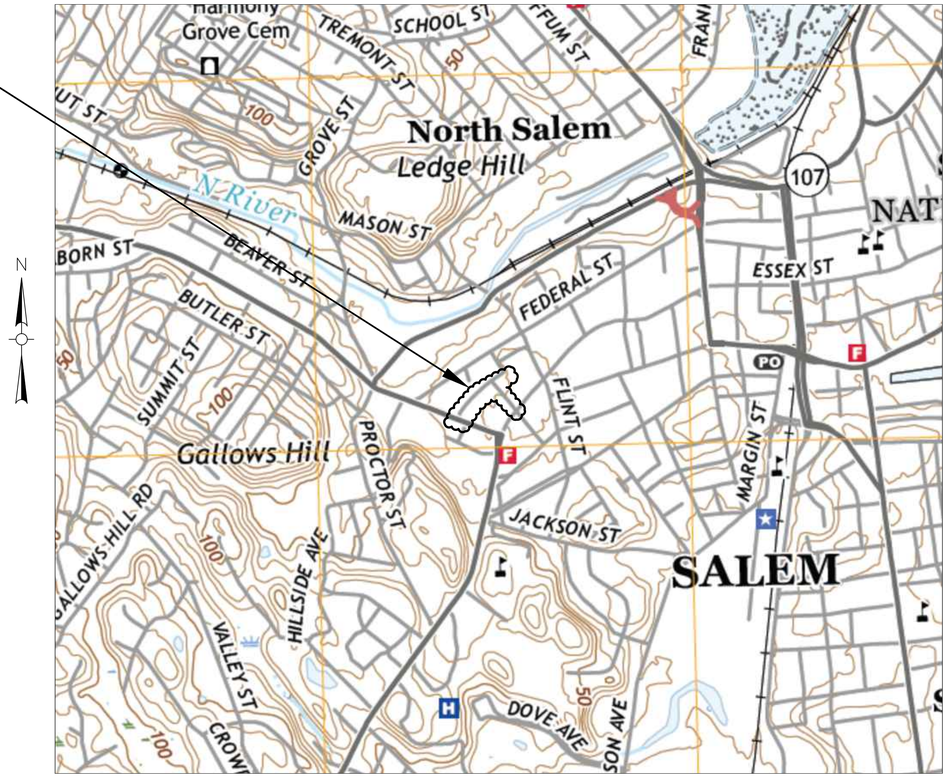
CITY OF SALEM, MASSACHUSETTS

FOWLER STREET UTILITY PROJECT
DECEMBER 2018

CONTRACT NO. 19-32-230

PROJECT LOCATION



LOCUS MAP (NO SCALE)

CITY OF SALEM
KIMBERLEY DRISCOLL
Mayor

DAVID KNOWLTON, P.E.
City Engineer, DPS Director

DRAWING INDEX:

NEW ENGLAND CIVIL ENGINEERING CORP.

NECE
NEW ENGLAND CIVIL ENGINEERING
SALEM, MA

265 Essex Street
Suite #102
Salem, MA 01970
(978) 741-7401

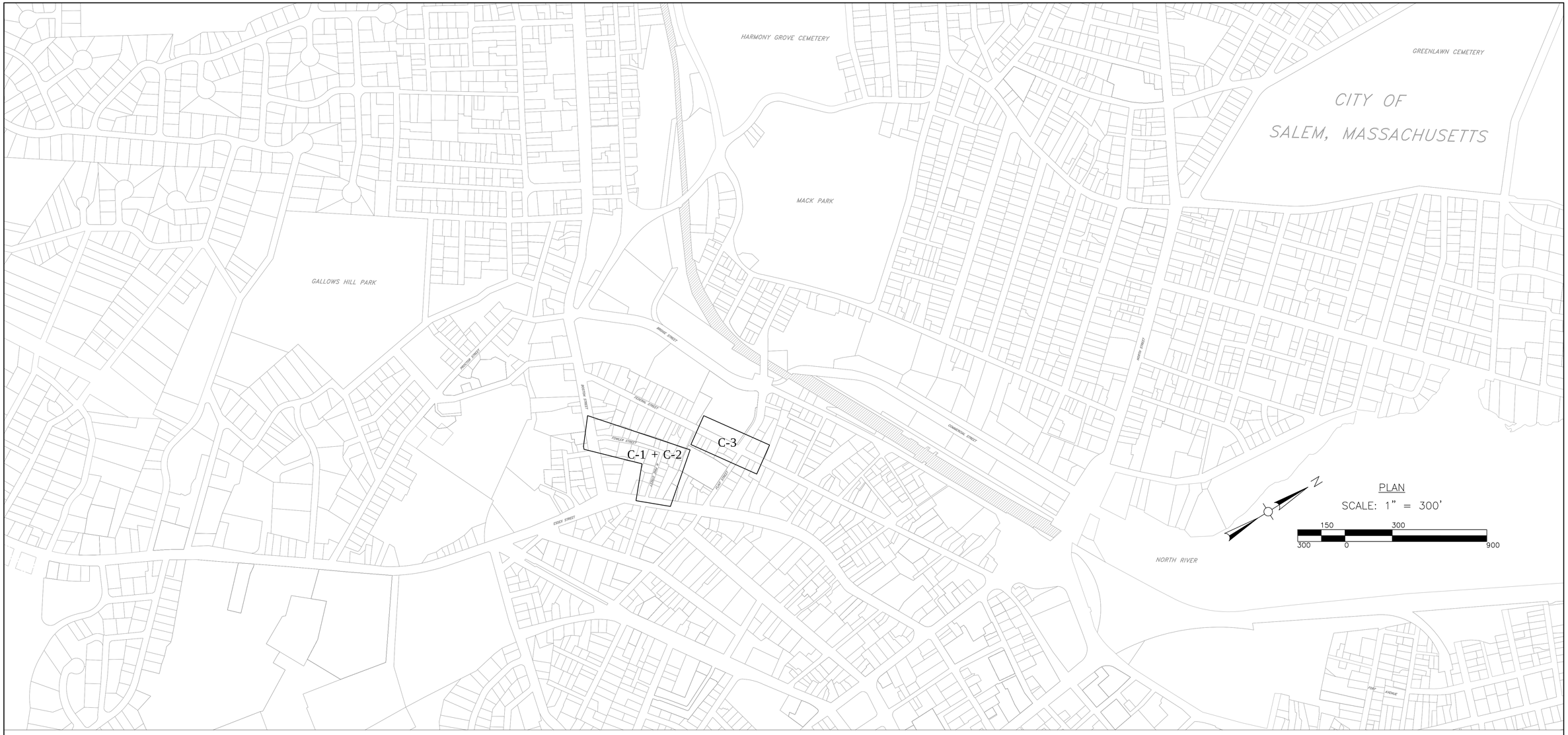
COMPLETE SET 10 PAGES

Sheet
G-1

GENERAL NOTES

1. VERTICAL DATUM BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). HORIZONTAL DATUM BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM, 1983 (NAD83).
2. BASE SURVEY INFORMATION PROVIDED BY CITY OF SALEM AND MASSGIS.
3. BENCHMARKS ARE NOT PROVIDED, CONTRACTOR TO ESTABLISH BENCHMARKS ON LOCAL DATUM.
4. FULL PERIMETERS AND EXTERIOR DIMENSIONS OF BUILDINGS NOT ACCURATELY SHOWN ON BASE SURVEY, CONTRACTOR TO CONFIRM DIMENSIONS AND FOOTPRINTS OF BUILDINGS BEFORE BEGINNING WORK CLOSE TO BUILDINGS AND ON PRIVATE PROPERTY.
5. THE EXISTENCE, SIZE, PIPE MATERIAL, LOCATION, ORIENTATION AND DESCRIPTION OF UTILITIES ARE FROM THE EXISTING INFORMATION PROVIDED, BUT ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UNDERGROUND UTILITIES BEFORE EXCAVATING.
6. ALL RIM AND INVERT ELEVATIONS ARE APPROXIMATE AND ARE SHOWN TO WITHIN 0.01 FEET. CONTRACTOR TO COMPLETE INDEPENDENT SURVEY VERIFICATION IN THE FIELD BY PROFESSIONAL LAND SURVEYOR.
7. ALL BURIED ELECTRIC AND TELECOM CONDUITS ARE SHOWN SCHEMATICALLY AND NOT TO SCALE, CONTRACTOR TO ASSUME ALL BURIED UTILITIES ARE INSTALLED IN MULTIPLE CONDUIT DUCT BANKS AND MAY BE CONCRETE ENCASED, CONTRACTOR TO COMPLETE TEST PITS AND ADJUST LAYOUT AND MEANS AND METHODS TO AVOID CONFLICTS.
8. THE LOCATION OF ALL BURIED ELECTRIC AND TELECOMMUNICATIONS CONDUITS, MANHOLES, HANDHOLES, AND WIRES IS NOT KNOWN. NEW OR ADDITIONAL BURIED ELECTRIC AND TELECOMMUNICATIONS CONDUITS AND WIRES MAY HAVE BEEN INSTALLED OR MAY EXIST WHICH ARE NOT SHOWN ON THE PLANS.
9. EXISTING PAVEMENT THICKNESS, SIDEWALK MATERIALS, AND SUBBASE MATERIALS VARY AND MAY INCLUDE MULTIPLE, VARIED PAVEMENT MATERIALS, AND COBBLESTONES ON FEDERAL, FOWLER, AND BOSTON STREETS. BOSTON STREET HISTORICALLY HAD TROLLEY TRACKS, RAILS, TIMBERS, AND COBBLES EXIST IN SOME PORTIONS OF THE PROJECT AREA. CONTRACTOR SHALL REMOVE AND LEGALLY DISPOSE ALL RAILS, TIMBERS, COBBLES AND SUBBASE MATERIALS ENCOUNTERED AS PART OF THE WORK.
10. BEFORE EXCAVATING, BLASTING, BACK FILLING, GRADING, PAVEMENT RESTORATION, OR REPAIRING, ALL UTILITY COMPANIES, PUBLIC AND PRIVATE, MUST BE CONTACTED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THESE PLANS. SEE CHAPTER 370, ACT OF 1963, MASSACHUSETTS GENERAL LAWS. THE OWNER AND ENGINEER ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN.
11. EXISTING PIPE SIZE AND MATERIAL ARE APPROXIMATE AND MAY HAVE DIFFERING HORIZONTAL AND/OR VERTICAL DIMENSIONS DEPENDING ON THE SHAPE (EGG–SHAPED, TEAR–DROP, ETC.) EXISTING PIPES MAY BE SLIPLINED IN LARGER PIPES OF DIFFERENT MATERIAL. ASBESTOS CEMENT (AC) PIPES MAY EXIST. IF ENCOUNTERED, THERE OR ELSEWHERE, CONTRACTOR SHALL IMPLEMENT APPROPRIATE HEALTH AND SAFETY PROVISIONS AND REMOVE AND DISPOSE AS PIPE IN LEGAL MANNER.
12. THE CONTRACTOR SHALL PREMARK THE EXCAVATION AREA IN WHITE PAINT PRIOR TO CALLING THE DIG SAFE CENTER (TEL. NO. 1–888–DIG–SAFE). THE CONTRACTOR SHALL CONTACT THE DIG SAFE CENTER AT LEAST THREE BUSINESS DAYS PRIOR TO ANY EXCAVATION. IN ADDITION, NOTIFICATION SHALL ALSO BE GIVEN TO ALL AFFECTED PRIVATE AND/OR PUBLIC UTILITIES TO PERMIT STREET MARKING OF THEIR LINES.
13. CONTRACTOR TO COORDINATE WITH GAS COMPANY AND OWNERS OF OTHER UTILITIES TO PROTECT AND SUPPORT (OR REMOVE AND REPLACE) ALL UTILITIES ENCOUNTERED DURING CONSTRUCTION.
14. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE UTILITY COMPANIES DOING WORK IN THE SAME AREA, AND ALLOW THE UTILITY COMPANIES AND THEIR REPRESENTATIVES TO INSTALL OR MAINTAIN THEIR SYSTEMS WITHIN CITY–OWNED STREETS AND EASEMENTS. A SCHEMATIC LAYOUT SHOWING THE APPROXIMATE LIMITS AND LOCATIONS OF PROPOSED GAS WORK (BY OTHERS) WILL BE PREPARED BY NATIONAL GRID. CONTRACTOR SHALL COORDINATE WITH NATIONAL GRID TO REVIEW REVISED/FINAL LIMITS AND LOCATIONS OF PROPOSED/COMPLETED GAS UTILITY WORK IN THE AREA, THEN ADJUST PROPOSED LAYOUT OF CONTRACTOR'S WORK AS REQUIRED.
15. IF THE CONTRACTOR DAMAGES UTILITY SERVICES, HE SHALL IMMEDIATELY NOTIFY THE RESPECTIVE UTILITY COMPANY AND SHALL IMMEDIATELY REPLACE OR REPAIR.
16. WHERE UTILITY RELOCATION IS REQUIRED, THE CONTRACTOR SHALL NOTIFY THE AFFECTED UTILITY COMPANY AT LEAST 30 DAYS IN ADVANCE OF CONSTRUCTION AND SHALL COORDINATE THE PROPOSED WORK WITH THE UTILITY RELOCATION.
17. THE CONTRACTOR'S ATTENTION IS DIRECTED TO EXISTING LABELED SEWER MANHOLE OR DRAINAGE MANHOLE COVERS SHOWN ON THE PLANS AS THEY MAY NOT ACCURATELY REPRESENT THE UNDERGROUND SERVICE BELOW. CONTRACTOR SHALL ANTICIPATE BYPASS PUMPING WILL BE REQUIRED DURING CONSTRUCTION INVOLVING INCREASED BYPASS PUMPING CAPACITY DURING RAINFALL.
18. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS INFORMATION AND REPORT ANY DISCREPANCIES BETWEEN THE PLANS AND THE ACTUAL CONDITIONS TO THE ENGINEER PRIOR TO BEGINNING WORK.
19. EXPLORATORY EXCAVATIONS (TEST PITS) SHALL BE EXCAVATED AT THOSE LOCATIONS INDICATED ON THE PLANS AND WHERE ORDERED AND APPROVED BY THE OWNER. TEST PIT EXCAVATIONS SHALL BE MADE TO DETERMINE THE LOCATIONS OF ALL EXISTING UTILITIES, STRUCTURES, OR SUBSURFACE CONDITIONS IN ADVANCE OF CONSTRUCTION OPERATIONS SO THAT ANY REQUIRED CHANGES IN ALIGNMENT AND/OR GRADE OF THE PROPOSED WORK OR UTILITY LOCATIONS MAY BE DETERMINED. ALL DECISIONS RELATIVE TO UTILITY CONFLICTS AND RELOCATION REQUIREMENTS WILL BE MADE BY THE RESIDENT ENGINEER.
20. PROPOSED INVERT ELEVATIONS AND SLOPES OF NEW OR REPLACEMENT SEWER/DRAIN PIPES AND SERVICES TO BE DETERMINED IN THE FIELD BY THE ENGINEER BASED ON CONTRACTOR'S SURVEY OF EXISTING RIM AND INVERT ELEVATIONS COMPLETED IN CONJUNCTION WITH CONFINED SPACE ENTRY OR TEST PITS. TEST PITS MAY NOT BE COMPLETED TOO FAR IN ADVANCE OF PIPELINE INSTALLATION IN THE OPINION OF THE ENGINEER, AUTHORIZATION REQUIRED FROM ENGINEER TO BEGIN TEST PITS ON EACH STREET OR IN EACH WORK AREA.
21. CONTRACTOR SHALL NOT ORDER PRECAST CONCRETE STRUCTURES OR MANHOLE/CATCH BASIN CASTINGS UNTIL TEST PITS AND CONTRACTOR'S LEVEL SURVEY HAVE BEEN COMPLETED ON ALL EXISTING STRUCTURES AND CONNECTIONS ON EACH STREET OR IN EACH WORK AREA AS DETERMINED BY THE ENGINEER AND THE ENGINEER CAN CONFIRM NUMBER, SIZE, AND TYPE. PIPE OPENINGS IN EACH MANHOLE OR STRUCTURE TO BE FACTORY CAST OR CORED IN FIELD AS DIRECTED BY ENGINEER.
22. DAMAGE OF PROPERTY BEYOND THE WORK LIMITS CAUSED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE, SUBJECT TO THE APPROVAL OF THE ENGINEER.
23. WHERE WATER LINES, DRAINAGE PIPES, STRUCTURES, OR CONDUITS ARE ABANDONED IN PLACE, CONTRACTOR SHALL MAKE SURE THAT ALL CONNECTING PIPES, INLETS AND OUTLETS ARE PLUGGED.
24. CONTRACTOR TO PROTECT AND SUPPORT OR REMOVE AND REPLACE UTILITY POLES, STREET LIGHTS, SIGNS, POSTS, HYDRANTS, FENCES, GATES, OR OTHER SURFACE FEATURES THAT OBSTRUCT CONSTRUCTION OPERATIONS OR ARE DAMAGED BY CONSTRUCTION. AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE, SUBJECT TO THE APPROVAL OF THE ENGINEER.
25. ALL EXISTING MANHOLE FRAMES AND COVERS AND CATCH BASIN FRAMES AND GRATES REMOVED BUT NOT REUSED, AND SELECTED FOR SALVAGE BY THE OWNER, SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION DESIGNATED BY THE OWNER. CASTINGS NOT SELECTED BY THE OWNER FOR SALVAGE SHALL BE DISPOSED OF BY THE CONTRACTOR.
26. A MINIMUM 10–FOOT HORIZONTAL SEPARATION SHALL BE MAINTAINED BETWEEN WATER AND SEWER (SANITARY OR STORM) MAINS. SEPARATION IS MEASURED FROM EDGE TO EDGE. IN CASES WHERE 10–FOOT SEPARATION CANNOT BE MAINTAINED, WATER MAIN SHALL BE LAID IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE SIDE OF THE SEWER AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18–INCHES ABOVE THE TOP OF THE SEWER. AT CROSSINGS, ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE WITH 18 INCH VERTICAL SEPARATION, WITH WATER MAIN ABOVE SEWER IF AT ALL POSSIBLE.
27. CONTRACTOR SHALL BACKFILL, COMPACT, AND PAVE IN ACCORDANCE WITH THE REQUIREMENTS OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MDOT) AND THE CITY OF SALEM, INCLUDING AT A MINIMUM THE REQUIREMENTS SHOWN ON DETAILS.
28. THE CONTRACTOR SHALL INSTALL TEMPORARY PAVEMENT ON A DAILY BASIS AND SHALL MAINTAIN TEMPORARY PAVEMENT FOR A MINIMUM OF 90 DAYS EXCEPT IF TEMPORARY PAVEMENT IS PLACED AFTER OCTOBER 15TH, THEN IT SHALL BE MAINTAINED UNTIL APRIL 15TH OF THE FOLLOWING YEAR UNLESS AUTHORIZED BY THE CITY. TEMPORARY CENTERLINE OR FOGLINE PAVEMENT PAINT SHALL BE PLACED ON THE TEMPORARY PAVEMENT WHEREVER EXISTING PAINT IS DISTURBED DURING CONSTRUCTION.
29. PERMANENT PAVEMENT SHALL BE PLACED BETWEEN APRIL 15TH AND OCTOBER 15TH OF EACH CALENDAR YEAR UNLESS AUTHORIZED BY THE TOWN OUTSIDE THESE DATES.
30. THE CONTRACTOR SHALL PROTECT ALL TRAVELED WAYS AND PEDESTRIAN WAYS FROM CONSTRUCTION DEBRIS AT ALL TIMES.
31. CONTRACTOR SHALL MAINTAIN ONE LANE (ONE–WAY) OF TRAFFIC AT ALL TIMES AND ACCESS FOR EMERGENCY VEHICLES AND PEDESTRIANS, CONTRACTOR SHALL COORDINATE TRAFFIC MANAGEMENT PLAN WITH CITY OF SALEM POLICE DEPARTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR MANAGEMENT OF TRAFFIC AND PUBLIC SAFETY, INCLUDING SIGNAGE AND DETOURS. TRENCHES MUST BE PASSABLE AND GRAVEL MUST BE MAINTAINED. CONTRACTOR SHALL PREPARE A TRAFFIC MANAGEMENT PLAN IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF SALEM POLICE DEPARTMENT IF REQUIRED. CONTRACTOR SHALL REVIEW TRAFFIC MANAGEMENT PLAN WITH THE POLICE DEPARTMENT PRIOR TO BEGINNING CONSTRUCTION LAYOUT.
32. CONTRACTOR SHALL NOT BE PROVIDED A STAGING AREA BY THE OWNER, CONTRACTOR SHALL BE RESPONSIBLE FOR SAFETY, SECURITY, AND CLEANUP.
33. CONTRACTOR IS RESPONSIBLE TO PREVENT STEEL PLATES FROM MOVING, INCLUDING CUTTING PAVEMENT TO RECESS PLATES, UTILIZATION OF STEEL SPIKES AND WEDGES, AND COLD PATCH SHIMS AND RAMPS.
34. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED AND APPROVED BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. DEVICES SHALL INCLUDE AT A MINIMUM GEOTEXTILE (SILT SACK) IN ALL CATCH BASINS AND A BARRIER CONSISTING OF SILT FENCE OR MULCH SOCK / STRAW WATTLES AROUND SOIL STOCKPILES AND ALONG PROJECT BOUNDARY AS DIRECTED. ALL CONSTRUCTION DEWATERING WATER MUST BE TREATED WITH A SEDIMENTATION TANK PRIOR TO DISCHARGE UPGRADIENT OF OTHER EROSION AND SEDIMENTATION DEVICES AND CONTROLS.
35. CONTRACTOR SHALL MAINTAIN EDGE OF ROADWAY DRAINAGE PATTERNS INCLUDING REPLACEMENT OF PAVED AND UNPAVED SWALES, BERMS, AND CURBS.
36. DIVERSION AND CONTROL OF EXISTING SANITARY, STORM SEWER, DRAINAGE CULVERTS AND PROCESS DRAIN FLOWS AND DEWATERING ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR'S INTENDED METHODS FOR DIVERSION AND CONTROL AND DEWATERING SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. BYPASS HOSES SHALL NOT BE ALLOWED TO LEAK AND SURFACE WATER RELATING TO CONSTRUCTION OPERATIONS SHALL BE PREVENTED FROM FREEZING.
37. THE CONTRACTOR SHALL PROVIDE METHODS DURING DEWATERING OPERATIONS AND FOR STORM WATER RUNOFF NOT TO ALLOW SILT OR DEBRIS TO ENTER EXISTING DRAINAGE FACILITIES OR CREATE NUISANCES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING EXISTING OR NEW FACILITIES IF SILTATION OCCURS DUE TO THE CONTRACTOR'S OPERATIONS. CONTRACTOR RESPONSIBLE FOR ALL PERMITTING REQUIREMENTS RELATED TO DEWATERING IF DISCHARGE TO DRAINAGE OR SURFACE WATER WILL BE REQUIRED.
38. THE CONTRACTOR SHALL DISPOSE OF ALL DEMOLISHED MATERIALS, RUBBISH, EXCAVATED MATERIAL AND DEBRIS, UNLESS OTHERWISE NOTED, IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL REQUIRED DISPOSAL PERMITS AND FEES.
39. NO TRASH, GREASE TUBES, OR DEBRIS SHALL BE THROWN INTO CONSTRUCTION TRENCHES PRIOR TO BACKFILL.
40. CONTRACTOR TO MAINTAIN HAZMAT SPILL KITS ON SITE AT ALL TIMES.
41. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING DUST DURING CONSTRUCTION OPERATIONS INCLUDING BUT NOT LIMITED TO REGULAR STREET SWEEPING AND APPLICATIONS OF CALCIUM CHLORIDE OR OTHER APPROVED DUST INHIBITOR.
42. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE UTILITY COMPANIES DOING WORK IN THE SAME AREA. THE CONTRACTOR SHALL ALLOW THE UTILITY COMPANIES AND THEIR REPRESENTATIVES TO INSTALL OR MAINTAIN THEIR SYSTEMS WITHIN CITY OWNED STREETS AND EASEMENTS.
43. NO WATER SERVICE INTERRUPTIONS SHALL BE PERMITTED UNLESS THE CONTRACTOR PROVIDES THE SALEM WATER DEPARTMENT 72 HOUR (3 DAY) NOTICE EXCLUDING WEEKEND DAYS.
44. ALL SERVICES TO BE RECONNECTED, NUMBER AND LOCATION OF PROPOSED SERVICE LINES (1"–6") SHOWN ARE APPROXIMATE, CONTRACTOR TO LAY OUT PROPOSED SERVICE LINES IN FIELD.
45. BACKFLOW PREVENTION DEVICE TO BE PROVIDED BY THE CONTRACTOR AND USED FOR ALL CONSTRUCTION WATER.
46. ANY LABORATORY USED FOR WATER ANALYTICAL TESTING SHALL BE STATE OF MASSACHUSETTS CERTIFIED LABORATORY.
47. THE CONTRACTOR SHALL BE AWARE THAT BORINGS HAVE NOT BEEN COMPLETED AND THE EXISTING SOIL CONDITIONS AND GROUNDWATER LEVEL ARE NOT KNOWN. BUT GROUNDWATER LEVELS ARE ASSUMED TO BE HIGH AND HIGHLY VARIABLE DUE TO THE CLOSE PROXIMITY OF THE PROJECT TO THE OCEAN, NORTH RIVER, WETLAND AREAS, AND TIDAL IMPACTS. UNSUITABLE SOILS ARE KNOWN TO EXIST DUE TO THE PROXIMITY OF THE PROJECT TO FILLED AREAS. CONTRACTOR SHALL ANTICIPATE THAT REMOVAL AND DISPOSAL OF UNSUITABLE SOILS AND CONSTRUCTION DEWATERING DUE TO GROUNDWATER WILL BE REQUIRED THROUGHOUT THE PROJECT AREA WITH INCREASED DEWATERING REQUIRED DURING RAINFALL AND HIGH TIDE CONDITIONS.
48. CONTRACTOR TO SCHEDULE NEW DRAIN INSTALLATIONS AND ADJUST LAYOUT OF NEW DRAINS IN THE FIELD TO AVOID CONFLICTS WITH EXISTING AND PROPOSED SEWERS, WATER MAINS, DRAINS, GAS, ELECTRIC, AND OTHER EXISTING UTILITIES.
49. CONTRACTOR TO PREPARE A VALVE OPERATION AND WATER SERVICE INTERRUPTION SEQUENCING PLAN AND SUBMIT FOR REVIEW BY THE OWNER PRIOR TO BEGINNING CONSTRUCTION. THE CITY WILL REVIEW THE PLAN AND PROVIDE FEEDBACK ON THE EXTENT OF THE SERVICE INTERRUPTION NOTIFICATION FLYERS TO BE DISTRIBUTED BY THE CONTRACTOR TO AFFECTED RESIDENTS. CONTRACTOR SHALL BE AWARE THAT COMPLETE (WATERTIGHT) SHUTDOWN AND/OR ISOLATION OF ANY EXISTING WATER VALVE TO REMAIN IN SERVICE WILL NOT BE POSSIBLE DUE TO THE CONDITION OF THE EXISTING VALVES TO REMAIN IN SERVICE. CONTRACTOR SHALL ASSUME ALL EXISTING VALVES WILL LEAK AND SHALL PREPARE FOR DEALING WITH THE LEAKAGE DURING CONSTRUCTION AND WHEN MAKING ALL CONNECTIONS BETWEEN NEW AND EXISTING WATER MAINS AND SERVICES.
50. WITH THE EXCEPTION OF A BRIEF INITIAL WATER SERVICE INTERRUPTION OF THE EXISTING WATER MAINS AT FOWLER STREET AND BOSTON STREET AND NORTH PINE STREET TO REPLACE VALVES; NO WATER SERVICE INTERRUPTIONS WILL BE PERMITTED WITHIN THE PROJECT AREA UNTIL THE NEW WATER MAIN HAS BEEN INSTALLED PAST THE POINT OF EACH PROPOSED SERVICE INTERRUPTION, DISINFECTED, AND HAS PASSED BACTERIA AND PRESSURE TESTING; ALLOWING FOR A SINGLE, BRIEF SERVICE INTERRUPTION FOR EACH NEW AND EXISTING SERVICE CONNECTION AND FIRE HYDRANT. NO ADDITIONAL SERVICE INTERRUPTIONS WILL BE PERMITTED UNTIL ALL SERVICE CONNECTIONS AND FIRE HYDRANTS ARE BROUGHT BACK IN SERVICE.
51. CONTRACTOR IS RESPONSIBLE FOR LOCATING AND CONNECTING EVERY WATER SERVICE (INCLUDING FIRE SERVICES) AFFECTED BY ABANDONING THE EXISTING WATER MAIN ON EACH STREET (AND SIDE STREETS) INCLUDING BUT NOT LIMITED TO THOSE SERVICES IDENTIFIED ON PLANS. NUMBER AND LOCATION OF PROPOSED SERVICE LINES (1"–6") SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD DURING CONSTRUCTION BY CONTRACTOR AND APPROVED BY THE ENGINEER BEFORE INSTALLATION. ALL NEW SERVICES TO BE 1" COPPER UNLESS OTHERWISE INDICATED. ALL SERVICE TAPS FOR NEW 1", 1–1/2" AND 2" SERVICES SHALL BE "WET TAPS" INSTALLED AFTER THE NEW WATER MAIN HAS BEEN BROUGHT BACK INTO SERVICE.
52. TEMPORARY WATER BYPASS SHALL INCLUDE MINIMUM 4" DIAMETER PIPE BETWEEN ALL HYDRANTS AND MINIMUM 2" DIAMETER PIPE TO ALL SERVICE CONNECTIONS; AND SHALL BE BURIED, INSULATED, AND HEATED AS REQUIRED TO PREVENT FREEZING AND AVOID PEDESTRIAN AND TRAFFIC IMPACTS. TEMPORARY PIPING AND HOSES MUST BE IDENTIFIED FOR POTABLE WATER USE BY NSF OR AWWA. AND DISINFECTED IN ACCORDANCE WITH AWWA STANDARDS. TEMPORARY BYPASS TO INCLUDE AIR BLOW BACK PIPING TO ALL FIRE AND DOMESTIC SERVICES FOR USE DURING WATER MAIN INFRASTRUCTURE WORK.
53. ROADWAY RECONSTRUCTION SEQUENCE TO INCLUDE STRIPPING AND GRADING NEW SUBBASE, FOLLOWED BY INSTALLATION OF BINDER COURSE, SETTING/RESETTING NEW CURBS, INSTALLATION OF THE SURFACE COURSE, THEN SIDEWALK RECONSTRUCTION. ROADWAY GRADING AND PAVING TO BE COMPLETED TO MATCH EXISTING ROAD SHAPE AND CATCH BASIN GRATE ELEVATIONS. APPROXIMATE SPOT GRADES OF CASTINGS PROVIDED, CONTRACTOR TO COMPLETE ADDITIONAL SURVEY AS NEEDED TO MAINTAIN DRAINAGE PATTERNS, CURB REVEAL AND TO PREVENT PUDDLES.
54. SIDEWALK, CURB, DRIVEWAY APRONS, AND ADA RAMP REPAIRS AND REPLACEMENTS ARE NOT SHOWN ON DRAWINGS AND SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER IN AREAS WHERE PROPOSED WORK IMPACTS EXISTING SIDEWALKS.
55. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING TRAFFIC AND NOISE CONTROLS AND SCHEDULING ACTIVITIES TO MINIMIZE DISRUPTION OF BUSINESSES.
56. BID ITEM NO. 33 (FURNISH AND INSTALL 1–INCH COPPER SERVICE PIPE) TO INCLUDE WATER SERVICE PIPE REPLACEMENT SHOWN ON PLANS PLUS ADDITIONAL SERVICE PIPE REPLACEMENT WITHIN THE WATER BYPASS AREAS TO REPLACE LEAD, IRON, STEEL, OR LEAKING COPPER SERVICE PIPE AT LOCATIONS NOT INDICATED ON THE PLANS; AS DIRECTED BY THE ENGINEER.

Client: CITY OF SALEM, MASSACHUSETTS	Scale: N/A				NEW ENGLAND CIVIL ENGINEERING CORP.	Sheet: G-2
Project: FOWLER STREET UTILITY PROJECT	Date: 1/9/19				SALEM, MASSACHUSETTS	
GENERAL NOTES	Job: Fowler St.					
	Designed by: WMR					
	Drawn by: DJW					
	Checked by: WMR	No.	Description	Date		
	Approved by: WMR	File: W:\Salem\Fowler Street\CAD\FowlerDesign.dwg				



LEGEND

EXISTING FEATURES

- FIRE HYDRANT
- WATER MAIN WITH PIPE SIZE, MAIN LINE VALVE, AND WATER SERVICE WITH CURB STOP (8"W)
- SEWER MANHOLE AND SEWER MAIN WITH PIPE SIZE (8"VC S)
- STORMWATER MANHOLE AND STORMWATER MAIN WITH PIPE SIZE AND FLOW DIRECTION (8" PVC D)
- CATCH BASIN (CB)
- GAS MAIN WITH PIPE SIZE & MATERIAL AND GAS VALVE (GV, 2" PL G)
- UTILITY PIPE WITH CONTINUATION SYMBOL
- TELEPHONE / COMMUNICATION CONDUIT
- ELECTRIC CONCUIT
- UTILITY MANHOLE (ELECTRIC / COMMUNICATION)
- ROADWAY SIGN
- UTILITY POLE OVERHEAD WIRE
- LIGHT POST/POLE
- TREE
- VEGETATION BOUNDARY
- PARCEL / PROPERTY LINE
- FENCE
- BUILDING / HOUSE / STRUCTURE
- ELEVATION CONTOUR WITH SPOT GRADE ELEVATION (FEET) SHEETS C-1 TO C-6 (89.05)
- ELEVATION CONTOUR WITH ELEVATION LABEL (FEET) FOR SHEETS C-7 AND C-8 (10)

BIT.	BITUMINOUS
CONC.	CONCRETE
GRAN.	GRANITE
PL	PLASTIC
BS	BARE STEEL
VC	VITRIFIED CLAY
AC	ASBESTOS CEMENT
DI	DUCTILE IRON
RET.	RETAINING
ABD.	ABANDONED
INV.	INVERT
TYP.	TYPICAL
DMH	DRAIN MANHOLE
SMH	SEWER MANHOLE
MIN.	MINIMUM
STA	STATION
PROP	PROPOSED

PROPOSED FEATURES

- FIRE HYDRANT
- WATER MAIN, MAIN LINE VALVE, AND WATER SERVICE WITH CURB STOP
- WATER MAIN COUPLING CONNECTING EXISTING MAIN TO NEW WATER MAIN (W)
- TEE CONNECTION
- PIPE BEND
- TAPPING SLEEVE AND VALVE ON EXISTING WATER MAIN
- REDUCER
- LINESTOP ON EXISTING WATER MAIN (V)
- NEW DRAIN MANHOLE
- NEW SEWER MANHOLE
- NEW CATCHBASIN STRUCTURE
- NEW DRAIN PIPE
- NEW SEWER PIPE
- CURED IN PLACE SEWER PIPE LINER
- CAPPED / PLUGGED PIPE
- RECONSTRUCT / REHABILITATE SEWER MANHOLE
- RECONSTRUCT / REHABILITATE CATCHBASIN
- EXPLORATORY EXCAVATION (TEST PIT)

Client	CITY OF SALEM, MASSACHUSETTS
Project	FOWLER STREET UTILITY PROJECT
	GENERAL LEGEND AND SHEET LAYOUT

Scale	1"=300'
Date	1/9/2019
Job	Fowler St.
Designed by	
Drawn by	DJW
Checked by	
Approved by	WMR

No.	Description	Date
File: W:\Salem\Fowler Street\CAD\FowlerDesign.dwg		

COMMONWEALTH OF MASSACHUSETTS — WILLIAM M. RICE — No. 41098 — REGISTERED PROFESSIONAL ENGINEER

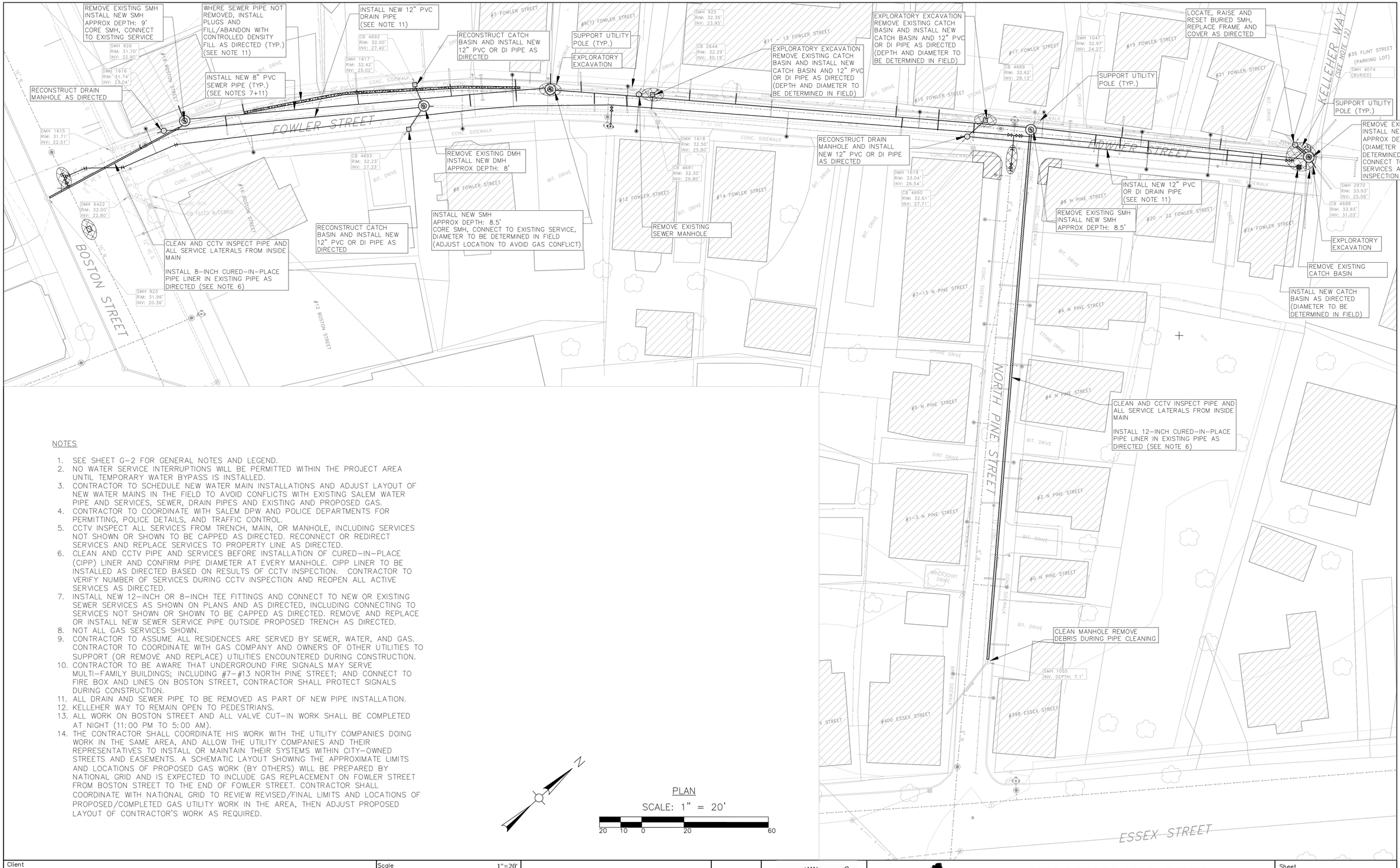
NECE

NEW ENGLAND CIVIL ENGINEERING CORP.

SALEM, MASSACHUSETTS

Sheet

G-3



NOTES

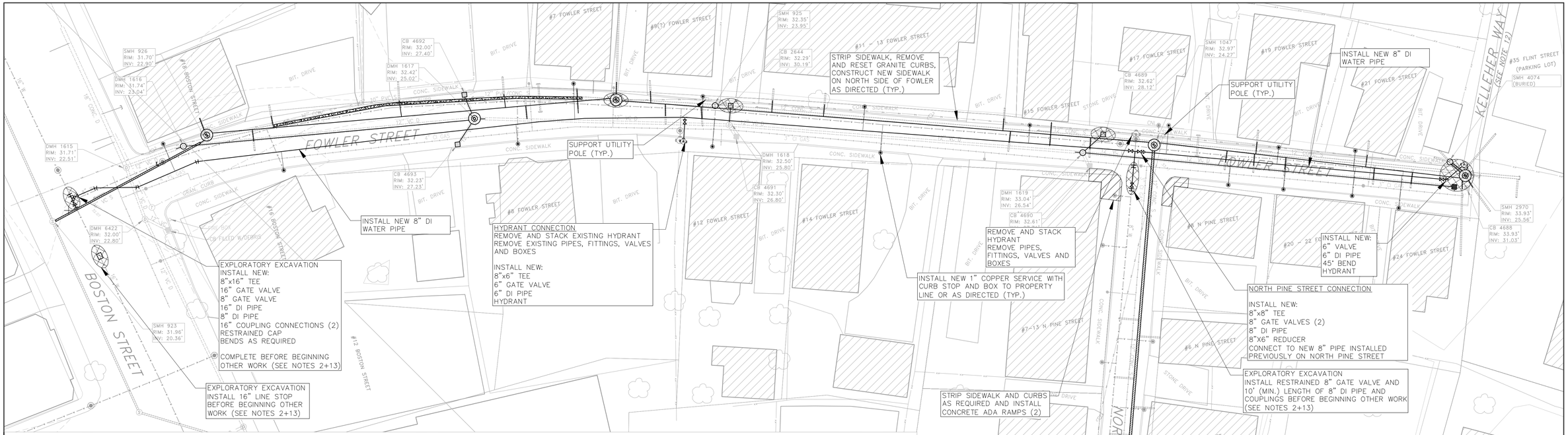
1. SEE SHEET G-2 FOR GENERAL NOTES AND LEGEND.
2. NO WATER SERVICE INTERRUPTIONS WILL BE PERMITTED WITHIN THE PROJECT AREA UNTIL TEMPORARY WATER BYPASS IS INSTALLED.
3. CONTRACTOR TO SCHEDULE NEW WATER MAIN INSTALLATIONS AND ADJUST LAYOUT OF NEW WATER MAINS IN THE FIELD TO AVOID CONFLICTS WITH EXISTING SALEM WATER PIPE AND SERVICES, SEWER, DRAIN PIPES AND EXISTING AND PROPOSED GAS.
4. CONTRACTOR TO COORDINATE WITH SALEM DPW AND POLICE DEPARTMENTS FOR PERMITTING, POLICE DETAILS, AND TRAFFIC CONTROL.
5. CCTV INSPECT ALL SERVICES FROM TRENCH, MAIN, OR MANHOLE, INCLUDING SERVICES NOT SHOWN OR SHOWN TO BE CAPPED AS DIRECTED. RECONNECT OR REDIRECT SERVICES AND REPLACE SERVICES TO PROPERTY LINE AS DIRECTED.
6. CLEAN AND CCTV PIPE AND SERVICES BEFORE INSTALLATION OF CURED-IN-PLACE (CIPP) LINER AND CONFIRM PIPE DIAMETER AT EVERY MANHOLE. CIPP LINER TO BE INSTALLED AS DIRECTED BASED ON RESULTS OF CCTV INSPECTION. CONTRACTOR TO VERIFY NUMBER OF SERVICES DURING CCTV INSPECTION AND REOPEN ALL ACTIVE SERVICES AS DIRECTED.
7. INSTALL NEW 12-INCH OR 8-INCH TEE FITTINGS AND CONNECT TO NEW OR EXISTING SEWER SERVICES AS SHOWN ON PLANS AND AS DIRECTED, INCLUDING CONNECTING TO SERVICES NOT SHOWN OR SHOWN TO BE CAPPED AS DIRECTED. REMOVE AND REPLACE OR INSTALL NEW SEWER SERVICE PIPE OUTSIDE PROPOSED TRENCH AS DIRECTED.
8. NOT ALL GAS SERVICES SHOWN.
9. CONTRACTOR TO ASSUME ALL RESIDENCES ARE SERVED BY SEWER, WATER, AND GAS. CONTRACTOR TO COORDINATE WITH GAS COMPANY AND OWNERS OF OTHER UTILITIES TO SUPPORT (OR REMOVE AND REPLACE) UTILITIES ENCOUNTERED DURING CONSTRUCTION.
10. CONTRACTOR TO BE AWARE THAT UNDERGROUND FIRE SIGNALS MAY SERVE MULTI-FAMILY BUILDINGS; INCLUDING #7-#13 NORTH PINE STREET; AND CONNECT TO FIRE BOX AND LINES ON BOSTON STREET, CONTRACTOR SHALL PROTECT SIGNALS DURING CONSTRUCTION.
11. ALL DRAIN AND SEWER PIPE TO BE REMOVED AS PART OF NEW PIPE INSTALLATION.
12. KELLEHER WAY TO REMAIN OPEN TO PEDESTRIANS.
13. ALL WORK ON BOSTON STREET AND ALL VALVE CUT-IN WORK SHALL BE COMPLETED AT NIGHT (11:00 PM TO 5:00 AM).
14. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE UTILITY COMPANIES DOING WORK IN THE SAME AREA, AND ALLOW THE UTILITY COMPANIES AND THEIR REPRESENTATIVES TO INSTALL OR MAINTAIN THEIR SYSTEMS WITHIN CITY-OWNED STREETS AND EASEMENTS. A SCHEMATIC LAYOUT SHOWING THE APPROXIMATE LIMITS AND LOCATIONS OF PROPOSED GAS WORK (BY OTHERS) WILL BE PREPARED BY NATIONAL GRID AND IS EXPECTED TO INCLUDE GAS REPLACEMENT ON FOWLER STREET FROM BOSTON STREET TO THE END OF FOWLER STREET. CONTRACTOR SHALL COORDINATE WITH NATIONAL GRID TO REVIEW REVISED/FINAL LIMITS AND LOCATIONS OF PROPOSED/COMPLETED GAS UTILITY WORK IN THE AREA, THEN ADJUST PROPOSED LAYOUT OF CONTRACTOR'S WORK AS REQUIRED.

PLAN

SCALE: 1" = 20'

20 10 0 20 60

Client: CITY OF SALEM, MASSACHUSETTS	Scale	1"=20'			NEW ENGLAND CIVIL ENGINEERING CORP.
Project: FOWLER STREET UTILITY PROJECT	Date	1/11/19			SALEM, MASSACHUSETTS
FOWLER AND NORTH PINE STREETS SEWER AND DRAIN	Job	Fowler St.			Sheet: C-1
	Designed by	WMR			
	Drawn by	DJW			
	Checked by	WMR	No.	Date	
	Approved by	WMR	File: W:\Salem\Fowler Street\CAD\FowlerDesign.dwg		



NOTES

1. SEE SHEET G–2 FOR GENERAL NOTES AND LEGEND.
2. NO WATER SERVICE INTERRUPTIONS WILL BE PERMITTED WITHIN THE PROJECT AREA UNTIL TEMPORARY WATER BYPASS IS INSTALLED.
3. CONTRACTOR TO SCHEDULE NEW WATER MAIN INSTALLATIONS AND ADJUST LAYOUT OF NEW WATER MAINS IN THE FIELD TO AVOID CONFLICTS WITH EXISTING SALEM WATER PIPE AND SERVICES, SEWER, DRAIN PIPES AND EXISTING AND PROPOSED GAS.
4. CONTRACTOR TO COORDINATE WITH SALEM DPW AND POLICE DEPARTMENTS FOR PERMITTING, POLICE DETAILS, AND TRAFFIC CONTROL.
5. CCTV INSPECT ALL SERVICES FROM TRENCH, MAIN, OR MANHOLE, INCLUDING SERVICES NOT SHOWN OR SHOWN TO BE CAPPED AS DIRECTED. RECONNECT OR REDIRECT SERVICES AND REPLACE SERVICES TO PROPERTY LINE AS DIRECTED.
6. CLEAN AND CCTV PIPE AND SERVICES BEFORE INSTALLATION OF CURED–IN–PLACE (CIPP) LINER AND CONFIRM PIPE DIAMETER AT EVERY MANHOLE. CIPP LINER TO BE INSTALLED AS DIRECTED BASED ON RESULTS OF CCTV INSPECTION. CONTRACTOR TO VERIFY NUMBER OF SERVICES DURING CCTV INSPECTION AND REOPEN ALL ACTIVE SERVICES AS DIRECTED.
7. INSTALL NEW 12–INCH OR 8–INCH TEE FITTINGS AND CONNECT TO NEW OR EXISTING SEWER SERVICES AS SHOWN ON PLANS AND AS DIRECTED, INCLUDING CONNECTING TO SERVICES NOT SHOWN OR SHOWN TO BE CAPPED AS DIRECTED. REMOVE AND REPLACE OR INSTALL NEW SEWER SERVICE PIPE OUTSIDE PROPOSED TRENCH AS DIRECTED.
8. NOT ALL GAS SERVICES SHOWN.
9. CONTRACTOR TO ASSUME ALL RESIDENCES ARE SERVED BY SEWER, WATER, AND GAS. CONTRACTOR TO COORDINATE WITH GAS COMPANY AND OWNERS OF OTHER UTILITIES TO SUPPORT (OR REMOVE AND REPLACE) UTILITIES ENCOUNTERED DURING CONSTRUCTION.
10. CONTRACTOR TO BE AWARE THAT UNDERGROUND FIRE SIGNALS MAY SERVE MULTI–FAMILY BUILDINGS; INCLUDING #7–#13 NORTH PINE STREET; AND CONNECT TO FIRE BOX AND LINES ON BOSTON STREET, CONTRACTOR SHALL PROTECT SIGNALS DURING CONSTRUCTION.
11. ALL DRAIN AND SEWER PIPE TO BE REMOVED AS PART OF NEW PIPE INSTALLATION.
12. KELLEHER WAY TO REMAIN OPEN TO PEDESTRIANS.
13. ALL WORK ON BOSTON STREET AND ALL VALVE CUT–IN WORK SHALL BE COMPLETED AT NIGHT (11:00 PM TO 5:00 AM).
14. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE UTILITY COMPANIES DOING WORK IN THE SAME AREA, AND ALLOW THE UTILITY COMPANIES AND THEIR REPRESENTATIVES TO INSTALL OR MAINTAIN THEIR SYSTEMS WITHIN CITY–OWNED STREETS AND EASEMENTS. A SCHEMATIC LAYOUT SHOWING THE APPROXIMATE LIMITS AND LOCATIONS OF PROPOSED GAS WORK (BY OTHERS) WILL BE PREPARED BY NATIONAL GRID AND IS EXPECTED TO INCLUDE GAS REPLACEMENT ON FOWLER STREET FROM BOSTON STREET TO THE END OF FOWLER STREET. CONTRACTOR SHALL COORDINATE WITH NATIONAL GRID TO REVIEW REVISED/FINAL LIMITS AND LOCATIONS OF PROPOSED/COMPLETED GAS UTILITY WORK IN THE AREA, THEN ADJUST PROPOSED LAYOUT OF CONTRACTOR'S WORK AS REQUIRED.

N

PLAN

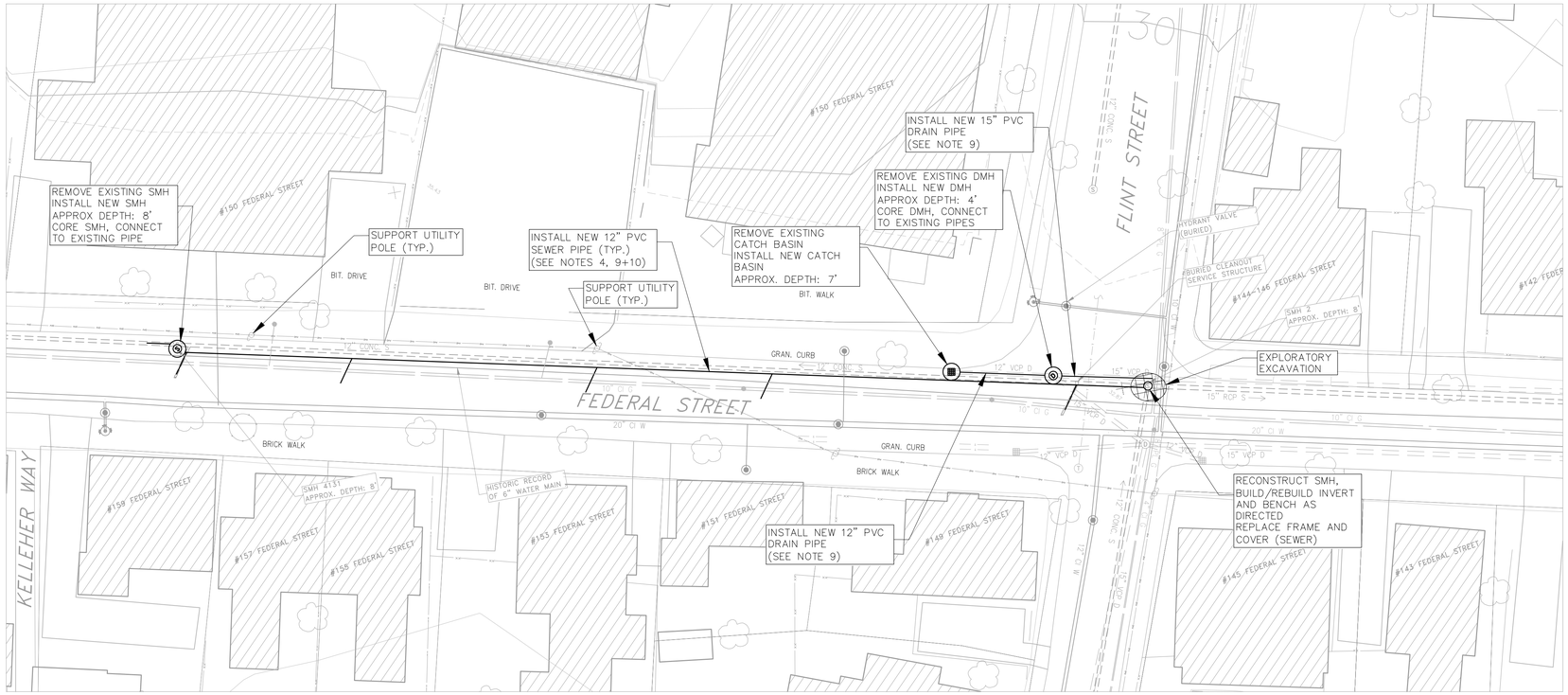
SCALE: 1" = 20'

20 10 0 20 60

Client: CITY OF SALEM, MASSACHUSETTS	Scale	1"=20'			NEW ENGLAND CIVIL ENGINEERING CORP.
Project: FOWLER STREET UTILITY PROJECT	Date	1/11/19			SALEM, MASSACHUSETTS
	Job	Fowler St.			
	Designed by	WMR			
	Drawn by	DJW			
FOWLER AND NORTH PINE STREETS WATER	Checked by	WMR	No.	Date	
	Approved by	WMR	File: W:\Salem\Fowler Street\CAD\FowlerDesign.dwg		

COMMONWEALTH OF MASSACHUSETTS WILLIAM M. RAFFA No. 41099 REGISTERED PROFESSIONAL ENGINEER

Sheet C-2



NOTES

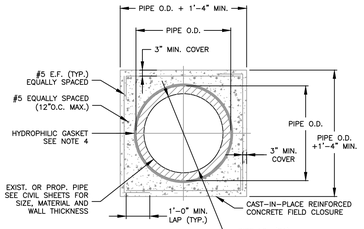
1. SEE SHEET G–2 FOR GENERAL NOTES AND LEGEND.
2. CONTRACTOR TO COORDINATE WITH SALEM DPW AND POLICE DEPARTMENTS FOR PERMITTING, POLICE DETAILS, AND TRAFFIC CONTROL.
3. CCTV INSPECT ALL SERVICES FROM TRENCH, MAIN, OR MANHOLE, INCLUDING SERVICES NOT SHOWN OR SHOWN TO BE CAPPED AS DIRECTED. RECONNECT OR REDIRECT SERVICES AND REPLACE SERVICES TO PROPERTY LINE AS DIRECTED.
4. INSTALL NEW 12–INCH OR 8–INCH TEE FITTINGS AND CONNECT TO NEW OR EXISTING SEWER SERVICES AS SHOWN ON PLANS AND AS DIRECTED, INCLUDING CONNECTING TO SERVICES NOT SHOWN OR SHOWN TO BE CAPPED AS DIRECTED. REMOVE AND REPLACE OR INSTALL NEW SEWER SERVICE PIPE OUTSIDE PROPOSED TRENCH AS DIRECTED.
5. NOT ALL GAS SERVICES SHOWN.
6. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE UTILITY COMPANIES DOING WORK IN THE SAME AREA, AND ALLOW THE UTILITY COMPANIES AND THEIR REPRESENTATIVES TO INSTALL OR MAINTAIN THEIR SYSTEMS WITHIN CITY–OWNED STREETS AND EASEMENTS. A SCHEMATIC LAYOUT SHOWING THE APPROXIMATE LIMITS AND LOCATIONS OF PROPOSED GAS WORK (BY OTHERS) WILL BE PREPARED BY NATIONAL GRID AND IS EXPECTED TO INCLUDE GAS REPLACEMENT ON FEDERAL STREET FROM BOSTON STREET TO FLINT STREET. CONTRACTOR SHALL COORDINATE WITH NATIONAL GRID TO REVIEW REVISED/FINAL LIMITS AND LOCATIONS OF PROPOSED/COMPLETED GAS UTILITY WORK IN THE AREA, THEN ADJUST PROPOSED LAYOUT OF CONTRACTOR'S WORK AS REQUIRED.
7. CONTRACTOR TO ASSUME ALL RESIDENCES ARE SERVED BY SEWER, WATER, AND GAS. CONTRACTOR TO COORDINATE WITH GAS COMPANY AND OWNERS OF OTHER UTILITIES TO SUPPORT (OR REMOVE AND REPLACE) UTILITIES ENCOUNTERED DURING CONSTRUCTION.
8. CONTRACTOR TO BE AWARE THAT UNDERGROUND FIRE SIGNALS MAY SERVE MULTI–FAMILY BUILDINGS and EDUCATIONAL/INSTITUTIONAL BUILDINGS, INCLUDING MULTIPLE BUILDINGS AT #150 FEDERAL STREET, CONTRACTOR SHALL PROTECT SIGNALS DURING CONSTRUCTION.
9. ALL SEWER AND DRAIN PIPE TO BE REMOVED AS PART OF NEW PIPE INSTALLATION.
10. SEWER SERVICES SHOWN SCHEMATICALLY, NOT ALL SEWER SERVICES SHOWN.
11. FEDERAL STREET SEWER IS COLLAPSED AND HAS NOT BEEN INSPECTED, BYPASS PUMPING WILL BE REQUIRED AND SERVICE CONNECTION LOCATIONS ARE UNKNOWN.
12. WORK ON FEDERAL STREET SHALL BE COMPLETED FIRST TO ADDRESS SEWER COLLAPSE, WORK TO BE COMPLETED IN WINTER 2019 WITH TEMPORARY PAVEMENT. CONTRACTOR IS RESPONSIBLE TO MAINTAIN FLOW, COMPLETE SPOT REPAIRS, AND BYPASS PUMP IF BACKUP OCCURS WITHIN PROJECT AREA ON FEDERAL STREET FOLLOWING EXECUTION OF THE AGREEMENT.

PLAN

SCALE: 1" = 20'

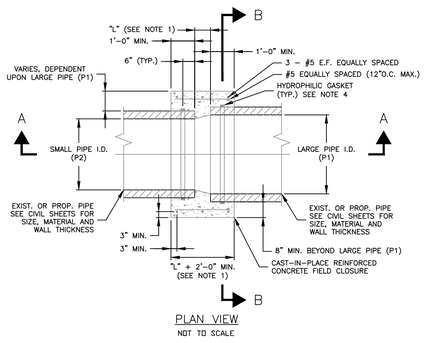
20 10 0 20 60

Client: CITY OF SALEM, MASSACHUSETTS	Scale: 1"=20'			NECE	NEW ENGLAND CIVIL ENGINEERING CORP.
Project: FOWLER STREET UTILITY PROJECT	Date: 1/11/19				SALEM, MASSACHUSETTS
FEDERAL STREET SEWER	Job: Fowler St.				Sheet: C-3
	Designed by: WMR				
	Drawn by: DJW				
	Checked by: WMR	No.	Date		
	Approved by: WMR	File: W:\Salem\Fowler Street\CAD\FowlerDesign.dwg			



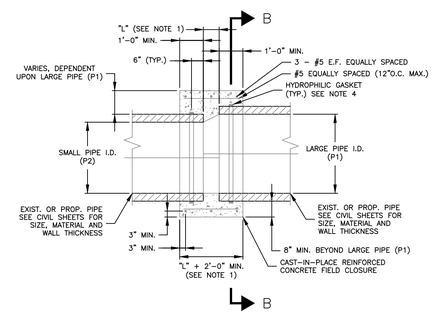
SECTION B–B

NOT TO SCALE



PLAN VIEW

NOT TO SCALE



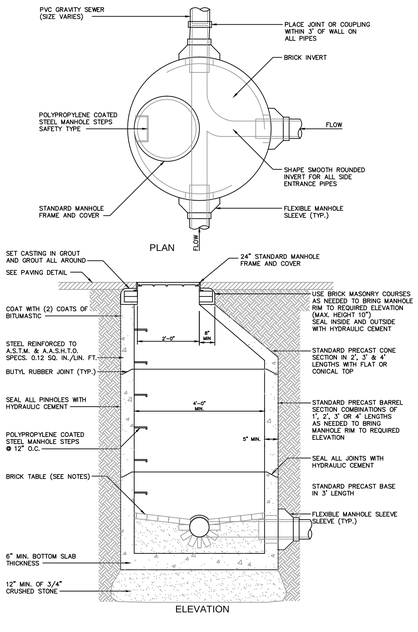
SECTION A–A

NOT TO SCALE

CAST–IN–PLACE FIELD CLOSURE DETAIL

FOR NON–PRESSURE PIPES OF DIFFERENT MATERIALS OR SIZES (P1 = 48" MAX.)

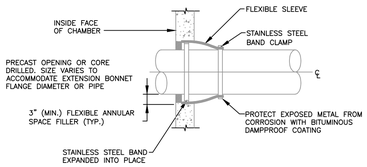
NOTES:
1. SPACING BETWEEN PIPES (L) DEPENDS ON PIPE SIZES, FOR PIPES OF THE SAME SIZE USE 4" MINIMUM. THE DISTANCE "L" EQUALS THE LARGE PIPE I.D. MINUS THE SMALL PIPE I.D. TIMES TWO [L=(P1–P2)x2].
2. PROPOSED PIPE INVERT SHALL MATCH EXISTING PIPE INVERT UNLESS OTHERWISE SHOWN ON CIVIL SHEETS.
3. SAND BLAST EXISTING PIPE PERIMETER AND APPLY BONDING AGENT PRIOR TO CONCRETE ENCASEMENT.
4. INSTALL HYDROPHILIC (WATER STOP) GASKET ALONG PIPE PERIMETER FOR EACH PIPE AS SPECIFIED.
5. CONCRETE AND REBAR REQUIREMENTS SHALL CONFORM TO THE SPECIFICATIONS.
6. LOCATION OF FIELD CLOSURE SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL.



NOTES:
1. INNER EDGE OF BRICK TABLE TO BE AT ELEVATION OF CROWN OF TOP PIPE. TABLE TO SLOPE AT 1" PER 1' TO INSIDE OF MANHOLE BASE.
2. TYPICAL MANHOLE TO BE 4–FOOT DIAMETER MINIMUM.
3. CONTRACTOR TO SELECT MANHOLE DIAMETER TO ACCOMMODATE NUMBER OF PIPE OPENINGS PER MANUFACTURERS REQUIREMENTS AND INTERNAL DROP PIPING.

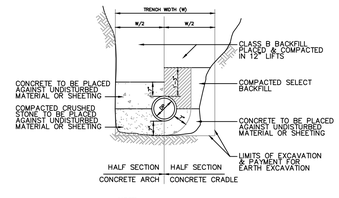
TYPICAL MANHOLE DETAIL

NOT TO SCALE



FLEXIBLE SLEEVE CONNECTION DETAIL

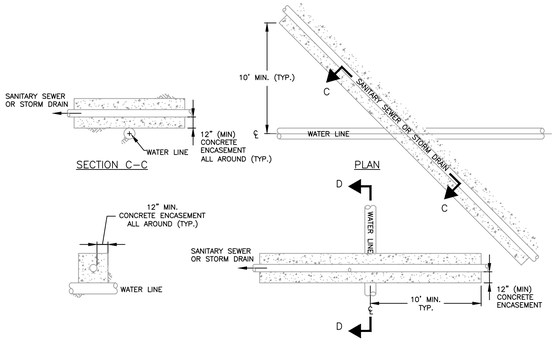
NOT TO SCALE



NOTE:
IF CONCRETE ENCASEMENT IS REQUIRED, CONCRETE OF 6" MINIMUM THICKNESS SHALL BE PLACED ALL AROUND PIPE.

CONCRETE ARCH AND CRADLE DETAIL

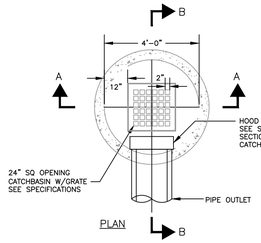
NOT TO SCALE

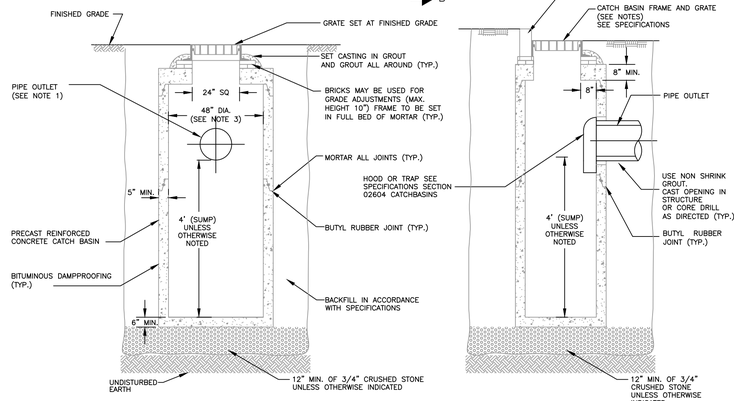


NOTE:
1. CONCRETE SHALL BE 3,000 PSI STRENGTH AS INDICATED IN SPECIFICATIONS

CONCRETE ENCASEMENT DETAIL

NOT TO SCALE

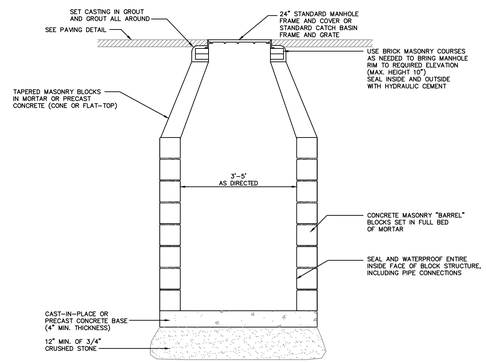




CATCH BASIN WITH GRATE
(OR CB CONVERTED TO DMH WITH SUMP)

NOT TO SCALE

NOTES:
1. FACE OF PIPE NOT TO PROJECT MORE THAN 4" FROM FACE OF WALL ALONG CENTERLINE OF PIPE.
2. FOR DESCRIPTION OF MATERIALS AND CONSTRUCTION METHOD, SEE SPECIFICATIONS.
3. 5' DIAMETER MANHOLES FOR DOUBLE CATCH BASINS, 8" BASE SLAB THICKNESS.
4. DESIGN PRECAST SECTIONS WITH FRAME AND GRATE FOR AASHTO H20 LOADING.
5. CATCH BASIN FRAME AND GRATE REPLACED WITH "DRAIN" FRAME AND COVER FOR NEW CBS INSTALLED WITH GUTTER INLETS (OR CBS CONVERTED TO DMHS).
6. PIPE OPENINGS IN EACH MANHOLE OR STRUCTURE TO BE FACTORY CAST OR FIELD CORED AS DIRECTED BY ENGINEER.



TYPICAL BLOCK STRUCTURE

NOT TO SCALE

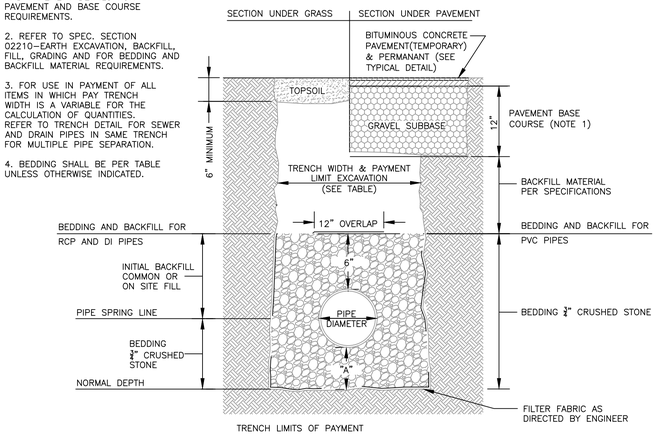
Client	CITY OF SALEM, MASSACHUSETTS	Scale	N/A			NEW ENGLAND CIVIL ENGINEERING CORP.
Project	FOWLER STREET UTILITY PROJECT	Date	1/9/19			SALEM, MASSACHUSETTS
	DETAILS	Job	Fowler St.			Sheet D-1
		Designed by	WMR			
		Drawn by	DJW			
		Checked by	WMR	No.	Description / Date	
		Approved by	WMR	File: W:\Salem\Fowler Street\CAD\FowlerDesign.dwg		

NOTES:
1. REFER TO SPEC. SECTION 02500–PAVING AND SURFACING, AND PAVEMENT DETAILS FOR PAVEMENT AND BASE COURSE REQUIREMENTS.

2. REFER TO SPEC. SECTION 02210–EARTH EXCAVATION, BACKFILL, FILL, GRADING AND FOR BEDDING AND BACKFILL MATERIAL REQUIREMENTS.

3. FOR USE IN PAYMENT OF ALL ITEMS IN WHICH PAY TRENCH WIDTH IS A VARIABLE FOR THE CALCULATION OF QUANTITIES, REFER TO TRENCH DETAIL FOR SEWER AND DRAIN PIPES IN SAME TRENCH FOR MULTIPLE PIPE SEPARATION.

4. BEDDING SHALL BE PER TABLE UNLESS OTHERWISE INDICATED.



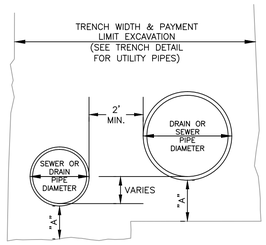
TRENCH LIMITS OF PAYMENT

NOMINAL PIPE SIZE	TRENCH WIDTH	"A"
≤12" ø	4'	6"
>12" ø	O.D. DIA. +3'	9"
MANHOLES AND ALL STRUCTURES	O.D. DIA. +3'	12"
DRAIN AND SEWER PIPES IN SAME TRENCH	COMBINED PIPE O.D.s +4'	VARIES; SEE INDIVIDUAL PIPE SIZES

O.D. = OUTSIDE DIMENSION

TRENCH DETAIL FOR UTILITY PIPES

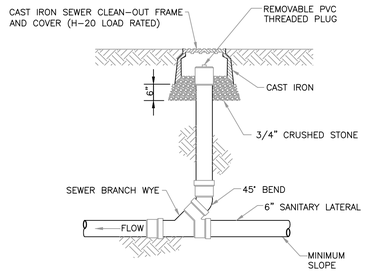
NOT TO SCALE



NOTES:
1. MINIMUM SEPARATION BETWEEN PIPES TO BE 2–FEET UNLESS DIRECTED OTHERWISE BY ENGINEER.
2. REFER TO TRENCH DETAIL FOR UTILITY PIPES FOR BEDDING AND BACKFILL DETAILS AND PAYMENT LIMITS.

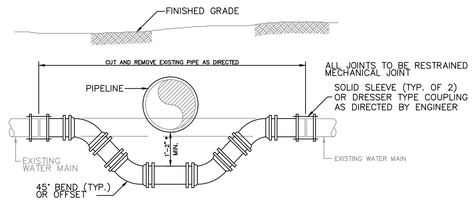
TRENCH DETAIL FOR SEWER AND DRAIN PIPES IN SAME TRENCH

NOT TO SCALE



SEWER CLEAN–OUT IN PAVED AREAS

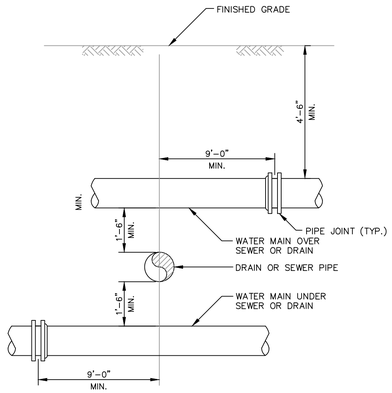
NOT TO SCALE

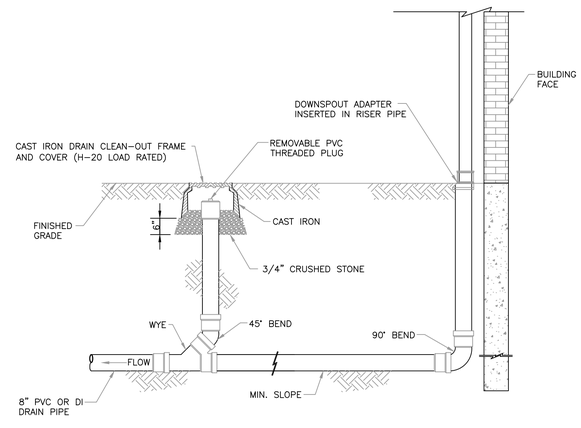


*FOR SEWER CROSSINGS, RELOCATE MAIN ABOVE SEWER (WHERE POSSIBLE) AND PROVIDE 18" MINIMUM CLEARANCE.

RELOCATION OF EXISTING WATER MAIN DETAIL

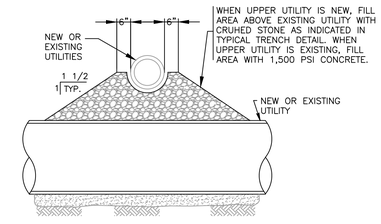
NOT TO SCALE



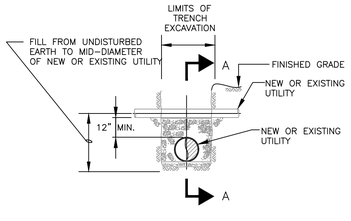


DRAIN SERVICE PIPE AND ROOF LEADER CONNECTION

NOT TO SCALE



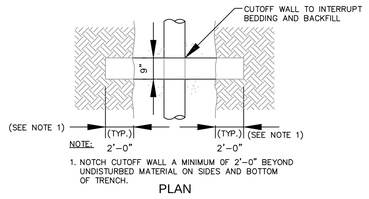
SECTION A–A



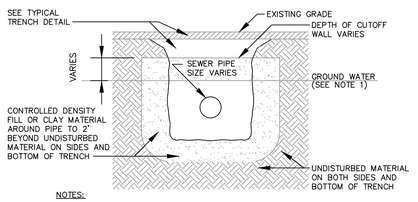
ELEVATION

UTILITY CROSSING DETAIL

NOT TO SCALE



PLAN

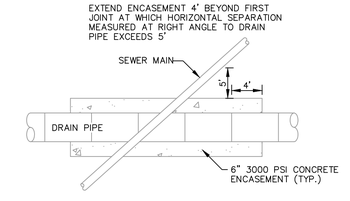


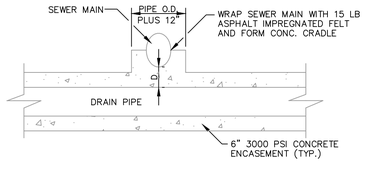
NOTES:
1. THE TOP OF THE CUTOFF WALL SHALL EXTEND A MINIMUM OF 5'–0" ABOVE THE GROUND WATER LEVEL, AS DETERMINED BY THE NEAREST BORING OR BY THE ENGINEER.
2. CUTOFF WALLS SHOULD ONLY BE INSTALLED WHERE DIRECTED BY THE ENGINEER.

ELEVATION

TYPICAL CUTOFF WALL DETAIL

NOT TO SCALE



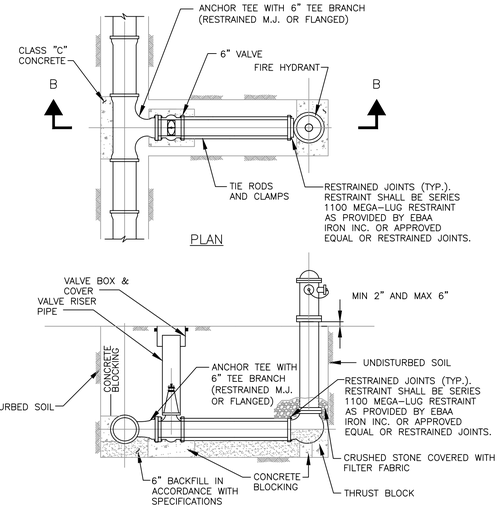


CONCRETE ENCASEMENT FOR SEWER AND DRAIN CROSSING

NOT TO SCALE

Client: CITY OF SALEM, MASSACHUSETTS	Scale	N/A			NEW ENGLAND CIVIL ENGINEERING CORP. SALEM, MASSACHUSETTS
Project: FOWLER STREET UTILITY PROJECT	Date	1/9/19			
	Job	Fowler St.			
	Designed by	WMR			
	Drawn by	DJW			
DETAILS	Checked by	WMR	No.	Description / Date	
	Approved by	WMR	File: W:\Salem\Fowler Street\CAD\FowlerDesign.dwg		

Sheet: D-2



FIRE HYDRANT DETAIL

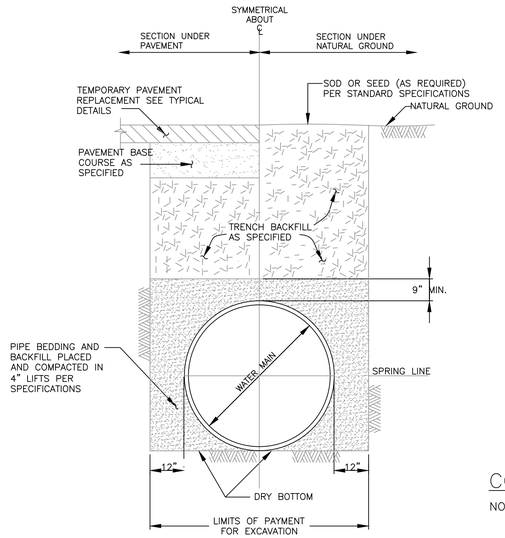
NOT TO SCALE

NOTES:
1. LOCATE FIRE HYDRANTS AS SHOWN ON DRAWINGS, APPROXIMATELY 3 FEET BEHIND CURB OR PROJECTED FUTURE CURB.

2. THE FIRE HYDRANT STEAMER NOZZLE SHALL FACE THE STREET.

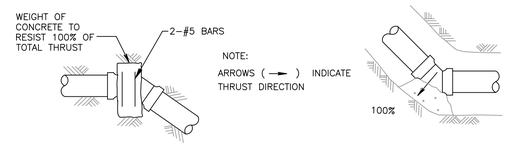
3. REFER TO SPECIFICATION SECTION 03300 FOR CONCRETE (3,000 PSI) THRUST BLOCKS.

4. PROVIDE HYDRANT, VALVE AND TEE JOINTS WITH RESTRAINED MECHANICAL JOINTS.



WATER MAIN TRENCH DETAIL

NOT TO SCALE

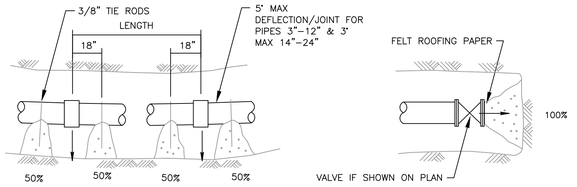


VERTICAL BEND

NOTE:
CONC. FOR THRUST BLOCKS TO BE 3000 P.S.I

HORIZONTAL BEND

NOTE:
FIGURE (100%) AT THRUST BLOCK INDICATES PERCENT OF TOTAL THRUST TO BE APPLIED FOR BEARING AREA.



CURVE THRUST BLOCKING

DEAD-END

CONCRETE THRUST BLOCKS FOR DUCTILE IRON PIPE

NOT TO SCALE

THRUST PER PSI OF WATER PRESSURE AT VARIOUS FITTINGS				
PIPE SIZE	DEAD END OR TEE	90° ELBOW	45° ELBOW	22 1/2° ELBOW
6	39	55	30	15
8	67	94	51	26
10	109	154	84	43
12	155	218	119	61
16	275	383	209	106
18	351	494	269	137

SIDE THRUST PER 100 lb./sq.in. PRESSURE PER DEGREE OF DEFLECTION			
PIPE SIZE-in.	SIDE THRUST-lb.	PIPE SIZE-in.	SIDE THRUST-lb.
6	72	12	278
8	122	16	486
10	197	18	665

MULTIPLY THRUST BY DEGREE OF DEFLECTION TO OBTAIN TOTAL THRUST

EXAMPLE:
8-INCH 90° ELBOW, PRESSURE=200lb./SQ.IN.
FROM TABLE: THRUST=94 x 200=18,800 lb.
ASSUME BEARING STRENGTH OF SOIL=2000 lb./SQ.FT.

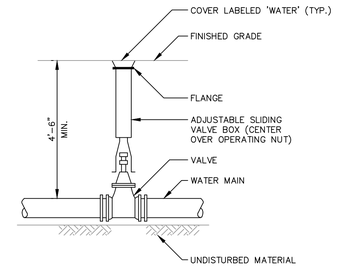
$\frac{18,800}{2000}$ =9.4 SQ.FT.= AREA OF BEARING REQUIRED FOR THRUST BLOCK

NOTES:
1. IN USING THE ABOVE TABLES, USE THE MAXIMUM INTERNAL PRESSURE ANTICIPATED (i.e. HYDROSTATIC TEST PRESSURE, POSSIBLE SURGE PRESSURE DUE TO PUMP SHUT-OFF, ETC.

2. ASSUME A SOIL BEARING STRENGTH OF 2000 LB. PER SQ. FOOT.

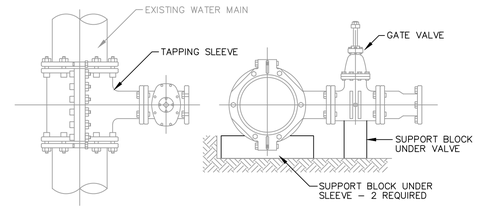
3. JOINTS SHALL BE PROTECTED BY FELT ROOFING PAPER PRIOR TO PLACING CONCRETE.

4. REFER TO SPECIFICATION SECTION 03300 - CONCRETE FOR CONCRETE REQUIREMENTS



TYPICAL VALVE BOX DETAIL

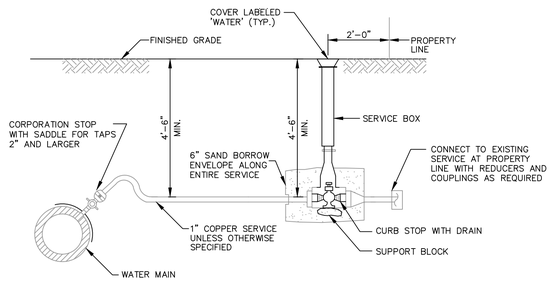
NOT TO SCALE



NOTE:
SUPPORT BLOCKS TO BE PRESSURE TREATED WOOD OR CONCRETE MASONRY BLOCK.

TAPPING SLEEVE WITH GATE VALVE

NOT TO SCALE

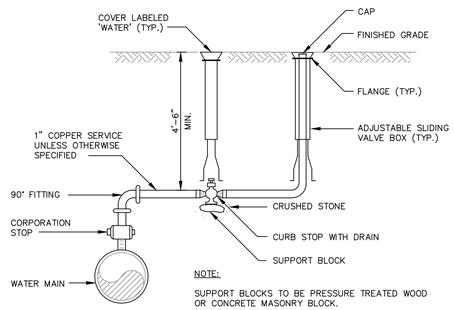


NOTES:

1. FLUSH ALL NEW SERVICE LINES PRIOR TO CONNECTING TO EXISTING.
2. AFTER CONNECTION, CONTRACTOR SHALL ASSIST WATER DEPT. PERSONNEL IN FLUSHING SERVICE LINES UP TO THE METER.
3. COPPER SERVICE TO BE INSTALLED IN 6-INCH SAND ENVELOPE.
4. CONNECT TO EXISTING SERVICE. WHERE EXISTING SERVICES DO NOT EXIST, PLUG END OF CURB STOP.
5. ALL NEW COPPER SERVICES TO BE CONTINUOUS WITHOUT UNIONS OR COUPLINGS BETWEEN CORPORATION AND CURB STOP.

COPPER SERVICE CONNECTION DETAIL

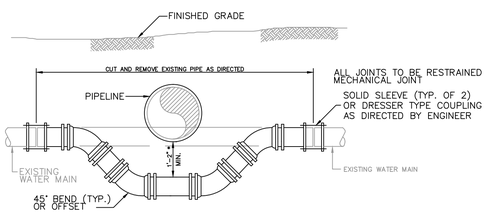
NOT TO SCALE



NOTE:
SUPPORT BLOCKS TO BE PRESSURE TREATED WOOD OR CONCRETE MASONRY BLOCK.

CURB STOP BLOWOFF DETAIL

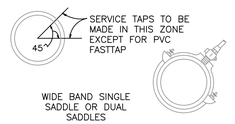
NOT TO SCALE



*FOR SEWER CROSSINGS, RELOCATE MAIN ABOVE SEWER (WHERE POSSIBLE) AND PROVIDE 18" MINIMUM CLEARANCE.

RELOCATION OF EXISTING WATER MAIN DETAIL

NOT TO SCALE



SERVICE CONNECTION

NOT TO SCALE

NOTES:
1. BLOW-OFF & CHLORINATION TAPS ARE MADE IN VERTICAL POSITION

PIPE TAPPING SCHEDULE	
WATER MAIN TYPE AND DIAMETER	SERVICE TAP TYPE
12" OR LESS CAST IRON OR DUCTILE IRON	DSS, WBSS
16" AND UP CAST IRON OR DUCTILE IRON	DWBSS

DSS - DUAL STRAP SADDLES
WBSS - WIDE BAND STRAP SADDLES
DWBSS - DUAL WIDE BAND STRAP SADDLES

Client	CITY OF SALEM, MASSACHUSETTS
Project	FOWLER STREET UTILITY PROJECT
	DETAILS

Scale	N/A
Date	1/9/19
Job	Fowler St.
Designed by	WMR
Drawn by	DJW
Checked by	WMR
Approved by	WMR

No.	Description	Date
File: W:\Salem\Fowler Street\CAD\FowlerDesign.dwg		

COMMONWEALTH OF MASSACHUSETTS WILLIAM M. ROBY JR. No. 51080 REGISTERED PROFESSIONAL ENGINEER

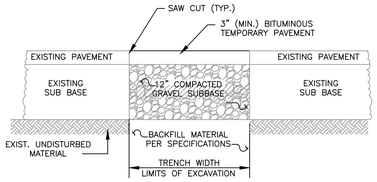
NECE

NEW ENGLAND CIVIL ENGINEERING CORP.

SALEM, MASSACHUSETTS

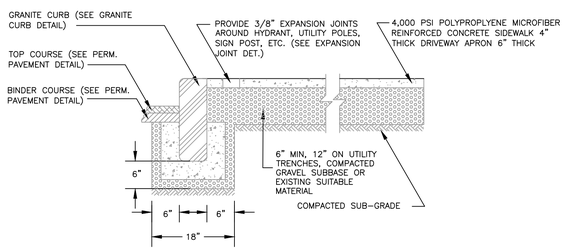
Sheet

D-3



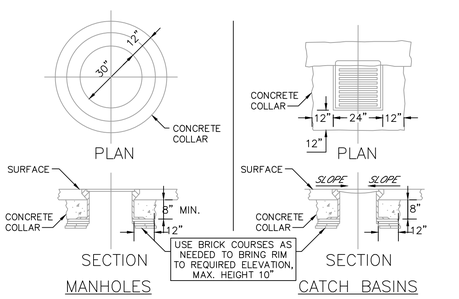
TEMPORARY PAVEMENT DETAIL

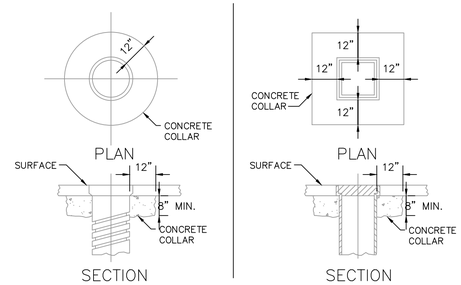
NOT TO SCALE



CONCRETE SIDEWALK DETAIL

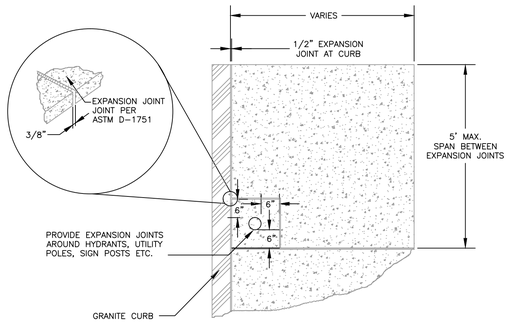
NOT TO SCALE





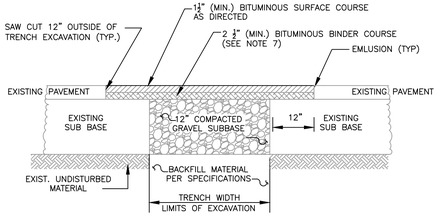
DETAILS FOR RAISING CASTINGS

NOT TO SCALE



CONCRETE SIDEWALK EXPANSION JOINT

NOT TO SCALE



PERMANENT PAVEMENT DETAIL

NOT TO SCALE

GENERAL PAVING NOTES:

1. THE CONTRACTOR SHALL MAINTAIN TEMPORARY PAVEMENT FOR A MINIMUM OF 90 DAYS UNLESS DIRECTED OTHERWISE BY THE ENGINEER EXCEPT IF TEMPORARY PAVEMENT IS PLACED AFTER OCTOBER 15, THEN IT SHALL BE MAINTAINED UNTIL APRIL 15 OF THE FOLLOWING YEAR.

2. PERMANENT PAVEMENT SHALL BE PLACED BETWEEN APRIL 15 AND OCTOBER 15 OF EACH CALENDAR YEAR.

3. THE CONTRACTOR SHALL SAW CUT 12" OUTSIDE OF TRENCH EXCAVATION. TEMPORARY PAVEMENT SHALL BE REMOVED AND DISPOSED OF. THE GRAVEL SHALL BE FINE GRADED, EMULSION PLACED ON ALL JOINTS, AND PERMANENT PAVEMENT PLACED IN TWO COURSES.

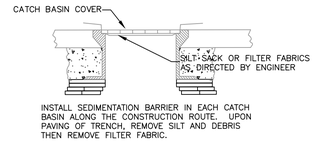
4. CONTRACTOR SHALL MATCH EXISTING ROADWAY GRADES AND EXISTING THICKNESS UNLESS OTHERWISE DIRECTED.

5. REFER TO SPECIFICATION SECTION 02500 PAVING AND SURFACING FOR ADDITIONAL REQUIREMENTS.

6. PERMANENT PAVEMENT DETAIL TO APPLY TO TRENCH PAVEMENT AND FULL WIDTH ROADWAY RECONSTRUCTION AND/OR PAVEMENT.

7. BITUMINOUS BINDER COURSE FOR ROADWAY RECONSTRUCTION (CURB TO CURB) TO BE 2-INCH MIN. THICKNESS.

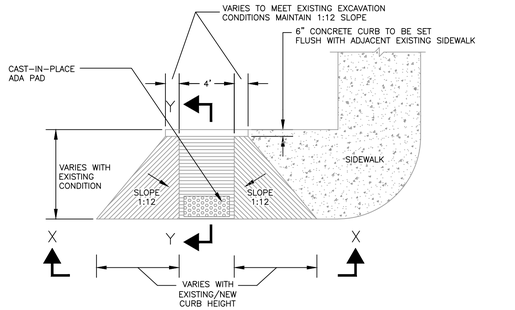
8. GRAVEL SUBBASE TO BE 12-INCH THICKNESS ON UTILITY TRENCH, 6-INCH MINIMUM THICKNESS IN STRIPPED AREAS OUTSIDE TRENCH.



INSTALL SEDIMENTATION BARRIER IN EACH CATCH BASIN ALONG THE CONSTRUCTION ROUTE. UPON PAVING OF TRENCH, REMOVE SILT AND DEBRIS THEN REMOVE FILTER FABRIC.

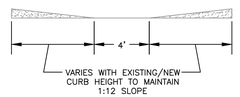
CATCH BASIN SEDIMENTATION BARRIER

NOT TO SCALE

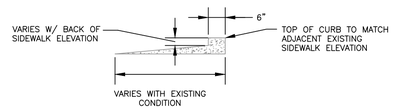


MAINTAIN 1:12 SLOPE TO MEET EXIST/NEW CONDITIONS

PLAN



SECTION X–X



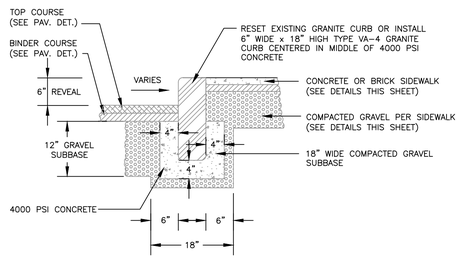
SECTION Y–Y

ADA RAMP DETAIL

NOT TO SCALE

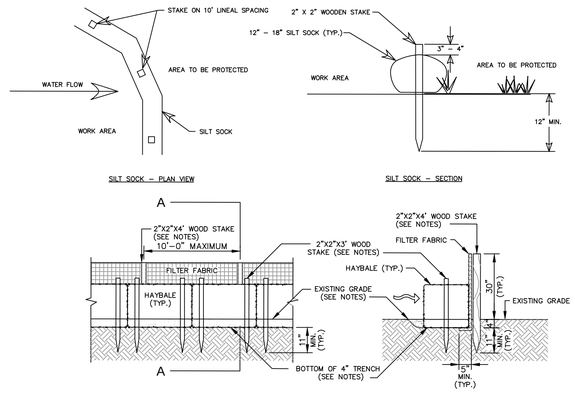
GENERAL HANDICAP NOTES:
1. REINFORCEMENT FOR HANDICAP RAMP SHALL BE THE SAME AS MICROFIBER REINFORCED CONCRETE FOR SIDEWALK.

2. ADA RAMPS TO CONFORM TO LATEST MDOT STANDARDS.



GRANITE CURB DETAIL

NOT TO SCALE



EROSION & SEDIMENTATION BARRIER

NOT TO SCALE

NOTES:

1. CONTRACTOR TO INSTALL HAYBALES AND SILT FENCE OR MULCH SOCK (SILTSOXX OR EQUAL) AS APPROVED BY THE CITY'S CONSERVATION COMMISSION

2. FABRIC TO BE UV RESISTANT POLYPROPYLENE WITH A MINIMUM WEIGHT OF 2.5 OZ./S.Y.

3. FABRIC TO BE ATTACHED TO STAKES WITH STAPLES.

4. HAY BALES SHALL BE SALT MARSH HAY AS APPROVED BY THE CITY'S CONSERVATION COMMISSION

5. WHERE HAYBALES ARE USED, TRENCH A MINIMUM OF 4" INTO EXISTING GRADE.

6. A MINIMUM OF (2) WOODEN OR METAL STAKES PER HAYBALE. DRIVE STAKES A MINIMUM OF 12" INTO GROUND.

7. MULCH SOCK DEPICTED IS FOR MINIMUM SLOPES. GREATER SLOPES MAY REQUIRE MORE SOCKS PER ENGINEER

8. COMPOST MATERIAL TO BE DISPERSED ON SITE AS DETERMINED BY ENGINEER

9. CONTRACTOR TO INSTALL GEOTEXTILE (SILT SACK) IN ALL CATCH BASINS PRIOR TO EXCAVATION.

10. ALL CONSTRUCTION DEWATERING MUST BE TREATED WITH A SEDIMENTATION TANK PRIOR TO DISCHARGE UPGRADIENT OF OTHER EROSION AND SEDIMENTITION DEVICES AND CONTROLS.

Client	CITY OF SALEM, MASSACHUSETTS
Project	FOWLER STREET UTILITY PROJECT
	DETAILS

Scale	N/A
Date	1/9/19
Job	Fowler St.
Designed by	WMR
Drawn by	DJW
Checked by	WMR
Approved by	WMR

No.	Description	Date

File: W:\Salem\Fowler Street\CAD\FowlerDesign.dwg

NEW ENGLAND CIVIL ENGINEERING CORP.
SALEM, MASSACHUSETTS

Sheet D-4