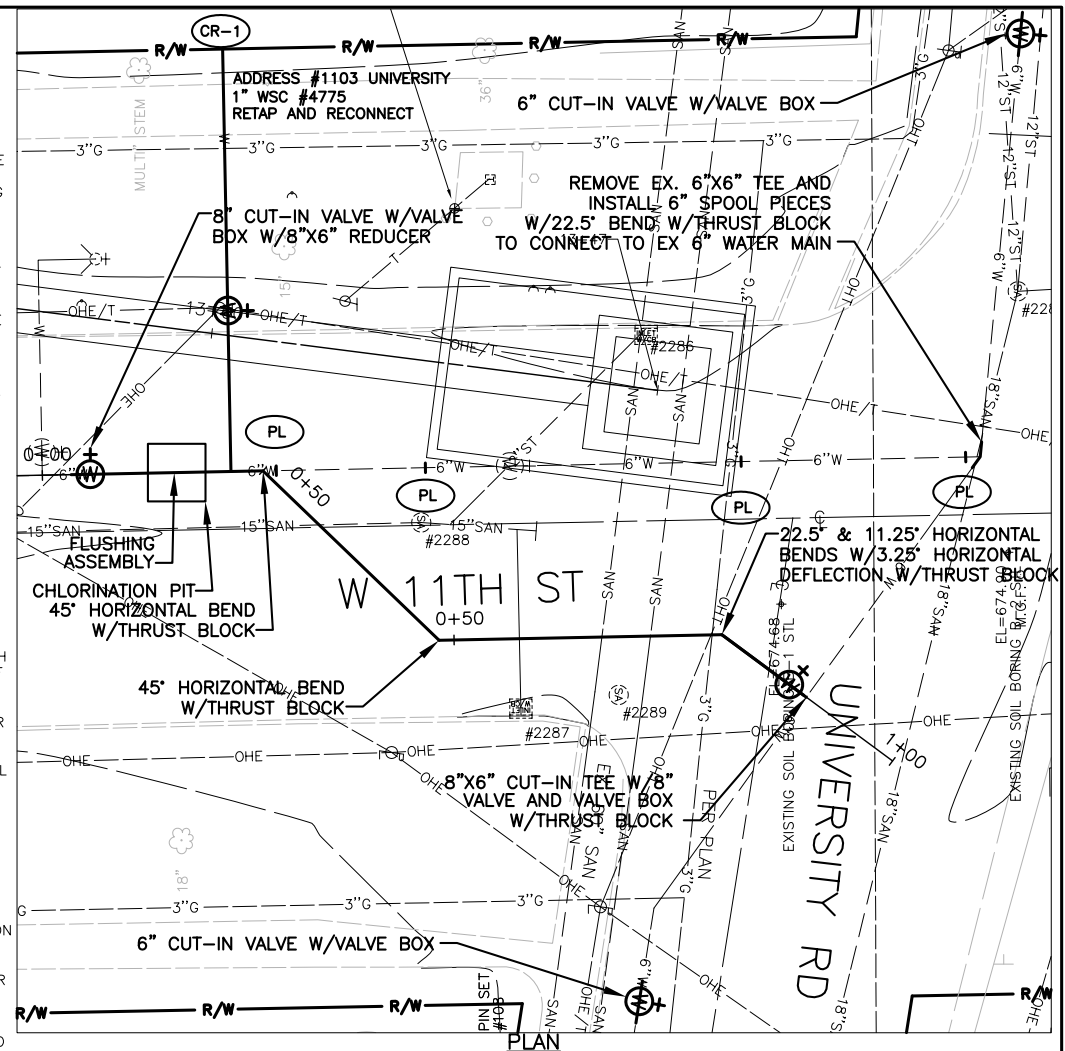
- THE LOCATION OF THE EXISTING UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS AND BELIEVED TO ESSENTIALLY CORRECT. THE LOCATIONS WERE OBTAINED FROM THE OWNERS OF THE UTILITIES AS REQUIRED BY SECTION 153.64 O.R.C. NO GUARANTEE IS MADE RELATIVE TO THE COMPLETENESS OR ACCURACY AND THE CONTRACTOR IS REQUIRED TO CONTACT THE REGISTERED UTILITY PROTECTION SERVICE AND THE OWNERS OF EACH UNDERGROUND UTILITY FACILITY SHOWN ON THE PLANS AT LEAST TWO WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION IN ANY AREA.
- ALL EXISTING UTILITIES, SERVICES, POLES AND CONNECTIONS SHALL BE PROTECTED AT THE CONTRACTOR'S EXPENSE. IF DAMAGE IS CAUSED BY CONSTRUCTION TO ANY EXISTING UTILITY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR RESTORATION OF SAME AT HIS EXPENSE IN ACCORDANCE WITH DIRECTIONS OF THE ENGINEERS, AND FOR ANY RESULTING CONTINGENT DAMAGES. EXISTING UTILITIES INCLUDE, BUT ARE NOT LIMITED TO WATER MAINS, STORM SEWERS, SANITARY SEWERS, GAS, ELECTRICAL, TELEPHONE, FIBER OPTIC CABLE, TELEVISION CABLE, AND INDIVIDUAL SERVICE CONNECTIONS AND LATERALS.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXPOSE ALL EXISTING UTILITIES, SERVICES, OR STRUCTURES TO VERIFY THE VERTICAL AND HORIZONTAL LOCATION OF THE UTILITY, SERVICE, OR STRUCTURE AND ITS EFFECT ON THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE UTILITY OWNER.
- INDIVIDUAL STORM, SANITARY, GAS, WATER, ELECTRICAL, TELEPHONE AND CABLE SERVICE CONNECTIONS MAY NOT BE SHOWN. THE CONTRACTOR SHALL LOCATE AND PROTECT SERVICE CONNECTIONS THROUGHOUT THE COURSE OF THE WORK. IN THE EVENT SERVICE CONNECTIONS ARE BROKEN OR DISTURBED, THE CONTRACTOR SHALL REPAIR OR REPLACE THE SERVICE CONNECTIONS TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL EXPECT EACH RESIDENCE/COMMERCIAL PROPERTY ALONG THE ROUTE TO HAVE AT LEAST ONE SERVICE CONNECTION FOR EACH UTILITY.
- EXISTING LATERAL CONNECTIONS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE TO DETERMINE LOCATION AND NUMBER OF LATERALS. NOT ALL LATERALS MAY BE SHOWN.
- THE COST OF RELOCATION AND/OR SECURING ANY UTILITY POLES AS NECESSARY TO COMPLETE THE WORK SHALL BE INCLUDED IN THE BID PRICE PER LINEAL FOOT OF WATER MAIN. THE UTILITY MUST BE INFORMED BY THE CONTRACTOR OF THE PROPOSED METHODS BEFOREHAND TO VERIFY THE ADEQUACY OF SUCH SUPPORTS. NOTE THE OSHA REGULATIONS PROHIBIT CRANE/ BACKHOE OPERATIONS WITHIN TEN FEET OF THE ENERGIZED PRIMARY CONDUCTORS. CONTRACTOR MAY ELECT TO PAY THE UTILITY TO PERFORM THIS WORK AT NO ADDITIONAL COST TO OWNER.
- STORM SEWER, SANITARY SEWER, AND CULVERT INVERTS SHOWN ON THE PLANS ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY DEPTHS AND LOCATIONS PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL REPAIR AT HIS OWN COST ANY DAMAGE TO TRAFFIC SIGNAL LOOP DETECTORS. CONTRACTOR SHALL FIELD VERIFY ALL LOOP DETECTORS WITHIN PROJECT AREA.
- THE CONTRACTOR MAY DAMAGE EXISTING CATCH BASINS WHILE INSTALLING THE WATER MAIN. THE CONTRACTOR SHALL REPAIR OR REPLACE DAMAGED CATCH BASINS TO THE SATISFACTION OF THE CITY OF SHAKER HEIGHTS.

**PAVEMENTS AND WALKS:**

- ROADWAYS, DRIVES, AND PAVEMENTS DISTURBED BY CONSTRUCTION SHALL BE REPLACED. SEE DETAILS ON PLANS AND SPECIFICATIONS. TEMPORARY PAVEMENT SHALL BE USED WHEN HOT MIX ASPHALT IS NOT AVAILABLE OR WHEN WEATHER FOR PAVEMENT IS UNACCEPTABLE. SIDEWALKS AND DRIVEWAY APRONS SHALL BE FLOAT FINISHED.
- THE CONTRACTOR MAY DAMAGE EXISTING ROADWAY CURBING WHILE INSTALLING THE WATER MAIN. THE CONTRACTOR SHALL REPLACE ANY DAMAGED CURBING ALONG ALL ROADS WITH ODOT 609 CURBING. CURB REPLACEMENT SHALL MATCH EXISTING CURB, AND LIMITS OF REPLACEMENT SHALL BE TO THE NEAREST CONTROL JOINT ON EITHER SIDE OF THE AREA DAMAGED.
- THE CONTRACTOR MAY DAMAGE EXISTING DRIVE APRONS WHILE INSTALLING THE WATER MAIN. DRIVE APRONS SHALL BE REMOVED AND REPLACED TO THE NEAREST JOINT. PAVEMENT TYPE AND THICKNESS SHALL MATCH EXISTING.
- EXISTING SANDSTONE WALKS THAT MAY BE AFFECTED BY CONSTRUCTION SHALL BE SALVAGED AND RESET. IF STONE WALKS ARE DAMAGED DURING CONSTRUCTION, THEY SHALL BE REMOVED TO THE NEAREST JOINT AND REPLACED IN KIND WITH NEW SANDSTONE WALKS.
- WHERE NECESSARY TO DISTURB PAVEMENTS OR DRIVES, PAVEMENT SHALL BE CUT IN NEAT, STRAIGHT LINES.

**SUPPLEMENTAL WATER MAIN NOTES:**

- ALL NEW VALVES SHALL OPEN BY TURNING CLOCKWISE. VALVES SHALL BE SAME SIZE AS THE WATER MAIN. ALL VALVE BOXES SHALL BE INSTALLED FLUSH TO GRADE.
- THE MAXIMUM TRENCH OPENING SHALL NOT EXCEED 100 LINEAL FEET. WHERE ACCESS TO DRIVES AND PARKING LOTS IS HINDERED OR BLOCKED FOR AN EXTENDED PERIOD OF TIME, THE CONTRACTOR SHALL PROVIDE TEMPORARY BITUMINOUS PAVEMENT TO MAINTAIN ACCESS. CONTRACTOR SHALL KEEP ALL WORK WITHIN THE RIGHT-OF-WAY.
- THE CONTRACTOR SHALL INSTALL DETECTABLE TRACER TAPE IN THE SAME TRENCH WITH ALL WATER MAINS. TAPE SHALL BE 3" WIDE, BLUE CODED POTABLE ON BOTH SIDES. TRACER TAPE SHALL BE INCLUDED IN THE PRICE BID PER LINEAL FOOT OF WATER MAIN.
- UNLESS OTHERWISE NOTED, THE NEW WATER MAIN SHALL HAVE 6' MINIMUM COVER OVER THE TOP OF PIPE.
- A MINIMUM OF 35 PSI SHALL BE MAINTAINED TO THE CURB STOP DURING NORMAL OPERATING CONDITIONS.
- BOOSTER PUMPS ARE NOT PERMITTED ON SERVICE CONNECTIONS.
- PIPE JOINTS SHALL BE DEFLECTED TO MAINTAIN HORIZONTAL ALIGNMENT AND VERTICAL ELEVATIONS UNLESS OTHERWISE INDICATED. DEFLECTIONS SHALL NOT EXCEED THE PIPE MANUFACTURERS RECOMMENDATIONS.
- CONTRACTOR SHALL ESTABLISH AND STAKE OUT THE WATER MAIN ALIGNMENT FOR CONSTRUCTION FROM THE HORIZONTAL AND VERTICAL CONTROL AS REFERENCED ON THE DRAWINGS.
- ALL COSTS ASSOCIATED WITH ABANDONING AND/OR REMOVING THE EXISTING WATER MAIN, LINE VALVES, OR SERVICE CONNECTIONS SHALL BE INCLUDED IN THE BID PRICE PER LINEAL FOOT OF WATER MAIN.
- NEW FIRE HYDRANTS SHALL BE BAGGED UNTIL THE NEW WATER MAIN IS INSTALLED AND IN OPERATION.
- THE WATER MAIN SHALL BE PRESSURE TESTED AND DISINFECTED PRIOR TO PERFORMING CORPORATION STOP TAPS.
- FIRE HYDRANT PLACEMENT SHALL BE ESTABLISHED BY GOVERNING FIRE DEPARTMENT.
- CONTRACTOR SHALL PRESSURE TEST AND DISINFECTION TEST WITHIN 15 DAYS OF WATER MAIN INSTALLATION.
- ANY EXISTING UTILITIES OR APPURTENANCES INSIDE OR OUTSIDE OF THE CONSTRUCTION LIMITS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
- GROUNDWATER CONTROL MEASURES SHALL BE IN PLACE PRIOR TO THE TIME THE EXCAVATION REACHES THE GROUNDWATER LEVEL TO MAINTAIN INTEGRITY OF THE IN-SITU MATERIALS. WHILE THE EXCAVATION IS OPEN, THE GROUNDWATER LEVEL SHALL BE MAINTAINED CONTINUOUSLY AT 2 FEET OR MORE BELOW THE WORKING LEVEL.
- UNSTABLE OR UNSUITABLE PIPE FOUNDATION CONDITIONS THAT RESULT FROM INADEQUATE OR INAPPROPRIATE DEWATERING METHODS SHALL BE CORRECTED BY THE CONTRACTOR AT NO COST TO THE OWNER.
- THE CONTRACTOR SHALL REMOVE ALL GUARDRAIL AND FENCE AS NECESSARY TO FACILITATE CONSTRUCTION OF THE PROPOSED WATER MAIN. ANY GUARDRAIL OR FENCE DAMAGED DURING CONSTRUCTION BY THE CONTRACTOR SHALL BE REPLACED IN COMPLETE LENGTH AND KIND BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- ANY EXISTING PROPERTY CORNER PINS OR MONUMENTS DAMAGED OR DESTROYED BY THE CONSTRUCTION SHALL BE RESET BY A REGISTERED SURVEYOR UPON COMPLETION OF THE PROJECT PRIOR TO FINAL PAYMENT. A CERTIFICATION SHALL BE FURNISHED BY A REGISTERED SURVEYOR, STATING THAT SAID DAMAGES HAVE BEEN RESTORED. THE COST SHALL BE INCLUDED IN THE PRICE BID PER LINEAL FOOT OF WATER MAIN.
- CONTRACTOR SHALL GRADE AND RESLOPE ALL DITCHES DISTURBED DURING CONSTRUCTION. THE COST SHALL BE INCLUDED IN THE PRICE BID PER LINEAL FOOT OF WATER MAIN.
- ACCESS TO ADJOINING PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.
- UNLESS MARKED FOR REMOVAL, SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGE TO TREES AND THEIR ROOT SYSTEMS. IN GENERAL, WHERE THE TRENCH FALLS WITHIN THE LIMITS OF THE LIMB SPREAD, THE LEAVING OF HEADERS ACROSS TO PROTECT ROOTS WILL BE REQUIRED. THE OPERATION OF ALL EQUIPMENT, PARTICULARLY WHEN EMPLOYING BOOMS, THE STORAGE OF MATERIALS, AND DEPOSITION OF EXCAVATION SHALL BE CONDUCTED IN A MANNER WHICH WILL NOT INJURE TREE TRUNKS, BRANCHES, OR ROOTS UNLESS SUCH TREES ARE DESIGNATED BY THE MUNICIPALITY'S SUPERINTENDENT OF FORESTRY FOR REMOVAL.



**LEGEND**

(CR-1) REPLACE EXISTING CONNECTION, SHORT SIDE, (1" AND UNDER) WITH 1" COPPER CONNECTION, INCLUDING CURB VALVE AND VALVE BOX

(PL) PLUG EXISTING WATER MAIN END

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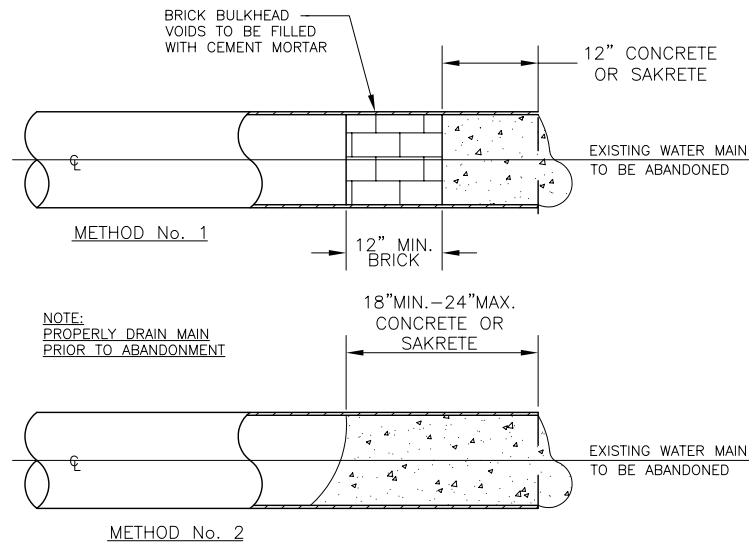
WALWORTH RUN INTERCEPTOR REALIGNMENT

PROJECT NO.: \_\_\_\_\_  
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 SCALE: 1"=10'  
 SHEET NO.: C-6

**SUPPLEMENTAL WATER MAIN NOTES: (CONTINUED)**

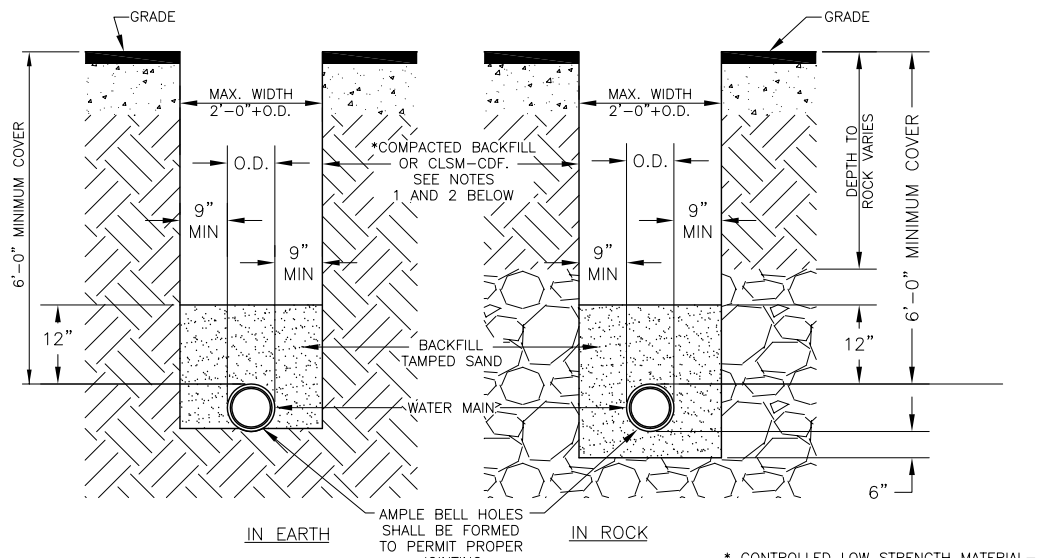
22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING MAIL SERVICE IN THE CONSTRUCTION AREA. PRIOR TO DISTURBING ANY MAIL BOXES, THE CONTRACTOR SHALL CONTACT THE POSTAL AUTHORITIES AND SHALL TEMPORARILY RELOCATE MAIL BOXES IN ACCORDANCE WITH THEIR REQUIREMENTS. THE CONTRACTOR SHALL RESTORE MAIL BOXES TO THEIR ORIGINAL CONDITION AND LOCATION. COST OF SAME SHALL BE INCLUDED IN THE UNIT PRICE PER LINEAL FOOT OF WATER MAIN.
23. RIGHT-OF-WAY AND PROPERTY LINES SHOWN WERE PREPARED FROM RECORD INFORMATION AND DO NOT REPRESENT A BOUNDARY SURVEY.
24. THE BIDDER SHALL MAKE HIS OWN INVESTIGATIONS OF THE SITE CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL. IF THE BIDDER DESIRES TO OBTAIN ADDITIONAL INFORMATION AS TO SOIL CONDITIONS, HE MUST DO SO AT HIS OWN EXPENSE AND SECURE ALL APPLICABLE APPROVALS AND PERMITS.
25. CONTRACTOR SHALL KEEP ALL WORK WITHIN THE RIGHT-OF-WAYS AND EASEMENTS.
26. THE CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL CONSTRUCTION DEBRIS INCLUDING BUT NOT LIMITED TO EXCESS SOIL, ROCK, OR ANY OTHER TYPE OF MATERIALS. THE CONTRACTOR SHALL NOT FILL ANY WETLANDS, LOWLANDS, FLOOD PLAINS, OR DRAINAGE WAYS WITH SAID DEBRIS.
27. THE CONTRACTOR SHALL REMOVE AND REINSTALL CULVERT AND/OR DRAINAGE PIPE AS NECESSARY TO FACILITATE CONSTRUCTION OF THE PROPOSED WATER MAIN. PROPER DRAINAGE MUST BE MAINTAINED AT ALL TIMES. ANY CULVERT OR DRAINAGE PIPE DAMAGED OR BROKEN DURING THE CONSTRUCTION BY THE CONTRACTOR SHALL BE REPLACED, COMPLETE IN LENGTH AND KIND BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
28. CONTRACTOR SHALL CLEAN THE ROADWAY AT THE END OF EACH DAY OF OPERATION OR EVERY 500 FEET OF INSTALLED WATER MAIN. CLEANING SHALL BE PERFORMED USING A POWER BROOM OR HYDROSPRAYER, OR AS DIRECTED BY THE ENGINEER.
29. THE CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED FOR CONSTRUCTION, INCLUDING BUT NOT LIMITED TO EXCAVATION AND ROAD OPENINGS. PERMITS SHALL BE OBTAINED FROM THE CITY ENGINEER AND FROM ANY LOCAL GOVERNMENTAL OFFICIALS IN WHICH THE WORK IS BEING PERFORMED.
30. CONTRACTOR SHALL PERFORM ALL CLEAN-UP, ROCK REMOVAL, FINAL GRADING, AND SEEDING TO AREAS DISTURBED BY WORK ASSOCIATED WITH INSTALLATION OF NEW WATER MAIN.
31. CONTRACTOR SHALL PROPERLY NOTIFY PROPERTY OWNERS OF CONSTRUCTION ACTIVITIES THAT WILL IMPACT THEM.
32. CONTRACTOR SHALL NOT BE PERMITTED TO STORE MATERIALS, EQUIPMENT, OR VEHICLES ON PRIVATE PROPERTY.
33. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING LANDSCAPE ITEMS SUCH AS SHRUBBERY, RAILROAD TIES, ETC. IN A MANNER SUITABLE FOR REPLANTING OR RELOCATION BY THE CONTRACTOR, OR AT THE OPTION OF THE PROPERTY OWNER, SHALL REMOVE AND DISPOSE OF THE LANDSCAPE ITEMS. THE COST FOR THE ABOVE RESTORATION SHALL BE INCLUDED IN THE BID PRICE PER LINEAL FOOT OF WATER MAIN.
34. THE CONTRACTOR SHALL PROVIDE TEMPORARY WATER MAINS AND SERVICE CONNECTIONS PER SPECIFICATION SECTION D-45. TEMPORARY MAINS SHALL BE LAID IN THE GUTTERLINES AND SHALL CROSS THE STREETS AT INTERSECTIONS. TEMPORARY MAINS SHALL NOT BE LAID ON TREELAWNS.

**CONSTRUCTION SEQUENCE**



**PLUGGING ABANDONED WATER MAIN ENDS (STD-004)**

- NOT TO SCALE -

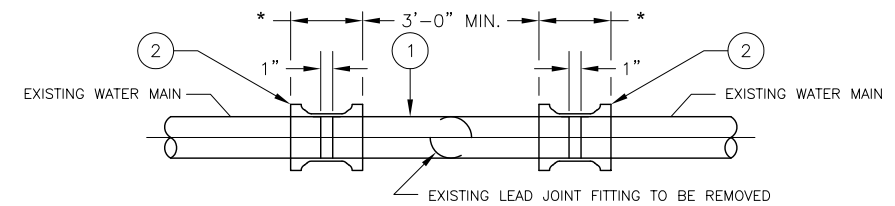


**WATER MAIN TRENCH DETAILS (STD-001)**

- NOT TO SCALE -

**NOTES:**

- 1) PREMIUM BACKFILL CONSISTING OF CONTROLLED LOW STRENGTH MATERIAL - CONTROLLED DENSITY FILL (CLSM-CDF) "FLOWABLE FILL" IS REQUIRED:
  - A) UNDER ALL EXISTING OR FUTURE PAVEMENTS, SIDEWALKS AND DRIVES
  - B) AT ALL LOCATIONS WITHIN THE CITY OF CLEVELAND CORPORATION LIMITS
  - C) AS SPECIFIED IN LOCAL MUNICIPALITIES SERVED BY CWD (SEE LOCAL REQUIREMENTS)
- 2) WHEN PREMIUM BACKFILL IS REQUIRED BY THE LOCAL MUNICIPALITY FOR CASES OTHER THAN THOSE LISTED IN NOTE 1 ABOVE, IT SHALL BE LIMESTONE GRADED PER ODOT 304.02 OR ODOT 411. NO SLAG IS PERMITTED.\*
- 3) CONTRACTOR SHALL USE SPECIAL CARE IN PLACING THE SAND BEDDING, SO AS TO AVOID SCRAPING OF THE EXTERIOR COATING, INJURING THE PIPE, DISTORTING OR MOVING THE PIPE WHEN COMPACTING THE SAME. THE SAND BEDDING BACKFILL SHALL BE TAMPED IN SIX (6) INCH LAYERS, SIMULTANEOUSLY ON EACH SIDE OF THE PIPE, AND THOROUGHLY COMPACTED SO AS TO PROVIDE A SOLID BACKING AGAINST THE EXTERNAL SURFACE OF THE PIPE.
- 4) MINIMUM COMPACTION FOR ALL SAND BEDDING, BACKFILL AND PREMIUM BACKFILL SHALL BE 95% STANDARD PROCTOR.
- 5) PAVEMENT, SIDEWALK OR DRIVES TO BE INSTALLED IN ACCORDANCE WITH LOCAL MUNICIPALITY'S SPECIFICATIONS.



- 1) PLAIN END x PLAIN END DUCTILE IRON PIPE AS SPECIFIED (CUT TO SUIT).
- 2) \*CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

3) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".

**SPOOL PIECE INSTALLATION DETAIL (STD-008)**

-NOT TO SCALE-

\*CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

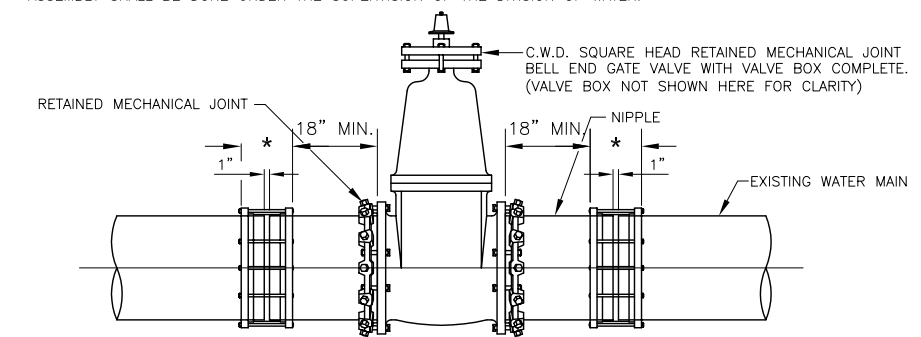
MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".

THE DIVISION OF WATER WILL DETERMINE THE FIELD LOCATION OF THE CUT-IN-VALVE ASSEMBLY. THE DIVISION OF WATER WILL ALSO SET THE TIME OF INSTALLATION OF THE CUT-IN-VALVE ASSEMBLY.

THE CONTRACTOR SHALL DO ALL PIPE CUTTING AND INSTALLATION. HOWEVER, THE INSTALLATION OF THE CUT-IN-VALVE ASSEMBLY SHALL BE DONE UNDER THE SUPERVISION OF THE DIVISION OF WATER.



NOTE:  
BEFORE CUTTING EXISTING WATER MAIN, THE NIPPLES SHALL BE CONNECTED TO THE MECHANICAL JOINT BELL END GATE VALVE. AFTER CUTTING PIPE, FINAL CONNECTIONS SHALL BE MADE WITH COUPLINGS/SOLID SLEEVES AS SPECIFIED.

**CUT-IN-VALVE DETAIL (STD-005)**

- NOT TO SCALE -

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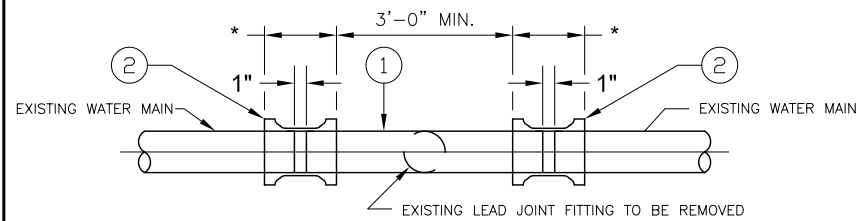


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**WALWORTH RUN INTERCEPTOR REALIGNMENT**

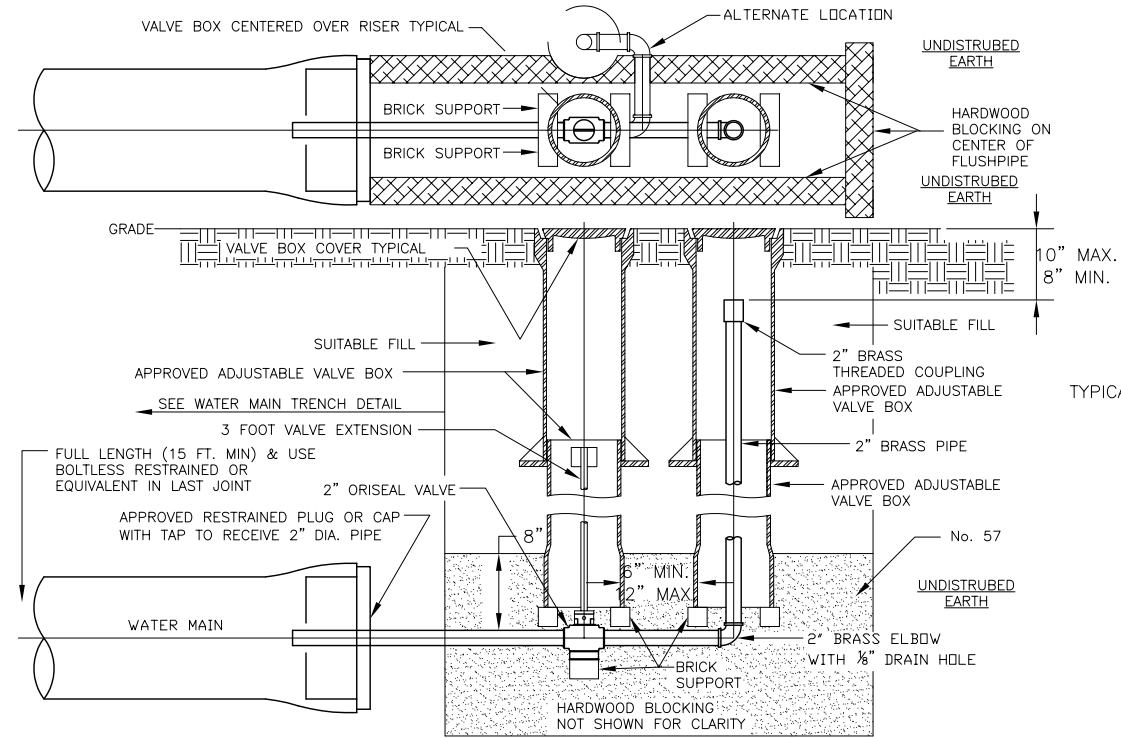
**WATER MAIN NOTES AND DETAILS**

PROJECT NO.:	
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SHEET NO.:	C-7

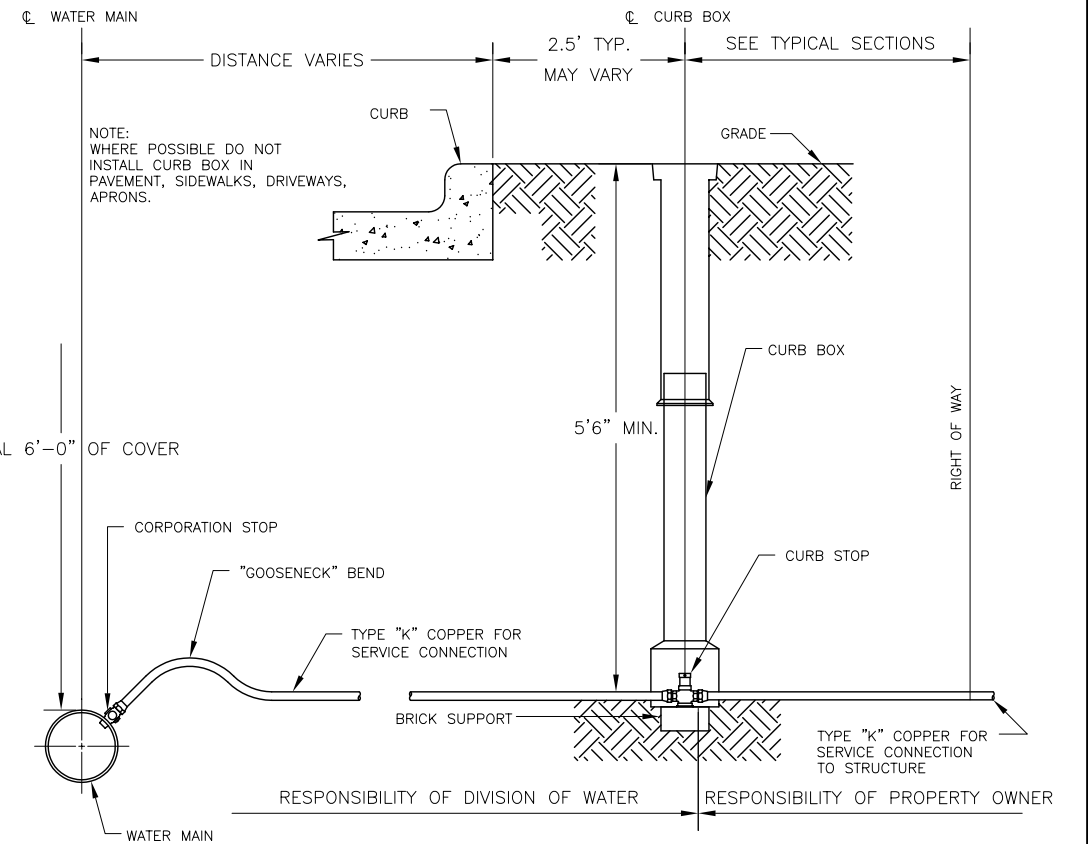


- 1) PLAIN END x PLAIN END DUCTILE IRON PIPE AS SPECIFIED (CUT TO SUIT).
- 2) \*CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.  
COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.  
MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).  
THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.
- 3) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".

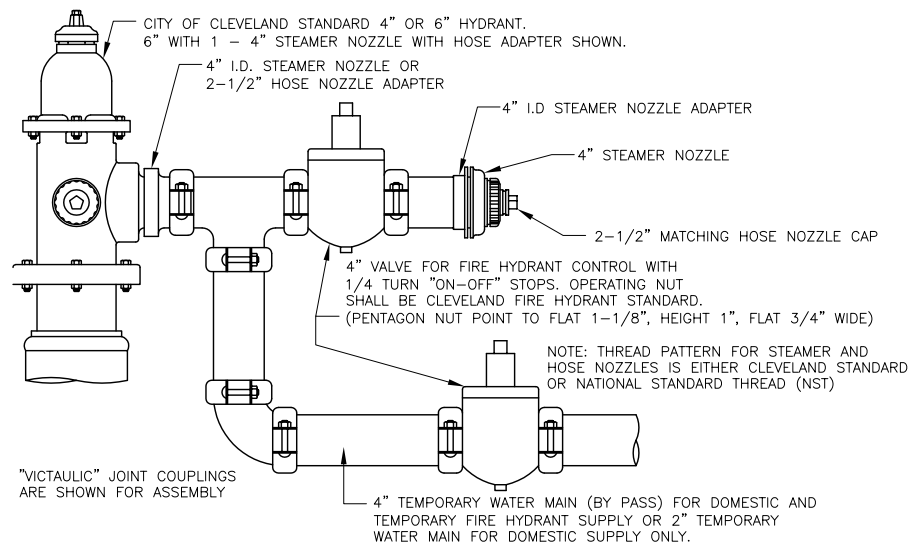
**SPOOL PIECE INSTALLATION DETAIL (STD-008)**  
- NOT TO SCALE -



**TYPICAL FLUSHING ASSEMBLY**  
- NOT TO SCALE -

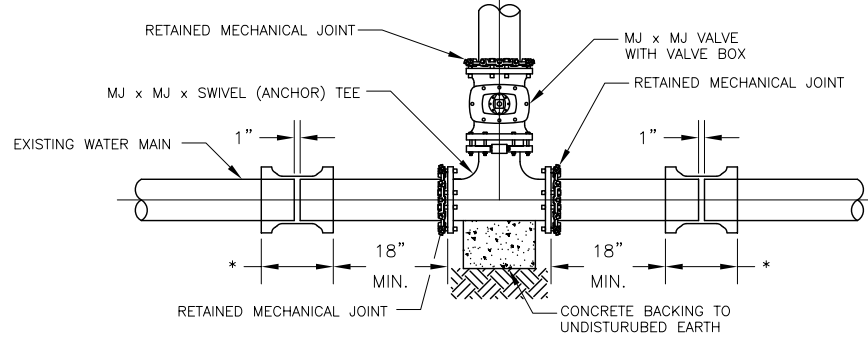


**NEW 1" SERVICE CONNECTION DETAIL IN PUBLIC RIGHT OF WAY (STD-C04)**  
- NOT TO SCALE -

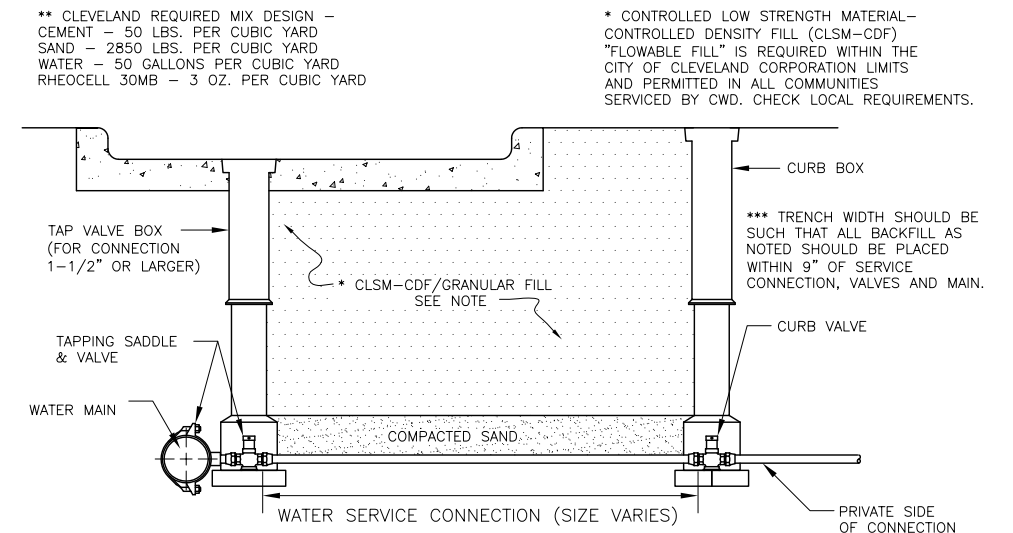


**TEMPORARY WATER MAIN & HYDRANT CONNECTION ASSEMBLY-A TO PROVIDE SIMULTANEOUS SERVICE IN EXISTING HYDRANT AND TEMPORARY BYPASS MAIN (STD-H14)**  
- NOT TO SCALE -

- \* CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.
- COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/A194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.
- MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).
- THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.
- ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".



**CUT-IN TEE DETAIL METHOD No.1 STD-T01**  
NOT TO SCALE



- NOTES:
- 1) CONTRACTOR SHALL USE SPECIAL CARE IN PLACING THE SAND BEDDING BACKFILL, SO AS TO AVOID SCRAPING OF THE EXTERIOR COATING, INJURING THE PIPE, DISTORTING OR MOVING THE PIPE WHEN COMPACTING THE SAME. THE SAND BEDDING BACKFILL SHALL BE TAMPED IN SIX (6) INCH LAYERS, SIMULTANEOUSLY ON EACH SIDE OF THE PIPE, AND THOROUGHLY COMPACTED SO AS TO PROVIDE A SOLID BACKING AGAINST THE EXTERNAL SURFACE OF THE PIPE.
  - 2) MINIMUM COMPACTION FOR ALL SAND BEDDING BACKFILL, BACKFILL AND PREMIUM BACKFILL SHALL BE 95% STANDARD PROCTOR.

**SERVICE CONNECTION BACKFILL DETAIL (STD-023)**  
- NOT TO SCALE -

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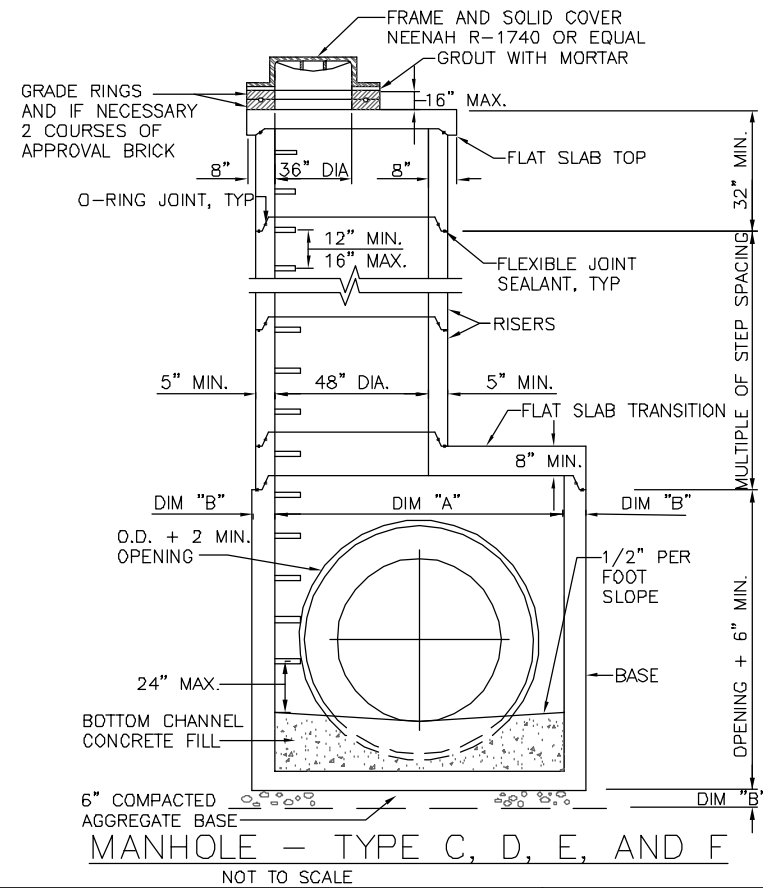
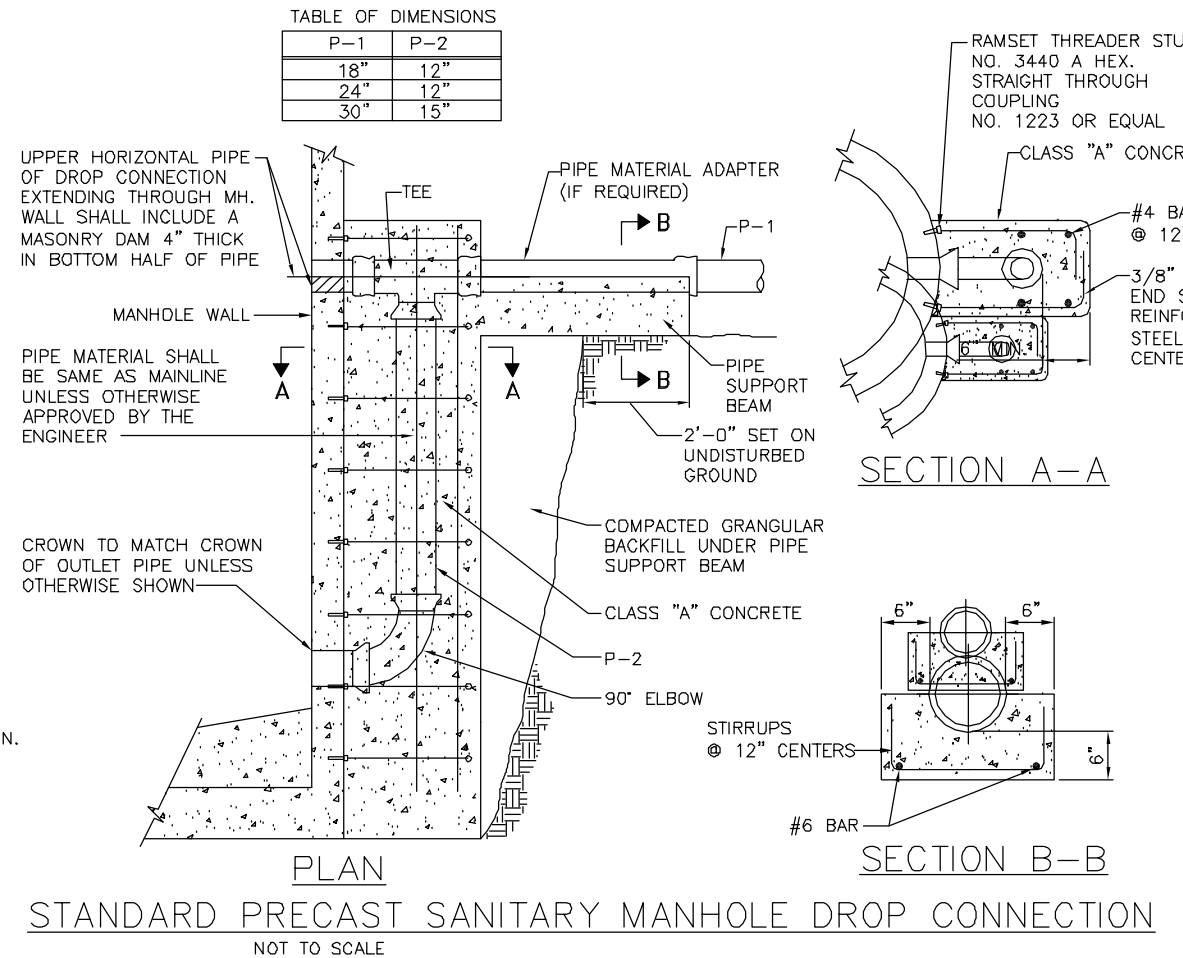
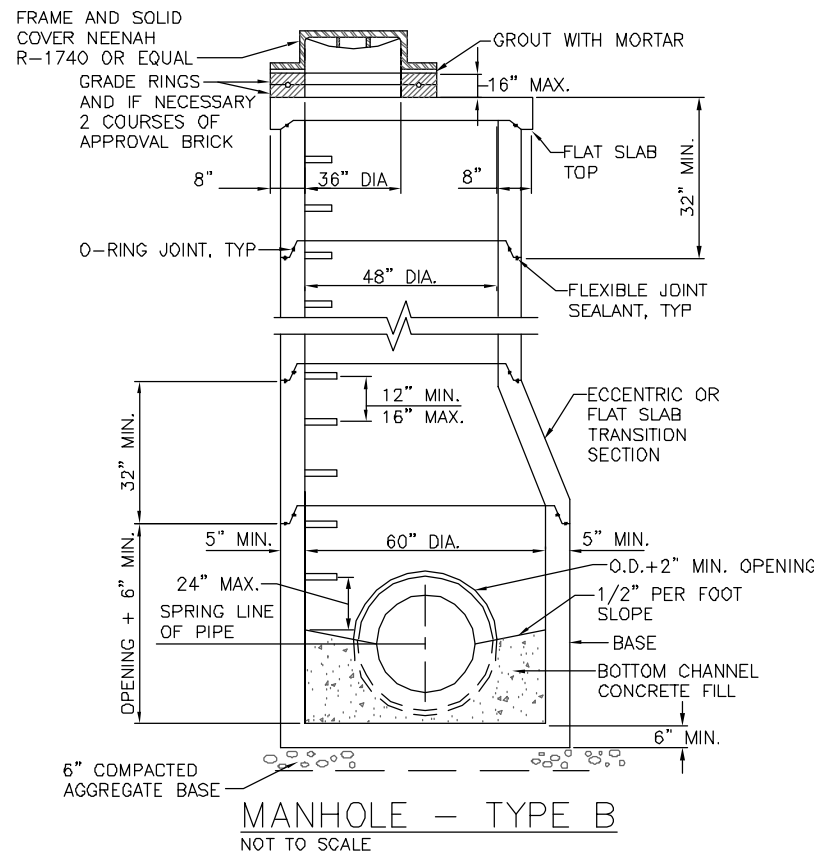
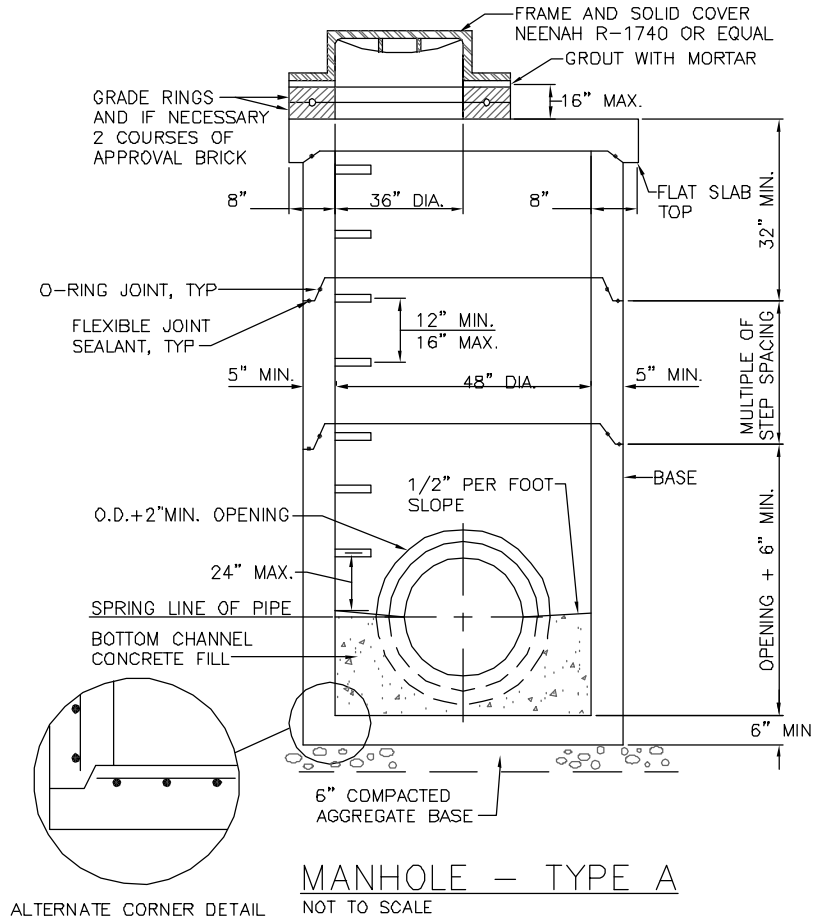
**WATER MAIN RELOCATION DETAILS**

PROJECT NO.:	
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SCALE:	NTS
SHEET NO.:	C-8



MANHOLE NUMBER	MANHOLE TYPE						SPECIAL	COMMENTS
	TYPE A	TYPE B	TYPE C	TYPE D	TYPE E	TYPE F		
1								
1A								
1B								
1C								
2								
TOTAL								

- NOTES**
- SECTIONS OF THE PRECAST MANHOLE SHALL BE CAST AND ASSEMBLED WITH EITHER ALL TONGUE OR ALL GROOVE ENDS UP. LIFT HOLES MAY BE PROVIDED IN EACH SECTION FOR HANDLING.
  - BASES FOR MANHOLES ARE SHOWN WITH MONOLITHIC FLOOR AND RISERS WHICH MAY BE CAST IN ONE OR TWO OPERATIONS. A PERMISSIBLE ALTERNATE IS TO CAST AND SHIP THE FLOOR AND BARREL SEPARATELY. OPENINGS FOR INLET AND OUTLET PIPES SHALL BE PROVIDED, EITHER WHEN THE UNIT IS CAST OR LATER, TO MEET PROJECT REQUIREMENTS. BOTTOM CHANNELS MAY BE FORMED OF CONCRETE PRECAST IN THE BASE OR INSTALLED BY FIELD CONSTRUCTION. FLOORS MAY ALSO BE POURED IN PLACE.
  - OPENINGS IN RISER SECTIONS SHALL BE PREFABRICATED. FLEXIBLE CONNECTIONS SHALL BE PROVIDED FOR SANITARY AND STORM SEWERS. PREMIUM SEALS SHALL MEET ASTM C-923.
  - JOINT SEALS BETWEEN PRECAST MANHOLE SECTIONS SHALL BE RESILIENT AND FLEXIBLE GASKET JOINTS. JOINTS SHALL MEET ASTM C-443, FEDERAL SPECIFICATION SS-S-00210 (210 A), AND AASHTO M-198.
  - MANHOLE JOINTS SHALL BE SEALED BY A FLEXIBLE SEALANT, CONSEAL CS-202 AS MANUFACTURED BY CONSEAL CONCRETE SEALANTS, INC., OR APPROVED EQUAL.
  - MANHOLE GRADE RINGS SHALL BE SEALED EXTERNALLY AND BETWEEN GRADE RINGS WITH A LAYER OF MASTIC COMPOUND SUCH AS FABERLITE, KENT SEAL, OR EQUAL.
  - PRECAST MANHOLES SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478.
  - SEAL ALL LIFT HOLES WITH APPROVED CONCRETE PLUGS.
  - SEE PLANS FOR FRAME AND COVER ELEVATIONS.
  - TOP MANHOLE STEP SHALL BE INSTALLED NOT MORE THAN 2' BELOW TOP OF FRAME.
  - APPLY "THOROSEAL" BY THORO SYSTEM PRODUCTS, OR APPROVED EQUAL TO THE INSIDE EXPOSED SURFACES OF ALL MANHOLES.



MH TYPE	DIM "A"	MIN DIM "B"
C	72"	6"
D	84"	7"
E	96"	8"
F	120"	10"

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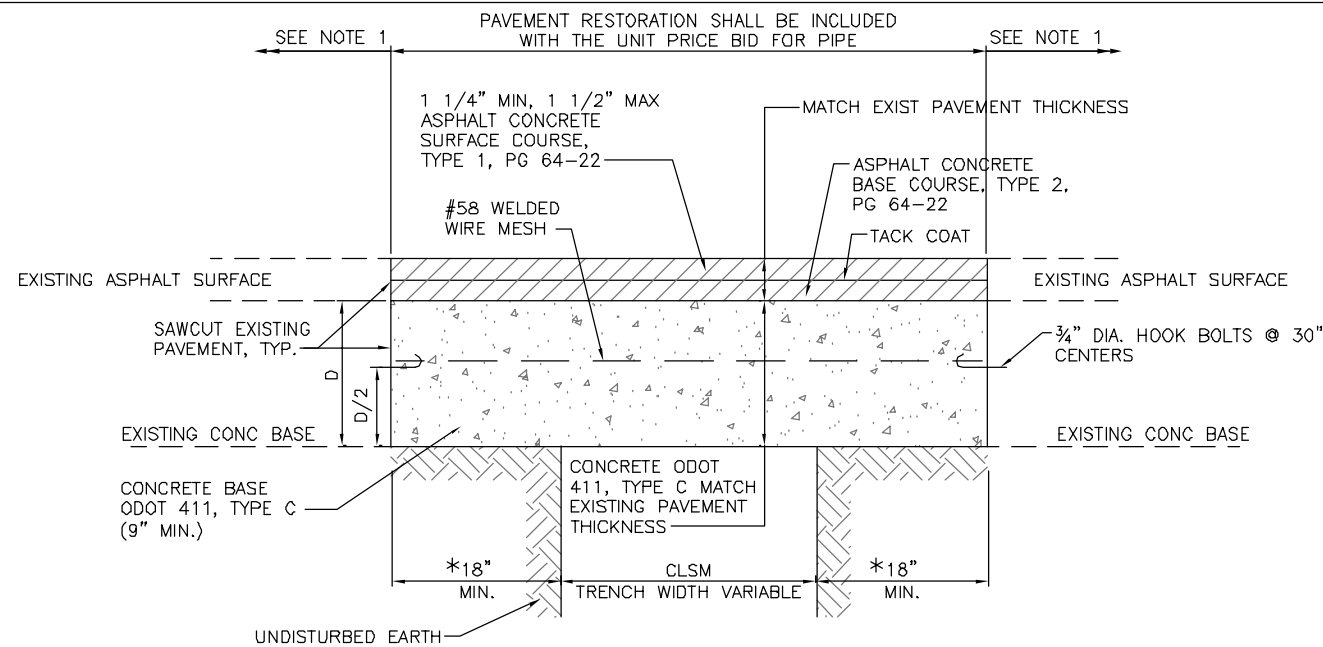


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PRECAST CONCRETE MANHOLE DETAILS

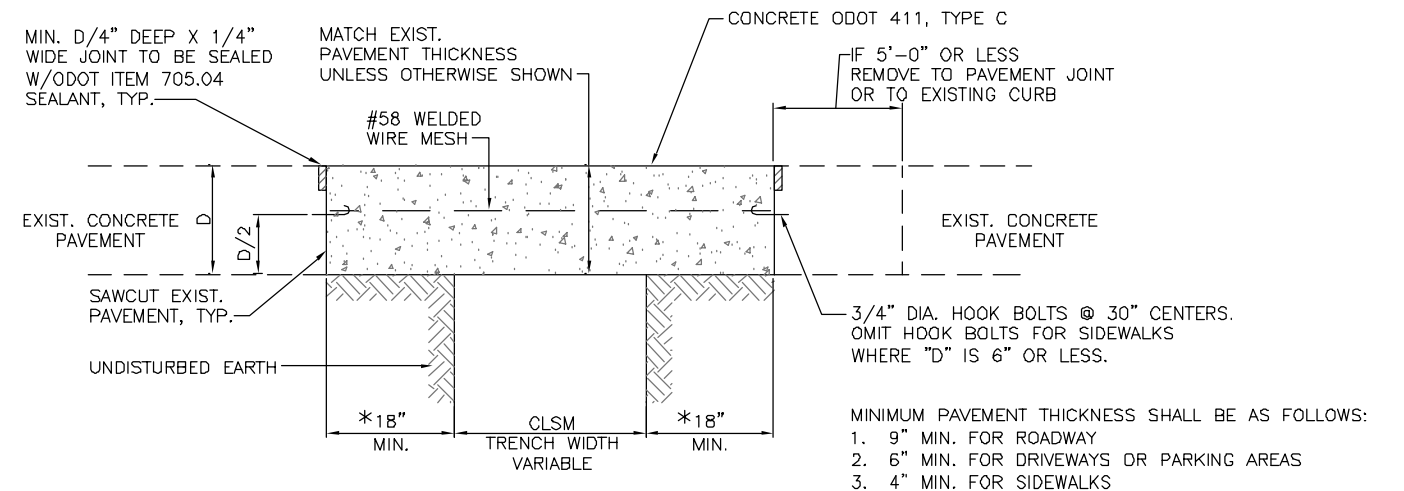
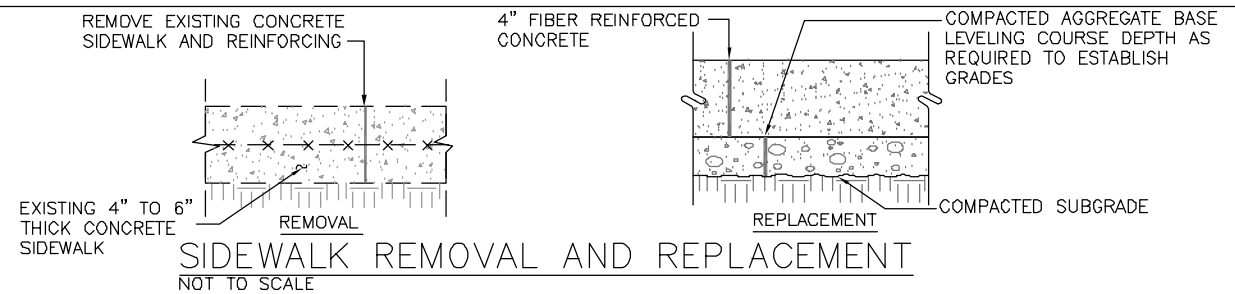
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 SHEET: \_\_\_\_\_  
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 SHEET NO.: C-9



TYPICAL TRENCH DETAIL FOR ASPHALT PAVEMENT WITH CONCRETE BASE

NOT TO SCALE

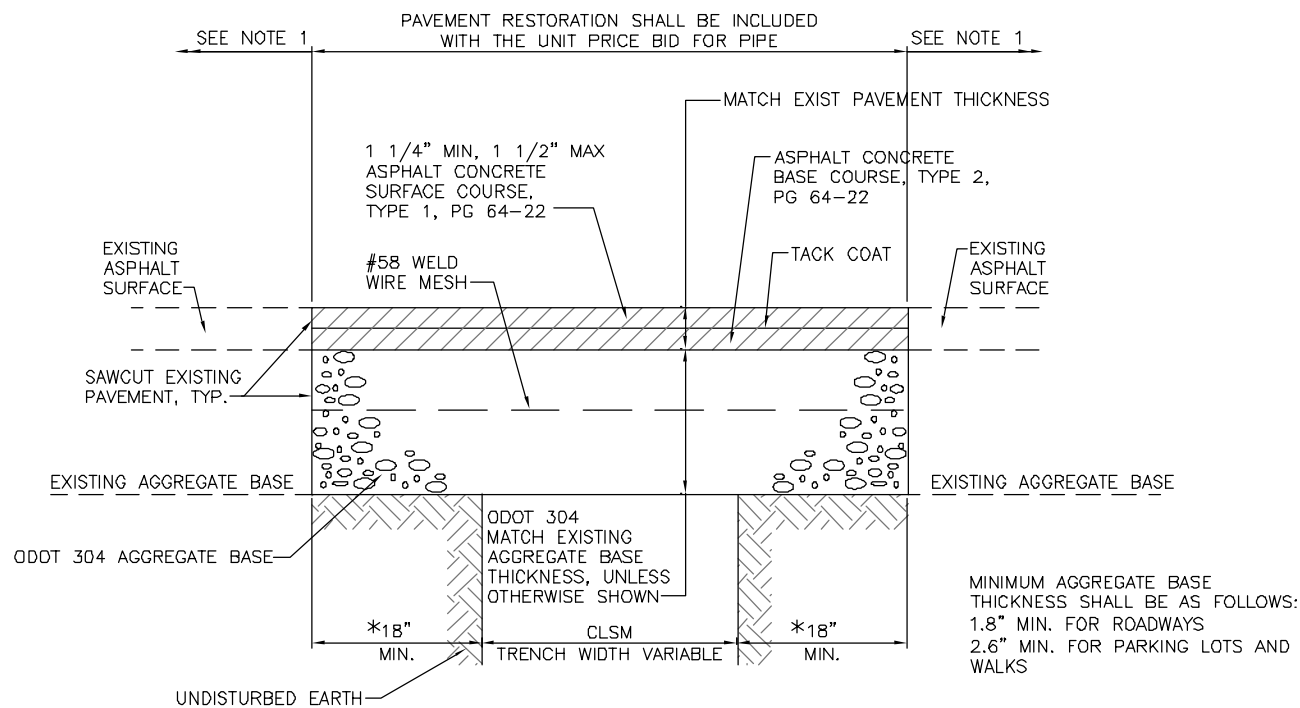
\*CONTINUE PAVEMENT REPLACEMENT TO CURB WHERE SAWCUT OCCURS LESS THAN 3' FROM FACE OF CURB



TYPICAL TRENCH DETAIL FOR CONCRETE PAVEMENT

NOT TO SCALE

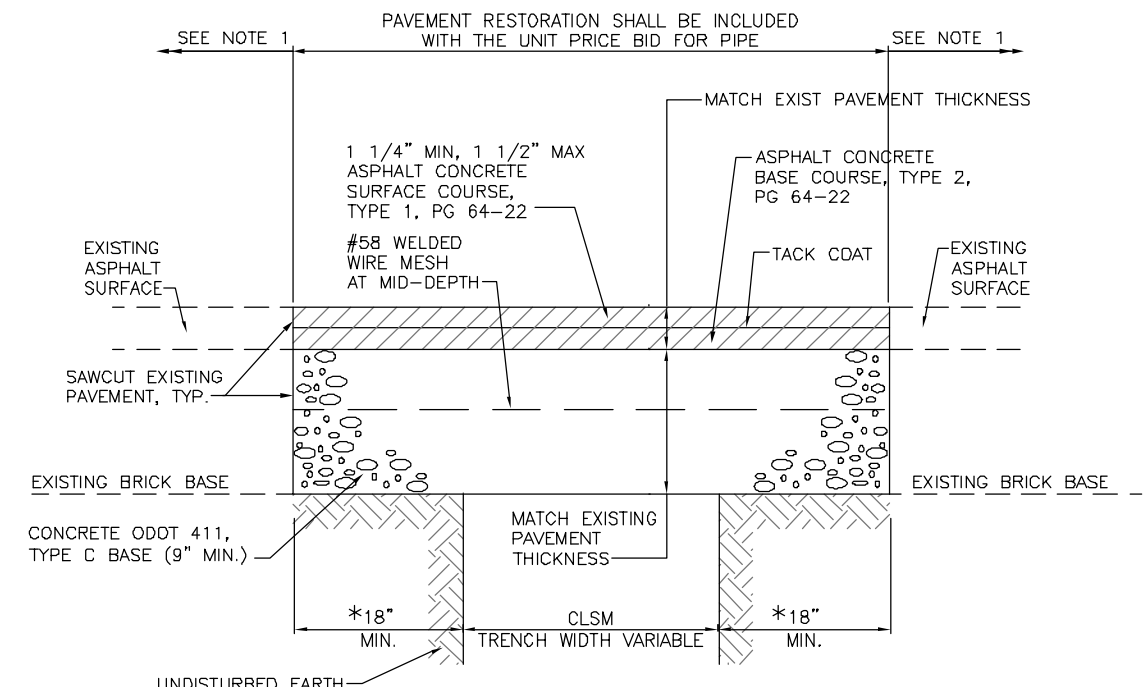
\*CONTINUE PAVEMENT REPLACEMENT TO CURB WHERE SAWCUT OCCURS LESS THAN 3' FROM FACE OF CURB



TYPICAL TRENCH DETAIL FOR ASPHALT PAVEMENT WITH AGGREGATE BASE

NOT TO SCALE

\*CONTINUE PAVEMENT REPLACEMENT TO CURB WHERE SAWCUT OCCURS LESS THAN 3' FROM FACE OF CURB

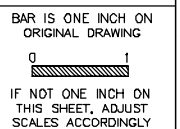


TYPICAL TRENCH DETAIL FOR ASPHALT PAVEMENT WITH BRICK BASE

NOT TO SCALE

\*CONTINUE PAVEMENT REPLACEMENT TO CURB WHERE SAWCUT OCCURS LESS THAN 3' FROM FACE OF CURB

NOTE:  
1. MILL AND RESURFACE ASPHALT PAVEMENT WHERE SHOWN ON THE DRAWINGS. PAYMENT SHALL BE INCLUDED WITH THE UNIT PRICE BID FOR PAVEMENT MILLING AND RESURFACING



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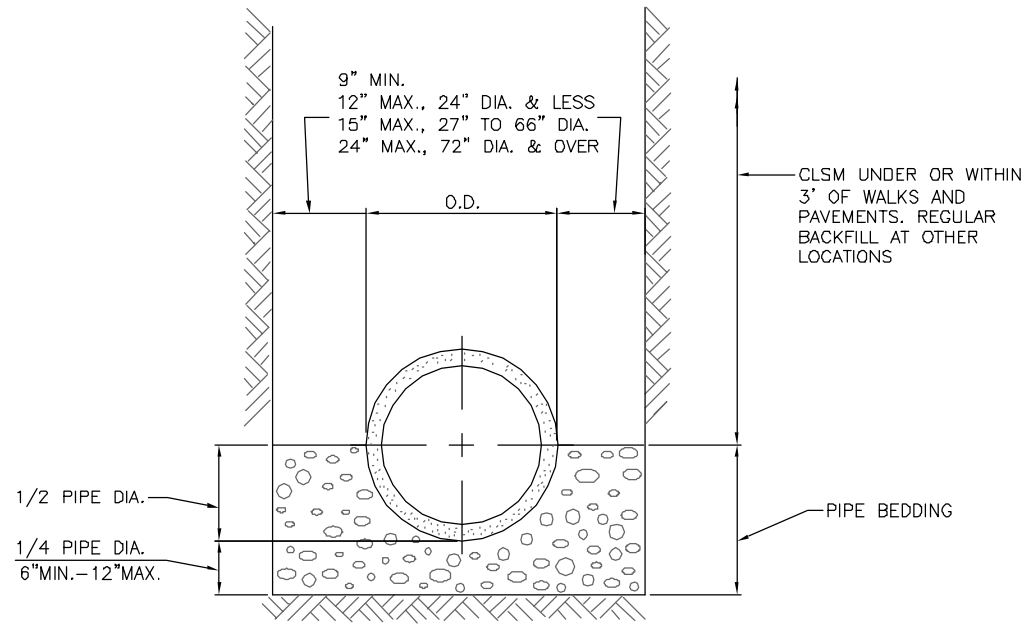


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TRENCH REPAIR DETAILS

PROJECT NO.: \_\_\_\_\_  
 SHEET: \_\_\_\_\_  
 SCALE: NONE  
 SHEET NO.: C-10



TYPICAL SEWER TRENCH  
FOR RCP AND VCP  
NOT TO SCALE

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DATE: \_\_\_\_\_

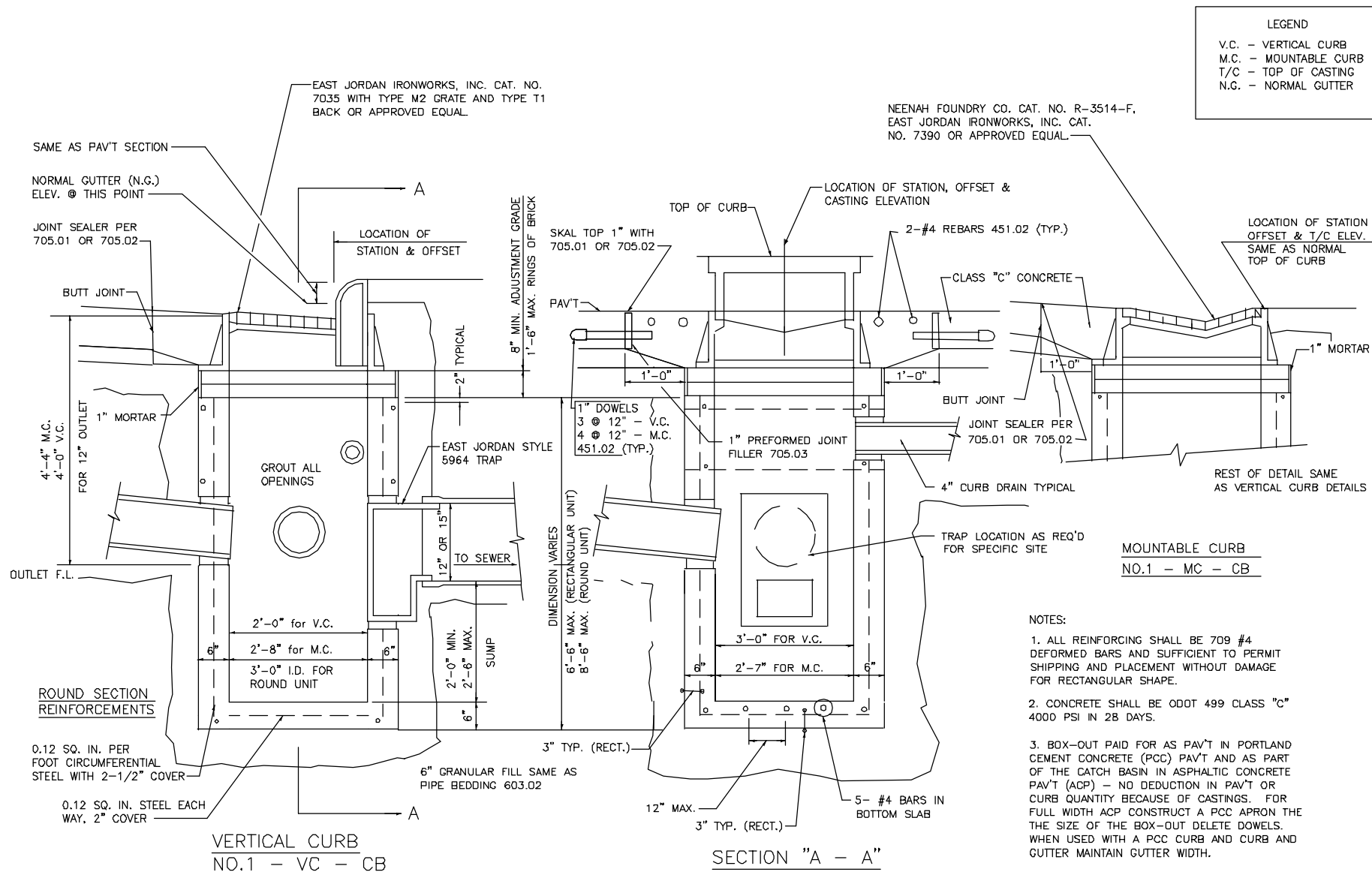


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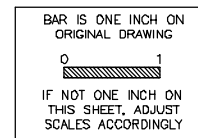
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CIVIL DETAILS

PROJECT NO.: \_\_\_\_\_  
SHEET: \_\_\_\_\_  
SCALE: NONE  
SHEET NO.: C-11



CITY OF CLEVELAND STANDARD CATCH BASIN  
NOT TO SCALE



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APPROVED BY:	
DATE:	

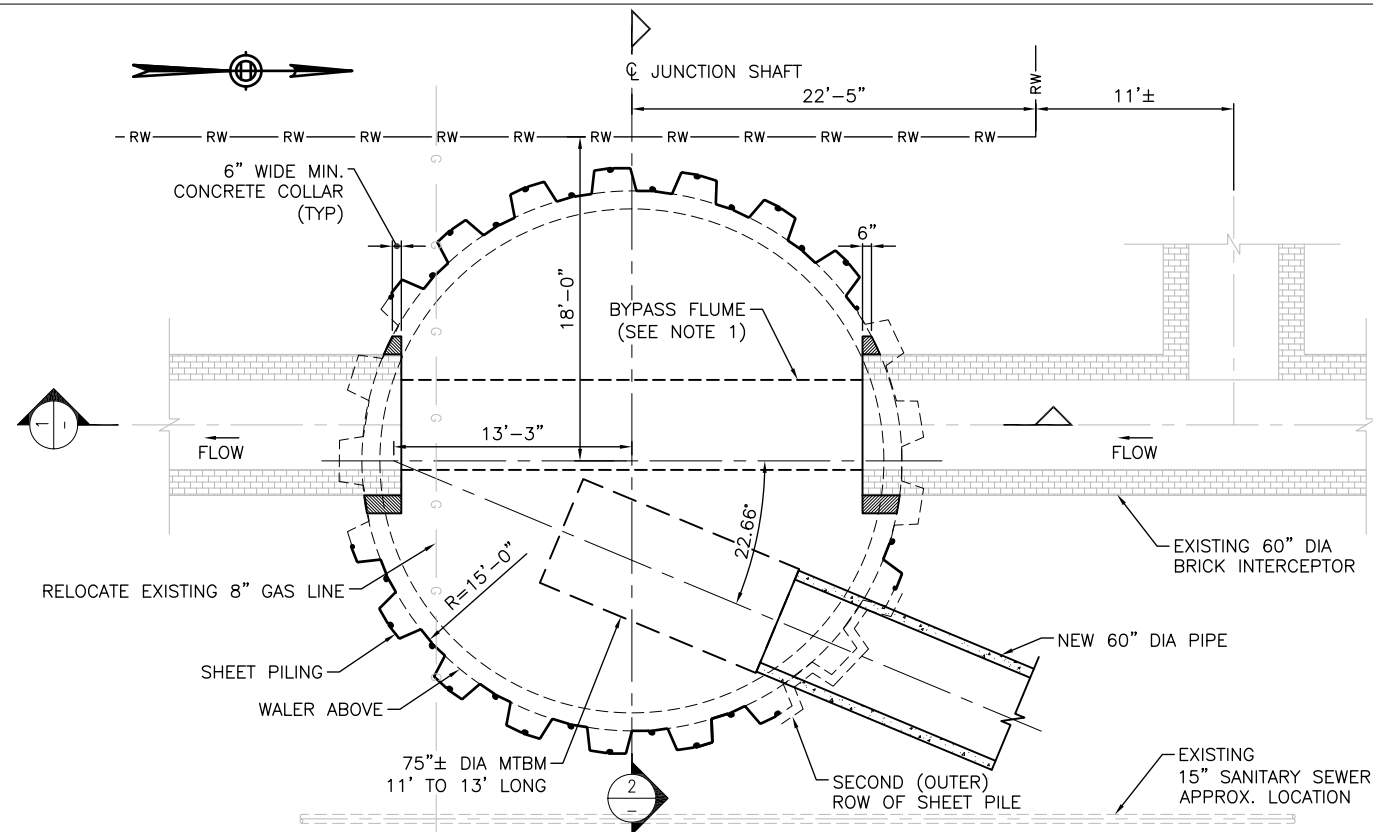


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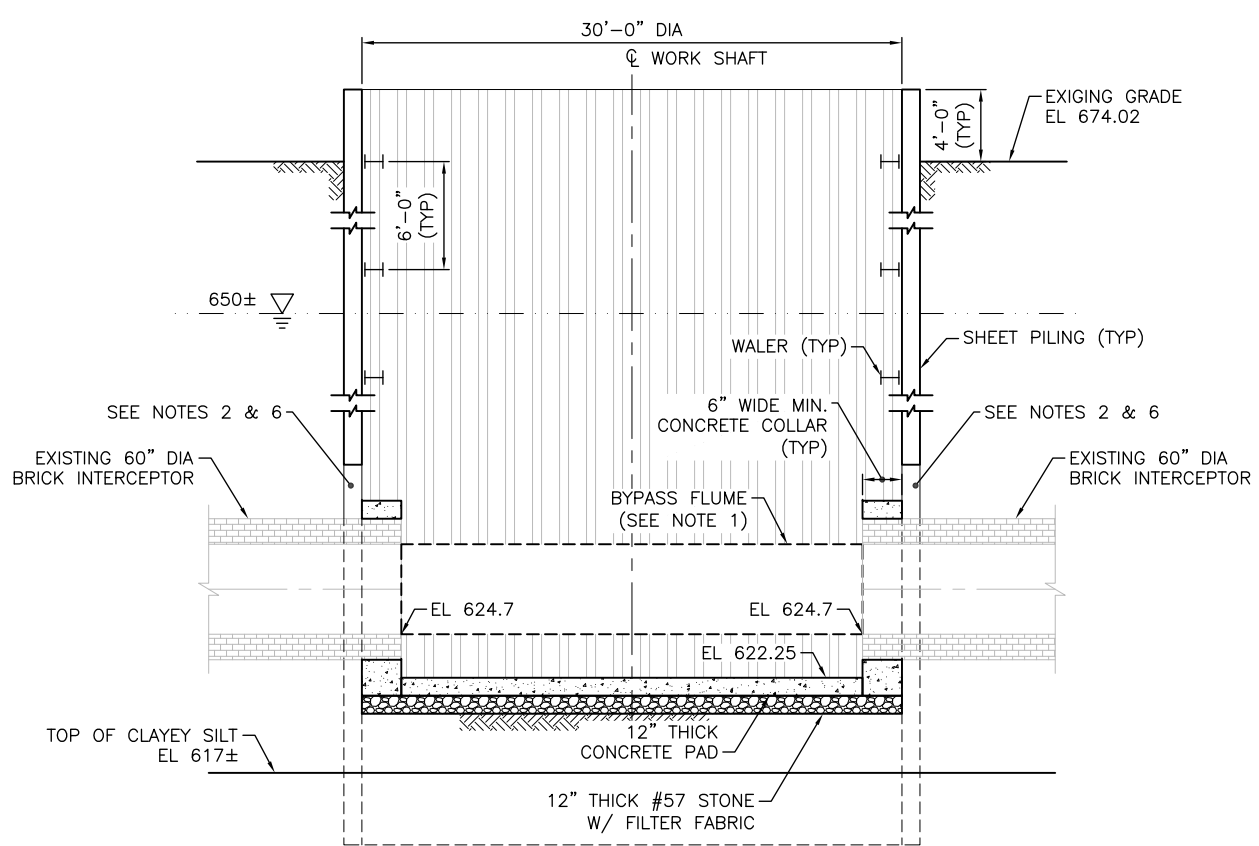
WALWORTH RUN INTERCEPTOR REALIGNMENT

CITY OF CLEVELAND CATCH BASIN DETAIL

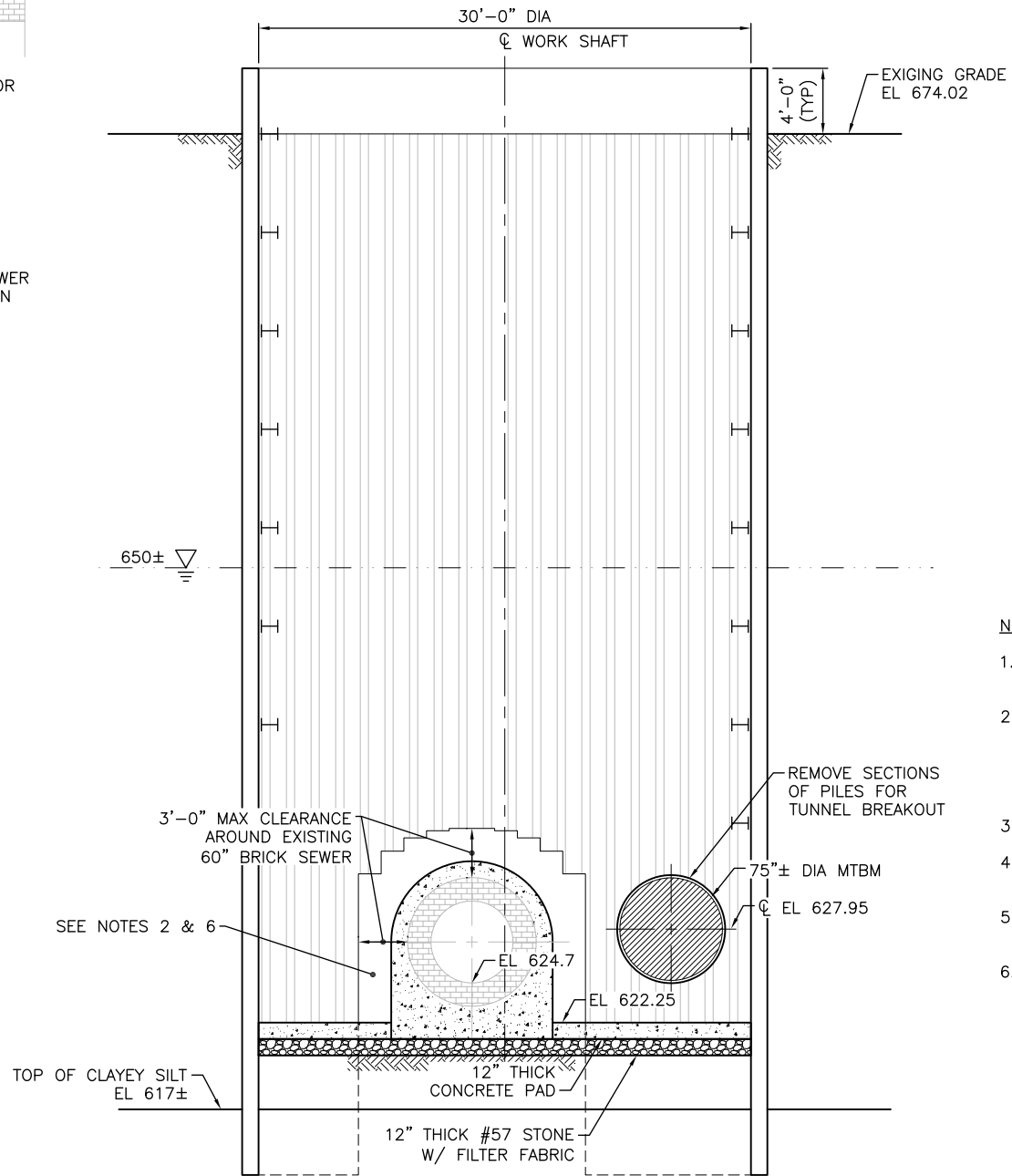
PROJECT NO.:	
SHEET:	
SCALE:	NONE
SHEET NO.:	C-12



**PLAN VIEW – TUNNEL LEVEL**  
SCALE: 3/16" = 1'-0"

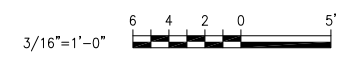


**SECTION 1**  
SCALE: 3/16" = 1'-0"



**SECTION 2**  
SCALE: 3/16" = 1'-0"

- NOTES:**
- DESIGN AND INSTALL FLOW BYPASS FLUME FOR 154 CFS CAPACITY.
  - TYPE OF GROUT WILL BE DETERMINED BASED ON SOIL TESTING RESULTS – JET GROUTING OR CHEMICAL GROUTING IS STILL UNDER CONSIDERATION. ALSO, DEWATERING BY TWO WELLS IS UNDER CONSIDERATION PENDING SOIL SAMPLE TESTING RESULTS.
  - REFER TO SHAFT SITE PLANS FOR UTILITY INFORMATION.
  - OVERHEAD UTILITIES NOT SHOWN. THEY WILL BE RELOCATED DURING CONSTRUCTION.
  - REFER TO SHEET \_\_\_\_\_ FOR SUGGESTED MTBM BULLSEYE ARRANGEMENT.
  - DESCRIBE FOREPOLING AT EXISTING SEWER – CLOSE ALL GAPS.



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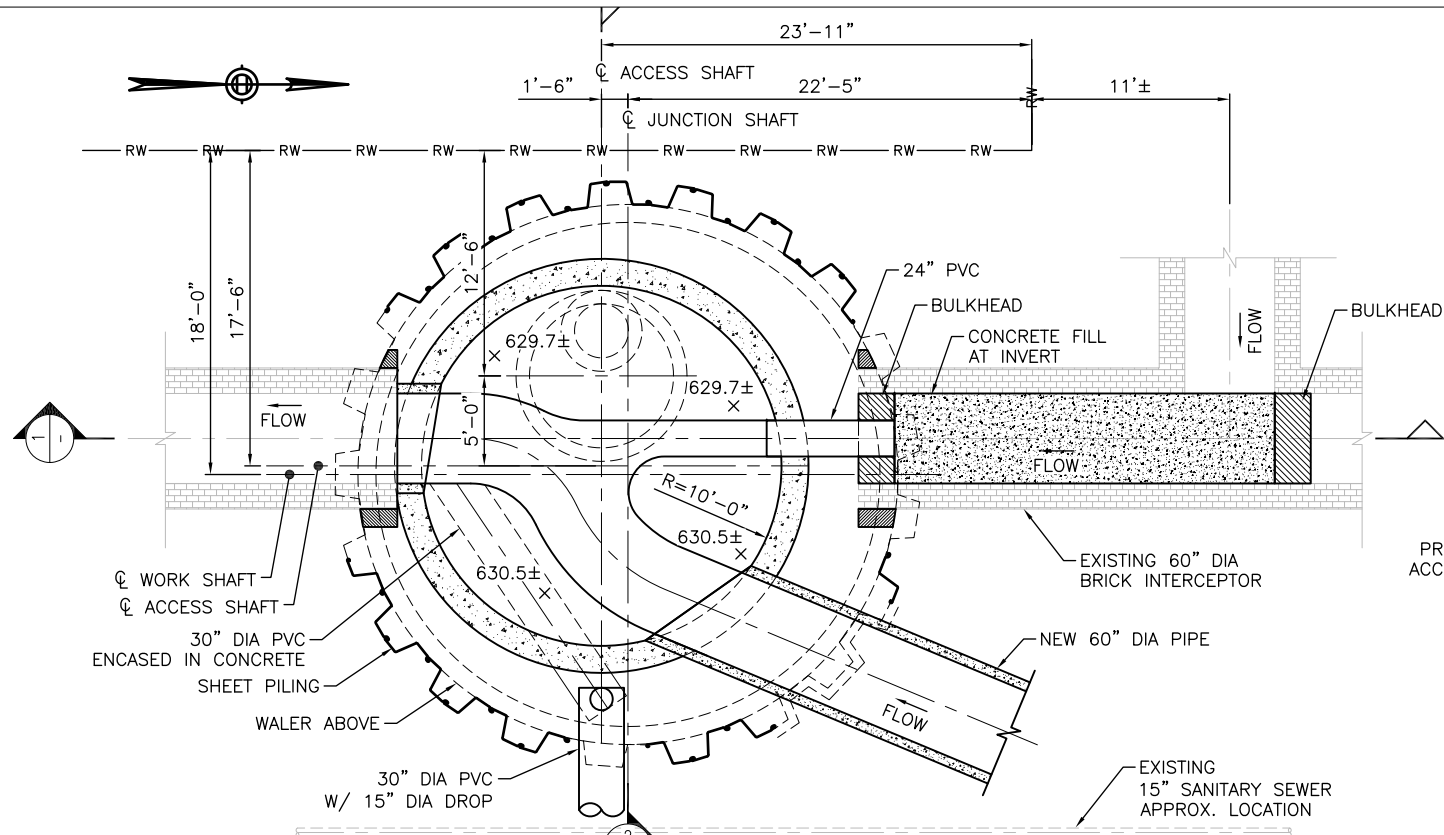
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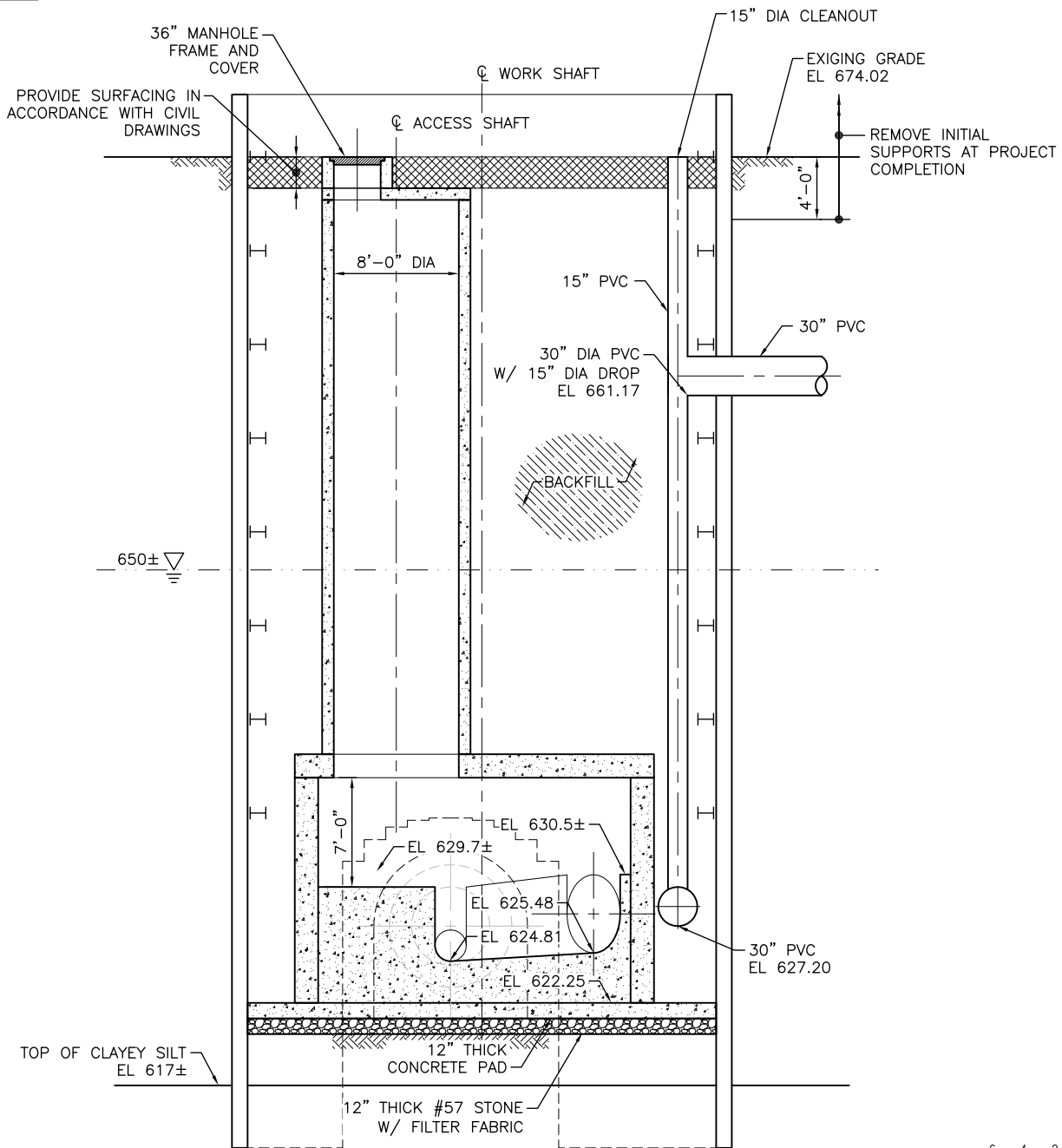
**WORK SHAFT JUNCTION CHAMBER No. 1 INITIAL SUPPORTS**

PROJECT NO.: \_\_\_\_\_  
SHEET: \_\_\_\_\_  
SCALE: 3/16"=1'-0"  
SHEET NO.: TU-1

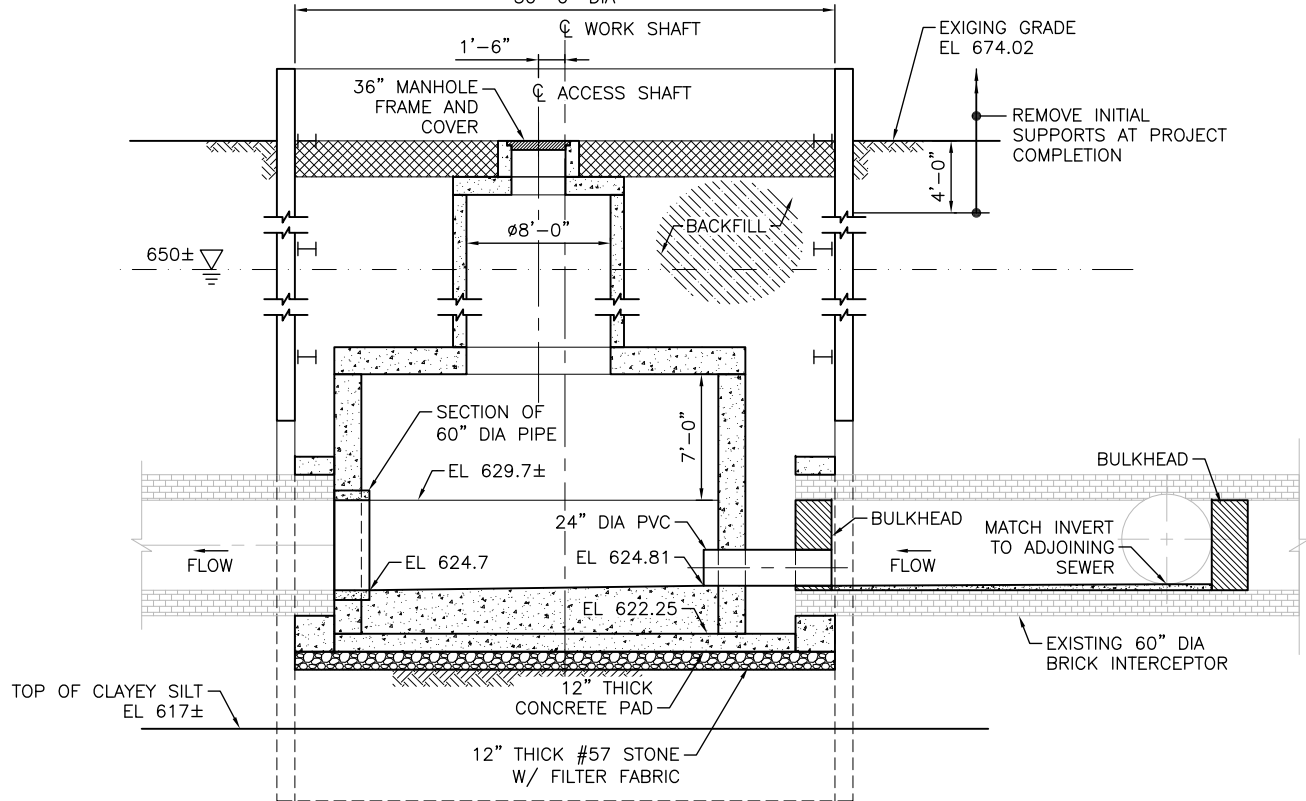
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PLAN VIEW - TUNNEL LEVEL  
SCALE: 3/16" = 1'-0"



SECTION 2  
SCALE: 3/16" = 1'-0"



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



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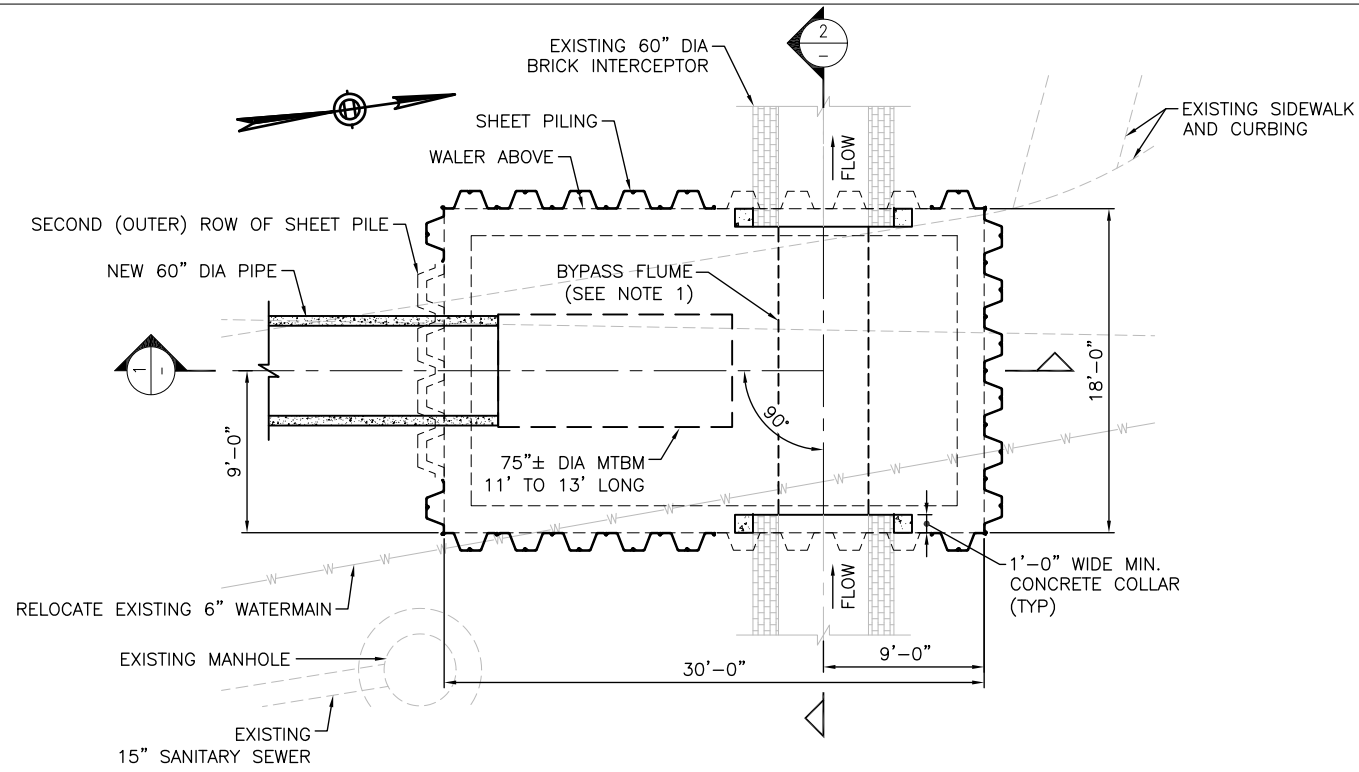
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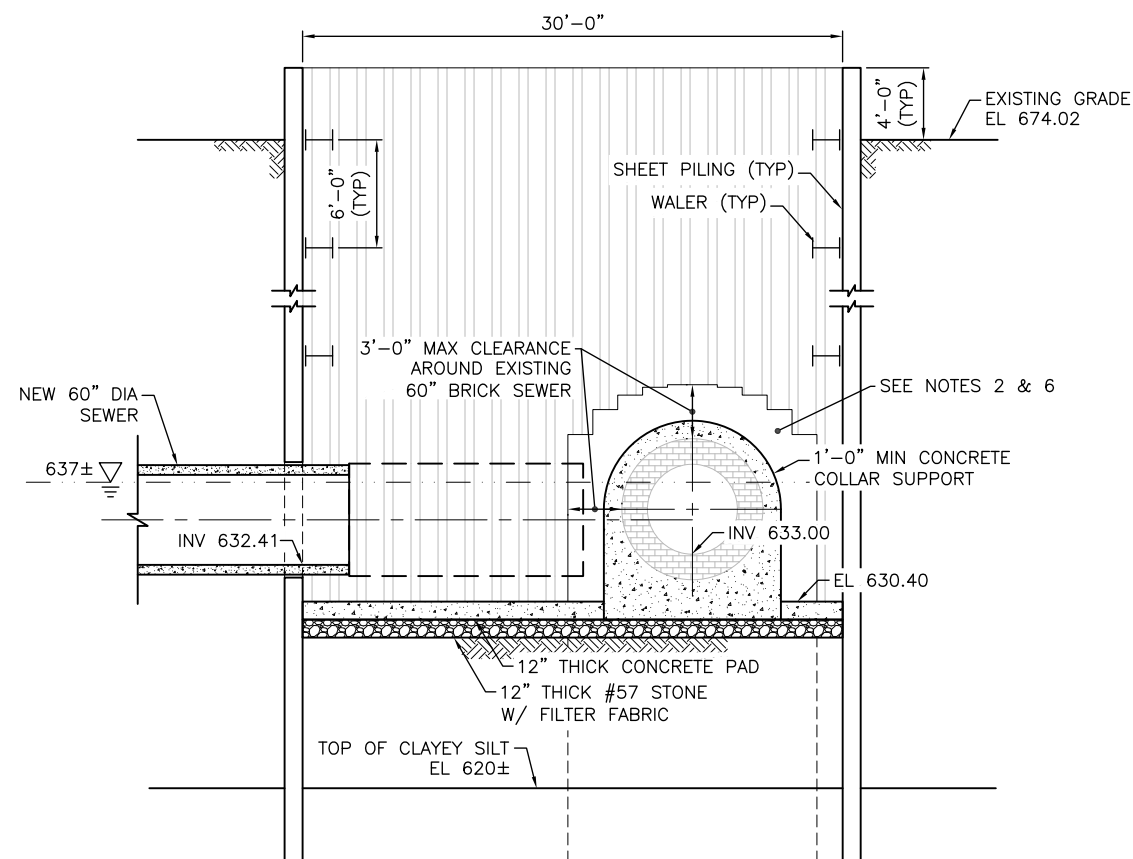
JUNCTION CHAMBER No. 1 FINAL SUPPORTS

PROJECT NO.: \_\_\_\_\_  
SHEET: \_\_\_\_\_  
SCALE: 3/16" = 1'-0"  
SHEET NO.: TU-2



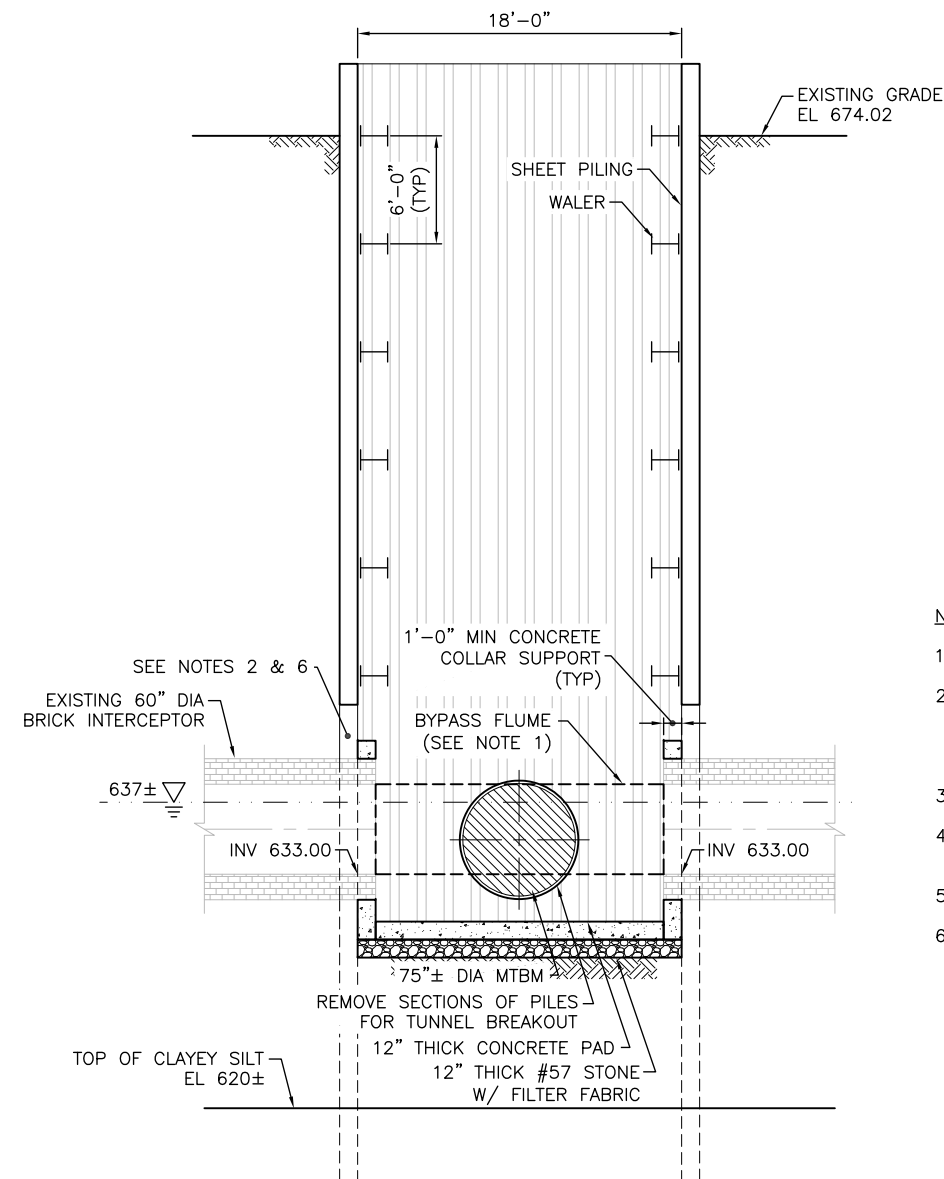
PLAN VIEW — TUNNEL LEVEL

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



SECTION 1

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

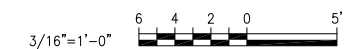


SECTION 2

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

NOTES:

- DESIGN AND INSTALL FLOW BYPASS FLUME FOR 154 CFS CAPACITY.
- TYPE OF GROUT WILL BE DETERMINED BASED ON SOIL TESTING RESULTS — JET GROUTING OR CHEMICAL GROUTING IS STILL UNDER CONSIDERATION. ALSO, DEWATERING BY TWO WELLS IS UNDER CONSIDERATION PENDING SOIL SAMPLE TESTING RESULTS.
- REFER TO SHAFT SITE PLANS FOR UTILITY INFORMATION.
- OVERHEAD UTILITIES NOT SHOWN. THEY WILL BE RELOCATED DURING CONSTRUCTION.
- REFER TO SHEET \_\_\_ FOR SUGGESTED MTBM BULLSEYE ARRANGEMENT.
- DESCRIBE FOREPOLING AT EXISTING SEWER — CLOSE ALL GAPS.



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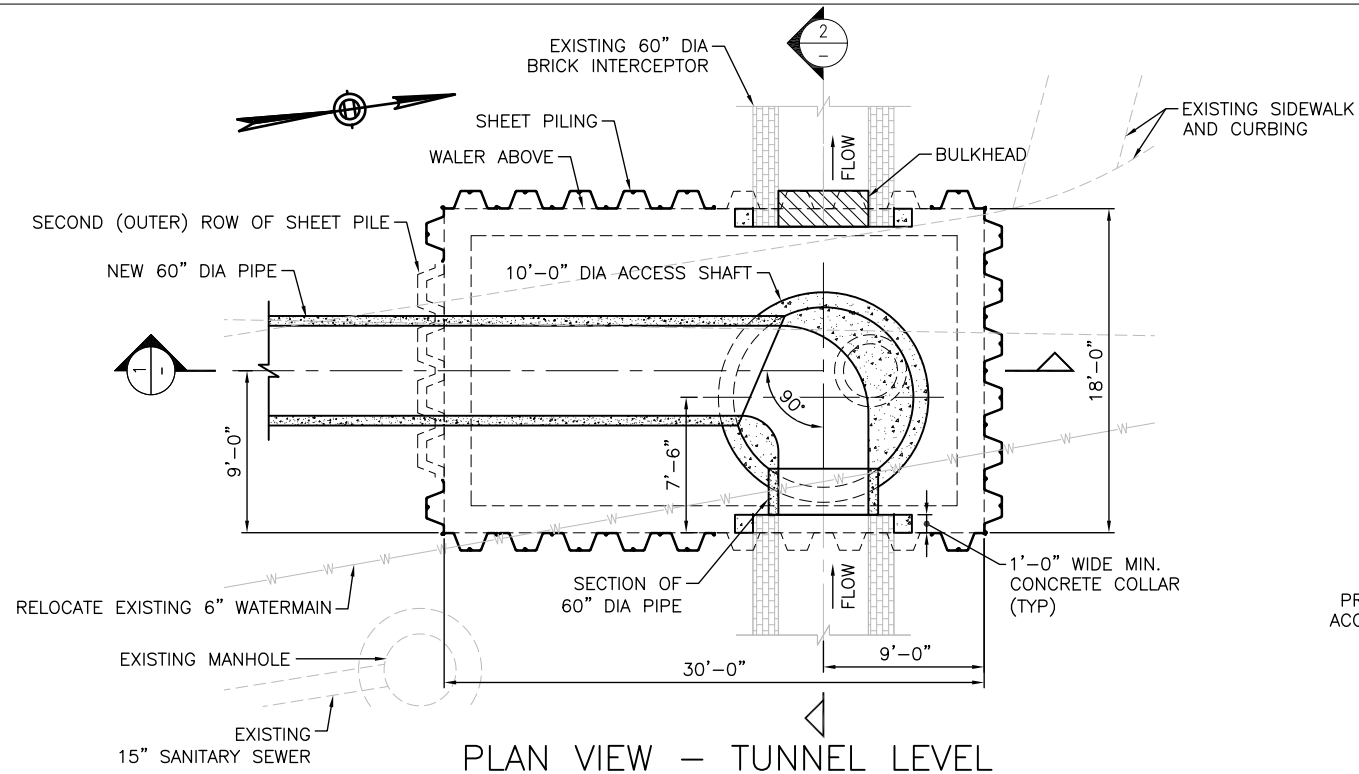
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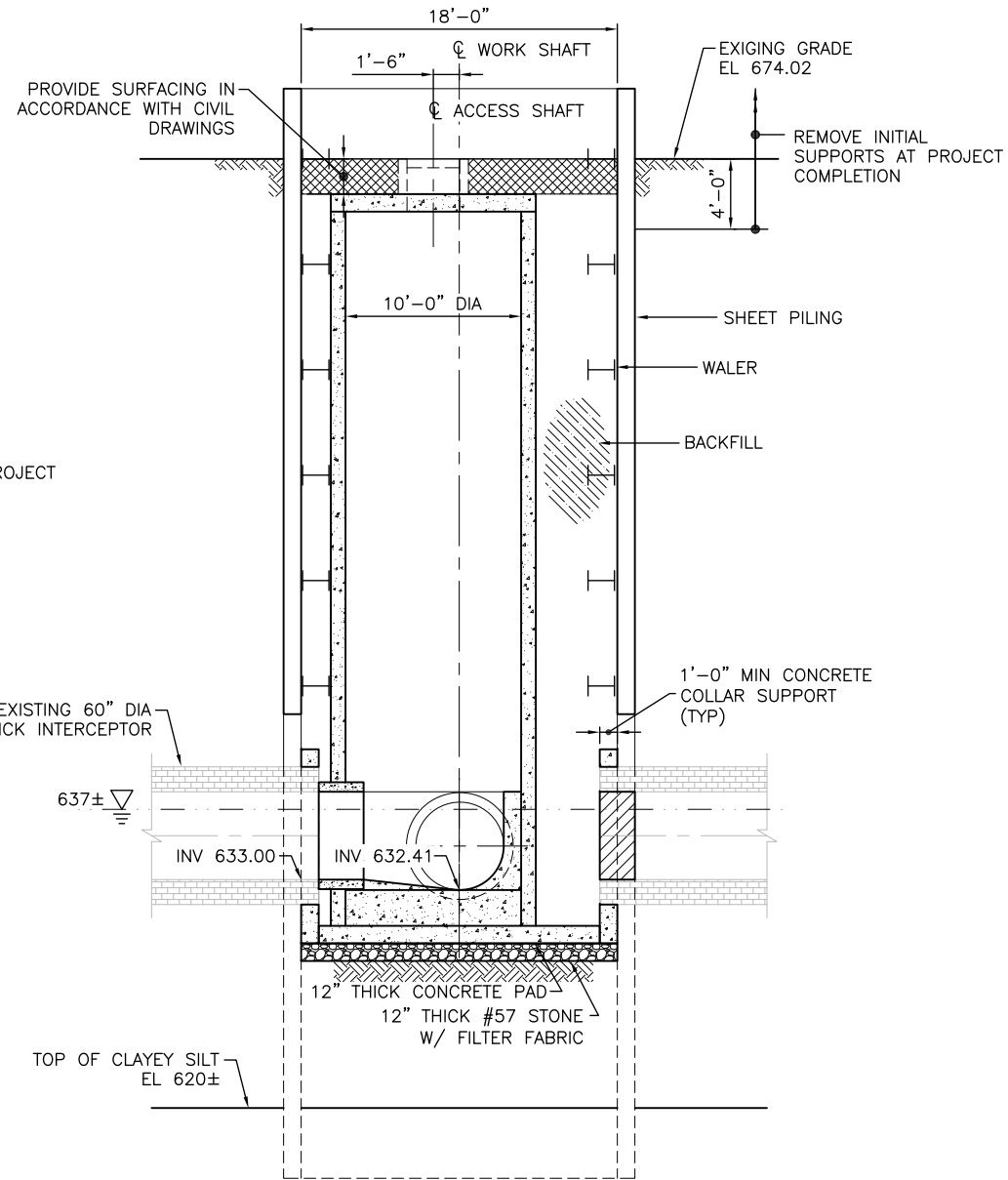
WORK SHAFT JUNCTION CHAMBER No. 2 INITIAL SUPPORTS

PROJECT NO.: \_\_\_\_\_  
SHEET: \_\_\_\_\_  
SCALE: 3/16"=1'-0"  
SHEET NO.: TU-3



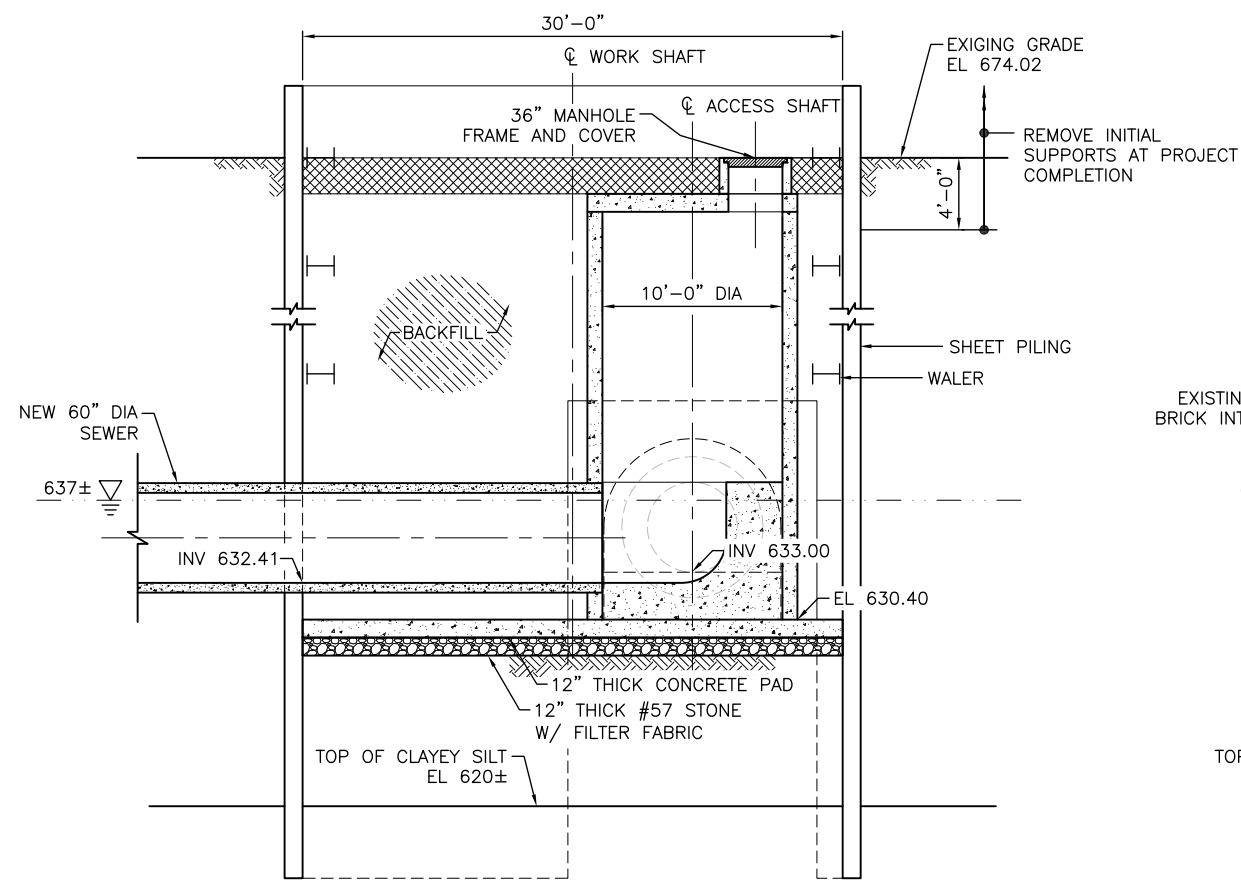
PLAN VIEW - TUNNEL LEVEL

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



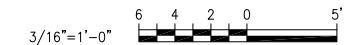
SECTION 2

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



SECTION 1

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



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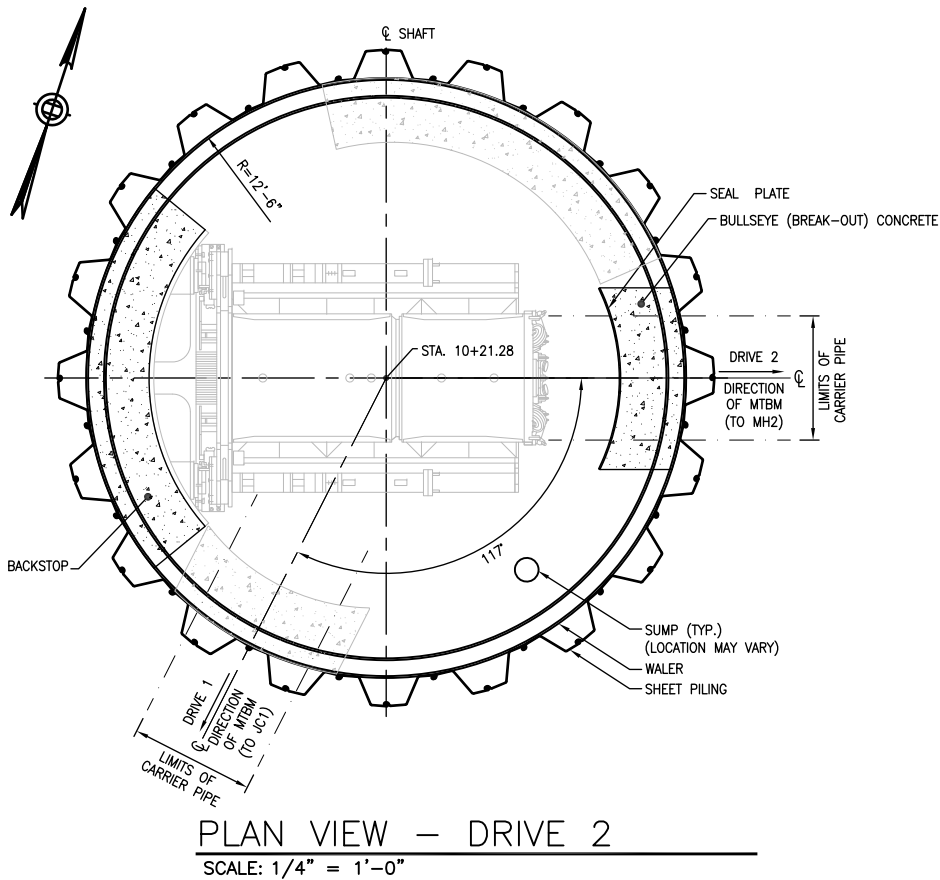
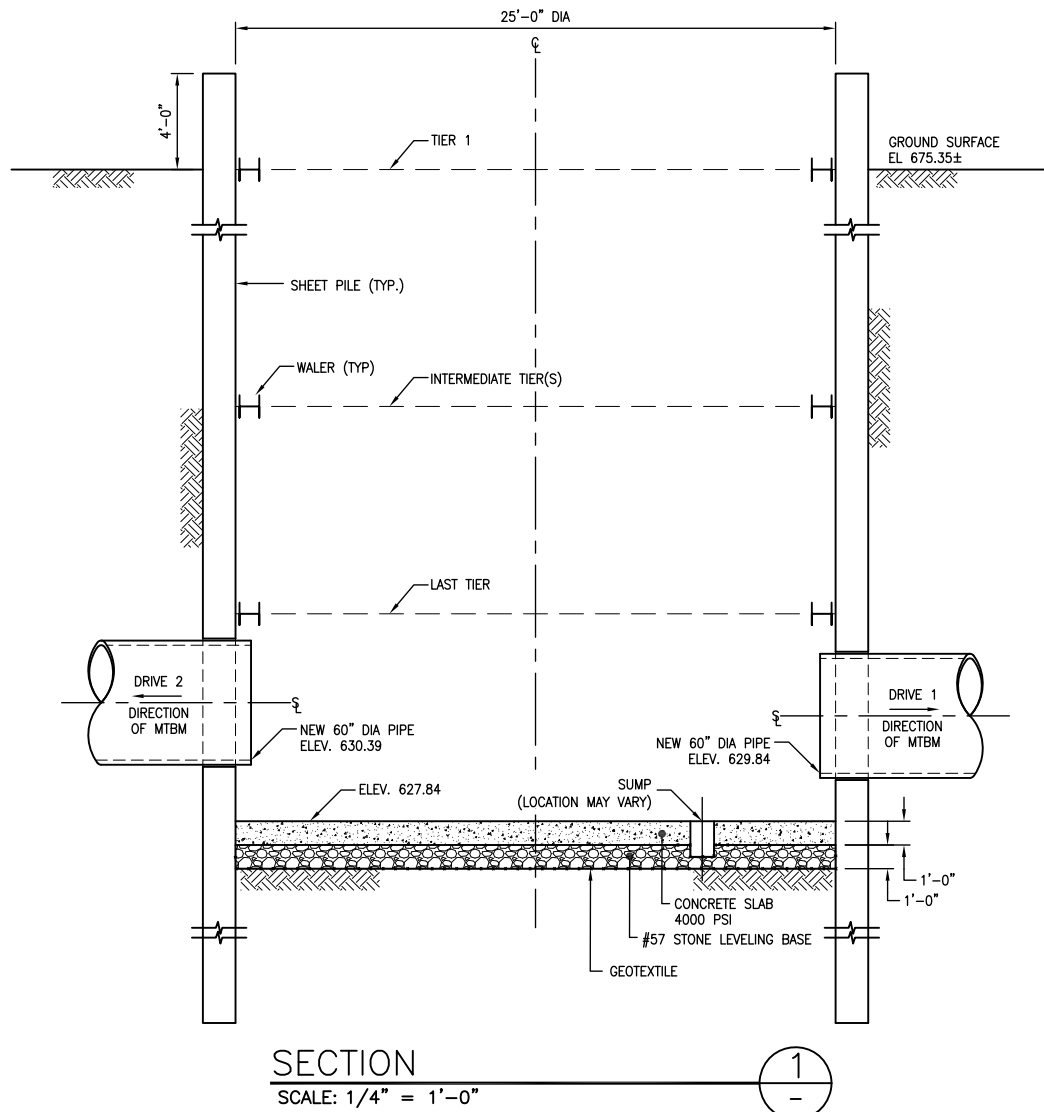
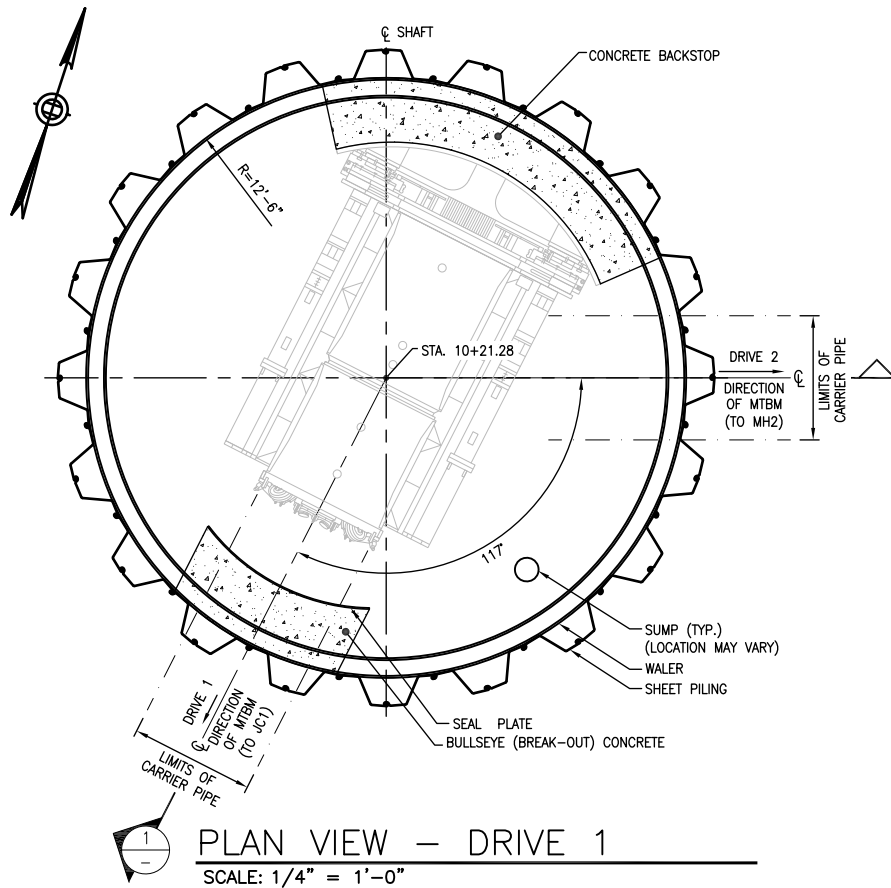
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JUNCTION CHAMBER No. 2 FINAL SUPPORTS

PROJECT NO.: \_\_\_\_\_  
 SHEET: \_\_\_\_\_  
 SCALE: 3/16"=1'-0"  
 SHEET NO.: TU-4





**GENERAL NOTES:**

1. ALL STRUCTURAL STEEL MEMBERS ARE FY = 50 KSI.
2. STEEL SHEETING IS PZ27 OR EQUAL (FY = 50 KSI)
3. USE E70XX ELECTRODES FOR ALL WELDS.
4. THE MAX. THRUST LOAD FROM MTBM ON TUNNEL BREAK-IN CONCRETE SHALL NOT EXCEED 50 TONS.

**SEQUENCE OF CONSTRUCTION FOR WORK SHAFT AT MANHOLE No. 1 (MH1)**

THE FOLLOWING SEQUENCE OF CONSTRUCTION FOR WORK SHAFT AT MH1 IS PREPARED CONSIDERING THAT MICROTUNNEL DRIVE 1 WILL BE COMPLETED FIRST AND THEN DRIVE 2 WILL BE COMPLETED.

TO MAINTAIN THE EXCAVATION AND SUPPORT STABILITY, THE FOLLOWING SEQUENCE OF CONSTRUCTION FOR THE WORK SHAFT SHALL BE FOLLOWED:

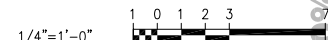
1. INSTALL SHEET PILES TO THE DEPTH SHOWN FOR THE CIRCULAR SHAFT.
  2. INSTALL SECOND (OUTER) ROW OF SHEET PILES AT TUNNEL BREAK-OUT LOCATIONS WITHIN LIMITS INDICATED.
  3. EXCAVATE PIT "IN DRY" TO MAXIMUM OF 2 FEET DEPTH BELOW TIER 1 LEVEL AND INSTALL TIER 1 STEEL SUPPORTS.
  4. CONTINUE TO EXCAVATE PIT "IN DRY" IN STEPS TO MAXIMUM OF 2 FEET DEPTH FOR EACH OF THE REMAINING TIER LEVEL AND INSTALL REMAINING TIER STEEL SUPPORTS.
  5. AFTER INSTALLATION OF THE LAST TIER, CONTINUE TO EXCAVATE THE PIT "IN DRY" DOWN TO THE BOTTOM OF EXCAVATION.
  6. CLEAN THE BOTTOM OF EXCAVATION AND PLACE GEOTEXTILE FABRIC, CRUSHED STONE BASE AND CONCRETE SLAB.
  7. PROVIDE SUMP PIT AS SHOWN ON THE DRAWINGS. ALLOW THE CONCRETE SLAB TO GAIN THE DESIGN STRENGTH.
  8. IF GROUND WATER IS IN-FILTERING INTO THE SUMP PIT, CONTINUOUSLY PUMP OUT THE WATER FROM THE SUMP PIT FOR THE ENTIRE DURATION OF WORK.
- PREPARATION FOR BREAK-OUT FOR DRIVE 1 AND DRIVE 2**
9. PLACE SUITABLE GROUT BETWEEN TWO ROWS OF SHEETING AT TUNNEL BREAK-OUT LOCATIONS TO PREVENT GROUNDWATER OR SOIL INFILTRATION WHEN MAIN SHEET PILES ARE CUT FOR MICROTUNNEL BORING MACHINE (MTBM) BULLS EYE.
  10. CUT THE SHEET PILES (INSTALLED FOR THE SHAFT) IN THE MICROTUNNEL BREAK-OUT AREAS (BULLSEYE). IF DURING CUTTING OF SHEET PILES, GROUNDWATER OR SOIL INFILTRATION IS OBSERVED, PROVIDE SECONDARY GROUT TO COMPLETELY SEAL BULLSEYE ZONE AS NECESSARY. APPLY A BOND BREAKER AGAINST SHEET PILES IN THE BULLSEYE ZONE.

**PROCEDURE FOR BREAK-OUT FOR DRIVE 1 AND DRIVE 2**

11. INSTALL STEEL BULLSEYE SEAL PLATE AND PLACE CONCRETE FOR THE TUNNEL BREAK-OUT BETWEEN SEAL PLATE AND SHEET PILES FOR DRIVE 1. ALLOW THE CONCRETE TO GAIN THE DESIGN STRENGTH. PULL UP THE SECOND (OUTER) ROW OF SHEET PILES JUST ENOUGH TO CLEAR THE MICRO TUNNEL BORING MACHINE (MTBM) FOR DRIVE 1.
12. ON COMPLETION OF DRIVE1, INSTALL BREAK-OUT FOR DRIVE 2 SIMILAR TO THE BREAK-OUT PROCEDURE FOR DRIVE 1. ALLOW THE CONCRETE TO GAIN THE DESIGN STRENGTH. PULL UP THE SECOND (OUTER) ROW OF SHEET PILES JUST ENOUGH TO CLEAR THE MICROTUNNEL BORING MACHINE (MTBM) FOR DRIVE 2.

**CONCRETE BACKSTOP CONSTRUCTION FOR DRIVE 1 AND DRIVE 2**

13. CONSTRUCT THE CONCRETE BACK STOP AS SHOWN ON THE DRAWING FOR DRIVE 1.
14. ON COMPLETION OF DRIVE1, CONSTRUCT THE CONCRETE BACK STOP FOR DRIVE 2.



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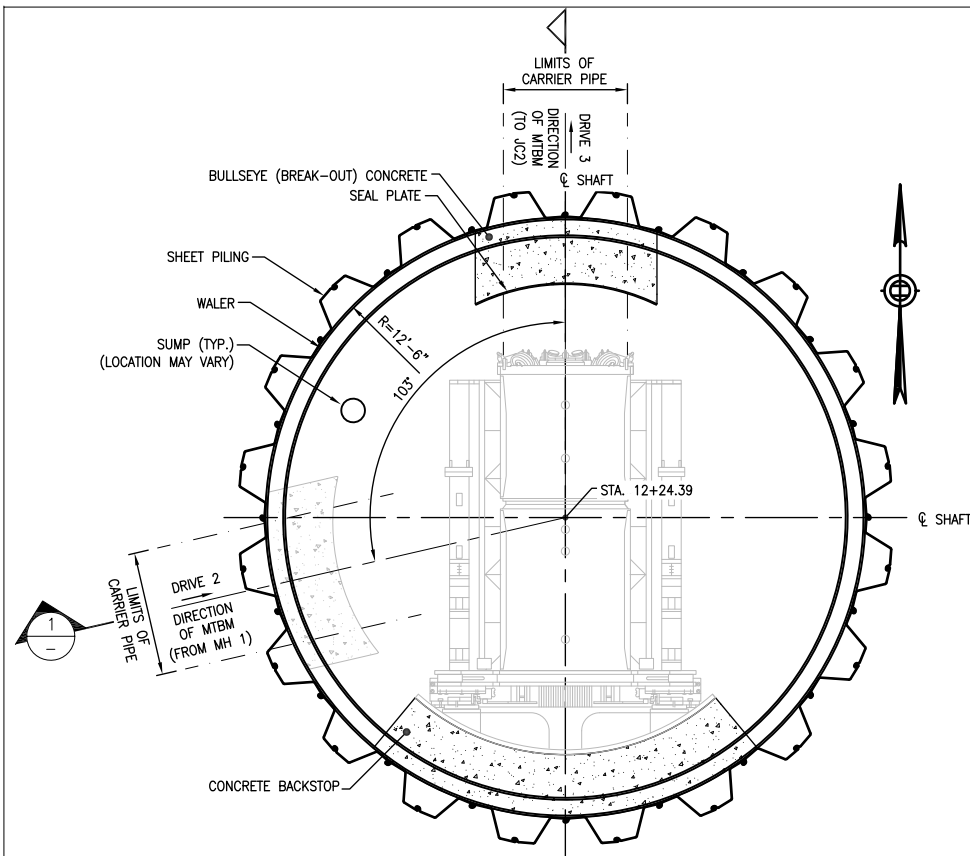
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**WALWORTH RUN INTERCEPTOR REALIGNMENT**

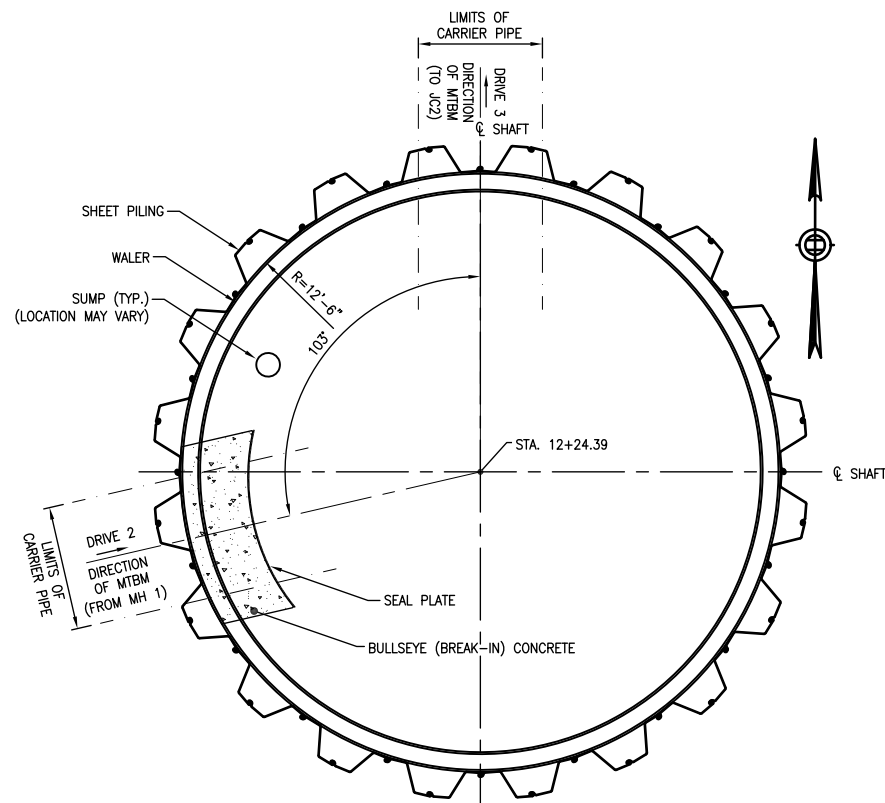
**WORK SHAFT MANHOLE No.1 INITIAL SUPPORTS**

PROJECT NO.: \_\_\_\_\_  
 SHEET: \_\_\_\_\_  
 SCALE: AS NOTED  
 SHEET NO.: TU-5



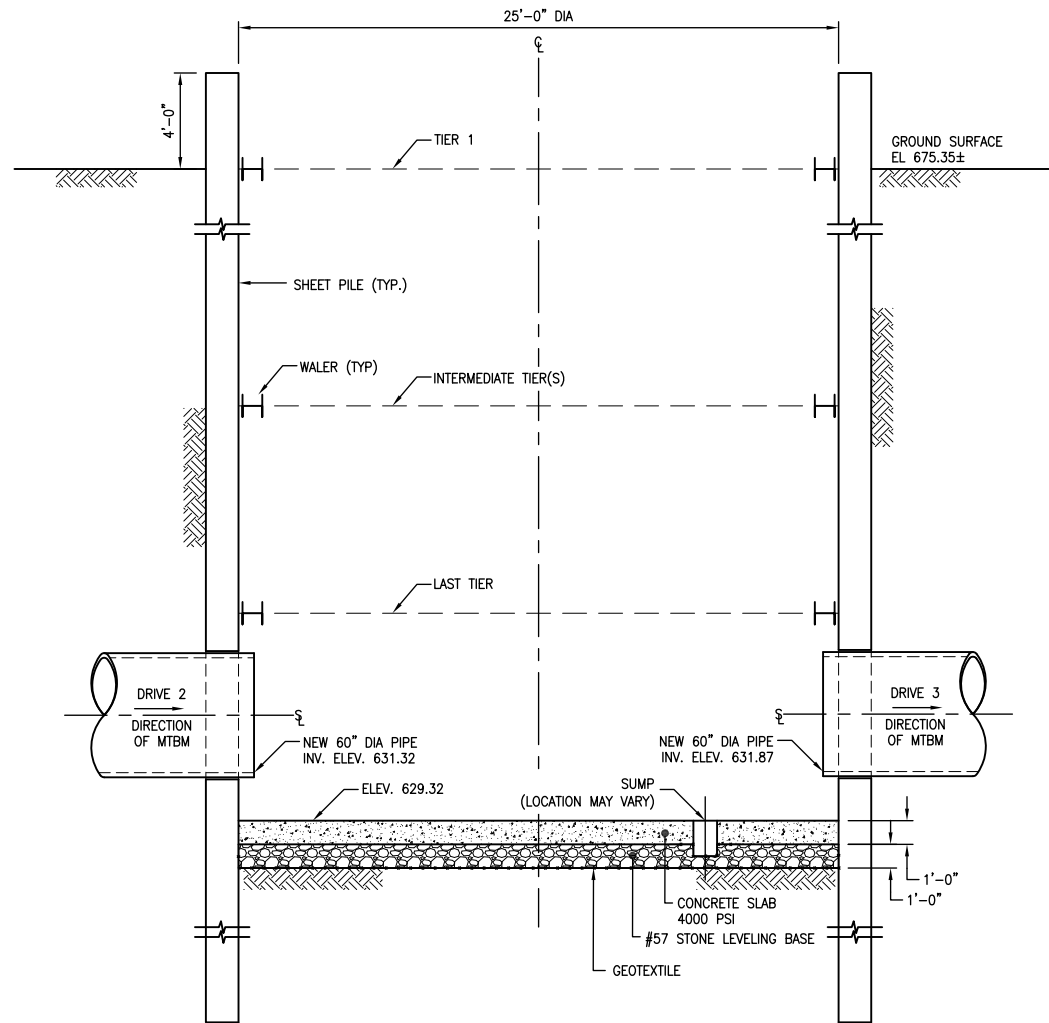
PLAN VIEW - DRIVE 3

SCALE: 1/4" = 1'-0"



PLAN VIEW - DRIVE 2

SCALE: 1/4" = 1'-0"



SECTION

SCALE: 1/4" = 1'-0"

**GENERAL NOTES:**

1. ALL STRUCTURAL STEEL MEMBERS ARE FY = 50 KSI.
2. STEEL SHEETING IS P227 OR EQUAL (FY = 50 KSI)
3. USE E70XX ELECTRODES FOR ALL WELDS.
4. THE MAX. THRUST LOAD FROM MTBM ON TUNNEL BREAK-IN CONCRETE SHALL NOT EXCEED 50 TONS.

**SEQUENCE OF CONSTRUCTION FOR WORK SHAFT AT MANHOLE NO. 2 (MH2)**

THE FOLLOWING SEQUENCE OF CONSTRUCTION FOR WORK SHAFT AT MH2 IS PREPARED CONSIDERING THAT MICROTUNNEL DRIVE 2 WILL BE COMPLETED FIRST AND THEN DRIVE 3 WILL BE COMPLETED.

TO MAINTAIN THE EXCAVATION AND SUPPORT STABILITY, THE FOLLOWING SEQUENCE OF CONSTRUCTION FOR THE WORK SHAFT SHALL BE FOLLOWED:

1. INSTALL SHEET PILES TO THE DEPTH SHOWN FOR THE CIRCULAR SHAFT.
2. INSTALL SECOND (OUTER) ROW OF SHEET PILES AT TUNNEL BREAK-IN AND BREAK-OUT LOCATION WITHIN LIMITS INDICATED.
3. EXCAVATE PIT "IN DRY" TO MAXIMUM OF 2 FEET DEPTH BELOW TIER 1 LEVEL AND INSTALL TIER 1 STEEL SUPPORTS.
4. CONTINUE TO EXCAVATE PIT "IN DRY" IN STEPS TO MAXIMUM OF 2 FEET DEPTH FOR EACH OF THE REMAINING TIER LEVEL AND INSTALL REMAINING TIER STEEL SUPPORTS.
5. AFTER INSTALLATION OF THE LAST TIER, CONTINUE TO EXCAVATE THE PIT "IN DRY" DOWN TO THE BOTTOM OF EXCAVATION.
6. CLEAN THE BOTTOM OF EXCAVATION AND PLACE GEOTEXTILE FABRIC, CRUSHED STONE BASE AND CONCRETE SLAB. PROVIDE SUMP PIT AS SHOWN ON THE DRAWINGS. ALLOW THE CONCRETE SLAB TO GAIN THE DESIGN STRENGTH.
7. IF GROUND WATER IS IN-FILTERING INTO THE SUMP PIT, CONTINUOUSLY PUMP OUT THE WATER FROM THE SUMP PIT FOR THE ENTIRE DURATION OF WORK.

**PREPARATION FOR BREAK-IN FOR DRIVE 2 AND BREAK-OUT FOR DRIVE 3**

8. PLACE SUITABLE GROUT BETWEEN THE TWO ROWS OF SHEET PILING AT TUNNEL BREAK-IN AND BREAK-OUT LOCATIONS TO PREVENT GROUNDWATER OR SOIL INFILTRATION WHEN MAIN SHEET PILES ARE CUT FOR MICROTUNNEL BORING MACHINE (MTBM) BULLS EYE.
9. CUT THE SHEET PILES (INSTALLED FOR THE SHAFT) IN THE MICROTUNNEL BREAK-IN AND BREAK-OUT AREA (BULLSEYE). IF DURING CUTTING OF SHEET PILES, GROUNDWATER OR SOIL INFILTRATION IS OBSERVED, PROVIDE SECONDARY GROUT TO COMPLETELY SEAL BULLSEYE ZONE AS NECESSARY. APPLY A BOND BREAKER AGAINST SHEET PILES IN THE BULLSEYE ZONE.

**PROCEDURE FOR BREAK-IN FOR DRIVE 2**

10. INSTALL STEEL BULLSEYE SEAL PLATE AND PLACE CONCRETE FOR THE TUNNEL BREAK-IN FOR DRIVE2. ALLOW THE CONCRETE TO GAIN THE DESIGN STRENGTH. PULL UP THE SECOND (OUTER) ROW OF SHEET PILES JUST ENOUGH TO CLEAR THE MICROTUNNEL BORING MACHINE (MTBM) FOR DRIVE 2.
11. RECEIVE THE MTBM IN THE SHAFT AND GROUT THE ANNULUS AROUND THE CARRIER PIPE THROUGH THE GROUT PORTS.

**PROCEDURE FOR BREAK-OUT FOR DRIVE 3**

12. ON COMPLETION OF DRIVE 2, INSTALL STEEL BULLSEYE SEAL PLATE AND PLACE CONCRETE FOR THE TUNNEL BREAK-OUT FOR DRIVE 3. ALLOW THE CONCRETE TO GAIN THE DESIGN STRENGTH. JUST BEFORE COMMENCING THE WORK ON MICROTUNNELING FOR DRIVE 3, PULL UP THE SECOND (OUTER) ROW OF SHEET PILES JUST ENOUGH TO CLEAR THE MICROTUNNEL BORING MACHINE (MTBM) FOR DRIVE 3.

**CONCRETE BACKSTOP CONSTRUCTION FOR DRIVE 3**

13. ON COMPLETION OF DRIVE 2, CONSTRUCT THE CONCRETE BACK STOP AS SHOWN ON THE DRAWING FOR DRIVE 3.

1/4"=1'-0"



50% DESIGN SUBMITTAL

REV. NO.	DATE	ISSUE BY	REMARKS

DESIGNED BY: \_\_\_\_\_  
 DRAWN BY: \_\_\_\_\_  
 SHEET CHK'D BY: \_\_\_\_\_  
 CROSS CHK'D BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_

**Dawn Underground Engineering, Inc.**  
 Tunnel and Underground Structures Consultants  
 10 Village Court - Hazlet - New Jersey 07730  
 Tel: 732-739-8840 Fax: 732-739-8870

**Northeast Ohio Regional Sewer District**  
 Protecting Your Health and Environment

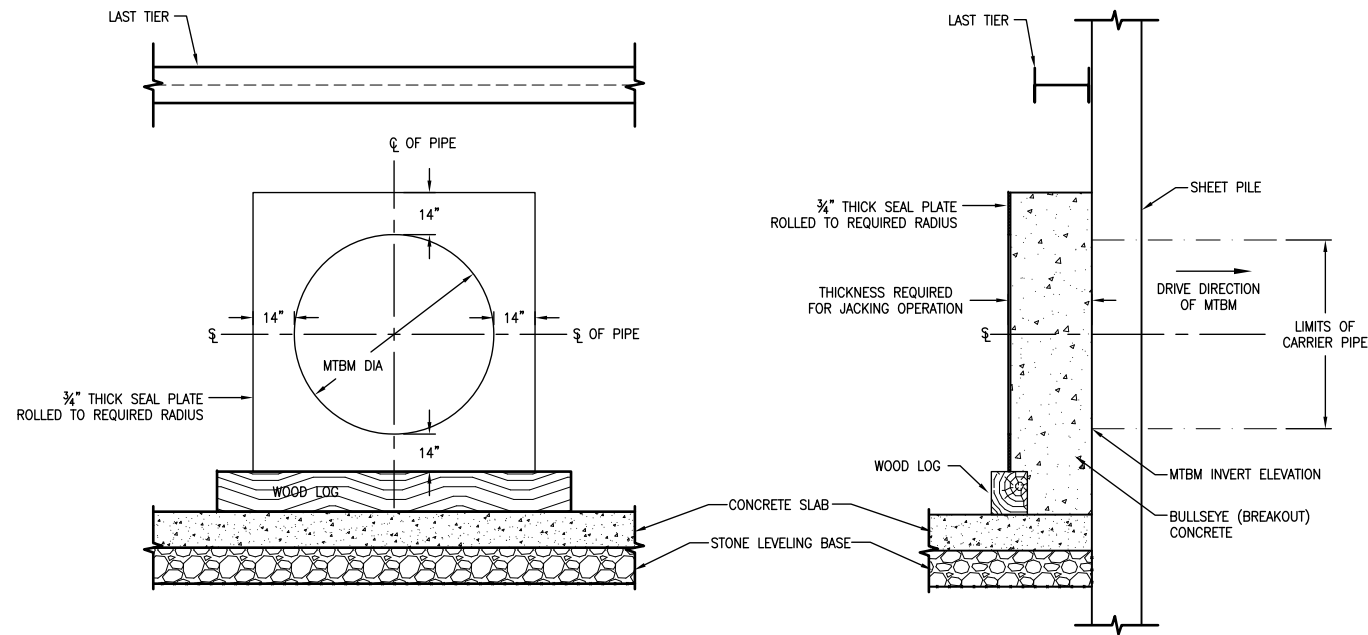
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WALWORTH RUN INTERCEPTOR REALIGNMENT

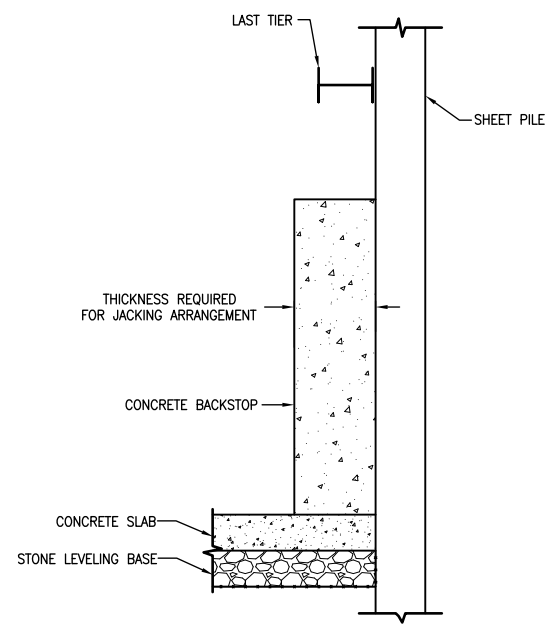
WORK SHAFT MANHOLE No.2 INITIAL SUPPORTS

BAR IS ONE INCH ON ORIGINAL DRAWING  
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

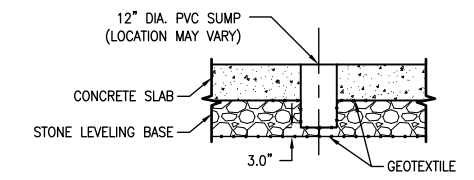
PROJECT NO.: \_\_\_\_\_  
 SHEET: \_\_\_\_\_  
 SCALE: AS NOTED  
 SHEET NO.: TU-6



SEAL PLATE DETAIL  
SCALE: N.T.S.



BACKSTOP DETAIL  
SCALE: N.T.S.



SUMP DETAIL  
SCALE: N.T.S.

50% DESIGN SUBMITTAL

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

REV. NO.	DATE	ISSUE BY	REMARKS

DESIGNED BY: \_\_\_\_\_  
DRAWN BY: \_\_\_\_\_  
SHEET CHK'D BY: \_\_\_\_\_  
CROSS CHK'D BY: \_\_\_\_\_  
APPROVED BY: \_\_\_\_\_  
DATE: \_\_\_\_\_

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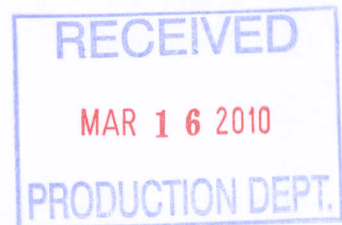
WALWORTH RUN INTERCEPTOR REALIGNMENT

BREAK-IN, BREAK-OUT, BACKSTOP AND SUMP DETAIL

PROJECT NO.: \_\_\_\_\_  
SHEET: \_\_\_\_\_  
SCALE: AS NOTED  
SHEET NO.: TU-7



## WALWORTH RUN INTERCEPTOR REALIGNMENT PROJECT - CONTRACT WRIR



# DRAFT BASIS OF DESIGN REPORT

February 4, 2010

Prepared for

Northeast Ohio Regional Sewer District

Prepared by

DLZ Ohio, Inc. in Conjunction with  
Dawn Underground Engineering, Inc.

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## 1.0 Background

### 1.1 General

This Basis of Design Report summarizes the features of the Walworth Run Interceptor Realignment (WRIR) Project. This project involves the relocation of the Walworth Run Interceptor (WRI) to accommodate the future Interstate 90 Innerbelt Bridge Project by the Ohio Department of Transportation (ODOT). The affected segment of the WRI commences at Regulator WR-27A at the intersection of University Road and West 10<sup>th</sup> Street. The section to be realigned is from Regulator WR-27A to Regulator WR-24 at Fairfield Avenue. The relocated WRI will be constructed entirely within the City of Cleveland.

### 1.2 Background Information

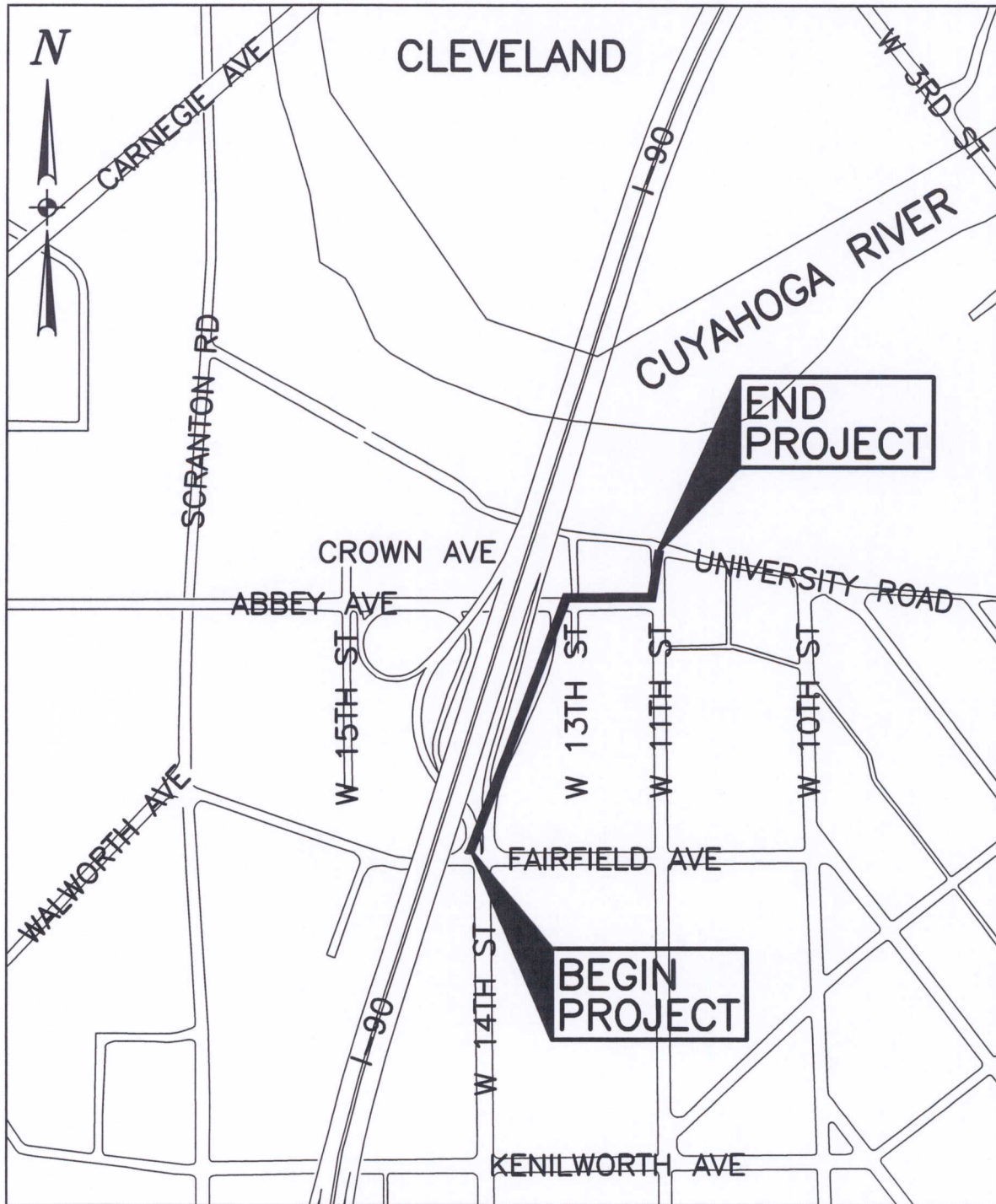
The Interstate 90 Innerbelt Bridge Project provides for the phased replacement of the existing Central Viaduct (Innerbelt Bridge) through the construction of a new westbound bridge to the north of the existing bridge, followed by the construction of a new eastbound bridge on essentially the same alignment as the existing bridge. The project requires the relocation of the 5 ft diameter Walworth Run Interceptor (WRI) and several local sewer utilities in the area of the new I-90 bridge replacement. Figure 1 shows the general location of the WRI relocation.

The area where the I-90 bridge replacement will impact the NEORS D utilities is located at the west bank of the Cuyahoga River under the existing Innerbelt Bridge, approximately north of Fairfield Avenue between West 15<sup>th</sup> and West 11<sup>th</sup> Streets.

In general, the new I-90 Innerbelt Bridge is to be located approximately 210 ft west of the existing I-90 bridge at the west bank of the Cuyahoga River. ODOT anticipates one of the first construction activities being the slope stabilization of the west bank of the Cuyahoga River. The stabilization consists of cutting and benching the existing slope starting just north of Abbey Avenue between West 13<sup>th</sup> and West 15<sup>th</sup> Streets.

Figure 2 depicts the proposed re-grading plan of the west bank of the Cuyahoga River at the I-90 Bridge.

BASIS OF DESIGN  
FOR THE  
WALWORTH RUN INTERCEPTOR  
REALIGNMENT (WRIR)



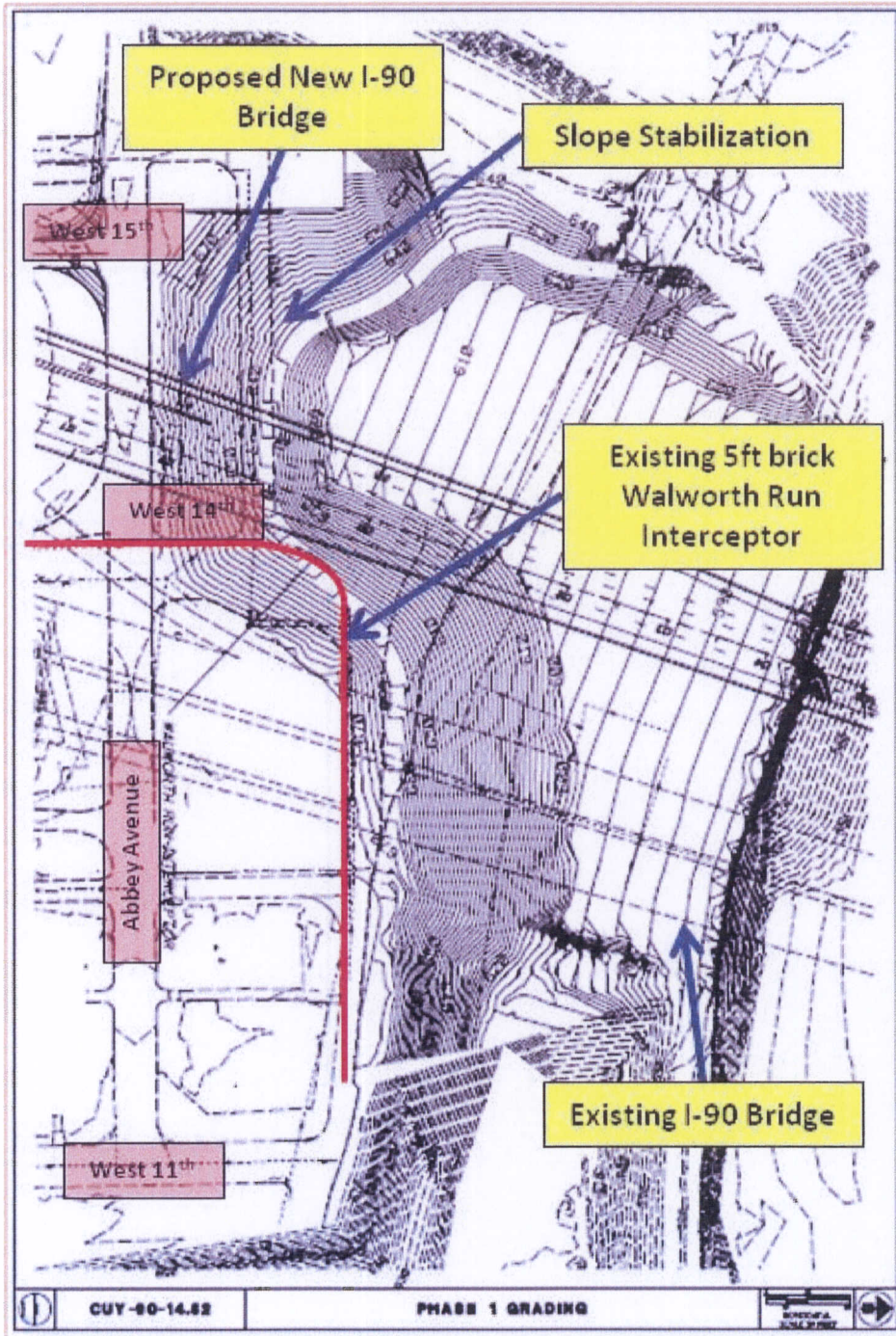
VICINITY PLAN  
SCALE: 1"=500'



FIGURE 1



→N



**FIGURE 2**

**PROPOSED FUTURE WORK AT WEST BANK OF CUYAHOGA RIVER AT THE I-90 BRIDGE**



## 1.3 Existing Walworth Run Interceptor (WRI)

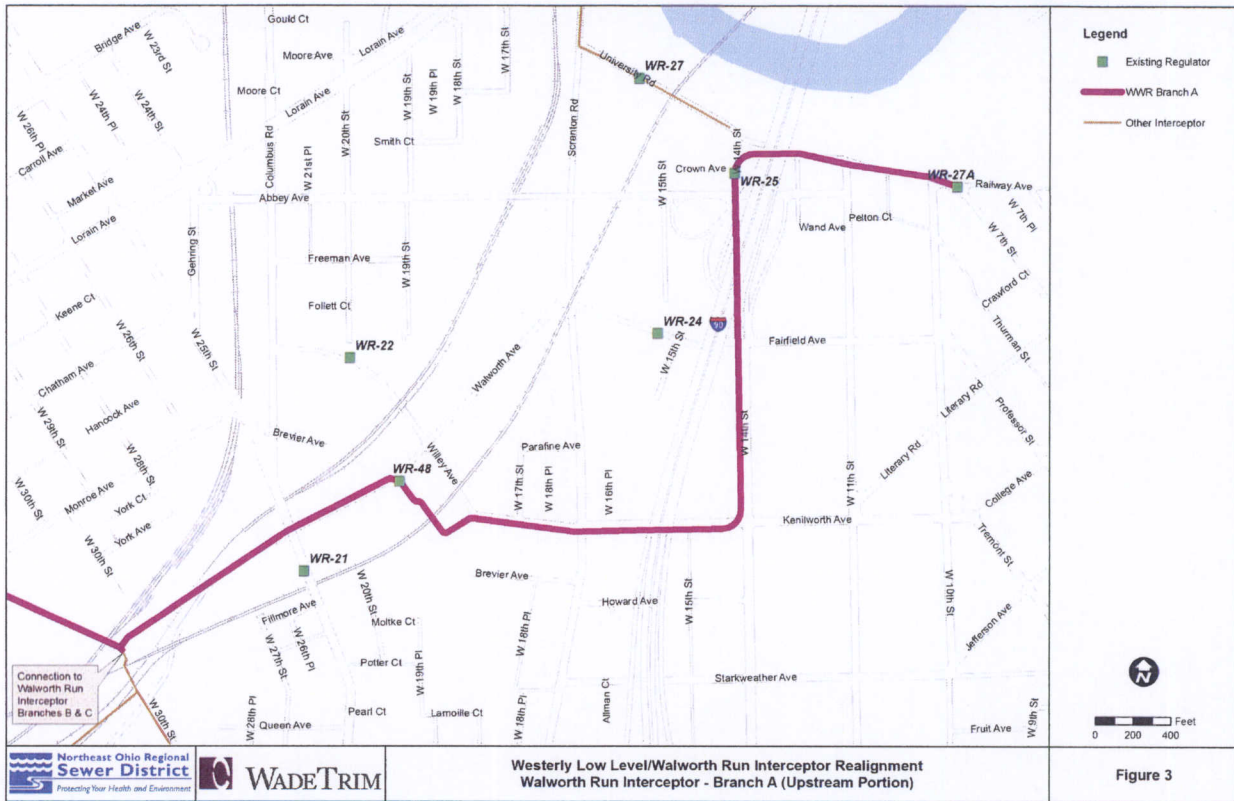
### 1.3.1 Alignment

Most of the combined sewer overflow during both dry and wet weather goes to the WRI. The WRI is the oldest of the four interceptors in the Westerly District. The initial purpose of the interceptor was to collect the combined sewer overflow from the local sewers and transport that flow to the Cuyahoga River.

The affected WRI segment begins at the dry weather outlet Regulator WR-27A. The regulator directs flow from the Tremont Bluff area to either the head of the WRI or CSO 81. The interceptor runs down University Road as a 5 ft tunnel to West 14th Street. After turning south on West 14th Street, flow from the local sewer drops in at Crown Avenue through the leaping weir regulator WR-25. The interceptor continues on West 14th Street to Kenilworth Avenue. WRI then turns west onto Kenilworth Avenue, crosses Scranton Avenue, where Kenilworth Avenue becomes Willey Avenue and heads down the hill. Near the Animal Protective League facility, the interceptor turns south and then west along the route that used to be Shay Court and Brevier Avenue. The interceptor then turns west continuing to Train Avenue.

WRI reaches the bottom of the hill and turns southwest, crossing over the larger Walworth Run Overflow sewer (CSO 080). A 24 inch pipe connects the interceptor and the overflow pipe at the turn. The connection was constructed to relieve surcharging in the interceptor.

Once on Train Avenue, the interceptor decreases from a 5 ft circular sewer to a No 4 egg-shaped sewer and accepts dry weather flow from the regulator WR-22. The WRI continues on a southerly path, picking up flow from regulator WR-21 on West 25th Street. The interceptor stays on Train Avenue until turning north at West 30th Street. WRI enters the intersection of Train Avenue and West 30th Street and combines with dry weather flows from other sewer branches. Figure 3 shows the alignment of the WRI within Branch A of the sewer system.



**FIGURE 3**

**WALWORTH RUN INTERCEPTOR - BRANCH A**

Table 1.3.1 summarizes existing design criteria for the Walworth Run Interceptor.

Table 1.3.1 – Existing WRI Design Criteria

Interior Diameter	5 ft
Maximum Flow (manning's full pipe capacity)	185 cfs flowing full
10-yr, 6-hr flow <sup>(1)</sup>	109 cfs
Dry Weather Flow (DWF) flow <sup>(1)</sup>	6.85 cfs
Slope	0.43%
Pipe Material	Brick
Average Invert Depth at the Project Area	Approx. 45 ft

<sup>(1)</sup> Estimates based on Westerly CSO Phase II Facilities Plan models (Feb 2000)

## 1.4 Walworth Run Interceptor Realignment (WRIR)

### 1.4.1 Option Evaluation

Five (5) conceptual relocation options for a portion of the WRIR were considered to accommodate the future design of the Interstate 90 Innerbelt Bridge. Options 1 and 2 were presented by NEORSRD during the proposal stage. Options 3 through 5 were developed by DLZ as potential alternates and included in the proposal submission. Based on project goals, cost and schedule, DLZ concurred with the original NEORSRD recommendation that Option 2 be selected as the preferred alternate for the WRIR. The updated WRIR Draft Technical Memorandum dated January 11, 2010 and February 4, 2010 (Revision No. 1), prepared by DLZ, is included as Appendix A.

### 1.4.2 Alignment

The WRIR begins by connecting to the existing WRI at the intersection of University Road and West 11<sup>th</sup> Street. Approximately 140' of 60" tunneled pipe runs southbound from the connection point along West 11<sup>th</sup> Street to an installed manhole at the intersection of Abbey Avenue. The alignment of the 60" tunneled pipe then runs westbound approximately 275' along Abbey Avenue to an installed manhole at the West 14<sup>th</sup> Street intersection. From this point, the alignment of the 60" tunneled pipe proceeds along the West 14<sup>th</sup> connector ramp within the ODOT limited access (LA) for approximately 900' to the intersection of West 14<sup>th</sup> Street and Fairfield Avenue. At this point, the 60" tunneled pipe connects to the existing WRI with a connecting structure.



**FIGURE 4**

**WRIR GENERAL ROUTE**

### 1.4.3 Interceptor and Regulator Structures

The WRIR design includes four (4) major interceptor structures to be constructed within tunnel/work shafts. Two of the structures will be cast in place concrete junction chambers constructed to temporarily bypass flow from WRI. The junction chambers will be located at University Road and West 11<sup>th</sup> Street and Fairfield Avenue and West 14<sup>th</sup> Street. The two remaining structures at the turning points will be manholes and will be located at Abbey Avenue & West 11<sup>th</sup> Street and at Abbey Avenue & West 14<sup>th</sup> Street. DLZ will determine if the manholes will be entirely pre-cast or have cast-in-place components. Additionally, Regulator WR-25 at Crown Avenue & West 14<sup>th</sup> Street will be abandoned and Regulator WR-24 on Fairfield Avenue will be rebuilt.

Table 1.4.3 shows the proposed design summary for the Walworth Run Interceptor Realignment Project.



Table 1.4.3 – Proposed WRIR Design Summary

Interior Diameter <sup>(1)</sup>	60 inches
Full Flow Capacity <sup>(2)</sup>	187 cfs
Design Slope <sup>(3)</sup>	0.51%
Pipe Material	To be determined
Average Invert Depth at the Project Area	Approximately 45 ft

- <sup>(1)</sup> Interior diameter may need to increase if surveyed inverts are different than what has been presented in the RFP.
- <sup>(2)</sup> Full Flow Capacity is based on 60" diameter pipe with a Manning's  $n=0.013$ , and 0.51% slope.
- <sup>(3)</sup> Design Slope is based on inverts determined by field investigation and record data. Additional field information is necessary at the WRI downstream connection point for verification of all design assumptions.



## 2.0 Permits

### 2.1 General

The WRIR alignment will require significant permitting coordination. Construction permits will be required from the City of Cleveland for work located within city street right-of-way such as University Road, West 11<sup>th</sup> Street, Abbey Avenue, Crown Avenue, West 14<sup>th</sup> Street, and Fairfield Avenue. These construction permits will require considerations for traffic control and other potential construction disturbances.

In addition to permitting coordination normally associated with the City of Cleveland, there will be activity associated with acquiring a permit from ODOT. All portions of the WRIR in the Interstate 90 LA will require the acquisition of an ODOT MR 509 Permit for permission to perform the necessary work.

Additional permitting will be necessary to meet the Ohio EPA regulations for the Permit to Install, and it may become necessary to apply for coverage under a National Pollutant Discharge Elimination System (NPDES) general permit if one or more acres of land is disturbed. Additional agencies may become involved as the work is better defined.



## 3.0 Local Sewers and Hydraulics

### 3.1 Local Sewers

Local sewers are impacted by the proposed Innerbelt work. Table 3.1 lists the impacted sewers and their disposition. DLZ will contact the appropriate agencies to coordinate the necessary work on the impacted sewers. This work will require the re-direction of flows at MH No. 5 and at the Crown Avenue Animal Hospital, and the assessment of pipe capacities.

Table 3.1 – WRIR Sewer Impacts

Identification	Impacted Section
No 4 - No 5 existing 48" diameter brick combined sewer running north along West 14 <sup>th</sup> Street.	Remove or Abandon from MH 5 located at the intersection West 14 <sup>th</sup> Street and Fairfield Avenue to regulator WR 27 located at intersection of University Road and the Walworth Run overflow sewer (CSO 080).
12" diameter existing combined sewer running east along Abbey Avenue from approximately West 15 <sup>th</sup> to West 14 <sup>th</sup> Street.	The complete sewer line is to be abandoned.
12" diameter existing combined sewer running east along Crown Avenue from approximately West 15 <sup>th</sup> to West 14 <sup>th</sup> Street.	The complete sewer line is to be abandoned.
36" diameter existing combined sewer - Running west along University Road.	Remove or abandoned from MH located at the intersection of West 13 <sup>th</sup> and University Road. to regulator WR-25 located at the intersection of West 14 <sup>th</sup> Street and Crown Avenue.
Existing Storm sewer draining into MH 5 located at the intersection of West 14 <sup>th</sup> Street and Fairfield Avenue.	Abandon or remove all of this sewer line. This storm sewer runs in a southeast direction and ends at MH 5.
Existing 12" storm sewer draining into MH 3. This storm sewer runs in a northwest direction and ends at MH 3.	Abandon or remove the complete sewer line.
Existing storm sewers running east and draining into MH 2.	Abandon or remove all the storm sewers connected to MH 2.





Table 3.1 – WRIR Sewer Impacts (Continued)

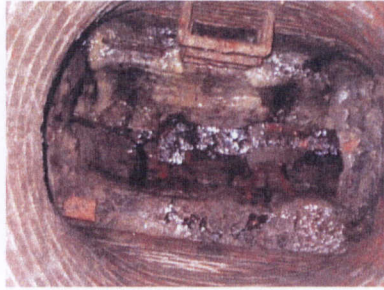
Identification	Impacted Section
Existing 12" storm sewer running west and draining into MH 2.	Abandon or remove all the storm sewers connected to MH 2.
Existing 15" storm sewer running west along Abbey Avenue and draining into MH 1.	Abandon or remove all of this sewer line.
Existing 18" storm sewer running west along University Road. This 18" storm line connects to the 24" combined sewer at the intersection of West 14 <sup>th</sup> Street and University Road.	To be removed by the stabilization works of the east bank slope.
Existing storm sewers north of the intersection between West 14 <sup>th</sup> Street and University Road discharging on the Cuyahoga River.	These sewers v. will be removed during the stabilization of the Cuyahoga River west bank.
Dry weather outlet from WR-24 to West 14 <sup>th</sup> Street.	May need to be upsized.
Combined sewer on Fairfield Avenue connecting to Regulator WR-24.	May need to be upsized.

### 3.2 Local Sewer Regulators

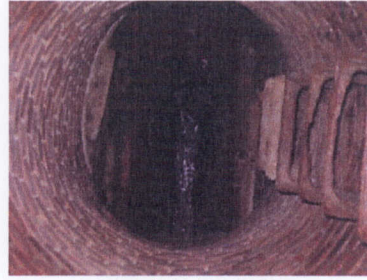
There are two regulators in the project area that are impacted by the Innerbelt Bridge project.

Table 3.2 – WRI Regulator Impacts

Regulator ID	Location	DWO Destination	Wet Weather Destination	Regulator Type	Proposed Dispensation
WR-24	West 15 <sup>th</sup> Place – 1515 Fairfield Avenue	WRI – Branch A	Regulator WR-27	Leaping Weir	Modify and Rebuild
WR-25	Crown Ave at West 14 <sup>th</sup> Street	WRI – Branch A	Westerly Low Level Interceptor	Leaping Weir	Abandon



Regulator WR-24



Regulator WR-25

### 3.3 Flow Characteristics

The relocated segment of Walworth Run Interceptor is required to convey the flows contained in Table 1.2 of the RFP including the maximum flow of 185 cfs. The surveying work has been completed, and the inverts and slopes of the existing Walworth Run Interceptor have been confirmed, except at the proposed downstream connection point. Apparently, there is no existing structure at the connection of the 60" overflow from WR-24 at the Interceptor. Based on the confirmed inverts, a conservative approximation of the invert of the proposed connection point using existing drawings, and an anticipated length of 1,315 lineal feet, it has been determined that the relocated segment of Walworth Run Interceptor can be designed at a slope of 0.51% (6.81 feet of drop over 1,315 lineal feet), which is greater than the slope of 0.47% that was listed in the RFP. The full-flow capacity of the relocated segment using a Manning's n-factor of 0.013 would be approximately 187 cfs, which is greater than the maximum design flow of 185 cfs. Once the proposed connection point invert is confirmed, the design slope will be updated accordingly.



## 4.0 Geotechnical Considerations

### 4.1 Project Geologic Setting

The Walworth Interceptor Realignment Project (WRIR) is within the northern section of the Cuyahoga River Valley. Geologically, most of this area is classified as "made land" composed of fill materials of variable source, composition and depth.

A total of eight (8) soil borings have been taken along the Option 2 alignment at this writing. Figure 5 shows the locations of the borings. The draft boring logs are included as Appendix "B." The borings reveal that the fill layer varies from a couple of feet to as much as 19 feet (Boring B-7). Brick pieces were recovered while sampling the fill layer in this boring. Beneath the fill materials, alluvium deposits extend consisting mostly of very loose to medium dense sands and silts; and medium stiff silty clay lenses (Boring B-3 and B-8). Most of the deposits show a stratified or inter-layered structure containing fine sands and silts. The alluvium materials were deposited prior to the Cuyahoga River. Beneath the alluvium deposits, lacustrine deposits start approximately 55 feet below the surface and consist mostly of medium stiff to very stiff silty clays stratified with silt layers.

Based on preliminary information, the ground water table has been estimated to be between 30 to 35 feet below ground surface.

### 4.2 Subsurface Conditions Along the Tunnel

The proposed tunnel construction will be below ground water and through sandy and silty soils. In the past, these soil deposits were most troublesome for tunneling projects in Cleveland. In the WRIR case, soils within the tunnel zone will be dense to very dense and below ground water. This setting will make the soil susceptible to uncontrollable flow unless proper tunnel techniques for supporting the tunnel



Microtunneling from a caisson

face are employed. Slurry shields with one-pass concrete segmental linings or microtunneling



with pipe jacking will be evaluated given the subsurface conditions anticipated at the site. Based on the short length of the project and the 90 degree turns required to negotiate the alignment, it appears that microtunneling will be the most cost effective solution.

Shafts for the WRIR will be constructed through all of the soil deposits mentioned above. Shafts at Borings B-1, B-3 and B-4 will terminate in silt deposits and the Shaft at B-8 (the down stream connection) will terminate in silty clay or clay. Excavating shafts below the water table through the upper deposits of loose sands and silts may present unstable side and bottom conditions unless water tight supports are employed. These supports must be pre-installed ahead of the shaft excavations and extend deep enough to prevent boiling and bottom heave. Currently, the design team is investigating the use of pre-driven steel sheet piles, secant piles, precast concrete caissons, slurry walls and jet grouting as methods for excavating the shafts.

A soil profile of the WRIR is shown on Sheets 1-6 of 6 following Section 4.5 of this report. A jacking pit concept plan is also included following Section 4.5.

### 4.3 Tunnel Support

Based on microtunneling appearing to be the most effective tunneling method for the replacement sewer installation, reinforced concrete pipe, centrifugally cast fiberglass reinforced polymer mortar pipe (CCFRPM) such as produced by HOBAS, and clay pipe can be suitable candidates for this project since they are all specifically designed and produced for installation by jacking. Microtunneling methods of tunneling provide immediate initial support for the tunnel since the final carrier pipes are jacked behind a TBM or MTBM.



CCFRPM Pipe



Reinf. Conc. Jacking Pipe

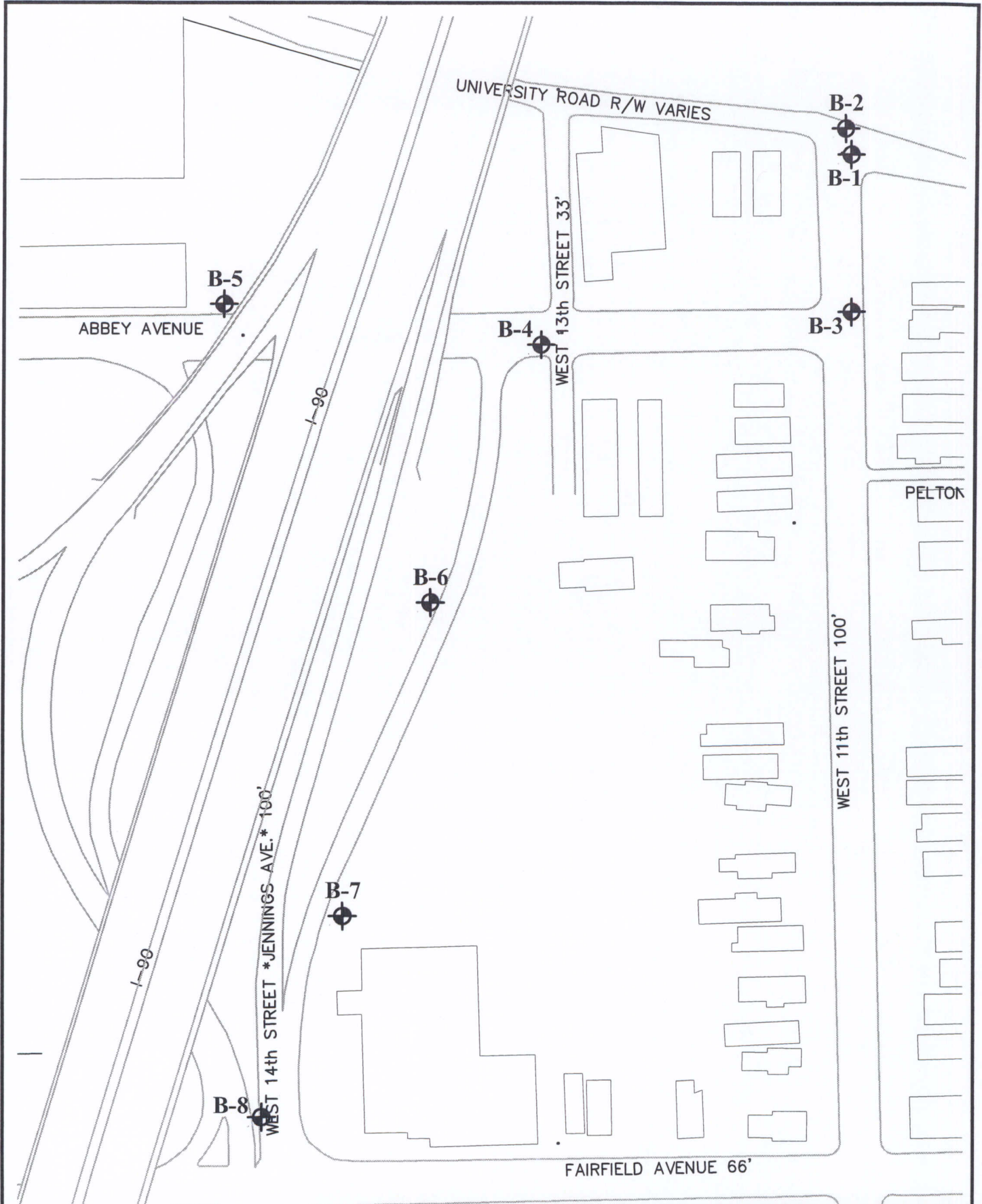


#### **4.4 Additional Borings**

Boring B-7 shows 19 feet of fill. Two adjacent borings (B-6 and B-8) show only a couple feet of fill. This indicates that the fill depth may vary greatly within the project area. Currently it is contemplated that the downstream connection may be moved to the south-west corner of the Fairfield Avenue and West 14<sup>th</sup> Street intersection. This will require the shaft construction to place a connection structure and also to retrieve the MTBM or TBM. If the connection point is moved, DUE recommends that an additional boring be taken near the new location. Sampling in this boring may only extend to the bottom of fill or the first 25 feet (whichever is greater) and the remainder of the boring extended only for placement of the piezometer.

#### **4.5 Long-Term Ground Water Observation**

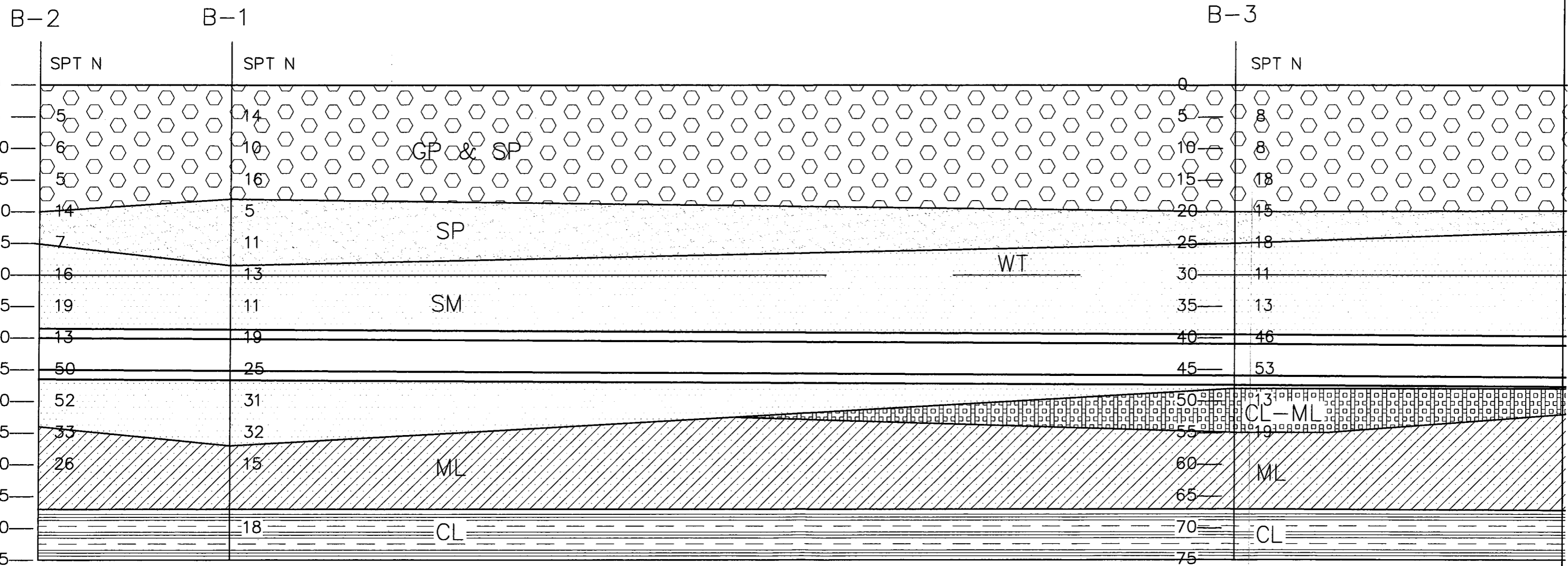
The Design Team recommends that long term observation of ground water levels be conducted at each shaft location. Currently there are only two piezometers at the site – one near boring B-3 marked W-1 and one near boring B-5 marked W-2. Additional piezometers should be installed near the planned connection point on University Road, near Boring B-4 and near the connection point downstream at Fairfield Avenue and W 14<sup>th</sup> Street (three additional piezometers). The piezometers should be located where they will not be damaged later by construction. This will allow the Design Team to monitor the ground water during construction should the need arise to confirm design assumptions. Water levels should be monitored on a monthly basis until the project bidding period. The Design Team will coordinate the location of the piezometer tip elevations and location of the screens.



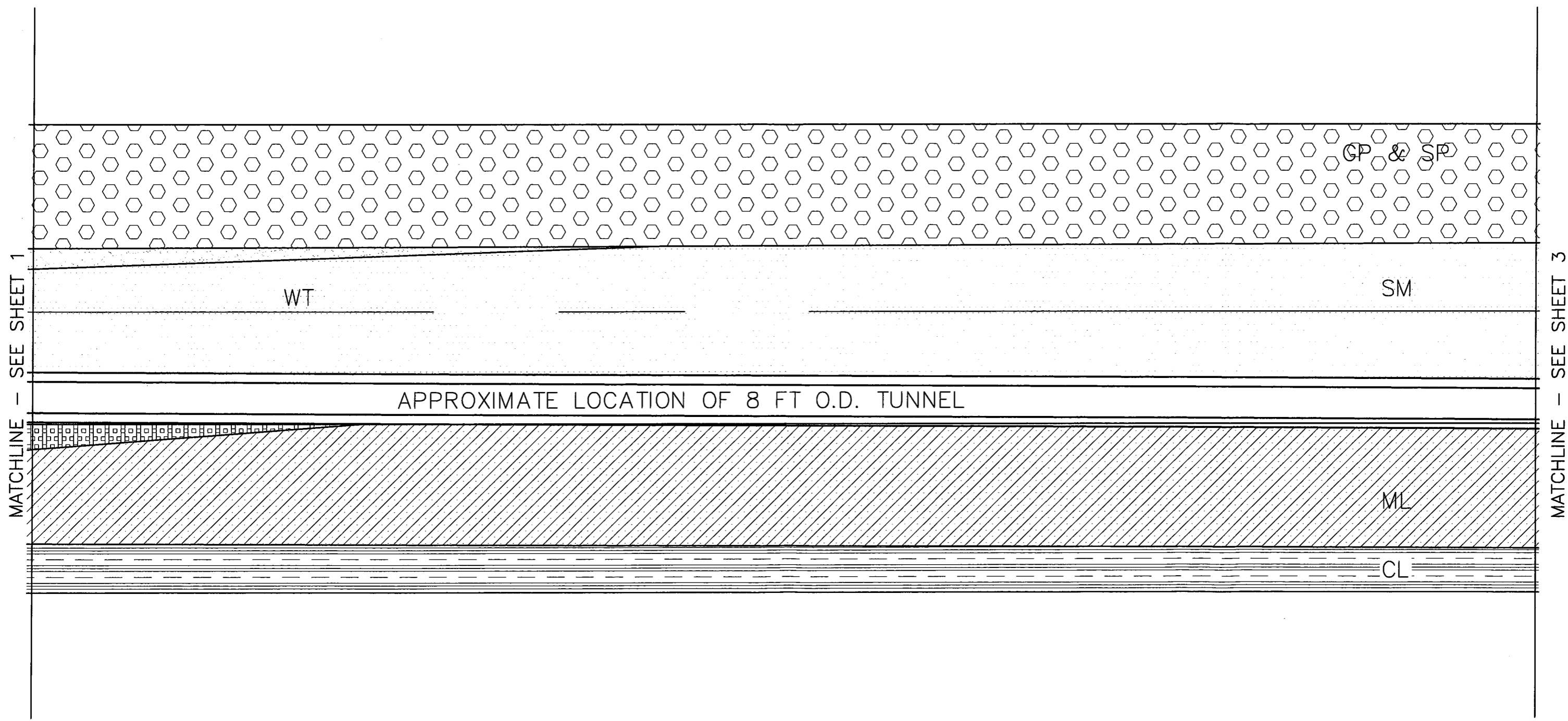
WRIR  
BORING LOCATION MAP

FIGURE 5

M:\Proj\0922\6016\Docs\Basis of Design\Waiworth Soil Profile.dwg, 2/4/2010 1:57:33 PM, Xerox WorkCentre 7655 PS.pcs3



MATCHLINE - SEE SHEET 2



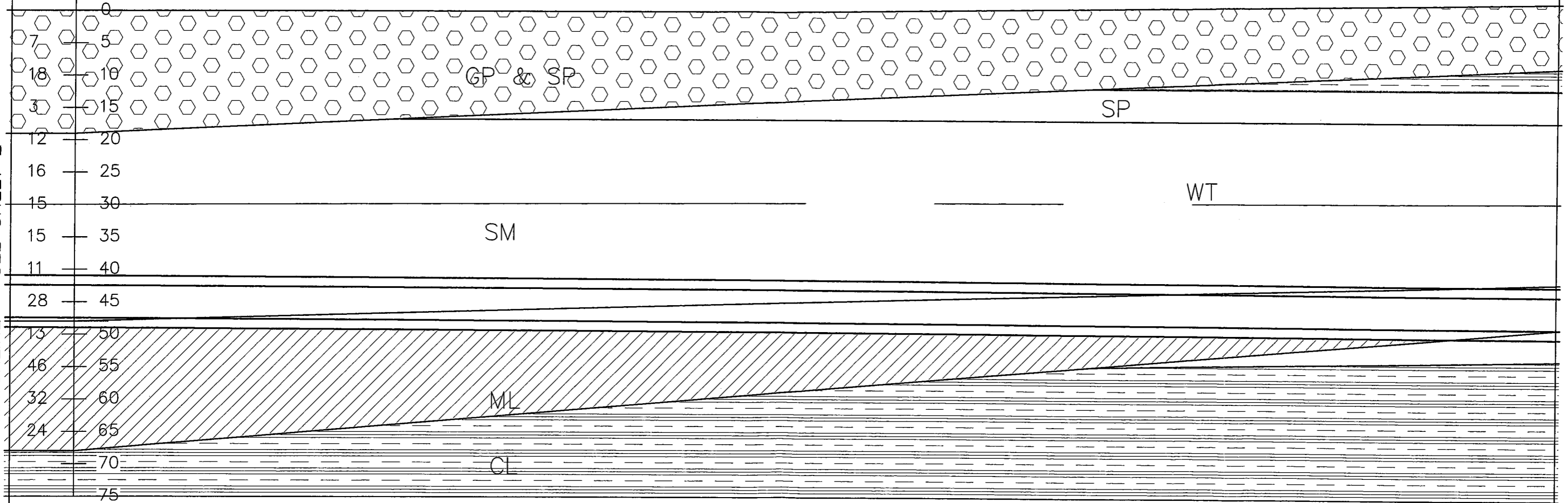


B-4

SPT N

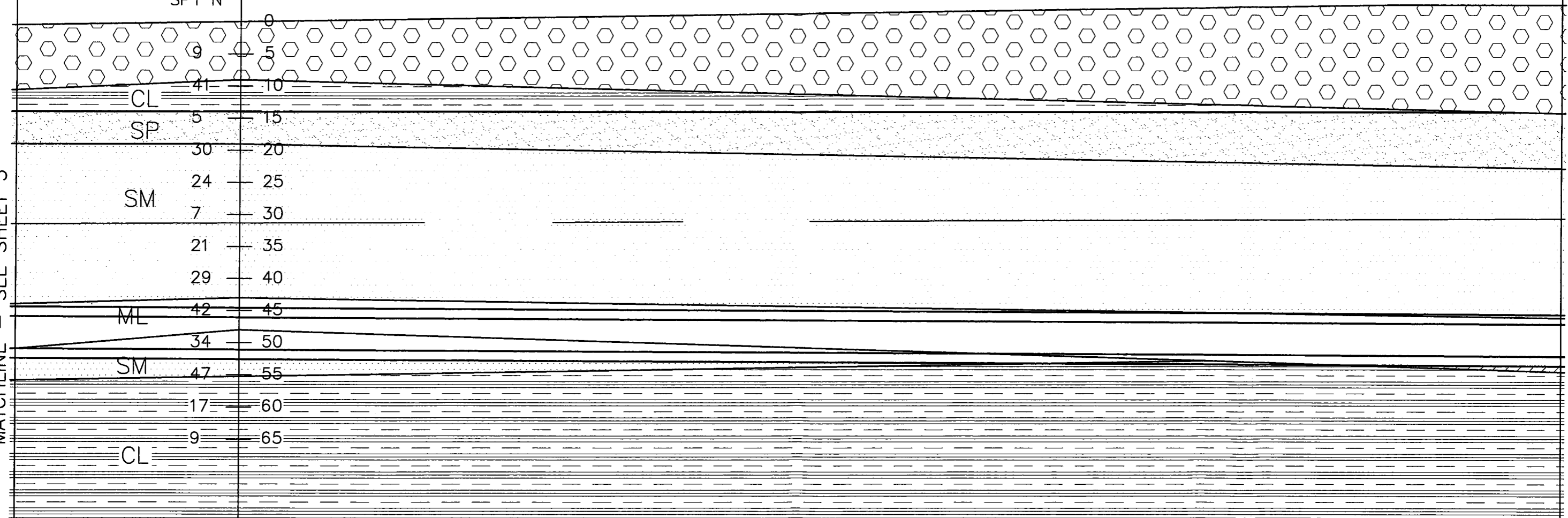
MATCHLINE - SEE SHEET 2

MATCHLINE - SEE SHEET 4



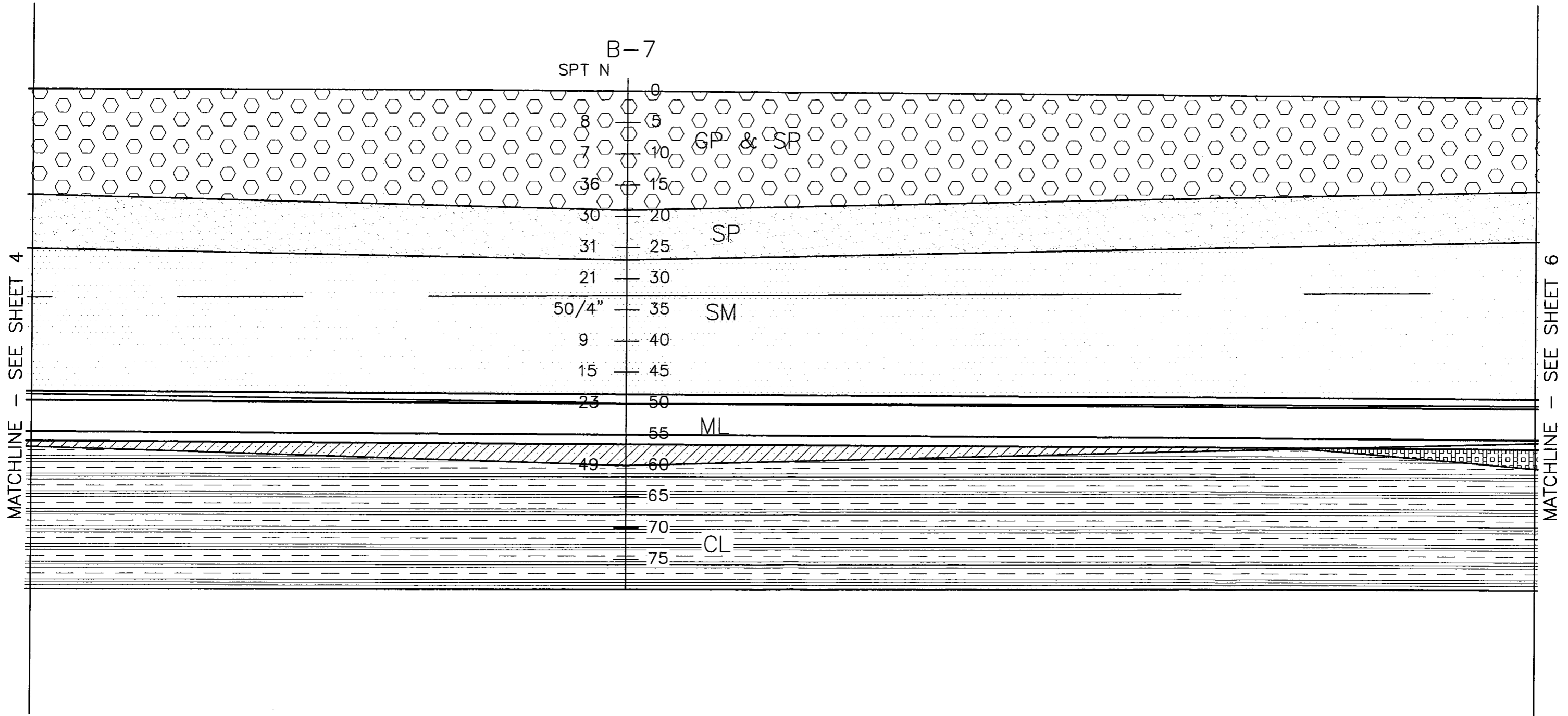
B-6

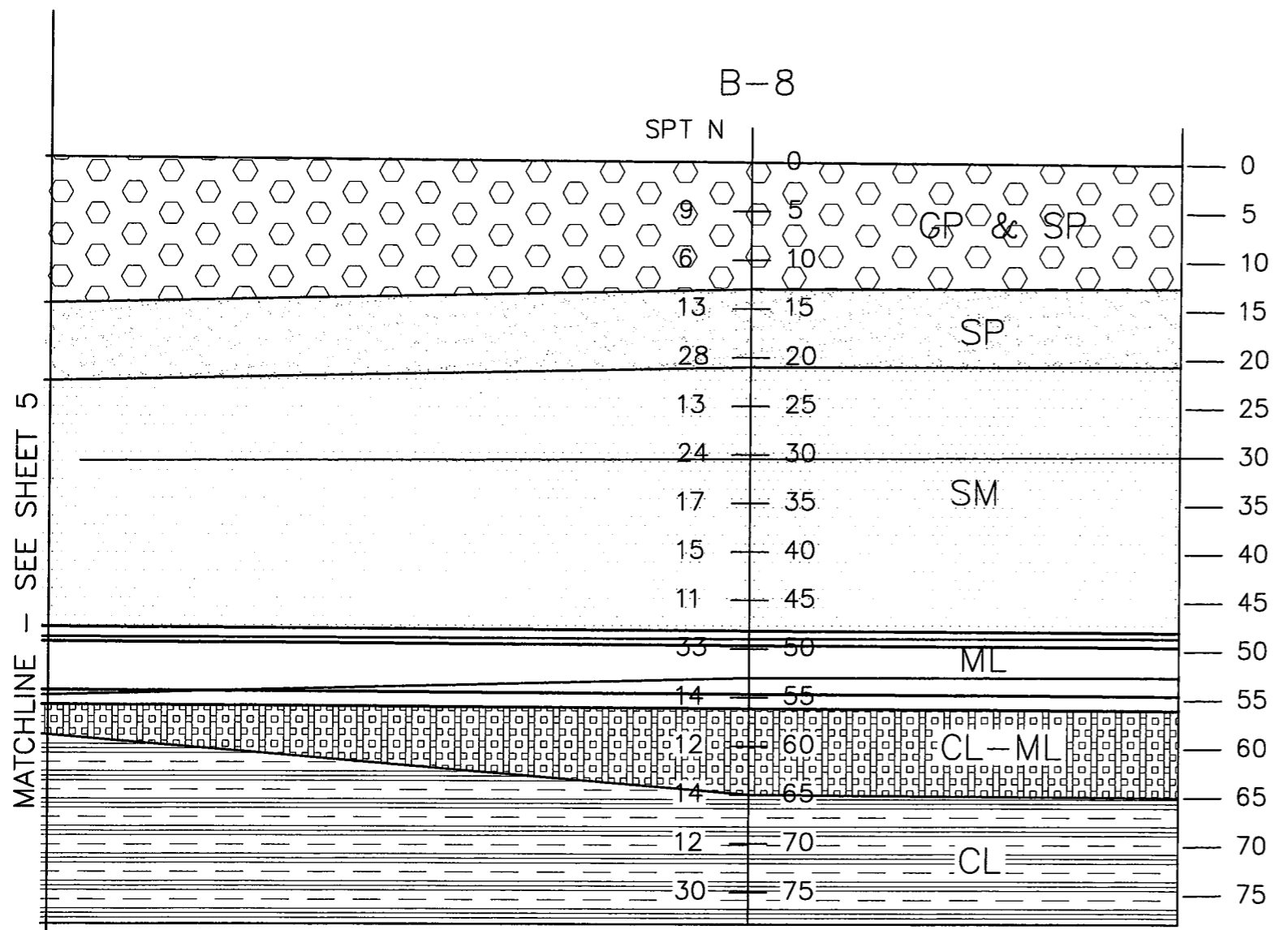
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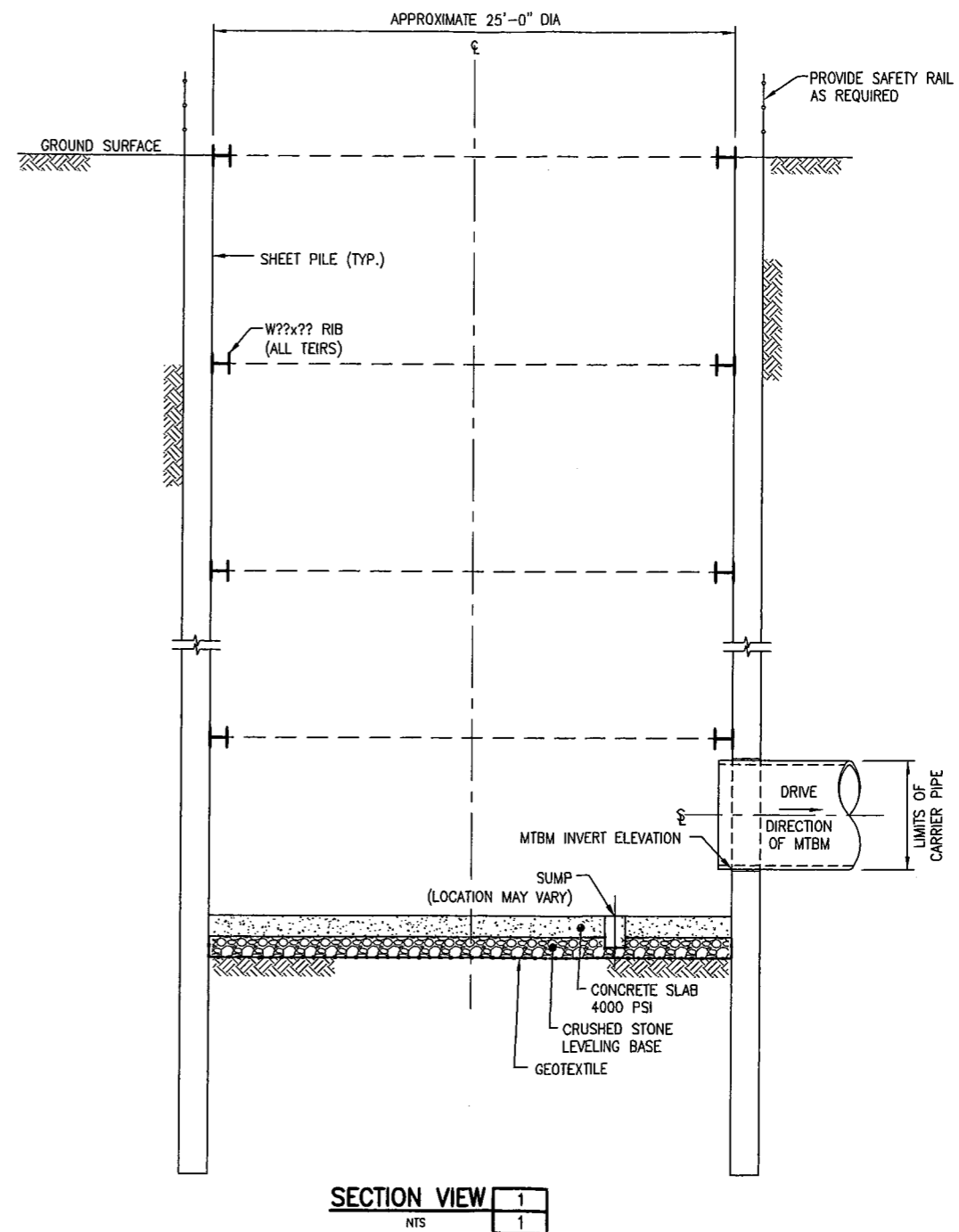
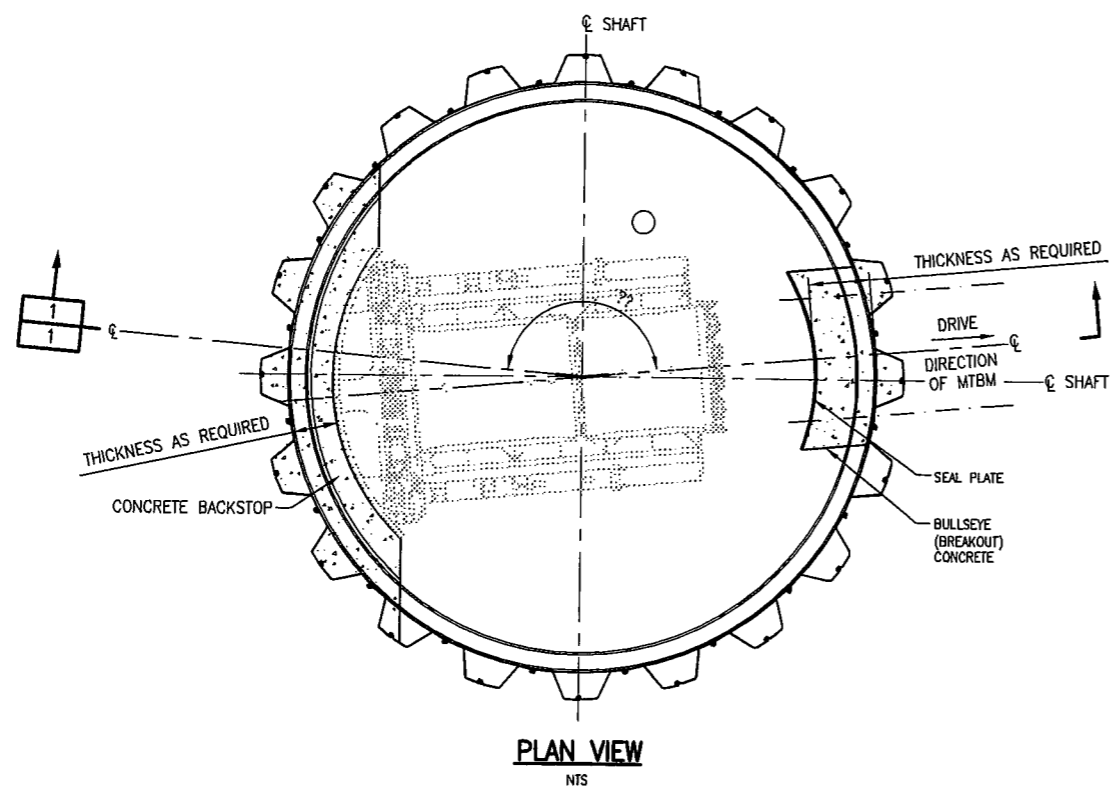


MATCHLINE - SEE SHEET 3

MATCHLINE - SEE SHEET 5







**CONCEPT OF JACKING PIT  
 PLAN AND SECTION**

**WALWORTH RUN INTERCEPTOR REALIGNMENT**

## APPENDIX "A"

Draft Technical Memorandum

## **DRAFT TECHNICAL MEMORANDUM**

**To:** Mr. Brian Page, PE  
**From:** Mr. Thomas Hessler, PE, PS  
**Date:** January 11, 2010 (1<sup>st</sup> Issue)  
February 4, 2010 (Revision No. 1)  
**Subject:** Walworth Run Interceptor Relocation Alignment Option Evaluation

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### **Section 1 - Project Description**

The Ohio Department of Transportation (ODOT) is designing the future Interstate 90 Innerbelt Bridge Project. The design of the new westbound structure adversely impacts the existing Walworth Run Interceptor (WRI) and several local storm and sanitary sewers in the project area. The new Innerbelt Bridge will require the regrading of the west bank of the Cuyahoga River. This regrading work requires the relocation of the WRI. ODOT is also evaluating several options with respect to the existing Innerbelt Bridge that will impact the WRI relocation.

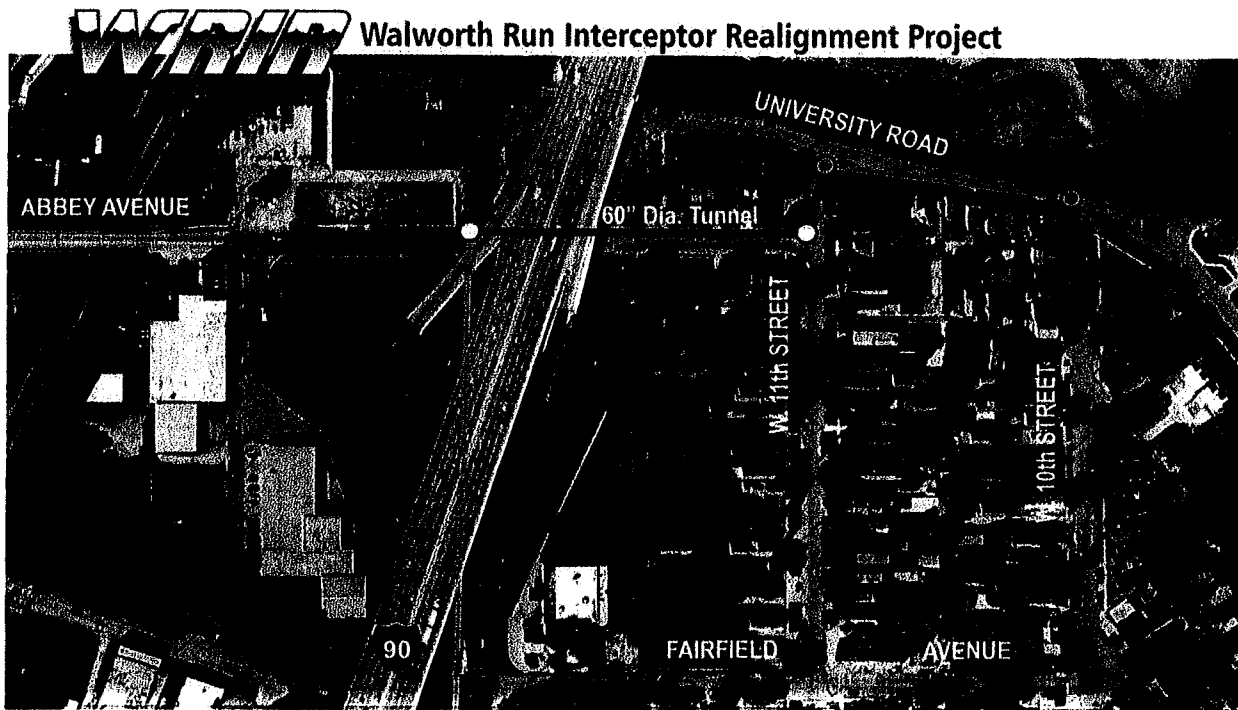
The WRI is divided into three (3) branches; A, B, and C. This project involves the relocation of a section of Branch A. Branch A commences at Regulator WR-27A at the intersection of University Road and West 10<sup>th</sup> Street. The area to be evaluated is from Regulator WR-27A to Regulator WR-24 at Fairfield Avenue.

### **Section 2 - Option Evaluations**

The relocation options for a portion of the WRI Branch A must consider the future design of the Interstate 90 Innerbelt Bridge. Five (5) conceptual options are discussed in this section. Options 1 and 2 were presented by NEORS D during the proposal stage. Options 3 through 5 were developed by DLZ as potential alternates and included in our proposal submission.

## 2.1 Option 1

Conceptual Option 1, shown in Figure A, consists of approximately 900' of 60" diameter tunneled pipe and three (3) major interceptor structures. This option would begin at a connection to the existing WRI at the intersection of University Road and West 11<sup>th</sup> Street. Approximately 200' of 60" tunneled pipe would run southbound from the connection point along West 11<sup>th</sup> Street to the intersection of Abbey Avenue where a manhole would be installed. The 60" tunneled pipe alignment would then run westbound for a distance of approximately 700' along Abbey Avenue to the West 14<sup>th</sup> Street intersection. At this point, it would tap into the existing WRI alignment with a connecting structure.



**Figure A - Conceptual Option 1**

Several local sewers will be removed or abandoned with this option. Additionally, Regulator WR-25 at Crown Avenue and West 14<sup>th</sup> Street would be abandoned and Regulator WR-24 on Fairfield Avenue would be rebuilt. The existing 190' run of 12" sanitary sewer on Crown



Avenue for the Animal Hospital will be relocated. Also, the combined sewer on Fairfield Avenue connecting to Regulator WR-24 may need to be upsized. The dry weather outlet from Regulator WR-24 to West 14<sup>th</sup> Street may also need to be upsized.

Option 1 removes the WRI from the westbound Innerbelt bridge slope regrading area, and provides a relatively short relocation run of tunnel to the connection at Abbey Avenue and West 14<sup>th</sup> Street. However, a significant portion of the relocated WRI is still in the footprint of the eastbound Innerbelt Bridge and passes under the current Innerbelt alignment. This alignment maintains a section of existing WRI along West 14<sup>th</sup> Street under the current Innerbelt Bridge and therefore limits options regarding the potential alignment or subsurface needs of a future eastbound bridge.

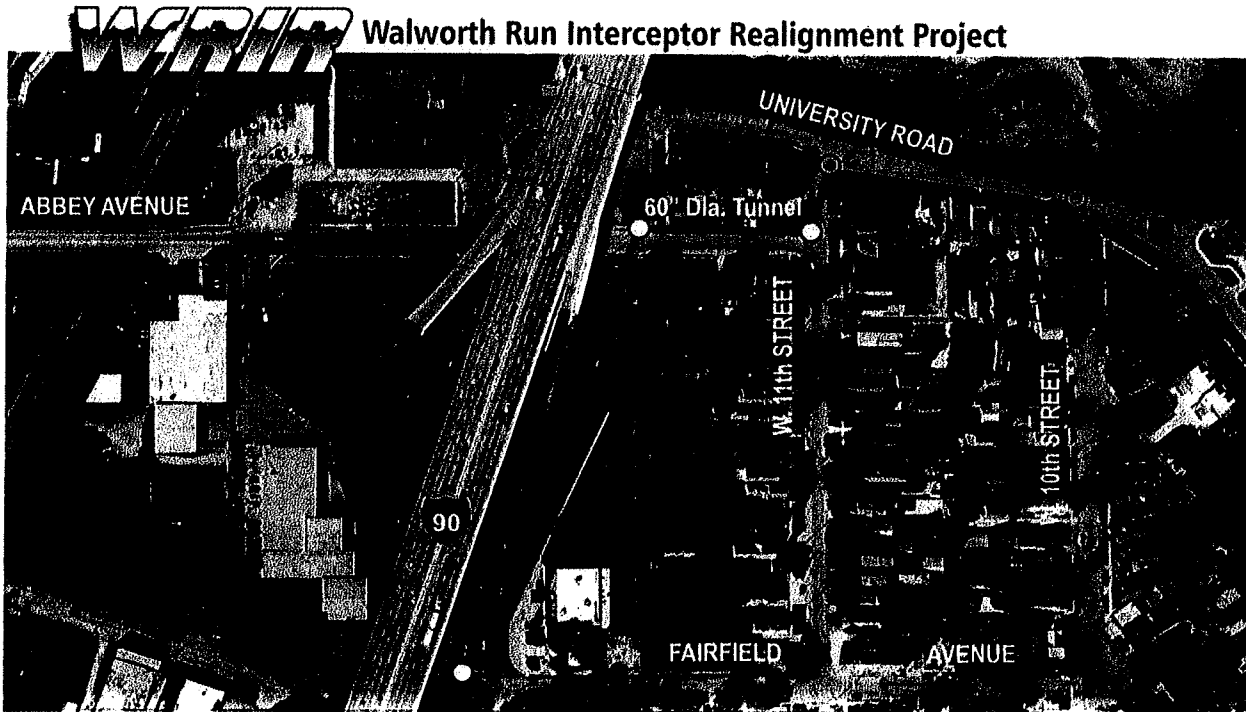
## **2.2 Option 2**

Conceptual Option 2 is shown in Figure B. This option consists of approximately 1,400' of 60" diameter tunneled pipe and four (4) major interceptor structures. This option would begin by connecting to the existing WRI at the intersection of University Road and West 11<sup>th</sup> Street. Approximately 140' of 60" tunneled pipe would run southbound from the connection point along West 11<sup>th</sup> Street to the intersection of Abbey Avenue where a manhole would be installed. The alignment of the 60" tunneled pipe would then run westbound approximately 275' along Abbey Avenue to the West 14<sup>th</sup> Street intersection where a manhole would be installed. From this point, the alignment of the 60" tunneled pipe would proceed along the West 14<sup>th</sup> connector ramp within the ODOT limited access for approximately 900' to the intersection of West 14<sup>th</sup> Street and Fairfield Avenue. At this point, the 60" tunneled pipe would connect to the existing WRI at a connecting structure.

As with Option 1, several local sewers will be removed or abandoned. Additionally, Regulator WR-25 at Crown Avenue and West 14<sup>th</sup> Street would be abandoned and Regulator WR-24 on Fairfield Avenue would be rebuilt. The existing 190' run of 12" sanitary sewer on Crown

Avenue for the Animal Hospital will be relocated. Also, the combined sewer on Fairfield Avenue connecting to Regulator WR-24 may need to be upsized. The dry weather outlet from Regulator WR-24 to West 14<sup>th</sup> Street may also need to be upsized.

Option 2 provides for the complete removal of the WRI from the Innerbelt project footprint. The relocated WRI will not be in conflict with any slope modifications that may be necessary for the existing eastbound Innerbelt Bridge along Abbey Avenue or West 13<sup>th</sup> Street. This Option meets the objectives of the WRI relocation.



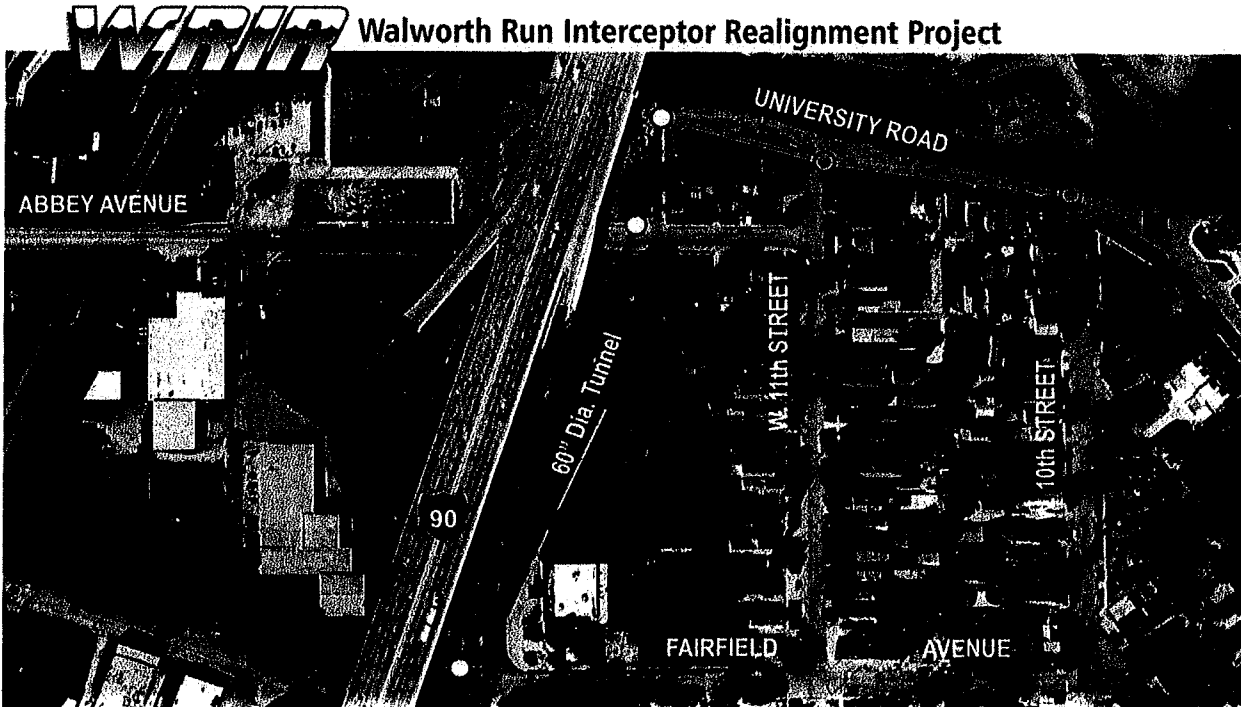
**Figure B - Conceptual Option 2**

### 2.3 Option 3

Figure C shows Conceptual Option 3, which is a variation of Option 2. This option consists of approximately 1,000' of 60" diameter tunneled pipe and three (3) major interceptor structures. It would begin at a connection to the existing WRI on University Road near West 13<sup>th</sup> Street. The alignment of the 60" tunneled pipe would then run south approximately 200' to the

intersection of Abbey Avenue and West 14<sup>th</sup> Street where a work shaft and a manhole would be installed. The 60" tunneled pipe would then run southwest along the West 14<sup>th</sup> St. / Abbey Avenue access ramp for a distance of approximately 800' to the intersection of Fairfield Avenue and West 14<sup>th</sup> Street where it would connect to the existing WRI with a connecting structure.

As with Options 1 and 2, several sewer pipes would be removed or abandoned with this option. Additionally, Regulator WR-25 at Crown Avenue and West 14<sup>th</sup> Street would be abandoned and Regulator WR-24 on Fairfield Avenue would be rebuilt. The existing 190' run of 12" sanitary sewer on Crown Avenue for the Animal Hospital will be relocated. Also, the combined sewer on



**Figure C - Conceptual Option 3**

Fairfield Avenue connecting to Regulator WR-24 may need to be upsized. The dry weather outlet from Regulator WR-24 to West 14<sup>th</sup> Street may also need to be upsized.

The major advantage of Option 3 is only one shaft is needed as the drive shaft for the microtunnel (tunnel) operation. This shaft would be located at Abbey Avenue. Also, this option

only has two (2) tunnel shafts, therefore reducing the number of tunnel shafts necessary for the run when compared to the other options. Option 3 meets the requirement to remove the WRI from the future Innerbelt Project area. This alternative also has less traffic conflicts.

However, there are some disadvantages with Conceptual Option 3. The existing WRI would remain along a longer portion of University Road, which may be a concern regarding future slope failures or movements. Another disadvantage is that the starting point of Option 3 is very close to the final Innerbelt grading at the corner of University Road and West 13<sup>th</sup> Street and may conflict with the future grading plan for the eastbound bridge.

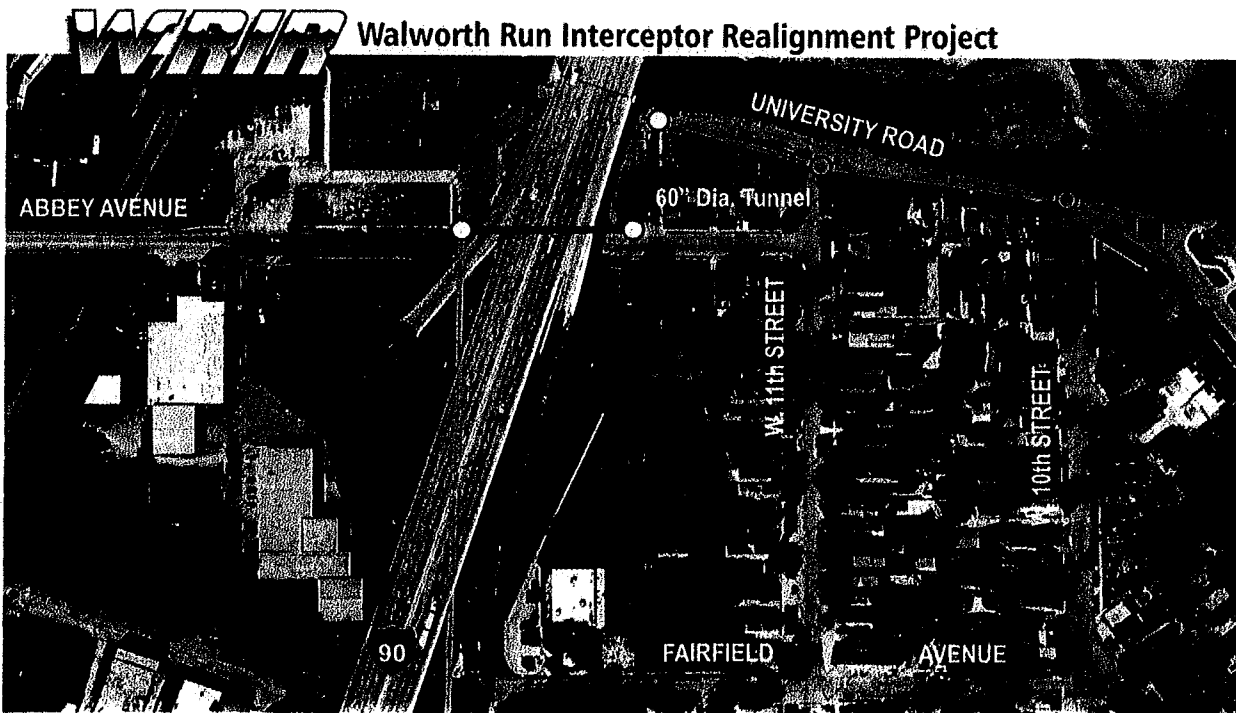
#### **2.4 Option 4**

Conceptual Option 4 is shown in Figure D, and is a variation of Option 1. Conceptual Option 4 consists of 500' of 60" diameter tunneled pipe and three (3) structures. The 60" tunneled pipe would begin by connecting to the existing WRI at University Road and West 13<sup>th</sup> Street and run south approximately 200' to Abbey Avenue near West 13<sup>th</sup> Street in to a manhole. The alignment would then travel westbound along Abbey Avenue for a distance of approximately 300' to the intersection of Abbey Avenue and West 14<sup>th</sup> Street. At this point, the 60" tunneled pipe would connect to the existing WRI with a connecting structure.

As with the other options, several sewer pipes would be removed or abandoned with this option. Additionally, Regulator WR-25 at Crown Avenue and West 14<sup>th</sup> Street would be abandoned and Regulator WR-24 on Fairfield Avenue would be rebuilt. The existing 190' run of 12" sanitary sewer on Crown Avenue for the Animal Hospital will be relocated. Also, the combined sewer on Fairfield Avenue connecting to Regulator WR-24 may need to be upsized. The dry weather outlet from Regulator WR-24 to West 14<sup>th</sup> Street may also need to be upsized.

Option 4 removes the WRI from the westbound Innerbelt Bridge slope regrading area, and similar to Option 1 provides a relatively short relocation run of tunnel to the connection at Abbey Avenue and West 14<sup>th</sup> Street. However, a significant portion of the relocated WRI is still

in the footprint of the eastbound Innerbelt Bridge and passes under the current Innerbelt alignment. This alignment maintains a section of existing WRI along West 14<sup>th</sup> Street under the current Innerbelt Bridge and therefore limits options regarding the potential alignment or subsurface needs of a future eastbound bridge. The existing WRI would remain along a longer portion of University Road, which may be a concern regarding future slope failures or movements. Another disadvantage is that the starting point of Option 4 is very close to the final Innerbelt grading at the corner of University Road and West 13<sup>th</sup> Street and may conflict with the future grading plan for the eastbound bridge.

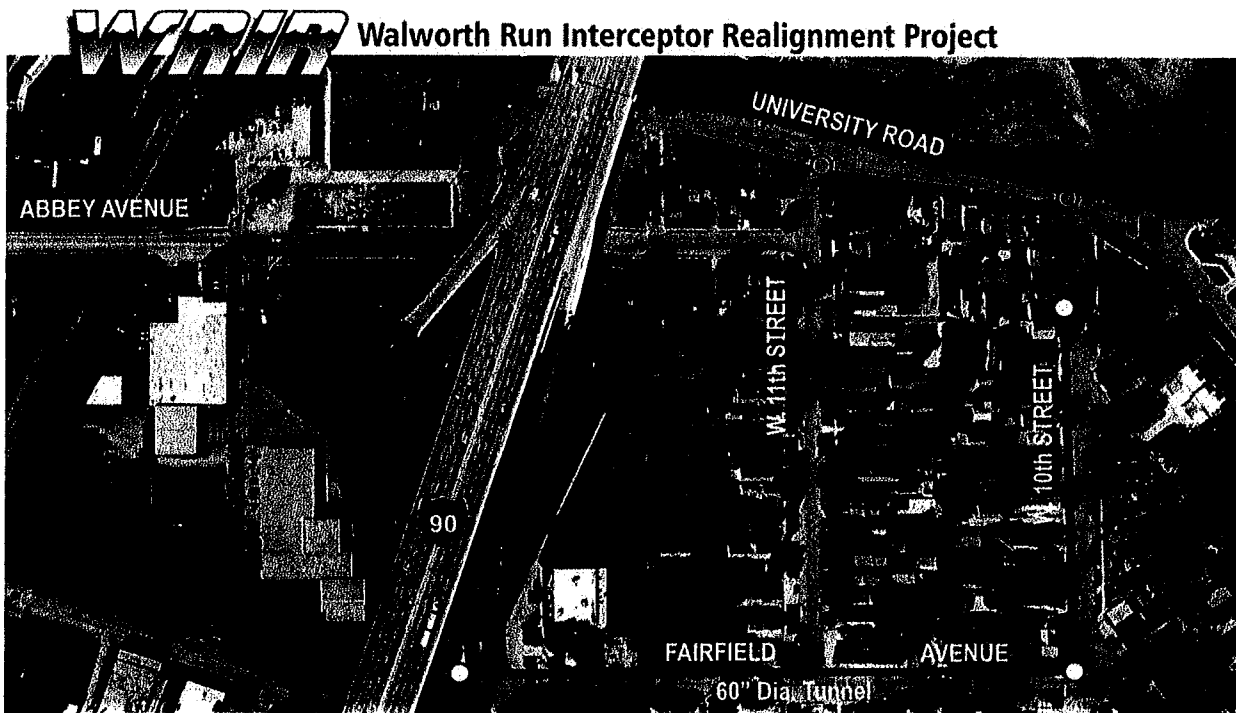


**Figure D - Conceptual Option 4**

## 2.5 Option 5

Conceptual Option 5 is shown in Figure E. This option consists of approximately 1,900' of 60" diameter tunneled pipe and four (4) major interceptor structures. The 60" tunneled pipe would begin by connecting to the existing WRI near Regulator WR-27A located on University Road, close to West 10<sup>th</sup> Street. From this point, the alignment would run southwest for

approximately 200' in to a manhole located on West 10<sup>th</sup> Street. From this point, the 60" tunneled pipe alignment would run southward along West 10<sup>th</sup> Street for a distance of approximately 600' to the intersection of West 10<sup>th</sup> Street and Fairfield Avenue. At this intersection, a manhole would be installed. From this structure, the alignment would run westbound for approximately 1,100' along Fairfield Avenue to the connection point at the intersection of Fairfield Avenue and West 14<sup>th</sup> Street. At this point, the 60" tunneled pipe would connect to the existing WRI with a connecting structure. As with the other options, several sewer pipes would be removed or abandoned with this option. Additionally, Regulator WR-25 at Crown Avenue and West 14<sup>th</sup> Street would be abandoned and Regulator WR-24 on Fairfield Avenue would be rebuilt. The existing 190' run of 12" sanitary sewer on Crown Avenue for the Animal Hospital will be relocated. Also, the combined sewer on Fairfield Avenue connecting to Regulator WR-24 may need to be upsized. The dry weather outlet from Regulator WR-24 to West 14<sup>th</sup> Street may also need to be upsized.



**Figure E - Conceptual Option 5**

Option 5 completely removes the WRI from the University Road area, which may be a long term slope failure concern. There could also be a possible reduction in flow to CSO-081, near the Cuyahoga River, based on favorable hydraulic evaluations. In addition, Option 5 meets the requirement to remove the WRI from the future Innerbelt Project area.

Option 5 is estimated to be the most costly option. It has a total length of 1,900 feet. Because the beginning and ending inverts are controlled by the existing WRI sewer, the proposed pipe may need to be larger than 60" diameter due to a lesser slope. The proposed diameter of the pipe would need to be evaluated. Additional soil borings would be required, adding to the total design cost. Also, two of the work shafts for Option 5 would be located in the Tremont neighborhood and may have stakeholder concerns. This option exceeds the original intent of the WRI relocation project.

### **Section 3 – Table 3.1 - Estimate of Probable Construction Cost (2010 Dollars)**

Table 3.1 on the following pages lists estimated probable construction costs for the proposed WRI construction options. These costs are preliminary budgetary estimates based on comparison with recently completed projects. They do not include design engineering, construction administration, field inspection, legal review, easement acquisition, or property procurements costs that may be associated with the construction project.

<b>Option 1</b>	<b>Qty.</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Total</b>
Mobilization	1	LS	\$200,000	\$200,000
Tunnel Shaft w/Junction Chamber No. 1	1	Ea.	\$750,000	\$750,000
Tunnel Shaft w/ Manhole	1	Ea.	\$400,000	\$400,000
Tunnel Shaft w/Junction Chamber No. 2	1	Ea.	\$750,000	\$750,000
60" Tunneled Pipe	900	LF	\$2,500	\$2,250,000
Utility Relocations	1	LS	\$250,000	\$250,000
Remove / Abandon Sewer Pipes 24" & Smaller	3,400	LF	\$100	\$340,000
Remove / Abandon Sewer Pipes 30" & Larger	1,100	LF	\$200	\$220,000
Remove / Abandon Exist. 64" WRI	800	LF	\$500	\$400,000
Abandon Regulator WR-25	1	Ea.	\$20,000	\$20,000
Rebuild Existing Regulator WR-24	1	Ea.	\$30,000	\$30,000
Upsize WR-24 DWO Alignment	450	LF	\$200	\$90,000
Relocate Exist. 12" Sanitary to Animal Hospital	190	LF	\$150	\$28,500
Upsize Combined Sewer to WR-24	260	LF	\$200	\$52,000
Subtotal				\$5,780,500
Contingency (30%)				\$1,734,150
<b>Option 1 Total</b>				\$7,514,650
			<b>USE</b>	<b>\$7.5 M</b>

<b>Option 2</b>	<b>Qty.</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Total</b>
Mobilization	1	LS	\$200,000	\$200,000
Tunnel Shaft w/Junction Chamber No. 1	1	Ea.	\$750,000	\$750,000
Tunnel Shaft w/Junction Chamber No. 2	1	Ea.	\$750,000	\$750,000
Tunnel Shaft w/ Manhole No. 1	1	Ea.	\$400,000	\$400,000
Tunnel Shaft w/ Manhole No. 2	1	Ea.	\$400,000	\$400,000
60" Tunneled Pipe	1,400	LF	\$2,500	\$3,500,000
Utility Relocations	1	LS	\$250,000	\$250,000
Remove / Abandon Sewer Pipes 24" & Smaller	3,400	LF	\$100	\$340,000
Remove / Abandon Sewer Pipes 30" & Larger	1,100	LF	\$200	\$220,000
Remove / Abandon Exist. 64" WRI	1,500	LF	\$500	\$750,000
Abandon Regulator WR-25	1	Ea.	\$20,000	\$20,000
Rebuild Existing Regulator WR-24	1	Ea.	\$30,000	\$30,000
Upsize WR-24 DWO Alignment	450	LF	\$200	\$90,000
Relocate Exist. 12" Sanitary to Animal Hospital	190	LF	\$150	\$28,500
Upsize Combined Sewer to WR-24	260	LF	\$200	\$52,000
Subtotal				\$7,780,500
Contingency (30%)				\$2,334,150
<b>Option 2 Total</b>				\$10,114,650
			<b>USE</b>	<b>\$10.1 M</b>



<b>Option 3</b>	<b>Qty.</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Total</b>
Mobilization	1	LS	\$200,000	\$200,000
Tunnel Shaft w/Junction Chamber No. 1	1	Ea.	\$750,000	\$750,000
Tunnel Shaft w/Junction Chamber No. 2	1	Ea.	\$750,000	\$750,000
Tunnel Shaft w/ Manhole	1	Ea.	\$400,000	\$400,000
60" Tunneled Pipe	1,000	LF	\$2,500	\$2,500,000
Utility Relocations	1	LS	\$250,000	\$250,000
Remove / Abandon Sewer Pipes 24" & Smaller	3,400	LF	\$100	\$340,000
Remove / Abandon Sewer Pipes 30" & Larger	1,100	LF	\$200	\$220,000
Remove / Abandon Exist. 64" WRI	1,200	LF	\$500	\$600,000
Abandon Regulator WR-25	1	Ea.	\$20,000	\$20,000
Rebuild Existing Regulator WR-24	1	Ea.	\$30,000	\$30,000
Upsize WR-24 DWO Alignment	450	LF	\$200	\$90,000
Relocate Exist. 12" Sanitary to Animal Hospital	190	LF	\$150	\$28,500
Upsize Combined Sewer to WR-24	260	LF	\$200	\$52,000
Subtotal				\$6,230,500
Contingency (30%)				\$1,869,150
<b>Option 3 Total</b>				<b>\$8,099,650</b>
			<b>USE</b>	<b>\$8.1 M</b>

<b>Option 4</b>	<b>Qty.</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Total</b>
Mobilization	1	LS	\$200,000	\$200,000
Tunnel Shaft w/Junction Chamber No. 1	1	Ea.	\$750,000	\$750,000
Tunnel Shaft w/Junction Chamber No. 2	1	Ea.	\$750,000	\$750,000
Tunnel Shaft w/ Manhole	1	Ea.	\$400,000	\$400,000
60" Tunneled Pipe	500	LF	\$2,500	\$1,250,000
Utility Relocations	1	LS	\$250,000	\$250,000
Remove / Abandon Sewer Pipes 24" & Smaller	3,400	LF	\$100	\$340,000
Remove / Abandon Sewer Pipes 30" & Larger	1,100	LF	\$200	\$220,000
Remove / Abandon Exist. 64" WRI	400	LF	\$500	\$200,000
Abandon Regulator WR-25	1	Ea.	\$20,000	\$20,000
Rebuild Existing Regulator WR-24	1	Ea.	\$30,000	\$30,000
Upsize WR-24 DWO Alignment	450	LF	\$200	\$90,000
Relocate Exist. 12" Sanitary to Animal Hospital	190	LF	\$150	\$28,500
Upsize Combined Sewer to WR-24	260	LF	\$200	\$52,000
Subtotal				\$4,580,500
Contingency (30%)				\$1,374,150
<b>Option 4 Total</b>				<b>\$5,954,650</b>
			<b>USE</b>	<b>\$6.0 M</b>

<b>Option 5</b>	<b>Qty.</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Total</b>
Mobilization	1	LS	\$200,000	\$200,000
Tunnel Shaft w/Junction Chamber No. 1	1	Ea.	\$750,000	\$750,000
Tunnel Shaft w/Junction Chamber No. 2	1	Ea.	\$750,000	\$750,000
Tunnel Shaft w/ Manhole No. 1	1	Ea.	\$400,000	\$400,000
Tunnel Shaft w/ Manhole No. 2	1	Ea.	\$400,000	\$400,000
60" Tunneled Pipe	1,900	LF	\$2,500	\$4,750,000
Utility Relocations	1	LS	\$250,000	\$250,000
Remove / Abandon Sewer Pipes 24" & Smaller	3,400	LF	\$100	\$340,000
Remove / Abandon Sewer Pipes 30" & Larger	1,100	LF	\$200	\$220,000
Remove / Abandon Exist. 64" WRI	2,000	LF	\$500	\$1,000,000
Abandon Regulator WR-25	1	Ea.	\$20,000	\$20,000
Rebuild Existing Regulator WR-24	1	Ea.	\$30,000	\$30,000
Upsize WR-24 DWO Alignment	450	LF	\$200	\$90,000
Relocate Exist. 12" Sanitary to Animal Hospital	190	LF	\$150	\$28,500
Upsize Combined Sewer to WR-24	260	LF	\$200	\$52,000
Subtotal				\$9,280,500
Contingency (30%)				\$2,784,150
<b>Option 5 Total</b>				\$12,064,650
			<b>USE</b>	<b>\$12.1 M</b>

#### **Section 4 – Comparison of Sewer Construction Options**

Five (5) general WRI construction options were described and evaluated. Table 4.1 summarizes these options and presents estimated probable construction costs, advantages, and disadvantages associated with each option.

**Table 4.1 – Summary of WRI Construction Options**

Description	Estimated Probable Construction Cost (2010 Dollars)	Advantages	Disadvantages
Option 1	\$7.5 Million	<ul style="list-style-type: none"> <li>❖ Removes WRI from westbound bridge grading area.</li> <li>❖ Relatively short tunnel run</li> <li>❖ Meets required schedule</li> </ul>	<ul style="list-style-type: none"> <li>❖ Relocated WRI is in the eastbound Innerbelt Bridge footprint and may conflict with future eastbound bridge needs.</li> </ul>
Option 2	\$10.1 Million	<ul style="list-style-type: none"> <li>❖ Relocated WRI is completely removed from the Innerbelt footprint</li> <li>❖ Meets required schedule</li> </ul>	<ul style="list-style-type: none"> <li>❖ Longer project length with respect to other options (except Option 5)</li> </ul>
Option 3	\$8.1 Million	<ul style="list-style-type: none"> <li>❖ Relocated WRI is completely removed from the Innerbelt footprint.</li> <li>❖ Only 2 tunnel shafts necessary</li> <li>❖ Only 1 drive shaft needed</li> <li>❖ Minimal traffic conflicts</li> <li>❖ Meets required schedule</li> </ul>	<ul style="list-style-type: none"> <li>❖ Long length of existing WRI run on University Rd. may be future concern for slope failures</li> <li>❖ Connection point very close to final Innerbelt grading at University Rd. and West 13<sup>th</sup> St.</li> </ul>
Option 4	\$6.0 Million	<ul style="list-style-type: none"> <li>❖ Removes WRI from westbound bridge grading area.</li> <li>❖ Minimal traffic conflicts</li> <li>❖ Meets required schedule</li> </ul>	<ul style="list-style-type: none"> <li>❖ Long length of existing WRI run on University Rd. may be future concern for slope failures</li> <li>❖ Connection point very close to final Innerbelt grading at University Rd. and West 13<sup>th</sup> St.</li> </ul>
Option 5	\$12.0 Million	<ul style="list-style-type: none"> <li>❖ WRI not in conflict with future Innerbelt Project area</li> <li>❖ Completely removes WRI from University Rd. area, thus easing future slope failure concern</li> <li>❖ Possible reduction in flow to CSO-081 based on favorable hydraulic evaluation</li> <li>❖ Most likely will have schedule implications</li> </ul>	<ul style="list-style-type: none"> <li>❖ 2 work shafts located in Tremont neighborhood may have Stakeholder concerns</li> <li>❖ May need larger diameter pipe than 60" due to long length of run and pipe grades.</li> <li>❖ Additional soil borings required</li> <li>❖ Most costly option</li> </ul>

## Section 5 – ODOT’s Comments and Concerns

ODOT reviewed DLZ’s Technical Memorandum dated Jan 11, 2010 and provided comments. DLZ’s responses are as follows:

### ODOT District 12 Comments (By David Lastovka):

Comments Dated 1/20/2010

#### 1. Alignment Recommendation

Comment 1A: ODOT concurs with the recommended Option #2 alignment (University-W11th-Abbey-frontage road between Abbey & Fairfield)

DLZ Response: *Comment Noted.*

#### 2. Phasing

Comment 2A: During detail design, ODOT requests consideration for project phasing that considers earlier abandonment/removal of the Westerly Low Level Interceptor between Abbey and the NS overpass in the project construction schedule. If the Westerly Low Level Interceptor can be abandoned early, then the ODOT project can begin removal of the Cold Storage building, along with initial slope excavation, in advance of completion of the Walworth Run Interceptor relocation. This strategy would allow some overlap in both ODOT’s and NEORS D’s construction schedules.

DLZ Response: *DLZ will investigate the hydraulic impacts of abandoning or removing the Westerly Low Level Interceptor between Abbey Avenue and the NS overpass as an early phase of construction. Please note that earlier abandonment/removal would require an elaborate bypass pumping plan.*

#### 3. Right of Way

Comment 3A: As previously discussed, early identification of any needed project right of way is critical to maintaining the project schedule.

DLZ Response: *DLZ understands that early identification of any needed project right-of-way is critical to maintaining the project schedule. As of this report, it appears that the main sewer tunnel will be constructed without the need of right-*

*of-way. However, it should be noted that as the project progresses it may become necessary to obtain additional right-of-way for construction staging areas or other reasons.*

Comment 3B: Additionally, since this relocation is within the Tremont Historic District, any additional RW needs may require additional Environmental coordination with the Federal Highway Administration (FHWA). If at all possible, the relocation work should be designed within the existing public right of way.

DLZ Response: *Comment Noted.*

Comment 3C: ODOT's record right of way plans were emailed to DLZ on 1-15-2010.

DLZ Response: *DLZ has received ODOT's record right of way plans.*

#### 4. Access Shaft Locations

Comment 4A: Maintenance of Traffic (MOT) - During detail design, consideration should be given to minimizing local traffic impacts.

DLZ Response: *DLZ will investigate ways to minimize local traffic impacts. One example is the relocation of the downstream connection away from the Fairfield Avenue/West 14<sup>th</sup> Street intersection to a location in the ODOT property on the southwest corner.*

Comment 4B: W14th/Fairfield Shaft Location - ODOT's record information for the existing 60" Walworth run interceptor reflects that the sewer is east of the location shown on the Conceptual Plan graphic. Depending on the exact location of the existing sewer, consideration should be given to moving the access shaft either north or south of the Fairfield/W14th intersection, in order to minimize the work area's impact on traffic. See attached screen capture from the project's DGN basemap file.

DLZ Response: *The field survey recently completed by DLZ shows the WRI on the west side of West 14<sup>th</sup> Street in the tree lawn. Currently it is contemplated that the downstream connection may be moved to the southwest corner of the Fairfield Avenue and West 14<sup>th</sup> Street intersection.*

## 5. City of Cleveland Coordination

Comment 5A: The Innerbelt project has had significant coordination with Cleveland Engineering & Construction (Rob Mavec), Traffic (Andy Cross), and Water Pollution Control (Rachid Zoghaib). These offices should be coordinated with during project development.

DLZ Response: *Coordinating with the aforementioned offices is standard operating procedure. DLZ is very familiar with the City of Cleveland and will coordinate as necessary.*

## 6. Interim Condition

Comment 6A: There is a need to coordinate the existing I90 and local storm drainage (mainly west of W13th and north of Fairfield) with the proposed work. As you progress in detail design we will need to determine the disposition of this storm water, both in the interim condition and permanently.

DLZ Response: *DLZ will address this issue during the design phase and work with ODOT.*

## 7. Survey Control

Comment 7A: Confirmation that both projects are on the same survey control and all questions related to this topic are resolved.

DLZ Response: *DLZ's survey will show elevations and horizontal coordinates referenced to the Ohio State Plane North Zone NAD 83 and NAVD 88 Datums as the primary system with the Cleveland Regional Geodetic Survey (CRGS) Datum as the secondary system.*

## 8. As-Built Plans

Comment 8A: Does NEORSR have as-built plans created for projects? Coordination between the as-constructed NEORSR project and the ODOT design-build team will be very important.

DLZ Response: *Yes, the design team will provide ODOT with all available as-builts at the completion of the project.*

## 9. Haul Roads for NEORS D Project

Comment 9A: In coordination with Cleveland, our Design-Build project is not allowing Scranton or West 14<sup>th</sup> to be project haul roads. These same restrictions should be in place for the NEORS D project.

DLZ Response: *DLZ will take these restrictions into account.*

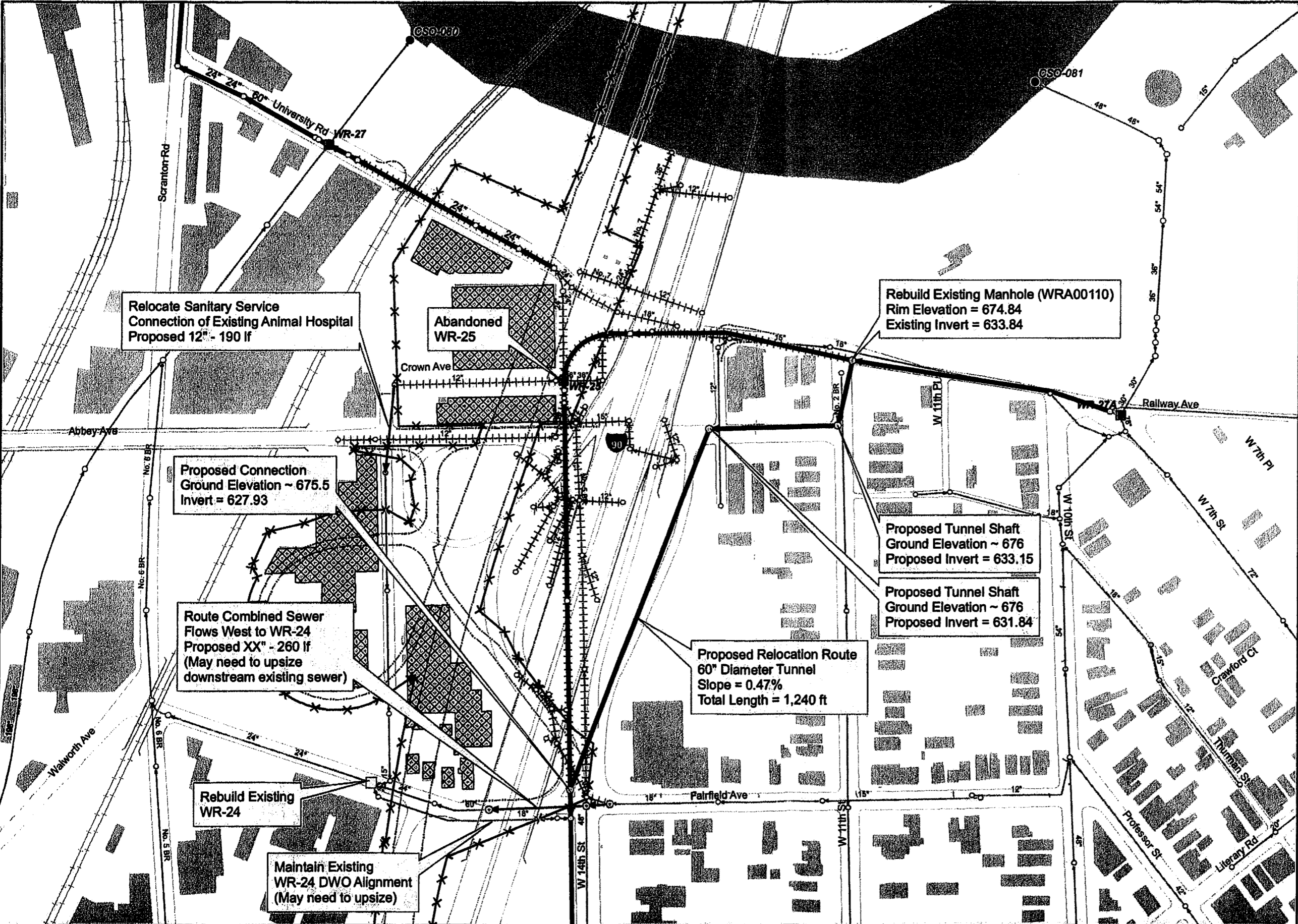
## 10. Vibration Monitoring

Comment 10A: We recommend requiring vibration monitoring of properties adjacent to the NEORS D work locations. Section 9.3.4 of the Design-Build scope addresses ODOT's approach to Vibration Monitoring and Control. This scope language can be provided upon request.

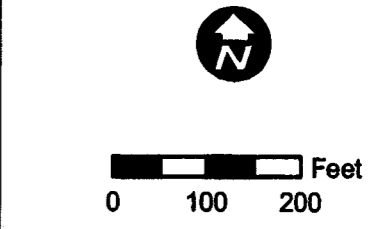
DLZ Response: *DLZ will investigate vibration monitoring of properties adjacent to the NEORS D work locations.*

## Section 6 – Recommendation

Based on the evaluation of the above options, considering the project goals, cost and schedule, DLZ concurs with the original NEORS D recommendation that **Option 2** be selected as the preferred alternate for the WRIR. The estimated probable construction cost for the recommended sewer construction plan is \$10,100,000 (2010 Dollars). This plan is shown on the attached plan view exhibit previously prepared by NEORS D and Wade Trim. This estimate should be regarded as a budgetary planning estimate. The estimate will be revised and updated throughout the project's design as more detailed design information becomes available.



- Legend**
- ⊙ Proposed Manhole
  - ⊙ Proposed Tunnel Shaft
  - Rebuild Regulator
  - ➔ Proposed Interceptor
  - ➔ Proposed Local Sewer
  - ||||| To Be Abandoned
  - - - - - Proposed Road Work
  - ✕ ✕ Construction Limits
  - ▨ To Be Demolished
  - NEORSO CSO Outfall
  - Existing Regulator
  - Existing Interceptor Manhole
  - Existing Local Manhole
  - ➔ Existing Interceptor
  - ➔ Existing Combined
  - ➔ Existing Sanitary
  - ➔ Existing Storm
  - ▨ Existing Building





**APPENDIX "B"**

Draft Soil Boring Logs

ADD ~~PP~~ PUSHING PRESSURES. (SHELOY)  
 PP READINGS WHERE APPLICABLE.



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**BORING NUMBER B-1**

PAGE 1 OF 2

CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio  
 DATE STARTED 11/18/09 COMPLETED 11/18/09 GROUND ELEVATION \_\_\_\_\_  
 DRILLING CONTRACTOR Solar Testing Laboratories, Inc. BORING LOCATION W. 11th & University  
 DRILLING METHOD Hollow Stem Auger GROUND WATER LEVELS:  
 LOGGED BY R. Spellacy DRILLER J. Deranek  $\nabla$  WATER ON ENCOUNTER 38.8 ft  
 NOTES \_\_\_\_\_  $\nabla$  WATER ON COMPLETION 38.8 ft  
 HOLE SIZE \_\_\_\_\_ AUGER SIZE 4.25 I.D. WATER AFTER \_\_\_\_\_ HRS: --

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
0				3" ASPHALT, 4" BRICK.								
0.6				SOLIDIFIED BASE.								
1.4				FILL: Brown SAND, little gravel, trace silt, brick.	(Moist) 4-4-5 (9)							
5	SS				11-17-7-6 (24)		4.7					
5	SS			Loose to medium dense brown medium to fine SAND, little gravel, trace silt.	(Moist) 2-3-4-4 (7)							
	SS			4" layer of SILTY CLAY at 7.3'. 4" layer of SILTY CLAY at 7.7'. -GRAINED	4-5-6-9 (11)							
10	SS	SP			3-2-3-4 (5)							
	SS				4-4-6-7 (10)							
15	SS				5-8-8-9 (16)							
	SS				8-6-8-7 (14)		4.2					
17.0	SS	SM		Loose brown FINE SAND, little silt.	(Moist) 2-2-3-4 (5)							
19.0	SS			SILT SAND								
20	SS			Loose to medium dense brown MEDIUM SAND, little gravel, trace silt.	(Moist) 4-4-4-4 (8)		6.7					
	SS	SP			3-4-7-9 (11)							
	SS				6-7-6-8 (13)							
25	SS			Medium dense brown FINE SAND, some silt, few sandy silt layers.	(Moist) 4-5-6-6 (11)							
	SS				5-6-5-7 (11)							
30	SS	SM		SILT SAND	6-6-5-6 (11)		9.4					
	SS				6-6-7-7 (13)							
	SS				6-6-6-7 (12)							





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# BORING NUMBER B-1

PAGE 2 OF 2

CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
35												
35-37.0	SS	SM		Medium dense brown FINE SAND, some silt, few sandy silt layers. (continued)	(Moist) 6-8-9-10 (17)							
37.0-39.0	SS	SP		Medium dense brown medium to fine SAND, trace silt.	(Wet) 7-5-6-7 (11)							
39.0-40.0	SS			Medium dense to dense gray SILTY FINE SAND.	(Moist) 9-9-10-11 (19)		20.7					
40.0-41.5	SS	SM			10-15-21-27 (38)							
41.5-43.0	SS				10-12-13-18 (25)							
43.0-45.0	SS			BECOMES MEDIUM DENSE WITH								
45.0-47.0	SS	SM		Medium dense gray SILTY FINE SAND, few silt interlayers.	(Moist) 7-10-11-15 (21)							
47.0-49.5	SS	SM		Dense gray FINE SAND, little silt.	(Moist) 16-23-27-29 (50)							
49.5-51.0	SS			BECOMES DENSE								
51.0-53.0	SS			Medium dense to dense gray SILTY FINE SAND, clayey silt interlayers (stratified).	(Wet) 12-14-17-21 (31)							
53.0-55.0	SS				3-7-9-11 (18)							
55.0-57.0	SS	SM-ML		CHECK ??	(Moist) 10-14-18-20 (32)							
57.0-59.0	SS			Medium dense gray SILTY little sand, trace clay, few silty clay interlayers (stratified).	(Moist) 7-8-9-11 (17)							
59.0-61.0	SS			CL-ML SILTY CLAY.	(Wet) 4-6-9-10 (15)		24.9			25	5	20
61.0-63.0	SS	ML		(TESTING CLASSIFIES AS CL-ML)	(Moist) 8-9-10-12 (19)							
63.0-65.0	SS				(Moist) 4-5-7-9 (12)							
65.0-67.0	ST				POSITIVE PRESSURE ???					26	7	19
67.0-69.0	SS			Stiff to very stiff gray SILTY CLAY little sand, few silt interlayers (laminated).	(Moist) 6-9-9-11 (18)		23					
69.0-71.0	SS			LEAN CLAY	(Moist) 8-11-12-14 (23)							
71.0-73.0	SS				(Moist) 6-7-7-9 (14)		25.7			31	11	20
73.0-75.0	SS				(Moist) 5-6-7-9 (13)							

Bottom of hole at 75.0 feet.



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# BORING NUMBER B-1

PAGE 2 OF 2

CLIENT Northeast Ohio Regional Sewer District

PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project

PROJECT NUMBER A09570x10

PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
35												
	SS	SM		Medium dense brown FINE SAND, some silt, few sandy silt layers. (continued)	(Moist) 6-8-9-10 (17)		20.7					
	SS	SP		Medium dense brown medium to fine SAND, trace silt.	(Wet) 7-5-6-7 (11)							
40	SS	SM		Medium dense to dense gray SILTY FINE SAND.	(Moist) 9-9-10-11 (19)							
	SS			10-15-21-27 (36)								
	SS			10-12-13-16 (25)								
45	SS	SM		Medium dense gray SILTY FINE SAND, few silt interlayers.	(Moist) 7-10-11-15 (21)							
	SS	SM		Dense gray FINE SAND, little silt.	(Moist) 16-23-27-29 (50)							
50	SS	SM-ML		Medium dense to dense gray SILTY FINE SAND, silt and clayey silt interlayers (stratified).	(Wet) 12-14-17-21 (31)							
	SS			3-7-9-11 (16)								
	SS			(Moist) 10-14-18-20 (32)								
55	SS		(Wet) 12-18-20-25 (38)									
	SS		(Moist) 7-8-9-11 (17)									
60	SS	ML	Medium dense gray SILT, little sand, trace clay, few silty clay interlayers (stratified).	(Moist) 4-6-9-10 (15)								
	SS		(Wet) 4-5-7-9 (12)									
	SS		(Moist) 8-9-10-12 (19)									
65	ST											
	SS	CL	Stiff to very stiff gray SILTY CLAY, little sand, few silt interlayers (laminated).	(Moist) 6-9-9-11 (18)								
70	SS		8-11-12-14 (23)									
	SS		6-7-7-9 (14)									
	SS		5-6-7-9 (13)									
75												

Bottom of hole at 75.0 feet.

MISSING SOME OF THE SOIL TESTING



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**BORING NUMBER B-2**

PAGE 1 OF 2

CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio  
 DATE STARTED 11/19/09 COMPLETED 11/19/09 GROUND ELEVATION \_\_\_\_\_  
 DRILLING CONTRACTOR Solar Testing Laboratories, Inc. BORING LOCATION W. 11th & University  
 DRILLING METHOD Hollow Stem Auger GROUND WATER LEVELS:  
 LOGGED BY C. Bangarter DRILLER J. Deranek  WATER ON ENCOUNTER 37.0 ft  
 NOTES \_\_\_\_\_  WATER ON COMPLETION 37.0 ft  
 HOLE SIZE \_\_\_\_\_ AUGER SIZE 2.25 I.D. WATER AFTER \_\_\_\_\_ HRS: \_\_\_\_\_

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
0				5" ASPHALT, 4 1/4" BRICK PAVER, 3" BASE, 6" CONCRETE.								
1.6				FILL: CINDERS & SAND.	9-6-5 (11)							
2.5	SS			Loose brown SAND, little gravel, trace silt, few silty clay interlayers. (Moist)	4-2-3 (5)							
5	SS				4-4-4 (8)							
10	SS				3-3-3 (6)		7.7					
15	SS				3-3-2 (5)		6.8					
18.5	SS			Medium dense brown SAND, trace silt. <b>TRACESILT</b> (Moist)	5-6-8 (14)		5.5					
23.5	SS			Loose brown SAND, little gravel, trace silt, few silty clay interlayers. (Moist)	2-3-4 (7)		11.9					
28.5	SS			Medium dense brown FINE SAND, trace silt. (Moist)	5-7-9 (16)							
35	SS			<b>SILTY SAND.</b>	7-8-11 (19)							









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# BORING NUMBER B-2

PAGE 2 OF 2

CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
35				Medium dense brown FINE SAND, little silt. (continued) (Moist)								
		SM	▼ 37.0	Medium dense brown FINE SAND, trace silt. (Wet)								
40	SS				3-5-8 (13)							
		SP										
45	SS		43.5	Dense to very dense gray SILTY FINE SAND. (Moist)	15-22-28 (50)		23.3					
		SM										
50	SS				16-22-30 (52)							
55	SS		54.0	Medium dense to dense gray SILT, some sand, few thin silty clay interlayers. (Moist)	11-16-17 (33)							
		ML										
60	SS		60.0	Bottom of hole at 60.0 feet.	10-15-11 (26)		19.8					





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# BORING NUMBER B-3

PAGE 1 OF 2

CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio  
 DATE STARTED 11/20/09 COMPLETED 11/23/09 GROUND ELEVATION \_\_\_\_\_  
 DRILLING CONTRACTOR Solar Testing Laboratories, Inc. BORING LOCATION W. 11th & Abbey  
 DRILLING METHOD Hollow Stem Auger GROUND WATER LEVELS:  
 LOGGED BY R. Spellacy DRILLER J. Deranek ∇ WATER ON ENCOUNTER 32.5 ft  
 NOTES \_\_\_\_\_ ∇ WATER ON COMPLETION 60.0 ft  
 HOLE SIZE \_\_\_\_\_ AUGER SIZE 4.25 I.D. WATER AFTER \_\_\_\_\_ HRS: --

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
0				2 3/4" ASPHALT, 4 3/4" BRICK PAVER, 4" Gray CLAYEY SILT.								
1.0				Loose to medium dense brown SAND & GRAVEL, trace silt. (Moist)	4-4-4-3 (8)							
5	SS	SP-GP			3-4-4-6 (8)		4.4					
7.0				Loose to medium dense brown MEDIUM SAND, little gravel, trace silt, few silty clay interlayers. (Moist)	7-9-12-10 (21)							
10	SS	SP			3-3-3-5 (6)							
13.0				Loose to medium dense brown MEDIUM SAND, little gravel, trace silt, few silty clay interlayers. (Wet)	2-3-5-5 (8)							
15	SS	SP-GP		Medium dense brown SAND & GRAVEL, trace silt. (Moist)	3-6-6-10 (12)							
20	SS	SP		Medium dense brown FINE SAND, trace gravel, silt. (Moist)	7-7-11-8 (18)		4.8					
25	SS	SM		Medium dense brown SILTY FINE SAND, few thin interlayers of sandy silt. (Moist)	5-8-9-9 (17)							
30	SS	ML-SP		Medium dense to dense brown SANDY SILT, interlayers of FINE SAND, trace silt, stratified. (Wet)	6-7-8-10 (15)							
31.0					7-7-8-11 (15)							
35	SS				8-9-11-12 (20)							
	SS				7-9-9-10 (18)							
	SS				10-11-12-13 (23)							
	SS				8-8-8-10 (16)							
	SS				5-5-6-11 (11)							
	SS				6-8-9-11 (17)							
	SS				4-5-8-9 (13)							



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# BORING NUMBER B-3

PAGE 2 OF 2

CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS			
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT	
35	SS	ML-SP		Medium dense to dense brown SANDY SILT, interlayers of FINE SAND, trace silt, stratified. (continued)	(Wet) 7-8-23-27 (31)								
	SS			Dense gray SILTY FINE SAND, few silt interlayers.	(Moist) 12-20-29-38 (49)								
40	SS	SM		SILTY SAND (SM)	13-20-26-32 (46)								
	SS	SP		Very dense gray MEDIUM SAND, trace silt.	(Moist) 9-24-32-39 (56)		18.4				NP	NP	NP
	SS			Medium dense to very dense gray SILT, some sand, with SILTY SAND interlayers.	(Moist) 20-25-28-31 (53)								
45	SS	ML-SM			17-25-31-34 (56)								
	SS				10-14-16-22 (30)								
50	SS	CL-ML		Medium dense to dense gray SILT, little clay, sand.	(Moist) 5-6-7-9 (13)		22				24	5	19
	SS			SILTY CLAY	5-6-8-9 (14)								
	SS				4-6-13-14 (19)								
55	SS	ST ML									NP	NP	NP
	SS				10-9-11-14 (20)								
60	SS				10-15-17-20 (32)		17						
	SS				9-12-16-19 (28)								
	SS	SP		Dense gray SAND, trace silt.	(Moist) 20-19-28-34 (47)								
65	SS	ML		Dense gray SANDY SILT.	(Moist) 15-20-23-30 (43)								
	SS			SILT	6-7-8-9 (15)								
	SS			Stiff to very stiff gray SILTY CLAY, little sand, stratified, few silt interlayers.	(Moist) 6-7-8-9 (15)		23						
70	SS	CL		LEAN CLAY	(Wet) 7-9-12-14 (21)								
	SS				6-9-11-12 (20)								
	SS				6-7-11-13 (18)		25.6						
75													

Bottom of hole at 75.0 feet.



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# BORING NUMBER B-3

PAGE 2 OF 2

CLIENT Northeast Ohio Regional Sewer District

PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project

PROJECT NUMBER A09570x10

PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
35	SS	ML-SP		Medium dense to dense brown SANDY SILT, interlayers of FINE SAND, trace silt, stratified. (continued) (Wet)	7-8-23-27 (31)							
	SS			Dense gray SILTY FINE SAND, few silt interlayers. (Moist)	12-20-29-38 (49)							
40	SS	SM			13-20-26-32 (46)							
	SS			Very dense gray MEDIUM SAND, trace silt. (Moist)	9-24-32-39 (56)		18.4					
45	SS	SP			20-25-28-31 (53)							
	SS			Medium dense to very dense gray SILT, some sand, with SILTY SAND interlayers. (Moist)	17-25-31-34 (56)							
	SS	ML-SM			10-14-16-22 (30)							
50	SS			Medium dense to dense gray SILT, little clay, sand. (Moist)	5-6-7-9 (13)		22					
	SS				5-6-8-9 (14)							
	SS				4-6-13-14 (19)							
55	ST	ML			10-9-11-14 (20)							
	SS				10-15-17-20 (32)		17					
60	SS				9-12-16-19 (28)							
	SS			Dense gray SAND, trace silt. (Moist)	20-19-28-34 (47)							
65	SS	SP			15-20-23-30 (43)							
	SS			Dense gray SANDY SILT. (Moist)	6-7-8-9 (15)							
	SS	ML			7-9-12-14 (21)							
70	SS			Stiff to very stiff gray SILTY CLAY, little sand, stratified, few silt interlayers. (Moist)	6-9-11-12 (20)		23					
	SS				6-7-11-13 (18)							
	SS	CL										
75							25.6					

Bottom of hole at 75.0 feet.

ADD PP WHERE APPLICABLE



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**BORING NUMBER B-4**

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CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio  
 DATE STARTED 11/30/09 COMPLETED 11/30/09 GROUND ELEVATION \_\_\_\_\_  
 DRILLING CONTRACTOR Solar Testing Laboratories, Inc. BORING LOCATION Abbey at W. 14th Ramp  
 DRILLING METHOD Hollow Stem Auger GROUND WATER LEVELS:  
 LOGGED BY R. Spellacy DRILLER J. Deranek  WATER ON ENCOUNTER 34.0 ft  
 NOTES \_\_\_\_\_  WATER ON COMPLETION 34.0 ft  
 HOLE SIZE \_\_\_\_\_ AUGER SIZE 4.25 I.D. WATER AFTER \_\_\_\_\_ HRS: \_\_\_\_\_

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
0												
0.8				9" CONCRETE.								
1.5				FILL: Brown SAND, little gravel (BASE). POSSIBLE FILL: Loose to medium dense brown SAND & GRAVEL, trace silt. (Moist)	4-7-8-7 (15)							
5	SS	SP-GP			3-4-3-4 (7)							
6.0	SS	SM		POSSIBLE FILL: Medium dense brown SAND, little gravel, silt, trace clay. (Moist)	5-7-9 (16)							
8.5	SS			Very loose to medium dense brown medium to coarse SAND & GRAVEL, trace silt, organics, thin silty clay layer. (Moist)	6-8-10 (18)		6.4					
15	SS	SP-GP			2-1-2 (3)		7.6					
20	SS	ML		Medium dense brown SILT, little sand, clay. (Moist)	5-5-7 (12)		21.8					
20.0				Medium dense brown FINE SAND, little silt. (Moist)								
25	SS	SM			5-6-10 (16)		10.1					
30	SS				7-7-8 (15)							
35	SS	ML-SM		Medium dense brown SILT, little sand, interlayers of silty fine sand. (Wet)	5-6-9 (15)							

SOIL DISTRIBUTION  
 → B-4 23.5 to 25 ft  
 % GRAVEL 0.4  
 % SAND 79.1  
 SAND

PLEASE MATCH SOIL TESTING WITH BORING.





Solar Testing Laboratories, Inc.  
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# BORING NUMBER B-4

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CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (ROD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS			
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT	
35				Medium dense brown SILT, little sand, interlayers of silty fine sand. (continued) (Wet)									
37.0				Medium dense gray SILTY FINE SAND, few silt interlayers. (Wet)									
40	SS				2-4-7 (11)		29.3						
45	SS				8-12-16 (28)								
48.0				Medium dense to dense gray SILT, little sand, trace clay, some clayey silt interlayers. (Wet)									
50	SS				5-5-8 (13)								
55	ST										NP	NP	NP
55	SS				17-19-27 (46)		18.6						
60	SS				13-15-17 (32)		19						
65	SS				13-14-10 (24)		16.9						
70	ST										28	9	19
72.0				Very stiff gray SILTY CLAY, little sand. (Wet)									
75.0	SS			LEAN CLAY	7-11-14 (25)		22.6						

CHECK

ACCORDING TO TESTING @ 68 FT.

SHELBY PUSHING PRESSURES.

Bottom of hole at 75.0 feet.





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# BORING NUMBER B-4

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CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
35				Medium dense brown SILT, little sand, interlayers of silty fine sand. (continued) (Wet)								
		ML-SM										
			37.0	Medium dense gray SILTY FINE SAND, few silt interlayers. (Wet)								
40	SS				2-4-7 (11)		29.3					
		SM										
45	SS				8-12-16 (28)							
			48.0	Medium dense to dense gray SILT, little sand, trace clay, some clayey silt interlayers. (Wet)								
50	SS				5-5-8 (13)							
		ST										
55	SS				17-19-27 (46)		18.6					
60	SS				13-15-17 (32)		19					
		ML										
65	SS				13-14-10 (24)		16.9					
		ST										
70												
			72.0	Very stiff gray SILTY CLAY, little sand. (Wet)								
		CL										
75	SS		75.0		7-11-14 (25)		22.6					

Bottom of hole at 75.0 feet.



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# BORING NUMBER B-5

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CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio  
 DATE STARTED 11/23/09 COMPLETED 11/27/09 GROUND ELEVATION \_\_\_\_\_  
 DRILLING CONTRACTOR Solar Testing Laboratories, Inc. BORING LOCATION W. 14th & Abbey  
 DRILLING METHOD Hollow Stem Auger GROUND WATER LEVELS:  
 LOGGED BY R. Spellacy DRILLER J. Deranek  WATER ON ENCOUNTER 32.0 ft  
 NOTES \_\_\_\_\_  WATER ON COMPLETION 48.0 ft  
 HOLE SIZE \_\_\_\_\_ AUGER SIZE 4.25 I.D. WATER AFTER \_\_\_\_\_ HRS: \_\_\_\_\_

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (ROD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
0				3" ASPHALT, 4" BRICK PAVER.								
0.6				FILL: Brown SAND, little silt, trace gravel, coal, few thin silty clay layers. (Moist)	11-9-8 (17)							
5	SS			4.5': STORM SEWER at edge of hole. Could not auger past. Moved hole 2 feet east.	4-3-4-4 (7)							
5.0	SS			FILL Brown SAND & GRAVEL, trace silt, few thin silty clay layers. (Moist)	4-3-3-3 (6)							
9.0	SS			8.5': Abandoned METAL PIPE.	1-1-1-50/2"							
10	SS			Loose to medium dense brown medium to coarse SAND, some gravel, trace silt. (Moist)	5-7-4-3 (11)							
11.3	SS	SP		11.3': 8-inch-thick layer of SILTY CLAY. <i>GRAINED</i>	3-4-6-7 (10)							
15	SS			Loose to medium dense brown fine to medium SAND, trace silt. <i>BECOMES MEDIUM DENSE, TRACE SILT</i>	3-6-9-9 (15)		5.9					
15.0	SS	SP		Loose to medium dense brown fine to medium SAND, trace silt. <i>BECOMES LOOSE</i>	7-7-9-13 (16)							
19.0	SS			Loose brown SILTY SAND, trace gravel. (Moist)	6-5-5-6 (10)							
20	SS	SM		Loose to medium dense brown fine to medium SAND, trace silt. (Moist)	6-8-8-9 (16)							
23.0	SS			Loose brown fine to medium SAND, little gravel, trace silt. (Moist)	4-3-4-4 (7)							
25	SS	SP		Loose to medium dense brown FINE SAND, little silt, trace gravel. (Moist)	4-3-5-5 (8)		7.4					
26.0	SS			Loose to medium dense brown FINE SAND, little silt, trace gravel. (Moist)	3-4-6-6 (10)							
30	SS	SM		SILTY SAND	6-9-10-12 (19)							
31.0	SS			Loose to medium dense brown FINE SAND, trace silt. (Moist)	3-2-3-5 (5)							
35	SS	SP		Loose to medium dense brown FINE SAND, trace silt. (Moist)	8-10-12-15 (22)							

*SP ACCORDING TO GRAN DISTRIBUTION TEST.*





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# BORING NUMBER B-5

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CLIENT Northeast Ohio Regional Sewer District

PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project

PROJECT NUMBER A09570x10

PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (ROD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS			
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT	
35	SS	SP		Loose to medium dense brown FINE SAND, trace silt. (continued)	(Moist) 5-8-10-11 (18)								
	SS			38' Heaving SAND.	(Wet) 4-7-9-12 (16)								
	SS			Medium dense gray SILT, some sand, interlayers of wet FINE SAND, trace silt, stratified.	(Moist) 5-7-11-13 (18)								
40	SS	SM		IS THIS OK?? CHECK	6-9-10-11 (19)								
	SS	ML			3-6-8-9 (14)								
45	SS	SM		Medium dense gray SILTY FINE SAND.	(Moist) 9-12-14-17 (26)								
	SS			48.0 ▼	4-6-9-11 (15)								
	SS			Medium dense gray SILT, some sand, few silty sand interlayers.	(Moist)								
50	ST	ML		PUSHING PRESSURES	8-9-15-19 (24)						22	3	19
	SS				12-15-19-23 (34)								
55	SS			55.0	11-16-19-26 (35)		20.1						
	SS			Dense gray SILT, little sand, clay.	(Moist)								
	ST	ML		PUSHING PRESSURES	16-19-21-26 (40)						NP	NP	NP
60	SS				14-17-20-25 (37)			17.6					
	SS			63.0	14-11-15-16 (26)								
	SS			Stiff to very stiff gray SILTY CLAY, little sand, interlayers of SILT, stratified.	(Moist)								
65	SS			69-71 — LEAN CLAY	5-6-8-10 (14)								
	SS				(Wet)								
	SS	CL-ML											
70	ST										29	9	20
	SS				8-11-14-18 (25)		22						
	SS				7-9-12-14 (21)		22.5						
75				75.0									

Bottom of hole at 75.0 feet.



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# BORING NUMBER B-5

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CLIENT Northeast Ohio Regional Sewer District

PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project

PROJECT NUMBER A09570x10

PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS			
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT	
35	SS	SP		Loose to medium dense brown FINE SAND, trace silt. (continued)	5-8-10-11 (18)								
	SS			38': Heaving SAND.	4-7-9-12 (16)								
	SS			Medium dense gray SILT, some sand, interlayers of wet FINE SAND, trace silt, stratified.	5-7-11-13 (18)								
	SS	SM-ML			6-9-10-11 (19)								
	SS				3-6-8-9 (14)								
	SS	SM			Medium dense gray SILTY FINE SAND.	9-12-14-17 (26)							
	SS			48.0 ▼	Medium dense gray SILT, some sand, few silty sand interlayers.	4-6-9-11 (15)							
	ST	ML				8-9-15-19 (24)							
	SS					12-15-19-23 (34)							
	SS			55.0	Dense gray SILT, little sand, clay.	11-16-19-26 (35)		20.1					
	ST	ML			16-19-21-26 (40)								
	SS				14-17-20-25 (37)		17.6						
	SS		63.0	Stiff to very stiff gray SILTY CLAY, little sand, interlayers of SILT, stratified.	14-11-15-16 (26)								
	SS				5-6-8-10 (14)								
	SS					0							
	ST	CL-ML			8-11-14-18 (25)		22						
	SS				7-9-12-14 (21)		22.5						
75			75.0										

Bottom of hole at 75.0 feet.





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# BORING NUMBER B-6

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CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio  
 DATE STARTED 11/28/09 COMPLETED 11/28/09 GROUND ELEVATION \_\_\_\_\_  
 DRILLING CONTRACTOR Solar Testing Laboratories, Inc. BORING LOCATION W. 14th Ramp to Abbey (south end)  
 DRILLING METHOD Hollow Stem Auger GROUND WATER LEVELS:  
 LOGGED BY R. Spellacy DRILLER J. Deranek ▽ WATER ON ENCOUNTER 29.0 ft  
 NOTES \_\_\_\_\_ ▽ WATER ON COMPLETION 54.0 ft  
 HOLE SIZE \_\_\_\_\_ AUGER SIZE 4.25 I.D. WATER AFTER \_\_\_\_\_ HRS: ---

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
0												
0.3				4" TOPSOIL. FILL: Brown SAND, little silt. (Moist)	2-1-2-3 (3)							
2.5				FILL: Gray SILTY FINE SAND, trace organics. (Moist)								
2.8				Loose brown SAND & GRAVEL, trace silt. (Moist)	3-4-5 (9)							
5	SS	SP GP		Medium dense brown fine to medium SAND, trace silt, gravel. (Moist)	6-8-7 (15)		7.2					
10	SS	SP		Hard brown SILTY CLAY, little sand, trace CaCO <sub>3</sub> . (Moist)	11-18-23 (41)							
15	SS	CL		Loose brown MEDIUM SAND, some gravel, trace silt. (Moist)	3-2-3 (5)							
20	SS	SP		Medium dense brown FINE SAND, little silt, few silty clay lenses, trace gravel. (Moist)	11-16-14 (30)		10.9					
25	SS	SM			13-10-14 (24)							
30	SS			Loose to medium dense brown SANDY SILT, interlayers of SAND. (Wet)	12-3-4 (7)		30					
35	SS	ML-SP			3-8-13 (21)							



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# BORING NUMBER B-6

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CLIENT Northeast Ohio Regional Sewer District

PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project

PROJECT NUMBER A09570x10

PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (ROD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
									LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
35			Loose to medium dense brown SANDY SILT, interlayers of SAND. (continued) (Wet)								
37.0			Medium dense to dense gray SILTY FINE SAND. (Wet)								
40	SS		<b>SILTY SAND</b>	7-13-16 (29)		22.6					
45	SS		<b>SILT (ML)</b>	7-16-26 (42)		21.2			NP	NP	NP
48.0			Dense gray FINE SAND, trace silt. (Moist)								
50	SS		<b>(SM) SILTY SAND</b>	8-10-24 (34)		22.3			NP	NP	NP
54.0			Dense gray SILT, little sand. (Moist)	13-19-28 (47)		18					
57.0			Very stiff gray CLAYEY SILT, little sand. (Moist)								
60	SS			7-8-9 (17)		21.1			24	5	19
63.5			Stiff gray SILTY CLAY, little sand, few silt interlayers. (Moist)	4-4-5 (9)		28.6					
65.0			Bottom of hole at 65.0 feet.								

CHECK

**SILT (ML)**

**(SM) SILTY SAND**

LEAN CLAY

REVISE THIS BORING LOG

THIS TEST IS MISSING







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# BORING NUMBER B-7

PAGE 1 OF 2

CLIENT Northest Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey; W 14th Streets, Cleveland, Ohio  
 DATE STARTED 12/3/09 COMPLETED 12/3/09 GROUND ELEVATION \_\_\_\_\_  
 DRILLING CONTRACTOR Solar Testing Laboratories, Inc. BORING LOCATION W. 14th Ramp to Abbey (north end)  
 DRILLING METHOD Hollow Stem Auger GROUND WATER LEVELS:  
 LOGGED BY R. Spellacy DRILLER J. Deranek  WATER ON ENCOUNTER 27.0 ft  
 NOTES \_\_\_\_\_  WATER ON COMPLETION 27.0 ft  
 HOLE SIZE \_\_\_\_\_ AUGER SIZE 4.25 I.D. WATER AFTER \_\_\_\_\_ HRS: --

DEPTH (ft)	SAMPLE TYPE	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (ROD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
									LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
0			10" TOPSOIL.	2-2-3-4 (5)							
0.8			FILL: Brown SAND, little silt, trace gravel, brick. (Moist)								
3.5			FILL: Brown SAND & GRAVEL, trace silt, brick. (Moist)	3-3-5 (8)							
4-3-3 (6)											
3-3-4 (7)						7					
10-16-20 (36)						5					
19.0			Medium dense brown SILTY SAND. (Moist)	9-13-17 (30)		14.5					
19.5	SM		Medium dense brown SILT, little sand. (Moist)								
20.5	ML		Dense brown fine to medium SAND, trace silt. (Moist)								
12-15-16 (31)											
27.0			Loose to very dense brown FINE SAND, little silt, few thin silt layers. (Wet)	9-9-12 (21)		22.1					
18-19-50/4"											

SILTY SAND



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# BORING NUMBER B-7

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**CLIENT** Northeast Ohio Regional Sewer District **PROJECT NAME** Walworth Run Interceptor Realignment (WRIR) Project  
**PROJECT NUMBER** A09570x10 **PROJECT LOCATION** W 11th, Abbey, W 14th Streets, Cleveland, Ohio  
**DATE STARTED** 12/3/09 **COMPLETED** 12/3/09 **GROUND ELEVATION** \_\_\_\_\_  
**DRILLING CONTRACTOR** Solar Testing Laboratories, Inc. **BORING LOCATION** W. 14th Ramp to Abbey (north end)  
**DRILLING METHOD** Hollow Stem Auger **GROUND WATER LEVELS:**  
**LOGGED BY** R. Spellacy **DRILLER** J. Deranek  **WATER ON ENCOUNTER** 27.0 ft  
 **WATER ON COMPLETION** 27.0 ft  
**NOTES** \_\_\_\_\_  
**HOLE SIZE** \_\_\_\_\_ **AUGER SIZE** 4.25 I.D. **WATER AFTER** \_\_\_\_\_ **HRS:** --

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
0												
0.8				10" TOPSOIL.								
	SS			FILL: Brown SAND, little silt, trace gravel, brick. (Moist)	2-2-3-4 (5)							
3.5				FILL: Brown SAND & GRAVEL, trace silt, brick. (Moist)	3-3-5 (8)							
5	SS											
	SS				4-3-3 (6)				7			
10	SS				3-3-4 (7)							
15	SS				10-16-20 (36)				5			
19.0												
19.5	SM			Medium dense brown SILTY SAND. (Moist)	9-13-17 (30)				14.5			
20.5	ML			Medium dense brown SILT, little sand. (Moist)								
				Dense brown fine to medium SAND, trace silt. (Moist)								
25	SS				12-15-16 (31)							
27.0												
				Loose to very dense brown FINE SAND, little silt few thin silt layers. (Wet)								
30	SS				9-9-12 (21)				22.1			
35	SS				18-19-50/4"							



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# BORING NUMBER B-7

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CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project

PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
35				Loose to very dense brown FINE SAND, little silt few thin silt layers. (continued) (Wet)								
40	SS	SM		SILTY SAND.	3-4-5 (9)							
45	SS			SILTY SAND	5-6-9 (15)		25.3					
47.0				Medium dense gray FINE SAND/ little silt. (Wet)								
49.8				Dense gray SILT, little sand, clay. (Wet)	7-10-13 (23)							
55	ST	ML		(PP=4.5+)		13	18.1			24	4	20
60	SS			Bottom of hole at 60.0 feet.	16-24-25 (49)		21.2			23	3	20





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# BORING NUMBER B-8

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CLIENT Northeast Ohio Regional Sewer District PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project  
 PROJECT NUMBER A09570x10 PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio  
 DATE STARTED 12/1/09 COMPLETED 12/2/09 GROUND ELEVATION \_\_\_\_\_  
 DRILLING CONTRACTOR Solar Testing Laboratories, Inc. BORING LOCATION W. 14th & Fairfield  
 DRILLING METHOD Hollow Stem Auger GROUND WATER LEVELS:  
 LOGGED BY R. Spellacy DRILLER J. Deranek  WATER ON ENCOUNTER 26.0 ft  
 NOTES \_\_\_\_\_  WATER ON COMPLETION 44.0 ft  
 HOLE SIZE \_\_\_\_\_ AUGER SIZE 4.25 I.D. WATER AFTER \_\_\_\_\_ HRS: ---

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
0				2 1/2" ASPHALT, 7/8" CONCRETE.								
0.9				FILL: Brown SAND & GRAVEL, trace silt, few thin layers of black sandy silt with little clay. (Moist)	5-6-7-8 (13)							
3.0	SS			Loose to medium dense brown SAND & GRAVEL, trace silt. (Moist)	3-5-4-4 (9)							
5	SS				4-2-2-3 (4)							
	SS				2-2-1-2 (3)							
10	SS				2-2-4-6 (6)		5.7					
	SS				4-5-6-8 (11)							
13.2												
14.0	ML			Medium dense brown SILT, little sand, clay. (Moist)	3-5-8-13 (13)							
15	SS			Medium dense brown fine to medium SAND, trace gravel, silt. (Moist)	8-10-11-14 (21)							
	SS											
17.0	SP											
18.0	ML			Medium dense brown SILT, little sand, trace clay. (Moist)	4-6-7-10 (13)							
20	SS			Medium dense brown fine to medium SAND, trace silt. (Moist)	10-13-15-20 (28)							
	SS											
21.0	SS			20' 2-inch SILT layer.								
	SS			Medium dense brown SILTY FINE SAND, few silt interlayers. (Moist)	10-11-10-10 (21)							
	SS											
25	SS				4-6-7-9 (13)							
	SS				5-6-7-9 (13)							
26.5												
	SS			Medium dense brown SILT, little sand. (Moist)	7-12-11-14 (23)							
29.0	ML											
	SS			Medium dense brown FINE SAND, little silt. (Wet)	9-11-13-14 (24)							
30	SS											
	SS			Medium dense brown SILTY FINE SAND, few thin silt interlayers, stratified. (Wet)	7-8-10-11 (18)							
	SS											
35	SS				4-8-9-11 (17)							





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# BORING NUMBER B-8

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CLIENT Northeast Ohio Regional Sewer District

PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project

PROJECT NUMBER A09570x10

PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
35	SS	SM	36.0	Medium dense brown fine to medium SAND, trace silt, few silt layers. Heaving Sand.	(Wet) 5-8-13-15 (21)		18.8					
	SS	SP			5-7-9-8 (16)							
40	SS		41.0	Medium dense brown FINE SAND, little silt.	(Wet) 4-9-6-7 (15)							
	SS				9-12-11-16 (23)							
	SS				4-5-6-4 (11)							
45	SS	SM			4-5-6-4 (11)							
	SS				6-7-10-11 (17)							
50	SS		49.5	Dense gray SILT, little sand.	(Wet) 9-15-18-21 (33)		20.5			NP	NP	NP
	SS	ML			14-19-25-28 (44)							
	SS	ST	53.0	Stiff gray CLAYEY SILT, little sand.	(Wet)					24	4	20
55	SS	CL-ML			5-6-8-10 (14)		19.3					
	SS		59.0	Stiff gray SILTY CLAY, little sand, interlayers of SILT, stratified.	(Wet) 4-5-7-7 (12)							
	SS	ST			5-7-7-8 (14)					25	5	20
65	SS		65.0	Stiff gray SILTY CLAY, little sand, laminated.	(Wet) 3-4-4-5 (8)		24.1					
	SS	CL			5-6-6-8 (12)							
70	SS	ST			9-10-14-16 (24)		21.1			30	10	20
	SS	ML	71.0	Very stiff gray CLAYEY SILT, little sand.	(Wet) 10-14-16-17 (30)							
75	SS		75.0				20.2					

Bottom of hole at 75.0 feet.

*Handwritten annotations:*

- SILTY SAND** (circled) with arrows pointing to the 41.0 ft and 49.5 ft layers.
- SILTY CLAY** (circled) with arrows pointing to the 53.0 ft and 59.0 ft layers.
- LEAN CLAY** (circled) with arrows pointing to the 65.0 ft and 71.0 ft layers.
- PRESSURES** (circled) with arrows pointing to the 53.0 ft and 71.0 ft layers.
- CHECK THIS** (circled) with an arrow pointing to the 71.0 ft layer.
- CL-ML** (circled) with an arrow pointing to the 71.0 ft layer.





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# BORING NUMBER B-8

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CLIENT Northeast Ohio Regional Sewer District

PROJECT NAME Walworth Run Interceptor Realignment (WRIR) Project

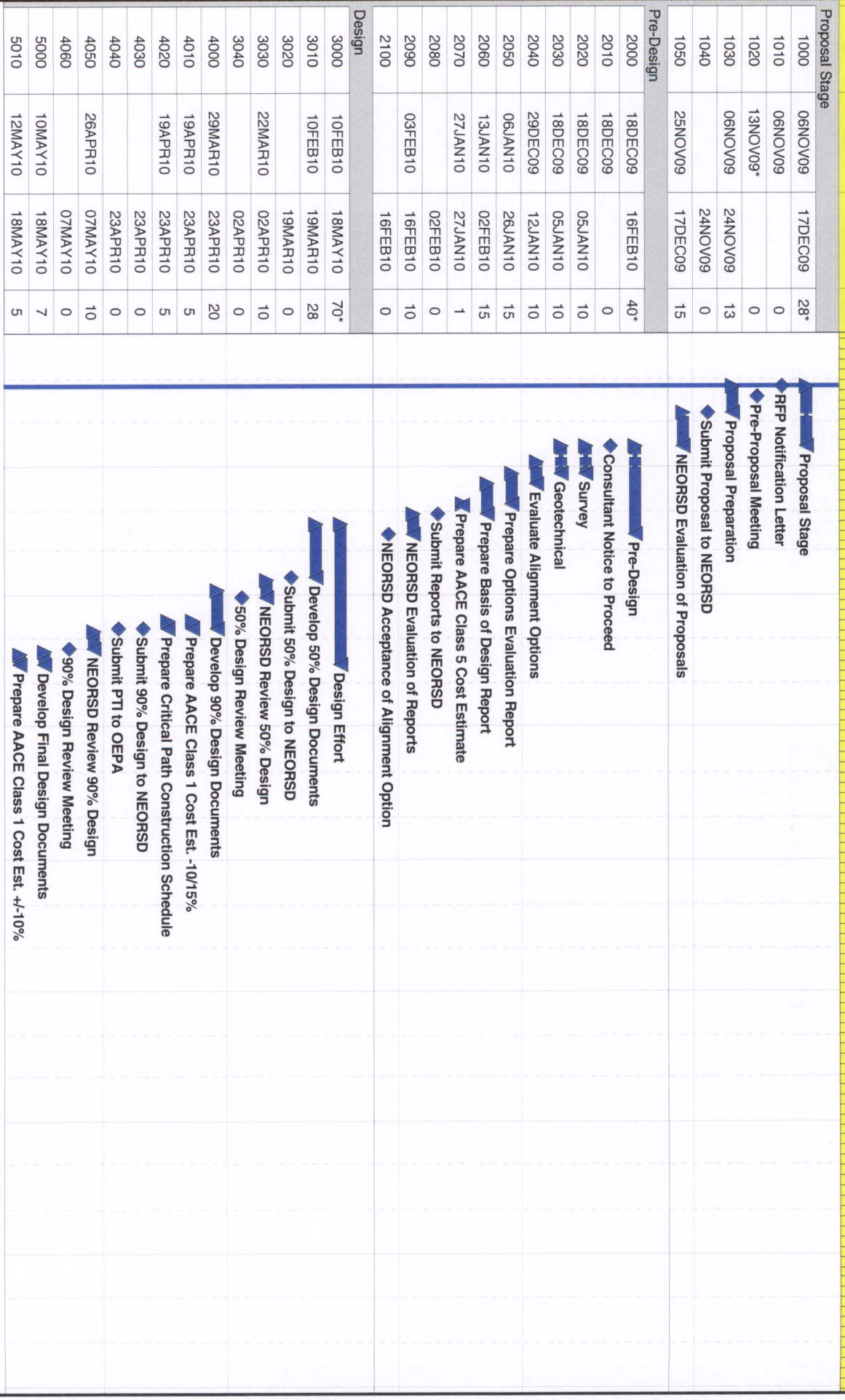
PROJECT NUMBER A09570x10

PROJECT LOCATION W 11th, Abbey, W 14th Streets, Cleveland, Ohio

DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	MOISTURE CONTENT (%)	UN. COMP. STRENGTH (tsf)	DRY UNIT WT. (pcf)	ATTERBERG LIMITS		
										LIQUID LIMIT	PLASTICITY INDEX	PLASTIC LIMIT
35												
	SS	SM	36.0	Medium dense brown fine to medium SAND, trace silt, few silt layers. Heaving Sand.	(Wet) 5-8-13-15 (21)		18.8					
	SS				(Wet) 5-7-9-8 (16)							
40	SS	SP			4-9-6-7 (15)							
			41.0	Medium dense brown FINE SAND, little silt.	(Wet) 9-12-11-16 (23)		20.5					
	SS				4-5-6-4 (11)							
45	SS	SM			4-5-6-4 (11)							
	SS				6-7-10-11 (17)							
			49.5	Dense gray SILT, little sand.	(Wet) 9-15-18-21 (33)		19.3					
	SS	ML			14-19-25-28 (44)							
			53.0	Stiff gray CLAYEY SILT, little sand.	(Wet)		24.1					
55	ST				5-6-8-10 (14)							
	SS	ML			4-5-7-7 (12)							
			59.0	Stiff gray SILTY CLAY, little sand, interlayers of SILT, stratified.	(Wet)		21.1					
60	SS	CL-ML			5-7-7-8 (14)							
			65.0	Stiff gray SILTY CLAY, little sand, laminated.	(Wet)		20.2					
	SS	CL			3-4-4-5 (8)							
			71.0	Very stiff gray CLAYEY SILT, little sand.	(Wet)							
	SS	ML			9-10-14-16 (24)							
	SS				10-14-16-17 (30)							
75			75.0									

Bottom of hole at 75.0 feet.

Activity ID	Early Start	Early Finish	Orig Dur	2009	2010	2011
				OCT	NOV	DEC
				JAN	FEB	MAR
				APR	MAY	JUN
				JUL	AUG	SEP
				OCT	NOV	DEC
				JAN	FEB	MAR
				APR	MAY	JUN
				JUL	AUG	SEP



Start Date: 06NOV09  
 Finish Date: 17AUG11  
 Data Date: 06NOV09  
 Run Date: 23MAR10 10:20

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Legend:  
 Early Bar (Yellow)  
 Progress Bar (Blue)  
 Critical Activity (Blue with red outline)

Project: NEORSRD  
 Description: Walworth Run Interceptor  
 Classic Schedule Layout

Sheet 1 of 2

Date	Revision	Checked	Approved

Red 3/23/2010

