

**DATE:** October 25, 2012

**TO:** Associate Region Engineers – Development  
Region Design Engineers  
Operations – Field Services Division  
Bridge Development – Design Division  
Design Programs – Design Division

**FROM:** Bradley C. Wieferich  
Engineer of Design

**SUBJECT:** Design Process and Plan Changes – Phase II

The first of a multi-phase implementation of changes to design processes and plan set standards was rolled out in the spring of 2011. Phase I, which is now fully implemented, incorporated new sheet borders, employed the use of MS Word and Excel to create information sheets, and enhanced the way that drawing and sheet numbers are developed.

The changes directed by this memo for Phase II are primarily the result of efforts led by the Right of Way Process Improvement (ROW PI) and the Design Deliverables Enhancement Project (DDEP) teams, which are both comprised of department staff and members of the consultant community.

Reference Information Documents:

MDOT has developed a Reference Information Document (RID) process by which electronic data files such as CADD drawings or survey files, are made available through the e-Proposal website. Contractors may use these non-contractual items prior to bidding on construction projects. In order to facilitate the process of posting RID documents in a uniform manner to the e-Proposal site, maintain uniform ProjectWise file structuring, and create statewide consistency for ease of finding information for future use, file naming conventions have also been established. The following attachments are included for reference:

- Attachment A: e-Proposal RID Process
- Attachment B: RID Files and Naming Conventions
- Attachment C: Example of RID Index

This guidance for RID is effective for all projects starting with the January 11, 2013, letting.

Design Plan and Process Changes:

Several other changes to the design process are being implemented to enhance deliverables and improve consistency in plan development. The attachments listed below provide detailed guidance for the preparation of plans including true typical sections, design cross sections at development milestones, and Right of Way (ROW) and alignment concepts:

- Attachment D: Plan and Proposal Milestone Naming Conventions
- Attachment E: Typical Section Development Guidelines
- Attachment F: Design Cross Section Guidelines
- Attachment G: Adaptation of Alignment/ROW Concepts
- Attachment H: Example Alignment/ROW Sheets

These plan and process changes are effective for all projects with design commencing after November 1, 2012.

In the coming months, the Design Services Section will be hosting Design Technology Forums across the state to communicate changes in detail to MDOT design staff and consultant attendees. Updates to the Road Design Manual, to specify process and plan development with the integration of the above requirements are pending.

It is understood that not all guidance will be applicable to non-road design projects (i.e. bridge, signals, signing, ITS, etc...). The Design Services Section will meet with these groups individually to discuss what portions shall be implemented.

Please ensure that this direction is provided to all project managers in your area. Contact the Design Services Section Manager, Dan Belcher, at 517-335-2182 or ([belcherd@michigan.gov](mailto:belcherd@michigan.gov)), if there are questions.

\_\_\_\_\_  
Signature on File  
Engineer of Design

cc: D. Belcher  
R. VanDeventer  
J. Lobbestael  
C. Youngs  
L. Strzalka  
T. VandenBerg  
M. Shulick  
H. VerHage

## e-Proposal – Reference Information Documents (RID) Process

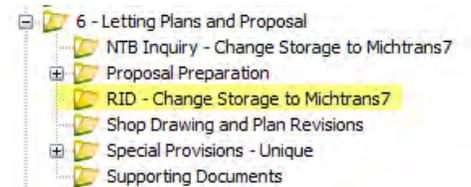
**Beginning 01-11-13, the Reference Information Documents (RID) Process will be a requirement of the e-Proposal Process.** Project Managers will be required to turn-in specific reference files at final turn-in, along with the Proposal, Plan Set and supporting documents, to Specs & Estimates. The files we are releasing are for information only. There is a disclaimer on the main e-Proposal sign in page (<https://mdotwas1.mdot.state.mi.us/public/eprop/login/>) that has been approved by the AG's office. This disclaimer protects MDOT/consultants from the RID being anything but for information purposes only.

The e-Proposal website displays a section for RID files. RID files to be published will include design files, survey deliverable files, and a RID Index Sheet. For a detailed list and naming convention on what to include in the RID, please see the attached file (MDOT RID Files and Naming Conventions.doc).

These files are published to the web using a ProjectWise workflow similar to the NTB Inquiry process. The initial RID files will be submitted to Specs & Estimates at final turn-in. Specs & Estimates will review for concurrence with MDOT RID standards. Finance will then publish RID files to the web at the same time the Proposal and Plans are published. **Any changes made to these files after this time, due to an Addendum, will be the responsibility of the Project Manager to publish.** Each published 'set' released after the original publication shall include a revised Index Sheet that includes a brief explanation of the changes made to the files.

### **Adding Initial RID files to RID folder:**

1. At the time of final turn-in to Specs & Estimates, drag and drop files into the RID – Change Storage to Michtrans7 located under Region > TSC > JN folder > 6 – Letting Plans and Proposal > RID – Change Storage to Michtrans7.  
(If you need a RID folder added to your ProjectWise project folder, please send a request to [MDOT-ProjectWise@michigan.gov](mailto:MDOT-ProjectWise@michigan.gov) )
2. Use the Advanced Wizard to assign appropriate attributes and a Document Type of 'Reference Information Documents' to all RID files.
3. **DO NOT CHANGE** the state to next on these files at this time. Finance will perform the initial publication of RID files to the website at the same time the Proposal and Plans are published.



### **Adding updated files to RID folder AFTER initial publication:**

\*\*\*This is the responsibility of the Project Manager to publish, not Finance\*\*\*

1. If updates/changes are needed after initial publication of RID files, copy updated DGN files to the RID – Change Storage to Michtrans7 folder. Be sure to include an updated Index Sheet with explanation of changes.
2. File names shall include date of publication.
3. Change the workflow state of the documents to post updated files to website. Highlight all of the revised/additional files to post > single right mouse click > select Change State > Next. The state is now e-Proposal RID Published.

# RID Files and Naming Conventions

This document is a guide as to which project documents shall be released as reference information documents (RID) for bidding purposes, and what format and file naming convention shall apply. To apply to projects for any given job number (XXXXXX):

## Design Files:

(The files listed under Design Files are applicable for plan set projects containing road work. They may not apply to bridge or ITS projects at this time.)

- XXXXXX\_Align\_date.dgn
  - DGN file from design that contains all project horizontal roadway alignments. (If using models or multiple alignment scales, include only one set of the project alignments, preferably the alignments at the scale used for the Alignment/ROW Sheets.)
  - Please refer to alignment levels within the Alignments Level Library (mdot\_01 workspace) for standard levels that would be used within this reference file.
- XXXXXX\_Const\_date.dgn
  - DGN file from design that contains proposed construction elements.
- XXXXXX\_Drain\_date.dgn
  - DGN file from design that contains **proposed** project drainage. Depending on the size of the project, and the design preferences of the project team, the information in this file may be included in the XXXXXX\_Const\_date.dgn.
  - Please refer to the proposed drainage levels within the Drainage Level Library (mdot\_01 workspace) for standard levels that would be used within this reference file.
- XXXXXX\_Parcel\_date.dgn\*
  - DGN file from real estate/design that contains project parcel information. This file should be provided by Real Estate or the Real Estate consultant.
  - Please refer to parcel levels within the Boundary Level Library (mdot\_01 workspace) for standard levels that would be used within this reference file.
- XXXXXX\_Prof\_date.dgn or XXXXXX\_Prof\_roadway\_date.dgn
  - DGN file(s) from design that contains profile information.
  - Please refer to profile levels within the Profile Level Library (mdot\_01 workspace) for standard levels that would be used within this reference file.
- XXXXXX\_ROW\_date.dgn
  - DGN file from design that contains existing and proposed ROW information.
  - Please refer to boundary levels within the Boundary Level Library (mdot\_01 workspace) for standard levels that would be used within this reference file.
- XXXXXX\_Topo\_date.dgn
  - DGN file from design that contains existing topographic project data.
  - This file includes topographic project data from surveys, and any existing items moved to a removal, adjust, or relocate level.

- XXXXXX\_Utility\_date.dgn
  - DGN file from design that contains underground and overhead utility lines. Typically this information is provided by the utility companies during the life of the project and may be in approximate locations.
  - Please refer to underground and overhead utility line levels within the Utilities Level Library (mdot\_01 workspace) for standard levels that would be used within this reference file.
- XXXXXX\_PrModel\_date.dgn **(if applicable)**
  - Copy of the proposed final surface model from design, generated with Roadway Designer, that includes the 3D line strings for critical proposed final surface features (i.e. proposed edge of pavement, proposed back of curb, etc.).
  - For directions on creating this GEOPAK file, please see the GEOPAK Road Design Training Manual.
- XXXXXX\_PrTriangle\_date.dgn **(if applicable)**
  - File from design that contains the proposed surface triangle file for the project.
  - For directions on creating this GEOPAK file, please see the GEOPAK Road Design Training Manual.
- XXXXXX\_LandXML\_Geometry\_date.xml **(if applicable)**
  - File from design that shall include all alignments (horizontal and vertical).
  - For directions on creating this GEOPAK output file, please see the GEOPAK Road Design Training Manual.

### **Survey Files:**

- XXXXXX\_Survey\_2D\_date.dgn and XXXXXX\_Survey\_3D\_date.dgn **(if applicable)**
  - Copies of the original survey topo files delivered for the project design.
  - These files should be in their original state and should not contain any changes from design.
- XXXXXX\_ExTriangle\_date.dgn
  - Copy of the original survey existing surface triangle file delivered for the project design.
  - This file should be in its original state and should not contain any changes from design.
- XXXXXX\_ExDTM\_date.tin or XXXXXX\_ExDTM\_date.dat **(if applicable)**
  - Copy of the original survey existing tin (current standard survey deliverable) or dat (previous standard survey deliverable) GEOPAK file delivered for the project design.
  - This file should be in its original state and should not contain any changes from design.
- XXXXXX\_ControlPts\_date.txt
  - Copy of the original survey control points file delivered for the project.
  - This file should be in its original state and should not contain any changes from design.

### Miscellaneous Files:

- XXXXXX\_Xsec\_roadway\_date.pdf
  - Cross-section files from design placed on cross-section grids.
  - Add station range to the file name if necessary. (XXXXXX\_XSEC\_roadway\_310-320.pdf)
  - Please refer to cross-section levels within the XS Level Library (mdot\_01 workspace) for standard levels that would be used within this reference file.

\* - This file is a new reference file for the ROW PI pilot projects. It is not a reference file that all projects may currently have. More information on the implementation of this reference file will be forthcoming.

### Please Note:

1. For *date*, label with the date of original project turn in to the Specifications & Estimates Unit. Or, in the case of file updates, please use the date of the addendum. The date will be important for tracking changes that have been made during advertisement. The process for adding updated files to e-Proposal after advertisement will be the same process as the MDOT Notice to Bidder Inquiry process. Add updated files with the appropriate date to the RID area in ProjectWise, include an updated Index, and change the state on the additional files. (MDOT Project Managers - See RID Process directions or contact MDOT's Design Services Section for more information.)
2. If design files were created an older MDOT workspace than MDOT's current workspace (mdot\_01), please provide the design files with the appropriate levels from the workspace used to design the project.
3. Files labeled to deliver "**(if applicable)**" are not currently a requirement for plan turn in but the inclusion of them is encouraged if the files were created. Whether or not the files exists may be dependent on which MDOT workspace the project is completed in, the survey deliverables for the project, and/or whether GEOPAK Roadway Designer (mdot\_01 MicroStation workspace) was employed for the design. Further deliverable requirements will be forthcoming. If the project has the listed file available, or the listed file has been created as part of the design process, it shall be included as part of the RID. For any questions regarding this matter, please contact MDOT's Design Services Section.

# Example of RID Index

*RID – I-99 from Main Street to M-00  
Contract ID: 99999-123456*

## Index of Reference Information Documents

<b><u>Design Files:</u></b>
123456_Align_10-5-2012.dgn: road alignment file
123456_Const_10-5-2012.dgn: proposed roadway design base file
123456_Drain_10-5-2012.dgn: proposed drainage file (plan view)
123456_Prof_10-5-2012.dgn: road centerline elevation design file, includes drainage structures
123456_ROW_10-5-2012.dgn: existing and proposed right-of-way file
123456_Topo_10-5-2012.dgn: existing road file including removal items
123456_Utility_10-5-2012.dgn: existing underground and overhead utilities file
123456_PrModel_10-5-2012.dgn: proposed model of final surface including 3D line strings
123456_PrTriangle_10-5-2012.dgn: 3D file containing proposed surface triangles
123456_LandXML_Geometry_2012.xml: xml file containing all horizontal and vertical alignments

<b><u>Survey Files:</u></b>
123456_Survey_2D_10-5-2012.dgn: original survey topo file as delivered to design
123456_ExTriangle_10-5-2012.dgn: original survey existing surface triangle file as delivered to design
123456_ControlPts_10-5-2012.dgn: original survey control points as delivered to design

<b><u>Miscellaneous Files:</u></b>
123456_Xsec_M43_10-5-2012.pdf: pdf document of M-43 design cross-sections

## Plan and Proposal Milestone File Naming Convention

For the given job number XXXXXX:

### Base Plans:

XXXXXX \_Road\_Base.pdf

XXXXXX \_Bridge\_Base.pdf

XXXXXX \_Proposal\_Base.pdf (if applicable)

### Preliminary Plans:

XXXXXX \_Road\_Prelim.pdf

XXXXXX \_Bridge\_Prelim.pdf

XXXXXX \_Proposal\_Prelim.pdf (if applicable)

### Marked Final ROW:

XXXXXX \_Road\_MFROW.pdf

### OEC Plans:

XXXXXX \_Road\_OEC.pdf

XXXXXX \_Bridge\_OEC.pdf

XXXXXX \_Proposal\_OEC.pdf

### Final Plan Turn In:

XXXXXX \_Road.pdf

XXXXXX \_Bridge.pdf

XXXXXX \_Proposal.pdf

The maximum pdf file size for any given plan set submittal is **30 MB**. If more than one set is needed per package due to size, number sets sequentially. For example:

XXXXXX \_Road\_OEC1.pdf

XXXXXX \_Road\_OEC2.pdf

**TYPICAL SECTIONS - GENERAL ITEMS:**

- G1. All work items on the typical cross sections are to be in capital letters. Use the proper fonts, sizes, levels, weights, etc. Proper pay items on the typical sections are to match the MDOT standard pay items and/or the specifications book.
- G2. Whole words should be used when possible, but abbreviations are acceptable. The following are some standard abbreviations:
- PAVT – Pavement
  - SHLD – Shoulder
  - CP – Crown Point
  - PT – Point
  - AGG – Aggregate
  - OGDC – Open Graded Drainage Course
  - POR – Point of Rotation
  - PG – Plan Grade
  - CONC – Concrete
- G3. Label the existing and proposed lanes and shoulders. If the dimension is a whole number do not label with a decimal. Do not show grade differentials (-0.24') and or circles at break points. For horizontal dimensions use decimals not feet and inches. Vertical dimensions are typically in inches.
- G4. Always show existing and proposed plan grade, crown point and point of rotation locations.
- G5. Typical sections are a general representation; the intent is not to show every scenario. Utilize miscellaneous details or side typical sections to illustrate unique construction locations.
- G6. Label the typical sections with general varying widths for the station range of the typical. Exact station ranges and widths of tapers, transitions, gores, etc are to be shown on the construction sheets.
- G7. Existing typical cross sections should be developed as complete as possible from old plans, pavement cores, soil borings and field inspections. All layers of all materials should be shown including subbase and aggregate if known. It is critical to identify the type and thickness of concrete pavement, HMA thickness, existing underdrains, or other items that can affect the bid price.
- G8. The following items may require separate half section typical or details and shall be used as needed:
- Guardrail sections
  - Shoulder sections
  - Crossroads
  - Fill/Cut sections
  - Curb and gutter sections
  - Turn lanes
  - Lane widening
  - Ramps
  - Crossovers
  - Retaining Walls
- G9. Government lines shall not be shown on the typical sections.

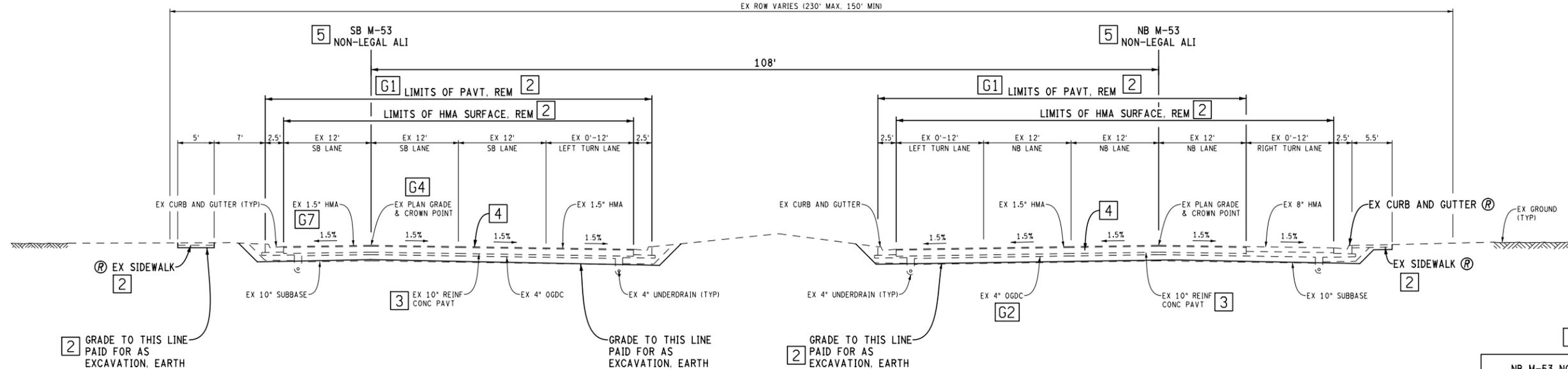
**TYPICAL SECTIONS:**

1. Existing typical sections will be located before the proposed typical sections and will be grouped together. Existing and proposed typical sections will not be on the same sheet.
2. The removal type lines and the 'GRADE TO THIS LINE' call will address how removal items are paid for. Items that are not included in the removal type lines or the 'GRADE TO THIS LINE' call will be called out to be removed separately (example: guardrail or curb and gutter when paid for separately). If the items being removed are covered by the specifications book the pay item name is not required on the typical section. The 'GRADE TO THIS LINE' call is only shown on the existing typical section and should match the bottom line of the coinciding proposed typical section.
3. Label all existing materials. Clarity on where this information originated from may be added by notes if needed.
4. Removal items on the existing typical sections are not to be crosshatched.
5. Only show alignments (LEGAL ALI OR NON-LEGAL ALI) that are being used to construct the roadways. Alignment labels shall match the labels in the plan set.
6. Existing and proposed ROW is labeled from ROW line to ROW line, it is not tied to any of the alignments. Identify if it is limited access (LA) ROW.
7. Include station equations that are within the typical section station range. If multiple equations exist within the station range they should be shown in a separate box.
8. Multiple station ranges can be used on the same typical section.
9. Side slopes that vary through the station limits shall be labeled as "SLOPE VARIES" or "SLOPES VARY" in the type line or "VARIES" with an arrow instead of specifying a slope. The specific slopes will typically be detailed on the profile sheets. If there are no profile sheets this information can be detailed on the typical.
10. When the pay item "SLOPE RESTORATION, TYPE \_" is used, the type can be left blank.
11. The longitudinal pavement joint type labels shall not be shown on the typical sections. Pavement joints will only be shown as a vertical line along with a horizontal lane tie.
12. Proposed ditches that vary within the station range shall be labeled as "DITCH SLOPES, BOTTOM WIDTH AND DEPTH VARY". The specific slopes, bottom width and depth will typically be detailed on the profile sheets. If there are no profile sheets this information can be detailed on the typical.
13. The pavement cross slope on a superelevated typical section will be labeled as 'RATE OF SUPER' when the typical section includes the crown-runout and transition or if multiple curves are within the typical station ranges. If the superelevated typical section is in full super for the entire station range then the specific percent super can be shown.
14. Varying shoulder slopes on super elevated typical sections will be labeled with an asterisk (\*). Shoulder slopes that are in the same direction that the pavement is superelevated will include a slope arrow. Slopes on the high side that slope in the opposite direction of the pavement super will not have an arrow.
15. The HMA application table should appear only on the first proposed typical sheet that has an HMA pavement section. This table should be placed in the lower left corner of the typical sheet.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE )									NO SCALE	DATE:	CS:	PLAN GUIDELINES	DRAWING	SHEET
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION			DESIGN UNIT:	JN:	TYPICAL SECTIONS		SECT 1
										FILE:	TSC:			

1

6



EXISTING NORMAL SECTION

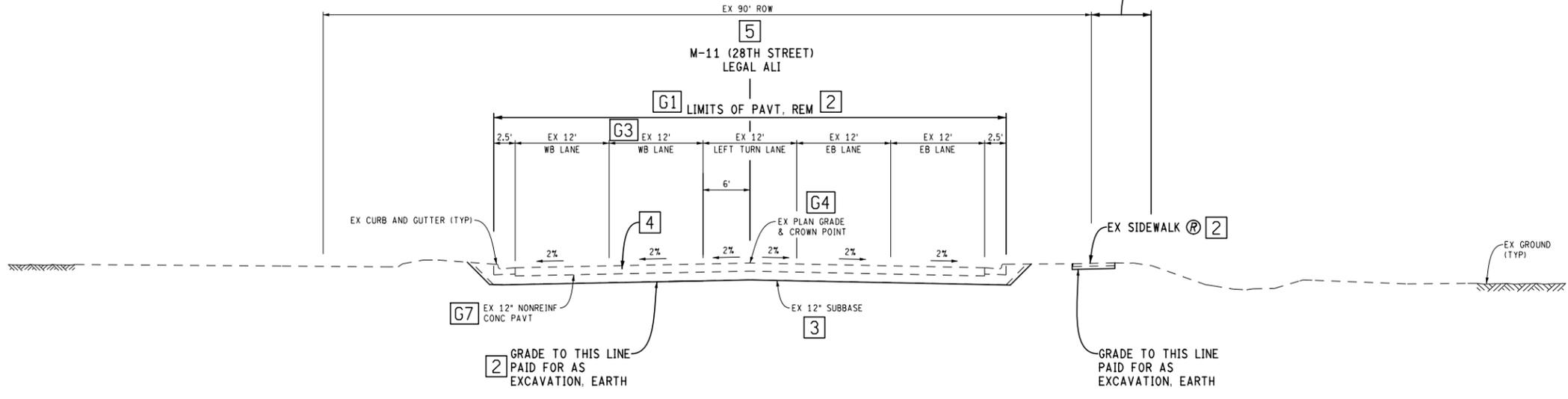
SECTION APPLIES TO:  
 SB M-53 STA 520+00.00 TO STA 529+47.00  
 SB M-53 STA 550+00.00 TO STA 600+00.00

EXISTING NORMAL SECTION

SECTION APPLIES TO:  
 NB M-53 STA 520+00.00 TO STA 529+47.00  
 NB M-53 STA 550+00.00 TO STA 600+00.00

7  
 NB M-53 NON-LEGAL ALI  
 STA EQUATION  
 STA 527+46.10 BK=  
 STA 527+47.16 AH  
 LINE SHORTENS 1.06'

6



EXISTING NORMAL SECTION

SECTION APPLIES TO:  
 M-11 (28TH ST) STA 70+00.00 TO STA 140+00.00

FINAL ROW PLAN REVISIONS ( SUBMITTAL DATE: )							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



DATE:	CS:
DESIGN UNIT:	JN:
TSC:	

EXISTING TYPICAL SECTIONS		DRAWING	SHEET
		EXTYP	SECT 1
		001	

1

6

EX 300' LA ROW

5 WB I-196  
NON-LEGAL ALI

5 EB I-196  
NON-LEGAL ALI

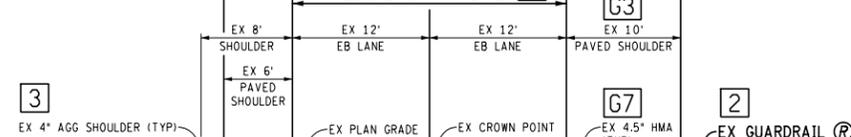
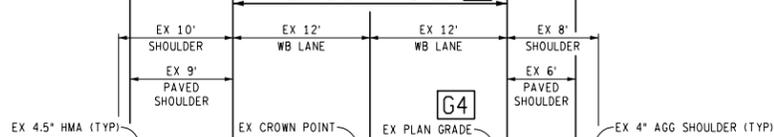
93'

2 LIMITS OF HMA SURFACE, REM G1

2 LIMITS OF HMA SURFACE, REM G1

LIMITS OF PAVT, REM 2

LIMITS OF PAVT, REM 2



2 GRADE TO THIS LINE  
PAID FOR AS  
EXCAVATION, EARTH

2 GRADE TO THIS LINE  
PAID FOR AS  
EXCAVATION, EARTH

EXISTING NORMAL SECTION

EXISTING NORMAL SECTION

SECTION APPLIES TO:  
WB I-196 STA 1279+41.00 TO STA 1280+70.00

SECTION APPLIES TO:  
EB I-196 STA 1277+80.00 TO STA 1280+70.00

6

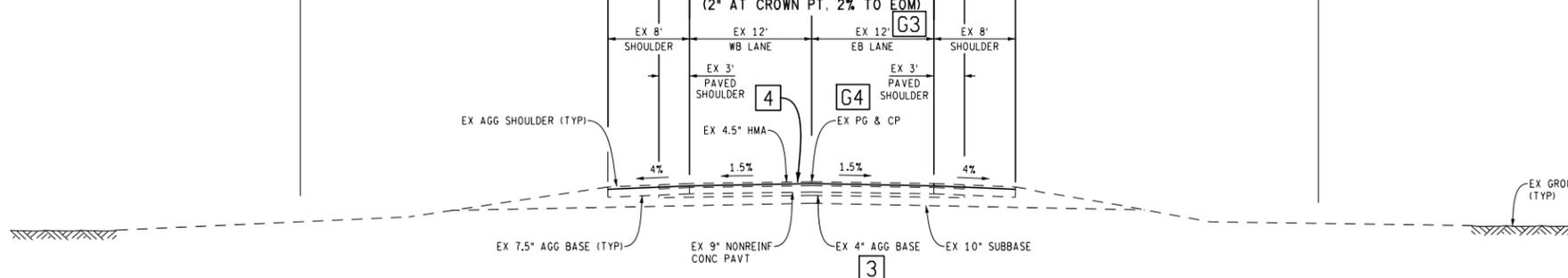
EX 100' ROW

5 M-89  
LEGAL ALI

2 COLD MILLING HMA SURFACE (4% SLOPE)  
LIMITS OF TRENCHING  
(2.75' AT EOM, 5' AT 4%)

2 COLD MILLING HMA SURFACE (4% SLOPE)  
LIMITS OF TRENCHING  
(2.75' AT EOM, 5' AT 4%)

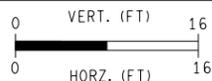
LIMITS OF PROFILE G1  
COLD MILLING HMA SURFACE  
(2' AT CROWN PT, 2% TO EOM)



EXISTING NORMAL SECTION

SECTION APPLIES TO:  
M-89 STA 100+00.00 TO STA 200+00.00

FINAL ROW PLAN REVISIONS ( SUBMITTAL DATE: )							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

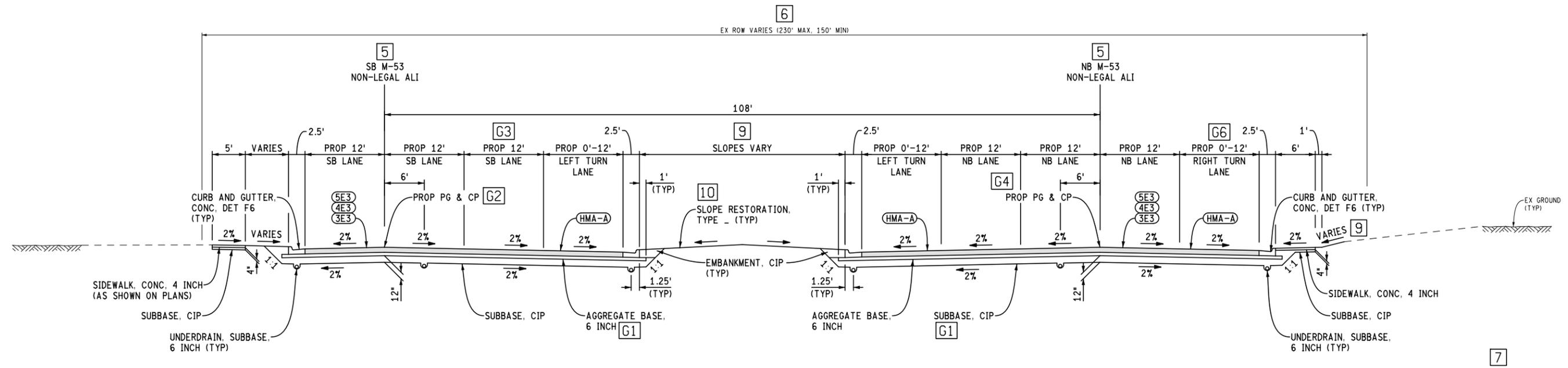


DATE: \_\_\_\_\_  
DESIGN UNIT: \_\_\_\_\_  
TSC: \_\_\_\_\_  
FILE: \_\_\_\_\_

CS: \_\_\_\_\_  
JN: \_\_\_\_\_

EXISTING TYPICAL SECTIONS

DRAWING	SHEET
EXTYP 002	SECT 1



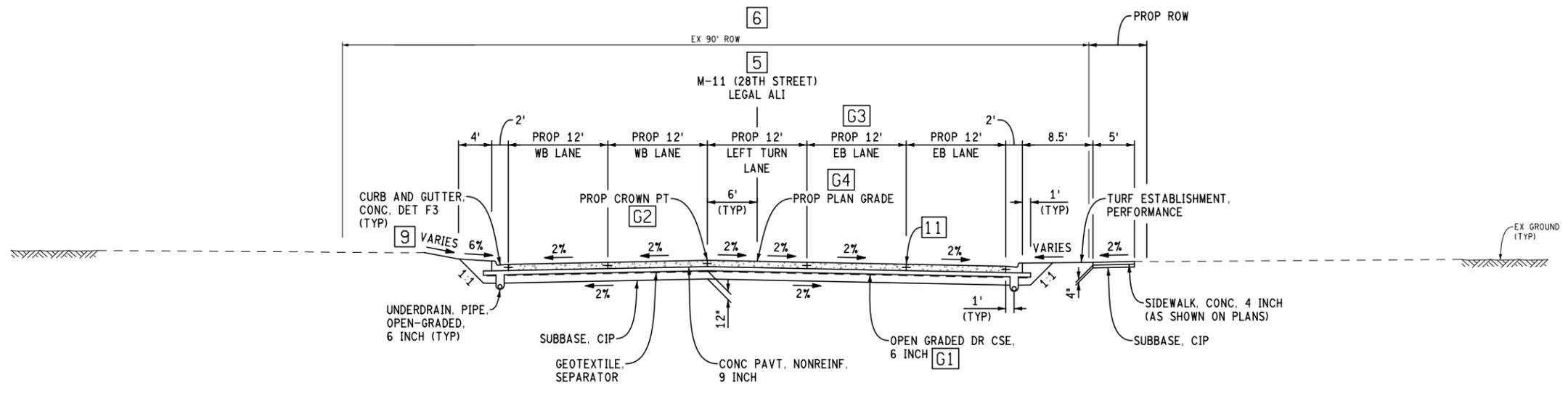
PROPOSED NORMAL SECTION

SECTION APPLIES TO:  
SB M-53 STA 520+00.00 TO STA 524+50.00

PROPOSED NORMAL SECTION

SECTION APPLIES TO:  
NB M-53 STA 520+00.00 TO STA 524+50.00

NB M-53 NON-LEGAL ALI  
STA EQUATION  
STA 527+46.10 BK=  
STA 527+47.16 AH  
LINE SHORTENS 1.06'



PROPOSED NORMAL SECTION

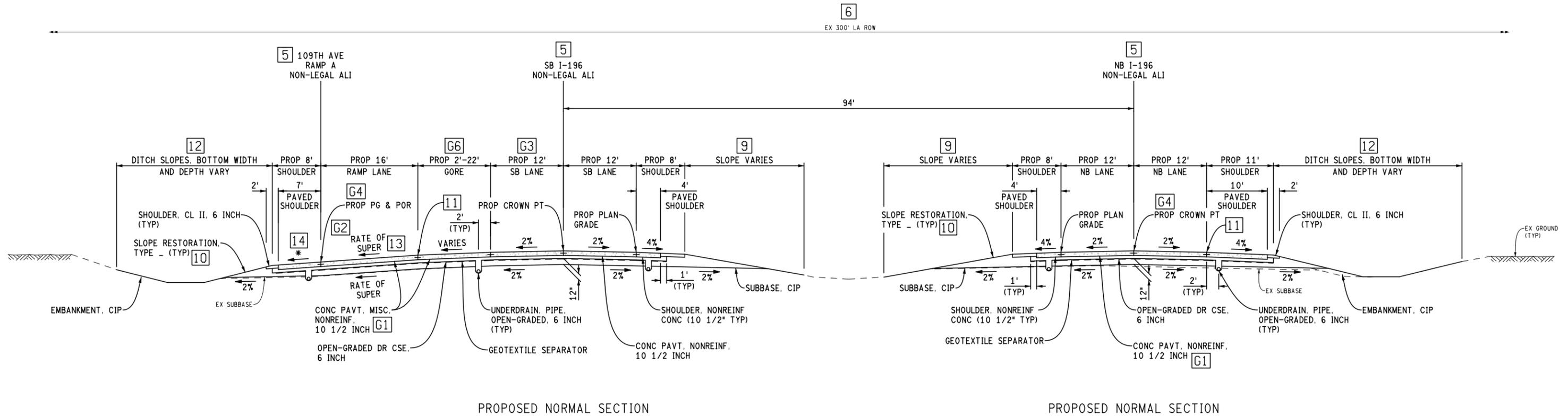
SECTION APPLIES TO:  
M-11 (28TH ST) STA 70+00.00 TO STA 73+00.00

15 HMA APPLICATION ESTIMATE

IDENT NO.	ITEM	RATE LBS PER SYD	PERFORMANCE GRADE	REMARKS
5E3	HMA, 5E3	220	64-28	TOP COURSE AWI=260
4E3	HMA, 4E3	220	64-28	LEVELING COURSE
3E3	HMA, 3E3	550	58-22	BASE COURSE
HMA-A	HMA APPROACH	990	64-28	TURN LANES 220 LB/SYD HMA, 5E3 - TOP COURSE AWI=260 220 LB/SYD HMA, 4E3 - LEVELING COURSE 550 LB/SYD HMA, 3E3 - BASE COURSE (PG 58-22)
HP	HAND PATCHING	330	64-22	HMA, 4E3
	* BOND COAT	0.05-0.15 GAL		

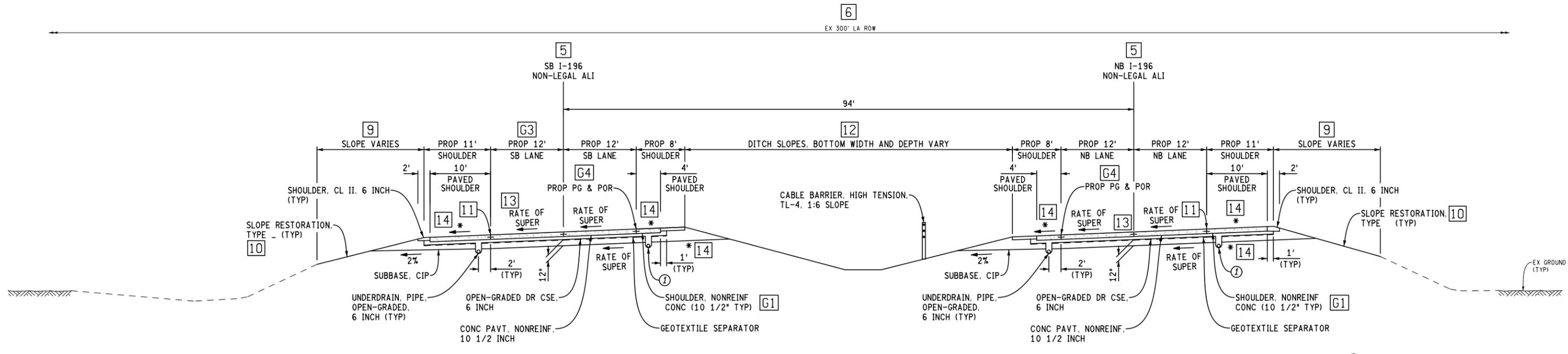
\*FOR INFORMATION ONLY

Attachment E - Typical Section Examples  
Page 4



PROPOSED NORMAL SECTION  
SECTION APPLIES TO:  
SB I-196 STA 1693+40.00 TO STA 1694+11.00  
109TH AVE RAMP A STA 1693+44.00 TO STA 1694+13.00

PROPOSED NORMAL SECTION  
SECTION APPLIES TO:  
NB I-196 STA 1691+00.00 TO STA 1700+00.00  
NB I-196 STA 1696+86.00 TO STA 1703+00.00



PROPOSED SUPERELEVATED SECTION

SECTION APPLIES TO:  
NB I-196 STA 1642+00.00 TO STA 1647+63.00  
NB I-196 STA 1647+95.00 TO STA 1653+60.00

PROPOSED SUPERELEVATED SECTION

SECTION APPLIES TO:  
NB I-196 STA 1642+00.00 TO STA 1647+63.00  
NB I-196 STA 1647+95.00 TO STA 1653+60.00

① WHEN ALL LANES ARE IN FULL SUPERELEVATION THE UNDERDRAIN UNDER THE HIGH SIDE SHOULDER IS NOT REQUIRED

⑭ \* FOR SHOULDER SLOPES IN SUPER TRANSITION AND FULL SUPER SEE STANDARD PLAN R-107 SERIES

Attachment E - Typical Section Examples  
Page 5

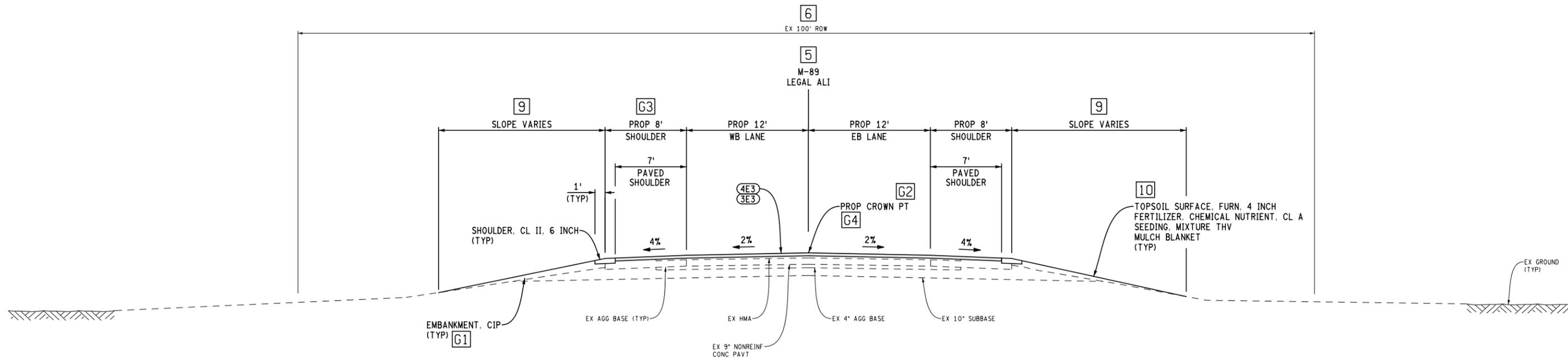
FINAL ROW PLAN REVISIONS ( SUBMITTAL DATE: )			
NO.	DATE	AUTH	DESCRIPTION



DATE: \_\_\_\_\_  
DESIGN UNIT: \_\_\_\_\_  
TSC: \_\_\_\_\_  
FILE: \_\_\_\_\_

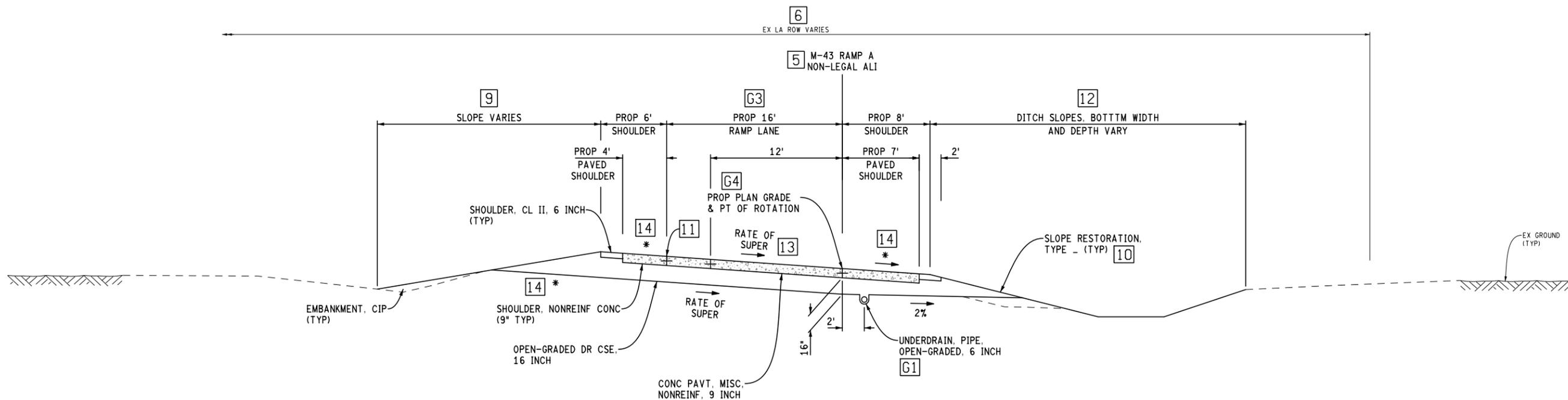
CS: \_\_\_\_\_  
JN: \_\_\_\_\_

PROPOSED TYPICAL SECTIONS		DRAWING	SHEET
		PRTYP 002	SECT 1



PROPOSED NORMAL SECTION

SECTION APPLIES TO:  
M-89 STA 100+00.00 TO STA 200+00.00



PROPOSED RAMP SUPERELEVATED SECTION

SECTION APPLIES TO:  
RAMP A STA 10+00.00 TO STA 20+00.00

14  
\* FOR SHOULDER SLOPES IN SUPER TRANSITION AND FULL SUPER SEE STANDARD PLAN R-107 SERIES

FINAL ROW PLAN REVISIONS ( SUBMITTAL DATE: )							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



DATE:	CS:
DESIGN UNIT:	JN:
TSC:	
FILE:	

PROPOSED TYPICAL SECTIONS

DRAWING	SHEET
PRTYP 003	SECT 1

**Cross Section Sheets**

The full set of design cross sections shall be provided with plan set submittals (Base, Preliminary, and OEC) for review, and at final Plan Turn In (see RID requirements). It is the intent that at plan submittal time, the project team or designer will cut cross sections at where the project stands at the time of submittal and submit with plan set(s). It is not intended that the design cross sections require additional detailing and clean up at any submittal prior to final Plan Turn In. At final Plan Turn In, provide final, detailed, design cross sections.

Base Plans Submittal, Preliminary Plans & OEC:

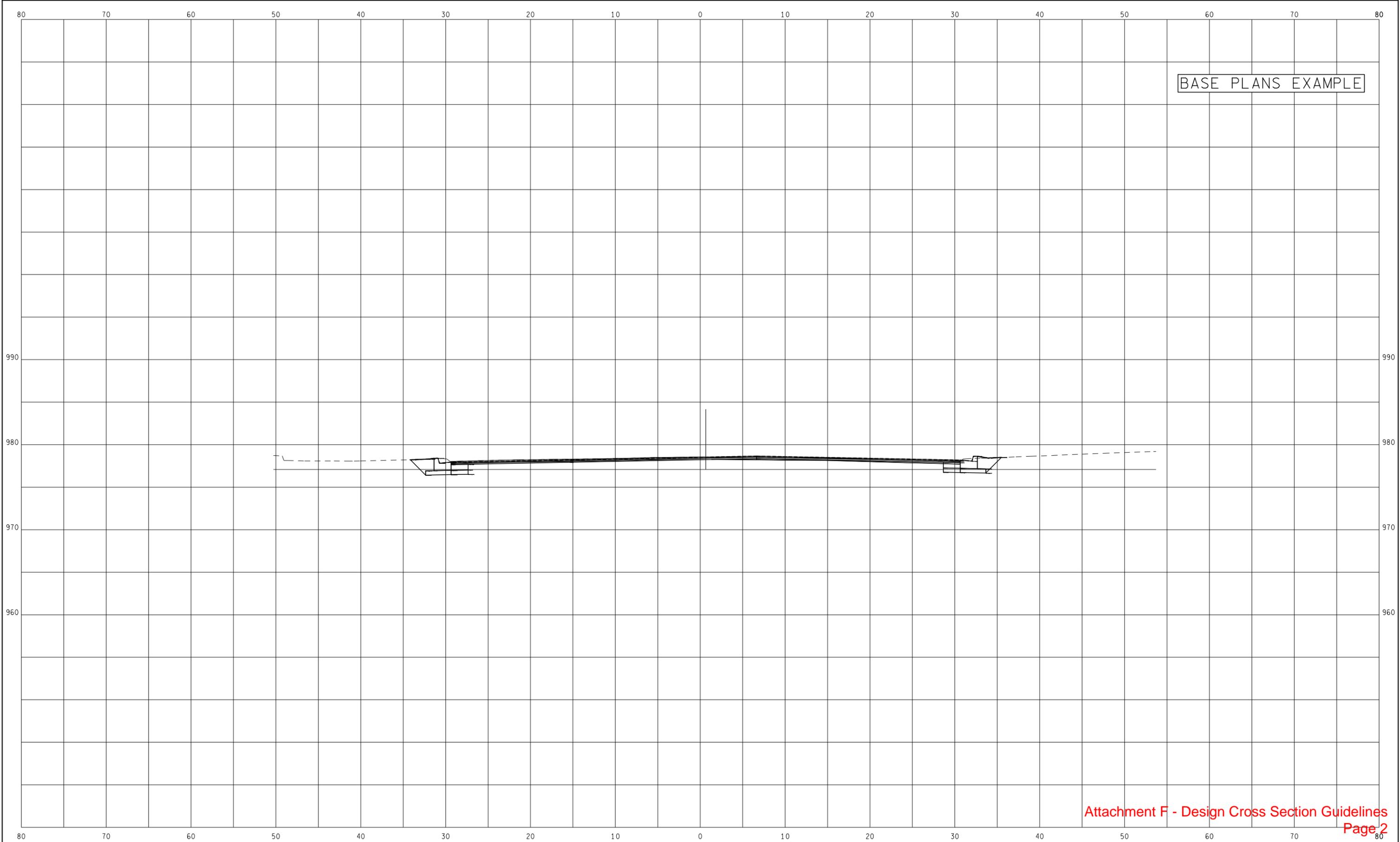
- Cross Section Cell with station
- Grid line elevations
- Existing Ground/Surface
- Proposed Top Surface
- Proposed Agg Base
- Proposed Subbase
- Tie point where the PR surface meets EX ground
- Slopes of pavement and shoulders
- Ditch slopes
- Subbase Slopes
- EX and PR ROW lines
- Excavation Limits

Final Plan Turn In are 100% complete.

- Offset distance of the pavement edges from the center line
- Elevation at the pavement edges
- Ditch bottom elevation
- Dependent or Independent Ditch label
- Driveway and Side Road ties
- Guardrail

REVISIONS								Insert Logo		NO SCALE	DATE:	CS:	Plan Guidelines	DRAWING	SHEET	
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION				DESIGN UNIT:	JN:		Design Cross Section Guidelines	NOTE	SECT 1
											FILE: ####_Note_###.doc	TSC:				001

BASE PLANS EXAMPLE

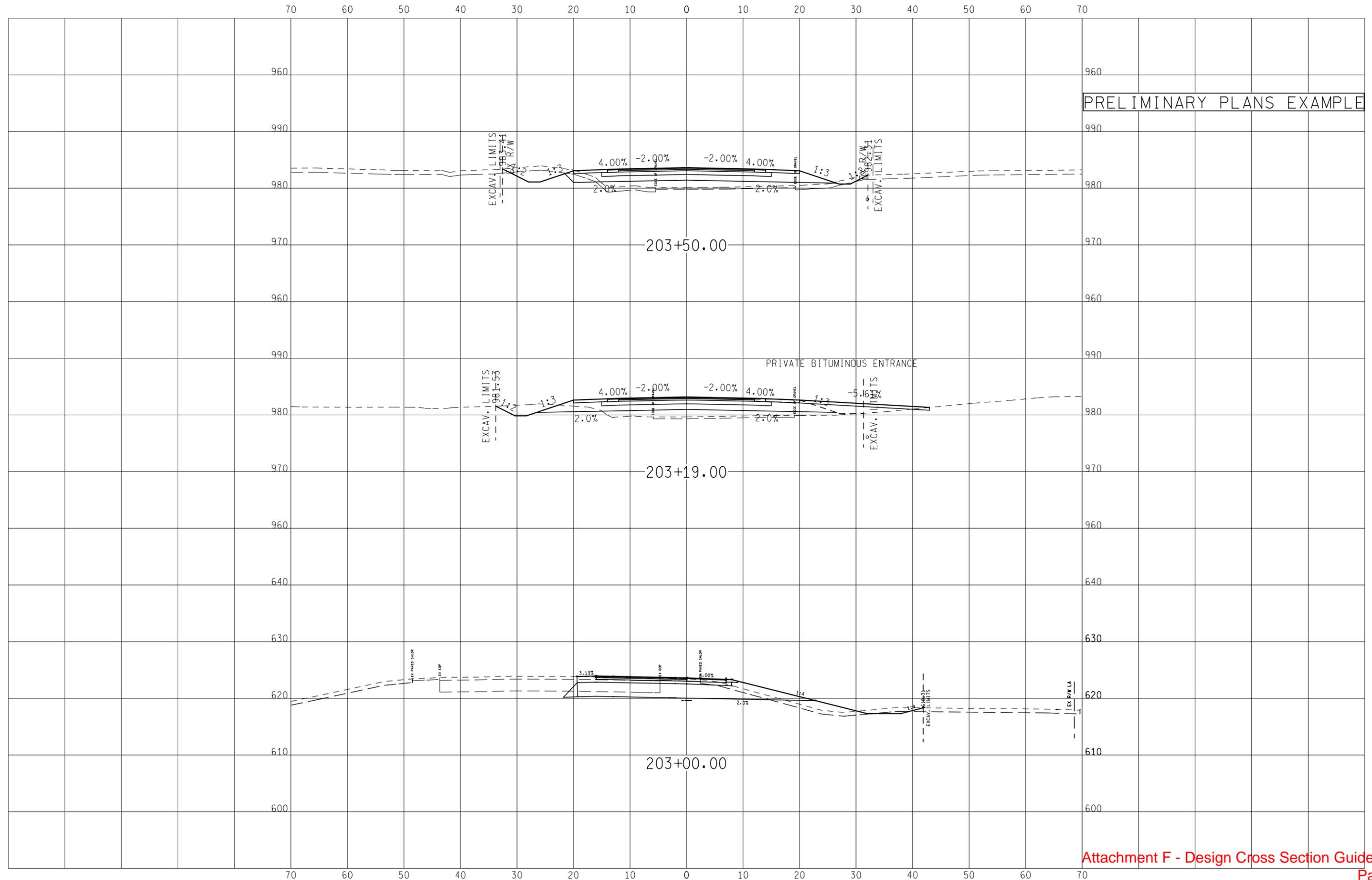


Attachment F - Design Cross Section Guidelines  
Page 2

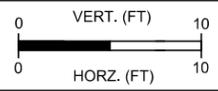
FINAL ROW PLAN REVISIONS:				ASSEMBLY PLAN REVISIONS:					VERT. (FT) 0 ————— 5   0 ————— 5 HORZ. (FT)	DATE: 05/01/12 DESIGN UNIT: Project Manager TSC: Location	CS: 12345 JN: 54321A	CROSS SECTION SHEET M-2000 STA 25+00.00 TO 28+00.00	DRAWING SHEET M-2000 XSHEET SECT 1
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION						
		X				X							

FILE: 54321 XS-Sheet.dgn

PRELIMINARY PLANS EXAMPLE



AS-LET PLAN REVISIONS							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



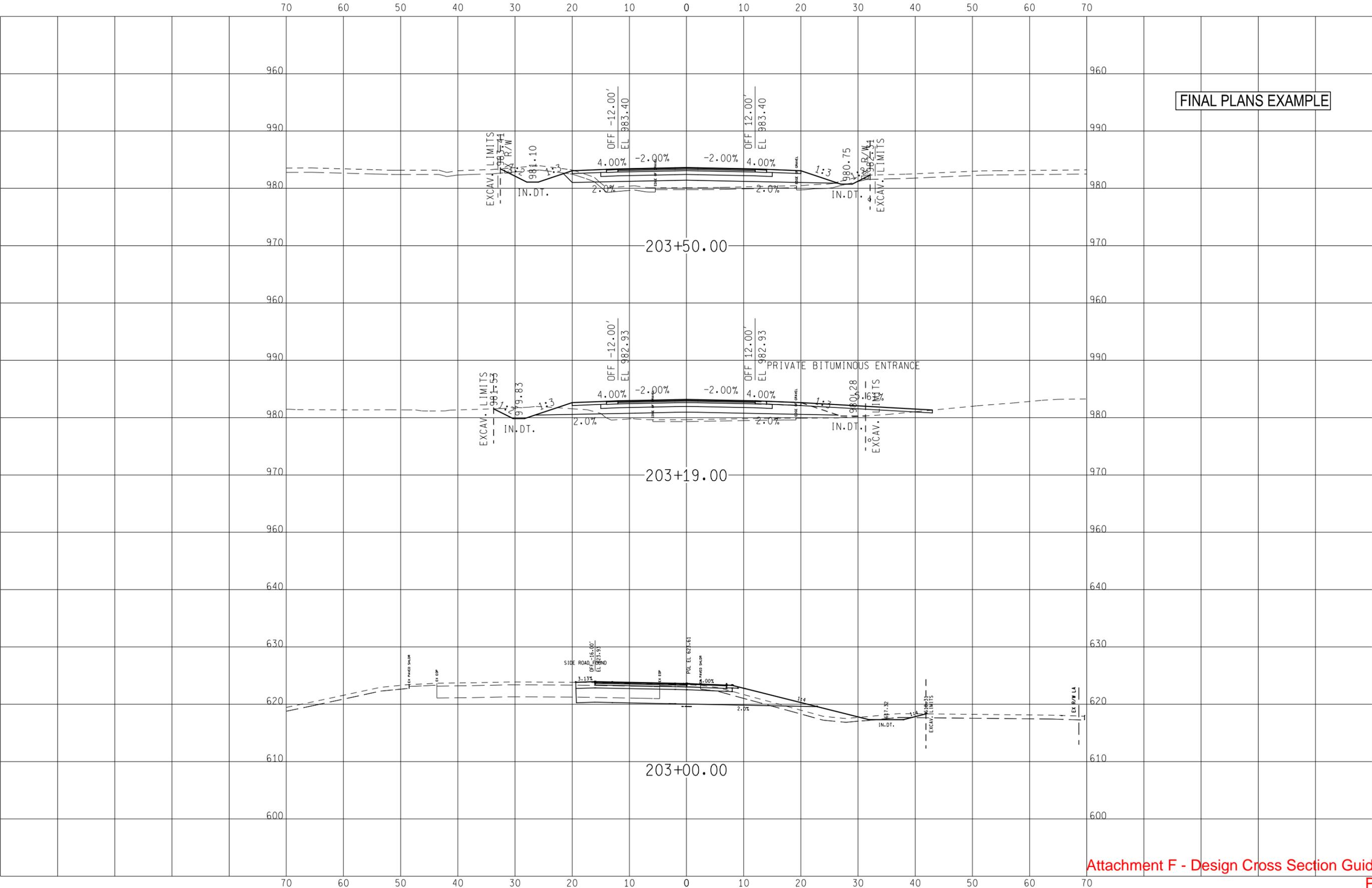
DATE: 05/01/12  
DESIGN UNIT: Project Manager  
TSC: Location  
FILE: 54321\_XS-Sheet.dgn

CS: 12345  
JN: 54321A

CROSS SECTION SHEET  
M-1000  
STA 203+00 TO 203+50

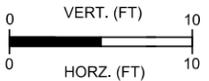
DRAWING SHEET  
SECT 1

FINAL PLANS EXAMPLE



Attachment F - Design Cross Section Guidelines  
Page 4

AS-LET PLAN REVISIONS							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



FILE: 54321\_XS-Sheet.dgn

DATE: 10/07/12  
DESIGN UNIT: Project Manager  
TSC: Location

CS: 12345  
JN: 54321A

CROSS SECTION SHEET  
M-1000  
STA 203+00 TO 203+50

DRAWING SHEET  
SECT 1

## **Adaptation of Proposed Alignment/ROW Concepts**

The following guidance is for the proposed conceptual changes to MDOT standards for alignment definitions and annotation within plan sets and in practice.

### **Proposed Design Process & Plan Changes:**

Right of Way (ROW) acquisitions are to be based on previously established legal alignments, as retraced for the project, whenever possible. The appropriate project personnel (designer, surveyor and/or real estate technician) should determine when it may be necessary to depart from the previously established legal alignment for acquisition. (In circumstances where the route is entirely new or significantly departs from existing alignment it may be necessary to create new legal alignments.)

### **Alignment/ROW Sheets**

It is intended that combined Alignment/ROW Sheets will be included in all plan sets.

Alignment/ROW Sheets shall include the following components:

- All pertinent alignments to the project, relative to the public land survey system (PLSS), as provided by the surveyor, plus any alignments for the project as proposed by the engineer.
- All pertinent PLSS corners and government lines.
- ROW limits dimensioned from the legal alignments from which the limits were established.
- All applicable project ties for alignments, ROW, and government lines.
- Curve data for all project alignments shall be shown on the Alignment/ROW Sheets only. Curve data shall be placed once on the Alignment/ROW Sheet of which the curves point of intersection (PI) station is located.
- Plat/subdivision information shall be shown on the Alignment/ROW sheets, as well as on the Removal and Construction sheets.
- MDOT parcel numbers and property boundary information shall be shown on the Alignment/ROW sheets only.

Please note that:

- These sheets may be best represented at the same scale as the project Removal and Construction Sheets.
- The detailed alignment, ROW, and government line ties should only be shown on the Alignment/ROW Sheets, and should not be repeated on the Removal and Construction Sheets.

### **Removal & Construction Sheets**

- The Removal and Construction Sheets shall only include the alignment required to construct the project.
- In instances where a proposed construction alignment is required on a project, and intended to be used for ROW acquisition, it shall be designated/annotated as legal on the plans.
- PC, PI, and PT station labels shall be shown for the alignment shown (the alignment required to construct the project).

## **Typical Sheets**

Typicals shall only include the alignment required to construct the project (the same alignment shown/called out on the Removal and Construction Sheets). An overall right of way dimension shall be included.

## **Alignment Definitions & Key**

Alignment types (As-Constructed, Construction, or Survey) of existing alignments are determined by their historic origin and shall be provided by the surveyor. Plan users will refer to the Alignment Key (as described in this document) for alignment clarification and historical origin. For alignment definitions, please reference the MDOT 2012 Design Surveys Standards of Practice – Alignment Section (Pages 16-20).

An Alignment Key shall be included on the first Alignment/ROW Sheet included in the project plan set. The key shall provide descriptions of each alignment included in the project. The key shall include descriptions/definitions of existing/retraced project alignments as provided by the surveyor as a survey deliverable. A description of any proposed alignments shall be provided by the designer.

### **Annotation of Alignments:**

Annotation along the alignments shall be as follows:

### **ROADWAY + LEGAL or NON-LEGAL + ALI**

In instances where there are recurring alignments, a sequential letter designation shall be used, with the letter coinciding with information found in the alignment key.

### **Example Alignment Annotations:**

*M-3 LEGAL ALI*

*M-3 NON-LEGAL ALI*

*US-2 NON-LEGAL (A) ALI*

*US-2 NON-LEGAL (B) ALI*

*US-2 LEGAL (A) ALI*

*US-2 LEGAL (B) ALI*

### **Alignment Key:**

Alignment definitions/descriptions provided in the Alignment Key shall include the following:

Retraced Alignments (provided with survey deliverables):

- Route Name
- Origin Name, Origin Year and Origin Job Number
- “as retraced for” Job Number
- Year of Retracement

Proposed Construction Alignments (provided by the engineer):

- “Construction”
- “Alignment for” + Job Number
- Description of what the alignment is for and/or how it was produced

### **Example Alignment Key:**

*M-43 LEGAL (A) ALI = M-43 1954 Construction Alignment from Project 82-24 as retraced for Job Number 111659 in 2011.*

*M-43 LEGAL (B) ALI = Construction Alignment for Job Number 111659 for the relocated curve from station 119+00 to 321+96. Intended for acquisition on this project.*

*WB I-96 NON-LEGAL ALI = Construction Alignment for WB I-96 lanes as proposed by engineer for Job Number 123658.*

Questions or comments regarding this document please contact [vandeventerr@michigan.gov](mailto:vandeventerr@michigan.gov)

**ALIGNMENT/ROW SHEETS:**

1. Label all roadway names and county drains at the outside of the sheet using MDOT Pr x 1.5 text size.
2. Label all alignments using current naming convention.
3. Place north arrow (upper right corner when possible).
4. Show section, township and range information, and city, village, township or county.
5. ROW is dimensioned only to the legal alignments. If a legal alignment is not available then the ROW is dimensioned from ROW line to ROW line. Label ROW within the sheet every time it changes. Label and dimension proposed ROW.
6. An alignment key is required and should be located in the upper left corner of the first alignment sheet.
7. Show section corners, quarter corners, section lines, bearings of the section lines and distances as shown. The section corner information will only be shown on the alignment sheets.
8. All crossroad alignment ties will only be shown on the alignment sheets. Only tie the section lines and crossroads to the legal alignment.
9. Show tangent bearings on all alignments.
10. Existing and proposed alignment curve data is only shown on the alignment sheets. Show the curve data on the sheet where the PI appears. Show existing and proposed superelevation
11. Dimension the distances between alignments.
12. Show all parcel and plat lines on the alignment sheets. Parcel lines are not shown on the removal and construction sheets.
13. Label all subdivisions and plats. Label with proposed text size and on the appropriate level.
14. If a POT is shown at the end/beginning of an alignment, northing and eastings shall be included to establish the location.
15. The POB/POE, job number, control section and mile points, and physical reference and mile points need to be shown at the beginning and end of the construction limits.
16. If the existing ROW has been established from survey and it is not dependent on the legal alignment, label the bearing and distance of the existing ROW and the station of the location that the ROW is no longer dependent on the legal alignment.
17. Label and dimension any existing or proposed easements.
18. Use the standard Geopak orientation for labeling PC, PI & PT locations whenever possible. These can be modified if readability becomes an issue.
19. Parcel numbers and property boundary information shall be shown on the Alignment/ROW sheets only.
20. Use separate sheets for ramp and/or crossroad alignments as needed, only show the information once.
21. The scale of the Alignment/ROW sheets is at the discretion of the designer. Due to the amount of information shown on these sheets it may be beneficial to use the same scale as the removal and construction sheets.
22. Show all station equations.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE )									NO SCALE	DATE:	CS:	PLAN GUIDELINES	DRAWING	SHEET
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION			DESIGN UNIT:	JN:	ALIGNMENT/ROW SHEETS		SECT 1
										FILE:	TSC:			

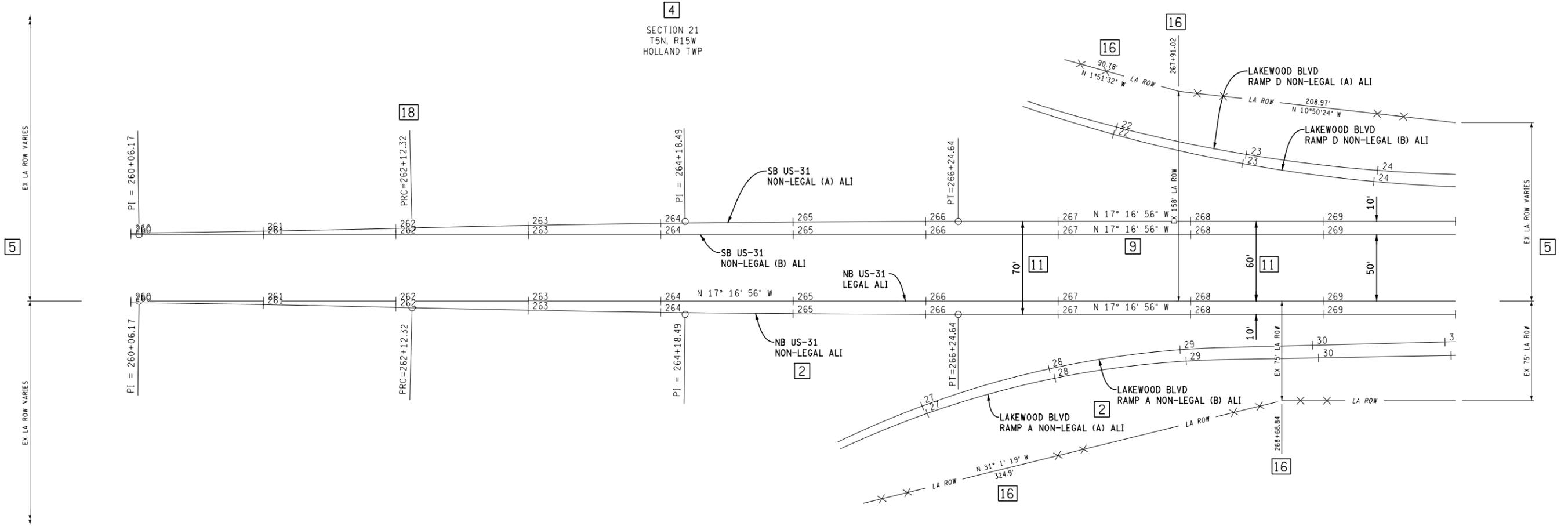
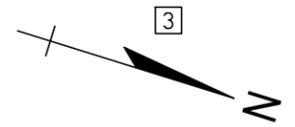


10

SB US-31 NON-LEGAL ALI  
 $\Delta = 1^\circ 23' 23''$  (LT)  
 $D = 0^\circ 20' 13''$   
 $T = 206.17'$   
 $L = 412.32'$   
 $R = 17,000.00'$   
 $E = 1.25'$   
 $PC = 258+00.00$  N = 480,514.79 E = 12,662,117.45  
 $PI = 260+06.17$  N = 480,711.66 E = 12,662,056.20  
 $PRC = 262+12.32$  N = 480,906.98 E = 12,661,990.20  
 $PR SUPER = N.C.$

SB US-31 NON-LEGAL ALI  
 $\Delta = 1^\circ 23' 23''$  (RT)  
 $D = 0^\circ 20' 13''$   
 $T = 206.17'$   
 $L = 412.32'$   
 $R = 17,000.00'$   
 $E = 1.25'$   
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 $PT = 266+24.64$  N = 481,299.16 E = 12,661,862.95  
 $PR SUPER = N.C.$

RAMP D



4  
 SECTION 21  
 T5N, R15W  
 HOLLAND TWP

SECTION 21  
 T5N, R15W  
 HOLLAND TWP

NB US-31 NON-LEGAL ALI  
 $\Delta = 1^\circ 23' 23''$  (RT)  
 $D = 0^\circ 20' 13''$   
 $T = 206.17'$   
 $L = 412.32'$   
 $R = 17,000.00'$   
 $E = 1.25'$   
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 $PI = 260+06.17$  N = 480,726.51 E = 12,662,103.95  
 $PRC = 262+12.32$  N = 480,924.80 E = 12,662,047.49  
 $PR SUPER = N.C.$

NB US-31 NON-LEGAL ALI  
 $\Delta = 1^\circ 23' 23''$  (LT)  
 $D = 0^\circ 20' 13''$   
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 $L = 412.32'$   
 $R = 17,000.00'$   
 $E = 1.25'$   
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 $PI = 264+18.49$  N = 481,123.09 E = 12,661,991.03  
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 $PR SUPER = N.C.$

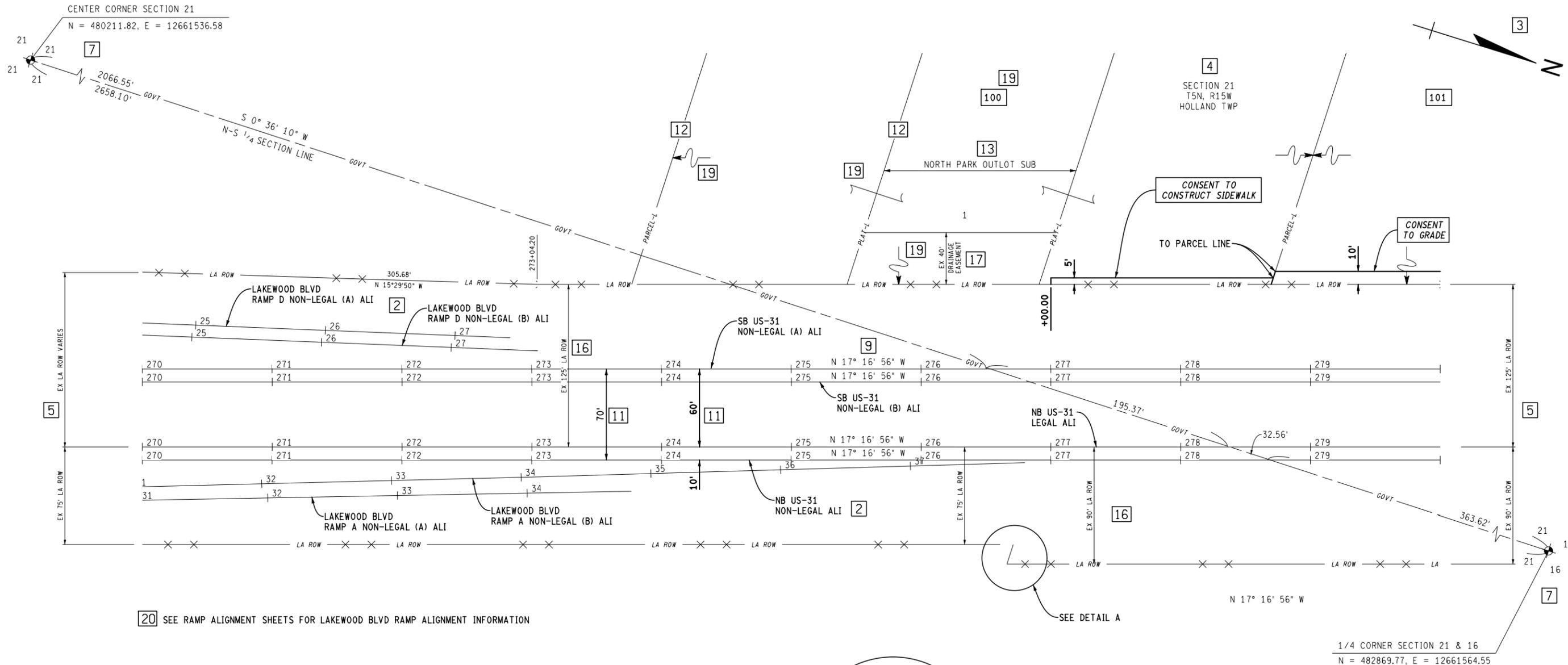
20 SEE RAMP ALIGNMENT SHEETS FOR LAKEWOOD BLVD RAMP ALIGNMENT INFORMATION

RAMP A

FINAL ROW PLAN REVISIONS ( SUBMITTAL DATE: )								ALIGNMENT/ROW SHEET		DRAWING SHEET	
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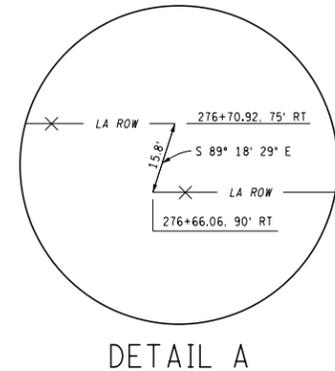


21  
 DATE: \_\_\_\_\_ CS: \_\_\_\_\_  
 DESIGN UNIT: \_\_\_\_\_ JN: \_\_\_\_\_  
 TSC: \_\_\_\_\_ FILE: \_\_\_\_\_



20 SEE RAMP ALIGNMENT SHEETS FOR LAKEWOOD BLVD RAMP ALIGNMENT INFORMATION

SECTION 21  
T5N, R15W  
HOLLAND TWP

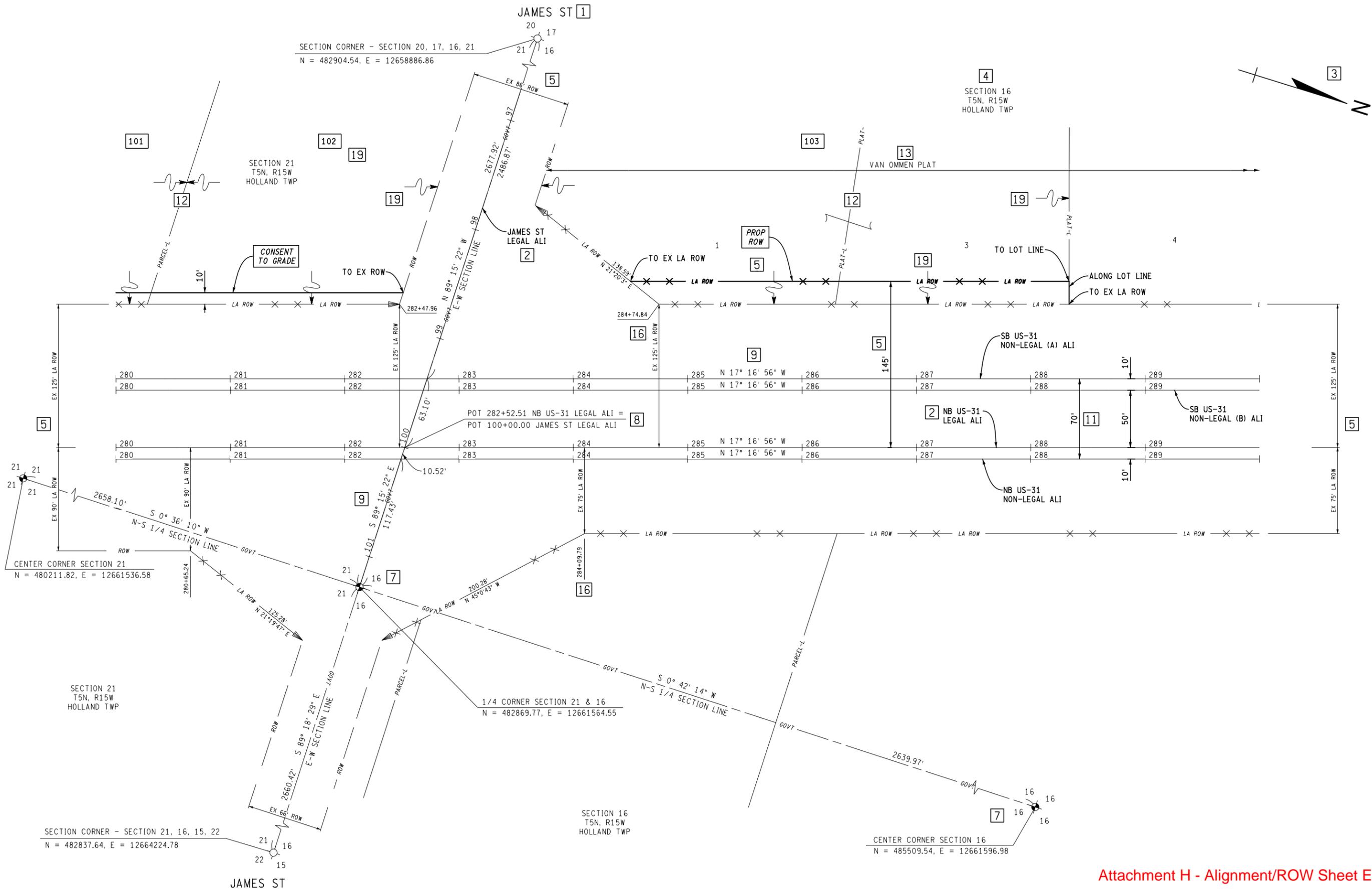


DETAIL A

FINAL ROW PLAN REVISIONS ( SUBMITTAL DATE: )								ALIGNMENT/ROW SHEET		DRAWING SHEET	
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION	US-31 STA 270+00 TO STA 280+00		US31 ALI 003	SECT 1



DATE: \_\_\_\_\_ CS: \_\_\_\_\_  
 DESIGN UNIT: \_\_\_\_\_ JN: \_\_\_\_\_  
 TSC: \_\_\_\_\_ FILE: \_\_\_\_\_



Attachment H - Alignment/ROW Sheet Examples  
Page 5

FINAL ROW PLAN REVISIONS ( SUBMITTAL DATE: )							
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DATE:	CS:
DESIGN UNIT:	JN:
TSC:	
FILE:	

ALIGNMENT/ROW SHEET		DRAWING	SHEET
US-31 STA 280+00 TO STA 290+00		US31 ALI 004	SECT 1