NOTE: TITLES AND PAGE NUMBERS FOUND IN THIS AREA WITHIN THE INNER AND OUTER SHEET BORDER LINES ARE INCLUDED TO NAVIGATE THE SAMPLE DRAWINGS AND ARE NOT TO BE INCLUDED ON PROJECT SUBMISSIONS.

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

MASSDOT PROJECT DEVELOPMENT & DESIGN GUIDE
CHAPTER 18, VOL III: PROJECT SAMPLE PLANS

JUNE 2026

654123_HD_TITLE_(PDDG).DWG Plotted on 25-Jun-2026 5:01 p

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General Notes

1. This sample plan set is provided for illustrative purposes only and is not intended to represent standard design practices or requirements for all MassDOT Highway Division projects. The design elements and project details shown herein may not reflect current or typical MassDOT design standards in all cases.

2. The primary purpose of VOL III: PROJECT SAMPLE PLANS is to demonstrate standardized graphical presentation and to provide guidance on the formatting, organization, and drafting methods used in the preparation of MassDOT Highway Construction Plans. Users shall refer to the latest applicable MassDOT design manuals, standards, and project-specific requirements for actual design guidance.

3. The sample plans demonstrate the applicable graphical and CAD standards required for MassDOT Highway Construction Plans submissions. Graphical standards (shown as red keynotes) refer to the drafted style of the plan and how the project information is conveyed. CAD standards (shown as blue keynotes) refer to the means and methods of drawing preparation using the MassDOT CAD Standards.

4. The samples and guidance provided within the sample plan set are intended to facilitate project drawing development, quality, and consistency. The sample plan set shall also be used as a primary reference for the review of Highway Construction Plan submissions.

5. The information found within the graphical and CAD standards keynotes is intended to serve as a summary only. Users shall be directed to the most detailed information within the MassDOT PDDG or CAD Standards documentation.

6. Sheet numbers shown within the sample sheet title blocks are for demonstration purposes only and are not intended to reflect the actual page numbers required for each project plan set.

KEYNOTES LEGEND

[#] GRAPHICAL STANDARDS KEYNOTE

(#) CAD STANDARDS KEYNOTE

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

18 **ANDOVER** (2)
ROUTE 104 AT ROUTE 112

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA 19	01	60
PROJECT FILE NO.	654123		

TITLE SHEET & INDEX

1 PLAN AND PROFILE OF

INTERSECTION RECONSTRUCTION ON ROUTE 104 (READING ROAD)
2
AT ROUTE 112 (LAKESHORE AVENUE AND WILMINGTON ROAD)
3
IN THE TOWN OF

ANDOVER

ESSEX COUNTY

FEDERAL AID PROJECT NO. NFA 4

100% SUBMITTAL 5

OTHER COMMON SHEET TYPES (IF REQUIRED)

INDEX 6 (3)

	SHEET NO. 7	DESCRIPTION
	1	TITLE SHEET & INDEX
	2	INDEX
	3	LEGEND & ABBREVIATIONS
	4	GENERAL NOTES
BORING LOGS	5	KEY PLAN & BORING LOCATIONS
SURVEY BASE PLANS	6 - 7	TYPICAL SECTIONS
	8 -10	SURVEY CONTROL PLANS
	11 - 13	CONSTRUCTION PLANS
	14 -17	CONSTRUCTION PROFILES 8
	18 - 19	CONSTRUCTION PROFILES - SIDE STREETS
	20 - 22	CURB TIE & GRADING PLANS
	23 - 25	DRAINAGE & UTILITY PLANS
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TRAFFIC SIGNAL PLANS	31	TRAFFIC LEGEND, ABBREVIATIONS AND NOTES
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	37 - 39	LANDSCAPE PLANS
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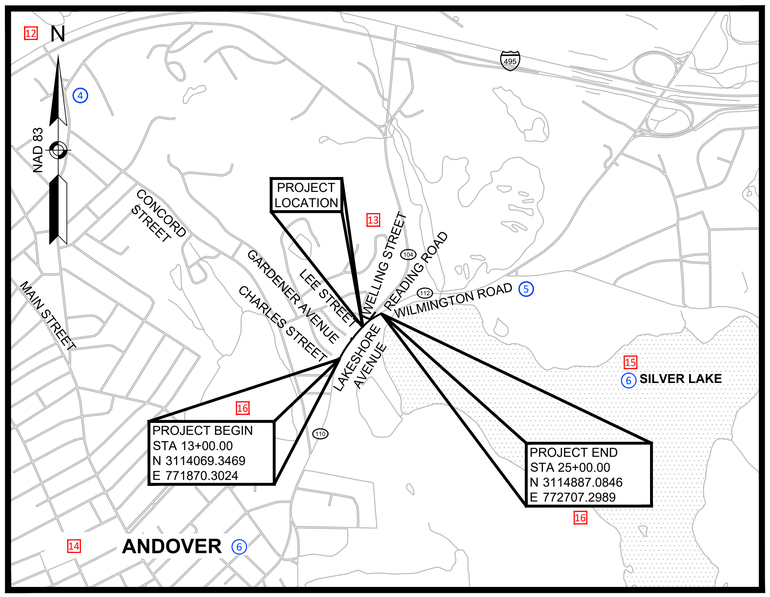


17 1000 0 1000 2000
SCALE: 1" = 1000'

20

THESE PLANS ARE SUPPLEMENTED BY THE LATEST EDITIONS OF THE FOLLOWING PUBLICATIONS, AS IDENTIFIED IN THE CONTRACT SPECIAL PROVISIONS: THE MASSDOT CONSTRUCTION STANDARD DETAILS, THE MASSDOT STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE MASSDOT STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, THE MASSDOT OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, THE MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, AND THE ANSI AMERICAN STANDARD FOR NURSERY STOCK.

21 DESIGN DESIGNATION

ROAD	ROUTE 112 LAKESHORE AVENUE 22	ROUTE 104 READING ROAD 22
DESIGN SPEED	40 MPH	40 MPH
ADT (2019)	13,650 VPD	4,950 VPD
ADT (2039)	16,650 VPD	6,050 VPD
K	8.6%	10.2%
D	56% NB	81% SB
T (PEAK HOUR)	1.5%	0.2%
T (AVERAGE DAY)	1.9%	2.0%
DHV	1,440 VPH	620 VPH
DDHV	810 VPH	500 VPH
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL	URBAN MINOR ARTERIAL

26 LENGTH OF PROJECT = 1804.00 FEET = 0.342 MILES

23

DATE	DESCRIPTION	REV #
02/15/2021	100% SUBMISSION	0
06/12/2020	75% SUBMISSION	0
05/25/2019	25% SUBMISSION	0

If secondary P.E. seal and signature are required, please add additional blocks here.

24 **P.E. STAMP SIGNATURE**

If secondary P.E. seal and signature are required, please add additional blocks here.

COMPANY NAME AND ADDRESS
Length of block may vary to accommodate company name.
25

massDOT Massachusetts Department of Transportation Highway Division

APPROVED

CHIEF ENGINEER DATE

Plotted on 2-Dec-2025 9:07 AM

01 654123_HD_TITLE.DWG

TITLE KEYNOTES

SAMPLE PLAN KEYNOTES	
#	KEYNOTE DESCRIPTION
1	Indicate the type of construction plan set.
2	For projects with a Town Line Bridge (bridges spanning a town line possessing multiple bridge numbers), an additional line is required to include the additional bridge number.
3	Indicate whether the municipality(ies) where the project is located is a town or city.
4	Please erase FEDERAL AID PROJECT NO. text for non-Federal Aid projects. FEDERAL AID PROJECT NO. text shown only as a sample graphical reference.
5	Plan submissions should show design stage (25, 75, or 100 percent). Delete "##% SUBMITTAL" text from final PS&E submittal. There should be no submittal stage text on the final PS&E plan set title sheet.
6	If space permits, place Index on the title sheet, otherwise place Index on separate sheet and place the following note on the title sheet: "SEE SHEET NO. 2 FOR INDEX".
7	Single-digit sheet numbers shall be numbered 01, 02, 03, etc. Series of sheets such as Construction Plans shall be indicated with a sheet range as shown.
8	Plans and profiles may appear on the same sheet. Curb Tie and Grading Plans may be provided as separate Curb Tie Plan and Grading Plan sheets. Drainage and Utility Plans may be provided as separate Drainage Plan and Utility Plan sheets.
9	Traffic Plans shall be located following the Drainage and Utility Plans.
10	Landscape plans shall follow any Traffic plans.
11	Bridge Plans are added to the end of the Highway Construction Plans.
12	Provide a locus plan reproduced from a topographic map (without contours) or similar map or plan. The locus plan shall be suitable for producing a clear legible photocopy. The locus plan shall not be a photograph, color map, or shaded map. Provide a North Arrow for the locus plan that points in the 90 degree direction (directly to the top of the sheet). The North Arrow shall be placed in the upper left of the locus plan.
13	Denote route numbers and names of all roads in the vicinity of the project.
14	Denote the name of all municipalities shown on the locus plan.
15	Denote the names of all major geographic features shown on the locus map.
16	Denote the stations to the nearest 0.01 foot and coordinates to the nearest 0.0001 foot for the beginning and end of project.
17	The locus plan must be drawn to scale and at a scale large enough to clearly identify and label the project location. Provide a bar scale denoting the scale of the locus plan.
18	Federal Aid Block: Include Federal Aid project number, project file number, sheet number and total sheet count on all sheets in the plan set.
19	Enter "NFA" for non-Federal Aid projects. NFA shown here only as a sample graphical reference.
20	Use the latest Design References Note available from the MassDOT CAD Standards Department. The note is provided with the latest version of the MassDOT CAD Standards. In the event the note must be updated on the sheet, place the Design References Note directly below the Federal Aid block. The Standard Specifications are not to be listed in the Design References Note.
21	Provide listing of the Design Designation Data including all traffic data and Functional Classification of roadway(s).
22	Add Street names in addition to Route number if applicable.
23	The revision block on the title sheet shall be used to track submission and re-submission revision dates during the project design phase. All information shall be cleared from the revision block on the Title Sheet when the project is advertised. From this point on, the revision block shall be used to track all revisions during the project construction phase and shall become a permanent part of the title sheet.
24	Block for the P.E. seal and signature of the design consultant. Projects sealed by multiple firms may stamp as required on a project-specific basis.
25	Block for the design consultant's firm name and address.
26	Denote the project length of roadway, expressed to the nearest 0.01 foot and 0.001 mile. This is the length of roadway measured along the center line of construction considering all equations. The length of divided highways will be the average length of each roadway.
27	Not all sheets necessary in a plan set are included in the project sample plans. Not all sheets shown in the above listing are required for all projects. Atypically large or complex projects with many sheets may require non-standard index on one or more dedicated plan index sheets.

SAMPLE PLAN CAD KEYNOTES	
#	KEYNOTE DESCRIPTION
1	To create the Highway Construction Plans Title Sheet layout, follow the guidance provided in the MassDOT Sheet Production Toolset (MSPT) Help Doc for Highway Construction Plans. The sheet layout template is available in the HWY_CONST_PLAN_SHEETS.dwg sheet template DWG file available in the MassDOT CAD Standards downloads.
2	MassDOT sheet layout templates contain Sheet Set Manager (SSM) text fields that display sheet data such as project numbers and location consistently throughout a plan set. Fields may be provided as either block attributes or text objects within the sheet layout templates. A key to all SSM field locations is provided in the MSPT Help Docs. Any SSM field can be overriden by simply overwriting the field in the block attribute or text object.
3	Table Style: DOT-Index Layer: GE-SHEET The Drawing Index is provided on the sheet layout template with a pre-populated list of sheets, change the list to reflect the actual project sheet listing and sheet numbering for the project.
4	The TITLE SHEET sheet layout template contains all necessary blocks for the locus map. Some blocks are embedded with SSM fields. The North Arrow block is provided at 0.75 of its normal size.
5	Use text style DOT-Standard at 0.125" height on locus map text as the default size.
6	Use DOT-Standard-Bold text style at varying sizes to label major features such as lakes, town, and state names.

NOTE:
KEYNOTE NUMBERING MAY NOT BE CONSECUTIVE. SOME GAPS HAVE BEEN LEFT TO ALLOW FOR FUTURE KEYNOTES TO BE PLACED.

654123_HD_TITLE.DWG Plotted on 2-Dec-2025 9:07 AM

ANDOVER
ROUTE 104 AT ROUTE 112

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	05	60
PROJECT FILE NO.	654123		

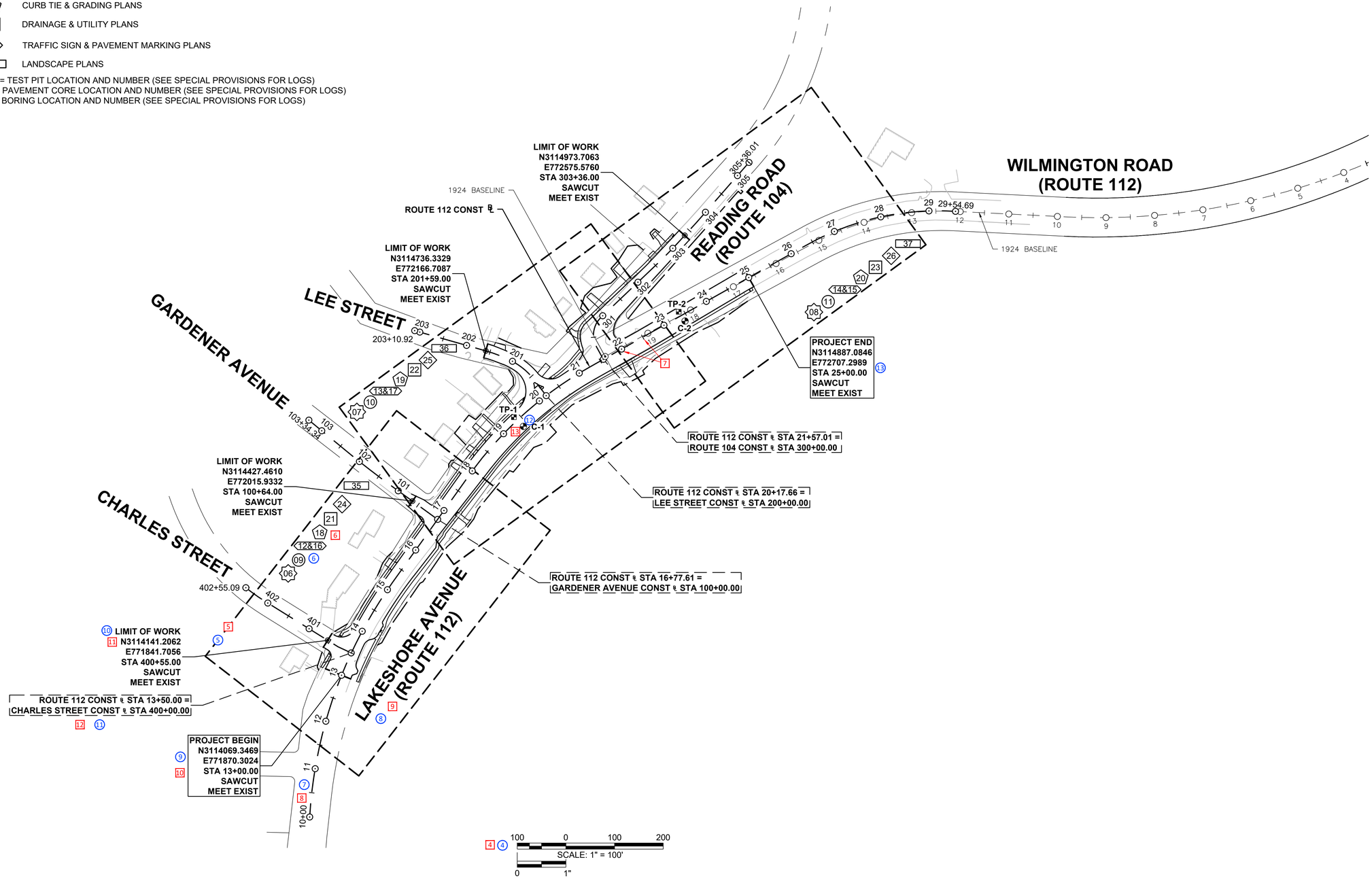
KEY PLAN & BORING LOCATIONS

SHEET REFERENCE LEGEND

SYMBOL	DRAWING TITLE
#	SURVEY CONTROL PLANS
##	CONSTRUCTION PLANS
##	CONSTRUCTION PROFILES
##	CURB TIE & GRADING PLANS
##	DRAINAGE & UTILITY PLANS
##	TRAFFIC SIGN & PAVEMENT MARKING PLANS
##	LANDSCAPE PLANS

TP-# = TEST PIT LOCATION AND NUMBER (SEE SPECIAL PROVISIONS FOR LOGS)
C-# = PAVEMENT CORE LOCATION AND NUMBER (SEE SPECIAL PROVISIONS FOR LOGS)
B-# = BORING LOCATION AND NUMBER (SEE SPECIAL PROVISIONS FOR LOGS)

N
NAD83



654123_HD_KEYPLAN.DWG Plotted on 25-Jun-2026 4:55 p

KEY PLAN & BORING LOCATIONS KEYNOTES

10-Dec-2025 8:42 AM
654123_HD_KEYPLAN.DWG

SAMPLE PLAN KEYNOTES

#	KEYNOTE DESCRIPTION
1	The location of the north arrow is typically in the upper left hand corner but can be shifted to accommodate the information on the plan.
2	Provide a Sheet Reference Legend denoting where drawing numbers and titles from the sheet index are located spatially.
3	Provide a symbol and abbreviation legend for the Key Plan & Boring Locations sheet. When soil logs are not shown on the key plan & boring locations, note that they can be found in the specifications/special provisions. (Refer to the MassDOT Bridge Manual for requirements for projects that are governed by the requirements of the Bridge Manual.)
4	Include a bar scale in the bottom center area of the sheet. Key plans are drawn at a scale that will fit the entire project one a single sheet, if possible. All key plans must indicate drawing scale.
5	Show the outline of each sheet view location. All sheets referenced shall show the same view limits. Each sheet view rectangle shall bear symbols indicating the number of the referenced sheet in this sheet view location. Each sheet symbol used shall be from the standard General ID symbol set. All sheet reference symbols shall be shown in the Sheet Reference Table. No key plan sheet index shall be shown except as approved for large and complex projects.
6	Sheet reference symbols can be located anywhere along the edges of their respective sheet reference view frame. The sheet ## symbol text within the ID symbol shall be oriented horizontal on the sheet.
7	Ensure view frame overlap includes at least two alignment station markers (tick or label) and one station label. Two correlating alignment points must exist within the overlap and be shown on each sheet in the plan set.
8	Show each construction baseline with station labels only. It is not necessary to show any baseline horizontal geometry labels such as PC's and PT 's.
9	All streets, roads, highways, and other public ways shall be called out using 1/4" tall, bold text.
10	Denote the stations and coordinates for the beginning and end of the project to the nearest 0.01 foot and coordinates to the nearest 0.0001 foot. The beginning of a project is always the southerly or western end; the end is always the northerly or easterly extremity.
11	Denote the stations to the nearest 0.01 foot and coordinates to the nearest 0.0001 foot at each of the limits of work.
12	Denote all intersecting baseline equations using a dashed border callout.
13	Show the locations of soil testing such as test pits and borings and label the symbol with an identifier to match into the soil logs.

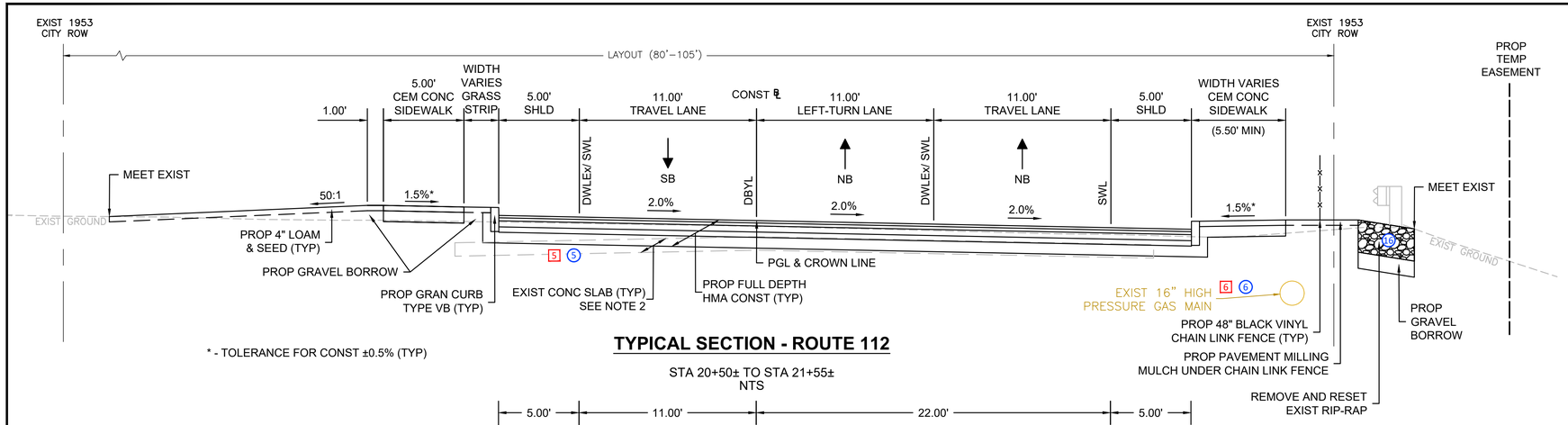
SAMPLE PLAN CAD KEYNOTES

#	KEYNOTE DESCRIPTION
1	To create the Highway Construction Plans KEY PLAN layout, follow the guidance provided in the MassDOT Sheet Production Toolset (MSPT) Help Doc for Highway Construction Plans. Use the Blank sheet template layout SHEET_HCP within the HWY_CONST_PLAN_SHEETS.dwg sheet template DWG file available in the MassDOT CAD Standards downloads.
2	The North Arrow symbol for plan sheets in the Highway Construction Plans use the GE-NORTH block symbol inserted on the GE-SHEET layer. MassDOT CAD State Kit users can insert this block from the Sheet Symbols tool palette by navigating to the MassDOT ribbon tab and selecting the Sheet Symbols button and then locating the North Arrow block tool on the palette. The North Arrow block symbol shall be inserted in model space to maintain the correlation of the North Arrow and plan view orientation should the orientation or spatial location of a sheet change over the course of drawing development. The horizontal datum to display on the North Arrow can be set by selecting the block and changing the visibility state grip to either refer to State Plane (True) North or a Magnetic (Assumed) North reference.
3	Legends specific to a sheet shall be created using a Table object of style DOT-LEGEND on layer GE-TEXT. Insert the block symbol into the table on the left column as shown. Enter the description of the symbol found in the right column by editing the DESCRIPTION attribute of the ID block symbol.
4	The bar scale symbol for plan sheets in the Key Plan use the GE-BARSC block symbol inserted on the GE-SHEET layer. The bar scale block shall be inserted in Model space to maintain a visual correlation of the viewport scale and target drawing scale depicted by the bar scale symbol. Ensure all viewport scales are set to the correct MassDOT annotation scale setting provided in the MassDOT Civil 3D templates prior to plotting. Select the key plan scale using the dynamic block visibility state grip.
5	Draw the sheet views on layer GE-KEYPLAN.
6	Each sheet type is assigned a general ID block symbol from the GE-ID blocks. Place each block on the PR-HD-TEXT layer. A sheet set manager sheet number reference field can be added to the ID attribute of the ID symbol block to keep sheet numbers coordinated with its symbol on the key sheet.
7	Include all reference and proposed baselines as Civil 3D alignments. Include the referenced station label set style and place the label sets on the referenced station labels layer. Ensure all labels do not overlap by flipping and dragging them as necessary. Proposed Alignment Style: MassDOT_Proposed Construction Centerline Existing Alignment Style: Select an EX style based on the layout type of the referenced baseline. Alignment Object Layer: OB-BASELINE-[Alignment Name] Proposed Alignment Station Label Set Style: MassDOT_Proposed BL_Major and Minor Only Proposed Alignment Station Labels Layer: PR-HD-BL-TEXT Existing Alignment Station Label Set Style: MassDOT_Existing Existing Alignment Station Labels Layer: EX-SV-BL-TEXT
8	Label roadway names using block HD-STREET_TITLE inserted on layer PR-HD-BL-TEXT. This block contains attribute text using text style DOT-STREET at a 0.25" height for the roadway name and route number. The block can be changed to show only the roadway name or roadway name with route number. Select the block and click on the block visibility state grip to choose the label configuration.
9	Label the beginning project limit as a Civil 3D alignment station offset label. Label Style: MassDOT_PR_HD_BL_PROJECT BEGIN Object Layer: PR-HD-BL-TEXT Marker Style: MassDOT_Circle Edit the Description 1 and Description 2 label components if the limit of work is not described as SAWCUT MEET EXIST.

SAMPLE PLAN CAD KEYNOTES

#	KEYNOTE DESCRIPTION
10	Label the Limit Of Work as a Civil 3D alignment station offset label. Label Style: MassDOT_PR_HD_BL_LIMIT OF WORK Object Layer: PR-HD-BL-TEXT Marker Style: MassDOT_Circle Edit the Description 1 and Description 2 label components if the limit of work is not described as SAWCUT MEET EXIST.
11	Label the baseline intersection station equations as a Civil 3D alignment station offset label. Label Style: MassDOT_PR_HD_BL_STA_EQUA Object Layer: PR-HD-BL-TEXT Marker Style: MassDOT_Circle After applying the label to the primary baseline alignment object, select the intersecting baseline alignment to set the alignment name and station of intersection.
12	Test pits and soil boring locations shall be depicted using blocks HD-TEP and HD-BHL, respectively. Place symbols and labels on layer PR-GT-FEAT.
13	Label the end project limit as a Civil 3D alignment station offset label. Label Style: MassDOT_PR_HD_BL_PROJECT END Object Layer: PR-HD-BL-TEXT Marker Style: MassDOT_Circle Edit the Description 1 and Description 2 label components if the limit of work is not described as SAWCUT MEET EXIST.

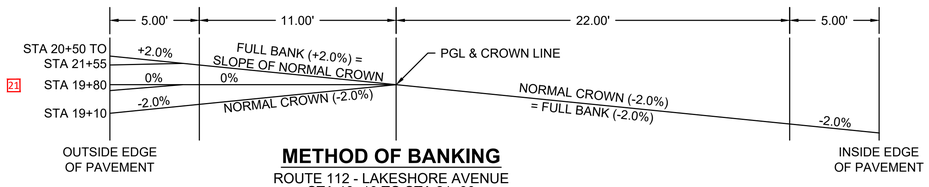
NOTE:
KEYNOTE NUMBERING MAY NOT BE CONSECUTIVE.
SOME GAPS HAVE BEEN LEFT TO ALLOW FOR FUTURE KEYNOTES TO BE PLACED.



* - TOLERANCE FOR CONST ±0.5% (TYP)

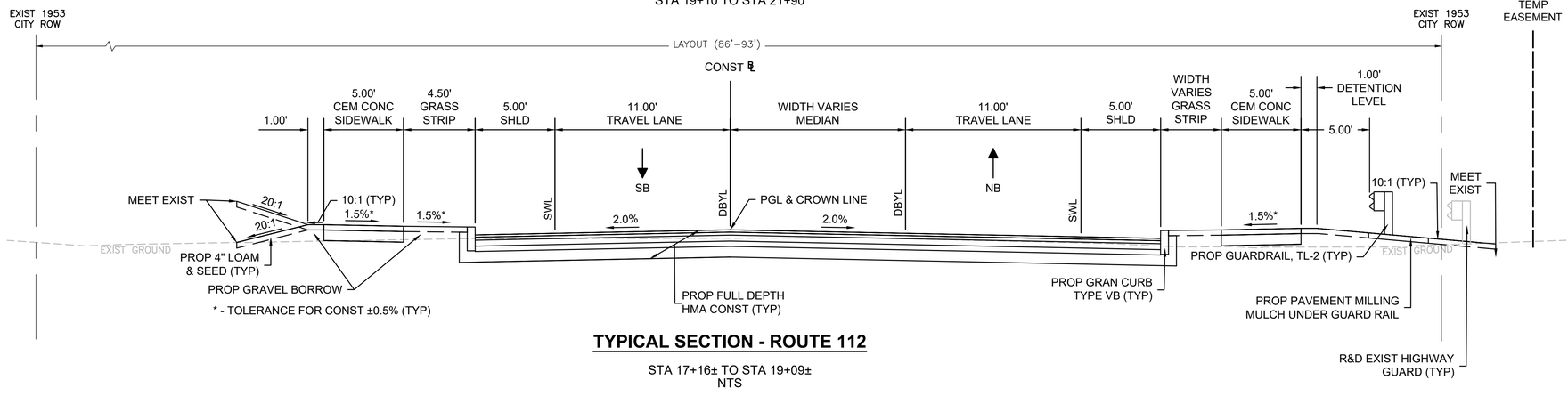
TYPICAL SECTION - ROUTE 112

STA 20+50± TO STA 21+55±
NTS



METHOD OF BANKING

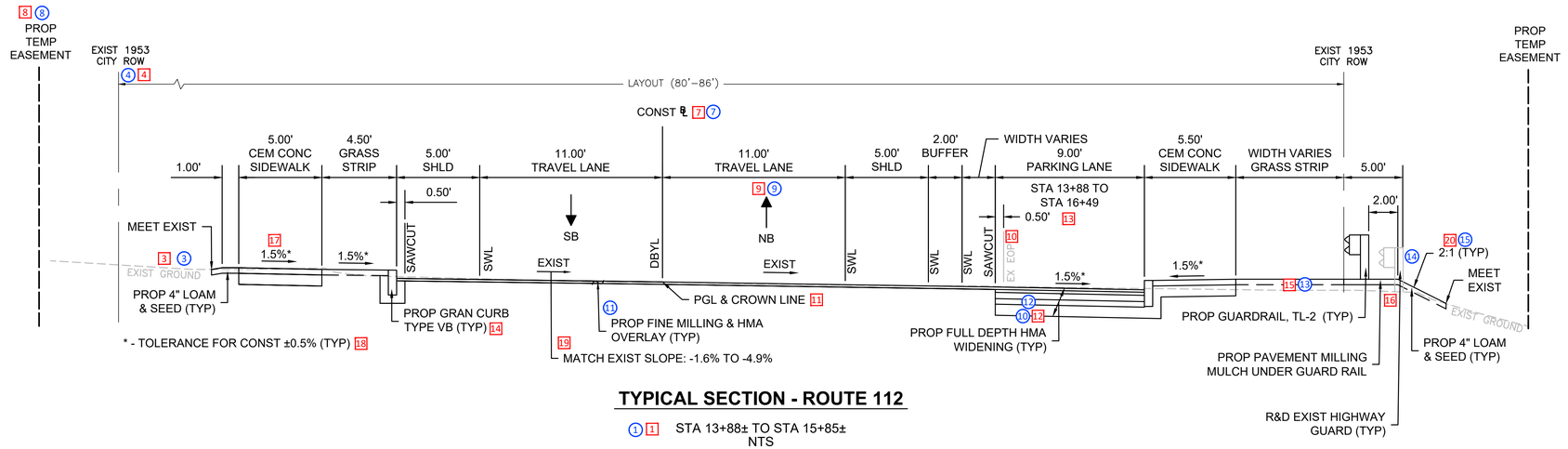
ROUTE 112 - LAKESHORE AVENUE
STA 19+10 TO STA 21+90



* - TOLERANCE FOR CONST ±0.5% (TYP)

TYPICAL SECTION - ROUTE 112

STA 17+16± TO STA 19+09±
NTS



* - TOLERANCE FOR CONST ±0.5% (TYP) 18

TYPICAL SECTION - ROUTE 112

1 1 STA 13+88± TO STA 15+85±
NTS

ANDOVER
ROUTE 104 AT ROUTE 112

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	06	60
PROJECT FILE NO. 654123			

TYPICAL SECTIONS

2 PAVEMENT NOTES

FULL DEPTH HMA CONSTRUCTION AND FULL DEPTH HMA WIDENING

SURFACE COURSE: 1.75" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
2.25" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC-19.0) OVER
BASE: 4.5" SUPERPAVE BASE COURSE - 37.5 (SBC-37.5) OVER
SUBBASE: 4" DENSE GRADED CRUSHED STONE OVER
8" GRAVEL BORROW TYPE B (OR SUITABLE EXIST MATERIAL)

PAVEMENT FINE MILLING & HMA OVERLAY

SURFACE COURSE: 1.75" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
SURFACE MILLING: VARIABLE DEPTH (1.75" ± 0.75") PAVEMENT FINE MILLING

CEMENT CONCRETE SIDEWALKS, ISLANDS, PEDESTRIAN CURB RAMPS AND WALKWAYS

SURFACE COURSE: 4" CEMENT CONC (AIR ENTRAINED 4000 PSI, 3/4", 610) OVER
SUBBASE: 8" GRAVEL BORROW TYPE B

CEMENT CONCRETE SIDEWALKS AT DRIVEWAY

SURFACE COURSE: 6" CEMENT CONC (AIR ENTRAINED 4000 PSI, 3/4", 610) OVER
SUBBASE: 8" GRAVEL BORROW TYPE B (OR SUITABLE EXIST MATERIAL)

HMA DRIVEWAYS

SURFACE COURSE: 1.5" SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER
2.5" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
SUBBASE: 8" GRAVEL BORROW TYPE B (OR SUITABLE EXIST MATERIAL)

HMA WALKWAY

SURFACE COURSE: 1.25" SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER
1.75" INTERMEDIATE COURSE - 12.5 (SSC-12.5) OVER
SUBBASE: 8" GRAVEL BORROW TYPE B

GRAVEL SHOULDER AND WALKWAY

SURFACE COURSE: 8" GRAVEL BORROW TYPE B

TACK COAT

ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED AT RATE OF 0.XX GAL/SY ON ALL HMA BASE COURSES, INTERMEDIATE COURSES, WEDGE JOINTS, VERTICAL SURFACES, AND DRAINAGE STRUCTURES PRIOR TO PAVING.

GENERAL NOTES

1. THE SECTIONS OF ROADWAY NOT COVERED IN THE RANGE OF STATIONS ASSOCIATED WITH THE TYPICAL SECTIONS ARE EITHER AT INTERSECTIONS OR ARE IN AREAS OF TRANSITION AND THEREFORE HAVE NOT BEEN SHOWN.
2. FROM STA 19+10± TO STA 25+00 THERE IS AN EXISTING 8" REINFORCED CONCRETE SLAB. EXTENTS OF THE CONCRETE SLAB ARE BASED ON RECORD DRAWINGS AND ACTUAL WIDTHS AND DEPTHS MAY VARY. THE SLAB IS TO REMAIN IN PLACE IN AREAS OF FULL DEPTH CONSTRUCTION. THE GRAVEL BORROW LAYER SHALL BE REDUCED IN THESE AREAS. SEE SPECIAL PROVISION AND ANY SLAB REMOVAL WILL BE AT THE DIRECTION OF THE ENGINEER.

654123_HD_TYP.DWG Plotted on 10-Dec-2025 8:47 AM

SAMPLE PLAN PDDG KEYNOTES

#	KEYNOTE DESCRIPTION
1	Display each typical section in order of increasing station range. The station ranges of typical sections increase from the bottom to the top of the sheet.
2	Pavement structures are to be detailed in the Pavement Notes on the right side of a Typical Sections drawing. Pavement structure titles in the Pavement Notes shall match with respective callouts in the typical sections. The title shall be size 0.25 in with a font style of Bold, Underlined. Headings shall be size 0.18 in with a font style of Bold, Underlined. Body text is 0.125 in with normal font style. Leave a space below title, headings, and sections preceding the next line of text.
3	Show existing grade with a thin, gray, dashed line and denote it with a label in 0.1 in tall gray text.
4	Denote the location and record year of applicable layout lines using an Offset Marker Label. Denote the location of permanent and temporary easements of layout line using Offset Marker Labels. An Offset Marker Label depicts linear features and offsets from horizontal plan view in section view. It consists of a vertical line located at the horizontal offset from the baseline on the section view with center justified description label added above. Offset Marker Labels can be applied to any existing or proposed linear features from the plan view. The linetype of the vertical line marker shall be the same linetype as the line in plan view. Denote ROW width using a horizontal dimension with range of ROW layout widths encountered along the station range of the typical section. Denote off-sheet or varying offset widths using a dimension jog line "break" symbol.
5	Existing features shall be gray. Denote existing subsurface structures with a thin, dashed gray line.
6	Subsurface utilities of note shall be displayed on the typical sections in color per project-specific situations.
7	Denote the construction baseline offset.
8	Denote the location of permanent and temporary easements of layout line using Offset Marker Labels.
9	Denote titles and widths of all cross section elements using dimensions. Denote traveling directions with arrow and label (NB, SB, EB, WB).
10	Denote offset locations of pavement markings, sawcuts and other cross section points to be constructed. Denote proposed cross section point feature offset locations using 0.125 in dark black vertical text and offset line. Denote existing cross section point feature offset locations using 0.1 in gray vertical text and offset line.

#	KEYNOTE DESCRIPTION
11	Denote the proposed profile grade line point. Denote the Crown Line grade break point and any other longitudinal grade break points along the cross section.
12	Proposed pavement structures, curbing, and other proposed features excluding the bottom of grassed and landscaped areas are drawn as continuous, medium, black lines. Call out descriptions of pavement and shoulder structures to be detailed in the Pavement Notes. Pavement structure callouts in the typical sections shall match with the respective pavement structure titles in the Pavement Notes.
13	If a cross section feature such as a lane, shoulder, median grass strip, or sidewalk is present but not for the entire typical section station range,then the typical section shall call out the station ranges of such features.
14	Denote types of curbing, edging, and berms to be constructed. Add reveal note only when it does not follow standard 6" reveal.
15	Draw the bottom of proposed loam and seed areas and mulch areas using a black dashed line.
16	Denote other standard structures and details which have not been approved as standards
17	Denote cross slope of surfaces constructed to a specified grade and note the tolerance for construction of 0.50% using an astersim and note on each typical section.. The default cross slope grade notation shall use the % format to the nearest tenth of a percent. Do not omit the trailing zero for a whole number grade value.
18	Indicate the slope tolerance for construction on each typical section.
19	Provide range of existing cross-slopes when matching existing pavement grades.
20	Denote cross slopes of non-paved surfaces and embankments constructed to a specified slope. The default slope notation shall use the Run:Rise format to the nearest tenth of a foot. Omit the horizontal component trailing zero for a whole number slope value. Denote where proposed grade meets existing grade with a callout. Denote method of slope stabilization.
21	Show the Method of Banking figure for typical sections containing superelevated curves. Denote the street name and station range of the superelevated curve in the Method of Banking figure subtitle. Denote all critical stations and station ranges required to construct the superelevated curve or curves. Denote all cross slopes at critical stations. Denote the station range of Full-Bank condition. Show and label the inside and outside edges of roadway. Dimension widths to lane and shoulder grade breaks. Denote the crown line and profile grade line point(s).

SAMPLE PLAN CAD KEYNOTES

#	KEYNOTE DESCRIPTION
1	For typical section titles, use block GE-TITLE on layer GE-TEXT. Insert the GE-TITLE block, then set title attribute and underline length. Then set the block visibility state grip to use the Typical Section Title setting, and set the station limits of the typical section. When a typical section will be used on more than one station range, a second block attribute set up for multiple line text is provided. Enter the remaining station ranges in the same format as the first station range. Once all station ranges are entered, move the NTS abbreviation to the bottom of the station range listing using the included dynamic block grip.
2	Pavement Notes should be created using a multiline text (MTEXT) object with style DOT-Standard on layer GE-TEXT. Refer to the graphical standards keynotes for title, heading, and body text formatting requirements for Pavement Notes. Title and heading formatting is performed within the MTEXT object as a property override to DOT-Standard to keep the notes within a single MTEXT object. The General Notes should be created similarly using an MTEXT object.
3	The existing grade line shall be drawn on layer PR-HD-XSECT-EG. Existing grade labels shall use text style DOT-E and be placed on layer PR-HD-XSECT-EG-TEXT.
4	Existing layout text and dimension shall be placed on layer PR-HD-XSECT-LO-TEXT. Use text style DOT-E.
5	Existing subsurface structures (excluding existing/record location subsurface utilities) shall be drawn on layer PR-HD-XSECT-EX by default.
6	Place utility pipes and structures on their designated utility XSECT layer so they will plot in color. Place utility cross section text on the utility's designated XSECT-TEXT layer. Callouts for existing and record location utilities use the DOT-E_arrow multileader style. Callouts for proposed utilities use the DOT-P_arrow multileader style.
7	To insert baseline symbol, insert character Boundary Line (unicode U\+E100).
8	Proposed Right of Way text shall be placed on layer PR-RW-TEXT. Use text style DOT-P. Place the ROW offset marker line on the layer matching the type of ROW line being depicted at that offset.
9	Insert the lane arrow symbol using block HD-XS-LANE-ARROW on layer PR-HD-TEXT. The lane direction label component includes options for NB, SB, EB, and WB. The arrow direction can be flipped to indicate the route's direction of travel.
10	Spanning area labels can be created using dynamic block HD-SPANNING-LABEL placed on layer PR-HD-TEXT. Insert the block at the leader vertex point, then enter area label text into multiline block attribute. Then set the spanning leader points. The block is defined to set the spanning leader orientation to 30 degrees from World Coordinate System. The placement of the label text can be fine tuned by using the Landing Distance parameter to apply a longer leader landing distance. The block can be flipped to display the leader as left or right attachment.
11	For narrow areas where a spanning area label cannot fit between lines use a multileader of style DOT-P_arrow_tilde on layer PR-HD-TEXT.
12	Constructed features shall be drawn on layer PR-HD-XSECT-CONST by default.
13	The bottom of loam and seed areas and mulch areas shall be drawn on layer PR-HD-XSECT-CONST-DASH.
14	The guardrail cross section symbol block name is HD-XS-GR-WB-SP-SF-R.
15	Label the point where proposed grade meets existing grade using a multileader of style DOT-P_arrow on layer PR-HD-TEXT.
16	Section hatch patterns can be placed on PR-HD-XSECT-MATL-PATT layer.

GRAPHICAL STANDARDS NOTES

DRAFTING AND ANNOTATION DISPLAY ORDER STANDARDS

1. Existing features are drafted gray by default.
2. Proposed features are drafted black by default.
3. Black proposed features drafting and annotation shall always be drawn over the top of screened survey feature drafting and annotation.
4. Proposed feature annotation shall not obscure survey feature symbols or annotation. Proposed feature linework and symbols may be drawn over the top of survey features and annotation. Care must be taken to preserve legibility of survey feature annotation.
5. Annotation may be placed over linework and symbols of differing colors without masking provided the annotation does not obscure depiction of the underlying features.
6. Existing linework through proposed annotation is permitted.
7. Proposed annotation may not be drawn over the top of proposed drafting and annotation. Where proposed annotation and proposed feature linework unavoidably conflict, apply selective masking to prevent proposed line through text.

APPLYING MASKING AND WIPEOUTS

1. Masking shall not be applied to design annotation over survey symbols or annotation. Survey features and annotation are drawn grey to contrast with black design annotation, therefore a mask is not necessary over survey features.
2. Masking shall be applied selectively to annotation objects that require it only in areas where the overlap of design annotation and underlying features renders the design annotation unreadable when plotted or published.

CALLOUT ANNOTATION BEST PRACTICES

1. Arrange callouts to maximize plan clarity and readability. Provide space around callout text to preserve overall plan clarity. Do not pack callouts tightly together if possible.
2. Align leaders and avoid crossing leader lines of the same color.
3. Align callout text to neatly arrange annotation for increased plan clarity. If necessary the leader landing length can be extended to maintain alignment of the leader with those of other callouts.

TYPICAL SECTIONS KEYNOTES

CAD STANDARDS NOTES

TYPICAL SECTIONS SHEET CREATION

1. The standard method of Typical Section creation is to develop the sheet using the guidance found in the ***MassDOT Sheet Production Tools (MSPT) Help Doc for Highway Construction Plans***.
2. The workflows listed in the help doc direct the user to utilize the sheet set manager functionality to produce each series of Typical Sections. Use the following content as indicated in the ***MassDOT CAD Standards Manual*** for assembling a series of Typical Sections sheets:

Template for creating Model DWG's	MassDOT_C3D_Design.DWT
Template for creating Sheet DWG's	HWY_CONST_PLAN_SHEETS.DWG
Plot Style Table Page Setup	MADOT-D.STB MassDOT-Design-36x24-PDF
Layer Group	HD Highway Design
Annotation Styles	DOT-P Text/Dim/Multileader Styles

3. The linework and annotation for a set of typical sections shall be produced in Model space.
4. First set the intended viewport scale in Model space, then create sheet view frames using the dynamic block GE-VIEW Arch D - Array option on the GE-VFRM layer. The array of sheet view rectangles can be extended to create a row of additional sheet views.
5. Limit the number of sheet layouts in a Typical Sections sheet DWG to 10 or less. If more than 10 sheet layouts are required in a sheet DWG, start a new sheet DWG.

TYPICAL SECTIONS DRAFTING STANDARDS

1. All drafted linework shall be drawn to a lineweight found on sheet 1.2 LINEWORK & LINEWEIGHT STANDARDS in the MassDOT PDDG Ch 18 VOL I GENERAL STYLE SAMPLE PLANS.
2. All annotation shall be created using the CAD styles found on sheet 1.3 ANNOTATION STYLES in the MassDOT PDDG Ch 18 VOL I GENERAL STYLE SAMPLE PLANS.
3. All cross section symbols shall use the MassDOT standard symbol set available from the latest version of the MassDOT CAD Standards download.
4. Linework shall be drawn on a standard MassDOT CAD layer or a copy of a standard MassDOT CAD layer that uses a MassDOT standard linetype and plot style from the MassDOT CAD Standard pen table STB files.
5. Where it is required to deviate from using the default ByLayer setting for linework drawing objects it is noted with a CAD keynote.

TYPICAL SECTIONS ANNOTATION STANDARDS

1. Create annotation objects using the designated styles listed below. Do not change the size of text or arrows. Other annotation object parameters may be modified to fit project-specific situations.
2. Create single-line text strings using a single-line text object.
3. Create notes and other multiple-line text using a multiline text object. Manual formatting overrides within the MTEXT object are permitted provided the formatting changes approximate an existing MassDOT text style.
4. Create callout labels using either multileaders or Civil 3D label styles pulled into dragged state.
5. Create dimensions using dimension objects.
6. Do note explode AutoCAD or Civil 3D annotation objects.
7. The default annotation style for all existing features is based on text style DOT-E (RomanS, 0.1"). All multileader, dimension, and Civil 3D label styles shall utilize this text style. All existing text, multileader, dimension, and Civil 3D label objects shall utilize these DOT-E based styles.
8. The default annotation style for all proposed and modified features is based on text style DOT-P (Arial, Regular, 0.125"). All multileader, dimension, and Civil 3D label styles shall utilize this text style. All proposed text, multileader, dimension, and Civil 3D label objects shall utilize these DOT-P based styles. Use DOT-PB text style-based annotation styles for putting emphasis on major features.
9. The default annotation layer for proposed features on Typical Sections is PR-HD-TEXT. All text, multileader, dimension, and Civil 3D label objects shall be placed on this layer unless otherwise indicated in the keynotes.

NOTE:
KEYNOTE NUMBERING MAY NOT BE CONSECUTIVE. SOME GAPS HAVE BEEN LEFT TO ALLOW FOR FUTURE KEYNOTES TO BE PLACED.

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HIGHWAY GUARD DETAILS

STA 13+95 RT TO STA 14+31 RT - TRANSITION TO NCHRP 350 GUARDRAIL
STA 14+31 RT TO STA 16+93 RT - GUARDRAIL, TL-2 (SINGLE FACED)
STA 16+93 RT TO STA 17+02 RT - TRAILING ANCHORAGE
STA 17+16 RT TO STA 17+25 RT - TRAILING ANCHORAGE
STA 17+25 RT TO STA 19+71 RT - GUARDRAIL, TL-2 (SINGLE FACED)

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE SHEET 23

ANDOVER
ROUTE 104 AT ROUTE 112

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	11	60
PROJECT FILE NO.	654123		

CONSTRUCTION PLANS

NAD83

CHARLES STREET

PC +06.89
N 58° 04' 51" W 176.89'
1953 TOWN LAYOUT
GRASS
LIMIT OF FINE M&O
END PROP GRAN CURB, R&D COBBLE CURB
PROP LOAM & SEED
RET BUSHES
REM BUSH
PROP TEMPORARY CONSTRUCTION EASEMENT
N/F THE PHILIP R. WARNER TRUST PHILIP R. WARNER, TR BK/PG 39139/251 PB/PL 78/52 384 LAKESHORE AVE MAP/LOT 662-3-14
BRICK WALK
POST & RAIL FENCE
N/F JEFFREY BATES AND ELEANOR BAILEY BK/PG 37113/415 PB/PL 78/52 374 LAKESHORE AVE MAP/LOT 662-2-1
END PROP GRAN CURB
PROP LOAM & SEED
SPRINKLER
PROP TEMPORARY CONSTRUCTION EASEMENT
R&D
SAWCUT, MEET EXIST HMA SIDEWALK STA 13+00.00
HMA WALK
GRASS
EOP
ULT 80-45
SAWCUT
N 64° 54' 08" W 30.00'
END PROP GRAN CURB
PROJECT BEGIN N3114069.3469 E771870.3024 STA 13+00.00 SAWCUT MEET EXIST
Δ=32° 10' 26" L=518.30' R=923.00'
R&R GRAN CURB
CONC WALK
GUARD RAIL
RET
SAWCUT MEET EXIST CEM CONC SIDEWALK STA 13+00.00
PROP 5.5' CEM CONC SIDEWALK (TYP)
END PROP GRAN CURB MEET EXIST
100-FOOT BUFFER ZONE
50-FOOT NO BUILD ZONE
25-FOOT NO DISTURBANCE ZONE
WF#1-105
WF#1-106
WF#1-104
N/F NORTHERN GAS COMPANY BK/PG 4207/167 BK/PG 7348/214 PL 823 OF 1954 377 LAKESHORE AVE MAP/LOT 465-1-4B
PI +30.00
SAWCUT
PROP CONT DIR PCR (TYP)
PROP FINE M&O
PROP GRASS STRIP
PT +18.30
N 35° 32' 43" E 271.47'
+85.00
SAWCUT
REM HMA CURB
RET
BOS
PROP FULL DEPTH WIDENING (TYP)
PROP TRANSITION TO NCHRP 350 GUARDRAIL
PROP PCR ON NARROW SIDEWALK (TYP)
PROP TL-3 GUARDRAIL (TYP)
MEET EXIST HIGHWAY GUARD
HMA PAD
STAIRS (APPROXIMATE LOCATION)
PROP VAR WIDTH GRASS STRIP
ROUTE 112 CONST ℄ STA 13+50.00 = CHARLES STREET CONST ℄ STA 400+00.00

LAKESHORE AVENUE (ROUTE 112)

PROP 5' CEM CONC SIDEWALK (TYP)
LIMIT OF GRADING (TYP)
PROP CEM CONC SIDEWALK AT DRIVEWAY (TYP)
PROP TEMPORARY CONSTRUCTION EASEMENT
N/F EDWARD MYERS BK/PG 22352/67 PB/PL 78/52 394 LAKESHORE AVE MAP/LOT 662-3-15
PROP GRAN CURB TYPE VB (TYP)
REM EXIST PAVEMENT
PROP GRASS STRIP
PROP LOAM & SEED
RET STONE MONUMENT
HYDR
SAWCUT
TOS
BOS
EOP
PROP SELECTIVE CLEARING & THINNING (TYP) STA 13+95 TO STA 18+77
PROP SEDIMENT CONTROL BARRIER (TYP)
PROP TEMPORARY CONSTRUCTION EASEMENT
PROP GRAN CURB TYPE VB (TYP)
PROP LOAM & SEED TO FACE OF GUARDRAIL
PROP 5' CEM CONC SIDEWALK
PROP VAR WIDTH GRASS STRIP
N/F TOWN OF ANDOVER (WATER WORKS) BK/PG 1359/481 259 LAKESHORE AVE MAP/LOT 465-1-1
ROUTE 112 CONST ℄ STA 16+77.61 = GARDENER AVENUE CONST ℄ STA 100+00.00

GARDENER STREET

1953 TOWN LAYOUT
Δ=3° 28' 31" L=106.48' R=1755.44'
N 54° 02' 39" W 121.40'
PC +21.40
LIMIT OF WORK N3114427.4610 E772015.9332 STA 100+64.00 SAWCUT MEET EXIST
N/F PHYLLIS YOUNG, DONALD YOUNG, AND BERNARD YOUNG BK/PG 30988/19 PB/PL 41/34 400 LAKESHORE AVE MAP/LOT 664-6-165
PROP FULL DEPTH PVMT TRANSITION
END PROP GRAN CURB
PROP TEMPORARY CONSTRUCTION EASEMENT
PROP LOAM & SEED
PROP GRASS STRIP
REM EXIST PAVEMENT
PROP FULL DEPTH HMA CONSTRUCTION
PC +89.77
PROP LOAM & SEED TO FACE OF GUARDRAIL
PROP VARIABLE WIDTH GRASS STRIP
PROP PCR WITH LANDSCAPE STRIP (TYP)
PROP 8' HMA WALKWAY
MEET EXIST GRAVEL PATH
CONTINUED ON SHEET NO. 09

SCALE: 1" = 20'
20 0 20 40
0 1"

LEGEND
(#) DRIVEWAY
[##] PEDESTRIAN CURB RAMP

FOR CONSTRUCTION PROFILE: SEE SHEET NO. 14

654123_HD_CO.DWG Plotted on 10-Dec-2025 2:16 PM

SAMPLE PLAN PDDG KEYNOTES

#	KEYNOTE DESCRIPTION
1	The location of the north arrow is typically in the upper left hand corner but can be shifted to accommodate the information on the plan. The north arrow shall be in model space.
2	The Design Details Reference Notes shall be created at the top of each Construction Plan sheet referring to proposed design details found within the project area shown on that sheet. Each reference note shall indicate if that design detail is present and what sheet it can be found on (either the sheet below or on a seperate sheet). Highway Guard Details refer to required highway guard items and their locations on the current sheet. Traffic Signal Conduit refers to the presence of proposed traffic signal conduit on the Construction Plan or on the sheet number reference of the Traffic Plans the traffic signal conduit details are shown on. Water Supply Alterations refers to the presence of proposed water supply alterations on the Construction Plan or the sheet number reference of either a Drainage & Utility Plan, Utility Plan, or dedicated Water Supply Alteration Plan sheet that the water supply alteration details are shown on. Drainage Details refers to the presence of proposed drainage on the Construction Plan sheet or the sheet number reference of either a Drainage & Utility Plan or dedicated Drainage Plan showing the drainage details. See the keynote below each reference note for more detailed information regarding what should be shown in each note. When the construction plan sheet does not have any design detail features of a particular type, "NONE" should be listed under the design detail header rather than deleting the design detail note and header.
3	When plans are shown along more than one baseline, add the baseline name below the plan title. For larger plan sets, add an additional line of text with the sheet series index number and total number of sheets in the series to indicate the position of the sheet along the primary construction baseline, SHEET XX OF XX.
4	Plan information shall extend a minimum of 150 feet beyond the beginning and end of the project.
5	When the continuity of streets or ramps is broken, a sheet number reference should be noted at the breaks. 20 scale plans should have min. 50 ft overlap, 40 scale plans shall have a min. 100 ft overlap. Two correlating alignment station markers minimum shall be shown within the overlapping area of each sheet. The first sheet in the series shall have no sheet reference applied on the baseline alignment down-station side of the sheet. The last sheet in the series shall have no sheet reference applied on the baseline alignment up-station side of the sheet. Note on the sample plan sheet that the sheet location is at the beginning of the series at the project beginning limit and the up-station direction of the baseline alignment is towards the right, so the left-side sheet reference label is omitted. The continuity of the roadway plan is interupted on the right side of the sheet so a sheet reference label is added at that edge of the sheet. Roadway plans along baselines extending in different directions away from the sheet's primary baseline (such as at an intersection) shall show sheet reference labels at each of those sheet limits.
6	When the construction plan and profile are shown on separate sheets, provide a sheet number reference to each correlated profile in the lower right edge of the sheet (inside the border).
7	Include a legend for any symbols specific to the Construction Plans.
8	All construction plans must indicate drawing scale by including a bar scale in the bottom center area of the sheet. Construction plans are drawn at a scale of 1" = 20' by default; 1" = 40' is acceptable with MassDOT project manager approval.
10	The proposed center line and record baseline are to be shown and stationed at a 100 ft interval and labeled with appropriate geometric data.
11	By default, all baseline and/or construction centerlines shall display all tangent and curve data details on the Survey Control Plans. All other sheets referencing the Survey Control Plans shall display only the bearing and distance of tangents and the radius and length of curves. Tangent and curve labels shall be placed beneath the baseline alignment by default when the baseline runs across the length of the sheet. If space allows and all construction plan sheets remain uncluttered when a full curve data label is applied then full curve data can be added to the Construction Plans in lieu of requiring the Survey Control Plans.

#	KEYNOTE DESCRIPTION
12	When the label length of a tangent or curve label cannot be comfortably accommodated on the alignment segment, show the label as a callout.
13	Ensure all baseline segment labels running at angles across the width of the sheet are able to be read easily by flipping or dragging labels when needed.
14	Denote the stations and coordinates for the beginning and end of the project. The beginning of a project is always the southerly or western end; the end is always the northerly or easterly extremity. Denote how existing features will be impacted at the project limits.
15	Denote the stations and coordinates at each limit of work. Denote how existing features will be impacted at each limit of work.
16	Denote all intersecting baseline equations using a dashed border callout.
17	All streets, roads, highways, and other public ways shall be called out using 1/4" tall, bold text.
18	Show the State Highway, City, Town, or County layout. Do not show the radii, ties, etc., of layout lines. Show the beginning and end of the State Highway Layout, State Highway Alterations , and the year recorded.
19	Easement lines are drawn as long dash lines and labeled drainage, slope, or construction easement, as appropriate. Designate whether the easement line is temporary or permanent.
20	Names of property owners are noted in thin black lettering. Place the label within the property boundaries or provide a callout using the Arrow-Tilde leader tip style.
21	The leader tip style for point type symbol features shall be a solid arrowhead.
22	The leader tip style for identifying a linear feature shall be a solid arrowhead.
23	The leader tip style for identifying a specific location on a linear feature is the dot leader tip style.
24	Two area feature callout styles are allowed. The default style is to use a spanning dimension line and callout label that reaches across the width of the roadway section where the area is located. The other is a callout label with an Arrow-Tilde leader tip style. Use this style where the spanning dimension line arrow heads would clash due to the area being too narrow.
25	Denote how existing features will be impacted at the project limits.
26	The roadway widths are indicated at the beginning and end of each sheet and at all other points where a change in width occurs.
27	Show only all utility structures within and around the project area on the construction plans. For clarity, do not include subsurface pipes and other utility lines on the construction plans. By default, Highway Construction Plans include a dedicated detail sheet to supplement the construction plans that will show drainage, water supply alteration, and utility relocation details to a higher level of detail. Show subsurface drainage, water, and other utility elements on these sheets providing a higher level of detail. When all proposed construction is shown on the construction plan (allowed with approval only), all subsurface utilities must also be shown to identify utility conflicts. Proposed structures that have no standard symbols or designations shall be described and marked "PROP" (proposed). Existing structures that have no standard symbols shall show the structure abbreviation as shown on the Legend & Abbreviations sheet or legend included on the current sheet.
28	Coordinate the names of constructed features with titles and nomenclature of corresponding cross-sectional elements shown in the typical sections.
29	Proposed sawcuts shall be called out and shown with a heavy short dashed line.
30	Areas of full-depth pavement construction shall be indicated with a dotted hatch pattern. Some projects that are full-depth over the entire width and are nearly entirely full-depth over the length of the project will not require the dotted hatch pattern to be shown.

#	KEYNOTE DESCRIPTION
31	The types of edging, curbing, and berms are shown without indicating lengths. Extremities of each type will be defined by callout with closed arrowhead leader tip style. The abbreviation "PROP" (proposed) shall appear before the description.
32	Proposed sidewalks, walks, bicycle lanes, and multi-use paths shall be drawn with a heavy solid line representing the edges. When sidewalks are adjacent to curbing the heavy solid edge line will be replaced by the medium solid line representing the back of curb. All sidewalk grade breaks and transition edges shall be shown using medium solid lines. The type of structure should be noted with the abbreviation "PROP" (proposed) before the description. The minimum width of sidewalks and walkways shall be noted.
33	Pedestrian curb ramps must be identified with references to a separate detail sheet listing critical dimensions including ramp length, design slope, curb transition lengths, gutter slopes and level landings. 75 Percent Design submission milestone for all pedestrian curb ramps. To identify the PCR or other structure a tag ID symbol will be used by default. A callout may be placed when space allows. The name format for callouts shall be PCR-#. All symbols used to represent PCR and other pedestrian or bicycle structures shall be represented in a legend in the lower right-hand corner of each Construction Plan. The name of each type of PCR shall be called out once per sheet using the (TYP) notation. The name used in the callout shall match that on the PCR construction detail. Denote stations at pedestrian ramps on the CURB TIE & GRADING PLANS.
34	Proposed edges of driveways are drawn as heavy solid lines. Sidewalk Through Driveway must be identified with references to a separate detail sheet listing critical dimensions including ramp length, design slope, curb transition lengths, gutter slopes and level landings must be shown and completed at the 75 Percent Design submission milestone for all driveway aprons with continuous sidewalk. Driveways without sidewalks must be identified with references to a separate detail sheet identifying the typical construction parameters for each driveway type To identify the DWY a tag ID symbol will be used by default. A callout may be placed when space allows. The name format for callouts shall be DWY-#. The circle symbol for DWY structures shall be represented in a legend on the same sheet in the lower right-hand corner. Each DWY type must be identified with one (TYP) callout identifying which DWY detail it is based upon
35	Draw the limit of grading with a heavy short dashed line and denote it with a callout or line label.
36	Proposed tops and bottoms of slopes are shown as dashed lines and marked TOS and BOS, respectively.
37	All existing features within the project area intended to be retained shall be notated with RET.
38	Areas that are to be modified shall have the modification label in dark text placed next to the existing area feature label.
40	The words "HIGHWAY GUARD DETAILS" with location references such as "SEE BELOW" or the type and station of guardrail will be tabulated in the upper part of the sheet near the border. The above is noted whether or not highway guard is required in the area shown on the sheet. Where there is no proposed highway guard required, the word "NONE" is substituted for the location referenced. If the proposed highway guard does not obscure the detail than it can be drawn on the plan.

#	KEYNOTE DESCRIPTION
41	The words "TRAFFIC SIGNAL CONDUIT," with a location reference such as "SEE BELOW," will be placed on the upper part of the sheet near the border. This is only noted when a traffic signal conduit is required in the area shown on the sheet. Complex traffic signal installations should be shown on a separate plan. For sheets not showing any traffic signal conduit, enter "NONE". For construction plan sheets showing the traffic signal conduit, enter "SEE BELOW." For those traffic signal installations shown on a separate plan sheet enter the sheet number "SEE SHEET XX".
42	The words "WATER SUPPLY ALTERATIONS," with a location reference such as "SEE BELOW" will be placed on the upper part of the sheet near the border. This is only noted when water supply changes are required in the area shown on the sheet. Plans should also note what type of water supply is within the area, including boundaries of surface water protection areas (Zone A, Zone B, Zone C) and wellhead protection areas (Zone II, Zone I, Interim Wellhead Protection Area (IWPA)). Where the proposed water supply system may be obscured by existing details, a separate plan is recommended. This should be combined with the proposed drainage details and/or utility relocations plan. Heavy, solid lines designate any proposed water pipe. The length, size, type of material, direction of flow, and bends must be noted. Other details include hydrants, gates, etc. The abbreviation "PROP" is required before the description. The description will include any special materials such as insulation, etc.
43	The words "DRAINAGE DETAILS" with location reference such as "SEE BELOW" or "SEE SHEET XX" will be placed on the upper part of the sheet near the border. The above is noted whether or not drainage is required in the area shown on the sheet. Designers shall prepare Drainage and Utility Plan sheets to be included in the plan set. Designers may opt to omit the Drainage and Utility Plan sheets (showing proposed utility relocation details on the Construction Plans) if: (1) District Utilities Engineer and Designer determine there are no utility relocations required in the contract in addition to no drainage work is proposed. (2) With approval from the District Utilities and Constructability Engineer, proposed utility relocations and drainage work may be shown on the Construction Plans if doing so would not create legibility issues on the Construction Plans. (3) Designers may prepare separate Drainage Plans and Utility Plans if combining the two areas of work on one sheet would create legibility issues. Any water supply alterations and other underground utility data should also be shown on the separate plan. Please refer to the Drainage & Utility Plan sample for examples of how utility designs shall be shown in MassDOT Highway Construction Plans.

CONSTRUCTION PLAN KEYNOTES

GRAPHICAL STANDARDS NOTES

DRAFTING AND ANNOTATION DISPLAY ORDER STANDARDS

1. Black proposed features drafting and annotation shall always be drawn over the top of screened survey feature drafting and annotation.
2. Proposed feature annotation shall not obscure survey feature symbols or annotation. Proposed feature linework and symbols may be drawn over the top of survey features and annotation. Care must be taken to preserve legibility of survey feature annotation.
3. Annotation may be placed over linework and symbols of differing colors without masking provided the annotation does not obscure depiction of the underlying features.
4. Existing linework through proposed annotation is permitted.
5. Proposed annotation may not be drawn over the top of proposed drafting and annotation. Where proposed annotation and proposed feature linework unavoidably conflict, apply selective masking to prevent proposed line through text.

APPLYING MASKING AND WIPEOUTS

1. Masking shall not be applied to design annotation over survey symbols or annotation. Survey features and annotation are drawn grey to contrast with black design annotation, therefore a mask is not necessary over survey features.
2. Masking shall be applied selectively to annotation objects that require it only in areas where the overlap of design annotation and underlying features renders the design annotation unreadable when plotted or published.

CALLOUT ANNOTATION BEST PRACTICES

1. Arrange callouts to maximize plan clarity and readability. Provide space around callout text to preserve overall plan clarity. Do not pack callouts tightly together if possible.
2. Align leaders and avoid crossing leader lines of the same color.
3. Align callout text to neatly arrange annotation for increased plan clarity. If necessary the leader landing length can be extended to maintain alignment of the leader with those of other callouts.

NOTE:
KEYNOTE NUMBERING MAY NOT BE CONSECUTIVE. SOME GAPS HAVE BEEN LEFT TO ALLOW FOR FUTURE KEYNOTES TO BE PLACED.

654123_HD_CO.DWG Plotted on 4-Jun-2026 2:50 PM

SAMPLE PLAN CAD KEYNOTES

#	KEYNOTE DESCRIPTION
1	The North Arrow symbol for plan sheets in the Highway Construction Plans can be created using two methods. The preferred method is to use the North arrow symbol included in the the GE-VIEW block's Plan Views - 20 Scale visibility state option inserted in the HD drawing file's Model space on the GE-KEYPLAN layer. The North arrow in this block shall maintain the required zero-degree orientation and the symbol can then be used by all sheets. The alternative method is to insert the GE-NORTH block on layer GE-SHEET in Model space. Use this method when the default North arrow location set in the HD drawing using the GE-VIEW block is unable to be used. Inserting the GE-NORTH block enables the user to override the defaault location. Neither the GE-VIEW or GE-NORTH block insertions shall be rotated in Model space. These block insertions must remain at zero rotation. The horizontal datum to display on the North Arrow can be set by selecting the block and changing the visibility state grip to either refer to State Plane (True) North or a Magnetic (Assumed) North reference. MassDOT CAD State Kit users can insert these blocks from the Sheet Symbols tool palette by navigating to the MassDOT ribbon tab and selecting the Sheet Symbols button and then locating the desired block tool on the palette.
2	Add the Design Details Reference Notes using the dynamic sheet block PR-HD-SHEET_REF-CONST_PLAN on layer GE-TEXT. The block is included on the PLAN_20Sc and PLAN_40Sc sheet layout templates in the HWY_CONST_PLAN_SHEETS.dwg sheet template file. Set the block visibility state to Multiple-line references to access the multi-line text block attribute. The dynamic block also has a horizontal grip that allows the user to space the columns across the top of the sheet as needed to suit the sheet's plan view.
3	Add the Highway Guard Details as part of dynamic sheet block PR-HD-SHEET_REF-CONST_PLAN on layer GE_TEXT. The Highway Guard Details column contains 5 block attributes for entering guard data into, four single-line attributes and if additional rows are required the remaining attribute can be entered as multi-line text. Set the block visibility state to Multiple-line references to access the multi-line text block attribute. The dynamic block also has a horizontal grip that allows the user to space the columns across the top of the sheet as needed to suit the sheet's plan view.
4	Indicate the presence of traffic signal conduit , water supply alterations, and/or drainage details as part of dynamic sheet block HD-SHEET_REF-CONST_PLAN on layer GE-TEXT. Keep the default attribute value "NONE", enter "SEE BELOW", or enter "SEE SHEET XX". XX can be replaced by a sheet set manager sheet number reference field to the sheet showing the related design details. The dynamic block also has a horizontal grip that allows the user to space the columns across the top of the sheet as needed to suit the sheet's plan view.
5	Follow the guidance provided in the MassDOT Sheet Production Tools (MSPT) Help Doc for Highway Construction Plans for setting up the Federal Aid title block.
6	The sheet border and Federal Aid title block are provided in dynamic sheet block GE-BORDER and placed on layer GE-SHEET. Dynamic block GE-BORDER includes plot stamp information, drawing template information, and a visibility state control that changes the information displayed under the Federal Aid title block. MassDOT sheet layout templates contain Sheet Set Manager (SSM) text fields that display sheet data such as project numbers and location consistently throughout a plan set. Fields may be provided as either block attributes or text objects within the sheet layout templates. A key to all SSM field locations is provided in the MSPT Help Docs. The visibility state gives the option of showing the sheet name, sheet subset name, and sheet subset range in addition to several standard sheet titles for Highway Construction Plans. Any block attribute containing SSM field text can be cleared to add user-defined text in the field's place. Construction plans are grouped in SSM using a subset named CONSTRUCTION PLANS which sets the name on the construction plan sheets. Set the Federal Aid title block to use the SUBSET NAME option. A SSM sheet property Sheet-Baseline can be set to the name of the primary baseline to include the baseline name under the subset name. A construction plan sheet range can also be included by choosing one of the visibility state options that has Sheet Range in the name.
7	Sheet number references at view breaks on the right side of the sheet are created using block GE-MATCHLINE_LABEL-RIGHT and placed on layer GE-SHEET. It displays the current sheet number value +1 (sheet view orientations shall follow the increasing baseline value across the sheet from left to right). Delete this block label at the end of the sheet range. The left side sheet number reference is omitted on the first sheet of the sheet series and is created using block GE-MATCHLINE_LABEL-LEFT placed on layer GE-SHEET. It displays the current sheet number value -1 The block is included on the SHEET_20Sc and SHEET_40Sc sheet layout templates.
8	Legends specific to a sheet shall be created using a Table object of style DOT-LEGEND on layer GE-TEXT. Insert the block symbol into the table on the left column as shown. Enter the description of the symbol found in the right column by editing the DESCRIPTION attribute of the ID block symbol.

#	KEYNOTE DESCRIPTION
9	The profile sheet number reference is created using block HD-SHEET_REF-PROF_SHEET. The block is included on the SHEET_20Sc and SHEET_40Sc sheet layout templates. Delete this block label when the profile is included on the same sheet as the construction plan. To coordinate the profile sheet number with the sheet number on the construction plan, set the sheet number block attribute value to a sheet set manager sheet number reference field value.
10	The bar scale symbol for plan sheets in the Highway Construction Plans can be created using two methods. Bar scales must be inserted in Model space to maintain the correlation between the plotted graphical bar scale symbol size and the scale of the viewport. Always check the viewport scale is set correctly prior to plotting sheets. The preferred method is to use the bar scale symbol included in the the GE-VIEW block's Plan Views - 20 Scale visibility state option inserted in the HD drawing file's Model space on the GE-KEYPLAN layer. The bar scale in this block shall maintain the required viewport scale and the symbol can then be used by all sheets. The alternative method is to insert the GE-BARSC block on layer GE-SHEET in Model space. Use this method when the default bar scale location set in the HD drawing using the GE-VIEW block is unable to be used. Inserting the GE-BARSC block enables the user to override the defaault location. The bar scale symbol for plan sheets in the Highway Construction Plans use the GE-BARSC block symbol inserted on the GE-SHEET layer. Select the construction plan scale using the dynamic block visibility state grip if the view scale is different than the scale of the sheet layout template being used. MassDOT CAD State Kit users can insert these blocks from the Sheet Symbols tool palette by navigating to the MassDOT ribbon tab and selecting the Sheet Symbols button and then locating the desired block tool on the palette.
11	Create the survey base plan in the construction plan sheet DWG using an external reference (XREF) placed on layer GE-XREF-SV. Rename the XREF in the External References palette to SV so that XREF layer names are prefixed SV|, e.g. SV|EX-SV-DETAIL. Attach the survey base plan DWG file using the Attach option when using view frame groups to generate sheets. Otherwise, use the Overlay option.
12	Proposed primary baselines are to be created as Civil 3D alignment objects with the following creation notes: The name of the alignment shall be the route number (e.g. Route 112) when the baseline is part of the state or federal highway system or it can be the name of the local roadway (e.g. Charles Street). Spell out the roadway name as it would appear on the profile view title. Alignment Type: Centerline (Be sure to set Design Criteria) Alignment Style: MassDOT_Proposed Construction Centerline Alignment Object Layer: OB-BASELINE-[Alignment Name] (Add a suffix to the alignment layer naming template) Alignment Label Set: By default, use MassDOT_Proposed BL. For alignments with superelevation, use MassDOT_Proposed BL_Superelevation Points.
13	Add curve segment labels. Alignment Curve Label Style: MassDOT_Proposed Alignment Curve Label Style for Tag Labels: MassDOT_Tag_Label Alignment Curve Label Layer: PR-HD-BL-TEXT
14	Add the project limit beginning point label and project limit line. Use an alignment station offset fixed point label. Project Limit Line layer: PR-HD-LIMIT-WORK Alignment Station Offset Label Style: MassDOT_PR_HD_BL_PROJECT BEGIN Marker Style: MassDOT_Circle Alignment Station Offset Label Layer: PR-HD-BL-TEXT If the project limit point is not on a sawcut meet existing grade line as denoted in the default condition in the label style (shown), edit the Description 1 and Description 2 label components.
15	Add the limit of work label and limit of work line. Use an alignment station offset fixed point label. Project Limit Line layer: PR-HD-LIMIT-WORK Alignment Station Offset Label Style: MassDOT_PR_HD_BL_LIMIT OF WORK Leader Tip Marker Style: MassDOT_Circle Alignment Station Offset Label Layer: PR-HD-BL-TEXT If the project limit point is not on a sawcut meet existing grade line as denoted in the default condition in the label style (shown), edit the Description 1 and Description 2 label components.
16	Label the baseline intersection station equations as a Civil 3D alignment station offset label. Label Style: MassDOT_PR_HD_BL_STA_EQUA Object Layer: PR-HD-BL-TEXT Marker Style: MassDOT_Circle After applying the label to the primary baseline alignment object, select the intersecting baseline alignment to set the alignment name and station of intersection.

#	KEYNOTE DESCRIPTION
17	Label roadway names using block HD-STREET_TITLE inserted on layer PR-HD-BL-TEXT. Block contains attribute text using text style DOT-STREET at a 0.25" height for the roadway name and route number. The block can be changed to show only the roadway name or roadway name with route number. Select the block and click on the block visibility state grip to choose the label configuration.
18	Add Line segment labels. Alignment Line Label Style: MassDOT_Proposed Alignment Line Label Style for Tag Labels: MassDOT_Tag_Label Alignment Line Label Layer: PR-HD-BL-TEXT
19	Layout (LO) lines are shown from the survey XREF. The LO annotation from the survey XREF may also be used provided it does not clash with drafted design features. When design linework conflicts are present, the LO text can be either copied from the XREF or the LO text can be re-produced in the sheet DWG. LO annotation is placed on layer EX-LO-TEXT and uses 0.1" DOT-E text style.
20	Proposed temporary easements are drawn on layer PR-RW-TEMPEASE. Right of Way annotation is placed on layer PR-RW-TEXT.
21	Use the DOT-P_arrow multileader style on layer PR-HD-TEXT by default on construction plans to call out proposed features and construction. Follow the guidelines provided in the graphical keynotes and VOL I - GENERAL STANDARDS AND STYLE SAMPLES regarding leader tip usage.
22	Use the DOT-P dimension style on layer PR-HD-TEXT to denote each roadway width and other dimensioned roadway geometry.
23	The bottom/front and top/back edges of curbing, edging, and berms are to be drawn on the following layers. The limits of each type of curb and transition curbing are to be shown on the Top/Back Curb layer. Bottom/Front Curb Face: PR-HD-CURB-BOT Top/Back Curb Face, Curb Limits: PR-HD-CURB-TOP Curbing, edging, berms and their associated roadside treatments such as grass strips, sidewalks, slopes, and ditches can be modeled in 3D using corridor models, grading objects, or a combination of each. The MassDOT Corridor Modeling Tools (MCMT) and MassDOT Subassembly Library (MSL) contain custom subassemblies and coordinated code set styles to produce corridor models. The related MCMT-MSL package is available within the MassDOT CAD State Kit for Civil 3D within the MSL Tool Palette tabs. The MSL Tool Palettes has tabs containing a set of subassemblies referred to as the Roadside Elements Tool Palettes for modeling roadside features and cross section types. Roadside Elements palette tabs are provided for Curbing, Edging, Berms, Sidewalks, Curb Ramps, Driveways, Side Slopes, Ditches, and automated cross section labeling for existing, layout, and ROW features. For more information about corridor modeling for MassDOT projects, refer to the MassDOT CAD Standards Manual, MassDOT Project Development & Design Guide Chapter 18 VOL II - HIGHWAY CONSTRUCTION PLANS STYLE SAMPLES, the MCMT-MSL User Guide, subassembly help docs, and corridor modeling help docs.
24	Pedestrian Curb Ramp (PCR) can be drawn in 2D on the following layers or users can insert a MassDOT PCR dynamic block symbol for designs that are more typical. Bottom/Front Curb Face: PR-HD-CURB-BOT, Top/Back Curb Face: PR-HD-CURB-TOP Outside Edges of Sidewalk: PR-HD-WALK, Internal Transition Edges or Grade Breaks of Sidewalk: PR-HD-WALK-JOINT Detectable Warning Panel: Draw and hatch or insert block HD-PCR-DWP on layer PR-HD-WALK-DWP, edge of pavement at PCR entrance to be drawn on layer PR-HD-EPAV. This PCR design for ramp 12 can be inserted and fit to the design as a dynamic block PCR symbol HD-PCR-NARROW placed on layer PR-HD-WALK. A PCR can be modeled in 3D using corridor models, grading objects, or a combination of each. The MassDOT Corridor Modeling Tools (MCMT) and MassDOT Subassembly Library (MSL) contain custom subassemblies and coordinated code set styles to produce corridor models. The related MCMT-MSL package is available within the MassDOT CAD State Kit for Civil 3D within the MSL Tool Palettes > Curb Ramps tab. Refer to the MassDOT CAD Standards Manual for more detailed information about MassDOT PCR and Driveway blocks, MassDOT Project Development & Design Guide Chapter 18 VOL II - HIGHWAY CONSTRUCTION PLANS STYLE SAMPLES, the MCMT-MSL User Guide, and corridor modeling help docs for Pedestrian Curb Ramps.
25	Pedestrian Curb Ramp (PCR) labels can be created using the GE-ID-SQUARE block symbol placed on layer PR-HD-TEXT. Enter the PCR ID as the ID attribute and PEDESTRIAN CURB RAMP as the DESCRIPTION attribute.

CONSTRUCTION PLAN CAD KEYNOTES

#	KEYNOTE DESCRIPTION
26	The spanning area label is created using the dynamic block PR-HD-SPANNING_LABEL placed on the text layer of the area feature the label is applied to. This label is placed on layer PR-HD-TEXT. The label can be accessed from the HWYDESIGN_SYMBOLS.DWG block symbol DWG or in the MassDOT CAD State Kit block insertion tool palette for Highway Design Symbols. To insert the spanning area label block, first place the block where the text should be placed. The label has a visibility state to choose either single-line text, multi-line text, or no text (for placing the spanning label as a spanning leader only). The label can be flipped using the dynamic block flip grip so the label can be justified to the desired side. Finally, place the spanning leader line arrows using the square dynamic block grips to the desired position. The leader landing distance can also be adjusted to fine tune the horizontal location of the text. Alternatively, when the area is too narrow to comfortably accomodate the spanning area label's arrow heads, call out the area using a multileader object of style DOT-P_arrow_tilde placed on the area feature's text layer.
27	Draw sawcut lines using polylines on layer PR-HD-SAWCUT. Optionally create a Civil 3D feature line object from the polyline on the same layer using feature line style MassDOT_Standard. The elevation source for this feature line is typically the existing grade (EG) surface with intermediate grade break points added. Label the line "SAWCUT" using a Civil 3D general line label or single line text aligned to the sawcut line. General Line/Curve Label Style: MassDOT_PR_SAWCUT Label Layer: PR-HD-TEXT
28	Driveways can be drawn as an area in 2D using a polyline on the specified driveway layer. Sidewalk-driveway crossings can be created using a MassDOT Driveway Layout dynamic block and use similar drafting conventions as the PCR blocks. Use a circular ID symbol to denote driveway crossings. They can also be drawn in 2D using the same layer conventions referenced for drafting PCR linework. Driveway layer: PR-HD-DRIVEWAY ID Label block: GE-ID-CIRC ID Label layer: PR-HD-TEXT Driveways can be modeled in 3D using corridor models, grading objects, or a combination of each. The MassDOT Corridor Modeling Tools (MCMT) and MassDOT Subassembly Library (MSL) contain custom subassemblies and coordinated code set styles to produce corridor models. The related MCMT-MSL package is available within the MassDOT CAD State Kit for Civil 3D within the MSL Tool Palettes > Driveways tab. Refer to the documentation provided in MassDOT Project Development & Design Guide Chapter 18 VOL II - HIGHWAY CONSTRUCTION PLANS STYLE SAMPLES, the MCMT-MSL User Guide, and corridor modeling help docs for Sidewalk Through Driveway.
29	Draw sediment barriers on layer PR-EV-SED-BARRIER or PR-EV-SED-BARRIER-COIRLOG. Call out environmental features on layer PR-EV-TEXT.
30	For areas of full depth pavement construction that will be identified with a hatch, the DOT hatch pattern shall be used at a hatch scale of 1.5x the drawing scale.
31	Proposed guardrail linework is to be placed on a layer based on the guardrail post type, steel or wood. Additionally, the guardrail polyline's linetype must be set to one of the guardrail linetypes to reflect the side of the baseline the guardrail is on. Steel Post Guardrail: PR-HD-GRDL-STBM (shown) Wood Post Guardrail: PR-HD-GRDL-WOOD Guardrail linework must be drawn in the same direction as the baseline alignment. Linetypes for each side will appear reversed if attempting to draw the line against the baseline direction. Double faced (DF) guardrail does not require a direction or side to be chosen. Steel Post Linetypes: GRDRAIL-STEEL-LT, GRDRAIL-STEEL-RT (shown), GRDRAIL-STEEL-DF Wood Post Linetypes: GRDRAIL-WOOD-LT, GRDRAIL-WOOD-RT, GRDRAIL-WOOD-DF
32	Proposed drainage can be drawn in 2D using block symbols and polylines or modeled in 3D using MassDOT Civil 3D pipe network tools (MPNT). Catch Basin with Curb Inlet block symbol: HD-CBCI Catch Basin with Curb Inlet structure style: MassDOT_DRN_PR_CBCI Drain Manhole block symbol: HD-MHD Drain Manhole structure style: MassDOT_DRN_PR_DMH Proposed Drainage Structures layer: PR-UT-DRAIN-STRC (Place all block symbols and pipe network structures on this layer) See the Drainage & Utility Plan sample sheet for more detailed information regarding drawing and modeling utilities.

CAD STANDARDS NOTES

CONSTRUCTION PLAN CREATION

1. The standard method of construction plan creation is to develop the sheet using the guidance found in the ***MassDOT Sheet Production Tools (MSPT) Help Doc for Highway Construction Plans***.
2. The workflows listed in the help doc direct the user to utilize the Civil 3D view frame groups and sheet set manager functionality to produce each series of construction plans that are placed along a project baseline alignment. This workflow results in the need to create both model DWG files and a sheet DWG containing a sheet layout that is part of a sheet set. Use the following content as indicated in the ***MassDOT CAD Standards Manual*** for assembling a series of construction plans:

Template for creating Model DWG's	MassDOT_C3D_Design.DWT
Template for creating Sheet DWG's	HWY_CONST_PLAN_SHEETS.DWG
Plot Style Table Page Setup	MADOT-D.STB MassDOT-Design-36x24-PDF
Layer Group	HD Highway Design
Annotation Styles	DOT-P Text/Dim/Multileader Styles

3. HD model DWG files should only include annotation that will be applied in the same location on all sheets. Most annotation should be applied primarily in the sheet DWG.
4. Prior to creating the view frame group that generates sheet DWG files, a sheet set data DST file and project sheet set template DWG file must be created. Refer to the MSPT User Guide and MSPT Help Doc for Highway Construction Plans for detailed sheet set creation.
5. Include the PLAN_XXSc layout from the above referenced sheet template DWG when creating the project sheet template DWG file:
   - 5.1. Use the Design Center functionality to import a layout to a new DWG created from the latest MassDOT C3D Design DWT.
   - 5.2. Modify the PLAN_XXSc layout to serve as the source sheet for each construction plan in the series. Refer to the MSPT help doc for detailed instructions.
   - 5.3. Set this sheet layout as the source layout for view frame sheet creation. The resulting sheet DWG will contain all necessary styles for annotating the features on the sheet.
6. When creating sheets, it is recommended to create only a single sheet layout per sheet DWG.

CONSTRUCTION PLAN DRAFTING STANDARDS

1. Linework shall be drawn on a standard MassDOT CAD layer or a copy of a standard MassDOT CAD layer that uses a MassDOT standard linetype and plot style from the MassDOT CAD Standard pen table STB files.

Where it is required to deviate from using the default ByLayer setting for linework drawing objects it is noted with a CAD keynote.

2. All drafted linework shall be drawn to a lineweight found on sheet 1.2 LINEWORK & LINEWEIGHT STANDARDS in the MassDOT PDDG Ch 18 VOL I GENERAL STYLE SAMPLE PLANS.
3. All annotation shall be created using the CAD styles found on sheet 1.3 ANNOTATION STYLES in the MassDOT PDDG Ch 18 VOL I GENERAL STYLE SAMPLE PLANS.
4. Existing survey baseplan detail information shall be screened for clarity. Refer to the MassDOT Field Survey Guidelines and Baseplan Requirements and the MassDOT CAD Standards Manual for a listing of CAD drafting and annotation standards that must be followed for drafting survey baseplans.
5. All plan symbols shall use the MassDOT standard symbol set available from the latest version of the MassDOT CAD Standards download.

CONSTRUCTION PLAN ANNOTATION

1. The default annotation style for all proposed and modified features is based on text style DOT-P (Arial, Regular, 0.125"). All multileader, dimension, and Civil 3D label styles shall utilize this text style. All text, multileader, dimension, and Civil 3D label objects shall utilize these DOT-P based styles.
2. The default annotation layer for proposed features on construction plans is PR-HD-TEXT. All text, multileader, dimension, and Civil 3D label objects shall be placed on this layer unless otherwise indicated in the keynotes.
3. When using a single sheet layout per sheet DWG all annotations may be placed on PR-HD-TEXT.
4. If including multiple sheet layouts per sheet DWG, to account for overlapping sheet text the PR-HD-TEXT layer may be split into an odd-even set of layers:
   - 4.1. Duplicate layer PR-HD-TEXT and then rename each to create PR-HD-TEXT-ODD and PR-HD-TEXT-EVEN layers.
   - 4.2. Place annotations for the respective sheets on those layers.
   - 4.3. Viewport freeze the -ODD layer on even-numbered sheets and -EVEN sheets on odd-numbered sheets.

NOTE:
KEYNOTE NUMBERING MAY NOT BE CONSECUTIVE.
SOME GAPS HAVE BEEN LEFT TO ALLOW FOR FUTURE KEYNOTES TO BE PLACED.

10-Dec-2025 8:56 AM
654123_HD_CO.DWG

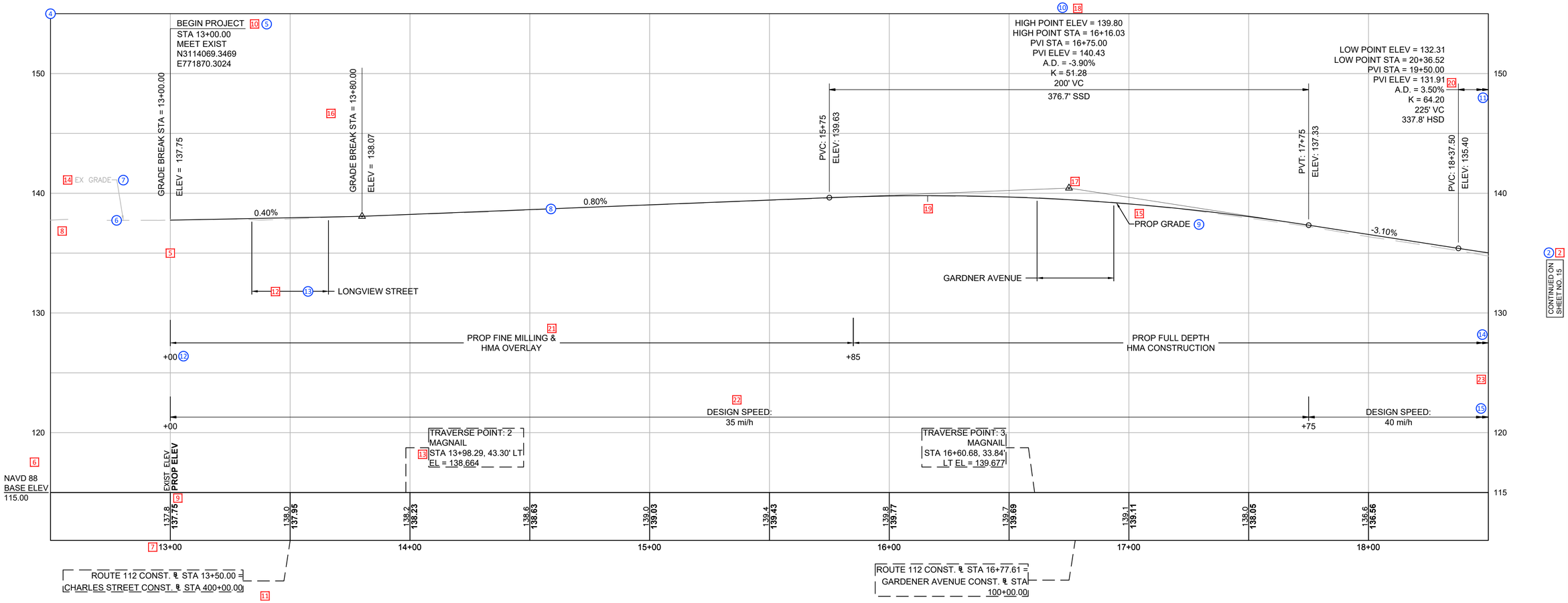
ANDOVER
ROUTE 104 AT ROUTE 112

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	14	60
PROJECT FILE NO.	654123		

CONSTRUCTION PROFILES

654123_HD_PR.DWG Plotted on 10-Dec-2025 9:05 AM

ROUTE 112 [4]



HOR. SCALE IN FEET
20 0 20 40
VER. SCALE IN FEET
4 0 4 8
0 1"

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 11

CONSTRUCTION PROFILE KEYNOTES

SAMPLE PLAN PDDG KEYNOTES	
#	KEYNOTE DESCRIPTION
1	Sheets that show only profiles will have their corresponding plan sheet number placed on the lower right edge of the sheet inside the border. Omit the sheet reference note for sheets showing both plan and profile. Profiles of intersecting streets, drives, roads, etc., are plotted in the sequence of the base or center line stationing.
2	Indicate the sheet number where the profile continues from on the left side of the sheet. Indicate the sheet number where the profile continues to on the right side of the sheet.
3	Horizontal and vertical bar scales will be shown on construction profiles.
4	Denote baseline name.
5	Horizontal and vertical grid lines to be gray. Draw the border of the profile view with a black, continuous line.
6	Label the vertical datum of the profile and the datum elevation as shown. Denote elevations in 10' interval on each side of profile grid, vertical grid factor shall be 1 horizontal grid line every 5'.
7	Denote stations in 100 ft intervals along the bottom of the profile view using 0.14 in size black text. When the profile is shown on the same sheet as the plan view, the length of the profile should be the same length in stations as the baseline of the plan, to the maximum extent possible. When the profile is on a separate sheet, the length shown must be the same as the length of the corresponding plan in stations. An overlap of 100 feet is required for each sheet. For construction profiles plotted at a 20 scale, a 50' overlap is permissible.
8	Profiles should extend a minimum of 50 feet beyond the beginning of the project as shown on plans.
9	Label the existing and proposed grade labels at the beginning of the profile station range. The existing elevations are labeled to the left of the respective upright.
10	The beginning and end of the project will be shown and the stations, impacts at the project limit, and coordinates indicated.
11	Denote station equations at the primary baseline station along the bottom of the profile using a dashed border and leader. When streets, drives, and roads are indicated by stations along their profile, only the main baseline station is shown rather than an equation.
12	Indicate locations of ramps, side streets, and intersecting streets using a dimension. Denote the name of the ramp or street.
13	Indicate locations of temporary and permament benchmarks along the bottom of the profile using a dashed border and leader. Denote the benchmark description, station, offset, and elevation as shown.
14	Show existing grade as a thin, gray, dashed line. Denote existing grade line.
15	The proposed profile lines are drawn as heavy solid lines. Denote proposed grade line.
16	Denote station and elevation of all points of vertical intersection.
17	Draw the location of points of vertical intersection (PVI's) and tangent extensions leading to and leaving the PVI.
18	The rates of grade, points of curvature and tangency, and vertical curve data (length of curve, K value, PVI station and elevation, etc.) must be denoted. PVI's shall be located at stations values to nearest foot (XX+XX.00). The calculated lengths of vertical curve sight distances are labeled and described as (distance in feet) SSD or HSD.
19	Denote high point/low point locations with tick marks. The high point ticks shall only be applied to a crest curve with positive incoming slope and negative outgoing slope. A low point tick shall only be applied to a sag curve with negative incoming tangent and positive outgoing tangent.
20	Vertical curves extending beyond the limits of the sheet shall display a double arrow indicating the continuation of the curve. The label shall include all required curve data on each sheet. Right justify the label at the end of profile views and left justify the label at the beginning of profile views.
21	Denote distinct areas and station limits of pavement construction using a dimension.
22	Denote station limits of design speeds using a dimension.
23	Dimensions extending beyond the sheet limit shall be indicated with a double arrow symbol.

SAMPLE PLAN CAD KEYNOTES	
(#)	KEYNOTE DESCRIPTION
1	The profile sheet number refrerence is created using block HD-SHEET_REF-PROF_SHEET. The block is included on the SHEET_20Sc and SHEET_40Sc sheet layout templates. Delete this block label when the profile is included on the same sheet as the construction plan. To coordinate the profile sheet number with the sheet number on the construction plan, set the sheet number block attribute value to a sheet set manager sheet number reference field value.
2	The sheet continuation blocks are included on the profile layout templates. The left side block reads from the sheet number and subtracts one to output the preceding sheet number. The right side block adds a number to output the following sheet number.
3	Insert bar scale in model space so the viewport scale and the plotted graphical scale always correlate.
4	Use the standard MassDOT profile view style for all profile sheets. Profile View Style: MassDOT_Standard Profile View Layer: OB-PROF-VIEW Use the profile band set MassDOT_EG_FG_Speed to create the elevation labels along the bottom. Assign the EG profile to Profile 1, and FG profile to Profile 2. The design speed will automatically be geneated using the MassDOT_EG_FG_Speed profile band set style. Some grip editing may be necessary to align dimension omcponents. CTRL+Right click to isolate design speed dimensions for grip editing. The identifing labels for the elevation labels will also be automatically created in the MassDOT_EG_FG_Speed profile band set style.
5	The project beginning and end labels are created using a profile view station elevation label style. Profile View Station Elevation Label Style: MassDOT_PROJECT BEGIN or MassDOT_PROJECT END Put on layer PR-HD-PROF-TEXT. Once the label is inserted, assign the primary construction baseline alignment object to the reference text component to apply the coordinate values. The description of the condition at the project limit shall match the description denoted at the project begining and end on the Construction Plans. Edit the text component if necessary if the condition is not MEET EXIST.
6	The existing centerline grade profile is created as a Civil 3D Surface Profile. Profile Style: MassDOT_Existing Profile Layer: OB-PROF Profile Label Set: MassDOT_No Display
7	Profile View Station Elevation Label Style: MassDOT_EX GRADE Put on layer PR-HD-PROF-EG-TEXT.
8	The proposed centerline grade profile is created as a Civil 3D Profile By Layout. Profile Style: MassDOT_Design Profile Layer: OB-PROF Profile Label Set: MassDOT_MHD_Design Profile Label Set Layer: OB-PROF-TEXT Profile Line Label Style: MassDOT_Design
9	Profile View Station Elevation Label Style: MassDOT_PROP GRADE Put on layer PR-HD-PROF-FG-TEXT.
10	Crest Curve Label Style: MassDOT_Crest_Curve_SSD Denotes crest curves only on the layout profile. For profile crest curves with no high point in the curve, the crest curve label automatically omits the high point portion of the curve data and high point tick. The same behavior is found for sag curves with no low point. Apply to layout profile using label set style MassDOT_MHD_Design.

SAMPLE PLAN CAD KEYNOTES	
(#)	KEYNOTE DESCRIPTION
11	To create the curve labels continuing beyond the profile vie wlimit, CTRL+Left click to isolation select the label out of the set, then apply the appropriate label style to the label. Each crest and sag curve standard label style has two alternate label styles for applying to the beginning and end of the profile view. Use the label styles suffixed with _Beg at the beginning of profile views when a curve preceding the sheet continues onto the current sheet. Use the label styles with suffix _End at the end of profile views when curves extend beyond the end of the view.
12	Profile View Station Elevation Label Style: MassDOT_DESIGN_STA Only Use the DOT-P dimension style and a text override of the dimension value to denote distinct station ranges of differing construction.
13	Use the DOT-P dimension style and a text override of the dimension value to denote ramps, side streets, and intersecting streets Put on layer PR-HD-PROF-TEXT.
14	To apply a double arrow at the end of a dimension line apply User Arrow block _MassDOTDoubleArrow.
15	Alternatively, use a block to add the double arrow. Block: GE-DBL_ARROW Put on layer PR-HD-PROF-TEXT.

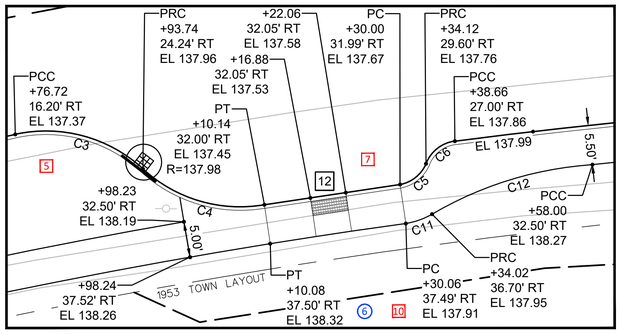
NOTE:
KEYNOTE NUMBERING MAY NOT BE CONSECUTIVE. SOME GAPS HAVE BEEN LEFT TO ALLOW FOR FUTURE KEYNOTES TO BE PLACED.

654123_HD_PR.DWG Plotted on 10-Dec-2025 9:06 AM

ANDOVER
ROUTE 104 AT ROUTE 112

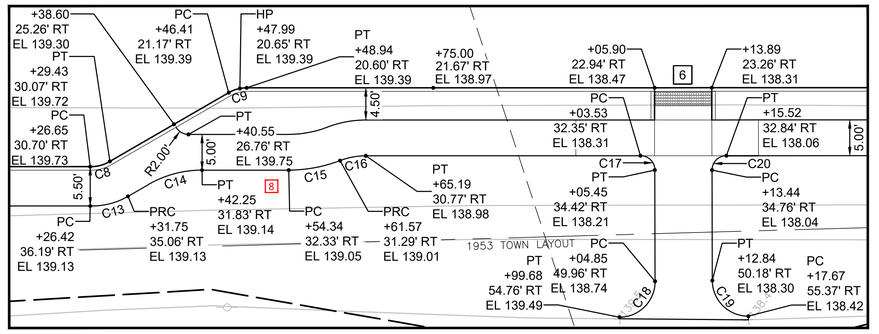
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	20	60
PROJECT FILE NO.	654123		

CURB TIE & GRADING PLANS



INSET PLAN A

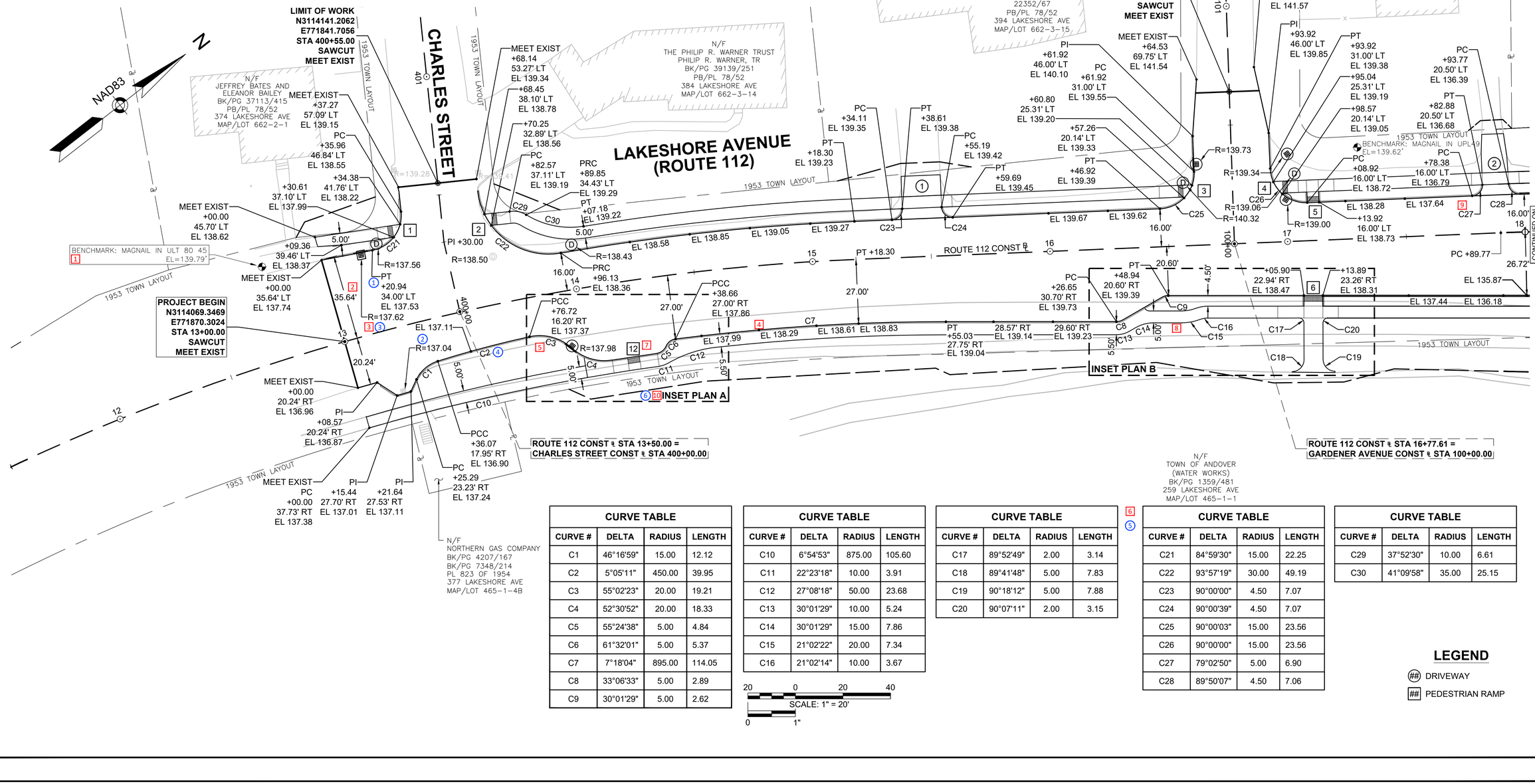
SCALE: 1' = 10'



INSET PLAN B

SCALE: 1' = 10'

10 0 10 20
SCALE: 1" = 10'



CURVE TABLE			
CURVE #	DELTA	RADIUS	LENGTH
C1	46°16'59"	15.00	12.12
C2	5°05'11"	450.00	39.95
C3	55°02'23"	20.00	19.21
C4	52°30'52"	20.00	18.33
C5	55°24'38"	5.00	4.84
C6	61°32'01"	5.00	5.37
C7	7°18'04"	895.00	114.05
C8	33°06'33"	5.00	2.89
C9	30°01'29"	5.00	2.62

CURVE TABLE			
CURVE #	DELTA	RADIUS	LENGTH
C10	6°54'53"	875.00	105.60
C11	22°23'18"	10.00	3.91
C12	27°08'18"	50.00	23.68
C13	30°01'29"	10.00	5.24
C14	30°01'29"	15.00	7.86
C15	21°02'22"	20.00	7.34
C16	21°02'14"	10.00	3.67

20 0 20 40
SCALE: 1" = 20'
0 1"

CURVE TABLE			
CURVE #	DELTA	RADIUS	LENGTH
C17	89°52'49"	2.00	3.14
C18	89°41'48"	5.00	7.83
C19	90°18'12"	5.00	7.88
C20	90°07'11"	2.00	3.15

CURVE TABLE			
CURVE #	DELTA	RADIUS	LENGTH
C21	84°59'30"	15.00	22.25
C22	93°57'19"	30.00	49.19
C23	90°00'00"	4.50	7.07
C24	90°00'39"	4.50	7.07
C25	90°00'03"	15.00	23.56
C26	90°00'00"	15.00	23.56
C27	79°02'50"	5.00	6.90
C28	89°50'07"	4.50	7.06

CURVE TABLE			
CURVE #	DELTA	RADIUS	LENGTH
C29	37°52'30"	10.00	6.61
C30	41°09'58"	35.00	25.15

LEGEND

(##) DRIVEWAY
[##] PEDESTRIAN RAMP

654123_HD_CT-GD.DWG Plotted on 25-Jun-2026 6:42 p

CURB TIE & GRADING PLAN KEYNOTES

SAMPLE PLAN PDDG KEYNOTES

#	KEYNOTE DESCRIPTION
1	Show at least one survey control benchmark on each curb tie & grading sheet.
2	Dimension the roadway widths at the beginning and end of the sheet's station range and at width transition points.
3	Denote elevation of all drainage structure inlets. Existing inlets not to be modified or that are outside project limits shall be denoted with an existing rim elevation label.
4	The elevation will be computed along each roadway edge at 25-foot intervals and at other intermediate points where required. 25-foot interval labels shall include only the elevation when the width is the same as the typical section. When the offset to the roadway edge differs from that listed on the typical section, include the offset in the label. When a label does not coincide with a 25-foot interval, the station shall be denoted. The offset shall also be listed when the offset to roadway edge differs from that listed on the typical section. A dot marker shall denote the elevation point location on the roadway edge.
5	Label all curved curbing with a curve ID number label. Provide the curve delta angle, radius, and length for each curve. Curve labels do not need to be applied to curves that are concentric and running parallel with the baseline.
6	Curved curbing curve information shall be shown in curve tables indicating curve number, delta, radius, and length. Curves that are concentric to the baseline do not need to be in curve tables.
7	Denote stations at pedestrian ramps.
8	Features with a uniform width along a station range can be dimensioned at the beginning and end of the station range to identify edge line locations.
9	Denote stations at driveways.
10	In areas of high detail an inset plan can be created to show the additional detail in the area at a smaller scale.

SAMPLE PLAN CAD KEYNOTES

(#)	KEYNOTE DESCRIPTION
1	Curb tie curved curbing geometry points are to be annotated with the primary baseline alignment station, offset, and finish grade elevation with an alignment station offset label. An elevation label component is provided which enables the user to reference the finish grade elevations from a corridor surface. Two station offset label style types are provided for curb tie plans: (1) styles including the abbreviation BL in the name are to be applied from the primary baseline alignment; (2) styles including the abbreviation CTG in the name are to be applied from the roadway edge/bottom of curb alignment, the user can then set the station and offset to read from the primary baseline alignment. BL and CTG station offset label styles are provided for all curb tie labeling scenarios. Alignment Station Offset Label Style: MassDOT_HD_STA_OFFSET_ELEV Label Layer: PR-HD-TEXT Set the surface reference text label component to the corridor's finish grade surface.
2	Annotate multiple curved curbing geometry points at once with a CTG alignment label set created from the bottom of curb alignment. An elevation label component is provided which enables the user to reference the finish grade elevations from a corridor surface. Alignment Station Label Set Style: MassDOT_Proposed CTG Label Layer: PR-HD-TEXT Set the surface reference text label component to the corridor's finish grade surface for all group labels.
3	Denote the rim elevation for all drainage inlets using a data shortcut reference pipe network structure and label that only shows rim elevation. Civil 3D Structure Label Style:: MassDOT__Plan_PR_Rim Elev Label Layer: PR-UT-DRAIN-TEXT
4	Annotate curved curbing segments using Civil 3D tag curve labels. Alignment Curve Label Style: MassDOT_Tag_label Label Layer: PR-HD-TEXT
5	List curved curbing dimensions in an alignment segment table. Alignment Segment Table Style: MassDOT_Curved Curbing_Table Table Layer: GE-TABLE Only create curve tag labels and only include curved tag labels in table.
6	The Inset Plan view frame is generated from dynamic block GE-INSET_PLAN inserted on layer GE-SHEET. The dynamic block allows the user to set the border dimensions of the Inset Plan outline. The Inset Plan view border is created using block

GRAPHICAL STANDARDS NOTES

GENERAL

1. Follow all Graphical Standards Notes and keynotes provided on the Construction Plans Keynotes sheet.

CAD STANDARDS NOTES

CURB TIE & GRADING PLAN CREATION

1. The standard method of Curb Tie & Grading Plans creation is to develop the sheet using the guidance found in the ***MassDOT Sheet Production Tools (MSPT) Help Doc for Highway Construction Plans***.
2. Create a view frame group and Curb Tie & Grading Plans sheet template layout to generate each sheet in the series.

Template for creating Model DWG's	MassDOT_C3D_Design.DWT
Template for creating Sheet DWG's	HWY_CONST_PLAN_SHEETS.DWG
Plot Style Table Page Setup	MADOT-D.STB MassDOT-Design-36x24-PDF
Layer Group	HD Highway Design
Annotation Styles	DOT-P Text/Dim/Multileader Styles

3. When creating sheets, it is recommended to create only a single sheet layout per sheet DWG.
4. The Civil 3D label styles provided in the MassDOT C3D Design template require the following drawing objects to be in the Curb Tie & Grading Plans sheet DWG to automatically compute station, offset, and, elevation values of curb tie labels:
   - 4.1. Primary Baseline alignment object
   - 4.2. Roadway Edge/Bottom Curb alignment object
   - 4.3. Other miscellaneous linear features such as back of sidewalks possessing curves that are to be included in the CURVE TABLE alignment curve table must be created as an alignment.
   - 4.4. Features with curves not created using an alignment object must be included in a separate line and curve table.
   - 4.5. Existing and Finish Grade surface objects.

CURB TIE & GRADING PLAN DRAFTING STANDARDS

1. Linework shall be drawn on a standard MassDOT CAD layer or a copy of a standard MassDOT CAD layer that uses a MassDOT standard linetype and plot style from the MassDOT CAD Standard pen table STB files.
2. Where it is required to deviate from using the default ByLayer setting for linework drawing objects it is noted with a CAD keynote.

CURB TIE & GRADING PLAN ANNOTATION

1. The default annotation style for all proposed and modified features is based on text style DOT-P (Arial, Regular, 0.125"). All multileader, dimension, and Civil 3D label styles shall utilize this text style. All text, multileader, dimension, and Civil 3D label objects shall utilize these DOT-P based styles.
2. The default annotation layer for proposed features on curb tie & grading plans is PR-HD-TEXT. All text, multileader, dimension, and Civil 3D label objects shall be placed on this layer unless otherwise indicated in the keynotes.
3. When using a single sheet layout per sheet DWG all annotations may be placed on the default PR-HD-TEXT layer.
4. If including multiple sheet layouts per sheet DWG, to account for overlapping sheet text the default PR-HD-TEXT layer may be split into an odd-even set of layers:
   - 4.1. Duplicate layer PR-HD-TEXT and then rename each to create PR-HD-TEXT-ODD and PR-HD-TEXT-EVEN layers.
   - 4.2. Place annotations for the respective sheets on those layers.
   - 4.3. Viewport freeze the -ODD layer on even-numbered sheets and -EVEN sheets on odd-numbered sheets.
5. If including one or more inset plans into the sheet, to account for isolating inset plan annotation from the master plan view, the default annotation layer may be split into PLAN and INSET layers:
   - 5.1. Duplicate the annotation layer twice and add suffix -INSET to the first layer and -PLAN to the second.
   - 5.2. Duplicate the GE-MASKING layer twice and add suffix -INSET to the first layer and -PLAN to the second.
   - 5.3. Place annotation and associated wipeouts on the respective layers corresponding to the view that the annotation is found within. Annotation objects that are used in both the master plan view and an inset plan view can be kept on the parent annotation layer the INSET and PLAN layers were created from.
   - 5.4. Viewport freeze the -INSET layers in the master plan view's viewport and the -PLAN layers in each inset plan's viewport.
6. Tables on Curb Tie & Grading Plans sheets shall be created on the GE-TABLE layer.

NOTE:
KEYNOTE NUMBERING MAY NOT BE CONSECUTIVE. SOME GAPS HAVE BEEN LEFT TO ALLOW FOR FUTURE KEYNOTES TO BE PLACED.

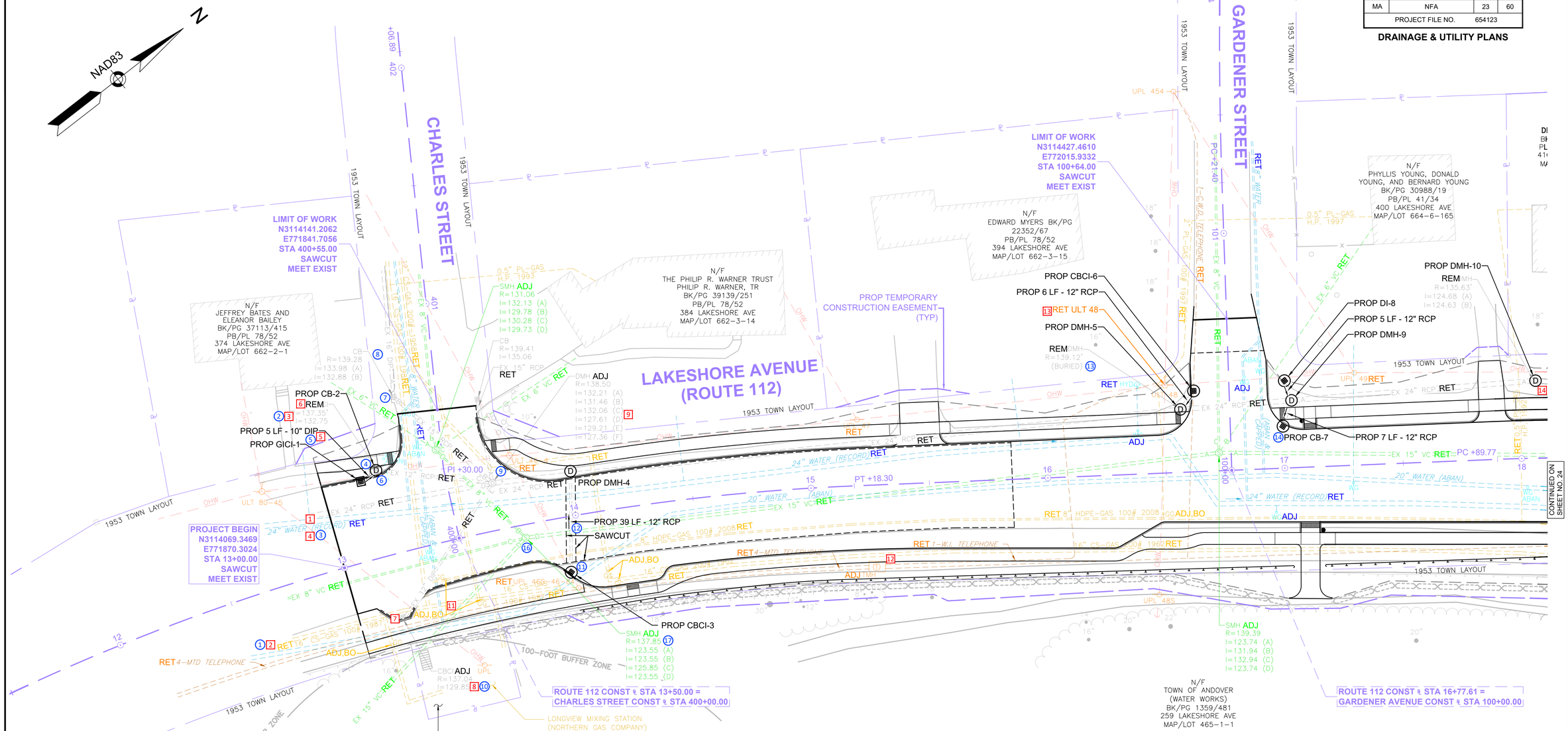
10-Dec-2025 9:15 AM
654123_HD_CT-GD.DWG

ANDOVER
ROUTE 104 AT ROUTE 112

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	23	60
PROJECT FILE NO.	654123		

DRAINAGE & UTILITY PLANS

654123_HD_DRUT.DWG Plotted on 10-Dec-2025 3:00 PM



DRAINAGE STRUCTURE DATA 10 15

NO.	TYPE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
1	PROP GICI	13+16 33.3' LT	138.00		I=135.52' (2)	
2	PROP CB	13+23.2 36.3' LT	139.10	I=135.48' (1)	I=132.75' (EX DMH)	WITH F&C CONN. TO EXIST.
3	PROP CBCI	13+94 23.3' RT	137.60		I=130.28' (4)	
4	PROP DMH	14+01 18.7' LT	138.90	I=128.85' (3) I=127.03' (EX DMH)	I=130.58' (5)	CONN. TO EXIST.
5	PROP DMH	16+57 26.6' LT	142.49	I=137.57' (4) I=134.74' (6)	I=125.76' (9)	

DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
6	PROP CBCI	16+62.9 34.1' LT	139.38		I=135.55' (5)	
7	PROP CB	17+00 17.7' LT	138.60	I=125.26' (9)		
8	PROP DI	17+01.3 36.8' LT	139.60		I=128.52' (9)	
9	PROP DMH	17+04 28.4' LT	139.10	I=125.42' (5) I=128.47' (8)	I=125.42' (10) I=125.32' (7)	CONN. TO EXIST.
10	PROP DMH	18+06.4 32.7' LT	127.43	I=124.68' (9)	I=124.63' (S4)	

NOTE:
1. THE POSITION AND ELEVATION IN THIS TABLE REFLECT CENTERLINE OF ROAD TO CENTER OF STRUCTURE.
2. INVERTS SHOWN FOR REVIEW PURPOSES ONLY (NOT FOR CONSTRUCTION).

CONTINUED ON SHEET NO. 24

SAMPLE PLAN PDDG KEYNOTES	
#	KEYNOTE DESCRIPTION
1	Both existing and proposed utility segments (subsurface pipes and other lines) 8" and larger shall be represented by a double line.
2	By default, all proposed utility feature text is shown as 0.125" height in the same DIGSAFE color as the utility.
3	Existing utilities are annotated using 0.1" text height in the same DIGSAFE color as the utility.
4	Record Location utilities are annotated using oblique 0.1" text in the same DIGSAFE color as the utility.
5	The required information to be shown for proposed drainage structures includes the status (PROP), structure type abbreviation, a hyphenated structure ID number, rim elevation, location referenced to station, offset, and side, invert information listed with the name of the connected structure at the opposite end of the pipe, and any remarks about additional construction details such as castings, special components, hoods, connection to existing drainage system, etc. By default, this information is shown in a Drainage Structure Data Table, shown at the bottom of the sheet. Each proposed structure in plan view is labeled with the status, structure type abbreviation, and hyphenated structure ID number. When placing the table on a plan sheet, show only the proposed structures shown on the sheet. The table may be placed anywhere on the sheet convenient or it may be attached to a separate sheet at the end of the drainage & utility plans. Structure Numbering: All proposed drainage structures are to be numbered in series along the primary baseline's station order, starting at 1 for the furthest down-station structure and increasing in the up-station direction as shown. shown. The structures are to be be numbered consecutively regardless of the structure type, i.e. DMH structures are not numbered separately from CB structures, they are both part of the same number series. The required information to be shown for proposed drainage pipes is the status, length, size and pipe material. Specify length in linear feet (LF) along the centerline of the pipe between the inside edges of the connecting structures. Specify the size in inches using the double prime symbol (") for normal circular pipe. A hyphen is to be placed between the length and size. Proposed drain pipes shall also display the flow direction of the pipe using a black arrow. Special drainage structures must be noted; the abbreviation "PROP" is not necessary before the description. Details of all special drainage structures will be shown on a separate sheet.
6	This existing curb inlet is being removed and replaced with a proposed, new construction catch basin with frame and cover. When structures are to be removed and replaced as a whole or in part (rebuilding, remodeling) the original existing structure symbol shall be shown beneath the proposed structure symbol to indicate the relative position of each. Proposed utilities including modifications made to existing structures such as adjusting the structure are annotated using 0.125" text.
7	This existing catch basin curb inlet is being adjusted in-place. It is only necessary to show the existing structure symbol in this case and mark the structure for adjustment with "ADJ" using 0.125" text..
8	When an existing structure only has a single pipe connection do not apply pipe connection ID label and do not show any ID letter next to the invert row of the structure label.
9	Pipe or line inverts listed in existing structure labels shall show an identifier for each pipe or utility line connected to the structure and each pipe connection will be labeled with that identifier. Pipes identifiers shall be capitalized alphabetical, A, B, C, D, etc. as shown. Pipe identifier labels can be oriented in any direction that provides the best plan clarity and readability, whether aligned with the pipe or horizontal.
10	Provide a drainage structure table denoting the station and offset location, rim elevation, invert data (elevation and connecting structure), and any comments on the construction or other components of the structure. For complex drainage installations, a separate structure table sheet can be created at the end of the drainage & utility plans. Table row order shall correspond with the structure number/primary baseline up-station direction.
11	Denote the type of construction modification to apply to existing utility structures in 0.125" text in the same color as the DIGSAFE utility type. Work to be done by others shall be denoted BO as shown.
12	Utility structures with a known shape shall be depicted accurately to model dimensions. Show a manhole symbol at all located structure access points.
13	When the modification label for a proposed construction modification feature cannot be placed next to the feature's label and the feature's label has unique text (such as the pole number in this case), use a callout and include the label text of the symbol in the callout text as shown.
14	It is permissible to extend the visible edge of the plan view slightly if a pipe can be contained within a single sheet rather than breaking the continuity of the sheet at a point within the span of the pipe.

DRAINAGE & UTILITY PLAN KEYNOTES

GRAPHICAL STANDARDS NOTES

GENERAL

1. Follow all Graphical Standards Notes and keynotes provided on the construction plan sample drawings.
2. Utilities and other drawing features plot in color. Utility colors are intended to match with their DIGSAFE color designation. All annotation associated with that utility shall be in the corresponding color.
3. Roadway, Traffic, Landscape, and any other non-Utility design features are drawn using thick dark gray lines to provide greater clarity to the thick, black Drainage features.
4. MassDOT projects requiring SUE (Subsurface Utility Engineering method) have additional drawing requirements and standards that must be followed for this project type. See the MassDOT project sample plans volume for SUE projects for information on these additional requirements and standards.

DRAINAGE AND UTILITY FEATURE STATUSES

All drainage and utility facilities shown on project drawings shall be assigned one of the following utility statuses for designating drafted features to their correct plan symbol, annotation styles, and CAD layers:

Existing Utilities
Utility Facilities depicted from field observations or within utility structures by Land Surveying Firm.

Record Location Utility
Utility Facilities not directly observed in the field, depicted from record plans, DIGSAFE markings, and other evidence by Land Surveying Firm.

Proposed Utility
Utility Facilities to be newly constructed, removed/abandoned, or modified as part of the proposed project construction.

NOTE:
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654123_HD_DR-UT.DWG Plotted on 8-Jun-2026 2:47 p

SAMPLE PLAN CAD KEYNOTES

#	KEYNOTE DESCRIPTION
1	Proposed utility feature text shall use the DOT-P text, dimension, and multileader styles.
2	Existing utility feature text shall use the DOT-E text, dimension, and multileader styles.
3	Utility Record Location text shall use the DOT-E-OBL text, dimension, and multileader styles.
4	Proposed drainage can be drawn in 2D using block symbols and polylines or modeled in 3D using MassDOT Civil 3D pipe network tools (MPNT). To create block symbols, access the MassDOT CAD State Kit Block Insertion Tool Palettes by clicking on the desired symbol group in the MassDOT ribbon tab > Block Symbols panel. MPNT proposed drainage features can be created using the MassDOT_MPNT_DRN_PR parts list. Users may also create their own custom parts lists using the guidance found in the MassDOT CAD State Kit MassDOT Support ribbon tab > Pipe Network Tools panel, > MPNT Parts List Creation workflow doc. Curb Inlet block symbol: HD-CI Curb Inlet structure style: MassDOT_DRN_PR_CI_Structure Drain Manhole block symbol: HD-MHD Drain Manhole structure style: MassDOT_DRN_PR_DMH Proposed Drainage Structures layer: PR-UT-DRAIN-STRC (Place all block symbols and pipe network structures on this layer) Pipe Style: MassDOT_DRN_PR_Single-Line Proposed Underground Drainage Pipe Layer: PR-UT-DRAIN-UGND (Place all linework and pipe network pipes on this layer)
5	By default, show proposed drainage structure data in a Drainage Structure Data table and structure name label that shows the status (PROP), the structure type, and the hyphenated ID number. When using pipe networks customized for MassDOT, special label styles that will read the custom pipe network properties must be used. These label style names contain the prefix MPNT. For example, the labels shown here have fields that display structure status, abbreviation and the construction modification abbreviation. Structure Label Style: MassDOT_MPNT-Plan_PR_Struc Type-Number Structure Label Layer: PR-UT-DRAIN-TEXT The structure status (PROP) and abbreviation (GICI) are applied to the structure part through MPNT structure properties automatically. Apply the structure number through the structure Name property as a numeric value only. Do not add the structure status or type to the structure name. If project-specific situations arise where it is more appropriate to show a full data label with location and invert information included and provided it would not create unnecessary drawing clutter to the plan view use the structure label style MassDOT_MPNT-Plan_PR_Name_Location_Rim_Inverts. Pipe Label Styles: MassDOT_MPNT-Plan_PR_L_D_M, MassDOT__Plan_Flow Arrow_Half Size Pipe Label Layer: PR-UT-DRAIN-TEXT The pipe label application for short pipes requires the label to be placed as a callout by dragging it from the pipe. This results in the flow arrow included in the primary label disappearing because the label is now in dragged state. Apply the Half-Size arrow label to replace the arrow.
6	Indicate the construction modification type. If using pipe networks, use structure label style MassDOT_MPNT-Plan_PR_Construction Modification placed on layer PR-UT-DRAIN-TEXT.
7	Existing drainage can be drawn in 2D using block symbols and polylines or modeled in 3D using MassDOT Civil 3D pipe network tools (MPNT). To create block symbols, access the MassDOT CAD State Kit Block Insertion Tool Palettes by clicking on the desired symbol group in the MassDOT ribbon tab > Block Symbols panel. MPNT existing drainage features can be created using the MassDOT_MPNT_DRN_EX parts list. Users may also create their own custom parts lists using the guidance found in the MassDOT CAD State Kit MassDOT Support ribbon tab > Pipe Network Tools panel, > MPNT Parts List Creation workflow doc. Catch Basin block symbol: SV-CB Catch Basin structure style: MassDOT_DRN_EX_CB Drain Manhole block symbol: SV-MHD Drain Manhole structure style: MassDOT_DRN_EX_DMH Existing Drainage Structures layer: EX-UT-DRAIN-STRC (Place all block symbols and pipe network structures on this layer) Pipe Style: MassDOT_DRN_EX_Single-Line Existing Underground Drainage Pipe Layer: EX-UT-DRAIN-UGND (Place all linework and pipe network pipes on this layer)

#	KEYNOTE DESCRIPTION
8	Using pipe network models of the existing drainage system enables users to apply existing drainage annotation as needed on drainage plans instead of relying on the labels applied in the survey XREF. By default, show existing and record location drainage structure data in a full data label that shows the structure type, rim elevation, and inverts. Structure Label Style: MassDOT_MPNT-Plan_EX_Struc Type_Rim_Inverts Structure Label Layer: EX-UT-DRAIN-TEXT Each invert in the structure label is identified with a pipe connection ID letter. The ID letter is applied to the pipe object that is connected to the structure. The order of the connected pipes is dictated first by whether it is an inflow or outflow pipe (inflow pipes first rows, outflow pipe(s) last) and second by the order in which the pipes were connected to the structure. See the keynote below, right at the large existing DMH structure label for additional pipe connection ID label setup guidance. Pipe Label Styles: MassDOT_MPNT-Plan_EX_D_M, MassDOT_MPNT-Plan_EX_Pipe Connection_Aligned Pipe Label Layer: EX-UT-DRAIN-TEXT Apply the pipe connection ID letter to the pipe Description property.
9	When multiple pipes are connected to a structure pipe connection ID labels shall be applied to each pipe to identify which invert the pipe corrsponds with in the structure label. Within the structure label, the sequence of letters should attempt to stay in order. The order of the inflow pipe or outflow pipe invert rows can be changed by disconnecting the pipes and then reconnecting them in the intended order. Apply the pipe connection ID letter to the pipe Description property. Pipe Label Styles: MassDOT_MPNT-Plan_EX_Pipe Connection_Aligned Pipe Label Layer: EX-UT-DRAIN-TEXT Several pipe connection ID label styles variations are provided. Here, the Aligned pipe connection label style option can be put into dragged state and stay aligned to the pipe orientation. The sewer manhole to the left of this drain manhole uses another pipe connection label style (MassDOT_MPNT-Plan_EX_Pipe Connection) to hold a horizontal label text orientation when placed into dragged state.
10	Structures with a single pipe connection shall not show the pipe connection ID. Use the MassDOT_MPNT-Plan_EX_Struc Type_Rim_Single Invert structure label style placed on layer EX-UT-DRAIN-TEXT for single-pipe structures.
11	Proposed catch basins with curb inlet can be drawn using a block symbol or modeled using a pipe network structure. Proposed Catch Basin block symbol: HD-CBCI Proposed Catch Basin Curb Inlet structure style: MassDOT_DRN_PR_CBCI Layer: PR-UT-DRAIN-STRC
12	When using pipe networks and a pipe crosses the baseline as shown, opt to set the pipe to use the pipe style that has a name with suffix Crossing Pipe. The default proposed pipe label shows the status (PROP), length, diameter, material, and flow direction arrow of the pipe to be installed. Pipe Label Style Name: MassDOT_MPNT_Plan_PR_L_D_M Pipe Label Layer: PR-UT-DRAIN-TEXT When the length of the pipe label cannot be fit comfortably on the pipe, turn the label into a callout by dragging it from the pipe into dragged-state as shown. When dragging a label, the pipe arrow will disappear. Replace it with the flow direction arrow pipe label style MassDOT__Plan_Flow Arrow placed on layer PR-UT-DRAIN-TEXT. Sawcuts for subsurface pipe installations shall be shown and called out on the Drainage & Utilities Plan. Place sawcuts for utility installations on the PR-UT-SAWCUT layer. Use the line label style MassDOT_PR_SAWCUT placed on layer PR-HD-TEXT.
13	Pipe network label text may be edited to include additional detail if neceessary.
14	Proposed catch basins can be drawn using a block symbol or modeled using a pipe network structure. Proposed Catch Basin block symbol: HD-CB Proposed Catch Basin structure style: MassDOT_DRN_PR_CB Layer: PR-UT-DRAIN-STRC

#	KEYNOTE DESCRIPTION
15	The Drainage Structure Data Table is created by selecting all the proposed structures to include in the table, then use Structure Table style MassDOT_MPNT-DRN_Prop Set on layer GE-TABLE. The table requires property set data to be applied to each structure. This can be done by going to the Extended Data tab of the Properties palette and clicking the icon in the lower left of the Extended Data tab. Apply the Structure Data property set to the structures to be included in the table, Once the property set data is applied to the structures, use the Notes property of the structure to fill in information about each structure that will be applied to the REMARKS column of the Drainage Structure Data table.
16	Existing sewer can be drawn in 2D using block symbols and polylines or modeled in 3D using MassDOT Civil 3D pipe network tools (MPNT). To create block symbols, access the MassDOT CAD State Kit Block Insertion Tool Palettes by clicking on the desired symbol group in the MassDOT ribbon tab > Block Symbols panel. MPNT existing sewer features can be created using the MassDOT_MPNT_SWR_EX parts list. Users may also create their own custom parts lists using the guidance found in the MassDOT CAD State Kit MassDOT Support ribbon tab > Pipe Network Tools panel, > MPNT Parts List Creation workflow doc. Sewer Manhole block symbol: SV-MHS Sewer Manhole structure style: MassDOT_SWR_EX_SMH Existing Drainage Structures layer: EX-UT-SEWER-STRC (Place all block symbols and pipe network structures on this layer) Pipe Style: MassDOT_SWR_EX_Single-Line Existing Underground Sewer Pipe Layer: EX-UT-SEWER-UGND (Place all linework and pipe network pipes on this layer)
17	Using pipe network models of the existing sewer system enables users to apply existing sewer annotation as needed on utility plans instead of relying on the labels applied in the survey XREF. By default, show existing and record location sewer structure data in a full data label that shows the structure type, rim elevation, and inverts. Structure Label Style: MassDOT_MPNT-Plan_EX_Struc Type_Rim_Inverts Structure Label Layer: EX-UT-SEWER-TEXT Each invert in the structure label is identified with a pipe connection ID letter. The ID letter is applied to the pipe object that is connected to the structure. The order of the connected pipes is dictated first by whether it is an inflow or outflow pipe (inflow pipes first rows, outflow pipe(s) last) and second by the order in which the pipes were connected to the structure. Pipe Label Styles: MassDOT_MPNT-Plan_EX_D_M, MassDOT_MPNT-Plan_EX_Pipe Connection_Aligned Pipe Label Layer: EX-UT-SEWER-TEXT Apply the pipe connection ID letter to the pipe Description property.

DRAINAGE & UTILITY PLAN CAD KEYNOTES

CAD STANDARDS NOTES

DRAINAGE & UTILITY PLANS CREATION

1. Generate Drainage & Utility Plans sheets using the content and guidance found in the ***MassDOT Sheet Production Tools (MSPT)***. The MSPT uses Sheet Set Manager and CIvil 3D plan production features like view frame groups to generate, coordinate, manage, and publish sheets.
2. Per MSPT guidance, a sheet set data file and project sheet template DWG containing a sheet template layout set up for generating Drainage & Utility Plans sheets must first be created.
3. Use the following drawing setup:

Template for creating Model DWG's	MassDOT_C3D_Utility.DWT
Template for creating Sheet DWG's	UTILITY_SHEETS.DWG
Plot Style Table Page Setup	MADOT-U.STB MassDOT-Utility-36x24-PDF
Layer Group	UT Utility
Annotation Styles	DOT-P Text/Dim/Multileader Styles

4. When creating sheet DWG's, it is recommended to create only a single sheet layout per sheet DWG and no more than 10 layouts in a single sheet DWG.

Drainage & Utility Plans DRAFTING STANDARDS

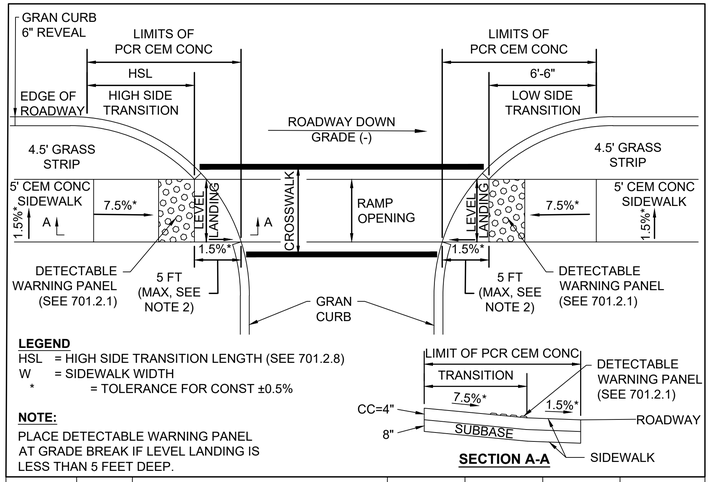
1. Linework shall be drawn on a standard MassDOT CAD layer or a copy of a standard MassDOT CAD layer that uses a MassDOT standard linetype and plot style from the MassDOT CAD Standard pen table STB files.
2. Where it is required to deviate from using the default ByLayer setting for linework drawing objects it is noted with a CAD keynote.

Drainage & Utility Plans ANNOTATION STANDARDS

1. The default annotation style for all proposed (PR) and modified features is based on text style DOT-P (Arial, Regular, 0.125"). All multileader, dimension, and Civil 3D label styles shall utilize this text style. All text, multileader, dimension, and Civil 3D label objects shall utilize these DOT-P based styles.
2. Annotation layers for proposed utility features on Drainage & Utility Planss is based on the utility type. All text, multileader, dimension, and Civil 3D label objects shall be placed on the PR-UT-XXXX-TEXT layer corresponding to the utility type.
3. When it is necessary to annotate existing (EX) utilitiy features, annotation is based on text style DOT-E (RomanS, 0.1"). Use a EX-UT-XXXX-TEXT layer.
4. When it is necessary to annotate record location (RD) utilitiy features, annotation is based on text style DOT-E-OBL (RomanS, 10° Oblique, 0.1"). Use a RD-UT-XXXX-TEXT layer.
5. When using a single sheet layout per sheet DWG all annotations may be placed on the default utility text layers.
6. If including multiple sheet layouts per sheet DWG, to account for overlapping sheet text the default utility text layers may be split into an odd-even set of layers:
   - 6.1. Duplicate utility layer PR-UT-XXXX-TEXT and then rename each to create PR-UT-XXXX-TEXT-ODD and PR-UT-XXXX-TEXT-EVEN layers.
   - 6.2. Place annotations for the respective sheets on those layers.
   - 6.3. Viewport freeze the -ODD layer on even-numbered sheets and -EVEN sheets on odd-numbered sheets.
7. Tables on Drainage & Utility Plans sheets shall be created on the GE-TABLE layer.

NOTE:
KEYNOTE NUMBERING MAY NOT BE CONSECUTIVE. SOME GAPS HAVE BEEN LEFT TO ALLOW FOR FUTURE KEYNOTES TO BE PLACED.

654123_HD_DR-UT.DWG Plotted on 8-Jun-2026 2:48 p

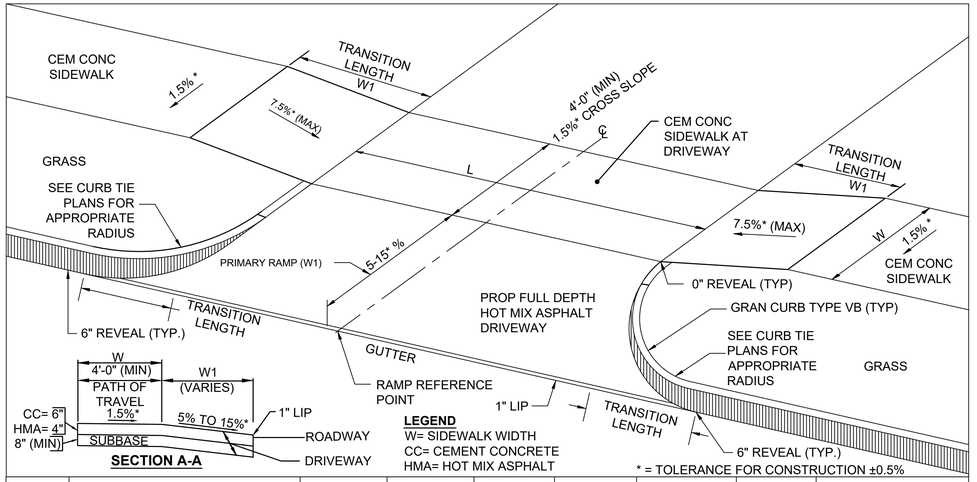


MASSDOT ID	PCR #	RAMP REFERENCE POINT			WIDTH OF SIDEWALK	WIDTH OF OPENING	ROADWAY GUTTER SLOPE	TRANSITION LENGTH
		BASELINE	STATION	OFFSET				
-	1	ROUTE 112	13+32.86	39.39' LT	5.0'	5.0'	0.17%	6'-6"
-	2	ROUTE 112	13+69.21	35.51' LT	5.0'	5.0'	0.76%	7'-8"
-	3	ROUTE 112	16+59.61	23.00' LT	5.0'	5.0'	-1.20%	9'-0"

NOTE: TRANSITION LENGTH SIDES AS VIEWED FROM PROPOSED CONSTRUCTION BASELINE.

PEDESTRIAN AND BICYCLE CROSSING FOR ONE CONTINUOUS DIRECTION OF TRAVEL

NTS



DWY #	RAMP REFERENCE POINT			LENGTH OF PRIMARY RAMP	ENTRANCE RAMP GRADE	WIDTH OF SIDEWALK (W)	WIDTH OF DRIVEWAY (L)	DEPTH OF PATH OF TRAVEL (MIN) 3'-0"	ROADWAY GUTTER SLOPE	TRANSITION LENGTH (W1)	
	BASELINE	STATION	OFFSET							LEFT SIDE	RIGHT SIDE
1	ROUTE 112	15+46.91	16.00' LT	4.5'	5.00%	5.0'	16.5'	5.0'	0.76%	6'-6"	7'-8"
2	ROUTE 112	17+88.38	16.00' LT	4.5'	5.00%	5.0'	11.0'	5.0'	-3.03%	11'-0"	6'-6"

NOTE: TRANSITION LENGTH SIDES AS VIEWED FROM PROPOSED CONSTRUCTION BASELINE.

SIDEWALK THROUGH DRIVEWAYS AT LANDSCAPING STRIP

NTS

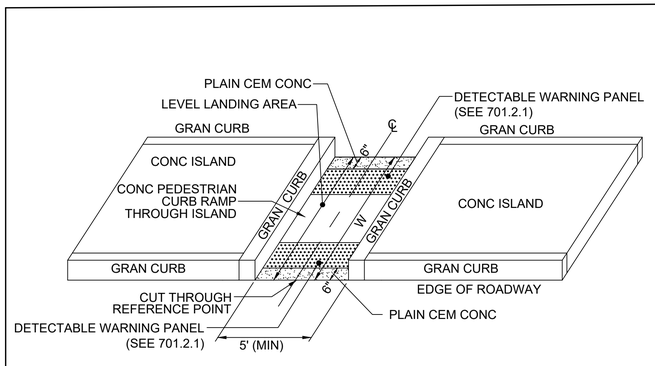
ANDOVER
ROUTE 104 AT ROUTE 112

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	44	60
PROJECT FILE NO.	654123		

PEDESTRIAN CURB RAMP & DRIVEWAY DETAILS

Pedestrian Curb Ramp & Driveway Details Notes

1. Each Pedestrian Curb Ramp (PCR) and Driveway/Sidewalk Through Driveway (DWY) type must have an accompanying construction detail and table detailing the dimensions of all PCR and DWY structures being constructed.
2. There are more styles of PCR's and DWY's than are shown in this specific plan-set. See the latest MassDOT design guides for more examples.
3. Custom PCR or DWY details may be necessary for certain instances.
4. Dimension values depicted in detail tables for PCR and DWY structures may be shown as decimal (X.X') values or architectural (X'-X") notation values.
5. PCR detail tables shall include the MassDOT Statewide ADA Transition and Prioritization Plan (SATP) Curb Ramp Inventory System (CRIS) ID for each PCR in the column to the left of the project-specific PCR ID named MASSDOT ID. When no CRIS ID exists, place a dash in the MASSDOT ID column.



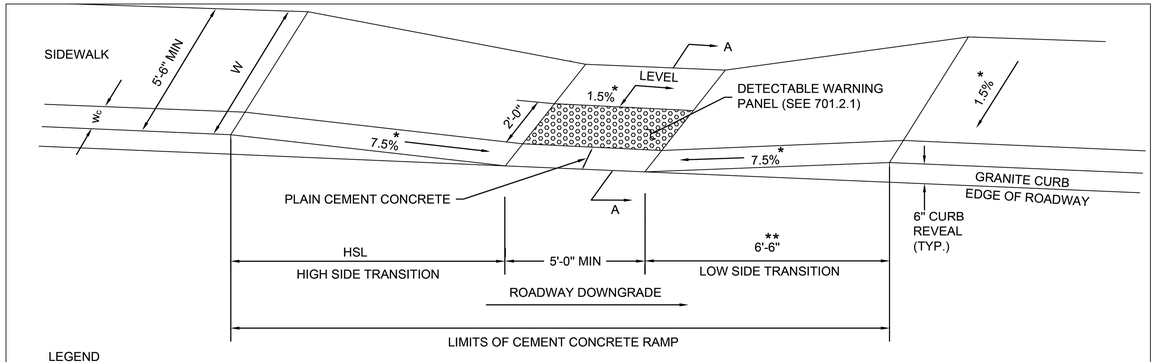
CEMENT CONCRETE ISLAND CUT THROUGH NOTES

1. PATH THROUGH ISLAND SHALL BE CEMENT CONCRETE. SEE PAVEMENT NOTES.
2. CONCRETE SHALL BE TEXTURED BY BROOMING IN A DIRECTION PERPENDICULAR TO THE LENGTH OF THE RAMP.
3. A MIN. RUNNING SLOPE OF 1.5% THROUGH THE CUT THROUGH SHALL BE PROVIDED TO PREVENT PUDDLING WITHIN THE CUT THROUGH.
4. A 2' DETECTABLE WARNING PANEL SHALL BE LOCATED AT EACH EXIT/ENTRANCE TO THE CEM CONC CUT THROUGH.
5. THE CEM CONC PATH THROUGH THE ISLAND SHALL BE ADA COMPLIANT IN TERMS OF MAX. RUNNING SLOPE AND CROSS SLOPE.
6. FOR A 6' WIDTH ISLAND, THE PANELS SHOULD BE LOCATED AT THE CURB LINE TO ACHIEVE THE REQUIRED 2' CONC SURFACE BETWEEN PANELS.
7. ADD A NOTE FOR ISLAND CUT THROUGH WHERE THE ISLAND WIDTH IS LESS THAN 6' MULTIPLE PANELS ARE NOT REQUIRED.

MASSDOT ID	PCR #	CUT THROUGH REFERENCE POINT			WIDTH OF ISLAND 6'-0" (MIN)
		BASELINE	STATION	OFFSET	
-	8	LEE STREET	200+23.45	4.79' LT	15.0'

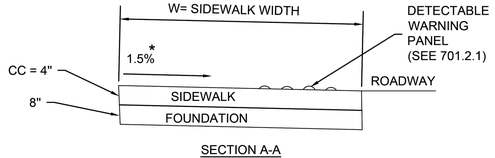
CEMENT CONCRETE ISLAND WITH SIDEWALK 'CUT THROUGH'

NTS



LEGEND
HSL = HIGH SIDE TRANSITION LENGTH (SEE 701.2.8)
W = SIDEWALK WIDTH
W_C = CURB WIDTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION=0.5%±
** = TRANSITION LENGTH SHOWN IS MINIMUM

NOTES:
1. LEVEL LANDING AND RAMP MUST BE CLEAR OF ANY VERTICAL OBSTRUCTIONS.
2. DETECTABLE WARNING PANEL MUST BE 2'-0" AT ALL POINTS IN PEDESTRIAN PATH OF TRAVEL.
3. PEDESTRIAN PATH OF TRAVEL SHALL BE NO LESS THAN 4'-0" WIDE AND FREE OF VERTICAL OBSTRUCTIONS (FOR ALL CONSTRAINED CONDITIONS).
4. ALL SLOPE VALUES LISTED HERE ARE MAXIMUM VALUES WITH CONSTRUCTION TOLERANCE OF ±0.5%.
5. USABLE SIDEWALK WIDTH = $W-W_C$



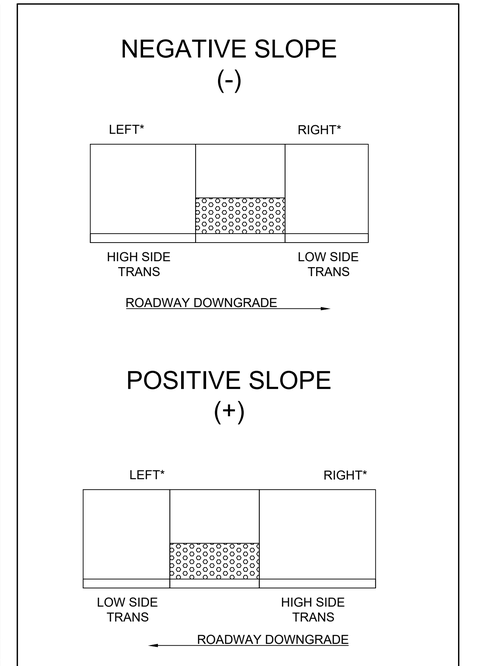
MASSDOT CONSTRUCTION STANDARD DETAIL DRAWING # 701.2.2

MASSDOT ID	PCR #	RAMP REFERENCE POINT			SIDEWALK WIDTH (W, 5'-6" MIN)	WIDTH OF RAMP ENTRANCE 5'-0" (MIN)	DEPTH OF LEVEL LANDING 4'-0" (MIN)	ROADWAY GUTTER SLOPE	TRANSITION LENGTH	
		BASELINE	STATION	OFFSET					LEFT SIDE	RIGHT SIDE
-	9	ROUTE 112	19+82.16	16.0' LT	5.5'	5.0'	5.5'	-1.25%	6'-6"	7'-8"
PED-456321	10	ROUTE 112	19+79.14	18.5' RT	5.5'	5.0'	5.5'	-1.30%	11'-0"	6'-6"

NOTE: TRANSITION LENGTH SIDES AS VIEWED FROM PROPOSED CONSTRUCTION BASELINE.

PEDESTRIAN CURB RAMP IN CONSTRAINED CONDITION WITH DETECTABLE WARNING PANEL

NTS



* AS VIEWED FROM CONST BASELINE

NOTE: DETECTABLE WARNING PANELS ARE REQUIRED ON ALL PEDESTRIAN CURB RAMPS.

PEDESTRIAN CURB RAMP AND DRIVEWAY TRANSITION CURB DIRECTION REFERENCE

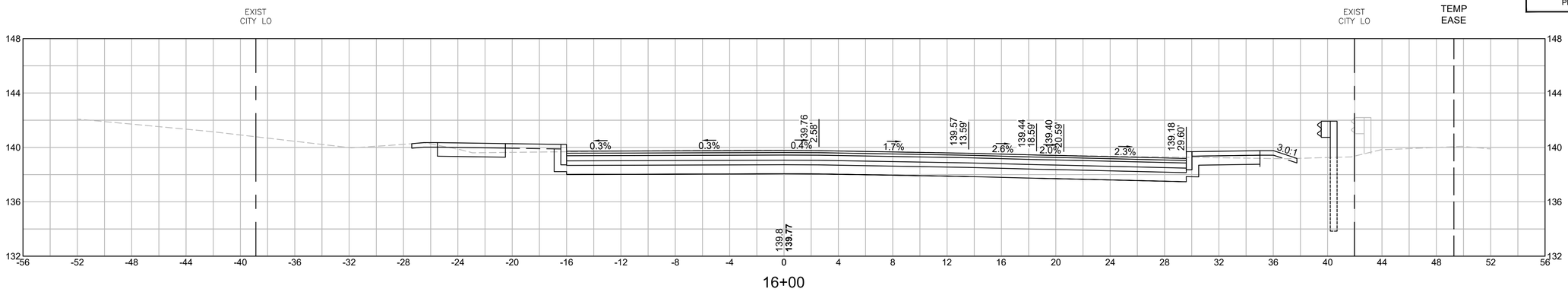
NTS

654123_HD_DT-PCR&DWY.DWG Plotted on 16-Jun-2026 8:54 p

ANDOVER
ROUTE 104 AT ROUTE 112

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	46	60
PROJECT FILE NO.	654123		

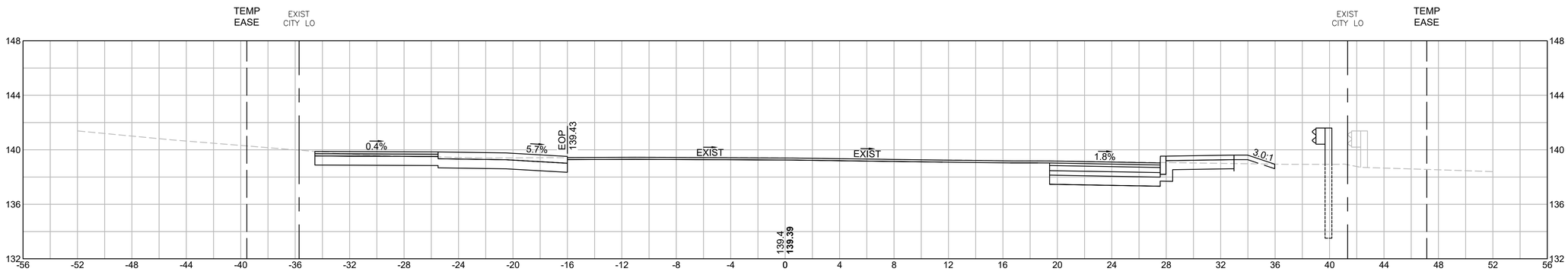
CROSS SECTIONS



16+00

CUT: 78.66 SF

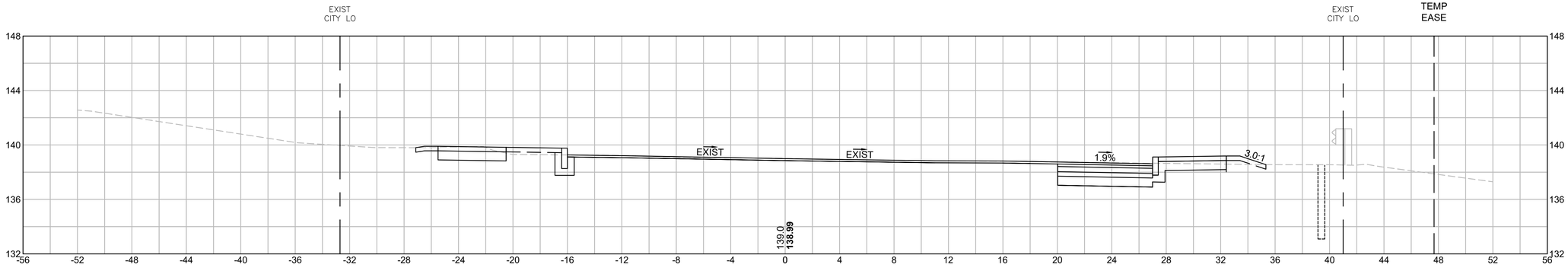
FILL: 0.00 SF



15+50

CUT: 19.47 SF

FILL: 0.00 SF



15+00

CUT: 17.20 SF

FILL: 0.00 SF

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET
0 1"

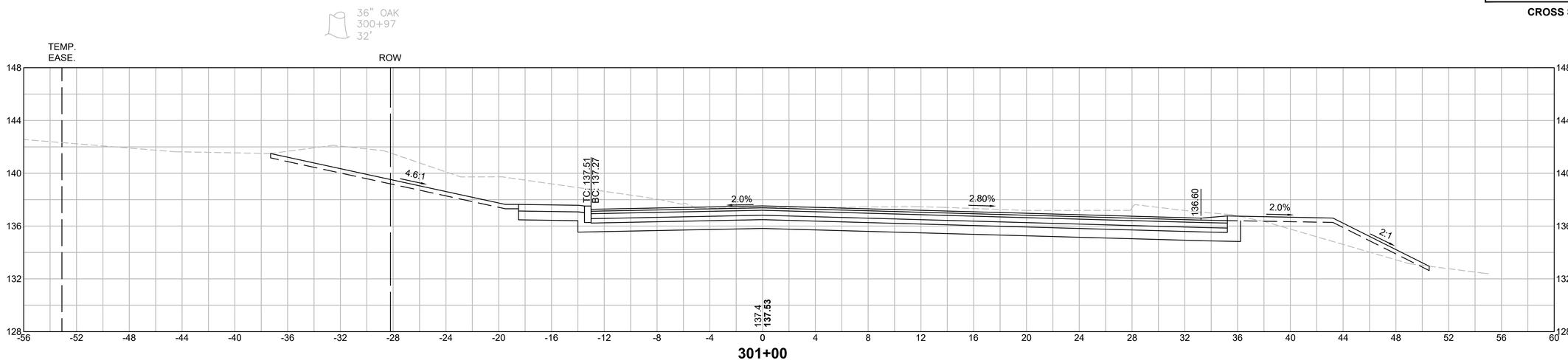
654123_HD_XS_CORR.DWG Plotted on 10-Dec-2025 10:08 AM

ANDOVER
ROUTE 104 AT ROUTE 112

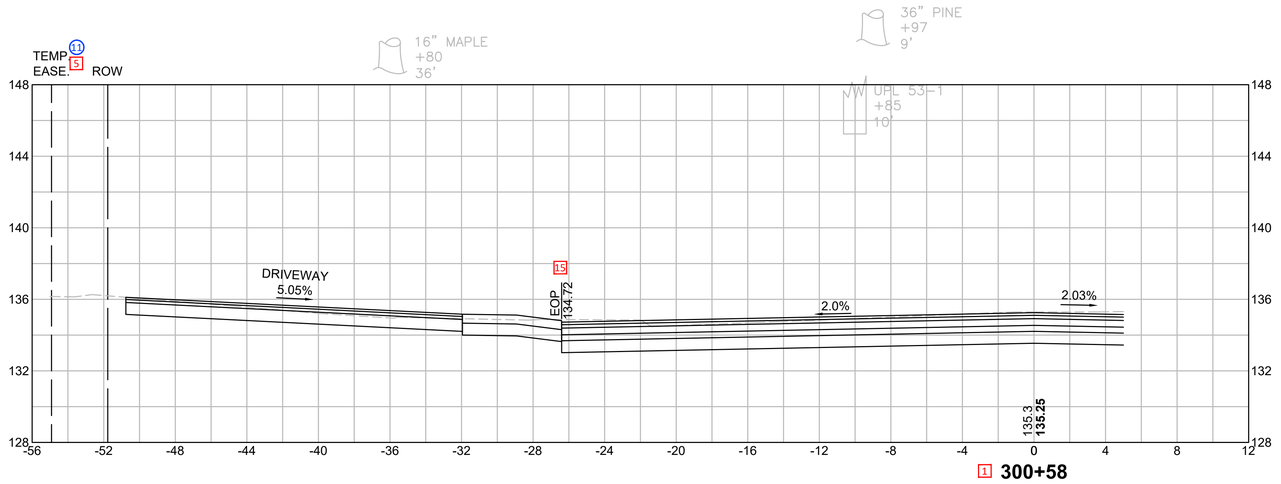
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	57	60
PROJECT FILE NO.	654123		

CROSS SECTIONS

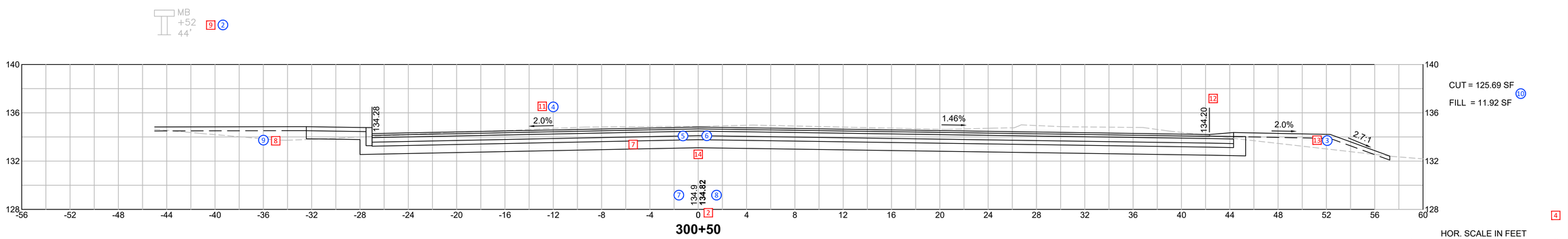
654123_HD_XS_CORR.DWG Plotted on 10-Dec-2025 10:08 AM



301+00



300+58



300+50

CROSS SECTIONS KEYNOTES

SAMPLE PLAN PDDG KEYNOTES

#	KEYNOTE DESCRIPTION
1	Cross-sections are normally plotted along the length of the cross-section sheet. The stations of cross-sections increase from the bottom to the top of the sheet. The cross-sections of very narrow roads may be plotted across the width of the sheet. Profiles of intersecting streets, drives, roads, etc., are plotted in the sequence of the base or center line stationing. When streets, drives, and roads are indicated by stations along their profile, only the main baseline station is shown rather than an equation.
2	The proposed profile elevation shall be noted on each roadway cross-section. On a banked curve or a curve transition, the theoretical profile elevation is noted on the left side of the profile grade line, and the actual elevation is noted on the right side of the profile grade line (with "actual" noted in parentheses). Show actual edge elevations for banked curves and curve transitions. Denote existing grade elevation at section station in light text to the nearest 0.1'. Denote proposed grade elevation at section station in bold text to the nearest 0.01'.
3	Cross-sections shall be plotted at 50-foot intervals and at critical points, such as superelevation transition points, intersecting streets, driveways, etc.
4	The usual scale for cross-sections is 1" = 4' horizontally and vertically. However, on multilane divided highways, a scale of 1" = 8' is more practical. The selection of the proper scale depends on the width of the cross-section.
5	Denote ROW and other boundary limit offsets.
6	The reference baseline for intersecting streets, drives, walks, and steps may be offset from the regular cross-section to allow more room for plotting the profiles.
7	The proposed roadway cross-sections are to be plotted as thick, dark lines.
8	Denote existing subsurface structures as thin, dashed screened lines.
9	Hydrants, poles, and mailboxes are plotted by station and offset. All trees 8 inches and over should be plotted. The diameter and type of tree, station, and offset should be noted.
10	Record cut and fill (square feet) for each section to the right of the particular proposed roadway cross-section so that the areas measured will be clearly defined.
11	In 50' cross sections, the slope of all lanes, shoulders, medians, driveways, and ramps shall be shown with the default slope % label notation. Show all slope labels for lanes, medians, and shoulders built to match existing grade. Sidewalk cross slopes are standard cross slope and are not labeled. Sections with irregular geometry from what is defined in the typical sections must possess all annotation required to construct that section of roadway. Label all embankments using the run:rise label notation. In critical cross sections such as driveways and curb ramps, the slopes of critical geometry shall be labeled such as driveway entry slopes and vertical transitions for curb ramps. All annotation required to construct the roadway section must be included.
12	Denote elevation at roadway edges. The offset shall be denoted for any roadway edge point that varies from a constant value indicated on the typical sections. When several roadway edge geometry points exist within close proximity to each other, such as at top and bottom of curb, the points with the elevation labeled shall include the standard abbreviation. Section points should not be displayed when redundant, in cluttered drawing areas, or when denoting the elevation of a point that is unhelpful such as labeling the top and bottom of curb elevations where the reveal is the standard 6" height shown on typical sections and construction details. Points that are able to be identified by inspection, such as crown point, do not require an identification abbreviation.
13	Draw the bottom surface of grassed and landscaped areas using a heavy dashed line.
14	Pavement structure material section area edge linework shall indicate continuous areas of material out to the horizontal edge of the material. Do not show vertical lines denoting the edge of a material within the horizontal limits of the material when the material is the same on each side.
15	Where the roadway edge point being labeled could be in question (such as the edge of pavement elevation below the driveway lip point shown here), label the geometry point using the standard abbreviation.

SAMPLE PLAN CAD KEYNOTES

#	KEYNOTE DESCRIPTION
1	Section View Style: MassDOT_Standard Users can override the grid padding by adjusting the section view offset range in the section view properties Offsets tab to best fit the drawing sheet for that station range. Users can override the elevation grid padding by adjusting the section view elevation range in the section view properties Elevations tab to best fit the section for that elevation range. Changes to the grid offset range or elevation range of all section views in the group should be made to the Section View Group properties. Follow all the section drawing file setup guidance provided in the MSPT Highway Construction Plans Help Doc.
2	Survey point objects can be projected to section views such as stumps and mailboxes shown here. The label components use reference text from the source point object. To assign the source point to the projection object, select the object and go to Properties. Select the first row Reference Text Objects and you will be prompted to select the point to attach the data from. In this example the point data indicates the tree species and size and the address of the mailbox that are all part of each point's raw descriptions.
3	Dashed section linework is applied selectively through the code set style according to graphical standards provided in the PDDG Project Sample Plans.
4	Section grade and slope label visibility can be controlled on the subassembly using the GLbl and SLbl link codes. MSL subassemblies all have a toggle that allows users to apply the labels or hide them. See the MSL subassemly help docs for more information regarding a particular subassembly's label settings.
5	Corridors shall be displayed using code set style MassDOT_MCMT-Section Codes.
6	All common section material areas that span two or more subassemblies shall show a continuous material section with no vertical lines indicating the edges of the subassembly objects. Show the vertical material edge link at the outer boundaries of a material section only. Use MSL Material Edge Toggling to control the visibility of these edge lines. Choose Yes to display a vertical material edge link or No to hide it. See the MCMT-MSL User Guide for more detailed information.
7	Set the Section1 band to the existing grade section object. In the section view group properties, go to the Bands tab and assign the section object in the Section1 column to the EG surface section.
8	Set the Section2 elevation in the Band set style to use the proposed grade profile. In the section view group properties, go to the Bands tab and assign the section object in the Section2 column to the proposed grade surface section.
9	Section Style: MassDOT_Existing
10	Section view tables for cut and fill or any other material in the corridor model can be displayed at the upper right corner of the section view. Users must first compute cut and fill quantities. See the MQTO User Guide for more detailed information.
11	Use one of the Section Offset Label Line styles to create highway layout boundary lines in section view.

NOTE:
KEYNOTE NUMBERING MAY NOT BE CONSECUTIVE. SOME GAPS HAVE BEEN LEFT TO ALLOW FOR FUTURE KEYNOTES TO BE PLACED.

654123_HD_XS_CORR.DWG Plotted on 10-Dec-2025 10:10 AM

SUPPLEMENTAL GRAPHICAL STANDARDS

SUPPLEMENTAL STANDARDS NOT DEPICTED IN SAMPLE PLANS

CONSTRUCTION PLAN

1. **RECORD BASELINE -** A HISTORICAL REFERENCE IN THE FORM OF SURVEY CONTROL PLAN SHEETS WILL BE PROVIDED IN THE HIGHWAY CONSTRUCTION PLANS TO ESTABLISH A REFERENCE TO THE PROJECT DESIGN'S HORIZONTAL CONTROL. IT IS ALSO THE REFERENCE USED FOR ALL RIGHT OF WAY WORK.

   THE REQUIRED RECORD BASELINE DATA TO BE SHOWN ON THE SURVEY CONTROL PLAN INCLUDES ALL HISTORICAL TIES, SURVEY MONUMENTATION, RECORD GEOMETRIC DATA & FIELD-MEASURED DEVIATIONS, AND STATION EQUATIONS.

2. **CULVERTS -** THE TYPE OF MATERIAL USED FOR CULVERT END WILL BE NOTED AT EACH END.

3. **DITCHES -** DITCHES THAT ARE NOT PART OF THE NORMAL SECTION ARE SHOWN BY TWO HEAVY BROKEN LINES. NOTE THE APPROPRIATE PAYMENT ITEM. THE DISTANCE BETWEEN THE LINES REPRESENTS THE WIDTH OF THE BOTTOM OF THE DITCH TO SCALE. THE ABBREVIATION "PROP" IS PART OF THE DESCRIPTION.

4. **PAVED WATERWAYS -** THE TYPE IS IDENTIFIED AND THE ABBREVIATION "PROP PWW." IS REQUIRED. PAVED WATERWAYS ARE DRAWN AS HEAVY LINES AND CROSS-HATCHED WITH ITS DESCRIPTION SHOWN.

5. **SUB-DRAINS -** THESE ARE SHOWN AS HEAVY SOLID LINES WITH THEIR LENGTH AND DIAMETER OF PIPE; FOR EXAMPLE: "300' – 8" SUBDRAIN." THE ABBREVIATION "PROP" IS REQUIRED. WHEN A GRADE LINE IS BROKEN, THE DESIGNER SHOULD INDICATE THE DIRECTION OF FLOW.

6. **RELOCATION OF STREAMS -** THE RELOCATION OF BROOKS, RIVERS, OR OTHER WATERWAYS IS SHOWN AS A SOLID LINE. THE LINES DEFINING THE NEW LOCATION WILL BE DESIGNATED BY CROSSHATCHING. PLANS SHOULD INDICATE WHETHER THIS CHANGE IS TEMPORARY OR PERMANENT.

7. **DEMOLITION -** BUILDINGS THAT WILL BE DEMOLISHED ARE DESIGNATED WITH CROSS-HATCHING AND MARKED "STRUCTURE NO. ___." (INSERT NUMBER SHOWN ON THE DEMOLITION REPORT OR DETAIL SHEET).

8. **BRIDGES -** THE OUTLINES OF ALL BRIDGES WILL BE SHOWN ON THE CONSTRUCTION PLANS. THE BRIDGE NUMBER WILL BE PLACED AS CLOSE TO THE BRIDGE AS POSSIBLE.

9. **SLOPE PAVING -** THE AREA WHERE SLOPE PAVING IS PLACED, SUCH AS ON THE SLOPES AT OPEN-END SPAN BRIDGES, SHOULD BE INDICATED AS "SLOPE PAVING."

10. **FENCES -** SIZE AND MATERIAL OF EXISTING AND PROPOSED FENCES ARE INDICATED ON THE CONSTRUCTION PLANS. THE "DETAIL SHEETS" SHALL BE USED TO IDENTIFY STATIONING OR LENGTH.

11. **REVISIONS -** DURING THE CONSTRUCTION PHASE, ANY DESIGN CHANGES BETWEEN THE PLANS INITIALLY ADVERTISED TO POTENTIAL BIDDERS AND THE MOST RECENT PLAN SET SHOULD BE CALLED OUT WITH A REVISION CLOUD SHAPE TO HIGHLIGHT REGIONS THAT HAVE BEEN MODIFIED.

12. **UTILITY RELOCATION** - THE PROPOSED RELOCATION OF UTILITIES SUCH AS UTILITY POLES, UNDERGROUND UTILITY CONDUIT, GAS LINES, ETC., ARE SHOWN DIRECTLY ON THE ROADWAY PLAN WITH HEAVY SOLID LINES SO THE PROPOSED DETAIL WILL BE EASILY DISTINGUISHED FROM THE EXISTING FACILITIES. WHERE THERE IS A CONSIDERABLE AMOUNT OF INFORMATION ON THE PLAN THAT MAY OBSCURE THE PROPOSED UTILITY, A SEPARATE PLAN SHOWING THE PROPOSED UTILITY INFORMATION IS RECOMMENDED.

    OVERHEAD WIRE IS INDICATED WITH A LONG DASHED LINE WITH "OHW" NOTED ON EACH LENGTH. DESIGNERS MUST PLACE PROPOSED UTILITIES, EXISTING UTILITIES (LOCATED BY SURVEY), AND RECORD UTILITIES ON THE APPROPRIATE DRAWING LAYER AS SHOWN IN THE SAMPLE PLANS, WITH THE TYPE OF CONDUIT MARKED ON EACH SPAN. ALL UTILITY STRUCTURES (BOTH EXISTING AND PROPOSED) MUST BE NOTED. THE ABBREVIATION "PROP" IS NECESSARY BEFORE THE DESCRIPTION.

    PROPOSED WORK THAT IS NOT TO BE PERFORMED BY THE CONTRACTOR, BUT WHICH IS TO BE PERFORMED WITHIN THE PROJECT LIMITS EITHER BY OR FOR A UTILITY COMPANY, SHALL BE CLEARLY LABELED "(TYPE OF WORK) BY OTHERS."

    TO INDICATE THE UTILITIES IN THE EXISTING UTILITY SYSTEM THAT WILL BE INCORPORATED INTO THE NEW SYSTEM, BUT NOT RELOCATED, THE PROPER NOTATIONS MUST BE MADE, SUCH AS "RET" (RETAIN), "ADJ" (ADJUST), "ABAN" (ABANDON), "REM" (REMOVE), ETC.

LANDSCAPE PLAN

1. **SURVEY LAYERS -** SHOW ALL LAYERS SUCH AS UTILITIES, SIGNS, SIGNALS, AND LIGHTING TO AVOID PLANT PLACEMENT CONFLICTS.

2. **EXISTING VEGETATION -** SHOW EXISTING TREES AND OTHER VEGETATION AS RELEVANT TO THE LANDSCAPE PLANS.

3. **EXISTING INVASIVE PLANTS -** IF REQUESTED BY THE LANDSCAPE DESIGN SECTION, DELINEATE INVASIVE PLANT SPECIES WITHIN AND ADJACENT TO THE PROJECT LIMITS. INCLUDE APPROXIMATE AREA OF PLANTS.

4. **TREE PROTECTION -** TREE PROTECTION MEASURES SHOULD BE SHOWN ON THE CONSTRUCTION PLANS AND ONLY IF RELEVANT, ON THE LANDSCAPE PLANS. DISTINGUISH BETWEEN PROPOSED USE OF TREE PROTECTION FENCING VERSUS ARMORING AND PRUNING OF INDIVIDUAL TREES.

5. **KEY PLAN -** LANDSCAPE KEY PLANS ARE USEFUL ON INTERCHANGE, LARGE CORRIDOR, AND SHARED-USE PATH PROJECTS. SHOW A SMALLER KEY PLAN ON EACH SHEET WITH THE CORRESPONDING SHEET HIGHLIGHTED FOR REFERENCE AS SHOWN IN THE EXAMPLE.

6. **NORTH ARROW -** SHOW A NORTH ARROW ON ALL LANDSCAPE PLANS EXCEPT DETAIL SHEETS.

7. **BAR SCALE -** SHOW A BAR SCALE ON ALL LANDSCAPE PLANS. DETAIL SHEETS SHOULD SHOW BAR SCALES AS NEEDED.

8. **PLANT SYMBOLS** - SHOW PLANT SYMBOL GRAPHICS TO ACCURATELY INDICATE PROPER PLANT SPACING OR GROUPINGS. WHERE NECESSARY FOR CLARITY, LINK GROUPS OF THE SAME PLANT SPECIES TOGETHER WITH A CONTINUOUS LEADER LINE.

9. **PLANT TAGS -** PROVIDE TAG LABELS WITH PLANT QUANTITIES AND SYMBOLS THAT CORRESPONDS TO THE PLANT LIST. (SEE PLANT LIST EXAMPLE BELOW).

10. **PLANT LIST -** PROVIDE A PLANT LIST ON EACH SHEET THAT CORRESPONDS TO PLANTS SHOWN ON THAT SHEET AS WELL AS A SUMMARY PLANT LIST. PLANT LISTS SHOULD INCLUDE THE FOLLOWING:
    - 10.1. SYMBOL FOR EACH SPECIES AND BY SIZE AS RELEVANT
    - 10.2. QUANTITY FOR EACH SPECIES
    - 10.3. BOTANICAL NAME INCLUDING CULTIVAR
    - 10.4. COMMON NAME (GENUS - SPECIES - CULTIVAR). DESCRIPTION SHOULD MATCH THE NOMENCLATURE FORMAT STYLE AS SHOWN IN THE EXAMPLE. PLANTS USED DO NOT HAVE TO BE LISTED IN THE NOMENCLATURE.
    - 10.5. SPECIFIED SIZE
    - 10.6. COMMENTS/NOTES
    - 10.7. ITEM NUMBERS ARE NOT NECESSARY.

11. **LEGEND -** PROVIDE A LEGEND ON EACH SHEET FOR SYMBOLS, HATCH PATTERNS AND OTHER RELEVANT INFORMATION.

12. **NOTES -** ADD OR REMOVE NOTES FROM THE STANDARD NOTES BLOCK ON THE LANDSCAPE PLAN SHEET AS NECESSARY TO ADDRESS PLANTING, SEEDING, EROSION CONTROL, OR OTHER ITEMS AS RELEVANT. NOTES SHOULD AVOID REPEATING INFORMATION CONTAINED IN SPECIFICATIONS TO AVOID CONFLICTING DIRECTION.

PLANT LIST

SYM	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES					
AMCh3	3	Amelanchier canadensis	Shad Tree	1 - 1.5" CALIPER	
MCRBh2	5	Malus 'Red Baron'	Crabapple-Columnar 'Red Baron'	6 - 8 FT	
TONh2	14	Thuja accidentalis 'Nigra'	Arborvitae-Eastern 'Nigra'	6 - 8 FT	

WETLAND REPLICATION PLANS

PLANS

THE FOLLOWING INFORMATION SHALL BE SHOWN ON WETLAND REPLICATION PLANS:

1. SQUARE FOOT AREA FOR BOTH REPLICATION AND RESTORATION AREAS.
2. ELEVATIONS OF EXISTING ADJACENT WETLAND BEING USED AS THE HYDROLOGIC CONNECTION.
3. WATER LINES (I.E., ORDINARY HIGH WATER LINE).
4. EXISTING TREES TO REMAIN (INCLUDE TREE AND PLANT PROTECTION FENCE ITEM IF NECESSARY).
5. GRADING CONTOURS (TYPICALLY 1-FOOT INTERVALS) AND TARGET ELEVATIONS. SHOW HOW PROPOSED CONTOURS MEET EXISTING CONTOURS.
6. SEDIMENT BARRIER TO PROTECT BOTH PROPOSED AND ADJACENT WETLANDS DURING ROADWAY AND WETLAND CONSTRUCTION.
7. EROSION CONTROL MEASURES (JUTE MESH, COMPOST TOPDRESSING, ETC.).
8. PROPOSED ACCESS ROUTE. ROUTE SHOULD BE FOR SMALLEST EQUIPMENT POSSIBLE AND CAUSE AS LITTLE LAND DISTURBANCE AS POSSIBLE. SHOW EXISTING TREES ADJACENT TO THE PROPOSED ACCESS ROUTE.
9. RESTORATION OF DISTURBED UPLAND AND ACCESS ROUTE AS REQUIRED (SEE SECTION BELOW).
10. SEEDING LIMITS AND MIX TYPES.
11. TEMPORARY WILDLIFE BARRIERS AS APPLICABLE (I.E., TURTLE BARRIER).
12. LOCATION OF MONITORING WELLS FOR WETLANDS OVER 1,000 SF OR PER PERMIT REQUIREMENTS.
10. **PLANT LIST -** PROVIDE A PLANT LIST ON EACH SHEET THAT CORRESPONDS TO PLANTS SHOWN ON THAT SHEET AS WELL AS A SUMMARY PLANT LIST. PLANT LISTS SHOULD INCLUDE THE FOLLOWING:
    - 10.1. SYMBOL FOR EACH SPECIES AND BY SIZE AS RELEVANT
    - 10.2. WETLAND STATUS
    - 10.3. QUANTITY FOR EACH SPECIES
    - 10.4. BOTANICAL NAME INCLUDING CULTIVAR
    - 10.5. COMMON NAME (GENUS - SPECIES - CULTIVAR). DESCRIPTION SHOULD MATCH THE NOMENCLATURE FORMAT STYLE AS SHOWN IN THE EXAMPLE. PLANTS USED DO NOT HAVE TO BE LISTED IN THE NOMENCLATURE.
    - 10.6. SPECIFIED SIZE
    - 10.7. COMMENTS/NOTES
    - 10.8. ITEM NUMBERS ARE NOT NECESSARY.

CROSS SECTIONS

THE FOLLOWING INFORMATION SHALL BE SHOWN ON WETLAND REPLICATION PLAN CROSS SECTIONS:

11. TARGET ELEVATIONS AND HOW GRADING TIES INTO EXISTING OR PROPOSED FINAL GRADES AND TO ADJACENT WETLAND OR HYDROLOGIC SOURCE.
12. SEEDING AND PLANTING (IF INCLUDED) OF THE AREA SURROUNDING THE REPLICATION.
13. WHERE NECESSARY FOR CLARITY, PROVIDE TWO CROSS-SECTION VIEWS OF WIDTH AND LENGTH.

TIDAL WETLANDS

FOR TIDAL WETLANDS SHOW OR NOTE:

14. BIOLOGICAL BENCHMARKING (TYPE OF VEGETATION OR WRACK LINES) USED TO DETERMINE TARGET ELEVATIONS.
15. EXISTING AND PROPOSED INTERTIDAL ELEVATIONS, INCLUDING MEAN LOW WATER (MLW), MEAN HIGH WATER (MHW) AND MEAN HIGH HIGH WATER (MHHW).
16. TIDE GAUGES IF APPLICABLE.
17. VEGETATION IN THE ADJACENT WETLAND BEING USED AS THE HYDROLOGIC CONNECTION.

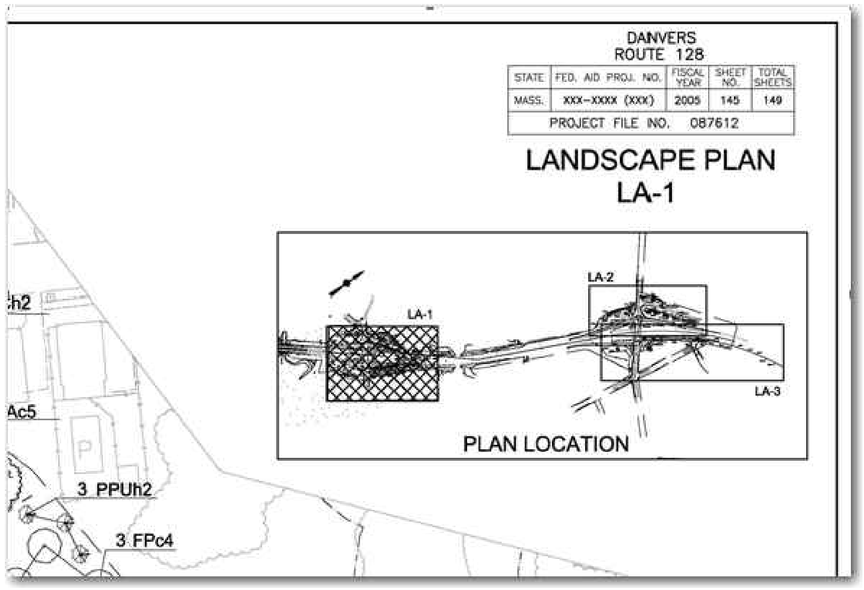
COORDINATING OTHER DRAWINGS WITH WETLAND REPLICATION PLANS

SHOW THE FOLLOWING EXISTING CONDITIONS AND ANY OTHER PERMIT REQUIREMENTS ON THE CONSTRUCTION PLANS, IMPACT PLANS, OR THE MITIGATION PLANS AS REQUIRED AND MOST RELEVANT:

18. EXISTING WETLAND DELINEATION LIMITS
19. IMPACTED AREA LIMITS
20. 100 FT BUFFER ZONE
21. 100 FT FLOODPLAIN
22. 200 FT RIVERFRONT AREA
23. EXISTING VEGETATION LIMITS
24. INVASIVE SPECIES (WHEN APPLICABLE)
25. REFERENCE WETLAND AREA (WHERE APPLICABLE)

PLANT LIST - UPLAND RESTORATION

KEY	QTY	WETLAND STATUS	BOTANICAL NAME	COMMON NAME	PLANT SIZE	REMARKS
DECIDUOUS TREES						
AR	2	FAC	Acer rubrum	Red Maple	4-5 FEET	
AS	1	FACW	Acer saccharinum	Silver Maple	4-5 FEET	
BN	3	FACU	Betula nigra	River Birch	4-5 FEET	
DECIDUOUS BUSHES						
AA	4	FACW	Aronia arbutifolia	Red Chokeberry	2-3 FEET	
AM	3	FAC	Aronia melanocarpa	Black Chokeberry	2-3 FEET	



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