LAYOUT POINTS

Point #	Raw Description	Northing	Easting
4	END DRIVE ALIGNMENT	5550.0130	7804.7695
5	CORNER OF SLUDGE TANK	5487.3929	7803.4529
6	CORNER OF SLUDGE TANK	5454.5197	7855.7373
7	CORNER OF CHEMICAL ROOM	5481.7054	7695.6453
8	CORNER OF CHEMICAL ROOM	5447.2986	7682.0374
9	CORNER OF PAVEMENT	5463.9123	7681.3932
10	CORNER OF VESTIBULE	5403.0827	7660.6034
11	CORNER OF VESTIBULE	5385.1075	7653.4943
12	CORNER OF PAVEMENT	5410.5619	7549.0424
13	CORNER OF PAVEMENT	5337.9244	7574.8048
14	CORNER OF ELECTRICAL ROOM	5253.4406	7567.9089
15	CORNER OF ELECTRICAL ROOM	5247.5845	7582.7987
16	CORNER OF CORNER OF PAVEMENT	5287.8720	7647.7812
17	CORNER OF PAVEMENT	5289.4412	7792.9563
18	CORNER OF PAVEMENT	5208.6159	7760.7710
19	CORNER OF CONTACT CHAMBER	5265.5675	7826.1294
20	CORNER OF CONTACT CHAMBER	5190.7917	7913.2332
21	CORNER OF PAVEMENT	5222.5896	7948.3920
22	CORNER OF PAVEMENT	5374.1654	8008.3401
23	CORNER OF GRAVEL	5581.1910	7756.4561
24	CORNER OF GRAVEL	5550.6062	7736.7189
25	CORNER OF GRAVEL	5676.2044	7533.9033
26	CENTER ISLAND RADIUS	5571.4843	7585.6509
27	CENTER ISLAND RADIUS	5515.6984	7563.6072
28	CORNER OF PAVEMENT	5612.1459	7497.4903
29	CORNER OF PAVEMENT	5563.9343	7461.7776
30	CORNER OF PAVEMENT	5454.4321	7590.8011
31	CORNER OF PAVEMENT	5441.3821	7623.7773
32	CORNER OF PAVEMENT	5509.6169	7663.3520
33	CORNER OF PAVEMENT	5400.5208	7968.8921
34	CORNER OF PAVEMENT	5396.1074	7980.0511
35	CORNER OF TRANSFORMER	5628.4725	7420.0775
36	CORNER OF TRANSFORMER	5614.6166	7417.2470
37	CORNER OF PAVEMENT	5638.8354	7422.3361
38	CORNER OF PAVEMENT	5617.7167	7435.7021

AMESBURY ROAD

OHE

EXTEND FENCE TO MATCH TO EXISTING SEE CHAIN LINK FENCE DETAIL DWG. C-14

CONTROL/SIGNAL HANDHOLE SEE ELECTRICAL DWG'S.

POWER HANDHOLE SEE ELECTRICAL DWG'S.

AUTOMATIC GATE CONTROLLER SEE ELECTRICAL DWG'S.

SLIDING GATE

EXTEND FENCE TO MATCH TO EXISTING SEE DECORATIVE SLIDE GATE DETAIL DWG. C-14

SLOPED GRANITE CURB ISLAND (REUSE AND RESET CURBING FROM EXISTING ISLAND)

KENOZA LAKE
WATER ELEV.=110.5±

WF A1
WF A2
WF A3
WF A4
WF A5
WF A6

25' NO DISTURBANCE ZONE
50' NO BUILDING ZONE
100' BUFFER ZONE
200' RESERVOIR BUFFER ZONE

LAWN

PAVEMENT

FOUNTAIN

DMH
RIM EL.=114.84

MATCH EDGE OF PAVEMENT

GRANITE CURB TIPDOWN (TYP EACH SIDE)

TRANSFORMER PAD SEE ELECTRICAL DWG'S.

BOLLARDS (TYP) SEE DWG. C-14

10'R

15'R

GRANITE CURB TIPDOWN

50'R

GRANITE CURB TIPDOWN

10+00

BP: 10+00.00

PT: 10+25.35

PC: 10+76.94

11+00

25'

MATCH EDGE OF PAVEMENT

ELETRICAL EQUIPMENT SEE ELECTRICAL DWG'S.

36 35 37 38

12" RCP
INV=123.50

MATCH LINE

C-5
C-6

N

0 20 40

PARTIAL PLAN
SCALE: 1"=10'

1.75'R BOTH ENDS

22'-0"

3'-6"

2" HOT MIX ASPHALT

N

DRAWING C-5

HAVERHILL, MASSACHUSSETTS
WATER TREATMENT PLANT UPGRADES

SITE LAYOUT PLAN I

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BRIAN J. MONTEJUNAS CIVIL No. 47341 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS 11/14/16

DESIGNED BY: JDP
CAD COORD: BAJ
CAD: RJB
CHECKED BY: JDP
DATE: 10-6-16
APPROVED BY: ACC
DATE: 10-20-16
PROJECT NO: 13109A

NO	SUBMISSIONS/REVISIONS	APP'D	DATE
	CONTRACT DRAWINGS	ACC	10-16
1	SITE IMPROVEMENT EDITS	BJM	11/16
2			
3			
4			

MATCH LINE C-5 / C-6

BITUMINOUS BERM

REMOVE EXISTING CURB IN LIMITS OF STONE LEVEL SPREADER

5' WIDE STONE LEVEL SPREADER. 1"-1½" WASHED STONE 8" THICK PLACED ON FILTER FABRIC

CONCRETE

PAVEMENT

COBBLESTON

WATER MAINTENANCE BUILDING F.F.E.=117.4±

100' BUFFER ZONE

GARAGE SLAB ELEV.=115.4±

CONC.

LAWN

BRICK RETAINING WALL

GRINDER PUMP CONTROL PANEL SEE ELECTRICAL DWG'S.

ELECTRICAL MOUNTING STRUCTURE SEE ELECTRICAL DWG'S.

MATCH TO EXISTING PAVEMENT LIMITS

25' NO DISTURBANCE ZONE

50' NO BUILDING ZONE

REMOVE EXISTING CURB IN LIMITS OF STONE LEVEL SPREADER

55'R

67'R

107'R

121'R

SMH

REMOVE EXISTING DRIVEWAY APRON

GENERATOR PAD SEE ELECTRICAL DWG'S.

BOLLARDS (TYP) SEE DWG. C-14

CRUSHED STONE MOWING STRIP SEE DWG. C-13

5'R

LIGHT FIXTURE (TYP) SEE ELECTRICAL DWG'S

RAW WATER INTAKE PUMP STATION SLAB ELEV.=115.50

CB

EMH

TRANSFORMER PAD SEE ELECTRICAL DWG'S

CRUSHED STONE MOWING STRIP SEE DWG. C-13

BRICK

TIPDOWN

RE-STRIPE EXISTING PARKING SPACES

POWER STATIONS MOUNTED ON BOLLARDS (INSTALLED UNDER DIVISION 16) SEE ELECTRICAL DWG'S. (TYP)

6-10x18 PARKING SPACES

5-12x18 PARKING SPACES

2" HOT MIX ASPHALT

VERTICAL GRANITE CURB ISLAND (TYP) 10' WIDE

4" WHITE PAINTED LINES (TYP)

7'R

PT: 11+66.29

12+00

13+00

PC: 13+05.01

PT: 13+30.57

14+00

PC: 14+11.14

25'

10'

50'R

40'R

15+00

15+32.59

CONTROL JOINTS (10'-0" O.C.)

CONCRETE TRANSITION

PRECAST CONCRETE KNOB BLOCKS (30"Hx36"Wx48"L) SET ON 6" OF 3/4" CRUSHED STONE

GRAVEL STORAGE AREA

18-10x18 PARKING SPACES

14' WIDE BRICK UNIT PAVER WALKWAY SEE DETAIL DWG C-14

HANDICAP PARKING SIGN SEE DETAIL DWG C-14

CHEMICAL ROOM ADDITION FFE=130.00'

HANDICAP PARKING SPACES SEE DETAIL DWG C-14

16' WIDE BRICK UNIT PAVER WALKWAY SEE DETAIL DWG C-14

VESTIBULE FFE=130.00'

KILOWATT HOUR METER AND METER SOCKET SEE ELECTRICAL DWG'S.

ELECTRICAL ROOM FFE=120.50'

OH

GRAVEL

ELECTRICAL EQUIPMENT MOUNTING STRUCTURE SEE ELECTRICAL DWG'S.

DAF SLUDGE TANK EL=123.00 TOP OF TANK SEE DETAILS ON DWG. PR-16

200' RESERVOR BUFFER ZONE

BUILDING ADDITION F.F.E.=130.00

BOLLARDS SEE DETAIL DWG C-14 (TYP)

INV.=115.0± (PLAN)

100' BUFFER ZONE

5' PAVED WALKWAY

PROJECT TBM TOP OF SPINDLE OF FIRE HYDRANT ELEV=129.27

FINISH WATER METER VAULT

6' CHAIN LINK FENCE AND 20' CANTILEVERED GATE (SEE DETAIL DWG. C-14)

GRANITE CURB FOR DUMPSTER AREA

12'x20' DUMPSTER AREA

WOODEN GUARDRAIL SEE DETAIL DWG C-10

POWER MANHOLES SEE ELECTRICAL DWG'S

POWER MANHOLE SEE ELECTRICAL DWG'S

CONTROL/SIGNAL MANHOLE SEE ELECTRICAL DWG'S

WATER TREATMENT PLANT F.F.E.=130.00

CONTACT CHAMBER NO. 1 TOP OF TANK EL=126.50 (SEE STRUCTURAL DWGS.)

VENT PIPING SEE STRUCTURAL DWG'S

WF A18 WF A19 WF A20 WF A21 WF A22 WF A23 WF A24 WF A25 WF A26 WF A27 WF A28

0 20 40

N

HAVERHILL, MASSACHUSSETTS
WATER TREATMENT PLANT UPGRADES

DRAWING C-6

SITE LAYOUT PLAN II

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BRIAN J. MONTEJUNAS CIVIL No. 47347 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS 11/14/16

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CAD COORD: BAJ
CAD: RJB
CHECKED BY: JDP
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3			
4			

PARTIAL PLAN
SCALE: 1"=20'

GRASS FILTER SWALE
REMOVE EXISTING CURB
END CURB HERE
BITUMINOUS BERM
5' WIDE STONE LEVEL SPREADER. 1½" WASHED STONE 8" THICK PLACED ON FILTER FABRIC
CONCRETE
FOUNTAIN
PAVEMENT
MATCH LINE
COBBLESTONE
WATER MAINTENANCE BUILDING F.F.E.=117.4±
100' SETBACK
GARAGE SLAB ELEV.=115.4±
CONC.
WF A1
WF A2
WF A3
SD
OHE
DMH
RIM EL.=117.02
INV IN(12" RCP-S)=112.40
INV OUT(12" RCP-N)=112.30
CB
RIM EL.=116.50
INV IN(12" RCP-S)=111.50
INV OUT(12" RCP-W)=111.40
RIM EL.=117.13
INV IN(8" PVC-SE)=112.67
INV IN(8" PVC-SE)=112.67
INV OUT(12" RCP-N)=112.53
DMH
RIM EL.=117.44
INV IN(12" RCP-SW)=112.79
INV IN(8" PVC-NW)=112.69
INV OUT(8" PVC-NW)=112.69
CB
RIM EL.=116.24
INV OUT(10" RCP-SW)=113.59
DMH
RIM EL.=116.31
INV IN(10" RCP-SE)=113.01
INV IN(10" RCP-S)=113.01
INV IN(10" RCP-E)=113.01
INV OUT(12" RCP-NE)=112.91
CB
RIM EL.=116.00
INV OUT(10" RCP-N)=113.05
CB
RIM EL.=116.22
INV IN(10" RCP-NE)=113.22
INV OUT(10" RCP-W)=113.07
MATCH TO EXISTING PAVEMENT (TYP.)
SILT FENCE SEE DETAIL DWG C-11
CB
RIM EL.=117.73
INV OUT(10" RCP-N)=114.18
TOP OF ISLAND EL=117.60'
MATCH TO EXISTING PAVEMENT (TYP.)
CB
RIM EL.=117.60
INV IN(10" RCP-SE)=113.67
INV IN(10" RCP-S)=113.67
INV IN(10" RCP-SE)=113.67
INV OUT(10" RCP-NW)=113.55
INSTALL CATCH BASIN SILT SACK SEE DETAIL DWG. C-11
1' WIDE GRASS BERM TOP OF BERM EL=120.0'
STONE CHECK DAM SEE DETAIL DWG. C-11
CB
RIM EL.=119.97
INV IN(10" RCP-SE)=115.65
INV OUT(10" RCP-NW)=115.52
4" UD INV IN=116.00'
INSTALL CATCH BASIN SILT SACK SEE DETAIL DWG. C-11
CORE HOLE FOR 4" UNDERDRAIN INV IN=115.70'
4" UD INV=116.20
COMBINATION SILT FENCE/HAYBALE SEE DETAIL DWG C-11
SEE PARTIAL PLAN THIS DWG.
25' NO DISTURBANCE ZONE
50' NO BUILDING ZONE
100' BUFFER ZONE
200' RESERVOIR BUFFER ZONE
LAWN
PAVEMENT
MATCH
0 20 40

C-9

DRAWING C-9

HAVERHILL, MASSACHUSSETTS
WATER TREATMENT PLANT UPGRADES

GRADING PLAN I

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COMMONWEALTH OF MASSACHUSETTS
BRIAN J. MONTEJUNAS
CIVIL
No. 47347
REGISTERED PROFESSIONAL ENGINEER
11/14/16

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CAD COORD:	BAJ
CAD:	RJB
CHECKED BY:	JDP
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		ACC	10-16
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3			
4			

MATCH LINE C-3 / C-4

BITUMINOUS BERM

5' WIDE STONE LEVEL SPREADER. 1"-1½" WASHED STONE 8" THICK PLACED ON FILTER FABRIC 114.75

CONCRETE

PAVEMENT

25' NO DISTURBANCE ZONE

50' NO BUILDING ZONE

COBBLESTON

WATER MAINTENANCE BUILDING F.F.E.=117.4±

100' BUFFER ZONE

GARAGE SLAB ELEV.=115.4±

CONC.

LAWN

BRICK RETAINING WALL

SEE PARTIAL PLAN DWG. C-9

SILT FENCE SEE DETAIL ON DWG C-11

SMH

REMOVE DRIVE APRON

12" SD INV=115.50'

CROSS FILTER SWALE

COMBINATION SILT FENCE/HAYBALE SEE DETAIL ON DWG C-11

RIPRAP SLOPE PROTECTION-SEE DETAIL DWG. C-14

RAW WATER INTAKE PUMP STATION SLAB ELEV.=115.50

CB

DMH

BRICK

CLEANOUT SEE DETAIL ON DWG C-12

CB-3 RIM=126.40' INV OUT=123.95'

12" SD L=60' S=0.0050

15" SD L=68' S=0.0015

RIPRAP APRON SEE DETAIL ON DWG C-14 INV=123.50'

CB-2 RIM=126.25' INV IN=123.65' INV IN=123.65' INV OUT=123.60'

DMH-1 RIM=126.80' INV IN=123.87' INV IN=123.87' INV OUT=123.85'

CB-3 RIM=126.65' INV OUT=123.92'

12" SD L=5' S=0.0100

6" UD

CHEMICAL ROOM ADDITION FFE=130.00'

VESTIBULE/LOBBY FFE=130.00'

200' RESERVOIR BUFFER ZONE

NEW CATCH BASIN FRAME AND COVER

PROJECT TBM TOP OF SPINDLE OF FIRE HYDRANT ELEV=129.27

FINISH WATER METER VAULT

INV.=115.4± (PLAN)

INV.=117.75± (PLAN)

INV.=115.04± (PLAN)

INV.=110.50±

INV.=119.49

CB-4 (REMOVE EXISTING CB AND INSTALL NEW CB) RIM=119.21' (4" UD) INV IN=116.00' INV OUT=115.65'

ELECTRICAL ROOM FFE=120.50'

4" UNDERDRAIN (TYP)

INSTALL UNDERDRAIN BENEATH BEDDING. SLOPE APPROXIMATELY 1/8"/FT. (TYP)

COMBINATION SILT FENCE/HAYBALE SEE DETAIL ON DWG C-11

EROSION CONTROL MATTING SEE DETAIL ON DWG C-11

GRAVEL

BUILDING ADDITION F.F.E.=130.00

WATER TREATMENT PLANT F.F.E.=130.00

STONE CHECK DAM (TYP) SEE DETAIL ON DWG C-11

6" RL DN SEE PLUMBING DWG'S FOR MORE INFO INV=114.32

6" RL DN SEE PLUMBING DWG'S FOR MORE INFO INV=114.90

100' BUFFER ZONE

N

0 20 40

HAVERHILL, MASSACHUSSETTS WATER TREATMENT PLANT UPGRADES

GRADING PLAN II

DRAWING C-10

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BRIAN J. MONTEJUNAS CIVIL No. 47347 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS 11/14/16

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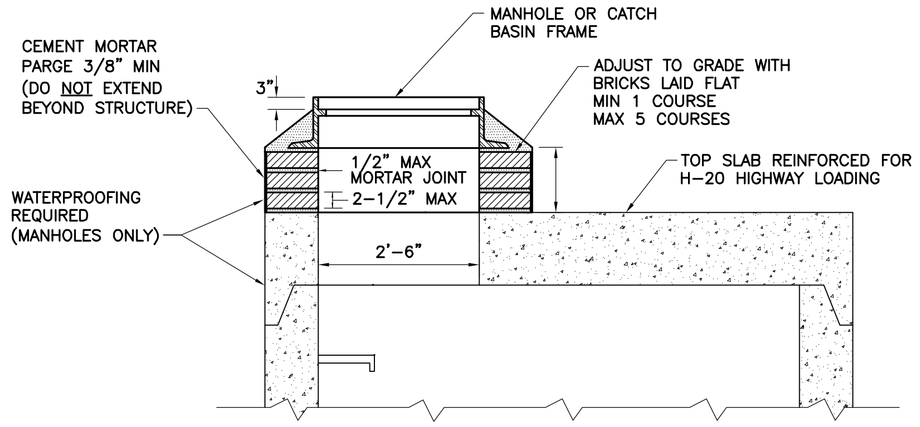
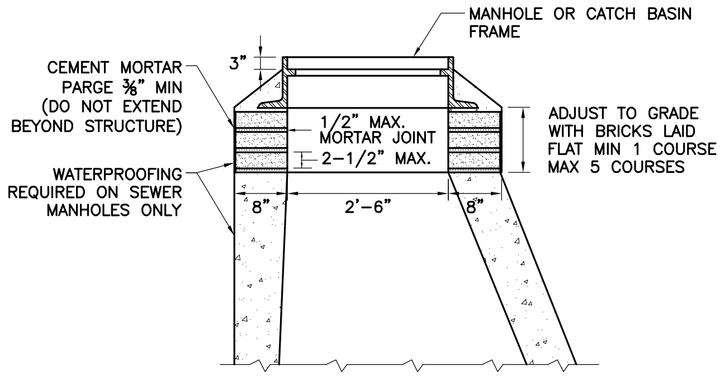
2			
3			
4			

LAST SAVED BY: BRIAN.MONTEJUNAS 11/14/2016 9:17 AM
G:\DWGS\MA\HAVERHILL\13109-WTP-UPGRADE\13109-CA\CIV\DETAILS 1.DWG | Details 1 | 1:10.1236 | ---- | 11/14/2016 10:36:05 AM | BRIAN.MONTEJUNAS



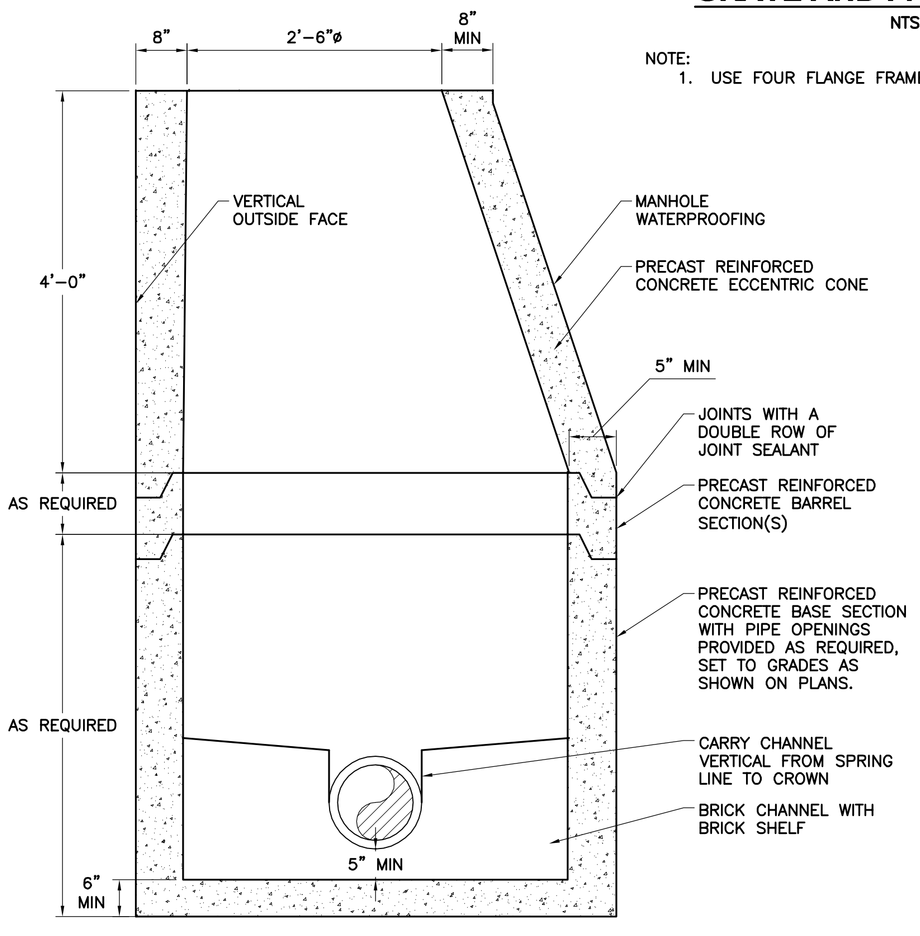
FLAT SLAB TOP MANHOLE FRAME INSTALLATION

NTS



MANHOLE AND CATCH BASIN FRAME INSTALLATION

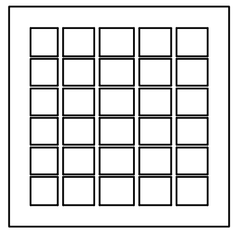
NTS



NOTES:
1. MANHOLE CHANNELS REQUIRING A CHANGE IN DIRECTION ARE TO BE BUILT ON A SMOOTH CURVE OF THE LONGEST POSSIBLE RADIUS. IF SIDE PIPES ENTER CHANNEL, SHAPE TO RECEIVE ADDED SIDE FLOW.
2. USE A FLAT SLAB TOP MANHOLE WHEN THE HEIGHT DIFFERENCE BETWEEN THE HIGHEST INVERT AND RIM IS LESS THAN 6'-0" AND WHEN MANHOLE DIAMETER IS GREATER THAN 4'-0".

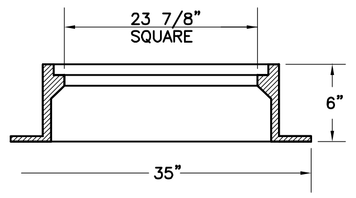
TYPICAL 4-FT MANHOLE

NTS



TOP

GRATE



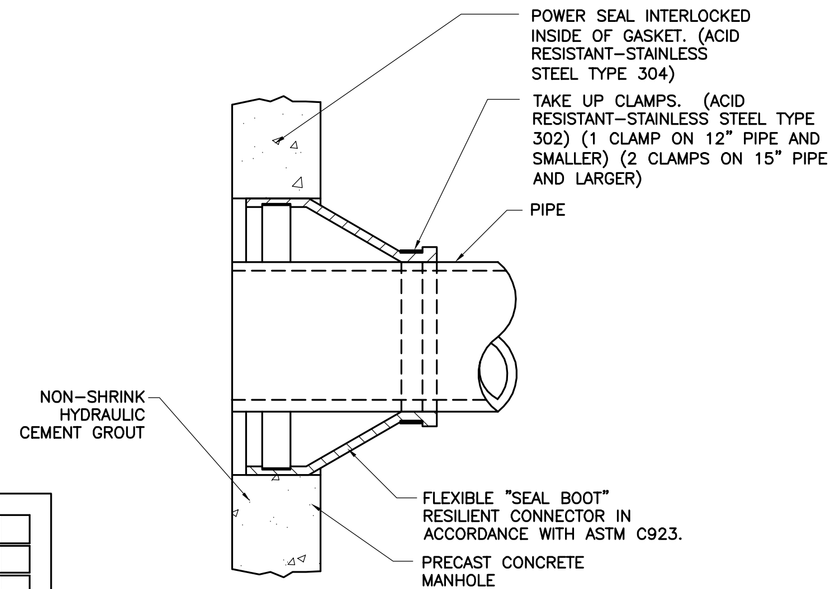
SECTION

4 FLANGE FRAME

GRATE AND FRAME DETAIL

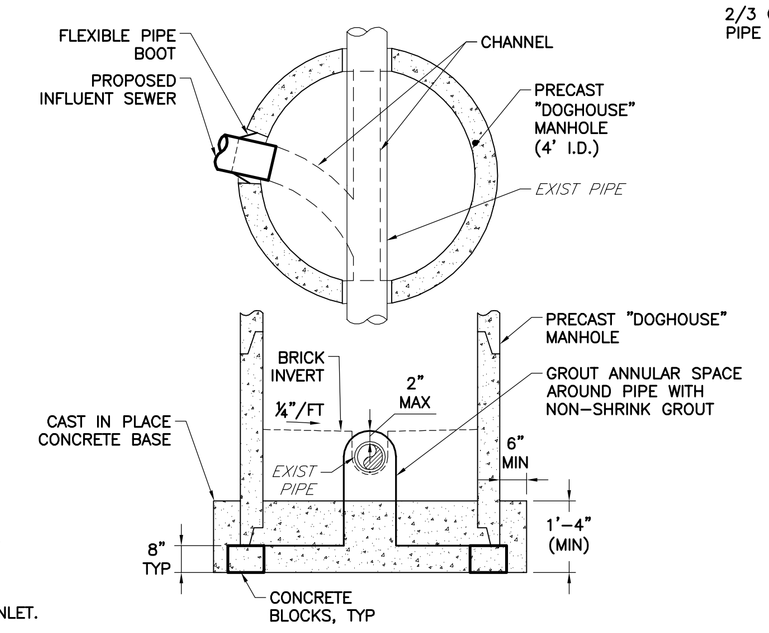
NTS

NOTE:
1. USE FOUR FLANGE FRAME WITHOUT CUT CURB INLET.



MANHOLE SEAL

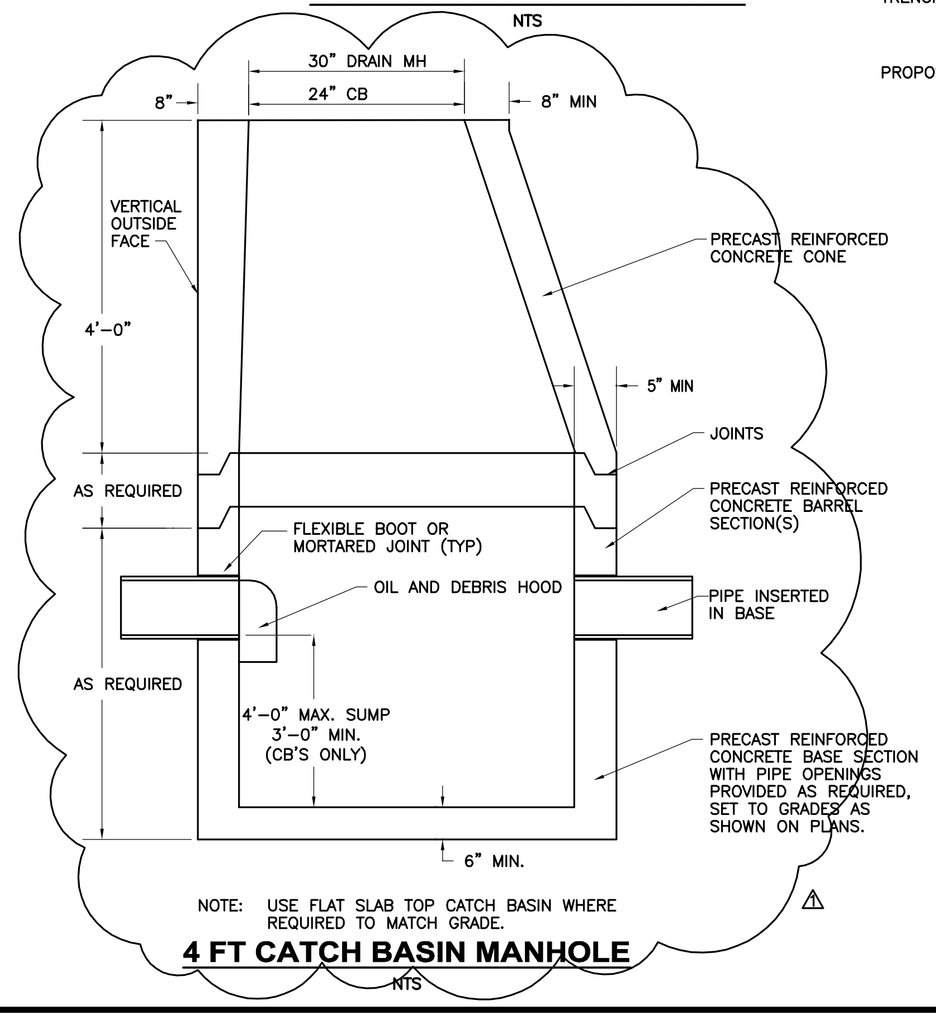
SCALE: "NTS"



NOTE: CUT TO REMOVE TOP HALF OF EXISTING PIPE FOLLOWING INSTALLATION OF "DOGHOUSE" AND PRIOR TO CONSTRUCTION OF BRICK INVERT. NOTCH SIDE OF PIPE TO RECEIVE SIDE FLOWS.

DOGHOUSE TYPE MANHOLE

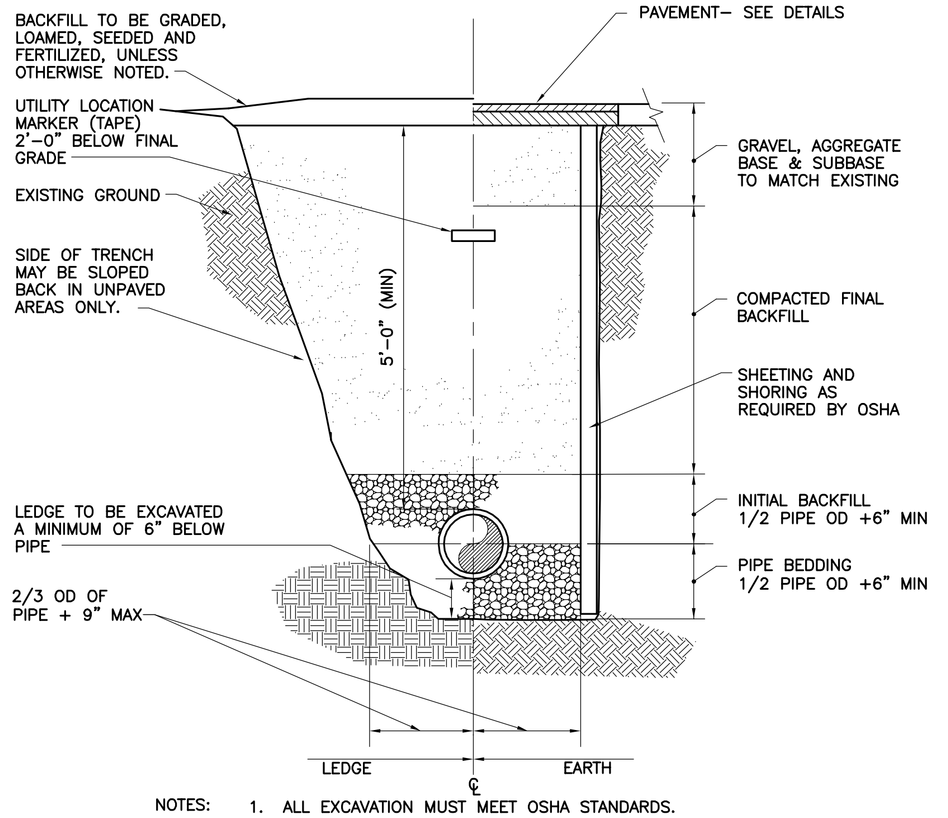
NTS



NOTE: USE FLAT SLAB TOP CATCH BASIN WHERE REQUIRED TO MATCH GRADE.

4 FT CATCH BASIN MANHOLE

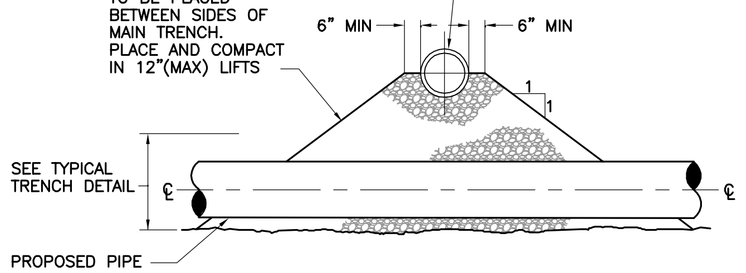
NTS



NOTES:
1. ALL EXCAVATION MUST MEET OSHA STANDARDS.
2. INSTALL 3 FOOT LONG IMPERVIOUS MATERIAL DAM IN BEDDING/INITIAL BACKFILL MATERIAL EVERY 100' TO PREVENT TRENCH GROUND WATER FROM BEING CHANNELED ALONG BEDDING/INITIAL BACKFILL 50 FT ON SLOPES EXCEEDING 2:1.
3. SEE SPECIFICATIONS FOR BEDDING AND BACKFILL REQUIREMENTS FOR TRENCHES IN LDF AND NATIVE CLAYS. MINIMUM SOIL COVER 5.0 FEET

PIPE TRENCH DETAIL

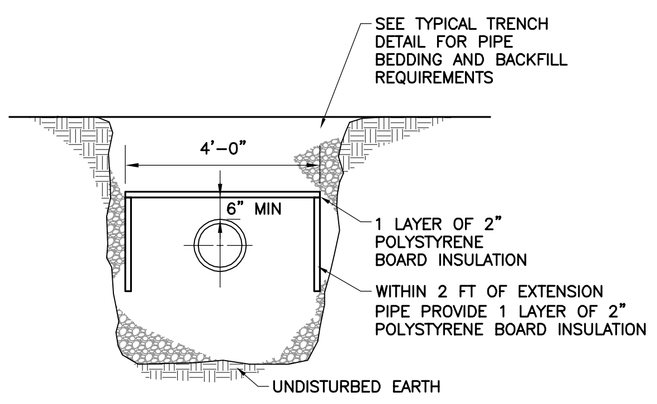
NTS



NOTE:
JOINTS ON EACH PIPE TO BE AS FAR FROM INTERSECTION AS POSSIBLE

PIPE CROSSING

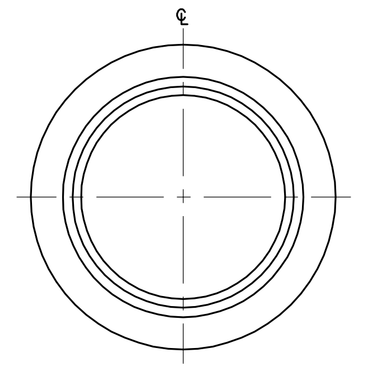
SCALE: "NTS"



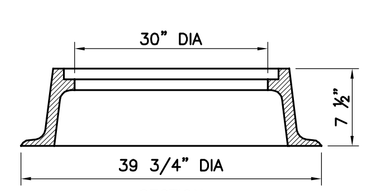
NOTE:
TRENCH PIPE INSULATION TO BE USED WHERE DEPTH OF COVER IS LESS THAN 4 FT OR AS DIRECTED BY THE ENGINEER

TRENCH PIPE INSULATION

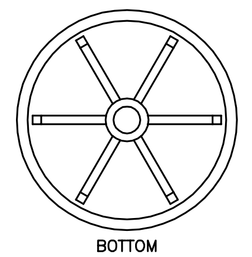
NTS



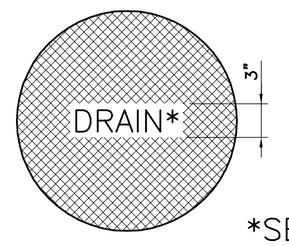
PLAN



SECTION



BOTTOM



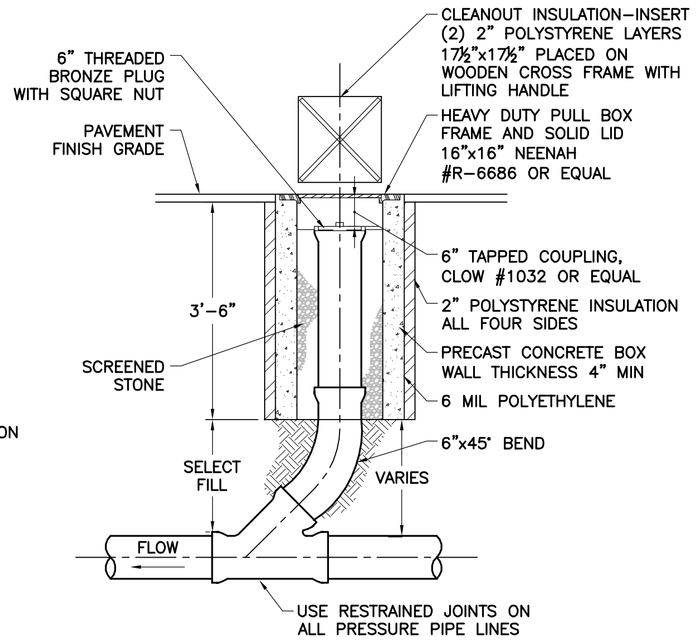
TOP

*SEWER

SECTION

MANHOLE COVER AND FRAME

SCALE: NTS



TYPICAL CLEANOUT

NTS

NO	SUBMISSIONS/REVISIONS	DATE	APP'D
	CONTRACT DRAWINGS	10-16	ACC
1	REVISED CB	11/16	BJM
2			
3			
4			

DESIGNED BY: JDP
CAD COORD: BAJ
CAD: RJB
CHECKED BY: JDP
DATE: 10-6-16
APPROVED BY: ACC
DATE: 10-20-16
PROJECT NO: 13109A

COMMONWEALTH OF MASSACHUSETTS BRIAN J. MONTEJUNAS No. 43581 CIVIL REGISTERED PROFESSIONAL ENGINEER 11/14/16

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HAVERHILL, MASSACHUSETTS
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DETAILS I

DRAWING
C-12