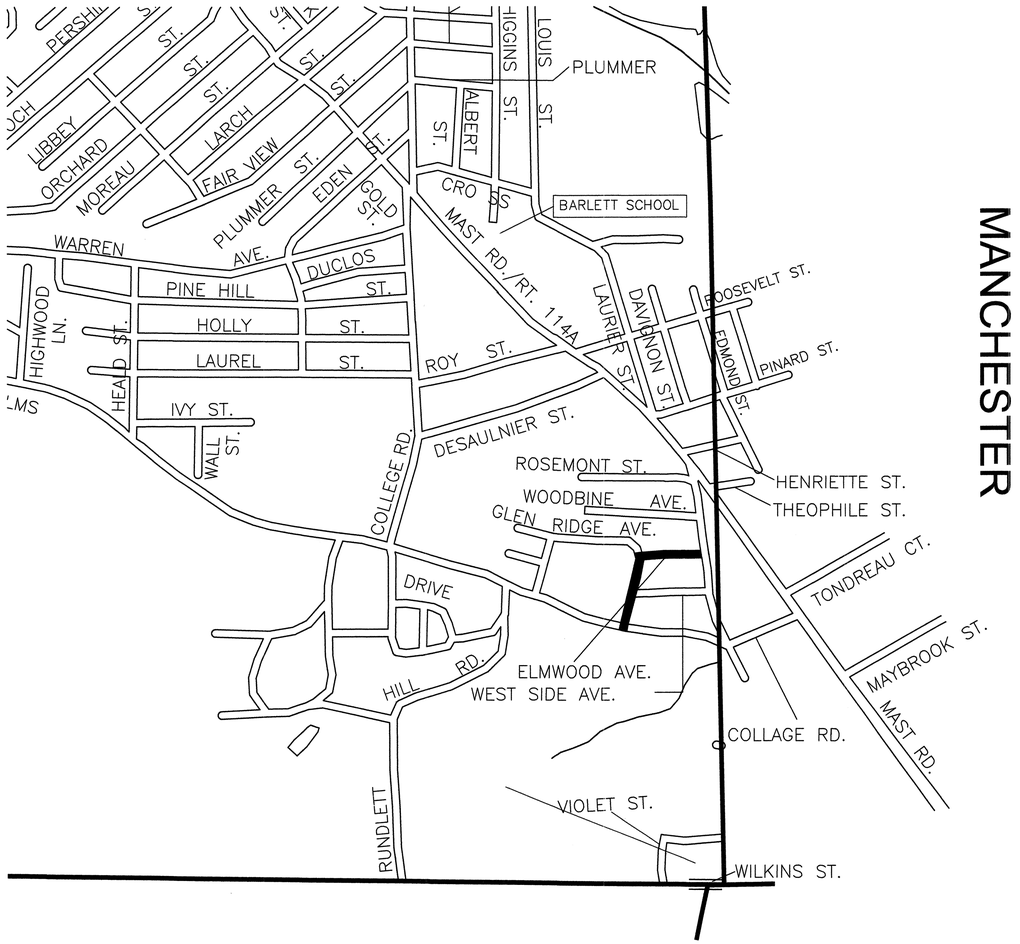
PLANS FOR IMPROVEMENTS
GLENRIDGE AVE. & ELMWOOD AVE.
SEWER REPLACEMENT PROJECT



TOWN OF GOFFSTOWN
DEPARTMENT OF PUBLIC WORKS
404 ELM STREET
GOFFSTOWN, NH 03045
PHONE: (603) 497-3617
FAX: (603) 497-5700

Latest Revision Date: 9-15-14

TOWN OF GOFFSTOWN
SEWER COMMISSION
16 MAIN STREET
GOFFSTOWN, NH 03045
PHONE: (603) 497-8990
FAX: (603) 497-8993

LEGEND:

DRAIN PIPE		RETAINING WALL	
WATER LINE		STONE WALL	
SEWER		GUARDRAIL	
WATER		RAILROAD	
UTILITY POLE		POOL	
UTILITY BOX		EDGE OF PAVEMENT	
LIGHT POLE		UNPAVED ROAD	
HYDRANT		TRAIL	
CATCH BASIN		WETLAND	
MANHOLE		PROP. EOP	
TREELINE		PROP. BLDG	
FENCE			
CULVERT			

NOTE: LOCATIONS OF EXISTING BURIED UTILITIES AND SEWER SERVICE LATERALS TO BE CONFIRMED BY CONTRACTOR.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

THE STATE OF NEW HAMPSHIRE
MICHAEL A. TRAINQUE
No. 7885
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY
1	9-15-14	HTA COMMENTS	MOY

GLENDRIGE AVE. & ELMWOOD AVE.
SEWER REPLACEMENT
PROJECT
PLAN VIEW
MAST RD.
GOFFSTOWN, NH

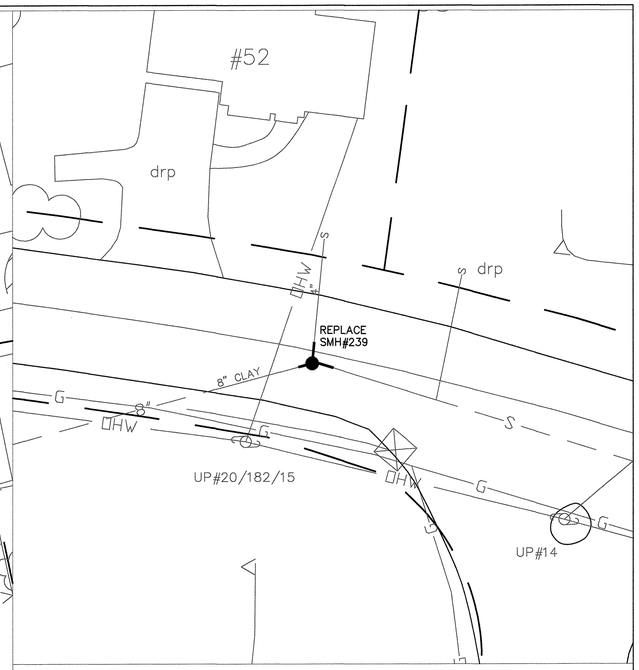
PREPARED BY:
TOWN OF GOFFSTOWN

DEPARTMENT OF PUBLIC WORKS
GOFFSTOWN, NEW HAMPSHIRE

PROJ MANAGER: MET	CHECKED BY: MET	DRAWN BY: MOY
DATE: 07-25-14	DWG#: S1	SHEET #1 OF 6

PLAN VIEW
GLENRIDGE AVE.

PLAN VIEW
ST.ANSELMS DRIVE &
GLENRIDGE AVE.



PLAN VIEW
ST.ANSELMS DRIVE
MANHOLE REPLACEMENT

(REPLACE) SMH#239
RIM 321.89
4' (DIA.) IN SIDE DROP

(NW)4"INV.IN 312.26
(W)8"INV.IN 316.06
(E)8"INV.OUT 311.79

LEGEND:

DRAIN PIPE
WATER LINE
SEWER
WATER
UTILITY POLE
UTILITY BOX
LIGHT POLE
HYDRANT
CATCH BASIN
MANHOLE
TREELINE
FENCE
CULVERT
RETAINING WALL
STONE WALL
GUARDRAIL
RAILROAD
POOL
EDGE OF PAVEMENT
UNPAVED ROAD
TRAIL
WETLAND
PROP. EOP
PROP. BLDG

NOTE: LOCATIONS OF EXISTING BURIED UTILITIES AND SEWER SERVICE LATERALS TO BE CONFIRMED BY CONTRACTOR.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

THE STATE OF NEW HAMPSHIRE
MICHAEL A. TRAINQUE
No. 7333
LICENSED
PROFESSIONAL ENGINEER

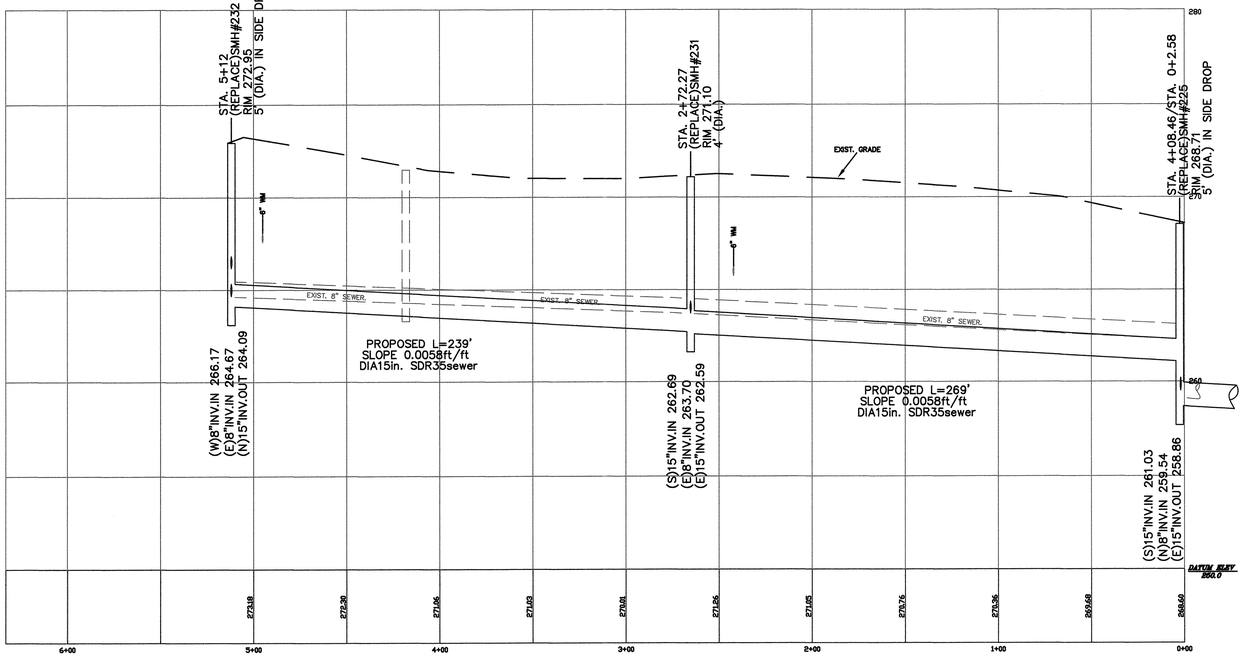
NO.	DATE	DESCRIPTION	BY
1	9-15-14	HTA COMMENTS	MOY

GLENDRIGE AVE. & ELMWOOD AVE.
SEWER REPLACEMENT
PROJECT
PLAN VIEW
MAST RD.
GOFFSTOWN, NH

PREPARED BY:
TOWN OF GOFFSTOWN

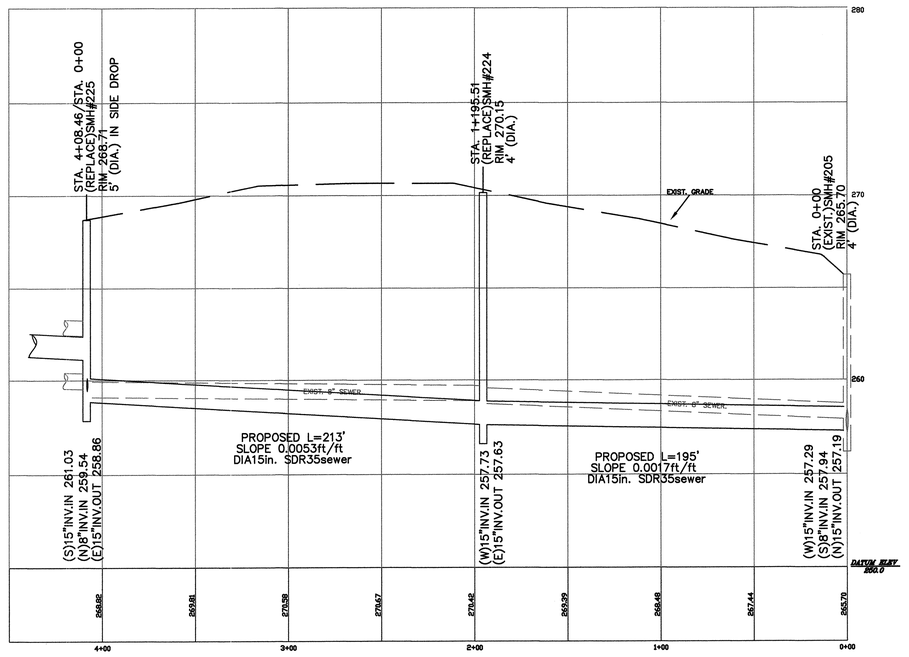
DEPARTMENT OF PUBLIC WORKS
GOFFSTOWN, NEW HAMPSHIRE

PROJ MANAGER: MET	CHECKED BY: MET	DRAWN BY: MOY
DATE: 07-25-14	DWG#: S2	SHEET #2 OF 6



PROFILE
VERT. 1"=4'
HORZ. 1"=40'

GLENRIDGE AVE.



PROFILE
VERT. 1"=4'
HORZ. 1"=40'

ELMWOOD AVE.

THE STATE OF NEW HAMPSHIRE
MICHAEL A. TRAINQUE
No. 7333
LICENSED
PROFESSIONAL ENGINEER

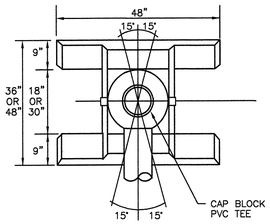
NO.	DATE	DESCRIPTION	BY
1	9-15-14	HTA COMMENTS	MOY

GLENDRIGE AVE. & ELMWOOD AVE.
SEWER REPLACEMENT
PROJECT
PROFILE VIEW
GLENRIDGE AVE.& ELMWOOD AVE.
GOFFSTOWN, NH

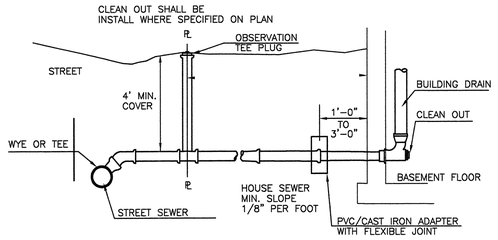
PREPARED BY:
TOWN OF GOFFSTOWN

DEPARTMENT OF PUBLIC WORKS
GOFFSTOWN, NEW HAMPSHIRE

PROJ MANAGER: MET	CHECKED BY: MET	DRAWN BY: MOY
DATE: 07-25-14	DWG#: P1	SHEET #3 OF 6

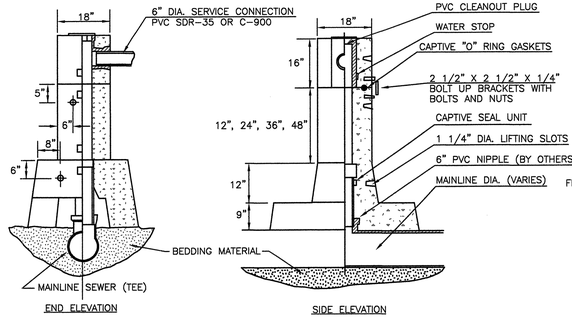


PLAN VIEW

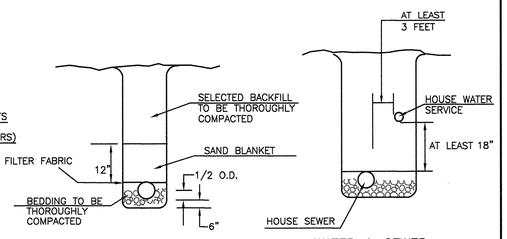


NOTE: MINIMUM SIZE PIPE FOR HOUSE/BUILDING SERVICES SHALL BE SIX (6) INCHES

SEWER AND HOUSE SEWER



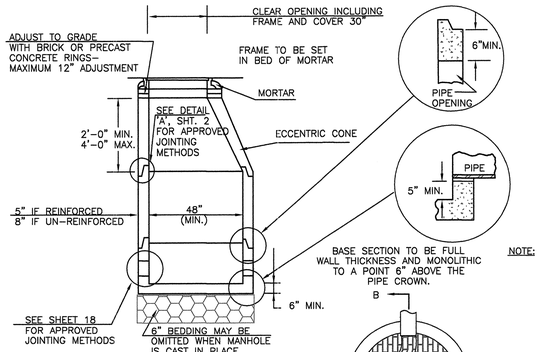
CHIMNEY DETAILS



TRENCH CROSS SECTION

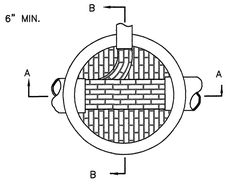
WATER & SEWER IN SAME TRENCH

HOUSE SEWER DETAILS



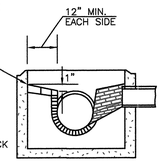
TYPICAL SECTION

NOTE:



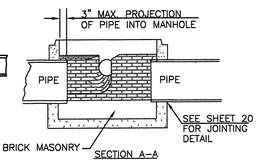
PLAN

NOTE: INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST



NOTE: CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.

SECTION B–B



SECTION A–A

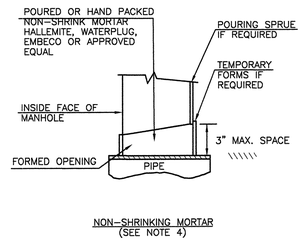
NOTES:

1. THE MANHOLE, INCLUDING ALL COMPONENT PARTS, SHALL HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY FOR THE INTENDED SERVICE, SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS, WITH OR WITHOUT STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH OR WITHOUT REINFORCEMENT.THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H–20 LOADING) WITHOUT FAILURE

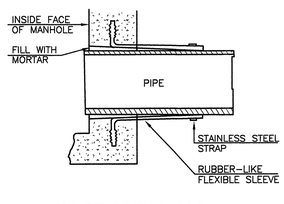
2. INVERTS AND SHELVES. MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

3. SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER SHALL BE USED, WHERE INDICATED, HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H–20 LOADS.

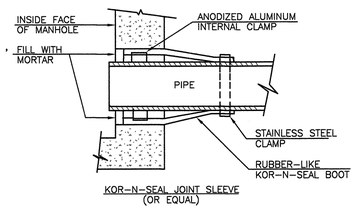
SEWER MANHOLE DETAIL



NON–SHRINKING MORTAR (SEE NOTE 4)



LOCK–JOINT FLEXIBLE MANHOLE SLEEVE (OR EQUAL)



KOR–N–SEAL JOINT SLEEVE (OR EQUAL)

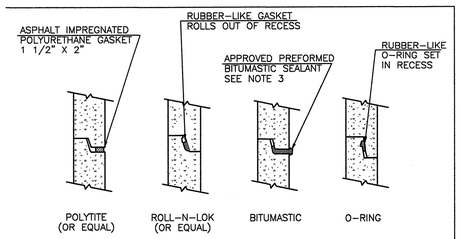
NOTES:

1. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE ENGINEER, WHICH TYPE SHALL, IN GENERAL, DEPEND FOR WATERTIGHTNESS UPON AN ELASTOMERIC OR MASTIC–LIKE GASKET SHALL BE DOUBLE ROW.

2. PIPE TO MANHOLE JOINTS SHALL BE ONLY AS APPROVED BY THE ENGINEER AND IN GENERAL, WILL DEPEND FOR WATERTIGHTNESS UPON ELASTOMERIC SEALANT.

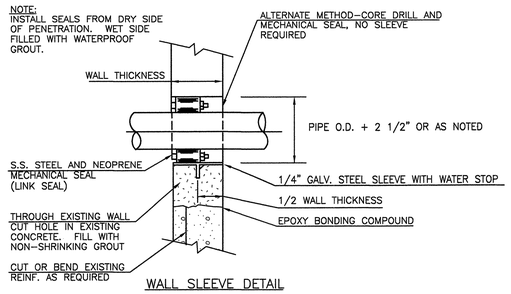
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.

4. NON–SHRINKING MORTAR SHALL ONLY BE USED WHERE SPECIFICALLY APPROVED BY THE ENGINEER.



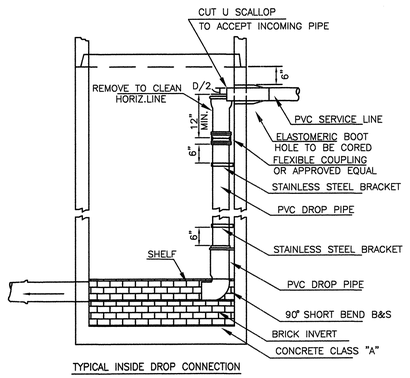
NOTE: ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND NHDES DESIGN STANDARDS

DETAIL–A



WALL SLEEVE DETAIL

SEWER MANHOLE DETAIL



TYPICAL INSIDE DROP CONNECTION

NO.	DATE	DESCRIPTION	BY

GLENRIDGE AVE. & ELMWOOD AVE. SEWER REPLACEMENT PROJECT

CONSTRUCTION DETAILS

MAST RD.

GOFFSTOWN, NH

PREPARED BY

TOWN OF GOFFSTOWN
DEPARTMENT OF PUBLIC WORKS

GOFFSTOWN, NEW HAMPSHIRE

PROJ MANAGER: MET	CHECKED BY: MET	DRAWN BY: MOY
DATE: 7–25–14	DWG #: DET–1	SHEET #4 OF 6

ROAD DESIGN REQUIREMENTS

ROAD GRADE (MIN.)	1/2%
ROAD GRADE (MAX.)	8%
GRADE WITHIN 100' OF INTERSECTION	2%
MINIMUM ANGLE AT INTERSECTION	60 DEG.
CENTERLINE RADIUS – CURVES (MIN.)	325'
TANGENT LENGTHS (MIN.)	100'
EDGE OF PAVEMENT RADII (MIN.)	25'
DESIGN SPEED (LOCAL ROADS)	35 MPH

NOTES:

1. ALL ROAD DESIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE FOLLOWING DESIGN STANDARDS:
   NHDOT – "HIGHWAY DESIGN MANUAL
   AASHTO – "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS".
2. ANGLE OF INTERSECTION MAY BE MODIFIED, SUBJECT TO APPROVAL OF THE PLANNING BOARD.

ROADWAY PAVEMENT THICKNESSES

BINDER COURSE	2.5" (MIN.)
WEARING COURSE	1.5" (MIN.)

NOTES:

1. BINDER AND WEARING COURSES SHALL NOT BE CONSTRUCTED IN THE SAME SEASON UNLESS APPROVED BY THE DIRECTOR OF PUBLIC WORKS.

MAXIMUM SIDE SLOPES

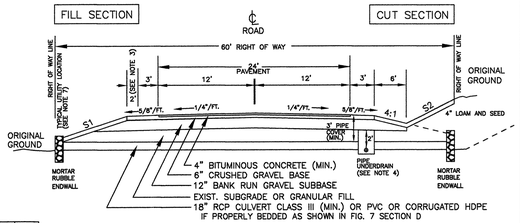
DISTANCE TO ORIGINAL GROUND	S1	S2
0 – 10'	4:1	3:1
10' – 20'	3:1	2:1
> 20'	2:1	2:1
LEDGE	–	1:2

NOTES:

1. IF SLOPE S1 IS STEEPER THAN 4:1 AND/OR THE DISTANCE FROM THE EDGE OF SHOULDER TO ORIGINAL GROUND IS LESS THAN 10 FT (HORIZONTAL), GUARDRAIL SHALL BE PROVIDED.

GENERAL ROAD CONSTRUCTION NOTES

1. REMOVE ALL LOAM, CLAY, MUCK, STUMPS, AND OTHER IMPROPER ROAD FOUNDATION MATERIAL WITHIN 3' OF SUBGRADE. REPLACE WITH COMPACTED GRANULAR FILL MATERIAL ACCEPTABLE TO THE DIRECTOR OF PUBLIC WORKS. COMPACTION TO BE AT LEAST 95% OF THE DRY WEIGHT AS DETERMINED BY STANDARD PROCTOR TESTING (ASTM 1557).
2. ALL PAVEMENT, BASE MATERIALS AND WORKMANSHIP TO BE IN COMPLIANCE WITH N.H.D.O.T. "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" APPROVED AND ADOPTED 1990.
3. A 2' SHOULDER EXTENSION IS REQUIRED WHERE SLOPE S1 IS 2:1 TO PROVIDE FOR THE GUARD RAIL CONSTRUCTION AND SUPPORT.
4. UNDERDRAIN PIPE SHALL BE PROVIDED IN ALL AREAS WHERE THE SEASONAL HIGH WATER TABLE IS WITHIN 5 FT OF FINISHED GRADE THE PIPE SHALL DISCHARGE THROUGH A MORTARED RUBBLE MASONARY ENDWALL OR INTO A CATCH BASIN.
5. AN EASEMENT SHALL BE PROVIDED BEYOND THE LIMITS OF THE RIGHT OF WAY, TO THE BOUNDARY OF THE EXISTING WETLAND, TO PROVIDE FOR MAINTENANCE OF THE DRAINAGE STRUCTURES.
6. ALL ROAD SWALES SHALL BE LINED WITH RIP–RAP (2 LAYERS, 6–8" DIA., 3' EA. SIDE OF SWALE CENTERLINE) WHERE ROAD GRADE EXCEEDS 5%. WHERE ROAD GRADE IS LESS THAN 5%, EROSION CONTROL FABRIC SHALL BE INSTALLED AND EXTEND 3' EA. SIDE OF THE SWALE CENTERLINE.
7. ALL UNDERGROUND FACILITIES AND TRANSFORMER SLABS SHALL BE LOCATED AT THE RIGHT OF WAY LINE, UNLESS OTHERWISE APPROVED BY THE PLANNING BOARD.

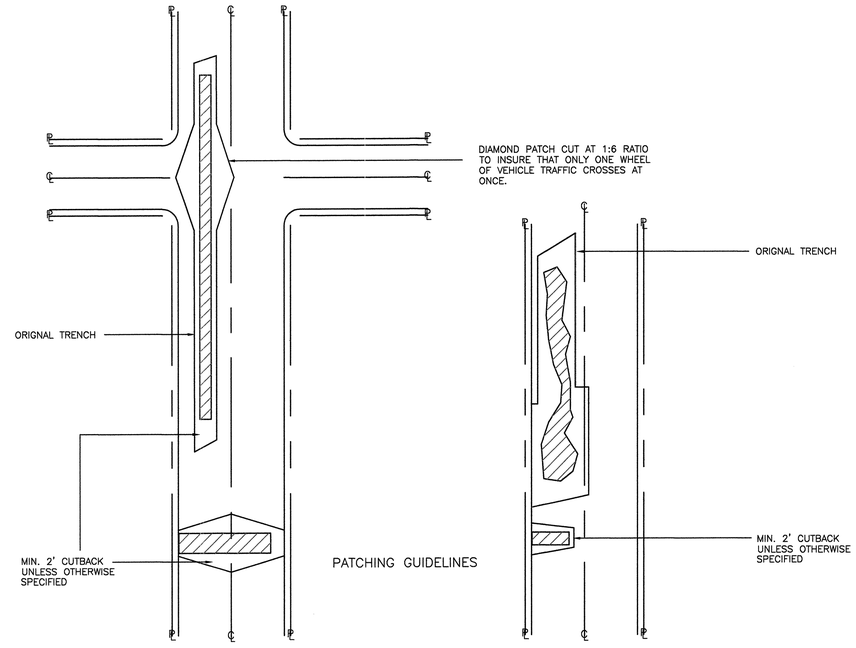


NO.	DATE	DESCRIPTION	BY
1	10–04–02	REVISED DRAWING	MOY
2	3–25–05	REVISED NOTES	MOY

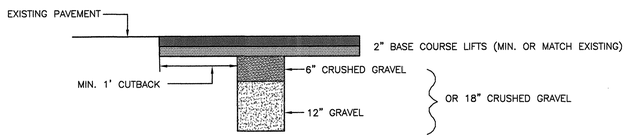
TYPICAL RURAL ROAD CROSS SECTION

NOT TO SCALE

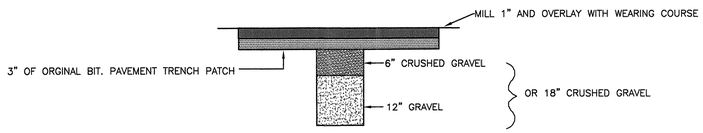
DEPARTMENT OF PUBLIC WORKS FIGURE 1



PATCHING GUIDELINES

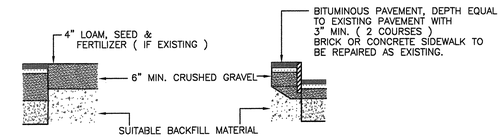


BITUMINOUS PAVEMENT TRENCH PATCH



MILL AND TRENCH OVERLAY

* MILL AROUND ALL STRUCTURES AS REQUIRED



SHOULDER REPAIR SIDEWALK REPAIR

THE STATE OF NEW HAMPSHIRE
MICHAEL A. TRAINGUE
No. 7339
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

GLENRIDGE AVE. & ELMWOOD AVE. SEWER REPLACEMENT PROJECT

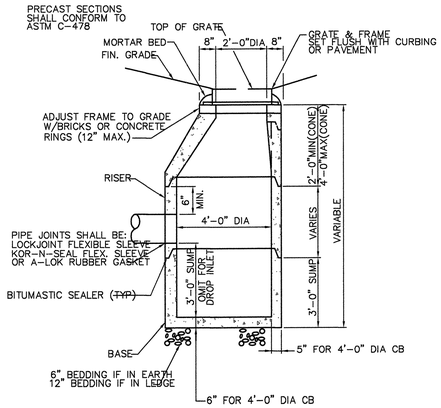
CONSTRUCTION DETAILS
MAST RD.
GOFFSTOWN, NH

PREPARED BY

TOWN OF GOFFSTOWN
DEPARTMENT OF PUBLIC WORKS

GOFFSTOWN, NEW HAMPSHIRE

PROJ MANAGER: MET	CHECKED BY: MET	DRAWN BY: MOY
DATE: 7–25–14	DWG #: DET–2	SHEET #5 OF 6

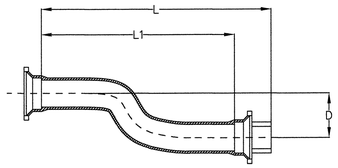


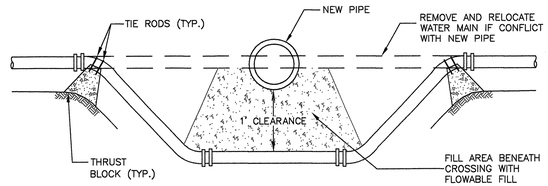
PRECAST REINFORCED CATCH BASIN

NOT TO SCALE

Size	D	DIMENSIONS L1	DIMENSIONS L	WEIGHTS MJ x MJ	WEIGHTS MJ x PE
4	6	19	27	75	70
4	12	22	30	85	80
4	18	30	38	105	100
4*	24	26	34	120	115
6	6	20	28	110	105
6	12	26	34	135	130
6	18	33	41	165	160
6*	24	24	32	165	160
8	6	21	29	160	155
8	12	28	36	200	195
8	18	35	43	245	240
8*	24	36	44	280	275
10	12	30	38	280	280
10	18	38	46	340	340
10	24	38	46	420	...
12	6	26	34	320	320
12	12	37	45	420	420
12	18	48	56	520	520
12*	24	48	56	640	630
16	12	40	48	715	690
16	18	50	58	850	830
20*	12	40	48	1025	...
20*	18	48	60	1275	...

*not included in AWWA C110

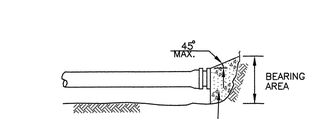




NOTE: ALL WATERMAIN WORK MUST BE COORDINATED WITH MANCHESTER WATER WORKS CLASS 52 D.I.

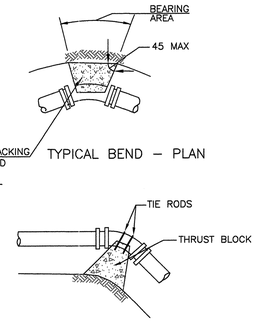
WATER MAIN CROSSING

NOT TO SCALE



TYPICAL PLUG – ELEVATION

TYPICAL TEE – PLAN



TYPICAL BEND – PLAN

TYPICAL VERTICAL BEND – ELEVATION

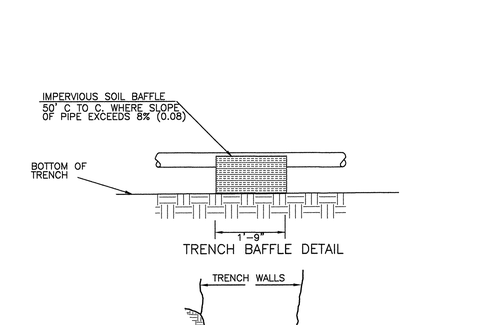
1. BLOCK WIDTH SHALL BE EQUAL TO OR NOT GREATER THAN TWICE THE BLOCK HEIGHT.
2. PIPE JOINTS SHALL NOT BE ENCASED WITH CONC.

THRUST BLOCK BEARING AREAS (S.F.)					
PIPE SIZE	TEES & ENDS	90 B	45 B	22 1\2 B	11 1\4 B
6&8	6	8	4	2	1
12	12	16	9	5	2.5

NOTE:
AREAS SHOWN ARE BASED ON PIPE WORKING PRESSURE OF 150 PSI AND SOIL BEARING PRESSURE OF 3000 PSF. OTHER VALUES AS DETERMINED BY THE ENGINEER MAY CAUSE BEARING AREAS TO CHANGE.

THRUST BLOCK DETAILS

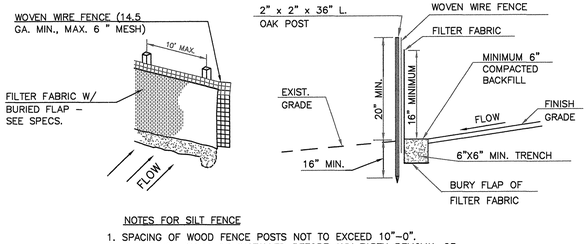
NOT TO SCALE



TRENCH BAFFLE DETAIL

NOT TO SCALE

NOTE: TRENCH BAFFLE ARE ONLY INSTALLED WHERE REQUIRED BY THE ENGINEER

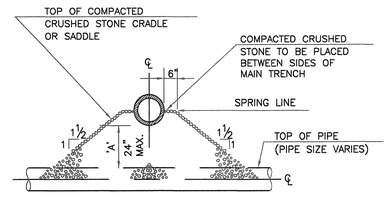


NOTES FOR SILT FENCE

1. SPACING OF WOOD FENCE POSTS NOT TO EXCEED 10'–0".
2. SILT FENCE SHALL BE INSTALLED BEFORE ANY EARTH REMOVAL OR EXCAVATION TAKES PLACE.
3. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO POSTS WITH WIRE TIES OR STAPLES AT TOP, MID–POINT AND BOTTOM.
4. FILTER FABRIC TO BE FASTENED SECURELY TO WOVEN WIRE FENCE.
5. OVERLAP BY 6", FOLD AND STAPLE ADJOINING SECTIONS OF FILTER FABRIC.
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED, AND THE MATERIAL REMOVED WHEN "BULGES" DEVELOP. DO NOT DEPOSIT MATERIAL NEAR WETLANDS OR WATERCOURSES.

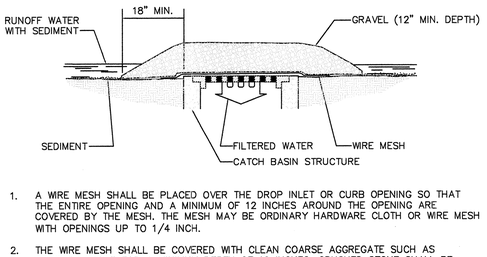
SILT FENCE DETAIL

NOT TO SCALE



PIPE CROSSING DETAIL

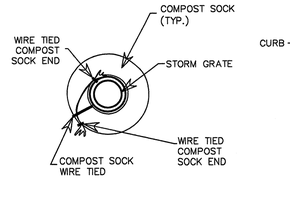
NOT TO SCALE



1. A WIRE MESH SHALL BE PLACED OVER THE DROP INLET OR CURB OPENING SO THAT THE ENTIRE OPENING AND A MINIMUM OF 12 INCHES AROUND THE OPENING ARE COVERED BY THE MESH. THE MESH MAY BE ORDINARY HARDWARE CLOTH OR WIRE MESH WITH OPENINGS UP TO 1/4 INCH.
2. THE WIRE MESH SHALL BE COVERED WITH CLEAN COARSE AGGREGATE SUCH AS CRUSHED STONE FOR A MINIMUM DEPTH OF 12 INCHES. CRUSHED STONE SHALL BE BEDDING STONE FOR SEWERS (ASTM STONE SIZE NO. 67). SEE SPECIFICATIONS.
3. THE COARSE AGGREGATE SHALL EXTEND AT LEAST 18 INCHES BEYOND ALL SIDES OF THE CATCH BASIN/DRAIN OPENING.
4. THIS SEDIMENTATION CONTROL SHALL BE UTILIZED AT ALL CATCH BASINS ENCOUNTERED.

SEDIMENTATION CONTROL AT CATCH BASIN DETAIL

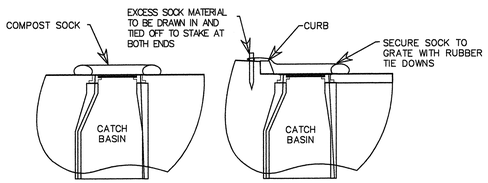
NOT TO SCALE



STANDARD PLAN VIEW

CURBSIDE OPTION "A" PLAN VIEW

CURBSIDE OPTION "B" PLAN VIEW



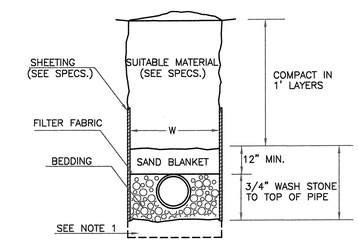
STANDARD SECTION

CURBSIDE SECTION

NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS OR APPROVED EQUAL.
2. COMPOST/SOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

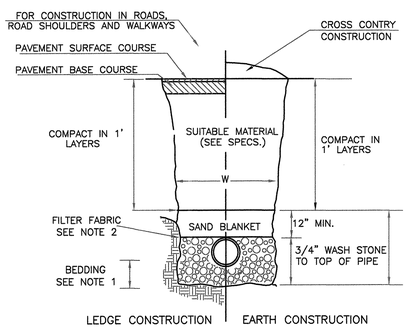
COMPOST SOCK INLET PROTECTION DETAIL

NOT TO SCALE



1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE. REFILL WITH BEDDING MATERIAL. SEE ALSO NOTE 2.
2. W=MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.

EARTH CONSTRUCTION WITH SHEETING



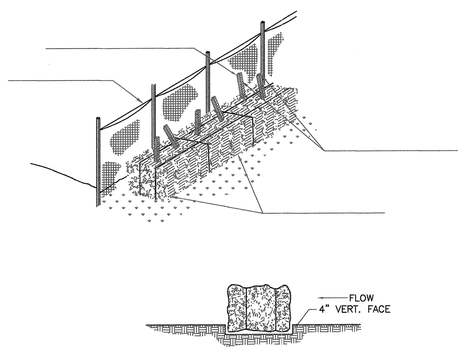
LEDGE CONSTRUCTION EARTH CONSTRUCTION

NOTES:
1. BEDDING:
   6" BEDDING IN EARTH CONSTRUCTION.
   12" BEDDING REQUIRED IF ON LEDGE.
2. FILTER FABRIC TO COVER ENTIRE TRENCH WIDTH. OVERLAP FABRIC ENDS BY 12".
3. TRENCH WIDTH:
   FOR 12" PIPES AND UNDER, TRENCH WIDTH SHALL BE 3 FEET MIN. FOR PIPES OVER 12", TRENCH WIDTH SHALL BE INSIDE PIPE DIAMETER PLUS 12" ON EACH SIDE OF PIPE.

LEDGE/EARTH CONSTRUCTION DETAIL

SEWER AND STORM DRAIN PIPE DETAIL

NOT TO SCALE



EMBEDDING DETAIL

NOTES:
1. BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4".
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY STAKES OR REBARS DRIVEN THOUGH THE BALES. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARDS PREVIOUSLY LAID BALE TO FORCE BALES TOGETHER.
4. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL– NESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

STRAW BALE DETAIL

NOT TO SCALE

THE STATE OF NEW HAMPSHIRE
MICHAEL A. TRAINQUE
No. 7355
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

GLENRIDGE AVE. & ELMWOOD AVE. SEWER REPLACEMENT PROJECT

CONSTRUCTION DETAILS
MAST RD.
GOFFSTOWN, NH

PREPARED BY

TOWN OF GOFFSTOWN
DEPARTMENT OF PUBLIC WORKS

GOFFSTOWN, NEW HAMPSHIRE

PROJ MANAGER: MET	CHECKED BY: MET	DRAWN BY: MOY
DATE: 7–25–14	DWG #: DET–3	SHEET #6 OF 6