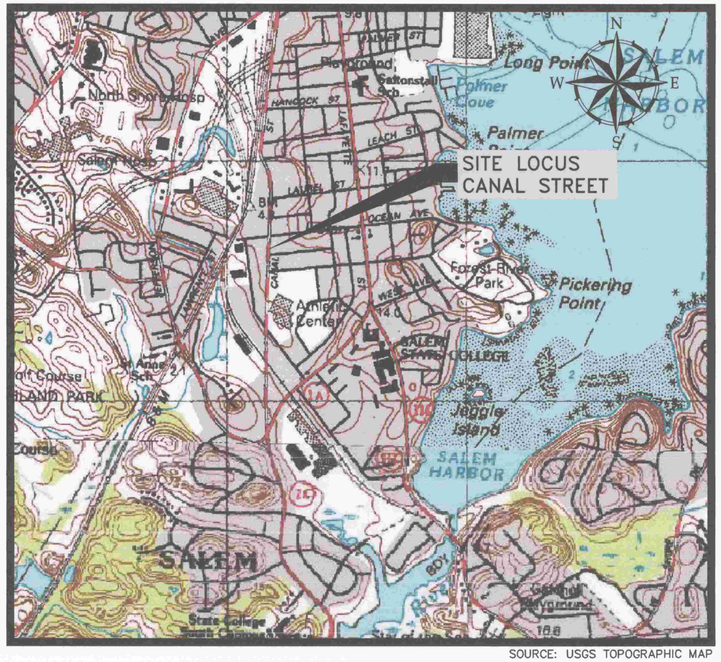
CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS

CONTRACT NO. O-38



SOURCE: USGS TOPOGRAPHIC MAP

SITE LOCATION MAP

SCALE: 1=1,000'

Mayor: KIMBERLEY DRISCOLL

City Engineer: DAVID KNOWLTON, P.E.

SALEM: CONDITA A.D. 1626 · CIVITATIS REGIMINE DONATA A.D. 1836

JANUARY 25, 2013

BID SET NO.____

WOODARD & CURRAN

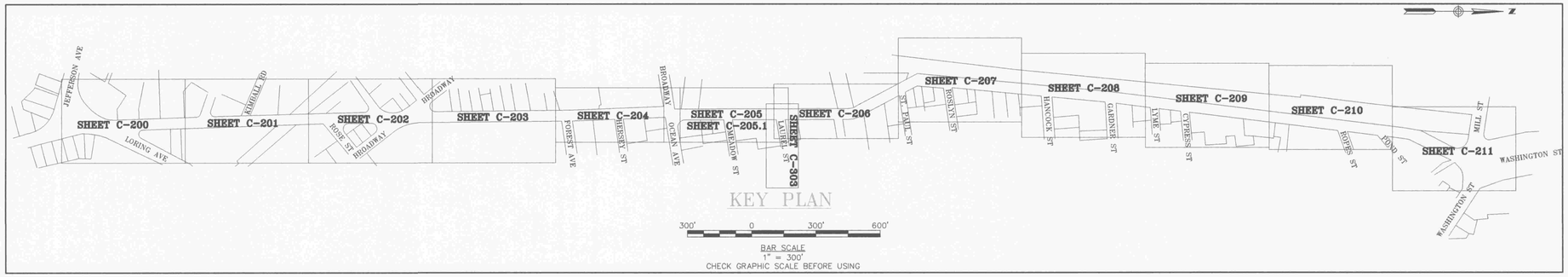
40 SHATTUCK ROAD, SUITE 110
ANDOVER, MASSACHUSETTS 01810
866-702-6371 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

W&C PROJECT NO. 224404

SHEET INDEX:

COMMONWEALTH OF MASSACHUSETTS · DAVID A. WHITE · CIVIL · No. 39680 · REGISTERED PROFESSIONAL ENGINEER

David A. White 1/25/13



GENERAL NOTES:

1. THESE PLANS WERE PREPARED FROM A COMBINATION OF AERIAL AND ON THE GROUND SURVEYING. AERIAL MAPPING WAS PERFORMED IN MAY 2008. ON THE GROUND SURVEY WAS CONDUCTED BY WSP SELLS BETWEEN OCTOBER 2 AND NOVEMBER 4, 2008.
2. THE HORIZONTAL DATUM SHOWN HEREON REFERENCES MASSACHUSETTS STATE PLANE COORDINATES (NAD 83).
3. THE VERTICAL DATUM SHOWN HEREON REFERENCES NAVD 1988. BENCHMARK LOCATIONS ARE SHOWN ON PLANS.
4. PROPERTY AND RIGHT OF WAY LOCATIONS SHOWN HEREON ARE APPROXIMATE AND DO NOT REPRESENT A PROPERTY SURVEY.
5. BUILDINGS SHOWN HEREON WERE LOCATED BY MEANS OF AERIAL MAPPING.
6. PLAN REFERENCES:
   - A. PLAN ENTITLED "PLAN OF LAND IN SALEM, MASS. PREPARED FOR THE JEFFERSON TRUST" DATED: MARCH 6, 1985, SCALE: 1" = 40', RECORDED AT THE ESSEX COUNTY REGISTRY OF DEEDS SOUTHERN DISTRICT IN PLAN BOOK 271 PLAN 3.
   - B. PLAN ENTITLED "PLAN OF LAND IN SALEM, MASS. OWNED BY HARRY KIMBALL" DATED: JULY, 1929, SCALE: 1" = 20', RECORDED AT THE E.C.R.D. AS PLAN 147 OF 1929.
   - C. PLAN ENTITLED "PLAN OF LAND IN SALEM PREPARED FOR DONALD J. MICHAUD" DATED: SEPT. 5, 1973, SCALE: 1" = 30', RECORDED AT THE E.C.R.D. AS PLAN 463 OF 1973.
   - D. PLAN ENTITLED "LAND OF PAUL N. CHAPUT SALEM" DATED: APRIL 13, 1911, SCALE: 1" = 40', RECORDED AT THE E.C.R.D. IN BOOK 2072 PAGE 368.
   - E. PLAN ENTITLED "LAND OF ROSILDA PELLETIER SALEM, MASS." DATED: OCTOBER 1945, SCALE: 1" = 20', RECORDED AT THE E.C.R.D. IN BOOK 3427 PAGE 317.
   - F. PLAN ENTITLED "PLAN OF LAND OF JAMES F. ALMY ON MEADOW, LAUREL AND CANAL STREETS" DATED: JANUARY 1895, SCALE: 1" = 100', RECORDED AT THE E.C.R.D. IN BOOK 1438 PAGE 1.
   - G. PLAN ENTITLED "PLAN OF LAND IN SALEM, MASS. FOR MCDONALD'S CORPORATION" DATED: FEB. 7, 1974, SCALE: 1" = 200', RECORDED AT THE E.C.R.D. IN PLAN BOOK 131 PLAN 17.
   - H. PLAN ENTITLED " PLAN OF LAND IN SALEM, MASS. OWNED BY HERBERT L. AND FLORENCE M. MACKEY" DATED: AUGUST 30, 2000, SCALE 1" = 10', RECORDED IN PLAN BOOK 348 PLAN 27.
   - I. PLAN ENTITLED "PLAN OF LAND IN SALEM, MASS. SHOWING EASEMENTS OVER LAND OF COMMONWEALTH OF MASSACHUSETTS" DATED: SEPT. 1975, SCALE: 1"= 40', RECORDED AT THE E.C.R.D. IN PLAN BOOK 139 PLAN 85.
   - J. PLAN ENTITLED "PREPARED FOR ZBIGNIEW KANTOROSINSKI 36 FOREST STREET AND 19 HERSEY STREET SALEM, MASSACHUSETTS" DATED: JULY, 17 2008, SCALE: 1" = 20', RECORDED AT THE E.C.R.D. IN PLAN BOOK 400 PLAN 81.
   - K. ASSESSORS PLANS ON FILE WITH THE SALEM MASSACHUSETTS GIS DEPARTMENT.
7. SOIL BORINGS PERFORMED BY GEOCOMP CORPORATION, ACTON, MASSACHUSETTS.
8. UTILITY LOCATIONS SHOWN IN THE PLANS AND PROFILES ARE APPROXIMATE BOTH AS TO SIZE AND LOCATION. CONTRACTOR TO INVESTIGATE EXISTING CONDITIONS AND FIELD VERIFY LOCATIONS OF UTILITIES AND SUB-SURFACE STRUCTURES PRIOR TO CONSTRUCTION. CONTACT THE ENGINEER IMMEDIATELY UPON DISCOVERING CONFLICTS WITH THE EXISTING AND PROPOSED UTILITY LOCATIONS. NOT ALL EXISTING UTILITIES ARE SHOWN ON THE DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING UTILITIES.
9. EXCAVATE TEST PITS AT ALL PROPOSED UTILITY CROSSINGS OR LOCATIONS WHERE CONNECTIONS TO EXISTING FACILITIES ARE PROPOSED TO VERIFY FIELD CONDITIONS AND THE LOCATION, ELEVATION, SIZE, TYPE, MATERIAL, AND ORIENTATION OF EXISTING UTILITIES. NOTIFY ENGINEER AND OWNER IF CONFLICT EXISTS PRIOR TO CONSTRUCTION.
10. COORDINATE DIRECTLY WITH UTILITY COMPANIES PER THE GENERAL REQUIREMENTS. NOTIFY UTILITY COMPANIES PRIOR TO COMMENCING WORK TO ALLOW SUFFICIENT TIME TO LOCATE AND MARK THE LOCATION OF BURIED UTILITIES.
11. LOCATION AND DEPTH OF VERIZON DUCT BANK IS APPROXIMATE. CONTRACTOR TO FIELD VERIFY DEPTH AND LOCATION WITH TEST PITS. COORDINATE WITH VERIZON TO VERIFY SEPARATION TO EXISTING AND PROPOSED UTILITIES, AND TO COORDINATE PROPOSED CONSTRUCTION ACTIVITIES. NOTIFY ENGINEER AND OWNER IF CONFLICT EXISTS PRIOR TO CONSTRUCTION.
12. CONTACT "DIG SAFE", TELEPHONE 888-344-7233, AT LEAST 72 HOURS PRIOR TO CONSTRUCTION. PROTECT, REPAIR DAMAGED UTILITIES, AND RELOCATE UTILITIES AS NEEDED.
13. COORDINATE WITH PROVIDERS OPERATING UTILITY POLES TO SUPPLY POLE SUPPORTS DURING CONSTRUCTION ACTIVITIES AS NECESSARY. PROVIDE BRACING/SUPPORT AS NEEDED.
14. OVERHEAD WIRES ARE LOCATED THROUGHOUT THE PROJECT CORRIDOR. COORDINATE WITH PROVIDERS/OWNERS OPERATING THE OVERHEAD WIRES TO PROTECT WIRES DURING CONSTRUCTION ACTIVITIES.
15. SEWER AND WATER SERVICE LATERALS INDICATED ON THE DRAWINGS ARE FOR ESTIMATING PURPOSES. ACTUAL SERVICE LATERAL LOCATIONS, DEPTHS, AND LENGTHS ARE TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR.
16. LINEAR FOOT (LF) SHOWN ON PROPOSED STORM DRAIN PROFILE IS APPROXIMATE. THE DIMENSION SHOWN IS MEASURED FROM THE INSIDE OF UPSTREAM MANHOLE WALL TO INSIDE OF DOWNSTREAM MANHOLE WALLS.
17. RESTRICT ACCESS TO SITE THROUGH THE USE OF APPROPRIATE SIGNAGE, BARRIERS, FENCES, ETC. IN ACCORDANCE WITH THE GENERAL REQUIREMENTS. SITE SHALL BE LEFT WITH APPROPRIATE SAFETY MEASURES IN PLACE DURING NON-WORKING HOURS. NO TRENCH SHALL BE LEFT OPEN DURING NON-WORKING HOURS. SITE SAFETY IS THE RESPONSIBILITY OF CONTRACTOR, DURING BOTH WORKING AND NON-WORKING HOURS.
18. REPLACEMENT OF WATER SERVICES, OR INSTALLATION OF NEW WATER AND SEWER SERVICES SHALL BE FROM THE MAIN TO THE PROPERTY LINE (INCLUDING CURB STOPS) EXCEPT FOR LOCATIONS WHERE WALLS, PLANTERS OR VEGETATION MUST BE PROTECTED. IN THAT CASE, THE SERVICE SHALL EXTEND AS CLOSE TO THE PROPERTY LINE AS PRACTICAL, AS DIRECTED BY THE ENGINEER.
19. PROVIDE 4-INCHES OF LOAM AND SEED IN ALL LAWN AREAS DISTURBED BY CONTRACTOR'S OPERATIONS.
20. CONTRACTOR SHALL REPLACE EXISTING PAVEMENT MARKINGS/STRIPING AS NECESSARY WHERE IMPACTED BY CONSTRUCTION.
21. CONTRACTOR IS RESPONSIBLE FOR PROVIDING MATERIAL STORAGE AND STAGING AREA(S) PER THE GENERAL REQUIREMENTS.
22. DO NOT IMPEDE ACCESS TO OR STORE EQUIPMENT ON ADJACENT CITY OR PRIVATELY OWNED PROPERTY, UNLESS PERMISSION HAS BEEN GRANTED IN WRITING BY OWNER AND/OR LAND OWNER.
23. WORKERS' PERSONAL VEHICLES MAY NOT BE PARKED WITHIN THE PUBLIC RIGHT OF WAY OR ON PRIVATE OWNERS LOTS, UNLESS PERMISSION HAS BEEN GRANTED IN WRITING BY OWNER AND/OR LAND OWNER.
24. PERFORM WORK WITHIN THE RIGHTS OF WAY OF CITY OF SALEM STREETS IN ACCORDANCE WITH CITY ORDINANCES. PRIOR TO START OF WORK, SUBMIT TRAFFIC CONTROL PLAN PER GENERAL REQUIREMENTS.
25. COORDINATE CONSTRUCTION OF DRAINAGE, SEWER, AND WATER IMPROVEMENTS TO MINIMIZE DISRUPTION OF SERVICE TO RESIDENTS AND BUSINESSES. COORDINATE DISRUPTION OF PRIVATE UTILITY SERVICES WITH AFFECTED RESIDENTS AND BUSINESSES AT LEAST TWO DAYS (48 HOURS) PRIOR TO DISRUPTION. SEE THE GENERAL REQUIREMENTS.
26. PROTECT AND AVOID DISTURBING PROPERTY MARKERS AND BENCHMARKS. PROTECT EXISTING FACILITIES (E.G. CURB STOP BOXES, POLES, LIGHT POSTS, CATCH BASINS, ETC.) AND TREES DURING CONSTRUCTION.
27. OBTAIN REQUIRED PERMITS FOR TEMPORARY AND PERMANENT STOCKPILING OF ANY SURPLUS SOIL AND ROCK AND MEET APPLICABLE SETBACK REQUIREMENTS IN THE CITY ORDINANCES. PROVIDE PROPER STABILIZATION AND EROSION AND SEDIMENT CONTROL MEASURES PER THE GENERAL REQUIREMENTS.
28. PRIOR TO START OF WORK, DIGITALLY RECORD ON DVD PRE-CONSTRUCTION CONDITIONS IN ACCORDANCE WITH THE GENERAL REQUIREMENTS, INCLUDING SURFACE FEATURES (PAVEMENT, SIDEWALKS, CROSSWALKS, CURBING, AND RELATED ITEMS). PROVIDE COPIES OF DVD AND WRITTEN LOGS TO THE ENGINEER PRIOR TO COMMENCING WORK.
29. WHERE POSSIBLE MAINTAIN AT LEAST 10 HORIZONTAL FEET AND A MINIMUM OF 18 VERTICAL INCHES BETWEEN SEWER MAINS AND SERVICES AND WATER MAINS AND SERVICES.
30. ABANDON THOSE EXISTING MANHOLES AND CATCH BASINS SO DESIGNATED FOR ABANDONMENT IN PLACE BY REMOVING EXISTING FRAMES AND COVERS/GRATES. PLUG EXISTING STORM DRAIN LINES IN AND OUT WITH BRICK AND MORTAR, DEMOLISH TOP 3 FEET OF STRUCTURE, AND FILL WITH CONTROLLED DENSITY FILL. DELIVER FRAMES AND COVERS/GRATES TO THE DEPARTMENT OF PUBLIC WORKS YARD.
31. CAP ABANDONED STORM DRAIN PIPE WITH BRICK AND MORTAR AT EACH END TO PREVENT INFILTRATION.
32. REMOVE AND LEGALLY DISPOSE OF REMOVED AND DEMOLISHED FACILITIES INCLUDING EXISTING PIPE, MANHOLES, HYDRANT ASSEMBLIES, AND CONSTRUCTION DEBRIS.
33. RESTORE AREAS DISTURBED BY CONTRACTOR'S OPERATIONS TO ORIGINAL FINISH OR IN KIND (GRAVEL, PAVEMENT, CURBS, GRASS, ETC.). RESTORE PAVED SURFACES, ROADWAY STRIPING, GRAVEL SURFACES, DRIVEWAYS, AND LAWNS DAMAGED BY CONSTRUCTION ACTIVITIES OUTSIDE OF LIMITS OF WORK INDICATED ON THE DRAWINGS AT NO ADDITIONAL COST TO OWNER.
34. THE LIMITS OF WORK DEPICTED ON THE DRAWINGS REPRESENT THE LIMITS OF SURFACE AND SUBSURFACE DISTURBANCE AND REPLACEMENT OF EXISTING SURFACE FEATURES (SUCH AS PAVEMENTS, SIDEWALKS, CURBING AND PAVEMENT MARKINGS). NO ADDITIONAL COMPENSATION SHALL BE PROVIDED FOR WORK PERFORMED BEYOND THESE LIMITS. HOWEVER, TEMPORARY USE OF THE PUBLIC RIGHT-OF-WAY OUTSIDE THE LIMIT OF WORK WILL BE ALLOWED FOR LIMITED SPECIFICALLY ALLOWED ACTIVITIES SUCH AS EQUIPMENT AND MATERIAL STORAGE AND CONTRACTOR OPERATIONS IN ACCORDANCE WITH THE PROVISIONS OUTLINED IN THE SECTIONS 01001 AND 01003 OF THE GENERAL REQUIREMENTS.
35. EXCESS GRANITE CURB DESIGNATED FOR REMOVAL SHALL BE DELIVERED TO THE DEPARTMENT OF PUBLIC WORKS YARD.

SEDIMENTATION & EROSION CONTROL NOTES:

1. SOIL AND EROSION CONTROLS SHALL BE PLACED PRIOR TO CONSTRUCTION ACTIVITIES. CONTRACTOR TO NOTIFY THE ENGINEER AND THE OWNER AT LEAST 48 HOURS PRIOR TO CONSTRUCTION ACTIVITIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL EROSION CONTROL MEASURES NECESSARY TO PREVENT OFF-SITE TRACKING OF EARTH, SEDIMENT AND DEBRIS.
3. EROSION CONTROL MEASURES SHALL BE INSPECTED AT A MINIMUM FREQUENCY OF ONCE EVERY WEEK, AND DURING AND AFTER EVERY RAIN EVENT GREATER THAN 0.5". ANY NECESSARY REPLACEMENT OR REPAIR SHALL BE PERFORMED PROMPTLY BY THE CONTRACTOR.
4. PROVIDE AND MAINTAIN SILT SACK INLET PROTECTION AT CATCH BASINS WITHIN THE PROJECT LIMIT OF WORK AND DOWNSTREAM OF THE LIMIT OF WORK. REMOVE SILT SACKS PRIOR TO LARGE STORM EVENT AND REPLACE SILT SACKS AT END OF STORM EVENT TO PREVENT FLOODING. CONTRACTOR IS RESPONSIBLE FOR REMOVING/REPLACING SILT SACKS DURING BOTH WORK AND NON-WORK HOURS.

LEGEND

UTILITY POLE WITH TRANSFORMER
UTILITY POLE WITH RISER
UTILITY POLE WITH RISER AND TRANSFORMER
UTILITY POLE WITH LIGHT AND TRANSFORMER
UTILITY POLE WITH LIGHT, TRANSFORMER, AND RISER
UTILITY POLE WITH LIGHT AND RISER
UTILITY POLE WITH LIGHT
UTILITY POLE
HANDHOLE
I-BEAM
TELEPHONE MANHOLE
RISER
MONITORING WELL
COLUMN
GROUND LIGHT
ELECTRIC BOX
FLAG POLE
MAILBOX
TREE
SHRUB
VALVE
CULVERT
WGS WATER GATE
HYDRANT
WATER SHUT OFF VALVE
CATCH BASIN
SEWER MANHOLE
DRAIN MANHOLE
ELECTRIC METER
NO LABEL MANHOLE
GAS VALVE
GAS METER
LIGHT POLE
PARKING METER
AIR CONDITIONER UNIT
SIGN
HANDICAPPED PARKING
ELECTRIC HANDHOLE
WHH WATER HANDHOLE
VGC VERTICAL GRANITE CURB
BIT. BITUMINOUS PAVEMENT
SBG SLOPED BITUMINOUS CURB
SGC SLOPED GRANITE CURB
RR SPK RAILROAD SPIKE
IRF IRON ROD FOUND
SB STONE BOUND FOUND
CB CONCRETE BOUND FOUND
SBDH STONE BOUND FOUND WITH DRILL HOLE
CBDH CONCRETE BOUND FOUND WITH DRILL HOLE
IPF IRON PIPE FOUND
DHF DRILL HOLE FOUND

ABUTTERS LOT LINE
PROPERTY LINE
EASEMENT
EDGE OF RIVER
WOOD FENCE
IRON FENCE
GUARDRAIL
WATER LINE
CABLE LINE
TELEPHONE LINE
ELECTRIC LINE
OVERHEAD WIRE
DRAIN LINE
SEWER LINE
GAS LINE
SEWER LINE CONDUIT
DRAIN LINE CONDUIT
PROPOSED DRAIN MANHOLE
PROPOSED CATCH BASIN
PROPOSED GATE VALVE
PROPOSED HYDRANT
PROPOSED CORPORATION STOP
PROPOSED CURB STOP
PROPOSED INSERTION VALVE
PROPOSED DRAIN LINE
LIMIT OF NEW PAVEMENT AND LIMIT OF WORK

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Andover, Massachusetts 01810
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COMMITMENT & INTEGRITY DRIVE RESULTS

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
No. 39960
PROFESSIONAL ENGINEER
11/2/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

GENERAL NOTES, LEGEND, AND KEY PLAN

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 2 OF 24

C-100

22x34 SHEET
1:1

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 6:20pm

22x34 SHEET
1:1

MATCHLINE TO SHEET C-201

MAP 32 LOT 27
NOW OR FORMERLY
ESTHER REALTY INC
S.E.D.R.D. BOOK 14511 PAGE 317

MAP 32 LOT 29
NOW OR FORMERLY
ESTHER REALTY INC
S.E.D.R.D. BOOK 14511 PAGE 317

MAP 32 LOT 30
NOW OR FORMERLY
ESTHER REALTY INC
S.E.D.R.D. BOOK 14511
PAGE 317

MAP 32 LOT 31
NOW OR FORMERLY
ESTHER REALTY INC
S.E.D.R.D. BOOK 14511 PAGE 317

JEFFERSON AVENUE

CANAL STREET

LORING AVENUE

CB
RIM=18.82
DEPTH=15.32
INV.1=15.77

DMH
RIM=19.47
INV.1=15.18
INV.2=15.03
INV.3=14.98
INV.4=15.01

CB
RIM=19.14
DEPTH=13.44
INV.1=15.29

DMH
RIM=19.10
INV.1=13.81
INV.2=14.71
INV.3=13.75
INV.4=14.69

CB
RIM=20.17
DEPTH=13.57
INV.1=15.62

CB
RIM=18.46
DEPTH=11.26
INV.1=14.91

CB
RIM=19.70
DEPTH=13.10
INV.1=15.15

ABANDON EXISTING 8" WATER MAIN

CUT AND CAP EXISTING 8" WATER MAIN CONNECTION TO EXISTING 6" WATER MAIN

PROVIDE FIRE SERVICE CONNECTION WITH GATE VALVE
L=20'

NOTE: CUT AND CAP EXISTING SERVICE CONNECTION TO EXISTING 8" WATER MAIN. REMOVE AND DISPOSE EXISTING VALVES. FIELD VERIFY SERVICE LATERAL PIPE LOCATION AND SIZE.

2" WATER SERVICE
L=20'
2" CURB STOP AND BOX
2" CORPORATION STOP AND SADDLE

NOTE: CUT AND CAP EXISTING SERVICE CONNECTION TO EXISTING 8" WATER MAIN. REMOVE AND DISPOSE EXISTING VALVES. FIELD VERIFY SERVICE LATERAL PIPE LOCATION AND SIZE.

REMOVE AND REPLACE EXISTING HYDRANT. NEW HYDRANT ASSEMBLY TO CONNECT TO EXISTING 12" WATER MAIN.

NOTE: CUT AND CAP EXISTING HYDRANT CONNECTION TO EXISTING 8" WATER MAIN

SMH 1449
RIM=16.97
INV.1=9.77
CAPPED
INV.2=9.47

CB
RIM=13.93
DEPTH=9.88
INV.1=10.23

TBM D
CHISEL "X" IN HYD
ELEVATION: 19.91'

SMH
RIM=17.41
INV.1=11.05
INV.2=10.86

CB
RIM=17.49
DEPTH=11.89
INV.1=14.68

DMH
RIM=18.21
INV.1=14.06
INV.2=13.06
INV.3=12.94

DMH
RIM=17.11
INV.1=11.36
INV.2=11.29

CB
RIM=13.97
DEPTH=8.37
INV.1=10.53

SMH
RIM=11.99
INV.1=1.79
INV.2=1.69

SMH
RIM=18.60
INV.1=10.71
INV.2=10.80

DMH
RIM=19.82
INV.1=15.43
INV.2=13.86
INV.3=14.15

MAP 32 LOT 22
NOW OR FORMERLY
MAGUIRE, MARILYN G
MAGUIRE, AMY JEAN
S.E.D.R.D.
BOOK 13197 PAGE 435

MAP 32 LOT 21
NOW OR FORMERLY
TOY, JOHN S
TOY, ROSEMARY
S.E.D.R.D.
BOOK 23134 PAGE 168

MAP 32 LOT 20
NOW OR FORMERLY
SALEM ST. COLLEGE ASSISTANT CORPORATION
S.E.D.R.D. BOOK 14102 PAGE 29

MAP 32 LOT 23
NOW OR FORMERLY
BECKER, MICHAEL
S.E.D.R.D. BOOK 24092 PAGE 477

32 LOT 24
FORMERLY
LI, FAIK
LI, ALBA
OK 22910 PAGE 2

MAP 32 LOT 65
NOW OR FORMERLY
CAPPPUCCIO, BERTHA L
S.E.D.R.D. BOOK 22924 PAGE 580

MAP 32 LOT 20
NOW OR FORMERLY
SALEM ST. COLLEGE
ASSISTANT CORPORATION
S.E.D.R.D. BOOK 14102 PAGE
29

NOTE: ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.

20' 0 20' 40'
BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 38860
PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

UTILITY IMPROVEMENT PLAN 1

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE,
SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 3 OF 24

C-200

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 5:16pm

22x34 SHEET
1:1

MATCHLINE TO SHEET C-200

MATCHLINE TO SHEET C-202

MAP 32 LOT 33
NOW OR FORMERLY
JEDS REALTY TRUST
BORNSTEIN, STEVEN M TR
290 CANAL STREET
S.E.D.R.D. BOOK 15004 PAGE 510
AREA = 0.353 ACRES

MAP 32 LOT 102
NOW OR FORMERLY
J A B TRUST
BERTINI, JOHN A TR
S.E.D.R.D. BOOK 8720 PAGE 485

MAP 32 LOT 37
NOW OR FORMERLY
ESTHER REALTY INC
282 CANAL STREET
S.E.D.R.D. BOOK 6409 PAGE 588
AREA = 0.363 ACRES

MAP 32 LOT 38
NOW OR FORMERLY
TWO HUNDRED SIXTY SIX CANAL STREET TRUST
BERTINI, JOHN A TR
BERTINI, FRANK C TR
BERTINI, ESTHER TR
266 CANAL STREET
S.E.D.R.D. BOOK 10716 PAGE 430
AREA = 3.040 ACRES

MAP 32 LOT 36
NOW OR FORMERLY
J A B TRUST
BERTINI, JOHN A TR
286 CANAL STREET
S.E.D.R.D. BOOK 8720 PAGE 485
AREA = 0.205 ACRES

MAP 23 LOT 144
NOW OR FORMERLY
ESTHER REALTY INC
282 REAR CANAL /
S.E.D.R.D.
BOOK 6409 PAGE 588
AREA = 9.350 ACRES

KIMBALL ROAD

CANAL STREET

1" WATER SERVICE
L=25'
1" CURB STOP AND BOX
1" CORPORATION STOP AND SADDLE

NOTE: CUT AND CAP EXISTING SERVICE CONNECTION TO EXISTING 8" WATER MAIN. REMOVE AND DISPOSE EXISTING VALVES. FIELD VERIFY SERVICE LATERAL PIPE LOCATION AND SIZE.

OPEN CUT REPAIR #1
(OCR #1)

EXISTING 8" WATER MAIN
TO BE ABANDONED

2" WATER SERVICE
L=20'
2" CURB STOP AND BOX
2" CORPORATION STOP AND SADDLE

NOTE: CUT AND CAP EXISTING SERVICE CONNECTION TO EXISTING 8" WATER MAIN. REMOVE AND DISPOSE EXISTING VALVES. FIELD VERIFY SERVICE LATERAL PIPE LOCATION AND SIZE.

OPEN CUT REPAIR #2
(OCR #2)

PROVIDE FIRE SERVICE CONNECTION WITH
GATE VALVE
L=30'

NOTE: CUT AND CAP EXISTING SERVICE CONNECTION TO EXISTING 8" WATER MAIN. REMOVE AND DISPOSE EXISTING VALVES. FIELD VERIFY SERVICE LATERAL PIPE LOCATION AND SIZE.

KIMBALL ROAD TIE-IN

12"x6" TAPPING SLEEVE AND GATE VALVE
5'-6" DI PIPE
6"-1/16 BEND
2'-6" DI PIPE
6" COUPLING ONTO EXISTING 6" WATER MAIN

NOTE: CUT AND CAP EXISTING 6" CONNECTION TO ABANDONED 8" MAIN

FUTURE HYDRANT SERVICE

12"x6" TAPPING SLEEVE AND GATE VALVE
10'-6" DI PIPE
6" CAP

NOTE: CAP AND PLUG 6" DI PIPE FOR FUTURE HYDRANT CONNECTION. RESTRAIN ASSEMBLY WITH THREAD RODS. GATE VALVE SHALL BE IN CLOSED POSITION.

2" WATER SERVICE
L=30'
2" CURB STOP AND BOX
2" CORPORATION STOP AND SADDLE

NOTE: CUT AND CAP EXISTING SERVICE CONNECTION TO EXISTING 8" WATER MAIN. REMOVE AND DISPOSE EXISTING VALVES. FIELD VERIFY SERVICE LATERAL PIPE LOCATION AND SIZE.

DMH
RIM= 9.15
INV.1=5.79
INV.2=5.85
INV.3=5.85

DMH (ABANDONED)
RIM= 8.53
INV.1=4.08
INV.2=4.30
INV.3=4.11
PIPES NOT VISIBLE
UNDER WATER AND DIRT

DMH
RIM= 9.48
DEPTH=4.03
INV.1=4.13
INV.2=4.33
INV.3=4.03
INV.4=4.68

CB
RIM=7.70
DEPTH=1.00
INV.1=4.95
INV.2=5.30
INV.3=5.32

CB
RIM= 7.77
DEPTH=0.37
INV.1=5.22
FILLED WITH WATER
INV.2=NOT VISIBLE
INV.3=NOT VISIBLE

DMH (ABANDONED)
RIM= 8.19
INV.1=3.59
INV.2=4.27
INV.3=3.69
INV.4=3.74

CB
RIM= 7.77
DEPTH=0.51
INV.1=4.42
INV.2=PIPE NOT VISIBLE

DMH
RIM= 9.29
DEPTH=3.89
INV.1=3.94
INV.2=4.84
INV.3=4.50
INV.4=4.84

DMH
RIM= 9.06
DEPTH=3.76
INV.1=3.81
INV.2=6.01
INV.3=3.76
INV.4=3.81

SMH 1328
RIM=10.68
INV.1=5.53
INV.2=5.60

SMH 1329
RIM=12.22
INV.1=5.[illegible]
INV.2=5.72
INV.3=5.70
INV.4=5.69
ROOF DRAIN

SMH 1448
RIM=13.79
INV.1=2.78
INV.2=2.47
INV.3=2.46
INV.4=5.04
ROOF DRAIN
INV.5=2.99
ROOF DRAIN

SMH 1327
RIM=13.42
INV.1=2.49
INV.2=4.07
INV.3=3.47

MAP 32 LOT 62
NOW OR FORMERLY
NORTH SHORE REALTY DEVELOPMENT LLC
S.E.D.R.D. BOOK 27260 PAGE 87

MAP 32 LOT 64
NOW OR FORMERLY
NORTH SHORE REALTY DEVELOPMENT LLC
S.E.D.R.D. BOOK 27260 PAGE 87

MAP 32 LOT 27
NOW OR FORMERLY
SALEM CITY OF
S.E.D.R.D. BOOK 13827 PAGE 596

Sewer Open Cut Repairs

OCR #	Start (From) MH	End (To) MH	Street	Cover	Pipe Dia. (in.)	Pipe Length	Pipe Material	Footage from start MH	Assumed Length of Repair
1	1329	1327	Canal St.	Street	8	102	VCP	80	6
2	1329	1328	Canal St.	Street	8	107	PVC	100	7

NOTES:
1. ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.
2. SEE TRENCH DETAIL ON SHEET C-300.

20' 0 20' 40'
BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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Andover, Massachusetts 01810
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COMMITMENT & INTEGRITY DRIVE RESULTS

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 39580
REGISTERED PROFESSIONAL ENGINEER
1/25/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/NCI CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/AB/GP

UTILITY IMPROVEMENT PLAN 2

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE,
SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 4 OF 24

C-201

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 5:17pm

22x34 SHEET
1:1

MATCHLINE TO SHEET C-201

MATCHLINE TO SHEET C-203

MAP 32 LOT 32
NOW OR FORMERLY
SALEM CITY OF
S.E.D.R.D. BOOK 13827 PAGE 596

36"RCP

MAP 32 LOT 40
NOW OR FORMERLY
GARDNER MATTRESS CORP
250 & 252 CANAL STREET
S.E.D.R.D. BOOK 23951 PAGE 484
AREA = 0.509 ACRES

MAP 32 LOT 39
NOW OR FORMERLY
GARDNER MATTRESS CORPORATION
S.E.D.R.D. BOOK 5737 PAGE 201

MAP 32 LOT 42
NOW OR FORMERLY
ABP REALTY TRUST
PELLETIER, DAVID TR
S.E.D.R.D. BOOK 14809 PAGE 185

MAP 32 LOT 43
NOW OR FORMERLY
SU, ANNA
90 BROADWAY
S.E.D.R.D. BOOK 15854 PAGE 605
AREA = 0.100 ACRES

MAP 32 LOT 44
NOW OR FORMERLY
SU, ANNA
88 BROADWAY
S.E.D.R.D.
BOOK 14319 PAGE 34
AREA = 0.072 ACRES

MAP 32 LOT 45
NOW OR FORMERLY
CORREA, WILMA
S.E.D.R.D. BOOK 28141 PAGE 501

MH
RIM=18.59
PAVED OVER

DMH
RIM=9.09
INV.1=6.74
NO PIPES VISIBLE
FILLED WITH DIRT

DMH
RIM=8.91
INV.1=5.91
NO PIPES VISIBLE
FILLED WITH DIRT

12"WATER (APPROX)

CANAL STREET

ROSE STREET

BROADWAY

16 4" BFD

6"GAS (BY OTHERS)

6"GAS (TO BE ABANDONED BY OTHERS)

2"WATER

10"CLAY

4"PVC

6"CLAY

6"WATER

12"WATER

CB
RIM=7.88
DEPTH=0.66
INV.1=4.51 UNKNOWN
INV.2=NOT VISIBLE

MAP 32 LOT 60
NOW OR FORMERLY
259 CANAL STREET TRUST
WILSON, LLOYD C TR
PRICE, JENNIFER TR
S.E.D.R.D. BOOK 20015 PAGE 207

MAP 32 LOT 61
NOW OR FORMERLY
LAM, QUANG TICH
LAM, DE S
S.E.D.R.D. BOOK 20143 PAGE 387

MAP 32 LOT 59
NOW OR FORMERLY
LIMA, PETRONIO
LIMA, GIOVANNA
S.E.D.R.D. BOOK 18865 PAGE 284

MAP 32 LOT 58
NOW OR FORMERLY
CORNELL REALTY TRUST
S.E.D.R.D. BOOK 26835 PAGE 136

SMH 1511
RIM=18.52
INV.1=9.80
INV.2=9.75
INV.3=13.37
INV.3=TOP OF PIPE

OPEN CUT REPAIR #3
(OCR #3)

SMH 1509
APPROX. LOCATION

MAP 32 LOT 74
NOW OR FORMERLY
CRUGER, CHRISTOPHER W
S.E.D.R.D. BOOK 14122 PAGE 259

Sewer Open Cut Repairs

OCR #	Start (From) MH	End (To) MH	Street	Cover	Pipe Dia. (in.)	Pipe Length	Pipe Material	Footage from start MH	Assumed Length of Repair
3	1511	1509	Broadway	Street	8	62	VCP	58	4

NOTES:
1. ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.
2. SEE TRENCH DETAIL ON SHEET C-300.

20' 0 20' 40'
BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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COMMITMENT & INTEGRITY DRIVE RESULTS

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 38560
PROFESSIONAL ENGINEER
1/25/13

REV	DATE	DESCRIPTION
	01-25-13	ISSUED FOR BID

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/NS
DRAWN BY: HCP/JB/GP

UTILITY IMPROVEMENT PLAN 3

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE,
SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 5 OF 24

C-202

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 5:17pm

22x34 SHEET
1:1

MATCHLINE TO SHEET C-202

MATCHLINE TO SHEET C-204

MAP 32 LOT 46
NOW OR FORMERLY
MCKAY, FLORENCE M
MCKAY, HERBERT L JR
230 CANAL STREET
S.E.D.R.D.
BOOK 5488 PAGE 526
AREA = 0.143 ACRES

MAP 32 LOT 423
NOW OR FORMERLY
MACKEY, ELAINE M
228 CANAL STREET
S.E.D.R.D.
BOOK 18787 PAGE 436
AREA = 0.125 ACRES

MAP 32 LOT 48
NOW OR FORMERLY
BELFIORE, COLLETTE
226 CANAL STREET
S.E.D.R.D. BOOK 18109 PAGE 552
AREA = 0.135 ACRES

MAP 32 LOT 48
NOW OR FORMERLY
GOYETTE, PAUL M
224 1/2 CANAL STREET
S.E.D.R.D. BOOK 18703 PAGE 175
AREA = 0.145 ACRES

MAP 32 LOT 49
NOW OR FORMERLY
KARPINSKI, DONNA R
224 CANAL STREET
S.E.D.R.D. BOOK 6777 PAGE 395
AREA = 0.098 ACRES

MAP 32 LOT 50
NOW OR FORMERLY
DIXEY, WILLIAM H
DIXEY, HELEN A
222 CANAL STREET
S.E.D.R.D. BOOK 9810 PAGE 564
AREA = 0.165 ACRES

MAP 32 LOT 51
NOW OR FORMERLY
VELOZ, JOSE C
VELOZ, FRANCISCA A
220 CANAL STREET
S.E.D.R.D. BOOK 17700 PAGE 147
AREA = 0.174 ACRES

MAP 32 LOT 52
NOW OR FORMERLY
OUELLETTE, RICHARD R
JACKEL, MICHELLE M
OUELLETTE, PAUL E
OUELLETTE, PHILIP G
218 CANAL STREET
S.E.D.R.D. BOOK 18412 PAGE 418
AREA = 0.259 ACRES

MAP 32 LOT 53
NOW OR FORMERLY
BEAUREGARD, DORIS A
BEAUREGARD, GEORGE A
216 CANAL STREET
S.E.D.R.D.
BOOK 3912 PAGE 384
AREA = 0.321 ACRES

MAP 32 LOT 54
NOW OR FORMERLY
EL ASHKAR, JILL F
EL ASHKAR, EMAD M
212 CANAL STREET
S.E.D.R.D. BOOK 19015 PAGE 3
AREA = 0.098 ACRES

CB-101
RIM=15.07
DEPTH=9.12
INV.1=11.12

CB-103
RIM=12.36
DEPTH=6.76
INV.1=9.11

TBM C
CHISEL "X" IN HYD
ELEVATION: 14.53'

SMH 1397
RIM=12.40
INV.1=4.49
INV.2=0.91
INV.3=1.00

CANAL STREET

8"GAS (TO BE ABANDONED BY OTHERS)
8"GAS
8"WATER
6"SEWER
8"CLAY
12"IRON
4" GAS
36"RCP
ABANDONED SEWER PIPE FILLED WITH CONCRETE

REMOVE AND REPLACE GATE VALVE
2-8" COUPLINGS
4'-8" DI PIPE
1-8" GATE VALVE AND BOX
4'-8" DI PIPE

OPEN CUT REPAIR #4
(OCR #4)

OPEN CUT REPAIR #5
(OCR #5)

CB-102
RIM=12.31
DEPTH=6.41
INV.1=8.31

DMH-101
RIM=12.78
INV.1=7.13
INV.2=7.75
INV.3=7.18
INV.4=7.75

BUS STOP
SHELTER

SMH
RIM=10.53
FILLED WITH DEBRIS

SMH 1398
RIM=16.01
COULD NOT OPEN

CB-100
RIM=15.17
DEPTH=12.37
INV.1=12.62
(TOP OF PIPE)

DMH-100
RIM=15.57
INV.1=10.67
INV.2=10.13
INV.3=10.88

MAP 32 LOT 124
NOW OR FORMERLY
DION, FRED
SALEM CITY OF
MASSACHUSETTS THE COMMONWEALTH OF
ALYCES HOME MADE ICE CREAM INC
S.E.D.R.D. BOOK 5574 PAGE 741

12"CLAY
18"RCP
18"CCP

CB
RIM= 6.92
DEPTH=1.32
INV.1=4.32
INV.2=4.22
INV.3=4.52

CB
RIM= 6.93
DEPTH=1.23
INV.1=4.13
INV.2=3.93

DMH
RIM= 6.98
INV.1=3.28
INV.2=3.48
INV.3=3.58

CB
RIM= 4.74
DEPTH=0.04
INV.1=1.94
INV.2=1.84

20' 0 20' 40'
BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

Sewer Open Cut Repairs

OCR #	Start (From) MH	End (To) MH	Street	Cover	Pipe Dia. (in.)	Pipe Length	Pipe Material	Footage from start MH	Assumed Length of Repair
4	1397	1398	Canal St.	Street	8	275	VCP	150	10
5	1397	1398	Canal St.	Street	8	275	VCP	80	4

NOTES:
1. ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.
2. SEE TRENCH DETAIL ON SHEET C-300.

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COMMITMENT & INTEGRITY DRIVE RESULTS

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 39850
REGISTERED PROFESSIONAL ENGINEER
1/25/13

REV.	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

UTILITY IMPROVEMENT PLAN 4

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE,
SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 6 OF 24

C-203

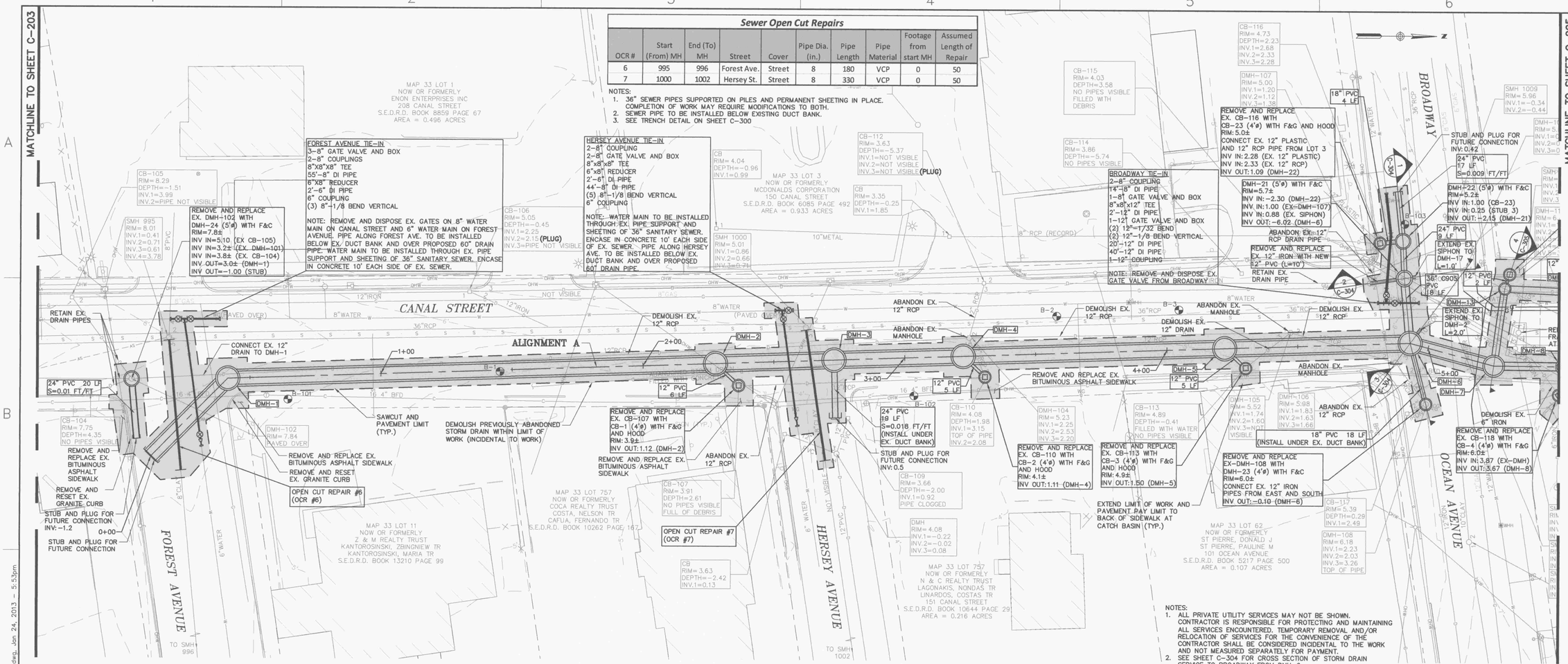
\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 5:17pm

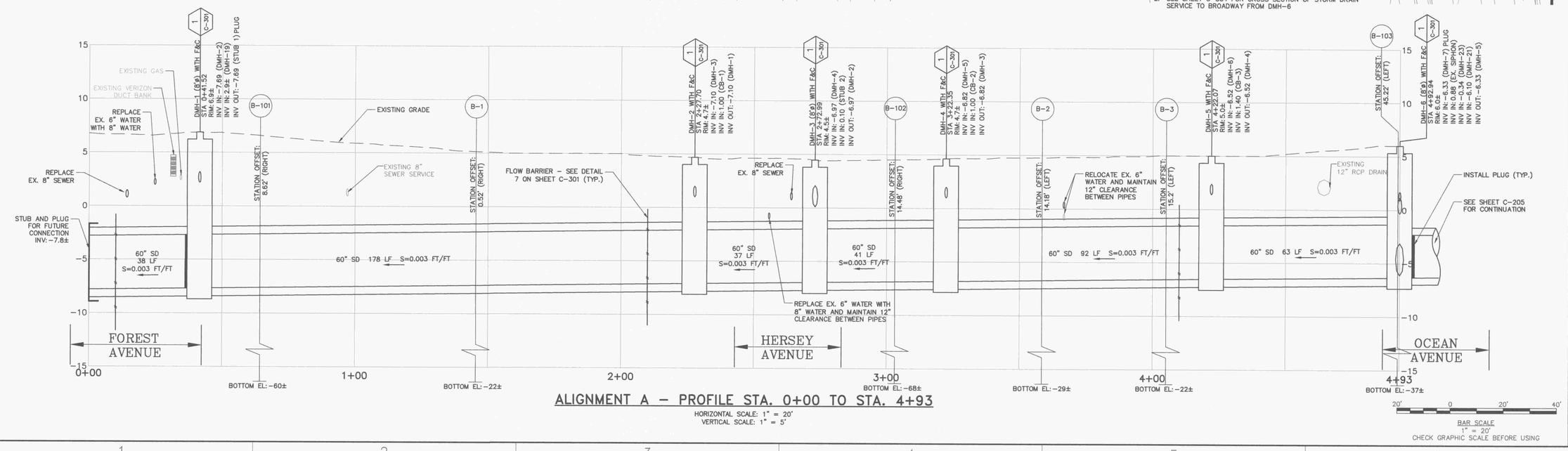
22x34 SHEET
1:1

Sewer Open Cut Repairs

OCR #	Start (From) MH	End (To) MH	Street	Cover	Pipe Dia. (in.)	Pipe Length	Pipe Material	Footage from start MH	Assumed Length of Repair
6	995	996	Forest Ave.	Street	8	180	VCP	0	50
7	1000	1002	Hersey St.	Street	8	330	VCP	0	50

NOTES:
1. 36" SEWER PIPES SUPPORTED ON PILES AND PERMANENT SHEETING IN PLACE. COMPLETION OF WORK MAY REQUIRE MODIFICATIONS TO BOTH.
2. SEWER PIPE TO BE INSTALLED BELOW EXISTING DUCT BANK.
3. SEE TRENCH DETAIL ON SHEET C-300





ALIGNMENT A – PROFILE STA. 0+00 TO STA. 4+93

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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Andover, Massachusetts 01810
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COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 38890
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MG CHECKED BY: DAW/RWS/NS
DRAWN BY: HCP/JB/GP

UTILITY IMPROVEMENT PLAN 5
DRAINAGE ALIGNMENT A
STA 0+00 TO 4+93

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 7 OF 24

C-204

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 5:53pm

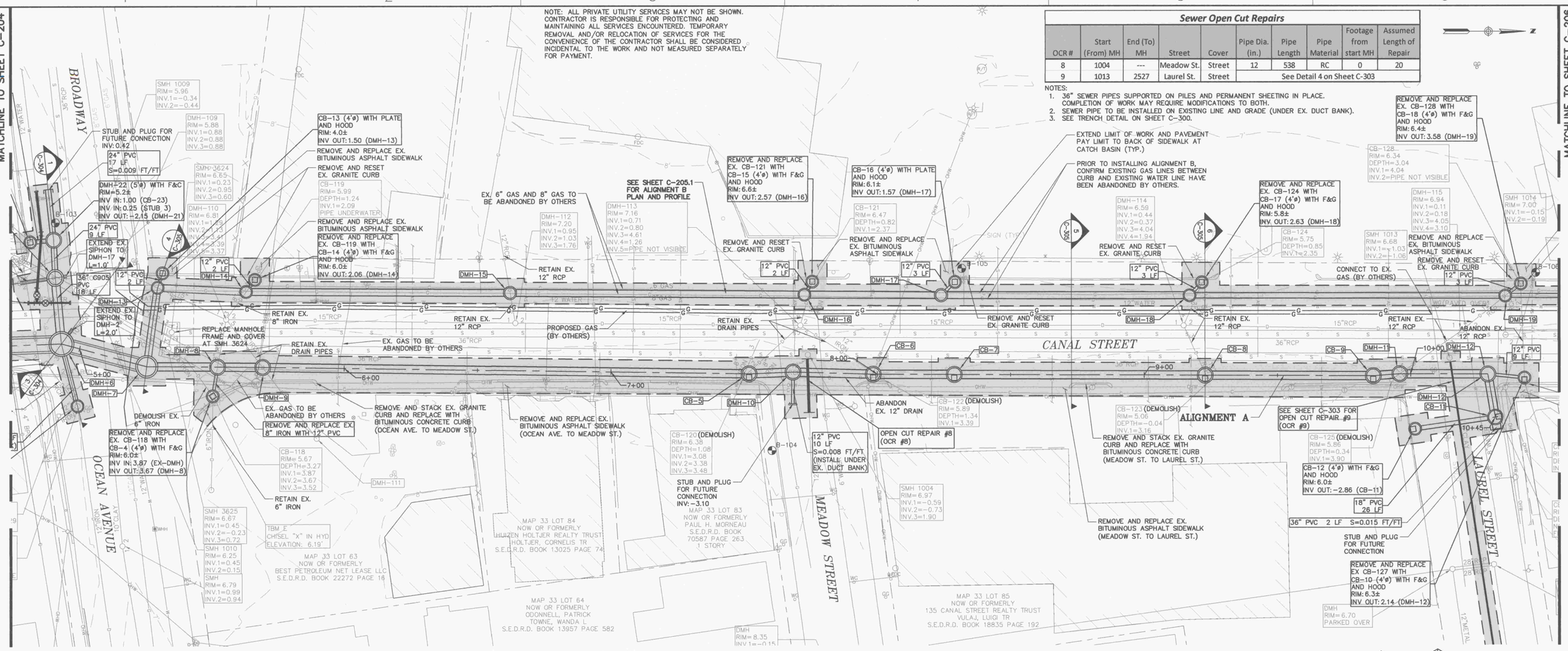
22x34 SHEET
1:1

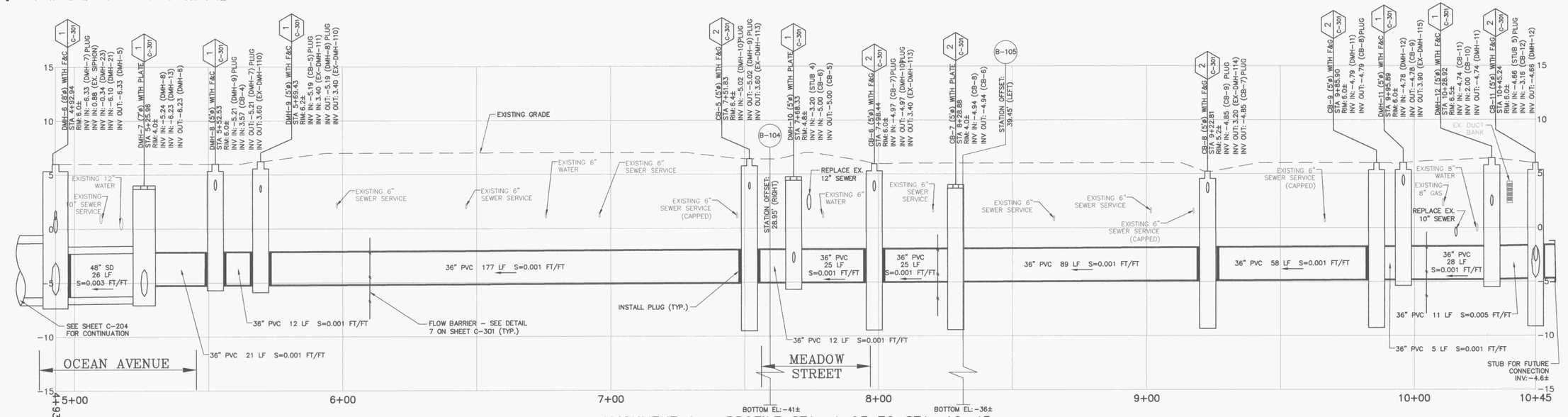
NOTE: ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.

Sewer Open Cut Repairs

OCR #	Start (From) MH	End (To) MH	Street	Cover	Pipe Dia. (in.)	Pipe Length	Pipe Material	Footage from start MH	Assumed Length of Repair
8	1004	---	Meadow St.	Street	12	538	RC	0	20
9	1013	2527	Laurel St.	Street	See Detail 4 on Sheet C-303				

NOTES:
1. 36" SEWER PIPES SUPPORTED ON PILES AND PERMANENT SHEETING IN PLACE. COMPLETION OF WORK MAY REQUIRE MODIFICATIONS TO BOTH.
2. SEWER PIPE TO BE INSTALLED ON EXISTING LINE AND GRADE (UNDER EX. DUCT BANK).
3. SEE TRENCH DETAIL ON SHEET C-300.





ALIGNMENT A – PROFILE STA. 4+93 TO STA. 10+45

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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Andover, Massachusetts 01810
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COMMONWEALTH OF MASSACHUSETTS DAVID A. WHITE CIVIL No. 39860 REGISTERED PROFESSIONAL ENGINEER
01-25-13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

UTILITY IMPROVEMENT PLAN 6
DRAINAGE ALIGNMENT A
STA 4+93 TO 10+45

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 8 OF 24

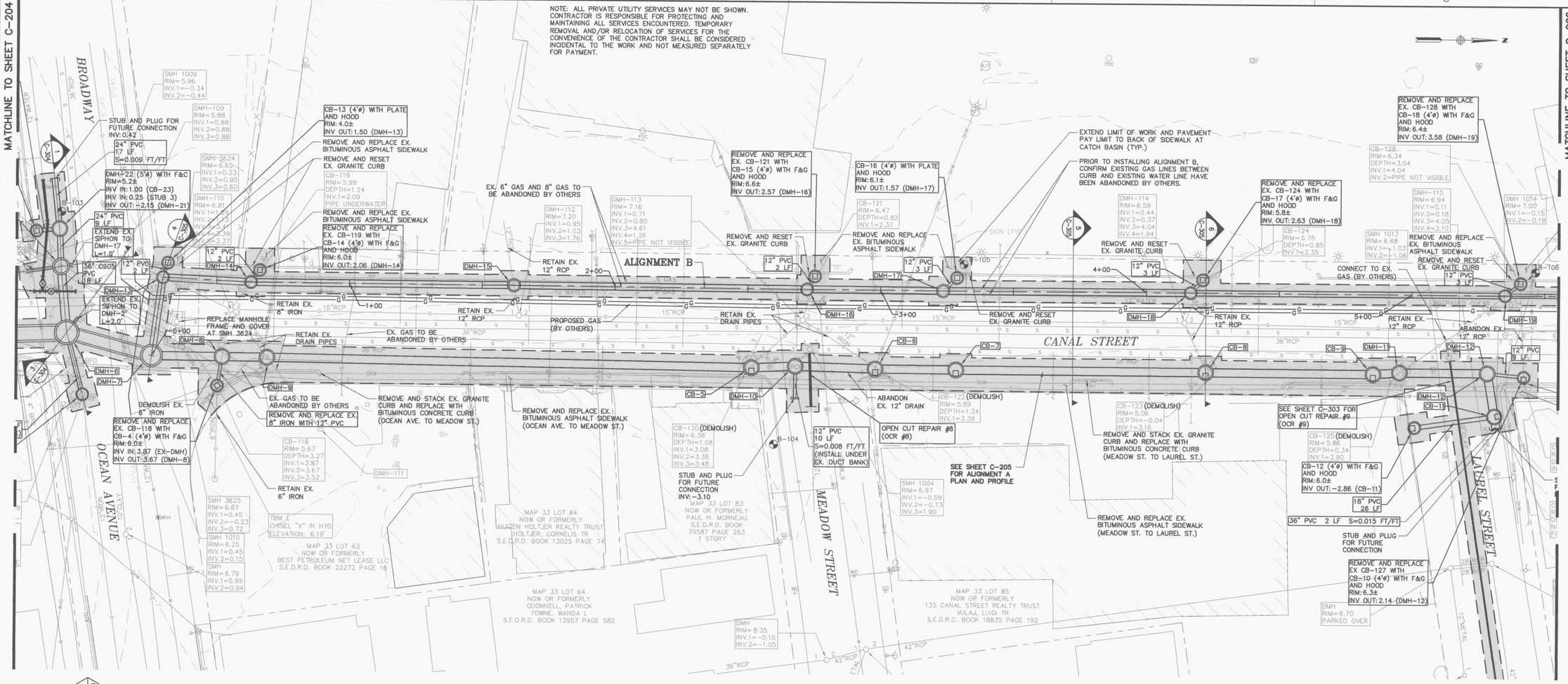
C-205

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 6:10pm

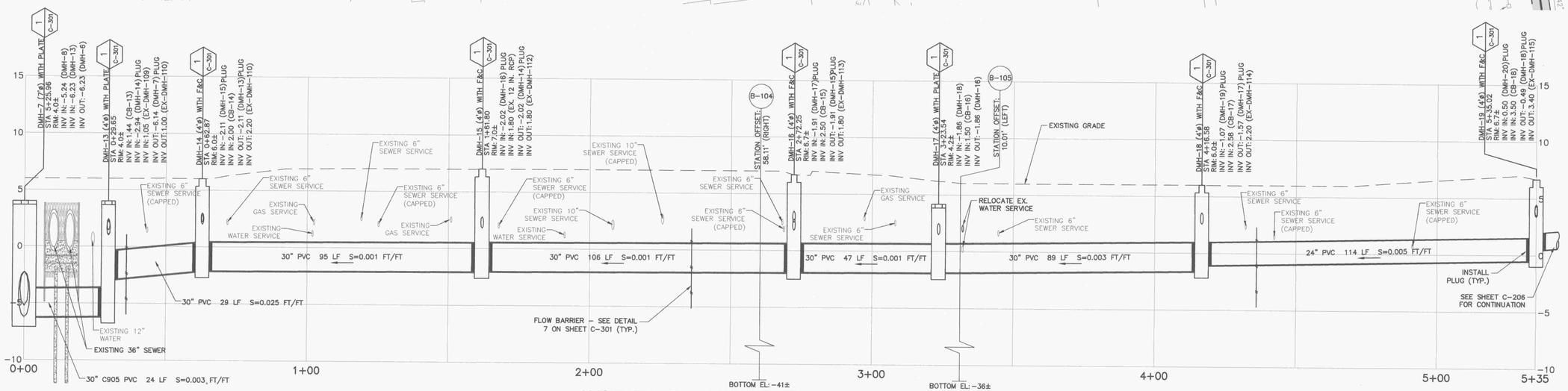
22x34 SHEET
1:1

MATCHLINE TO SHEET C-204

NOTE: ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.



MATCHLINE TO SHEET C-206



ALIGNMENT B - PROFILE STA. 0+00 TO STA. 5+35

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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Andover, Massachusetts 01810
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COMMITMENT & INTEGRITY DRIVE RESULTS
WOODARD & CURRAN

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 38860
REGISTERED PROFESSIONAL ENGINEER
1/25/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

UTILITY IMPROVEMENT PLAN 7
DRAINAGE ALIGNMENT B
STA 0+00 TO 5+35

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

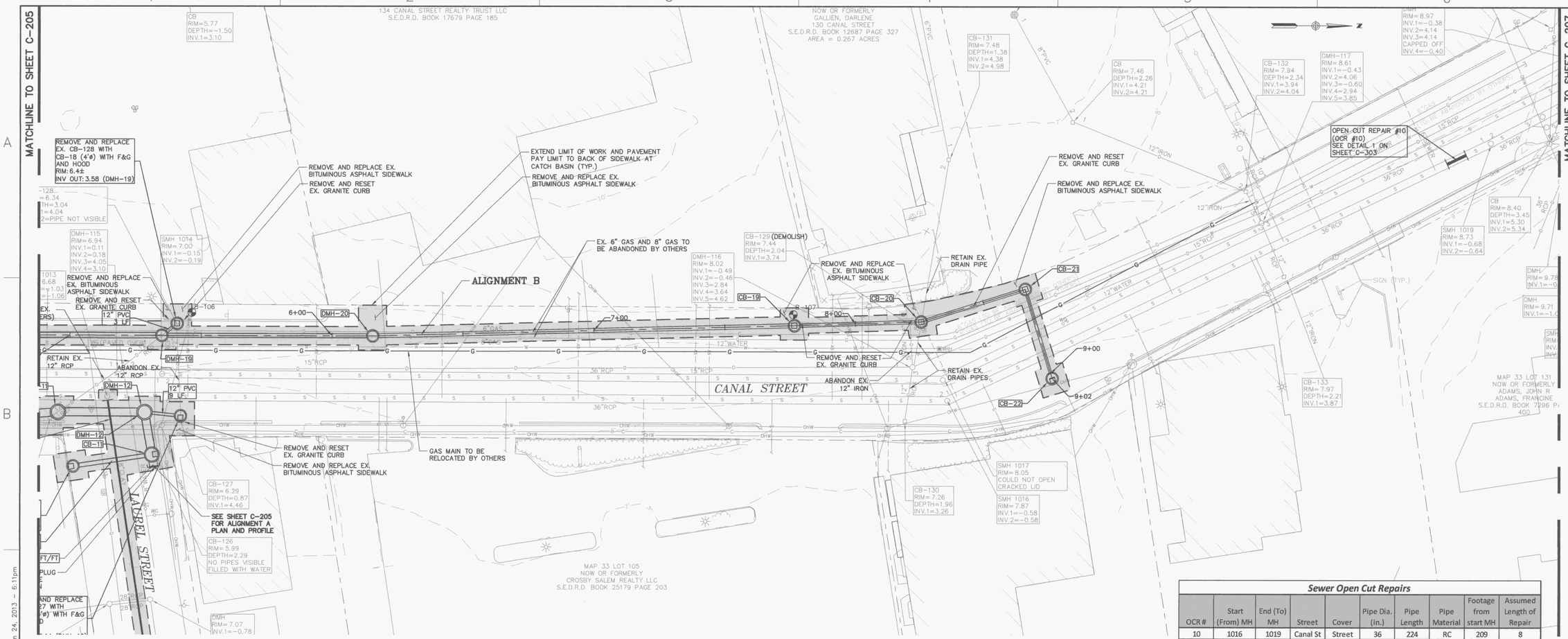
CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 9 OF 24

C-205.1

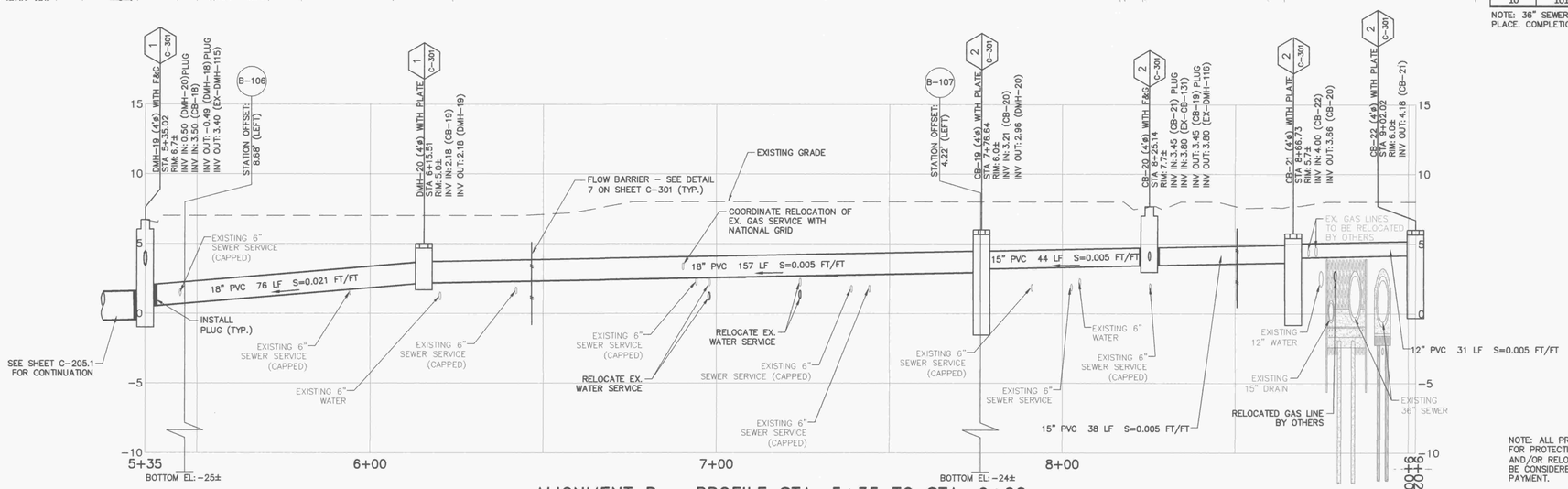
\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 6:19pm

22x34 SHEET
1:1



Sewer Open Cut Repairs									
OCR #	Start (From) MH	End (To) MH	Street	Cover	Pipe Dia. (in.)	Pipe Length	Pipe Material	Footage from start MH	Assumed Length of Repair
10	1016	1019	Canal St	Street	36	224	RC	209	8

NOTE: 36" SEWER PIPES SUPPORTED ON PILES AND PERMANENT SHEETING IN PLACE. COMPLETION OF WORK MAY REQUIRE MODIFICATIONS TO BOTH.



ALIGNMENT B – PROFILE STA. 5+35 TO STA. 9+02

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'

NOTE: ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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COMMITMENT & INTEGRITY DRIVE RESULTS

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 39880
REGISTERED PROFESSIONAL ENGINEER
1/25/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCF/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCF/JB/GP

UTILITY IMPROVEMENT PLAN & DRAINAGE ALIGNMENT B STA 5+35 TO 9+02

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 10 OF 24

C-206

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 6:11pm

22x34 SHEET
1:1

MATCHLINE TO SHEET C-206

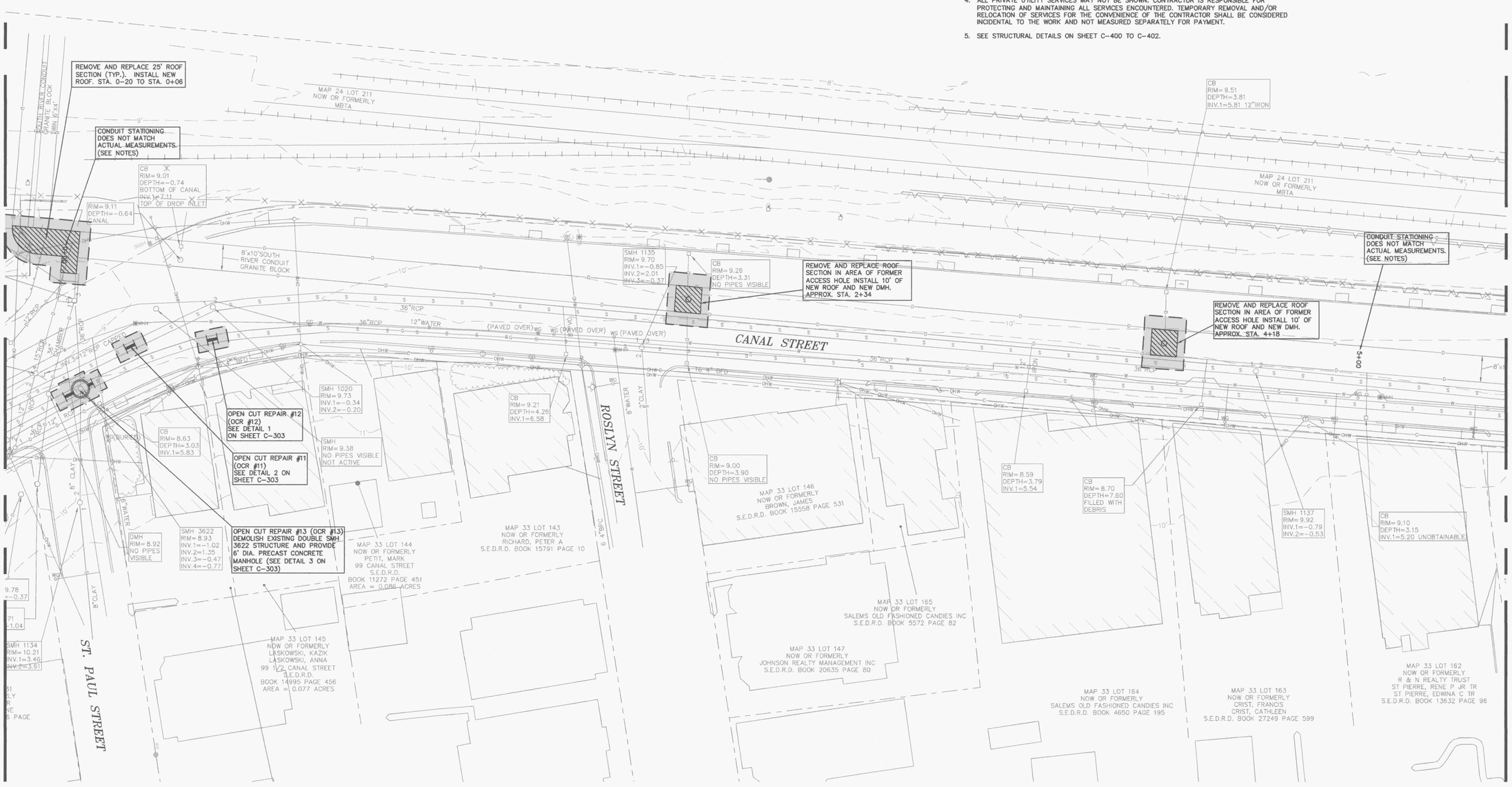
MATCHLINE TO SHEET C-208

Sewer Open Cut Repairs									
OCR #	Start (From) MH	End (To) MH	Street	Cover	Pipe Dia. (in.)	Pipe Length	Pipe Material	Footage from start MH	Assumed Length of Repair
11	1020	1017	Canal St.	Street	36	170	RC	32	4
12	3622	1135	Canal St.	Street	36	217	RC	51	4
13	SEE DETAIL ON SHEET C-303								

NOTE: 36" SEWER PIPES SUPPORTED ON PILES AND PERMANENT SHEETING IN PLACE. COMPLETION OF WORK MAY REQUIRE MODIFICATIONS TO BOTH.

NOTES:

1. LOCATION AND SHAPE OF SOUTH RIVER CONDUIT IS APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF ACTUAL FIELD CONDITIONS.
2. STATIONING INDICATED IS BASED ON STATIONING PAINTED ON THE WEST WALL INSIDE THE CONDUIT, AND IS APPROXIMATE ONLY. STATIONING IS PAINTED AT 10 FOOT INTERVALS AND INCLUDES DISCREPANCIES SUCH AS REPEATED STATIONS AT SOME LOCATIONS. STATIONING INDICATED DOES NOT ACCURATELY REFLECT DIMENSIONING ALONG THE ROADWAY SURFACE. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EACH REPAIR AREA WITH THE ENGINEER PRIOR TO COMMENCING WORK IN EACH AREA.
3. CONTRACTOR IS RESPONSIBLE FOR ALL LOCAL, STATE, AND FEDERAL APPLICABLE SAFETY REQUIREMENTS FOR ALL PARTIES WHEN ENTERING CONFINED SPACES DURING CONSTRUCTION.
4. ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.
5. SEE STRUCTURAL DETAILS ON SHEET C-400 TO C-402.



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COMMONWEALTH OF MASSACHUSETTS DAVID A. WHITE CIVIL No. 39880 REGISTERED PROFESSIONAL ENGINEER 01/25/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

UTILITY IMPROVEMENT PLAN 9

CITY OF SALEM, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 11 OF 24

C-207

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 5:19pm

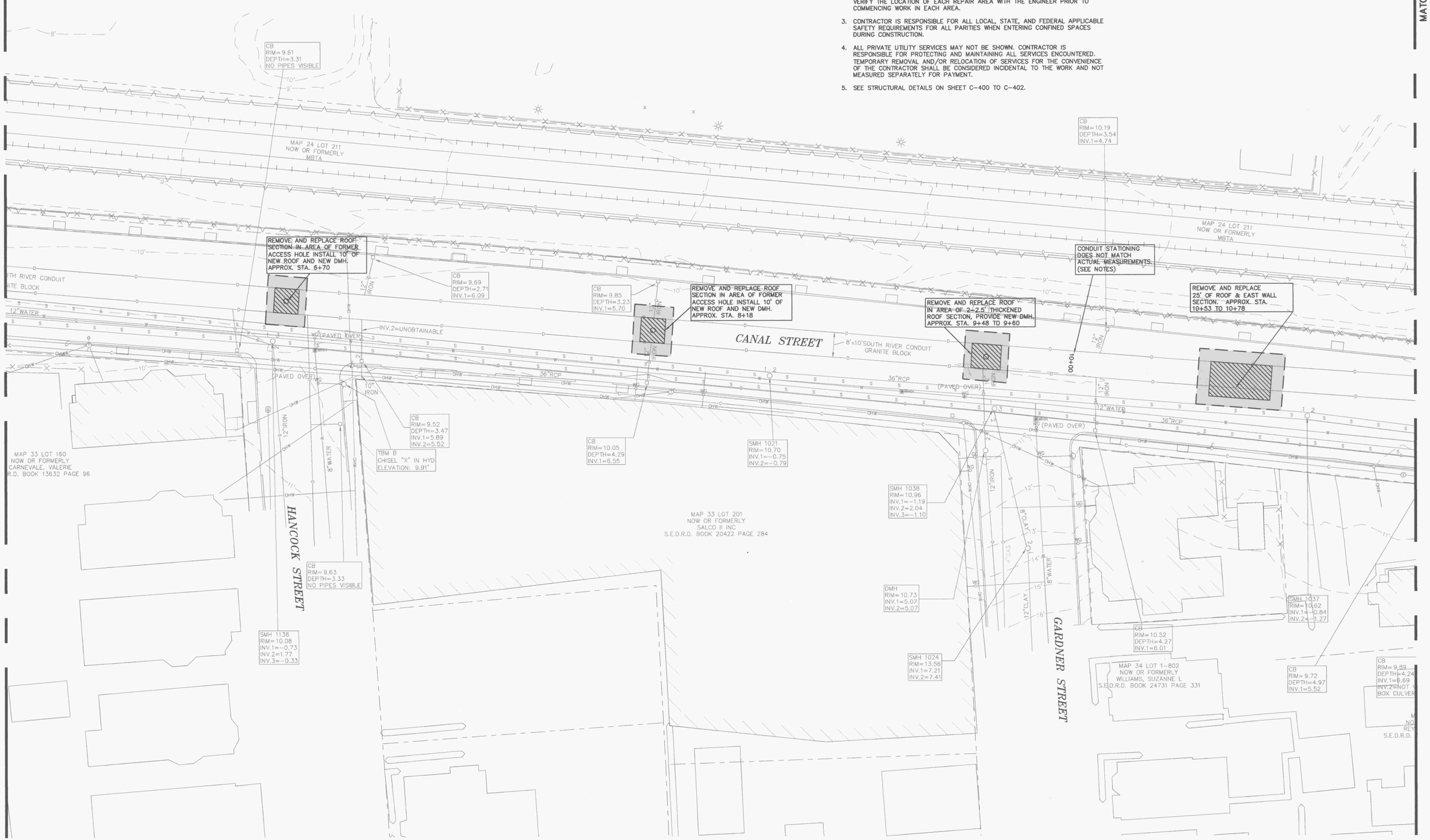
22x34 SHEET
1:1

MATCHLINE TO SHEET C-207

MATCHLINE TO SHEET C-209

NOTES:

1. LOCATION AND SHAPE OF SOUTH RIVER CONDUIT IS APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF ACTUAL FIELD CONDITIONS.
2. STATIONING INDICATED IS BASED ON STATIONING PAINTED ON THE WEST WALL INSIDE THE CONDUIT, AND IS APPROXIMATE ONLY. STATIONING IS PAINTED AT 10 FOOT INTERVALS AND INCLUDES DISCREPANCIES SUCH AS REPEATED STATIONS AT SOME LOCATIONS. STATIONING INDICATED DOES NOT ACCURATELY REFLECT DIMENSIONING ALONG THE ROADWAY SURFACE. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EACH REPAIR AREA WITH THE ENGINEER PRIOR TO COMMENCING WORK IN EACH AREA.
3. CONTRACTOR IS RESPONSIBLE FOR ALL LOCAL, STATE, AND FEDERAL APPLICABLE SAFETY REQUIREMENTS FOR ALL PARITIES WHEN ENTERING CONFINED SPACES DURING CONSTRUCTION.
4. ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.
5. SEE STRUCTURAL DETAILS ON SHEET C-400 TO C-402.



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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 38880
REGISTERED PROFESSIONAL ENGINEER
1/25/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/NS
DRAWN BY: HCP/AB/GP

UTILITY IMPROVEMENT PLAN 10

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE,
SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 12 OF 24

C-208

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 5:20pm

22x34 SHEET
1:1

MATCHLINE TO SHEET C-208

Sewer Open Cut Repairs

OCR #	Start (From) MH	End (To) MH	Street	Cover	Pipe Dia. (in.)	Pipe Length	Pipe Material	Footage from start MH	Assumed Length of Repair
14	1027	1026	Lyme St.		8	27	VCP	0	27
15	1031	1030	Cypress St.	Street	8	52	VCP	0	4

NOTES:
1. 36" SEWER PIPES SUPPORTED ON PILES AND PERMANENT SHEETING IN PLACE. COMPLETION OF WORK MAY REQUIRE MODIFICATIONS TO BOTH.
2. SEWER PIPE TO BE INSTALLED ON EXISTING LINE AND GRADE (UNDER EXISTING DUCT BANK AT OCR #14).
3. SEE TRENCH DETAIL ON SHEET C-300.

NOTES:
1. LOCATION AND SHAPE OF SOUTH RIVER CONDUIT IS APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF ACTUAL FIELD CONDITIONS.
2. STATIONING INDICATED IS BASED ON STATIONING PAINTED ON THE WEST WALL INSIDE THE CONDUIT, AND IS APPROXIMATE ONLY. STATIONING IS PAINTED AT 10 FOOT INTERVALS AND INCLUDES DISCREPANCIES SUCH AS REPEATED STATIONS AT SOME LOCATIONS. STATIONING INDICATED DOES NOT ACCURATELY REFLECT DIMENSIONING ALONG THE ROADWAY SURFACE. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EACH REPAIR AREA WITH THE ENGINEER PRIOR TO COMMENCING WORK IN EACH AREA.
3. CONTRACTOR IS RESPONSIBLE FOR ALL LOCAL, STATE, AND FEDERAL APPLICABLE SAFETY REQUIREMENTS FOR ALL PARTIES WHEN ENTERING CONFINED SPACES DURING CONSTRUCTION.
4. ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.
5. SEE STRUCTURAL DETAILS ON SHEET C-400 TO C-402.

MATCHLINE TO SHEET C-210

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COMMONWEALTH OF MASSACHUSETTS DAVID A. WHITE CIVIL No. 38693 PROFESSIONAL ENGINEER
01-25-13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC | CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/AB/GP

UTILITY IMPROVEMENT PLAN 11

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 13 OF 24

C-209

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 5:20pm

22x34 SHEET
1:1

MATCHLINE TO SHEET C-209

MATCHLINE TO SHEET C-211

Sewer Open Cut Repairs									
OCR #	Start (From) MH	End (To) MH	Street	Cover	Pipe Dia. (in.)	Pipe Length	Pipe Material	Footage from start MH	Assumed Length of Repair
16	3658	1303	Pond St.	Street	8	212	VCP	32	4

NOTES:
1. 36" SEWER PIPES SUPPORTED ON PILES AND PERMANENT SHEETING IN PLACE. COMPLETION OF WORK MAY REQUIRE MODIFICATIONS TO BOTH.
2. ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.
4. SEE TRENCH DETAIL ON SHEET C-300.

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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COMMITMENT & INTEGRITY DRIVE RESULTS

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 38880
REGISTERED PROFESSIONAL ENGINEER
1/25/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/NC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

UTILITY IMPROVEMENT PLAN 12

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE,
SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 14 OF 24

C-210

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 5:20pm

22x34 SHEET
1:1

MATCHLINE TO SHEET C-210

MAP 24 LOT 211
NOW OR FORMERLY
MBTA

DMH
RIM=12.26
INV.1=4.86
INV.2=PIPE NOT VISIBLE

DEPTH=4.81
INV.1=6.21 12"PVC

CB
RIM=13.27
DEPTH=8.17
INV.1=9.07

72"SOUTH RIVER CONDUIT C.I.P.C.P.
72"SOUTH RIVER CONDUIT C.I.P.C.P.

MAP 34 LOT 478
NOW OR FORMERLY
M D J REALTY TRUST
BARDARO, PAUL TR
S.E.D.R.D. BOOK 13604 PAGE 386

SMH
RIM=14.32
INV.1=-1.53
INV.2=-1.48
BOX CULVERT

SMH 2054
RIM=16.77
DEPTH=-3.33
NO PIPES
VISIBLE

CB
RIM=10.94
DEPTH=5.64
NO PIPES VISIBLE
FILLED WITH WATER

MAP 34 LOT 301
NOW OR FORMERLY
BRITO REALTY LLC
17 CANAL STREET
S.E.D.R.D. BOOK 14503 PAGE 89
AREA = 0.423 ACRES

CB
RIM=11.44
DEPTH=8.09
FILLED W/ DEBRIS
NO PIPES VISIBLE

DMH
RIM=11.97
INV.1=7.24
INV.2=7.71
INV.3=7.12

SMH
RIM=12.30
INV.1=8.80
INV.2=-0.97
INV.3=-1.01

SMH 3659
RIM=12.73
INV.1=-1.67
INV.2=-1.42

DMH
RIM=15.44
INV.1=8.54
INV.2=11.69
PIPE UNDER WATER

MAP 34 LOT 300
NOW OR FORMERLY
CONNERS, EDWARD WAYNE
S.E.D.R.D. BOOK 13619 PAGE 141

DMH
RIM=18.55
INV.1=14.58
INV.2=14.45

CANAL STREET

MILL STREET

WASHINGTON STREET

NLMH
RIM=11.58
INV.1=-.07
INV.2=0.3

NLMH
RIM=13.48
INV.1=0.53
INV.2=0.30

SMH
RIM=14.58
INV.1=-1.52
INV.2=-3.47
BOX CULVERT

RONALI
S.E.D.R

SMH 3621
RIM=17.28
INV.1=-0.72
INV.2=-1.02

MH
RIM=16.52
COULD NOT OPEN

SMH 2454
RIM=18.40
INV.1=-1.40
INV.2=-1.40

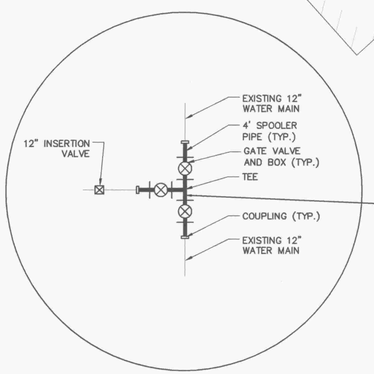
CB
RIM=15.85
DEPTH=9.10
INV.1=11.17

APPROXIMATE LOCATION OF EXISTING WATER MAIN TIE IN TO BE REMOVED AND REPLACED. SEE NOTE 1, THIS SHEET.

SEE INSET A

SMH 1307
RIM=19.09
INV.1=-1.19
INV.2=-1.36

SMH 1308
RIM=19.61
INV.1=1.71
INV.2=-1.24
INV.3=-1.30



INSET A
N.T.S.

MILL STREET TIE-IN

3-12" GATE VALVE AND BOX
1-12" INSERTION GATE VALVE AND BOX
3-12" COUPLINGS
12"x12"x12" TEE
12'-12" DI PIPE

NOTES:

1. CONTRACTOR TO CONDUCT TEST PITS TO CONFIRM LOCATION, SIZE, AND ORIENTATION OF EXISTING WATER MAINS. INCIDENTAL TO MILL STREET TIE-IN.
2. WATER MAINS ARE LOCATED APPROXIMATELY 10' BELOW EXISTING GROUND SURFACE.
3. PROVIDE EXTENSION FOR VALVE BOXES AND EXTEND STEMS BY FIELD MEASUREMENT TO DEPTH SUITABLE FOR OPENING/CLOSING VALVE WITH STANDARD WRENCH. SOLID SHAFT 5'-0" OR UNDER, HOLLOW SHAFT IF OVER 5'-0".
4. WATER MAIN FROM CANAL STREET TO BE ISOLATED FROM TIE-IN WITH INSERTION VALVE.
5. ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL AND/OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.
6. INSERTION VALVE TO BE INSTALLED AT LOCATION CONVENIENT TO CONTRACTOR TO MAINTAIN FLOWS.

20' 0 20' 40'
BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 39600
REGISTERED PROFESSIONAL ENGINEER

01-25-13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

UTILITY IMPROVEMENT PLAN 13

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

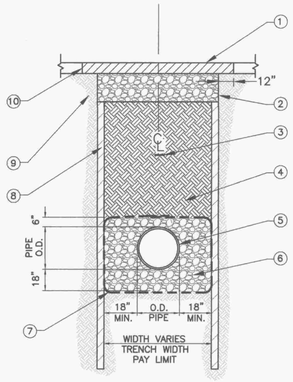
CANAL STREET DRAINAGE,
SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 15 OF 24

C-211

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Canal Street Site (2013.01.25).dwg, Jan 24, 2013 - 6:15pm

22x34 SHEET
1:1



1. SEE PAVEMENT DETAIL
2. EXCAVATION PAY LIMIT
3. WARNING TAPE CENTERED ON PIPE 18"–24" ABOVE PIPE
4. COMPACTED PIPE AND STRUCTURE BACKFILL MATERIAL
5. PIPE SIZES AS SHOWN ON PLANS
6. 3/4" COMPACTED CRUSHED STONE
7. STABILIZATION FABRIC (SEE NOTE 1)
8. SUPPORT OF EXCAVATION (CONTRACTOR DESIGNED)
9. EXISTING UNDISTURBED MATERIAL
10. SAWCUT AND TACK COAT (TYP.)

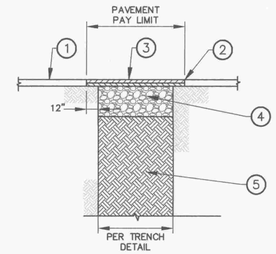
TRENCH WIDTHS (a)	
PIPE SIZE (INCHES)	MAX. (ONE PIPE) (b)
6"	4.0'
8"	4.0'
10"	4.0'
12"	4.0'
15"	4.0'
18"	5.0'
24"	5.5'
30"	6.0'
36"	7.0'
48"	8.0'
60"	10.0'

a. REPRESENTS TRENCH WIDTH PAY LIMIT
b. FOR ROCK EXCAVATION SUBTRACT 1'–0"

NOTES:

1. WRAP BEDDING IN STABILIZATION FABRIC. STABILIZATION FABRIC MAY BE OMITTED, AS DIRECTED BY ENGINEER, IN INSTANCE WHERE EXISTING SOILS AT THE TRENCH BOTTOM AND SIDEWALLS ARE SUITABLE GRANULAR MATERIAL.
2. MAINTAIN UNIFORM TRENCH WIDTH TO 6" ABOVE TOP OF PIPE.
3. BRACING AND SHEETING OR OTHER TRENCH PROTECTION TO BE PROVIDED TO MEET APPLICABLE O.S.H.A. SAFETY REGULATIONS. ALL SUCH TRENCH PROTECTION TO BE RESPONSIBILITY OF CONTRACTOR. CONTRACTOR TO PROVIDE SHOP DRAWINGS OF TRENCH SUPPORT SYSTEMS ENDORSED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MASSACHUSETTS.

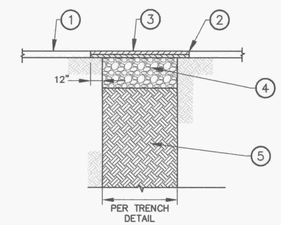
1 SEWER AND STORM DRAIN TRENCH DETAIL
N.T.S.



NOTES:

1. EXISTING PAVEMENT
2. SAWCUT, TACK COAT EDGES (TYP)
3. 4" BINDER COURSE (2–½" AND 1–½" LIFTS)
4. 6" GRAVEL BORROW
5. FINAL BACKFILL PER TRENCH

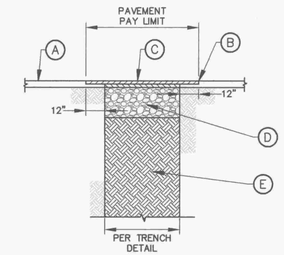
2 TYPICAL PAVEMENT DETAIL (EXCEPT FOR LAUREL ST.)
N.T.S.



TEMPORARY

NOTES:

1. EXISTING PAVEMENT
2. SAWCUT, TACK COAT EDGES (TYP)
3. 4" BINDER COURSE (2–½" AND 1–½" LIFTS)
4. 12" GRAVEL BORROW
5. FINAL BACKFILL PER TRENCH DETAIL

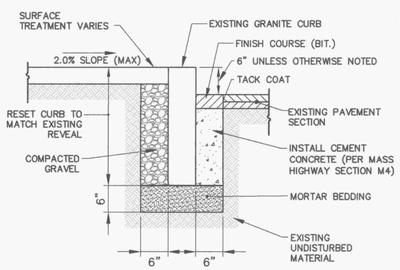


PERMANENT

NOTES:

A. EXISTING PAVEMENT
B. SAWCUT, TACK COAT EDGES (TYP) SEAL JOINTS BY INFRARED TECHNIQUES
C. 1 1/2" BIT. CONC. TOP COURSE 2 1/2" BIT. CONC. BINDER COURSE OR MATCH EXISTING PAVEMENT SECTION IF > 4".
D. 12" GRAVEL BORROW
E. FINAL BACKFILL PER TRENCH DETAIL

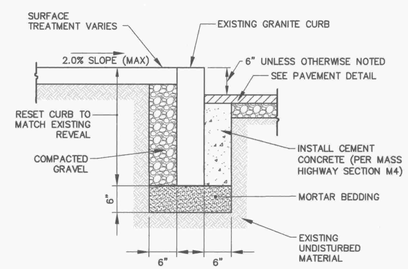
3 PAVEMENT DETAIL – LAUREL STREET
N.T.S.



NOTE:

1. THIS PROCEDURE IS APPLICABLE ONLY IF CURB IS TO BE SET AFTER BASE AND/OR BINDER ARE IN PLACE, OR SET IN EXISTING PAVEMENT.
2. SAWCUT NEAT LINE 6" FROM CURB LINE AND REMOVE BINDER, BASE AND GRAVEL, REPLACE WITH CEMENT CONCRETE.
3. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE MASS HIGHWAY STANDARD SPECIFICATIONS MAY BE USED; ALL TEST REQUIREMENTS ARE WAVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.
4. PAYMENT PER FOOT OF CURB IS INCLUSIVE OF ALL ITEMS OF WORK REQUIRED TO COMPLETE PROPER INSTALLATION OF THE CURB.

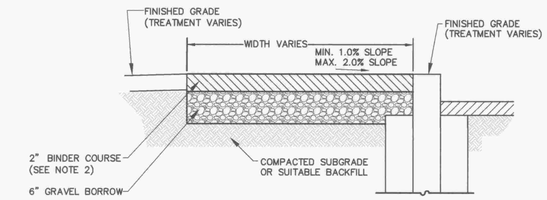
4 RESET EXISTING GRANITE CURB DETAIL (INSTALLATION IN EXISTING PAVEMENT)
N.T.S.



NOTE:

1. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE MASS HIGHWAY STANDARD SPECIFICATIONS MAY BE USED; ALL TEST REQUIREMENTS ARE WAVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.
2. PAYMENT PER FOOT OF CURB IS INCLUSIVE OF ALL ITEMS OF WORK REQUIRED TO COMPLETE PROPER INSTALLATION OF THE CURB.

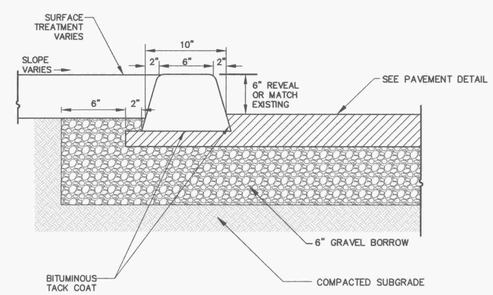
5 RESET EXISTING GRANITE CURB DETAIL (INSTALLATION IN NEW PAVEMENT)
N.T.S.



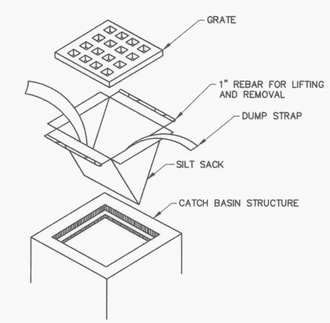
NOTES:

1. EXISTING GRAVEL SUB-BASE TO REMAIN IN AREAS WHERE NO TRENCHING IS PROPOSED.
2. PROVIDE (2) 2" LIFTS (4" TOTAL) AT DRIVEWAY ENTRANCES.

6 TYPICAL BITUMINOUS CONCRETE SIDEWALK DETAIL
N.T.S.



7 BITUMINOUS CURB
N.T.S.



NOTE:

1. INSTALL SILTSACK PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. EMPTY OR REMOVE SEDIMENT FROM SILTSACK WHEN RESTRAINT CORD IS NO LONGER VISIBLE. CLEAN, RINSE, AND REPLACE AS NEEDED.
2. SILT SACKS TO BE INSTALLED DURING CONSTRUCTION OPERATIONS.

8 SILT SACK INLET PROTECTION DETAIL
N.T.S.

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Andover, Massachusetts 01810
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COMMITMENT & INTEGRITY DRIVE RESULTS
WOODARD & CURRAN

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
No. 39890
PROFESSIONAL ENGINEER
1/25/13

REV.	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCF/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCF/JB/GP

SITE DETAILS 1

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 16 OF 24

C-300

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Details (2013.01.25).dwg, Jan 24, 2013 - 6:46pm

22x34 SHEET
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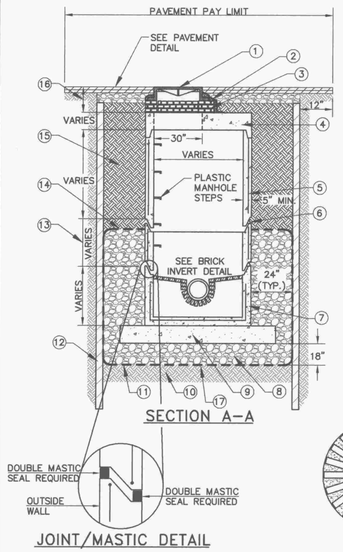
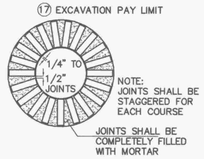


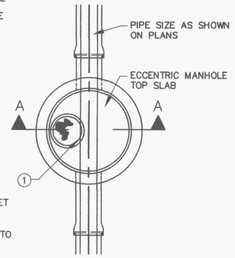
SECTION A–A

JOINT/MASTIC DETAIL

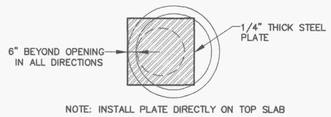
1. CAST IRON MANHOLE FRAME AND COVER OR ALTERNATE STEEL PLATE (AS SPECIFIED)
2. PORTLAND CEMENT MORTAR PARGING
3. ADJUST TO GRADE WITH BRICK
4. TOP SLAB
5. PRECAST REINFORCED CONCRETE MANHOLE TOP SECTION
6. PRE–MOLDED JOINT FILLER OR BIT. MASTIC SEAL
7. PRECAST CONCRETE BOTTOM SECTION WITH PIPE OPENINGS PROVIDED AS REQUIRED
8. COMPACTED 3/4" CRUSHED STONE
9. ANTI–FLOATATION SLAB
10. COMPACTED SUBGRADE OR SUITABLE BACKFILL
11. WRAP BEDDING IN STABILIZATION FABRIC. STABILIZATION FABRIC MAY BE OMITTED, AS DIRECTED BY ENGINEER, IN INSTANCE WHERE EXISTING SOILS AT THE TRENCH BOTTOM AND SIDEWALLS ARE SUITABLE GRANULAR MATERIAL.
12. SUPPORT EXCAVATION (CONTRACTOR DESIGNED)
13. PRECAST REINFORCED CONCRETE BARREL SECTION. MATCH 1'–" TO 4'–0" LENGTH TO MEET FIELD CONDITIONS
14. COMPACTED 3/4" CRUSHED STONE TO EXTEND TO 6" ABOVE TOP OF PIPE
15. COMPACTED PIPE AND STRUCTURE BACKFILL MATERIAL
16. 24" UNLESS OTHERWISE DIRECTED BY ENGINEER
17. EXCAVATION PAY LIMIT



BRICK JOINT DETAIL



PLAN

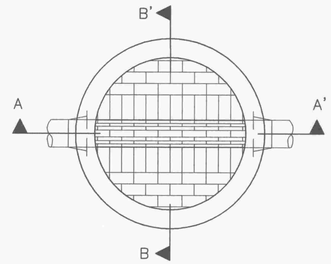


ALTERNATE STEEL PLATE

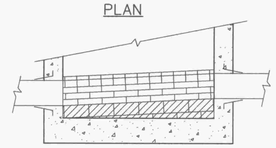
1 PRECAST CONCRETE MANHOLE
N.T.S.

EXCAVATION PAY LIMITS	
MANHOLE SIZE (FEET)	MAXIMUM
4'	8' X 8'
5'	9' X 9'
6'	10' X 10'
7'	11' X 11'
8'	12' X 12'

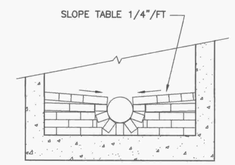
NOTES:
1. TOOL ALL JOINTS IN CHANNEL AND ON TABLES.
2. FILL UNDER TABLE WITH MORTAR–BEDDED BRICK.
3. SLOPE CHANNEL DOWN FROM INLET TO OUTLET.
4. MAKE CHANGES IN FLOW DIRECTION BY CIRCULAR CHANNEL CONSTRUCTION WITH MAXIMUM RADIUS POSSIBLE.
5. FOR DEAD–END MANHOLES, BUILD CHANNEL AS DIRECTED BY ENGINEER.
6. OMIT BRICK INVERT AT STRUCTURES WHERE PVC PLUG IS SPECIFIED.



PLAN

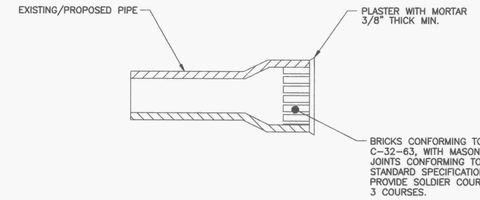


SECTION A–A'

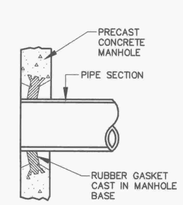


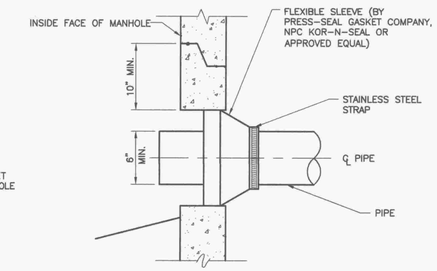
SECTION B–B'

BRICK INVERT

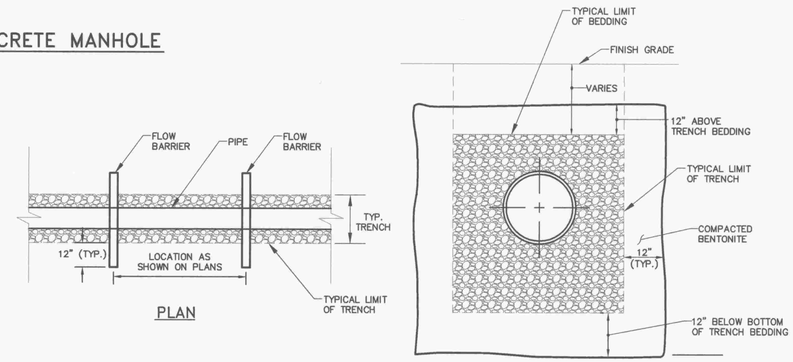


3 MASONRY PLUG DETAIL
N.T.S.





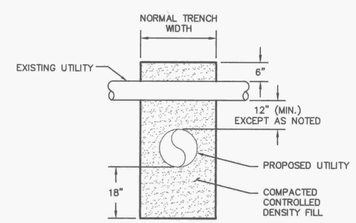
4 MANHOLE SEALS
N.T.S.



PLAN

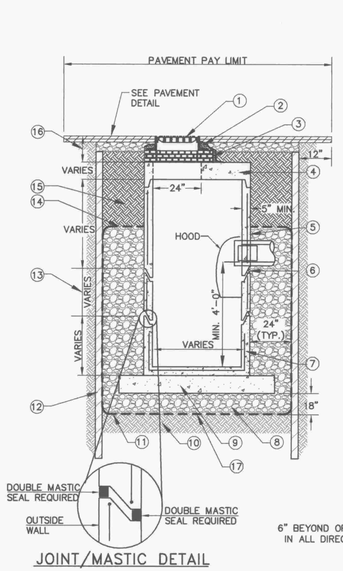
ELEVATION

7 FLOW BARRIER
N.T.S.



NOTE:
THIS DETAIL TYP. FOR ALL PIPE

5 UTILITY CROSSING DETAIL
N.T.S.



JOINT/MASTIC DETAIL

1. CAST IRON FRAME AND GRATE OR ALTERNATE STEEL PLATE (AS SPECIFIED)
2. PORTLAND CEMENT MORTAR PARGING
3. ADJUST TO GRADE WITH BRICK
4. TOP SLAB
5. PRECAST REINFORCED CONCRETE MANHOLE TOP SECTION
6. PRE–MOLDED JOINT FILLER OR BIT. MASTIC SEAL
7. PRECAST CONCRETE BOTTOM SECTION WITH PIPE OPENINGS PROVIDED AS REQUIRED
8. COMPACTED 3/4" CRUSHED STONE
9. ANTI–FLOATATION SLAB
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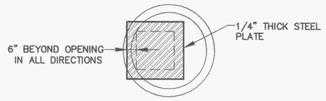
13. PRECAST REINFORCED CONCRETE BARREL SECTION. MATCH 1'–" TO 4'–0" LENGTH TO MEET FIELD CONDITIONS
14. COMPACTED 3/4" CRUSHED STONE TO EXTEND 6" ABOVE TOP OF PIPE
15. COMPACTED PIPE AND STRUCTURE BACKFILL MATERIAL
16. 24" UNLESS OTHERWISE DIRECTED BY ENGINEER
17. EXCAVATION PAY LIMIT

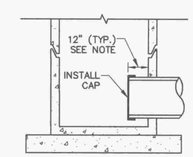


ALTERNATE STEEL PLATE

2 PRECAST CONCRETE CATCH BASIN
N.T.S.

GENERAL NOTES FOR MANHOLES AND CATCH BASINS

1. ALL CONCRETE SHALL BE CLASS "A" AND HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4000 PSI AT THE END OF 28 DAYS, UNLESS OTHERWISE NOTED.
2. CASTINGS SHALL CONFORM TO ASTM DESIGNATION A48–CLASS 35. ALL PARTS OF CASTINGS, EXCEPT FINISHED SURFACE, SHALL RECEIVE A COAT OF COAL TAR PITCH VARNISH OR ASPHALTUM PAINT WHICH SHALL BE SMOOTH AND TOUGH BUT NOT BRITTLE.
3. MANHOLES SHALL BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE.
4. PRECAST REINFORCED BARREL MANUFACTURED PER ASTM SPEC. C–478–67
5. CONTRACTOR SHALL SUBMIT ANTI–FLOATATION CALCULATIONS FOR ALL MANHOLE, CATCH BASIN, AND T–BASE STRUCTURES.
6. ALL PRECAST MANHOLES AND CATCH BASINS SHALL BE IDENTIFIED BY STATION, OFFSET, AND STRUCTURE ID PAINTED ON THE SIDE OF THE STRUCTURE BY THE MANUFACTURER.
7. STORM MANHOLES SHALL HAVE SOLID COVERS WITH ONE DRILLED PICK HOLE.
8. EXISTING MANHOLES, CATCH BASINS, FRAMES, AND COVERS SHALL BE SALVAGED BY THE CONTRACTOR, AND SHALL REMAIN THE PROPERTY OF THE CITY OF SALEM.
9. WHEN THE FLOW CHANGES DIRECTION IN A MANHOLE, THE CHANNEL ALIGNMENT SHALL FOLLOW A SMOOTH RADIUS. CHANNELS SHALL BE FORMED TO ACCEPT ALL INLET PIPES.
10. ON STORM DRAIN MANHOLES, THE SHELF AND CHANNEL SHALL BE FORMED BY BRICK SET IN CEMENT MORTAR OR BY FACTORY PRE–CAST CONCRETE. SUCH PRE–CAST CONCRETE SHALL BE EPOXY COATED AND THE SHELF SHALL HAVE A PERMANENT NON–SKID SURFACE.



NOTES:
1. EXTEND PIPE PAY LIMIT 12" BEYOND INSIDE WALL OF MANHOLE/CATCH BASIN AT LOCATIONS WHERE PLUG IS SPECIFIED.
2. OMIT BRICK INVERT AT STRUCTURES WHERE PVC PLUG IS SPECIFIED.

6 PVC PIPE PLUG DETAIL
N.T.S.

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COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 39890
REGISTERED PROFESSIONAL ENGINEER
1/25/13

REV.	DATE	DESCRIPTION
	01-25-13	ISSUED FOR BID

DESIGNED BY: HCP/SMK/MG CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

SITE DETAILS 2

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE,
SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 17 OF 24

C-301

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Details (2013.01.25).dwg, Jan 24, 2013 - 7:05pm

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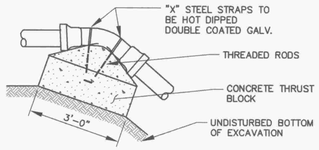
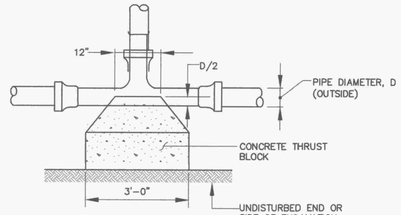
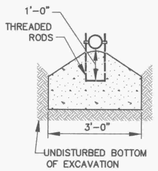


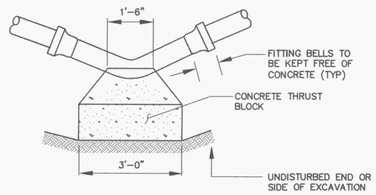
PLAN – VERTICAL BEND



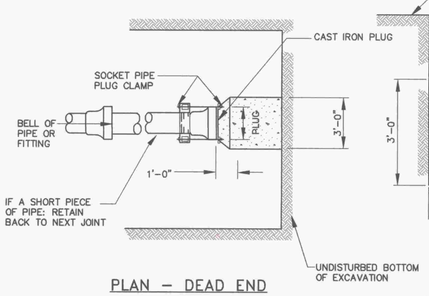
PLAN – TEE



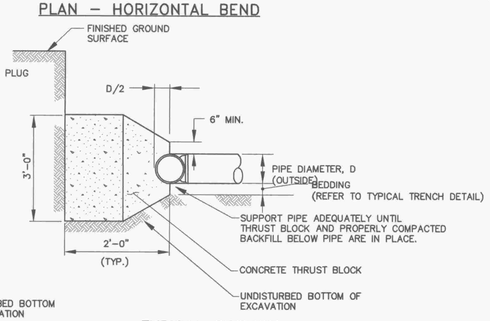
SECTION – VERTICAL BEND



PLAN – HORIZONTAL BEND



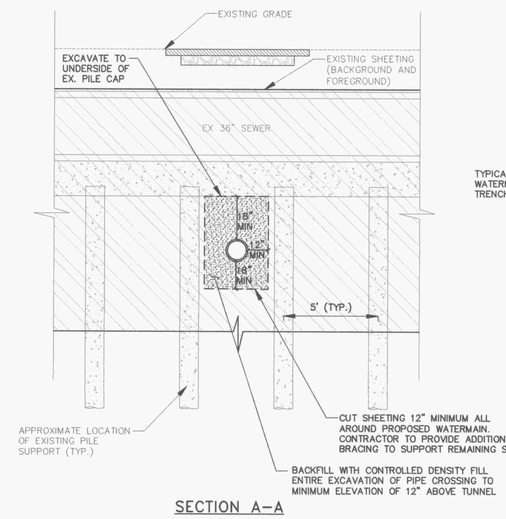
PLAN – DEAD END



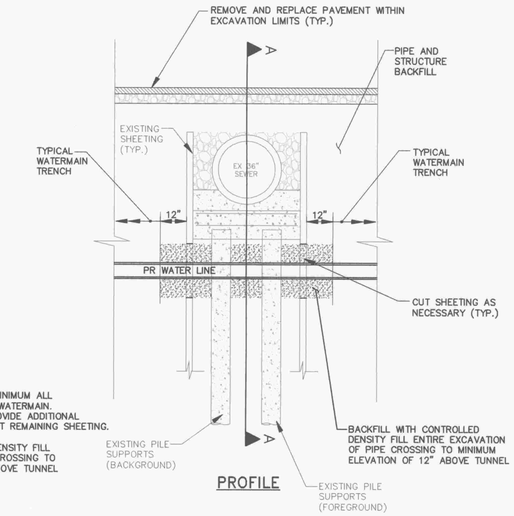
TYPICAL SECTION
(FOR TEES, BENDS AND DEAD ENDS)

NOTES:
1. ALL FITTINGS SHALL BE ANCHORED BY MECHANICAL MEANS OR BY CONCRETE THRUST BLOCKS, OR BOTH.
2. ALL EXPOSED METAL SHALL BE PAINTED OR COATED.
3. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRESS OF 3000 P.S.I. AT 28 DAYS.
4. THESE ARE TYPICAL THRUST BLOCK INSTALLATIONS. ACTUAL METHOD OF RESTRAINT MUST BE DETERMINED BY FIELD CONDITIONS. SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER.

1 – TYPICAL THRUST BLOCK
N.T.S.



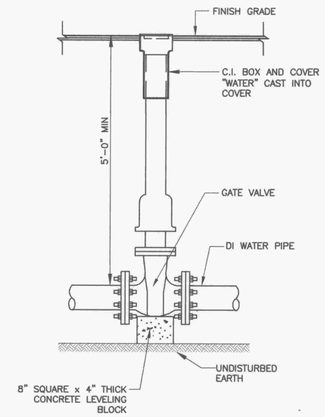
SECTION A–A



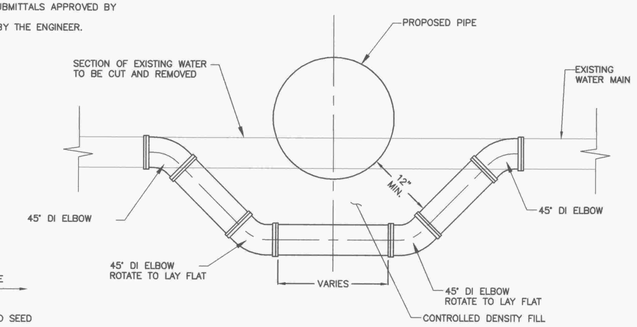
PROFILE

NOTES:
1. CONTRACTOR SHALL FIELD VERIFY AND DOCUMENT DIMENSIONS AND LOCATIONS OF EXISTING PILES AND RELATED FOUNDATION ELEMENTS SUPPORTING EXISTING UTILITIES AT PROPOSED CROSSING. NOTIFY ENGINEER OF ANY CONFLICTS WITH PROPOSED WORK.
2. PROVIDE FIELD VERIFICATION OF PILE FOUNDATION INFORMATION TO ENGINEER PRIOR TO REMOVAL OR DEMOLITION OF EXISTING FOUNDATIONS. RECEIVE APPROVAL FROM ENGINEER BEFORE PROCEEDING WITH INSTALLING TEMPORARY SUPPORT FACILITIES AND/OR EXISTING FOUNDATION ELEMENT REMOVAL.
3. CONTRACTOR SHALL PROVIDE ALL MEANS AND METHODS TO TEMPORARILY SUPPORT EXISTING UTILITIES DURING TUNNELING OPERATIONS.
4. EXCAVATE FOR PIPE ACCESS THROUGH SOILS.
5. INSTALL TUNNEL LINING AROUND PERIMETER OF EXCAVATED PIPE ACCESS IN ACCORDANCE WITH CONTRACTOR SUBMITTAL APPROVED BY ENGINEER.
6. REMOVE AND DEMOLISH SECTIONS OF PILES AND FOUNDATION ELEMENTS IN ACCORDANCE WITH SUBMITTALS APPROVED BY ENGINEER.
7. PROVIDE ADDITIONAL PERMANENT SEWER FOUNDATION SUPPORT WHERE REQUIRED AS APPROVED BY THE ENGINEER.

2 – WATERLINE CROSSING AT SEWER DETAIL
N.T.S.

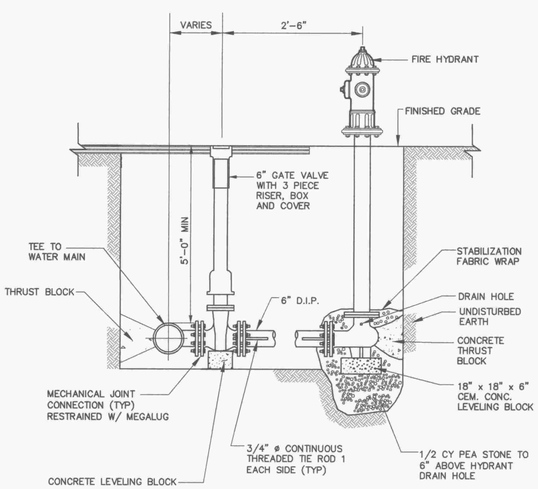


3 – GATE VALVE
N.T.S.

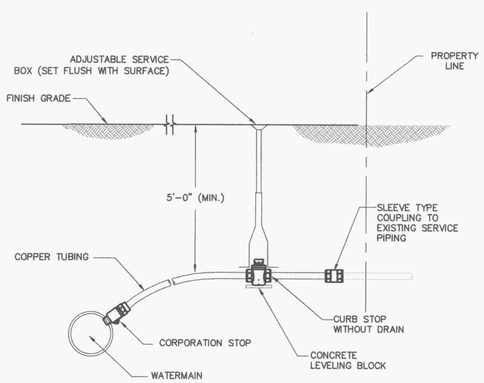


NOTE:
ALL FITTINGS SHALL BE RESTRAINED MECHANICAL JOINTS.

7 – WATER LINE CROSSING DETAIL
N.T.S.

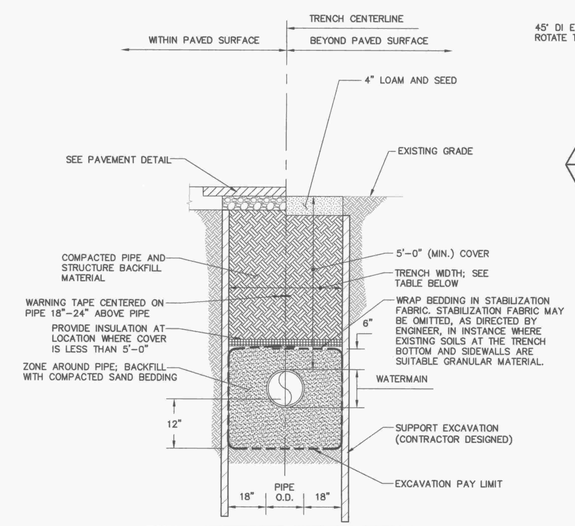


4 – FIRE HYDRANT CONNECTION
N.T.S.



NOTES:
1. ALL JOINTS SHALL BE COMPRESSION TYPE.
2. COPPER TUBING SHALL BE BACKFILLED WITH SAND BY HAND TO 6" ABOVE COPPER TUBING AT 98% COMPACTION.
3. CORPORATION STOP LARGER THAN ONE INCH SHALL HAVE A SADDLE.

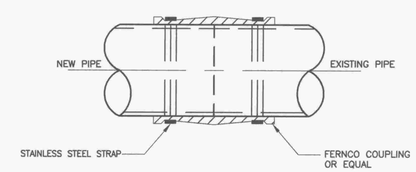
5 – WATER SERVICE CONNECTION
N.T.S.



TRENCH WIDTH TABLE(a)		
PIPE DIA.	12" & UNDER	16"
TRENCH WIDTH	4'-0"	4'-4"

(a) REPRESENTS TRENCH WIDTH PAY LIMIT

6 – WATERMAIN TRENCH
N.T.S.



8 – NEW PIPE TO EXISTING PIPE CONNECTION
N.T.S.

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 38860
PROFESSIONAL ENGINEER
1/25/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/AB/GP

SITE DETAILS 3

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 18 OF 24

C-302

\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Details (2013.01.25).dwg, Jan 24, 2013 - 6:33pm

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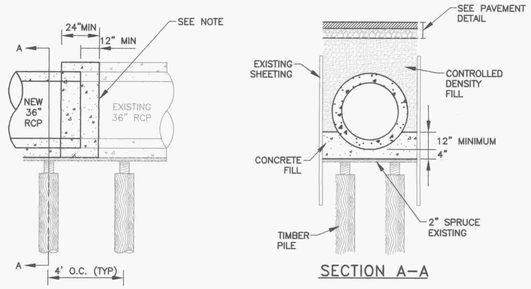


PROFILE

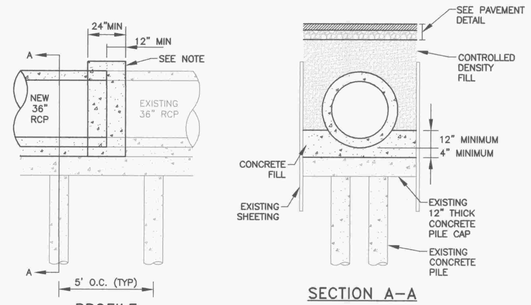
SECTION A–A

NOTES:

1. ENCAPSULATE 36" RCP WITH MIN 6" CONCRETE AROUND PIPE. MINIMUM 12" FROM PIPE JOINT.
2. REMOVE AND REPLACE CONCRETE FILL AROUND 36" CONCRETE PIPE TO EXISTING 2" SPRUCE.
3. CONTRACTOR TO FIELD VERIFY PRESENCE OF PILE CAP. IF PIPE IS EARTH SUPPORTED, INSTALL PIPE PER TRENCH DETAIL. CONNECTION TO EXISTING WORK AS SHOWN.

1 – OPEN CUT REPAIR #10 & #12

N.T.S.



PROFILE

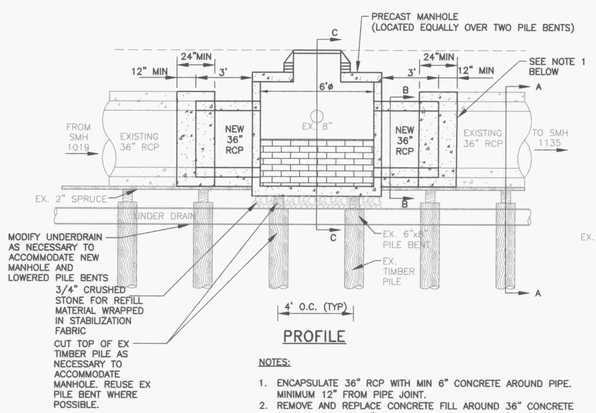
SECTION A–A

NOTES:

1. ENCAPSULATE 36" RCP WITH MIN 6" CONCRETE AROUND PIPE. MINIMUM 12" FROM PIPE JOINT.
2. REMOVE AND REPLACE CONCRETE FILL AROUND 36" CONCRETE PIPE TO EXISTING 12" THICK CONCRETE PILE CAP.
3. CONTRACTOR TO FIELD VERIFY PRESENCE OF PILE CAP. IF PIPE IS EARTH SUPPORTED, INSTALL PIPE PER TRENCH DETAIL. CONNECTION TO EXISTING WORK AS SHOWN.

2 – OPEN CUT REPAIR #11

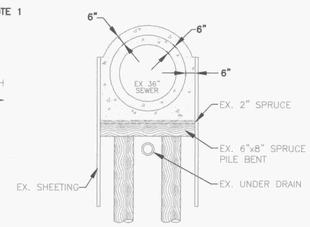
N.T.S.



PROFILE

NOTES:

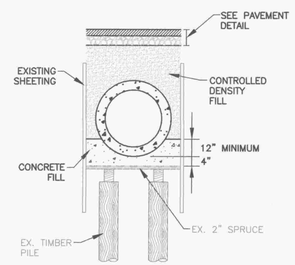
1. ENCAPSULATE 36" RCP WITH MIN 6" CONCRETE AROUND PIPE. MINIMUM 12" FROM PIPE JOINT.
2. REMOVE AND REPLACE CONCRETE FILL AROUND 36" CONCRETE PIPE TO EXISTING 2" SPRUCE.
3. CONTRACTOR TO FIELD VERIFY PRESENCE OF PILE CAP. IF PIPE IS EARTH SUPPORTED, INSTALL PIPE PER TRENCH DETAIL. CONNECTION TO EXISTING WORK AS SHOWN.



SECTION A–A

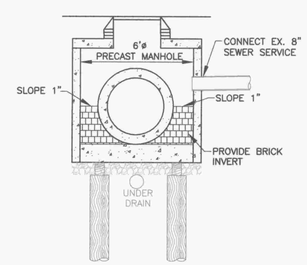
TYPICAL EXISTING PIPE ON TIMBER FOUNDATION

(SHOWN FOR REFERENCE, TAKEN FROM SEWERAGE IMPROVEMENTS PLANS BY CE MAGUIRE, INC DATED 1976)



SECTION B–B

TYPICAL PROPOSED PIPE ON TIMBER FOUNDATION



SECTION C–C

3 – OPEN CUT REPAIR #13

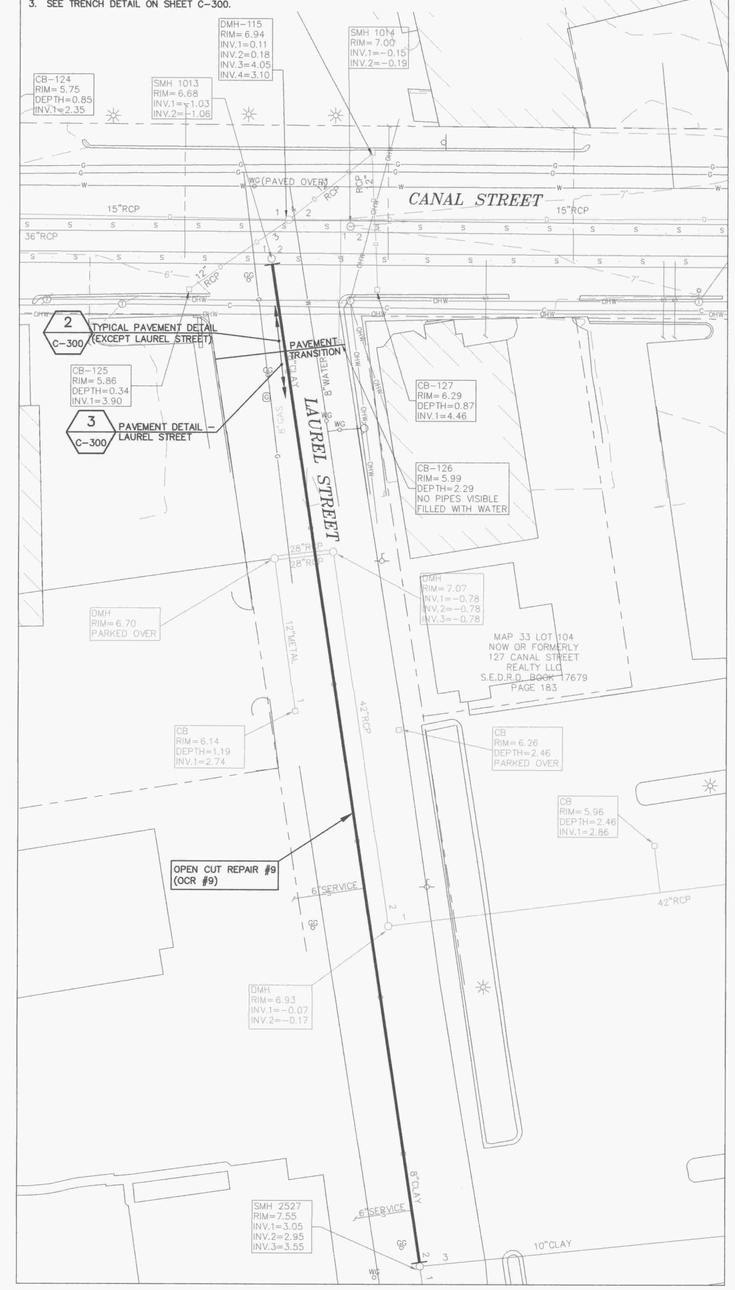
N.T.S.

Sewer Open Cut Repairs

OCR #	Start (From) MH	End (To) MH	Street	Cover	Pipe Dia. (in.)	Pipe Length	Pipe Material	Footage from start MH	Assumed Length of Repair
9	1013	2527	Laurel St.	Street	8	265	VCP	0	265

NOTES:

1. 36" SEWER PIPES SUPPORTED ON PILES AND PERMANENT SHEETING IN PLACE. COMPLETION OF WORK MAY REQUIRE MODIFICATIONS TO BOTH.
2. ALL PRIVATE UTILITY SERVICES MAY NOT BE SHOWN. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL SERVICES ENCOUNTERED. TEMPORARY REMOVAL OR RELOCATION OF SERVICES FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND NOT MEASURED SEPARATELY FOR PAYMENT.
3. SEE TRENCH DETAIL ON SHEET C–300.



4 – OPEN CUT REPAIR #9 – LAUREL STREET

SCALE: 1"=20'

20' 0 20' 40'

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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COMMITMENT & INTEGRITY DRIVE RESULTS

COMMONWEALTH OF MASSACHUSETTS DAVID A. WHITE CIVIL No. 40860 REGISTERED PROFESSIONAL ENGINEER 1-25-13

REV	DATE	DESCRIPTION
	01-25-13	ISSUED FOR BID

DESIGNED BY: HCP/SMK/MG CHECKED BY: DAW/RWS/MAS
DRAWN BY: HCP/JB/GP

SITE DETAILS 4

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

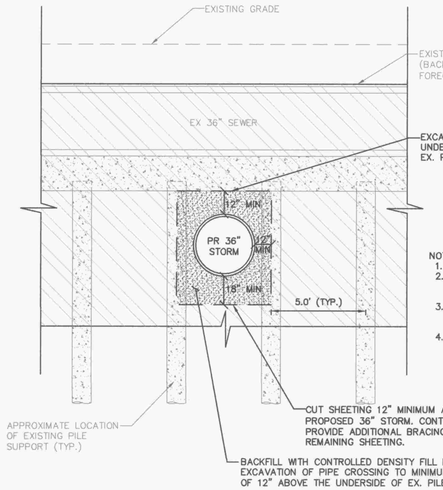
CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: AS SHOWN
SHEET: 19 OF 24

C-303

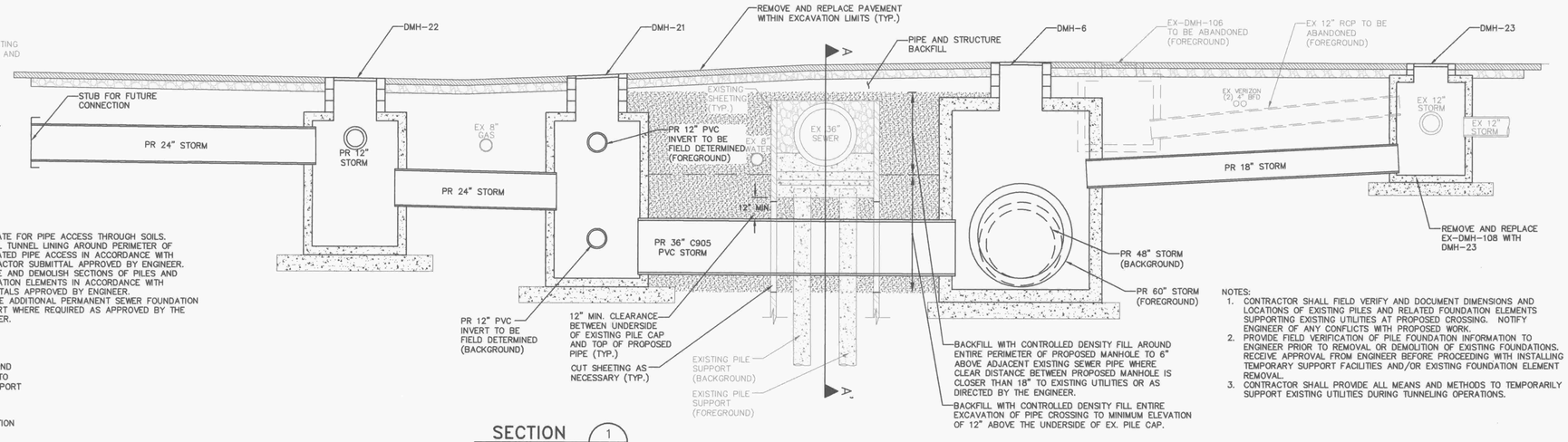
\\providence\Projects\224404 Salem MA - Canal Street Flood Mitigation\wip\Drawings\224404-Details (2013.01.25).dwg, Jan 24, 2013 - 7:09pm

22x34 SHEET
1:1



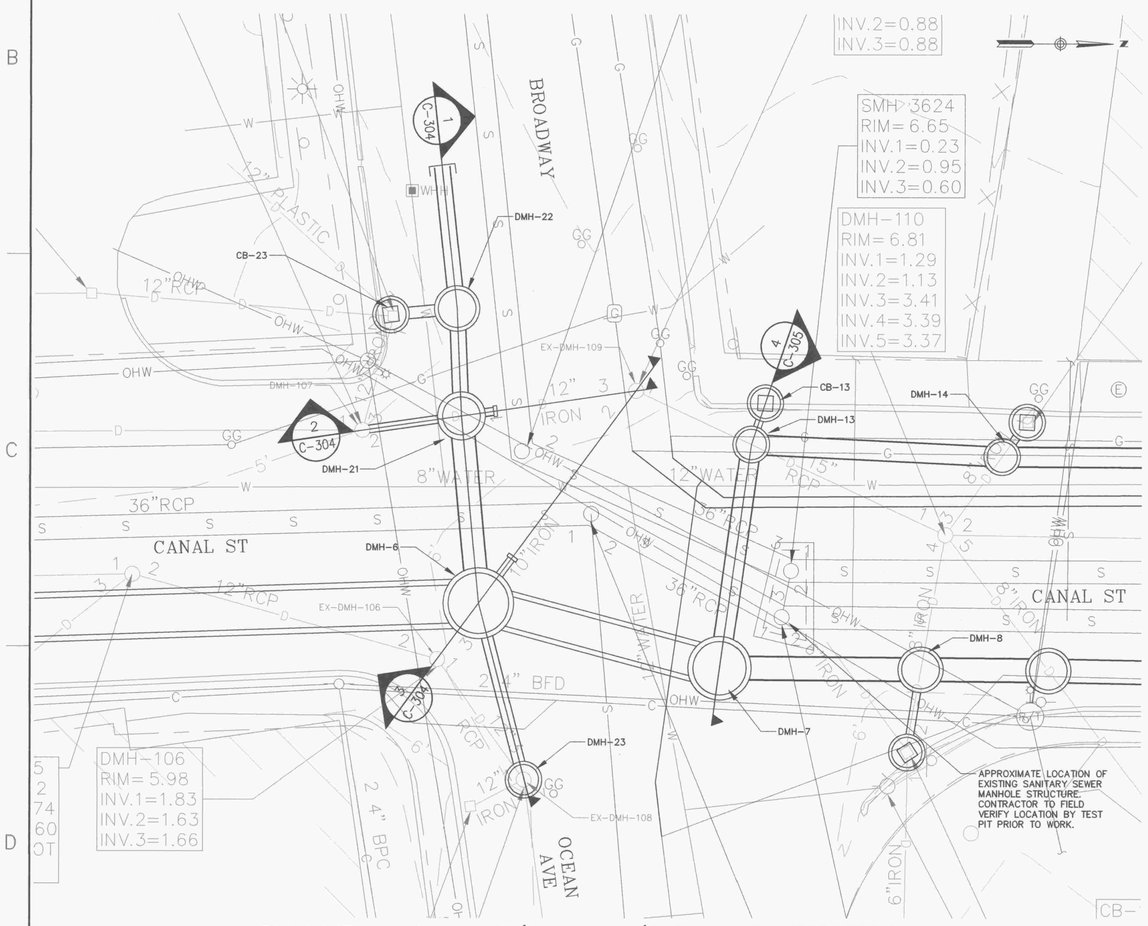
NOTES:
1. EXCAVATE FOR PIPE ACCESS THROUGH SOILS.
2. INSTALL TUNNEL LINING AROUND PERIMETER OF EXCAVATED PIPE ACCESS IN ACCORDANCE WITH CONTRACTOR SUBMITTAL APPROVED BY ENGINEER.
3. REMOVE AND DEMOLISH SECTIONS OF PILES AND FOUNDATION ELEMENTS IN ACCORDANCE WITH SUBMITTALS APPROVED BY ENGINEER.
4. PROVIDE ADDITIONAL PERMANENT SEWER FOUNDATION SUPPORT WHERE REQUIRED AS APPROVED BY THE ENGINEER.

SECTION A–A'



NOTES:
1. CONTRACTOR SHALL FIELD VERIFY AND DOCUMENT DIMENSIONS AND LOCATIONS OF EXISTING PILES AND RELATED FOUNDATION ELEMENTS SUPPORTING EXISTING UTILITIES AT PROPOSED CROSSING. NOTIFY ENGINEER OF ANY CONFLICTS WITH PROPOSED WORK.
2. PROVIDE FIELD VERIFICATION OF PILE FOUNDATION INFORMATION TO ENGINEER PRIOR TO REMOVAL OR DEMOLITION OF EXISTING FOUNDATIONS. RECEIVE APPROVAL FROM ENGINEER BEFORE PROCEEDING WITH INSTALLING TEMPORARY SUPPORT FACILITIES AND/OR EXISTING FOUNDATION ELEMENT REMOVAL.
3. CONTRACTOR SHALL PROVIDE ALL MEANS AND METHODS TO TEMPORARILY SUPPORT EXISTING UTILITIES DURING TUNNELING OPERATIONS.

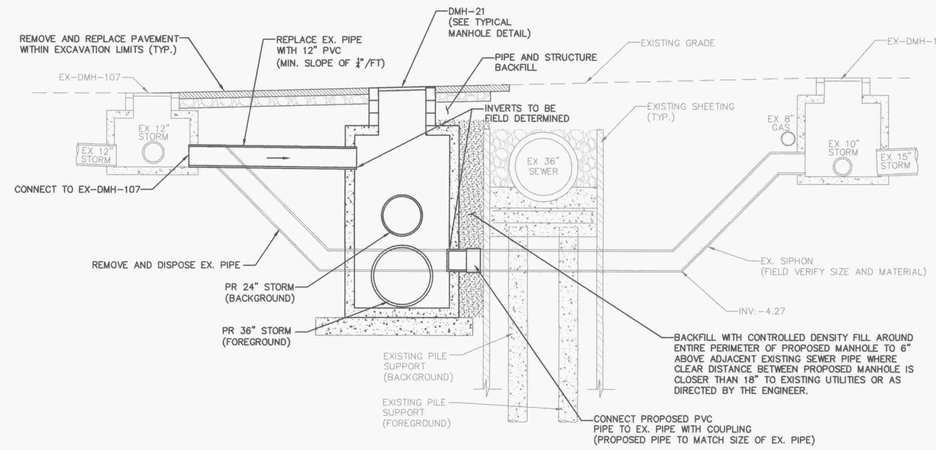
SECTION 1
SCALE: 1"=4'



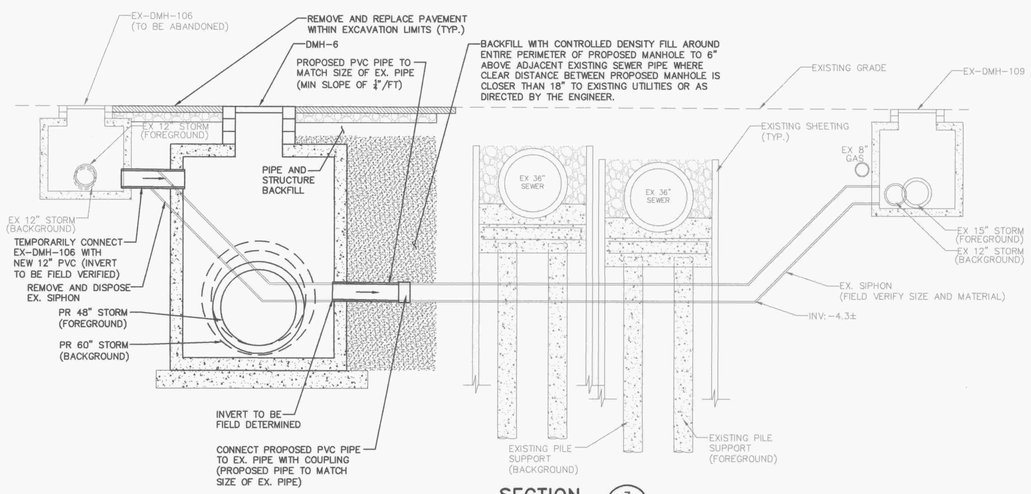
PLAN VIEW – CANAL ST/BROADWAY/OCEAN AVE INTERSECTION
SCALE: 1"=10'

10' 0 10' 20'
BAR SCALE
1" = 10'
CHECK GRAPHIC SCALE BEFORE USING

NOTES:
1. CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXISTING SANITARY SEWER(S) AND DRAIN PIPES PRIOR TO INSTALLATION OF PROPOSED IMPROVEMENTS.
2. CONTRACTOR SHALL PROVIDE ALL SHORING AND BRACING NECESSARY TO ADEQUATELY PROTECT EXISTING UTILITIES.
3. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AND LOCATIONS OF ALL PILES AT PROPOSED CROSSING. NOTIFY ENGINEER OF ANY CONFLICTS WITH PROPOSED WORK.



SECTION 2
SCALE: 1"=4'



SECTION 3
SCALE: 1"=4'

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
No. 39880
REGISTERED PROFESSIONAL ENGINEER
1/25/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

CROSS SECTIONS 1

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

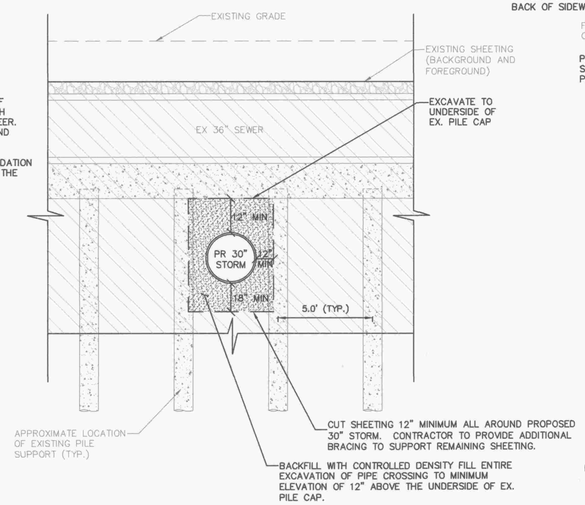
CANAL STREET DRAINAGE,
SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: AS SHOWN
SHEET: 20 OF 24

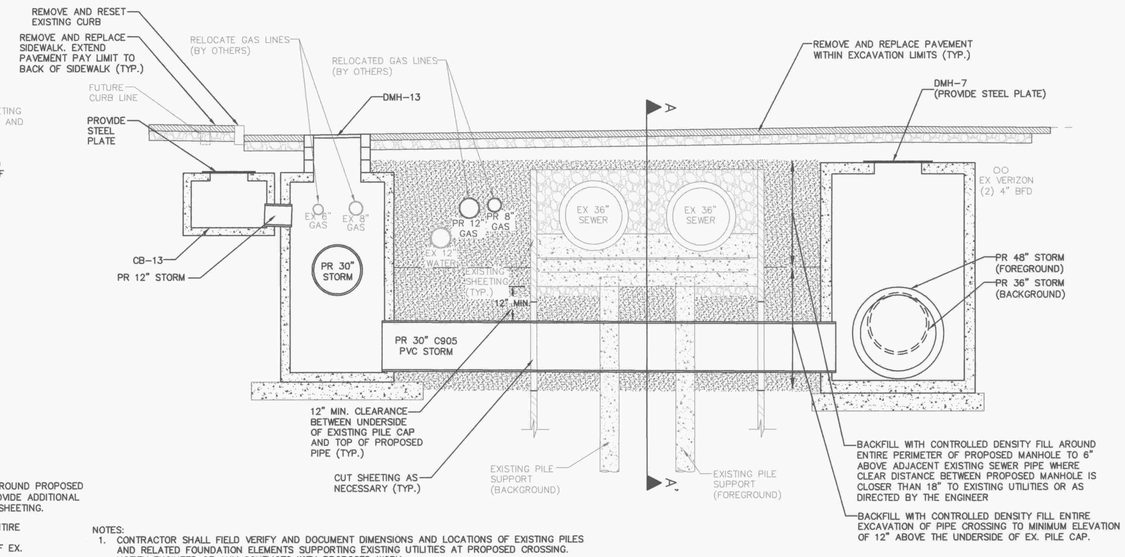
C-304

22x34 SHEET
1:1

NOTES:
1. EXCAVATE FOR PIPE ACCESS THROUGH SOILS.
2. INSTALL TUNNEL LINING AROUND PERIMETER OF EXCAVATED PIPE ACCESS IN ACCORDANCE WITH CONTRACTOR SUBMITTAL APPROVED BY ENGINEER.
3. REMOVE AND DEMOLISH SECTIONS OF PILES AND FOUNDATION ELEMENTS IN ACCORDANCE WITH SUBMITTALS APPROVED BY ENGINEER.
4. PROVIDE ADDITIONAL PERMANENT SEWER FOUNDATION SUPPORT WHERE REQUIRED AS APPROVED BY THE ENGINEER.

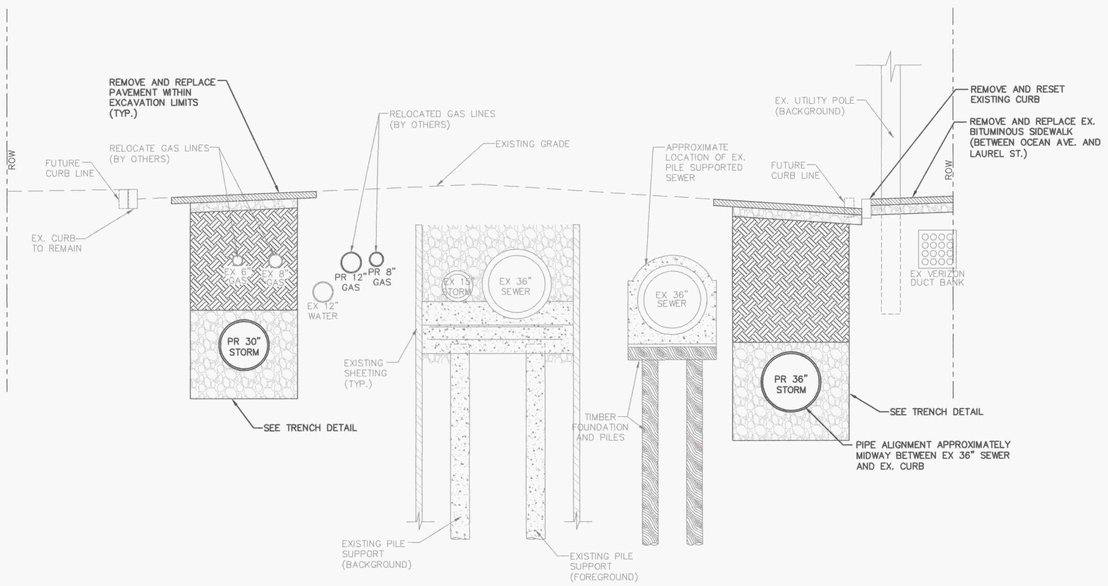


SECTION A–A'

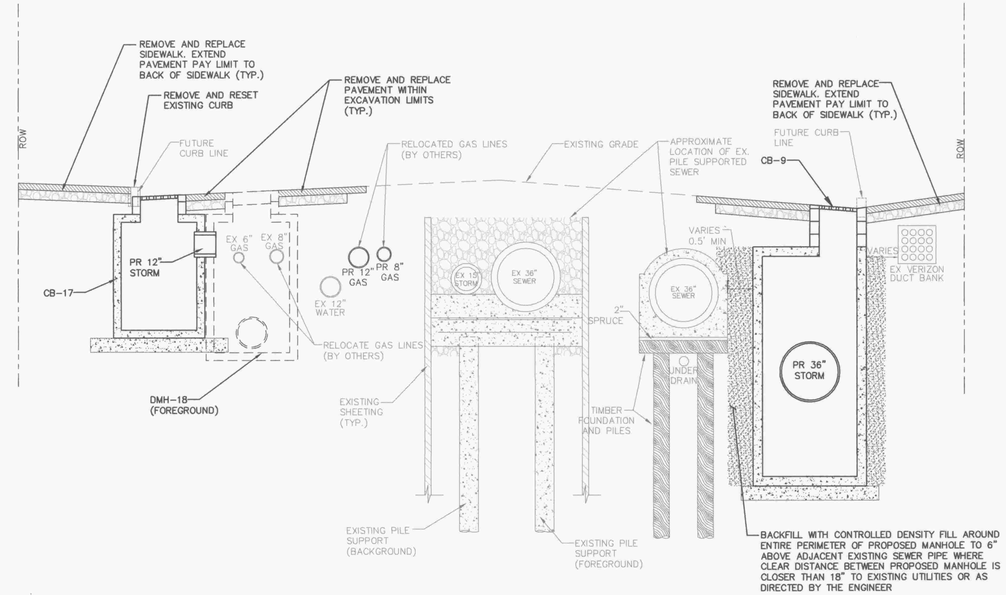


NOTES:
1. CONTRACTOR SHALL FIELD VERIFY AND DOCUMENT DIMENSIONS AND LOCATIONS OF EXISTING PILES AND RELATED FOUNDATION ELEMENTS SUPPORTING EXISTING UTILITIES AT PROPOSED CROSSING. NOTIFY ENGINEER OF ANY CONFLICTS WITH PROPOSED WORK.
2. PROVIDE FIELD VERIFICATION OF PILE FOUNDATION INFORMATION TO ENGINEER PRIOR TO REMOVAL OR DEMOLITION OF EXISTING FOUNDATIONS. RECEIVE APPROVAL FROM ENGINEER BEFORE PROCEEDING WITH INSTALLING TEMPORARY SUPPORT FACILITIES AND/OR EXISTING FOUNDATION ELEMENT REMOVAL.
3. CONTRACTOR SHALL PROVIDE ALL MEANS AND METHODS TO TEMPORARILY SUPPORT EXISTING UTILITIES DURING TUNNELING OPERATIONS.

SECTION 4 –
SCALE: 1"=4'



SECTION 5 –
SCALE: 1"=4'



SECTION 6 –
SCALE: 1"=4'

NOTES:
1. CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXISTING SANITARY SEWER(S) AND DRAIN PIPES PRIOR TO INSTALLATION OF PROPOSED IMPROVEMENTS.
2. CONTRACTOR SHALL PROVIDE ALL SHORING AND BRACING NECESSARY TO ADEQUATELY PROTECT EXISTING UTILITIES.
3. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AND LOCATIONS OF ALL PIPES AT PROPOSED CROSSING. NOTIFY ENGINEER OF ANY CONFLICTS WITH PROPOSED WORK.

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COMMONWEALTH OF MASSACHUSETTS
DAVID A. WHITE
CIVIL
No. 38860
REGISTERED PROFESSIONAL ENGINEER
1/31/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

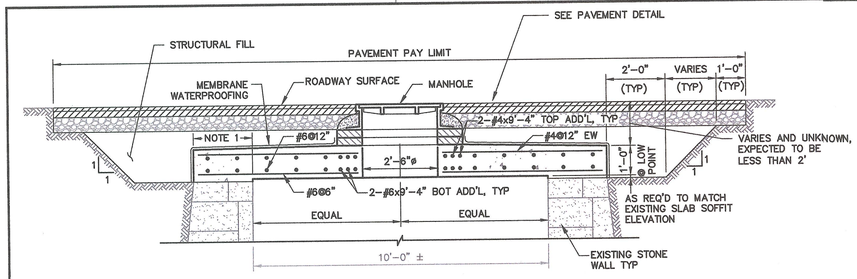
CROSS SECTIONS 2

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE,
SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: AS SHOWN
SHEET: 21 OF 24

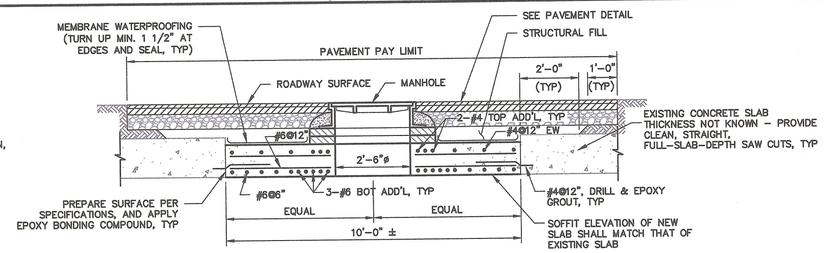
C-305



NOTE:

1. MATCH THICKNESS OF TOP OF EXISTING WALL.

SECTION A C-400
SCALE: 3/8"=1'-0"



SECTION B C-400
SCALE: 3/8"=1'-0"

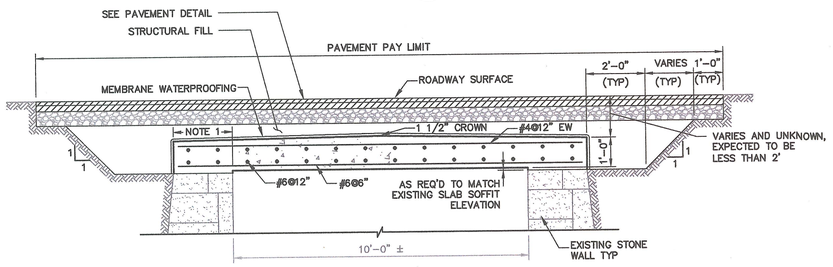
MINIMUM REINFORCING BAR SPLICE LENGTHS (IN)		
BAR SIZE	TOP BARS	OTHER BARS
4	20	16
5	23	17
6	27	21
7	40	31
8	45	35
9	51	39
10	58	44
11	64	49

TABLE NOTES:

1. THIS TABLE IS BASED ON CLEAR SPACING NOT LESS THAN FOUR BAR DIAMETERS, AND CLEAR COVER NOT LESS THAN TWO BAR DIAMETERS.

2. WHERE SPACING BETWEEN BARS IS LESS THAN FOUR BAR DIAMETERS, OR CLEAR COVER IS LESS THAN TWO BAR DIAMETERS, INCREASE SPLICE LENGTHS SHOWN BY 67%.

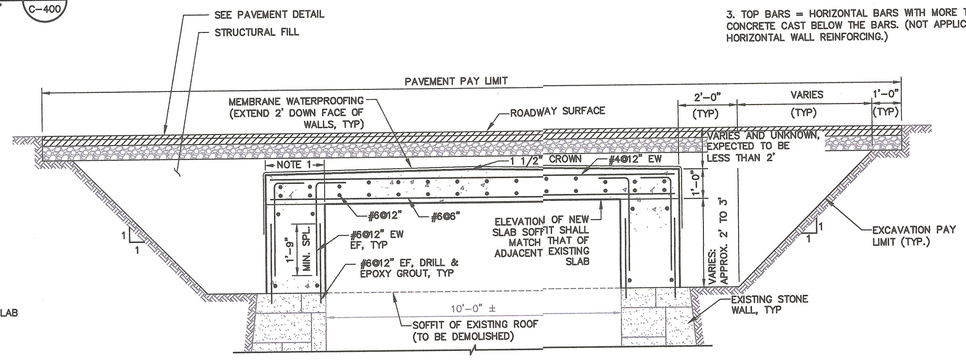
3. TOP BARS = HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BARS. (NOT APPLICABLE TO HORIZONTAL WALL REINFORCING.)



NOTE:

1. MATCH THICKNESS OF TOP OF EXISTING WALL.

SECTION C C-400
SCALE: 3/8"=1'-0"

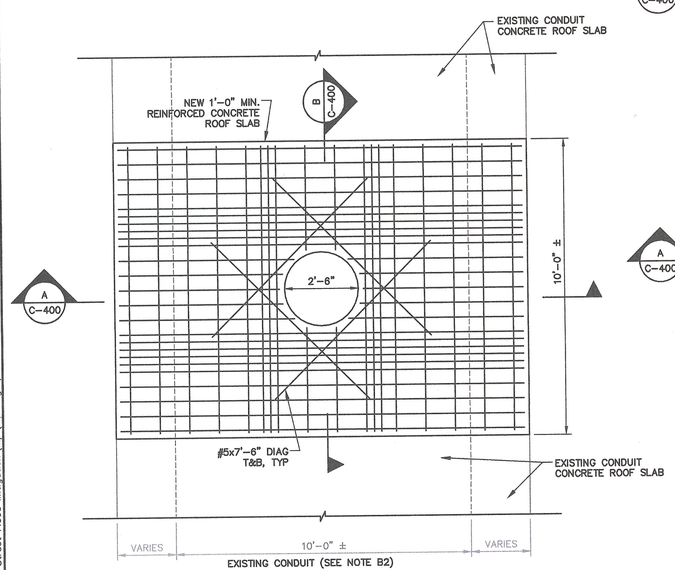


NOTES:

1. MATCH THICKNESS OF TOP OF EXISTING WALL, BUT NOT LESS THAN 1'-0", TYP.

2. WALLS SHALL BE BACKFILLED IN EQUAL INCREMENTS AND ONLY AFTER SLAB HAS CURED FOR 7-DAYS.

SECTION D C-400
SCALE: 3/8"=1'-0"

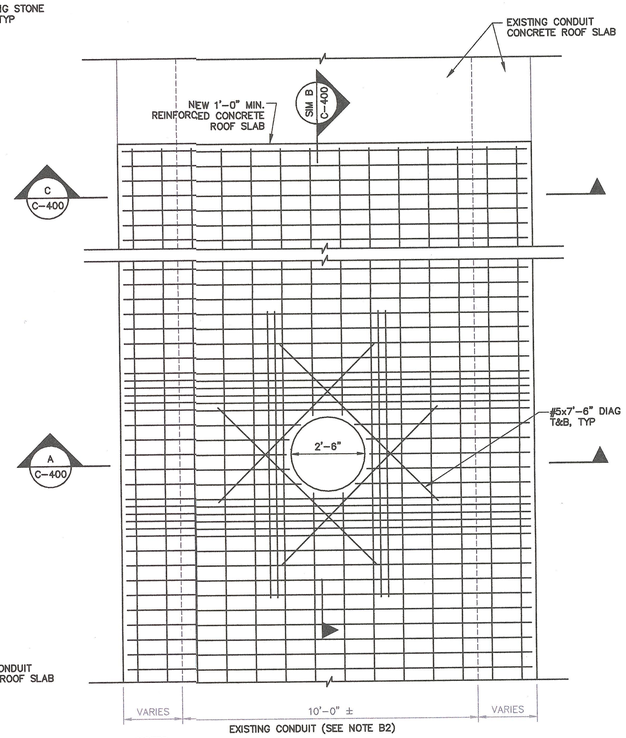


NOTES:

1. MANHOLE SHALL BE CENTERED WITHIN NEW SLAB AREA.

2. BOTTOM REINFORCEMENT IS SHOWN. SEE SECTION FOR TOP AND BOTTOM REINFORCEMENT CALL-OUTS AND FOR TOP REINFORCEMENT PLACEMENT.

ROOF SLAB REPLACEMENT AT NEW MANHOLE
1 TYPICAL OF (8) LOCATIONS
SCALE: 3/8"=1'-0"



NOTES:

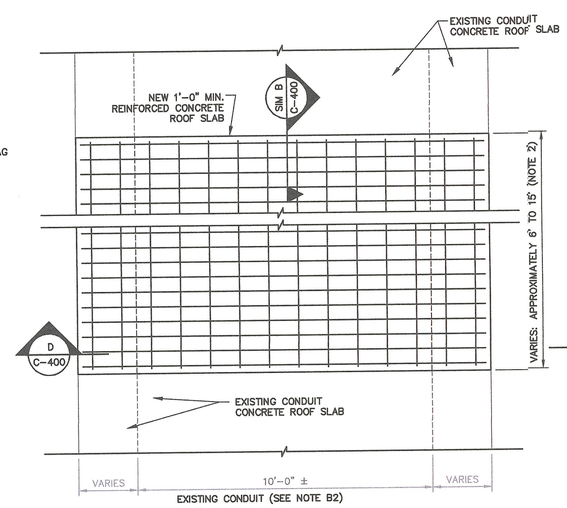
1. EXISTING VISIBLE CONDUIT ROOF CONSTRUCTION AT THIS LOCATION CONSISTS OF (21) CLOSELY SPACED PARTIALLY CONCRETE-ENCASED STEEL BEAMS WITH WOOD AND CONCRETE INFILL.

2. MANHOLE SHALL BE CENTERED WITHIN NEW SLAB AREA.

3. THE FLOOR (OR INVERT) OF THE CONDUIT STEPS UP A VARYING AMOUNT OF APPROXIMATELY 2 TO 3 FEET ACROSS THE FULL WIDTH AND LENGTH IN THIS AREA. THIS MAY BE THE REMAINS OF A COLLAPSED CONDUIT ROOF. THE MATERIAL CREATING THE RAISED INVERT SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR SO THAT THE CONDUIT INVERT ELEVATION MATCHES THAT UPSTREAM AND DOWNSTREAM OF THIS AREA.

4. BOTTOM REINFORCEMENT IS SHOWN. SEE SECTION FOR TOP AND BOTTOM REINFORCEMENT CALL-OUTS AND FOR TOP REINFORCEMENT PLACEMENT.

ROOF SLAB REPLACEMENT & CONDUIT INVERT REPAIR
2 APPROX. STA 14+40 TO 14+75
SCALE: 3/8"=1'-0"



NOTES:

1. A MANHOLE IS TO BE PROVIDED AT (1) LOCATION ONLY, AND SHALL BE CENTERED WITHIN THAT SLAB AREA. REFER TO "ROOF SLAB REPLACEMENT AT NEW MANHOLE" DETAIL, THIS SHEET, FOR TYPICAL REINFORCEMENT IN AREA OF MANHOLE.

2. BOTTOM REINFORCEMENT IS SHOWN. SEE SECTION FOR TOP AND BOTTOM REINFORCEMENT CALL-OUTS AND FOR TOP REINFORCEMENT PLACEMENT.

REPLACEMENT AT EXISTING ROOF STEP DOWN
3 TYPICAL OF (4) LOCATIONS
SCALE: 3/8"=1'-0"

GENERAL NOTES

A. GENERAL:

1. DESIGN OF NEW ROOF SLAB IS IN ACCORDANCE WITH THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, 17TH EDITION.

2. DESIGN LOAD IS AASHTO H20 (OR HS20) VEHICLE LOAD.

3. THE CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS, INCLUDING DIMENSIONS, AND SHALL NOTIFY THE ENGINEER OF ANY AND ALL DISCREPANCIES BEFORE PROCEEDING ON THE AFFECTED PORTION OF THE WORK.

4. THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE DRAWINGS AND SPECIFICATIONS OF ALL DISCIPLINES.

5. ANY STATIONING INDICATED IS APPROXIMATE ONLY. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EACH REPAIR AREA WITH THE ENGINEER PRIOR TO COMMENCING WORK IN EACH AREA.

6. SEE SHEETS C-207 TO C-209 FOR LOCATIONS AND CORRESPONDING APPROXIMATE DIMENSIONS OF WORK.

B. EXISTING CONDITIONS

1. EXISTING STONE WALLS PREDATE 1889 AND ARE SHOWN SCHEMATICALLY ONLY. ACTUAL THICKNESS IS UNKNOWN, AND SHALL BE FIELD DETERMINED BY CONTRACTOR.

2. 10'-0" CONDUIT WIDTH IS BASED ON JULY 1966 DRAWINGS BY CDM, AND SHALL BE FIELD VERIFIED.

3. EXISTING ROOF SLAB IS ANTICIPATED TO BE DOWELED INTO THE TOP OF THE EXISTING STONE WALL. AT LOCATIONS WHERE THE EXISTING WALL IS DAMAGED OR WHERE STONES ARE REMOVED DURING REMOVAL OF THE EXISTING SLAB. THE CONTRACTOR SHALL PROVIDE REPAIRS, WHICH MAY INCLUDE FILLING VOIDS WITH CONCRETE.

C. CONCRETE:

1. DESIGN IS IN ACCORDANCE WITH ACI 318-08, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE".

2. IN ORDER TO ACCELERATE RE-USE OF THE ROADWAY, ALL CONCRETE SHALL HAVE A MINIMUM 7-DAY COMPRESSIVE STRENGTH OF 4000 PSI, UNLESS NOTED OTHERWISE.

3. REINFORCING STEEL SHALL COMPLY WITH ASTM A615, GRADE 60.

4. AT SURFACES WHERE CONCRETE IS EXPOSED TO WEATHER OR MOISTURE, INCLUDING ALL INTERIOR SURFACES OF THE SOUTH RIVER CONDUIT, REINFORCING BAR ACCESSORIES SHALL BE PLASTIC TIPPED.

5. CLEAR COVER TO REINFORCEMENT SHALL BE 3" AT THE INTERIOR FACE OF NEW WALLS AND AT BOTTOMS OF NEW FOOTINGS, AND 2" ELSEWHERE, WITH TOLERANCES AS SPECIFIED.

6. ALL NEW CONCRETE ROOF SLABS SHALL RECEIVE MEMBRANE WATERPROOFING IN ACCORDANCE WITH MASSDOT 1988 STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES – SECTION 965.20, SYSTEM 1: COAL TAR EMULSION REINFORCED WITH TWO PLIES OF COATED GLASS FABRIC. COAL TAR EMULSION AND COATED GLASS FABRIC SHALL MEET MASSDOT DIV. III MATERIALS SPECIFICATIONS M3.03.3 AND M3.06.1, RESPECTIVELY. THE SLAB SURFACE SHALL BE PREPARED IN ACCORDANCE WITH MASSDOT 965.60 AND THE SYSTEM APPLIED IN ACCORDANCE WITH MASSDOT 965.61. THE MEMBRANE SHALL BE BACKFILLED AFTER IT HAS COMPLETELY CURED. DAMAGE DURING BACKFILLING SHALL BE PREVENTED.

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Andover, Massachusetts 01810
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COMMONWEALTH OF MASSACHUSETTS
MARK W. CUNNINGHAM
No. 40958
STRUCTURAL
REGISTERED PROFESSIONAL ENGINEER
01-25-13

REV	ISSUED FOR BID	DATE
	DESCRIPTION	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

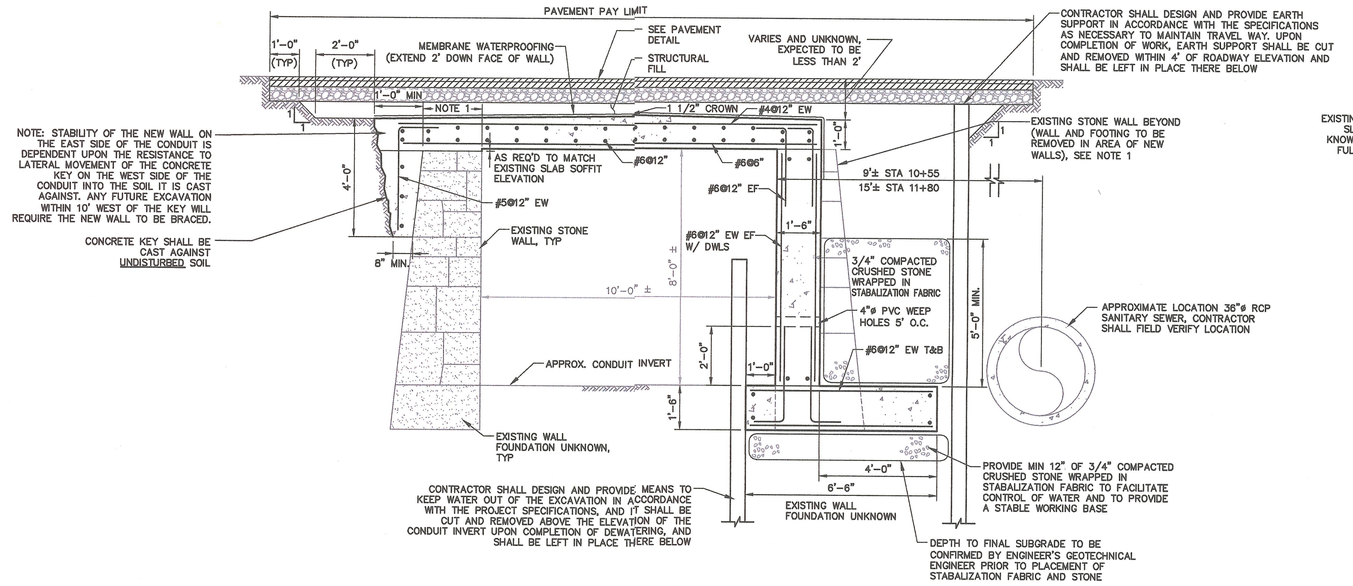
STRUCTURAL DETAILS 1

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

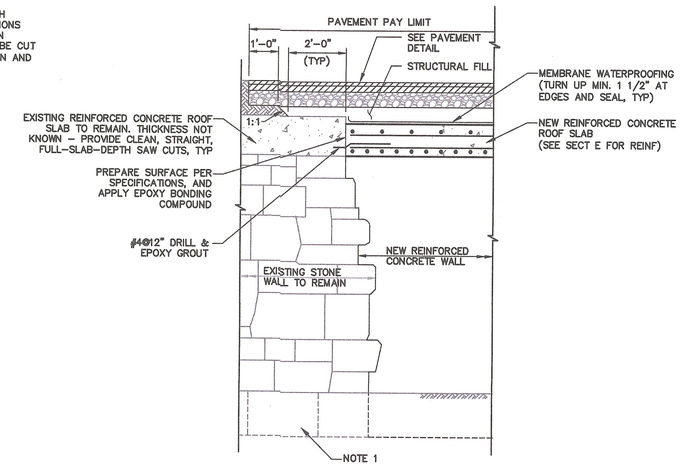
CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 22 OF 24

C-400



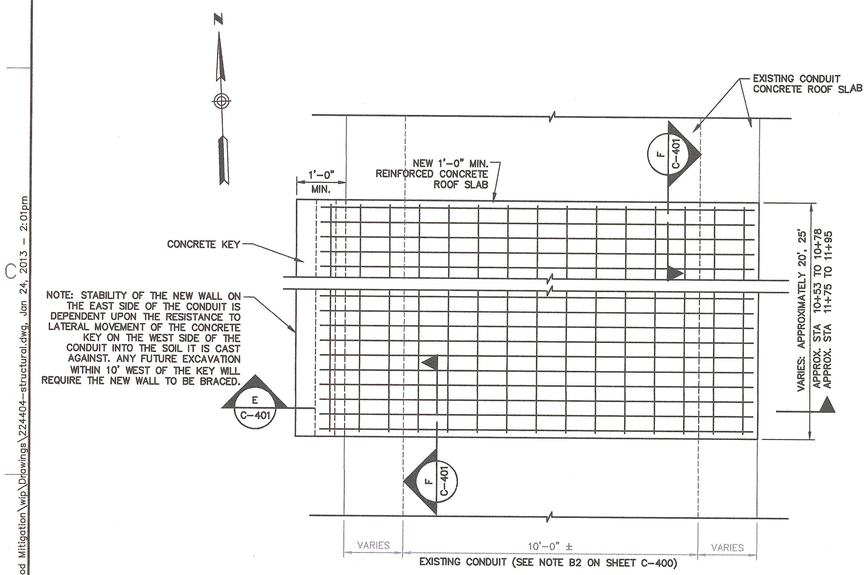
SECTION E C-401
SCALE: 3/8"=1'-0"



NOTE:

1. THE EXISTING STONE WALL IS SHOWN IN ORDER TO SHOW HOW THE NEW WALL WILL INTERFACE WITH THE EXISTING WALL.

SECTION F C-401
SCALE: 3/8"=1'-0"



NOTE:

1. NEW ROOF SLAB BOTTOM REINFORCEMENT IS SHOWN. SEE SECTIONS FOR TOP AND BOTTOM REINFORCEMENT CALL-OUTS AND FOR TOP REINFORCEMENT PLACEMENT.

WALL AND ROOF SLAB REPLACEMENT (TWO LOCATIONS)
1 –
SCALE: 3/8"=1'-0"

22x34 SHEET
1:1

40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
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COMMONWEALTH OF MASSACHUSETTS
MARK W. CUNNINGHAM
No. 45058
STRUCTURAL
REGISTERED PROFESSIONAL ENGINEER
01-24-13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

STRUCTURAL DETAILS 2

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 23 OF 24

C-401

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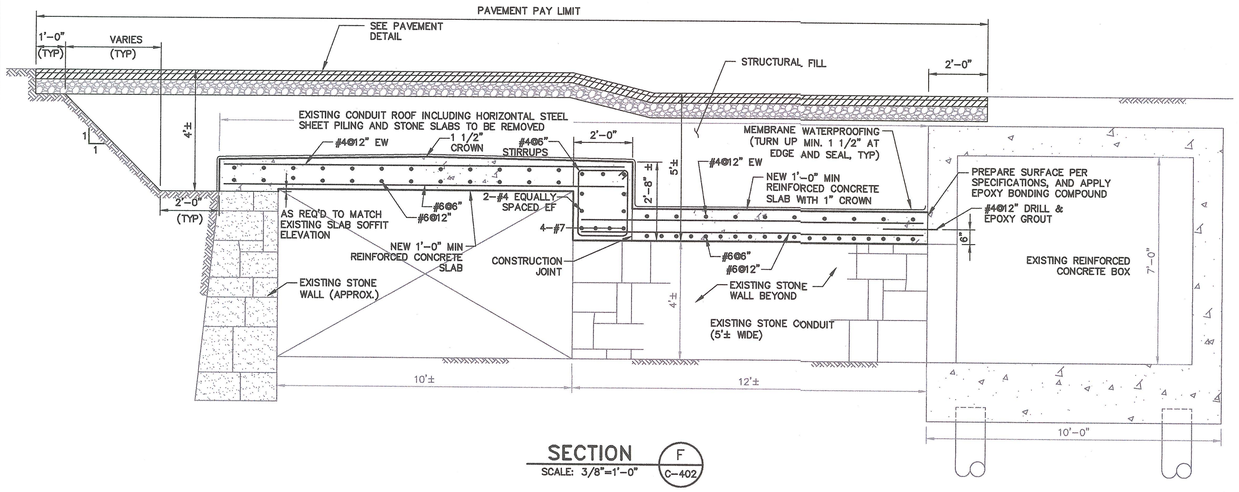
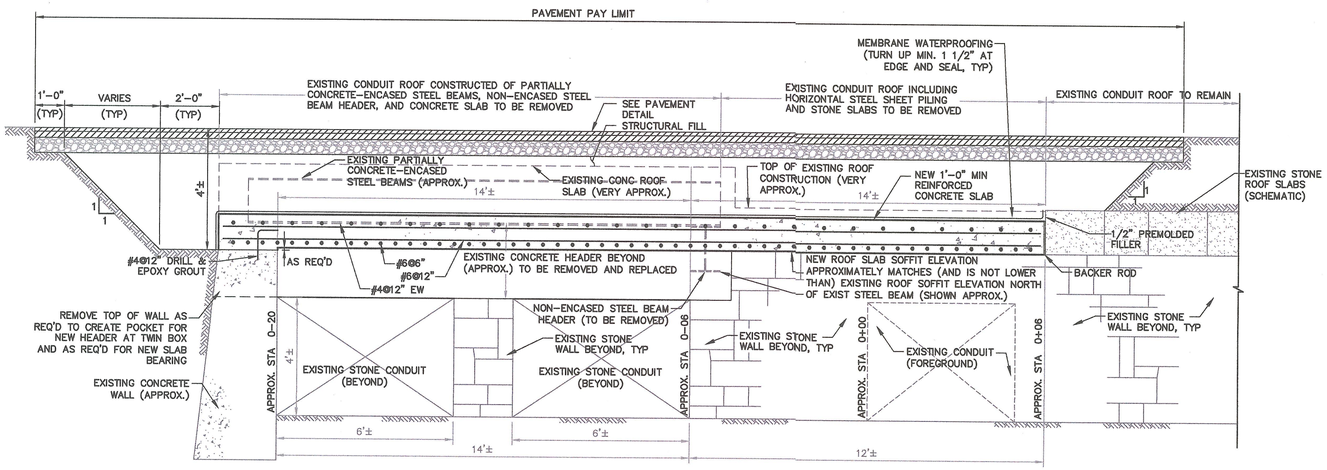
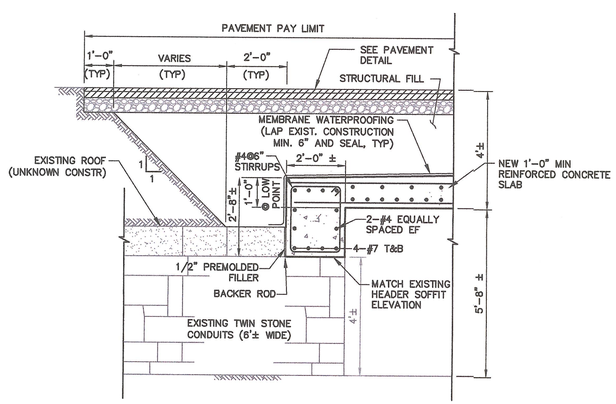


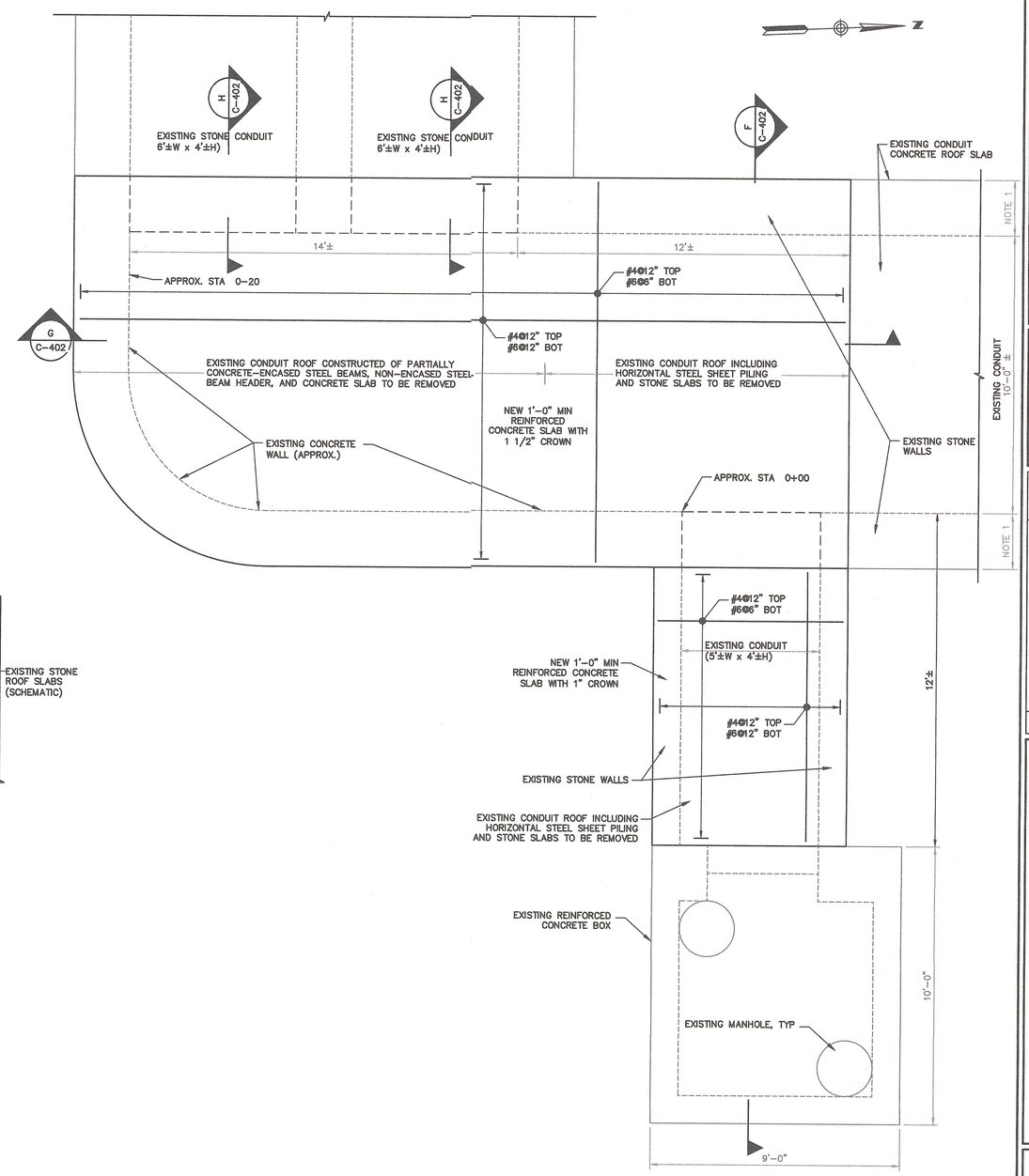
SECTION F C-402
SCALE: 3/8"=1'-0"



SECTION G C-402
SCALE: 3/8"=1'-0"



SECTION H C-402
SCALE: 3/8"=1'-0"



REPLACEMENT OF ROOF APPROX. STA 0-20 TO 0+06 (SOUTH END OF CONDUIT)

1 / –
SCALE: 3/8"=1'-0"

NOTE:

1. NOTE WELL: THERE ARE NO EXISTING DETAILED PLANS OF THE CONDUIT, AND DIMENSIONS AND GEOMETRY ARE SHOWN VERY APPROXIMATE ONLY. THE CONTRACTOR SHALL FIELD DETERMINE ALL DIMENSIONS AND PLAN TO ACCOMMODATE MODIFICATIONS AS DEMOLITION OCCURS AND THE WORK PROCEEDS.

22x34 SHEET
1:1

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01/25/13

REV	DESCRIPTION	DATE
	ISSUED FOR BID	01-25-13

DESIGNED BY: HCP/SMK/MC CHECKED BY: DAW/RWS/MS
DRAWN BY: HCP/JB/GP

STRUCTURAL DETAILS 3

CITY OF SALEM, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

CANAL STREET DRAINAGE, SEWER & WATER IMPROVEMENTS
SALEM, MASSACHUSETTS

JOB NO.: 224404.02
DATE: JANUARY 25, 2013
SCALE: 1"=20'
SHEET: 24 OF 24

C-402

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