ADDENDUM 1

The following information is provided for all qualified bidders for the above project for bids now due October 15, 2020 at 1:30 P.M. This addendum shall be signed by all BIDDERs and included with the Bid Form.

The below BIDDER acknowledges receipt of this information.

BIDDER's Name: _____Date:_____

COMPANY NAME:_____

PLAN REVISIONS:

Minor plan revisions are included on the following plan sheets and are clouded and identified with the following symbol: 

Included Sheets: 5-10, 11, 12, 19, 20 30-34, 39, 40, 44-51, 53, 68, 69

SOIL AND GROUNDWATER MANAGEMENT PLAN (SGMP):

An updated SGMP shall be downloaded by all bidders from the Town's web site.

BID FORM:

A revised Bid Form (schedule of prices) is included with this addendum to replace the form in the original bid due to the changes summarized below:

-<u>DELETED</u> THE FOLLOWING BID ITEMS:

ITEM 203.11 COMMON EXCAVATION – LRS

Minimal LRS exists on site and it shall be paid as common excavation and reused on site as topsoil in the same vicinity the same day.

ITEM 203.2 ROCK EXCAVATION

Any rock or concrete qualifying as rock shall be paid under the new Item 206.2.

ITEM 203.35 HANDLING EXCAVATED CONTAMINATED SOILS

Handling excavated contaminated soils will not be paid separately but will be incidental to Items 1009.251 through 1009.235.

ITEM 615.023 REMOVING TRAFFIC SIGN TYPE B

ITEM 615.033 REMOVING TRAFFIC SIGN TYPE C

ITEM 615.053 REMOVING TRAFFIC SIGN TYPE BB

ITEM 615.063 REMOVING TRAFFIC SIGN TYPE CC

(Removing traffic signs will not be paid separately but will be considered incidental to the project.)

ITEM 615.071 REMOVE AND SALVAGE BUSINESS SIGN

The subject sign has been removed by the property owner.

ITEM 619.253 PORTABLE CHANGEABLE MESSAGE SIGN WEEKS

ITEM 632.0112 RETROREFLECTIVE PAINT PAVEMENT MARKING, SINGLE SOLID LINE, 12" LINE

ITEM 632.0118 RETROREFLECTIVE PAINT PAVEMENT MARKING, SINGLE SOLID LINE, 18" LINE

Note that temporary pavement markings are subsidiary to maintenance of traffic per the Town's supplemental specification for Section 619.

ITEM 670.1611 DISCHARGE PERMIT FOR TREATING CONTAMINATED WATER

It has been determined that this permit is not required.

-ADDED THE FOLLOWING BID ITEMS AND QUANTITIES:

ITEM 206.2 ROCK STRUCTURE EXCAVATION
400 CY

ITEM 403.119 HOT BITUMINOUS PAVEMENT, MACHINE METHOD, HIGH STRENGTH
5700 TON

ITEM 403.991 TEMPORARY PAVEMENT 1400 SQUARE YARDS

ITEM 611.5001 1" WATER SERVICE CONNECTION 1 EA

This new water service shall be added at approximate Station 111+50 RT or as directed by the Engineer. The item shall include all necessary components including corporation stop, curb stop, pipe, fittings, couplings, curb box, and items necessary to connect to the existing line from the structure, as specified in Section 611 -- Water System Installation in the project special provisions.

ITEM 619.25 PORTABLE CHANGEABLE MESSAGE SIGN 4 UNITS

ITEM 632.3104 RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKING, SINGLE SOLID LINE, 4" LINE 2200 LF

ITEM 632.3112 RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKING, SINGLE SOLID LINE, 12" LINE 1925 LF

ITEM 1009.22 OFFSITE DISPOSAL OF CONTAMINATED GROUNDWATER 100 MGAL

-REVISED QUANTITIES IN THE FOLLOWING ITEMS TO THE VALUES SHOWN BELOW:

ITEM 202.42 REMOVAL OF EXISTING PIPE OVER 24" DIAMETER
280 LF

ITEM 306.112 RECLAIMED STABILIZED BASE PROCESSED IN PLACE, 12" DEEP (F)
1700 SY

ITEM 306.212 RECLAIMED STABILIZED BASE REMOVED AND REHANDLED, 12" DEEP (F)
10950 SY

ITEM 306.36 STONE FOR RECLAIMED STABILIZED BASE
1700 TON

ITEM 403.11 HOT BITUMINOUS PAVEMENT, MACHINE METHOD
300 TON

ITEM 403.12 HOT BITUMINOUS PAVEMENT, HAND METHOD
150 TON

ITEM 614.511 CONCRETE PULL BOX 14" 14 EA

ITEM 614.73114 3" PVC CONDUIT, SCHEDULE 40 475 LF

ITEM 614.73118 3" PVC CONDUIT, SCHEDULE 80 375 LF

ITEM 615.0301 TRAFFIC SIGN TYPE C 120 SF

ITEM 615.0501 TRAFFIC SIGN TYPE BB 10 SF

ITEM 622.4 STONE BOUNDS 29 EA

ITEM 632.0104 RETROREFLECTIVE PAINT PAVEMENT MARKING, SINGLE SOLID LINE, 4" LINE
12650 LF

ITEM 1009.21 TREATMENT AND DISPOSAL OF CONTAMINATED GROUNDWATER
(FRAC TANK) 30 WEEKS (Note revised unit of measure)

ITEM 1009.251 TRANSPORT AND DISPOSAL OF TYPE B CONTAMINATED SOILS
1700 TON

ITEM 1009.252 TRANSPORT AND DISPOSAL OF TYPE C CONTAMINATED SOILS
1000 TON

ITEM 1009.253 TRANSPORT AND DISPOSAL OF TYPE D CONTAMINATED SOILS
440 TON

BID DOCUMENTS / SPECIFICATIONS:

Invitation to Bid:

The bid opening date has been changed to **October 15th**, still at 1:30 PM.

Revised Supplemental Specifications or Special Provisions (Attached):

Amendment to SECTION 403 – HOT BITUMINOUS PAVEMENT (Attached)

-Added Temporary Pavement Item and changed depth to 3"

615.072 REMOVE AND RELOCATE BUSINESS SIGN (Attached)

-Deleted Remove and Salvage Sign item

Amended Section 616 – TRAFFIC SIGNALS (Attached)

-Added geotechnical services to the signal item

AMENDMENT TO SECTION 619 – MAINTENANCE OF TRAFFIC (Attached)

-Added language on the type of portable changeable message signs that will be required and also noted that the signs shall become the property of the Town at the conclusion of construction.

1009.21 TREATMENT AND DISPOSAL OF CONTAMINATED GROUNDWATER (FRAC TANK) (Attached)

- Revised method of measurement and payment to Weeks

Added Supplemental Specifications or Special Provisions (Attached):

625.525 STREET LIGHTS INCLUDING POLES, FOUNDATIONS AND LUMINAIRES

625.6 REMOVE AND RELOCATE PRIVATE LIGHT POLE

1009.22 OFFSITE DISPOSAL OF CONTAMINATED GROUNDWATER

RESPONSES TO CONTRACTOR QUESTIONS:

Question: There isn't an item for Temporary Paving. How will trenches be paved and paid over the winter?

Response: An item for temporary paving has been added to the project.

Question: If drainage work is ongoing in the winter months, will the plowing of the work limits still be done by, state/town?

Response: Yes. The town will continue to plow through the winter within the work zone in lanes actively traveled by the public. However; shoulder cleanup/snow removal in designated work areas shall be the responsibility of the Contractor. Note that proper trench maintenance will be critical to the service provided by the Town.

Question: Town of Salem does not require Pavement Joint Adhesive. The project calls for pavement joint adhesive as subsidiary to the machine method. Will pavement joint adhesive be required?

Response: Pavement joint adhesive is only required on cold joints (i.e. paving the next day). Otherwise hot joints only require tack coat to be applied.

Question: 4)At pre-bid it was stated that "all" work at the intersection will be done at night. Can you clarify if this includes the paving, striping?

Response: Night work is not mandated. The determination of whether to use night work is a function of the Contractor's proposed schedule and potential impacts to traffic as a means of convenience to him and not a requirement of the Contract. As a matter of practice, traffic shall remain open on Broadway with at least one lane in each direction. Traffic on Main Street shall remain open with at least one lane (alternating traffic or one-way with detour). Paving at night will be entertained but is not

required. Night striping is not required. Striping during off-hours during low traffic volumes should be anticipated as it is with any other construction operation. If it is found the contractor's operations cause significant traffic delays that pose a significant public nuisance and/or impairment to emergency response in the area the Contractor shall propose an appropriate solution to the problem.

Question: It is stated that all temporary striping is subsidiary. What can the Contractor expect to be required for pavement markings after binder is placed and prior to wearing surface?

Response: Temp striping should consider the existing layout while the existing signal mast arm is still in place. Temp striping should consider the proposed layout where the existing mast arm has been removed. Temporary striping shall include Arrows, Legends, Stop Bars, Crosswalks and 4" lines matching back to existing at the project limits.

Question: Please clarify the following, big cost difference between Reconstruct/Relocate/Adjust:

604.4 Reconstructing/Adjusting CB & DI 3 EA: Are all intended to be reconstructed?

Response: This item is intended as an adjust and includes all brick down to the top of precast structure.

604.5 Reconstructing/Adjusting Manholes 23 EA: Are all intended to be reconstructed?

Response: This item is intended as an adjust and includes all brick down to the top of precast structure.

611.811 Adjusting/Relocating Hydrants 1 EA Is this an adjust or relocate?

Response: This item is intended to relocate the existing hydrant laterally, but it maintains the existing hydrant branch, tee and valve. Where an existing hydrant is relocated such that a new hydrant branch, valve and tee are needed the contract will add additional items.

611.911 Adjusting/Relocating Gate Valve with Box 25 EA Is this to relocate or adjust?

Response: This item is intended as an adjust, vertically. A relocation would be identified separately.

Question: Granite curb detail shows 6", NHDOT standard is 5". Please clarify

Response: The details on plan sheet 11 are incorrect and standard 5" NHDOT curb width shall be used. Note that the details in the plans are otherwise based on Town of Salem construction details, which shall govern.

Question: Plans state that any video inspection of drain lines, when ordered, is subsidiary. Shouldn't there be an Item for an unknown amount, if any.

Response: Video inspection of drain lines would be ordered by the Engineer only where product workmanship is called into question. There is no pay item. Where a video determines poor workmanship, the Contractor shall be responsible for the cost of the inspection and any subsequent remedial actions. Where video does not identify any deficiencies, it shall be paid in accordance to normal change order protocols.

Question: All the testing and analysis within the bid documents for the Contaminated Soils are Pre-Characterization. SGMP states that composite testing for all Types will be done at separate intervals. During the pre-bid it was stated that the intent was that all

material excavated during trench excavation was to go back in the same trench. If all contaminated materials needs to be stockpiled for confirmatory testing, then putting excavated trench excavation back in the same trench that same day does not seem reasonable to expect. Also, will there be an LSP on site at all times to direct the Contractor what soils need to be stockpiled and what Type it is assumed to be at time of stockpiling?

Response: The Town will have a full-time Resident Engineer on-site for the duration of the project as well as an environmental subconsultant during certain operations. In general, questionable material shall be segregated during the trench excavation process then used as backfill first. Trenches shall be capped with material believed to not be contaminated. Where the questionable material exceeds the available capacity of the trench then it shall be stockpiled. The excess material will then be pre-characterized and/or tested. Where material is determined as contaminated it shall be disposed according to its classification under the appropriate item. Note that the contractor shall maintain appropriate segregation practices. Where he fails to properly segregate material and mixes with common burrow material then he shall assume responsibility for disposal if necessary. Note also the Town has conducted excavation activities including utility trenching w/in the work zone on six separate occasions over the last 3 years. Minimal material has been shipped off-site for disposal. It is expected that the same will be true on this project for the trenching operations. It is understood that this is a waste job largely due to the roadway widening and pavement rehabilitation and the excavation for those operations shall follow the protocols in the SGMP.

Question: Item 203.35 Handling Excavated Soils, 3.13.4.2 states Care by Contractor that existing drilled wells within and adjacent to the site shall be uncontaminated and intact subsequent to earth & groundwater disturbance due to construction. Will there be any testing done by Owners prior to construction to confirm wells are indeed uncontaminated, intact and in fact not dry from drought? This testing and info would be valuable info in any future claims.

Response: The intent of this requirement is for the contractor to avoid damaging the wells through direct physical contact or ground disturbance too close to the wells. If physical damage to the wells is observed by the Engineer, the Contractor will be responsible for the cost or replacement. Pre-construction testing is not planned however pre-construction visual inspection is likely.

Question: What is the project cost estimate?

Response: The construction cost estimate was broken into two schedules as follows:

Schedule A: All general construction items: $3.2 to 3.5 Mil.

Schedule B: All items related to contaminated soil and groundwater: $ 0.3 to 0.6 Mil.

ADDENDUM 1

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
201.21	3 EA	REMOVING SMALL TREES AT _____ $_____DOLLARS PER EACH				
202.41	2350 LF	REMOVAL OF EXISTING PIPE 0-TO 24" DIAMETER AT _____ $_____DOLLARS LINEAR FOOT				
202.42	280 LF	REMOVAL OF EXISTING PIPE OVER 24" DIAMETER AT _____ $_____DOLLARS LINEAR FOOT				
202.5	13 EA	REMOVAL OF CATCH BASINS, DROP INLETS, AND MANHOLES AT _____ $_____DOLLARS PER EACH				
202.8	100 LF	REMOVE AND SALVAGE FENCE AT _____ $_____DOLLARS LINEAR FOOT				
203.1	7950 CY	COMMON EXCAVATION AT _____ _____DOLLARS PER CUBIC YARD				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
203.6	325 CY	EMBANKMENT IN PLACE (F) AT _____ _____DOLLARS PER CUBIC YARD				
206.19	300 CY	COMMON STRUCTURE EXCAVATION - EXPLORATORY AT _____ _____DOLLARS CUBIC YARD				
206.2	400 CY	ROCK STRUCTURE EXCAVATION AT _____ _____DOLLARS PER CUBIC YARD				
214	1 U	FINE GRADING AT _____ _____DOLLARS PER UNIT				
304.4	2400 CY	CRUSHED STONE (FINE GRADATION) (F) AT _____ _____DOLLARS CUBIC YARD				
304.5	1575 CY	CRUSHED STONE (COARSE GRADATION) (F) AT _____ _____DOLLARS CUBIC YARD				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
306.112	1700 SY	RECLAIMED STABILIZED BASE PROCESSED IN PLACE, 12" DEEP (F) AT _____ _____DOLLARS PER SQUARE YARD				
306.212	10950 SY	RECLAIMED STABILIZED BASE REMOVED AND REHANDLED, 12" DEEP (F) AT _____ _____DOLLARS PER SQUARE YARD				
306.36	1700 TON	STONE FOR RECLAIMED STABILIZED BASE AT _____ _____DOLLARS TON				
403.11	300 TON	HOT BITUMINOUS PAVEMENT, MACHINE METHOD AT _____ _____DOLLARS PER TON				
403.119	5700 TON	HOT BITUMINOUS PAVEMENT, MACHINE METHOD, HIGH STRENGTH AT _____ _____DOLLARS PER TON				
403.12	150 TON	HOT BITUMINOUS PAVEMENT, HAND METHOD AT _____ _____DOLLARS PER TON				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
403.991	1400 SY	TEMPORARY PAVEMENT AT _____ _____DOLLARS PER SQUARE YARD				
417	3200 SY	COLD PLANING BITUMINOUS SURFCES AT _____ _____DOLLARS PER SQUARE YARD				
603.00212	520 LF	12" R.C. PIPE, 2000D AT _____ _____DOLLARS LINEAR FOOT				
603.00215	1290 LF	15" R.C. PIPE, 2000D AT _____ _____DOLLARS LINEAR FOOT				
603.00218	170 LF	18" R.C. PIPE, 2000D AT _____ _____DOLLARS LINEAR FOOT				
603.00236	50 LF	36" R.C. PIPE, 2000D AT _____ _____DOLLARS LINEAR FOOT				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
603.00242	20 LF	42" R.C. PIPE, 2000D AT _____ _____DOLLARS LINEAR FOOT				
603.00415	100 LF	15" R.C. PIPE, 3750 D AT _____ _____DOLLARS LINEAR FOOT				
603.81008	20 LF	8" PVC PIPE AT _____ _____DOLLARS LINEAR FOOT				
604.0007	26 EA	POLYETHYLENE LINER AT _____ _____DOLLARS PER EACH				
604.124	25 U	CATCH BASINS TYPE B, 4-FOOT DIAMETER AT _____ _____DOLLARS PER UNIT				
604.324	2 U	DRAINAGE MANHOLES, 4-FOOT DIAMETER AT _____ _____DOLLARS PER UNIT				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
604.326	3 U	DRAINAGE MANHOLES, 6-FOOT DIAMETER AT _____ _____DOLLARS PER UNIT				
604.4	3 EA	RECONSTRUCTING/ADJUSTING CATCH BASINS AND DROP INLETS AT _____ _____DOLLARS PER EACH				
604.5	23 EA	RECONSTRUCTING/ADJUSTING MANHOLES AT _____ _____DOLLARS PER EACH				
604.62	3 EA	DRAINAGE MANHOLE COVERS AND FRAMES AT _____ _____DOLLARS PER EACH				
604.72	4 EA	GRATES AND FRAMES, TYPE B AT _____ _____DOLLARS PER EACH				
606.99	200 LF	REMOVE AND RESET EXISTING WOODEN BEAM GUARDRAIL AT _____ _____DOLLARS PER LINEAR FOOT				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
608.13	1160 SY	3-IN BITUMINOUS SIDEWALK (F) AT _____ _____DOLLARS PER SQUARE YARD				
608.34	1525 SY	4" REINFORCED CONCRETE SIDEWALK (F) AT _____ _____DOLLARS PER SQUARE YARD				
608.54	15 SY	DETECTABLE WARNING DEVICES, CAST IRON AT _____ _____DOLLARS PER SQUARE YARD				
609.01	3960 LF	STRAIGHT GRANITE CURB AT _____ _____DOLLARS PER LINEAR FOOT				
609.02	70 LF	CURVED GRANITE CURB AT _____ _____DOLLARS PER LINEAR FOOT				
609.5	70 LF	RESET GRANITE CURB AT _____ _____DOLLARS PER LINEAR FOOT				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
611.05206	6 LF	6" CEMENT LINED DUCTILE IRON WATER PIPE, CL 52 AT _____ _____DOLLARS PER LINEAR FOOT				
611.05212	10 LF	12" CEMENT LINED DUCTILE IRON WATER PIPE, CL 52 AT _____ _____DOLLARS PER LINEAR FOOT				
611.50010	1 EA	1" WATER SERVICE CONNECTION AT _____ _____DOLLARS PER EACH				
611.70006	4 EA	6" FITTING AT _____ _____DOLLARS PER EACH				
611.70012	4 EA	12" FITTING AT _____ _____DOLLARS PER EACH				
611.811	1 EA	ADJUSTING/RELOCATING HYDRANTS AT _____ _____DOLLARS PER EACH				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
611.90001	32 EA	ADJUSTING WATER GATES AND SHUTOFFS SET BY OTHERS AT _____ _____DOLLARS PER EACH				
611.911	25 EA	ADJUSTING/RELOCATING GATE VALVE WITH BOX AT _____ _____DOLLARS PER EACH				
612.61508	40 LF	8" PVC SEWER PIPE (SDR 35) AT _____ _____DOLLARS PER LINEAR FOOT				
612.61510	30 LF	10" PVC SEWER PIPE (SDR 35) AT _____ _____DOLLARS PER LINEAR FOOT				
614.511	14 EA	CONCRETE PULL BOX 14" AT _____ _____DOLLARS PER EACH				
614.72114	1975 LF	2" PVC CONDUIT, SCHEDULE 40 AT _____ _____DOLLARS PER LINEAR FOOT				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
614.72118	220 LF	2" PVC CONDUIT, SCHEDULE 80 AT _____ _____DOLLARS PER LINEAR FOOT				
614.73114	475 LF	3" PVC CONDUIT, SCHEDULE 40 AT _____ _____DOLLARS PER LINEAR FOOT				
614.73118	375 LF	3" PVC CONDUIT, SCHEDULE 80 AT _____ _____DOLLARS PER LINEAR FOOT				
615.0201	77 SF	TRAFFIC SIGN TYPE B AT _____ _____DOLLARS PER SQUARE FOOT				
615.0301	120 SF	TRAFFIC SIGN TYPE C AT _____ _____DOLLARS PER SQUARE FOOT				
615.034	2 UNIT	RELOCATING TRAFFIC SIGN TYPE C AT _____ _____DOLLARS PER UNIT				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
615.0501	10 SF	TRAFFIC SIGN TYPE BB AT _____ _____DOLLARS PER SQUARE FOOT				
615.0601	40 SF	TRAFFIC SIGN TYPE CC AT _____ _____DOLLARS PER SQUARE FOOT				
615.072	1 EA	REMOVE AND RELOCATE BUSINESS SIGN AT _____ _____DOLLARS PER EACH				
616.161	1 UNIT	TRAFFIC SIGNALS (TEMPORARY) AT _____ _____DOLLARS PER UNIT				
616.191	1 LS	ALTERATIONS TO TRAFFIC SIGNALS (MAIN ST AT BROADWAY ST) AT _____ _____DOLLARS PER LUMP SUM				
618.61	1 ALLOWANCE	UNIFORMED OFFICERS WITH VEHICLE AT _____FOUR HUNDRED THOUSAND_____ _____DOLLARS			$400,000	00

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
619.1	1 UNIT	MAINTENANCE OF TRAFFIC AT _____ _____DOLLARS PER UNIT				
619.25	208 UNIT	PORTABLE CHANGEABLE MESSAGE SIGN AT _____ _____DOLLARS PER UNIT				
622.4	29 EA	STONE BOUNDS AT _____ _____DOLLARS PER EACH				
625.525	19 EA	STREET LIGHTS INCLUDING POLES, FOUNDATIONS AND LUMINAIRES AT _____ _____DOLLARS PER EACH				
628.2	2800 LF	SAWED PAVEMENT AT _____ _____DOLLARS PER LINEAR FOOT				
632.0104	12650 LF	RETROREFLECTIVE PAINT PAVEMENT MARKING, SINGLE SOLID LINE, 4" LINE AT _____ _____DOLLARS PER LINEAR FOOT				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
632.3104	2200 LF	RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKING, SINGLE SOLID LINE, 4" LINE AT _____ _____DOLLARS PER LINEAR FOOT				
632.3112	1925 LF	RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKING, SINGLE SOLID LINE, 12" LINE AT _____ _____DOLLARS PER LINEAR FOOT				
632.3118	220 LF	RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKING, SINGLE SOLID LINE, 18" LINE AT _____ _____DOLLARS PER LINEAR FOOT				
632.32	850 SF	RETROREFLECTIVE THERMOPLASTIC, SYMBOL OR WORD AT _____ _____DOLLARS PER SQUARE FOOT				
632.911	12800 LF	OBLITERATE PAVEMENT MARKING, 12" WIDE & UNDER AT _____ _____DOLLARS PER LINEAR FOOT				
632.92	400 SF	OBLITERATE PAVEMENT MARKING, SYMBOL OR WORD AT _____ _____DOLLARS PER SQUARE FOOT				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
645.512	1000 LF	COMPOST SOCK FOR PERIMETER BERM AT _____ _____DOLLARS PER LINEAR FOOT				
645.533	30 EA	INLET FILTER BASKETS AT _____ _____DOLLARS PER EACH				
645.531	400 LF	SILT FENCE AT _____ _____DOLLARS PER LINEAR FOOT				
645.7	1 UNIT	STORM WATER POLLUTION PREVENTION PLAN AT _____ _____DOLLARS PER UNIT				
645.72	35 VISIT	MONITORING SWPPP AND EROSION AND SEDIMENT CONTROLS AT _____ _____DOLLARS PER VISIT				
646.51	6800 SY	TURF ESTABLISHMENT WITH MULCH, TACKIFIERS AND LOAM AT _____ _____DOLLARS PER SQUARE YARD				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
677.51012	140 LF	12-STRAND SINGLE MODE FIBER OPTIC CABLE AT _____ _____DOLLARS PER LINEAR FOOT				
677.53	180 EA	FIBER OPTIC SPLICE AT _____ _____DOLLARS PER EACH				
677.54101	1 UNIT	GROUND MOUNTED ITS EQUIPMENT CABINET AT _____ _____DOLLARS PER UNIT				
677.561	2 EA	FIBER OPTIC PATCH PANEL (12 POSITION) AT _____ _____DOLLARS PER EACH				
677.5612	1 EA	FIBER OPTIC PATCH PANEL (156 POSITION) AT _____ _____DOLLARS PER EACH				
677.5822	3 EA	1 GBPS FIBER ETHERNET SWITCH AT _____ _____DOLLARS PER EACH				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
677.64	1 EA	UNINTERRUPTABLE POWER SUPPLY (UPS) AT _____ _____DOLLARS PER EACH				
677.9308	50 LF	3-CONDUCTOR #8 AWG CABLE AT _____ _____DOLLARS PER LINEAR FOOT				
692	1 UNIT	MOBILIZATION AT _____ _____DOLLARS PER UNIT				
697.31	1 UNIT	PROJECT OPERATIONS PLAN AT _____ _____DOLLARS PER UNIT				
698.13	12 MO	FIELD OFFICE TYPE C AT _____ _____DOLLARS PER MONTH				
1009.21	30 WK	TREATMENT AND DISPOSAL OF CONTAMINATED GROUNDWATER (FRAC TANK) AT _____ _____DOLLARS PER WEEK				

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID	UNIT PRICES Dollars	UNIT PRICES Cents	AMOUNT Dollars	AMOUNT Cents
1009.22	100 MGAL	OFFSITE DISPOSAL OF CONTAMINATED GROUNDWATER AT _____ _____DOLLARS THOUSAND GALLONS				
1009.251	1700 TON	TRANSPORT AND DISPOSAL OF TYPE B CONTAMINATED SOILS AT _____ _____DOLLARS PER TON				
1009.252	1000 TON	TRANSPORT AND DISPOSAL OF TYPE C CONTAMINATED SOILS AT _____ _____DOLLARS PER TON				
1009.253	440 TON	TRANSPORT AND DISPOSAL OF TYPE D CONTAMINATED SOILS AT _____ _____DOLLARS PER TON				
1010.2	1 $	ASPHALT CEMENT ADJUSTMENT AT _____ _____DOLLARS PER DOLLAR				

TOTAL BID = **$**_____

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 403 – HOT BITUMINOUS PAVEMENT

Description

Add the following to the end of the last sentence of part 1.1.

"or temporary. Sidewalks and walkways shall be as specified in section 608"

Amend 1.1.1 to Read:

Hand method shall include only the paving of raised islands, slopes, cattle passes, areas between rails at railroad crossings, driveways, driveway aprons, curb patch between concrete barrier and pavement, and permanent trench patches.

Amend 1.1.2 to Read:

1.1.2 Machine method shall include all paving operations not classified as hand method. Machine method shall also include those driveways and other areas completed with the use of a paver and those areas specifically identified as machine method.

Add section 1.4

1.4 Prior to the start of any paving operations a mandatory pre-paving meeting will be conducted.

Materials

Amend section 2.2 to read as follows:

2.2 Temporary bituminous pavement shall conform to 401, Table 1. Thickness shall be 3" minimum or as ordered by the Engineer.

Add section 2.3

2.3 Job mix formula for bituminous pavement materials shall be as follows:

a. Temporary pavement material shall be 3/4" base course gradation as specified in NHDOT Standard Specifications, Section 401.

b. Permanent base course pavement material shall be 3/4" base course gradation as specified in NHDOT Standard Specifications, Section 401.

c. Permanent binder course pavement material, including driveways, shall be 3/4" binder course gradation as specified in NHDOT Standard Specifications, Section 401.

d. Permanent wearing course pavement material shall be 1/2" wearing course gradation as specified in NHDOT Standard Specifications, Section 401.

e. Temporary bituminous pavement material shall be 3/4" binder course gradation as specified in NHDOT Standard Specifications, Section 401

f. Permanent bituminous pavement (for trench patching) shall have a minimum total thickness of four inches (4"), or match existing thickness, whichever is greater or as shown on the Contract Drawings. Permanent bituminous pavement with a thickness of four inches (4") shall be installed with a base lift of 2.5" of 3/4" binder course and a top lift of 1.5" of 1/2" wearing course or as shown on the Contract Drawings.

Construction Requirements

Add section 3.5

3.5 Temporary bituminous pavement will not be required for all trenches and structures, but shall only be installed when so directed by the Engineer.

Add section 3.6

3.6 Temporary pavement shall be repaired as necessary to maintain the surface of the pavement until replaced by the permanent pavement. If points of settlement or holes appear in the temporary pavement, the Contractor shall repair the same within 24 hours without any further compensation.

Add section 3.7

3.7 Permanent bituminous pavement shall be installed in multiple lifts of wearing, binder and base course mixes as indicated in the Contract Drawings or directed by the Engineer to achieve the total thickness of pavement as indicated in the Contract Drawings. Permanent bituminous pavement (for trench patching) with a total thickness of four inches (4") shall be installed with a base lift of 2.5" of 3/4" binder course and a top lift of 1.5" of 1/2" wearing course unless otherwise indicated on the Contract Drawings, or directed.

Add section 4.1.2

4.1.2 Temporary Pavement will be measured by the square yard in the completed work.

Add section 5.4

5.4 The accepted quantity of Temporary Pavement will be paid for at the Contract unit price per square yard complete in place.

Add section 5.5

5.5 Pavement Joint Adhesive shall be considered included in the price for hot bituminous pavement and no additional compensation will be allowed.

Add to Pay Item and Units:

403.99	Temporary Bituminous Pavement	Square Yard

SALEM DEPOT
12334

8/31/20

SPECIAL PROVISION

Item 615.072 – Remove and Relocate Business Sign

Description

1.1 This work shall consist of the removal and satisfactory resetting of existing business signs as shown on the plans and as directed.

1.2 The remove and relocate sign is intended for the gas station sign located at the corner at STA 111+20 Rt.

1.3 The removal shall include, but is not limited to, the following.

1.3.1 The removal of all sign above ground components and appurtenances found on the property.

1.3.2 Removal of the sign foundations to at least 3-feet below grade.

1.3.3 Placement of embankment in resulting excavations (foundation holes) level with the surrounding ground.

1.3.4 For relocated signs the work shall include resetting the sign at a new on-site location designated by the Engineer as determined through discussions with the property owner.

Materials

2.1 Not Used

Construction Requirements

3.1 The Contractor shall re-use all existing materials to the greatest extent possible for relocating and resetting the commercial sign. Backfill shall be incidental to the sign removal and shall consist of Item 304.3. The Contractor shall construct foundations for commercial sign to be reset matching the size and depth of the foundation of the sign at its original location or shall construct foundations to a size and depth necessary to support the sign as directed by the Engineer. The Contractor shall supply new hardware and accessories as needed for resetting and anchoring of existing commercial sign. The work shall include stubbing out electrical conduit below ground for future connection and electrification by the property owner or connecting to existing underground conduit if it is within 10 feet of the new sign location.

Method of Measurement:

4.1.1 Remove and Relocate Business Sign shall be measured by each for each business sign removed and reset, complete and in place.

4.1.3 If property owners decide that signs designated for relocation will be salvaged instead of reset on new foundations the signs shall be placed by the Contractor on boards at an onsite location designated by the property owner and shall still be measured for payment under Item 615.072.

4.1.4 If the property owner for signs designated for relocation decides not to have the signs reset or salvaged on their property the sings will become the property of the Contractor to dispose of and shall still be measured for payment under Item 615.072.

Basis of Payment:

5.1 The accepted quantity of Remove and Relocate Business Sign will be paid for at the Contract unit price per Each.

Pay Items and Units:

Pay Items	Description	Unit
Item 615.072	Remove and Relocate Business Sign	Each

ssd: 2/22/16

SALEM DEPOT
October 1, 2020

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 616 - TRAFFIC SIGNALS

Item 616.191 – Alterations To Traffic Signals

This special provision provides for signal work at the following location:

Signal ID#: N/A (Town maintained intersection)
Town/City: Salem
Intersection: Route 28 (South Broadway) and Route 97 (Main Street)

This signal is coordinated with the following intersections: The system shall be coordinated at a minimum with the following intersections located north, south, and west of the intersection:

1. Route 28 (South Broadway) and Old Rockingham Road with Retail Driveway
2. Route 28 (South Broadway) and Central Street with USPS Driveway
3. Route 97(Main Street) and Pleasant Street with Tuscan Driveway

This special provision amends Section 616 and addresses the design and installation criteria for new traffic signal structures and foundations, including installation and pretensioning procedures of anchor rods for double-nut moment connections (i.e. the base plate stands off from the concrete foundation, bears on leveling nuts, and is secured by top nuts).

This traffic signal system shall be connected through rerouted fiber optic cable and coordinated as part of the Town's ATMS/ITS system.

GENERAL:

All provisions of Section 616, except as modified or changed below, shall apply.

1. The Contractor shall be responsible for the traffic signal operation and maintenance once alterations to the existing signals, excavation or other work within 75 feet of the stop bar at any leg of the intersection has begun. The Contractor shall notify the Town's Contract Administrator/Engineer with names and phone numbers of persons to be contacted in case of a malfunction. The Contact person(s) must be available 24 hours a day, seven days a week. The Contractor shall also keep a signal log in the cabinet to track all maintenance work the Contractor completes on the signal system. This log shall be placed within a plastic cover and shall at least include the description of the trouble call, corrective action taken, date, time, and personnel who completed the work.

2. The power source for the new signal cabinet shall be a 30 AMP breaker on the existing power distribution cabinet.

3. The Contractor shall be responsible for the resetting of the existing signal equipment (video-based vehicle detection) as shown on the plans.

4. The Contractor shall be responsible for the dismantling and removing of the existing traffic signal control cabinet, mast arm poles, traffic signal heads, signal backplates, pedestrian signal heads, pushbuttons, traffic signal controller, and conflict monitor. All surplus equipment shall be salvaged and delivered to the Town of Salem Public Works (Contact David Wholley, 603-890-2159), during normal business hours.

5. The Contractor shall install a generator anchoring system to the traffic controller cabinet's concrete foundation. The location of the anchoring system will be on the side of the cabinet that houses the controller's power supply and installed to the raised foundation (see detail on contract plans). The anchoring system shall be a ½-inch x 13 tpi galvanized wrought eyebolt with a thread length of 1 5/8-inch. The eyebolt shall be installed in a 5/8-inch diameter drilled hole into the concrete foundation (the location of the drilled hole shall be placed in an area where it does not interfere with the controller cabinet anchor bolt system to the concrete foundation). The eyebolt shall be bonded into the concrete by an epoxy compound [Component "A" (105 resin) and Component "B" (205 hardener)], with the epoxy compound filling the drilled hole and covering the threads of the eyebolt. The epoxy compound shall be a product as included on the NHDOT's Qualified Product List (see page 17 of 24 Attachment A Detail Plan).

6. The cabinet hardwired equipment shall be protected with a plug-in surge suppressor with LED indicators for warnings or failure. HescoRLS HE 1750, Edco SHA-1250 or approved equal.

7. Interconnect cables shall be fiber optic and shall be terminated on a 12-position patch panel within the traffic signal cabinet.

8. Conductor intersection signal cable shall be a home run from the signal cabinet to each mast arm.

9. Foundations for mast arm poles and traffic signal (TS) posts are conceptually located to be within the existing right-of-way and avoid underground and overhead conflicts with information that was provided during design. However, the Contractor may with the approval from the Engineer and/or Town of Salem relocate TS posts and/or poles as needed and upon consultation to avoid unanticipated conflicts as long as the final location meets the guidelines in Section 4E.08 of the 2009 Manual of Uniform Traffic Control Devices (MUTCD).

10. Work will include programming the traffic signal controller to provide integration within the existing Advanced Traffic Signal (ATS) Management System (Contact Chris Bobay, VHB, 603-391-3911 during normal business hours). In addition, the work shall include support and technical assistance to the Town in upgrading the intersection level graphics within the existing ATS Management System.

Add to 2.1 the following:

2.1.3 List of Major Materials:

NOTE: The Contractor shall carefully note the amendment to Section 3.12 Painting as provided below. It is the intent that all signal equipment and hardware installed on this project shall be painted black (Federal Color Standard A595B Semi Gloss Black 27038), with the exception of the interior of signal visors, louvers and front faces of backplates, which shall be painted flat black (Federal Color Standard A595B Flat Black 37038).

Cabinet & Components:

1 - 16-Phase keyboard programmable traffic actuated signal controller with TS2-Type 2 input and output connections with internal time-based coordination and internal fire preemption. The controller shall be a Trafficware Commander ATC controller. The controller shall be capable of communicating to and fully compatible with the town's existing ATMS.now system. The controller shall be capable of Ethernet communications and shall include a Cat. 6 Ethernet cable for connection to an Ethernet switch to be located in the controller cabinet.

1 - "P" Type TS1 cabinet assembled by the equipment manufacturer which will include vehicle detection with power supply, telemetry harness with panel, and 15-inch extension base. The exterior of the cabinet shall be painted semi-gloss black in accordance with subsection 3.12.

1 – 16-channel Enhanced Malfunction Management Unit (MMU). The MMU supplied and installed by the Contractor shall be capable of communicating with and fully compatible with the Town's existing ATMS.now system through Ethernet-based communications and shall include a Cat. 6 Ethernet cable for connection to the Ethernet switch located in the controller cabinet.

Poles and Signal Heads:

1 – Galvanized steel semi-gloss black painted ornamental mast arm pole with 20-foot signal arm. The mast arm shall meet the requirements of section 2.1.4, below. Mast arms shall include new concrete foundations as described in Section 2.4, below.

1 – Galvanized steel semi-gloss black painted ornamental mast arm pole with 30-foot signal arm. The mast arm shall meet the requirements of section 2.1.4, below. Mast arms shall include new concrete foundations as described in Section 2.4, below.

1 – Galvanized steel semi-gloss black painted ornamental mast arm pole with 40-foot signal arm. The mast arm shall meet the requirements of section 2.1.4, below. Mast arms shall include new concrete foundations as described in Section 2.4, below.

1 – Galvanized steel semi-gloss black painted ornamental mast arm pole with 45-foot signal arm. The mast arm shall meet the requirements of section 2.1.4, below. Mast arms shall include new concrete foundations as described in Section 2.4, below.

1 – Galvanized steel semi-gloss black painted ornamental mast arm poles with 60-foot signal arm. The mast arm shall meet the requirements of section 2.1.4, below. Mast arms shall include new concrete foundations as described in Section 2.4, below.

5 - Mast arm bases shall be sealed with stainless steel wire cloth/mesh secured to mast arm base to

keep out small nesting animals. The cloth shall be SS 305, 4x4, .047 or similar wrapped around the anchor bolts between the bottom surface of the mast arm plate and the top surface of the concrete base.

7 – Steel semi-gloss black painted 8-foot ornamental one-piece shaft pedestal pole. The pole shall meet the requirements of section 2.1.4 below.

17 – One-way, three-section, 12-inch aluminum signal heads with LED modules type (Dialight brand or approved equivalent), mounted on mast arms with Pelco Astro-Brac, with 5-inch retroreflective louvered backplates. The outside perimeter of the backplate shall be lined with a fluorescent yellow 2-inch strip of Type IX or XI retroreflective sheeting to highlight the three-section signal head.

1 – One-way, four-section, 12-inch aluminum signal heads with LED modules type (Dialight brand or approved equivalent), mounted on mast arm with Pelco Astro-Brac, with 5-inch retroreflective louvered backplates. The outside perimeter of the backplate shall be lined with a fluorescent yellow 2-inch strip of Type IX or XI retroreflective sheeting to highlight the four-section signal head.

1 – One-way, four-section, 12-inch aluminum signal heads with LED modules type (Dialight brand or approved equivalent), mounted on mast arm pole upright with Pelco mounting hardware, with 5-inch retroreflective louvered backplates. The outside perimeter of the backplate shall be lined with a fluorescent yellow 2-inch strip of Type IX or XI retroreflective sheeting to highlight the four-section signal head.

2 – Bracket mounted 16-inch by 18-inch, LED black pedestrian heads with solid hand symbol, solid person symbol, and countdown timer display.

8 – Pedestal mounted 16-inch by 18-inch, LED black pedestrian heads with solid hand symbol, solid person symbol, and countdown timer display.

Vehicle Detection:

1 – Remove and reset the existing Vehicle Detection System, Aldis brand Gridsmart 360 degree with Single Fish-Eye mast arm mounted Bell Camera and shelf-mount Controller Unit, including mounting and support equipment, wiring and software including but not limited to traffic counts module, real-time data module, pedestrian module, and any other equipment installed on town's existing ATMS server to provide a complete working vehicle detection system. Upon reset, the camera and mounting hardware shall be painted black in accordance with the amendment to Section 3.12 hereinafter.

Emergency Preemption:

1 - Opticom Fire Preemptor Phase Selector, GTT Model 764, with a Model 760 Card Rack, TOMAR Strobecom II 1881 Card and Cage, Emtrac Priority Detector, or approved equivalent.

5 – Opticom receivers GTT Model 711, TOMAR 2091-SD, or approved equivalent.

2 – Confirmation strobe light, 120 VAC, with red Lexan optic lens. Whelan Model, IAC 12 RP, TOMAR Model 804-110, or approved equivalent.

Communication:

1 – SHDSL network extended kit, Zhone Model SNE2000G-KIT1US.

1 – Relocated utility grade, environmentally hardened, 10-port managed switch, RUGGEDCOM Model RS900G, or approved equivalent to be consistent with switches providing integration with the town's existing ATMS system.

6 – Ethernet and Serial Cables.

1 – 12-Position Fiber Optic Patch Panel to be mounted within the proposed P-Type controller cabinet (see Special Provision 677 for ITS Cabinet Specification).

1 - 12-strand Single Mode Fiber Optic Cable installed in new conduit for interconnection and integration with the Town's existing fiber optic network (see Special Provision 677 for Fiber Optic Communications).

1 – 12 fiber optic splices connecting the 12 strands of the fiber optic cable to 12 fiber optic pigtails (see Special Provision 677 for Fiber Optic Communications).

Other:

8 – Pedestrian push-buttons, Pelco model SE-2119-PNC, Polara Bulldog III RBDL3-Y-2H, Accessible Pedestrian Signal (audible signal push button station), Campbell Company Model A57 including vibro-tactile arrow and speaker and associated equipment housed in the controller cabinet, or approved equivalent.

8 – 9" x 15" Aluminum Blank Face Station with push-button housing, Pelco Model SE-2119 or approved equal.

2 – R10-3e (Double Arrow), 9-inch by 15-inch, Countdown Pedestrian Sign, Pelco Model SF-1074-15-D or approved equal.

4 – R10-3eR (Right Arrow), 9-inch by 15-inch, Countdown Pedestrian Sign, Pelco Model SF-1074-15-R or approved equal.

2 – R10-3eL (Left Arrow), 9-inch by 15-inch, Countdown Pedestrian Sign, Pelco Model SF-1074-15-L or approved equal.

2.1.4 The Fabricator of the traffic signal posts and mast arms shall be certified to AISC Fabricator Certified Quality Program. Proof of this certification will be required to ensure that the fabricator has the personnel, organization, experience, procedures, knowledge, equipment, capability and commitment to fabricate quality traffic pole structures.

In addition, quality assurance (QA) testing will be required to be performed by an independent testing firm retained by the Fabricator. The Fabricator shall provide certification of the QA testing upon delivery of the posts and mast arms.

2.1.4.1 Ornamental Mast Arm Structure. A Traffic Signal Mast Arm System consisting of a tapered pole, tapered mast arm(s), anchor bolts, signals, hangers, push buttons, signage and all appurtenances.

Poles shall be Union Metal Corporation Decorative Nostalgia Traffic Supports with 16-flute tapered steel and shall be designed in accordance NHDOT Standard Specifications and per contract special provisions for design criteria. The Ornamental Signal Pole shall be suitable for supporting one or more signal mast arms as specified by the Engineer. No welding will be allowed at the site at the time of erection.

Each structure shall include the following major components:

a) Fluted Pole Shaft, Mast Arm and Base

The pole and arm shaft shall be fabricated from commercial quality hot rolled steel. The shaft shall have only one (1) longitudinal, automatically, electrically welded joint, and shall have no intermediate horizontal joints nor welds. Only one (1) length of steel sheet shall be used, which shall be formed into a continuously tapered shaft, having a taper of approximately 0.14" per foot.

After forming and welding, the tapered shaft shall be longitudinally cold rolled over a hardened steel mandrel under sufficient hydraulic pressure to flatten the weld and increase the physical characteristics of the shaft. The shaft shall meet the chemical and physical properties of ASTM A595 Grade A, having a minimum yield strength of 55,000 PSI. The cold rolling process shall form a 16 flute cross section for the pole upright shaft and an round cross section for the arm shaft. The sixteen fluted upright shaft shall have sixteen (16) equally spaced Doric flutes, sharp and clear-cut throughout the entire length of the shaft.

The base plates shall conform to ASTM A709 GR36. They shall be connected to the upright shaft by means of a 100% penetration weld. Included with each pole shall be (6) steel partially galvanized anchor bolts with hex nuts and washers. Nuts, washers shall be hot dipped galvanized to ASTM A-153. Anchor bolts shall meet the requirements of ASTM F1554 GR 55.

The pole shaft shall be furnished with (1) 4" x 8" reinforcing handhole frame and a 1/2" - 13UNC grounding provision. A 2nd reinforcing handhole frame 3” x 5” will be supplied opposite the mast arm.

Each pole shall be provided with an ornamental casting stack ball pole top assembly. The pole top shall be mechanically attached to the top of the shaft to provide access for wiring signals secured by a j-hook wire support; also provided. Material shall conform to the requirements of AA-319 aluminum.

Couplings for the mounting of traffic signals shall be welded into pole for the purpose supporting pole side mounted pedestrian signals as required. Decorative elbows and pipe arms shall be supplied by the pole manufacturer. No stainless steel banding shall be used. Spacing shall be as required to support the signal type selected. Similar provisions will be used for the mounting of other appurtenances such as cameras or street name signs. Orientations and locations shall be supplied by the installer. No stainless steel banding shall be used.

Mast arms shall be round tapered monocurve welded flange plate mounted with an upsweep manufactured rise and shall include a steel arm plate with four (4) connecting bolts. Plates shall conform to the requirements of ASTM-A36 Steel. A ring stiffened gusset shall be used. Bolts shall conform to the requirements of ASTM A325. Arms shall be filled drilled by the installer. Rubber grommets shall be furnished for each signal location.

All welding to be performed in accordance with the requirements of AWS D1.1 in a shop certified to the American Institute of Steel Construction (A.I.S.C.) Category Simple Bridges (SBR).

Poles, arms, and other structural steel items shall be hot dipped galvanized to the requirements of ASTM A123 and all exterior surfaces shall be powder coated Fed Color Standard A595B Semi Gloss Black 27038 in accordance with powder coat manufacturers procedures. The powder coat finish will have a warranty of not less than 5 years after applied.

b) Decorative Cast Aluminum Base

The ornamental base shall be Union Metal Columbian Family Series and shall conform to the requirements of AA-319-O.F, aluminum. It shall be 2-piece split (clam shell) design with (2) removable doors at 180 degrees. The base halves shall be split equally and fitted to provide a hairline seam when assembled. The base halves shall be factory assembled before shipment by means of internal lugs cast into the base bottom and stainless steel connecting pins at the top. The base casting shall fit securely around the pole and the base opening shall match the contour of the fluted pole. Powder coat base to match pole.

2.1.4.2 Ornamental Signal Posts – 8 Foot and 10 Foot

Poles shall be Union Metal Corporation Decorative Nostalgia Traffic Supports with 16-flute tapered steel and shall be designed in accordance NHDOT Standard Specifications and per contract special provisions for design criteria.

a. Fluted Pole

The pole shaft shall be fabricated from commercial quality hot rolled steel. The pole shall have only one (1) longitudinal, automatically, electrically welded joint, and shall have no intermediate horizontal joints nor welds. Only one (1) length of steel sheet shall be used, which shall be formed into a continuously tapered shaft, having a taper of approximately 0.14" per foot.

After forming and welding, the tapered shaft shall be longitudinally cold rolled over a hardened steel mandrel under sufficient hydraulic pressure to flatten the weld and increase the physical characteristics of the shaft. The shaft shall meet the chemical and physical properties of ASTM A595 Grade A, having a minimum yield strength of 55,000 PSI. The cold rolling process shall form a 16 flute cross section for the. The sixteen fluted upright shaft shall have sixteen (16) equally spaced Doric flutes, sharp and clear-cut throughout the entire length of the shaft.

The base plates shall conform to ASTM A709 GR36. They shall be connected to the upright pole by means of a 100% penetration weld. Included with each pole shall be (4) steel patially galvanized anchor bolts with hex nuts and washers. Nuts, washers shall be hot dipped galvanized to ASTM A-153. Anchor bolts shall meet the requirements of ASTM F1554 GR 55.

The pole shall be furnished with (1) 3" x 5" reinforcing handhole frame and a 1/2" -13UNC grounding provision.

All welding to be performed in accordance with the requirements of AWS D1.1 in a shop certified to the American Institute of Steel Construction (A.I.S.C.) Category Simple Bridges (SBR).

Poles and other structural steel items shall be hot dipped galvanized to the requirements of ASTM A123 and all exterior surfaces shall be powder coated Fed Color Standard A595B Semi Gloss Black 27038 in accordance with powder coat manufacturers procedures. The powder coat finish will have a warranty of not less than 5 years after applied.

A tenon assembly consisting of a 4-inch diameter by 4-inch long stainless-steel pipe shall be welded to the top of the steel pole shaft.

A set of four (4) ¾ inch diameter by 24-inch long, fully hot dipped galvanized anchor bolts shall be furnished with each lighting pole. The manufacturer shall note the anchor bolts yield strength on the shop drawings and structural calculations.

b. Decorative Cast Aluminum Base

The ornamental base shall be Union Metal Columbian Family Series and shall conform to the requirements of AA-319-O.F, aluminum. It shall be 2-piece split (clam shell) design with (2) removable doors at 180 degrees. The base halves shall be split equally and fitted to provide a hairline seam when assembled. The base halves shall be factory assembled before shipment by means of internal lugs cast into the base bottom and stainless steel connecting pins at the top. The base casting shall fit securely around the pole and the base opening shall match the contour of the fluted pole. Powder coat base to match pole.

2.1.5 All structural steel materials are to be manufactured in the United States of America and comply with the American Society for Testing and Materials (ASTM) specifications. Mill certifications shall be supplied by the manufacture as proof of compliance with the specifications.

2.1.6 Design calculations and drawings bearing a registered New Hampshire professional engineering stamp shall be provided certifying that these designs meet these requirements shall be provided by the manufacturer and shall demonstrate compliance with the AASHTO specifications as noted in Section 2.4 of this special provision. They shall include stress analysis on the mast arm, luminaire arm, pole, base plate, and anchor bolts. Maximum loads and stresses shall be determined for the most critical wind direction.

Add to 2.2.3 the following:

Signal heads shall be rigid mounted on mast arms, with the bottom of all signals at the same height.

Amend 2.4 to read as follows:

2.4 Traffic Signal Poles, Mast Arms and Foundations.

Soil borings and geotechnical recommendations for foundation sizes for the traffic signal mast arms shall be provided by the Contractor per Section 3.4 below. A copy of the soil borings and geotechnical recommendations report shall be provided to Engineer for review. Upon review of the traffic signal structural shop drawings, the Town of Salem will verify that the preliminary foundation sizes are appropriate for construction.

The standard traffic signal mast arm foundations (TS-1, TS-2, TS-3 and TS-4) are shown in the NHDOT Standard Plans for Road and Bridge Construction 2010 located at:

https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/detailsheets/index.htm

Cast-in-place or precast foundations for the 8-foot and 10-foot signal posts shall be 24-inch diameter and 30 inches in depth.

2.4.1 General. Traffic signal structures and foundations shall be designed and installed in accordance with the current edition of the AASHTO "Standard Specifications for Structural Supports for Highway Traffic Signs, Luminaires and Traffic Signals" including all interims, except as modified per NHDOT design criteria stated herein:

2.4.1.1 Design Loads

2.4.1.1.1 Wind Loads:

(a) The 3-second wind gust map in AASHTO Specifications shows the basic wind speed to be used in computing design wind pressure.

(b) Basic wind speed of 100 mph shall be used for the whole state of NH *except* in the Special Wind Region (i.e. regions along the NH-VT border and Franconia Notch) as shown in AASHTO Specifications, Fig. 3.8.3-5. The maximum-recorded wind speed in this area shall be used as the basic wind speed if it is greater than the NH basic wind speed of 100 mph.

2.4.1.1.2 Design Life and Recurrence Interval (Table 3.8.3-2, AASHTO Specifications):

(a) 50 years for all traffic signal mast arms with/without luminaires (all heights).

2.4.1.1.3 Fatigue Design:

Fatigue design shall conform to AASHTO Specifications (Table 11.6-1) and the following categories:

1. Cantilevered Fatigue Category II:
   a. All traffic signal supports (mast arms)
      i. Natural Wind Gust loading shall be included.
      ii. Truck Induced Gust loading, Gallop loading and vortex shedding effects may be excluded.

2.4.1.2 Structure Requirements

(a) The maximum mast arm span is 60 feet. Any exception to this shall be approved by the Design Chief, Bureau of Bridge Design and the Bureau of Traffic.

(b) The standard layout plan TS-7 shows configurations of the traffic signal supports with combinations of signals, attachments and luminaire and the corresponding foundation that should be used with that configuration. The foundation configurations shall be based on current Department standard plans for either the Type 1 or Type 2 foundation (TS-1, TS-2, TS-3 and TS-4 Standard Plans) as directed and as modified by the Engineer. Any traffic signal structure with a different configuration or dimensions greater than what is shown on the standard layout plan TS-7 shall not be accepted, unless approved by the Design Chief, Bureau of Bridge Design and the Bureau of Traffic.

(c) The structures shall be steel, galvanized in accordance with NHDOT Specification 550 Section 2.9.

(d) Anchor rod size, length, and layout shall be designed by the traffic signal structure Fabricator. A minimum of 6 anchor rods shall be provided.

(e) The connection of the structure to the foundation shall be a double-nut moment connection. Do not place grout between the top of foundation and the base plate.

(f) Anchor rods shall be straight and conform to the requirements of ASTM F1554 Grade 55 (minimum). Do not use ASTM A615 reinforcing steel. Galvanize the entire rod per ASTM A153. Each anchor rod shall be supplied with a minimum of three hex nuts (ASTM A563 or ASTM A194) and a minimum of three flat hardened washers (ASTM F436). Lock washers shall not be used. The embedded end of the anchor rod shall have either one nut tack welded or double nuts. Bent (i.e. hooked or J-shaped anchor rods) shall not be used.

(g) Ultrasonic testing (UT) – The top ten inches of anchor rods shall be ultrasonically tested (UT) by the supplier, prior to shipment and installation, using a straight-beam transducer to verify the absence of flaws. The Contractor shall provide written documentation and traceability of the anchor roads supplied to the site. The Department will reject an anchor rod if reflectors are found with an indication of less than 15 decibels.

(h) Twenty five percent of the base plate-to-post weld shall be inspected by magnetic particle testing per AASHTO Specifications. This requirement shall be noted on the shop plans.

(i) The Contractor shall furnish the design calculations and complete shop drawings for the traffic signal structure and foundation (when required) for approval in accordance with Section 105.02.

(j) Screen. Furnish, install and secure stainless steel wire mesh around the space between the base plate and concrete foundation to prevent debris from collecting beneath the base plate, to keep animals out, and protect the electrical wires if present. The screen shall be secured in a manner that will permit its removal for maintenance activities. Provide a stainless steel standard grade wire cloth (1/4" maximum opening with minimum wire diameter of AWG No. 16) with a 2-inch overlap.

(k) Mast arm spans greater than 50 feet shall have a vibration mitigation device. The mitigation device shall consist of a horizontal sign blank 60"x16"x1/8" placed within 5 feet of the mast arm tip and provide at least 6 inches of clearance from the top of the signal assembly or sign panel.

2.4.1.3 Geometry.

(a) The top of the foundation should be placed 3± inches higher than adjacent highest finished grade.

(b) The bottom of the foundation shall be placed a minimum of 5'-0" below the lowest finished grade for frost protection.

(c) Provide minimum vertical clearance from bottom of overhead signal housings of not less than 16 feet above the traveled way.

(d) The distance from the top of the concrete foundation to the bottom of the signal mast arm structure base plate shall be the nut height plus 1 inch (preferred) or nut height plus the anchor road diameter (maximum). (Note the nut height equals the rod diameter.)

(e) The foundation and structure shall be located without interference with utilities, drainage pipes or structures.

2.4.1.4 Concrete for a circular shaft foundation, Type 2, shall be Concrete Class A for cast in place or Concrete Class AAA for precast, conforming to Section 520. Concrete for foundation Type 1 shall be Concrete Class B, conforming to Section 520. Reinforcing steel shall conform to AASHTO M31/31M, Grade 60 (420), and Section 544, unless otherwise noted.

2.4.1.5 Wood poles shall be Class IV, with a minimum fiber bending stress of 8,000 psi, to a length specified conforming to Rural Electrification Administration (REA) Specification DT-5C.

2.4.1.6 Messenger cable and guy cable shall be seven-strand wire with a minimum breaking strength of 8,000 psi, galvanized in accordance with NHDOT Specification 550, Section 2.9.

Add to 3.1 the following:

3.1.3 All welding shall be in accordance with the American Welding Society (AWS) D1.1 Structural Welding Code. Tackers and welders shall be qualified in accordance with the code.

Tube longitudinal seam welds shall be free of cracks and excessive undercut, performed with automatic processes, and are to be visually inspected. Longitudinal welds suspected to contain defects shall be magnetic particle inspected. All circumferential butt-welded tube splices shall be non-destructively tested.

Amend 3.12 Painting with the following:

a) The exterior of the controller cabinet shall be painted with two coats of black semi-gloss paint (Federal Color Standard A595B Semi Gloss Black 27038).

b) Signal heads, signal head mountings, brackets and fittings, detection camera and mounting accessories, and the outside of visors and back faces of backplates shall be factory finished with two (2) coats of black semi-gloss paint (Federal Color Standard A595B Semi Gloss Black 27038). Interior of signal visors, louvers, and front faces of backplates shall be finished with two (2) coats of flat black enamel paint (Federal Color Standard A595B Flat Black 37038).

c) 8-foot and 10-foot ornamental signal posts, and ornamental mast arm structures shall be painted with a black semi-gloss paint (Federal Color Standard A595B Semi Gloss Black 27038) in accordance with the following requirements:

3.12.1 Preparation

Before powder coating is started, verify with the powder manufacturer, galvanizing standards, SSPC and specifications for proper substrate preparation.

Galvanized Surfaces:

a) Remove zinc oxide prior to powder coating.

b) Any zinc or other metal oxide that remains on the surface of the galvanized steel can potentially retain air or moisture. This may cause the powder coating to blister or create voids. Likewise, the galvanized coat may also release gas.

c) Remove surface contamination and oils and wash with solvents per SSPC-SP-1.

d) Remove surface oxidation with a light sweep blast, SSPC SP-7. This process will also promote good adhesion between steel and powder coating.

e) Degassing any entrapped air or water within the galvanized coating is achieved by the process known as pre-baking. This is done in a drying oven operated at higher temperatures than curing temperature. This temperature is typically 55°F higher than the recommended curing temperature. In no instance the temperature should exceed 535°F.

f) Chemical cleaning is not allowed. (Chemical Cleaning leaves a film in the material surface that may create the effect of bond breaker between the base material and the powder coating.)

Cleaned material shall be stored in a controlled environment and preferably shall be coated immediately after the preparation.

3.12.2 Work Conditions

a) All powder coating shall be done in a climate controlled self-contained shop.

b) Do not apply materials when surface and ambient temperatures are outside the temperature and/or relative humidity ranges required by the powder coating product manufacturer.

c) Coordinate the shop work with field installation and other appurtenances.

3.12.3 Coatings

a) Except as otherwise specified, powder coating material will be products of the following manufacture.

1. Prism - Brunswick, OH
2. Vitracoat – Elkhart, IN

b) Materials:

1. Finish Products:
   i. Super Durable TGIC Polyester

2. All powder products shall be ready mixes from the manufacturer. No mixing is done in the applicator shop.

3.12.4 Powder Application

Prior to any powder application, any area not scheduled to be coated (threads, tight fit holes, friction bolted connections, etc.) will be masked.

a) Finish Coat: Following a cool-off period, we electrostatically apply the specified finish coat to the product.

b) Finish Cure: The product has re-entered the oven with a slightly higher temperature, approximately 400°F to be cured for 10 minutes.

3.12.5 Continuous Inspection

Provide a continuous process of assurance by visually corroborating the work performed at each stage of the operation. Should any non-conformance be observed, introduce mechanical non-destructive and also invasive test methods such as:

a) Abrasive Blasting:

i. Use surface comparator such as a magnifying glass with pre-set profile templates for each SSPC-SP number.

ii. Profile tape to measure the profile depth.

b) For Applied and Cured Products:

i. Use magnetic mill gage to maintain an average dry film thickness of 6–9 mils.
ii. For "holiday test" use a 67.5 volt wet sponge.
iii. Should adhesion tests be required, perform destructive "cross-hatch test".

c) Quality Control

1. Dry Film Thickness per ASTM D3778-07
2. Holiday Porosity Test per ASTM5162-01
3. Cross Hatch Adhesion per ASTM D6677-01
4. Pencil Hardness test per ASTM D3363
5. Impact Resistance per ASTM D2794
6. Gloss Inspection per ASTMD 523-85
7. Final Visual Inspection

3.12.6 Final Inspection

a) The hauling carts are moved (with the product) under a light for inspection, touch-up and wrapping for shipping.

b) Provide dunnage and isolate potential pinch points that may damage the finished product.

3.12.7 Warranty and Field Touch-Up Material

a) Warranty:

a. Furnish a five (5) year labor and manufacturer warranty for coatings.

b. Warranty will be co-signed by the manufacturer and the applicator that under normal design conditions, the coating system shall perform without failure.

b) Extra Materials:

Supply to the field touch-up coating of each color, type and surface.

c) Volatile Organic Compounds (VOC):

Products shall contain "virtually zero VOC's" (per product data sheets).

Amend 3.14 Installation of signals and equipment to read as follows:

3.14 Installation of Signals, Equipment, Signal Structures and Foundations.

Add to 3.14 Installation of Signals, Equipment, Signal Structures and Foundations the following:

3.14.4 The applicable provisions of 550.3 apply to the signal structures and installation of structure connections made with high strength bolts (e.g. ASTM A325). The installation procedures for anchor rods are different than for high strength bolts and shall conform to the following:

1. AASHTO "Standard Specifications for Structural Supports for Highway Traffic Signs, Luminaires and Traffic Signals";

2. FHWA "Guidelines for the Installation, Inspection, Maintenance and Repair of Structural Supports for Highway Signs, Luminaires, and Traffic Signals" (Publication No. FHWA NHI 05-036 March 2005). (See Sections 6.8 and 6.9).

3. See Appendix A for anchor rod installation and pretensioning requirements.

Add to 3.15

3.15.2 Changes from automatic flashing to stop-and-go operation and from stop-and-go to automatic flashing operation shall occur as set forth in Section 4D.28 – 4D.31 of the 2009 MUTCD.

Replace 3.16 with the following:

3.16 Warranty. Within three (3) days of the installation of warrantied components of the traffic signal, the Contractor shall forward to the Owner the respective warranties to the purchaser that the equipment which has been installed hereunder shall be free from defects in materials, workmanship, and title, and shall be of the kind and quality designated or described in the Contract. The foregoing supersedes all other warranties whether written, oral or implied.

3.16.1 The manufacturer of the ornamental traffic signal posts and bases, and the mast arm assemblies and bases shall warrant that they will repair and replace product that fails due to structural defect or faulty workmanship within five (5) years of the date of shipment.

3.16.2 Paint systems shall be warranted for a period of five (5) years against peeling, cracking or excessive fading.

3.16.3 LED modules shall be warranted for a period of fifteen (15) years.

Add 3.17 Documentation.

Each programmable local hardware component installed by the contractor (i.e. loop detector amplifier, emergency vehicle preemption phase selector) shall be initially programmed by the Contractor based on information contained on the plans. **Note: Three bound sets of hard copy programming per device shall be supplied to the Town of Salem by the Contractor.**

The CONTRACTOR shall supply an 8½"x11" laminated copy of the traffic signal design plan and sequence and timing chart to be left in the cabinet documentation envelope mounted on the inside of the cabinet door.

Drawings, manufacturer's specifications, and applicable catalog cuts for all materials and components shall be submitted in accordance with Section 105.02 of NHDOT Standard Specifications within 21 days after award of the contract. An additional set of final approved documents, to total 6 sets, shall be supplied to the Engineer.

Add to 3.4:

3.4.6 Geotechnical Engineering Services

3.4.6.1 The Contractor shall employ the services of a professional geotechnical engineering firm to provide geotechnical design and construction services for the mast arm support pole foundations. The Contractor's geotechnical engineer shall be responsible for identifying and performing all geotechnical investigations, engineering analyses and constructability assessments required to design and construct the mast arm support pole foundations. Design and analysis methods, construction control, quality assurance and documentation shall be prepared in accordance with the current *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals*, the accepted standards of practice in the industry and in conformance with the NHDOT Standard Specifications, project special provisions, FHWA design manuals for the selected foundation systems, and other standards as applicable. The results of any subsurface investigations, geotechnical evaluation and engineering shall be summarized in a geotechnical engineering report. The Contractor's selection of a geotechnical engineering firm shall be a firm on the NHDOT's approved list of geotechnical engineering companies.

3.4.6.2 The Contractor shall conduct geotechnical explorations and testing as needed to design and construct the selected foundation system. Only the geotechnical explorations and testing shall conform to *AASHTO LRFD Bridge Design Specifications*. The number and location of geotechnical explorations shall follow the guidance provided in Table 10.4.2-1 of the AASHTO manual for the foundation type and size. In general, one test boring per foundation location shall be completed. The test boring report shall meet the standards of Section 10.4.2 in AASHTO. The evaluation of the subsurface conditions shall be the full responsibility of the Contractor and shall be sufficiently thorough to ensure that all geotechnical related aspects of the project are covered. The Contractor shall access subsurface exploration or field-testing locations through State-owned or Town-owned Right-of-Way unless the Contractor makes their own arrangements with private landowners for access through private property. Subsurface explorations and field testing shall be conducted with proper traffic control devices in place, as needed, according to the Manual of Uniform Traffic Control Devices (MUTCD) and Department standards, and the work shall be conducted in compliance with Dig Safe and environmental regulations.

3.4.6.3 The Contractor shall select a suitable foundation system for each pole foundation location based on an evaluation of the subsurface conditions and design in accordance with *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals*. Possible foundation configurations include driven pile foundations with various pile types, drilled shafts, and drilled micropiles. Spread footings, spread footings with ground improvements are not recommended because of right-of-way and underground utility constraints.

3.4.6.4 The Contractor shall provide to the Department geotechnical calculations, computer analysis results (e.g. software input and output), laboratory and field test results, and subsurface information in accordance with the standard of practice that demonstrates the design basis of the structure. Brom's design procedure will not be accepted for the final design.

3.4.6.5 The Contractor shall select the foundation construction method and provide construction control and documentation in accordance with the standard of practice. Where applicable, the NHDOT Standard Specifications shall be used for material, construction and testing requirements of the foundation and the NHDOT Standard Plans for a Type 1 or Type 2 foundation shall guide the size and shape of the selected foundation. If groundwater is encountered and sloughing is anticipated the contractor shall be responsible for dewatering or other means such as casings to allow the construction of drilled shaft foundations.

3.4.6.5.1 For foundation systems not covered by the NHDOT Standard Specifications and Standard Plans, the Contractor (or their professional geotechnical engineering firm) shall develop specifications for materials, construction and testing that shall be modeled on similar NHDOT special provisions and/or AASHTO specifications for the selected foundation system. The specifications shall be provided to the Town of Salem as working drawings for review and approval before their use. Construction control and performance testing shall also be supported by geotechnical instrumentation if needed. All field personnel responsible for construction control shall have experience with the foundation system that is selected, and shall report directly to the professional geotechnical engineering firm.

3.4.6.6 All geotechnical services shall be completed prior to the construction of any foundations.

Add to 4.2:

4.2 Support pole and foundation designs and geotechnical services will not be measured for payment but shall be subsidiary to the traffic signal unit item.

Add to 5.1:

5.1.1 Foundation design and geotechnical engineering services shall be subsidiary.

5.1.2 All work, including labor and equipment, for failures due to pre-existing conditions will be subsidiary.

Appendix A

Procedure for Signal Mast Arm Anchor Rod Installation

Procedure for Installing Anchor Rods in the Foundation for Double-Nut Connections

The procedure for installing anchor rods in the foundation for double-nut connections is as follows:

1. Any alterations to the following procedures for the installation, pretensioning, and inspection of anchor rods by the Contractor shall be submitted to the Department for approval.

2. (blank)

3. Anchor rods shall be installed as a group in the concrete form and secured against relative movement and misalignment, such as with a template set composed of metal rings with nuts on both sides at two locations along the length of the anchor rods. One of the rings is usually above the top of the concrete and is reused as a template.

4. The template set (or other device) with anchor rods shall be secured in its correct position in the concrete form in accordance with the drawings. The exposed threads shall be taped with duct tape to prevent contamination by concrete.

5. The concrete shall be placed and cured.

6. If a top template is above the concrete surface, it may be removed 24 hours after placing the concrete.

7. The exposed part of the anchor rods shall be cleaned with a wire brush or equivalent and lubricated. Use an approved paraffin-based stick wax, as listed on the NHDOT Qualified Products List for Item 550 fasteners, applied to the threads and the nut face in contact with the washer.

8. At least 24 hours after placing the concrete, the anchor rods shall be inspected visually to verify that there is no visible damage to the threads and that their position, elevation, and projected length from the concrete are within the tolerances specified on the drawings. In the absence of required tolerances, the position, elevation, and projected length from the concrete shall be according to the AISC *Code of Standard Practice for Steel Buildings and Bridges*. The misalignment from vertical shall be no more than 1:40. It is good practice to use a steel or wood template with the required hole pattern to check the base of the post and the anchor rods.

   To check the thread condition the nuts shall be turned onto the rods full length well past the elevation of the bottom of the leveling nut and backed off by one worker using an ordinary wrench without a cheater bar. The threads are considered damaged if more than minimal effort (i.e. an unusually large effort) is required to turn the nut.

9. Once the concrete has reached sufficient strength (7 days minimum), anchor rods are ready to be subjected to erection loads.

Procedure for Pretensioning Anchor Rods in Double-Nut Moment Connections.

The procedure for pretensioning anchor rods in double-nut moment connections in the installed concrete foundation is as follows:

1. The proper position of the anchor rods and the proper hole pattern on the post shall be verified (preferably with a template).

2. It shall be verified that the nuts can be turned onto the rods well past the elevation of the bottom of the leveling nut and backed off by one worker using an ordinary wrench without a cheater bar.

3. If the threads of anchor rods were lubricated more than 24 hours before placing the leveling nuts or have been wet since they were lubricated, the exposed threads of the anchor rod shall be relubricated. Leveling nuts shall be cleaned and the threads and bearing surfaces lubricated.

4. Leveling nuts shall be placed on the anchor rods and set level.

5. Leveling nut washers shall be placed on the anchor rods.

6. The template shall be placed on top of the leveling nuts to check the level of the nuts. Verify that the maximum clear distance between the bottom of the bottom leveling nut and the top of the concrete is not more than one anchor rod diameter. The preferred clear distance is one inch. Start by placing the leveling nuts one half inch clear distance above the concrete foundation. Bring all the nuts to the same level as the highest nut above the foundation. Do not exceed the maximum clear distance of one anchor rod diameter between the concrete foundation and the bottom of the leveling nuts. Remove the template once all the nuts are level.

7. The baseplate and structural element (e.g. post, end frame, or structure leg) shall be placed with a crane.

8. The post, end frame, or structure leg shall be plumbed or the base plate leveled, and the anchor rods pretensioned. The following is the installation sequence for double-nut joints using the "turn-of-the-nut" method of pretensioning.

9. Top nut washers shall be placed. (Note: Do not use lock washers when anchor rods are pretensioned for double-nut connections using the pretension procedures described herein.)

10. Lubrication of the fastener components is required for proper installation. Anchor rod threads, nut threads, and the bearing surface of top nuts shall be lubricated, and the top nuts placed and tightened to the snug-tight condition. See Section 3.14.7, FHWA Guideline Reference. (Note: A snug-tight condition is the tightness attained by the full effort of a person using a wrench with a handle length equal to 14 times the diameter of the bolt but not less than 18 inches. Apply the full effort as close to the free end of the wrench as possible. Pull firmly by leaning back and using the entire body weight on the end of the wrench until the nut stops rotating.)

11. Leveling (bottom) nuts shall be tightened to the snug-tight condition (see Table 3) following a star pattern for two full tightening cycles. (Note: Use a minimum of two separate passes of tightening. Sequence the tightening in each pass so that the opposite side nut will be subsequently tightened (i.e. following a star pattern shown in Figure 1) until all the nuts in that pass have been snugged.)

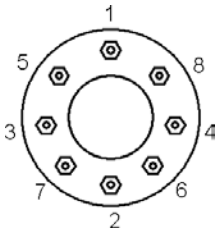


Figure 1. Star Pattern Tightening Sequence.

12. At this point, the installation crew shall verify if beveled washers are necessary. Beveled washers may be necessary under the leveling or top nut if any face of the base plate has a slope greater than 1:20 and/or any nut could not be brought into firm contact with the base plate. If any beveled washer is required, the installation crew shall disassemble the joint as necessary, add the beveled washer(s) and retighten (in a star pattern) to the snug-tight condition for the top and leveling nuts.

13. Pretensioning by "Turn-of-the-Nut": Pretension the anchor rods to the minimum Installation Pretension listed in Table 3 in the following manner. Before turning the top nuts further, the reference position of the top nut in the snug-tight condition shall be marked relative to the rod and base plate with a suitable marking using a permanent paint marker. Mark the rod, nut, and base plate with marks in a straight line when viewed from above. Top nuts shall be turned in increments following a star pattern for at least two full tightening cycles to attain the nut rotation specified in Table 1 if UNC threads are used. After pretensioning, the nut rotation shall be verified.

Table 1 - Nut Rotation for Turn-Of-Nut Pretensioning

Anchor Rod Diameter, in.	Nut Rotation from Snug-Tight Condition [a, b, c]	
	F1554 Grade 36	F1554 Grades 55 and 105 A615 and A706 Grade 60
1 1/2 or less	1/6 Turn (60°)	1/3 Turn (120°)
>1 1/2	1/12 Turn (30°)	1/6 Turn (60°)

a. Nut rotation is relative to the anchor rod. The tolerance is plus 20 degrees.
b. Applicable only to double-nut joints.
c. Beveled washer shall be used if:
   i) the nut is not in firm contact with the base plate; or
   ii) the outer face of the base plate is sloped more than 1:40.

14. The load may be released from the crane.

15. Initial check- A torque wrench shall be used to verify that a torque at least equal to the computed verification torque, Tv, is required to additionally tighten the leveling nuts and the top nuts. See 3.14.7 and Table 3. An inability to achieve this torque (meaning that the nut moves before the torque is achieved) shall be interpreted to indicate that the threads have stripped and shall be reported to the Department. (Note: The installation procedure relies on the "Turn-of-the-Nut"

method to achieve the Installation Pretension. Although torque is considered to be a poor way to ensure pretension (due to variable thread condition) it is the only way to check tension after tightening.)

16. The Department may reject, and subsequently require replacement of, the entire base installation if the threads have stripped. All costs associated with replacing the base installation, if rejected, or performing other repairs shall be borne by the Contractor.

17. Relaxation check- After at least 48 hours have elapsed, and in the presence of the Department, the torque wrench shall be used to verify that a torque at least equal to 110 percent of the verification torque, Tv, is required to additionally tighten the leveling nuts and the top nuts on the anchor rods. See 3.14.7 and Table 3. An inability to achieve this torque (meaning that the nut moves before the torque is achieved) shall be interpreted to indicate that the threads have stripped and shall be reported to the Department.

18. During maintenance activities the Department intends to verify that the top nuts are not loose. Under no circumstance shall any nut be tack welded to the washer or the base plate nor shall the leveling nut be tack welded as a method of preventing nut loosening.

FHWA Guideline Reference:

1. In the FHWA Guideline document, the snug-tight condition for anchor rods is defined as nuts tightened to a torque between 20 and 30 percent of the verification torque computed using the following equation:

   $T_v = 0.12 d_b F_I$ where

   T_v = verification torque (inch-kips)

   d_b = nominal body diameter of the anchor rod (inches)

   F_I = minimum installation pretension (kips) equal to 50 percent of the specified minimum tensile strength of F1554 Grade 36 rods, and 60 percent for all other threaded fasteners.

   (Note: the torque in "in-kips" can be multiplied by 83.3 to get ft-lb).

2. A very large torque may be required to properly tighten anchor rods greater than 1 inch in diameter. A "cheater bar" such as a pipe or extension handle as much as 10 feet long may be required for the torque wrench. For snugging the leveling nuts, an open-end wrench with a ten-foot long pipe or extension handle will typically suffice. Tightening the top nuts for anchor rods greater than 1 inch in diameter may require either of the following:

   - A hydraulic torque wrench, or
   - A box end "slug" or "knocker" wrench with a 10-ft, long pipe or extension handle.

   The box end wrench may be moved by impacts with a 16-pound sledgehammer or by the efforts of three or more workers. It is essential that the workers have good traction during this effort.

Table 2 - Tensile Properties for Anchor Rods

Tensile Property	ASTM F1554 Rod Grade 36	ASTM F1554 Rod Grade 55	ASTM F1554 Rod Grade 105	ASTM A706 Bars Grade 60 *
Minimum Yield Strength F_y, (ksi)	36	55	105	60
Minimum Tensile Strength F_u, (ksi)	58	75	125	80

* Reinforcing bars shall not be used for non-redundant, fatigue-susceptible support structures such as cantilevered overhead sign structures and high mast luminaires.

1. Note: According to AASHTO, anchor rods in single-nut connections may be either pretensioned or snug tightened, although pretensioned rods have shown better performance. Anchor rods in single-nut connections shall be tightened to at least one half of the double-nut pretension condition.

Table 3 - Minimum Anchor Rod Pretension for Double-Nut Moment Joints							
ASTM F1554 Grades 36, 55, and 105 rod material:							
Nom. Bolt diam D, (in)	Gross Area (sq in)	UNC Stress Area (sq in)		**Installation Pretension, Fi (kips)**	Snug Tight Torque check 20-30% Tv (ft-lb)	Verification Torque check Tv (ft-lb)	Relaxation Check 110% Tv (ft-lb)
Yield 36		Min. Tensile, Fu, 58 ksi	0.50 Fu (ksi)				
1.00	0.79	0.61	29	**18**	35-53	177	195
1.25	1.23	0.97	29	**28**	70-105	351	387
1.50	1.77	1.41	29	**41**	123-184	613	674
1.75	2.41	1.90	29	**55**	193-289	964	1,060
2.00	3.14	2.50	29	**73**	250-435	1,449	1,594
2.25	3.98	3.25	29	**94**	424-636	2,120	2,332
Yield 55		Min. Tensile, Fu, 75 ksi	0.60 Fu (ksi)				
1.00 *	0.79	0.61	45	**27**	55-82	274	302
1.25	1.23	0.97	45	**44**	109-164	545	600
1.50	1.77	1.41	45	**63**	190-285	951	1,047
1.75	2.41	1.90	45	**86**	299-449	1,496	1,645
2.00	3.14	2.50	45	**113**	450-675	2,249	2,474
2.25	3.98	3.25	45	**146**	658-987	3,289	3,618
Yield 105		Min. Tensile, Fu, 125 ksi	0.60 Fu (ksi)				
1.00	0.79	0.61	75	**45**	91-137	457	503
1.25	1.23	0.97	75	**73**	182-273	909	1000
1.50	1.77	1.41	75	**105**	317-476	1586	1744
1.75	2.41	1.90	75	**143**	499-748	2493	2742
2.00	3.14	2.50	75	**188**	750-1125	3749	4123
2.25	3.98	3.25	75	**244**	1096-1645	5482	6030
ASTM A615 and A706 bar material **:							
Yield 60		Min. Tensile, Fu, 80 ksi	0.60 Fu (ksi)				
1.00	0.79	0.61	48	**29**	59-88	293	322
1.25	1.23	0.97	48	**47**	116-175	582	640
1.50	1.77	1.41	48	**68**	203-304	1,015	1,116
1.75	2.41	1.90	48	**91**	319-479	1,595	1,755
2.00	3.14	2.50	48	**120**	480-720	2,399	2,639
2.25	3.98	3.25	48	**156**	702-1053	3,509	3,859

** Reinforcing bars shall not be used for non-redundant, fatigue-susceptible support structures, such as cantilevered overhead sign structures and high mast luminaires.

*Example:	Fi = (0.60) (Fu) (Stress Area)	Fi = (.6)(75 ksi)(0.61 sq in) = 27 kips
	Tv = (Fi) (D) (0.12) (83.3)	Tv = (27 k)(1.0 in)(0.12)(83.3) = 274 k-ft
	Snug = (Tv) (30%)	Snug = (274 k-ft)(.3) = 82 k-ft
	Check = (Tv) (110%)	Check = (274 k-ft)(1.1) = 302 k-ft

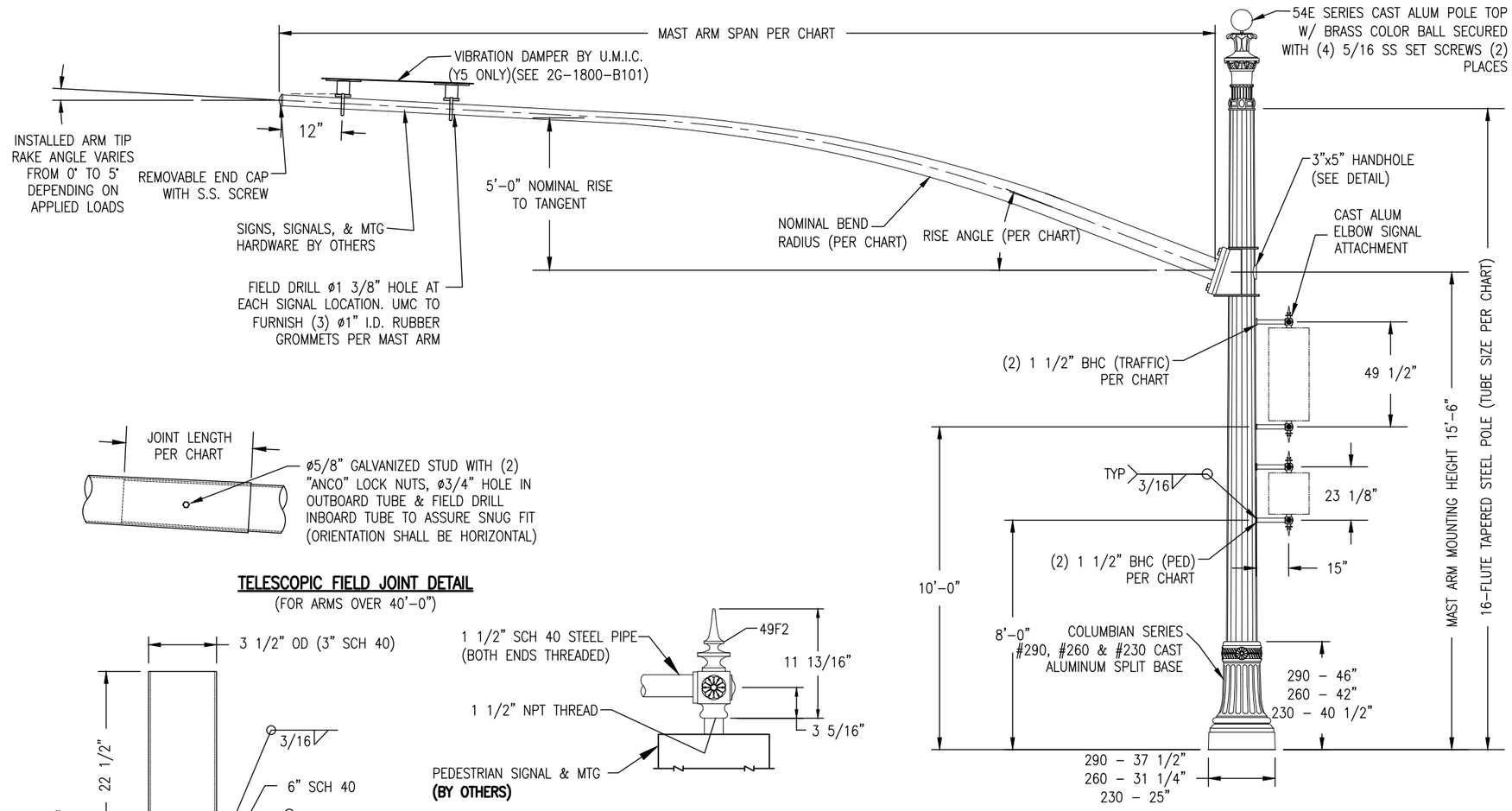
QTY	UMC DESIGN NUMBER	POLE ID	MAST ARM DATA						MAST ARM FLANGE CONNECTION DATA (in)								POLE TUBE SIZE	POLE BASE CONNECTION DATA (in)						DECO CAST BASE	PED COUPLINGS ORIENT	TRAFFIC SIGNAL ORIENT
			SPAN	TUBE SIZE	ORIENT	JOINT LENGTH	BEND RADIUS	RISE ANGLE	BOLT ø	X	Y	W	H	APL	PPL	G		B.C.	S	F	P	T	ANCHOR BOLT SIZE			
1	50600-B501-Y1	20	30'-0"	7E-9.50x5.16x31'-0"	180°	–	26'	24°	1 1/4	15	11	19	15	1 1/2	1 1/4	1/4	7F-12.00x9.20x20'-0"	16	17	8	4 1/4	1	(6) 1 x 40	230	–	–
1	50600-B501-Y2	4	45'-0"	3E-12.00x8.15x27'-6" 7E-8.79x5.99x20'-0"	180°	21	44.8'	18°	1 1/4	17	12	21	16	1 1/2	1 1/4	1/4	3F-14.00x11.20x20'-0"	19	20 1/2	9 1/2	5 1/4	1 1/4	(6) 1 1/4 x 48	260	90°	40°
2	50600-B501-Y3	11, 18	60'-0"	0E-16.00x11.03x35'-6" 7E-11.71x7.93x27'-0"	180°	24	44.8'	10°	1 1/2	21	16	26	21	2	1 3/4	5/16	3F-18.50x15.70x20'-0"	24	27	12	7 1/2	2	(6) 1 3/4 x 90	290	270°	–

0 GA = 0.313" WALL THICKNESS
3 GA = 0.250" WALL THICKNESS
7 GA = 0.179" WALL THICKNESS
E = ROUND TAPERED STEEL TUBE @ 0.14 in/ft TAPER
F = 16-FLUTE TAPERED STEEL TUBE @ 0.14 in/ft TAPER

DESIGN CRITERIA:

1. DESIGNED IN ACCORDANCE WITH 2009 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS" FOR 100 M.P.H. WIND ZONE.
   PARAMETERS INCLUDE:
   50 YEAR STRUCTURE DESIGN LIFE
   FATIGUE CATEGORY II CONSIDERATION FOR:
   NATURAL WIND GUST ONLY
2. ANCHOR BOLTS ANALYZED FOR STEEL STRENGTH ONLY. THE ANCHOR BOLT EMBEDMENT LENGTH SHOWN ON THIS DRAWING SHALL BE VERIFIED BY THE FOUNDATION ENGINEER.
3. THE EXPOSED LENGTH OF THE ANCHOR BOLT BETWEEN THE TOP OF THE FOUNDATION AND THE BOTTOM OF THE LEVELING NUT SHOULD NOT EXCEED ONE BOLT DIAMETER.
4. VIBRATION IS MORE LIKELY TO OCCUR WHEN STRUCTURES ARE INSTALLED WITHOUT ATTACHING THE SIGNALS AND OR SIGNS. THEREFORE, THE INTENDED EQUIPMENT OR DAMPENING DEVICES MUST BE INSTALLED AT THE TIME OF ERECTION. BECAUSE VIBRATION IS GENERALLY UNPREDICTABLE, A MAINTENANCE PROGRAM SHOULD INCLUDE INSPECTION FOR INDICATIONS OF EXCESSIVE VIBRATION OR FATIGUE AND EXAMINATION FOR ANY STRUCTURAL DAMAGE OR BOLT LOOSENING.
5. **CUSTOMER TO CONFIRM ALL DIMENSIONS & ORIENTATIONS BEFORE RELEASING ORDER FOR MANUFACTURING.**
6. **CONTRACTOR TO CONFRIM ALL SIDE MOUNT SIGNAL HEIGHTS AND ORIENTATIONS.**

MATERIAL SPECIFICATIONS	
TAPERED TUBE	ASTM A595 GR A
PLATE	ASTM A709 GR 36
HANDHOLE FRAME	ASTM A529 GR 50 or ASTM A572 GR 50 or ASTM A709 GR 50
HANDHOLE COVER	ASTM A36 or A1011
ANCHOR BOLTS	ASTM F1554 GR 55
ANCHOR BOLT NUTS	ASTM A563 GR A
FLAT WASHERS	ASTM F436
DECO BASE/ALUM CASTINGS	ASTM B26 (356.0F)
ARM CONNECTION BOLTS	ASTM A325
ARM CONNECTION NUTS	ASTM A563 GR DH
POLE TOP/ARM END CAP	ASTM B26 (356.0F) or A1011
PIPE	ASTM A53 GR B, or A500 GR B
COUPLING	ASTM-A513
S.S. HARDWARE	AISI-300 SERIES (18-8)
STRUCTURE FINISH	HD GALV TO ASTM A123 & POWDER COAT SEMI GLOSS BLACK (27038)
HARDWARE FINISH	HD GALV TO ASTM A153



TELESCOPIC FIELD JOINT DETAIL
(FOR ARMS OVER 40'-0")

TOP OF POLE DETAIL

PEDESTRIAN SIGNAL BRACKET DETAIL
REF DWGS NDA2735 & N49-3-B1

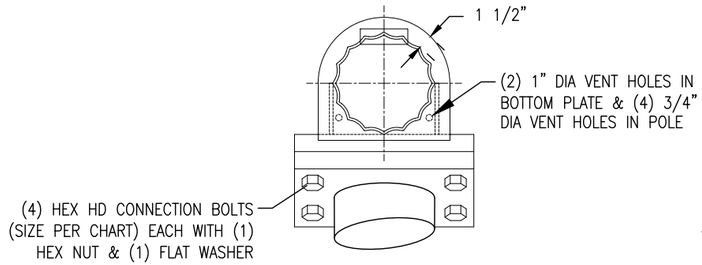
STATE: NH	**REQ# / SO# :** NNH-64801-2	**REV**	**DESCRIPTION**	**DATE**	**REV BY**	**CHK BY**
PROJECT NAME: ROUTE 28 / ROUTE 97			**REVISIONS**			

16-FLUTE TAPERED STEEL DECORITIVE TRAFFIC CONTROL STRUCTURES
SALEM, NEW HAMPSHIRE

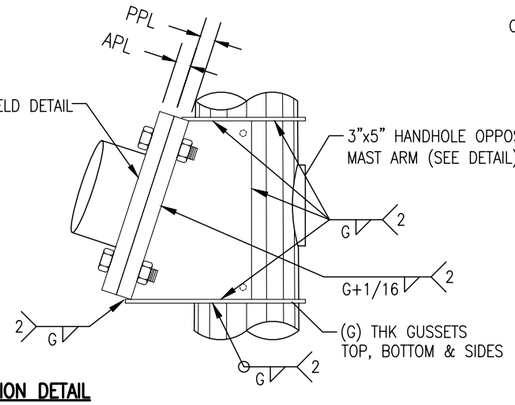
UNION METAL INDUSTRIES CORPORATION

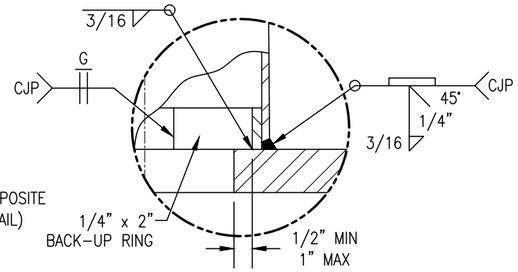
DESIGNED BY	CHECKED BY	DATE	SCALE	ENG REF
DJH	KMS	4/16/20	NTS	50600-B494

	REVISION	SHEET
50600-B501	R0	1 OF 2

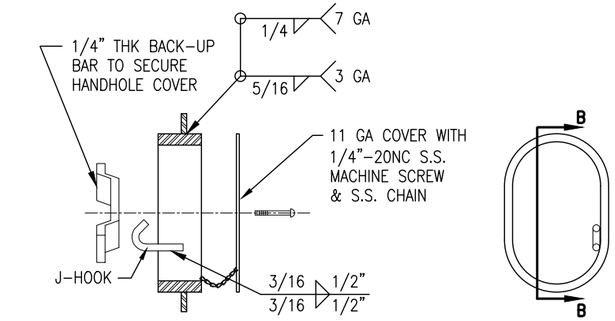


MAST ARM CONNECTION DETAIL





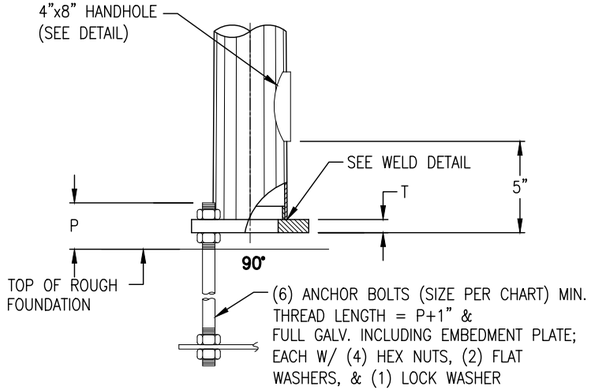
ARM FLANGE WELD DETAIL



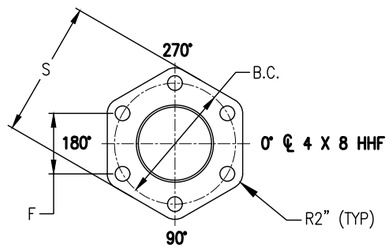
SECTION B-B

FRONT VIEW

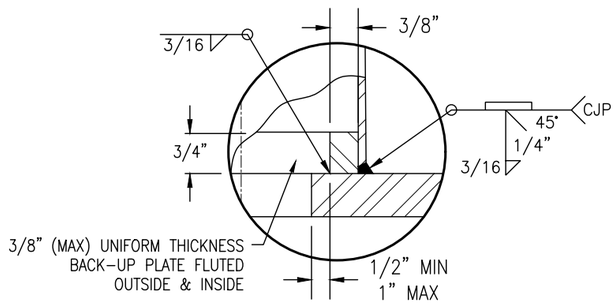
3" x 5" UPPER HANDHOLE FRAME DETAIL



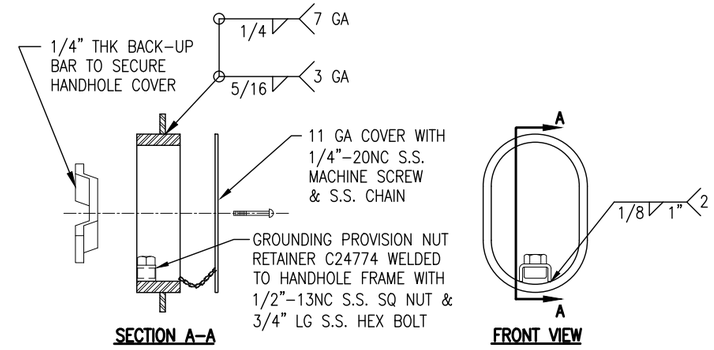
BASE CONNECTION DETAIL



BASE PLATE DETAIL



POLE BASE FLANGE WELD DETAIL



SECTION A-A

FRONT VIEW

4" x 8" LOWER HANDHOLE FRAME DETAIL

STATE: NH	**REQ# / SO# :** NNH-64801-2	**REV**	**DESCRIPTION**	**DATE**	**REV BY**	**CHK BY**	
PROJECT NAME: ROUTE 28 / ROUTE 97			**REVISIONS**				

16-FLUTE TAPERED STEEL DECORITIVE TRAFFIC CONTROL STRUCTURES
SALEM, NEW HAMPSHIRE

UNION METAL INDUSTRIES CORPORATION

DESIGNED BY	CHECKED BY	DATE	SCALE	ENG REF
DJH	KMS	4/16/20	NTS	50600-B494

50600-B501

REVISION R0

SHEET 2 OF 2

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 619 – MAINTENANCE OF TRAFFIC

Amend 619.2.1.5 **Delete** paragraph and **replace** with:

2.1.5 Portable Changeable message sign (PCM) shall be new at the start of the project. PCM shall be trailer mounted, battery powered with LED matric panels, on-board computer with keyboard and screen, leveling jacks, minimum 7' raised panel height and 360 rotation, and solar rechargeable with on-board deep cycle batteries. PCM shall be capable of up to three lines of display with eight characters per line and shall meet MUTCD requirements. Characters shall be a minimum of 18 inches high. Upon completion of the project the PCM shall become the property of the Owner, but shall first be inspected for condition and serviceability under the provisions of Paragraph 3.2.9.

Add Paragraph 619.3.1.8.2

3.1.8.2 The contractor shall be responsible for additional provisions under paragraph 3.1.8.1 as required to make the road passible and to stabilize his work. He shall further be responsible for maintaining and protecting any area on an as-needed or as-directed basis. In the event of adverse weather where instability and erosion are present shall use any additional measures to correct the concern.

Add Paragraph 619.3.2.9

3.2.9 PCM shall be maintained in working order and undamaged. Where damage has occurred and where maintenance is required the sign shall be fixed at no expense to the Owner. Where repair is not possible then the sign shall be replaced with a brand new sign at no expense to the Owner.

Amend 619.4.2 **Add** the following to the end of the paragraph:

"The unit shall mean that the Owner will take possession of a new, undamaged and fully functional PCM upon completion of the project. The Contractor shall maintain ownership and full maintenance responsibility of the PCM until the project has been completed."

Add Paragraph 619.4.4

4.4 Stabilization and erosion provisions such as stone used on trenches and other areas subject to traffic and as noted under 3.1.8.2 shall not be measured for payment but shall be considered subsidiary to Item 619.

Amend 619.5.1 **Delete** paragraph and **replace** with:

5.1 Maintenance of Traffic will be paid for at the contract lump sum price. Payment shall be made in installments equal to one ten (1/10) of the total price provided. Each tenth will be paid over the payment requisitions. If there are less than ten (10) total payment requisitions, the remaining balance shall be paid for as part of final payment.

Amend 619.5.1.3 **Delete** paragraph and **replace** with:

5.1.3 All costs associated with Calcium Chloride shall be considered to be included in the Maintenance of Traffic lump sum price.

Amend 619.5.1.4 **Delete** paragraph and **replace** with:

5.1.4 All costs associated with permanent or temporary construction signs shall be considered to be included in the Maintenance of Traffic lump sum price.

Amend 619.5.2 **Delete** paragraph and **replace** with:

5.2 All costs associated with installation and removal of temporary pavement markings shall be considered to be included in the Maintenance of Traffic lump sum price.

Add section 5.7

5.7 The unit price under this Item shall constitute full compensation for furnishing all labor, equipment and materials necessary to maintain safe and passable traffic conditions for pedestrians and vehicles at all times (day and night), as shown on the Drawings, as directed by the Engineer and as herein specified. Item shall include, but not be limited to: dust control (all methods), protection and maintenance of excavated, backfilled and graded areas; traffic signs, barricades, lights, signals, delineators, pavement markings, concrete barriers and other traffic control warning devices; and all work incidental to guiding vehicular and pedestrian traffic through the work zone in a safe and convenient manner. MUTCD standards must be followed.

SALEM DEPOT
12334

9/31/20

SPECIAL PROVISION

Item 625.6 – Remove and Relocate Private Light Pole

Description

1.1 This work shall consist of the removal and satisfactory resetting of existing private light poles as shown on the plans and as directed.

1.2 This remove and relocate private light pole item is intended for the existing light pole at the former Sunoco gas station located near the corner at approximate STA 111+25 Rt.

1.3 The removal shall include, but is not limited to, the following.

1.3.1 The removal of all light pole above ground components and appurtenances found on the property.

1.3.2 Removal of the light pole foundations to at least 3-feet below grade.

1.3.3 Placement of embankment in resulting excavations (foundation hole) level with the surrounding ground.

1.3.4 The work shall include resetting the light pole at a new on-site location designated by the Engineer as determined through discussions with the property owner.

Materials

2.1 Not Used

Construction Requirements

3.1 The Contractor shall re-use all existing materials to the greatest extent possible for relocating and resetting the private light pole. Backfill shall be incidental to the light pole removal and shall consist of Item 304.3. The Contractor shall construct a concrete foundation for the private light pole to be reset on matching the size and depth of the foundation of the existing light pole foundation. The Contractor shall supply new hardware and accessories as needed for resetting and anchoring of the existing light pole. The work shall include stubbing out electrical conduit below ground for future connection and electrification by the property owner or connecting to existing underground conduit if it is within 10 feet of the new light pole location.

Method of Measurement:

4.1.1 Remove and Relocate Private Light Pole shall be measured by each for each light pole removed and reset, complete and in place.

4.1.3 If property owners decide that light pole designated for relocation will be salvaged instead of reset on new foundation the light pole shall be placed by the Contractor on boards at an onsite location designated by the property owner and shall still be measured for payment under Item 625.6.

4.1.4 If the property owner of the light pole designated for relocation decides not to have the light pole reset or salvaged on their property the light pole will become the property of the Contractor to dispose of and shall still be measured for payment under Item 625.6.

Basis of Payment:

5.1 The accepted quantity of Remove and Relocate Private Light Pole will be paid for at the Contract unit price per Each.

Pay Items and Units:

Pay Items	Description	Unit
Item 625.6	Remove and Relocate Private Light Pole	Each

SALEM DEPOT
12334

August 14, 2020

SPECIAL PROVISION

SECTION 600 – SPECIAL PROVISION

Item 625.525 – Street Lights Including Poles, Foundations and Luminaires

Description

1.1 This work shall consist of furnishing and installing ornamental light poles, mast arms, luminaires, foundations, and all necessary fittings, cables, and components ordered.

Materials

2.1 Electrical materials shall meet the standards herein, local and utility codes, and the National Electrical Code, where applicable.

2.2 Drawings, manufacturer's specifications, and applicable catalog cuts for all materials and components shall be submitted in accordance with 105.02 within 21 days after award of the contract. An additional set of final approved documents, to total 6 sets, shall be supplied to the Engineer.

2.3 The Town of Salem has selected a manufacturer and models for the ornamental light poles, light support arms and the light fixtures. The following makes and models shall be supplied:

Light Poles:

Union Metal Corporation: 11 GA 16 flute tapered steel monotube pole 11F-9.50" x 5.12" x 31'-3" long. Include 4" x 6-1/2" handhole frame with ½" -13 GRD., Covers included. Base plates shall be 1" thick x 13" square with (4) 1" dia. x 36" x 4" ELL Anchor Bolts on a 13" B.C. Light poles shall include a cast aluminum top with brass color ball and stainless-steel set screws, and include J-hook wire support inside tenon.

Light pole tubes shall be ASTM A595 Gr. A.

Anchor bolts shall be ASTM F1554 Gr. 55 full galvanized to A153.

Anchor bolt nuts shall be ASTM A563 Gr. A galvanized to A153.

Plate bars shall be ASTM A36

Misc. hardware: (Stainless steel) AISI 300 Series (18-8)

Steel pipe: ASTM A53 GRB, A501

Steel plate: ASTM A36

Arm bolts: ASTM A325 Full galvanized To A153

Arm washers: ASTM F436 Full galvanized To A153

H.H. Frame: ASTM-A529 Gr. 50

H.H. Cover: C1010 STL.

Aluminum Bar: ASTM B221 6061

Cast Pole Top: ASTM B26 356.0 F

Split Base: ASTM B26 356.0 F

Finish: Hot Dipped Galvanized to ASTM A123 and powder coated, Black

Light Pole Bases:

#190AH Cast Aluminum Split Pedestal Base, 3'-7-3/4" high, 2'-2" Dia. at the base, with 2 access doors at 180 degrees secured with tamper-proof stainless-steel screws.

Crossarms:

Crass arms shall be curved Schedule 40 pipe with ¼" x 1-1/2" steel scroll support attached to pole and arm with ½" hex head cap screws and flat washers with square nuts welded to poles and arms.

Luminaires:

Luminaires shall be King Luminaires: K819 P4FL 100W LED Open Cage Pendant and KPL20 Elbow. Luminaires shall include twist-lock photocell eyes. Mounting heights shall be 30'-0" nominal above sidewalk surface.

Wiring:

The Contractor shall provide and install all wiring for the entire proposed lighting system. The wire shall be #6 AWG, copper, 600 volt insulated, type XHHW-2.

Foundations:

Light pole foundations shall be provided according to the NHDOT standard drawings for Concrete Light Pole Base, Type B with the bolt pattern to match the manufacturer's light poles specified herein, and integral conduit to connect to the proposed conduit system shown in the plans. Light pole foundations shall conform to the NHDOT standard specification for Concrete Light Pole bases, Type B.

Construction Requirements

3.1 The Contractor shall submit manufacturer's descriptive literature for materials specified in accordance with 105.02.

3.2 Transport, storage, and handling of products shall be in accordance with manufacturer's instructions.

3.2 Ornamental light poles shall be installed in the locations specified on the plans and in accordance with manufacturer's instructions.

Method of Measurement

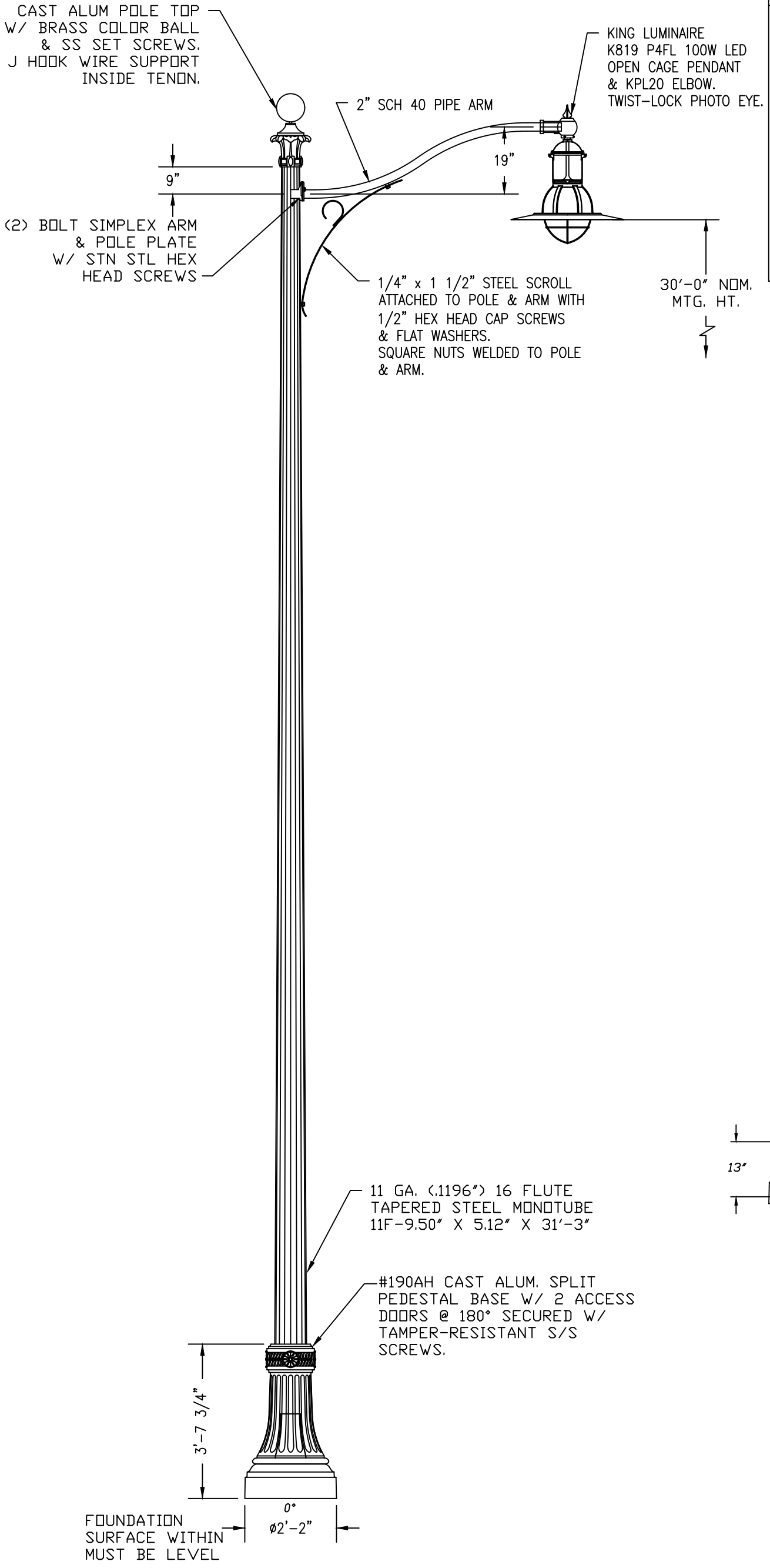
4.1 Street Lights Including Poles, Foundations and Luminaires will be measured by the number of units installed, complete with all poles, luminaires, crossarms, lamps, wiring, bases, foundations, grounds, accessories and incidentals. Conduit and pull boxes will be measured and paid separately.

Basis of Payment

5.1 The accepted quantity of Street Lights Including Poles, Foundations and Luminaires will be paid for at the contract unit price for each complete in place.

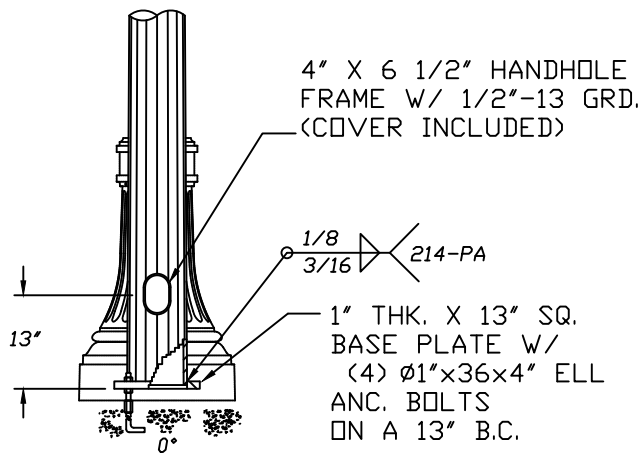
Pay Item and Unit

Item 625.525	Street Lights Including Poles, Foundations and Luminaires	Each



MATERIAL SPECIFICATIONS

TUBE: ASTM A595 GR. A.
PLATE,BAR: ASTM A36
ANCHOR BOLTS: ASTM F1554 GR55 FULL GALV TO A153
ANCHOR BOLT NUTS: ASTM A563 GR.A GALV. TO A153
MISC. HDWE: (STN. STL) AISI 300 SERIES (18-8)
STEEL PIPE: ASTM A53 GRB, A501
STEEL PLATE ASTM A36
ARM BOLTS: ASTM A325 FULL GALV TO A153
ARM WASHER: ASTM F436 FULL GALV TO A153
H.H. FRAME: ASTM-A529 GR. 50
H.H. COVER: C1010 STL.
ALUM BAR: ASTM B221 6061
CAST POLE TOP: ASTM B26 356.0F
SPLIT BASE: ASTM B26 356.0F
FINISH: HD GALV TO ASTM A123 & POWDER COATED, COLOR PER SALES ORDER



HANDHOLE ELEVATION & BASE PLATE DETAIL

STATE: NEW HAMPSHIRE	REQ# / SO# : NNH-64844-1	REV	DESCRIPTION	DATE	REV BY	CHK BY
PROJECT NAME: SALEM			REVISIONS			

ORNAMENTAL ROADWAY LIGHTING STANDARD
PRELIMINARY DESIGN

Union Metal Corporation

DESIGNED BY	CHECKED BY	DATE	SCALE	ENG REF
MRB		2/7/20	FS	N5922-190-B43

N5922-190-B71

REVISION R0.1

SHEET 1 OF 1

S P E C I A L P R O V I S I O N

SECTION 1009 -- CONTAMINATED SOILS AND GROUNDWATER

Item 1009.21 - Treatment and Disposal of Contaminated Groundwater (Frac Tank)

Item 1009.22 - Offsite Disposal of Contaminated Groundwater

This special provision is intended to provide and pay for certain measures that may be required during construction.

Description

1.1 This work shall include treatment and/or disposal of contaminated groundwater resulting from previous petroleum product(s) spillage, from tank leakage or other contaminants encountered on this project.

1.2 When working in areas suspected to contain contaminated groundwater, the Department's (and/or Town's) Environmental Consultant will be on-site to monitor the excavation/dewatering activities. On the basis of field screening results and a visual assessment of the groundwater, the Department's/Town's Environmental Consultant will identify, in their opinion, groundwater which may be discharged directly, groundwater which is suspect and requires confirmatory testing before discharge, and groundwater which will require treatment before discharge or offsite disposal. The Environmental Consultant(s) will be responsible for identifying disposal or treatment requirements for contaminated groundwater and assessing the nature and extent of contamination at the Department's and Town's discretion and as it may pertain to the Department's and Town's interests.

1.3 It has been determined that groundwater discharge permits from NHDES will not be required.

Materials, Codes, Permits and Fees

2.1 Unless specified or indicated, monitoring, treatment and/or disposal of contaminated groundwater, materials, workmanship, and equipment performance shall conform with, but not be limited to, the listed edition of the following standards, codes, specifications, requirements, and regulations:

2.1.1 New Hampshire Code of Administrative Rules Env-Or 600 – Contaminated Site Management.

2.1.2 New Hampshire Code of Administrative Rules - Hazardous Waste Rules Env-Hw 100-1100 (formerly Env-Wm 100-1100).

2.1.3 RSA 146-A, RSA 146-C, and RSA 146-D.

2.1.4 RSA 147-A and RSA 147-B (Administered by the NHDES Waste Management Division).

2.1.5 RSA 125-C (Administered by the NHDES Air Resources Division).

2.1.6 US Laws 29 Code of Federal Regulations (CFR) 1910 OSHA (Hazardous Materials Training).

Construction Requirements

3.1 An Environmental Consultant will be provided by the Department and/or Town to monitor excavation in areas where contamination is suspected. On behalf of the Department and/or Town, the Environmental Consultant will assess the extent of impacted groundwater encountered during the work based on observations during construction and results of field screening.

3.2 The Contractor shall pay all fees and taxes, submit all necessary documents, obtain all permits and certificates and all necessary approvals from the appropriate authorities and provide copies of all permits, approvals, and certificates to the Engineer.

3.3 Treatment and/or Disposal of Contaminated Groundwater.

3.3.1 The Contractor shall temporarily store groundwater pumped from areas of known or suspected contamination in accordance with the Project Operations Plan (pay item 697.31) and discussed in the Soil and Groundwater Management Plan (SGMP) or as directed by the Engineer. The storage of contaminated groundwater may include frac tank(s). The Contractor shall obtain samples of suspected contaminated groundwater for analysis for volatile organic compounds (VOCs). The Contractor shall manage the contaminated groundwater in accordance with the Project Operations Plan. The Contractor shall treat the contaminated groundwater to applicable standards and discharge the treated groundwater to the municipal sewer system within Project Limits, or dispose of groundwater found to be contaminated beyond the range that is acceptable for discharge to the sewage treatment plant to a facility permitted to accept the liquid.

3.3.2 The Contractor shall dispose of non-contaminated groundwater in accordance to the Project Operations Plan and approved by the Engineer.

3.3.3 The Contractor may elect to provide onsite treatment of contaminated groundwater. Typically, treatment may involve carbon, adsorption, and aeration with filtration as required prior to discharge. Additional information is provided in the Soil and Groundwater Management Plan. The Contractor shall be responsible for obtaining all necessary permits and approvals for discharging the contaminated groundwater. Potential options to manage the contaminated water may include: discharge to municipal sanitary sewer; discharge to the ground or groundwater under a NHDES Temporary Groundwater Discharge Permit; disposal as contaminated water at an appropriate treatment and/or disposal facility in accordance with all applicable federal, state, and local rules and regulations. The Contractor shall provide copies of any permits to the Department prior to initiating dewatering activities. The Contractor, as permittee, shall be responsible for compliance with the Terms and Conditions of such permits.

3.3.3.1 Treatment by such methods as filtration, carbon adsorption, or air stripping towers, or other appropriate methods shall be performed as quickly as possible to reduce public exposure. In the event free phase petroleum is recovered, it shall be disposed of off-site at a facility permitted to accept such waste.

3.3.4 When the groundwater pumped reaches volumes where it would be more cost effective or time efficient to treat on site than to ship offsite, the Engineer may order the Contractor to provide onsite treatment of contaminated groundwater.

3.4 If it is determined that the contaminated groundwater should be disposed of off-site, the Contractor shall obtain no less than two quotes for disposal from certified disposal facilities in accordance to the Project Operations Plan for the Engineer's consideration. After receiving the Engineer's approval, the Contractor shall obtain all permits and materials necessary to transport and dispose of the contaminated groundwater in an acceptable manner. The Engineer reserves the right to select an alternative disposal location from those proposed by the Contractor.

Method of Measurement

4.1 Treatment and Disposal of Contaminated Groundwater (Frac Tank) will be measured by the number of weeks (or fractions of a week) per frac tank that is in active service receiving, storing or treating groundwater on site as approved by the Engineer. Weeks when the frac tank is on site for the contractor's convenience but not in active service will not be included for payment.

4.2 Offsite Disposal of Contaminated Groundwater will be measured by the thousand gallons of contaminated water that is collected, transported and disposed of at an approved disposal facility.

4.2.1 Dewatering will be subsidiary to the pertinent contract items.

4.3 Water testing for contamination will be performed by the Department and/or the Town.

Basis of Payment

5.1 Payment for Treatment and Disposal of Contaminated Groundwater (Frac Tank) will be made on the basis of every week (or fraction of week) that a frac tank is in approved active use on site. Payment shall include frac tank rental, mobilization and demobilization, setup, containment berms, frac tank rinsing and cleaning, granular activated carbon including filter bags and disposal, flow metering, generator, piping and hoses, drums and all miscellaneous materials and labor necessary to complete the work.

5.1.2 Repair work to damaged or injured portions of the existing facilities made necessary due to the negligence or carelessness of the Contractor will not be paid for.

5.2 Payment for Offsite Disposal of Contaminated Water will be made on the basis of every thousand-gallons disposed of at the approved receiving facility.

5.3 The Project Operations Plan is a paid item under Item 697.31.

Pay items and units:

1009.21	Treatment and Disposal of Contaminated Groundwater (Frac Tank)	Weeks
1009.22	Offsite Disposal of Contaminated Groundwater	Thousand Gallon (MGAL)

S P E C I A L P R O V I S I O N

SECTION 1009 -- CONTAMINATED SOILS AND GROUNDWATER

Item 1009.25 – Transport and Disposal of Contaminated Soils

This section is intended to provide and pay for certain measures that will be required during construction.

Description

1.1 This is to pay for the excavation, transport to an approved and licensed disposal site and for the disposal "tipping" fees for the proper disposal of contaminated soils encountered in the work.

Contractor shall refer to the Soil and Groundwater Management Plan (SGMP) for information on the soil constituents and management guidelines.

For reference, the SGMP provides an approximation of where contaminated soils requiring offsite disposal may occur. The tonnages in the bid form are approximate and may increase or decrease depending on actual observations, testing and classification, or onsite reuse of the excavated materials. The following soil types are expected to be encountered in the excavations:

Type B	(Urban fill contaminated soils)
Type C	(Petroleum Contaminated Soils)
Type D	(RCRA Hazardous Waste Soils)

This section assumes that the Type D soils will receive a contained-out determination from NHDES, however that determination is pending.

Construction Requirements

3.1 The Contractor shall perform the work necessary to excavate, transport and dispose of the contaminated soils. Contaminated soil that is suitable backfill material shall be placed back in trench excavations from which it came.

3.2 Work ordered under this section shall be performed in accordance with the applicable provisions of the Standard Specifications; Special Provisions; and State, Regulations for the class of work involved and the pertinent provisions of 107.17.

3.3 The Contractor shall obtain no less than two quotes for disposal from licensed disposal facilities for the Engineer's consideration. After receiving the Engineer's approval, the Contractor shall obtain all permits and materials necessary to dispose of the material in an acceptable manner. The Engineer reserves the right, for just cause, to select an alternative disposal location from those proposed by the Contractor.

Method of Measurement

4.1 Work authorized under this section will be measured by the ton disposed of at the disposal facility as documented by weight slips and receipts from the disposal facility.

Basis of Payment

5.1 Payment for work authorized under this section will be made at the contract bid prices per ton for each type of contaminated soil excavated, transported and disposed of offsite.

Pay item and units:

1009.251	Transport and Disposal of Type B Contaminated Soils	Ton
1009.252	Transport and Disposal of Type C Contaminated Soils	Ton
1009.253	Transport and Disposal of Type D Contaminated Soils	Ton

REVISIONS AFTER PROPOSAL

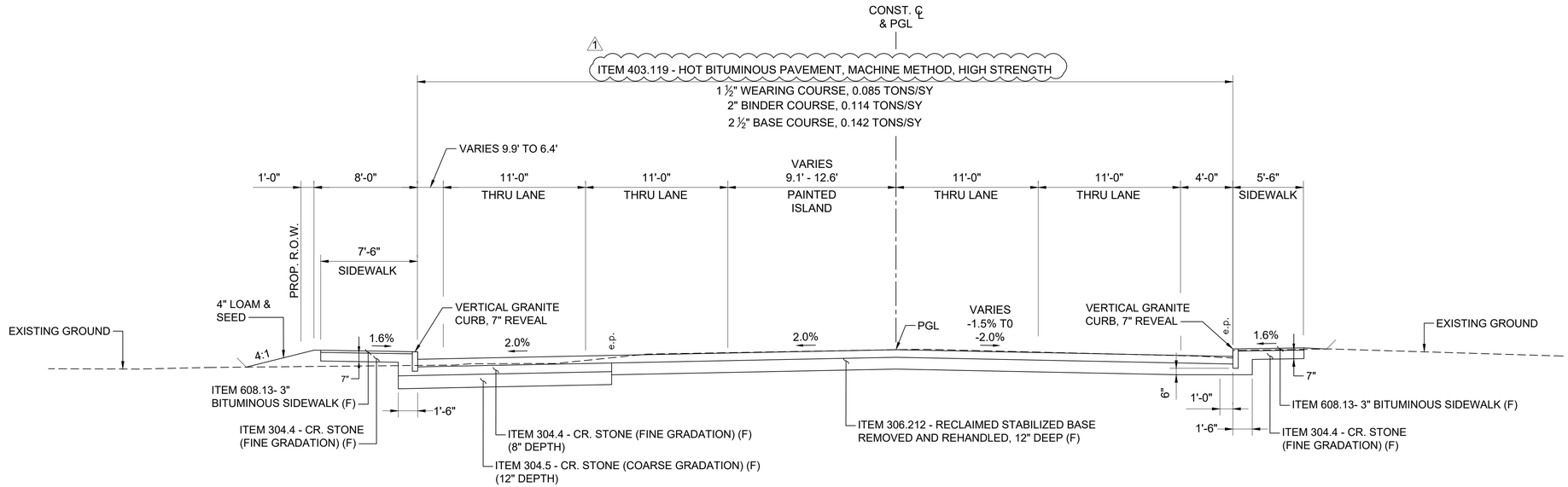
NUMBER	DESCRIPTION	STATION	DATE
ADDENDUM 1	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

SDR PROCCESSED DATE

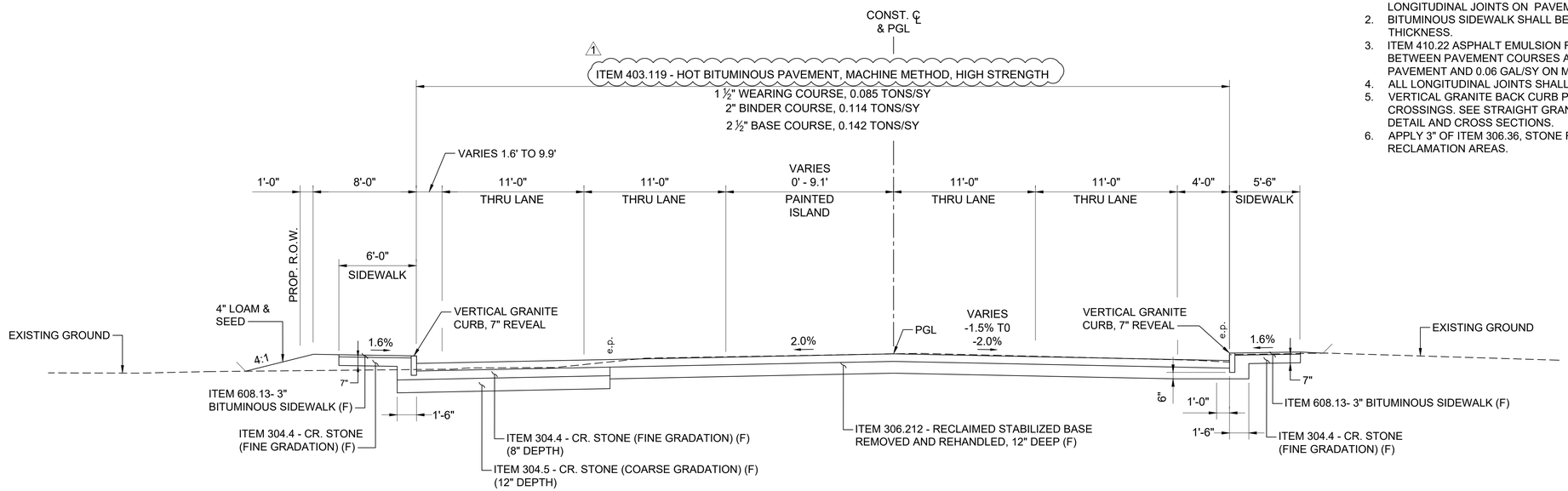
NEW DESIGN DATE

SHEET CHECKED DATE

AS BUILT DETAILS DATE



ROUTE 28
STA. 103+64 TO STA. 104+51 +/-
N.T.S.



ROUTE 28
STA. 101+00 TO STA. 103+64 +/-
N.T.S.

NOTES:

1. ITEM 403.6 - PAVEMENT JOINT ADHESIVE SHALL BE APPLIED TO ALL LONGITUDINAL JOINTS ON PAVEMENT COURSES. (SUBSIDIARY)
2. BITUMINOUS SIDEWALK SHALL BE PLACED IN TWO LAYERS OF EQUAL THICKNESS.
3. ITEM 410.22 ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED BETWEEN PAVEMENT COURSES AT THE RATES OF 0.04 GAL/SY ON SMOOTH PAVEMENT AND 0.06 GAL/SY ON MILLED SURFACES (SUBSIDIARY).
4. ALL LONGITUDINAL JOINTS SHALL BE OVERLAPPED BETWEEN COURSES.
5. VERTICAL GRANITE BACK CURB PRESENT AT RAISED ISLAND DRIVE CROSSINGS. SEE STRAIGHT GRANITE CURB SET IN EXISTING PAVEMENT DETAIL AND CROSS SECTIONS.
6. APPLY 3" OF ITEM 306.36, STONE FOR RECLAIMED STABILIZED BASE TO ALL RECLAMATION AREAS.

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

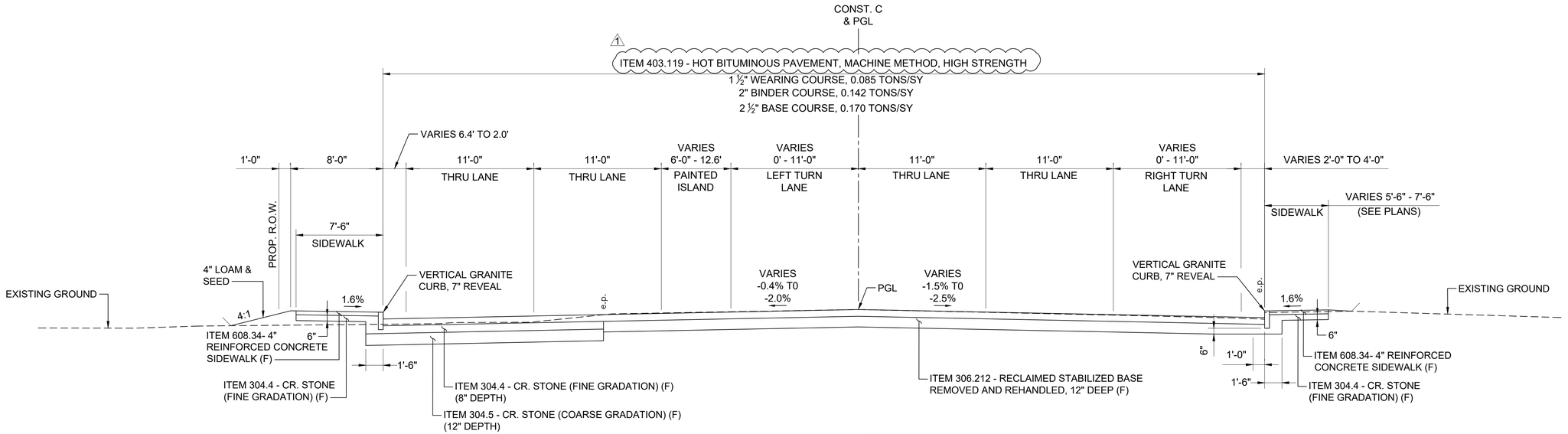
TYPICAL SECTIONS

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	TYP	12334	5	78

NUMBER	DESCRIPTION	STATION	DATE
1	ADDENDUM 1		9/30/2020

REVISIONS AFTER PROPOSAL

STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS



ROUTE 28
STA. 107+00 TO STA. 109+50 +/-
N.T.S.

NOTES:

1. ITEM 403.6 - PAVEMENT JOINT ADHESIVE SHALL BE APPLIED TO ALL LONGITUDINAL JOINTS ON PAVEMENT COURSES. (SUBSIDIARY)
2. BITUMINOUS SIDEWALK SHALL BE PLACED IN TWO LAYERS OF EQUAL THICKNESS.
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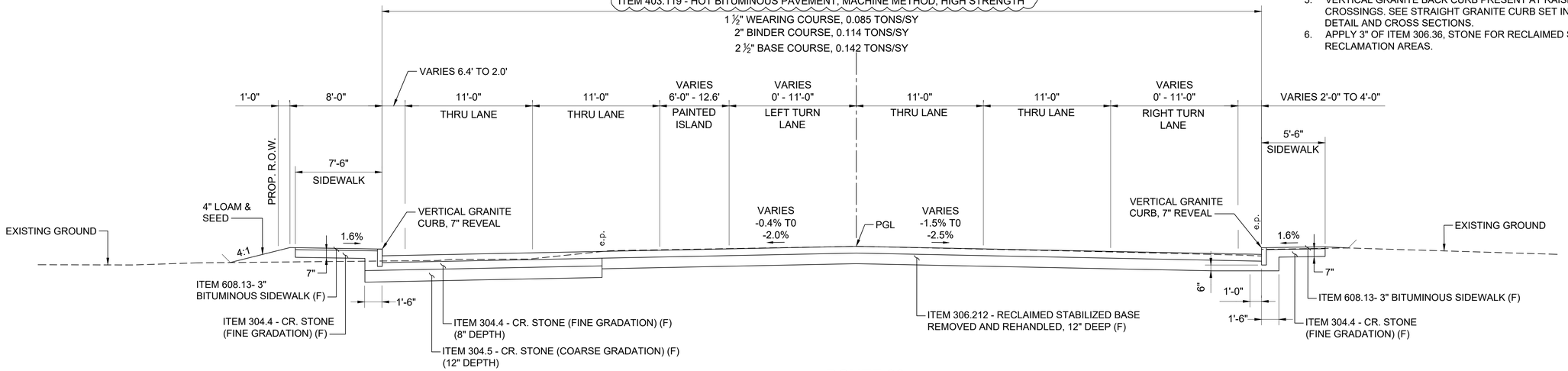


ROUTE 28
STA. 104+51 TO STA. 107+00 +/-
N.T.S.

	DATE
SDR PROCCESSED	
NEW DESIGN	
SHEET CHECKED	
AS BUILT DETAILS	

TOWN OF SALEM, NEW HAMPSHIRE

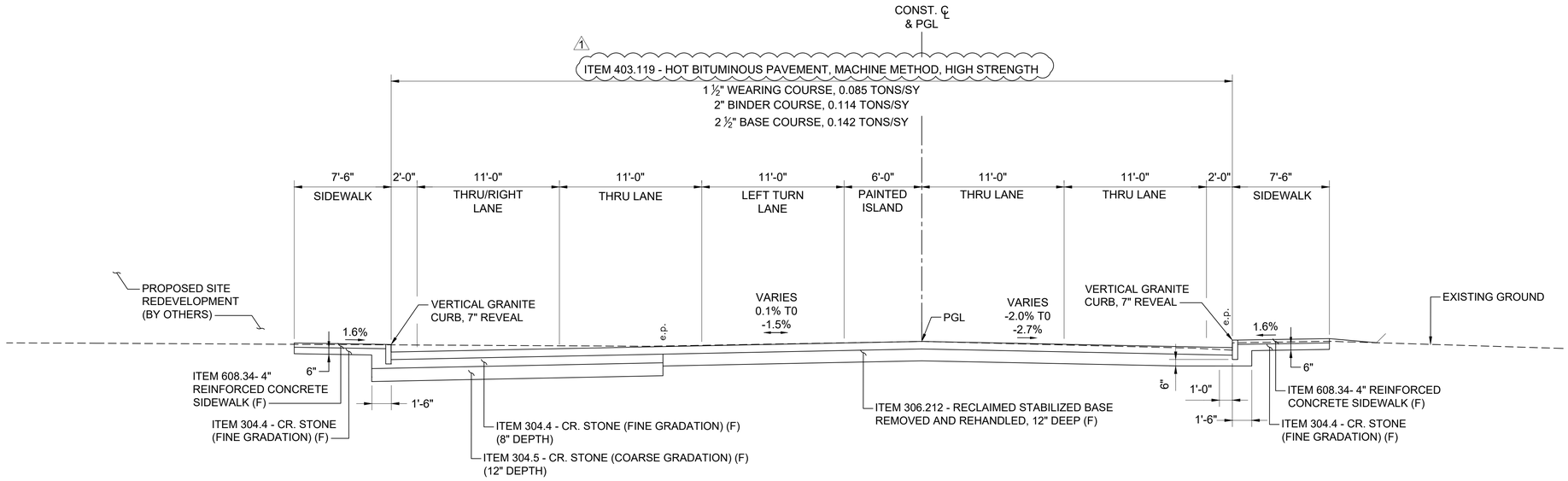
SALEM DEPOT - INTERSECTION IMPROVEMENTS

TYPICAL SECTIONS

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	TYP	12334	6	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS			9/30/2020



N.T.S.

ROUTE 28
STA. 111+80 TO STA. 114+51+/-

NOTES:

1. ITEM 403.6 - PAVEMENT JOINT ADHESIVE SHALL BE APPLIED TO ALL LONGITUDINAL JOINTS ON PAVEMENT COURSES. (SUBSIDIARY)
2. BITUMINOUS SIDEWALK SHALL BE PLACED IN TWO LAYERS OF EQUAL THICKNESS.
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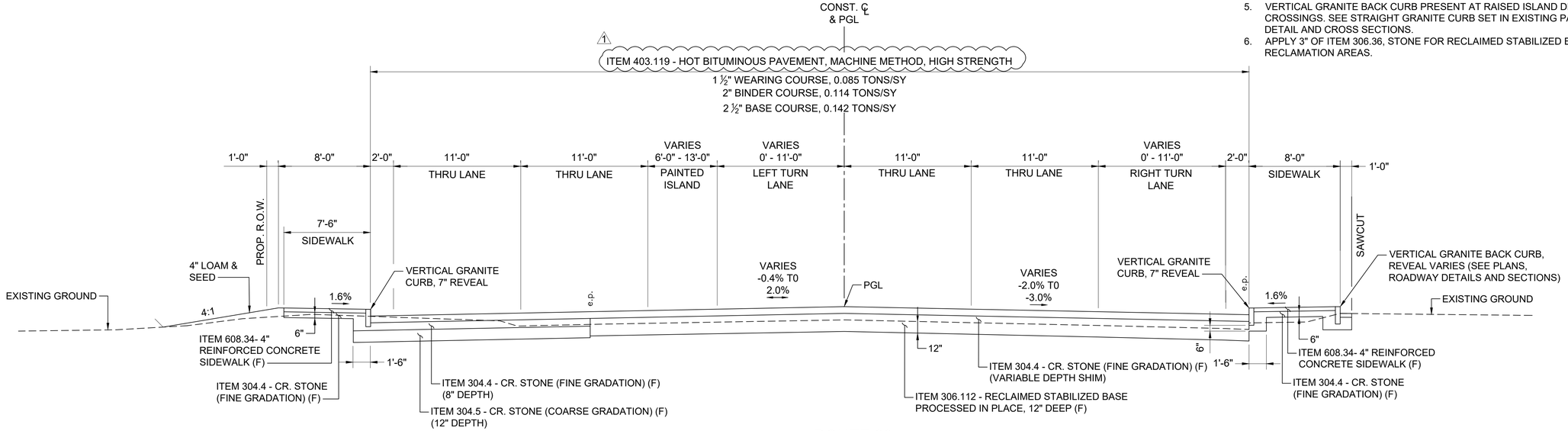


ROUTE 28
STA. 109+50 TO STA. 111+80 +/-

(SEE PLANS AND CROSS SECTIONS FOR SIDEWALK LOCATIONS AT INTERSECTION)
N.T.S.

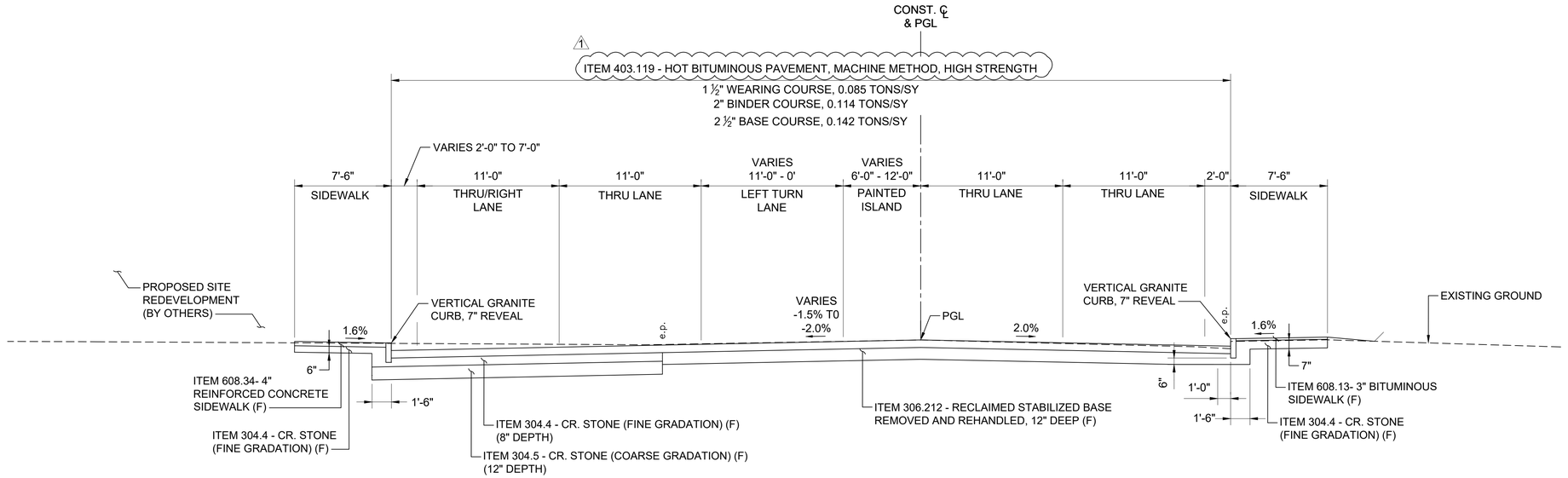
	DATE
SDR PROCCESSED	
NEW DESIGN	
SHEET CHECKED	
AS BUILT DETAILS	

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

TYPICAL SECTIONS

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	TYP	12334	7	78



ROUTE 28
STA. 115+49 TO STA. 117+46 +/-
N.T.S.

NOTES:

1. ITEM 403.6 - PAVEMENT JOINT ADHESIVE SHALL BE APPLIED TO ALL LONGITUDINAL JOINTS ON PAVEMENT COURSES. (SUBSIDIARY)
2. BITUMINOUS SIDEWALK SHALL BE PLACED IN TWO LAYERS OF EQUAL THICKNESS.
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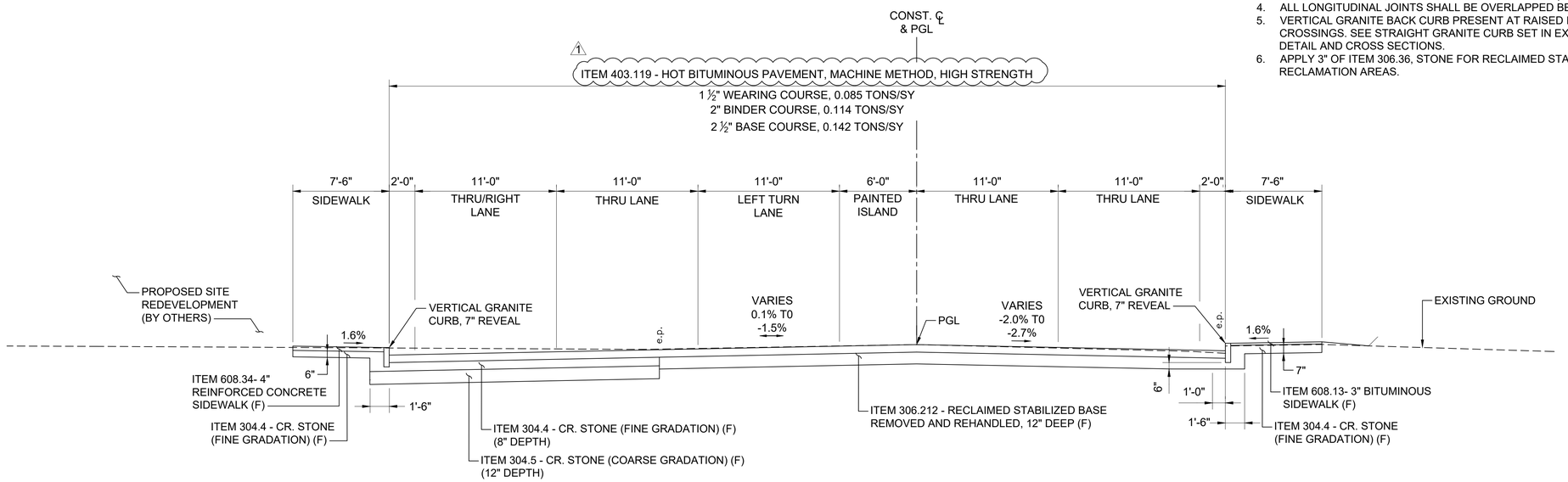
6. APPLY 3" OF ITEM 306.36, STONE FOR RECLAIMED STABILIZED BASE TO ALL RECLAMATION AREAS.



ROUTE 28
STA. 114+51 TO STA. 115+49+/-
N.T.S.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

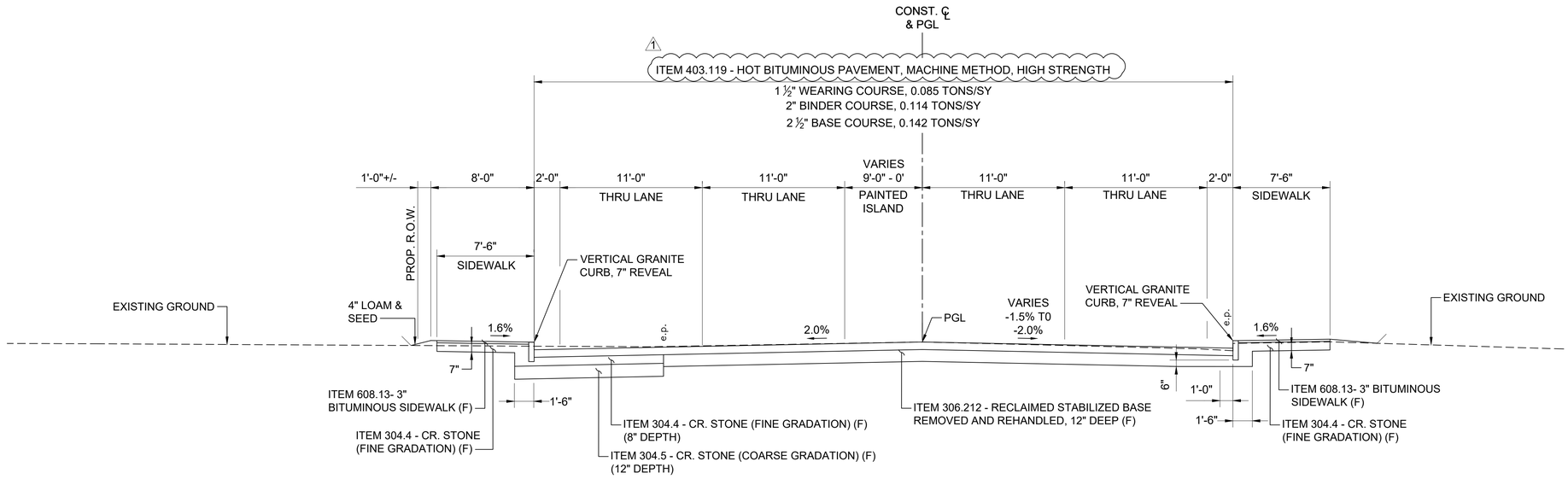
SDR PROCCESSED DATE
NEW DESIGN DATE
SHEET CHECKED DATE
AS BUILT DETAILS DATE

TOWN OF SALEM, NEW HAMPSHIRE

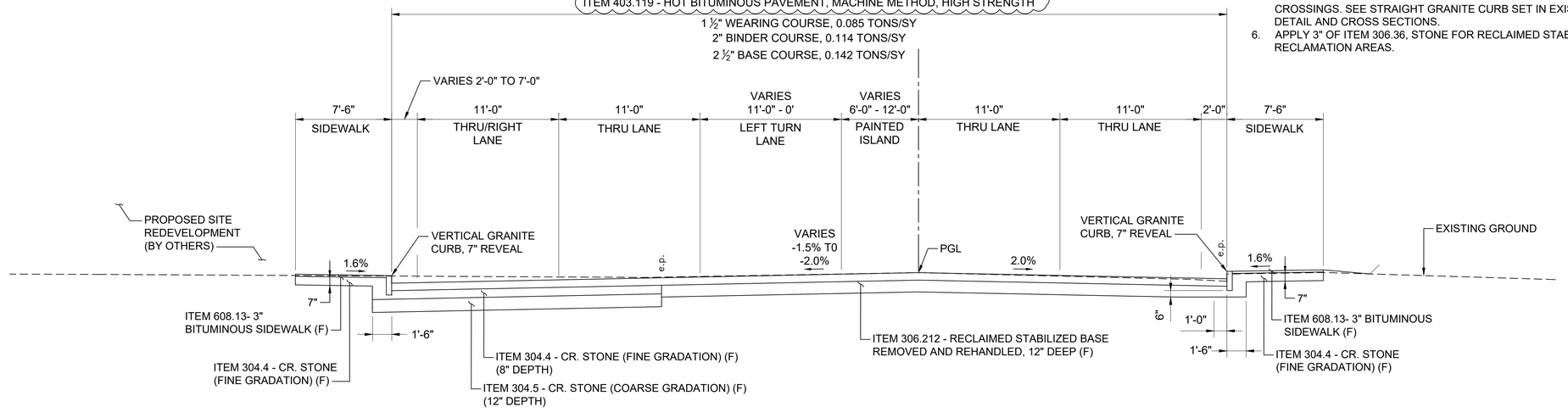
SALEM DEPOT - INTERSECTION IMPROVEMENTS

TYPICAL SECTIONS

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	TYP	12334	8	78



ROUTE 28
STA. 118+08 TO STA. 120+90 +/-
N.T.S.



ROUTE 28
STA. 117+46 TO STA. 118+08 +/-
N.T.S.

NOTES:

1. ITEM 403.6 - PAVEMENT JOINT ADHESIVE SHALL BE APPLIED TO ALL LONGITUDINAL JOINTS ON PAVEMENT COURSES. (SUBSIDIARY)
2. BITUMINOUS SIDEWALK SHALL BE PLACED IN TWO LAYERS OF EQUAL THICKNESS.
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6. APPLY 3" OF ITEM 306.36, STONE FOR RECLAIMED STABILIZED BASE TO ALL RECLAMATION AREAS.

NUMBER	DESCRIPTION	STATION	DATE
1	ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS	9/30/2020

REVISIONS AFTER PROPOSAL

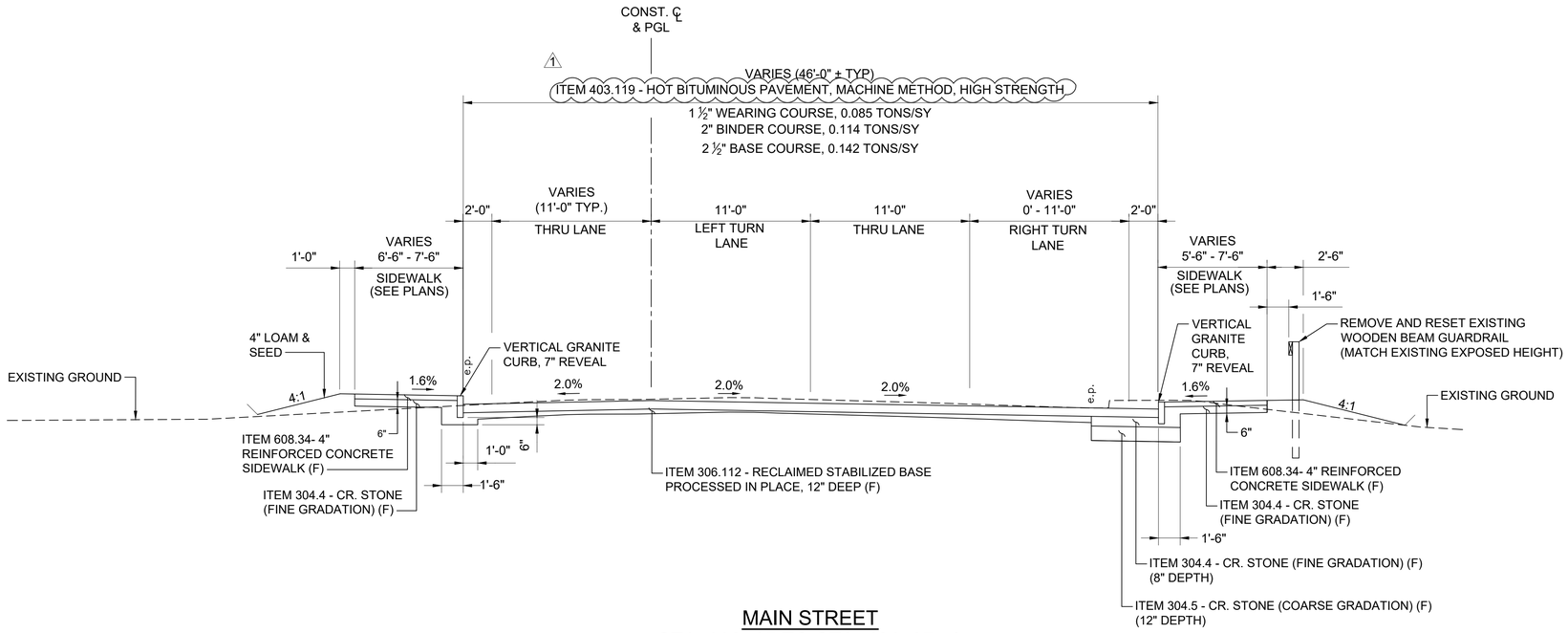
SDR PROCCESSED	DATE
NEW DESIGN	DATE
SHEET CHECKED	DATE
AS BUILT DETAILS	DATE

TOWN OF SALEM, NEW HAMPSHIRE

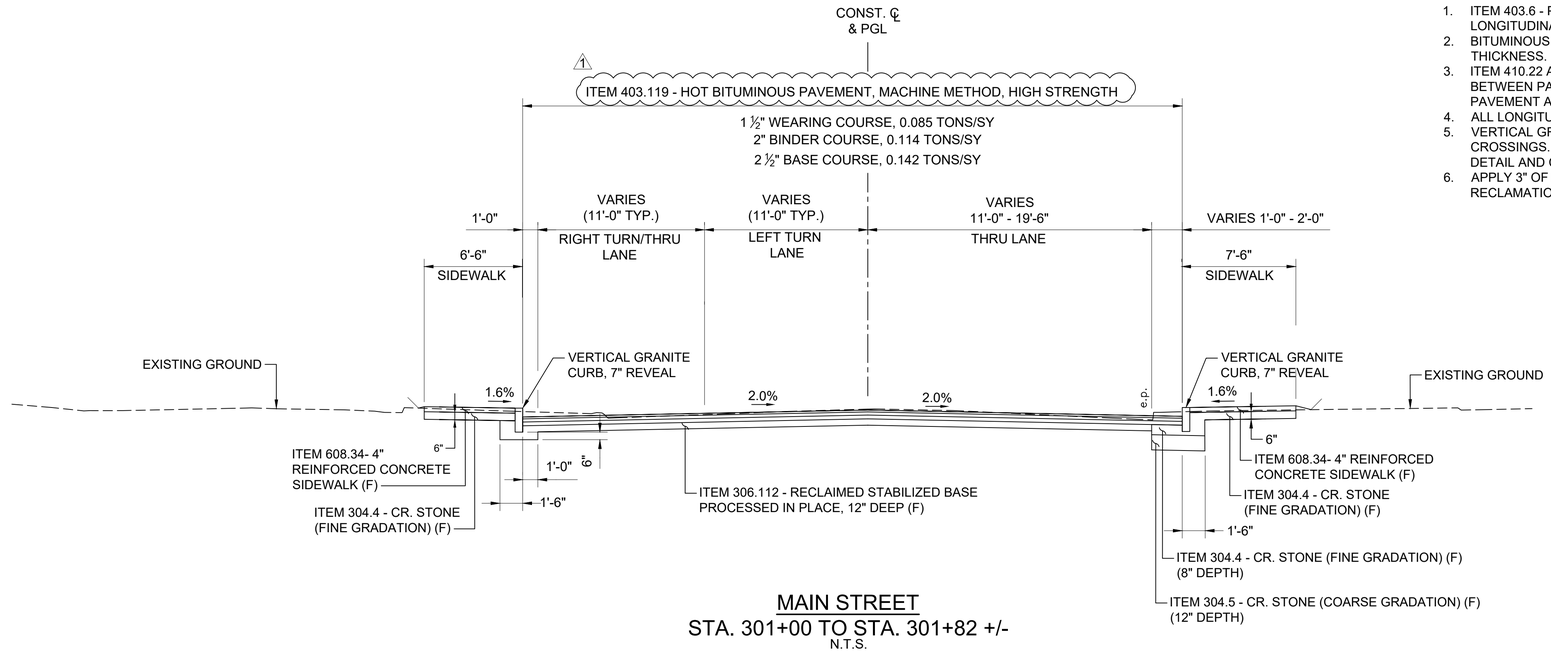
SALEM DEPOT - INTERSECTION IMPROVEMENTS

TYPICAL SECTIONS

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	TYP	12334	9	78



MAIN STREET
STA. 399+65 TO STA. 401+87 +/-
N.T.S.



MAIN STREET
STA. 301+00 TO STA. 301+82 +/-
N.T.S.

NOTES:

1. ITEM 403.6 - PAVEMENT JOINT ADHESIVE SHALL BE APPLIED TO ALL LONGITUDINAL JOINTS ON PAVEMENT COURSES. (SUBSIDIARY)
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NUMBER	DATE	STATION	DESCRIPTION
1 ADDENDUM	9/30/2020		STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS

REVISIONS AFTER PROPOSAL

SDR PROCCESSED DATE
NEW DESIGN DATE
SHEET CHECKED DATE
AS BUILT DETAILS DATE

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

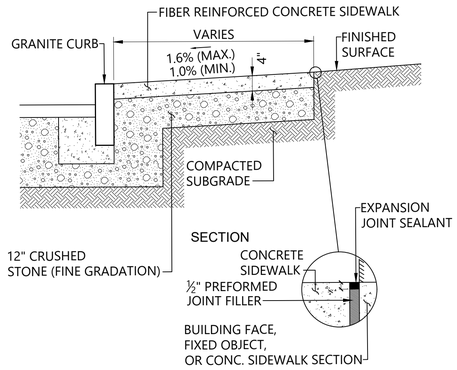
TYPICAL SECTIONS

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	TYP	12334	10	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE
ADDENDUM 1	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

	DATE
SDR PROCCESSED	
NEW DESIGN	
SHEET CHECKED	
AS BUILT DETAILS	

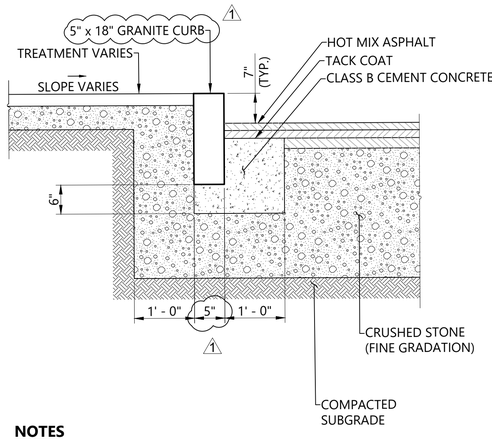


NOTES

1. PROVIDE EXPANSION JOINTS AT MIN. 25 FT. O.C. WITH PRE-FORMED JOINT FILLER.
2. PROVIDE TOOLED CONTROL JOINTS AT 5' O.C.
3. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.
4. INSTALL 2-FOOT LONG #5 SMOOTH STEEL REBARS, GREASED, SPACED 2' APART AT ALL CONCRETE SIDEWALK CONSTRUCTION JOINTS (SUBSIDIARY TO SIDEWALK ITEM). SET BARS MID DEPTH IN CONCRETE (SEE DETAIL A).

Item 608.34 Reinforced Concrete Sidewalk

N.T.S.

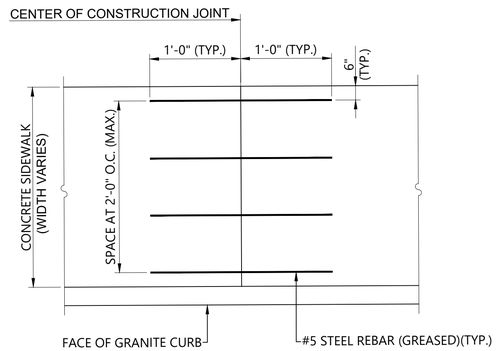


NOTES

1. APPLY TACK COAT TO CONCRETE BEDDING PRIOR TO PAVING OVER IT.
2. DETAIL ALSO APPLIES TO CURVED GRANITE CURB.
3. SUPPORT ENDS OF GRANITE CURB WITH BRICKS TO FACILITATE CONCRETE PLACEMENT. DO NOT PLACE EARTH UNDER GRANITE CURB.

Item 609.011 Straight Granite Curb

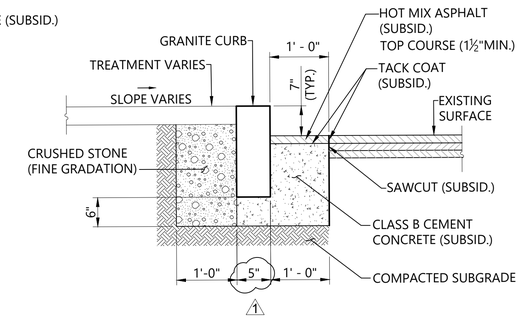
N.T.S.



PLAN VIEW

Detail A

N.T.S.

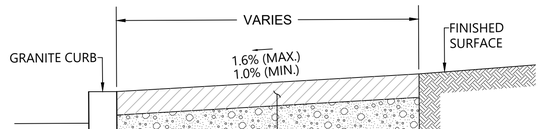


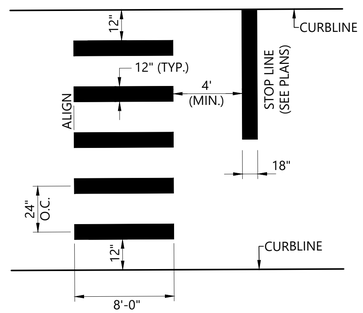
NOTES

1. APPLY TACK COAT TO CONCRETE BEDDING PRIOR TO PAVING OVER IT.
2. DETAIL ALSO APPLIES TO CURVED GRANITE CURB.
3. SUPPORT ENDS OF GRANITE CURB WITH BRICKS TO FACILITATE CONCRETE PLACEMENT. DO NOT PLACE EARTH UNDER GRANITE CURB.
4. DETAIL ALSO APPLIES FOR VERTICAL GRANITE BACK CURB.

Straight Granite Curb Set In Existing Pavement

N.T.S.



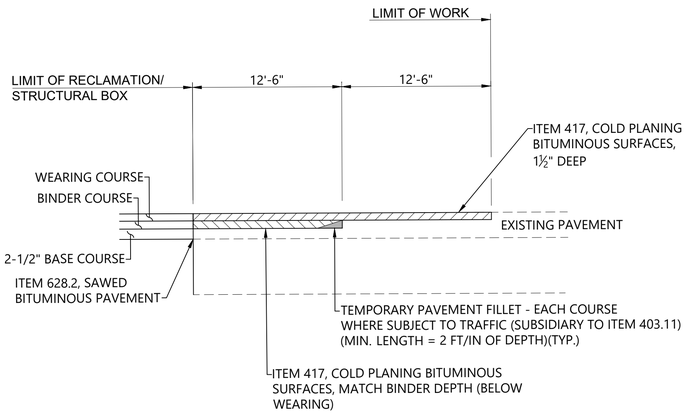


NOTES

1. TWELVE INCH (12") LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6 INCH LINES) WILL BE ACCEPTED.
2. LONGITUDINAL CROSSWALK LINES TO BE PARALLEL TO TRAVEL LANES.
3. ALL LONGITUDINAL CROSSWALK LINES TO BE THE SAME LENGTH AND PROPERLY ALIGNED.
4. AVOID PLACING LINES IN WHEEL PATHS.
5. CROSSWALK AND STOP LINE MARKINGS ON FINAL PAVING SHALL BE THERMOPLASTIC.

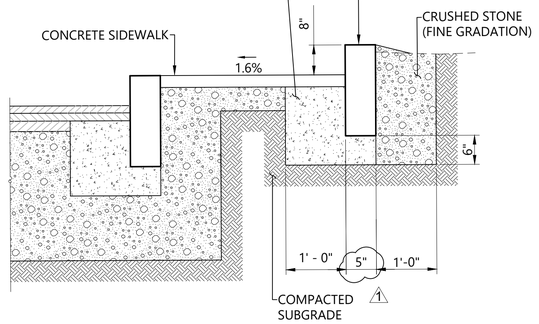
Crosswalk

N.T.S.



Item 608.13 - 3" Bituminous Sidewalk

N.T.S.



NOTES

1. APPLY TACK COAT TO CONCRETE BEDDING PRIOR TO PAVING OVER IT.
2. BACK CURB WITH REVEAL FROM STA. 107+75 TO STA. 108+75, RT.
3. SUPPORT ENDS OF GRANITE CURB WITH BRICKS TO FACILITATE CONCRETE PLACEMENT. DO NOT PLACE EARTH UNDER GRANITE CURB.

Vertical Granite Back Curb with Reveal

N.T.S.

Pavement Match Transition

N.T.S.

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

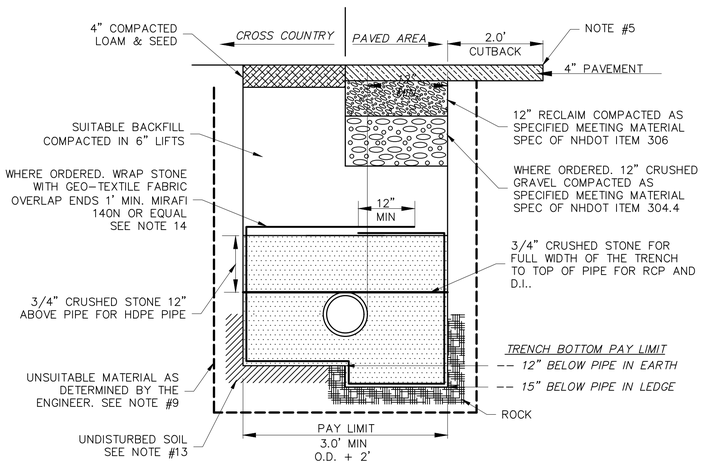
ROADWAY DETAILS

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	DET	12334	11	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS	
DATE 9/30/2020		

	DATE
SDR PROCCESSED	
NEW DESIGN	
SHEET CHECKED	
AS BUILT DETAILS	



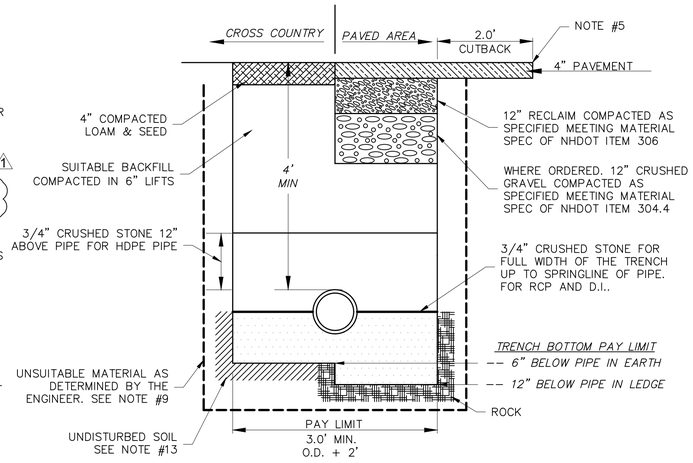
PAY LIMITS	
TRENCH WIDTH	I.D.
36" I.D. + 24" 2 x I.D.	UP TO 12" 12" TO 24" OVER 24"

Typical Drain Trench Detail (with less than 4' cover)

NO SCALE

DRAINAGE TRENCH NOTES:

1. REFERENCE TOWN OF SALEM STANDARD SPECIFICATIONS FOR METHOD OF MEASUREMENT AND PAYMENT.
2. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
3. ALL LOCAL STATE AND FEDERAL SAFETY STANDARDS SHALL BE STRICTLY ADHERED TO.
4. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO TOWN OF SALEM SUBDIVISION REQUIREMENTS
5. TRENCH PATCH: AFTER THE BASE COURSE HAS BEEN ROLLED TO THE REQUIRED GRADE, ANY BROKEN OR IRREGULAR EDGES OF THE EXISTING PAVEMENT SHALL BE SAW CUT IN STRAIGHT LINES LEAVING A SOUND VERTICAL FACE 24-INCHES BACK FROM THE EDGE OF THE TRENCH OR OTHER EXCAVATIONS TO ACCEPT PLACEMENT OF A 24-INCH MINIMUM OVERLAP OF BITUMINOUS BASE COURSE PAVEMENT ON UNDISTURBED MATERIAL. 1
6. BITUMINOUS PAVEMENT, DEPTH EQUAL TO EXISTING PAVEMENT WITH 4" MIN. (1.5" OF ½" WEARING, 2.5" OF ¾" BINDER). PAVEMENT SHALL CONFORM TO NHDOT ITEM 403.119.
7. DAMAGED OR OTHERWISE DEFICIENT PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE
8. INSPECTION: FOLLOWING INSTALLATION DRAIN LINES SHALL BE CLEANED AND VISUALLY INSPECTED. PIPES SHALL BE TRUE TO LINE AND GRADE PRIOR TO ACCEPTANCE AND USE.
9. UNSUITABLE MATERIAL & OVER EXCAVATION: ANY EXCAVATION OUTSIDE OF DEFINED PAY LIMIT SHALL BE STRICTLY COORDINATED AND MEASURED WITH THE ENGINEER FOR PAYMENT. ANY MATERIAL REMOVED WITHOUT PRIOR AUTHORIZATION SHALL NOT BE PAID. EXCAVATION AREAS SHALL BE BACKFILLED WITH APPROPRIATE BEDDING MATERIALS. UNSUITABLES WITHIN TRENCH PAY LIMITS ARE SUBSIDIARY.
10. MATERIAL SHALL BE REPLACED IN KIND WHENEVER POSSIBLE.
11. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL AND ALL ROCKS OVER SIX INCHES IN THE LARGEST DIMENSION, OR ANY MATERIAL WHICH, AS DETERMINED BY THE TOWN OF SALEM DEPARTMENT OF ENGINEERING, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION. SUITABLE MATERIAL SHALL BE PLACED IN 6" LIFTS AND THOROUGHLY COMPACTED.
12. COMPACTION: BACKFILL OF THE TRENCHES SHALL BE COMPACTED TO TO 95% MAX. DRY DENSITY UNDER ALL PAVED AREAS AND 92% MAX. DRY DENSITY UNDER OTHER AREAS IN ACCORDANCE WITH NHDOT STANDARD SPECIFICATIONS – SECTION 304.
13. IF TRENCH BOTTOM IS DISTURBED THEN CONTRACTOR SHALL COMPACT AS APPROPRIATE.
14. ENGINEER SHALL DETERMINE AT THE TIME OF CONSTRUCTION IF STONE IN SHALLOW TRENCHES SHALL BE WRAPPED IN FABRIC WHERE FIELD CONDITIONS DICTATE. FABRIC IS SUBSIDIARY TO PIPE ITEM NUMBER.
15. WHERE ROCK IS ENCOUNTERED IN TRENCH EXCAVATION. ALLOWABLE PAY LIMIT SHALL BE AS DEFINED IN THE CHART SHOWN IN THIS DETAIL TO 12-INCHES BELOW PIPE.
16. CORES: WHERE IT IS NECESSARY TO CORE AN EXISTING STRUCTURE THE CORE SHALL BE COMPLETED WITH A CIRCULAR HOLE SAW AND SHALL BE LARGE ENOUGH TO RECEIVE THE PIPE AND NEOPRENE BOOT. CRUDE METHODS WITH A PIPE SAW, SLEDGE HAMMER OR OTHER TOOLS ARE UNACCEPTABLE. CORES SHALL BE INCIDENTAL UNLESS SPECIFICALLY PROVIDED FOR IN THE BID.

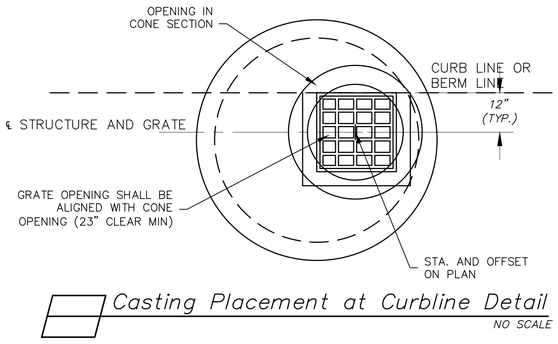


PAY LIMITS	
TRENCH WIDTH	I.D.
36" I.D. + 24" 2 x I.D.	UP TO 12" 12" TO 24" OVER 24"

Typical Drain Trench Detail

NO SCALE

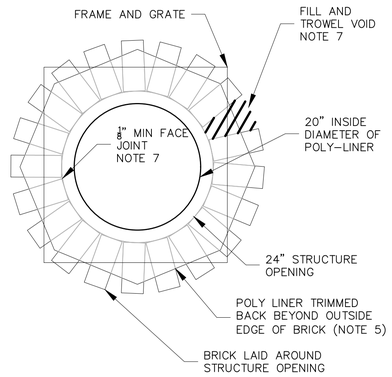
NOTE:
1. IF SITE CONDITIONS DO NOT ALLOW FOR SETTING CATCH BASINS AS SHOWN, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO SETTING STRUCTURE.
2. CONTRACTOR SHALL VERIFY ALL STRUCTURE LOCATIONS PRIOR TO LAYING PIPE
3. ALL CB RIMS (SINGLE AND DOUBLE) AGAINST GRANITE CURBING SHALL BE 3-FLANGED. ALL CB RIMS NOT AGAINST GRANITE CURBING SHALL BE 4-FLANGED.



Casting Placement at Curbline Detail

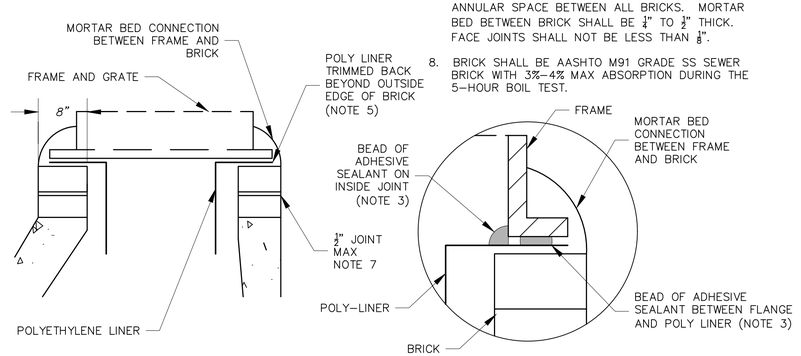
NO SCALE

NOTE:
1. DETAILS ON THIS SHEET PROVIDED BY THE TOWN OF SALEM, NH.



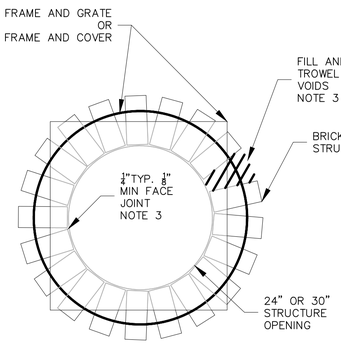
NOTES:

1. ALL CATCH BASINS SHALL BE OUTFITTED WITH A POLYETHYLENE LINER DOWNSPOUT.
2. POLYETHYLENE LINER SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
3. PLACE A CONTINUOUS BEAD OF AN APPROVED BONDING ADHESIVE SEALENT BETWEEN FRAME AND POLYETHYLENE SHEET AND AT THE INSIDE JOINT AFTER ASSEMBLY IS COMPLETE.
4. PLACE CLASS AA CONCRETE TO 2" BELOW THE TOP OF GRATE ELEVATION (SUBSIDIARY TO DRAINAGE STRUCTURE).
5. TRIM POLYETHYLENE BEYOND THE OUTSIDE EDGE OF BRICK TO PROVIDE A MORTAR CONNECTION BETWEEN THE FRAME AND BRICK. ALTERNATE TRIMMING METHODS MAY/SHALL BE REQUIRED BY THE OWNER WHEN USED WITH CURBING AND GUTTER INLETS.
6. THE CENTER OF THE GRATE & FRAME MAY BE SHIFTED A MAXIMUM OF 1" FROM THE CENTER OF THE DOWNSPOUT IN ANY DIRECTION.
7. BRICK MORTAR: COMPLETELY FILL AND TROWEL ANNULAR SPACE BETWEEN ALL BRICKS. MORTAR BED BETWEEN BRICK SHALL BE ¼" TO ½" THICK. FACE JOINTS SHALL NOT BE LESS THAN ⅛".
8. BRICK SHALL BE AASHTO M91 GRADE SS SEWER BRICK WITH 3%-4% MAX ABSORPTION DURING THE 5-HOUR BOIL TEST.



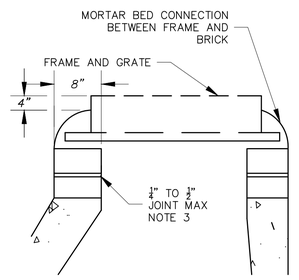
Poly-Liner Detail

NO SCALE



NOTES:

1. ALL STANDARD CATCH BASINS SHALL BE OUTFITTED WITH A POLYETHYLENE LINER DOWNSPOUT. EXCEPTIONS MAY APPLY. REFER TO SPECIFIC STRUCTURE TYPE AND CORRESPONDING CONSTRUCTION DETAILS (I.E. DOUBLE GRATE CB, "C-TOP" CB, DROP INLET, ETC.).
2. PLACE MORTAR TO 4" BELOW THE TOP OF GRATE ELEVATION (SUBSIDIARY TO STRUCTURE ITEM).
3. BRICK MORTAR: COMPLETELY FILL AND TROWEL ANNULAR SPACE BETWEEN ALL BRICKS. MORTAR BED BETWEEN BRICK SHALL BE ¼" TO ½" THICK. FACE JOINTS SHALL AVERAGE ¼" BUT NOT BE LESS THAN ⅛".
4. DO NOT PLASTER OR MORTAR OVER BRICK WORK. ALL JOINTS SHALL BE CLEAN AND PROPERLY POINTED.
5. BRICK SHALL BE AASHTO M91 GRADE SS SEWER BRICK WITH 3%-4% MAX ABSORPTION DURING THE 5-HOUR BOIL TEST. CONCRETE GRADE RINGS SHALL NOT BE ALLOWED.
6. DMH & SEWER FRAME AND COVER SHALL BE NEENAH MODEL #R-1743. DMH SHALL READ "DRAIN". SMH SHALL READ "SEWER". CB FRAME AND GRATE SHALL BE NEENAH MODEL #R-3570. DOUBLE GRATES SHALL BE EJ MODEL #0MA552000066.
7. ALL CATCH BASIN FRAMES (SINGLE AND DOUBLE) INSTALLED AT GRANITE CURBING LOCATIONS SHALL BE 3-FLANGED. ALL CATCH BASIN FRAMES (SINGLE AND DOUBLE) INSTALLED WITH NO CURBING SHALL BE 4-FLANGED.



Frame Set Detail (SMH, DMH or CB)

NO SCALE

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

ROADWAY DETAILS

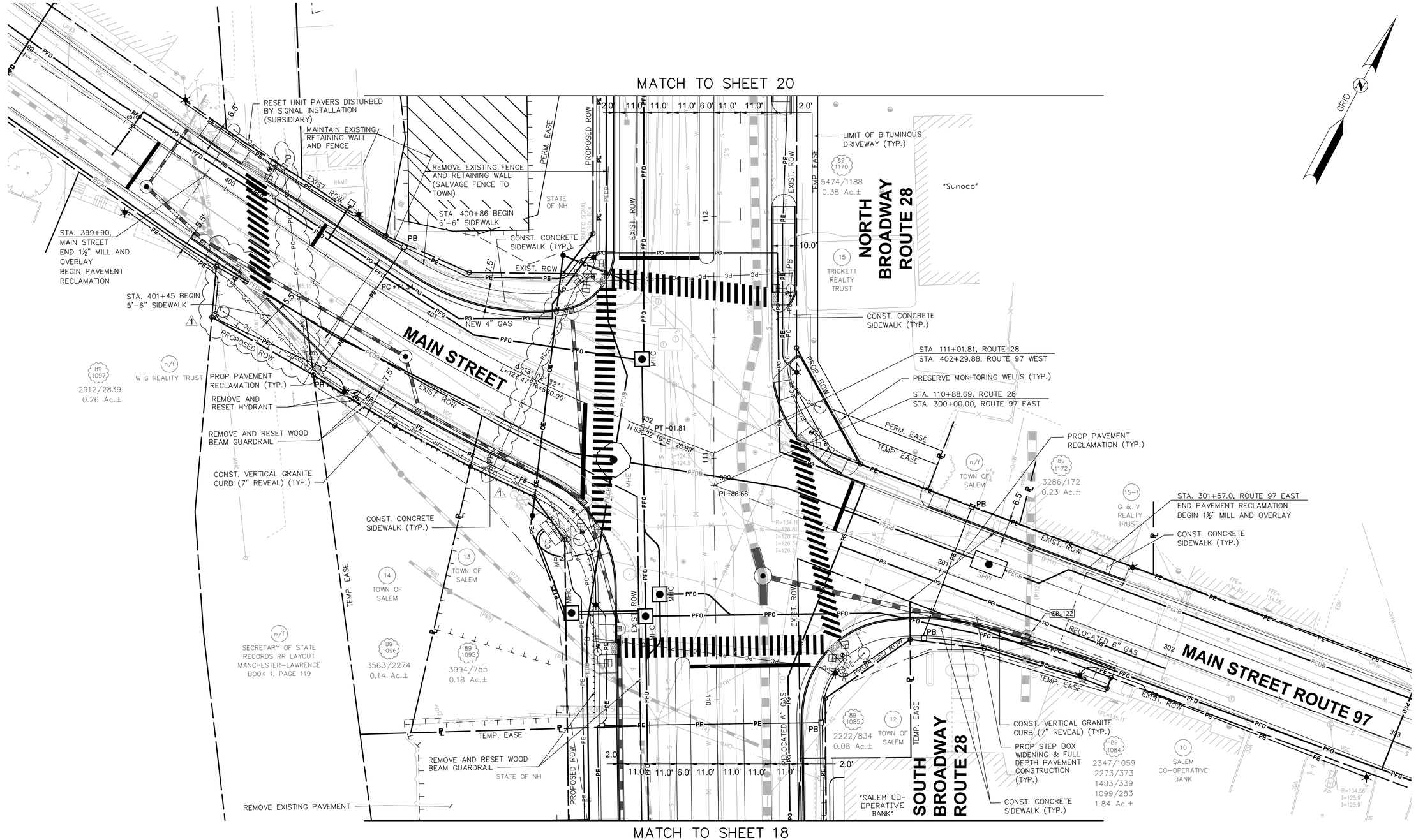
DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	DET	12334	12	78

\\VHB\GBL\PROJ\BEDFORD\52223.00\CAD\TE\PRJ\CUTSHEET\12334GEN_PLANS

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE
ADDENDUM 1	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS			9/30/2020

	DATE
SDR PROCCESSED	
NEW DESIGN	
SHEET CHECKED	
AS BUILT DETAILS	



NOTE:

1. ITEM 646.51, TURF ESTABLISHMENT WITH MULCH, TACKIFIERS AND LOAM (4" DEPTH) SHALL BE USED TO RESTORE BUILDING FOOTPRINTS AND PAVEMENT REMOVAL AREAS AND EXISTING GRASS AREAS DISTURBED BY THE CONSTRUCTION.
2. DETECTABLE WARNINGS NOT REQUIRED AT DRIVE RAMPS.
3. SEE NHDOT HIGHWAY DESIGN DETAIL "SIDEWALK CURB RAMP DETAILS (SHEETS 1 THRU 9)". BY REFERENCE, THESE DETAILS ARE INCLUDED IN THESE PLANS.

FORMER BUILDING FOOTPRINT AREA (BUILDING REMOVED IN SEPARATE CONTRACT)

20 0 20 40
SCALE IN FEET

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

GENERAL PLAN

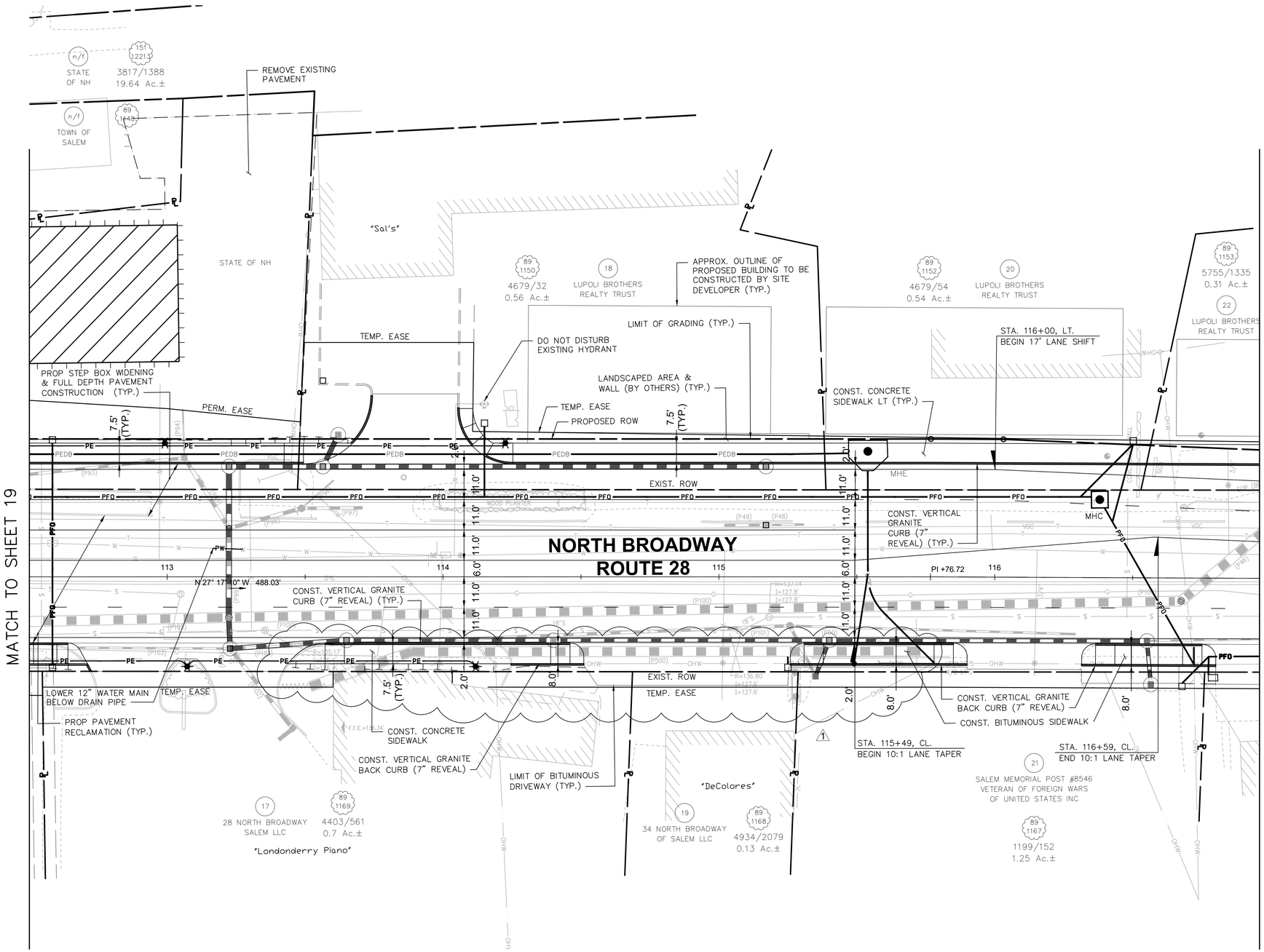
vhb

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	GEN	12334	19	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE
ADDENDUM 1	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

	DATE
SDR PROCCESSED	
NEW DESIGN	
SHEET CHECKED	
AS BUILT DETAILS	



NOTE:

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FORMER BUILDING FOOTPRINT AREA (BUILDING REMOVED IN SEPARATE CONTRACT)

20 0 20 40
SCALE IN FEET

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

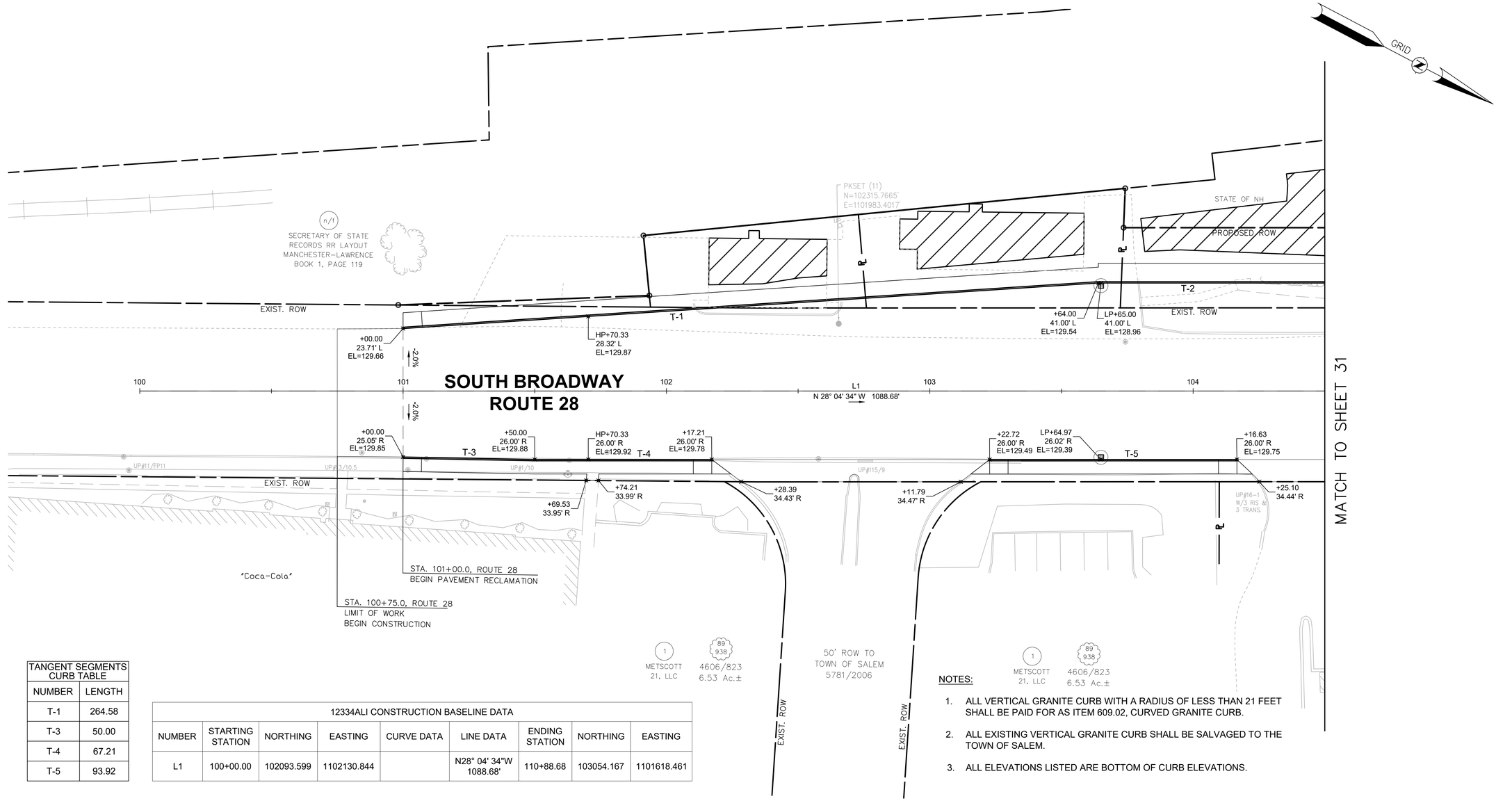
GENERAL PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	GEN	12334	20	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

SDR PROCCESSED DATE
NEW DESIGN DATE
SHEET CHECKED DATE
AS BUILT DETAILS DATE



TANGENT SEGMENTS CURB TABLE	
NUMBER	LENGTH
T-1	264.58
T-3	50.00
T-4	67.21
T-5	93.92

12334ALI CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	100+00.00	102093.599	1102130.844		N28° 04' 34"W 1088.68'	110+88.68	103054.167	1101618.461

NOTES:

1. ALL VERTICAL GRANITE CURB WITH A RADIUS OF LESS THAN 21 FEET SHALL BE PAID FOR AS ITEM 609.02, CURVED GRANITE CURB.
2. ALL EXISTING VERTICAL GRANITE CURB SHALL BE SALVAGED TO THE TOWN OF SALEM.
3. ALL ELEVATIONS LISTED ARE BOTTOM OF CURB ELEVATIONS.

1 PROPOSED STONE BOUND LOCATIONS
ITEM 622.4 - STONE BOUNDS

NUMBER	NORTHING	EASTING
1	102164.8428	1102055.8403
2	102247.2921	1102007.8057
3	102234.5959	1101988.7525
4	102387.5597	1101886.8481
5	102394.0473	1101900.3107

20 0 20 40
SCALE IN FEET

TOWN OF SALEM, NEW HAMPSHIRE
SALEM DEPOT - INTERSECTION IMPROVEMENTS

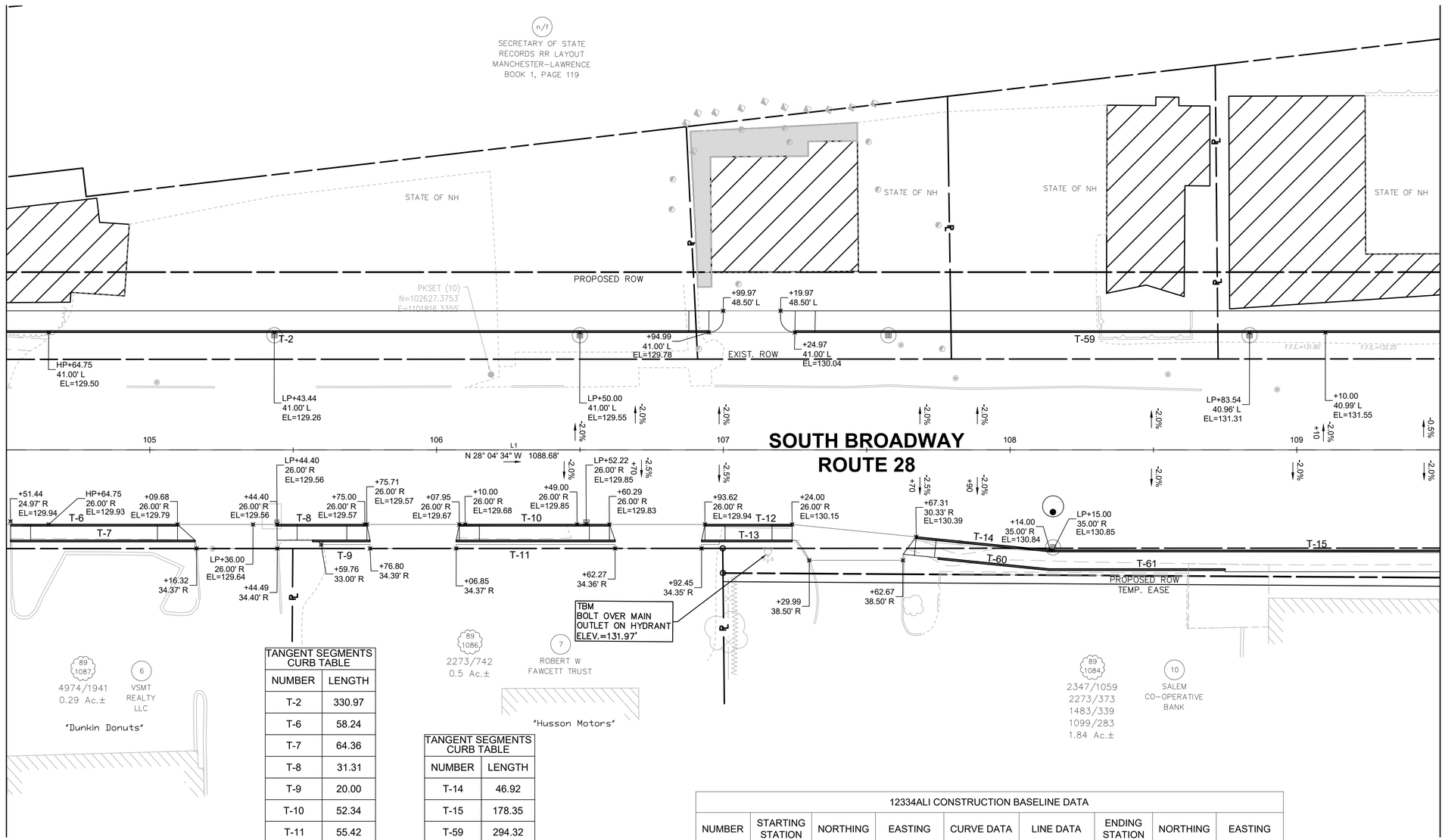
ALIGNMENT & GRADING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	GRAD	12334	30	78

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION
1 ADDENDUM	9/30/2020		STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS

SDR PROCCESSED — DATE
NEW DESIGN — DATE
SHEET CHECKED — DATE
AS BUILT DETAILS — DATE



TANGENT SEGMENTS CURB TABLE	
NUMBER	LENGTH
T-2	330.97
T-6	58.24
T-7	64.36
T-8	31.31
T-9	20.00
T-10	52.34
T-11	55.42
T-12	30.38
T-13	31.55

TANGENT SEGMENTS CURB TABLE	
NUMBER	LENGTH
T-14	46.92
T-15	178.35
T-59	294.32
T-60	38.87
T-61	61.32

12334ALI CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	100+00.00	102093.599	1102130.844		N28° 04' 34"W 1088.68'	110+88.68	103054.167	1101618.461

1

PROPOSED STONE BOUND LOCATIONS
ITEM 622.4 - STONE BOUNDS

NUMBER	NORTHING	EASTING
6	102727.2181	1101831.7849
7	102731.3469	1101839.3368

20 0 20 40
SCALE IN FEET

TOWN OF SALEM, NEW HAMPSHIRE
SALEM DEPOT - INTERSECTION IMPROVEMENTS

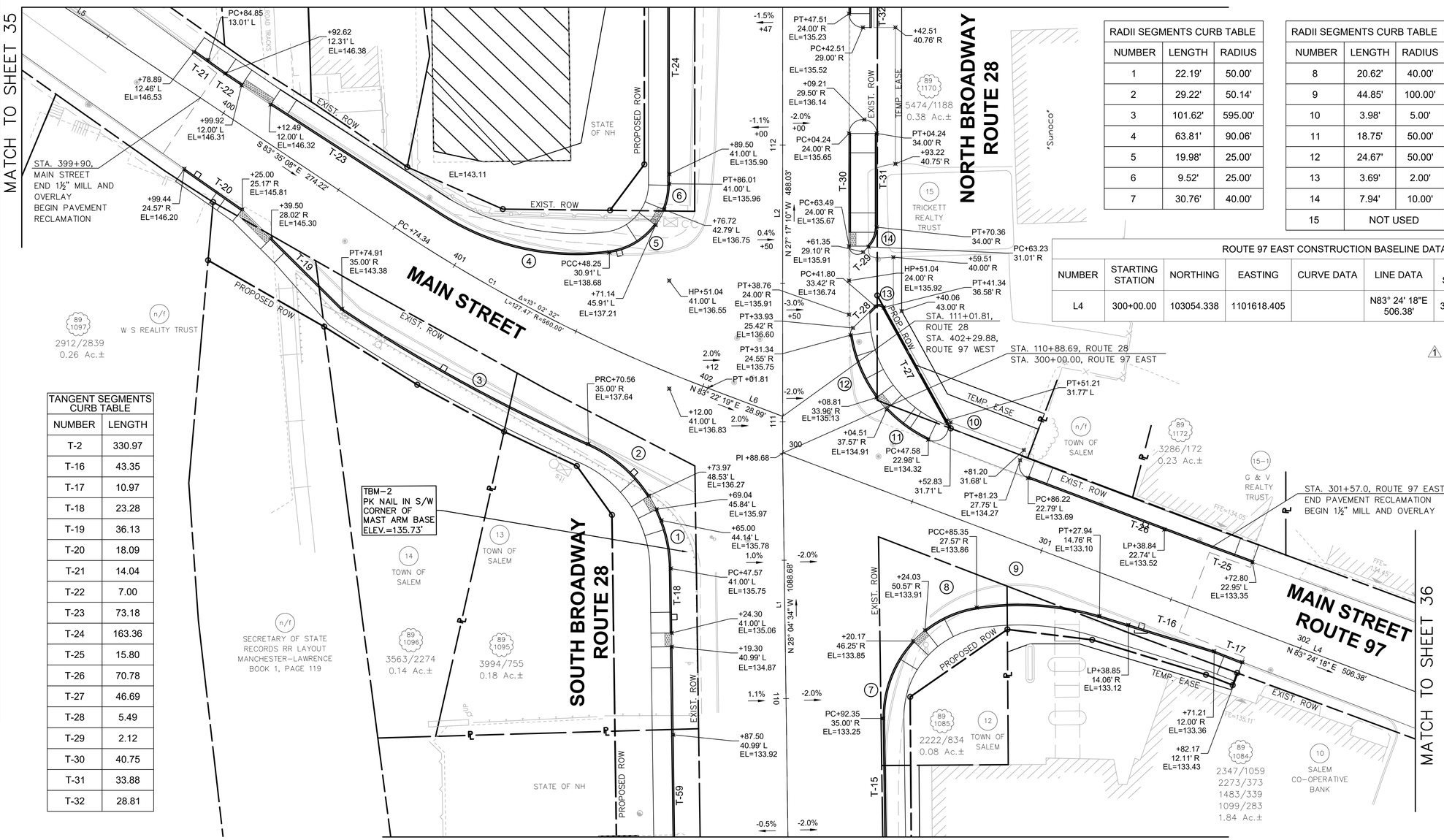
ALIGNMENT & GRADING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	GRAD	12334	31	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE
ADDENDUM 1	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS	STATION	9/30/2020

SDR PROCCESSED — DATE
NEW DESIGN — DATE
SHEET CHECKED — DATE
AS BUILT DETAILS — DATE



TANGENT SEGMENTS CURB TABLE	
NUMBER	LENGTH
T-2	330.97
T-16	43.35
T-17	10.97
T-18	23.28
T-19	36.13
T-20	18.09
T-21	14.04
T-22	7.00
T-23	73.18
T-24	163.36
T-25	15.80
T-26	70.78
T-27	46.69
T-28	5.49
T-29	2.12
T-30	40.75
T-31	33.88
T-32	28.81

RADII SEGMENTS CURB TABLE		
NUMBER	LENGTH	RADIUS
1	22.19'	50.00'
2	29.22'	50.14'
3	101.62'	595.00'
4	63.81'	90.06'
5	19.98'	25.00'
6	9.52'	25.00'
7	30.76'	40.00'

RADII SEGMENTS CURB TABLE		
NUMBER	LENGTH	RADIUS
8	20.62'	40.00'
9	44.85'	100.00'
10	3.98'	5.00'
11	18.75'	50.00'
12	24.67'	50.00'
13	3.69'	2.00'
14	7.94'	10.00'
15	NOT USED	

ROUTE 97 EAST CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L4	300+00.00	103054.338	1101618.405		N83° 24' 18"E 506.38'	305+06.38	103112.495	1102121.430

⚠1

PROPOSED STONE BOUND LOCATIONS ITEM 622.4 - STONE BOUNDS

NUMBER	NORTHING	EASTING
8	103006.0518	1101573.8575
9	103015.9571	1101554.4625
10	103014.9436	1101525.4015
11	103015.6143	1101489.7801
12	103018.8247	1101450.2648
13	103020.9133	1101401.9608
14	103103.5635	1101522.7960
15	103123.9798	1101526.1893
16	102997.0395	1101699.7892
17	103034.8130	1101719.8291
18	103045.5161	1101748.7962
19	103053.1648	1101791.1281
20	103089.9757	1101668.3281
21	103120.4884	1101622.7135
22	103040.4488	1101393.9321
23	103083.8599	1101450.4903
24	103086.1899	1101488.1433
25	103054.2459	1101801.4168
26	103058.9084	1101800.8777

MAIN STREET CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L5	398+00.12	103093.051	1101183.864		S83° 35' 08"E 274.22'	400+74.34	103062.416	1101456.363
C1	400+74.34	103062.416	1101456.363	R=560.00' Δ=13°02'32" L=127.47' T=64.01'		402+01.81	103062.653	1101583.561
L6	402+01.81	103062.653	1101583.561		N83° 22' 19"E 28.99'	402+30.80	103066.000	1101612.358

12334ALI CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	100+00.00	102093.599	1102130.844		N28° 04' 34"W 1088.68'	110+88.68	103054.167	1101618.461
L2	110+88.68	103054.167	1101618.461		N27° 17' 10"W 488.03'	115+76.72	103487.896	1101394.730

20 0 20 40
SCALE IN FEET

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

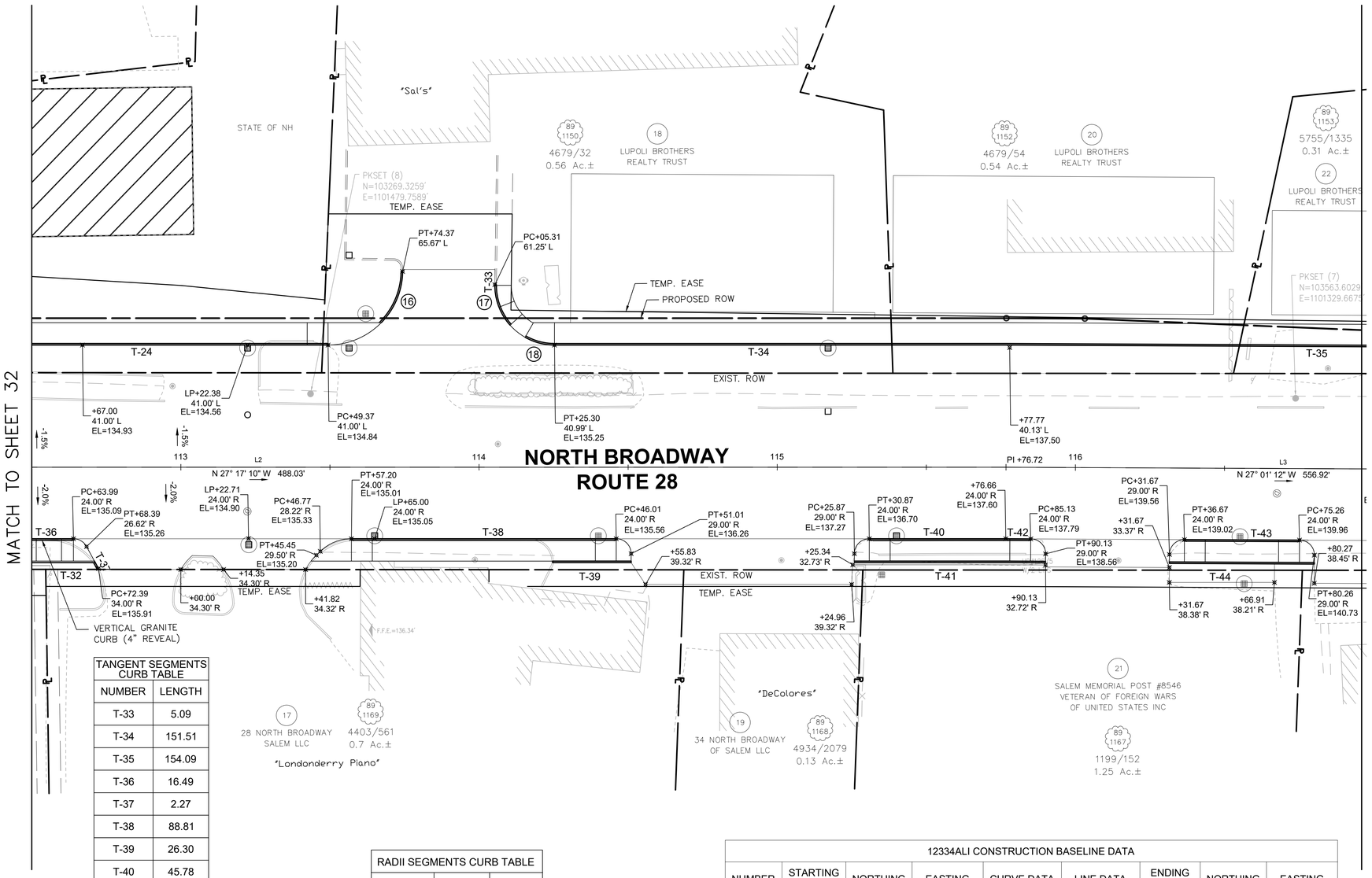
ALIGNMENT & GRADING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	GRAD	12334	32	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

SDR PROCCESSED DATE
NEW DESIGN DATE
SHEET CHECKED DATE
AS BUILT DETAILS DATE



TANGENT SEGMENTS CURB TABLE	
NUMBER	LENGTH
T-33	5.09
T-34	151.51
T-35	154.09
T-36	16.49
T-37	2.27
T-38	88.81
T-39	26.30
T-40	45.78
T-41	64.12
T-42	8.36
T-43	38.59
T-44	48.59

RADII SEGMENTS CURB TABLE		
NUMBER	LENGTH	RADIUS
16	22.03'	25.07'
17	14.84'	20.00'
18	10.29'	20.00'

12334ALI CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L2	110+88.68	103054.167	1101618.461		N27° 17' 10"W 488.03'	115+76.72	103487.896	1101394.730
L3	115+76.72	103487.896	1101394.730		N27° 01' 12"W 556.92'	121+33.64	103984.029	1101141.720

1

PROPOSED STONE BOUND LOCATIONS
ITEM 622.4 - STONE BOUNDS

NUMBER	NORTHING	EASTING
27	103465.0779	1101350.2402
28	103488.5316	1101338.2804

20 0 20 40
SCALE IN FEET

TOWN OF SALEM, NEW HAMPSHIRE
SALEM DEPOT - INTERSECTION IMPROVEMENTS

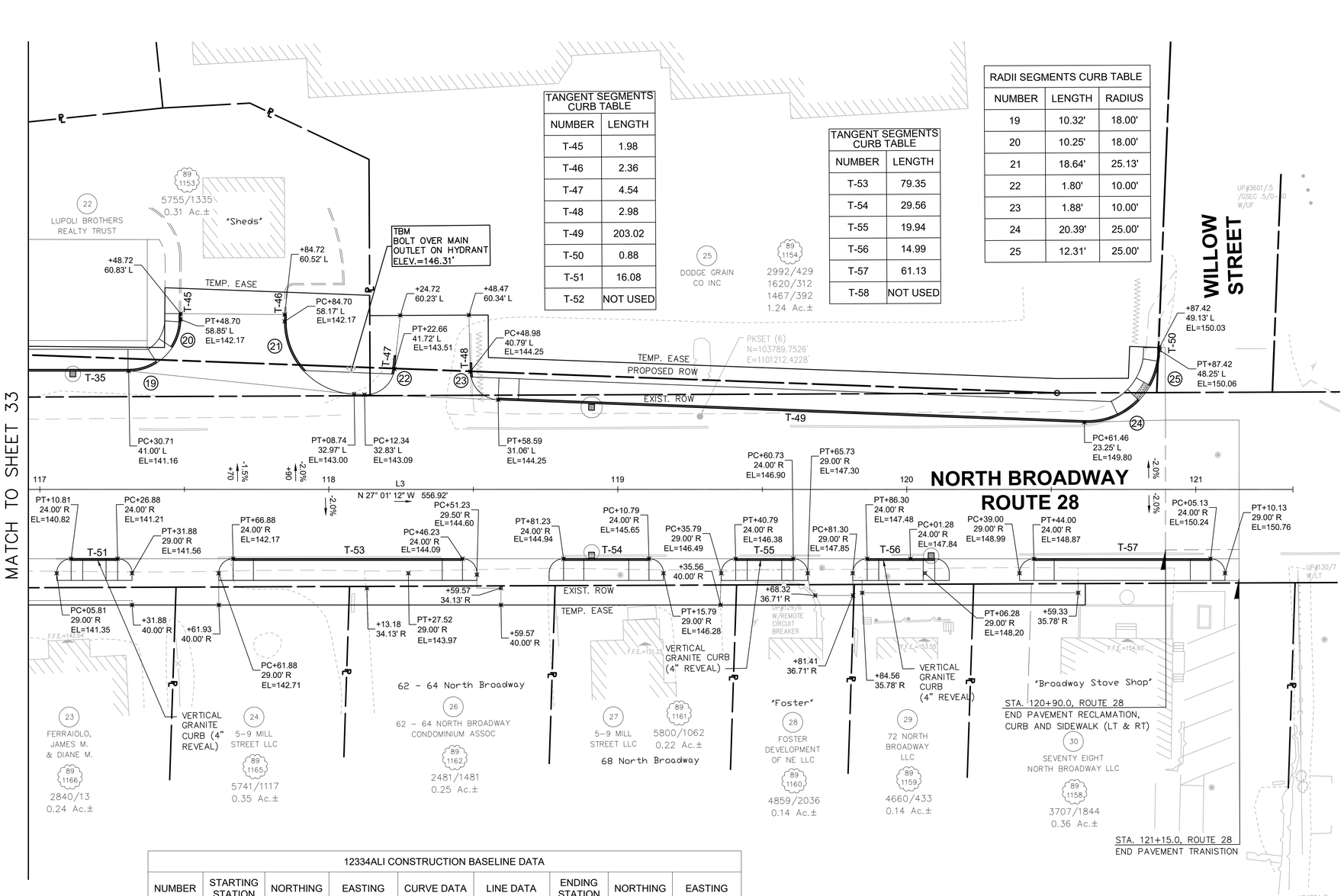
ALIGNMENT & GRADING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	GRAD	12334	33	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS			9/30/2020

SDR PROCCESSED DATE
NEW DESIGN DATE
SHEET CHECKED DATE
AS BUILT DETAILS DATE



TANGENT SEGMENTS CURB TABLE	
NUMBER	LENGTH
T-45	1.98
T-46	2.36
T-47	4.54
T-48	2.98
T-49	203.02
T-50	0.88
T-51	16.08
T-52	NOT USED

TANGENT SEGMENTS CURB TABLE	
NUMBER	LENGTH
T-53	79.35
T-54	29.56
T-55	19.94
T-56	14.99
T-57	61.13
T-58	NOT USED

RADII SEGMENTS CURB TABLE		
NUMBER	LENGTH	RADIUS
19	10.32'	18.00'
20	10.25'	18.00'
21	18.64'	25.13'
22	1.80'	10.00'
23	1.88'	10.00'
24	20.39'	25.00'
25	12.31'	25.00'

12334ALI CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L3	115+76.72	103487.896	1101394.730		N27° 01' 12"W 556.92'	121+33.64	103984.029	1101141.720

1

PROPOSED STONE BOUND LOCATIONS ITEM 622.4 - STONE BOUNDS		
NUMBER	NORTHING	EASTING
29	103896.1357	1101149.0748

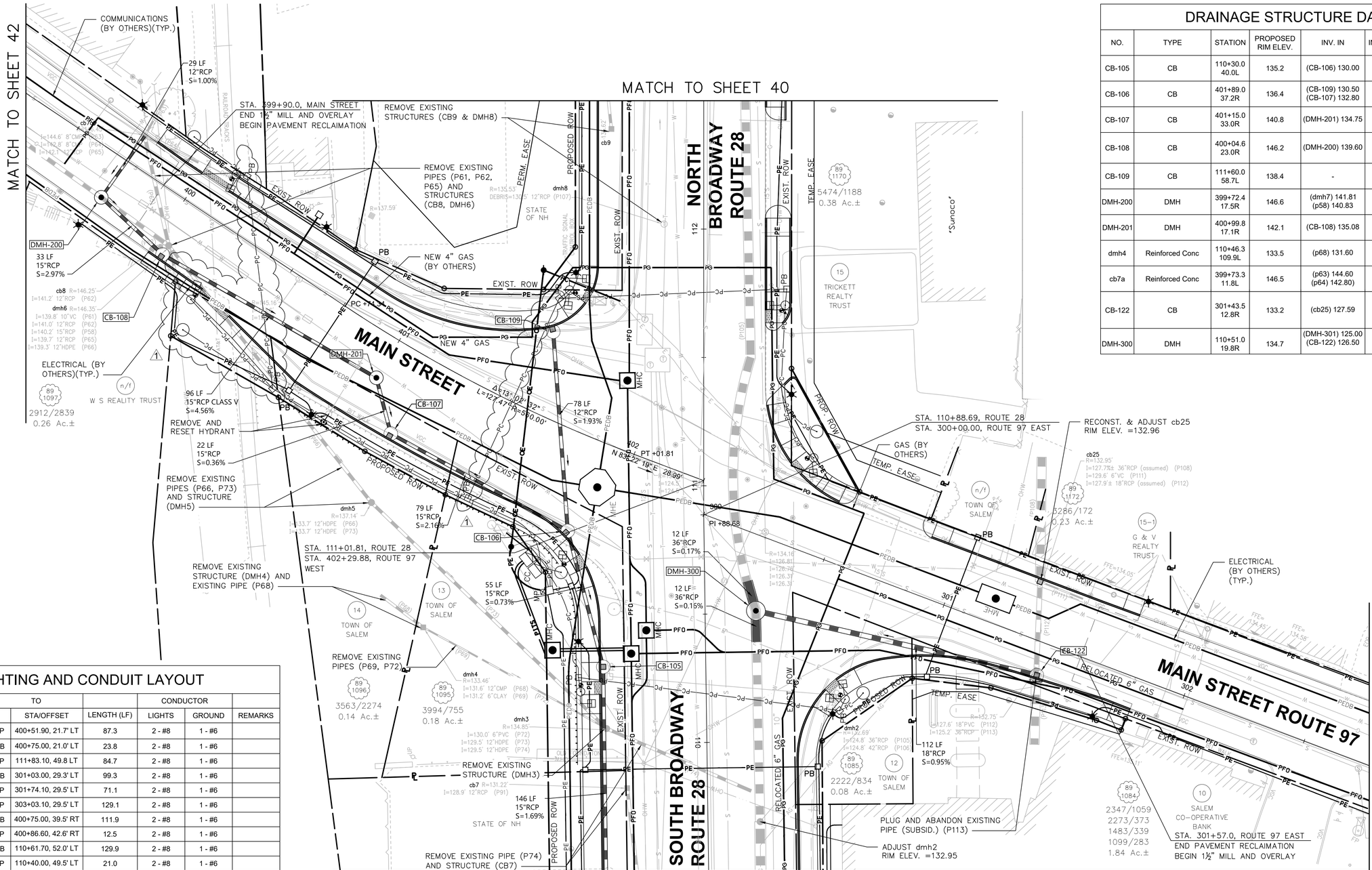
20 0 20 40
SCALE IN FEET

TOWN OF SALEM, NEW HAMPSHIRE
SALEM DEPOT - INTERSECTION IMPROVEMENTS

ALIGNMENT & GRADING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	GRAD	12334	34	78

REVISIONS AFTER PROPOSAL			
STATION	DESCRIPTION	DATE	NUMBER
STATION	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS	9/30/2020	ADDENDUM 1



DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	PROPOSED RIM ELEV.	INV. IN	INV. OUT	REMARKS
CB-105	CB	110+30.0 40.0L	135.2	(CB-106) 130.00	129.90	PROPOSED CB-B
CB-106	CB	401+89.0 37.2R	136.4	(CB-109) 130.50 (CB-107) 132.80	130.40	PROPOSED CB-B (Eccentric)
CB-107	CB	401+15.0 33.0R	140.8	(DMH-201) 134.75	134.50	PROPOSED CB-B (Eccentric)
CB-108	CB	400+04.6 23.0R	146.2	(DMH-200) 139.60	138.47	PROPOSED CB-B (Eccentric)
CB-109	CB	111+60.0 58.7L	138.4	-	132.00	PROPOSED CB-B (Eccentric)
DMH-200	DMH	399+72.4 17.5R	146.6	(dmh7) 141.81 (p58) 140.83	140.57	PROPOSED DMH
DMH-201	DMH	400+99.8 17.1R	142.1	(CB-108) 135.08	134.83	PROPOSED DMH
dmh4	Reinforced Conc	110+46.3 109.9L	133.5	(p68) 131.60	131.60	Existing DMH
cb7a	Reinforced Conc	399+73.3 11.8L	146.5	(p63) 144.60 (p64) 142.80)	142.10	Existing DMH
CB-122	CB	301+43.5 12.8R	133.2	(cb25) 127.59	127.59	PROPOSED CB-B (Plug Abandoned Pipe with Concrete Block and Mortar)(Subsid.)
DMH-300	DMH	110+51.0 19.8R	134.7	(DMH-301) 125.00 (CB-122) 126.50	125.00	PROPOSED 6' DIA. DMH

LIGHTING AND CONDUIT LAYOUT

FROM		TO			CONDUCTOR		
	STA/OFFSET		STA/OFFSET	LENGTH (LF)	LIGHTS	GROUND	REMARKS
LP	399+65.80, 21.4' LT	LP	400+51.90, 21.7' LT	87.3	2 - #8	1 - #6	
LP	400+51.90, 21.7' LT	PB	400+75.00, 21.0' LT	23.8	2 - #8	1 - #6	
PB	400+75.0, 21.0' LT	LP	111+83.10, 49.8 LT	84.7	2 - #8	1 - #6	
LP	111+35.60, 34.2' RT	PB	301+03.00, 29.3' LT	99.3	2 - #8	1 - #6	
PB	301+03.00, 29.3' LT	LP	301+74.10, 29.5' LT	71.1	2 - #8	1 - #6	
LP	301+74.10, 29.5' LT	LP	303+03.10, 29.5' LT	129.1	2 - #8	1 - #6	
LP	399+70.90, 31.3' RT	PB	400+75.00, 39.5' RT	111.9	2 - #8	1 - #6	
PB	400+75.00, 39.5' RT	LP	400+86.60, 42.6' RT	12.5	2 - #8	1 - #6	
LP	400+86.60, 42.6' RT	PB	110+61.70, 52.0' LT	129.9	2 - #8	1 - #6	
PB	110+61.70, 52.0' LT	LP	110+40.00, 49.5' LT	21.0	2 - #8	1 - #6	
LP	110+40.00, 49.5' LT	PB	109+90.00, 47.5' LT	51.2	2 - #8	1 - #6	
PB	109+90.00, 47.5' LT	PB	109+90.00, 43.1' RT	90.6	2 - #8	1 - #6	SCHED. 80
PB	109+90.00, 43.1' RT	LP	110+10.40, 49.2' RT	21.6	2 - #8	1 - #6	
LP	110+10.40, 49.2' RT	PB	301+03.70, 28.5' RT	42.0	2 - #8	1 - #6	
PB	301+03.70, 28.5' RT	PB	301+03.00, 29.3' LT	58.0	2 - #8	1 - #6	SCHED. 80
PB	301+03.70, 28.5' RT	LP	301+69.40, 20.1' RT	42.0	2 - #8	1 - #6	
LP	301+69.40, 20.1' RT	LP	302+95.20, 17.7' RT	129.8	2 - #8	1 - #6	
PB	400+75.00, 39.5 RT	PB	400+75. 0, 21.0' LT	60.5	2 - #8	1 - #6	SCHED. 80

NOTES:

1. THE FOLLOWING UTILITIES ARE SHOWN ON THESE PLANS FOR INFORMATIONAL PURPOSED ONLY AND WILL BE INSTALLED BY OTHERS IN ADVANCE OF THIS PROJECT IN THE APPROXIMATE LOCATIONS SHOWN:
   - PFO (PROPOSED FIBER OPTIC)
   - PEDB (PROPOSED ELECTRICAL DUCT BANK)
   - MHE (ELECTRIC POWER MANHOLE)
   - MHC (COMMUNICATIONS MANHOLE)
   - MP (METER PEDESTAL)
   - PG (GAS)
2. THE FOLLOWING UTILITIES SHALL BE INSTALLED AS PART OF THIS CONTRACT UNLESS NOTED OTHERWISE:
   - PE (PROPOSED UNDERGROUND ELECTRIC)
   - PC (PROPOSED UNDERGROUND TRAFFIC SIGNAL)
   - PITS (PROPOSED UNDERGROUND ITS)
   - PS (PROPOSED UNDERGROUND SEWER)
   - PW (PROPOSED UNDERGROUND WATER)
3. ALL SEWER, WATER, AND TELEPHONE MANHOLES SHALL BE ADJUSTED TO THE PROPOSED FINISHED GRADE.
4. IN-LINE DRAIN INSTALLATION SHALL BE DONE WITHOUT COUPLINGS. EXISTING DRAINAGE SHALL BE REMOVED TO NEAREST JOINT. NEW STRUCTURE AND PIPE SHALL BE PLACED IN THE EXCAVATION TOGETHER AND THEN PIPES SHALL BE CONNECTED.
5. SEE ALIGNMENT AND GRADING PLANS FOR TEMPORARY BENCHMARK LOCATIONS.
6. WHEN ORDERED, VIDEO INSPECTION OF INSTALLED DRAIN PIPES SHALL BE SUBSIDIARY TO THE PIPE ITEM.

20 0 20 40
SCALE IN FEET

SDR PROCCESSED	DATE
NEW DESIGN	DATE
SHEET CHECKED	DATE
AS BUILT DETAILS	DATE

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

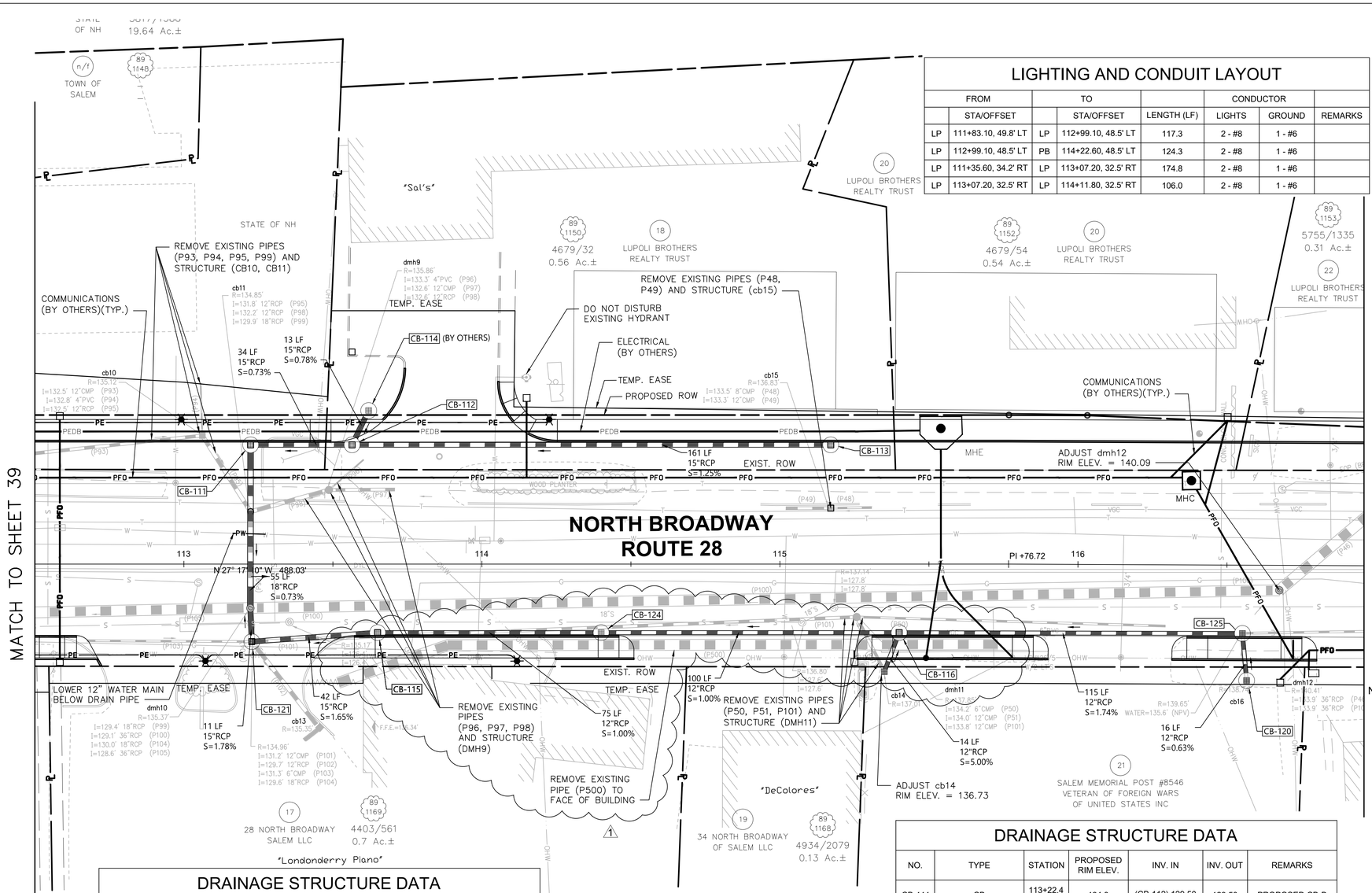
DRAINAGE & UTILITY PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	UTL	12334	39	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE
ADDENDUM 1	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

SDR PROCCESSED DATE
NEW DESIGN DATE
SHEET CHECKED DATE
AS BUILT DETAILS DATE



LIGHTING AND CONDUIT LAYOUT

FROM		TO			CONDUCTOR		
	STA/OFFSET		STA/OFFSET	LENGTH (LF)	LIGHTS	GROUND	REMARKS
LP	111+83.10, 49.8' LT	LP	112+99.10, 48.5' LT	117.3	2 - #8	1 - #6	
LP	112+99.10, 48.5' LT	PB	114+22.60, 48.5' LT	124.3	2 - #8	1 - #6	
LP	111+35.60, 34.2' RT	LP	113+07.20, 32.5' RT	174.8	2 - #8	1 - #6	
LP	113+07.20, 32.5' RT	LP	114+11.80, 32.5' RT	106.0	2 - #8	1 - #6	

DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	PROPOSED RIM ELEV.	INV. IN	INV. OUT	REMARKS
CB-115	CB	113+65.0 23.0R	135.1	(CB-124) 129.75	129.75	PROPOSED CB-B
CB-116	CB	115+40.0 23.0R	136.9	(cb14) 132.30 (cb17) 131.50	131.50	PROPOSED CB-B
CB-120	CB	116+56.8 38.7R	138.7	-	133.7	PROPOSED CB-B
CB-121	CB	113+22.8 26.0R	135.1	(cb13) 129.70 (CB-115) 129.05	129.05	PROPOSED CB-B
CB-124	CB	114+40.0 23.0R	135.5	(CB116) 135.50	130.50	PROPOSED CB-B
cb14	Reinforced Conc	115+35.0 36.1R	137.0	-	133.00	Existing CB
CB-125	CB	116+55.3 22.9R	139.5	(CB-120) 133.60	133.50	PROPOSED CB-B

DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	PROPOSED RIM ELEV.	INV. IN	INV. OUT	REMARKS
CB-111	CB	113+22.4 40.0L	134.8	(CB-112) 129.50	129.50	PROPOSED CB-B
CB-112	CB	113+58.4 40.0L	134.9	(CB-114) 129.90 (CB-113) 130.00	129.75	PROPOSED CB-B (CAP 15" PIPE FROM CB-114 MIN. 5' FROM SIDEWALK)
CB-113	CB	115+17.1 40.0L	136.3	-	132.00	PROPOSED CB-B WITH 4' DEEP SUMP
CB-114	CB	113+62.0 51.5L	136.1	-	130.00	PROPOSED CB-B STORMCEPTER (BY OTHERS) (CAP RCP)
dmh10	Conc	113+22.0 14.8R	135.1	(CB-111) 129.10 (dmh12) 129.10 (CB-121) 129.85	128.60	Existing DMH

NOTES:

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   - MHE (ELECTRIC POWER MANHOLE)
   - MHC (COMMUNICATIONS MANHOLE)
   - MP (METER PEDESTAL)
   - PG (GAS)
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   - PITS (PROPOSED UNDERGROUND ITS)
   - PS (PROPOSED UNDERGROUND SEWER)
   - PW (PROPOSED UNDERGROUND WATER)
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4. SEE ALIGNMENT AND GRADING PLANS FOR TEMPORARY BENCHMARK LOCATIONS.
5. WHEN ORDERED, VIDEO INSPECTION OF INSTALLED DRAIN PIPES SHALL BE SUBSIDIARY TO THE PIPE ITEM.

20 0 20 40
SCALE IN FEET

TOWN OF SALEM, NEW HAMPSHIRE
SALEM DEPOT - INTERSECTION IMPROVEMENTS

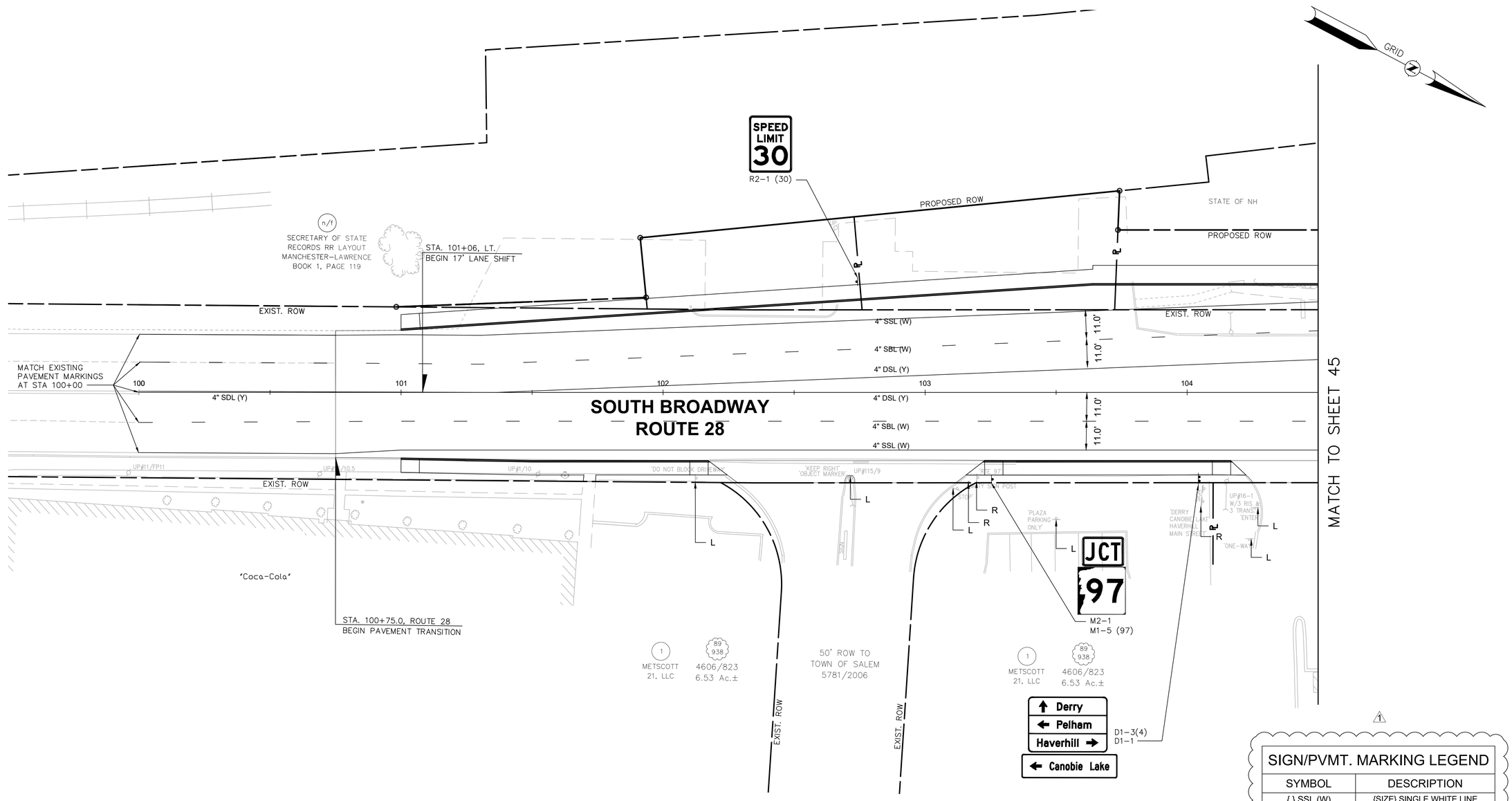
DRAINAGE & UTILITY PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	UTL	12334	40	78

NUMBER	DATE	STATION	DESCRIPTION
ADDENDUM 1	9/30/2020		STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS

REVISIONS AFTER PROPOSAL

SDR PROCCESSED — DATE
NEW DESIGN — DATE
SHEET CHECKED — DATE
AS BUILT DETAILS — DATE



NOTES:

1. ALL SYMBOLS, WORDS, TRANSVERSE MARKINGS (STOP BARS, LANE LINES, CROSSWALK LINES AND RAILROAD SYMBOLS) AND ALL OTHER MARKINGS NOTED WITH (T) SHALL BE THERMOPLASTIC.
2. THE CONTRACTOR SHALL CONTACT JULIE MATHEWS - NHDOT BUREAU OF TRAFFIC AT (603) 271-2291 TWO WEEKS PRIOR TO PAVEMENT MARKING INSTALLATION.
3. PLACE WORDS/SYMBOLS PER LATEST NHDOT STANDARD PLAN SHEETS.
4. REMOVAL OF TRAFFIC SIGNS TYPE B, C, BB, AND CC SHALL BE INCIDENTAL TO THE CONTRACT.

SIGN/PVMT. MARKING LEGEND

SYMBOL	DESCRIPTION
{ } SSL (W)	{SIZE} SINGLE WHITE LINE
{ } DSL (Y)	{SIZE} DOUBLE YELLOW LINE
4" SBL (W)	4" BROKEN WHITE LINE (SEE NHDOT STANDARD PLAN PM-2)
XW	12" CROSSWALK (SEE DETAILS)
R	REMOVE SIGN
L	LEAVE SIGN
R+R	REMOVE AND RELOCATE SIGN

20 0 20 40
SCALE IN FEET

vhb

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

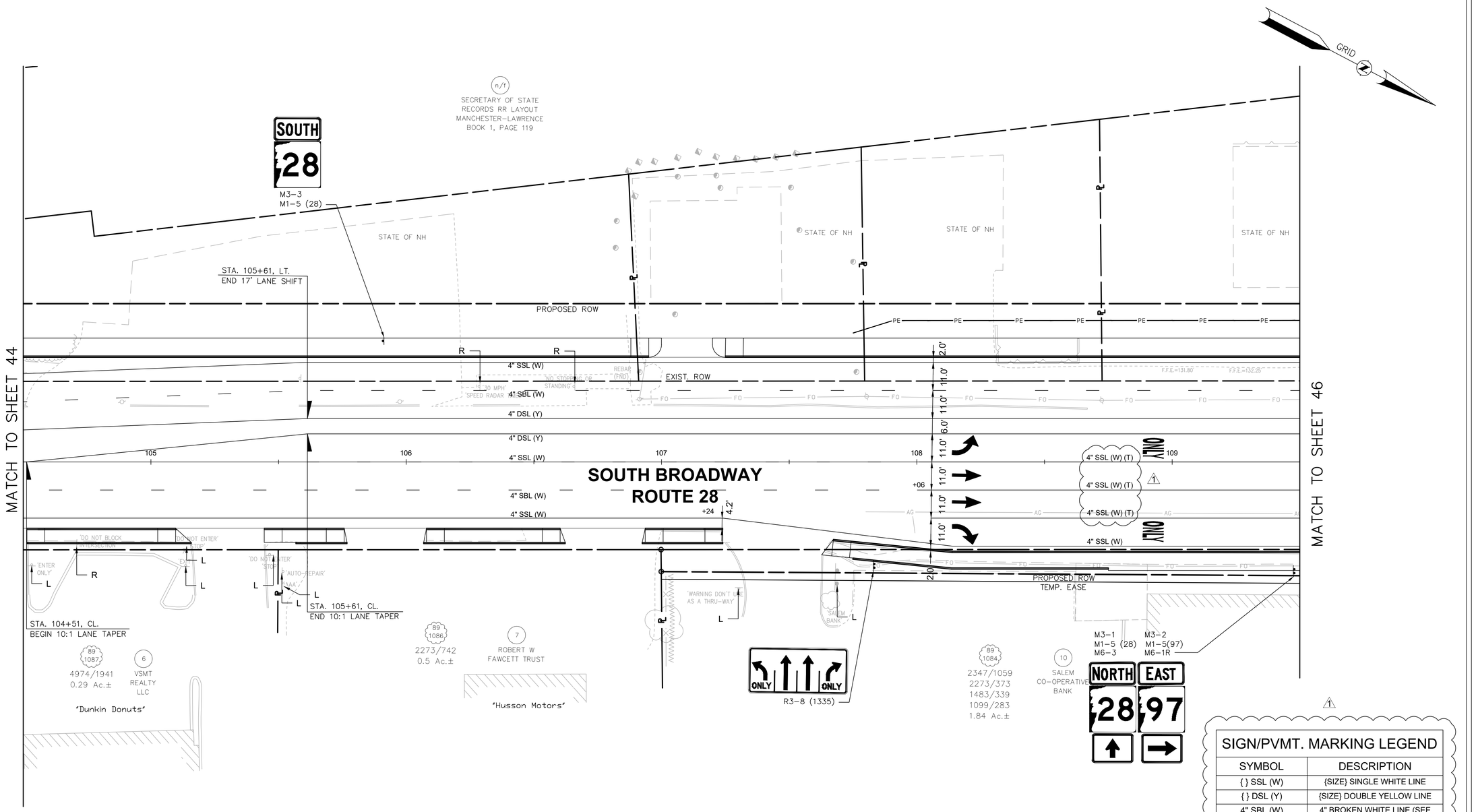
PAVEMENT MARKING & SIGNING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	PVT	12334	44	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS			9/30/2020

	DATE
SDR PROCCESSED	
NEW DESIGN	
SHEET CHECKED	
AS BUILT DETAILS	



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L	LEAVE SIGN
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20 0 20 40
SCALE IN FEET

vhb

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

PAVEMENT MARKING & SIGNING PLAN

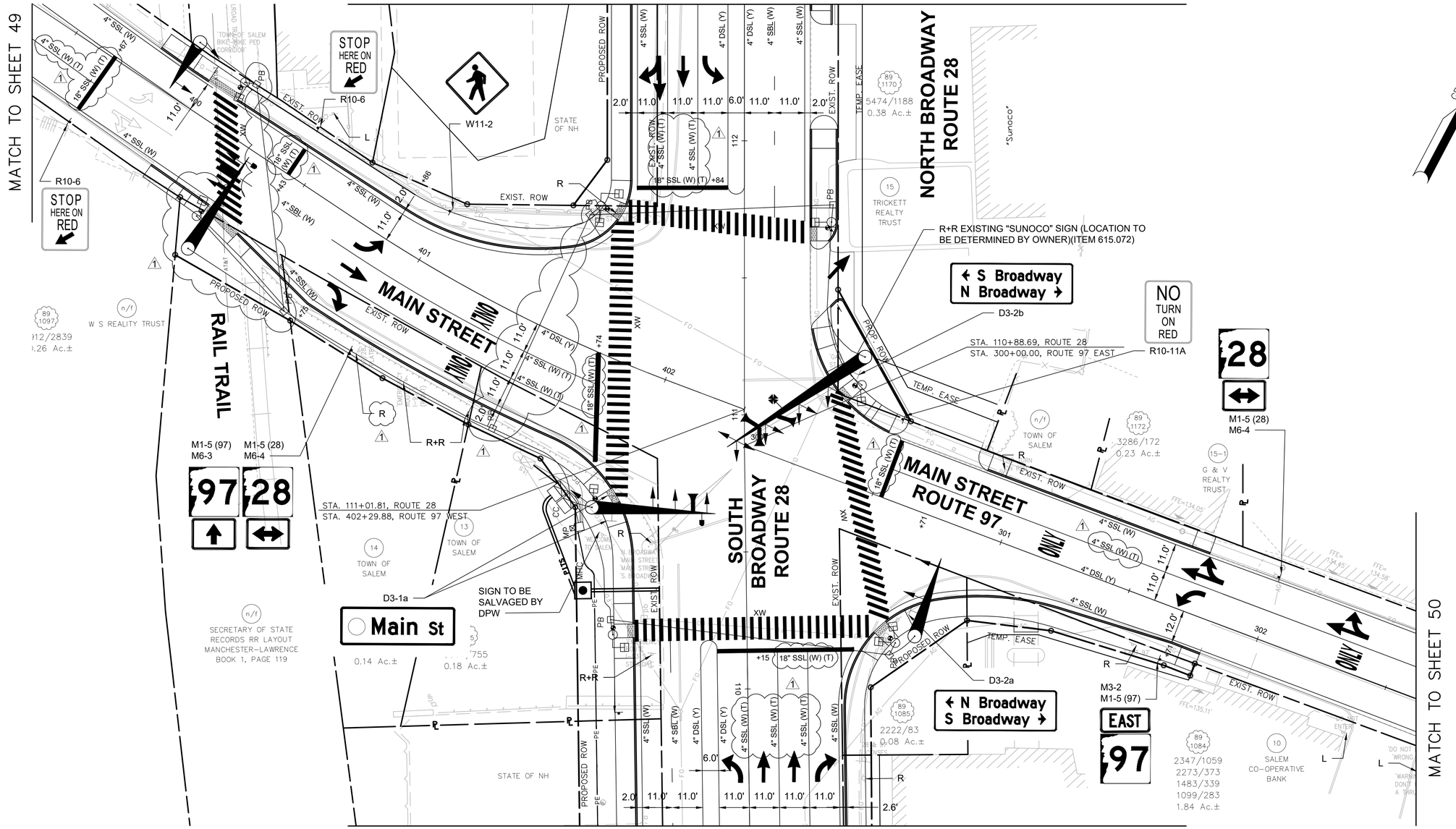
DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	PVT	12334	45	78

MATCH TO SHEET 47

MATCH TO SHEET 49

MATCH TO SHEET 50

MATCH TO SHEET 45



SIGN/PVMT. MARKING LEGEND

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20 0 20 40
SCALE IN FEET

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

	DATE
SDR PROCCESSED	
NEW DESIGN	
SHEET CHECKED	
AS BUILT DETAILS	

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

PAVEMENT MARKING & SIGNING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	PVT	12334	46	78

REVISIONS AFTER PROPOSAL

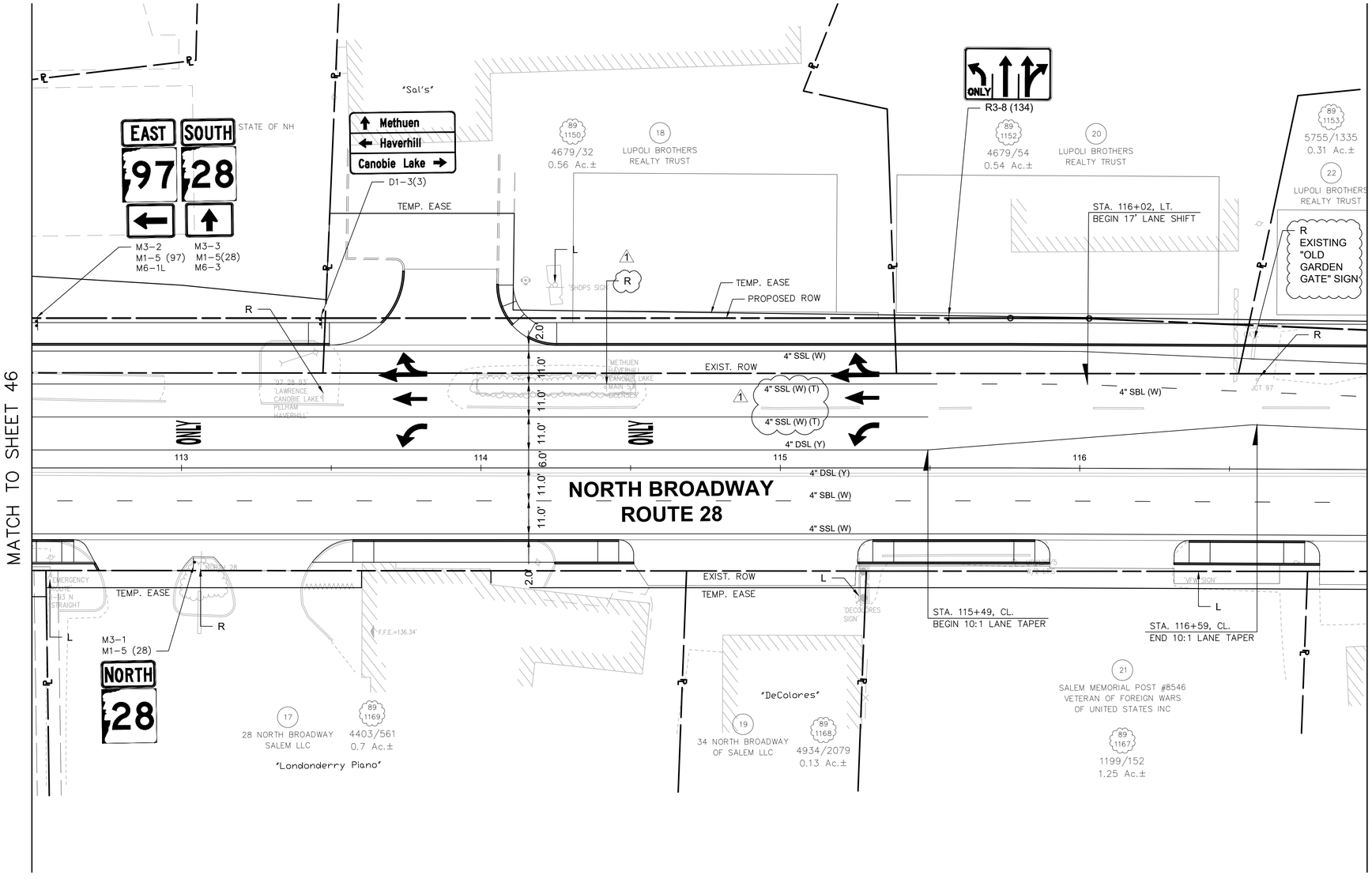
NUMBER	DESCRIPTION	STATION	DATE
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

SDR PROCCESSED DATE

NEW DESIGN DATE

SHEET CHECKED DATE

AS BUILT DETAILS DATE



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SCALE IN FEET

SIGN/PVMT. MARKING LEGEND

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XW	12" CROSSWALK (SEE DETAILS)
R	REMOVE SIGN
L	LEAVE SIGN
R+R	REMOVE AND RELOCATE SIGN

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

PAVEMENT MARKING & SIGNING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	PVT	12334	47	78

\\VHB\GBL\PROJ\BEDFORD\52223.00\CAD\TE\PRJ\CUTSHEET\12334PVT_PLANS

NUMBER	DESCRIPTION	STATION	STATION	DATE
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS			9/30/2020

REVISIONS AFTER PROPOSAL

SDR PROCCESSED — DATE
NEW DESIGN — DATE
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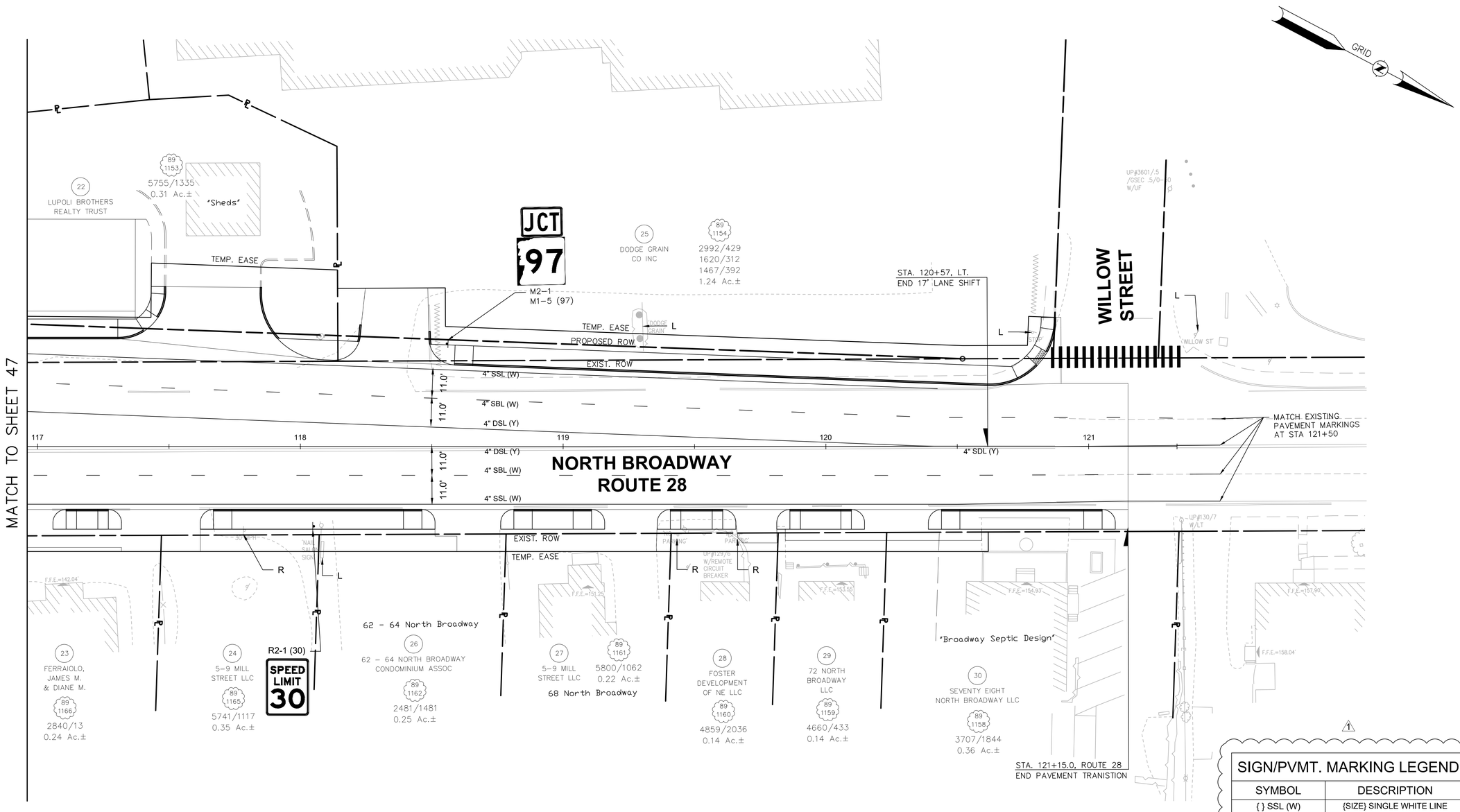
AS BUILT DETAILS — DATE



1

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SCALE IN FEET

vhb

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

PAVEMENT MARKING & SIGNING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	PVT	12334	48	78

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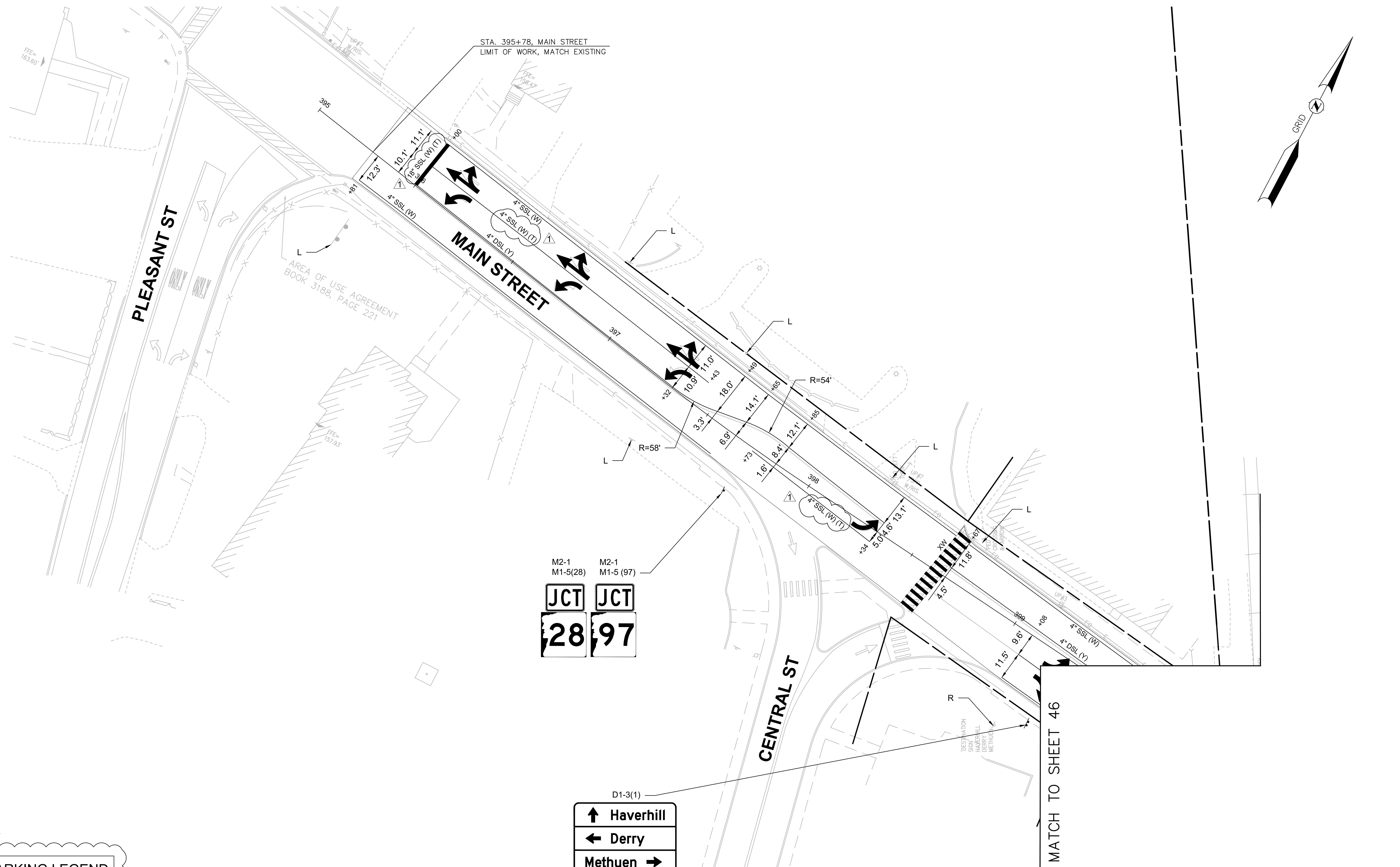

REVISIONS AFTER PROPOSAL			
NUMBER	DATE	STATION	DESCRIPTION
ADDENDUM 1	9/30/2020		STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS

SDR PROCESSED DATE
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20 0 20 40
SCALE IN FEET

vhb

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

PAVEMENT MARKING & SIGNING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	PVT	12334	49	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE
ADDENDUM 1	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

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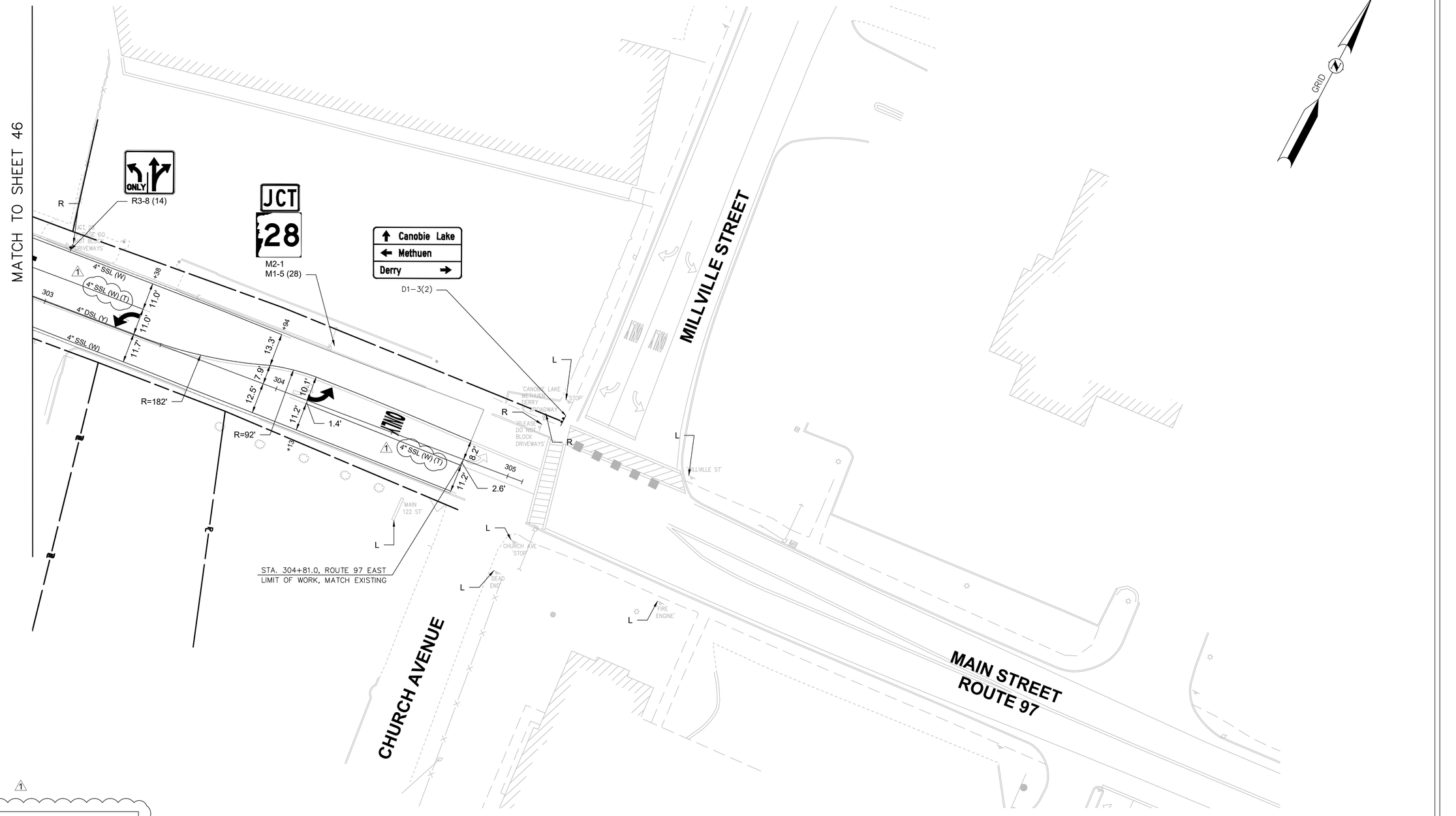
AS BUILT DETAILS		DATE



1

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3. PLACE WORDS/SYMBOLS PER LATEST NHDOT STANDARD PLAN SHEETS.

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20 0 20 40
SCALE IN FEET

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

PAVEMENT MARKING & SIGNING PLAN

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	PVT	12334	50	78

ITEM #	IDENT #	SIGN SIZE WIDTH (inch)	SIGN SIZE HEIGHT (inch)	TEXT	TEXT DIMENSIONS LETTER HEIGHT (inch) UC	LC	CAPS	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# OF SIGNS REQ'D	SIGN AREA (SQ. FT.) NOM AREA	TOTAL AREA	POSTS PER SIGN BREAKAWAY	STEEL I-BEAMS	4" ALUMINUM	U-CHANNEL-GALV.	REMARKS
615.0301	M1-5(28)	24	24	28						12D	8	4.00	32.00				1	BLACK / WHITE
615.0301	M1-5(97)	24	24	97						12D	7	4.00	28.00				1	BLACK / WHITE
615.0601	M2-1	21	15	JCT			9C				5	2.19	10.95				1	BLACK / WHITE MOUNT ABOVE M1-5(28) AND M1-5(97)
615.0601	M3-1	24	12	NORTH			7/6C				2	2.00	4.00				1	BLACK / WHITE MOUNT ABOVE M1-5(28)
615.0601	M3-2	24	12	EAST			7/6C				3	2.00	6.00				1	BLACK / WHITE MOUNT ABOVE M1-5(97)
615.0601	M3-3	24	12	SOUTH			7/6C				2	2.00	4.00				1	BLACK / WHITE MOUNT ABOVE M1-5(28)
615.0601	M6-1L	21	15	←							1	2.19	2.19				1	BLACK / WHITE MOUNT BELOW M1-5(97)
615.0601	M6-1R	21	15	→							1	2.19	2.19				1	BLACK / WHITE MOUNT BELOW M1-5(97)
615.0601	M6-3	21	15	↑							3	2.19	6.57				1	BLACK / WHITE MOUNT BELOW M1-5(28) AND M1-5(97)
615.0601	M6-4	21	15	↔							2	2.19	4.38				1	BLACK / WHITE MOUNT BELOW M1-5(28)
615.0301	R2-1(30)	30	36	SPEED LIMIT 30			5E 5E			12E	2	7.50	15.0				1	BLACK / WHITE
615.0501	D1-1	66 (1)	18	← Canobie Lake	6C	4.5C			6x9		1	8.25 (1)	8.25 (1)					WHITE / BROWN MOUNT BELOW D3-1(4)
615.0301	W11-2	36	36								1	9.00	9.00				1	BLACK / FLUORESCENT YELLOW

ITEM #	IDENT #	SIGN SIZE WIDTH (inch)	SIGN SIZE HEIGHT (inch)	TEXT	TEXT DIMENSIONS LETTER HEIGHT (inch) UC	LC	CAPS	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# OF SIGNS REQ'D	SIGN AREA (SQ. FT.) NOM AREA	TOTAL AREA	POSTS PER SIGN BREAKAWAY	STEEL I-BEAMS	4" ALUMINUM	U-CHANNEL-GALV.	REMARKS
615.0301	R3-8(1335)	48	30	ONLY ONLY			4D				1	10.00	10.00				2	BLACK / WHITE
615.0301	R3-8(14)	36	30	ONLY			4D				1	7.50	7.50				1	BLACK / WHITE
615.0301	R3-8(134)	42	30	ONLY			4D				1	8.75	8.75				1	BLACK / WHITE
615.0301	R10-6	24	36	STOP HERE ON RED			5D 3D 5D		6x14.6		2	6.00	12.00				1	BLACK / WHITE
615.0301	R10-11a	24 (1)	30 (1)	NO TURN ON RED			5E 4D 4D 4D				1	5.00 (1)	5.00 (1)				1	BLACK / WHITE
SUBSID. TO 616.191	D3-1a	54	18	Main St	8C	6C					2	6.75	13.50					WHITE / GREEN MOUNT TO MAST ARM INCLUDE TOWN SEAL
SUBSID. TO 616.191	D3-2a	78	30	← N Broadway S Broadway →	8C	6C					1	16.25	16.25					WHITE / GREEN MOUNT TO MAST ARM
SUBSID. TO 616.191	D3-2b	78	30	← S Broadway N Broadway →	8C	6C					1	16.25	16.25					WHITE / GREEN MOUNT TO MAST ARM
615.0201	D1-3(1)	60	42	↑ Haverhill ← Derry Methuen →	6D 6D 6D	4.5D 4.5D 4.5D			6x9 6x9 6x9		1	17.5	17.5				2	WHITE / GREEN
615.0201	D1-3(2)	72	42	↑ Canobie Lake ← Methuen Derry →	6D 6D 6D	4.5D 4.5D 4.5D			6x9 6x9 6x9		1	21.0	21.0				2	WHITE / GREEN /BROWN
615.0201	D1-3(3)	72	42	↑ Methuen ← Haverhill Canobie Lake →	6D 6D 6D	4.5D 4.5D 4.5D			6x9 6x9 6x9		1	21.0	21.0				2	WHITE / GREEN /BROWN
615.0201	D1-3(4)	60	42	↑ Derry ← Pelham Haverhill →	6D 6D 6D	4.5D 4.5D 4.5D			6x9 6x9 6x9		1	17.5	17.5				2	WHITE / GREEN

GENERAL NOTES

1. REFER TO THE 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION PUBLISHED BY THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION (NHDOT).
2. REFER TO THE LATEST EDITION OF THE STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION AS PUBLISHED BY THE NHDOT FOR EXACT DETAILS OF PERMANENT SIGNING STANDARDS.
3. NOTE NEW REFLECTIVITY REQUIREMENTS IN THE 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 718 PUBLISHED BY THE NHDOT.
4. REFER TO THE LATEST EDITION OF THE STANDARD HIGHWAY SIGNS MANUAL AS PUBLISHED BY THE USDOT-FHWA FOR EXACT DETAILS OF BORDERS, ETC.
5. THE ALUMINUM OR U-CHANNEL POSTS SHALL BE FLUSH WITH THE TOP OF THE TOP SIGN ON ALL SINGLE POST ASSEMBLIES.
6. DIGITALLY PRINTED SIGNS SHALL NOT BE PERMITTED.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE
1	ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS	9/30/2020

SDR PROCCESSED DATE
NEW DESIGN DATE
SHEET CHECKED DATE
AS BUILT DETAILS DATE

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

SIGN SUMMARY SHEET

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	TSSS	12334	51	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE
1 ADDENDUM	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS			9/30/2020

	DATE
SDR PROCCESSED	
NEW DESIGN	
SHEET CHECKED	
AS BUILT DETAILS	

CONSTRUCTION NOTES:

1. ALL CONSTRUCTION SHALL CONFORM WITH THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, BUREAU OF HIGHWAY DESIGN SPECIFICATIONS UNLESS OTHERWISE NOTED.
2. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED HEREIN USING NEW MATERIALS. THE TERM "REMOVE AND SALVAGE"(R+S) MEANS EQUIPMENT TO BE REMOVED AND DELIVERED TO THE TOWN OF SALEM. THE TERM "REMOVE AND RELOCATE" (R+R) MEANS EQUIPMENT TO BE REMOVED AND RE-USED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
3. PAVEMENT SAWCUTTING FOR CONDUITS AND JACKING PITS (WHEN REQUIRED) SHALL BE SUBSIDIARY TO ITEM 616.191. REPLACEMENT OF PAVEMENT FOR CONDUIT TRENCHES AND JACKING PITS WILL BE PAID UNDER ITEM 403.12 OR 403.99
4. MAST ARMS SHALL BE DESIGNED TO INCLUDE A 30"x36" SIGN MOUNTED 2-FEET TO THE RIGHT OF EACH SIGNAL HEAD.
5. ALL MAST ARM FOUNDATIONS SHALL INCLUDE A 12 INCH LAYER OF STRUCTURAL FILL BELOW THE BOTTOM OF THE FOOTING GRADE.
6. ALL MAST ARM FOUNDATIONS SHALL BE CONSTRUCTED FOLLOWING NHDOT STANDARD SPECIFICATIONS AND DETAILS.
7. ANY BEARING SURFACE MATERIAL DISTURBED BY EXCAVATION AND/OR BY DEWATERING METHODS SHALL BE REMOVED TO A DEPTH OF 12 INCHES AND REPLACED WITH STRUCTURAL FILL.
8. PLACEMENT OF STRUCTURAL FILL MATERIAL SHALL BE SUBSIDIARY TO ITEM 616.191.
9. SEE PAVEMENT MARKING AND SIGNING PLANS FOR ADDITIONAL PROPOSED AND EXISTING SIGNS.
10. PEDESTRIAN PUSHBUTTONS SHALL BE MOUNTED 42" ABOVE THE SIDEWALK.
11. ALL EQUIPMENT SHALL BE PAINTED BLACK.
12. EXISTING POWER UPON START OF CONSTRUCTION FOR THE SIGNAL SHALL BE VIA AERIAL CONNECTION BY TWO WOOD POLES TO THE EXISTING CONTROL CABINET.
13. EXISTING OVERHEAD POWER FEED SHALL BE REMOVED AND DISPOSED UPON INSTALLATION OF THE NEW CABINET AND POWER CONNECTIONS.

PROPOSED SIGNAL MOUNTED SIGNS

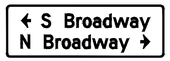
R10-3eR 9"x15" 4 - PROPOSED | R10-3eL 9"x15" 2 - PROPOSED | R10-3e 9"x15" 2 - PROPOSED

THE ABOVE SIGNS SHALL BE MOUNTED WITH PROPOSED PEDESTRIAN PUSH BUTTONS.

D3-1a
1 (54"x18")
2 - PROPOSED

R10-6
24"x36"
2 - PROPOSED

D3-2a
1 (78"x30")
1 - PROPOSED



D3-2b
1 (78"x30")
1 - PROPOSED

MAST ARM FOUNDATION	
LOCATION	TYPE
	TO BE COMPLETED WHEN GEOTECH REPORT COMPLETE

TEST BORINGS	
HOLE ID	LOCATION
	TO BE COMPLETED WHEN GEOTECH REPORT COMPLETE

EXISTING / PROPOSED FOUNDATION SCHEDULE

I.D.	STATION	FOUNDATION TYPE	REMARKS
102	STA 110+60 LT 61	–	PROPOSED POWER SOURCE *
2	STA 110+20 LT 49	TSFND	PROPOSED PEDESTAL POLE
3	STA 110+26 LT 50	PB	PROPOSED PULL BOX
4	STA 110+67 LT 56	TYPE TBD	W/ ANCHOR BOLTS FOR SIGNAL POLE
102	STA 110+60 LT 61	TSFND	PROPOSED PEDESTAL POLE (METER) *
7	STA 110+70 LT 64	CCFND	PROPOSED CONTROLLER CABINET
1 8	STA 401+51 RT 41	PB	PROPOSED PULL BOX
9	STA 110+84 LT 79	–	existing its cabinet
1 10	STA 400+69 RT 42	PB	PROPOSED PULL BOX
11	STA 400+24 RT 31	TSFND	PROPOSED PEDESTAL POLE
12	STA 399+90 LT 23	TYPE TBD	W/ ANCHOR BOLTS FOR SIGNAL POLE
13	STA 400+15 LT 21	PB	PROPOSED PULL BOX
14	STA 111+73 LT 56	PB	PROPOSED PULL BOX
15	STA 111+76 LT 52	TSFND	PROPOSED PEDESTAL POLE
16	STA 111+77 RT 32	PB	PROPOSED PULL BOX
17	STA 111+70 RT 32	TSFND	PROPOSED PEDESTAL POLE
18	STA 111+21 RT 44	TYPE TBD	W/ ANCHOR BOLTS FOR SIGNAL POLE
19	STA 111+10 RT 43	TSFND	PROPOSED PEDESTAL POLE
20	STA 110+19 RT 61	TYPE TBD	W/ ANCHOR BOLTS FOR SIGNAL POLE
21	STA 110+18 RT 53	TSFND	PROPOSED PEDESTAL POLE
22	STA 110+12 RT 52	PB	PROPOSED PULL BOX
23	STA 400+28 RT 43	TYPE TBD	W/ ANCHOR BOLTS FOR SIGNAL POLE
24	STA 400+11 LT 19	TSFND	PROPOSED PEDESTAL POLE
25	STA 110+77 LT 75	–	existing wood pole
26	STA 111+84 LT 62	–	existing wood pole

WHERE:

TYPE # = TRAFFIC SIGNAL MAST ARM FOUNDATION CONSTRUCTED IN ACCORDANCE WITH NHDOT TRAFFIC SIGNAL STANDARD TS-1, TS-2, OR TS-3 AS APPLICABLE. TBD MEANS TO BE DETERMINED BY CONTRACTOR OR HIS ENGINEER BASED ON BORINGS TO BE COMPLETED BY THE CONTRACTOR.

PB = 14-INCH CONCRETE PULL BOX CONSTRUCTED IN ACCORDANCE WITH NHDOT SIGNAL AND LIGHTING STANDARD SL-1 (UNLESS OTHER SIZE NOTED)

CCFND = CONCRETE FOUNDATION FOR CONTROLLER CABINETS CONSTRUCTED IN ACCORDANCE WITH NHDOT SIGNAL AND LIGHTING STANDARDS SL-2

TSFND = CONCRETE FOUNDATION FOR PEDESTALS (SIGNAL AND METER) CONSTRUCTED IN ACCORDANCE WITH NHDOT SIGNAL AND LIGHTING STANDARDS SL-2

* = DETAILS FOUND ON ITS PLANS

PROPOSED CONDUIT SCHEDULE

I.D.	NO.	LENGTH	SCHEDULE TYPE	REMARKS
2 - 3	1	6	40	FROM PROP PP TO PROP PB
3 - 7	1	45	40	FROM PROP PB TO PROP CC
3 - 22	1	103	80	FROM PROP PB TO PROP PB
4 - 7	1	6	40	FROM PROP MA TO PROP CC
102 - 7	1	8	40	FROM PROP MP TO PROP CC
1 7 - 8	1	40	40	FROM PROP CC TO PROP PB
1 8 - 10	1	88	40	FROM PROP PB TO PROP PB
1 8 - 14	1	86	80	FROM PROP PB TO PROP PB
1 10 - 11	1	48	40	FROM PROP PB TO PROP PP
1 10 - 13	1	84	80	FROM PROP PB TO PROP PB
1 10 - 23	1	42	40	FROM PROP PB TO PROP MA
12 - 13	1	29	40	FROM PROP MA TO PROP PB
13 - 24	1	5	40	FROM PROP PB TO PROP PP
14 - 15	1	6	40	FROM PROP PB TO PROP PP
14 - 16	1	89	80	FROM PROP PB TO PROP PB
16 - 17	1	7	40	FROM PROP PP TO PROP PB
17 - 18	1	56	40	FROM PROP PB TO PROP MA
17 - 19	1	64	40	FROM PROP PB TO PROP PP
20 - 22	1	12	40	FROM PROP MA TO PROP PB
21 - 22	1	5	40	FROM PROP PP TO PROP PB
TOTAL:		40: 467'	80: 362'	40 = 3-INCH PVC SCHEDULE 40 80 = 3-INCH PVC SCHEDULE 80

1

ITEM 616.191

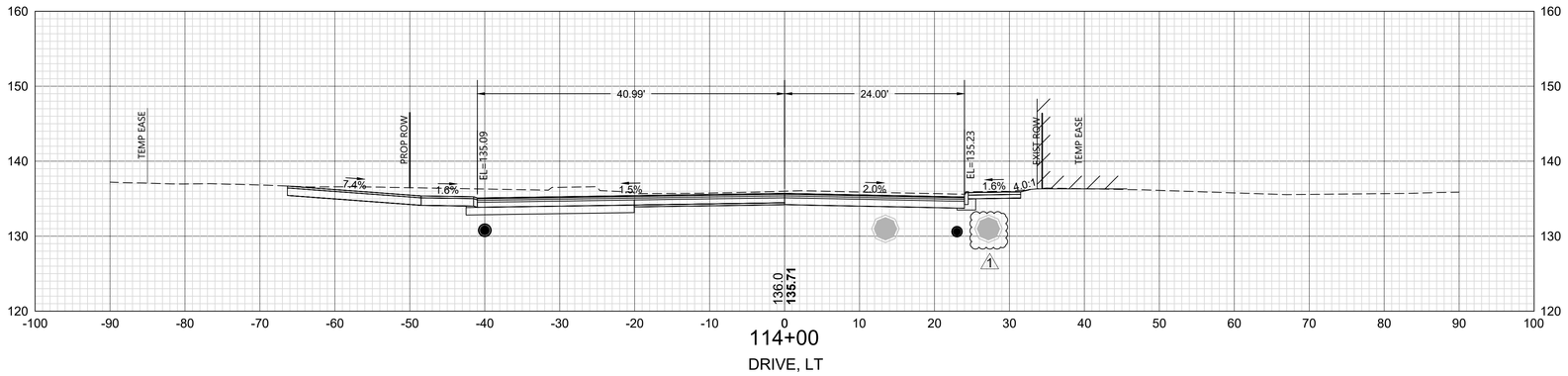
TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

SIGNALIZATION PLAN

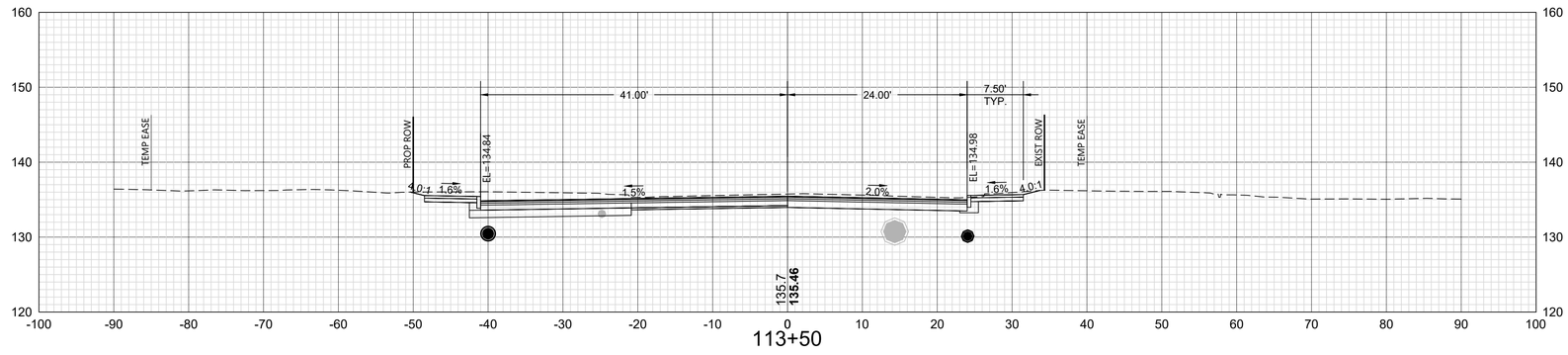
vhb

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	SIG	12334	53	78

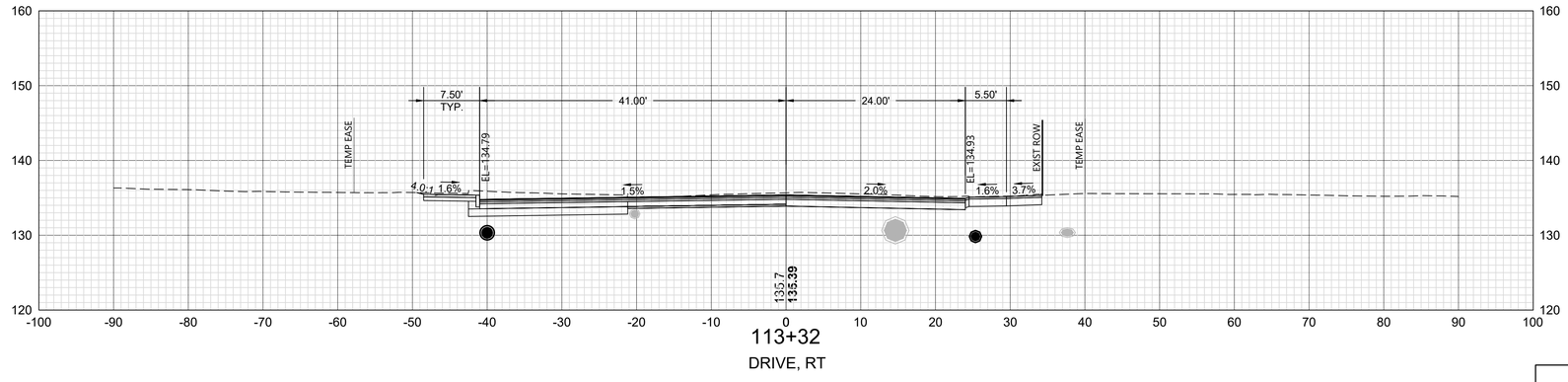


114+00

DRIVE, LT



113+50



113+32

DRIVE, RT

HORIZONTAL
10 0 10 20
10 0 10 20
VERTICAL
SCALE IN FEET

REVISIONS AFTER PROPOSAL

STATION	DESCRIPTION	STATION	DATE
	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS		9/30/2020

NUMBER	DATE
ADDENDUM 1	

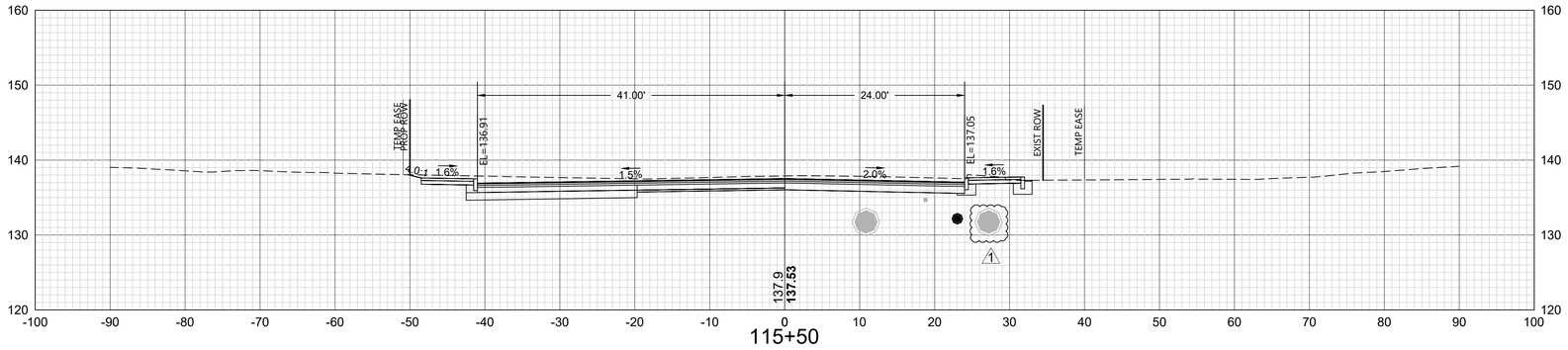
		DATE
SDR PROCCESSED	VHB	
NEW DESIGN	KMH	9/30/20
SHEET CHECKED	GLB	9/30/20
AS BUILT DETAILS		DATE

TOWN OF SALEM, NEW HAMPSHIRE

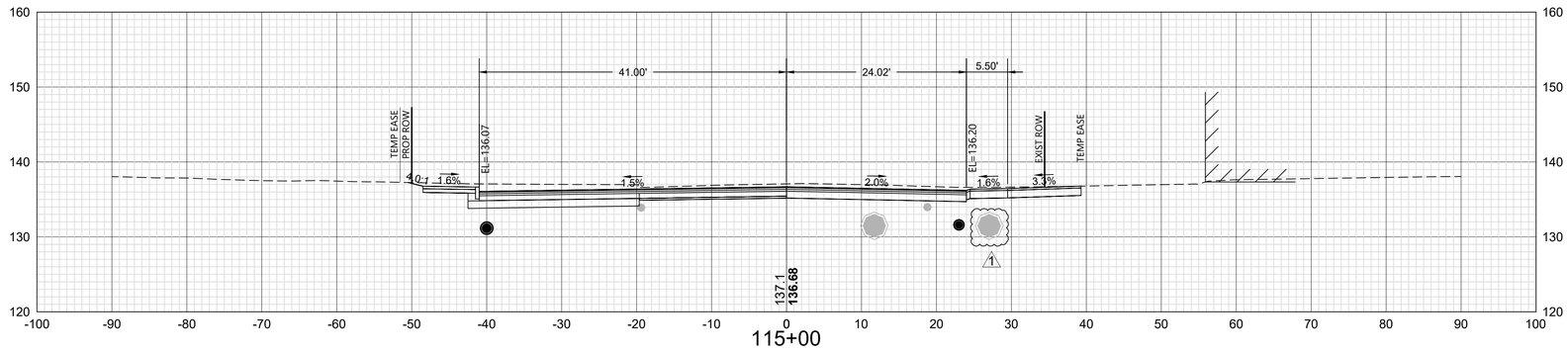
SALEM DEPOT - INTERSECTION IMPROVEMENTS

CROSS SECTIONS
ROUTE 28

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	XS	12334	68	78

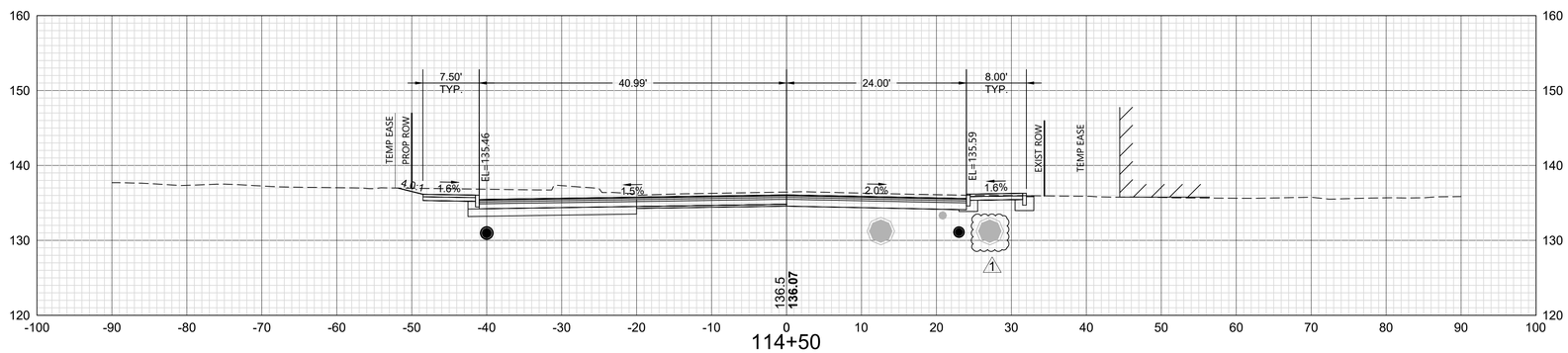


115+50



115+00

DRIVE, RT



114+50

HORIZONTAL
10 0 10 20
10 0 10 20
VERTICAL
SCALE IN FEET

TOWN OF SALEM, NEW HAMPSHIRE

SALEM DEPOT - INTERSECTION IMPROVEMENTS

CROSS SECTIONS
ROUTE 28

DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
30-Sep-20	52223.00	XS	12334	69	78

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE
ADDENDUM 1	STRIPING, SIGN, SIGNAL, BOUND, DRAINAGE AND PAVEMENT/CURB MODIFICATIONS			9/30/2020

		DATE
SDR PROCCESSED	VHB	
NEW DESIGN	KMH	9/30/20
SHEET CHECKED	GLB	9/30/20
AS BUILT DETAILS		DATE