TOWN OF MOULTONBOROUGH, NEW HAMPSHIRE
2015 ROAD PROGRAM
INTERSECTION IMPROVEMENTS PROJECT

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10	ROADWAY AND DRAINAGE DETAILS
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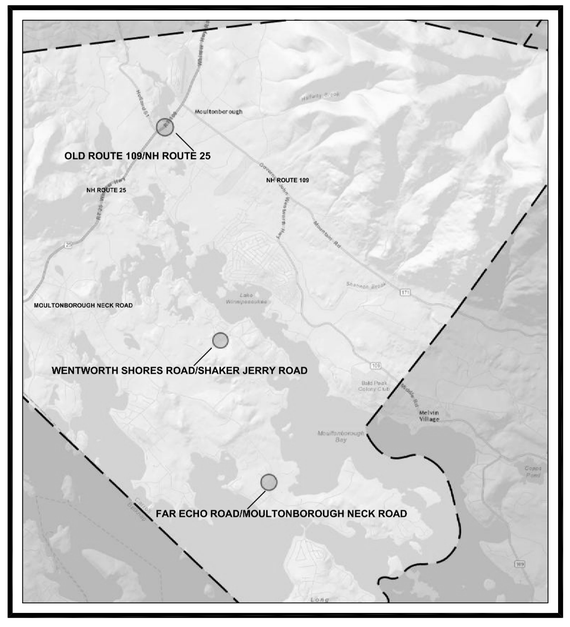

Locus Map
Not to Scale

BOARD OF SELECTMEN
Christopher P. Shipp, Chair
Russell C. Wakefield
Paul T. Punturieri
Jean M. Beadle
Josiah H. Bartlett

ROAD AGENT
Scott Kinmond

AUGUST 2015

KV Partners
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GENERAL NOTES

1. BASE MAP INFORMATION IS PROVIDED BY PROMISED LAND SURVEY, LONDONDERRY, NEW HAMPSHIRE. SURVEY COMPLETED IN:
   A. FAR ECHO ROAD: NOVEMBER 2012
   B. OLD ROUTE 109: NOVEMBER 2012
   C. WENTWORTH SHORES ROAD: DECEMBER 2013

2. HORIZONTAL DATUM AND VERTICAL DATUM:
   A. FAR ECHO ROAD: HORIZONTAL DATUM IS NAD83 BASED ON LEICA GPS. VERTICAL DATUM IS NAVD88 BASED ON LEICA GPS.
   B. OLD ROUTE 109: HORIZONTAL DATUM IS NAD83 BASED ON LEICA GPS. VERTICAL DATUM IS NGVD BASED NHDOT DISK #313–002.
   C. WENTWORTH SHORES ROAD: HORIZONTAL DATUM IS NAD83 BASED ON LEICA GPS VERTICAL DATUM IS NAVD88 BASED ON LEICA GPS.

3. THE CONTRACTOR SHALL VERIFY ALL RELEVANT ANGLES, LENGTHS, ELEVATIONS, AND INVERTS PRIOR TO CONSTRUCTION.

4. THE LOCATION OF EXISTING UTILITIES AND SUBSURFACE STRUCTURES AS SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND APPROPRIATE UTILITY AUTHORITY OF ANY DISCREPANCY WITH THE DRAWINGS. NEITHER THE ENGINEER NOR THE OWNER WARRANTS OR GUARANTEES THE CONDITIONS SHOWN ON THE DRAWINGS.

5. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL SUBSURFACE STRUCTURES AND UTILITIES THROUGH THE APPROPRIATE AGENCY. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL CALL THE DIG–SAFE CENTER (1–888–344–7233) AT LEAST 72 BUSINESS HOURS PRIOR TO ANY EXCAVATION.

6. THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITY WITH THE VARIOUS AFFECTED UTILITY AUTHORITIES TO PREVENT UNNECESSARY DELAY OF WORK OR INTERRUPTION OF SERVICES.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING AND SUPPORTING ALL UTILITIES DURING CONSTRUCTION AND FOR COORDINATING SUCH ACTIVITY WITH THE APPROPRIATE UTILITY AUTHORITY. UTILITIES DESTROYED OR DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE UTILITY AUTHORITY AT NO ADDITIONAL COST TO THE OWNER.

8. THE CONTRACTOR SHALL MAINTAIN TRAFFIC IN A SAFE MANNER AT ALL TIMES DURING CONSTRUCTION AND IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

9. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FACILITIES AS NEEDED TO AVOID SERVICE DISRUPTIONS. THE CONTRACTOR SHALL SUBMIT A PLAN TO BE REVIEWED BY THE ENGINEER FOR MAINTAINING SERVICE TO BUILDINGS AFFECTED BY THE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CUSTOMERS OF SERVICE DISRUPTIONS. NO DISRUPTION OF SERVICE SHALL BE BEFORE 9:00 AM OR AFTER 3:00 PM.

10. THE CONTRACTOR SHALL CONFINE ALL OPERATIONS AND ACTIVITIES FOR CONSTRUCTION PURPOSES WITHIN THE EXISTING RIGHT–OF–WAY, TEMPORARY EASEMENTS OR IN STAGING/STOCKPILE AREAS APPROVED BY THE OWNER. THE CONTRACTOR SHALL LOCATE STAGING AREAS THROUGH AGREEMENTS WITH AFFECTED PROPERTY OWNERS, OR PROVIDE ALTERNATE MEANS TO STORE MATERIAL AT THE WORK AREA AS REQUIRED.

11. DURING NON–WORKING HOURS, THE CONTRACTOR SHALL SECURE ALL EQUIPMENT AND MATERIALS WITHIN THE LIMITS OF WORK.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING PAVEMENT, ROADWAYS, SIGNS, CURBS, SIDEWALKS, DRIVEWAYS, MAILBOXES, FENCES, PLANTINGS OR OTHER PHYSICAL FEATURES CAUSED BY THE CONTRACTOR'S ACTIVITIES AND SHALL REPAIR THEM AT NO ADDITIONAL COST TO THE OWNER. ALL AREAS BEYOND THE LIMITS OF CONSTRUCTION WHICH ARE DISTURBED BY THE CONTRACTOR SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.

13. THE CONTRACTOR SHALL TAKE PRECAUTIONS DURING CONSTRUCTION TO MINIMIZE THE AMOUNT OF DEBRIS THAT COLLECTS IN CATCH BASINS, CULVERTS AND MANHOLES. THE CONTRACTOR SHALL CLEAN ALL CATCH BASINS, CULVERTS AND MANHOLES AFFECTED BY CONSTRUCTION IN ORDER TO MAINTAIN AN OPERATING SYSTEM.

14. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL CODES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS FROM APPLICABLE GOVERNMENTAL AGENCIES, INCLUDING THE OWNER, PRIOR TO THE START OF ANY CONSTRUCTION.

15. THE CONTRACTOR IS REQUIRED TO PROVIDE ADEQUATE SHORING FOR THE SOIL CONDITIONS AND DEPTHS ENCOUNTERED DURING CONSTRUCTION.

16. IN THE EVENT THE CONTRACTOR ENCOUNTERS EXISTING MATERIAL REASONABLY BELIEVED TO BE HAZARDOUS WHICH HAS NOT BEEN RENDERED HARMLESS, THE CONTRACTOR SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND REPORT THE CONDITION TO THE OWNER AND ENGINEER. WORK IN THE AFFECTED AREA SHALL NOT RESUME UNTIL WRITTEN VERIFICATION BY THE OWNER THAT THE MATERIAL HAS BEEN REMOVED OR OTHERWISE BEEN RENDERED HARMLESS.

17. THE CONTRACTOR AND ALL SUBCONTRACTORS SHALL FAMILIARIZE THEMSELVES WITH THE CONTRACT DOCUMENTS. ALL DRAWINGS OF ANY PARTICULAR TRADE SHALL BE USED IN CONJUNCTION WITH DRAWINGS OF ALL OTHER TRADES TO COORDINATE THE CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED WORK. ANY PROPOSED CHANGES, VARIATIONS, OR SUBSTITUTIONS MUST BE REVIEWED AND ACCEPTED BY THE ENGINEER PRIOR TO IMPLEMENTATION.

18. CONSTRUCTION SEQUENCING SHALL BE AS FOLLOWS. NO INTERSECTION WORK SHALL COMMENCE UNLESS CONTRACTOR CAN REACH SUBSTANTIAL COMPLETION ON OR BEFORE OCTOBER 31, 2015 UNLESS OTHERWISE AGREED TO BY THE OWNER. WORK NOT COMPLETED BY OCTOBER 31, 2015 WILL BE COMPLETED THE SUBSEQUENT CALENDAR YEAR ON A SCHEDULE AS DETERMINED BY THE OWNER. OPERATIONS REQUIRED FOR WINTER SHUTDOWN SHALL BE SUBSIDIARY TO ROADWAY CONSTRUCTION.
   A. OLD ROUTE 109/ROUTE 25
   B. FAR ECHO ROAD/MOULTONBOROUGH NECK ROAD
   C. WENTWORTH SHORES ROAD/SHAKER JERRY ROAD

LEGEND

EXISTING

- BOUND
- BOLLARD
- CATCH BASIN
- CONDUIT
- DELINEATOR
- DRAIN MANHOLE
- ELECTRIC BOX
- ELECTRIC HAND HOLE
- ELECTRIC METER
- FLAG
- FIRE HYDRANT
- FIRE UTILITY
- GAS GATE
- GAS METER
- GUYWIRE
- HVAC UNIT
- IRON PIPE/REBAR
- IRRIGATION
- LIGHT
- LIGHT POST
- MAILBOX
- MANHOLE
- POST
- ROCK
- SEWER MANHOLE
- SHRUB
- SIGN
- STUMP
- SUPPORT PILLAR
- TELEPHONE BOX
- TREE – CONIFEROUS
- TREE – DECIDIOUS
- UTILITY POLE
- VENT
- WATER GATE
- WATER SHUTOFF
- WETLAND

- CONTOUR MAJOR
- CONTOUR MINOR
- CURBING
- DELINEATED WETLAND
- DRAINAGE LINE
- EDGE OF PAVEMENT
- RETAINING WALL
- SEWER LINE
- SHRUB LINE
- TREE LINE

- BUILDING
- CONCRETE
- CRUSHED STONE
- LANDSCAPING
- LEDGE
- RIPRAP
- WARNING MAT

PROPOSED

- EDGE OF PAVEMENT
- LIMIT OF SLOPE
- DRAIN LINE
- CATCH BASIN
- FLARED END SECTION (FES)
- UTILITY POLE

NUMBER	DATE	BY	DESCRIPTION

STATE OF NEW HAMPSHIRE – RAYMOND H. KONGER – 7839 – LICENSED PROFESSIONAL ENGINEER

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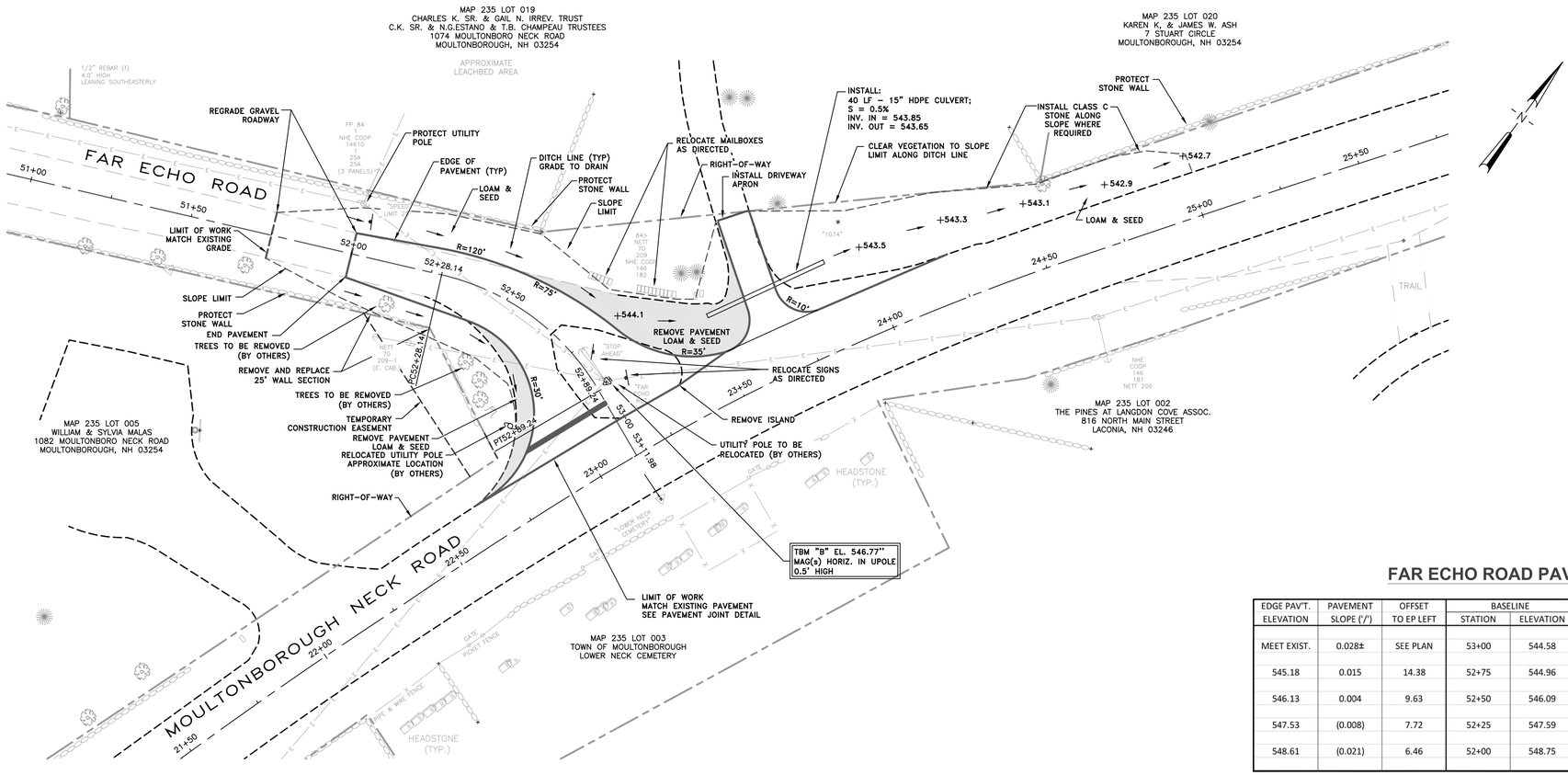
DESIGNED BY:	RHK
DRAWN BY:	NMT
CHECKED BY:	RHK
APPROVED BY:	RHK

2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

GENERAL NOTES AND LEGEND

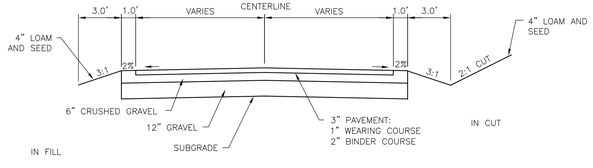
SHEET NO. **1**



PLAN
1" =20'

FAR ECHO ROAD PAVEMENT DATA

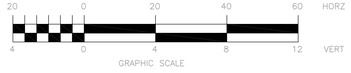
EDGE PAV'T. ELEVATION	PAVEMENT SLOPE (')')	OFFSET TO EP LEFT	BASELINE STATION	BASELINE ELEVATION	OFFSET TO EP RIGHT	PAVEMENT SLOPE (')')	EDGE PAV'T. ELEVATION
MEET EXIST.	0.028±	SEE PLAN	53+00	544.58	SEE PLAN	-0.028±	MEET EXIST.
545.18	0.015	14.38	52+75	544.96	16.49	(0.021)	544.61
546.13	0.004	9.63	52+50	546.09	10.93	(0.021)	545.86
547.53	(0.008)	7.72	52+25	547.59	10.23	(0.021)	547.38
548.61	(0.021)	6.46	52+00	548.75	7.37	(0.021)	548.60



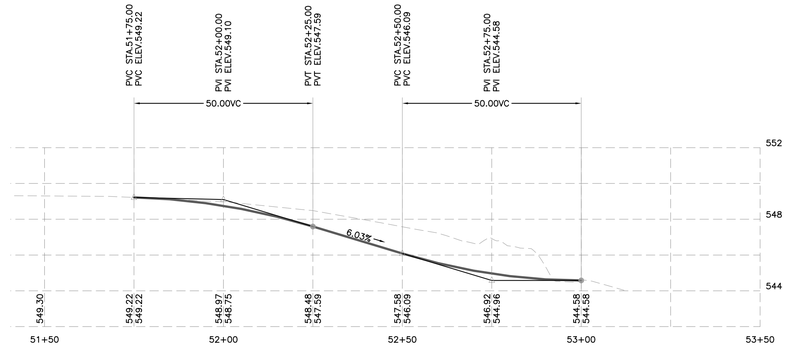
NOTES:
1. REFER TO PAVEMENT DATA SCHEDULE.

TYPICAL ROADWAY SECTION
NOT TO SCALE

NOTES:
1. REFER TO TYPICAL ROADWAY SECTIONS AND CROSS SECTIONS.
2. REFER TO CONSTRUCTION DETAILS.
3. CONTRACTOR SHALL LIMIT CLEARING AND GRUBBING OPERATIONS TO LIMIT OF SLOPE.
4. INSTALL SEDIMENTATION AND EROSION CONTROL MEASURES AS DIRECTED BY ENGINEER.
5. RELOCATING AND RESETTING SIGNAGE AND MAILBOXES SHALL BE SUBSIDIARY TO ROADWAY RECONSTRUCTION.
6. LOAM AND SEED ALL DISTURBED AREAS UNLESS OTHERWISE NOTED.



GRAPHIC SCALE



PROFILE
1" = 20' H, 1" = 4' V

REVISIONS			
NUMBER	DATE	BY	DESCRIPTION

STATE OF NEW HAMPSHIRE — RAYMOND H. KNOWLTON — NO. 7839 — LICENSED PROFESSIONAL ENGINEER

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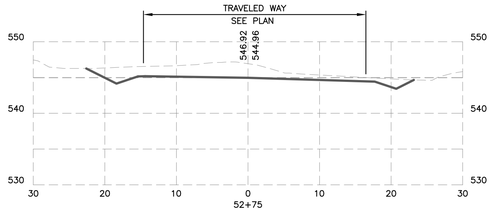
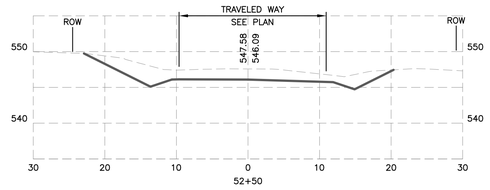
2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

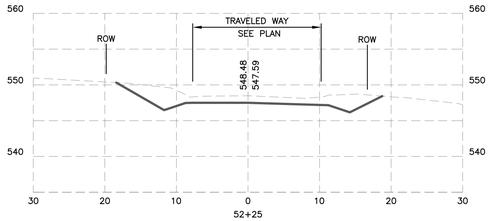
FAR ECHO ROAD INTERSECTION
PLAN, PROFILE AND TYPICAL SECTION

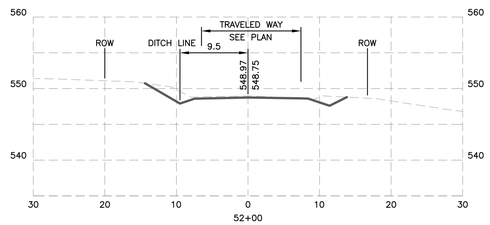
SHEET NO. **2**

SHEET 2 OF 11





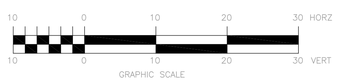


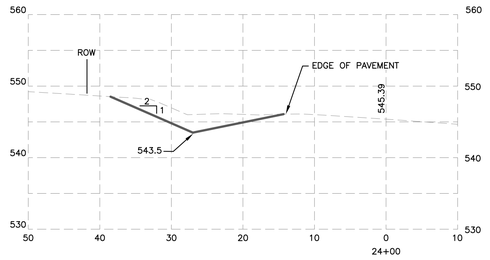


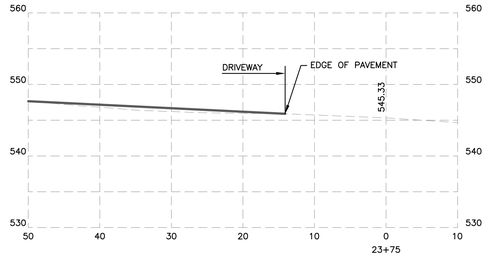
CROSS SECTIONS

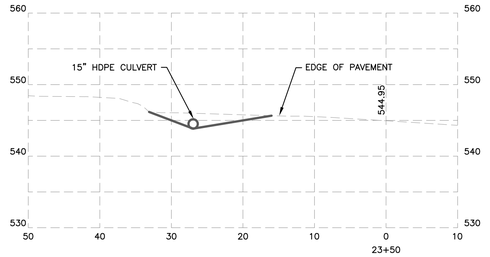
FAR ECHO ROAD

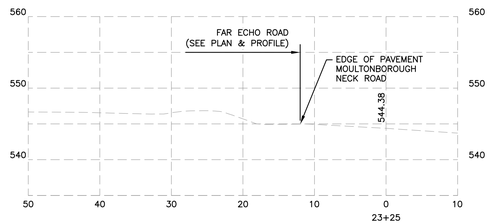
1" = 10' H, 1" = 10' V

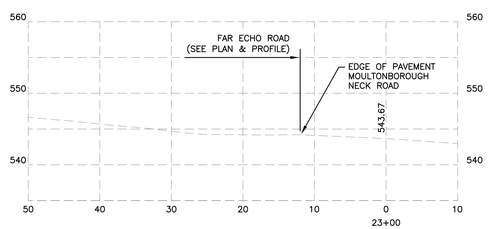


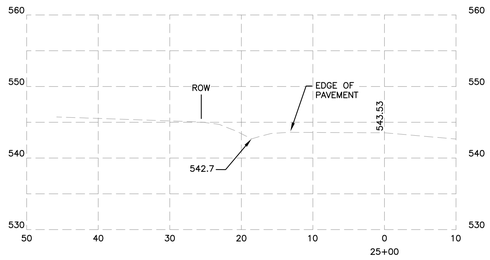


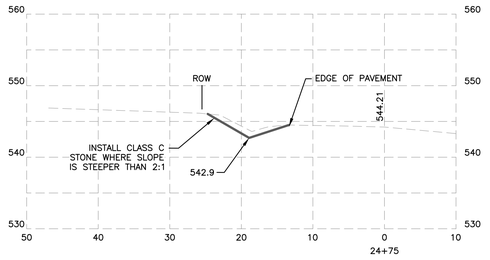


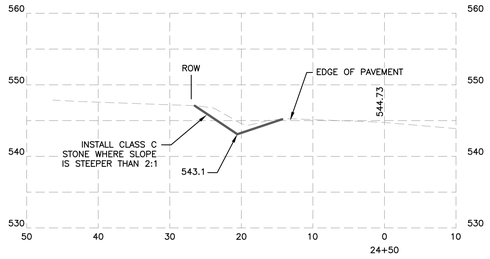


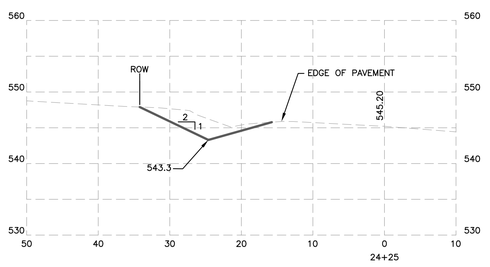












CROSS SECTIONS

MOULTONBOROUGH NECK ROAD

1" = 10' H, 1" = 10' V

REVISIONS			
NUMBER	DATE	BY	DESCRIPTION

STATE OF NEW HAMPSHIRE — RAYMOND H. KORBER — 7839 — LICENSED PROFESSIONAL ENGINEER

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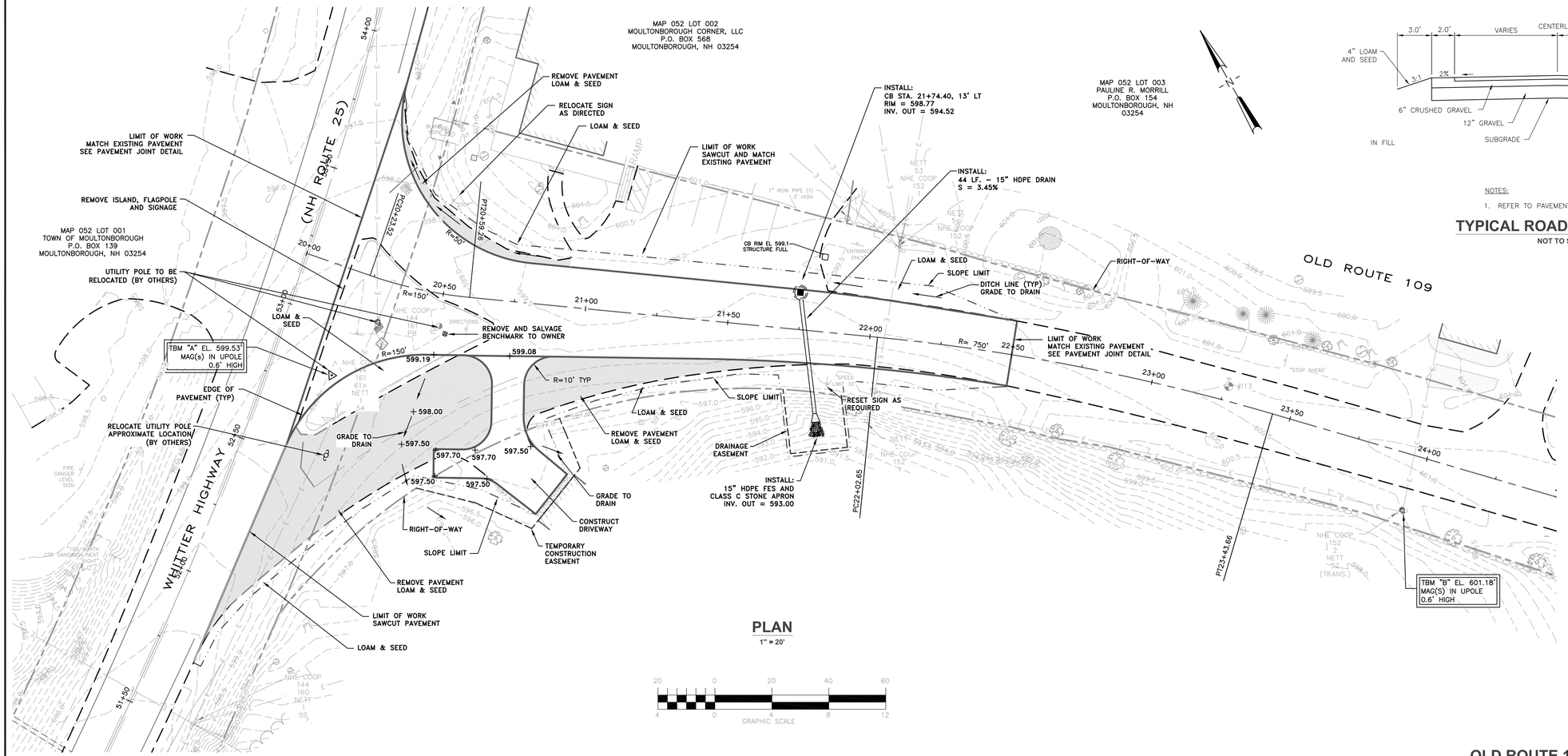
2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

FAR ECHO ROAD INTERSECTION
CROSS SECTIONS

SHEET NO.
3

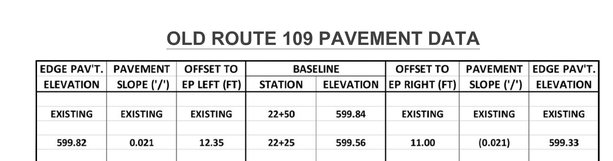
SHEET 3 OF 11



PLAN

1" = 20'

GRAPHIC SCALE

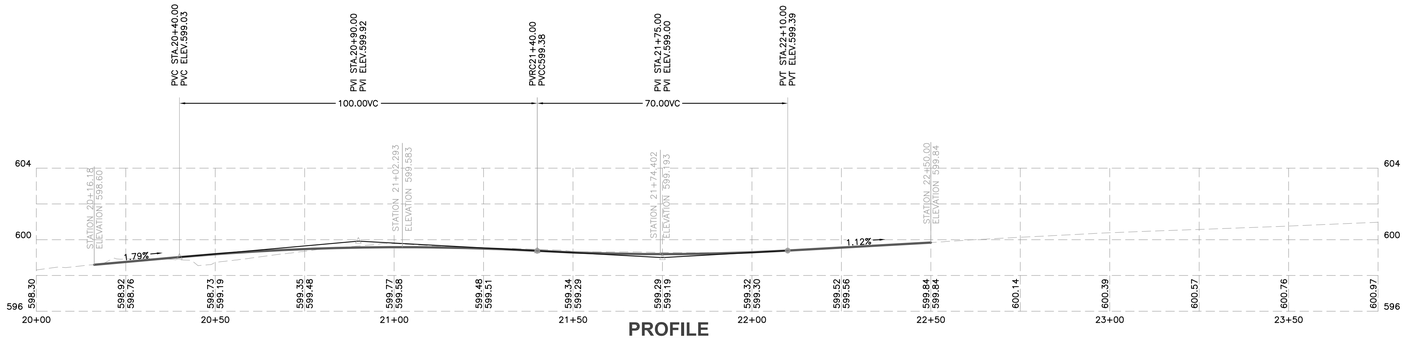


NOTES:

1. REFER TO PAVEMENT DATA SCHEDULE.

TYPICAL ROADWAY SECTION

NOT TO SCALE



PROFILE

1" = 20' H, 1" = 4' V

NOTES:

1. REFER TO TYPICAL ROADWAY SECTIONS AND CROSS SECTIONS.
2. REFER TO CONSTRUCTION DETAILS.
3. CONTRACTOR SHALL LIMIT CLEARING AND GRUBBING OPERATIONS TO LIMIT OF SLOPE..
4. INSTALL SEDIMENTATION AND EROSION CONTROL MEASURES AS DIRECTED BY ENGINEER.
5. RELOCATING AND RESETTING SIGNAGE AND MAILBOXES SHALL BE SUBSIDIARY TO ROADWAY RECONSTRUCTION.
6. LOAM AND SEED ALL DISTURBED AREAS UNLESS OTHERWISE NOTED.

OLD ROUTE 109 PAVEMENT DATA

EDGE PAV'T. ELEVATION	PAVEMENT SLOPE ('/')	OFFSET TO EP LEFT (FT)	BASELINE STATION	BASELINE ELEVATION	OFFSET TO EP RIGHT (FT)	PAVEMENT SLOPE ('/')	EDGE PAV'T. ELEVATION
EXISTING	EXISTING	EXISTING	22+50	599.84	EXISTING	EXISTING	EXISTING
599.82	0.021	12.35	22+25	599.56	11.00	(0.021)	599.33
599.30	LEVEL	13.47	22+00	599.30	11.00	(0.021)	599.06
598.77	(0.030)	14.00	21+75	599.19	11.52	(0.021)	598.95
598.99	(0.021)	14.00	21+50	599.29	12.88	(0.021)	599.02
599.21	(0.021)	14.00	21+25	599.51	14.90	(0.021)	599.20
599.29	(0.021)	14.00	21+00	599.58	16.97	(0.021)	599.22
599.18	(0.021)	14.20	20+75	599.48	19.09	(0.021)	599.08
598.72	(0.021)	22.38	20+50	599.19	21.56	LEVEL	599.19
597.92	(0.021)	39.70	20+25	598.76	38.52	0.018	599.45

REVISIONS			
NUMBER	DATE	BY	DESCRIPTION

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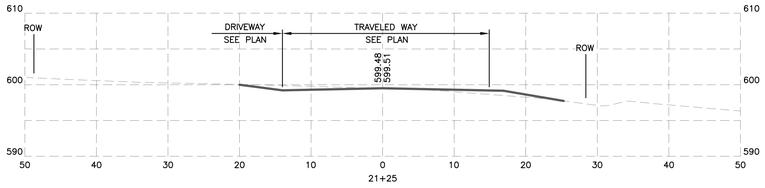
APPROVED BY:	RHK

2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

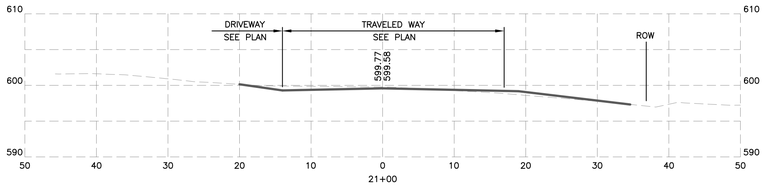
OLD ROUTE 109 INTERSECTION
PLAN, PROFILE AND TYPICAL SECTION

SHEET NO.
4

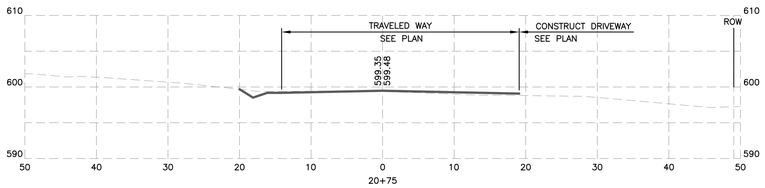
SHEET 4 OF 11



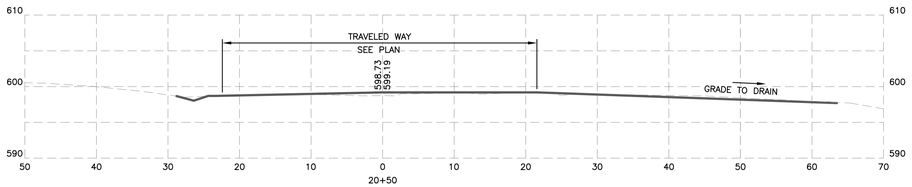
21+25



21+00



20+75



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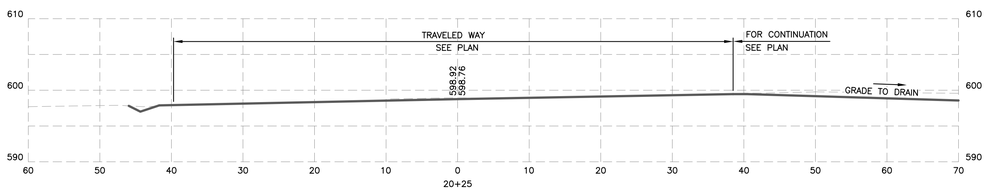

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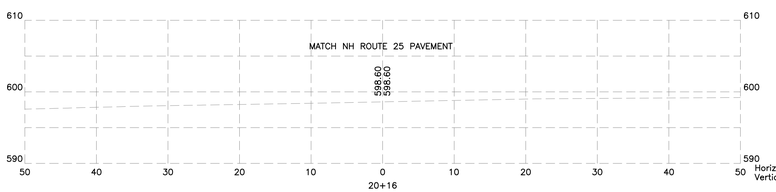

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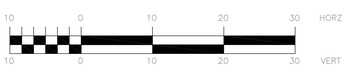
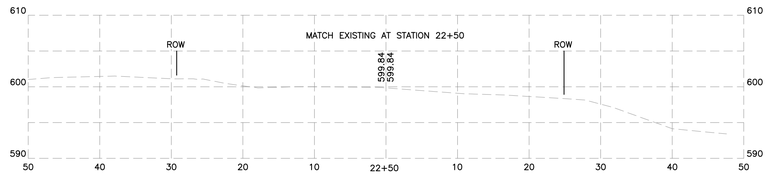
Horizontal Scale 10
Vertical Scale 10





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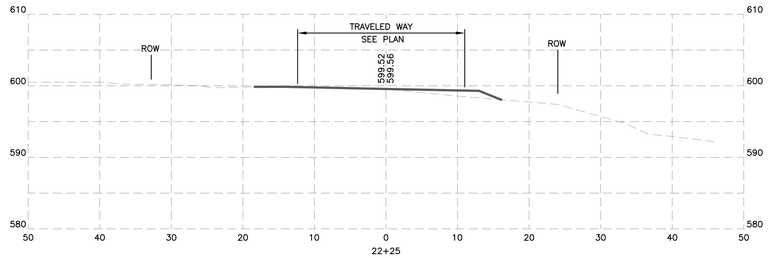

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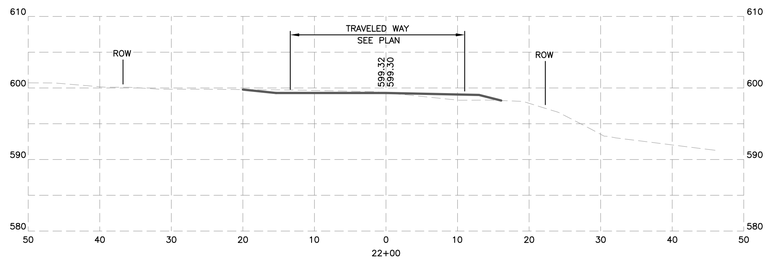

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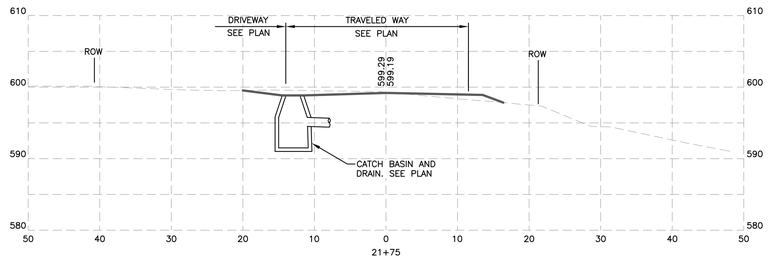

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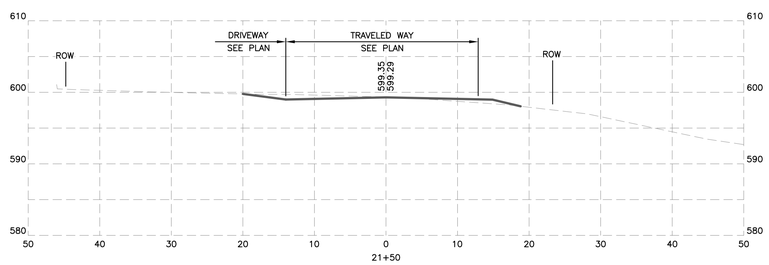

21+50

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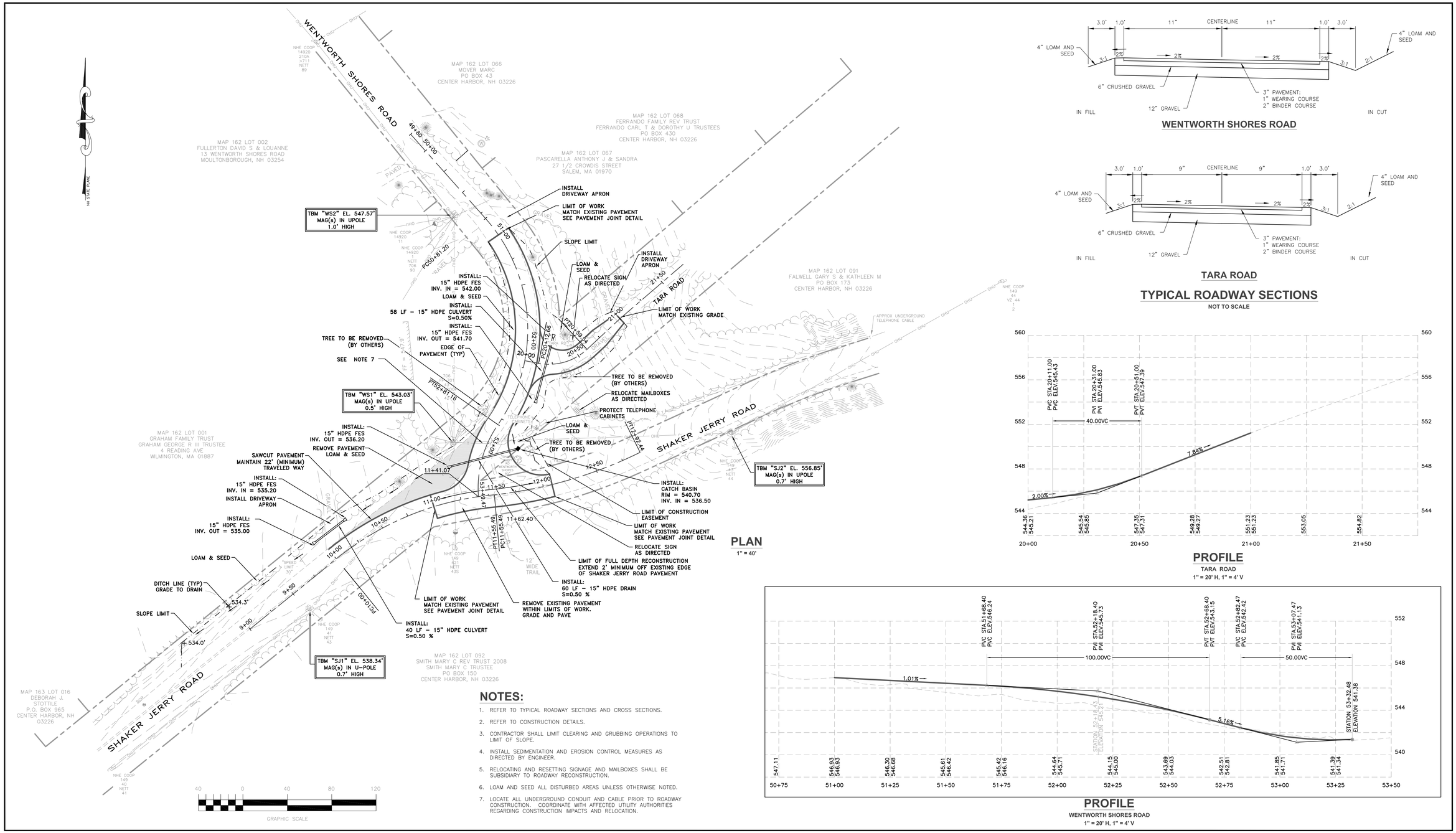
2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

OLD ROUTE 109 INTERSECTION
CROSS SECTIONS

SHEET NO.
5

SHEET 5 OF 11



PLAN

1" = 40'

WENTWORTH SHORES ROAD

TARA ROAD

TYPICAL ROADWAY SECTIONS

NOT TO SCALE

PROFILE

TARA ROAD

1" = 20' H, 1" = 4' V

PROFILE

WENTWORTH SHORES ROAD

1" = 20' H, 1" = 4' V

NOTES:

1. REFER TO TYPICAL ROADWAY SECTIONS AND CROSS SECTIONS.
2. REFER TO CONSTRUCTION DETAILS.
3. CONTRACTOR SHALL LIMIT CLEARING AND GRUBBING OPERATIONS TO LIMIT OF SLOPE.
4. INSTALL SEDIMENTATION AND EROSION CONTROL MEASURES AS DIRECTED BY ENGINEER.
5. RELOCATING AND RESETTING SIGNAGE AND MAILBOXES SHALL BE SUBSIDIARY TO ROADWAY RECONSTRUCTION.
6. LOAM AND SEED ALL DISTURBED AREAS UNLESS OTHERWISE NOTED.
7. LOCATE ALL UNDERGROUND CONDUIT AND CABLE PRIOR TO ROADWAY CONSTRUCTION. COORDINATE WITH AFFECTED UTILITY AUTHORITIES REGARDING CONSTRUCTION IMPACTS AND RELOCATION.

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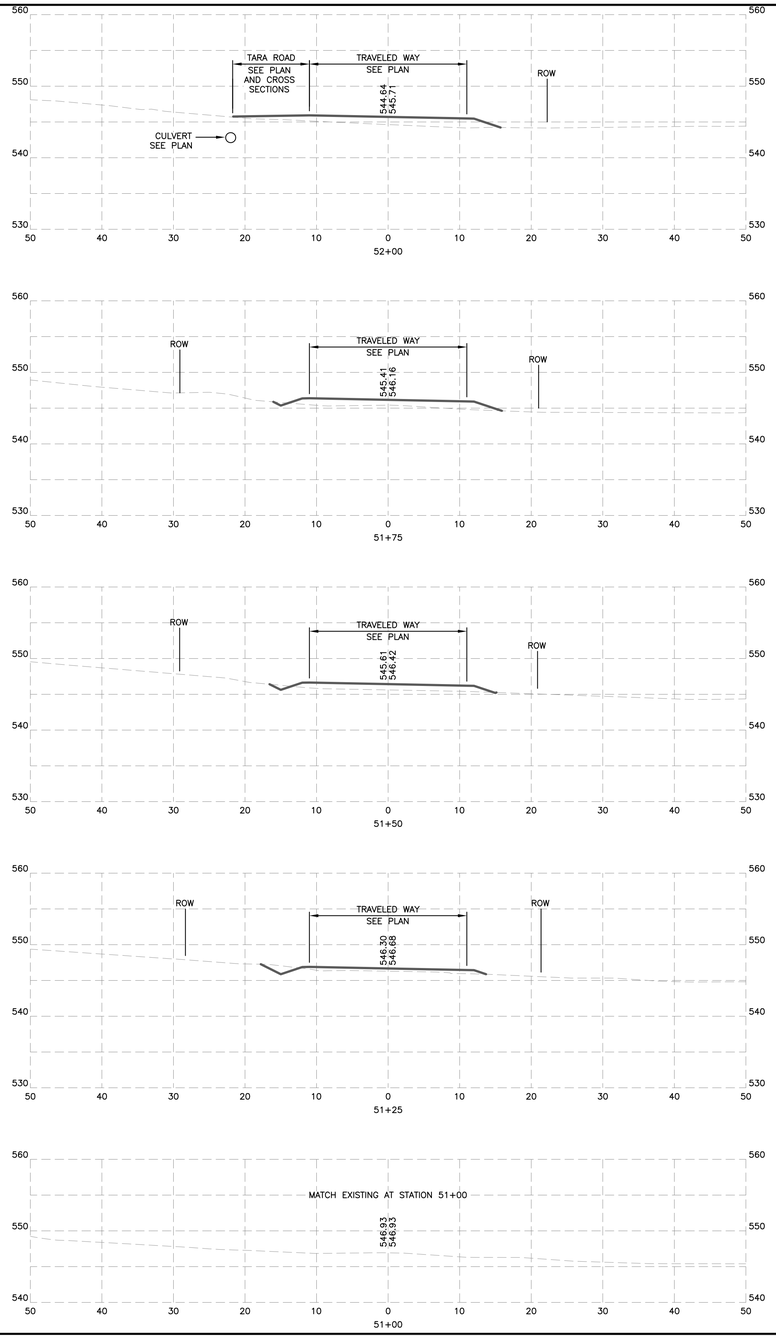
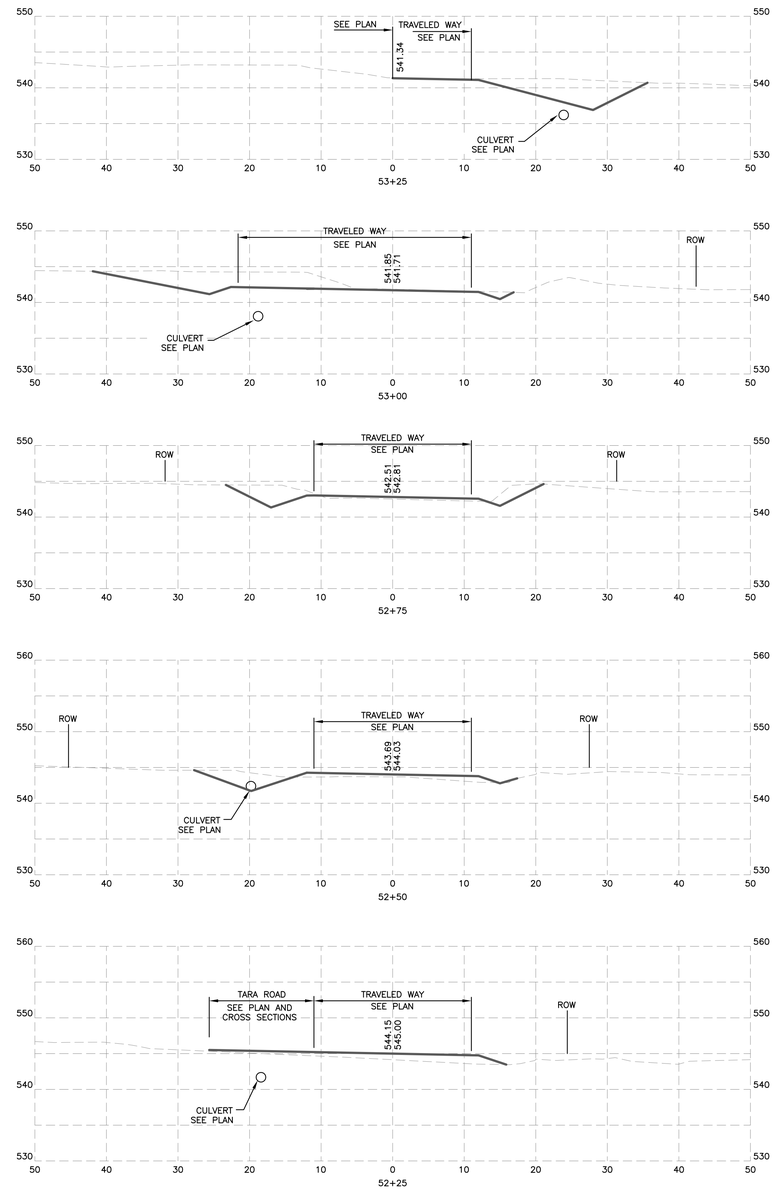
2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

WENTWORTH SHORES ROAD INTERSECTION
PLAN, PROFILE AND TYPICAL SECTIONS

SHEET NO. **6**

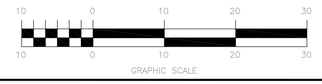
SHEET 6 OF 11





CROSS SECTIONS

WENTWORTH SHORES ROAD
1" = 10' H, 1" = 10' V



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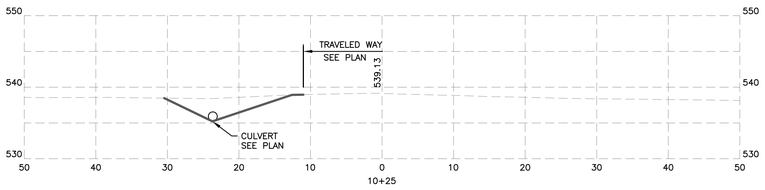
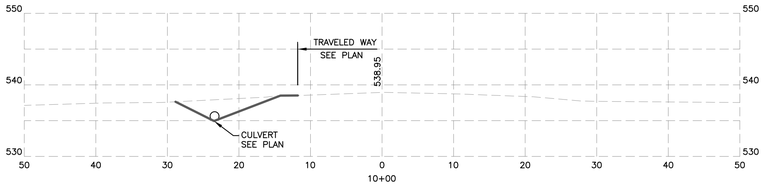
2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

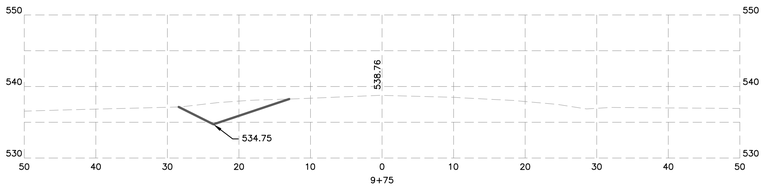
WENTWORTH SHORES ROAD INTERSECTION
CROSS SECTIONS

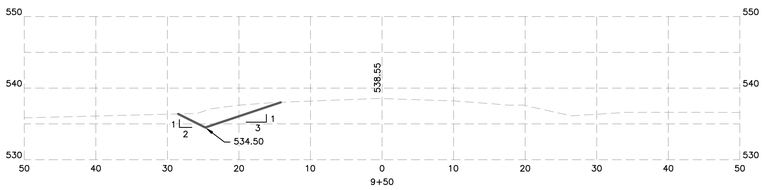
SHEET NO.
7

SHEET 7 OF 11



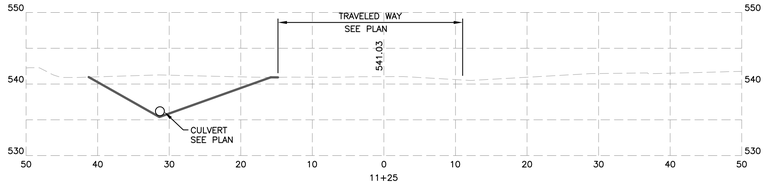


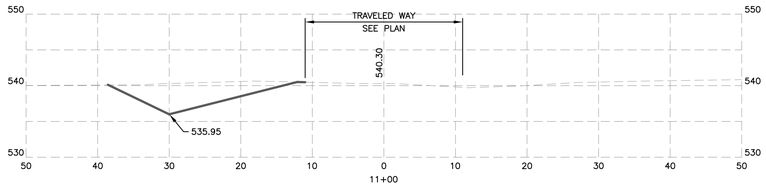


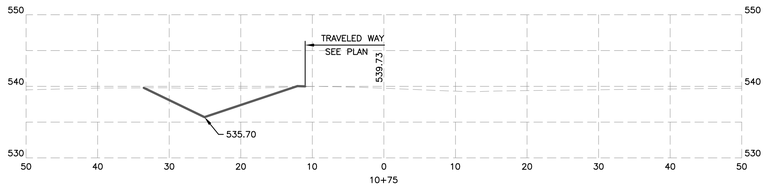


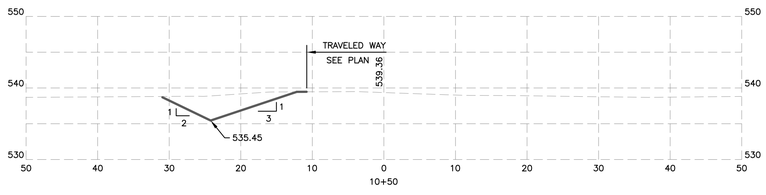
CROSS SECTIONS

SHAKER JERRY ROAD
1" = 10' H, 1" = 10' V



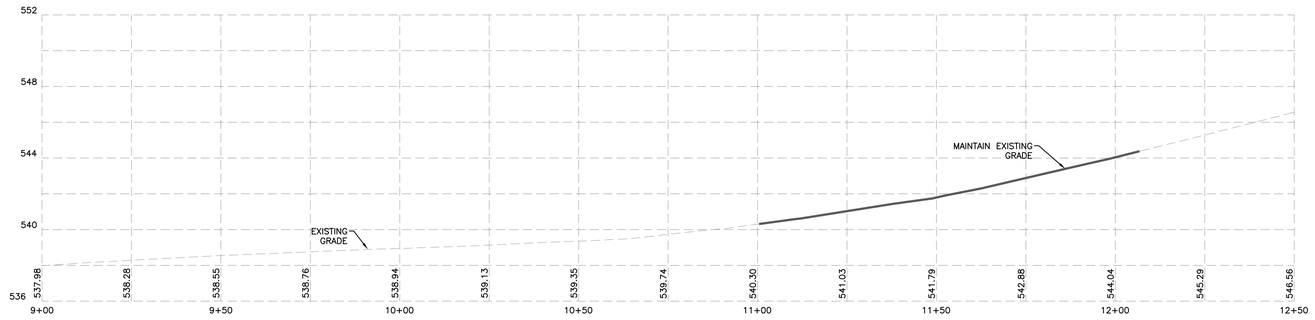






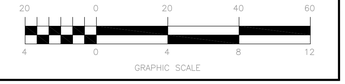
NOTES:

1. TRAVELED WAY FOR SHAKER JERRY ROAD SHALL MEET EXISTING GRADE AND CROSS SLOPE.



PROFILE

SHAKER JERRY ROAD
1" = 20' H; 1" = 4' V



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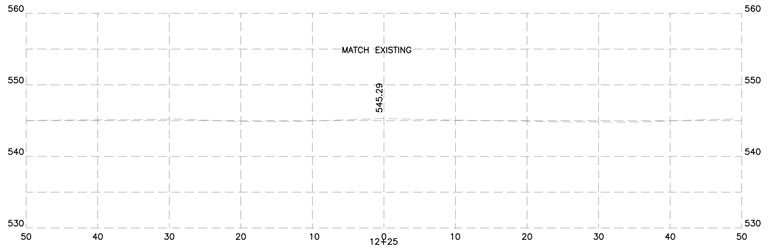
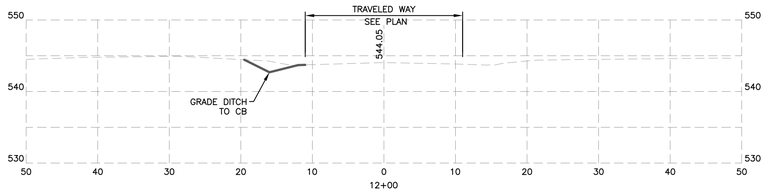
2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

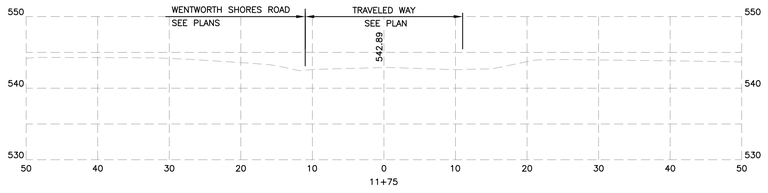
WENTWORTH SHORES ROAD INTERSECTION
PROFILE AND CROSS SECTIONS

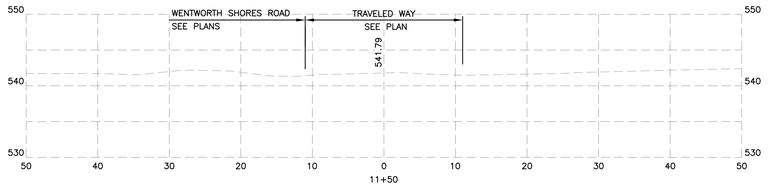
SHEET NO.
8

SHEET 8 OF 11









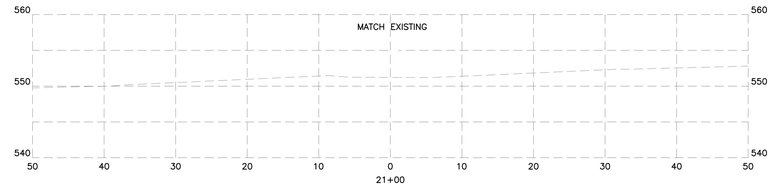
NOTES:

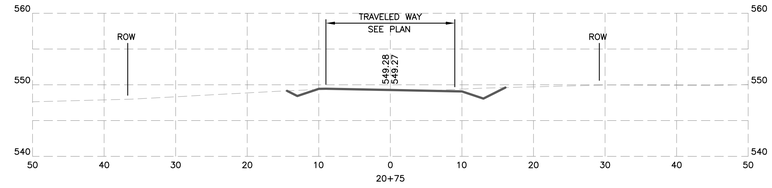
1. TRAVELED WAY FOR SHAKER JERRY ROAD SHALL MEET EXISTING GRADE AND CROSS SLOPE.

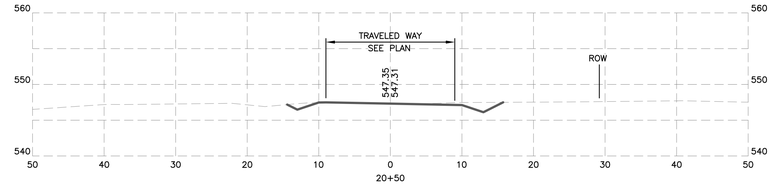
CROSS SECTIONS

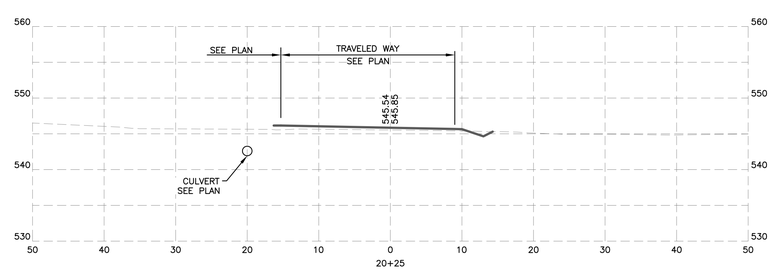
SHAKER JERRY ROAD

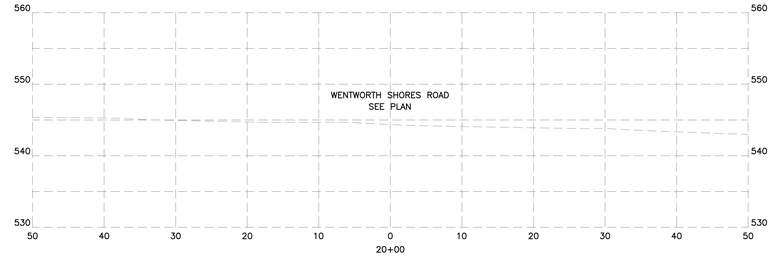
1" = 10' H; 1" = 10' V







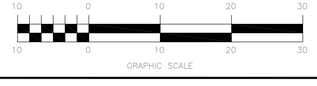




CROSS SECTIONS

TARA ROAD

1" = 10' H; 1" = 10' V



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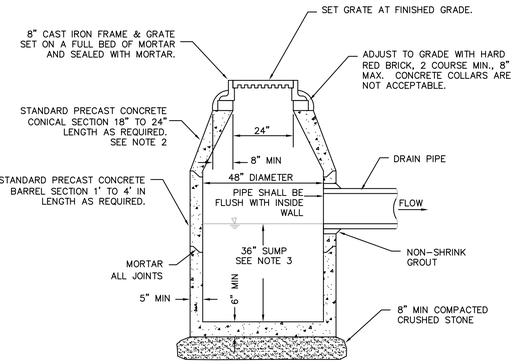
2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

WENTWORTH SHORES ROAD INTERSECTION CROSS SECTIONS

SHEET NO.

9

SHEET 9 OF 11

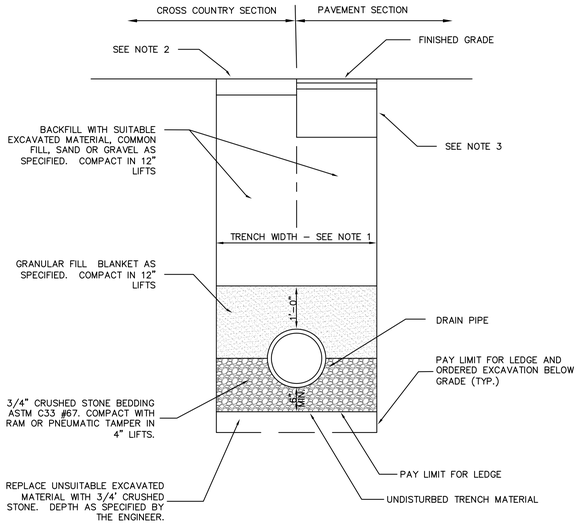


NOTES:

1. PRECAST CONCRETE SECTION ASSEMBLIES SHALL WITHSTAND H-20 LOADING AND SHALL CONFORM TO ASTM C478.
2. ECCENTRIC CONE AND FLAT TOP SECTIONS MAY BE USED. COORDINATE LOCATIONS WITH ENGINEER PRIOR TO INSTALLATION.
3. STANDARD SUMP DEPTH SHALL BE 36". ADJUST SUMP DEPTH AS REQUIRED TO FACILITATE INSTALLATION. COORDINATE DEPTH REQUIREMENTS WITH ENGINEER PRIOR TO INSTALLATION.

CATCH BASIN DETAIL

NOT TO SCALE

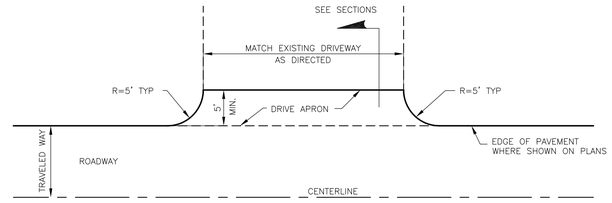


NOTES:

1. MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE GREATER OF 36" OR 2X THE NOMINAL PIPE DIAMETER. MINIMUM TRENCH WIDTH SHALL BE 36".
2. WHERE GRASS OCCURS, LOAM AND SEED ALL DISTURBED AREAS TO A MINIMUM DEPTH OF 4 INCHES UNLESS OTHERWISE NOTED. WHERE NO GRASS OCCURS, MATCH EXISTING MATERIALS AND DEPTHS OR PLACE A MINIMUM OF 6 INCHES OF GRAVEL, WHICHEVER IS GREATER.
3. REFER TO TYPICAL ROADWAY SECTIONS.

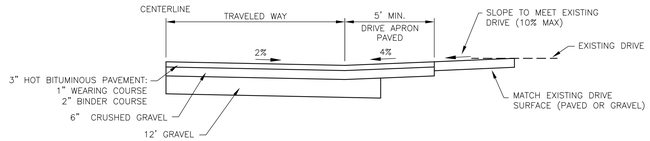
DRAIN TRENCH DETAIL

NOT TO SCALE

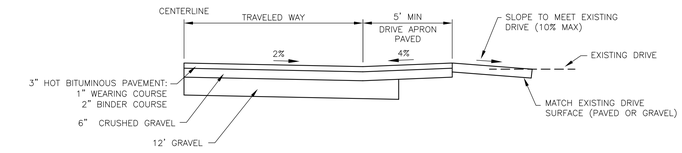


PLAN

SCALE 1" = 10'



SECTION - DRIVE ABOVE ROADWAY



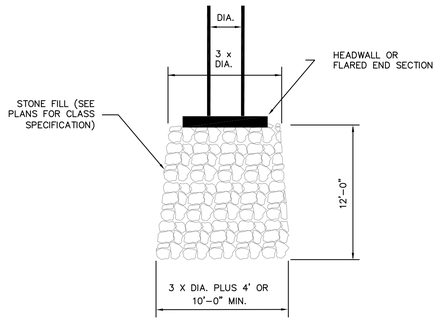
SECTION - DRIVE BELOW ROADWAY

NOTES:

1. CONTRACTOR SHALL COORDINATE WITH ENGINEER ON DRIVEWAY APRON WIDTH AND TRANSITION REQUIREMENT PRIOR TO COMMENCEMENT OF WORK.

DRIVEWAY APRON DETAIL

NOT TO SCALE

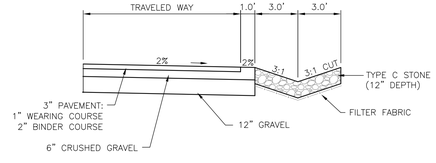


NOTES:

1. NON WOVEN FILTER FABRIC SHALL BE PLACED ON A PREPARED SUBBASE AND ROLLS SHALL BE OVERLAPPED A MINIMUM OF 12 INCHES. CARE SHALL BE TAKEN NOT TO PUNCTURE THE FABRIC DURING INSTALLATION AND ANY DAMAGED AREAS SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.
2. STONE FILL SHALL CONFORM TO NHDOT STONE SIZE CLASSIFICATIONS AND SHALL BE PLACED WITH A MINIMUM THICKNESS AS FOLLOWS:
   A. CLASS C STONE FILL - MINIMUM THICKNESS 12 INCHES
   B. CLASS B STONE FILL - MINIMUM THICKNESS 18 INCHES

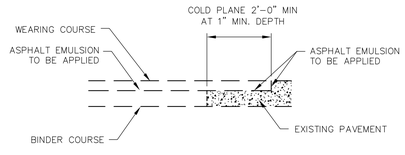
STONE APRON DETAIL

NOT TO SCALE



STONE LINED SWALE DETAIL

SCALE 1" = 5'



NOTES:

1. CONTRACTOR SHALL COORDINATE WITH ENGINEER PRIOR TO COMMENCEMENT OF WORK REGARDING JOINT LOCATION.

PAVEMENT JOINT DETAIL

NOT TO SCALE

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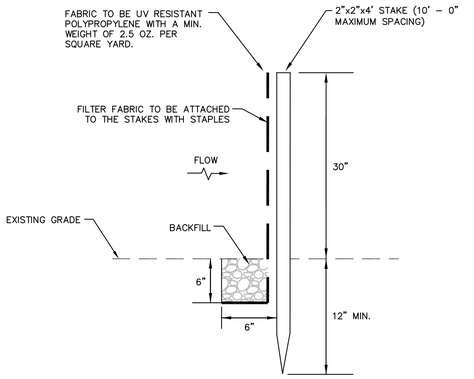
2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

ROADWAY AND DRAINAGE DETAILS

SHEET NO.
10

SHEET 10 OF 11

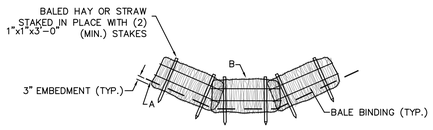


NOTES:

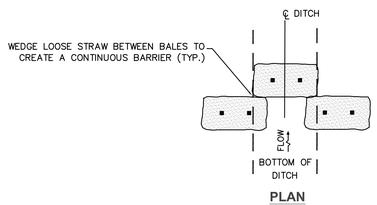
1. INSTALL HAY BALES AS DIRECTED BY THE ENGINEER.

SILT FENCE DETAIL

NOT TO SCALE



SECTION



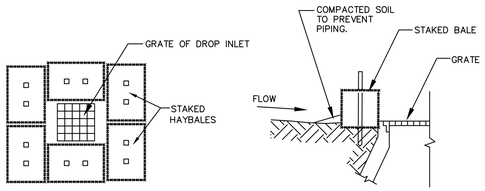
PLAN

NOTES:

1. THE BALES ARE TO BE EMBEDDED A MINIMUM OF 3" INTO THE EXISTING GROUND, ROADWAY SLOPE OR DITCH SECTION.
2. POINT "A" SHOULD BE AT A HIGHER ELEVATION THAN POINT "B."
3. BARRIERS SHALL BE INSTALLED AT 50 FOOT INTERVALS ALONG THE CENTERLINE OF THE PROPOSED DRAINAGE DITCHES, OR AS DIRECTED BY THE ENGINEER, UNTIL PERMANENT SURFACE TREATMENTS ARE INSTALLED AND FULLY STABILIZED.

EROSION CHECK DAM DETAIL

NOT TO SCALE

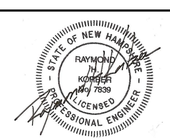


PLAN **SECTION**

HAY BALE SILT TRAP DETAIL

NOT TO SCALE

REVISIONS			
NUMBER	DATE	BY	DESCRIPTION



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DATE:	07/30/15
SCALE:	AS NOTED
DESIGNED BY:	RGR
DRAWN BY:	NMT
CHECKED BY:	RHK
APPROVED BY:	RHK

2015 ROAD PROGRAM
MOULTONBOROUGH, NEW HAMPSHIRE

MISCELLANEOUS DETAILS

SHEET NO.
11

SHEET 11 OF 11