Nevada Department of Transportation

Road Design Guide

2010 Edition

Nevada Department of Transportation
1263 South Stewart Street
Carson City, Nevada 89712

State of Nevada
Jim Gibbons, Governor

Department of Transportation
Susan Martinovich, Director

Road Design Division
Daryl James, P.E., Chief Road Design Engineer

NEVADA DEPARTMENT OF TRANSPORTATION

ROAD DESIGN GUIDE 2010 EDITION

This guide has been prepared for the Nevada Department of Transportation's engineering personnel and other interested agencies, departments, and individuals.

The purpose of this guide is to establish uniform design criteria, review important geometric elements for consideration, and provide supplemental information to the AASHTO Green Book in instances where it gives a large range or open to varying interpretation. It is also intended to provide uniform guidelines for design details that may arise from the Standard Plans, Standard Specifications, field reviews, and construction activities. This guide also outlines how to prepare contract plans and estimates to insure continuity level of standards are used throughout the State. This guide is not intended to replace engineering judgment or knowledge.

OVERVIEW OF CONTENTS

Section 1 Design Criteria. This Section establishes a range of design criteria for high speed and low speed facilities.

Section 2 Design Elements. This Section is a supplement to the Green Book and is intended to point out important geometric elements that should be checked or considered. This section also is intended to clarify, expand, and adopt certain geometric design elements used in Roadway Design.

Section 3 Standards and Practices. This Section addresses common design details that may arise from the Standard Plans, Standard Specifications, field reviews, and construction activities. It is also intended to establish standard design practices that are not necessarily a part of geometric design.

Section 4 Policy and Procedures. This Section addresses specific policy and procedures for items that are the responsibility of Roadway Design. This Section also defines submittal requirements, project types and scope, and reports that are commonly produced on capacity and 3R projects.

Section 5 Engineering Support, Divisional Resources and Other Agencies. This Section describes the type of services and design support provided by each division. It also describes the type of correspondence or information that may be exchanged between the Design Division and the other divisions.

Section 6 Project Workflow. This Section describes the major steps for developing capacity and 3R projects. These steps are generally in the order in which they occur. The terminology follows the PSAMS dashboard in an effort to reduce confusion across divisional departments within NDOT.

Section 7 Plan Preparation. This Section is to assist the plan preparer in developing contract plans that are consistent with NDOT standards.

Direct questions and comments to the following: Steve Bird, Senior Road Designer (775) 888-7591 sbird@dot.state.nv.us

TABLE OF CONTENTS

SECTION 1 DESIGN CRITERIA

1.1 Design Criteria.

General. This Section establishes a range of design criteria for the eight categories of roadway. For simplicity, the eight levels of categories are combined into high speed and low speed facilities. Use criteria that are appropriate for specific roadway category, terrain, AADT, and land use. For information that describes roadway categories and other design standards, roadway characteristics, access control, and general design features, refer to the Access Management System and Standards 1999 Edition. Refer to the 2005 AASHTO Policy on Design Standards Interstate System for other specific design criteria for Interstate Systems. In Nevada, the interstate standard only applies to I-15, I-215, I-515, I-80 and I-580. Other freeways on the NHS, but not on the interstate, (portions of US 95 in Las Vegas and portions of US 395 in Washoe County) are to be designed to Green Book standards. The criterion listed below is intended for new construction or capacity type improvements.

ROADWAY CATEGORIES

1.2 High Speed Facilities (50mph and above).

--- Roadway Category One, Freeways **--- Roadway Category Two, Expressways**
--- Roadway Category Three, Regional Highways **--- Roadway Category Four, Rural Highways**
--- Roadway Category Five, Principal Arterials

Design Element	Desirable Criteria		Min Criteria		Criteria Basis		Comments
Design Vehicle	WB-65		WB-50		2001 GB pg 18		See design vehicle in Section 2.6 for further guidelines
Design speed (Mainline)(Rural)	80mph Freeway	75mph (other)	50 mph Freeway	40mph (other)	2001 GB pg 507 FRWY	2001 GB pg 448	Need to consider terrain, adjacent land use, and functional class. See Section 2.5
Design speed (Mainline)(Urban)	75 mph Freeway	60 mph (other)	50 mph Freeway	30mph (other)	2001 GB pg 507 FRWY	2001 GB pg 425	Need to consider terrain, adjacent land use, and functional class. See Section 2.5
Design speed (Ramp)	50 mph		35 mph		2001 GB pg 830 Exh 10-56		See Ramps in Section 2.18 for further guidelines
Lane width (Mainline)	12’		12’		2001 GB pg 508		See lane width in Section 2.9 for further guidelines
Lane width (Ramp)(Turn lanes)	12’ Ramp	14’ Turn lanes	11’ Ramp	12’ Turn lanes	2001 GB pg 842-843 Exh 10-67		For ramp radius less than 500’ consider wider travel lane width for off tracking
Shoulder width (Mainline) (Rt)	12’ Freeway/Inter	10’ All Others	8’ Freeway/ Inter	4’ All Others	2001 GB pg 509		Widths shown include lateral offset for guardrail/barrier rail
Shoulder width (Mainline) (Lt)	8’ Freeway/ Interstate	6’ All Others	4’ Freeway/ Interstate	4’ All Others	2001 GB pg 509		1. Widths shown include lateral offset for guardrail/barrier rail 2. Number of lanes changes the shoulder widths (See Section 2.11 Shoulders)
Shoulder width (Ramp) (Rt)	8’ -10’		6’		2001 GB pg 842-843 Exh 10-67		Widths shown include lateral offset for guardrail/barrier rail
Shoulder width (Ramp) (Lt)	4’		2’		2001 GB pg 842-843 Exh 10-67		Widths shown include lateral offset for guardrail/barrier rail
Bridge width	---		Match approach roadway		2001 GB pg 765, 770		See design year (bridge projects) in Section 2.7 for other considerations
Horizontal Alignment							
Min radius (Mainline)	2675’ (^{e}max 8%, 80mph)**		760’ (^{e}max 8%, 50mph)**		2001 GB pg 159 Exh 3-22, pg 161 Exh 3-23		**Values shown are both considered minimum radius
Min radius (Ramps)	835’ (^{e}max 6%, 50mph)		380’ (^{e}max 6%, 35mph)		2001 GB pg 159 Exh 3-22		Loop ramps may use 25mph design speed, pg 201 Exh 3-43 and pg 829 “Loops”
Min length of curve (Mainline)	---		---		Varies		See Horizontal Alignments in Section 2.2
Min tangent between curves	---		---		Varies		See Horizontal Alignments in Section 2.2
Vertical Alignment							
Crest vertical curve “K” Value (Mainline)	384 (80mph)		84 (50mph)		2001 GB pg 273 Exh 3-75 & pg 274 Exh 3-76		See “K-Value” under Alignments in Section 2.3 for additional information
Crest vertical curve “K” Value (Ramp)	84 (50mph)		29 (35mph)		2001 GB pg 273 Exh 3-75 & pg 274 Exh 3-76		See “K-Value” under Alignments in Section 2.3 for additional information
Sag vertical curve “K” Value (Mainline)	231 (80mph)		96 (50mph)		2001 GB pg 278 Exh 3-78 & pg 280 Exh 3-79		Check against headlight sight distance in Section 2.12
Sag vertical curve “K” Value (Ramp)	96 (50mph)		49 (35mph)		2001 GB pg 278 Exh 3-78 & pg 280 Exh 3-79		Check against headlight sight distance in Section 2.12
Interstates - NHS	Min length of vertical curve = 1000’ on Interstate systems		Min length of vert curve =3X Design speed for NHS and other state routes		NDOT Policy		
Superelevation							
^{e}max (Method 5)	^{e}max 8%		^{e}max 6%				Cross slope of 6% should be considered max super in icy climates
Min. runoff length	Varies with no. of lanes and ^{e}max		---		2001 GB Eq 3-25, pg 171		Note:
Min. tangent runout	Varies with no. of lanes and ^{e}max		---		2001 GB Eq 3-26, pg 173		1. No runoff /run-out on bridge structures if all possible.
% of runoff on tangent	85% (Number of lanes changes %)		67% (Number of lanes changes %)		2001 GB pg 173-175		2. Consider extending runoff/run out thru bridge structure if Note 1 is unattainable

1.2 High Speed Facilities (50mph and above) continued.

Design Element	Desirable Criteria	Min Criteria	Criteria Basis	Comments
Grades				
Mountainous	5% max (Design speed of 70mph)	6% max (Design speed of 50mph)	2001 GB Exh 8-1, pg 510	Grades 1% steeper than values shown may be used for extreme cases in urban areas
Rolling	4% max (Design speed of 80mph)	5% max (Design speed of 50mph)	2001 GB Exh 8-1, pg 510	Grades 1% steeper than values shown may be used for extreme cases in urban areas
Level	3% max (Design speed of 80mph)	4% max (Design speed of 50mph)	2001 GB Exh 8-1, pg 510	Grades 1% steeper than values shown may be used for extreme cases in urban areas
Curb and gutter facilities	0.5% or greater slope	0.3%	NDOT Policy	Note: Consider truck climbing lanes over 6% grade
Sight Distance				
Stopping (Mainline)	910’ (80mph design speed)	425’ (50mph design speed)	2001 GB Exh 3-1, pg 112	Use adjustment factors for grades Exh 3-2 pg 115
Stopping (Ramps)	425’ (50mph design speed)	250’ (35mph design speed)	2001 GB Exh 3-1, pg 112	Use adjustment factors for grades Exh 3-2 pg 115
Stopping (Urban Arterials)	495’ (55mph design speed)	200’ (30mph design speed)	2001 GB Exh 3-1, pg 112	Use adjustment factors for grades Exh 3-2 pg 115
Passing Sight Distance	2480’ (70mph design speed)	1835’ (50mph design speed)	2001 GB Exh 3-7, pg 124	Adjustment factor for grades is not available, exercise judgment for adjusting distances
Intersection Sight Distance	--	--	2001 GB pg 654- 682	Sight distance is based on various cases (see page 658)
Horizontal (Mainline)	--	--	pg 228 thru 232	
One Lane Ramp Design				
Acceleration Lanes				
Gap acceptance length	500’	300’	2001 GB Exh 10-69, pg 849	Use adjustment factor for grades greater than 2% Exh 10-71 for lengths
Acceleration length	---	820’	2001 GB Exh 10-70, 10-71, pg 851-852	Length based on 45mph ramp and 70mph Freeway. Adjust for grades >2%
Taper	70:1	50:1	2001 GB Exh 10-69, pg 849	
Taper, parallel design (preferred)	---	300’	2001 GB Exh 10-69, pg 849	Use adjustment factor for grades greater than 2% Exh 10-71 for lengths
Deceleration Lanes				
Deceleration Length	---	390’	2001 GB Exh 10-73, pg 855	Length based on 45mph ramp and 70mph Freeway. Adjust for grades > 2%
Taper length	---	250’	2001 GB Exh 10-72, pg 854	
Divergence angle	2^o	5^o (max angle)	2001 pg 853	
Curve Radius	---	1000’	2001 pg 850	
Two Lane Ramp Design				
Acceleration Lanes				
Gap acceptance length	500’	300’	2001 GB Exh 10-76, pg 862	Gap acceptance is increased when volume exceeds capacity in HCM (pg 861)
Acceleration length	---	820’	2001 GB Exh 10-70, 10-71, pg 851-852	Length based on 45mph ramp and 70mph Freeway. Adjust for grades >2%
Taper	70:1	50:1	2001 GB Exh 10-76, pg 862	
Taper, parallel design (preferred)	---	300’	2001 GB Exh 10-76, pg 862	Use adjustment factor for grades greater than 2% Exh 10-71 for lengths
Deceleration Lanes				
Deceleration Length	---	390’	2001 GB Exh 10-73, pg 855	
Auxiliary lane length	---	1500’	2001 GB Exh 10-77, pg 863	
Taper length	---	300’	2001 GB Exh 10-77, pg 863	
Divergence angle from mainline to ramp	2^o	5^o (max angle)	2001 GB Exh 10-77, pg 863	
Curve Radius	---	1000’	2001 GB Exh 10-77, pg 863	
Clearances				
Vertical				
New highway bridges over or under street or highway		16’-6”	NDOT BDPM Tbl 11.3A	Vertical clearance on collector & local roads may be 14’-6” if approved by District Eng.
Temp. structures and false work		16’-0”	NDOT BDPM Tbl 11.3A	UPRR requires temporary construction 20’-6” vertical clearance
Bridges to remain in place		16’-0”	NDOT BDPM Tbl 11.3A	
Overhead sign struct./Ped-Xings		18’-0”	NDOT Policy	
Railroad under highway (measured from top of track to bottom of structure)		23’-0”	UPRR guidelines for highway separation over railroad 1999	Coordinate false work and construction activities with UPRR See Section 2.16 for additional information regarding clearances around R/R structures
Electrified (50 Kv Line)		26’-0”	Verify with utility	
Electrified (25 Kv Line)		24’-3”	Verify with utility	
Non Electrified		23’-0”	Verify with utility	
Horizontal				
Railroad to pier protection wall		18’-0”	Measured from centerline of track	Requires coordination with UPRR
Railroad to parallel roadway		25’-0”	Measured from centerline of track	Requires coordination with UPRR (UPRR may require future track or frontage)

SECTION 1 DESIGN CRITERIA

ROADWAY CATEGORIES

--- **Roadway Category Six, Minor Arterials**
--- **Roadway Category Seven, Collectors**
--- **Roadway Category Eight, Frontage or Service Roads**

Design Element	Desirable Criteria	Min Criteria	Criteria Basis	Comments
Design Vehicle	WB-50	Passenger Car	2001 GB pg 18	See design vehicle in Section 2.6 for further guidelines
Design speed (Rural)	50mph	30 mph	2001 GB pg 385 Exh 5-1	Need to consider terrain, adjacent land use, and functional classification
Design speed (Urban)	50 mph	30 mph	2001 GB pg 385 Exh 5-1	Need to consider terrain, adjacent land use, and functional classification
Lane width	12' Lane / 14' Turn lane	10' (30mph)	2001 GB pg 508	See lanes in Section 2.9 for further guidelines
Shoulder width (Mainline) (Rt)	10' Arterial / 4' Frontage/service road	6' Arterial / 2' Frontage/service road	2001 GB pg 388 & 429 Exh 5-5, 6-5	Widths shown include lateral offset for guardrail/barrier rail
Shoulder width (Mainline) (Lt)	8'	4'	2001 GB pg 509	Widths shown include lateral offset for guardrail/barrier rail
Bridge width	---	Match approach roadway		See design year (bridge projects) in Section 2.7 for other considerations
Horizontal Alignment				
Min radius (Mainline)	605' (normal crown @ 45mph)**	215' (Normal crown at 30mph)	2001 GB pg 197 Exh 3-41	**Values shown are both considered minimum radius 1. It is desirable to super-elevate roadway when possible. See Section. 2.13
Min tangent between curves	---	The sum of superelevation runoff and and runout lengths	2001 GB pg 234	
Vertical Alignment				
Crest vertical curve "K" Value (Mainline)	84 (50mph)	19 (30mph)	2001 GB pg 385 Exh 5-2	See "K-Value" under Alignments in Section 2.3 for additional information
Sag vertical curve "K" Value (Mainline)	96 (50mph)	37 (30mph)	2001 GB pg 385 Exh 5-2	Check against headlight sight distance in Section 2.12
Min length of vertical curve	600'	3X Design speed		
Superelevation				
^{e}max (Method 2)	^{e}max 6%	^{e}max 4%	2001 GB pg 193, 197 Exh 3-41	^{e}max 6% should be considered max super in icy climates
Min. runoff length	Varies with no. of lanes and ^{e}max	---	2001 GB pg 171 Exh 3-25,	
Min. tangent runout	Varies with no. of lanes and ^{e}max	---	2001 GB pg 173 Exh 3-26,	
% of runoff on tangent	67%	67%	2001 GB pg 173-175	1. No runoff /run-out on bridge structures if all possible. 2. Consider extending runoff/run out thru bridge structure if Note 1 is unattainable
Grades				
	Rural Arterial	Urban		
Mountainous	7% max (Design speed of 50mph)	9% max (Design speed of 50mph)	2001 GB pg 476 (Urban) pg 450 (Rural)	Consider truck climbing lanes over 6% grade
Rolling	5% max (Design speed of 50mph)	7% max (Design speed of 50mph)	2001 GB pg 476 (Urban) pg 450 (Rural)	
Level	4% max (Design speed of 50mph)	6% max (Design speed of 50mph)	2001 GB pg 476 (Urban) pg 450 (Rural)	
Curb and gutter facilities	0.5% or greater slope	0.3%	NDOT Policy	
Sight Distance				
Stopping (Mainline)	425' (50mph design speed)	200' (30mph design speed)	2001 GB pg 385 Exh 5-2, 5-13, 6-2	Use adjustment factors for grades Exh 3-2 pg 115
Intersection Sight Distance			2001 GB pg 654- 682	Sight distance based on various cases (see page 658)

2.1 Design Elements.

General. This Section is a supplement to the Green Book and is intended to review important geometric elements that should be checked or considered. This Section also is intended to clarify, expand, and adopt certain geometric design elements used in Roadway Design. These elements are listed in alphabetical order.

2.2 Horizontal Alignments.

General. The horizontal alignments of roadways should be free of curvature in and around intersections, interchanges, railroad crossings, drop lanes, and roadside hazards.

Compound curves. Compound curves should be used with caution. Although compound curves give flexibility to fitting the highway to the terrain and other controls, designers should avoid them whenever possible. When curves with considerably different radii are located too close together, the alignment will not have a pleasing appearance. On compound curves for open highways, the ratio of the larger radius to the smaller radius should not exceed 1.5 to 1. On ramps the ratio of the larger radius to the smaller radius may be increased to a 2 to 1 ratio. However, the use of compound curves on ramps, with a larger curve between two smaller curves should be avoided. **(2001 GB pg 234)**

Curve length. For small central angles, curves should be sufficiently long to avoid the appearance of a "kink" in the highway. The minimum length of horizontal curve on main highways should be 15 times the design speed. On high speed controlled access facilities a desirable minimum length of curve for aesthetic reasons should be 30 times the design speed for flat terrain. **(2001 GB pg 233)**

Reversing curves. Reversing curves should be avoided whenever possible. Severe physical restrictions or other considerations may dictate the use of curves in opposite directions with a short connecting tangent. In such cases, the minimum length of tangent shall be sufficient to provide superelevation transitions for both curves consistent with the design speed.

2.3 Vertical Alignments.

General. Avoid steep down grades on roads where high profile vehicles need to make free movement turns. For example, a roadway that has a design speed of 40mph at a 6% down grade could cause a high profile truck attempting to make a turn onto a cross street or on-ramp to tip over. The 6% down grade acts like a negative super when making the turning movement. Steep down grades should be limited near on-ramps and cross streets to avoid the affects of a negative superelevation.

K-value. K-value is a quick and useful way to verify the minimum lengths of vertical curves for various design speeds. K-value is the distance in feet needed to make a 1% change for the algebraic difference in intersecting grades (K= Length of curve / Algebraic difference in intersecting grades.) The table in **(2001 GB page 274, 276, and 280 Exh 3-75, 3-76, 3-79)** gives the designer the ability to check the design speed against the stopping sight distance for crest and sag vertical curves.

Crest. On flat vertical curves with curbs, a minimum grade of 0.30% should be reached 50' from the crest to satisfy any drainage issues. **(2001 GB pg 275)**

Sag. On flat vertical curves with curbs, a minimum grade of 0.30% should be reached 50' from the low point to satisfy any drainage issues. **(2001 GB pg 279)** Avoid "Roller-coaster" or hidden-dip" type profiles. Such profiles generally occur on relatively straight horizontal alignments where the roadway profile closely follows a rolling natural ground line. Hidden dips may create difficulties for drivers who wish to pass because the driver cannot be sure whether or not there is an oncoming vehicle hidden beyond the rise. See **(2001 GB pg 283)** for general controls on vertical alignments.

Profile-grade location. The profile grade is vertically situated on the final lift of the dense graded paving. On undivided roadways the profile is placed at the crown. On divided highways where the roadways are treated independently of each other, the profile is normally placed between lane 1 and lane 2 (or centerline). Divided highways that are intended to be widened to the median, the profile is located to an imaginary point halfway between the inside edges of the roadway. On ramps the profile is located at the outer edge of pavement. See profile location in Section 7.11 for location of vertical alignment.

Coordinate the location of vertical profile with the Structural Division for new bridges or reconstruction projects.

Grade breaks. Normally a vertical curve is required for all changes in grade. Grade breaks at the beginning or ending of a vertical curve should be avoided. On 3R projects grade breaks may be perpetuated only if the cost of eliminating the grade break is unreasonable. Grade breaks greater than 0.2% should be corrected with a vertical curve unless justified otherwise. These grade breaks may occur where a history of plantmix overlays meets Portland Cement Concrete Paving (P.C.C.P.)

On 3R projects a grade break may be introduced to transition the structural roadbed improvement into the adjoining section of road at the following rates:

- 50 feet per inch where the posted speed limit is 45 mph or less
- 100 feet per inch where the posted speed limit is greater than 45 mph

Vertical clearances. When developing vertical alignments, the clearance requirements for bridges must be considered, for example:

- Accommodating the current and future expansion of the roads
- The constructability of the bridge such as providing additional height for false work
- In urban areas achieving sight distance to the signal system heads
- Providing additional height on single point urban interchanges to accommodate clearance of the signal system when the convergence is designed underneath
- Meeting the requirements of the owner for structures over infrastructure such as railroads

See Section 1.2 for vertical and horizontal distances around bridge structures.

See Section 2.16 for clearances around railroad facilities.

See Section 4.10 for clearances around airport and heliports.

Drainage. Changes to vertical profiles can have significant impacts to the drainage design, e.g., overtopping areas, fill slopes (affecting culvert lengths, roadside ditches, pipe cover, etc.), longitudinal slopes (affecting onsite drainage design), etc. Consult with the Hydraulics Section when modifying vertical profiles throughout the design process.

2.4 Cross Slope.

Normal crown. On tangents, the standard cross slope should be a 2% crown section with the high point located at the center of the roadway. Divided roadways with medians less than 34' for plantmix (36' for P.C.C.P.) should be crowned to an imaginary point halfway between the inside edges of the roadway to accommodate future widening into the median and treated as a single vertical profile. The median width is the dimension between the through-lane edges including the left shoulders, if any. See page 8 for example. Existing facilities may deviate from this design suggestion and does not require an exception.

Divided roadways with medians greater than 34' that are not intended for future widening in the median, should be sloped to drain away from the inside edge of oil at a 2% slope and treated as independent alignments and profiles. See profile grade in Section 7.11 for location of vertical alignment.

Ramps. Ramps should be sloped to drain away from the inner edge of pavement (the edge adjacent to the mainline) at a 2% slope. See profile grade in Section 7.11 for location of vertical alignment.

Bridges. Geometric changes, such as superelevation and width transitions, should not occur within the limits of a bridge structure unless the cost of doing so is justified with the Structural Engineer. Such justification shall include the costs and schedule impacts associated with the design and construction of the bridge.

Drainage. If there are facilities that may impede drainage from the normal crown, e.g., offset median (worm) islands, raised lane separators, etc., coordinate with the Hydraulic Section for any necessary drainage considerations.

2.5 Design Speed.

General. Design speed is a concept by which coordination of the various physical design elements is achieved. Design speed has a significant effect on the operation and safety of a highway because it is used to determine various individual design elements with specific dimensions such as stopping sight distance or horizontal curvature.

Selecting design speed. The Designer selects the design speed based on the type of roadway category, AADT, terrain, and adjacent land use. For roadway category and design speeds see Access Management System and Standards 1999 Edition. For freeways, the design speed should equal or exceed the regulatory speed limit in every case. **(2001 GB pg 448 and 507).**

Coordinate the design speed with the Principal Traffic Operation Engineer and the Safety/Traffic Division on new facilities so the posted speed limit can be signed accordingly. For additional information on selecting a design speed see **NCHRP Report 504**.

It is preferred that the design speed is set 10mph over the anticipated posted speed.

See Section 2.18 concerning design speeds on ramps.

Posted speed. Posted speed limits are not the highest speeds that might be used by drivers. They are usually set to the approximate 85th percentile speed of traffic. **(2001 GB pg 72).** Posted speed is normally 10mph lower than the actual design speed.

Operating speed is the speed at which drivers are observed operating their vehicles. The 85th percentile of the distribution of observed speed is the most frequently used descriptive statistics for the operating speed associated with a particular location or geometric feature. Planning can provide speed studies when requested. See Section 5.12.

Improvements on existing facilities. Since speeds often increase when there is a new pavement widening and when geometric improvements are made, engineering judgment should be exercised in determining the reasonableness and applicability of using an existing off-peak 85th percentile speed that is below the maximum functional class speed.

New facilities. The anticipated operating speed and traffic volumes are frequently used when selecting the design speed. The anticipated off-peak 85th percentile speed may be based on the speeds of facilities with similar classifications, geometry, and traffic characteristics.

Other. No-passing zones should be based on a design speed of 70 MPH on 2-lane rural highways. Any approved modifications to highway preservation projects having criteria based on design speed should use 70 MPH. Coordinate the design speed with the Safety/Traffic Division (striping and signing section) to insure that proper regulatory signs are installed on the facility.

On 3R 2-lane rural highway projects, striping should be based on a pass/ no pass study. See Section 5.12 for requesting passing studies through Roadway Systems.

2.6 Design Vehicle.

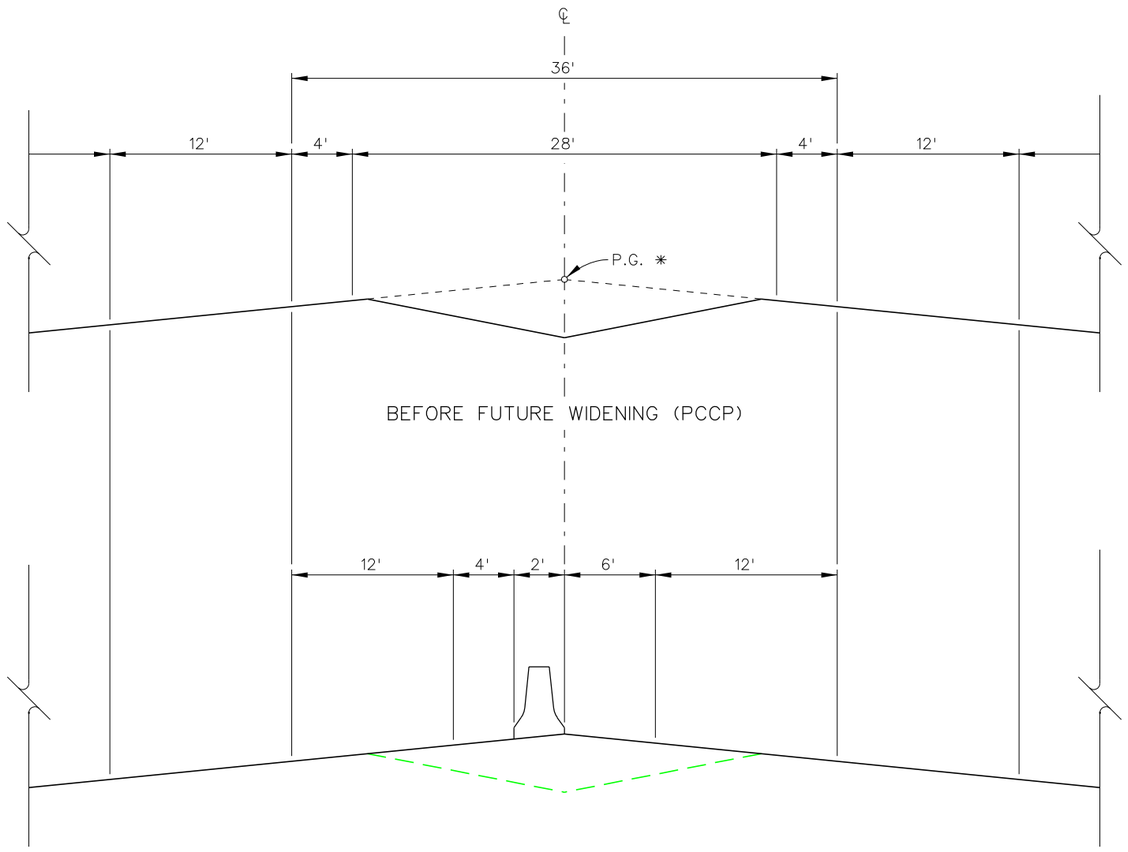
Interstate and NHS. The design vehicle for interstate and NHS routes is WB-65. The design vehicles for other routes need to be evaluated on a project basis by the Designer.

Turn templates. Select the appropriate design vehicle for the facility and run turning templates using "Auto-Turn" at all intersections to check for off-tracking around island noses, curb returns, and tight ramp configurations.

Permitted facilities. The physical design vehicle for all facilities intended for use by motor vehicles shall be all such vehicles allowed by law including tractor-trailer combinations operating under annual or trip permits issued by the department; the department's website lists the current dimensions for these tractor-trailer combinations. See Over-dimensional Permits for more information.

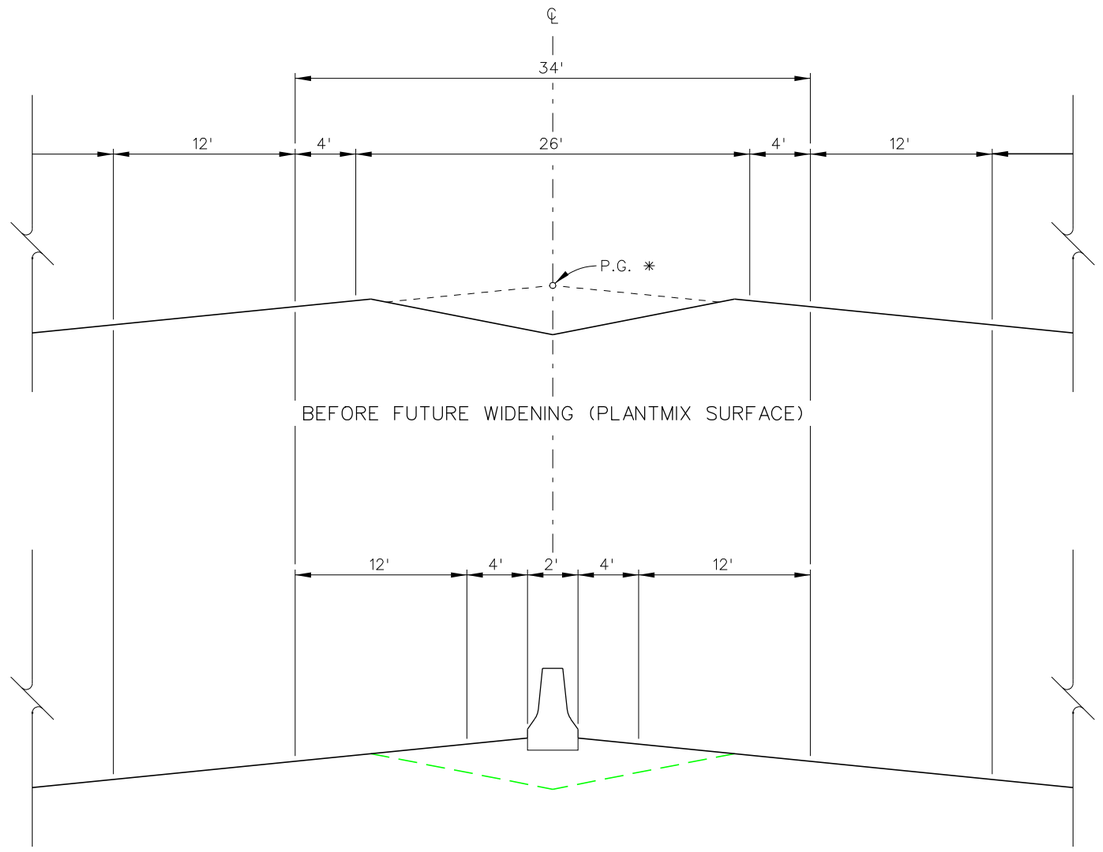
During temporary traffic control operations, the minimum distance between solid objects, such as barrier rail or guardrail is 14'. If it becomes necessary to reduce the lane plus the available shoulder to less than 14' from face of a solid object, then Over Dimensional Permits needs to be contacted.

CONSIDERATION FOR FUTURE MEDIAN WIDENING



BEFORE FUTURE WIDENING (PCCP)

AFTER FUTURE WIDENING (PCCP)



BEFORE FUTURE WIDENING (PLANTMIX SURFACE)

AFTER FUTURE WIDENING (PLANTMIX SURFACE)

* – PROFILE GRADE IS PROJECTED FROM DENSE GRADED SURFACE.

2.7 Design Year.

General. The design year starts from the time when a highway project is open to traffic. Highway and bridge design should be based on traffic volumes that are expected to occur within the expected service life of the project. Traffic forecast design years provide necessary information so that the designer can evaluate alternatives to address traffic and congestion issues. The selected design year is intended to cover the time period necessary to evaluate functionality over the expected service life of the project. This information is requested from the Principal Traffic Operation Engineer.

Design year traffic forecast volumes are necessary to:

- Determine the appropriate scope of improvements (e.g., adding a turn lane vs. not doing so) and associated geometric design criteria.
- Determine how well the project meets objectives for capacity, delay, and mainline or intersection level of service (LOS). LOS is determined by means of capacity analysis, which requires the design year traffic volumes. **(2001 GB pg 84-85)**
- Evaluate project work types on a consistent statewide basis.
- Determine the number of lanes to remain open during construction.
- Allow for informed decision making on project alternatives and trade-offs.

It may not always be practical to construct projects that fully accommodate design year traffic, or even to fully address existing traffic congestion. Engineering judgment and consideration of all relevant factors provides the flexibility in determining to what extent design year traffic can be accommodated. Traffic forecasts alone do not dictate project scope. Forecasts are only one of many factors (safety needs, mobility needs, environmental issues, community needs, etc.) to be addressed.

Capacity projects. New capacity projects are usually designed with a service life to meet the 20 year traffic forecast model.

Bridge projects. New bridge projects are usually designed with a service life to meet the 30 year traffic forecast model. Provide adequate bridge width for intersection approach lane widening, either in the scope of the bridge work or design the bridge to facilitate future widening.

Design designation. Traffic information such as current and future volume, speed, and directional split is shown on the title sheet for new construction and capacity projects. See Section 7.6 for additional information.

2.8 Intersection Design.

Angle. Intersecting streets should meet at approximately a 90 degree angle. Intersection legs that operate under stop control should intersect at right angles wherever practical, and should not intersect at an angle less than 60 degrees. See Section 2.12 for intersection sight distance.

Grades. The intersection and approach areas where vehicles are stored while waiting to enter the intersection should be designed with a relatively flat grade; the maximum grade should not exceed 5% where practical. Where ice and snow may create poor driving conditions, the desirable grade on the approach leg should be 0.5% with no more that 2% wherever practical. Intersections should not be located just beyond a short crest vertical curve or sharp horizontal curve.

Grading. If it is impractical to match the elevation of an intersecting road, the crossroad should be reconstructed for a suitable distance using adequate vertical geometry to make the grade adjustment. In general, a 2% maximum tangent grade break is allowed at the edges of signalized intersections to allow vehicles on the crossroads to pass through an intersection on a green signal. For un-signalized or stop condition intersections, a maximum tangent grade break of 4% may be employed.

Design vehicle path. The minimum edge of traveled way designs requires the use of simple curves with tapers or 3-centered curves for larger design vehicles. Use the appropriate edge design for the selected design vehicle so it does not encroach into oncoming lanes. **(2001 GB pg 598- 612 Exh 9-21 thru 9-28)**

Other. Intersections on sharp horizontal curves should be avoided wherever practical because the superelevation and widening of pavements on curves complicate the intersection design and may reduce sight distance. **(2001 GB pg 584 Exh 9-18)**

Type. For various types of intersection designs see **(2001 GB pg 562-580).**

2.9 Lanes.

Width. All traffic lanes intended for use by motor vehicles shall be 12’ wide with an additional 2’ added when the lane is directly adjacent to a curb or other physical feature.

In order to make bicycle travel safer on urban streets, the Department has agreed to stripe State owned and maintained roadways within Clark County using a striping standard established by the Clark County RTC as a guideline. The intent is to provide a shared outside travel lane of 14’ for bicyclists by reducing our standard 12’ travel lanes to 11’. Any lane next to a median barrier or curb will be a minimum 12’ wide with a desirable width of 13’. On preservation projects it will not always be possible to provide the desired lane configuration and judgment will have to be used to determine an acceptable compromise between lane widths and the desire to provide a 14’ outside travel lane. The Chief Road Design Engineer should review the compromise.

On reconstruction projects or new roadway projects, it is desirable to use a 15’ outside travel lane width while maintaining 12’ travel lanes. If this will cause the need for new right-of-way or significantly increase the size of takes, then the RTC standard may be used as described in the paragraph above. If Federal funds are involved then any planned bicycle facility must be accommodated.

Accel-decel lanes. Refer to the Access Management System and Standards 1999 Edition.

Auxiliary lanes. Auxiliary lanes are defined as the portion of the roadway adjoining the traveled way for speed change, turning, storage for turning, weaving, truck climbing, and other purposes supplementary to through traffic movements. The width of an auxiliary lane should be equal to the through lanes (12’ preferred). An auxiliary lane may be provided to comply with the concept of lane balance, to comply with capacity needs, or to accommodate speed changes, weaving and maneuvering of entering and leaving traffic.

Where auxiliary lanes are provided along freeway main lanes, the adjacent shoulder should be 8’-12’ in width; the preferred width of 12’ should be considered unless otherwise justified. **(2001 GB pg 818)**

2.9 Lanes (Continued).

Lane balance. To provide efficient traffic operation through and beyond an interchange, there should be a balance in the number of lanes on the freeway and ramps. The basic number of lanes should be established for a substantial length of freeway and should not be changed through pairs of interchanges; variations in traffic demand should be accommodated by means of auxiliary lanes where needed.

At a freeway entrance, the number of lanes beyond the entrance should not be less than the sum of the merging roadway lanes and the freeway minus one, but may be equal to the sum of all traffic lanes on the merging roadway. At a freeway exit, the number of approach lanes before the exit should be equal to the number of the lanes on the freeway beyond the exit, plus the number of lanes on the exit, minus one.

Exceptions to these principles occur at cloverleaf loop ramp exits that follow a loop-ramp entrance and at exits between closely spaced interchanges. The traveled way on the freeway should not be reduced by more than one traffic lane at a time. Examples of proper lane balance can be seen in **(2001 GB pg 816 Exh 10-49).**

Lane tapers. Refer to the Access Management System and Standards 1999 Edition for lane tapers. Use green book lane tapers when Access Management Standards cannot be achieved.

2.10 Medians.

General. A median is defined as the portion of a divided highway separating the traveled way for traffic in opposing directions. **(2001 GB pg 341)** The principle functions of a median are to provide separation from opposing traffic, provide a recovery area for out of control vehicles, provide a stopping area in case of emergencies, provide for special changes and storage of left turning and U-turning vehicles, minimize headlight glare, and to provide width for future travel lanes. Medians are highly desirable on arterials carrying four or more lanes.

Width. The median width is the dimension between the through-lane edges including the left shoulders, if any. The minimum width for interstates and freeways in rural areas is 36’ and 10’ in urban areas. For 3R projects, these widths should be evaluated based on crash information and considered for longitudinal protection such as guardrail, barrier rail, or cable rail. See page 8 for median design considerations.

Slopes. A depressed median is generally preferred on freeways for more efficient drainage and snow removal. Median slopes should preferably be 6H:1V, but slopes of 4H:1V may be adequate when constrained. Drainage inlets in the median should be designed with the top of the inlet flush with the ground and cross culverts extended beyond clear zone. See Section 3.13 for use of culvert safety end sections.

Median openings. Minimum spacing of median crossings used on individual projects is the length of need for weaving maneuvers and safe signing analyzed based on the design-year capacity. Arterials and collectors shall be further analyzed to ensure adequate turning movements and signal progressions are achieved. General guidelines for spacing of median openings refer to the Access Management System and Standards 1999 Edition.

Emergency cross-overs. When requested by NDOT Maintenance, the Nevada Highway Patrol, or other agencies, the NDOT may, with adequate justification, provide emergency crossovers on rural freeways at an average spacing of not less than 2 miles where interchange spacing is 4 miles or greater. The actual spacing shall be adjusted to avoid curves and other locations with inadequate geometrics for this type of maneuver. Delineation and markings for emergency crossovers will be in accordance with the Standard Plans. Signing, if any, will be as directed by the Traffic/Safety Division.

Raised median islands. Raised medians have application on arterial streets where it is desirable to regulate left turn movements. See Section 3.11 for selecting curb type.

Elongated or divisional islands should not be less than 4’ wide and 20’ to 25’ long. In special cases where space is limited, elongated islands may be reduced to a minimum width of 2’.

The approach nose of a curbed island should be conspicuous to approaching drivers and should be clear of vehicle paths, physically and visually, so drivers will not shy away from the island. The offset from the travel lane to the approach nose should be greater than that to the face of the curbed island, normally about 2’. For curbed median islands, the face of curb at the approach island nose should be offset at least 2’ and preferably 3’ from normal median edge of the traveled way. The island should then be gradually widened to its full width.

Where a curbed corner island is proposed on an approach roadway with shoulders, the face of curb on the corner island should be offset by an amount equal to the shoulder width. If the corner island is preceded by a right turn deceleration lane, the shoulder offset should be at least 8’. **(2001 GB pg 634-637 Exh 9-37 thru 9-40)**

Island shapes and types. It is important to consider the appropriated shape of a median end; run turning templates to ensure they work for the design vehicle and intersection skew angle **(2001 GB pg 701)**. There are 4 ways to develop left turn lanes. The preferred method is symmetrical reversing curves for most intersections **(2001 GB pg 721 Exh 9-95).**

The smallest curbed corner island normally should have an area of approximately 50 sqft for urban and 75 sqft for rural intersections. However a minimum of 100 sqft is preferable for both. Accordingly, corner triangular islands should not be less than 12’, and preferably 15’, on a side after the rounding of corners. **(2001 GB pg 631)**

2.11 Shoulders.

Interstate. The adopted criteria for Interstates specify that the paved width of the right shoulder shall not be less than 10’. Where truck traffic exceeds 250 DDHV (the design hourly volume for one direction) a 12’ right shoulder should be considered. On freeways with six or more lanes the usable paved width of the median shoulder should also be 10’ and preferably 12’ where the DDHV for truck traffic exceeds 250 veh./h. On freeways with a four-lane section, the paved width of the left shoulder shall be at least 4’. **(2001 GB pg 509)**

Ramps. On 3R projects, substandard ramp widths should be addressed during the Preliminary Design Field Study (PDFS) where it is economically feasible to widen them to meet current standards. The desirable single lane ramp width is 24’ (Striped 4’-12’-8’). See Section 1.2 for shoulder width criteria.

Drainage. Consult with the Hydraulic Section if shoulder widths next to barrier rail or curb and gutter are proposed to be reduced as this may affect onsite drainage design criteria.

2.12 Sight Distance.

Stopping sight distance. Stopping sight distance is the minimum sight distance to be provided at all points on multi-lane highways and on two-lane roads. Stopping sight distance also is to be provided for all elements of interchanges and intersections at grade, including driveways. The minimum stopping sight distance is the distance required by the driver of a vehicle, traveling at a given speed, to bring the vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eyes, which is 3.5’ above the pavement surface, to an object 2’ high on the road. Stopping sight distance design values can be obtained from **(2001 GB pg 112 Exh 3-1).** Increases in the stopping sight distances on downgrades are indicated in **(2001 GB pg 115 Exh 3-2).**

Stopping sight distance on horizontal curves. Where an object off the pavement such as a longitudinal barrier, bridge pier, bridge rail, sound wall, building, cut slope, or natural growth restricts sight distance, the minimum radius of curvature is determined by the stopping sight distance. Stopping sight distance for passenger vehicles on horizontal curves is obtained from **(2001 GB pg 230 Exh 3-57).** For sight distance calculations, the driver's eyes are 3.5’ above the center of the inside lane (inside with respect to curve) and the object is 2’ high. The line of sight is assumed to intercept the view obstruction at the midpoint of the sight line and 2.75’ above the center of the inside lane. Of course, the midpoint elevation will be higher or lower than 2.75’, if it is located on a sag or crest vertical curve respectively. The clear distance (M) is measured from the center of the inside lane to the obstruction. The general problem is to determine the clear distance from the centerline of inside lane to a median barrier, retaining wall, bridge pier, abutment, cut slope, or other obstruction for a given design speed. Using radius of curvature and sight distance for the design speed the middle ordinate (M) which is the clear distance from centerline of inside lane to the obstruction can be calculated **(2001 GB pg 230 Exh 3-57).** When the design speed and the clear distance to a fixed obstruction are known, this figure also gives the required minimum radius which satisfies these conditions.

When the required stopping sight distance is not available because of an obstruction such as a railing or a longitudinal barrier, the following alternatives shall be considered: increase the offset to the obstruction, increase the horizontal radius, use lower height barrier rail, or do a combination of both. However, any alternative selected should not require the width of the shoulder on the inside of the curve to exceed 12’, because the potential exists that motorists will use the shoulder in excess of that width as a passing or travel lane.

When determining the required middle ordinate (M) distance on ramps, the location of the driver's eye is assumed to be positioned 6’ from the inside edge of pavement on horizontal curves. The designer is cautioned in using the values from **(2001 GB pg 230 Exh 3-57)** since the stopping sight distances and middle ordinates are based upon passenger vehicles. The average driver's eye height in large trucks is approximately 120 percent higher than a driver's eye height in a passenger vehicle. However, the required minimum stopping sight distance can be as much as 50 percent greater than the distance required for passenger vehicles.

Stopping sight distance at under crossings. On routes with high percentages (10 percent or more) of truck traffic, the designer should consider providing greater horizontal clearances to vertical sight obstructions to accommodate the greater stopping distances required by large trucks. **(2001 GB pg 281 Exh 3-80)**

Headlight sight distance. For sag vertical curves, formal design exceptions are required for curves that meet the comfort criteria but not the headlight criteria, unless lighting is provided.

Passing sight distance. Passing sight distance is the minimum sight distance that must be available to enable the driver of one vehicle to pass another vehicle, safely and comfortably, without interfering with the speed of an oncoming vehicle traveling at the design speed, should it come into view after the overtaking maneuver is started. The sight distance available for passing at any place is the longest distance at which a driver whose eyes are 3.5’ above the pavement surface can see the top of an object 3.5’ high on the road. Passing sight distance is considered only on two-lane roads. At critical locations, a stretch of four-lane construction with stopping sight distance is sometimes more economical than two lanes with passing sight distance. **(2001 GB pg 118-130)** Adjustment factor for grades is not available, exercise judgment for adjusting distances.

See Section 5.12 for obtaining passing sight distance studies from Planning.

Intersection sight distance. Uncontrolled intersection designs should provide sufficient sight distances to avoid potential conflicts between vehicles turning onto or crossing a highway from a stopped position and vehicles on the through highway operating at the design speed. Specified areas along intersection approach legs and across their included corners should be clear of obstructions that might block a driver’s view of potentially conflicting vehicles. These specified areas are known as clear sight triangles specifically they are approach and departure sight triangles as depicted in **(2001 GB pg 656 Exh 9-50).** These sight triangles are determined by using the sight distance along the major and minor roads. The resulting sight triangles should be clear of obstructions.

Traffic barriers. The heights of longitudinal traffic barriers relative to the standard driver eye height of 42” requires that some consideration be given to sight distance when locating traffic barriers near intersections. This is especially true when the vertical alignments of the roadways exacerbate the affect of the traffic barriers in the lines of sight.

Left turn from minor road. Left turns from a minor road to a major road with a stop condition should provide departure sight distance for traffic approaching from the right or left. Approach sight distance is not needed in a stop condition on the minor road. The length of sight triangle along the minor road **(distance a in Exh 9-50B)** is 14.4’ plus ½ lane width approaching from the left or 1 ½ lane width from the approaching right. The length of the sight triangle along the major road is **(distance b in Exh 9-50B)** is determined by **(2001 GB pg 664-65 Exh 9-57/58).**

Left turns from a minor road to a major road with a yield condition should provide approach sight distance for traffic approaching from the right or left. Departure sight distance need not be checked as it is less than approach sight distance. The length of sight triangle along the minor road **(distance a in Exh 9-50A)** is 82’. The length of the sight triangle along the major road **(distance b in Exh 9-50A)** is determined by **(2001 GB pg 676 Exh 9-64).**

Right turn from minor road. Right turns from a minor road to a major road with a stop condition should provide departure sight distance for traffic approaching from the left. Approach sight distance is not needed in a stop condition on the minor road. The length of sight triangle along the minor road **(distance a in Exh 9-50B**) is 14.4’ plus 1 ½ lane width. The length of the sight triangle along the major road **(distance b in Exh 9-50B)** is determined by **(2001 GB pg 668 Exh 9-57/58).**

Right turns from a minor road to a major road with a yield condition should provide approach sight distance for traffic approaching from the left. The length of sight triangle along the minor road **(distance A in Exh 9-50A)** is 82’ The length of the sight triangle along the major road is **(distance B in Exh 9-50A)** is determined by **(2001 GB pg 676 Exh 9-64).**

2.12 Sight Distance (Continued).

Crossing maneuver from minor road. In most cases, the departure sight triangles for left and right turns onto the major road will provide adequate sight distance to cross the major road. However, if the major road is six lanes or wider, right or left turns are not permitted, or when a large amount of truck traffic in conjunction with steep grades the designer should verify the amount of sight distance available. **(2001 GB pg 667).**

Decision sight distance. Drivers need decision sight distances whenever roadway features have a distinct probability to cause driver error. Examples of locations that are likely to cause driver error are interchange and intersection locations where unusual or unexpected maneuvers are required, changes in roadway cross section such as toll plazas and lane drops, and areas with excessive sources of visual information such as traffic and advertising signs. It may not be feasible to provide decision sight distance because of horizontal or vertical curvature, thus the designer should look to provide advance warning of the critical location that may be encountered. Decision sight distances vary depending the location is on a rural or urban road and the type of avoidance maneuver required to negotiate the location properly. **(2001 GB pg 116)**

2.13 Superelevation Distribution.

General. NDOT has adopted super elevating roadways using Method Five for all high speed facilities (50mph or greater). Method Two is used in low speed facilities (45mph or less) which are typically urban streets. Use of other superelevation criteria requires approval of the Principal Design engineer. Desirably, the design should be based on an emax of 8% for all high-speed roads and an emax of 4% for urban conditions. In snow and ice prone locations, the cross slope should be limited to 6%. Provide adequate tangent lengths between reversing curves to accommodate superelevation transitions for full run-off and run-out between the curves. **(2001 GB pg 138-140)**

The superelevation rates for Method 5 can be found in **(2001 GB pg 157-165)** while those for method 2 are found in **(2001 GB pg 195-197).**

Local roads and city streets. Lower design speeds with larger radii may utilize a normal crown section instead of superelevating the roadway. **(2001 GB pg 168 Exh 3-26 and 201 Exh 3-43).**

Run-out transition. The tangent run-out section consists of the length of roadway needed to accomplish a change in outside-lane cross slope from the normal cross slope rate to zero (flat), or vice versa.**(2001 GB pg 185).**

Run-off transition. The superelevation run-off section consists of the length of roadway needed to accomplish a change in outside-lane cross slope from zero (flat) to full superelevation, or vice versa. **(2001 GB pg 185).** Minimum superelevation runoff and tangent runout lengths can be found in **(2001 GB pg 174 Exh 3-29)** Runoff locations are adjusted for the number of lanes rotated can be found in **(2001 GB pg 175 Exh 3-30).**

Number of lanes rotated. Auxiliary lanes are not to be considered as additional lanes to be rotated. Additionally, shoulder widths are generally not considered as additional lanes to rotate. **(2001 GB pg 175)**

Drainage. Check for drainage problems in vertical sag or crest curves that contain superelevation transitions. The location of the superelevation transition may cause a flat roadway cross slope (0% cross slope) at the bottom of a vertical sag curve or top of a crest curve. This can be corrected by moving the vertical sag out of the superelevation transitions. See **(2001 GB page 190, 279)** for additional guidance. Vertical grades or cross slopes less then 0.50% may cause drainage problems. For reverse superelevations on large, multi-lane facilities, short transitions are preferred for drainage, to minimize the areas with flat transverse slopes. The larger, flatter areas do not drain quickly, resulting in a potential increase for hydroplaning.

Ramps. Direct and semi-direct ramps generally are designed with a high speed exit and a high speed entrance and are designed with Method Five. For ramps designed for speeds of 45 mph or less Method Two can be used for the ramp proper. Loop ramps with a design speed less than 45mph use **(2001 GB pg 201 Exh 3-43)** for superelevation. Superelevation development at ramp entrance and exit terminals is shown in **(2001 GB pg 647-652).**

2.14 Axis of Rotation.

Undivided highways. For undivided highways, the axis of rotation for superelevation is usually the centerline of the traveled way. However, in special cases where curves are proceeded by long, relatively level tangents, the plane of superelevation may be rotated about the inside edge of the pavement to improve perception of the curve. In flat terrain, drainage pockets caused by superelevation may be avoided by changing the axis of rotation from the centerline to the inside edge of the pavement.

Divided highways. If future widening is to the inside median, then rotate dual roadbeds in a single plane about centerline. When considering facilities for future widening to the outside shoulder, roadbeds should be rotated independently to reduce earthwork, and to reduce the length of the superelevation transitions. For example, the longer superelevation transitions can have an adverse impact to closely spaced ramps. See **(2001 GB pg 184)** for the four methods of rotation.

Divided highways with medians less than 34’ should be super elevated around an imaginary point halfway between the inside edges of the roadway to accommodate future widening into the median. Where the ultimate median width is greater than 34’, the axis of rotation should be at the proposed median edges of pavement. See page 8 in this Section for example.

Ramps and freeway to freeway connections. The axis of rotation for ramps is usually along the outer edge of pavement. The axis of rotation for Multi-lane ramps and direct connects is usually at centerline and considered one lane for number of lanes rotated. Appearance and drainage considerations should always be taken into account in selection of the axis rotation.

2.15 Traffic Volumes.

Number of lanes. Coordinate with the Principal Traffic Operation Engineer concerning traffic volumes and number of lanes, length of turn lanes, storage lanes, etc.

2.16 Railroad Crossings.

General. All permanent structures over railroads require a minimum horizontal clearance of 12’ on one side and a minimum of 18’ on the other to provide for maintenance road access; space for the future addition of another track may also be required by the owner that would add 27’ to either side. Their desirable clearance to provide for maintenance road access is 23’. Temporary construction will require a minimum of 6.5’ horizontal clearance on tangent sections and a minimum of 9.5’ for all curved sections. For additional information see Guidelines for Railroad Grade Separation Projects.

2.17 Raised Features.

General. Concrete curbs, gutters, and dikes should only be used when justified for drainage, controlling traffic movements and replacement of existing infrastructure. Raised islands will be provided only in those instances where a need to control access is warranted.

The main purpose of shoulder dike is to confine drainage only where necessary to protect side slopes susceptible to erosion. Whenever possible, roadway drainage should be permitted to flow over the side of the fill as sheet flow to avoid concentrations points and the use of embankment protectors.

Curb height considerations. The standard height of dikes shall be 3" as this is suitable in most locations. For mountainous roadways with steep fill slopes a 4" dike may be used with the approval of the Chief Hydraulic Engineer. A 6" dike may be placed at site-specific locations where its use can be justified for both hydraulic and erosion control purposes; approval must be obtained from the Chief Hydraulic Engineer first and then the Chief Road Design Engineer.

Curbs 6" or less in height may be used along non-freeway urban arterials in areas where the posted speed limit is 45 mph or less. In areas where snow removal operations are expected, the use of mountable concrete curb designs are preferred over vertical (barrier) designs. The mountable designs have proven to be less susceptible to damage from scraping by the snow plow blades thereby resulting in longer lasting curbs.

Curb and barrier placement. Curbs installed in front of guardrail may cause vehicles to vault over the guardrail for some departure angles. Raised longitudinal features are not allowed within the end treatment area for any longitudinal traffic barrier. For operating speeds up to 50 mph, 1:1 slope faced curbs that are 6" or shorter can be used with a lateral offset of 0.0' (installed flush with the face of the guardrail.) **(NCHRP Report 537)** Guardrail installed behind curbs that are beyond the lateral offset of 0.0' (not flush with the face of the guardrail) should not be located closer than the following:

Operating Speed	Minimum Offset	Allowable Curb height
45 MPH or less	8'	6" or less with 1:1 sloping face
45 MPH to 55 MPH	12'	4" or less with 1:1 sloping face
55 MPH or greater	Not allowed	

The minimum offset shown above allows the suspension and bumper to return to their normal position after traversing over the curb allowing impacts with the barrier to proceed successfully.

2.18 Ramps.

Design speed. Ramp design speeds should approximate the low-volume running speed on the intersecting highways. This design is not always practical to provide design speeds on ramps that are comparable to those on the through roadways. On cloverleaf interchanges, the outer connections should desirably be designed for 35 mph. The minimum recommended ramp design speeds for various ramp configurations are as follows: Loop ramps, 25 mph; semi-direct, 30 mph; and direct connections, 40 mph. **(2001 GB pg 829-830, Exh 10-56).** The designer should make provisions to provide for design speeds in the upper range whenever possible.

Entrance ramps. Geometrics should be such that the vehicular speed is within 5 mph of the freeway speed and is obtained within the ramp before convergence. For consistency, the point of convergence is where the right edge of the ramp traveled way is 12' from the right edge of the through lane of the freeway. **(2001 GB page 850)** The minimum acceleration length for entrance terminals is indicated in **(2001 GB pg 851-852, Exh 10-70, 10-71.)** A parallel type design is preferred over a taper type **(2001 GB pg 821 & 853).**

Exit ramps. Taper design fits the direct path preferred by most drivers. **(2001 GB pg 853)** Use a parallel design when deceleration is needed before the ramp or additional storage length is needed. **(2001 GB pg 856)**

Future widths/lengths. When designing ramp/crossroad intersections that may ultimately be controlled by signals, consideration should be given to providing enough room to allow two lanes for the left turn from the ramp to the crossroad. If the 20-year traffic does not require two lanes, and the additional right of way needed would appear to be cost prohibitive, then the additional right of way would not be warranted. When additional right of way is not warranted, retaining walls are an option but will have to wait until the dual lanes are actually warranted by traffic in the future. For ramps at interchanges, consider designing them longer than required for an interim condition, such that it minimizes the impact when the ultimate section is constructed.

Accel lengths. For parallel design, length is measured from the point where the ramp joins the freeway (physical gore). In the taper design acceleration is accomplished on the ramp upstream of the convergence point **(2001 GB pg 850)**

Sight distance. Sight distance along a ramp should be at least as great as the design stopping sight distance. The sight distance on a freeway preceding the approach nose of an existing ramp should exceed the minimum stopping sight distance for the through traffic design speed, desirably by 25 percent or more. Decision sight distance is desirable where feasible. **(2001 GB pg 832)**

Tapers. See Section 1.2 for length and types of ramp tapers.

Loop ramps. The upper range values of design speed generally are not attainable on loop ramps. Ramp design speeds above 30 mph for loops involve large areas, rarely available in urban areas. Long loops, which are costly and left turning drivers to travel a considerable extra distance, therefore minimum values usually control. Highway speeds more than 50 mph, the loop design speed should not be less than 25 mph (150' Radius.) **(2001 GB pg 829)**

Terminal Spacing. When ramp terminals are placed in close succession proper weaving length should be provided, check **(2001 GB pg 848 Exh 10-68)** for the minimum terminal spacing. Also avoid placing exits on crest vertical curves.

Grade and profile design. Adequate sight distance is more important than a specific gradient control and should be favored in design. Usually, these two controls are compatible. With proper ramp terminal facilities, one-way ramps with short upgrades of 7 to 8% permit safe operation without unduly slowing down passenger cars. Short upgrades (less than 2000') as much as 5% do not usually interfere with truck and bus operation. On one-way down ramps, gradients up to 8% do not cause hazard due to excessive acceleration.

2.18 Ramps (Continued).

The length of vertical curve for ramps that extend onto the freeway should preferably be designed with mainline design speeds. Limit downgrades to 4% on ramps with sharp horizontal curvature and heavy truck traffic.

It is desirable that ascending gradients on ramps with a design speed of 45 to 50 mph be limited to 3 to 5%; 35 to 40 mph limited to 4 to 6%; and those for 25 to 30 mph limited to 5 to 7%. Where topographic conditions exist, grades with steeper ascending gradients mentioned above may be 2% greater. **(2001 GB pg 833)**

In areas of snow and ice, it is desirable to limit gradients near the ramp terminals to 2% where vehicles would normally stop.

Gores. The term gore refers to the area between a through roadway and an exit ramp, and may also be used to refer to the similar area between a through roadway and a converging entrance ramp. The physical gore nose should be paved up to a point between 4' to 8' in width. The neutral area refers to the triangular area between the painted nose (where the ramp shoulder and mainline shoulder lines meet) to the gore nose. The neutral area should be free of obstructions to provide a clear recovery area. The unpaved area beyond the physical nose to the gore nose **(2001 GB pg 837, Exh. 10-59)** should be graded as nearly as level to prevent overturning and abrupt stops. For striping the gore areas, refer to the 2009 Manual on Uniform Traffic Control Devices.

In special situations, gore areas may require grading details when the mainline cross slope does not cross the gore area at a constant slope.

Mainline rollover to ramp. Check cross-slope for maximum allowable rollover for entrance or exit ramps. **(2001 GB pg 652 Exh 9-49)** For example, when the freeway mainline cross-slope is 2% and the merging on-ramp is an 8% superelevation, this is an algebraic difference of 6%, which exceeds the maximum allowable rollover slope of 5%. Some superelevation is introduced at the nose gore, either by a single crown line centering on the nose or by a double break in the cross slope over the pavement wedge in front of the nose gore. Most of the superelevation should be gained beyond the nose. **(2001 GB pg 650 Exh 9-47)**

2.19 Reports and Publications.

General. The following is a listing of Publications for additional information regarding specific design standards adopted by NDOT:

AASHTO Publications

- 2001 Policy on Geometric Design of Highways and Streets
- 2005 Policy on Design Standards Interstate System
- 2006 Roadside Design Guide
- 1999 Guide for the Development of Bicycle Facilities
- 2004 Guide for the Planning, Design and Operation of Pedestrian Facilities

Federal Highway Administration (FHWA) Standards

- Federal-Aid Policy Guide
- 2009 Manual on Uniform Traffic Control Devices (MUTCD)
- Traffic Control Devices Handbook
- Standard Highway Signs

NDOT Publications

- 2006 NDOT Drainage Manual
- 1999 Access Management System and Standards
- 2010 Standard Plans for Road and Bridge Construction
- 2001 Standard Specifications for Road and Bridge Construction
- 2006 Standard Highway Signs, Nevada Supplement
- 2008 Nevada Work Zone Safety & Mobility Implementation Guide

2.20 Roadside Design

Clear zone. The clear roadside concept provides drivers a traversable area off the traveled way clear of obstructions and obstacles. This area is called the clear zone which is determined by speed, design AADT, and slopes of the traveled way **(2006 RDG pg3-6, table 3.1)**. However, table 3.1 only provides a general approximation of the needed clear zone distance. The designer must keep in mind site specific conditions, design speeds, rural versus urban locations, and practicality. Extrapolating clear zone data for higher design speeds not shown in table 3.1 will not be considered by NDOT.

In urban areas the back of sidewalk may be considered as the clear zone.

The designer may choose to modify the clear zone distance for horizontal curvature by using table 3.1 with table 3.2. **(2006 RDG pg 3-7, table 3.2)** These modifications are normally considered only when crash histories indicate a need, or a specific site investigation shows a crash potential that could be significantly lessened by increasing the clear zone width, and when such increases are cost effective.

Preferred channels. The preferred foreslopes and backslopes for basic ditch configurations are calculated by using tables from the **(2006 RDG pg 3-11 & 12, table 3.6 & 3.7).**

Side slopes. Side slopes are the cut and fill configurations that extend from the edge of the roadway to original ground. The Department determines desirable side slope limits for roadways based on the function and utilization of the facility in Table 2.20 on pg 15.

Flattening fill slopes to eliminate the need for guardrail shall be evaluated. Where possible the slopes should be flattened when the cost of flattening is less than the cost of the guardrail construction and associated maintenance for a 20 year design life.

2.20 Roadside Design (Continued).

The fore slope ratio should remain constant and uniform throughout a cut section except where variable slopes are needed to meet ditch grade elevations established by the hydraulic engineer. When the cut section is to be excavated for additional material or if for any other reason a flat bottom ditch is needed, the bottom should be graded to drain away from the roadbed at a 20:1 slope.

Changes in slope ratio should be transitioned a minimum distance along the edge of the road of 50' for every unit change in ratio. For example, a 200' or greater transition length would be required when changing from a 2:1 fill slope to a 6:1 fill slope.

Using a "barn roof" type roadside slope configuration to achieve clear zone (a recoverable slope out to the clear zone then a critical slope beyond) should be evaluated on a case by case scenario when right of way is a constraint. Written approval from the Principal Road Design Engineer is required for use of barn roof fill slope designs. The use of benched back slopes requires the approval of the Chief Road Design Engineer in consideration of the right-of-way, geotechnical, hydraulics and aesthetic impacts. Access to benches should be provided for maintenance.

When contemplating constructing 4:1 fore slopes the designer should consider using flatter slopes if all possible. This is because additional shouldering material on future overlays will potentially render a portion of a 4:1 slope non-recoverable (3:1) thereby reducing the applied clear zone. This can result in objects that were originally beyond the clear zone becoming situated in the clear zone.

2.21 Weaving Sections.

General. Weaving sections occur where one-way traffic streams cross by merging and diverging maneuvers. Principle types of weaving sections are illustrated in **(2001 GB pg 87, Exhibit 2-34).**

Length. The weaving section should have a length and number of lanes based on the appropriate level of service, as given in **(2001 GB pg 85, Exhibit 2-32).** The Highway Capacity Manual (HCM) presents an equation for predicting the average running speed of weaving and non-weaving traffic based on roadway and traffic conditions. Level of service criteria for weaving section are based on the average running speeds. The Designer coordinates weaving sections with the Principal Traffic Operation Engineer.

Ramps. The weaving section between ramps is shown in **(2001 GB pg 848, Exhibit 10-68).**

TABLE 2.20 Roadside Slope Design Guide

Functional Class	Parameters	Cut Slopes				Fill Slopes	
		Height (Feet)	Fore Slope		Back Slope	Height (Feet)	Slope Ratio
			Max.	Des.			
Freeways	All	0 to 4	6:1	10:1	6:1	0 to 5	10:1
		4 to 15	6:1	10:1	4:1	5 to 10	7:1
		Over 15	6:1	10:1	2:1	10 to 15	5:1
						Over 15	2:1
Principal Arterials	All	0 to 4	6:1	10:1	6:1	0 to 5	10:1
		4 to 15	6:1	10:1	4:1	5 to 10	7:1
		Over 15	6:1	10:1	1½:1*	10 to 15	5:1
						Over 15	2:1*
Minor Arterials and Collectors	Over 750 ADT	0 to 4	6:1	10:1	6:1	0 to 5	10:1
		4 to 15	6:1	10:1	4:1	5 to 10	7:1
		Over 15	6:1	10:1	1½:1*	10 to 15	5:1
						Over 15	2:1*
	50 to 750 ADT	0 to 4	6:1	10:1	6:1	0 to 4	10:1
		4 to 12	6:1	10:1	4:1	4 to 8	7:1
		Over 12	6:1	10:1	1½:1*	8 to 14	5:1
						Over 14	2:1*
	Under 50 ADT	0 to 3	6:1	10:1	6:1	0 to 4	10:1
		3 to 6	6:1	10:1	4:1	4 to 8	7:1
		Over 6	6:1	10:1	1½:1*	8 to 14	5:1
						Over 14	2:1*

Note: 4:1 fill slopes may be used to reduce right-of-way where the presence of roadside features, such as curbs and sidewalks, precludes the need for shouldering material on future overlays.

*Slopes steeper than 2:1 require a Geotechnical evaluation.

SECTION 3 DESIGN STANDARDS AND PRACTICES

3.1 Design Standards and Practices.

General. This Section addresses common design details that may arise from the Standard Plans, Standard Specifications, field reviews, and construction activities. It is also intended to establish standard design practices that are not necessarily a part of geometric design.

3.2 Adjust Covers.

General. There are 3 methods of adjusting manhole and valve covers as follows:

- **Method A.** Use this method when removal of existing pavement by cold milling is not required. Pave over the cover. Once all paving is completed, locate and adjust to the final finished pavement level.
- **Method B.** Use this method when removal of the existing pavement by cold milling is required.
- **Method C.** Use this method of adjustment outside the areas as described in Methods A and B. (i.e. Roadbed modification, Cold recycle, and utilities in sidewalks)

List the owner of the utility in the structure list as shown in Section 7.28.

See Section 5.16 for coordination of utilities.

3.3 Aggregate Base.

Type. Type 1, Class B aggregate base is used on all projects unless otherwise requested from Materials. Type 2, Class B aggregate base is used between median barrier rails. See Standard Plans sheet (R-8.6.2)

Quantities. The quantities for aggregate base are to include 8 percent for moisture content.

On new construction projects or reconstruction projects where gravel base courses are being placed, the base course material will be used as shouldering material.

3.4 Approaches and Access.

General. The minimum radius on approaches should not be less than 25’ (measured at the face of curb or edge of oil.) Refer to the Access Management System and Standards 1999 Edition for type of approach, spacing, and application on various roadway facilities.

Urban. In urban areas approaches are generally paved to the back of the radius returns in order to restore crosswalks and stop bars. Consideration to right of way needs to be addressed if paving to the radius returns puts the improvements beyond right of way. Temporary easements or permission to construct may be needed to perform this work or the scope is modified to avoid right of way.

Rural. In rural areas with dirt roads, approaches may be paved beyond the radius returns, not to exceed right of way limits, in an effort to provide room for mud and dirt to shed from the tires to keep the stop bars clean and visible. For construction of new approaches, refer to the Access Management System and Standards 1999 Edition for determining the approach type for roadway category.

On overlay projects, frequently used approaches should be keyed in with milling to the end of the curb or radius returns. Approaches that are used infrequently paving shall be transitioned within 10’ or to right-of-way, whichever is less. Pave permitted gravel approaches to protect the edge of road.

Policy and procedure. See Section 4.4 concerning permitted approaches.

3.5 Barrier Rail.

General. Median concrete barrier rail should not be used for carrying conduits. In order to do certain types of work on freeways portions of the barrier may be removed to construct temporary crossovers to accommodate traffic during construction. Rerouting conduit runs at that time is very expensive and might reduce the available options for traffic control.

Application. Concrete barrier rail is generally recommended in high volume urban areas especially freeways, because of frequent hits and minimal required maintenance. Considerations such as roadside drainage, flood plains, and accommodating future traffic control should be considered when contemplating its use versus other barrier systems such as guardrail or cable rail.

On controlled access highways, concrete barriers will generally be provided in medians of 24’ or less. On non-controlled access highways, concrete barriers may be used on medians of 24’ or less; however, care should be exercised in their use in order to avoid creating a restriction in sight distance at median openings or on horizontal curves. The use of concrete barriers on non-controlled access facilities should be restricted to areas with potential safety concerns such as railroad separations or through areas where median constriction occurs. Concrete barriers may be considered in medians wider than 24’ based on an operational/safety analysis.

Medians between 24’ and 50’, measured from striped inside shoulder to inside shoulder, the use of barrier rail, guardrail, or cable rail should be evaluated based on the hydraulics, structural and safety characteristics of each.

Divided roadways with Portland Cement Concrete Pavement (PCCP), separated by a concrete barrier should have the center of the crown coincide with one of the outside edges of the concrete barrier. This facilitates construction when constructing barrier rail on PCCP. See page 8 for example.

A common application of barrier rail and crash cushions is at elevated exit ramp gore or where bridge rail requires shielding and the use of guardrail does not work. Combinations of barrier rail and crash cushions are also frequently used to shield bridge columns within clear zone.

Existing. Traffic barriers may not be 3” or more below standard height after the roadway improvements are completed. Measures must be taken so those that fall below the 3” allowance are restored to standard height. Traffic barriers must be brought into conformance with the current length of need criteria. Obsolete crash cushions, guardrail end terminals, and barrier transitions (guardrail to bridge rail or guard rail to concrete barrier rail connections) must be upgraded to current standards.

Type. F-shaped barrier rail is used in critical areas such as the outside curve of fly-over structures and separating high volume/ high speed traffic on freeways. F-shape barrier rail is also preferred along retaining walls and tie back walls. A-shape barrier rail is used in all other locations where F-shape would otherwise take precedence.

Constant slope rail accommodates future pavement overlays (up to 10”) and should be evaluated on a case by case basis.

3.5 Barrier Rail (Continued).

Fine surface finish. Fine surface finish shall be placed on all bridge structures and concrete barrier rail installations in urban areas. Fine surface finish is not included in other items of work and requires a separate bid item paid for on a square area basis. Fine surface finish shall not be used in rural areas.

End treatments. When contemplating the use of safety hardware the designer should consider safety factors and economics. Ends of longitudinal traffic barriers flared beyond clear zone have a 3 percent better severity index than crash cushions. Therefore, the approach ends of longitudinal barriers should be flared out of the clear zone wherever practical and concrete barriers should only be fitted with a crash cushion when flaring is impractical. Flaring longitudinal traffic barriers beyond the clear zone also reduces the risk of vehicles passing behind the end terminal and being prevented from returning to the roadway thus eliminating the need to provide a safe run out area.

If there are extenuating circumstances the designer should seek approval to designate a specific device or to limit the choices to those devices listed in the QPL that will perform satisfactorily. Some possible scenarios are:

- If analysis indicates the device will be struck frequently, the designer should consider devices that have self-restoring properties and/or are quick, easy and inexpensive to maintain.
- If there is limited space for installing the crash cushion, their physical dimensions may preclude certain devices.
- If there is little room behind the crash cushion area, the location requires a device that can handle hits from both sides or there are other safety concerns with vehicles passing beyond the device then gating devices may be precluded.

Aesthetics. In areas of historic, environmental, or scenic significance (as determined by Environmental and Landscape and Aesthetics); Design will give attention to the barrier rail and identify it as a specific item on the PDFS Report. The report will recommend how the rail will be addressed; which will then be reviewed and approved by the Chief Road Design Engineer. Areas of potential scenic significance are:

- Areas of National Forests and State, Local, and National Parks
- Historic Districts/Landmarks
- Scenic Byways: Lake Tahoe-Eastshore Drive (US 50 & SR 28), South Las Vegas Strip (SR 604), North Las Vegas Strip, Pyramid Lake Scenic Byway (SR 445, SR 446, & SR 447), Angel Lake Road (SR 231), Lamoille Canyon Road (SR 227), Extraterrestrial Highway (SR 375), The Great Basin Byway (US 93, US 50, US 6), The Loneliest Road in America (US 50), Highway US 93 through Lincoln County, Mount Rose Highway (SR 431), Mt. Charleston Scenic Byway (SR 156, SR 157, & SR 158), Red Rock Canyon Road (SR 159), Valley of Fire State Park Roadways (from SR 169)

The first priority should be given to removing the need for barrier rail. Strategies must meet NCHRP 350 criteria.

3.6 Bike and Pedestrian Facilities.

Bike lanes. Bike lanes are used when it is desirable to delineate a portion of the pavement for preferential use by bicyclists or to provide for more predictable vehicle movements. Bike lanes are delineated with signs and pavement markings. They should be one-way facilities located within the limits of the paved shoulder. The minimum width of a bike lane is 4'. In areas with raised curb or longitudinal barriers, the minimum width is 5'. The open graded plantmix surface wearing course is to be paved flush with the lip of the gutter pan and inlet grates. A width of 5' or greater is preferred where substantial truck traffic is present, or where motor vehicle speeds exceed 50 mph.

On highways without full control of access where a bridge deck is being replaced or rehabilitated, and where bicycles are permitted to operate at each end, the bridge shall be reconstructed so that bicycles can be safely accommodated when it can be done at a reasonable cost. Consultation with local groups of organized bicyclists is encouraged in the development of projects with bicycle facilities.

In situations where the lateral offset of an existing longitudinal traffic barrier from the shoulder stripe is less than 5' then, in consideration of bicycle traffic, the placement of a rumble strip must be justified by an engineering study. The study should consider: [a] the consequences of omitting the rumble strip adjacent to the traffic barrier, and [b] adjusting the lateral offset of the traffic barrier to at least 5'. On new roads or new traffic barrier installations on existing roads, the minimum distance from the shoulder line to the face of the traffic barrier is 6' if the road also serves as a bikeway.

Additional resources. For further guidance refer to the 1999 AASHTO's Guide for Development of Bicycle Facilities.

Policy and Procedure. See Section 4.5 concerning bike facilities.

3.7 Cable Rail.

General. Use cable barrier materials meeting the manufacturer's requirements and specifications for NCHRP Report 350, TL-3. Evaluate the cost of flattening slopes and installing cable rail versus shielding with concrete barrier rail or guardrail; provide this information as part of the PDFS report if applicable.

Median application. Cable rail should be considered on all 4-lane divided highways separated with depressed medians using the following criteria:

- When the width of the median, measured from striped inside shoulder to inside shoulder, is between 24' and 50'. When Median widths vary from 50' (greater than and/or less than 50') maintain a continuous segment of cable rail.

- When the median width is between 50' and 70' a field study and discussions between Safety Engineering and the Design Team will determine if cable rail is required.

Medians less than 24', as described above, are to be protected with concrete barrier rail or guardrail due to the deflection associated with cable rail. Outside shoulders are generally high hit locations and are not suitable for cable rail because of continual maintenance.

Installation. Existing slopes in the median need to be flattened to 6:1 or flatter to accommodate cable rail. Horizontal angle points may be introduced into cable rail at a 30:1 ratio or flatter where needed. Cable rail should be installed on one side of the median slope rather than located near the flow line because of potential maintenance issues. Cable rail must be offset at least 8' from the flow line. If cable rail must be installed near the flow line, it cannot be any further than 1' from the flow line. Do not install cable rail between 1' to 8' of the flow line to allow the vehicles suspension to return to its normal position to prevent snagging. Consider the deflection of cable rail when orientating the horizontal location (deflection is approximately 12'). Maximum post spacing is not to exceed 10.5' unless necessary to span across culverts, utilities, etc.

Bid items. The associated bid items for a new cable rail installation are: cable rail (LNFT), cable barrier terminal (EA), and additional materials (LS).

3.8 Cattle Guards.

General. Steel cattle guards Type B, C, and Timber Foundation cattle guards are to be used in fence-line approach installations only. They are not appropriate for continuous, heavily traveled roadways.

Cattle guards are normally installed on ramps, cross roads and other suitable locations at interchanges. In areas of Open Range, at the limits of fenced right-of-way on a State maintained highway, metal cattle guards, wings and fencing shall be installed according to Department Standard Plans and Specifications.

Since cattle guard wings are an obstruction, the setback should be 2' wider than the edge of pavement on each side. The extra width is necessary in maintenance and overlay operations. In order to facilitate truck-turning movements the cattle guard should be constructed a minimum of 50' from the closest turning radius. All layouts should be tested with turning templates for WB-65 trucks to insure that the largest vehicle will be crossing the cattle guard on the tangent. The preferred cattle guard placement in an interchange would be on each end of a crossroad. If the cattle guards are to be placed on the ramps, that decision should be fully documented by the designer. The designer should take into consideration that motorists use the entire ramp as either an acceleration or deceleration zone. In either case the rails on the cattle guard degrades the friction factor necessary to changes in speed.

The Designer is further cautioned to choose a location so that the installation is free draining. Some thought should be given to the function of outlet pipe and the direction of drainage and any additional length of pipe should be specified in the plans.

Policy and procedure. See Section 4.6 concerning cattle guards.

3.9 Coldmilling.

General. Check for any drainage problems around bridge structures from past overlay projects. Correct drainage issues by providing an adequate slope 100' beyond the structure before transitioning back to the new finished grade elevation. The transitions at the beginning or end of a project may also require correction if the condition is warranted.

Disposal. The priority for the use of cold-milled products is as follows: 1) Used on the project as shoulder material 2) Stockpiled at respective district 3) Stockpiled with local governments 4) Disposed of by Contractor

Project needs will be met first with the coldmilled product. Second, the Project Coordinator shall contact the District Maintenance Engineer to determine if they want the excess coldmilled product from the project for their use. If the district does not want the excess coldmilled product then the Project Coordinator will contact the local government to offer them the cold-milled product. As a last choice the contractor will be given any excess coldmilled product as salvaged material.

When contacting the District and local governments make sure they provide a physical location where the coldmilled product will be placed and a contact person to coordinate with so this information can be added to the special provisions for the project. In addition, consider the haul distance from the project to the stockpile location; it should be relatively close to the project. A summary of coldmilled product table is required on all projects that have coldmilled product being generated.

The table should include the depth, amount of coldmilled product generated by the project, where the coldmilled product will be used, the amount that will be used and what will remain after all the project needs are satisfied. See the summary of cold-milled product table in Section 7.9.

For aesthetic reasons coldmilling product may not be used along roadsides as shoulder material in certain scenic areas including Washoe Valley and the Tahoe Basin. Coordination with the Landscape Architect and the Environmental Engineer is required to determine if coldmillings will be allowed on new construction projects.

Transitions. Normally mainline coldmilling depth is carried to the physical gore before starting a different pavement section (transition) along ramps. Transitions are normally carried beyond the project limits to provide full structural section within the project. Coldmilled transitions should also be completed 100' before/after bridge structures to reduce the "pounding" effect and helps eliminate potential ponding issues. On 3R projects a grade break may be introduced to transition the structural roadbed improvement into the adjoining section of road at the following rates:

- 50' per inch where the posted speed limit is 45 mph or less
- 100' per inch where the posted speed limit is greater than 45 mph

Miscellaneous cold milling. This item was created as a means to compensate the contractor for the additional coldmilling to remove areas of stripping or delamination encountered during the coldmilling process as determined by the Resident Engineer. Normally this item can be expected when cold milling is required for the full project length or in areas where delamination is anticipated. Miscellaneous cold milling is not intended to correct cross slopes.

The Designer will be notified of anticipated areas of stripping or delaminating by the Materials Division and will coordinate with them to determine a quantity or percentage of the project if an estimated amount is not

provided. The quantity should be estimated such that the Resident Engineer will have the flexibility to over run or under run the quantity without having to negotiate an agreed price.

3.10 Concrete Items.

Major Vs Minor bid item. Concrete for structures is classified as either major or minor depending on several considerations. The cost of minor concrete is significantly more than for major concrete to accommodate cost variables. A general distinction based on the pay quantity can be used as a starting point where less than 25 cubic yards is minor and greater than 25 cubic yards is major; this quantity is based on each structure or location and not on the contract quantity. In addition, the estimator must consider the complexity (special engineering, surveying, shop drawings and approvals) and amount of labor, equipment and materials included in the pour such as for forming (multiple angles, corners, vertical levels) and reinforcement (special doweling, multiple bends in reinforcing steel).

Some general examples of minor concrete include drop inlets (all types), pipe headwalls and small RCB headwalls, waterline caps and plugs, special manholes that are cast in place, special connections of pipes to RCB, and small drainage swales. In contrast, some examples of major concrete include a large cast-in-place RCB, approach slabs, wing walls, retaining walls, deck slabs, and a bridge barrier rail. A concrete slab with wire mesh reinforcing is a simple pour and, for a pay quantity moderately less than 25 cubic yards, could be considered major. Large junction boxes with multiple inlets, special separators for water quality improvements and special loadings are complex and, for a pay quantity moderately greater than 25 cubic yards, could be considered minor.

3.10 Concrete Items (Continued).

Class A Vs Class AA bid item. Class AA is air-entrained concrete and is produced through the use of air-entraining portland cement, or by introducing air-entraining admixtures. The use of air-entraining agents results in concrete that is highly resistant to severe frost action and cycles of wetting and drying or freezing and thawing and has a high degree of workability and durability. Class A is not air-entrained concrete and is used primarily in Clark County. Class AA concrete is to be used in all other counties unless otherwise specified by Construction or Materials.

Crack and seat PCCP. This is a rehabilitation process performed on failing Portland Cement Concrete Pavement (PCCP). A guillotine type of machine is utilized to break the pavement into blocks, which perform independently. Traffic is allowed to drive on this surface in order to seat it. A leveling course of plantmix is placed on this seated material and then the structural section plantmix is placed on top of the leveling course. A prime coat is placed between this seated concrete and the leveling course.

See section 410 in the Standard Specifications for more information on this operation and associated bid items.

Rubblization. This is a rehabilitation process performed on failing concrete pavement that is deemed to be in a worse condition than concrete slated for a crack and seat procedure. A guillotine type of machine is used to destroy the concrete to the point of making it into base material. A prime coat is then placed and then the structural section of plantmix is laid.

See section 410 in the Standard Specifications for more information on this operation and associated bid items.

3.11 Curbs and Gutters.

Type A Vs Type B. Type A curb should be limited to median islands in urban areas where speeds are less than 45 mph. Type B curb may be used for median islands in higher speed facilities. In areas where snow removal operations are expected, the use of mountable concrete curb such as Type 6, 7, and 8 designs are preferred over vertical Type 1, 2, 4, and 5 designs. The mountable designs have proven to be less susceptible to damage from scraping by the snow plow blades thereby resulting in longer lasting curbs. See raised features in Section 2.17 for placement or curbs around longitudinal traffic barriers.

Type 2 & 3. These curbs are generally used to match older curb sections that were used during the time of construction. Glue down curbs are generally easer to construct and are preferred over type 2 & 3. Type 2 & 3 curbs are generally used in areas where there is a known problem with Type A & B glue down curb breaking or in area of heavy truck traffic.

3.12 Curb Ramps.

New Vs existing bid item. When constructing new curb, gutter, and sidewalk, the curb ramp will be included in the respective bid items. When retrofitting curb ramps within existing curb, gutter, and sidewalk, the curb ramp will be paid for as concrete ramp. The bid item for detectable warnings is required on ramp structures regardless if it is new or retrofitted.

3.13 Culverts.

Safety end sections. Use safety end sections when cross culverts 30” or greater in diameter cannot be extended beyond clear zone. Longitudinal culverts larger than 12” that can be hit head-on within clear zone are to use safety end sections.

3.14 Excavation.

General. See Standard Specifications for various types of excavation, measurement, and payment. **(Section 203 pg 87-94)**

Shrink / Swell factors. The Designer requests shrink/swell factors from Geotech when earth work is required on a particular project. See example of earth work notes in Section 7.12.

See example shrink/swell factors in the summary of earthwork in Section 7.9.

3.15 Fences.

Open range. In areas of Open Range, as defined in NRS 568.355, any fence constructed outside Department right-of-way which intersects the right-of-way shall be terminated at the right-of-way line(s). Installation of gates, and the appropriate type, will be the responsibility of the road design division on a site-specific basis. Metal drive gates should be installed in right-of-way fences where property access may have frequent usage (excluding driveways, approaches, road intersections) and especially in those rural areas close to or bounded by urban or suburban areas. Missouri type gates may be installed in right-of-way fences in rural areas other than those stated above and where a relatively low incident of usage is required.

Be aware of fence (especially chain link) that would obstruct drainage paths or culvert inlets and outlets

In rural areas where both large and small animals exist, use fence type C-NV-4B per the Standard Plans.

Tortoise fencing. Upon evaluation from Environmental Services, tortoise fencing may be required to be installed within the project limits and proposed NDOT material site. These projects are typically in Clark County.

Control of access. Control of access fence should be installed whenever it is necessary to prohibit access to the roadway lanes by pedestrians, animals and/or vehicles. Control of access is generally placed along the right of way lines. At interchanges, the control of access fence in normally extended 750’ past the radius returns in urban areas and 1320’ in rural areas along major cross roads and/or frontage roads. In urban areas, a traffic study should be conducted to determine if any nearby access within these guidelines may pose a detriment to the operation of the interchange. The control of access may need to be lengthened or modified to accommodate operations. The traffic analysis is requested from the Principal Traffic Engineer. See page 21 for example of minimum spacing of approaches and access control near interchanges

In urban and suburban areas a 6’ chain link fence will be normally used. Check for possible sight distance issues when installing fence around intersections. In rural areas where animals exist, use a minimum of a 4 wire fence per the Standard Plans.

3.15 Fences (Continued).

Removal / modification. In many cases both a permit and an agreement will be required before we will authorize removal of our control of access fence; the agreement is to be negotiated by the Right-of-Way Division.

Removal of the state's access control fence in certain restrictive cases proposed by private, adjoining developers is subject to the following:

Case 1. When a developer proposes to remove our control of access fence and replace it on our right of way line with a block or concrete wall, or a metal fence (chain link or decorative iron), NDOT will require that the new wall or fence will become the property of NDOT with the developer being responsible for maintenance of the nonstandard wall or fence. A maintenance agreement with the developer, or some sort of property owners' association in the event the developer sells his interests to individual property owners, will be required for the continuing maintenance responsibility. A right of way occupancy permit will be issued for the actual construction.

The permit will cover removal of the existing fence, temporary fencing during construction, and traffic control requirements.

Case 2. When a developer proposes that we allow removal of our control of access fence in favor of a fence to be constructed on his property, all conditions listed in case 1 will apply, except the developer will continue to own the replacement fence since it will be on his property. NDOT will authorize removal of the fence only if it will b replaced by a block or concrete wall or metal fence (chainlike or decorative iron). NDOT will enter into the same type of agreement with the developer or property owner's association for maintenance specified in case 1. Should it be necessary to safety or security, the agreement will require that the existing NDOT access control fence be physically tied to the replacement fence or wall.

Case 3. In those cases where existing block or concrete walls, immediately outside NDOT's control of access fence, provide safe and durable access control barriers, NDOT may remove the access control fence to enhance aesthetics and/or for maintenance. Where necessary, we will, through our

Right of Way Division, enter into agreements with property owners allowing us to connect our remaining control of access fence to the existing block or concrete walls. In cases where we do remove our control of access fence in favor of existing block or concrete walls, our District personnel will take care to erect temporary fencing whenever breaks in the block or concrete walls are found. Should intentional access openings be developed in the block or concrete wall, or should necessary maintenance not be performed allowing some compromise to the access control, NDOT will immediately replace its permanent access control fence.

Wooden fences, even in combination with masonry or steel supports, are not allowed.

MINIMUM SPACING FOR FREEWAY INTERCHANGE AREAS WITH MULTI LANE CROSSROADS

Type Of Area	Spacing dimension			
	X	Y	Z	M
Fully Developed Urban*	750 ft	2640 ft	990 ft	990 ft
Suburban/Urban	990 ft	2640 ft	1320 ft	1320 ft
Rural	1320 ft	2640 ft	1320 ft	1320 ft

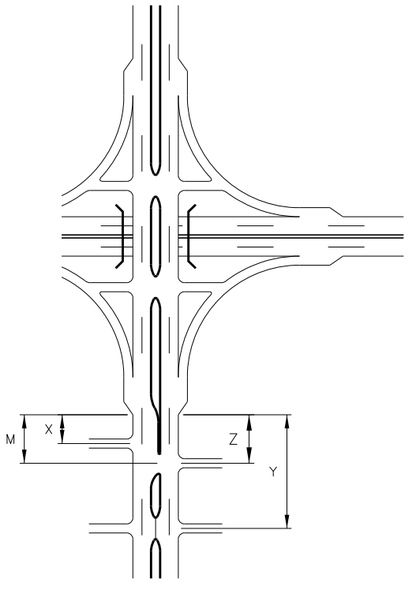
X = Distance to first approach on the right; right in/right out only.

Y = Distance to first major intersection. No four-legged intersections may be placed between ramp terminals and the first major intersection.

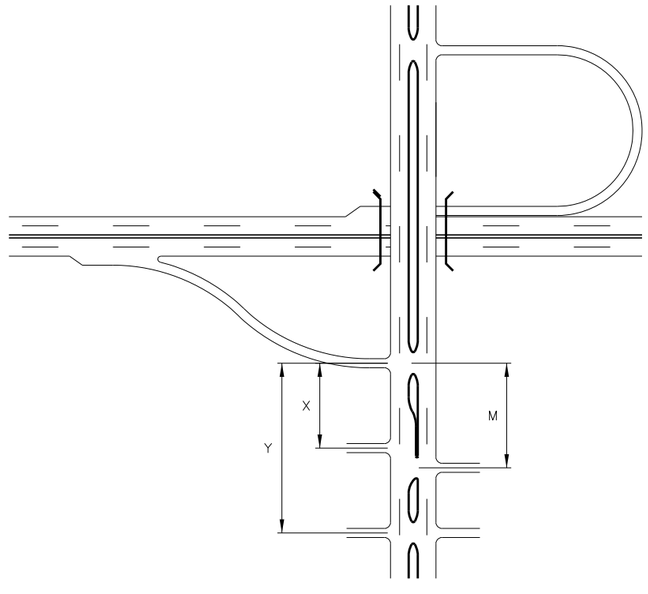
Z = Distance between the last access connection and the start of the taper for the on-ramp.

M = Distance to first directional median opening. No full median openings are allowed in nontraversable medians up to the first major intersection.

* Free-flow ramps are generally discouraged in fully developed urban areas and are questionable in suburban/urban areas because pedestrian and bicycle movements are difficult and potentially dangerous.



Diamond or Cloverleaf Interchange



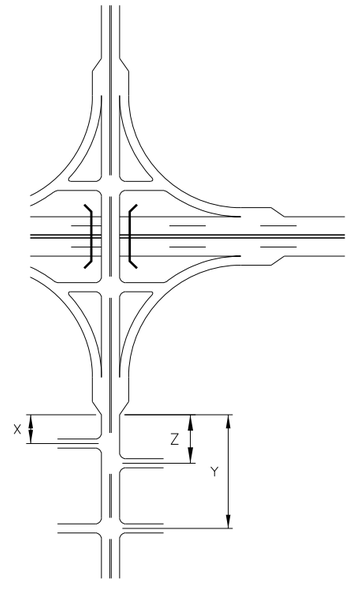
Partial Interchange

MINIMUM SPACING FOR FREEWAY INTERCHANGE AREAS WITH TWO-LANE CROSSROADS

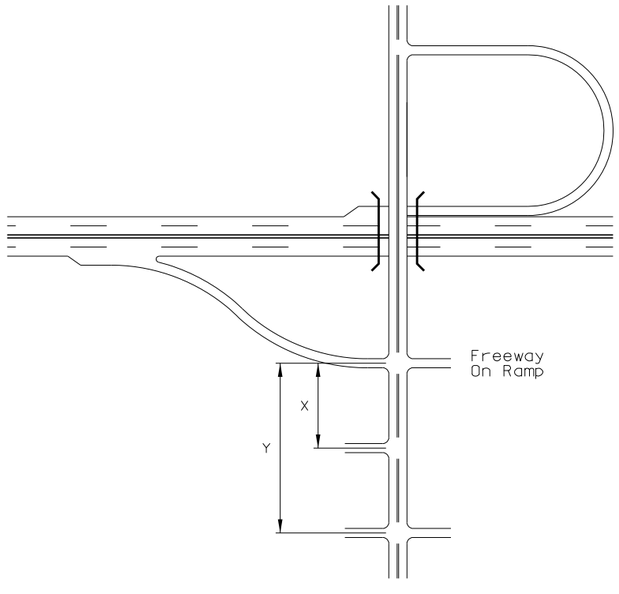
Type Of Area	Spacing dimension	
	X or Z	Y
Fully Developed Urban	750 ft	1320 ft
Suburban/Urban	990 ft	1320 ft
Rural	1320 ft	1320 ft

X or Z = Distance to first access connection from the taper of the off-ramp or on-ramp. This dimension provides for either X or Z but not both, to avoid a four-way connection.

Y = Distance to first major intersection. No four-legged intersections may be placed between ramp terminals and the first major intersection.



Diamond or Cloverleaf Interchange



Partial Interchange

3.16 Guardrail.

Application. Thrie-beam should be used on freeways where: snowmelt or other drainage considerations are an issue, adequate room is not available for concrete rail, or in flood areas. W-beam can be used off the freeway, especially when W-beam is predominant in the area or W-beam is being extended. W-beam would normally be used on low volume routes.

Guardrail should be installed in areas where the consequence of an errant vehicle leaving the roadway is judged to be more severe than impacting the guardrail. If economically feasible, flattening slopes, extending culverts, and removing obstacles from the clear zone should be considered first before installing any barriers. See Table 2.20 on page 15 for desirable side slopes.

Post length. When it is not economical to construct the additional 2' graded area behind the guardrail posts per the Standard plans, longer posts should be used and specified in the Special Provisions.

Blocks. Steel post thrie-beam systems with 14" modified steel offset blocks meet the NCHRP350 test requirements however the department no longer uses this configuration due to the 2" height difference between it and the other thrie-beam configurations. Therefore any such installation that is being altered in any way, either permanently or for temporary construction purposes, should have the offset blocks replaced with an approved offset block from the Qualified Product List (QPL). If the guardrail is determined to be in good condition and is to remain in place; the blocks are to be replaced using the pay item guardrail block. Address replacing blocks in the PDFS report.

End terminals. Break away crash terminals (BCT's) do not meet the NCHRP350 test requirements and should be upgraded with new end terminals from the QPL.

Flared and tangential guardrail end terminals each have advantages and disadvantages that must be considered when selecting the type of system to use. Tangential end terminals were developed to overcome the inflexible installation tolerances associated with the flared-type end terminals. The trade-off is that tangential end terminals are more likely to be struck than the flared type, resulting in higher maintenance costs. As a general rule, a flared-type end terminal is preferred to the tangential type and should be used unless problems installing or maintaining the system exist.

End anchors are used where it is not necessary to project the trailing end of the guardrail outside of clear zone in the opposing direction; typically found on divided highways and interstate systems.

Buried end sections are used when it is convenient to bury the end section into the back slope.

Existing. Traffic barriers may not be 3" or more below standard height (per the Standard Plans) after the roadway improvements are completed. Measures must be taken so those that would fall below the 3" allowance are restored to standard height. Traffic barriers must be brought into conformance with the current length of need criteria. Obsolete crash cushions, guardrail end terminals, and barrier transitions (guardrail to bridge rail or guard rail to concrete barrier rail connections) must be upgraded to current standards.

Grading. Material necessary to construct the graded areas around the end terminals and behind the run of guardrail posts normally consist of borrow, or coldmilled products. The use of plantmix around guardrail posts should be avoided. See special detail on Sharepoint when plantmix must be used in special situations. The quantities are to be included in the summary of base and surface (shouldering material is not suitable for this purpose). For end terminals, the use of longer posts is not an option and must be graded according to the Standard Plans.

Pay items. The remove and reset bid item will be used on projects to facilitate moving existing and/or new guardrail panels and blocks to accommodate the milling and paving operations.

On new construction projects, such as roadways with new alignments and no traffic will be operating on the roadway, the bid item will not be required. Projects with a combination of traffic and no traffic sections will have to be addressed accordingly.

The reconstruct guardrail bid item will require new guardrail posts; coordinate bid items with Specifications.

Markers. Additional guide posts are calculated along guardrail runs. See Standard Plans for details (R-9.2.2).

Miscellaneous. The distance behind the guardrail must allow for deflection necessary for proper function when guardrail is impacted. Methods 1-4 are shown in the Standard Plans (R-8.3.1) for guardrail installation, deflections and back spacing. When designing guardrail runs adjacent to fixed obstructions, the designer should state in the plans the preferred method to prompt the Contractor and Resident Engineer. The additional posts and/or nested rail in methods 2, 3, and 4 are at no direct payment.

3.17 Guideposts.

Placement. Guideposts should be placed along all roadways in accordance with the Nevada "Standard Plans for Road and Bridge Construction." Guideposts may be omitted from sections having longitudinal barriers if reflectors are included with the barrier system.

Additional guide posts are calculated along guardrail runs. See Standard Plans for details (R-9.2.2).

Type. Rigid guideposts are normally placed in heavy snow removal areas. Flexible guideposts are for all other areas in the state. Coordinate the type of post with District Maintenance and discussed in the PDFS report.

Removal. There is no direct payment for the removal of guidepost. A note is placed in the general notes directing the contractor to remove them at no direct payment. See general notes in Section 7.9.

3.18 Headlight Glare Screen.

General. Headlight glare screens are not installed routinely on median barriers or at other locations. Evaluation for its installation shall be made prior to incorporating in the plans. The evaluation should consider glare due to combined effects of grade, curvatures, heavy truck traffic, etc. Public complaints may also be an indication that glare screen is advisable.

3.19 Landscape and Aesthetics.

General. It is NDOT's policy that landscape and aesthetics will be considered with all other design factors in all transportation projects. They apply to the entire NDOT-managed highway system – urban freeways, rural highways, city streets, open spaces, rest areas, and maintenance yards. The landscape and aesthetic treatments emphasize regionally appropriate material and drought-resistant plants.

3.19 Landscape and Aesthetics (Cont.)

In general, three percent (3%) of the total construction costs on all new construction and capacity improvements is allocated to the landscape and aesthetic treatments. Landscape and aesthetics is not generally considered on pavement preservation projects unless there is extensive slope flattening involved. In which case, landscape and aesthetics should be considered to soften the impact of cut slopes along the roadway.

Guidelines. Landscape and aesthetic treatment types and levels have been identified on all major highways. The treatment types and levels are shown in the corridor plans and can be found at http://ndothighways.org/. For those roads not covered by a specific corridor plan, the treatment types and levels are determines using NDOT's Landscape and Aesthetics Master Plan and a nearby corridor plan, when appropriate.

Costs. Some treatments that improve the appearance of the highway are part of the normal construction practice. These treatments are required for safety or environmental mitigation and are considered standard construction costs. They do not count towards the required three percent (3%) landscape and aesthetic costs. Some examples include, rock mulch and revegation for erosion and dust control, standard surface treatments including paint on sound walls, retaining walls, or standard painting on bridge structures. For further direction or clarification of costs, see the Landscape Architecture Section.

In some cases, where there is already a standard surface treatment, such as fractured fin, the cost difference between the standard treatment and the enhanced treatment counts towards the landscape and aesthetic costs. Painting of existing structures and walls with the standard corridor colors is not considered a landscape and aesthetic cost.

Funding. Barring and major changes in the scope and size of a project, the landscape and aesthetic construction budget is established at the intermediate design stage.

3.20 Mailboxes.

General. Replace mailboxes within NDOT right of way that do not comply with standards. Since the U. S. Postal Service is installing neighborhood collection boxes in many rural and suburban areas, the Designer should contact the responsible local postmaster to see if neighborhood collection boxes, to be provided and perhaps installed at Postal Service expense, could be installed within the confines of the project. If so, NDOT will provide turnouts at our expense to allow safe location of the collection boxes and convenient delivery and pick-up of mail.

On projects where we cannot arrange for installation of neighborhood collection boxes, replace the mailboxes removed or relocated to facilitate construction using only approved tubular metal supports, at NDOT expense.

Turn outs. Summarize the type and amount of base and surfacing in the plan sheets that is to be placed at mailbox turn outs according to the Standard Plans (R-12.1.1). At a minimum, the mailbox turn outs should consist of a 4" of aggregate base course. Heavily used or large number of mail boxes should consider a plantmix surface.

3.21 Maintenance Access.

Roadway width. For controlled access facilities, provide maintenance access between fence lines (or right of way, which ever is less) to the adjacent fill slopes at the following widths:

SLOPE	WIDTH
3:1 fill slope or steeper	15'
3:1 fill slope or flatter	12'
3:1 cut slope or flatter	10'
3:1 cut slope or steeper	12'
Retaining walls	15'
Bridge structures	15'
Drainage structures	20'
Utilities	Determined by owner

Maintenance roads generally consist of a 4" aggregate base course. Paved maintenance roads should be evaluated on a case by case basis. Overhead signs and power lines need to be evaluated to ensure adequate clearance can be maintained for service equipment.

3.22 Markers.

Milepost markers (posts only). The bid item is calculated for the location of mileposts in the field and is summarized in the plans. The milepost panels will be installed on the posts by the Department. The location of the milepost panels are indicated on the location sketch under the milepost tabulation. See Section 7.7. There are two posts placed in the field, one in each direction, at each milepost location.

Post mile markers (posts only). The bid item is calculated for the location of post mile panels in the field. The post mile panels will be installed on the posts by the Department. These markers are only located on the interstate system, one in each direction, and start and end at the state lines. The numbering system runs continuously and does not break at county lines. The post mile markers (posts only) do not need to be summarized as part of the milepost markers.

Object Markers. Object markers should be placed to warn motorists of hazardous objects near the roadway such as bridge rails, underpass abutments, utility poles, and drainage structures that are in clear zone that are not protected. To the extent possible, the marker should be located so that if the motorist avoids the object marker they will also avoid the object. For objects offset from the roadway, it may not be possible to place the object marker right at the hazard. In such cases, the Resident Engineer should locate the hazard marker based on an errant vehicle departure angle of 15-degrees.

3.22 Markers (Cont.)

Where an object is clearly a concern relative to the motorist who inadvertently strays off the paved roadway then placing an object marker should be considered if any of the following conditions exist within the “clear zone” and/or within the area that “may be so close to the edge of the road” that concern for safety is evident:

- A culvert exists that is equal to or greater than 30” internal diameter with no provisions to allow passage of a vehicle over the culvert end,
- Headwalls or wing walls protrude 4” or more above the graded slope, thus causing a snagging problem,
- The span between the wing walls, at a height of 4” above the fill slope, is greater than 30” and no provision has been made to facilitate passage of cars over the span.

3.23 Portland Cement Concrete Paving (PCCP).

General. For concrete paving, widen 5’ beyond the paving to facilitate the paving equipment. Backfill the 5’ widened area with aggregate base after paving. In areas where tight right of way requires steep slopes and the 5’ widened area cannot be achieved, this 5’ wide area will be specified as miscellaneous concrete paving. When concrete paving abuts retaining walls, a 5’ area of miscellaneous concrete paving will be required in front of the wall.

Extend cement treated base one foot beyond the concrete paving. Do not use coldmilled plantmix products as shoulder material on PCCP. Use of bituminous material adjacent to the concrete pavements has lead to water being trapped along the edge of the concrete slab which ultimately leads to pumping.

Divided roadways with Portland Cement Concrete Pavement (PCCP), separated by a concrete barrier should have the center of the crown coincide with one of the outside edges of the concrete barrier. This facilitates construction when constructing barrier rail on PCCP. See page 8 for example.

Longitudinal weakened plane joints. For wide concrete pavement sections, the quantities for longitudinal weakened plane joints should be determined assuming that the contractor will pave in 24’ maximum width pours. In the past, we have had overruns because the designer assumed the contractor paved half width freeway sections in the range of 56+’ wide in one pass. It is Constructions opinion that a 24’ width would be appropriate for the determination of the weakened joint quantity. On rural freeways (2-Lanes each direction), the total width of 38’ can be assumed to be paved in one pass.

Profile grind. It is necessary to include Saw & Seal Longitudinal Joints and Transverse Joints bid items when profile grinding PCCP.

Sign foundations within concrete paver track. On projects that require sign foundations, such as spread footings for overhead sign structures, the Traffic Designers will more accurately calculate the pedestal heights so that paving operations are not severely disrupted when sign footings are constructed prior to paving operations. The pedestal heights will be set flush with the concrete pavement and the pole lengths will be calculated based on this elevation.

This will allow the contractor to build temporary earth ramps to carry the paver tracks over the pedestals. In order to do this, the designers will have to get the concrete surface elevations at these locations to traffic in a timely manner. When there is sufficient room, the foundations may be offset 5’ from the edge of concrete pavement.

3.24 Plantmix and Asphalt Items.

Shoulder dike. Shoulder dikes are paid for as wet tons of plantmix and a linear foot item “Shoulder Dike”. Calculate tack and seal coat for the plantmix dike; sand blotter is not required. (Asphalt type and application rate determined by Materials.) See Section 2.17 for locations and restrictions for shoulder dike.

Cold recycles. The bid items for cold recycles are covered under Section 404 in the Standard Specifications. Provide a bid item for sand blotter so traffic can run on the recycled surface.

Roadbed modifications. The bid items for roadbed modifications are covered under Section 305 in the Standard Specifications. Provide a bid item for sand blotter so traffic can run on the modified surface. Include additional one foot of width on each side of when calculating processing for roadbed modification. Paving items will also need to be adjusted for the additional width.

Open grade. Open-graded plantmix surface wearing course will be placed on all facilities with speeds in excess of 40 MPH and facilities with speeds of 40 MPH and less where there is stop and go traffic and/or abrupt turning movements. Generally, this will be all arterial streets and highways. The open graded plantmix surface may be eliminated from such roads if it is demonstrated that an alternate wearing course type (chip seals, etc.) would be more cost effective. This is to be evaluated on a project-by-project basis by the Materials Division.

The open-graded surface must be flush with the top of surface drainage inlets on bicycle routes and bicycle lanes and/or where the inlets encroach into a travel lane. In some cases, special details will be necessary to modify existing drainage facilities. In snow removal areas the open-grade should be placed full width to eliminate drop-offs, grade breaks and other undesirable features that cause the snow removal equipment to snag and/or grade off plane (i.e. paved turn out’s for chain up areas). Open grade is also to be paved flush with the lip of gutter in all cases.

Prime coats. Prime coats are applied between the base course and the first plantmix lift. Prime coats normally consist of MC-70; SS-1h may be used for prime coats in small areas. SS-1h requires two separate applications. (Asphalt type and application rate determined by Materials.)

Tack coats. Tack coats are applied between plantmix lifts. Plantmix lifts are placed in 3” maximum depths. (Asphalt type and application rate determined by Materials).

Seal coats / sand blotter. Seal costs consist of MC-250 and are normally placed on plantmix surfaces that do not receive open-grade. Examples of such areas may include approaches, paved islands, ditches, and dikes.

Mineral filler/ asphalt cement. See SharePoint/010>Design Division>Project Estimation and Estimate Building Procedures for items and percentages.

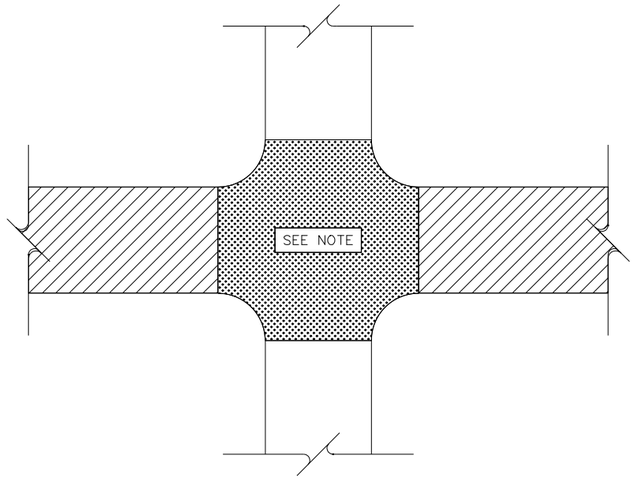
Miscellaneous paving. Limits of miscellaneous paving will be calculated as shown on page 25.

STANDARD AREAS OF MISCELLANEOUS PAVING

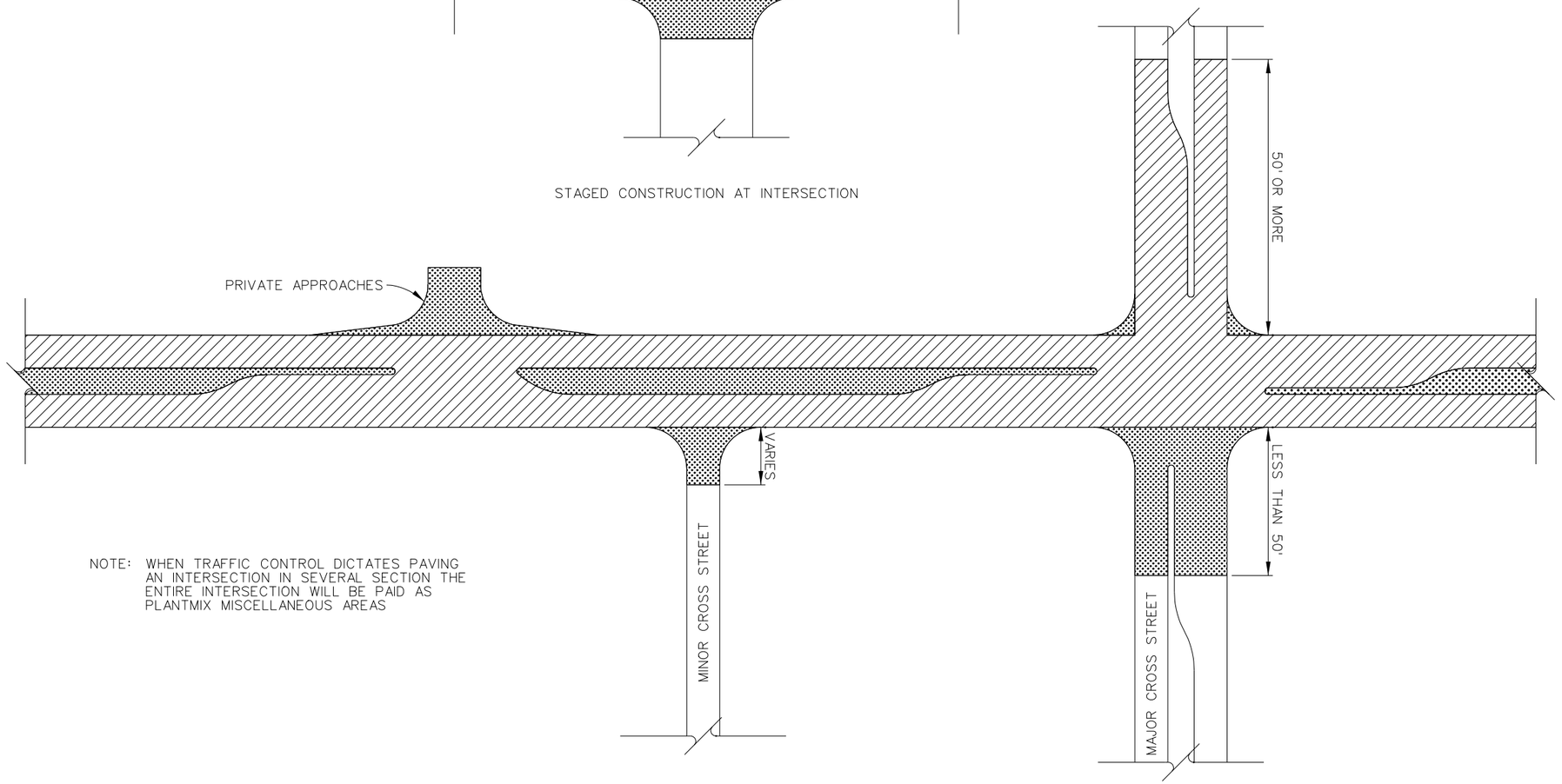
– LEGEND –

– LIMITS OF PLANTMIXING MISCELLANEOUS AREAS

– LIMITS OF NORMAL PAVING AREAS



STAGED CONSTRUCTION AT INTERSECTION



NOTE: WHEN TRAFFIC CONTROL DICTATES PAVING AN INTERSECTION IN SEVERAL SECTION THE ENTIRE INTERSECTION WILL BE PAID AS PLANTMIX MISCELLANEOUS AREAS

3.25 Pollution Control.

General. The Designer submits a project category score sheet to the Hydraulic Engineer generally before the Intermediate review submittal. The project category score sheet can be found in the Water Quality Manual (appendix A)

Hydraulics calculates the dollar amount to be included in the bid item for pollution control.

3.26 Pre-Emergent Herbicide.

General. The use of a pre-emergent herbicide should be considered on plantmix surfaces that are 2" in depth in order to prevent vegetation from damaging the pavement. This should be discussed with the District Maintenance Engineer, Hydraulics, and coordinated with the Landscape Architect who will provide Specifications application rates. This is especially applicable to paved ditches, bicycle paths and other paved surfaces where excessive cracking would result in premature failure of an important design feature.

3.27 Pull Boxes and Loops.

General. To be developed.

3.28 Removal Items.

Clearing and grubbing. Clearing and grubbing items should be discussed with Construction and Specifications when selecting "Lump sum" versus "Acre."

Composite surface. Removal of Composite Surface is generally used to remove a combination of items such as concrete curb, gutter, sidewalk, plantmix surface, and aggregate base. Using this bid item eliminates the need to itemize removal of separate items. As an example, use this item when trenching and widening in an urban area where all of these items would be encountered.

Detours. Any detours designated to be removed after construction will require bid item(s) for removal. Paved detours are usually removed under the bid items "removal of bituminous surface" and "rent equipment (motor grader)" when the fill can be used to flatten slopes in the surrounding area. When this is not possible, such as in an urban area, the bid item "roadway excavation" or "removal of composite surface" may be used. Temporary "Sho-fly" detours with an aggregate base course are generally removed with "rent equipment (motor grader) when the material can be utilized to flatten surrounding slopes.

Headwalls. When removing a headwall to extend a pipe, no allowance is given for cutting the pipe. Headwalls are to be removed without damaging the existing pipe (R.C.P. or C.M.P.) and payment for removal of the headwall is all inclusive. Cutting the existing pipe, while permissible, is not desirable (especially R.C.P.'s) and should be avoided when extending existing culverts. See Standard Specifications Subsection 601.03.06. In the case of extending R.C.B culverts, the headwall may be left in place as long as the existing headwall can be buried in the new roadway slope. See Standard Plans sheet (B-20.1.7)

Plantmix dike. On all 3R type projects, existing plantmix shoulder dike should be evaluated by Hydraulics to determine the necessity. Remove shoulder dike that is not warranted to remove roadside obstacles.

Traffic lines. Raised pavement markers do not need to be removed as a separate bid item when coldmilling and paving. Raised pavement markers will need to be removed with a bid item for slurry seals or other surface treatments.

3.29 Rumble Strips.

Edge line. Rumble strips should be placed on all rural highways that have a shoulder width greater than or equal to four feet. In situations where the lateral offset of a longitudinal traffic barrier from the shoulder stripe is less than 5' then, in consideration of bicycle traffic, the placement of a rumble strip must be justified by an engineering study. The study should consider the consequences of omitting the rumble strip adjacent to the traffic barrier, and adjusting the lateral offset of the traffic barrier to provide at least five feet. Rumble strips normally will not require a seal coat unless otherwise directed from the Materials Division.

Rumble strips should be avoided within 1000' of residential areas.

Center line. At the request of Safety Engineering, center line rumble strips may be added to the project.

3.30 Shoulder Material.

General. Shouldering for new construction will be accomplished with the same material as the base course, not with shouldering material. Overlays outside of curb and gutter areas usually require a quantity for shouldering material. Shoulder material is not suitable for embankment, slope flattening, or backfill materials. Accordingly, it cannot be used to grade roadsides for guardrail, end terminals, crash cushions or contour fill over culvert extensions.

The use of milled plantmix material for shouldering material along concrete pavements and concrete pavement overlays is not allowed. Use of bituminous material adjacent to concrete pavements has led to water being trapped along the edge of the concrete slab that ultimately causes pumping.

Quantities. Shoulder material should typically be set up using the tons per station per side as shown in the table below. Quantities should be evaluated on case by case scenario during the PDFS and take into account excessive erosion or low shoulders. Quantities shown below include 1' shoulder widening as shown in the typical sections.

SHOULDER MATERAIL (TONS PER STATION PER SIDE)

Height of overlay	Tons
2"	10
3"	15
4"	20
5"	25
6"	30

3.31 Sidewalks and Ramps.

General. Schools, daycare facilities, senior homes, etc. can provide unusual pedestrian, bike, and motorized chair movements. Any observation of unusual pedestrian activity including high volumes, special needs or mobility issues should prompt the designer to obtain actual pedestrian traffic data from Inter-modal Planning. Traffic generators that create intermittent peak demands, such as schools, may require special design considerations. Issues such as capacity, access and inter-modal continuity should be considered when determining what data is required to design an appropriate facility.

When feasible, pedestrian under-crossings should be designed so that continuous lighting is provided through the structure. Along freeways or expressways where frontage roads intersect local streets with walkways, it is desirable to construct walkways along the frontage road to provide continuity.

Width. As a general guideline, the desirable width of a walkway should be at least six feet, but in areas with heavy pedestrian activity walkway widths up to 12' should be considered. The sidewalk must be a minimum of 48" wide with no wall or post-mounted objects that have leading edges between 27" and 80" above the surface protruding 4" or greater into it.

When determining the appropriate width for walkways, the designer should consider total pedestrian volumes, the presence of pedestrian traffic generators (i.e. schools, hospitals and banks), the proximity of vehicular traffic, the placement of street hardware (i.e. fire hydrants, light standards and street signs), and the nature of the pedestrians expected to use the facility most often.

Additional publications. Design issues are discussed in AASHTO's A Policy on Geometric Design of Highways and Streets and FHWA's Designing Sidewalks and Trails for Access, Parts I and II. Design considerations for access by disabled persons are discussed in AASHTO's Policy on Geometric Design of Highways and Streets and the Access Board's "Accessible Rights-of-way Design Guide" and "ADA and ABA Guidelines".

Policy and Procedure. See Section 4.2 concerning ADA policy and procedures.

3.32 Slope Flattening.

General. For projects that require slope flattening to bring slopes into compliance; accomplish the work with a borrow embankment/roadway excavation item. If encountering rock slopes and the material will be used as fill, consider using aggregate base or shoulder material to cap the roadway slope to provide a smooth surface. The depth of aggregate base or shoulder material should be discussed during the PDFS and reviewed by the Constructability section. See Table 2.20 on page 15 for desirable roadway slopes.

Construction platform. When constructing flatter fill slopes adjacent to existing steeper fill slopes, the minimum proposed sub-grade width should be 10' to allow construction equipment to construct "sliver" embankments. Geotech and Constructability should be consulted.

3.33 Soil Stabilizer.

General. New embankment or slope flattening projects not designated for landscaping should be treated with soil stabilizer. The calculated area includes the disturbed area and any maintenance roads or temporary access roads necessary to construct the project that will no longer receive traffic. Coordinate the use of soil stabilizer with the Hydraulics Division.

3.34 Stockpiles.

General. Maintenance stockpiles that are produced expressly for that purpose require a separate funding breakout which the FHWA will not participate in these costs. Normally such stockpiles are funded through the district's betterment program. Maintenance stockpiles that are produced incidental to the construction (such as with coldmilled product) require coordination with the district engineer to ensure that an area will be available to handle the amount of material when the contractor is ready to deliver it.

3.35 Striping.

Striping width. On interstates and freeways, edge line striping shall be 8" wide, lane lines 6" wide, gore lines, auxiliary lanes and dotted lines leading up to the gore shall be 12" wide. All other roadway types, edge line and lane lines are usually 4" wide.

Bike lanes are striped 6" wide. See Standard Plans for other striping widths and markings.

Temporary striping. Temporary centerline and lane lines must be placed on pavement that is not the finished surface whenever traffic will utilize the pavement. If traffic will be on the new surface for more than 14 calendar days, then temporary striping should also be used for edge lines, crosswalks, stop bars, gore markings, railroad crossings, words, symbols, etc. The estimate of quantities must include the temporary striping for all lifts of asphalt that will carry traffic.

Temporary striping tape. Type 1 tape is more readily removable from the surface and is recommended for use on surfaces which are not designated to be covered or removed, and on temporary areas where traffic patterns are to be altered. Type 2 tape is much more difficult to remove from the surface and is recommended for use on surfaces which are to be covered or removed in which removal of the tape will not usually be required. The use of temporary pavement marking tape shall not be used on sections where cold milling conflicts with pavement markings. It will be necessary to paint pavement markings in these areas. The use of tape should be discussed during the traffic control meeting if it is determined to be used on the project.

Permanent striping. Combinations of striping and reflective and non-reflective pavement markers are used in Clark County. See standard plans for location of reflective and non-reflective pavement markers. For all other counties, epoxy paint for lane lines, shoulders, and gores are normally used on Interstates and NHS. Waterborne Type II is used for all other roadways unless requested by District.

Permanent pavement markings. For Stop bars, cross-walks, arrows, "ONLY", and railroad pavement markings use Type 2 marking film for new paving projects to receive open grade. The use of thermoplastic is generally used on roadways that receive other surface treatments such as chip seals, micro surfacing, and PCCP.

3.36 Traffic Control.

General. Use NDOT Standard Plans and the MUTCD for the development of traffic control plans. Analyze the impact that temporary measures are expected to have on traffic. Situations that require a lane reduction or detouring traffic onto a lower capacity facility are good examples of where the level of service will likely be reduced. By understanding the potential impacts of this reduction the design team can establish additional measures to improve the temporary condition such as:

- Adjusting signal timings
- Restricting the hours of construction operations to avoid peak volumes
- Providing adequate storage area for turning movements
- Adjusting lane assignments to match morning/evening directional peak flows

If hourly counts are needed to determine limitations of operations for work zone traffic control, the information should be requested for the anticipated time when construction is expected to occur. The Principal Traffic Engineer should be consulted for analysis of the data and recommendations regarding acceptable working hours.

Arrow boards. See Standard Plans (T-35.1.1) for the type of arrow board used during construction.

Cones Vs drums. The use of cones is normally used for traffic control in urban or rural areas where the speed limits is below 50 mph. Use drums on all interstate and NHS routes; rolling operations such as striping may use cones if approved during the traffic control meeting.

Portable barrier rail. The Designer is cautioned when using portable barrier rail around intersections and approaches. Check for site distance issues that may arise during construction when barrier rail may be installed. When lump sum traffic control items are used, note any potential site distance conflicts in the plans or special provisions. Select the appropriate end treatment from the Standard Plans.

Barrier rail is generally used when longitudinal drop offs exceed 3” with speeds greater than 35 mph. The use of portable barrier rail is evaluated on a case by case basis and should be discussed during the PDFS and traffic control meetings.

Low profile impact attenuators. The use of low profile impact attenuators may be specified were sight distance is an issue such as around approaches or intersections.

Contractor furnished – lump sum. Projects in rural areas may use the lump sum method. Projects located in major urban areas, such as Las Vegas, Reno and Carson City, will be based on individual bid items and plans. Projects located in small urban areas such as Elko and Winnemucca may use lump sum if this method is decided to be appropriate during the traffic control meetings. Lump sum traffic control requires formal approval from the Chief Safety/Traffic Engineer.

On contracts using lump sum traffic control plans, a traffic control matrix and device summary is unnecessary since the construction phasing and staging requirements will be the responsibility of the contractor. The Construction division is responsible to provide the designer with the number of working days, project completion date, flagger hours and liquidated damages.

Temporary lane width reductions. The reduction of lane widths to accommodate construction should be evaluated carefully and reducing lane widths to less than 11’ requires approval of the Chief Road Design Engineer. Refer to over dimensional permits under Administrative Services in Section 5.3 concerning lane width reductions.

Policy and procedure. See Section 4.10 for reporting traffic control minutes and Transportation Management Plan (TMP).

Speed reductions. Existing speed limits shall remain in effect through work zones on state highways except where those work zone activities create a condition that would be aggravated by retaining the existing speed limits. On those types of projects, the plans or specifications shall specify speed limit reductions through the work zone. Such conditions could include:

- Reduction in lane widths
- Reduction in the number of lanes and/or shifting of lanes from the designed alignment
- Uneven surfaces
- Temporary surfaces such as roadbed modifications, cement treated bases, chip seals, etc.

A temporary reduction in the regulatory speed limit may be established as part of the traffic control plan, including those furnished by contractors.

The regulatory speed limit in a project work area may be temporarily reduced by 10 mph or to 55 mph, whichever is lower; the Director must approve greater reductions based upon a recommendation from the Chief Safety/Traffic Engineer. The following speed limit reductions may be temporarily implemented for work zone traffic control without the director's approval: [a] any speed limit of 65 mph or more can be reduced to no lower than 55 mph and [b] any speed limit of 60 mph or less can be reduced by no more than 10 mph. Greater reductions must be reviewed by the Chief Safety/Traffic Engineer and require the Director's approval on case by case basis. This policy also applies to traffic control plans furnished by the contractor.

The temporary regulatory speed limit should be instituted when the daily operations begin and are removed when the daily operations end but in no event more than two hours before or after the beginning and end of operations. The temporary regulatory speed limit should not be left in effect beyond the daily hours of operations unless the condition for which the speed reduction was implemented continues to exist, or channeling devices are required to route traffic through the work zone area. Additionally, the temporary regulatory speed limit should not extend beyond the reasonable limits of the actual current work area regardless of the extent of the project area unless conditions exist elsewhere in the project area that requires a reduced speed limit.

Unless otherwise approved by the Director, if a project is shut down for the winter or if no substantial work on the project takes place for 30 days or more, the project area shall be left so that the original regulatory speed limit may be reinstated without a significant safety hazard to motorists.

The original regulatory speed limit shall be resumed by posting new signs at the end of the work zone for each direction of traffic. Speed limit signs alone do not always reduce vehicle speeds in highway work zones. Law enforcement officials should be called on to discuss the application and to provide enforcement of work zone speed limits. The Resident Engineer or Maintenance Supervisor shall contact the proper authorities for notifications of dates, times, duration, and location for which the new temporary regulatory speed limit signs will be erected.

For additional information Refer to the Work Zone Safety and Mobility Implementation Guide 2008 edition.

SECTION 4 POLICY AND PROCEDURE

4.1 Policy and Procedure.

General. This Section addresses specific policy and procedures for items that are the responsibility of Roadway Design. This Section also defines submittal requirements, project types, scope, and reports that are commonly produced on capacity and 3R projects.

4.2 Americans with Disabilities Act (ADA).

Policy. Pedestrian facilities owned by NDOT undergoing alteration, as part of the project scope, must conform to current criteria where technically feasible. This policy includes adding new sidewalks to provide continuity when there is activity, need, and it is economically feasible. Where constraints (such as existing grades, buildings, walls, major utilities, etc.) prohibit full compliance the alteration shall conform to the maximum extent possible. Sidewalks owned or maintained by another agency or private property should be brought into conformance with current standards. However, these improvements are contingent upon the owner agreeing to pay for them. If NDOT's offer is rejected or the party involved does not respond to repair their sidewalk as part of our project, NDOT proceeds without including that work. The letter shall state they have 15 days to respond.

Examples of some of the deficiencies are narrow raised medians extended through crosswalk areas, push buttons for crosswalks are un-accessible to the handicapped, and curb ramps not constructed at intersections.

Curb ramps within the limits of construction that do not meet the minimum ADA Accessibility Guidelines requirements shall be reconstructed to current department standards except where the only deficiency is the absence of detectable warnings; the curb ramp need only be retrofitted with a detectable warning. For ramps maintained by other entities: [a] the detectable warning may be constructed with products approved by that entity in lieu of the department's qualified products and [b] other local entity ADA compliance standards may be used instead of the department's if approved by the Chief Road Design Engineer. Raised median islands that encroach into a crosswalk shall be adjusted to allow unobstructed passage or be modified to have curb cuts and/or ramps constructed in accordance with current criteria.

Procedure. For badly deteriorated sidewalks, curbs and gutters being considered for replacement, the PDFS report must include photographic evidence of the condition. New sidewalks will be considered based on: [a] pedestrian activity and needs, [b] right-of-way and utility constraints, [c] environmental constraints, and [d] other considerations.

The city, county or private property owners may construct and maintain walkways within the state's right-of-way but are subject to obtaining a permit from the State through the District Office.

Exceptions to the design standards shall be identified and justified, taking into consideration the effect of any deviation from design standards on safety. The project files must include this information. Approved exceptions shall be identified in project correspondence or on the project plans. The Chief Road Design Engineer's approval must be obtained in writing for design exceptions.

4.3 Adjust Covers.

Procedure. The Designer submits 3 sets of plans to the right of way utility agent to obtain ownership and location of manhole and valve locations. See SharePoint/010>Design Division>Project Estimation and Estimate Building Procedures for obtaining 3rd party agreement numbers. See Section 5.16 for the coordination of Utilities.

4.4 Approaches.

Policy. On preservation projects outside of urban areas and where no curb and gutter section exists, existing un-permitted approaches will be improved to current minimum standards (at least Type 1), so long as the approach owner obtains an encroachment permit for which the fee will be waived. This does not apply to situations where no defined and periodically used approach exists, such as at a seldom-used stock gate in rural areas or at an obviously abandoned approach. Do not encourage access where access is not commonly needed or presently used. Work on these approaches, which shall be at State expense, shall be the absolute minimum necessary to bring the approach to the minimum standard and shall be predicated on the owner making application for an encroachment permit in those instances where a permit has not been previously issued. If the owner does not make application for the permit, no work will be performed on the approach.

Procedure. During the initial field reconnaissance on preservation projects, the design squad shall locate all qualifying approaches and plot them on preliminary design plans. Correlate these approaches with those reflected on the permits maintained in Central Records. A set of the plans showing the approaches with those noted that are under permit will be submitted to the Right-of-Way Division. The Right of Way Division shall perform the necessary title work to determine the names and addresses of the property owners served by the approaches without permits and shall make contact with the property owners. Encroachment permits can be found under the respective District on SharePoint>Design Division Home Page> Design Portal.

4.5 Bike Facilities.

Policy. The bicycle elements of local master plans must be considered in the design process. A bicycle facilities checklist must be completed for all projects. Bicycle facilities developed by the department shall be designed for transportation, or commuter type, users (in contrast to recreational users). On roads designated as bicycle lanes and routes, the striping and signing shall conform to the appropriate standards. Consideration shall be given to the perpetuation of existing bicycle traffic that will be affected during the construction of proposed improvements. These considerations must be reflected in the traffic control plan. Bicycles are not normally allowed on the shoulders of urban freeways. On rural roads that allow bicycle travel, the shoulder shall be designed to accommodate bicycles (5' width is recommended).

NDOT does not eliminate vehicle travel lanes on existing streets to provide bicycle lanes. NDOT builds short sections of paths that connect on-system bike lanes to other on-system bike lanes or paths where the missing section is on NDOT right-of-way. It is preferred that designers provide facilities to assist bicycle operators at destination points within the bikeway network to reduce conflicts with other transportation modes such as pedestrians at busy traffic areas like parks and transit terminals.

Procedure. At the request of the proper governing body, consideration may be given to provide bicycle paths within the highway right-of-way. Of particular concern are those projects in urban, suburban, recreational areas, and areas of anticipated land use change that could affect the transportation facility. When the paths are not a part of the immediate design, sufficient room for their future construction should be considered and may be included in the right-of-way width requirement. Local government improvements that would interfere with the primary purpose of the right-of-way will not be allowed.

Information is requested through Inter-Modal Planning for bicycle facilities, bus lanes and turnouts, and missing ADA improvements.

4.6 Cattle Guards.

Policy. Approaches that enter a state highway within a project's limits in fenced areas should be reviewed for livestock protection. During the design of new facilities, attention must be given to approaches that intersect state highways, especially on controlled access facilities. Where there may not be livestock grazing in the immediate area, there might be livestock in the surrounding area that could get onto the highway. If an existing approach is used for stock drives then a gate should be installed next to the cattle guard.

Painted cattle guards shall not be permitted on or adjacent to a state highway where a cattle guard would be specified to prevent livestock from entering highway right-of-way. Painted cattle guards shall be removed as right-of-way fencing projects are undertaken or as funding becomes available and at that time non right-of-way fences shall be terminated at the right-of-way line(s). Additionally, cattle guards may be installed subject to the following conditions:

- In areas where right-of-way is fenced through grazing lands and where a gate on an approach is impractical: (i.e. local roads, driveways, approaches, etc.)
- On entrance and exit ramps or preferably on approaches (Cross Streets) to the Interstate or other controlled access highways in areas where grazing lands may be encountered.

In no case shall cattle guards be permitted across the travel lanes of any highway having full control of access. On the Interstate or other full control of access highway, gates may be permitted.

Procedure. The installation and removal of cattle guards will be the responsibility of the Road Design Division on a site-specific basis. Coordinate the installation or removal of these facilities with right of way, property owner, BLM, NHP or local sheriff, and the appropriate NDOT District.

4.7 Design Exceptions.

Policy. Where the "Green Book" or interstate standards apply, design exceptions are required for projects that do not meet standards for the following controlling criteria: [1] Design Speed; [2] Lane Width; [3] Shoulder Width; [4] Bridge Width; [5] Structural Capacity; [6] Horizontal Alignment; [7] Vertical Alignment; [8] Grades; [9] Stopping Sight Distance; [10] Cross Slope; [11] Super-elevation; [12] Horizontal Clearance (other than the "clear zone"); and [13] Vertical Clearance.

Exceptions to accepted standards and policies shall be justified and documented by memo, the thirteen controlling criteria noted above, and require approval.

Design exceptions to these controlling criteria can, in the most part, be easily identified and defined. However, two items, horizontal clearance and design speed, warrant some further explanation and discussion as indicated below.

Procedure. Design exceptions are addressed to the Chief Road Design Engineer, from the originating Project Coordinator or Principal Engineer, and recommended by the appropriate Assistant Chief Road Design Engineer. Design exceptions approved by NDOT for the FHWA are still subject to FHWA oversight through periodic process reviews. An outline for preparing design exceptions can be found on SharePoint>Design Division Home Page>Project Development Related Links/Forms.

Design exceptions are normally prepared and approved during the preliminary design phase but no later than setting right of way.

If the FHWA is involved in reviewing and approving plans, specifications and estimates for interstate and NHS projects. The FHWA must also review and approve design exceptions to the thirteen controlling criteria standards applicable to that project.

On other projects, the Assistant Director, Engineering, must approve design exceptions for these thirteen controlling criteria. Evaluation and documentation requirements for those approvals will be as if doing it for the FHWA. The Chief Road Design Engineer may approve design exceptions for elements other than the thirteen controlling criteria.

Exceptions to the design standards shall be identified and justified, taking into consideration the effect of any deviation from design standards on safety. The project files must include this information. Approved exceptions shall be identified and kept in the workbook under project correspondence. Design Exception requests to FHWA shall be addressed to the FHWA Division Administrator, from the Assistant Director, Engineering. Design Exception memoranda to the Assistant Director, Engineering, should be from the originating Project Coordinator or Principal Engineer. The Chief Road Design Engineer must review and recommend approval for design exception requests prior to submittal to the FHWA or to the Assistant Director, Engineering for approval. Design exception documentation and approvals must be kept in the project notebook. Approval letters are to be kept in the Roadway Design "Design Exceptions" general file and in the central records project files.

Horizontal clearance. This item refers to clearances designated in the Green Book or Interstate Standards. It does not refer to clear zones. While a recovery area clear of unyielding objects should be established for all projects, the criteria for clear zones comes from the AASHTO Roadside Design Guide and should be treated as guidance for setting individual project or statewide criteria.

The Roadside Design Guide is not a national standard requiring a design exception if not met.

Design speed. Design speed is a concept by which coordination of the various physical design elements is achieved. Design speed has a significant effect on the operation and safety of a highway because it is used to determine various individual design elements with specific dimensions such as stopping sight distance or horizontal curvature. Therefore, a "design speed exception" is really an exception to individual physical design elements (e.g., stopping sight distance, vertical curvature, super-elevation, etc.) and accordingly must be justified on that basis. For instance, if design speed cannot be achieved because it is impossible to get the proper stopping sight distance, the justification would be written around the stopping sight distance constraints.

Mitigation. Possible mitigation strategies for design exceptions can be found on SharePoint>Design Division Home Page.

4.8 Geometric Approvals.

Policy. Federal projects developed under partial oversight and state projects with new or significant changes to alignments, super-elevations, velocities or AADT require a geometric approval. In geometric approval requests the reasons for changes and non-standard geometrics shall be included along with plan and profile sheets and striping sheets depicting the new or changed geometrics. This is a method for summarizing the geometric design issues encountered during the development of the project to facilitate a one step formal approval process. Accordingly, there shall not be any new geometric design issues introduced into the project at this step; such issues shall have been discussed and adequately documented during the preliminary, or occasionally the detail design phase of the project.

4.8 Geometric Approvals (Cont.)

Procedure. The Principal Road Design Engineer prepares a memorandum to the Assistant Director, Engineering. The memo shall include a "Concur and Recommend Approval" line for the Assistant Chief Road Design Engineer's signature and an "Approved" line for the Assistant Director, Engineering's signature. Always submit the prepared request to the Assistant Chief Road Design Engineer for concurrence prior to forwarding to the Assistant Director - Engineering. For full oversight projects the Assistant Director, Engineering requests approval by a letter to the FHWA division administrator.

The geometric approval must be prepared and approved before setting final right of way.

An outline for preparing geometric approvals can be found on SharePoint>Design Division Home Page>Project Development Related Links/Forms.

4.9 Outside Information and Confidentiality.

Electronic files. The external distribution of electronic project files requires the recipient to enter into an agreement with the department regarding the authorized use of the information. For entities generally known to the department (such as public agencies, utility owners, consultant firms, general contractors, etc.), and that are working closely with the department on the associated project, the "Disclaimer and Agreement" form may be used. The original signed document will need to be returned by the recipient to the department, however, the form can be faxed to the requestor for signature then faxed back to the department for the digital information to be provided.

The "Disclaimer and Agreement" can be found on SharePoint>Design Division Home Page>Project Development Related Links/Forms.

For large complex urban projects, or any project designated as a super project, a "supplemental certification and agreement provision of digital design information" must be processed through the Administrative Services Division.

Engineers estimate. A detailed Engineers Estimate with unit prices will not be released to the public or construction industry from the time the project is programmed, until the end of the bid opening. During the advertisement period the bid items and quantities will still be included in the "Estimate of Quantities" that is generated by Administrative Services. The Department's Unit Bid Prices will be held confidential until the bid opening. The updated IFS CM 30 report can be used to provide bid items and quantities for anyone outside the Department who requests the information; such as, the asphalt producers, concrete manufacturers, CMP & RCB producers, contractors producing aggregates, etc.

4.10 Project Reporting.

General. Example of the documents listed below can be found on SharePoint>Design Division Home Page>Project Development Related Links/Forms>Standard Project Memo Templates.

Airway-Highway Clearance Requirements. Construction activities that interfere with FAA airport or heliport glide paths will require a "Notice of Proposed Construction or Alteration" (form 7460-1). General guide lines are (1) construction or alteration of more than 200 feet in height above the ground. (2) construction or alteration of greater height than imaginary surface extending outward and upward at one of the following slopes:

- 100 to1 for horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport (as defined in the FAA guidelines) or with at least one runway more than 3,200 feet in actual length, excluding heliports.
- 50 to 1 for horizontal distance of 10,000 feet from the nearest point of the nearest runway of each airport (as defined in the FAA guidelines) or with at least one runway more than 3,200 feet in actual length, excluding heliports.
- 25 to 1 for horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff are of each heliport as defined in the FAA guidelines.

Forms, instructions, and further explanation can be obtained online at www.faa.gov. Contact Western Pacific Regional Office, Air Traffic Division, AWP-520, 15000 Aviation Boulevard, Hawthorne, CA 90260 Phone: (310) 725-6557

Design constraints. On capacity projects, this document is prepared by the Project Coordinator to summarize the design criteria to be used on the project and constraints imposed upon the project by management. This document summarizes the operating parameters the design team will use for the project.

Design exceptions. See Section 4.7 for reporting design exceptions.

Design notes to specifications. These notes are prepared by the Designer and are required to inform the specifications writer of special or non-standard construction materials or construction methods being used on the contract. They need to be of sufficient detail for the specifications writer to incorporate them completely into the contract as a Special Provision. When writing them it is essential to refer to the Standard Specifications to ensure that conflicting information is resolved and that the note conforms to the format of the Standard Specifications.

Dredge and fill report. The Designer prepares this information when requested by Environmental Services (as required under Section 404 of the Clean Water Act for dredging and fill within waters of the U.S.) This report is issued when the roadway, bridge and hydraulic designs are sufficiently developed to generate realistic estimates of the related project impacts measured as the footprint (area of work within the high water mark) and the associated volumes of material. The report must contain a map indicating the locations involved a summary of the locations with a description of the work, the area of impact, and the volume of material to be removed and/or deposited within water of the U.S.

Geometric approval memo. See Section 4.8 for reporting geometric approvals.

Preliminary design field study (PDFS) report. The Project Coordinator prepares the findings of the field study, along with recommendations and conclusions resulting thereof, shall be discussed in the report.

The report includes a list of attendees; the proposed scope of work; the time and location of the study; and related information that arises between the study and completing the report. Provide photographs of items or areas itemized in the report. The report should be reviewed and commented on by the PDFS team prior to the Chief Road Design Engineer's approval. A copy of the final report is forwarded to the Standard and Compliance Specialist.

Preliminary scoping report. The Scoping Coordinator prepares a report describing the alternatives and their respective scopes and submits it to the Chief Road Design Engineer for approval. The report must include concepts that were dropped from consideration as an alternative and the reasons why.

4.10 Project Reporting (Continued).

The report must contain a diagram of each alternative that indicates the locations of at-grade intersections, grade separations and interchanges. The diagram must also show the locations of identified avoidance areas, proposed bridge structures, major utilities, and proposed major off-site drainage facilities. The report is based on the conclusions derived from the traffic operational analysis and any other pertinent information discovered while investigating the various design alternatives.

Public interest finding. Several federal requirements (e.g. use of proprietary products, use of public equipment or material) may be waived if it is determined to be in the public's best interest. These requests should be used sparingly. The actually public interest finding is a written document outlining the basis for the request and the supporting documentation for it. The supporting documentation can include a cost/benefit analysis, a discussion of the product compatibility with the existing system, logistical concerns etc. Cost is usually not an acceptable justification for a public interest finding.

Approvals of a public interest finding request for projects located on the NHS are done by the FHWA. The Principal Road Design Engineer writes the request with a concurrence by the Chief Road Design Engineer. For projects located off of the NHS, the Principal Road Design Engineer writes the request to the Chief Road Design Engineer for approval.

Proprietary products. Specifying brand name products that have not been submitted to, or approved by the Product Evaluation Committee (PEC), must be justified as being in the public interest by memo from the requesting Division or District to the Chief Road Design Engineer. On Federal Oversight projects, justification will be forwarded to the Federal Highway Administration for their approval with the Chief Road Design Engineer's recommendation. All public interest justifications must discuss why the product was not processed through the PEC. Specifying proprietary products for state and federally funded construction projects is generally prohibited. The state statute, NRS 338.140, Drafting of Specifications for Bids: prohibits specifications that call for a designated material, product, thing or service by specific brand or trade name (i.e. proprietary products) unless:

- Method 1. The product is designated to match others in use on a particular public improvement either completed or in the course of being completed: or
- Method 2. At least two brand or trade names of comparable quality or utility are included and are followed by the words "or equal." The NRS further states, "In those cases involving a unique or novel product application required to be used in the public interest or where only one brand or trade name is known to the specifying agency, it may list only one."

The use of Method 2, as noted above, is normally not allowed. If there are two or more known brands of the product that are potentially acceptable, it is expected they will be submitted for evaluation by the PEC. If the product in question will be used infrequently, or is unique to a small number of projects, it may be inappropriate for inclusion on a QPL and Method 2 would apply. This must be documented in the form of a memo from the requesting Division or District to the Research Division Chief, stating why the product is not appropriate for a QPL. The memo must include a signature line for the concurrence of the Research Division Chief.

Requests to specify a brand name based on compatibility with completed improvements or when only one brand or trade name is known to exist, must be justified in writing by the requesting Division or District for approval by the Chief Road Design Engineer.

Certain products may warrant a trial section (experimental construction) on an upcoming project in order to observe and evaluate performance under in-service conditions. Such requests must be made through the PEC. The requesting Division or District in cooperation with the Research Division must develop an acceptable Work Plan. Requests for exceptions to this procedure must be submitted for approval to the Assistant Director, Operations.

The Product Evaluation Program is detailed in Chapter 2 of the department's Research Manual. The Product Evaluation Committee only meets once per quarter so schedule requests accordingly; failure to plan ahead is not justification for an exception. Local agency projects administered under the stewardship agreement must follow state law but they are not required to utilize the department's QPL.

Project checklist. The project checklist is not technically a report, but is intended for the Designer to use during the development of the project. The intent of the checklist is to help guide the Designer on major items that are commonly done on most 3R and capacity type projects. The checklist should be periodically reviewed to make sure certain items of work are completed or requested on an as needed basis.

The QA/QC checklist can be found on SharePoint>Design Division Home Page>Project Development Related Links/Forms. The checklist should be printed and placed in the front of the workbook.

Purpose and need statement. The purpose and need statement is used by Environmental Services in the NEPA document. This document is prepared by the Project Coordinator during the planning process and is updated as the project evolves during the project development process. The document needs to clearly demonstrate that a "need" exists in terms understandable to the general public including a clear description of the problem(s) the proposed action is to correct. The purpose and need lays out why the proposed action is being pursued and demonstrates the problems that will result if the project is not implemented.

The purpose and need defines what can be considered reasonable, prudent, and practicable alternatives. If an alternative does not meet the project's purpose or satisfy the needs then the alternative is not prudent provided the purpose and need section can substantiate that unique problems will be caused by not building the project. The purpose and need should be as comprehensive and specific as possible and include:

- Justification of why the improvement must be implemented
- Reexamined and updated as appropriate throughout the project development process

Change of access control. The Principal Design Engineer prepares the control of access report. Access changes to the interstate system will require approval by NDOT or FHWA. FHWA has retained approval rights to the control of access of the interstate system. For additional information see http://www.fhwa.dot.gov/programadmin/fraccess.cfm. All access changes to the state maintained highway system will require approval by NDOT.

A guide for writing a request for access change report can be found on SharePoint>Design Division Home Page>Project Development Related Links/Forms.

4.10 Project Reporting (Continued).

Right of Way setting memo. The memo is prepared by the Project Coordinator and shall be addressed to the Assistant Director, Engineering from the Project Coordinator. Recommend approval signature lines for the Chief of the originating division. Chief Environmental Services Division, Chief Right-of-Way Agent, Chief Hydraulic Engineer, and an approval signature line for the Assistant Director shall also be included.

The right of way memo should address the following:

- Plans that identify areas and parcels to be acquired.
- What is the acquisition (i.e. Fee Title, Permanent Easement, Temporary/Construction Easement, Controlled Access, Permissions to Construct)
- What alternatives were evaluated to avoid right of way (i.e. Retaining walls, Shifting the alignment, reducing design speed or other design exceptions)
- What is the justification for pursuing this course of action (i.e. costs, slopes, avoidance of environmentally sensitive area)
- Were all the Divisions contacted to determine if the amount is appropriate (i.e. room for construction staging and utility replacements)
- Is there anticipation of changes or options that Right-of-Way can use in the negotiations?
- Will there be subsequent right-of-way settings?
- Is the current request part of an overall phasing plan - outline the plan.

See Section 4.13 for additional information.

Traffic control minutes. The minutes of the traffic control meeting are to outline the traffic control strategy and develop the limitations of operations. The minutes are drafted by the Designer and are to include a list of attendees; the scope of work; the time and location of the meeting; and information or decisions that arise during the meeting.

Traffic control/constructability meeting minutes are sent to Traffic, Specifications, and Construction for review and comment. After comments are resolved, the final report is rerouted and a copy is placed in the workbook. Lump Sum Traffic Control is not exempt from these meetings occurring.

Projects that are within urban areas will require the review and approval of the Chief Traffic Engineer. For the purposes of this requirement, urban areas shall be the counties of Clark, Carson, Douglas, Lyon, Storey and Washoe. Projects outside of these counties can be advertised without an approval letter signed by the Chief Traffic Engineer. The processing memo shall indicate which projects require a formal review by the Chief Traffic Engineer.

Traffic control meetings with Road Design, Traffic, Construction, and Specification representatives develop the Limitations of Operations (Section 108.04), Liquidated Damages (Section 108.09), Accommodations for Public Traffic (Section 624) and Contractor Designed Traffic Control Plans (625.03.05). The limitations of operations, liquidated damages, and accommodations for public traffic imposed on projects will aid the Contractor in establishing the types of traffic control measures that will need to be included in the Contractor's bid documents. The design team must determine constraints and requirements that are needed on the contractor's traffic control plan and include them in the design notes to specifications or otherwise address them in the contract documents. The design team should consider:

- A requirement to furnish minimum quantities of certain traffic control devices such as changeable message boards, traffic drums, arrow boards, etc.
- Requiring the use of traffic barriers, such as portable concrete barriers, to shield traffic from longitudinal drop-offs, excavations, and other construction activities.
- Any constraints such as reducing the number of lanes, lowering the speed limit, diminishing the lane widths, traffic on the coldmilled surface, staging, and ADA issues.
- The impacts on adjacent property owners such as restricted access, hours of operation, length of work zones, pedestrian access, emergency response, and special events.

Transportation Management Plan (TMP). Refer to the Work Zone Safety and Mobility Implementation Guide 2008 edition.

Tree removal memo. Significant trees (25 years and older or 8” in Diameter) that are required to be removed will require approval from the Assistant Deputy Director, Engineering.

Workbook. The project workbook is organized into established sections and is considered the projects documentation. These standardized sections can be found in Designs file cabinet. All required reports and documentation needs to be neatly organized so that it can be found easily and checked either by another design squad or during QA/QC. Work sheets and calculations are also stored in the workbook along with the approved scope and decisions made during the design.

4.11 Project Scope.

3R (NHS interstate). Interstate 3R projects must be brought to current design standards, including geometric deficiencies, roadside design, and adopted criteria listed in Section 2.19. Refer to the 2005 AASHTO Policy on Design Standards Interstate System for other specific design criteria for Interstate Systems.

In Nevada, the interstate standard only applies to I-15, I-215, I-515, I-80 and I-580. Other freeways on the NHS, but not on the interstate, (portions of US 95 in Las Vegas and portions of US 395 in Washoe County) are to be designed to Green Book standards.

If cost prohibitive solutions create a financial hardship to bring the project to current design standards, a request for a design exception can be developed. See Section 4.7 for reporting design exceptions.

3R (NHS non-interstate)(State routes). This scope includes work to preserve and extend the service life of an existing highway, including safety improvements justified by existing or potential accident information.

Work is limited to pavement rehabilitation along the existing alignment, and can include correction of minor subgrade problems, minor shoulder widening, minor adjustment of vertical and/or horizontal alignment. Work may also include drainage improvement, slope work, and/or replacement of signs and signals, guardrail and roadside appurtenances.

Low cost operational improvements are also encouraged such as providing or lengthening acceleration/deceleration lanes, adding turn lanes, arterial driveway consolidation. Construction of bus turnouts, pedestrian and bicycle accommodations may be considered.

These projects may incorporate Intelligent Transportation System (ITS) measures, such as signal retiming and detection, ramp metering, overhead sign structures, and incident detection and management.

4.11 Project Scope (Continued).

Improvements are subject to available funding and will be approved on a case by case basis by the Chief Road Design Engineer.

The following are typical non-compliant roadside design issues to be considered for improvements on 3R projects:

- The clear zone may be different than previous contracts due to increased traffic volumes, increased running speeds, and recoverable slopes becoming non-recoverable slopes from shouldering operations. This may require redesigning the roadsides. Critical roadside slopes within the clear zone shall be addressed where there is a history of roadside crashes occurring in the vicinity. Right-of-way and environmental impacts, such as those associated with earthwork and/or traffic barriers, must be considered in the benefit cost analysis.
- Existing traffic barriers may not be 3" or more below standard height after the roadway improvements are completed. Measures must be taken so those that would fall below the 3" allowance are restored to standard height.
- Traffic barriers should be brought into conformance with the current length of need. Obsolete crash cushions, guardrail end terminals, and barrier transitions (guardrail to bridge rail or guard rail to concrete barrier rail connections) should be upgraded to current standards. Steel offset blocks used on steel post thrie-beam guardrail systems, other than the 14" modified steel offset block, did not pass NCHRP350 testing and should be replaced.
- Non-conforming culvert installations should be evaluated for appropriate safety measures including installing safety grates, extending with contour fill, or shielding with traffic barriers.
- Mailboxes that are not crash worthy should either be moved outside of the clear zone or replaced with an approved system.
- Signs and light poles should have crashworthy bases. Bases may be adjusted if shouldering or other project activities render them ineffective.
- Rumble strips shall be installed on shoulders that are at least 4' wide in rural areas. The rumble strip shall be eliminated through sections where the distance from the shoulder line to an adjacent traffic barrier is less than 5'. However, consideration should first be given to adjusting the lateral offset of the traffic barrier where the existing graded area is sufficient to attain the minimum clearance.

Evaluate geometrics that are significantly nonconforming to current standards including alignments, shoulder widths, gores, ramp lengths, and sight distance. Improvements to rural interchanges should only be made if the interchange services a significant traffic generator such as a rest stop, recreational area or business access or if the improvement can be justified by crash reduction.

The following are typical non-compliant geometric issues to be considered for improvements on 3R projects:

- Narrow mainline shoulders may be contributing to run-off-road type crashes and consideration should be given to widening shoulders where it can be economically justified. Shoulders on ramps are also commonly too narrow and should be brought to minimum standards.

- Constructing emergency maneuvering areas on exit ramps where none currently exist should be considered. Ramp gores should be improved to the current minimum physical gore width.
- The profile grade must be corrected where a history of transitioning surface improvements at the beginning and/or ending of the project has rendered the profile grade substandard. An example of this is sometimes found where plantmix overlays meet Portland Cement Concrete Paving (P.C.C.P.).
- Vertical clearance under existing bridge structures should not be less than 16.5'.
- Traffic barriers near intersections, median crossovers and approaches should be evaluated to determine if the installation obstructs the required sight distance and corrective measures should be taken as appropriate.

District contracts. Procedures and guidelines for District contracts are outlined on SharePoint>Design Division Home Page>Project Development Related Links/Forms.

Reconstruction and new construction. These types of projects includes work to replace an existing highway, including rebuilding to incorporate current geometric standards, or construction on new alignment. Projects generally involve extensive rebuilding of subgrade, drainage systems, and utility work. These projects may also utilize ITS and ramp metering measures. These projects provide a full depth replacement of Portland cement concrete or plantmix bituminous surface.

Safety projects/improvements. See Section 4.14.

Surface treatment. Occasionally surface treatment projects are processed through design as headquarters contracts. It is desirable to field review these projects prior to final design. However, these reviews should be combined with project reviews for larger projects to save time and money. Surface Treatment projects include inexpensive preservation strategies such as chip seals, slurry seals and flush seals and do not require that other roadway or roadside features be upgraded to current standards regardless of the road classification.

Bridge replacement projects. The Bridge Program provides funding to replace or rehabilitate substandard bridges owned by public agencies. Bridges that are privately owned, carry railroads, or are predominately for pedestrian/bicycle use are not eligible under this program. A bridge is defined as a structure that carries highway traffic and has a span (length) of 20 feet or more measured along the centerline of the road. A series of pipes or culverts can also be considered a bridge if the length is 20 feet or more. The primary focus of the Bridge Program is to replace and rehabilitate deficient bridges. NDOT has determined 85 percent of Bridge Program funds will be used for replacement and rehabilitation projects. The remaining 15 percent will be used to administer the Bridge Program. Administration activities include conducting federally mandated condition assessment inspection, compiling federally mandated inventory data, developing and operating a Bridge Management System, and calculating load ratings for existing bridges.

At least 15 percent of Bridge Program funds must be spent on bridges that are off the federal-aid system. A road's functional classification is used to define on and off the federal-aid system. Roads on the federal-aid system include roadways such as interstate, urban collector, and rural minor arterial while off-system roads include rural minor collector and urban local. Eligible project costs are funded at 95 percent federal and 5 percent local agency. Project costs eligible for bridge program funds include preliminary engineering, right of way, construction engineering, and actual construction costs.

Eligibility and priority for funding projects under the bridge program are based on a bridge's sufficiency rating. The Sufficiency Rating is a numerical assessment of a bridge's serviceability and is based on condition assessment inspection and inventory data. Its value varies from 0 to 100, with 100 representing no deficiencies. A bridge is eligible for replacement when its Sufficiency Rating is less than 50 and is eligible for rehabilitation when its Sufficiency Rating is less than 80.

4.11 Project Scope (Continued).

In addition to meeting the sufficiency rating requirement, a bridge must also be classified as either Structurally Deficient or Functionally Obsolete.

A bridge is considered Structurally Deficient when key elements reach an established level of deterioration. A bridge is considered Functionally Obsolete when it no longer adequately serves the road it carries.

Replacement projects include constructing a new bridge in the same general highway corridor that the existing bridge serves. The bridge does not have to be built at the same location as the old bridge, but the old bridge must be removed. A nominal amount of approach work, sufficient to connect the new facility to the existing roadway or to return the roadway profile to an attainable touchdown point is also eligible.

Rehabilitation projects generally include widening, strengthening, and/or reconstructing deteriorated elements. A rehabilitation project must correct the deficiencies making the bridge eligible for Bridge Program funds. Major safety defects must also be corrected as part of a rehabilitation project.

Betterments. Improvements that are beyond normal maintenance and outside the scope of preservation projects are addressed as betterments. Through its Betterment Program, the department provides a district level budget for such improvements that covers a wide range of work. Much of the work in the betterment program is accomplished directly at the district level but some of these projects are designated for incorporation into a headquarters contract. If during the development of a betterment project it becomes apparent that a substantial change to the scope or cost is required, the project must be returned to the originating district for further disposition. Any proposal for a value added scope change to a betterment project must be submitted by the proponent, in writing, to the Assistant Director, Operations for approval. Betterment projects usually are not allowed to jeopardize the schedule of the headquarters contract.

Enhancements. Transportation enhancements are transportation-related activities that are designed to strengthen the cultural, aesthetic, and environmental aspects of the nation's Intermodal Transportation System. There are twelve eligible transportation enhancement activities. The most common of these are facilitates for pedestrians and bicyclists and landscaping. Program Development oversees the selection process for these projects. New projects are selected every other year. The funding for the project is limited to what was originally approved. The majority of these projects are completed under the Local Public Agency Program but some may be completed as a normal NDOT project.

Off-system. The more common types of off-system projects are bridge replacements, landscaping, lighting and sidewalks, and bikeways. Locally owned (off-system) routes for which NDOT is providing funding, be it federal or state, are to be designed to the local agency's current approved standards. If they have none, Green Book standards or the AASHTO publication, "Guidelines for Geometric Design of Very Low-Volume Local Roads" will apply.

4.12 Public Involvement.

Public meetings. The NEPA requires involving the general public in the development of capacity projects. These requirements are addressed during the project development phase in cooperation with the Environmental Division and the FHWA. The following is the description of the general types of meetings:

Location public hearing is a public hearing held when the project involves a new location for which feasible alternatives can be developed before the route location is approved and before the department is committed to a specific proposal.

Design public hearing is a public hearing held for a project following a location public hearing and location approval, but before the Department is committed to a specific design proposal. It is held to ensure that an opportunity is afforded for effective participation by interested persons in the process of determining the specific location and major design features of a federal aid highway and it provides a public forum that affords a full opportunity for presenting views on major highway design features, including the social, economic, and environmental concerns as well as other effects of alternate designs.

Location / design public hearing is a public hearing held for a project for which the alternatives are limited to a single feasible location as determined by public involvement, terrain, or development restrictions. Generally, there are a limited number of relatively minor alignment alternatives available on a basic location. This meeting is used when an improvement on an existing facility requires significant right-of-way acquisitions or there are adverse impacts to adjacent property. Adverse social, environmental, and economic impacts are also discussed during these meetings.

Opportunity for public hearing is a public notice that is provided to advertise a planned project when the proposed project has apparent local support and/or minimum impact. This is determined from public input to the intent-to-study notice and from informational meetings. The notice of opportunity for public hearing will advise the public of the pending project, where information is available, and how a hearing may be requested, including the time limitation on receipt of such a request. If a request is not received by the deadline, the project proceeds directly to the applicable approval action without a hearing. There may be occasions when only one or a few requests for a hearing will be received in response to the opportunity notice. In these instances, it will be permissible to meet with the parties at some convenient location to explain the project and answer any questions. If satisfied, the requesting party may withdraw the request for the hearing in writing. The proceedings must be documented and made a part of the project record. If the requesting party does not wish to withdraw the request, an appropriate hearing may be held. If not held, the Nevada Department of Transportation must document reasons for not holding a hearing and this will be made a part of the project record. Federal Highway Administration concurrence will be required.

Informational meeting is a meeting in either a formal or informal setting, depending on its intended audience, at which the objective is to present, receive, and/or exchange information. These meetings are useful for special interest groups, neighborhood associations, and advisory committees in particular. Informational meetings are noticed in a manner appropriate to the intended audience. Appropriate notice shall be no less than 15 days, circulated in adjudicated newspaper(s) for meetings of general purpose; and could be several days' telephone contact for small, cohesive organizations. Generally, these meetings are most effective early in the project planning so that citizen responses can be evaluated prior to any commitment being made.

Intent to study letter is a letter describing the preliminary concept of the project (usually containing a location map or sketch of the project area), the details of any scheduled informational meeting, and requesting expressions of concern or special knowledge from the addressee. These letters are sent to affected federal, state and local agencies, political leaders, recognized special interest groups, and concerned/affected citizens.

Scoping is a study management technique specified in 40 CFR 1500 et seq. To provide "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." The use of a widely distributed intent-to-study letter, together with an informational meeting(s), constitutes the Nevada Department of Transportation scoping process.

4.12 Public Involvement (Continued).

Preservation projects. On preservation projects the Department is obligated to coordinate certain improvements or project activities with the public. Associated public meetings are arranged through the Public Meeting Officer and are usually very informal. The public involvement section on information meetings provides guidance on this aspect of coordinating projects with the public. Some improvements that may require such meetings with the general public are:

- Changes to access
- Closing a median opening; leaving right in, right out access only
- Restricting left turn movements with a “worm island”
- Elimination of on-street parking
- Addition of lighting
- Establishing contractor working hours

Procedure. Once the need for a public informational meeting has been determined, the Public Meeting Officer must be involved to provide guidance and assistance on the appropriate procedure. The Public Meeting Officer must be involved with any informational meeting. They will find a place for the meeting and arrange to have a stenographer on hand to record public input. Their experience and skills are essential in planning, conducting and completing a public informational meeting process that meets departmental standards.

Requirements. On projects that require an information meeting, an intent-to-study letter will be sent to affected agencies, political leaders, special interest groups, and known concerned or affected citizens. The intent-to-study letter is sent as early as possible in the project development process. The purpose is to identify the scope and significance of issues to be addressed.

Informational meetings will be held when deemed necessary and appropriate, usually early in the project development process. Information developed and obtained from these meetings is useful in determining whether or not a formal hearing is necessary or required. These meetings are very useful for informing the public of proposed projects and obtaining information on controversy and issues that may arise in the project development process.

Projects having significant social, environmental and/or economic impacts or other significant impacts to abutting communities and resources will require public meeting(s). These projects normally require an Environmental Impact Statement (EIS). Hearings will be held at a convenient time and location to maximize public participation and coordinated with Environmental Services.

On other projects that are processed with an environmental assessment or categorical exclusion, hearing requirements will be determined on a case-by-case basis. Hearings will be held at a convenient time and location to maximize public participation. The following criteria will be considered in determining whether one or more public hearing will be required or not:

- Projects that require acquisition of significant right-of-way.
- Substantially change the layout or function of connecting streets and roadways.
- Substantially change the facility being improved, or have substantial adverse impact on abutting communities and resources.
- May have social, environmental and/or economic impacts.

Additional hearing opportunities are to be afforded when there have been substantial changes in the scope of the project, substantial unanticipated development in the area affected by the project, an unusually long lapse of time since the last hearing, and identification of significant social, environmental and economic effects not previously considered at earlier hearings.

4.13 Right of Way Setting.

General. The right of way setting is a formal process to request the acquisition of right of way needed for a project. The right of way setting should take place around the intermediate design when the scope of the project will not change but no sooner than the completion of NEPA process and alternatives selection.

Procedure. On large projects, the Project Coordinator schedules a pre-right of way setting with the Chief Right of Way Agent to orient the project team with the right of way and utility issues. Minutes of the meeting are distributed and incorporated into the final right of way meeting. Projects that require minimal right of way may skip the pre right of way setting at the discretion of the Chief Right of Way Agent.

The final right of way setting covers items generated from the pre-right of way setting meeting and finalizes outstanding issues to set right of way. The need for right of way must be discussed and documented as to the location, the required limits, the duration, and the purpose the right of way is needed.

List and/or indicate on plan sheets, the various right of way takes, along with the existing property boundaries, and existing right-of-way widths. Further indicate all overpasses, staging areas, alignment changes, and other features that will affect adjacent property owners and/or require additional right-of-way. List areas where multiple use of right-of-way is feasible and describe the possible use.

The different types and purposes of right of way to be acquired include:

- TE (Temporary Easement) – a temporary right of use over the property of another. Typical uses are construction, access, geotechnical testing, equipment or material storage, etc.
- PE (Permanent Easement) – a permanent right of use over the property of another. Typical uses are maintenance, drainage, access, utilities, slopes, hydrology retention and detention basins, etc.
- FEE SIMPLE – An absolute interest in land forever without limitation or condition.
- Slope easements – a permanent right to occupy property for the purpose of containing roadway slopes. The easement is dissolved if the property owner raises the grade and eliminates the slopes.
- P/C (Permission to Construct) – Written permission from an owner of land to accomplish specific construction upon that owner’s land. Design is responsible for ensuring information pertinent to the P/C is included on the construction plans. Note: The only time NDOT can pursue a P/C is when the requested work is for the sole advantage of the property owner and is not necessary for the Department’s project (i.e. repaving approaches.)

4.13 Right of Way Setting (Continued).

- "Prescriptive rights" means the Department has openly and continuously operated and maintained a highway for more than five years and though we have no documented rights to the land, we have a right through prescription to continue to operate and maintain the highway. The actual boundary of the Prescriptive Right would be the outer limits of the road surface, slope grading of shoulders, rehabilitation of ditches and dikes, maintenance of fencing and those areas regularly involved in the removal of bush, debris and rock; in short, whatever NDOT forces, or its contractors, have maintained.

- Prior right is a right that has established a legal right to use real property. This right must precede and take precedence over the right of another. Types of documents that may be used to establish the "prior right" or compensable interest are, Franchise Agreements with a local government, Prescriptive Easements, Permanent Easements or Fee Ownership. A company will be reimbursed for its reasonable and necessary expenses only if it has "prior rights".

The Department will perpetuate the existing rights of a utility which is required to relocate a facility because or in accommodation of a project of the department if the utility had a prior compensable interest in the property.

For additional information see Federal Highway Administration's "Highway Utility Guide", Federal Policies

A "compensable interest" under the Federal Policies, means the relocation meets Federal guidelines for reimbursement.

- The utility has a property interest (for example, ownership or an easement) in the land that it occupies before the relocation.

- The utility occupies privately or publicly owned land, including public road or street ROW (right of way), and the HA (Highway Administration) has a legal basis for making the reimbursement.

- The utility occupies publicly owned land, including public road and street ROW, and is owned by a public agency or political subdivision of the State, and is not required by law or agreement to move at its own expense, and the HA has a legal basis for making the reimbursement.

Utilities. Utilities that are impacted as part of a project need to be properly identified and determined if any replacement easements are required. The Utility Division will make the determination of eligibility of compensable interests in accordance with 23 CFR (Code of Federal Regulations) 645 & 646, NAC (Nevada Administrative Code), Chapter 408 and NDOT's Utility Manual. Replacement easements are coordinated between the Project Coordinator and the Chief Right of Way Agent and are shown and described in the right of way setting memo. Identify the need for additional power sources for signals, lighting, irrigation systems, water and phone sources.

R/W setting check list. A copy of the right of way check list is available on SharePoint>Design Division Home Page>Project Development Related Links/Forms>Right of Way Checklist. Following are the items that need to be accomplished prior to a right-of-way setting so that they are addressed at the actual meeting:

- Know what you are going to build and don't change the design.
- Identify and analyze existing permits and project impacts on them.
- Identify and justify any needs or changes for signage.
- Identify and justify any needs for telephone, electrical power and water.
- Request a right-of-way verification and incorporate into drawings.
- Identify utilities impacted.
- Identify and justify any hydraulic needs or changes.
- Identify and justify any control of access needs or changes.
- Identify and justify any maintenance needs or changes.
- Identify and justify any right-of-way needed for the proposed project and its construction needs. This could be fee, permanent easements, temporary easements or permission to construct.
- If appropriate, identify staging area.
- What alternative designs have been considered - - i.e., avoid a park.
- Have environmental approval.
- Have Inter-local Agreement in place and include the right to occupy City or County streets/property during construction.

R/W setting memo. See Section 4.10 on page 33 for developing a right of way memo.

Change of access control (Freeways). See Section 4.11 on page 32 for change of access.

See Section 3.15 for installation of fence around control of access facilities.

4.14 Safety Improvements.

Policy. The need for including safety improvements in the scope of a non-interstate preservation project must be justified by documented crash history. Crash data shall be analyzed to determine appropriate counter measures and, if justified by economic analysis, incorporate them into the contract as funding allows.

Procedure. The analysis of crash history data in conjunction with developing the project scope provides the best opportunity to improve the safety of Nevada's roads by identifying locations where reasonable and effective countermeasures can be deployed. The Designer must work with the Safety Engineer to ensure that adequate attention and effort is given to obtaining, analyzing, and utilizing the crash history data, on projects that involve improvements to existing roads, in accordance with the following procedures:

- The Designer can request crash information by downloading the crash data request form from SharePoint and email the request to crashinfo@dot.state.nv.us. The information for the project limits spanning a time frame of not less than three years will be provided by the Safety Engineering Division. This request should occur no later than four to six weeks prior to the PDFS to allow time for processing and analysis of the data. The early request also allows time to locate the crash data on the PDFS plan set.

- Safety Engineering will contact the Designer when the information has been processed. A safety review meeting should then be conducted to discuss analysis of the data, any noted problem areas, possible countermeasures and sources of funding.

- A Safety Engineering representative will attend the PDFS if appropriate to discuss safety issues and associated counter measures.

4.14 Safety Improvements (Cont.)

- The Safety Engineering Division shall document any recommendations in writing by identifying the priority of a specific problem in relation to other areas Statewide and provide supporting data.

- Where a complete analysis of the project roadsides is required to evaluate the benefits and costs of the proposed countermeasures the Standards Compliance Specialist is responsible for performing such analysis using the AASHTO's Roadside Safety Analysis Program. The Designer shall assist the Standards Compliance Specialist with the analysis by developing and providing the required input data. On low volume roads the time span of the crash history should be increased as necessary to normalize the software to the actual crash experience.

Road Safety Audits (RSA). Road safety audits are requested by the Safety Division. This request normally occurs around the time of the PDFS. The Designer provides plans for the safety audit team to review the project in the field. The Safety Audit Coordinator prepares recommendations to the Project Coordinator for items to be included in the scope of work. The Project Coordinator reviews the items and prepares a final recommendation to the Chief Road Design Engineer for final approval of items to be included in the project.

4.15 Speed Reductions.

Policy. Refer to the Work Zone Safety and Mobility Implementation Guide 2008 edition.

4.16 Structural Sections.

Procedure. The Materials Division develops the structural section design for the project. The Chief Materials Engineer will transmit the approved structural sections to the Project Coordinator by memo. The structural design should be coordinated with the Constructability Engineer and Specifications Writer during the development of the traffic control plan. Identify special limitations for the proposed structural section such as the number of days traffic is allowed on the coldmilled surface, Roadbed modified surface, leveling course, etc.

4.17 Submittal Requirements.

Preliminary plans (conceptual thru preliminary). The purpose of the preliminary plans is to establish the roadway geometrics and to start the other divisions such as Hydraulics and Structural Design to evaluate the proposed alignment information, roadway widths, clearances, etc. Preliminary plans are to evaluate any sight distance issues and present the basic foot print of the project in order to begin indentifying impacts to utilities and right of way.

Submittal requirements require engineering judgment, depend on the type of project, and are subject to the needs of the Project Coordinator and project team. The following are guidelines for what should be contain in a set of preliminary plans and the status of each sheet:

Sheet # and description		Status
1	Title sheets	Completed as practical. Items not needed may include design designation, mile posting, refined index of sheets, and length of construction.
1A.	Location sheet.	Completed as practical. Items not needed may include material sites, mile posting, and structure numbers.
2.	Typical Sections	Completed as practical. Items not needed may include stationing, exact widths, longitudinal sections.
3.	General notes, Summaries and Estimate of Quantities	Not needed.
4.	Plan sheets	Completed as practical. Items not needed may include plan notes, refined cut and fill lines, new right or way or temporary easements, island geometrics, curb ramps, slopes, curbs, gutters, dikes, begin/end construction, utility relocations, temporary detours, refined hydraulic layout, guardrail/barrier rail locations, and control of access.
5.	Profile sheets	Completed as practical. Items not needed are ditch notes and earthwork quantities.
6.	Grading plan	Not needed.
7.	Geometric sheets	Not needed unless it demonstrates any unique changes to geometrics and right of way impacts.
LC1	Location control	Not needed.
SD1	Special details	Not needed unless it demonstrates any unique changes to geometrics and right of way impacts.
SP1	Site preparation (removals)	Not needed unless it demonstrates any unique changes to geometrics and right of way impacts.
L1	Landscape details	Not needed unless it demonstrates any unique changes to geometrics and right of way impacts.
D1	Drainage plans	Refer to NDOT Drainage Manual.
RW1	Right of way	Not needed.
ST1	Permanent striping details	Completed as practical.
TC1	Work zone traffic control	Not needed unless it demonstrates any unique changes to geometrics and right of way impacts.
T1	Signals, lighting, and intelligent traffic systems	Not needed unless it demonstrates any unique changes to geometrics and right of way impacts.
TS1	Permanent signing	Not needed unless it demonstrates any unique changes to geometrics and right of way impacts.
B1	Bridge structures	Front sheet is completed.
S1	Structure list	Not needed.

4.17 Submittal Requirements (Continued).

Estimate. Estimates at this level can be accomplished with "Order of magnitude" which means that detailed bid items and quantities are usually not required. Costs are captured based on the major items that make up approximately 80% of the project costs such as, earthwork, base and surfacing, and concrete structures. Percentages are applied to other items such as traffic control, landscaping, signing, drainage, etc., that make up the remainder of the project costs.

Intermediate plan submittal. The purpose of intermediate plans is to refine quantities, geometrics, and incorporate all information from the other divisions to demonstrate the outcome of the project in more detail. The plans should contain the basic information for all of the possible types of sheets mentioned above. Any special details are also conceptually developed. Most importantly, the plans need to have sufficient information to identify all impacts to right of way and utilities.

The following are guidelines for what should be contained in a set of Intermediate plans and what other divisions should have accomplished:

- Roadway Design details the locations for barrier rail, guardrail, sound walls and retaining walls. All pedestrian facilities and bike plan facilities have been incorporated into the design. Roadway design along with Hydraulics and Structural design compile a list of locations for potholing utilities in conflict. Property boundaries, existing right of way, proposed right of way, and control of access have been sufficiently detailed.
- Any special structures such as retaining walls and sound walls have been forwarded to Structural design. Adequate bridge design and estimates have been completed and provided to Roadway Design.
- Refer to the Drainage Manual for required items and coordination for the hydraulic design
- Geotechnical exploration and analysis are conducted and the draft geotechnical report has been forward to Structures, Hydraulics and Design for design completion.
- The Construction Division along with Roadway Design and the Traffic Division develop a traffic control plan. A constructability meeting takes place and agreement has been reached and documented on how the project will be constructed. Limitations of operations are developed and a draft traffic control matrix is based on traffic control scenarios during each phase of construction. Preliminary time frames and construction sequencing is developed for the length of time temporary easements will be needed.
- Conflicts with underground utilities have been resolved, and any associated adjustments to the proposed project improvements are reflected in the design. Plans for utility relocation work are sufficiently developed to determine any right-of-way needs. Request for water, power and telephone sources for NDOT facilities have been forwarded to utility companies by R/W or District, and preliminary approvals have been returned. In addition, the utility companies have provided plans showing proposed utility relocations.
- Landscaping plans, including bid items, quantities, and notes for specification have been developed. Location of water sources, power and telephone lines have also been identified.
- The NEPA process is complete and a final Record of Decision, FONSI, or Categorical Exclusion have been issued and approved.

Estimate. Estimates at this level are required to be entered into NDOT Integrated Financial System (IFS). Quantities should be refined as much as possible and unit bid prices should be preliminarily reviewed by the Principal Design Engineer.

QA/QC plan submittal. The final set of plans has addressed every aspect of the project and is ready for the QA/QC process. The design squad has cross checked the plans to ensure accuracy and completeness.
The workbook is also updated and organized so it can be given to the QA/QC specialist for checking and cross referencing. The Designer has completed the checklist and placed it in the workbook.

Estimate. Estimates at this level are complete and have been price checked by the Principal Design Engineer and updated in the Integrated Financial System (IFS).

4.18 QA/QC Checklist.

General. This checklist is to aid the Designer/Coordinator to request or provide information to other Divisions. It also is intended to help check or consider important design elements, and to ensure plan content and quality are maintained. A copy of this checklist is to be made available in the front of the project workbook and maintained on a regular basis. A copy of this form can be printed from Sharepoint.

CORRESPONDENCE REQUESTED / PRODUCED BY DESIGNER

	INFORMATION TO BE REQUESTED	REQUESTED FROM
	Mapping / survey	Geodesy, Chief Location Engineer
	Control sheets or check existing alignment	Geodesy, Chief Location Engineer
	Right of way verification	Right of way, Chief Right of Way Agent
	Utility designation/SUE (subsurface underground exploration)	R/W / Utilities, Chief Right of Way Agent
	As-Builts	Contract Records, Construction or District
	Bike checklist	State Pedestrian and Bicycle Program Manager
	Traffic counts / Design designation	Traffic Engineering, Principal Traffic Engineer
	Operation review/Operational analysis (check turn pocket lengths) FAST review and ITS (Intelligent Transportation Systems)	Traffic Engineering, Principal Traffic Engineer
	Railroad crossing (DOT number and R/R mileposts)	Safety Engineering, Railroad Safety Coordinator
	Accident data / guardrail inventory	Safety
	Pipe Survey (to check for corroded pipes)	District Maintenance Engineer
	Structural sections, Core data sheets, and Theoretical applications	Materials, Senior Material Engineer
	Material sites	Materials, Aggregate Lab (for new material sites) OR Right of Way, (for existing material sites)
	Title sheet/Location sheet check	Road systems, Chief Roadway System Engineer
	City master plan	City or county
	Permits (approaches, developments, etc.)	Right of Way Utilities
	Adjust covers	Right of Way Utilities
	Traffic counting loop /speed loops	Traffic Information Systems Manager
	Geotechnical information (retaining walls, etc.)	Geotechnical
	Environmental avoidance areas	Environmental
	BMP's High, Medium, Low	Environmental

4.18 QA/QC Checklist (Continued).

	INFORMATION TO BE REQUESTED	REQUESTED FROM
	Roadside safety review	Standards and Manuals
	Traffic Safety Report / Roadside Safety Audit (RSA)	Traffic, Principal Safety Engineer
	Signals and lighting, Signals analysis/ requirements	Traffic, Principal Traffic Engineer
	Signing and Striping	Traffic, Principal Traffic Engineer
	Check passing sight distance on 2-lane roads	Roadway Systems, Federal Programs Manager
	Traffic control/Constructability meeting minutes	
	Notes to specifications	
	Preliminary, Intermediate, Final review notes	

CORRESPONDENCE REQUESTED / PRODUCED BY PROJECT COORDINATOR

	Program project
	Update STIP/TIP if changes have been made from original operational analysis
	Update Financial Management of changes in scope, advance work of contract, etc.
	Request value analysis study (if over $20 million)
	PDFS invitation memo
	PDFS report
	Traffic Control Plan
	Traffic Operations Plan
	Traffic Management Plan
	Lump sum traffic control exception memo
	Intermediate submittal memo
	Intermediate distribution memo
	Purpose and need statement/ Project description, alternatives
	Review Inter Local Agreements due to constructability
	Speed reduction for traffic control request (temporary or permanent) speeds less than 55 mph
	Check unit bid prices and forward to Principal for final check
	Request out of state permit for traffic control
	Inter squad check of plan sets
	Pre-right of way setting memo
	Right of way setting memo
	Final specs memo (with any special events and notes for limitations of operations)
	Resolution of support from city, co. etc.
	Request for FAA clearance
	Answer RFI/ generate and maintain bid inquiry log
	Tree removal memo

CORRESPONDENCE REQUESTED / PRODUCED BY PRINCIPAL DESIGN ENGINEER

	Geometric approval memo
	>$100 million Financial Management Plan
	Request for access or access change
	Public Interest Finding memo
	Design recommendation memo
	Resolution of Support
	Price Check
	DESIGN EXCEPTIONS
	Design speed, lane width, shoulder width, bridge width, horizontal and vertical alignment
	Structural capacity
	Grades, stopping sight distance, cross slope, super elevation horizontal clearance (other than “clear zone”) and vertical clearance

The following is a checklist to prompt the Designer to review or consider important design aspects of the project:

	DESIGN ELEMENTS
	Operation / Capacity
	Traffic operational report
	Check and update turning movements
	Existing median openings
	Conflicting left turn movements identified and corrected
	Proper island offsets and nose types
	Minimum design widths for turning lanes
	Intersection sight triangle/at-grade intersection sight distance / Approach sight triangle during construction
	Critical length of grade
	Bridge Vertical Clearance for 100 year flood and free board
	ROADSIDE DESIGN
	Review and implement accident data/guardrail inventory (Traffic/Safety)
	Review and implement approved bike checklist
	Establish and check obstacles in clear zone
	Establish and check run-out length for guardrail/barrier
	End / median end treatments
	On ramp/off ramp fill slopes
	Guardrail height
	Guardrail posts (see NDOT’s Standard Plans)
	Mail boxes and turn outs
	Bridge structures (horizontal and vertical clearances)(future build-out)
	Critical slopes (non-recoverable)
	Check sight distance and provide limits and area to landscape architect
	Incorporate roadside safety review and roadside safety audit reports
	Quantities for auxiliary lanes, parking lots, chain up areas and truck lanes
	EARTHWORK
	Shrink ~ swell factors (get from Geotech)
	MSE Backfill
	Ditches and channels
	Suitability of Str. Exc., Roadway Exc., Drainage and Channel Exc. For embankment

4.18 QA/QC Checklist (Continued).

	EARTHWORK (Continued).
	Quantities for turnouts, sign islands, guardrail grading, drainage basins, median crossovers, detours and new approaches
	Quantities for auxiliary lanes, parking, chain-up area, truck lanes
	Select borrow at bridge structures (see Standard Plans)
	Mandatory waste material (as identified by materials)(shown on profile sheets)
	Balance points
	COLDMILLING
	Intersection/approach details
	Correct broken back cross slopes
	Check for drainage issues and build –up overlays at bridge structures (from past overlays)
	Transition milling depth around radius returns at bridges and termini etc.
	CONSTRUCTABILITY
	Median islands or barrier rail removed to accommodate traffic control
	Construction/removal of detour (with appropriate bid items)
	Check if construction staging areas are needed
	Bridge debris
	Temporary construction easements
	Clearances (room to work)
	Equipment access
	Phasing/Staging
	14 foot minimum lane
	Annual permit users
	Conflicts between roadway, drainage, signs, signals, lighting, landscape, utilities, structures, etc…
	HORIZONTAL ALIGNMENT
	Based on establish road type (Interstate, Principal, NHS, etc.)
	Based on established design speed and traffic volume
	Incorporate control from Geodesy / or approved existing bearing source
	Future horizontal considerations (accommodation of lanes under bridges, location of soundwalls, etc.)
	Frontage roads, channels, Power lines and High Mast Lighting
	VERTICAL ALIGNMENT / SIGHT DISTANCE
	Based on established road type (Interstate, Principal, NHS, etc.)
	Based on established design Speed (design speed is developed with Traffic Engineering)
	Coordination with Horizontal Alignment
	Run grades and check elevations
	Intersection transitions
	Spot check grade at intersections
	Spot check grade at the begin and end of each sheet
	Proper vertical clearances at bridges (for new construction consider lighting and signal heads under bridge) to include proper vertical clearances at tunnels
	Drainage considerations at vertical sag

	Based on established design speed
	Considerations on vertical curve
	Considerations on horizontal curve
	Passing (Sag ~ Crest) (considered only on 2-lane roads)
	Stopping (Sag ~ Crest)
	Headlight (Sag ~ Crest)
	Future widening allowing for cross slope elevations to bridge and falsework and high water over roadway.
	Intersection sight triangle/decision making sight distance (usually at intersections or approaches)
	Pedestrian (to include during construction)
	Bicycles and bicycle/shared use paths
	Sight distance impacts due to landscaping features
	SUPERELEVATIONS
	Axis of Rotation (consideration for future lanes)(different axis with or without median)
	Future travel lanes considered in developing super elevations
	DRAINAGE ISSUES
	Barrier rail, curb & gutter, asphalt dike, soundwall
	Construction that may impound additional flows (even a few inches)
	Superelevation or vertical curves where barrier rail or curb is present (change in low points)
	Roadway widening that results in less than minimum cover over culverts
	Restriping which reduces shoulder widths where barrier rail or curb is present (may cause spread violation)
	Widening or flattening shoulders that encroach into adjacent ditches or culvert openings
	Offset crown with islands or dike that trap water
	Approaches or driveways that affect conveyance areas

PLAN SHEET PREPARATION

	TITLE SHEET
	FHWA signature (if full oversight)
	Pull current edition of Title Sheet from server
	Checked by roadway systems and incorporated changes
	R/R milepost/DOT milepost included
	Mileposts are within route section
	Equation for complete route alignment as revised
	Incorporate traffic information in design designation (not required for 3R)
	Contract number before Director’s signature (contract number obtained from Admin Services)
	Director’s signature and correct approval date (on each title sheet for multiple projects)
	Designer and coordinator names and phone number (when location sketch is not used)
	All sheets accounted for in the index of sheets
	LOCATION SKETCH
	List side streets
	Incorporate material deposits (on or off project limits)(Materials if new/right of way if existing)

4.18 QA/QC Checklist (Continued).

	LOCATION SKETCH (Continued).
	Bridge structures and numbers (over 10’ foot span)(need to assign bridge number if none exists)
	Exception areas
	Detour alignments
	Stockpile locations
	Equations are shown and match plan and profile sheets
	Section net; township and range, and county lines
	Railroad crossings
	Designer and coordinator names and phone number
	Cumulative milepost and milepost summary
	Begin/end construction
	TYPICALS
	Incorporate structural sections/rehabilitation recommendation from Materials
	Indicate areas of over excavation with note
	Summary sheets match typicals (widths, depths, and stations)
	Match latest version of structural memo
	Legends match typicals
	SUMMARY SHEETS
	Breakout by project
	Breakouts for county line or third party
	Base and surface (in order of decreasing depth)
	Shoulder material (coldmilling summary)
	Incorporated theoretical material application from Materials
	Guidepost, object markers, raised pavement markings (non-reflective – reflective)
	Earthwork summary
	Standard general notes
	Incorporated core data sheets from Materials
	Miscellaneous coldmilling summary
	Plantmix overrun summary (slope allowances)
	Moisture content for aggregate base (8%)
	Estimate of asphalt and mineral filler for wet ton plantmix items
	Incorporate summary of quantities from Admin Services (generated from OPI2)
	PLAN SHEETS
	Incorporated mapping from Geodesy
	Incorporated permitted features (approaches, developments, utilities)
	Show covers/valves to be adjusted
	Curve data matches alignment, bearings and distances add up
	Bearing equations /station equations / north arrow
	Reference notes to special detail sheets
	Sheets requiring elevation control are shown
	Bearing source if no control sheet is provided (do not reference old contract number)
	Show location of loops, pull boxes, weather sensors (RWIS) and WIMS
	Show existing /new pipes and inlets (show size, length, skew angle and headwall type)
	Cut and fill slopes shown
	Legends are correct
	Proper section net and labels
	Right of way dimensioned and labeled (if no R/W sheets)
	Incorporate verified right of way
	Permission to construct dimensioned and labeled. P/L on plan sheets even if there are R/W sheets.
	Is work within right of way (permanent signs, pipes, slopes, etc.)
	Construction notes match structure list
	Begin and end limits match title sheet, location sketch, etc. (begin and end construction is shown if different from project limits)
	Avoidance areas shown
	Show fenced areas, control of access, etc.
	Show Limits of paving and plantmix miscellaneous areas
	Ditches, dikes, channels, etc…, are shown and labeled
	Review and implement pipe condition report
	3rd party work identified on plans
	LVVWD signature block (for details or notes that reference Las Vegas Water District)
	Soundwalls, retaining walls, concrete barrier rail, etc.
	Milepost diamond – match lines if required – split sheets as appropriate
	PLAN AND PROFILE SHEETS TO INCLUDE FRONTAGE ROADS, SPECIAL DETOURS, UNDERPASS/OVERPASS and INTERCHANGES
	Ditch notes
	Show ditch grades if different from mainline profile grade
	Superelevation annotation (axis of rotation, transitions, edge of oil)
	Line designation shown and station equations
	Earthwork notes (sources such as roadway excavation, borrow embankment) and quantities
	Show limits of bridge, pipes, cross streets
	Show limits of select borrow at bridge structures
	Structure numbers shown
	Street names
	Profile for ramps are shown or referenced
	Spot check grade at beginning and end of each sheet
	Check main line profile grade against intersections and cross roads (does it require grading plan)
	Show vertical curve location and information, vertical point of intersection, and tangents
	Temporary detours
	Removal of detour addressed in documents
	Provisions for temporary drainage
	GEOMETRICS AND ELEVATION CONTROL SHEETS
	Spot elevations and offsets
	Establish control point if different than face of curb (such as retaining walls)

4.18 QA/QC Checklist (Continued).

	LOCATION CONTROL SHEET (from Geodesy)
	Insert project number and sheet numbers
	Check project limits
	Perpetuate monuments
	SPECIAL DETAILS
	Sections for miscellaneous work (such as islands, patching, etc)
	Reference to material types, properties, etc.
	SITE PREPARATION/REMOVAL SHEETS
	Proper legends
	Removal depths and limits properly shown
	Project limits match plans
	Identify removals if by third party
	Quantities are coordinated and checked for overlap
	Quantities included in estimate
	LANDSCAPE AND AESTHETICS DETAILS
	Index of sheets are updated
	Quantities are coordinated and checked for overlap
	HYDRAULIC DETAILS/QUANTITIES
	Accounted for in the index of sheets
	Quantities are coordinated and checked for overlap
	Quantities are in the estimate
	RIGHT OF WAY
	See the index of sheets
	PERMANENT STRIPING SHEETS
	Cat tracks for dual lefts
	R/R crossing symbols at crossings
	Pavement Markings
	Raised pavements markers (District I)
	Striping at gores and islands
	Striping color and width identified to include bicycle lanes and symbols
	Striping by state forces (identified on plans)
	Auxiliary lanes
	Check with district for striping type (film, waterborne, or epoxy)
	Striping for ramp metering
	TRAFFIC CONTROL
	Phase/stage diagram
	Traffic control device matrix
	Incorporate items from traffic control meeting notes
	Bid item(s) to remove detour
	Pedestrian accommodation
	Legends
	Cover existing signs in conflict
	Show direction of traffic
	Temporary striping sheets if major changes to existing striping
	Overhead power lines or other utilities in conflict with construction
	Check turning movements
	Flagger hours, R/R flagger hours, and uniform T/C officer from construction division
	Traffic control supervisor
	SIGNALS, LIGHTING AND INTELLIGENT TRAFFIC SYSTEMS
	Index of sheets are updated
	ADA access for push buttons
	New signs have borrow or aggregate base for sign islands
	PERMANENT SIGNING
	New signs have borrow or aggregate base for sign islands
	BRIDGE SHEETS
	See the index of sheets
	RETAINING WALLS AND SOUND WALLS
	See the index of sheets
	BORING LOGS
	See the index of sheets
	STRUCTURE LIST
	Items accounted for in engineers estimate and summary sheets
	Sub totals and use totals add up
	Use totals match engineers estimate
	Break out by project
	Separate construction notes by type of work if appropriate (Guardrail, adjust covers, fence, pipes)
	Reference to special details or plan sheets
	Conforms to standard construction note format
	3rd party work identified by breakout (usually for utility adjustments)
	Breakout for separate county's
	Coordinate use totals with other structure lists and summary sheets
	ESTIMATE CM14 AND CM18
	Prices check by Senior and Principal (CM14)
	Breakouts and funding checked by Financial Management and Project Estimation Specialist (CM18)

4.19 Value Analysis.

General. Value analysis (VA) establishes a program to improve project quality, reduce project costs, foster innovation, eliminate unnecessary and costly design elements, and ensure efficient investments by requiring the application of VA to all federal aid highway projects with an estimated cost of $25 million or more, and any federal aid bridge project with an estimated cost of $20 million or more. In accordance with the federal-state relationship established under the federal aid highway program, NDOT is responsible for conducting a VA on all applicable projects and ensuring that all resulting approved recommendations are incorporated into the plans, specifications and estimate. VA is based on the concepts of value engineering which is the systematic application of recognized techniques by a multi-disciplined team to identify the function of a product or service, establish a worth for that function, generate alternatives through the use of creative thinking, and provide the needed functions to accomplish the original purpose of the project reliably, and at the lowest life cycle cost, without sacrificing the safety, necessary quality, and environmental attributes of the project.

Value analysis can occur anytime during the design process and multiple studies are sometimes conducted on a project. An early VA can be used to help determine and develop alternatives for an EA or EIS and a second one during the final design phase to fine-tune the project. The outcome of value analysis is often cost reduction, but the primary focus is value improvement.

More information from the FHWA on value analysis is available on http://www.fhwa.dot.gove/ve

Policy. It is NDOT's policy to conduct value analysis on any project on the National Highway System that has an estimated construction cost of $25 million or greater. Consider applying value analysis in all functional areas of projects having an estimated construction cost greater than $10 million.

The requirement is that a study be made during the project’s design however, performing a study before the design is adequately developed does not meet the law's intent to "redesign the project using different technologies, materials, or methods" since these terms apply more to specific design features than to the development processes. Whether or not a VA adequately evaluates a project's design is made on a project-by-project basis by NDOT management and/or FHWA field office.

Procedure. The Operations Analysis Division staff coordinates and conducts the value analysis studies, maintains an on-call list of certified value specialists with the Administrative Services Division, and manages value analysis consultant agreements. The candidate projects should be selected after the Transportation Board’s approval of the Statewide Transportation Projects Workbook (STPW), but not later than January 1 of each year.

Ideally, two studies should be performed on each qualifying project. The first analysis should be done early in the development phase to help minimize project impacts, develop an EIS or ROD, decide the best type of facility to build, and pinpoint its location. The second study should be performed before the right of way setting to address design issues (geometrics, drainage, construction staging, traffic control, signalization, roadbed design, structure details, etc.)

5.1 Engineering Support, Divisional Resources and Other Agencies.

General. This Section describes the type of services and design support provided by each division. It also describes the type of correspondence or information that may be exchanged between the Design Division and the other divisions listed below. For a listing of all divisions, names of individuals, and work titles go to SharePoint and the respective division.

5.2 Accounting.

General. The Accounting Division is responsible for the overall administration of the accounting function within the department. The division is comprised of Operations, Payroll, and Project Accounting. The Accounting Division reports to the Assistant Director, Administration.

Agreement close out. An agreement report is issued by the Administrative Services Officer on a quarterly basis. The Project Coordinator reviews the listing of agreements to see if they can be closed out or if they need to be amended. If the agreement is receivable, the Project Coordinator contacts Accounting to see whether or not there are still any monies associated with that agreement that have not yet been received. At that point, they will determine whether or not the agreement can be closed and if it can be, the Accounting Division will start the process. For all other agreements, the Project Coordinator needs to determine what the status of the agreement is. If the coordinator feels they should be closed, contact Design's Administrative Assistant to see if a final audit is pending or was requested. If no audit was done, a memo is sent to Internal Audit requesting the final "post" audit review. (cc the office Administrative Assistant on that request). When Internal Audit agrees to close out the agreement, contact the office Administrative Assistant so they can start the agreement closeout process.

5.3 Administrative Services.

General. The Administrative Services Division reports to the Assistant Director, Administration, and has six major areas of responsibility: the Building and Grounds Section; Purchasing and Reproduction Section; Records Management Section; Over-Dimensional Permits Section; Agreement Services; and Contract Services.

Agreement coordination. The Project Coordinator coordinates any agreements through the Agreement Services Section to ensure proper review and execution of the document. See Section 6.4 for developing agreements.

Over dimensional permits. The Designer is to notify over dimensional permits of any permanent design features and temporary traffic control measures that may limit certain vehicles, especially over-dimensional vehicles. Report the following situations to advise the Over Dimensional Vehicles Permits Office in writing at: OverDimensionalPermitsOffice@dot.state.nv.us:

- Separated and protected single travel lane; either direction including shoulders ≤ 20 feet.
- Opposing and unprotected single travel lanes; both directions including shoulders ≤ 30 feet.
- Separated and protected double or more travel lanes; either direction including shoulders 30 feet.
- Opposing and unprotected double or more travel lanes; either direction including shoulder ≤ 30 feet.
- Number, direction and width of each travel lane (not including shoulders).
- Maximum width and direction including all available travel lanes and shoulders, between planned temporary barriers and/or road cones (if applicable).
- Whether restriction is delineated by immovable walls, temporary walls, or road cones (if applicable).
- Height and location of highest barrier (if applicable).

Central Files. The central records section of the Administrative Services Division maintains the department's official records. These files include:

- A copy of the Design Division's archive of all pertinent project computer files on CDROM as they existed at the time the contract is awarded. All archives include the project design files and the special provisions and later versions also include the applicable standards.
- The complete project files are stored in central records, upon completion of the contract for 3 years. Select materials, such as construction change orders, are archived for 7 years. These files include the project workbooks and any information that was not incorporated into the contract documents such as cross sections, mass haul diagrams and BMP provisions.
- A set of contract plans marked up by the resident construction engineer to note differences between the design and the actual construction of the project. These plans are commonly referred to as "as built" or "as constructed" plans.
- Copies of the contract change orders.
- A complete set of contract documents as awarded including supplemental notifications.
- The Resident Engineer's field books.

Central files keep a record of any archived material that has been checked out and annually notifies recipients to return any overdue files. The recipient has the option of returning the material or checking it out for a longer period of time, and is responsible for returning all archived material to its proper place and in good condition.

5.4 Construction.

General. The Construction Division provides advice and assistance regarding highway construction, including engineering inspection of construction activities, constructability and guidance in the development and adoption of new and improved highway specifications. The Construction Division also provides the contract working days for inclusion into the special provisions for the contract. The Construction Manual and the Documentation Manual, which is on file with various design squads, details the division's operational policies and procedures. This division reports to the Assistant Director of Operations and has overall program authority, including the administration of statutory regulations and departmental policies that involve contract activities. As part of this overall program authority, the Construction Division provides assistance and advice regarding highway construction inspection and field testing; guidance in the development and adoption of new highway specifications; and oversight of contract change orders, dispute resolution, and claim resolution. This division is divided into four sections: Contract Compliance Section, Quality Assurance Section, Constructability, and Construction Administration Section.

5.4 Construction (Continued).

Contract Compliance addresses Equal Employment Opportunity, civil rights and labor issues and administers the Disadvantaged Business Enterprise (DBE) program. Quality Assurance provides oversight of construction procedures and practices, field-testing and equipment, independent assurance testing, and training of field personnel.

The Contract Administration section provides oversight of contractor payments, project documentation and coordinates construction consultants.

Constructability. The Designer coordinates with the Constructability Section for the development of traffic control plans. This section also helps develop the Limitations of Operations (108.04) and Accommodations for Public Traffic (624) in conjunction with the Designer, specifications and traffic. Complicated construction projects, such as urban 3R projects, capacity, and new construction, should involve the constructability section in the design process to ensure the project can be constructed within existing or proposed right of way and proposed cut and fills, alignments, bridges, and drainage facilities need to be constructed in certain sequences. They also develop working days, time related overhead, and traffic control supervisor hours for inclusion in the contract.

Change orders. Changes requested by the Design Division come from the Chief Road Design Engineer who forwards a memo to the Chief Construction Engineer requesting the initiation of the necessary revisions. A copy of the memo should be forwarded to the District Engineer and the Resident Engineer. The design squad prepares the construction details and quantities for these change orders, and any design related change orders requested by the Construction Division, upon approval of the Chief Road Design Engineer. The request shall include sufficient detail to convey the exact nature of the change and the affected work units. Additional drawings, quantity calculations and other supporting information should be attached to the request. If a change order requires reissuing a previous plan sheet with changes to that sheet, the top right corner of the new sheet should show a revised date and the word ”revised.” If the change requires a new plan sheet, the top right corner of the sheet will show the following information: CHANGE ORDER No. # (the number is provided by the resident construction engineer) and the date.

No major changes or major extra work will be performed on Full oversight Federal Aid construction projects without formal approval from the FHWA. Approval will be made through from FHWA01365 by the Construction Division. Refer the Construction Manual for additional information.

Pre-construction review. The Construction Division schedules pre-construction reviews to cover certain aspects of the contract documents with the contractor. The Designer and the Project Coordinator usually attend these meetings as they are scheduled. Roadway answers related questions and helps trouble shoot discrepancies in the plans.

Post construction review. When a contract nears completion, Road Design Administration automatically receives an email from the IFS. The Project Coordinator and the Standards Compliance Specialist are then notified in order to prepare for a post construction review meeting. Each appropriate division or section is normally invited to participate for contracts that have significant work on bridges, hydraulics, aesthetic and traffic facilities. Once construction of the contract has been completed the Construction Division will schedule the meeting to occur no later than 90 days after completion of the work. At the discretion of the Resident Engineer the contractor may be invited to the meeting.

The goals of the post construction review meeting generally are to: [a] improve future designs through discussion of change orders, field adjustments, plan deficiencies and constructability problems, and [b] assess new designs, products and procedures by evaluating associated construction problems and successes. The Construction Division is responsible for scheduling, facilitating and documenting the meeting and its outcomes. The Project Coordinator may need to prepare a memo to the Chief Road Design Engineer to follow up certain issues as reported by the Construction Division.

Copies of this memo are sent to the Resident Engineer, Assistant Chief Construction Engineer, District Engineer, Standards and Manuals supervisor, and Principal Design Engineer.

The Resident Engineer will keep a punch list of items during the life of the project that should be addressed during the post construction review. This punch list should be sent to all participants one week prior to the review so that appropriate personnel and information may be available during the review.

The Assistant Chief Road Design Engineer prepares an annual summary of the resulting design process improvements for the Standards and Manuals Engineer to incorporate into the Design Guide. If necessary, a meeting with design personnel will be conducted to further explain problems encountered and to brainstorm other potential solutions.

5.5 Districts.

General. The state is divided into three districts with sub districts for the purpose of administering the transportation program on a local level. A District Engineer is appointed to manage each district and ensure that the state’s interests are fully considered and protected in their district. The main responsibility of the district engineer is the administration of the transportation program’s construction and maintenance elements. Other responsibilities include encroachment permits, minor traffic studies and traffic control review. A Deputy Director is stationed in the Las Vegas metropolitan area to represent the department’s general interests in that area.

Construction. Each district has an Assistant District Engineer that oversees the construction operations through the Resident Engineers that are directly responsible for the implementation and administration of construction contracts. This is generally to ensure that the contractors construct the various elements of the contracts in accordance with the plans and specifications. The headquarters construction office establishes the policies and procedures used by the districts for the administration of construction operations.

Field visits. If it is necessary to review the project during construction, the Project Coordinator should notify the Resident Engineer prior to the review as a courtesy.

Maintenance. Each district has an Assistant District Engineer that oversees the maintenance operations through the maintenance superintendents that are directly responsible for maintaining the condition of the state’s road system. The headquarters maintenance office establishes the policies and procedures used by the districts for the administration of its maintenance operations. Each district has remote maintenance stations to facilitate the upkeep of Nevada’s extensive road system.

Pipe condition survey. The District Engineer is responsible for identifying deteriorated culverts prior to the PDFS and providing that information to the design team. The Designer provides the District Engineer a set of plans along with a written request to examine the pipes within the project limits to locate any culverts that are in poor condition or that may not be properly functioning. Example documents can be found on SharePoint>Design Division Home Page>Project Development Related Links/Forms>Standard Project Memo Templates.

District contracts. Guidance for developing district contracts can be found on SharePoint>Design Division Home Page>Project Development Related Links/Forms.

5.6 Environmental Services.

General. Responsibilities of Environmental Services during the preconstruction phase are to ensure the Department complies with the National Environmental Policy Act (NEPA) process. This includes preparing and processing Categorical Exclusions (CE), Environmental Assessments (EA), Environmental Impact Statements (EIS), and Record of Decision (ROD). Other work performed includes:

- Completing environmental studies, documentation and coordination for permits and clearances.
- Determining mitigation measures for environmental impacts from NDOT projects and ensuring they are included in project construction contract documents.
- Arranging, advertising and conducting public involvement activities in accordance with NDOT policies and Federal-aid project requirements for projects processed under NEPA.
- Obtaining permits and clearances for material sites.

Coordination. The Designer is to provide Environmental Services a set of plans along with the approved PDFS report so they can obtain necessary permits or clearances. For complex projects such as new construction, capacity projects, sound walls, etc., early and periodic coordination will need to occur during the preliminary design phase in an effort minimize environmental impacts.

5.7 Financial Management.

Programming section schedules the project in PSAMS; programs, monitors, and revises federal aid and state-funded preliminary engineering, right-of–way and construction projects; prepares requests for special federal aid funds; formulates, monitors, maintains and controls a complete accounting system of apportioned and allocated federal aid highway and transit funds and all state funds authorized for preservation and/or improvement projects; maintains and controls project index and scheduling systems; and prepares quarterly FHWA audit reports.

Budget section is under the general supervision of the Director and the Deputy Director, plans and organizes the activities associated with NDOT's budget planning, revises departmental annual budget work program and executive biennial budget, preparation, and execution. They also prepare financial forecasts of gas and motor vehicle tax revenue, highway funds and project expenditure rates. Funding for the department's operation is controlled by a line item biennial budget. This budget is prepared by the Financial Management Division and approved by the Director, Transportation Board and the Nevada State Legislature. Although the legislature approves a biennial budget, expenditure allocations are assigned on a fiscal year basis (July 1 through June 30 for State funds). Annual budgets are used to plan and control expenditures for a fiscal year unless modified by the Interim Finance Committee. Federal fiscal year is from October 1st through September 30st.The deadline to obligate for federal fiscal year is August 31st.

Programming. When a project is ready for engineering and related services to start, the Project Coordinator submits a programming and scheduling form to Financial Management. A project must be on the STIP to be programmed for federal participation and must either be in the annual work program or have written approval from the director to be programmed for state funding. Financial Management then assigns a project identity number and a project number, and allocates appropriate funding to the project. Newly scheduled construction projects should appear on the next project status report. The programming and scheduling form and instructions can be found on SharePoint>Design Division Home Page>Project Development Related Links/Forms

Budget scope change form. Any additional cost from the time the project is first programmed, a budget scope change form is issued to update costs, schedule or budget. Changes in costs greater than $250,000 or 20% of the project, whichever is less, is prepared by the Project Coordinator and forwarded to Program Development and Financial Management for approval. The form must also be completed by July 1, for federal projects scheduled for advertisement before October 1 of that same year.

The Right of Way Division may request the Project Coordinator to update the cost for right of way acquisitions and utilities as their estimate is developed.

The Budget and Scope Change Form and instructions are found on SharePoint>Design Division Home Page>Project Development Related Links/Forms.

Preliminary estimates. When the processing memo has been issued and a contract number has been assigned to the project, a preliminary estimate (CM 18) is generated and submitted to the Management Analyst for their review. The analyst will usually make comments concerning breakouts and makes necessary changes to the financial screens.

Instructions and procedures for developing estimates are found on SharePoint>Design Division Home Page. Updated unit costs can be found on SharePoint>Design Division Home Page>Project Development Related Links/Forms>Consolidated Monthly Materials Cost Table.

5.8 Legal.

General. The Legal Division is essentially NDOT's attorney. The division reports to the Director or Deputy Director and can be involved in almost every aspect of work being done by NDOT. It handles such issues as eminent domain, tort litigation, personnel matters, construction contract matters, project design and related issues, property acquisition and property disposals. Personnel matters may include civil rights, dismissals, demotions, and sexual harassment. The Legal Division provides counsel, advice and opinions for all divisions of NDOT. It prepares or reviews all agreements for the department and furnishes assistance to District Engineers and Resident Engineers in any legal problem that may arise. It also furnishes assistance in preparing for, attending, and defending the adequacy of public hearings and administrative regulations. In cooperation with other department personnel, the Legal Division develops proposals for legislative action to amend, add or repeal portions of the Nevada Revised Statutes to conform to federal legislation, regulations, or directives and to further enable the department to carry out its required duties. This division defends against all inverse condemnations, injunctions and restraining orders and represents the state in personal injury and property damage cases (torts) including those citing improper highway design. It also reviews manual changes, advises on how to handle collections, reviews specifications when necessary, and reviews wording in deeds, contracts and other right-of-way actions.

5.9 Location.

Mapping request. The Designer requests mapping through the Chief Location Engineer with a copy to the Chief Surveyor. The requests for location services should be in memorandum form, stating the nature of the services and timeframe for delivery. For additional information when requesting mapping, refer to the Special Instructions for Survey, Mapping or GIS Consultants Manual The Location Chief will normally respond to the request of services within 3 business days from the initial requests, or respond as to the reason for the delay in delivery of the estimate.

Request alignments. Existing alignments and retraced centerline alignments are requested from the Chief Location Engineer. Location control sheets are made part of the contract plans. See Section 7.15 for examples. Location does not normally provide ramp alignment information; the Designer will need to best fit the ramp alignment from previous contracts to the retraced mainline alignment.

5.9 Location (Continued).

Alignment coordination. Office generated alignments and modification to existing alignments need to be checked by the Chief Geodesist around the intermediate design level. Location will verify that the correct control sheets are in the plans during the intermediate review. It is important to make certain that any right of way acquisitions use the same adopted centerline alignment.

Monuments. The Location Engineer is responsible for the establishment and preservation of monuments. The Designer reviews the control sheets provided by Location and determines if any monuments will be disturbed by the proposed scope of work. If required, a bid item to perpetuate survey monuments are listed in the structure list with the appropriate station and offset.

5.10 Maintenance and Operations.

Traffic operations. When determining what traffic planning information is applicable to the project, the needs of pedestrians, bicycles, mass transit and motor vehicles during permanent and temporary (work zone traffic control) circumstances should be considered. The analysis of traffic operations is normally carried out by the Principal Traffic Engineer over traffic operations analysis. The types of traffic information that can be requested include:

- Traffic Impact Study Reviews & Comments
- Speed Study Reviews & Approvals
- Signal Warrant Reviews & Approvals
- All Related Highway Capacity Analysis
- Coordination with Planning for B/C Analysis on Major Projects
- Concurrence with Safety/Traffic Division on Traffic Control Approvals Prior to Advertising
- Input on Traffic Management Plans Associated with the NDOT Work Zone Safety & Mobility Implementation Guide
- Review and Comments on Change-In-Access Reports
- Participation in Performing & Reviewing Project Related Traffic Analysis

The analysis of traffic patterns is necessary to determine the features that will provide efficient operation of the roadway. Once the appropriate number of through travel lanes has been established, the need for special and exclusive use lanes is analyzed to optimize the level of service. The design team coordinates with the Principal Traffic Engineer and incorporates the results into the design. Some conventional design features that require such analysis are:

- Exclusive lanes for turning vehicles
- Adequate storage lengths for turning lanes to avoid blocking through lanes with overflow
- Providing additional length for deceleration outside of the through travel lanes
- Bicycle lanes or paths
- Walkways
- Improving or verifying passing sight distance based on current criteria
- Truck climbing lanes for roads with steep grades
- Turn-outs for roads with heavy recreational vehicle or truck use and few passing areas
- Improving approach geometry or relocating approaches to better locations
- Preventing cut-through traffic with traffic calming techniques
- Turn-out bus stop designs
- Widened shoulders for providing a multitude of operational benefits

AADT projections are needed for three intervals over a 20-year life cycle period: The current, mean and design years. The current year is when the project is expected to open to traffic after all construction is complete. For example, if an interchange project is expected to advertise in 2977 and take two years to construct, the current year would be 2979 and the mean and design years would be 2989 and 2999 respectively.

Any observation of unusual bicycle activity, including high volumes, should prompt the Designer to obtain actual bicycle traffic data. Traffic generators that create intermittent peak demands, such as schools, may require special design considerations. Issues such as capacity, access and inter-modal continuity should be considered when determining what data is required to design an appropriate facility.

Refer to Section 4.5 for policies and procedures, and Section 3.6 regarding the design of bike lanes.

Intelligent Transportation Systems (ITS). This subdivision of Operations is responsible for planning, designing, and reviewing projects associated with intelligent transportation systems. The section is responsible for hiring and managing consulting engineering firms that specialize in this type of transportation engineering. The section also prepares plans for the installation of devices associated with ITS such as ramp meters, dynamic message signs, highway advisory radio, power and communication. They also coordinate with FAST and Southern Nevada RTC and assist Safety/Traffic on Rewriting Sec. 623 of the Standard Specifications.

5.11 Materials and Testing.

General. The materials engineer provides advice and assistance in the exploration; testing and quality control of all material used for construction or maintenance; recommends structural designs for new roads and structural repair or improvement strategies for existing roads; performs chemical and physical tests and investigates failures in trouble spots and determines the causes.

The Materials Division reports to the Assistant Director, Operations and is divided into eight sections: Structural/Chemical, Aggregate/Asphalt/Bituminous Testing, Foundations/Geotechnical, Roadbed Design/Pavement Analysis, Laboratory Services, Las Vegas Testing Facility, and Research.

Aggregate/Asphalt/Bituminous testing section. This section is responsible for processing and analyzing all soils and aggregates samples for specification compliance, providing and approving all bituminous mix designs for maintenance and construction projects, conducting asphalt research, and calculating structural support characteristics of soils.

The Project Coordinator can request updated material site information or new site locations for major projects from the aggregate testing section.

Roadbed Design/Pavement analysis section. This section is responsible for collecting International Ride Index data and friction values for the Pavement Management System, which is used for project prioritization. The data is also used when calculating the Present Serviceability Index, which is a measure of pavement performance. In addition, the Pavement Analysis Section is responsible for researching project histories, conducting Falling Weight Deflect-o-Meter testing, and taking cores of the existing asphalt layer. This section also designs roadbed structural sections and also manages the 3R program.

5.11 Materials and Testing (Continued).

The Materials Division recommends a structural section for all project roadbed improvements. If additional work is added to a project, such as a detour or turn out, the design team needs to request additional recommendations for each proposed improvement. While the materials recommendations are normally used, if the proposed improvement will compromise a critical clearance, weight restriction, budget ceiling or other project limitation, the structural design may be modified, in cooperation with the Materials Division, with approval from the Chief Road Design Engineer. Structural sections are provided to the designer within 60 days of the PDFS.

Geotechnical. The geotechnical section is responsible for exploring, sampling, and testing soils; underlying new and existing roadbeds and structures; locating and performing exploratory sampling of material sites; and conducting special studies. This section also conducts pile load and embankment settlement tests and provides technical support when foundation or soil stability problems are encountered. It also submits depth checks of existing pavement structures, culvert condition surveys, and material deposit survey ties and sketches to the Roadbed Design Section.

The Designer coordinates ditch information (cut and fill slopes), horizontal and vertical information, drainage facilities, and proposed bridge locations on new projects for field exploration. On earthwork projects, Geotech provides the Designer shrink or swell factors.

Consult Geotech for cable rail projects, retaining walls, MSE walls, etc. since they require foundations.

5.12 Transportation and Multimodal Planning.

Inter-model planning. The designer requests information from Inter-modal Planning before the PDFS. Inter-modal Planning can provide information on projects such as any proposed bus lanes or turn outs, ADA improvements and missing pedestrian facilities that should be considered in the scope, and bicycle facilities that are on NDOT's and other Metropolitan and local bicycle plans. They will also provide any known special events that could impact traffic during construction such as bicycle races, triathlons, etc.

Traffic Information. Traffic Information provides the following services:

Traffic counts. In addition to the annual traffic report, Traffic Information can provide updated traffic/truck counts and can also accommodate special requests for traffic volume information. This information can be used for developing traffic control strategies, establishing hours of operations, predicting detour traffic volumes and many other design related tasks. The traffic information analysts also provide additional design designation data for developing designs and establishing criteria levels such as traffic mix percentages and average running speeds. Note that all requests for traffic projections should be coordinated through the traffic Operations Engineer of the Maintenance and Operations Engineering section.

Speed studies. Traffic Information can obtain empirical speed data on existing roads using special equipment and methods. This is especially important when establishing design speeds on roads that have different characteristics than the original design such as changed speed limits, increased traffic volumes or adjacent land development.

Traffic loop locations. Contact Traffic Information for guidance if any existing traffic counting loops will need to be replaced or installed as part of any 3R or new construction project.

Roadway Systems. Roadway Systems provides the following services:

Milepost index. Roadway Systems maintains the statewide milepost index. The milepost index relates the field location of milepost panels with the actual mileage and the engineer's stationing. This should be taken into consideration when contemplating new alignments over existing facilities.

Road-life history. Roadway Systems maintains a history of all improvements made to each section of roadway including all maintenance and contracted work. This is helpful when the Designer needs to know what is there before the materials core report is available.

Road-way systems. To evaluate striping on existing roads for appropriate passing zones, the Designer can request passing zone data from the Roadway Systems Section of the Planning Division.

Passing studies. Roadway Systems can obtain empirical passing sight distance data on existing roads using specially equipped vehicles. This is especially important when establishing striping details on roads that have different characteristics than the original design such as increased or decreased speed limits. Coordinate any changes to existing passing lanes with District, Traffic/Safety Division, and the NHP.

5.13 Program Development.

General. The transportation program is the planning and implementation involved in the development of the state's public transportation infrastructure.

Statewide transportation planning process. The state, in cooperation with local governments, develops the Statewide Transportation Improvement Plan (STIP). Each urbanized area with a population of more than 50,000 individuals may be designated a Metropolitan Planning Organization (MPO), usually titled as a Regional Transportation Commission. An MPO is required to maintain a 20-year Regional Transportation Plan (RTP) and a three-year Regional Transportation Improvement Program (RTIP). The RTIP is usually incorporated unchanged into the STIP. Additionally, the STIP is coordinated with federal, state, regional, Indian tribal and smaller local governments through the Statewide Transportation Technical Advisory Committee (STTAC).

Statewide transportation improvement plan. The Statewide Transportation Improvement Program (STIP) is the instrument used to implement plans resulting from the statewide transportation planning process and must comply with federal guidelines to be eligible for federal participation.

Annual work program. The Annual Work Program (AWP) is a project listing by county for the current fiscal year and also includes information for the short range (3-year) and long range (10-year) elements. The list includes construction projects that NDOT intends to start work on, participate in, or award, as well as any major maintenance initiated by NDOT for the given year(s). The AWP is approved by the State Transportation Board and is considered the department's capital improvement program.

Transportation system projects workbook. The STIP, AWP, the Short-Range Program and the Long-Range Program are all contained in the Transportation System Projects Workbook (TSPW). The TSPW is updated each year and covers a period of 10 years.

5.13 Program Development (Continued).

Local Public Agency (LPA) Program. The Nevada Department of Transportation (NDOT) and FHWA have entered into a Stewardship Agreement, allowing NDOT to assume the responsibilities of the FHWA under Title 23 of the United States Code for the design, plans, specifications, estimates, contract awards and inspection of projects. The Stewardship Agreement further allows NDOT to delegate project review and administration to capable local public agencies. A capable local public agency is one that has mechanisms in place to assure project actions will be carried out in accordance with applicable laws, regulations, and policies. Under the Stewardship Agreement, the FHWA requires NDOT to administer Federal-Aid Highway funds available to a local public agency and to retain oversight responsibilities on projects. Oversight is defined as the act of ensuring the Federal Highway Program is delivered consistent with laws, regulations and policies.

NDOT has further expanded the LPA Program to include state-funded projects selected under the Landscape and Aesthetics Community Match Program. These projects are treated similarly as the federally funded projects in the LPA Program. The federal requirements associated with a LPA project are not required on the Landscape and Aesthetics Community Match Program unless the local public agency is using Federal Enhancement Funds as the required match to the Community Match Funds.

Each project completed under the LPA Program is done through an agreement between NDOT and the local public agency. The design (including the development of plans, specifications, and estimates), advertising, awarding and construction monitoring of a contract is delegated to the local public agency. The local public agency is responsible for completing the surveys and permits required for compliance with the National Environmental Policy Act (NEPA.) NDOT retains the responsibility for providing FHWA with certification the project was completed in conformance with applicable federal laws and regulations.

The main objective of NDOT's LPA Program is to assist local public agencies in completing each project successfully with as little administrative oversight as possible, while ensuring federal and state requirements are fulfilled. This delegation is documented in this manual by defining the procedures NDOT and the local public agency must follow to comply with the intent of the Stewardship Agreement. A project completed under the LPA Program is referred to as a LPA Project.

5.14 Project Management.

General. Project management will normally manage "major projects" with services provided by a consultant or projects that will be designed by Road Design. When a project is designed by a consultant through the Project Manager, Design will provide technical review as requested. Projects that are managed by a Project Coordinator will accept full responsibility for external and internal coordination.

Coordination. The Project manager will coordinate the exchange of information with external entities such as counties, cities, and stakeholders. Road Design will provide technical support and/or engineering services and will coordinate internally with divisions such as Hydraulics, Materials, Environmental, Construction, etc.

5.15 Right of Way Division.

General. The various duties of the Right-of-Way Sections and Districts are outlined as follows:

Engineering section. Prepares mapping for land acquisition, leases, licenses and exhibits; conducts land title searches and related research; calculates land boundaries, highway centerline alignments, easements, land areas and the Public Land Survey System; writes legal descriptions of land; certifies material sites for NDOT construction projects; prepares applications for well permits from the State Engineer; and retains, maintains and is a public information office for all NDOT past and present land interests.

Appraisal review section. Examines all completed appraisal reports and conducts on-site investigations to determine completeness, validity, accuracy and correctness of material for approval of the reports or establishing the Reviewer's estimate of just compensation. The review section is also available for appraisal assignments.

Right-of-Way control section. Assists in the preparation, monitoring, and maintenance of the Right-of-Way Division's annual budget; gathers and compiles project cost estimates; programs funding for various right-of-way acquisition projects; monitoring of all Right-of-Way and Utility payments and processing of revenue receipts; preparation and maintenance of various Right-of-Way Control Ledgers; reviews and audits various reports for accuracy; and prepares and transmits various bills to other entities for their participation in project expenditures.

Northern Right-of-Way District. Provides appraisal, negotiations, relocation and property management services for the northern operational area. The Northern Right-of-Way District is located in the Department of Transportation Headquarters Building, Carson City.

Southern Right-of-Way District. Provides appraisal, negotiation, relocation, and property management within its area of responsibility. In addition the Southern Right-of-Way District has a utility relocation responsibility which includes negotiating utility and railroad adjustments performing required field inspections of such work underway for cost documentation, traffic safety and compliance with construction quality and location purposes and performs permit and field surveillance, under the direction of the Supervisor of the Utilities Section, related to outdoor advertising control. The Southern Right-of-Way District office is located in the District I complex, Las Vegas.

Right of way verification. The Designer requests right of way verification from Right of Way Engineering once the base plans have been developed with alignments and existing right of way limits. A set of plans is forwarded to the Chief Right of Way agent with a memo requesting this service. The plans are usually red lined with corrections and sent back to the appropriate Designer to update the right of way.

5.16 Utilities Section.

General. The Utility Section is a section of the Right of Way Division. The primary purpose of the Utility Section is to determine and arrange for the resolution of conflicts between proposed highway construction and existing and proposed utility facilities. Additionally, this section coordinates construction of highway projects with railroads that may be affected and arranges for the extension of new service lines or modification of existing service lines. This Section also coordinates the permitting of undocumented rural approaches on reconstruction projects.

The Utilities Section does not provide an engineering function, but serves as the liaison between NDOT Design engineers and utility and railroad company engineers to ensure that all potential conflicts are noted and that suitable arrangements are made to resolve the conflicts. This is accomplished through the relocation of utility or railroad facilities or the modification of NDOT design proposals to avoid conflicts, whichever is most cost effective for all parties. Although not engineering personnel, Utilities Section representatives do have experience and a basic understanding of the general requirements and capabilities regarding a wide range of utility facilities and engineering practices.

Coordination. Early in project development, the Utilities Section requests plans that include information such as alignments, edge of oil, cut and fill lines, design mapping, right of way lines and section net in order to locate and provide alignments of all utilities within the project limits. These plans will be sent to either the Utilities Section at headquarters for northern projects, or the District Right of Way office in Las Vegas for southern projects. The plans will then be provided to the appropriate utility inspector who will locate and plot the utility facilities (type, size, horizontal locations) on the plans. The inspector, in conjunction with the assigned right of way agent, will utilize a combination of field surveys and utility company as-built plans to develop the location information. One set of the marked-up plans will be provided to the project Designer so the utilities can be indicated on the plan sheets, and one set will be retained by the utility inspector and one by the right of way agent for future reference.

In order to successfully complete the utility relocation function, it is imperative for the project Designer to keep the Utilities Section advised of proposed and adopted design changes and for the Utilities Section to keep the Designer informed of utility information as it becomes available. It is helpful to invite the Utilities Section or the District I Right of Way office to all PDFS's on projects and for the Designer to be available for joint field reviews with the right of way agent, utility inspector and utility company representatives to review the project on-site. The most important facet is to establish and maintain continuous and effective communications between the design and right of way representatives to ensure that needs are fulfilled, changes are transmitted, and problems are identified and resolved as early as possible.

Other activities that must be considered and coordinated through the Utilities Section are the drafting of the Special Provisions that accurately describe the potential utility conflicts and concurrent work requirements so prospective bidders and the successful bidder are aware of potential disruptions or special work requirements due to utilities, the arrangement for acquisition of replacement rights of way for relocated utility facilities by NDOT, and the continuing coordination of utility relocation and location functions during NDOT project construction.

When the utility company plans and estimates are provided to the Utilities Section, the Right of Way Agent will provide a set of the proposed relocation plans for each company to the project Designer for his review to ensure that the proposed relocations or adjustments will indeed resolve the conflicts. These plans will be submitted under a checklist that is designed to ensure that all appropriate points of conflict are reviewed. While the design reviews are being conducted, the agent will review the companies' claims for reimbursement and prepare the appropriate relocation agreement which will govern the relocation work and reimbursement.

When a project requires utility adjustments (valve covers or manhole covers) or there are relocations, Las Vegas Valley Water District (LVVWD), Southern Nevada Water Authority (SNWA), and Clark County Water Reclamation District (CCWRCD) may require a signature and date line on a “Exhibit” plan or plan sheets that is made part of an agreement. If a plan sheet is too cluttered, place the signature line on the separate note sheet.

When any of the above listed utility companies require relocations as part of the contract, this information will be shown on utility sheets along with a signature line. These signatures are in addition to the necessary utility agreements.

Utility designation and subsurface underground exploration (SUE). The Designer may request to have utility locations designated if there is a potential that the proposed construction improvements will conflict with existing utilities. The request is done in a form of a memo to the Chief Right of Way agent. The Right of Way agent assigned to the utilities function will hire a contractor to designate and pothole potentially effected utilities.

It is extremely important to have the proposed design improvements developed to a point were all geometrics are set and the cut and fills have been identified, all proposed hydrology improvements have been designed, along with any structures such as bridges, sound walls, retaining walls, lighting and signing have been identified.

The contractor that designates the utilities will normally request CADD files of the proposed improvements along with location control to tie the existing utilities to the project. The contractor will send the Designer a CADD file with the horizontal designation once this work has been completed.

The Designer evaluates the horizontal location of the utilities and determines if potholes will be needed to establish precise depths of underground utilities to further assess conflicts and relocation needs. Do not perform wide-spread potholing without first determining the actual need since potholing is an expensive and time consuming process. Potholing typically costs $1000.00 or more per location, involves coordination of company crews that are most often committed to other company priorities, causes disruption and inherent hazards to the motorists and workers involved in the operation, and invariably results in tearing up the existing streets and highways.

The designated utility locations will be updated in the contract plans. The location of underground utility lines should be indicated on the profile sections in addition to the plan sections of our design plans as practicable.

Relocation. When all pertinent utility location data is displayed on the design plans, the Right of Way agent will order plans to provide them to each affected company and a set to the utility inspector. The plans must show all proposed construction such as new edge of pavement, vertical profiles, bridge structures, storm drain alignments and profiles along with laterals and drop inlets, location of light poles, signal poles and sign foundations. Consider detours and any other construction outside the immediate roadway work being done that also may adversely impact the utilities.

The Utilities Section authorizes the affected utility companies to proceed with their preliminary engineering to provide detailed plans and estimates for their required utility relocations. During the utility engineering process, the Utilities Section will provide a liaison and coordinates between the utility companies and NDOT.

5.16 Utilities Section (Continued).

Specific cross sections or other detail drawings may be requested from Design, and company requests for possible NDOT design changes may be coordinated to mitigate even greater utility disruptions. Provisions to accommodate utility company needs may be requested of Design or Structural Design as needed. It is important that the utility companies receive complete highway design information in order to adequately perform their internal engineering functions. Often the disruptions and demands our projects cause on utility facilities and manpower are equal to or greater than demands of the project on NDOT resources.

Upon completion of the reviews and agreement process, the right of way agent will authorize the utility companies to proceed with actual work.

Utility agreements. There are inherent time requirements necessary for the Utilities Section to process an agreement to a point where they can supply specifications to the utility owner with meaningful information. A period of 60 days from receipt of estimates from the utility companies for FHWA approval is not uncommon. This involves the various reviews and, because of pre-agreement review by Audit, the need for rebuttal and supplemental information can result in an even more time-consuming procedure.

When preliminary plans have been prepared to the extent utility adjustment work can begin, plans will be delivered by memo from the Principal Road Design Engineer to the Chief Right-of-way Agent advising that plans are sufficient for necessary utility adjustment work to begin. Copies of the memo shall be forwarded to the Supervisory Right-of-Way Agent responsible for utilities and the Chief Road Design Engineer.

For all projects in the Las Vegas area, a copy of the memo will also need to be forwarded to the Las Vegas Supervisory Right-of-Way Agent. For projects with no apparent utility involvement, other than adjusting covers, the memo will indicate that no utility adjustments are anticipated.

In critical problem areas where sufficient data cannot be developed to totally define the work in a normal time frame, contact the Utilities Section to review the matter with them. This way they will at least be aware of the problem and in many instances they will be able to accomplish considerable “leg-work” prior to our submittal.

Railroads. The Utilities Section also coordinates with the railroad. The railroad coordinator prefers to have only one contact per project, however the NDOT Utility Section will coordinate administrative aspects such as obtaining permits and maintenance and operation agreements. The Project Coordinator will coordinate the technical aspects. Railroads should also be considered for inclusion as party agreements where they are involved.

Railroad agreement processing can require six or nine months after receipt of design information and requirements. In order to comply with completion date schedules, it is important that the Utilities Section has adequate lead-time to accomplish their pre-construction activities. This means that they will need the basic utility or railroad package sufficiently in advance to have completed agreements by the document date.

Guidelines for Railroad Projects can be found on SharePoint>Design Division Home Page. The purpose of these Guidelines is to inform Applicants, Contractors and other parties concerned with Railroad policies, requirements and standards for the design and construction of Grade Separation Projects. Compliance with these Guidelines is required to achieve uniformity in the preparation of construction documents for Grade Separation Projects and to expedite the review and approval by the Railroad of design and construction submittals.

Some pointers in processing railroad submittals are:

- Narratives should include construction sequencing, clearances, etc.
- Describe and annotate utility impacts, right-of-way and existing track profile.
- Include necessary local entity approvals.
- Provide a drainage plan (existing and proposed).
- Local reviews versus headquarters reviews affect the schedule. Local reviews can occur in two to four weeks if they are clean.
- For projects with multiple crossings a separate submittal is required for each structure.
- Keep submittals brief but complete; do not include unnecessary back-up data.
- Railroads can do an initial review with intermediate design plans.
- Railroads use more preliminary plans to resolve issues like clearance problems.
- Railroads require wet stamped copies of finals.

Do not use NDOT structure numbers or mileposts when referring to railroad crossings and structures; they have no meaning to the railroad staff. The UPRR prefers USDOT milepost numbers, but their mileposts or subdivision names are suitable as well. Obtain R/R dot numbers and milepost from the Traffic/Safety R/R section. It may be necessary to include special provisions when disruption of service is possible on industrial spurs. When a temporary at-grade crossing is needed and only the contractor and NDOT will be using it, then it is considered a private crossing and either NDOT or the contractor must enter into a private crossing agreement.

Private crossings need not involve the PUC or USDOT-FRA. The railroad will usually install the required concrete panels. However, NDOT can purchase and reuse them when needed. When considering construction phasing, use the following schedule for temporary crossings:

- 30 days to develop plan and estimate
- 30 days for administration
- 30 days to get it on the ground (two days of actual construction time)

If the crossing is for light-duty vehicles only, a 9’ crossing is adequate but a 10’ crossing is required for heavy-duty vehicles. The 10’ crossing requires removal of the existing ties to install longer ones.

Permits and approaches. A complete file of all permits issued by the department is maintained in the Utilities Section. Upon request, the Permit Coordinator will provide the Designer with a copy of each permit located within the project limits. Designers should review the master index and provide the Permit Coordinator with a list of only those permits that are pertinent to the project design; otherwise the sheer volume of work would create a bottleneck and cause delays throughout the work program. Designers can request permits categorically within a range of mileposts, for example all approaches and underground utilities between SR430: WA-0.00 to WA-10.37. Designers should also ask for any information on pending permits within the project limits.

Regarding approaches, the NDOT policy requires that on highway reconstruction projects outside of curb and gutter section, we review the project to identify all approaches that are to be perpetuated and brought up to current standards. Refer to the Access Management System and Standards 1999 Edition for determining the approach type for roadway category.

Only regularly used approaches, not those infrequently or seasonally used, such as an approach allowing access to a farmer's fields, will be improved. The Designer must then check the Department's records to determine which of the approaches that qualify or perpetuation are currently located under an encroachment permit. All permitted approaches are to be paved.

5.16 Utilities Section (Continued).

The Designer provides a list of the undocumented approaches that should be paved, along with a set of plans with the undocumented approaches plotted on it, to R/W Engineering to enable them to perform assessor's checks to determine the property owners served by the undocumented approaches. The Right of Way agent furnishes the set of design plans with both the undocumented approach locations and the assessor's information on property ownerships to the Utilities Section where the assigned right of way agent contacts the property owners to get the undocumented approaches under permit. The incentive that is offered to the owners is the paving or repaving of the approach to at least our minimum standards at our expense, rather than at the expense of the owner. We also waive the minimum permit fee. This information is needed at the earliest possible time as any owner who refuses to get the permit does not get his approach paved. The ultimate purpose of this policy is to get complete segments of roadway brought up to current standards as to construction and permitting of approaches, after which the individual Districts can more easily maintain that status.

Encroachment permits can be found on SharePoint>Design Division Home Page>Roadway Design Portal.

Permit reviews. If the Designer receives a permit from the Project Management Division that is doing a technical review for a particular project, email the Design Administrative Assistant so that they can log in the information (who the project manager is, permit number, permittee, and the description on the permit). Once the permit is returned to the Project Management Division, let the Design Administrative Assistant know and they will then log back out to the Project Management Division.

5.17 Roadway Design.

General. Design reports to the Assistant Director of Engineering and is divided into five sections. Two of the sections are identical Roadway Design sections responsible for the preparation of highway construction plans utilizing in-house personnel. However, one section is responsible for the local public agency (LPA), where NDOT assumes the role of the FHWA and projects are funded by various federal sources such as enhancement funding and are designed and built by the public entity to which the funds were awarded. The second section is the Landscape and Aesthetics section. They develop and implement the Landscape and Aesthetics Master Plan for the State Highway System and manage the community match program. The third section is the Specifications Section, which maintains the standard specifications; the specifications pull sheets, the standard plans, this policies and procedures manual, CADD standards, and writes of the contract Special Provisions.

The fourth section is the Hydraulics section and is responsible for determining water flows, drainage structure sizes, impacts to floodways and flood plains, slope renovation, road surface water treatment methods, and erosion control. The fifth section is project scoping which develops preliminary scopes for 3R and capacity projects.

The Road Design Division is responsible for the following:

- Prepare, check and certify plans and special provisions in conformance with applicable policies, regulations, laws and engineering judgment.
- Design, coordinate, and determine necessary right of way on roadway projects.
- Develop and maintain Design Guidelines, Standard Plans, and Standard Specifications.
- Make recommendation for regulatory speed limits.
- Coordinate with the various divisions in development of project priorities.
- Coordinate with Environmental Services in the development of environmental documents and prepare purpose and need statement for the project.
- Participate in informational, location and design public hearings and prepare location and design recommendations for management approval.
- Determine need for design consultants and negotiate and administer required contract agreements.
- Investigate new products and engineering techniques.
- Coordinate design with private developers, local entities and governmental agencies and prepare related agreements.
- Obtain necessary permits from local, state and federal agencies for project construction (i.e., TRPA, US Corps of Engineers, FEMA, FAA).
- Prepare economic analysis such as benefit costs for inclusion of safety work in state 3R projects.
- Prepare necessary engineering estimates for future project work programs.
- Coordinate with other divisions and management to set project advertising dates. Prepare documentation to insure all steps have been completed prior to advertising.
- Review contract bids for accuracy, any indication of detrimental unbalancing, analyze low bids in excess of 7% of the Engineers Estimate, and recommend awarding of contract.
- Prepare memorandums for or recommend approval of change orders on contracts and prepare supplemental notices for contracts.
- Serve as chairman of guardrail review committee and serve on appropriate Department committees such as high hazard and safety, surplus property, project prioritization, pit review, state 3R, and contract claims board, serve on appropriate state and national committees.
- Prepare engineering portion of the Department's defense for tort litigation and condemnation cases. Act as expert witness when needed.
- Provide assistance to Districts in areas as design, traffic engineering, hydraulics, landscape and erosion control.
- Review for compliance all encroachment of right of way permits.
- Prepare and conduct training courses for design personnel as well as districts, other divisions and local entities.

Estimation section. The Project Estimation section provides guidance and instruction to staff for efficiently and consistently developing project cost estimates and inputting that estimate into the Contract Management Subsystem. Project Estimation Specialist teaches classes on Project Estimate Building, the Contract Management Subsystem, and checks project cost estimates before Preliminary Agreement Estimate and Agreement Estimate submittals.

Hydraulics section. Hydraulics provides design input for Environmental, Roadway Design, Bridge, Safety and District projects. It also initiates bridge scour, river training, erosion control, water quality, and flood control projects. This section also reviews encroachment permits and drainage studies; deals with litigations, flooding complaints and maintenance issues; participates in research projects; and evaluates drainage products.

The Designer coordinates new roadway geometrics as they are developed to resolve conflicts with vertical clearances, cut and fill slopes, location of drop inlets, and other roadside features. Culvert extensions, location of plantmix dikes, erosion control are other items that are coordinated with Hydraulics. Quantities are coordinated between the Hydraulics Engineer and the Designer for inclusion in the structure list and engineers estimate.

5.17 Roadway Design (Continued).

Landscape and aesthetics. The Landscape and Aesthetics (L&A) Section oversees improvements to landscape and aesthetic treatments associated with all components of the state highway system, including NDOT-managed rights-of-way, road services, maintenance stations, headquarters, and District Offices. The section manages the Landscape and Aesthetics Program, maintains the L&A Master Plan, develops L&A corridor plans, and coordinates their implementation within the state. In addition, the section directs, supervises, or develops L&A designs for all aspects of the L&A program; reviews all project plans and encroachment permits for impacts to the landscape and for consistency with corridor plans; reviews all developer, cooperative, and interlocal agreements related to Landscape and Aesthetics. Finally, the L&A section participates in all design consultant, construction contractor, and maintenance contractor selection and oversight processes that contain or affect an L&A component.

The Project Coordinator coordinates with the Landscape Architect Supervisor on all matters pertaining to landscape treatments and aesthetics. The Project Coordinator is responsible for obtaining reviews from the Landscape Architecture Section on all new construction, capacity improvements, and stewardship projects. L&A must be integrated into planning, design, construction, and maintenance at the beginning of every project, not added as an afterthought. Engineering design should incorporate L&A to create highway structures and facilities that are effective, safe, and aesthetically appealing. The ability of a roadway and other facilities to blend successfully into the surrounding landscape or integrate appropriately with surrounding land uses should be addressed at the outset of every project.

Scoping section. See Section 6.2.

Specification section. The Chief Specifications Engineer controls the listing of work units that can be used in the department's contracts. This authority includes adding, deleting and modifying the work unit database and identifying and documenting special considerations that accompany the various work units. The project estimation module of the department's computerized contract management subsystem is administered through the Standards and Manuals Section accordingly.

The Specifications Section also maintains the department's standard plans that include construction details for road design, lighting and signals, roadside signs, work zone traffic control, railroad crossings, permanent striping, and bridges.

The Specification Section is divided into 4 subsections as follows:

Specification writers. The Specifications Writers develop the Special Provisions for items that are not covered in the Standard Specification or plans. Traffic control minutes, limitations of operations, along with any special items that need to be included in the special provisions are coordinated with the specification writers.

Quality assurance. The Quality Control Specialist is responsible for the QA/QC for both the plans and specifications. The Quality Control Specialist reviews both intermediate and final plan submittals and provides comments and recommendations to the Designer. The QA specialist also:

- Meets with the Designer at the end of the quality assurance review to discuss the findings of the review and discuss any proposed changes.
- Ensures that the final plans correctly reflect any changes expected and agreed upon during the quality assurance review meeting and that all changes were fully implemented.
- Ensures that all written comments received from other sections or divisions are returned to the Project Coordinator and that the agreed changes have been incorporated into the plans.

Standards and manuals. The Standards and Manuals Section evaluates all contracts for roadside safety and ADA compliance early in the design process, and therefore should be invited to attend the PDFS on all contracts. If unable to attend, the Standards Compliance Specialist will independently visit the project site and submit written observations to the Project Coordinator. These comments should be incorporated into the PDFS report when possible. The Standards and Manuals Section, amongst other duties, insures the department's standards are up to date and are being implemented.

The Standards Compliance Specialist reviews the intermediate design on all contracts. This review should occur prior to the intermediate design review meeting early enough to allow for discussion of any findings at the review meeting. The Resident Engineer and Project Coordinator and/or Designer are expected to attend. The Project Coordinator should inform the Standards Compliance Specialist when a contract's roadside and pedestrian facility intermediate designs are sufficiently complete to initiate this review. Designers should be prepared to furnish copies of relevant worksheets and CADD files. The following is an outline of procedures for the individual sections:

Scoping:

- A list of 3R and new construction projects will be provided to the Standards and Manuals Section and the Road Safety Audit (RSA) coordinator.
- The Standards and Manuals Section will review projects for compliance with established standards and will request the crash data from the RSA coordinator.
- The Standards and Manuals Section, the RSA coordinator and the Scoping Section will conduct a safety field review of the 3R and new construction projects. The field review will be set up by the Scoping Section.
- The safety field review will be conducted during the scoping process, prior to the PDFS. The Standards and Manuals Section will provide roadside safety and ADA improvements to the Scoping Team for inclusion in the Scoping Report.
- The Designer will incorporate the suggestions into the PDFS report as part of the Final Scoping Report.
- The Designer will provide the Standards and Manuals Section with a copy of the Final Scoping Report.

Design:

- The Designer will submit a copy of the intermediate plan set on every project to the Standards and Manuals Section for review and comment.
- The Standards and Manuals Section will review the intermediate and provide a report on the plans compliance with Department Standards, including but not limited to roadside safety, ADA, pedestrian and bicycle issues.

5.17 Roadway Design (Continued).

Construction:

- The Resident Engineer will request an implementation field review of barrier rail and guardrail prior to installation. The Resident Engineer will have the locations of barrier rail and guardrail marked in the field prior to the implementation field review. The Standards and Manuals Section will inform the Designer and the Resident Engineer when they will conduct the implementation field review. ADA concerns may be made available during the field visit.
- If field adjustments are necessary, the Standards and Manuals Section will provide those adjustments to the Resident Engineer and copy the Designer and the Senior Designer. If a change order is necessary, the Standards and Manuals Section will discuss the change order request with the Designer, Senior Designer and the Chief Roadway Design Engineer. The Designer will calculate and draft the plan changes for the change order. The Senior Designer will write the change order for approval by the Chief Roadway Design Engineer.
- The Standards and Manuals Section will also conduct a field review of the project after the guardrail and ADA installations are completed. If the installations are not found in compliance, the Standards and Manuals Section will write a memo to the Resident Engineer citing the issues. The Resident Engineer must work with the contractor to bring those installations into compliance with Department Standards. If there are other deficiencies, the Standards and Manuals Section will write a memo to the Chief Road Design Engineer outlining issues and possible solutions. The Chief Road Design Engineer will determine if a change order is needed. If a change order will be issued, the Designer will calculate and draft the plan changes. The Project Coordinator will write the change order for approval by the Chief Roadway Design Engineer.

The Standards and Manuals Section insures compliance with the standard plans. It is the responsibility of the Designer and Senior Designer to design projects. To this end there may be standard compliance issues that arise other than those mentioned above. In those cases, the same procedures will be followed.

CADD standards. This section is responsible for developing and distributing CADD Standards and Procedures.

5.18 Safety/Traffic Engineering.

Accident data. The Designer can request crash information by downloading the crash data request form from SharePoint and email the request to crashinfo@dot.state.nv.us. The information for the project limits spanning a time frame of not less than three years will be provided by the Safety Engineering Division. This request should occur no later than four to six weeks prior to the PDFS to allow time for processing and analysis of the data. The early request also allows time to locate the crash data on the PDFS plan set.

Signing and Striping. This subdivision of Traffic Engineering provides the Designer new sign location sheets and quantities. The Designer coordinates the striping and traffic control layout during the preliminary design phase. The Traffic Engineer assigned to the project also checks the traffic control and striping layout before it is submitted to QA/QC.

It is important that on new construction or capacity projects the Designer coordinates signing of the posted speed limits based on design criteria used in the design.

Sign quantities are coordinated between the Designer and Traffic Engineering for inclusion in the engineer's estimate.

Signals and lighting. This subdivision of Traffic Engineering provides the Designer signal and lighting sheets and quantities. The Traffic Engineer coordinates power sources with the Designer and the Right of Way Utility agent.

Railroad. This subdivision of Traffic Engineering provides the Designer information such as R/R DOT numbers and mileposts.

Road safety audit. This subdivision of Traffic Engineering coordinates with the Designer to perform road safety audits. Safety audits are usually performed independent of the PDFS and recommendations are forwarded to the Project Coordinator. The Project Coordinator prepares a recommendation for the items to be included in the project scope and is approved by the Chief Road Design Engineer.

5.19 Structural Design (Bridge).

General. Structural Design is responsible for the design and maintenance of bridge structures. They also provide additional services such as, designing retaining walls, sound walls, and special hydraulic structures.

Coordination. On new capacity projects, roadway design coordinates horizontal and vertical alignments in the preliminary design phase.

The location of retaining walls and sound walls requires coordination of ground profiles and top and bottom alignment and elevations. Roadway Design will provide to the Geotechnical Section and the Bridge Division a horizontal alignment and profile of the wall and cross sections at 25' intervals for the length of the wall. Cross sections will include elevations of top of the wall, existing ground intersecting the plane of the wall, proposed ground at the exposed face at the base of the wall, bottom of the slope in front of the base (the slope supporting the wall), and the top of the slope above the wall (slope being retained by the wall). In addition, show any ditches behind or in front of any proposed walls. Topographical information for the existing and completed condition should be at least three times the wall height in front and behind the wall.

On 3R projects, the Designer requests bridge sheets for any proposed improvements on structures such as, stripping the deck of plantmix, replacement of strip seals, concrete repair, etc. Box culverts that span 10' or greater are assigned a structure number by the maintenance section of bridge. The span of the culvert is measured along the roadway center line.

Quantities are coordinated between the Designer and the Structure Division for inclusion in the structure list and engineers estimate.

5.20 Governmental Agencies.

Airports (FAA). See Section 4.10 Airway-Highway Clearance Requirements.

Adjacent states. When a project limit occurs at the boundary to an adjacent state, the department is required to coordinate the work with that neighbor. The minimum impact to that state's road system will be traffic control, but drainage and other components may become involved as well. The Project Coordinator must contact the appropriate agency representative. A listing of the various out of state counties and other agencies can be found on SharePoint>Design Division Home Page>Phone Directories

Commission / Boards. Occasionally, a project will involve a state commission or board and the Project Coordinator must represent the project to them on behalf of the department. When attending an official meeting, the Project Coordinator should keep in mind that these proceedings are always on record (and often covered by the media) and should prepare accordingly. It is usually necessary to make contact at least four weeks prior to a meeting to be placed on the agenda for an action item. If the commission or board has some authority over the project, the Project Coordinator should provide them with appropriate material in advance for them to study so they may take informed actions at the meetings.

County and City contacts. A listing of County and Cities can be found on SharePoint>Design Division Home Page>Phone Directories

Federal Highway Administration (FHWA). If the FHWA is involved in reviewing and approving plans, specifications and estimates for any NHS project, then FHWA must also review and approve design exceptions to the thirteen controlling criteria standards applicable to that project. On all other projects, the Assistant Director, Engineering, must approve design exceptions for these thirteen controlling criteria. Evaluation and documentation requirements for those approvals will be as if doing it for the FHWA.

The Chief Road Design Engineer may approve design exceptions for elements other than the thirteen controlling criteria. Those exceptions should be addressed to the Chief Road Design Engineer, from the originating project coordinator or principal engineer, and recommended by the appropriate Assistant Chief Road Design Engineer.

Design exceptions approved by NDOT for the FHWA are still subject to FHWA oversight through periodic process reviews. See Section 4.7 for processing design exceptions.

Stewardship projects. The department entered into an agreement with the FHWA regarding the level of oversight required on federally funded projects. This stewardship agreement allows the department to develop most projects with little federal involvement; however certain projects are designated as full oversight projects and are subject to full participation of the FHWA local office in the project's development.

Irrigation districts. In most cases the department is exempt from obtaining permits from irrigation districts, but is required to coordinate with them on activities that will affect their systems. The irrigation districts have a special status with the EPA regarding water quality and are usually concerned about protecting that status. Care should be taken to inform the irrigation district of the exact nature of work affecting their facility. The contractor is required to coordinate with the irrigation district during construction; the appropriate contact information should be made as part of the Special Provisions.

Native tribes. Any project occurring on tribal lands requires some coordination with the tribe. Certain requirements, such as the Tribal Employment Rights Ordinance (TERO) tax, may be applicable and should be stipulated in the contract documents. The tribe may also have cultural considerations that could be affected by the project. The Legal and Environmental Divisions should be included when a project becomes involved with a tribe to ensure that the tribal considerations are adequately and appropriately addressed.

Tahoe regional planning agency (TRPA). Generally any project in the basin, regardless of whether it's public or private, must be permitted by the TRPA. Its jurisdiction extends from the upper rim of the basin to the shoreline of Lake Tahoe. The TRPA is generally concerned with water quality, hard coverage, soft coverage land capability, riparian zones, erosion and aesthetics. However, all aspects of environmental quality are potential issues. The department and the TRPA signed a memorandum of understanding that defines what activities the department can undertake without needing to obtain a permit.

The process of coordinating with TRPA can vary by project, but the general process is:

- Notify TRPA of the project immediately so it can assign the project to one of its staff
- Invite the TRPA representative to the PDFS
- Acquire a TRPA permit (typically requires two to three months)
- Obtain and complete a permit application
- Submit application along with complete plans (TRPA is flexible on this)
- TRPA staff review (two to three weeks); may require supplemental information
- TRPA staff writes recommendation for approval or denial
- TRPA staff presents project at monthly TRPA board meeting
- If approved, TRPA staff stamps three sets of plans for use during construction

During construction a set of stamped plans must be on the project site at all times. One set remains with TRPA, another is given to the resident construction engineer and the Project Coordinator keeps the third. All TRPA issues will be resolved using these sets of plans.

Coordination. Coordinate with the Hydraulic Section for all TRPA permits.

6.1 Work Flow.

General. This Section describes the major steps for developing capacity and 3R projects. These steps are generally in the order in which they occur. The terminology listed below follows the PSAMS dashboard to reduce confusion across inter-divisional departments within NDOT.

6.2 Planning Level Scoping.

General. Planning level scoping consists of a broad look at a project to document the reason for the project, the major project components and to develop a reasonable cost estimate for a project being placed in the Transportation System Projects (TSP). Initially a Metropolitan Planning Organization (MPO), Regional Transportation Commission (RTC), city, county, Native American Tribe or developer will submit an application to NDOT for review by an Evaluation Committee. The applications will be evaluated and scored based on the established criteria in the urbanized, non-urbanized and 3R checklists. They will then be given a ranking of low, medium and high. If the project is ranked high, it is then forwarded to the Project Scoping Committee for review. After review, it is then returned to Program Development for distribution. If the project is selected by the Director, it is then presented to the Statewide Transportation Technical Advisory Committee (STTAC) for recommendation to the State Transportation Board for approval. If it is an urbanized review of projects and the MPO or RTC projects are located on a state or federal roadway and are to be included in the Statewide Transportation Improvement Program (STIP) within the next four (4) years, they will be evaluated using an application/checklist developed as part of linking planning and NEPA to the planning process. This form is called a Stage 1 Project Development Checklist for Funding Request and NDOT Preliminary Risk Assessment form. It is completed by the sponsoring agency requesting project inclusion in the NDOT State Transportation Improvement Program (STIP).

Scoping process. The Scoping Manager forms a scoping team comprised of a Project Coordinator and a Design Squad and major disciplines and stakeholders which is determined by the purpose and need statement on the Stage 1 checklist. The Scoping Manager will facilitate the process, manage the meetings and keep the Project Coordinator and the Roadway Chief involved with details and updates for each project. The scoping team will gather existing and available historic data to prepare the initial package. This team takes a detailed look at a project by gathering available data, reviewing this information, conducting field studies, coordinating with major disciplines including stakeholders, developing alternatives, determining the risk and preparing a cost estimate for the most likely alternative. This information is documented in a Project Scoping Report (PSR). This report will include the Stage 1 Project Development Checklist for Funding Request and NDOT Preliminary Risk Assessment form previously prepared. The planning level project scoping report should be completed prior to projects being added to the State Transportation Improvement Plan (STIP).

Conceptual alignments. Horizontal and vertical profiles are generated by Roadway Design to a minimal alternative analysis level. The main purpose of this milestone is to establish potential corridors or alternative design features so they can be studied to determine which have the least amount of impact to the surrounding environment, utilities, need for additional right of way, while balancing the needs of the project. Design distributes conceptual alignments, profiles, and modeled surfaces to Hydraulics, Geotech, Utilities, Right of Way, Bridge, and Traffic so they can start preliminary research, design, and cost estimates for each alternative.

Coordinate with the Traffic Operations Analysis Section while developing each alternative to ensure they meet minimum traffic capacity.

Design compiles the design work from the other divisions and develops cost estimates for each alternative design (i.e. Environmental, Right-of-Way, Utilities, Bridge, Safety/Traffic, and Hydraulics.) A brief summary of the alternatives and costs are submitted to the Chief Road Design Engineer for concurrence.

6.3 Preliminary Design.

Project initiation. The Project Coordinator contacts the appropriate divisions to form a project team. A meeting is held to establish who will be the point of contact and go over the scope of the project. The Project Coordinator invites project stakeholders such as the county, city, FHWA, public utility, etc., to identify whether other agencies will have input into the design process and to develop a contact list of local agency personnel as needed. The existence of local area master plans and associated project impacts should be determined in this meeting.

Program and schedule. The Project Coordinator program and schedules a project to begin preliminary engineering and related services to start, the Project Coordinator submits a programming and scheduling form to Financial Management. A project must be on the STIP to be programmed for federal participation and must either be in the annual work program or have written approval from the Director to be programmed for state funding. Financial Management then assigns a project identity number and a project number, and schedules appropriate funding to the project.

The programming and scheduling form and instructions can be found on SharePoint/010>Design Division>Project Development Related Links/Forms. If significant changes occur to the scope during the project development, notify Financial Management of items such as need for right of way, utility relocations, change in project scope or limits, and costs. Submit a Budget and Scope Change form to formalize the change. The Budget and Scope Change Form can be found on SharePoint/010>Design Division>Project Development Related Links/Forms.

Newly scheduled construction projects need to be entered into PSAMS by the Project Coordinator once the project has been programmed and is available for viewing on Dashboard. Update Dashboard on a monthly basis.

Request information. The Designer sends out requests for information to various divisions to gather specific information to incorporate into the base design. The various requests can be found on the QA/QC Checklist in Section 4.19. Example documents for requesting information can be found on Sharepoint. The timing of this step will vary on the complexity of a project and may come after project scoping once the preferred alignment has been established. See Section 5 for engineering support and requesting information from other divisions.

As-built contracts. As-built contracts should be reviewed when designing new projects. These are available through Central Records. As-built contracts document changes that were made during construction that would not otherwise be known when developing a project. To avoid developing certain sheets from scratch, existing electronic copies of contracts may be available from the archive files in the Specifications section. To find contracts that were done in certain counties or routes, Contract Search is available on SharePoint/010>Design Division>Project Development Related Links/Forms.

Design mapping. Mapping is requested from the Location Division. This information provides digital photogrammetric mapping, ortho photo's, survey data, and terrain models. There are minimum engineering survey standards to be determined (Levels 1, 2, and 3) when requesting mapping. Additionally, there are 4 scales to choose from when requesting mapping (Large, Intermediate, and two variations of the small scale).

6.3 Preliminary Design (Continued).

For additional information when requesting mapping, refer to the Special Instruction for Survey, Mapping or GIS Consultants Manual that is published by the Location Division located at Nevadadot.com>doing business with>contractor and consultant information.

Alternatives analysis. The alternatives from the conceptual alignments are studied in the field to determine potential impacts to infrastructure, right of way, and the environment. Prior to and during the field study, a set of plans is required to facilitate review and discussions by the project team so they can identify issues with the various alternatives. The Project Coordinator distributes a comment sheet and collects it at the end of the review. The comment sheet will allow input of critical field-observed data to help set a first-draft list of project priorities addressing the concerns of each contributing party or agency. An Alternative Analysis Field Study report documents the potential impacts discovered during the field review.

Alternatives are studied further with the project team to determine if there are flaws or if refinements can be made. Alternatives should provide sufficient information so they can be studied in the field to determine impacts to features on the ground such as utilities, right of way, drainage features, traffic control, adjacent developments, etc. The alternatives are evaluated by the project team based on input from the public, public agencies and regulatory agencies. This may include studying additional proposed alternatives, which may not have been considered and presented at the public informational meeting. Based on the Public Information Meeting input and sound engineering judgment, a “preferred” alternative is selected through the NEPA process, during preliminary design and proceeds to Intermediate Design phase. Consult the FHWA for proposed changes to the control of access as part of the alternative analysis.

Conceptual alignment development is usually not applicable on 3R projects and proceeds to the roadside safety audit and PDFS.

Value analysis. Projects requiring a value analysis are usually scheduled during the alignment development period. See Section 4.19 for additional information.

Refined alignment development. Roadway Design refines horizontal and vertical alignments and models cut and fill slopes to establish roadway widths. Geometrics including superelevations, are verified at interchanges and intersections to satisfy sight distance requirements. Changes in access points, control of access, and analysis of retaining walls versus right of way are refined to determine the need for additional right of way.

Design coordinates with the Traffic Operations Engineer to analyze each design alternative and determine their optimum configurations. Sight distance is checked at intersections, ramps, mainline alignments, etc.

Structural design begins the preliminary selection for the type of bridge and a front sheet is developed. Structures spanning over rivers and canals are checked by Hydraulics to ensure they meet adequate freeboard and foundation scour analysis.

Hydraulics begins preliminary design for on-site and off-site drainage features. Roadway profiles are verified and adjusted accordingly to accommodate proposed drainage structures that cross the roadway prism. Major drainage features have been designed to a level to established final grades.

Preliminary special drainage structures have been sent to Structures for review. Refer to the Drainage Manual for hydraulic coordination and deliverables.

Construction has identified areas that require staging areas or platforms for construction.

The Traffic Division locates overhead sign structures that may be required on the project and are examined for impacts to utilities or other design features.

Landscape and Aesthetics alternatives have been reviewed by the public entities and an alternative has been chosen. Preliminary landscape and aesthetics design proceeds to a level, which will provide a proposed “toe of slope” or an area of impact to related design features. Proposed landscape and aesthetic features should be checked for sight distance issues when refining alignments.

3R projects. For 3R projects and other maintenance projects, alignment refinement is usually not applicable and progress up to the Intermediate design level before there is a submittal requirement.

Identify preferred alignment. Once the preferred alignment(s) is select through the NEPA process, the project is formally field investigated through a Roadside Safety Audit and PDFS.

Roadside safety audit (RSA). The Safety/Traffic Division conducts an audit for most 3R and capacity projects around the time of the PDFS. Safety coordinates with Roadway Design for obtaining information and plan sets so they can conduct their audit. Recommendations are forwarded to Design for approval by the Chief Road Design Engineer. The Standard Compliance Section will also attend the road safety audit to ensure non compliant roadside features and ADA issues are addressed in the report. The Project Coordinator should check with the Safety/Traffic Division if safety funds are available to mitigate high crash locations.

Preliminary design field study (PDFS). Prior to holding the PDFS, crash information, pipe condition survey, and planning information is requested and received from Safety, District, and Inter-Multimodal Planning respectively. See Section 5 for engineering support and requesting information from other divisions. Allow 20 working days for the support divisions to process the requested information.

The Project Coordinator schedules a PDFS with the appropriate divisions. The Project Coordinator should determine the approximate number of attendees. If more than a van full of people is going to attend, the Project Coordinator should consider limiting each entity to one representative, holding a meeting prior to the PDFS to address some of the issues, or scheduling two reviews.

A PDFS comment sheet and check list should be distributed to the project team, and collected at the end of the review. The comment sheet will allow input of critical field-observed data to help draft a list of project priorities addressing the concerns of each contributing party or agency. Every entity involved with project development should be made aware of the review so they have the opportunity to be represented. Plans of the preliminary design should accompany the PDFS invitation memo.

Example PDFS requests can be found under standard project memo templates that are available on SharePoint/010>Design Division>Project Development Related Links/Forms.

Final scoping reports. The PDFS report is completed by the Project Coordinator and approved by the Chief Road Design Engineer. A draft copy should be distributed to the PDFS team to allow comments to be incorporated into the final draft before it is approved by the Chief Road Design Engineer. The approved PDFS report is distributed to the appropriate staff and Divisions.

The Roadside Safety Audit report is prepared by Safety/Traffic Division and forwarded to the Project Coordinator. The Project Coordinator prepares a list of recommendations and comments and forwards this to the Chief Road Design Engineer for approval.

6.3 Preliminary Design (Continued).

Preliminary design submittal. Once the scope is approved and the preliminary design work is sufficiently done to indentify impacts to right of way and utilities, the plans are submitted to the various divisions such as Hydraulics, Structural Design, Geotech, Construction, Traffic, and District for review. Once the divisions have reviewed and submitted comments, Roadway Design, Hydraulics, and Structural Design begin making refinements to prepare the plans for Intermediate design. See Section 4.17 for submittal requirements.

Geometric approval and design exceptions. The Principal Road Design Engineer prepares a memorandum outlining the geometric design for the project. Design exceptions are prepared in a memorandum at this time. See Section 4.7 for design exceptions and Section 4.8 concerning geometric approvals.

Change in control of access. The Principal Road Design Engineer prepares a memorandum for any change in control of access. Instructions for preparing a change in control of access can be found on SharePoint.

Transportation management plan (TMP). A TMP consists of a traffic control plan, has a traffic operations component, and addresses public information issues. A TMP is only applicable for projects with a large impact to traffic. The Designer is responsible for developing the traffic management plan for the project in cooperation with the Construction Division, District Engineer and Safety/Traffic Division. The Construction Division is responsible for reviewing the traffic control plans and making recommendations to the Project Coordinator regarding implementation of the traffic control plan. The District Engineer is responsible for reviewing the traffic control plans and making recommendations to the project coordinator regarding constructability. The Safety/Traffic Section is responsible for reviewing the traffic control plans and making recommendations to the project coordinator regarding compliance of the traffic control plan with relevant criterion and standard practice.

For more information on developing a TMP can be found in the 2008 Work Zone Safety & Mobility Implementation Guide.

Cost update. The Project Coordinator updates the scope budget form once an approved scope is finalized and project costs are updated. The budget and scope change form and Instructions are located on SharePoint.

Engineer's Estimate. An Engineer's Estimate should be entered into the IFS/CMS after the scope of the project has been approved. Instructions for developing an Engineers Estimate can be found on SharePoint.

6.4 Develop Agreements.

General. The need for an agreement is established by the Project Coordinator; details of the agreement are identified, put in writing, reviewed, and agreed upon by all parties. The agreement is reviewed by Agreement Services, Legal, and other divisions as needed. Once the edits and corrections have been made the agreement is signed by all applicable parties. Request for proposals for consultant services are written and executed if applicable.

Example agreements entered between the Department and outside entities are:

Inter-local. These are used when the department is "obtaining service" from or "providing service" to another state or local government agency.

Cooperative. These are used when a joint exercise of powers, privilege and authority by the department and another agency is contemplated, such as with state agencies, other states, local governments, Native American tribes and federal agencies.

Independent Contractor. These are used to procure private providers of services such as janitorial, landscaping, etc.

Consultant. These are used to procure private providers of engineering services such as for design, construction management, etc.

Private-party Agreements. These are used when the department is entering into an agreement with non-governmental parties, such as property developers, in order to coordinate and share in the cost of improvements to the transportation system with mutual benefit of both parties. It is important that third party agreements are properly entered into the IFS system with a separate breakout.

Generic agreement shells and instructions are found on SharePoint>Design Division Home Page>Project Development Related Links/Forms.

6.5 National Environmental Protection Act (NEPA).

General. The NEPA process should begin at the scoping phase and extend up to the point where the preferred alternative is selected. During the preliminary design phase, NEPA is ongoing and all reasonable and feasible alternatives are studied equally. This is a dynamic process and requires close coordination between Roadway Design and Environmental Services during the development of alternatives to setting the right of way. Changes to the final scope or right of way setting that produces additional impacts to the project footprint, changes to capacity, access points, and utilities, could be cause for a re-evaluation of NEPA approvals.

Before NEPA approvals are done, the final footprint of the project has been established and agreed to by the FHWA, NDOT Divisions, the project team, and public entities involved. The footprint for staging areas and detours for construction of the project have been indentified. Utility relocations have been established and agreed to by the utility companies. Public meetings have taken place and written comments have been included in the Environmental documentation.

Environmental Services initiates a formal notification for the project. The general public, public agencies and regulatory agencies are notified and entered into the project records. The approved alternatives are presented through the use of displays, photos and plans to the public at an informational meeting. The questions and issues, which are gathered from the public, public agencies, and regulatory agencies are answered by the appropriate Division and documented for inclusion in the environmental documents.

Environmental Services schedules the public meeting which is usually held at a public facility (i.e. school, city hall, etc.) Design provides displays for the various alternatives and technical support for the project.

See Section 4.12 regarding the type of information that is normally provided at public meetings.

Environmental Services has indentified the permits that will be required to construct the project and begin the process to acquire the necessary permits before the Doc date.

6.6 Intermediate Design.

General. Roadway Design, along with the other divisions, incorporates the recommendations from the alignment development meeting and final scoping reports into the plans. At this stage, the various divisions complete their design to a level where Right of Way can be set and utilities can be identified for conflict.

Roadway Design details the locations for barrier rail, guardrail, sound walls and retaining walls. Pedestrian facilities and bike plan facilities have been incorporated into the design. Roadway design, along with Hydraulics and Structural Design, compiles a list of locations for potholing utilities in conflict. Property boundaries, existing right of way, proposed right of way, and control of access have been sufficiently detailed.

The Project Coordinator coordinates among the Traffic Engineering Section and the Utilities Section to identify electrical service points for signs, lighting and signals, and Landscaping.

The Project Coordinator holds the traffic control review meeting to determine the limitation of operations and accommodation of public traffic criteria as they relate to the construction staging and the Traffic Control Plan (TCP.) The traffic representative is responsible for determining if the TCP conforms to the MUTCD and making recommendations to address non-conformities. The construction representative is responsible for determining if the TCP provides a reasonable approach for the contractor to control traffic during the construction and making recommendations to address potential construction problems with the TCP. The Project Coordinator is responsible for getting the approval from the Chief Maintenance Engineer for the Transportation Management Plan (TMP).

For more information on developing a TMP can be found in the 2008 Work Zone Safety & Mobility Implementation Guide.

The Construction Division, along with Roadway Design and the Safety/Traffic Division, develops a traffic control plan. A constructability meeting takes place and agreement is reached and documented on how the project will be constructed. Limitations of operations are developed and a draft traffic control matrix is based on traffic control scenarios during each phase of construction. Preliminary time frames and construction sequencing is developed regarding for the length of time temporary easements will be needed.

The need for special structures, such as retaining walls and sound walls, has been forwarded to Structural Design. Adequate bridge design and estimates have been completed and provided to Roadway Design.

Hydraulics has finalized the footprint for on-site and off-site drainage facilities. Special drainage structures that affect right of way are forwarded to Structural Design to establish footings that may encroach beyond right of way. Refer to the Drainage Manual for Hydraulic coordination and deliverables.

Geotechnical exploration and their analysis are conducted and the draft geotechnical report has been forward to Structures, Hydraulics, and Design for design completion.

Request for water, power and telephone sources for NDOT facilities have been forwarded to utility companies by R/W or District, and preliminary approvals have been returned. In addition, the utility companies have provided plans showing proposed utility relocations.

Landscape and aesthetics plans have identified the location where water, power and telephone lines will be located.

When restricted lanes, as listed in section 4, DIVSIONS, Over dimensional permits, are planned at the detail design and final design phases for either permanent infrastructure, temporary construction, or temporary traffic control, and at least seven days in advance (and sooner if possible) of implementation of any of these items during the construction phase, advise the Over Dimensional Vehicles Permits Office in writing at: OverDimensionalPermitsOffice@dot.state.nv.us

Intermediate submittal. The following is the procedure for processing intermediate submittals for 3R projects. A similar sequence of activity should be followed for capacity projects using appropriate adjustments to the time frame based on the project's particular requirements. The Project Coordinator decides when a given project is within five days of meeting intermediate design submittal requirements at which point Road Design will hand carry the following items to Specifications:

- A written request for Specifications to set an intermediate design review meeting to be held not less than 20 or more than 25 working days from the date of the request.
- A copy of the engineer's estimate (CM14 report) and notes related to Limitations of Operations, Traffic Control, or other Special Provision items that may have been agreed to at the PDFS or otherwise provided by Construction, the lab, district, or others.
- The Project Coordinator will discuss the bid items in detail with the specifications engineer at the time of the initial submittal to ensure the estimate is complete and the units of work are appropriate for the intended work. It will also be determined if additional notes to specifications are required.
- Within five working days after the above request, one set of the intermediate design plans and any additional notes to specifications will be hand delivered to Specifications for their use in developing the Special Provisions.

Specifications will:

- Select a date, time, and reserve a meeting place for the intermediate design review, ensuring that it does not conflict with other Specification reviews. In setting up the meeting, Specifications will contact the appropriate assistant construction engineer and assistant district engineer.
- Develop preliminary special provisions and furnish the appropriate number of sets (as established by the senior specifications writer in the intermediate design review list) to design within five working days of receipt of intermediate design plans and estimate.
- Provide design with a copy of the distribution list.
- Conduct the specifications portion of the review meeting.
- Coordinate specification related comments and make revisions as necessary.

Road Design will:

- Make arrangements and contact the participants for the intermediate design review.
- Arrange for reproduction of the appropriate number (as established by the senior specifications writer in the intermediate design review list) of intermediate design plans and estimates.
- Distribute plans, specifications and estimates for review. The transmittal letter will reiterate policy that no scope changes will be allowed after this review.
- Conduct the plan review portion of the meeting.
- Document plan and estimate review comments.
- Make plan and estimate revisions as necessary.

6.6 Intermediate Design (Continued).

Review Period. The total time for this process is 6 to 7 weeks once the project is submitted to QA/QC to when the review meeting is held. Allow 3 weeks once the plans, specs, and estimate are sent on review; large or complex projects should allow for 4 weeks.

Right of way setting. Right of way needs, along with utility adjustments and/or relocations, have been identified and approved by the project team. The Right-of-Way Setting memo outlines the various acquisitions involved and sent to the Assistant Director, Engineering for approval. Once the right of way memo has been signed, the various divisions are authorized to proceed with the necessary steps to complete the required right of way acquisitions and environmental clearances to complete this project.

Generic right-of-way memos can be found on SharePoint/010>Design Division>Project Development Related Links/Forms>Standard Project Memo Templates.

See Section 4.13 for additional information concerning right of way settings.

Update engineer's estimate. The Designer updates the engineer's estimate with approved unit prices from the Principal Design Engineer. See SharePoint/010>Design Division>Project Estimation and Estimate Building Procedures.

Program final design. Financial Management programs the project funds for final design and right-of-way acquisition once the Project Coordinator submits the program request form. Final design utilizing Federal Aid Funds cannot proceed until the NEPA process is complete.

6.7 Final Design.

General. After the Intermediate review meeting is held, the individual divisions such as bridge, traffic, and hydraulics finalize their plans and quantities and submit them to roadway design to be combined into the plan set. Roadway updates the Engineer's estimate into the IFS. See SharePoint/010>Design Division>Project Estimation and Estimate Building Procedures. Details of the project are finished and compiled into the plans and are ready for the discipline review.

Discipline submittals. This step applies to large or complex projects; 3R projects are normally exempt from this step. Discipline submittals are specific to the division in charge and do not require that multiple sets be submitted to other divisions. Structures reviews the drafted structural details for the bridge design, retaining walls, sound wall, special drainage structures, special structures, sign bridges, signal bridges, etc. and revises them before they are finalized for quantities & quality assurance review. Hydraulics reviews the drafted drainage details, permanent erosion control detail, temporary erosion control details and special drainage structure details, etc. and revises them before they are finalized for quantities & quality assurance review. Right of Way Engineering reviews and revises proposed parcel maps prior to going to the appraisal stage.

Discipline submittals are usually done on complex projects to assist other divisions to ensure accuracy. The discipline reviews need to be done and incorporate changes before preceding the QA/QC. 3R projects do not require discipline submittals and proceed to quality assurance/quality control review.

In-squad checking. Before submitting the project workbook and plans, the Designer ensures quantity calculations have been cross checked and the workbook is neatly organized and updated. It is preferable that another design squad checks the plans along with the engineer's estimate.

6.8 QA/QC Specifications Review Process.

Quality Assurance / Quality Control. A memo along with 2 sets of plans, the project workbook, notes to specifications, and 2 estimates (CM14) are submitted to Specifications. Generic QA/QC memos are found on SharePoint/010>Design Division>Project Development Related Links/Forms>Standard Project Memo Templates.

Specifications perform the QA on the plans and starts writing the specifications for the project. QA/QC takes approximately 2 weeks to complete this work.

The Senior Designer will check the plans and estimate for completeness and conformance with the Road Design Guide (also verifying the Structure List and the estimate match and quantities are correct) before submitting to Checking.

Once the checking section has completed their check of the plans and estimate, the designer will make the necessary corrections to both. The designer will then resubmit (the final submittal prior to sending out for review) the estimate into specifications to finalize the Special Provisions. Depending on the number of changes to the estimate and the workload of the specifications writer, a week or two of additional time may be added to the schedule.

Once Specifications has completed a quality assurance review, remarks and requests are returned to the Designer for revision. The Designer forwards revisions to the responsible Divisions and receives updated plans and estimates for inclusion into the review set.

Plan, Specs, and Estimate (PS&E) review. Once the QA/QC is complete, Specifications develops the Special Provisions and schedules the specs review meeting along with the number of sets of plans needed for review. The specs writer informs the Designer of the number of plans sets needed for review and prepares the memorandum that indicates the time and location of the meeting. Design provides the requested number of plan sets and specifications distributes the plans and special provisions.

Plans, specifications, and estimates have been reviewed by all Divisions and errors, revisions or recommendations have been forwarded to the appropriate Division for corrections.

Allow 3 weeks once the plans, specs, and estimate are sent on review; large or complex projects should allow 4 weeks.

Specifications review meeting. A formal meeting is held to review and discus issues brought up during the review period. The meeting determines which corrections and additional information needs to go into the final project documents.

Processing memo. The Chief Road Design Engineer prepares the processing memo around the time of the specs review meeting for signature by the Assistant Director of Engineering. The memo sets the advertising date, the advertising period, the date of reproduction for small sets, the date for approval of the traffic control by the Chief Safety/Traffic Engineer and the date for submittal of the preliminary agreement estimate to Financial Management. The contract number is issued by Administrative Services; the Project Coordinator obtains this information and it is passed to the Designer to put onto the title sheet. The Title sheet is signed by the Director once the title sheet is finalized. Design's Administrative Assistant will notify the Project Coordinator by email and will request information such as final construction cost, project scope, and location.

6.8 QA/QC Specifications Review Process (Continued).

Price check. The Principal Design Engineer checks the unit prices used by the Designer and forwards changes to the design squad to update the estimate in the IFS/CMS. The Principal Design Engineer sets the final prices for the preliminary agreement estimate and locks the estimate.

Submittals. After incorporation and verification of the specification review meeting changes, the design squad submits the preliminary agreement estimate to Financial Management and the electronic plan files to the specifications writer along with the IFS OPI2. At this point, all contact regarding plan reproduction must be directly made with Administrative Services concerning changes, schedule modifications, supplemental notices, plan sheet additions, etc.

On the date set forth to go to reproduction, the Designer will assemble pertinent files in a single directory named with the contract number. The directory location will be forwarded to Specifications. After the award of the contract, the specifications writer will retrieve a final copy of the special provisions, supplements, and plans and create three CD copies: one for Design, one for Central Records and one for Specifications.

Refer to Section 7.3 for electronically submitting plans.

Prior to advertising the project the participating agency, such as county, city, 3rd party, will be given an opportunity to review the proposed contract plans for the facilities in which it is participating. At the time of advertising, the agency should be notified and given a copy of small sets, special provisions and an estimate showing the amount of its participation.

Proof set. The Administrative Services Division prints proof sets for review. The Designer reviews the plans and the Specifications Section reviews the specification proof set before advertisement sets are printed. This review is for legibility, to make sure no pages are missing (index of sheets), PE stamps (if applicable), and the Director's signature.

The Project Coordinator authorizes the Administrative Services Division to print the construction plans once the Designer and specifications writer approve the proof sets.

If the proof sets are not approved, the Designer and/or specifications writer make the necessary changes and the plans and specifications are resubmitted to Administrative Services. The final plan set is submitted by Administrative Services to reproduction for advertising.

6.9 Documentation Date.

General. The documentation date is when the processing memo has been sent to all Divisions. The plans, quantities and estimates for all Divisions have been updated, corrected and submitted to Design and combined into a final Plans & Estimate package and delivered to Specifications. All Specifications have been updated, corrected and combined with the Plans and Estimate and are ready to be sent to Administrative Services for reproduction.

Projects that are within urban areas will require the review and approval of the Chief Traffic Engineer. For the purposes of this requirement, urban areas shall be the counties of Clark, Carson, Douglas, Lyon, Storey and Washoe. Projects outside of these counties can be advertised without an approval letter signed by the Chief Traffic Engineer. The processing memo shall indicate which projects require a formal review by the Chief Traffic Engineer.

On full oversight projects, one more additional week is needed to allow time for the FHWA to review the plans, special provisions and estimates (PSE). The FHWA must be informed of all changes, other than clarifications, to plans and specs that occur after the final spec review. In addition, the FHWA will physically sign the plans and special provisions.

Right of way certification. The Chief Right-of-way Agent is responsible for certifying the project is in compliance with applicable right-of-way and utility criteria.

Federal aid projects, including full oversight projects but not including local public agency projects, will be processed as follows: once a final processing memo is received by the Right of way Division, a certification letter will be sent to the Administrative Services Division. Paper copies will be sent to the Project Manager and the Financial Management Division and a digital copy will be emailed to the FHWA Division Administrator to the attention of the Right of Way Program Manager.

Federal aid local public agency projects will be processed as follows: Once a processing memo is received by the Right of Way Division, a certification letter will be sent to the Principal Intergovernmental Programs Engineer in the Road Design Division. A paper copy will be sent to the Financial Management Division and a digital copy will be emailed to the FHWA Division Administrator to the attention of the Right of Way Program Manager.

State funded projects, not including local public agency projects, will be processed as follows: once a processing memo is received by the Right of Way Division, a certification memo will be sent to the Administrative Services Division. Paper copies will be sent to the Project Manager and the Financial Management Division.

State funded local public agency projects will be processed as follows: once a processing memo is received by the Right of Way Division, a certification memo will be sent to the Principal Intergovernmental Programs Engineer in the Road Design Division. A paper copy will be sent to the Financial Management Division.

6.10 Advertise Date.

General. The contract cannot advertise until the project certifications are complete. Contracts with FHWA for Federal oversight projects will usually require additional time to certify. Most contracts are advertised for a period of 3-4 weeks. Administrative Services will forward two copies of the final plans and specifications to the Project Coordinator and Designer so they will have current information to answer the Contractor's questions during the advertising, pre-bid, pre-con, and construction phases of the contract.

Request for information (RFI's). During the advertising period, the Project Coordinator is required to answer contractor's questions in accordance with sub-section 102.05 of the Standard Specifications for Road and Bridge Construction. An email is sent to the assigned Project Coordinator informing that a question has been posted to NDOT's web site. The Project Coordinator responds in writing to the questions as they arise. RFI's are found at See SharePoint/010>Design Division>Project Development Related Forms/Links>Request for Information.

6.10 Advertise Date (Continued).

Supplemental notices. Based on questions that may arise from the pre-bid conference or RFI's (Request for Information), the Project Coordinator or other divisions may issue a supplemental notice to correct or clarify the project plans prior to bids being received. There are three main factors to consider in deciding to "supplement" or not:

- Is the information provided to bidders accurate so that contracts can be executed and performed without unnecessary difficulty?
- Do contractors have adequate time to prepare their responses to bids after receiving the information?
- Will the contracts get out and bids be awarded in time for the construction season?

  When a supplemental is needed, the matter must be dealt with promptly. The issuance of a supplemental cause a number of people to take action before the bid opening date and each person must handle their part with a sense of urgency. The following steps should be used to implement a supplemental:

- Review the matter with the Chief Road Design Engineer. If the consensus is that a supplemental is needed:
- The division head checks with other division personnel to find out if more items have been identified within that division.
- Submit a request for a supplemental to the specification writer on the contract.
- The specification writer will pool requests, check with other divisions to see if more items needing correction have been identified, and have the revisions reviewed by the principal specification engineer.
- The Chief or Assistant Chief Road Design Engineer will approve the supplemental notice as written, sign off, and deliver it to Contract Services. If the request occurs during the week of the bid opening, front office approval must be obtained for maintaining the bid date or postponing the opening.
- Contract Services will prepare the supplemental for vendor distribution and release it.

Close coordination with Administrative Services is vital to ensure proper timeframes and procedures are met. The Supplemental Notice needs to be processed at least one week before the bid opening date, or the bid date will need to be adjusted to allow sufficient time for review by contractors.

Bid opening. Administrative Services receives bids from the contractors and the bids are opened at the bid-opening meeting and the apparent low bidder is announced.

Award contract. Within two working days of a bid opening, Administrative Services provides the bid tabulation, including percentage variances from the engineer's estimate for each bid item to the chairman of the Bid Review Analysis Team (BRAT). They also notify the BRAT chairman of any defects or challenges that would or may render any of the bids non-responsive or otherwise affect the award of the contract.

If requested by the BRAT, the Designer reviews the quantities and prices of certain items to determine if there is an error in the contract that is prompting bidding discrepancies.
The BRAT reports to the director listing the effects of re-advertising on construction scheduling and the likelihood of receiving better bids with one of the following recommendations:

- Award to the apparent low bidder
- Award to the apparent second low bidder (or next responsive bid that is not materially unbalanced)
- Reject all bids, re-advertise and notify any agencies that are under agreement to provide funding.

Third party involvement. Any agreement with a local government (or private party) that is participating in the costs should review the bid and give concurrence to award the contract. Any such stipulation must be honored in accordance with the agreement.

Notice to proceed. Contracts in the Las Vegas area usually have a 45 working day notice to proceed; most northern Nevada projects have a 30 work day notice to proceed. The Construction Division sets the notice to proceed date.

6.11 Construction Support.

General. Once a contract has been awarded, it becomes the responsibility of the Resident Engineer to coordinate the activities. The design team provides the construction team with support throughout the remaining life of the contract.

Change orders. Change orders requested by Roadway Design go through the Chief Road Design Engineer to the Chief Construction Engineer. Examples of change orders can be found on SharePoint under standard project memo templates.

6.12 Archiving.

Electronic files. Roadway Design archives pertinent project computer files on CDROM around the time the contract is awarded. Archives include the project design files and the Special Provisions.

The Designer will assemble pertinent cad files (to include design files, finished drafted files, etc.) in a single directory named with the contract number. The location and path to this directory will be forwarded to Specifications, who will retrieve the files for temporary storage. The Designer should coordinate with the Safety/Traffic Division and Hydraulics when archiving projects to ensure that pertinent engineering documents are included.

After the award of the Contract, the Specifications writer will retrieve a final copy of the Special Provisions, Supplements, and any other correspondence pertinent to the contract. Specifications will copy the assembled files to three CD ROM disks; one to be forwarded to Central Records, one to be stored in the workbook in Design, and one to be kept in Specifications.

6.12 Archiving (Continued).

Workbook. The project files are to be retained by the Designer until the contract is completed so that construction problems can be worked out.

The material sent to Central Storage is to be reviewed by the Designer. Voided and non-current documents are to be disposed of prior to storage. FHWA requires that contract documents shall be retained until 3 years past the final pay or the final settlement of any litigation (whichever is the latest) This means that three years time is allowed for Federal Auditing after the final payment of the contract.

Therefore, documents to be stored are plainly labeled so that information can be readily located and retrieved.

Project records that are retained beyond the final payment + 3 years are such documents as follows:

- Original Traverses
- Hydraulic Calculations of Drainage Areas
- Field Books Containing Alignments, Check Levels, and Monuments
- Workbooks

Existing files. Previous contracts are available either in original 11”X17” printed format or on microfiche. Once a contract is available on microfiche, the printed version is no longer maintained in the division’s files. The microfiche system provides easy printing of pages from archived documents through the Xerox copier located next to the microfiche viewer. Printed contracts must be maintained in good condition and repaired if necessary prior to returning to the file. Cards are provided that must be filled out and inserted in place of the retrieved contract.

Older contracts produced using original versions of Microstation and Inroads are available from the Standards and Manuals section. These contain contract files that were converted from the Unix format to the Windows format and are not fully compatible with current versions of the programs or CADD standards. These may be useful for creating initial plan sets or for reproducing certain details, such as typical cross sections or special construction details.

A listing of contracts by county, route and project type is maintained by Roadway Design and is available on SharePoint>Design Division Home Page>Roadway Design Portal. This resource provides a convenient method to find contracts when you have only general information on the location.

SECTION 7 PLAN PREPARATION

7.1 Plan Preparation.

General. This section is to assist the plan preparer in developing contract plans that are consistent with NDOT standards. It offers solutions to common office questions and is not intended to replace engineering judgment or knowledge.

7.2 Plan Sheet Orientation and Color.

General. The contract plan sheets shall be produced on 11-inch by 17-inch white paper. The sheets shall be landscape oriented and bound along the left edge. The left margin shall be between ¾" to one inch. The top, bottom, and right margins shall be between ¼" to one-half inch.

Plan thickness. If the thickness of the contract plans exceeds three inches, the plan set may need to be separated into volumes to facilitate binding. The break for volumes shall be made at a logical point in the package so that a series of sheets is not separated.

Highlight color. The majority of plan components generated by the plan contributor are usually only displayed in black and white. When necessary or mandated, a highlight color may be used in the plans. Usually, a highlight color is used to differentiate existing topography from proposed construction items. The standard highlight color is green, with a RGB color value of (0,255,0), color #2 in the NDOT color table. No other color or color dithering will be accepted.

7.3 Plan Submittals and Revisions.

General. A plan submittal occurs when any event in the project development process requires a mass distribution of the associated plans to project contributors and stakeholders such as formal reviews and advertising of the contract. All submittals produced prior to the final advertisement set shall have each sheet clearly marked with the words "Preliminary - Subject to Revision."

During the design process each submittal shall be clearly marked to indicate the event and the production date of the set, or subset of plans (e.g. "Intermediate Design Submittal - January 1, 2099"). This information is generally placed above the preliminary stamp on the title sheet.

Sheet revisions. to the advertising set made after the contract has been advertised shall be clearly marked with the contract number, the word "Revised" and the revision date, for example "Contract 9999: Revised January 1, 2099." This applies to supplemental notices and contract change orders.

Electronic delivery workflow. Once the plans are ready to be advertised, plan contributors produce their assigned plans in a component PDF in the proper sheet order and in landscape orientation. The plan contributors, such as Bridge, Hydraulics, Traffic, Signals and Lighting, submit a copy of their component PDF to the Designer at the appropriate project schedule. Signatory hardcopies, such as the title sheet or plans by consultant engineers, are scanned into PDF and made part of the single component PDF.

The Designer assembles the various PDF files into a single composite PDF file that will be reproduced by Administrative Services. The composite PDF file contains all sheets that make up the entire contract plans except for the estimate of quantities. The estimate of quantities will be inserted electronically by Administrative Services.

The Designer electronically submits a copy of the composite PDF file to the Specifications Writer. The signed title sheet still needs to be hand delivered to the Specifications Writer for delivery to the Administrative Services Division.

The Specifications Writer electronically submits their Special Provisions and estimate, along with the single composite PDF file, to Administrative Services for reproduction, proofing and advertisement.

The electronic delivery server path is \\datsrv1\009specs\009AdminServices\ and is placed in the established contract folder.

The same process, as indentified above, occurs for plan revisions when a supplemental notice is issued.

Component naming standards. The following is the naming convention used during the initial submittal event:

Component deliverable	File naming convention
Roadway	[Contract #] DES.pdf
Hydraulic	[Contract #] HYD.pdf
Right of way	[Contract #] ROW.pdf
Signals and Lighting	[Contract #] SAL.pdf
Intelligent Transportation Systems	[Contract #] ITS.pdf
Permanent Signing	[Contract #] SGN.pdf
Bridge	[Contract #] STR.pdf

If a supplemental notice occurs after the contract has advertised, the naming convention for the component deliverable is followed by Rev[X]. Example: 3000DESRev1.pdf

Composite naming standards. The following is the naming convention used during the initial submittal event:

Component deliverable	File naming convention
Full contract set	[Contract #].pdf

If a supplemental notice occurs after the contract has advertised, the naming convention for the component deliverable is followed by Rev[X]. Example: 3000DESRev1.pdf

Resolution and format. The Xerox DocuTech 180 Highlight Color System currently being used by the Reproduction section has a maximum color printing resolution of 600 D.P.I.; therefore it is not necessary to generate the construction plans at a higher resolution. Plans should be produced at 600 D.P.I. Setting the default settings in Adobe Distiller to "Standard" will meet this requirement.

Compatibility of the PDF file format must adhere to Acrobat 5.0 (PDF 1.4) specification.

7.4 Base Plans for other Divisional use.

Roadway Design develops base plans for other Divisions. The Traffic Safety Division, Right of Way, Hydraulics, and Signals and Lighting utilize these plans in order to develop their respective design. Information contained in the base plans includes information such as alignments, edge of pavement, design mapping, and right of way lines. For an example, the base plans provided to the Traffic and Safety Section is for the preparation of Permanent Signs locations. The designer is to coordinate the exchange of this information early on in the design with the above mentioned divisions/sections.

7.5 Consultant Requirements.

Each original contract sheet prepared by a consultant engineer's firm shall be prepared and submitted in accordance with state law. The dimensions for the consultant advertisement logo are not to exceed one-half inches high by three inches long. They are to be placed on the location sketch in the lower right corner of the sheet unless the location sketch and title sheet are combined, in which case the advertisement may be placed in the same location on the first typical section sheet. If a consultant firm produces contract sheets only for specific functional areas, such as the bridge or hydraulics sheets, then the advertisement may only be placed on the first sheet of that section.

7.6 Title Sheets.

General. The purpose of the title sheet is to provide a general project location, a description of work to be done, and the route being constructed or improved. Geographical features such as highways, streets, roads, railroads, airports, county lines, detours, lakes, rivers, canals, peaks, mines, springs, wells, passes, and bridges are to be shown.

Title Sheet Guidelines. Electronic version of the title sheets are retrieved from the server using the link on SharePoint>010Design Division>CADD portal.

A title sheet is required for all projects. Multiple projects may be combined onto one title sheet if this can be accomplished without clutter or loss of legibility. Multiple projects are those listing two or more projects on the title sheet or having more than one title sheet.

The title sheet may also serve as the location sketch if it adequately fulfills the purpose of both sheets. Combining the title sheet and location sketch is usually done on point projects. Types of point projects include signal modifications, an interchange, cattle guard placement, a pedestrian structure, drainage work, bridge replacement, intersection modification, railroad crossing, or tunnels.

The title sheet must indicate the full route section, or portion of the route section, that is to be constructed or improved. Projects that are not State owned or maintained routes would be designated as "Off System." Off system projects shall be indicated on the title sheet where the route description would normally be shown.

The CADD Management Section in conjunction with the Planning Division maintains title sheets. The Planning Division reviews the title sheets and location sketch for each project at or approaching intermediate design submittal. Planning's function is to ensure that route designations and descriptions are current. Title sheet review includes, but is not limited to, alignment bar, milepost tabulation, retraced alignments, route and route section lengths, stationing of routes, route sections, construction and project lengths, and contract history.

All title sheets that are submitted for Planning's review must include the name and telephone extension of the requestor and the latest date that the title sheet needs to be returned after review. The designer makes the changes as necessary. When the changes have been performed, it is electronically submitted to the CADD Management Section where it is stripped of project related information and stored back on the server.

Title Sheet Particulars. Specific information for components on the title sheet as follows:

1) Alignment bar should be placed in the lower half of the title sheet. It depicts key points in the project such as begin/end construction (if applicable), begin/end project, all station equations, alignment designation changes (e.g. "A" to "O" line), structure limits (from abutment to abutment), and project exceptions. Divided roads with dual alignments shall include information for both alignments. The Location Division provides existing alignment information but new alignments (developed by the designers that are to become adopted alignments) need to be coordinated and approved with the Location Division. Design forwards approved alignments to Roadway Systems Division for new mile posting as shown in the milepost index.

Begin/End Construction needs to be identified in the alignment bar with appropriate stationing. These limits are for work that is being performed beyond the project limits, such as additional striping, signing, and pavement transitions beyond the project limits.

2) Approval signature and date is placed in the lower right corner of the Title Sheet. The Director signs the Title Sheet once it has been completed. The contract number, approval date, and final index of sheets need to be on the title sheet before signature. The project approval date is listed on the processing memo.

3) Begin/End route section is indicated by stationing with a leader/arrow extending to the particular point on the route. Routes may contain more than one route control number. For example, the statewide numbering scheme has 5 route control numbers on I-80 (IR080-1, IR080-2, etc). This information is available on the Intranet>Milepost index. For additional reference see Nevada's State Maintained Highways Descriptions, Index and Maps that is published by Planning (Roadway Systems Division). Show station equations at state lines, county lines, and at begin and end route.

4) Contact information is placed in the lower right-hand corner when the title sheet and location sketch has been combined. Provide the name of the Coordinator, Designer, and the Coordinator's phone number.

5) Contract number appears in the upper right hand corner of the Title Sheet and is provided by Administrative Services. The Senior Designer usually requests the contract number from Administrative Services after the processing memo is distributed. The contract number is only shown on the first title sheet on any given contract, regardless of the number of title sheets used.

6) Design designation is placed near the upper right hand corner of the Title Sheet. It provides traffic information and design criteria that a roadway or bridge is being designed to. The design designation is shown on the sheet in tabular form. The information shall contain the average annual daily traffic (AADT) (year advertised) and design year ~~ADT~~ AADT (usually 20 years from the year end of construction), the directional split (D), the design hour volume (DHV), the percentage of trucks T (DHV), and the design velocity (V). This information is requested from the Principal Traffic Operation Engineer and is used for projects such as new construction, capacity projects (Type 100), and bridge replacements. If the contract is for an interim design, both the interim and final design designation data should be shown. Design designations are not required on preservation (Type 200) projects. However, if engineering was performed under certain design controls, then the controlling data used in the calculations or analysis must be shown such (e.g. traffic volume, velocity, etc.). The posted speed limit must be shown for all railroad safety projects.

6a) Design criteria is placed near the upper right hand corner of the Title Sheet. Design criteria shall list the Manuals and Guides used during the design of the project. The design criteria is shown on the sheet in a tabular form. The information shall contain the year of the publication and publication's title.

7.6 Title Sheets (Continued).

7) DOT # and RR Milepost information is placed at railroad crossing(s) on projects that affect railroad structures, or construction that is within railroad right of way. This information is to be shown in a "flag" pointing to the appropriate structure or crossing. DOT# and RR Milepost numbers are provided/updated by the Traffic and Safety Division. RR mileposts are also available on the SharePoint>Milepost index.

8) History box provides information that includes the project number and station limits, the general description of the work, length of the total route or route section, length of project, length of construction, and length of exceptions within the project limits. The history box is to have leaders that extend to the scaled drawing of the route in a manner that clearly indicates the limits of the project. The project limits are initially established by the program papers, but may be changed as deemed necessary. Normally, project limits are tied to county lines, center of intersections, or beginning of a route. "Contract Ahead" and "Contract Back" are to be noted below and above the project station limits respectively, with the most recent original or major construction that was done in the area. Projects such as lighting, fencing, and overlays do not constitute original or major construction. There may be projects where no previous contracts exist; in this case the information would be left off the history.

9) Index of sheets is placed in the upper left hand corner of the Title Sheet and provides a listing of the type of sheets within the contract. Place the following standard note beneath the Index of Sheets: "See Standard Plans for Road and Bridge Construction, 200* edition." (* Standard Plans used in plan development.)

The following is an example of the index of sheets with the possible sheets used on a contract:

1 – 1Z	TITLE SHEETS AND LOCATION SKETCHES
2 – 2Z	TYPICAL CROSS SECTIONS
3 – 3Z	GENERAL NOTES, SUMMARIES AND ESTIMATE OF QUANTITIES
4 – 6	ROADWAY PLAN AND PROFILE
7 – 8	GRADING PLAN
9 – 10	GEOMETRICS AND ELEVATION CONTROLS
LC1 – LC9	LOCATION CONTROL
SD1– SD9	SPECIAL DETAILS
SP1 – SP9	SITE PREPARATION (REMOVALS)
L1 – L9	LANDSCAPE DETAILS
D(X)1- D(X)9**	DRAINAGE DETAILS (** -see section 12 Hydraulic plans for additional info.)
RW1 – RW9	RIGHT-OF-WAY
ST1 – ST9	PERMANENT STRIPING DETAILS
TC1 – TC9	TRAFFIC CONTROL
T1 – T9	SIGNALS AND LIGHTING
ITS1-ITS9	INTELLIGENT TRANSPORTATION SYSTEMS
TS1 – TS9	PERMANENT SIGNING
B1 – B9	BRIDGE SHEETS
BW1 – BW9	RETAINING WALLS AND SOUND WALLS
BL1 – BL9	BORING LOGS
S1 – S9	STRUCTURE LIST

10) Key map appears in the upper right hand corner of the title sheet. The purpose of the key map is to show where the project resides within the state.

11) Material site(s) are designated by the Materials Division and are approved by R/W. Electronic versions of these sites are available on SharePoint>010Design Division>CADD portal. When the material site is within the project limits, only the relationship of the site needs to be drawn to demonstrate approximate location, size, boundaries, haul roads in relation to alignment. It does not need to be drawn in detail because the sketch is made part of the Special Provisions, which is shown in greater detail. Material sites that are beyond the project limits need to be shown as a general map indicating the location and distance to the material site. Do not show commercial material sites. Material site information is only necessary on the title sheet when the title sheet and location sketch are combined.

12) Milepost tabulation information is required on the title sheet when the location sketch is combined. Information is available on SharePoint>Milepost index. The milepost tabulation provides a table of the stations, mileposts, a column for county cumulative mileposts for projects that core data is provided, and a description. Items to be included are begin/end construction, begin/end project, structures, and mileposts within the project limits.

13) North arrow is located on the Title Sheet and provides orientation. If township and range lines do not appear on this sheet then this information must be included on the north arrow.

14) Project number and milepost range come from the program papers and are placed along the leader with an arrow pointing to the appropriate location on the key map. There could be multiple project numbers and milepost ranges for one contract. In this case, multiple title sheets may be needed to avoid cluttering.

15) Project number and county is located in the upper right corner of the title sheet. List pertinent counties where the project is located.

16) Route section description is shown in the upper middle section of the sheet and describes the extending limits of the route. This information is to also contain the county(s) that the route extends through. Be aware that some routes have multiple route sections (e.g. US 395-1 and US 395-2 or US 50-1 through 6).

17) Scale bar is located in the lower middle section of the sheet and provides a reference to the length in miles or feet. If a different scale is used for the material site subset box, provide the appropriate corresponding scale.

18) Sheet numbering for the title sheet shall begin with number 1. Multiple title sheets shall be numbered 1, 1A, 1B, 1C, etc.

19) Section net includes townships and ranges through which the route section traverses. This information is provided by Location Division and is usually part of the title sheet from the server.

Not Required:

Begin/end construction and exception areas are not shown on the title sheet. This information is adequately described in the alignment bar and history box. Physical locations are only shown in the plans and noted in the typical sections by stationing.

SINGLE PROJECT

CONTRACT 3000

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-160-1(20)	CLARK	
		NYE	

DESIGN CRITERIA

XXXX AASHTO "GREEN BOOK"
XXXX MUTCD
XXXX ROADSIDE DESIGN GUIDE
XXXX NDOT ROAD DESIGN GUIDE
XXXX NDOT STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION

DESIGN DESIGNATION

AADT 1998	6000
AADT 2018	14800
D	57%
DHV	1320
T(DHV)	8%
V	70 MPH

FT=3

INDEX OF SHEETS

VOLUME I

VOLUME II

SEE BOOK OF STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION, 200* EDITION.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLANS

CLARK AND NYE COUNTIES

FROM SR604 LAS VEGAS BLVD TO WUL OF LAS VEGAS
VIA PAHRUMP VALLEY TO ROUTE US 095

PROJECT STP-160-1(20)

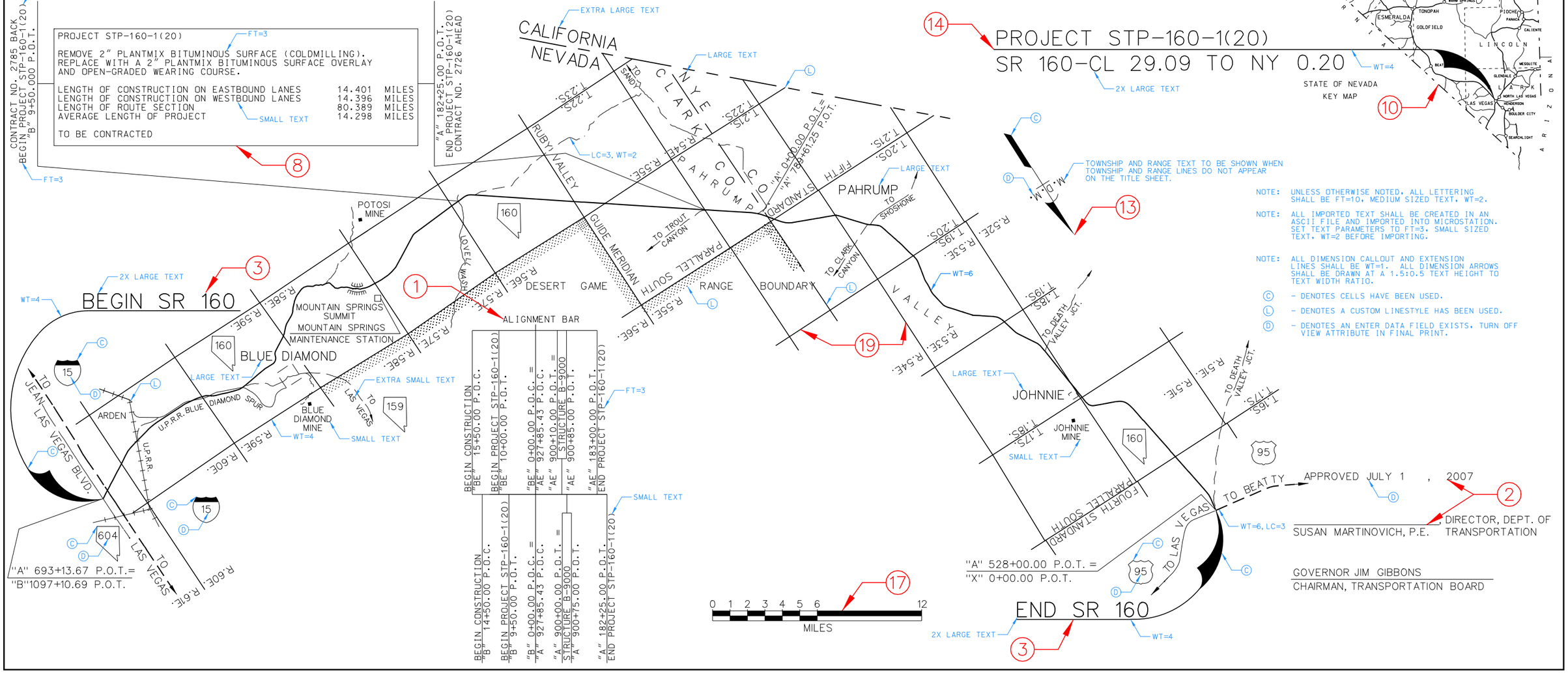
REMOVE 2" PLANTMIX BITUMINOUS SURFACE (COLDMILLING).
REPLACE WITH A 2" PLANTMIX BITUMINOUS SURFACE OVERLAY
AND OPEN-GRADED WEARING COURSE.

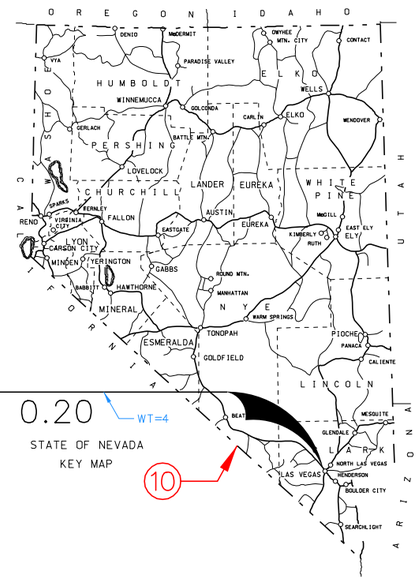
LENGTH OF CONSTRUCTION ON EASTBOUND LANES	14.401	MILES
LENGTH OF CONSTRUCTION ON WESTBOUND LANES	14.396	MILES
LENGTH OF ROUTE SECTION	80.389	MILES
AVERAGE LENGTH OF PROJECT	14.298	MILES

TO BE CONTRACTED

CONTRACT NO. 2785 BACK
BEGIN PROJECT STP-160-1(20)
"B" 9+50.000 P.O.T.

"A" 182+25.00 P.O.T.
END PROJECT STP-160-1(20)
CONTRACT NO. 2726 AHEAD





STATE OF NEVADA
KEY MAP

PROJECT STP-160-1(20)
SR 160-CL 29.09 TO NY 0.20

TOWNSHIP AND RANGE TEXT TO BE SHOWN WHEN TOWNSHIP AND RANGE LINES DO NOT APPEAR ON THE TITLE SHEET.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

APPROVED JULY 1 , 2007

SUSAN MARTINOVICH, P.E. DIRECTOR, DEPT. OF TRANSPORTATION

GOVERNOR JIM GIBBONS
CHAIRMAN, TRANSPORTATION BOARD

MULTIPLE PROJECTS

CONTRACT 3000

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	IM-080-1(128)41	WASHOE / LYON	1A
	STP-080-1(129)67	CHURCHILL	
	BHO-031(23)		

INDEX OF SHEETS (9)

FT=3 SMALL TEXT

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLANS

DESIGN CRITERIA

XXXX AASHTO "GREEN BOOK"
XXXX MUTCD
XXXX ROADSIDE DESIGN GUIDE
XXXX NDOT ROAD DESIGN GUIDE
XXXX NDOT STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION

(6a)

(5) (15) (18)

WASHOE-STOREY-LYON & CHURCHILL COUNTIES

(16) (D)

FROM THE CALIFORNIA/ NEVADA STATE LINE SOUTHWEST OF RENO VIA RENO TO THE CHURCHILL/PERSHING COUNTY LINE

(D) (14) 2X LARGE TEXT

PROJECT STP-080-1(129)67
IR80-CH 12.83 to 22.47
PROJECT IM-080-1(128)41
IR80-WA 41.49 to LY 5.84
PROJECT BHO-031(23)
OFF SYSTEM

WT=4

(3) 2X LARGE TEXT

END ROUTE SECTION 080-1

FT=3 SMALL TEXT

SEE BOOK OF STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION, 200* EDITION.

(1)

EXTRA SMALL TEXT

PROJECT BHO-031(23)

REMOVE AND RECONSTRUCT A PORTION OF CENTER PIER, AND SEISMICALLY UPGRADE 140' GRADE SEPARATION. REMOVE BITUMINOUS SURFACE FROM EXISTING STRUCTURE. SEAL DECK WITH 3/4" POLYMER CONCRETE. OVERLAY WITH 2 1/2" PLANTMIX BITUMINOUS SURFACE AND OPEN-GRADE FULL WIDTH (28').

LENGTH OF PROJECT	0.027 MILES
LENGTH OF CONSTRUCTION	0.031 MILES
OFF-SYSTEM PROJECT	

TO BE CONTRACTED

(8)

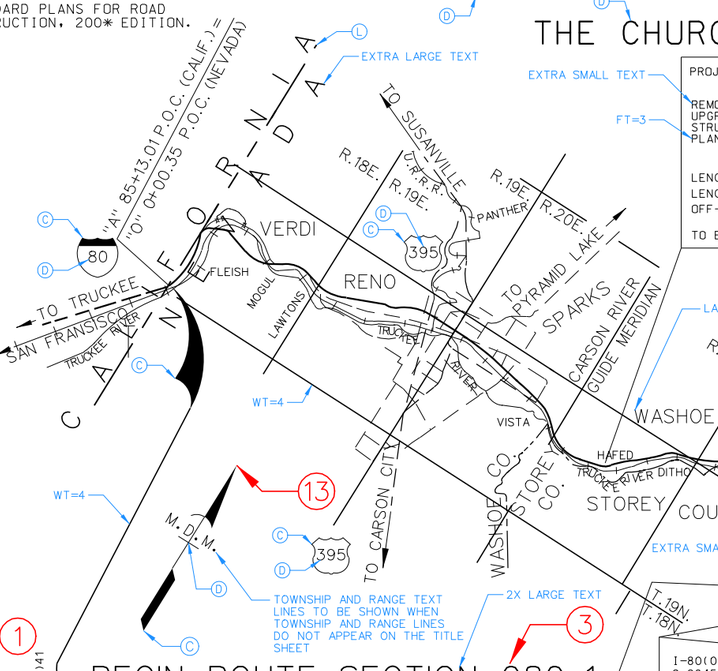
NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

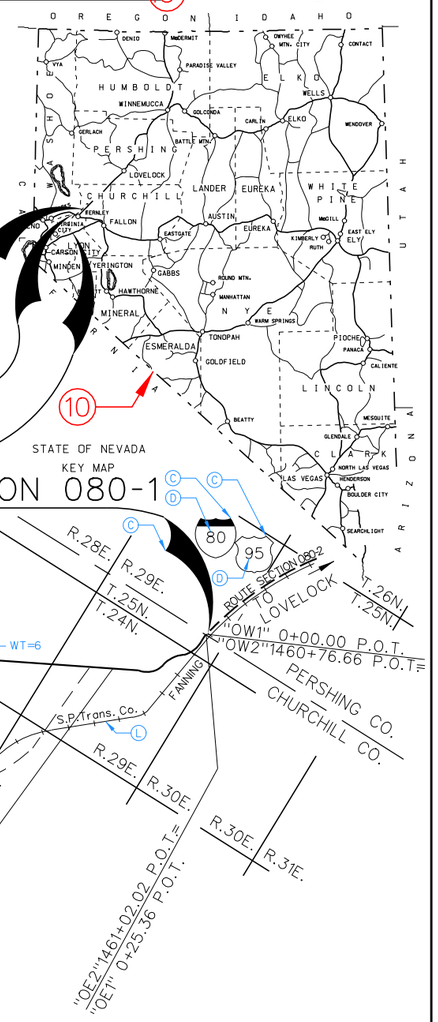
NOTE: ON MULTIPLE PROJECT TITLE SHEETS, EXTRA SMALL TEXT MAY BE USED IN THE HISTORY BOX AND ALIGNMENT BARS TO MAXIMIZE EFFICIENCY.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENTION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.
(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.
(D) - DENOTES AN ENTER DATA FIELD EXIST. TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.





ALIGNMENT BAR

BEGIN PROJECT STP-080-1(129)67	
"OE" 675+00.00 P.O.T.	"OW" 675+00.00 P.O.T.
"OE" 862+90.00 P.O.T.	"OW" 863+05.00 P.O.T.
10' x 4' x 87' RCB	C-919 E
"OE" 1184+73.92 P.O.T.	"OW" 1184+73.92 P.O.T.
END PROJECT STP-080-1(129)67	

(1)

ALIGNMENT BAR

BEGIN PROJECT IM-080-1(128)41	BEGIN PROJECT IM-080-1(128)41
"E" 1279+28.39 P.O.C.=	"OW" 1279+10.26 P.O.C.=
"OE" 1279+28.39 P.O.C.	"OW" 1279+66.38 P.O.C.
"OE" 1363+00.00 P.O.T.	"OW" 1363+00.00 P.O.T.
H-842 E	H-842 W
GILPIN GRADE SEPARATION	GILPIN GRADE SEPARATION
"LE" 1777+00.00 P.O.T.	"LW" 1777+00.00 P.O.T.
"OE" 0160+68.72 P.O.T.	"OW" 0160+68.72 P.O.T.
END PROJECT IM-080-1(128)41	END PROJECT IM-080-1(128)41

CONTRACT 2116 BACK
BEGIN PROJECT IM-080-1(128)41

"E" 1279+28.39 P.O.C.=	"OW" 1279+10.26 P.O.C.=
"OE" 1279+28.39 P.O.C.	"OW" 1279+66.38 P.O.C.

(8)

FT=3 EXTRA SMALL TEXT

PROJECT IM-080-1(128)41

REMOVE BITUMINOUS SURFACE FROM EXISTING STRUCTURES. SEAL DECKS WITH 3/4" POLYMER CONCRETE. REMOVE BITUMINOUS SURFACE (COLDMILLING) 3" DEPTH FROM 76' ROADBED (DUAL 38' ; INCLUDES 2-12' TRAVEL LANES , 1-10' AND 1-4' SHOULDER BOTH DIRECTIONS). OVERLAY STRUCTURE AND ROADWAY SURFACES WITH 5 1/2" PLANTMIX BITUMINOUS SURFACE AND OPEN-GRADE FULL WIDTH. REMOVE BITUMINOUS SURFACE (COLDMILLING); OVERLAY WITH PLANTMIX BITUMINOUS SURFACE AND OPEN-GRADE FULL WIDTH ALL RAMPS (DEPTH VARIES).

PROJECT AVERAGE LENGTH	9.426 MILES
LENGTH OF EASTBOUND (WA/ST)	3.590 MILES
LENGTH OF EASTBOUND (LYON)	5.842 MILES
LENGTH OF WESTBOUND (WA/ST)	3.609 MILES
LENGTH OF WESTBOUND (LYON)	5.811 MILES
LENGTH OF ROUTE SECTION	88.672 MILES

EXTRA SMALL TEXT

FT=3

TO BE CONTRACTED

(7)

I-80(0) - WA 23.54
G-2845 E&W
R/R MP 23.02 E&W
DOT 92410F

ALIGNMENT BAR

"LE" 1777+00.00 P.O.T.	"LW" 1777+00.00 P.O.T.
"OE" 0160+68.72 P.O.T.	"OW" 0160+68.72 P.O.T.
END PROJECT IM-080-1(128)41	CONTRACT 1226 AHEAD

CONTRACT 1126 BACK
BEGIN PROJECT STP-080-1(129)67

"OE" 675+00.00 P.O.T.	"OW" 675+00.00 P.O.T.

(8)

PROJECT STP-080-1(129)67

PULVERIZE EXISTING BITUMINOUS SURFACE (8" DEPTH). 8" ROADBED MODIFICATION, CEMENT TREATMENT. REMOVE BITUMINOUS SURFACE FROM ONE STRUCTURE AND SEAL DECK WITH 3/4" POLYMER CONCRETE. OVERLAY 5 1/2" AND OPEN-GRADE FULL WIDTH (INCLUDES 2-12' TRAVEL LANES.1-10' AND 1-4' SHOULDER BOTH DIRECTIONS).

PROJECT AVERAGE LENGTH	9.647 MILES
LENGTH OF EASTBOUND	9.642 MILES
LENGTH OF WESTBOUND	9.652 MILES
LENGTH OF ROUTE SECTION	88.672 MILES

EXTRA SMALL TEXT

FT=3

TO BE CONTRACTED

ALIGNMENT BAR

"OE" 1184+73.92 P.O.T.	"OW" 1184+73.92 P.O.T.
END PROJECT STP-080-1(129)67	CONTRACT 1089 AHEAD

0 3 6 12
MILES
(17)

APPROVED JULY 1 , 2007 (D)

(2)

SUSAN MARTINOVICH, P.E., DIRECTOR, DEPT. OF TRANSPORTATION

GOVERNOR JIM GIBBONS
CHAIRMAN, TRANSPORTATION BOARD

COMBINATION TITLE/LOCATION SKETCH-SINGLE PROJECT

CONTRACT 3000

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	CM-0667(4)	WASHOE	1B

INDEX OF SHEETS (9)

SEE BOOK OF STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION, 200* EDITION.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLANS

DESIGN CRITERIA (6a)

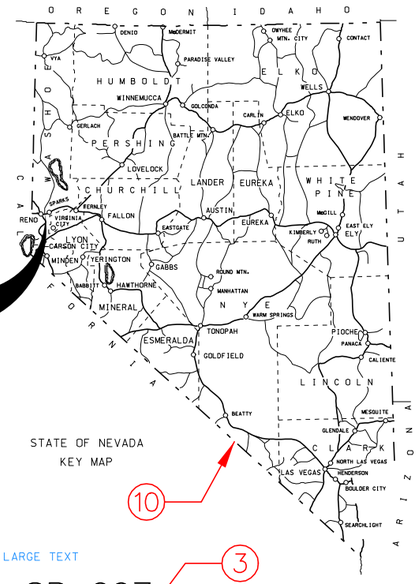
XXXX AASHTO "GREEN BOOK"
XXXX MUTCD
XXXX ROADSIDE DESIGN GUIDE
XXXX NDOT ROAD DESIGN GUIDE
XXXX NDOT STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION

WASHOE COUNTY

FROM S. VIRGINIA ST. SR430, WEST ON DEL MONTE LN TO KIETZKE LN AND ON KIETZKE LN. FROM DEL MONTE LN. NORTH TO "B" ST.

PROJECT CM-667(4)
SR667-WA 23.32

STATE OF NEVADA KEY MAP (10)



(1) ALIGNMENT BAR (SMALL TEXT)

BEGIN PROJECT "X" 24+57.93 P.O.T.
"X" 38+19.28 P.O.T.= "01" 38+19.28 P.O.T.
"01" 48+77.61 P.O.T. END PROJECT (FT=3)

(3) BEGIN SR 667 (2X LARGE TEXT, WT=4)

(13) TOWNSHIP AND RANGE TEXT TO BE SHOWN WHEN TOWNSHIP AND RANGE LINES DO NOT APPEAR ON THE TITLE SHEET

M.D.M.

(19) T.18N. T.19N. R.19E. R.20E.

DEL MONTE LN

S. VIRGINIA ST

KIETZKE LN

S. McCARRAN BLVD

NEIL RD

PECKHAM LN

LONGLEY LN

MOANA LN

GENTRY WAY

PLUMB LN

VASSER ST

ARLINGTON

PLUMAS ST

VIRGINIA LAKE (SMALL TEXT)

WELLS AVE (WT=2, LC=3)

EXTRA SMALL TEXT

WT=2, LC=3

WT=6

WT=6, LC=3

WT=4

430 TO CARSON CITY

580

80 TO VERDI

SIERRA ST

WT=6, LC=3

T.20N. T.19N.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.
(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.
(D) - DENOTES AN ENTER DATA FIELD EXISTS. TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

RENO TAHOE INTERNATIONAL AIRPORT (SMALL TEXT)

TRUCKEE RIVER (SMALL TEXT)

MILL ST

GLENDALE AVE

U.P.R.R.

B STREET

PRATER WAY

ODDIE BLVD

WEDEKIND RD

N. McCARRAN BLVD

EL RANCHO DR

SULLIVAN LN

CLEAR ACRE LN

TO STEAD 395

(7) I-80-WA 2.93
G-2845 E&W
R/R MP 0.52 E&W
DOT 924107F

TO FERNLEY 80

(END SR 667, 2X LARGE TEXT, WT=4) (3)

(11) Deposit No. WA - 12-4

(8)
CONTRACT 1126 BACK
BEGIN PROJECT CM-667(4)
"X" 24+57.93 P.O.T.

PROJECT NO. CM-667(4)

MOANA LANE AT KIETZKE LANE (SR667)
REMOVE BITUMINOUS SURFACE (COLDMILLING), OVERLAY WITH PLANTMIX BITUMINOUS SURFACE AND OPEN-GRADE.
CONSRUCT DUAL LEFT TURN LANES,
EASTBOUND TO NORTHBOUND
AND WESTBOUND TO SOUTHBOUND
EASTBOUND TO NORTHBOUND AND
WESTBOUND TO SOUTHBOUND (FT=3)

LENGTH OF PROJECT	0.522 MILES
LENGTH OF CONSTRUCTION	0.617 MILES
LENGTH OF ROUTE SECTION	5.895 MILES

(SMALL TEXT)

TO BE CONTRACTED

CONTRACT 1126 AHEAD
END PROJECT CM-667(4)
"01" 48+77.61 P.O.T.

(17) 0 1/4 1/2 1 MILES

(12) MILEPOST TABULATION

STATION	MILEPOST	STATION	COUNTY CUMULATIVE MILES
"X" 24+57.93 P.O.T.	SR667-WA 23.00	BEGIN PROJECT/MILEPOST 23	1.889
"01" 48+77.61 P.O.T.	SR667-WA 23.00	END PROJECT	2.347

(2) APPROVED JULY 1 , 2007

SUSAN MARTINOVICH, P.E. , DIRECTOR, DEPT. OF TRANSPORTATION

GOVERNOR JIM GIBBONS
CHAIRMAN, TRANSPORTATION BOARD

NOTE: CONTACT INFORMATION TO BE PLACED ON TITLE SHEET WHEN LOCATION SKETCH IS NOT USED.

(4)

DESIGN DIVISION	
DESIGNER	DESIGNER'S NAME
COORDINATOR	COORDINATOR'S NAME
PHONE (775)-888-2345	

COMBINATION TITLE/LOCATION SKETCH-OFF-SYSTEM PROJECT

CONTRACT 3000

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	ER-005(11)	DOUGLAS	1C

INDEX OF SHEETS (9)

FT=3 SMALL TEXT

SEE BOOK OF STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION, 200* EDITION

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLANS

(16)

DOUGLAS COUNTY (D)

FEDERAL-AID OFF-SYSTEM ROADWAY PROJECT (D)

RIVERVIEW DRIVE (D)

DESIGN CRITERIA

XXXX AASHTO "GREEN BOOK"
XXXX MUTCD
XXXX ROADSIDE DESIGN GUIDE
XXXX NDOT ROAD DESIGN GUIDE
XXXX NDOT STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION

(6a)

DESIGN DESIGNATION

AADT 1998	3500
AADT 2018	8000
D	42%
DHV	1126
T (DHV)	8%
V	35 MPH

(6)

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXIST, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

2X LARGE TEXT (14)

PROJECT ER-005(11)

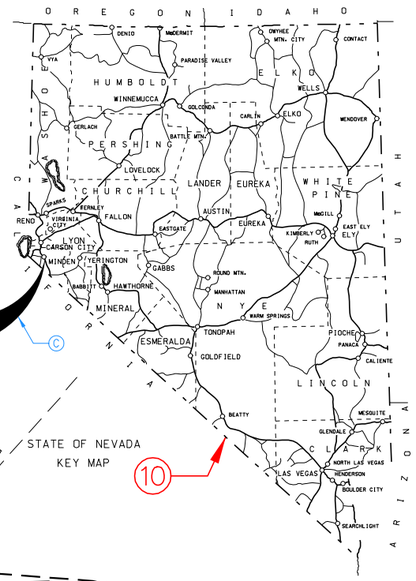
OFF SYSTEM

WT=4

2X LARGE TEXT

(5) (15) (18)

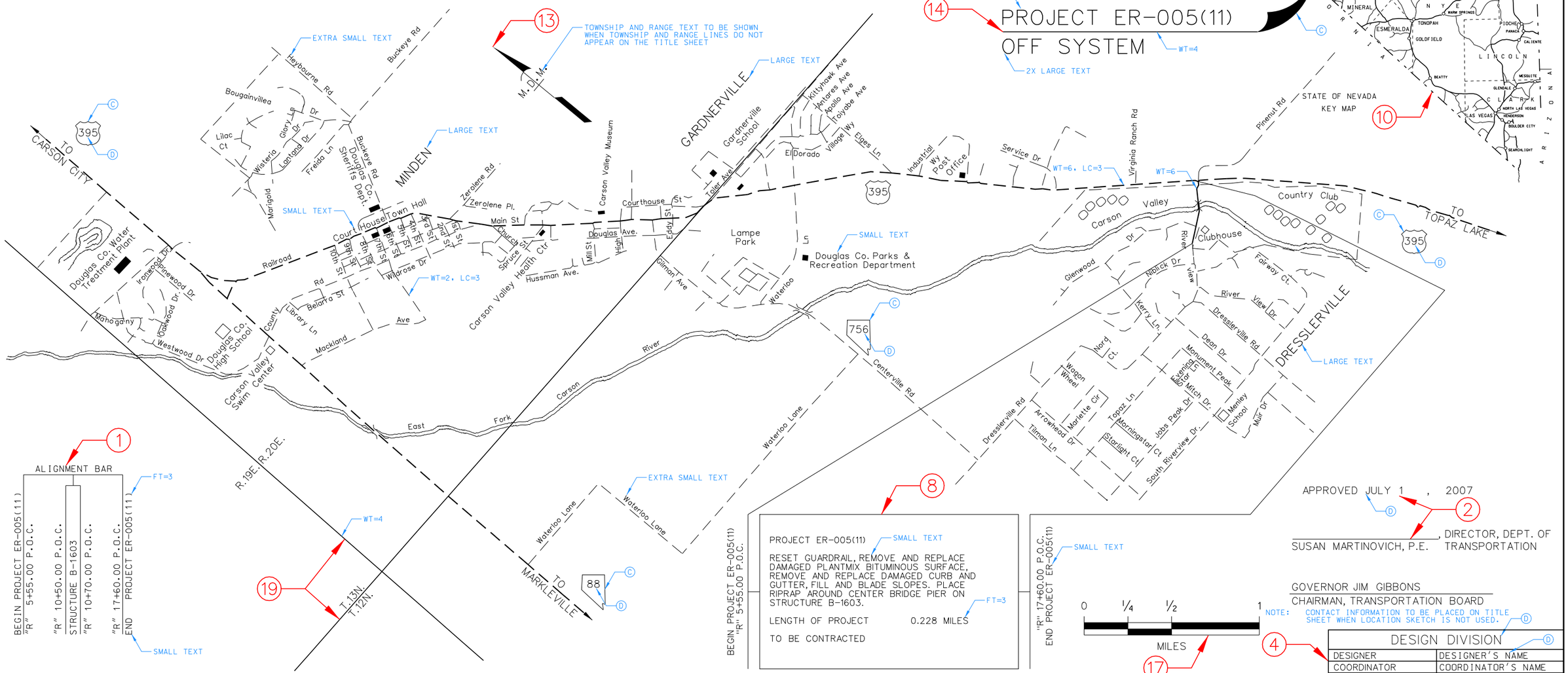
STATE OF NEVADA KEY MAP (10)



(13) TOWNSHIP AND RANGE TEXT TO BE SHOWN WHEN TOWNSHIP AND RANGE LINES DO NOT APPEAR ON THE TITLE SHEET

M. D. M.

LARGE TEXT



EXTRA SMALL TEXT

SMALL TEXT

(1)

ALIGNMENT BAR

FT=3

BEGIN PROJECT ER-005(11) "R" 5+55.00 P.O.C.
"R" 10+50.00 P.O.C. STRUCTURE B-1603
"R" 10+70.00 P.O.C.
"R" 17+60.00 P.O.C. END PROJECT ER-005(11)

SMALL TEXT

(19) WT=4

(8)

BEGIN PROJECT ER-005(11) "R" 5+55.00 P.O.C.

PROJECT ER-005(11) SMALL TEXT

RESET GUARDRAIL, REMOVE AND REPLACE DAMAGED PLANTMIX BITUMINOUS SURFACE, REMOVE AND REPLACE DAMAGED CURB AND GUTTER, FILL AND BLADE SLOPES. PLACE RIPRAP AROUND CENTER BRIDGE PIER ON STRUCTURE B-1603.

LENGTH OF PROJECT 0.228 MILES FT=3

TO BE CONTRACTED

"R" 17+60.00 P.O.C. END PROJECT ER-005(11) SMALL TEXT

0 1/4 1/2 1 MILES

(17)

APPROVED JULY 1 , 2007 (D) (2)

SUSAN MARTINOVICH, P.E., DIRECTOR, DEPT. OF TRANSPORTATION

GOVERNOR JIM GIBBONS
CHAIRMAN, TRANSPORTATION BOARD

NOTE: CONTACT INFORMATION TO BE PLACED ON TITLE SHEET WHEN LOCATION SKETCH IS NOT USED. (D)

(4)

DESIGN DIVISION (D)	
DESIGNER	DESIGNER'S NAME
COORDINATOR	COORDINATOR'S NAME
PHONE (775)-888-2345	

COMBINATION TITLE/LOCATION SKETCH-POINT PROJECT

CONTRACT 3000

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0531(002)	CARSON CITY	1D

DESIGN CRITERIA

XXXX AASHTO "GREEN BOOK"
XXXX MUTCD
XXXX ROADSIDE DESIGN GUIDE
XXXX NDOT ROAD DESIGN GUIDE
XXXX NDOT STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION

INDEX OF SHEETS

SEE BOOK OF STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION, 200* EDITION.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

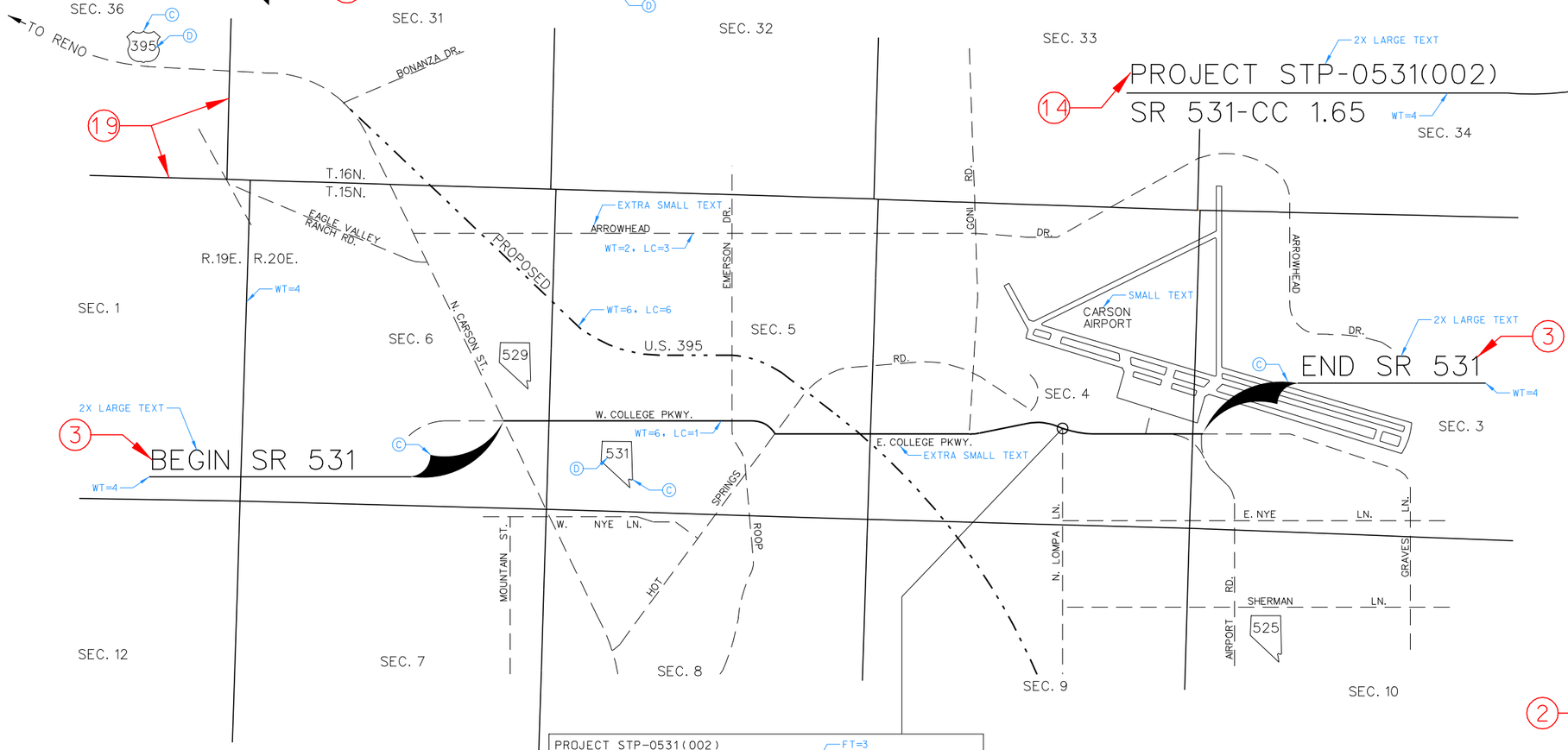
CONSTRUCTION PLANS

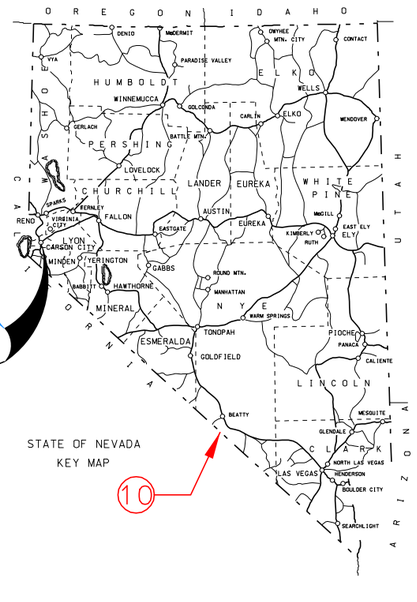
CARSON CITY

FROM SR 529 (N. CARSON ST.)
E. TO SR 525 (AIRPORT RD.)

TOWNSHIP AND RANGE TEXT TO BE SHOWN WHEN TOWNSHIP AND RANGE LINES DO NOT APPEAR ON THE TITLE SHEET

M.D.M.





NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(D) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

PROJECT STP-0531(002)

COLLEGE PARKWAY (SR531) AT LOMPA LANE
CONSTRUCT NEW SIGNAL SYSTEM

TOTAL LENGTH OF PROJECT 0.000 MILES
TOTAL LENGTH OF ROUTE 2.003 MILES

TO BE CONTRACTED

0 1/4 1/2 1
MILES

APPROVED JULY 1 , 2007

SUSAN MARTINOVICH, P.E., DIRECTOR, DEPT. OF TRANSPORTATION

GOVERNOR JIM GIBBONS
CHAIRMAN, TRANSPORTATION BOARD

NOTE: CONTACT INFORMATION TO BE PLACED ON TITLE SHEET WHEN LOCATION SKETCH IS NOT USED.

DESIGN DIVISION	
DESIGNER	DESIGNER'S NAME
COORDINATOR	COORDINATOR'S NAME
PHONE (775)-888-	

7.7 Location Sketch.

General. The purpose of the location sketch is to provide a more specific project location. This generally relates the project to major survey lines, mileposts, and prominent geographic features (e.g. rivers, city limits, railroads, township and ranges) to facilitate locating and staking plan elements in the field. The location sketch shows designated material sites and where they are located in relation to the project.

Location Sketch Guidelines. Electronic versions of location sketches may be retrieved from previous contracts archived in Specifications. Since Location sketches can widely vary from one project to another, there is no formal updating or archiving of this information.

Every project that has a location sketch needs to show and label all construction centerlines, detours, and haul routes.

Project limits are to be referenced to county mileposts based on the Department's master milepost index. The location sketch is to show the overall layout of the main line, ramps, frontage roads, and street locations. County roads and city streets shall be shown and labeled if they are important to the project. Do not show county roads and city streets just to "fill up" the sheet. As with all plan sheets, delete anything that does not add value to the plan sheet or provide detail or information that the reader needs.

Location sketches should normally be drawn at a scale to permit the full use of one sheet for all features. However, the scale of the location sketch shall be large enough to easily identify all construction lines and appropriate local and private roads. Do not reduce the scale in an effort to "squeeze" it all onto one sheet.

Location Sketch Particulars. Specific information for components on the location sketch as follows:

1) Alignments for roads, interchanges, frontage roads, detours and temporary connections to be constructed, improved, or removed are to be included. All alignments, including those for detours and temporary connections, shall be annotated with their associated identity.

2) Begin/End project is indicated by station with a leader/arrow extending to the particular point on the alignment. Provide the project number and indicate "Begin Project" or "End Project".

3) Contact information is placed in the lower right hand corner of the Location Sketch and provides the name of the Coordinator, Designer, and the Coordinator's phone number.

4) Material site(s) are designated by the Materials Division and are approved by the Right of Way Division. Electronic versions of these sites are available on SharePoint>010Design Division>CADD portal. The material site(s) only needs to be drawn on the location sketch to show the relationship of the site to the project limits. They only need to be drawn to show the approximate location, boundaries, haul roads in relation to alignment, and size. It does not need to be drawn in detail because the sketch is included in the Special Provisions, where it is shown in greater detail. Material sites that are beyond the project limits of the location sketch need to be shown as a general map indicating the location and distance to the material site. Do not show commercial material sites.

5) Milepost tabulation information is available on the SharePoint>Milepost index. The milepost tabulation provides a table of the stations, mileposts, a column for county cumulative mileposts for projects that core data is provided, and a description. Items to be included are begin/end project, flagged structures, and mileposts within the project limits.

6) North arrow is shown on the location sketch and provides orientation. If township and range lines do not appear on this sheet then this information must be included on the north arrow.

7) Project number and county is located in the upper right hand corner of the sheet. List pertinent counties where the project is located.

8) Scale bar is located in the lower middle section of the sheet and provides a reference to the length in miles or feet.

9) Section net is provided by the Location Division and provides the sections, townships and ranges through which the project limits traverse.

10) Sheet numbering for the location sketch shall begin with number 1A. When multiple title sheets and location sketches are used the numbering system would be 1, 1A (for title sheets) and 1B, 1C (for location sketches).

11) Station equations shall be shown on the location sketch. Show station equations with a leader line to the approximate point on the sketch (by stationing). If there is insufficient room on the location sketch to clearly identify the equation and exception areas, they may be shown in tabular form (data box) on the location sketch.

12) Structure numbers for bridges shall be identified with the appropriate structure number. The mileposts of these structures are contained in a flag and points to the appropriate structure. The Bridge Division assigns the structure numbers (e.g. I-1234, G-5678), refer to the current Structure index book for existing structure numbers. Culverts with assigned structure numbers are not shown on the Location Sketch, but only on the plan sheets.

Not Required:

Begin/end construction and exception areas are not needed on the location sketch. This information is adequately described in the alignment bar and history box in the title sheet. Physical locations are only shown in the plans and noted in the typical sections by stationing.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-080-1(129)67	CHURCHILL	1E

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

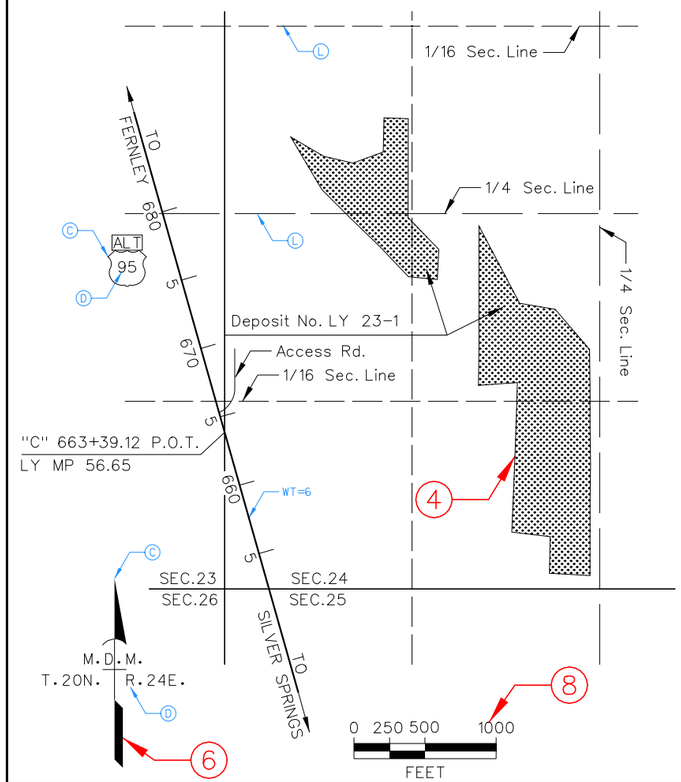
NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

MATERIAL SITE



TOWNSHIP AND RANGE TEXT TO BE SHOWN WHEN TOWNSHIP AND RANGE LINES DO NOT APPEAR ON THE LOCATION SKETCH.

M.D.M.

EXTRA LARGE TEXT

"OW" 1184+73.92 P.O.T.

END PROJECT STP-080-1(129)67

R.28E. R.29E.

US 95 INTERCHANGE

SEC. 17

TO LOVELOCK

80

SEC. 19

SEC. 20

1150

1100

TO FALLON

IR80-CH 22.09
I-816 E&W

WT=4

95

SEC. 24

1050

"AE" 1184+73.92 P.O.T.

END PROJECT STP-080-1(129)67

EXTRA LARGE TEXT

SEC. 25

"OW" 956+33.13 P.O.T.
"OW" 956+32.32 P.T. =

SEC. 26

1000

SEC. 27

SMALL TEXT

WT=2

JESSUP INTERCHANGE

950

WT=6

"AE" 958+25.45 P.O.T.
"AE" 957+63.91 P.T. =

SEC. 33

900

SEC. 34

HIGHWAY DESIGNATION

IR80-CH 17.73
I-819 E&W

STRUCTURE NUMBER PREFIX

STRUCTURE NUMBER

"OW" 827+30.92 P.O.T.
"OW" 827+30.35 P.T. =

WT=4

T.24N.

T.23N.

850

EXTRA LARGE TEXT

"OW" 675+00.00 P.O.T.

BEGIN PROJECT STP-080-1(129)67

WT=4

SEC. 6

SEC. 5

"OW"

800

"AE"

SEC. 4

R.27E. R.28E.

"OW" 706+32.36 P.O.T.
"OW" 706+21.92 P.T. =

750

SEC. 8

SEC. 12

SEC. 7

700

"AE" 704+46.35 P.O.T.
"OE" 704+46.01 P.T. =

SEC. 18

WT=6, LC=3

SEC. 13

80

TO FERNLEY

"OE" 675+00.00 P.O.T.

BEGIN PROJECT STP-080-1(129)67

WT=4

EXTRA LARGE TEXT

STRUCTURES THAT ARE WITHIN THE PROJECT LIMITS ARE TO BE FLAGGED, EXCLUDING C-STRUCTURES. C-STRUCTURES ARE SHOWN ON PLAN SHEETS ONLY.

0 1/4 1/2 1

MILES

SMALL TEXT

MILEPOST TABULATION

STATION	MILEPOST	DESCRIPTION	COUNTY CUMULATIVE MILES
"OE" 675+00.00 P.O.T.	IR80-CH-12.84	BEGIN PROJECT STP-080-1(129)67	12.832
"OE" 683+82.42 P.O.T.	IR80-CH-13.00	MILEPOST 13.00	13.000
"AE" 736+91.04 P.O.T.	IR80-CH-14.00	MILEPOST 14.00	13.999
"AE" 785+40.46 P.O.T.	IR80-CH-15.00	MILEPOST 15.00	14.872
"AE" 842+57.44 P.O.T.	IR80-CH-16.00	MILEPOST 16.00	16.078
"AE" 897+66.17 P.O.T.	IR80-CH-17.00	MILEPOST 17.00	17.198
"AE" 933+77.13 P.O.T.	IR80-CH-17.73	JESSUP INTERCHANGE I-819	17.734
"AE" 947+73.44 P.O.C.	IR80-CH-18.00	MILEPOST 18.00	17.997
"AE" 1055+25.18 P.O.T.	IR80-CH-20.00	MILEPOST 20.00	19.500
"AE" 1055+25.18 P.O.T.	IR80-CH-20.00	MILEPOST 20.00	20.065
"AE" 1108+06.92 P.O.T.	IR80-CH-21.00	MILEPOST 21.00	21.044
"AE" 1163+78.98 P.O.T.	IR80-CH-22.00	MILEPOST 22.00	22.051
"AE" 1164+69.11 P.O.T.	IR80-CH-22.09	US95 INTERCHANGE I-816 END IR80/US95-A BEG. IR80/US95	22.094 22.461
"AE" 1184+03.42 P.O.T.	IR80-CH-22.46	MILEPOST 22.46	22.462
"AE" 1184+73.92 P.O.T.	IR80-CH-22.47	END PROJECT STP-080-1(129)67	23.000

FT=3

NOTE: CONTACT INFORMATION TO BE PLACED ON TITLE SHEET WHEN LOCATION SKETCH IS NOT USED.

DESIGN DIVISION	
DESIGNER	DESIGNER'S NAME
COORDINATOR	COORDINATOR'S NAME
PHONE (775)-888-3456	

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

LOCATION SKETCH

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-395(001)	WASHOE	1F

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

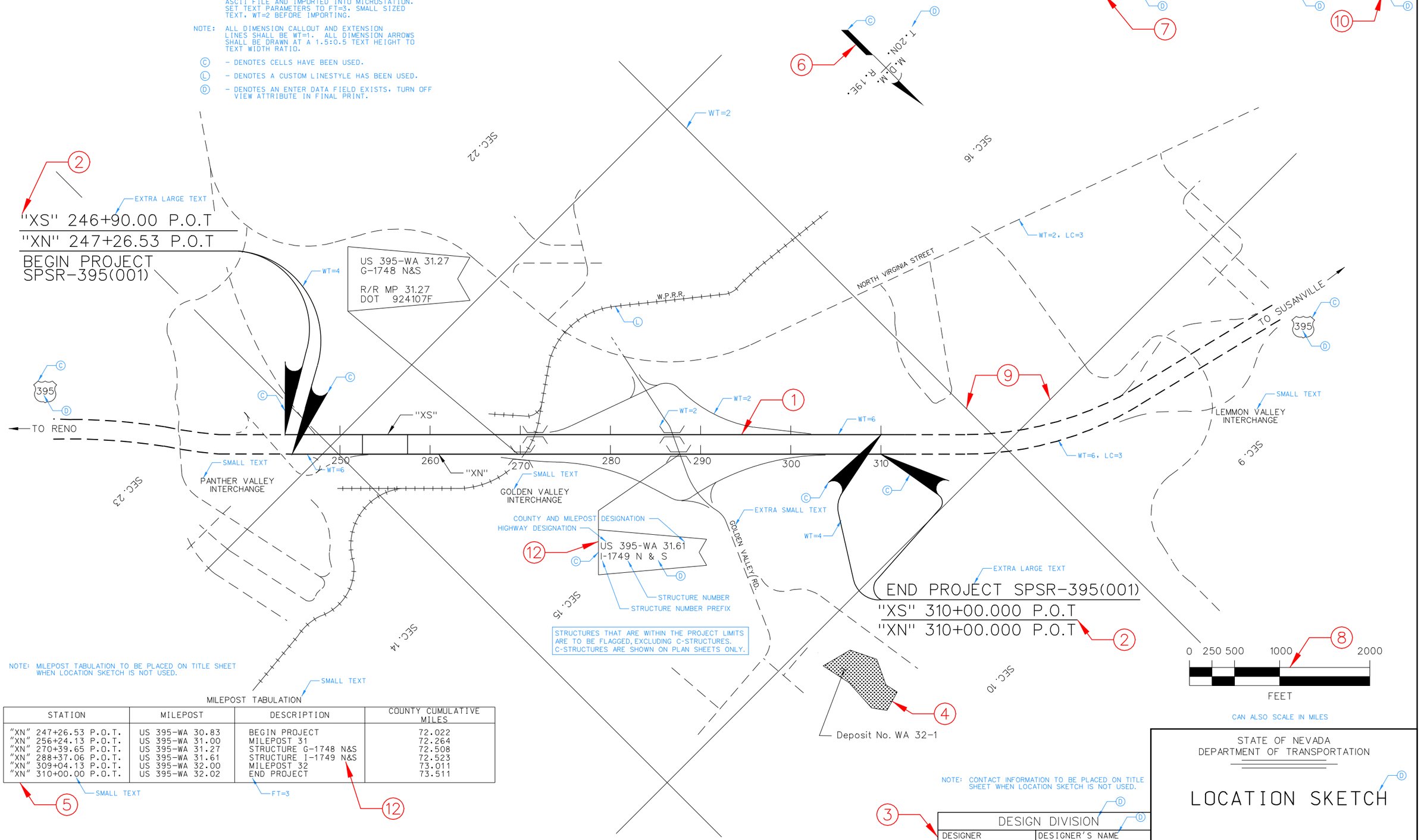
NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.



NOTE: MILEPOST TABULATION TO BE PLACED ON TITLE SHEET WHEN LOCATION SKETCH IS NOT USED.

SMALL TEXT

MILEPOST TABULATION

STATION	MILEPOST	DESCRIPTION	COUNTY CUMULATIVE MILES
"XN" 247+26.53 P.O.T.	US 395-WA 30.83	BEGIN PROJECT	72.022
"XN" 256+24.13 P.O.T.	US 395-WA 31.00	MILEPOST 31	72.264
"XN" 270+39.65 P.O.T.	US 395-WA 31.27	STRUCTURE G-1748 N&S	72.508
"XN" 288+37.06 P.O.T.	US 395-WA 31.61	STRUCTURE I-1749 N&S	72.523
"XN" 309+04.13 P.O.T.	US 395-WA 32.00	MILEPOST 32	73.011
"XN" 310+00.00 P.O.T.	US 395-WA 32.02	END PROJECT	73.511

5 SMALL TEXT — FT=3 — 12

NOTE: CONTACT INFORMATION TO BE PLACED ON TITLE SHEET WHEN LOCATION SKETCH IS NOT USED.

3

DESIGN DIVISION	
DESIGNER	DESIGNER'S NAME
COORDINATOR	COORDINATOR'S NAME
PHONE (775)-888-2345	

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

LOCATION SKETCH

7.8 Typical Sections.

General. The Materials Division provides structural sections that are requested by Roadway Design. Typical sections are for the purpose of depicting the structural elements of the roadway. They should not contain information concerning geometric elements, which can be adequately shown on the plans or geometric sheets. Typical sections shall be a graphic representation of the work to be performed.

Typical Section Guidelines. In most cases, the vertical scale of the sections should be exaggerated to clarify thickness of the various layers of the structural section. Use an appropriate H/V ratio to clearly depict details as necessary. Typicals should be drawn in such a fashion that it minimizes the amount of "white space" on the sheet.

Horizontal dimension of the typical sections shall be expressed in feet with accuracy to the tenth of a foot (0.1'). Vertical dimension of the typical cross sections shall be expressed in inches with accuracy to the quarter of an inch (¼"), excluding ditches, which are expressed in feet (e.g. 1.0 or 1.5 ditch).

Horizontal dimensions should be referenced to the control line. On new construction, or reconstruction, cross slopes on pavement surfaces are to be shown by percentage with an arrow and leader pointing in the direction of the slope. When perpetuating existing slopes, indicate "Match Existing" with an arrow and leader pointing in the downward direction of the slope. If dimensions vary, give the minimum to maximum values. Side slopes are to be identified as horizontal to vertical (e.g. 6:1 F.S.). Super elevations are not shown on the typicals, but are detailed on the profile sheets.

Vertical transition shall be 1 inch per 100 linear feet for high speed roadways, greater than or equal to 45 mph posted speed. For low speed facilities, less than 45 mph posted speed, 1 inch per 50 linear feet shall be used. Transitions around bridge structures should consider drainage. It is best to vertically transition 100' before and beyond the approach slab to avoid creating a ponding issue.

When there are multiple station-to-station entries under one typical, those entries are to be listed from the lowest stationing first and ascending down the sheet. Stationing is to be shown to the hundredth of a foot along with point type (e.g. (P.O.C.) point on curve, point of curvature (P.C.), point on tangent (P.O.T.), point of tangency (P.T.), etc.). It is important that station-to-station entries do not have "gaps." Gaps in stationing should be noted as area of exception, commonly over bridge structures, which in this case would be noted with a structure number and the corresponding stationing (e.g. Structure B-1234 Exception Area). Stationing should be connective and in logical order from sheet to sheet.

In areas where there are several station to station entries with varying widths, it is acceptable to show the min.~max. widths above the dimension lines and reference roadway widths and stationing to the base and surface sheets. This is in an effort to reduce the potential discrepancies between the base and surface sheets and the station to station entries in the typicals. When implementing this concept, care should be taken to provide adequate information so the substitution of the station to station entries on the typicals can stand alone in the summary sheets. For new construction or major reconstruction, it is recommended to show stationing in both the typicals and summary sheets if deemed appropriate.

Where new surfacing is to be placed on existing pavement, the bottom of the new surfacing which is to be in contact with the existing pavement shall be shown as a dashed line (shown in the Section of Improvement).

Addressing shoulder widening for guardrail or barrier rail in the typical sections is usually not required. The Standard Plans depict the placement detail for guardrail and barrier rail and they should not routinely be repeated on the typical sections. The typical sections are meant to show the structural section that is to be constructed with the project. The plans sheets and the structure list identify the location of guardrail and barrier rail. This, in conjunction with the Standard Plans, should be sufficient for identifying their location and construction thereof.

Right of way widths are not normally shown on the typicals if they can be adequately addressed in the plans or right of way sheets.

Typical Section Particulars. Specific information for components on the typical sections as follows:

1) Angle of repose is required when no other adjacent vertical feature will retain the sloughing of the bituminous material. Angle of repose is based on a 2H:1V slope. Angle of repose is not calculated for open-graded surface. P.C.C.P. is constructed vertically; therefore no angle of repose is shown or calculated.

2) As-Constructed is used for portraying the existing roadway prism, usually extending from the control line to the toe of slopes or back of curb. The As-Constructed demonstrates any surface preparation necessary to accommodate the Section of Improvement. For example, cold milling would be shown on the As-Constructed followed by the Section of Improvement. The Section of Improvement would show the new bituminous layers. The existing base and surface should be labeled as "Base and Surface" with arrows and leaders pointing to the respective layers. All lines that are used to show the As-Constructed shall be solid.

3) Control line should always be horizontally referenced and dimensioned to the respective roadway features. Dimensioning from one roadway feature to another roadway feature is acceptable, but it must have at least one tie to the control line. The appropriate alignment designation(s) should be shown next to the control line ("CL"). The control line should be dashed and projected from the As-Constructed to the Section of Improvement to show the relation of the two typicals. If there is a different control line from the As-Constructed to the Section of Improvement, then their relationship must be shown.

4) Cold milling below top of gutter pan needs to be dimensioned vertically at the front edge of gutter/edge of oil. The depth of cold milling needs to be referenced from "top of gutter". For example, the dimension would say "2 ¾" cold milling below top of gutter."

5) Cold milling details can be used to address varying widths around median turn pockets, islands, other unusual shapes, and at intersections. These details reduce multiple and complex station-to-station entries on the typicals. Dimension these areas on the typicals as "varies" with min.~max. limits. Place a note on the typicals referring to the appropriate sheet (e.g. "For cold milling details see sheets SP1-SP9"). Cold milling details may be shown in the typicals if they are incidental to the project. Where multiple sheets are required to show the cold milling details, it is better to use the site preparation plans to depict this information.

6) Project Number and county need to be shown in the upper right corner and placed in the appropriate designated boxes.

7.8 Typical Section (Continued).

7) Curb and gutter should be labeled with the appropriate type and dimensioned from the front edge of gutter/edge of oil to the control line. Dimensioning to the edge of gutter allows the pavement widths to match the base and surface sheets. When calling out new curb and gutter, the offset dimension is measured to the front face of curb (see Standard Plans). When encountering short sections of existing curb and gutter in an otherwise predominant edge of oil section, a note along with a drop down could be used to show this edge feature to handle cold milling and paving against the curb. In lieu of using station-to-station entries under the curb and gutter drop down a note could be used to say “See plan sheets for locations.”

8) Cross slope of the roadway should be indicated on the typicals with a leader and arrow pointing in the downward sloping direction. For new construction (Section of Improvement), the cross slope should be designated by percent, typically 2%. On maintenance overlays, the cross slope is usually perpetuated. It would say “match existing.”

9) Depth of cold milling and paving is labeled with an arrow and leader. Usually, plantmix bituminous materials are labeled above the bituminous courses and base layers are labeled below. Do not use legends to portray depths of removal sections or bituminous layers.

10) Dimensioning should be from the control line to the edge of oil. In a curb or gutter section,dimensioning would be from control line to the front edge of curb or gutter in order to match the widths on the summary sheets. When calling out new curb and gutter, the offset dimension is measured to the front face of curb (see Standard Plans). Longitudinal sections are dimensioned from station to station with corresponding lengths shown above.

11) Ditches and slopes are to be shown on the typicals for new construction, rehabilitation of existing, or when the profile sheets call out ditch notes. The ditches are to be dimensioned from the flow line to the projected dense-graded surface. Generally, ditches are shown on the left side of the typicals and the right is reserved for fill slopes. Construction of new slopes shall be designated with min.~max. slope ratios. Existing slopes to receive shoulder material would be designated with “Slope” on the as-constructed and “Exist Slope” on the Section of Improvement. Changes in slope ratio should be transitioned a minimum distance along the edge of the road 50 feet for every unit change in ratio. For example, a 200-foot or greater transition length would be required to change from a 2:1 fill slope to a 6:1 fill slope.

12) Drop down sections are usually required when addressing edge features that are not predominant to the overall composition of the roadway. For example, a drop down would be used in a short section of curb and gutter to address the additional milling depth to accommodate the open-graded surface. Other examples of drop downs would be to address paving of adjacent ditches, minor widening, etc.

13) Exception areas are to be listed within the station-to-station entries and accompanied with an explanation. For example, “X” 10+00.00 to “X” 11+00.00 (Structure B-1234)(Exception area). Where there is a gap in stationing because that section is a separate typical shown on a different sheet, reference to the sheet number should be included under the station-to-station entries.

14) Existing base and surface should be labeled with an arrow and leader below the typical section. In the As-constructed the existing base and surface is drawn with solid lines. However, under the Section of Improvement, the existing base and surface becomes a dashed line to represent existing.

15) Half Section of Improvements are usually used for showing different pavement strategies or depths, when they are different from one side of the road to another.

16) Islands (raised medians) should be shown on the typicals with appropriate minimum and maximum width along with the cross slope. Usually, the min.~max. dimensions are referenced to the geometric sheets for actual widths and locations. It is not necessary to show the types of island paving on the typicals since it is covered in the Standard Plans, special details, or landscaping plans.

17) Intersection details show the transition or the change in profile through an intersection where the structural section would adversely change the approach of a cross street. These details may be shown in the typicals or as a detail in the plans, and may require a longitudinal section to adequately show this information. Intersection details are primarily used in non-curb and gutter sections where the overlay changes the finished grade elevation. In contrast, this detail is usually not needed in curb and gutter section because mainline is usually cold milled and repaved to match the existing profile.

18) Legends are normally used to depict methods of removal, pulverization, or modification. Depths of removals and bituminous surfaces should be directly labeled with a leader and arrow rather than specified in the legend. The Legend box is placed in the upper left corner of the typicals.

19) Longitudinal sections are shown when depicting varying depths. Longitudinal sections are generally used for demonstrating deeper milling depths when showing the end of a full structural section (begin/end project) transitioning the overlay portion into the existing surface (begin/end construction). It is recommended that when transitioning at structures, to hold a constant depth a minimum of 100 feet before and after the approach slab before transitioning back up to the new finished grade elevation.

20) Modified sections are used for portraying alterations to the existing cross slope of the roadway. For example, when removing an existing median island and replacing it with a new structural section, this would be labeled “Modified.” Modified sections are also used on longitudinal sections when altering the existing profile of the roadway. For example, when the cold milling depth is increased near bridge structures, changing the profile, the longitudinal section would be labeled “Modified.” In other cases, a modified section may also be used when trying to portray multiple steps in rehabilitating the roadway surface. It would usually be followed by a Section of Improvement to address the placement of bituminous material.

21) Open-graded surface shall be flush with curb and gutter. If applicable, there should be a note under the Legend “Finished grade of ¾” Open-Graded Bituminous Surface shall be transitioned to match existing pavement surface at street intersections.” The open-grade should be flush with the top of surface drainage inlets on bicycle routes and bicycle lanes and/or where the inlets encroach into a travel lane. In some cases, special details will be necessary to modify existing drainage facilities. In snow removal areas the open-grade should be placed full width to eliminate drop-offs, grade breaks and other undesirable features that cause the snow removal equipment to snag and/or grade off plane.

22) Pavement reinforcing fabric or geotextile needs to be shown to the relative position within the roadway section and dimensioned appropriately to show widths and locations.

23) Profile grade is shown at the top of the dense graded surface and is required to be shown on typical sections for new construction. Profile grade is usually shown when substantially modifying the vertical profile and is accompanied with profile sheets. It is not necessary to reference profile grade on the typicals for most pavement rehabilitation methods or when transitioning milling or paving depths.

7.8 Typical Section Particulars (Continued).

24) Roadbed modification generally produces an additional 1-foot of widening as a result of the pulverizing and processing on each side of the roadway to facilitate construction. As a result of this process, the Section of Improvement should be dimensioned to reflect this additional widening. The dense graded and open graded surfaces are extended to accommodate the additional widening. The additional 1-foot widening is subject to variations to the existing width of the shoulder and terrain. Consideration of the additional widening should be discussed during the PDFS.

25) Sawcut lines should be shown and dimensioned on the typicals. Since there is usually no payment for sawcut the text should read “Sawcut (no direct payment).”

26) Seal coats are to be shown on the typicals when applied to the bituminous surface. This generally occurs when the surface does not receive open-graded surfacing.

27) Sections are for addressing miscellaneous areas such as patching details, approaches, minor widening, paving of median islands, etc. The cut section is usually designated with an “A-A” and references the corresponding plan sheet.

28) Section of Improvement is used to portray the finished product of the roadway surface. Any new base or bituminous layers are shown with appropriate widths and depths. Use green dashed lines to define existing surfaces.

29) Sheet numbering for the typical sections shall begin with number 2. Multiple typical section sheets shall be numbered 2, 2A, 2B, 2C, etc.

30) Shoulder widening of an additional 1-foot is required beyond the edge of pavement.

31) Sidewalks may be shown on the typicals as required. Generally, if work is being performed on the sidewalk, it can be portrayed and labeled “(width) sidewalk, see plans for locations.”

32) Stationing should be tabulated under the Section of Improvement. It is not necessary to repeat stationing both under the As-constructed and the Section of Improvement unless specifically warranted. Stationing should be to the hundredth of a foot and accompanied with the appropriate point type (e.g. P.O.C, P.O.T., etc.). At the designer’s discretion, stationing may be omitted from the typicals when the entries become extensively long. A note referencing the stationing and widths would be provided (e.g. “See summary sheets for stations and widths.”)

33) Varying widths are to be shown with the minimum and maximum widths above the dimension arrow. A circled letter is to be placed above the variable dimension for reference to the station-to-station entries. The variable widths are tabulated and placed below the typical, with a corresponding letter designation. As an effort to reduce station-to-station entries on the typicals, the roadway widths can be referenced with a note (e.g. “See summary sheets for stations and widths.”)

34) Witness lines are generally used for showing the relation of the As-Constructed to the Section of Improvement, usually when addressing widening from the normal edge of pavement. For example, witness lines should be extended from the As-Constructed saw cut line to the Section of Improvement to show the relation of widening at a glance. In most cases, control line should also extend from the As-Constructed to the Section of Improvement to show proper relation of the two typicals.

Not Required:

Roadside edge features such as barrier rail or guardrail do not necessarily need to be shown on the typicals, unless there is a need to address something that is not shown in the Standards. For example, the construction of new guardrail would not need to be shown on the typical because there is adequate detail in the Standard Plans for construction. The same is true when removing such roadway features. Other examples of roadway edge features that do not need to be shown are plantmix dike and sidewalk.

Plantmix type is not required on typicals. The bid item, theoretical applications, and the Special Provisions adequately cover plantmix type. However, when the use of leveling courses and different asphalt types are used to make up the composition of the various surfaces, the asphalt type shall be noted under the respective bituminous layer.

Other:

On roadbed modification, the pulverization bid item is calculated using the existing roadway width (including the angle of repose). The bid item for “Processing for Roadbed Modification” and “Portland Cement” is calculated using the additional 1’ width (or finished roadway width).

When the majority of the section consists of barrier rail, curb, gutter, and sidewalk, it is acceptable to show these features on the typicals. In special situations, such as non-standard placement of longitudinal barriers, it may be shown on the typicals when required.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-050-2(103)5	WHITE PINE	2

LEGEND – 18

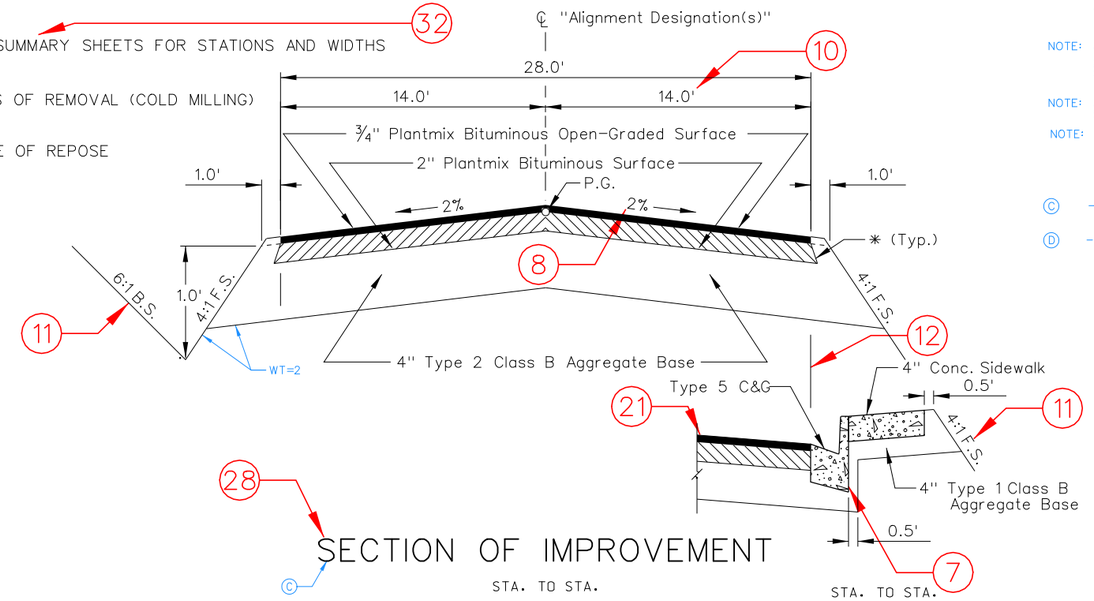
1 – SHOULDERING MATERIAL (AS DIRECTED BY THE ENGINEER)

A B – SEE SUMMARY SHEETS FOR STATIONS AND WIDTHS 32

LIMITS OF REMOVAL (COLD MILLING)

ANGLE OF REPOSE

NOTE: OPEN-GRADED SURFACE TO BE PAVED FLUSH WITH CURB AND GUTTER.



SECTION OF IMPROVEMENT

STA. TO STA.

STA. TO STA.

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: F.Y.I., ALL DETAILS SHOWN ON THIS PAGE WERE DRAWN AT A 1:6 HORIZONTAL TO VERTICAL RATIO. USE AN APPROPRIATE H/V RATIO TO CLEARLY DEPICT THE DETAILS.

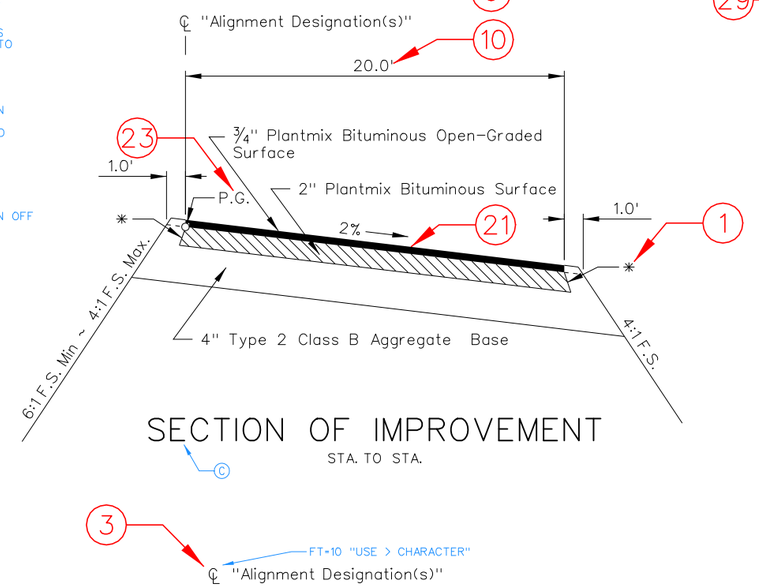
NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

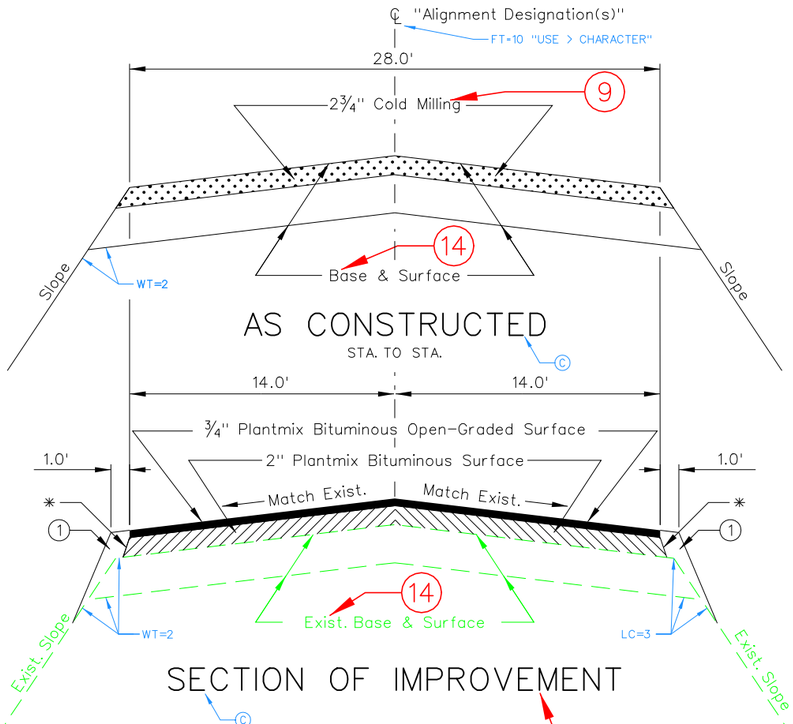
Ⓒ – DENOTES CELL HAS BEEN USED

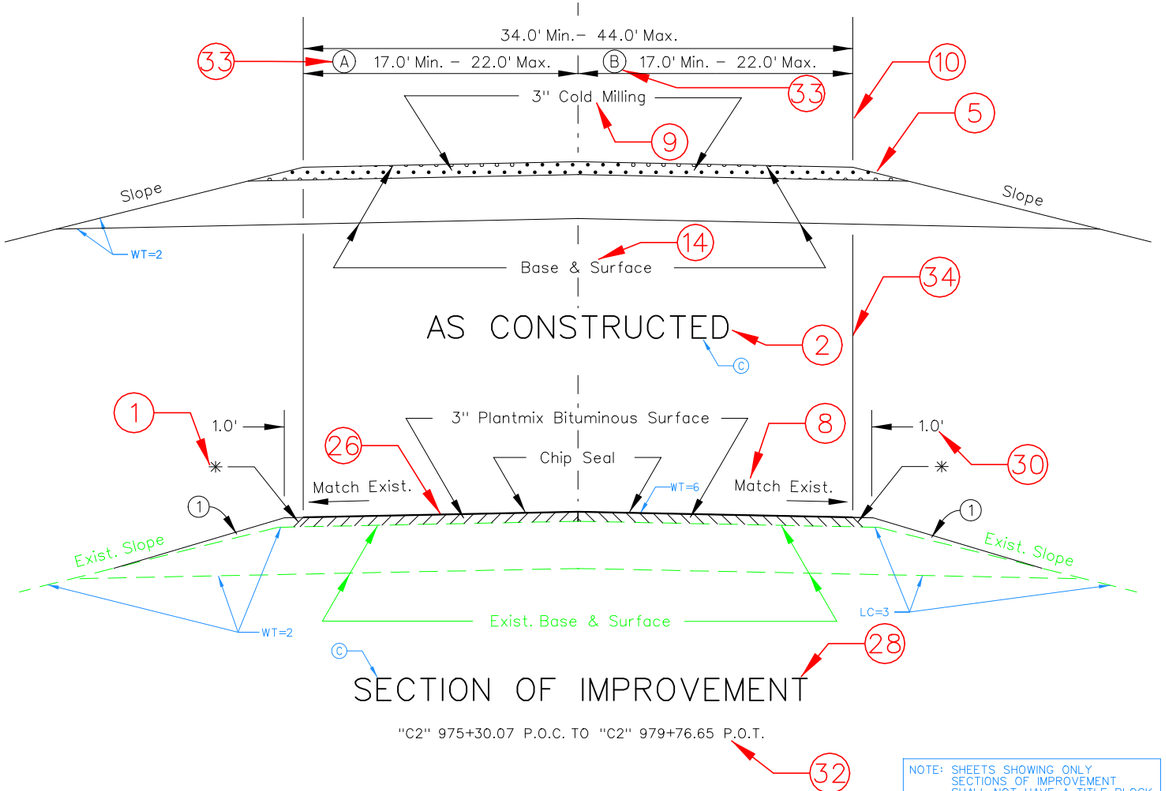
Ⓓ – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.



SECTION OF IMPROVEMENT

STA. TO STA.





NOTE: SHEETS SHOWING ONLY SECTIONS OF IMPROVEMENT SHALL NOT HAVE A TITLE BLOCK.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-050-2(103)5	WHITE PINE	2A

– LEGEND

(18)

- LIMITS OF REMOVAL (COLD MILLING)
- LIMITS OF PULVERIZATION
- LIMITS OF ROADBED MODIFICATION
- (1) SHOULDERING MATERIAL (AS DIRECTED BY THE ENGINEER)
- ANGLE OF REPOSE

NOTE: ¾" OPEN-GRADED BITUMINOUS SURFACE SHALL BE TRANSITIONED TO MATCH EXISTING PAVEMENT SURFACE AT STREET INTERSECTION. FT=3

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: F.Y.I., ALL DETAILS SHOWN ON THIS PAGE WERE DRAWN AT EITHER A 1:2 OR A 1:4 HORIZONTAL TO VERTICAL RATIO. USE AN APPROPRIATE H/V RATIO TO CLEARLY DEPICT THE DETAILS.

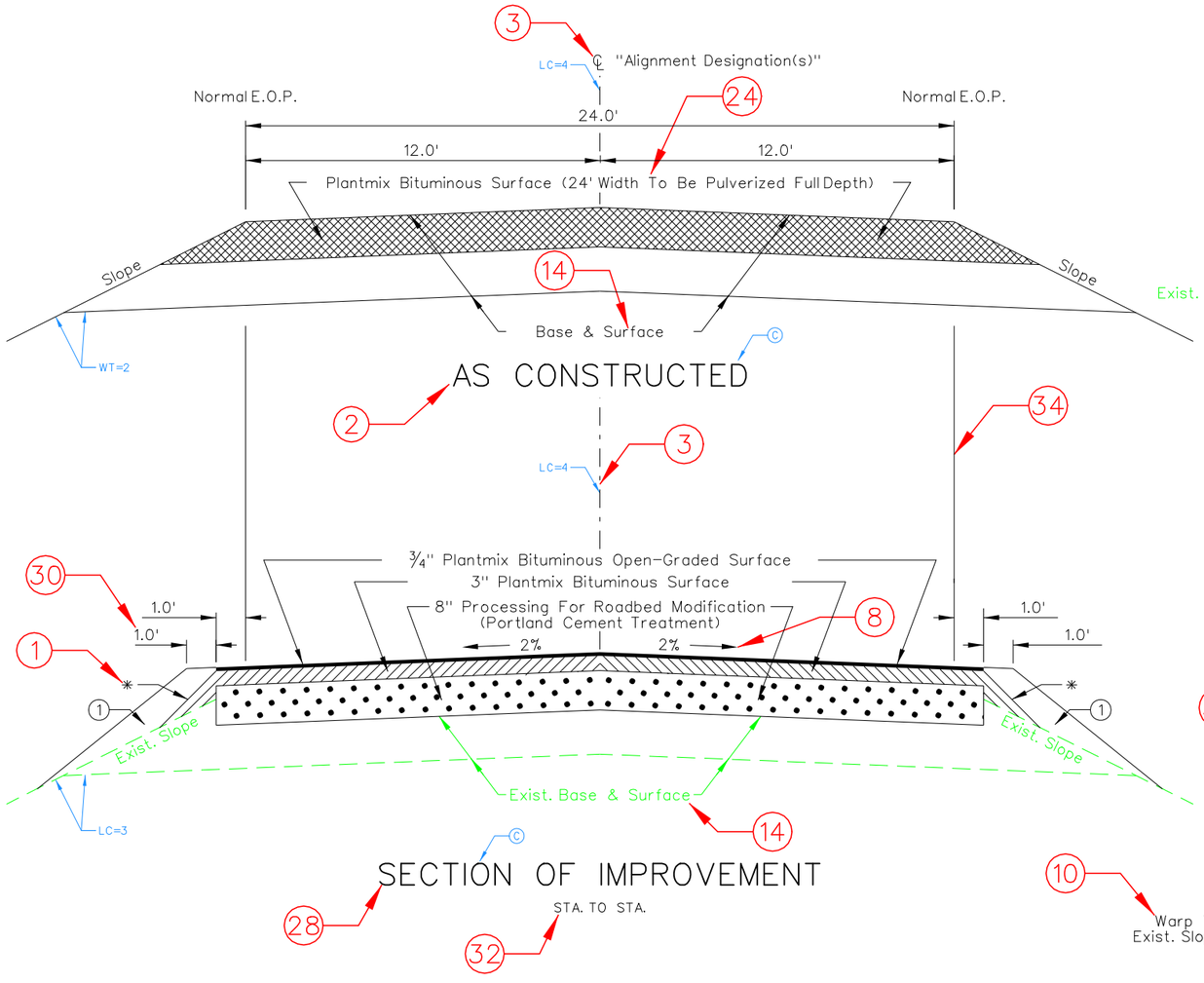
NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1, ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

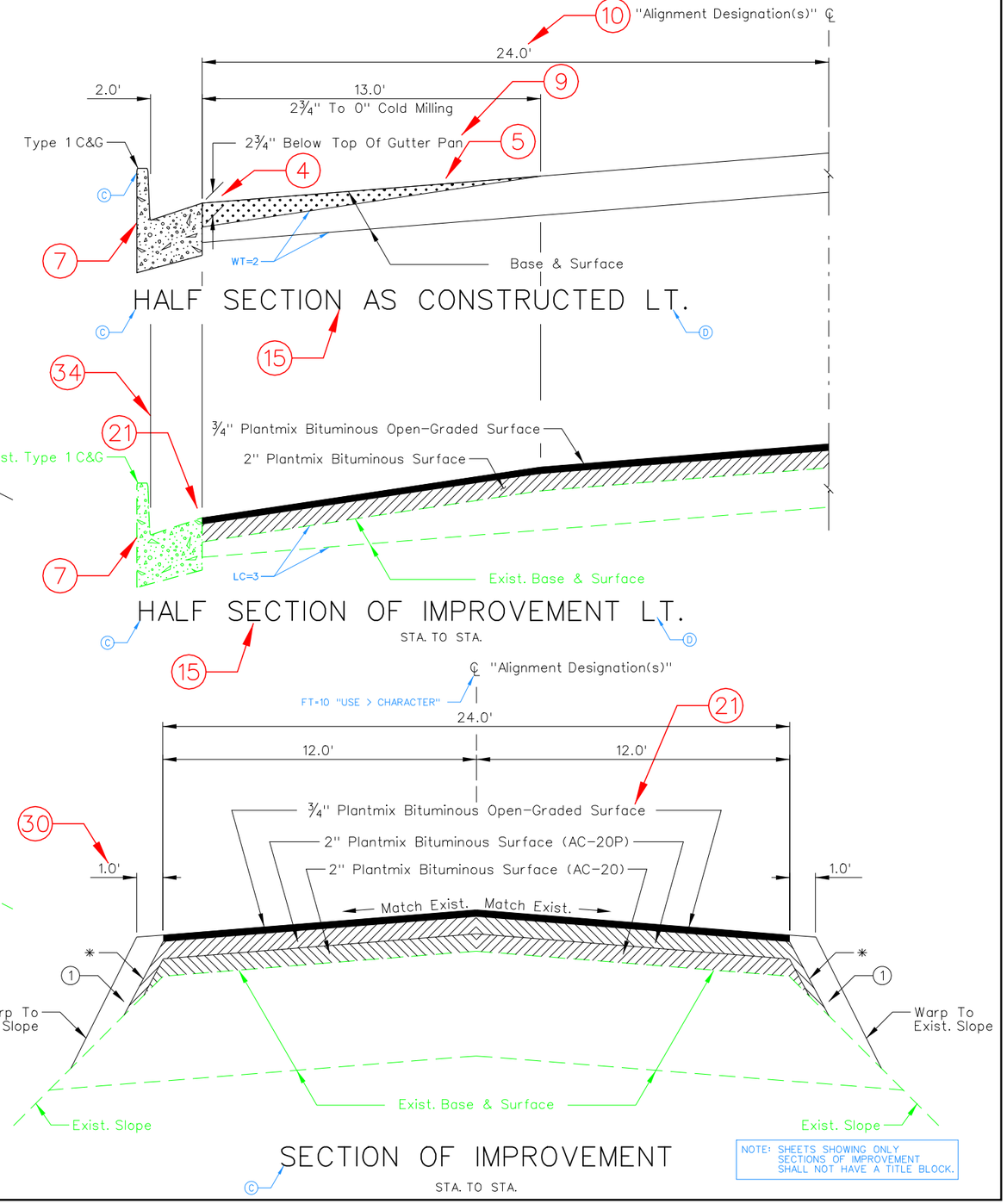
NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

(C) – DENOTES CELL HAS BEEN USED

(D) – DENOTES AN ENTER DATA FIELD EXISTS. TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.





NOTE: SHEETS SHOWING ONLY SECTIONS OF IMPROVEMENT SHALL NOT HAVE A TITLE BLOCK.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	AC-IM-080-4(067)305	ELKO	2B

– LEGEND – (18) (C) (C)

(C) – LIMITS OF REMOVAL (COLD MILLING)

(C) – LIMITS OF PULVERIZATION

(C) – LIMITS OF ROADBED MODIFICATION

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

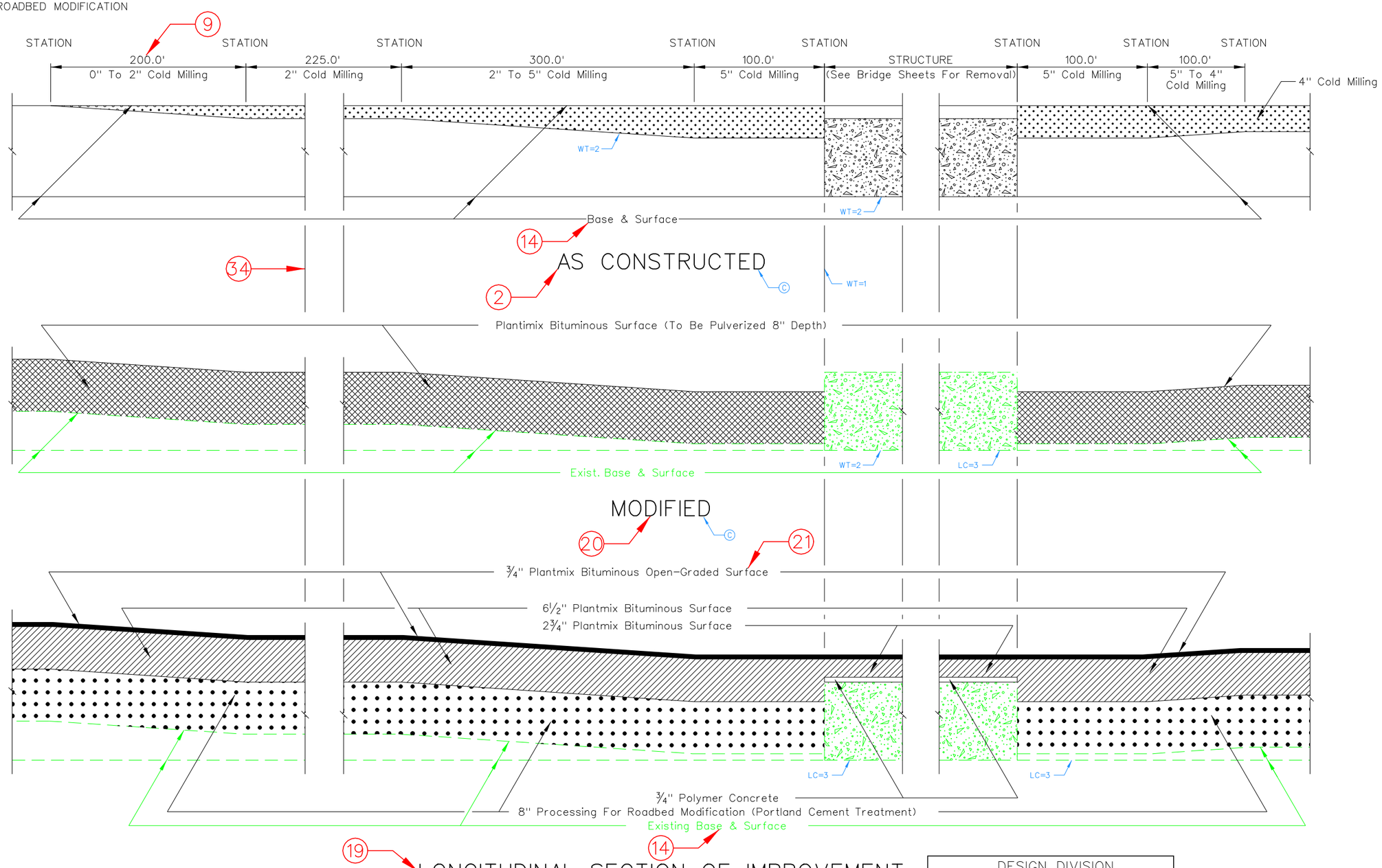
NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

(C) – DENOTES CELL HAS BEEN USED

(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

(D) (6) (D) (D) (29)



LONGITUDINAL SECTION OF IMPROVEMENT (C)

DESIGN DIVISION	
DESIGNER	
COORDINATOR	
PHONE (775)-888-	

NOTE: SHEETS SHOWING ONLY SECTIONS OF IMPROVEMENT SHALL NOT HAVE A TITLE BLOCK.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-225(1)	ELKO	2C

18 LEGEND (C)

LIMITS OF REMOVAL (COLD MILLING) (C)

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: F.Y.I., ALL DETAILS SHOWN ON THIS PAGE WERE DRAWN AT EITHER A 1:3, 1:4 OR A 1:10 HORIZONTAL TO VERTICAL RATIO. USE AN APPROPRIATE H/V RATIO TO CLEARLY DEPICT THE DETAILS.

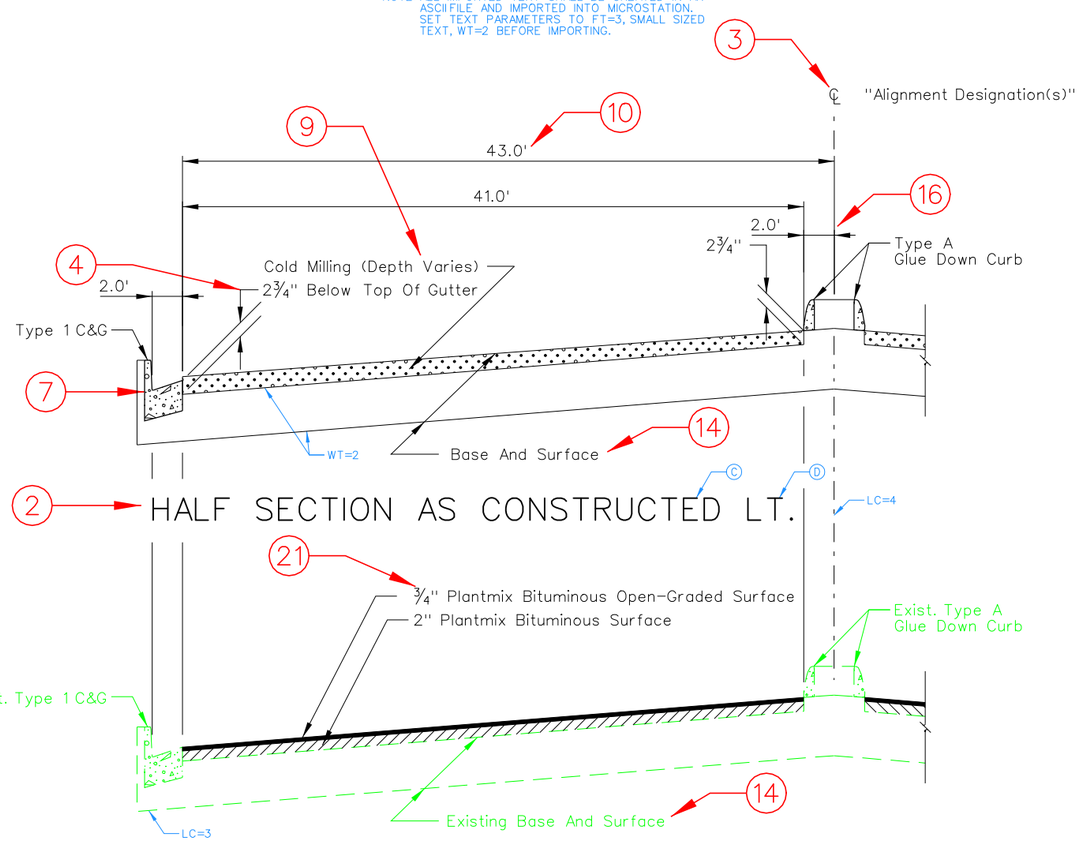
NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

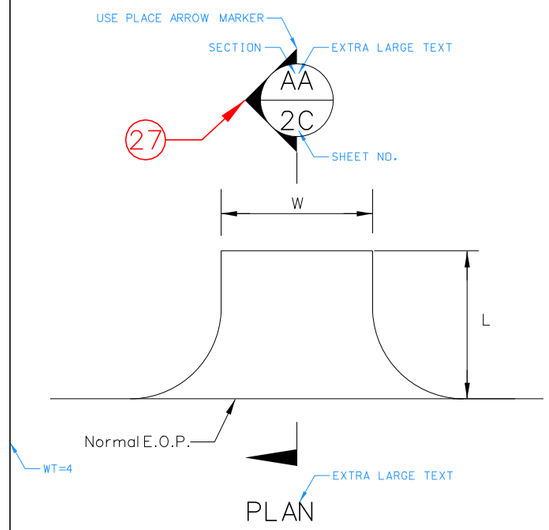
NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

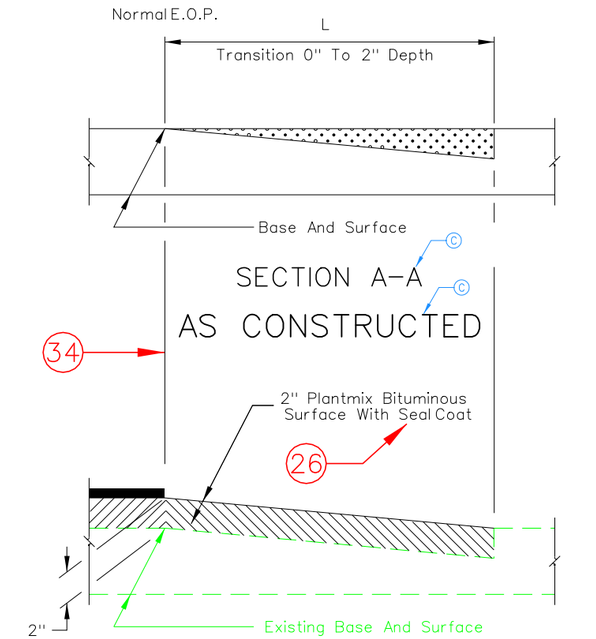
NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

(C) – DENOTES CELL HAS BEEN USED.

(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.







FOR (L) AND (W) SEE STRUCTURE LIST

METHOD OF PAVEMENT TRANSITION APPROACHES AND TURNOUTS

2X LARGE TEXT

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS & SPECIAL DETAILS (D)

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-0401(2)	PERSHING	2D

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: F.Y.I., ALL DETAILS SHOWN ON THIS PAGE WERE DRAWN AT A EITHER A 1:5 OR 1:3 HORIZONTAL TO VERTICAL RATIO. USE AN APPROPRIATE H/V RATIO TO CLEARLY DEPICT THE DETAILS.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

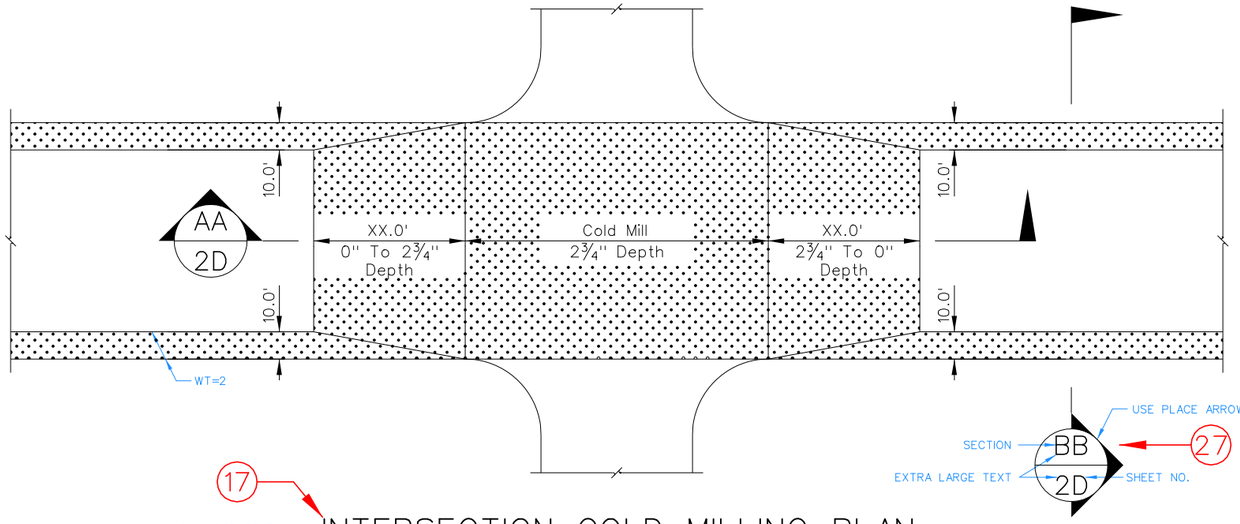
NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

(C) – DENOTES CELL HAS BEEN USED

(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

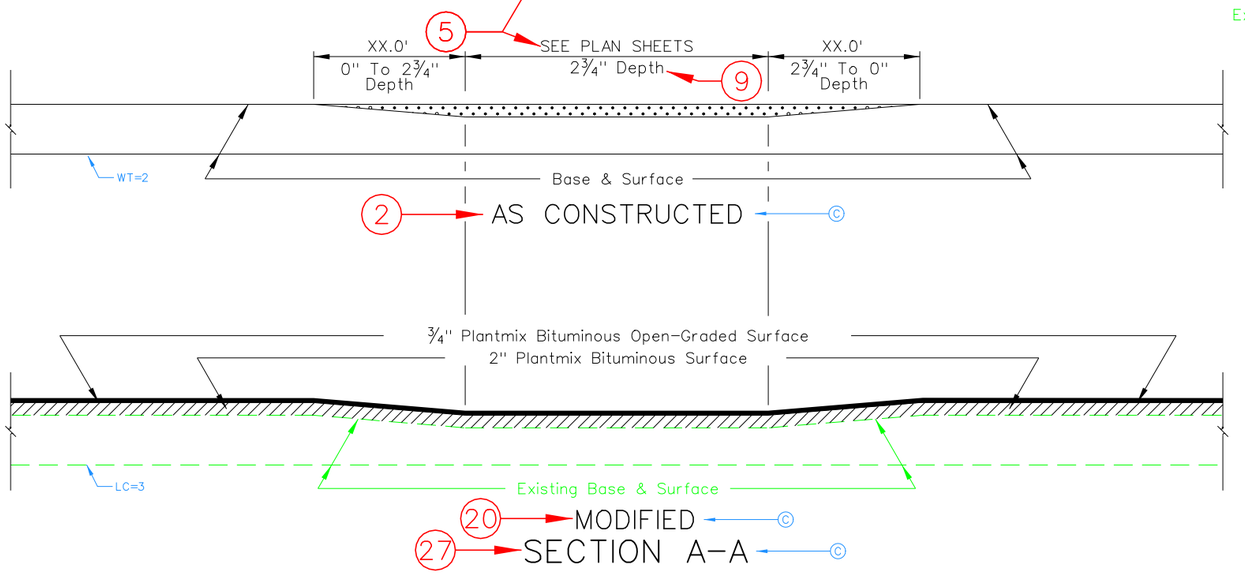
LEGEND

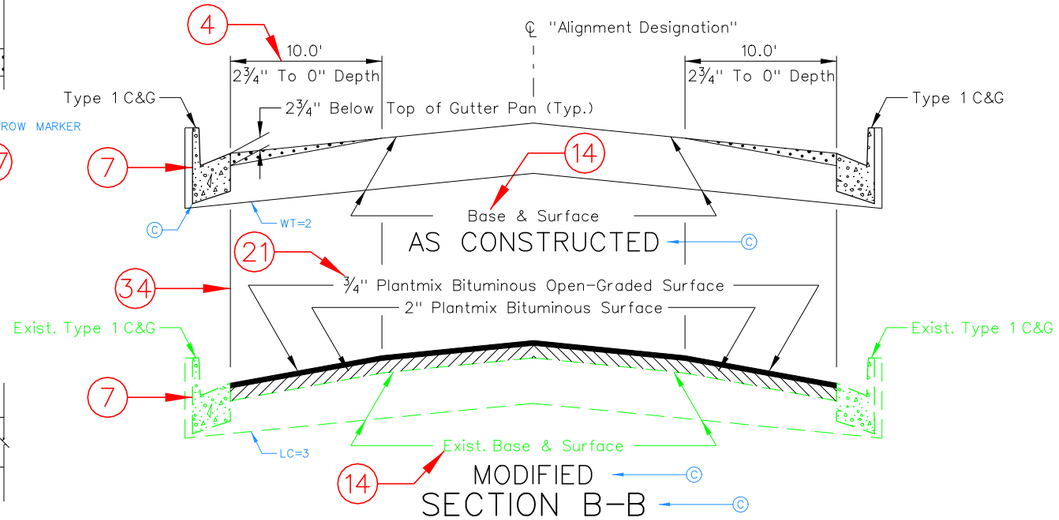
LIMITS OF REMOVAL (COLD MILLING)



INTERSECTION COLD MILLING PLAN

2x LARGE TEXT





STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION & SPECIAL DETAILS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	AC-IM-080-4(067)305	ELKO	2E

LEGEND

- CRACK AND SEAT CONCRETE SURFACE
- (1) SHOULDERING MATERIAL (AS DIRECTED BY THE ENGINEER)
- ANGLE OF REPOSE

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: F.Y.I., ALL DETAILS SHOWN ON THIS PAGE WERE DRAWN AT A 1:3 HORIZONTAL TO VERTICAL RATIO. USE AN APPROPRIATE H/V RATIO TO CLEARLY DEPICT THE DETAILS.

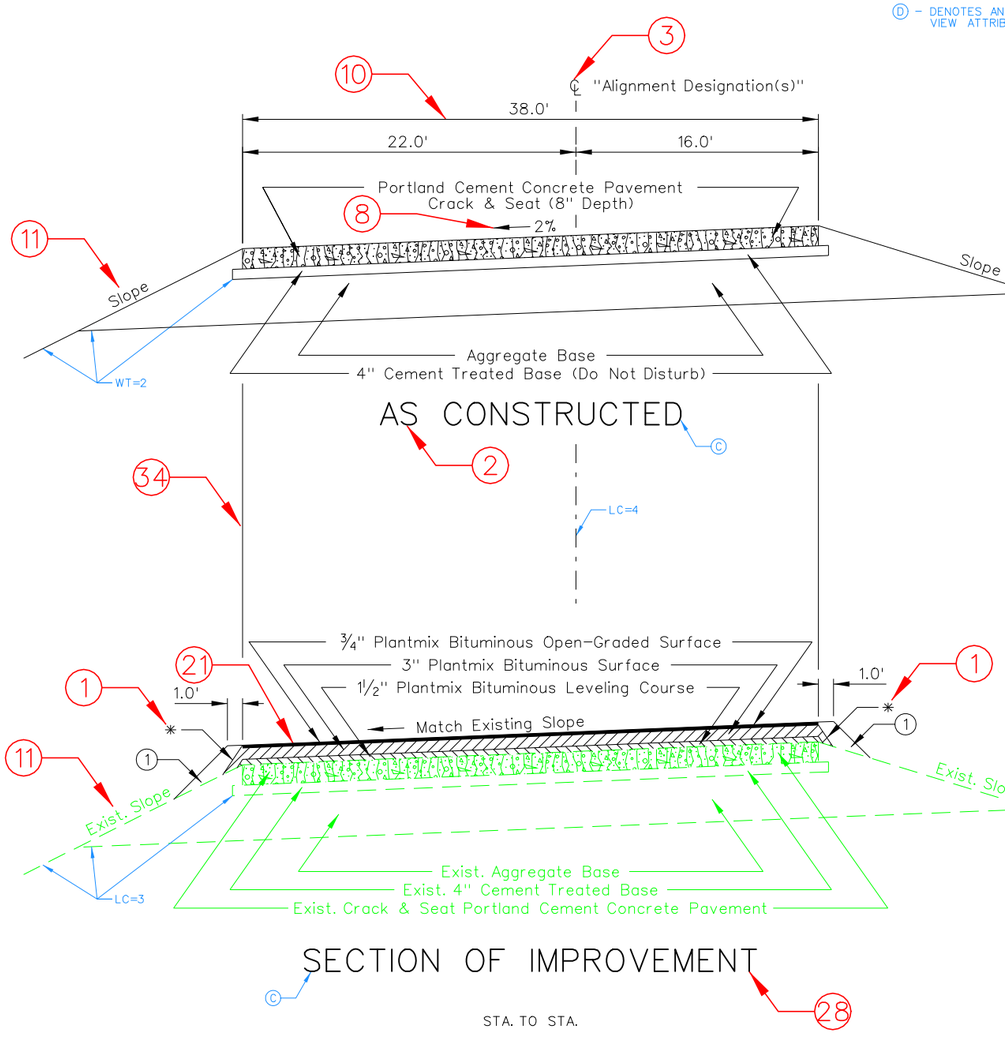
NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

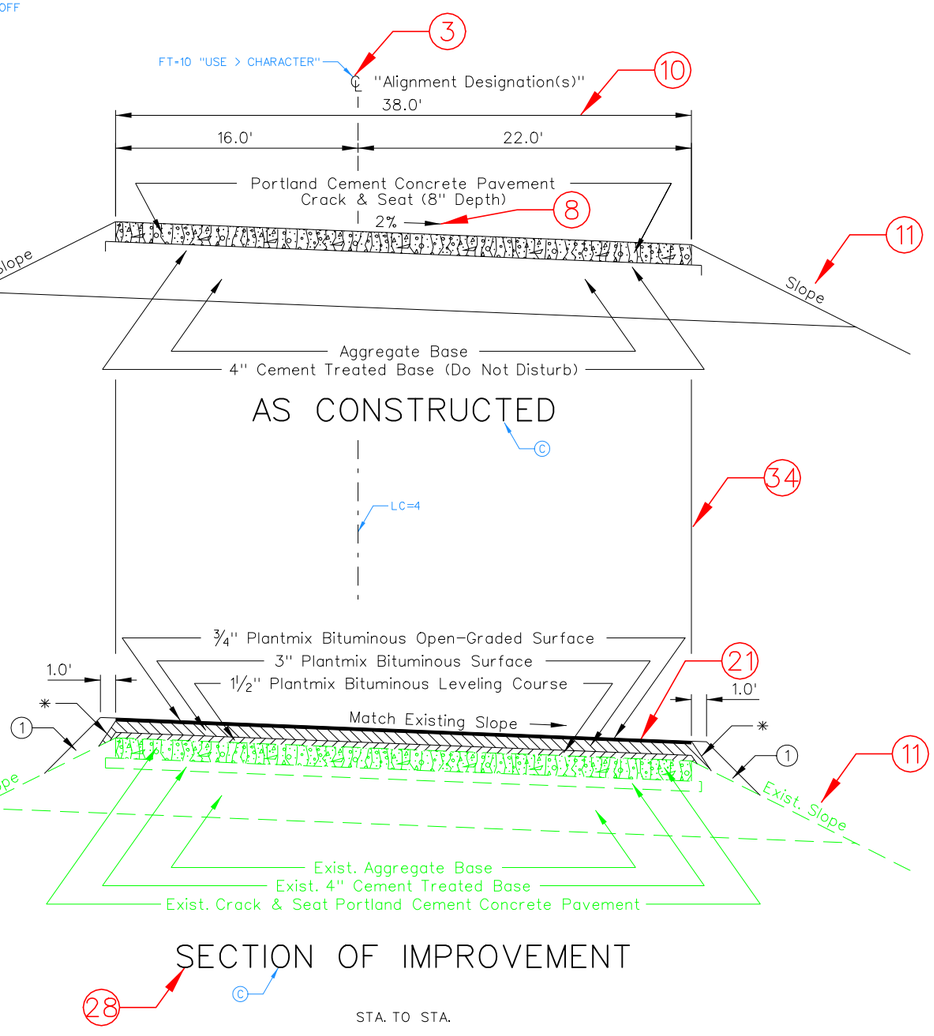
(C) – DENOTES CELL HAS BEEN USED

(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.



SECTION OF IMPROVEMENT

STA. TO STA.



SECTION OF IMPROVEMENT

STA. TO STA.

NOTE: SHEETS SHOWING ONLY SECTIONS OF IMPROVEMENT SHALL NOT HAVE A TITLE BLOCK.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPF-756-1(379)4	DOUGLAS	2F

LEGEND –

- LIMITS OF COLD RECYCLE
- LIMITS OF REMOVAL (COMPOSITE SURFACE)
- (1) SHOULDERING MATERIAL (AS DIRECTED BY THE ENGINEER)
- ANGLE OF REPOSE

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: F.Y.I., ALL DETAILS SHOWN ON THIS PAGE WERE EITHER DRAWN AT A 1:3 OR 1:2 HORIZONTAL TO VERTICAL RATIO. USE AN APPROPRIATE H/V RATIO TO CLEARLY DEPICT THE DETAILS.

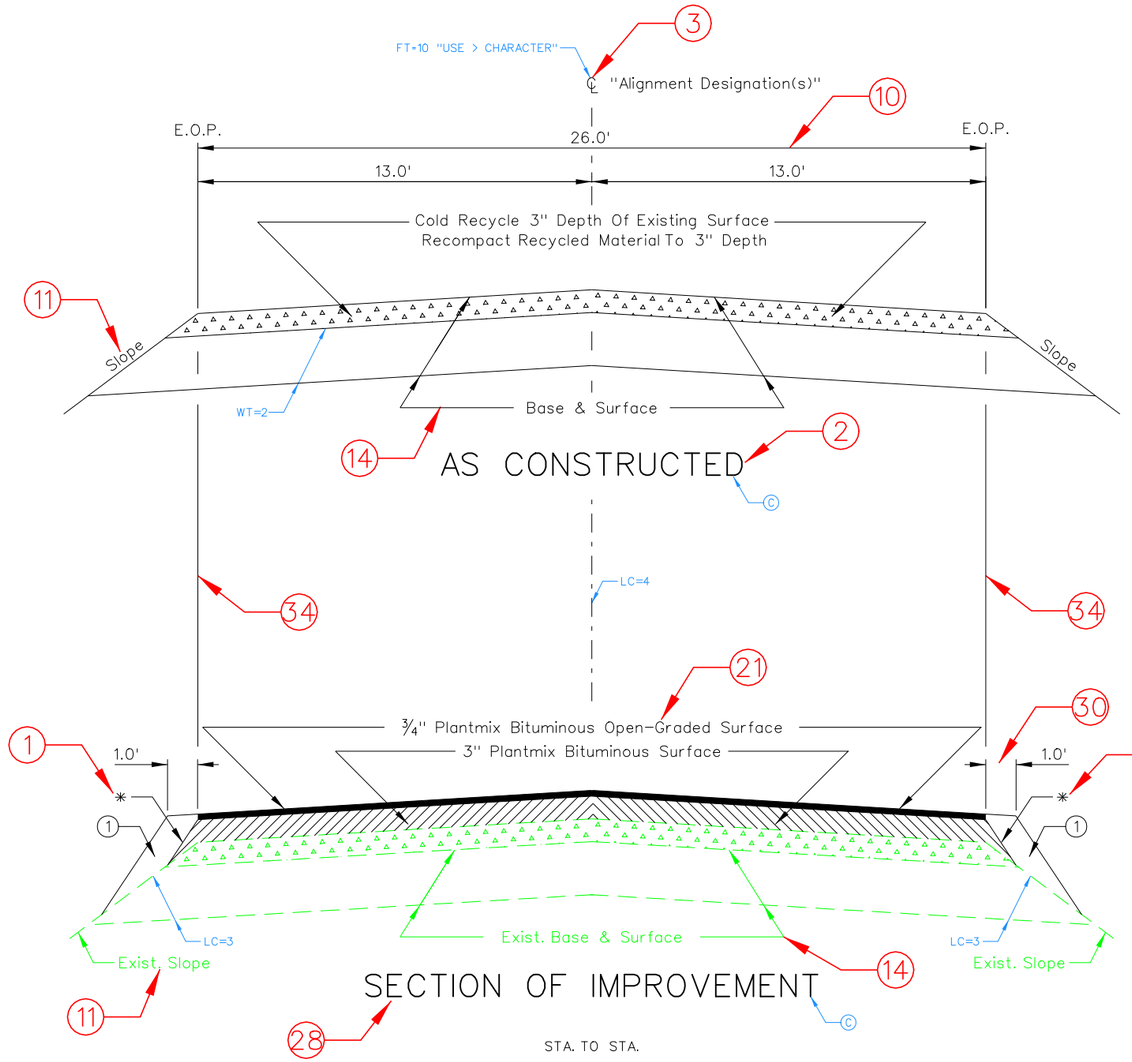
NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

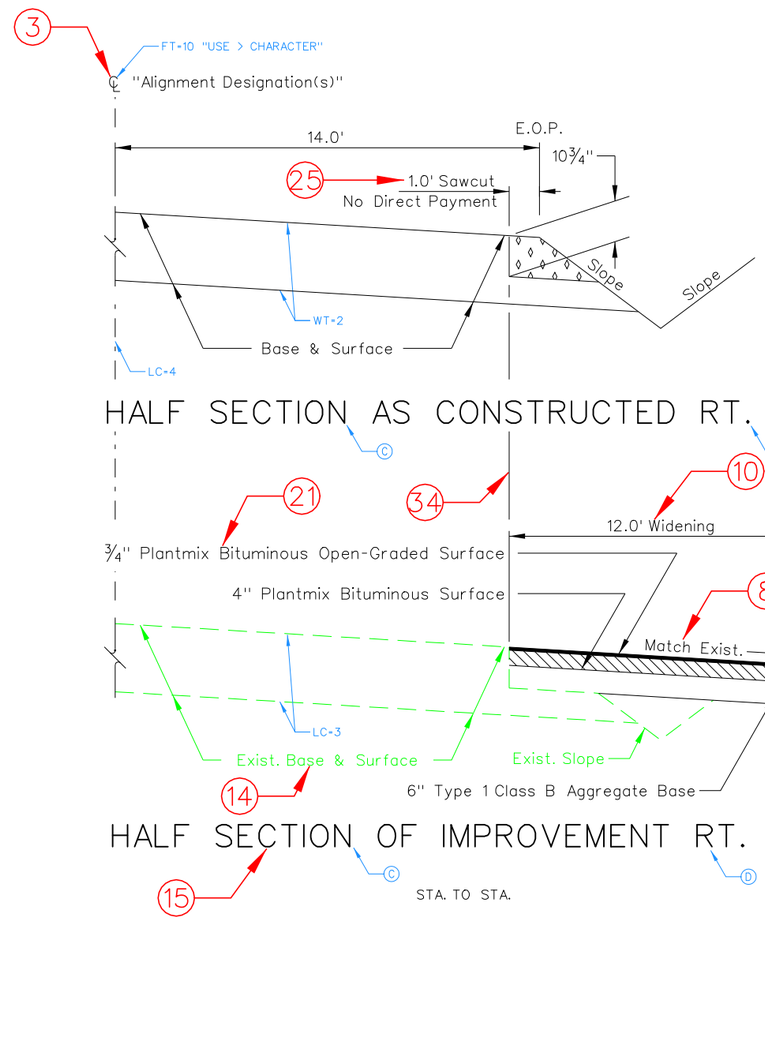
NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

(C) – DENOTES CELL HAS BEEN USED

(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.



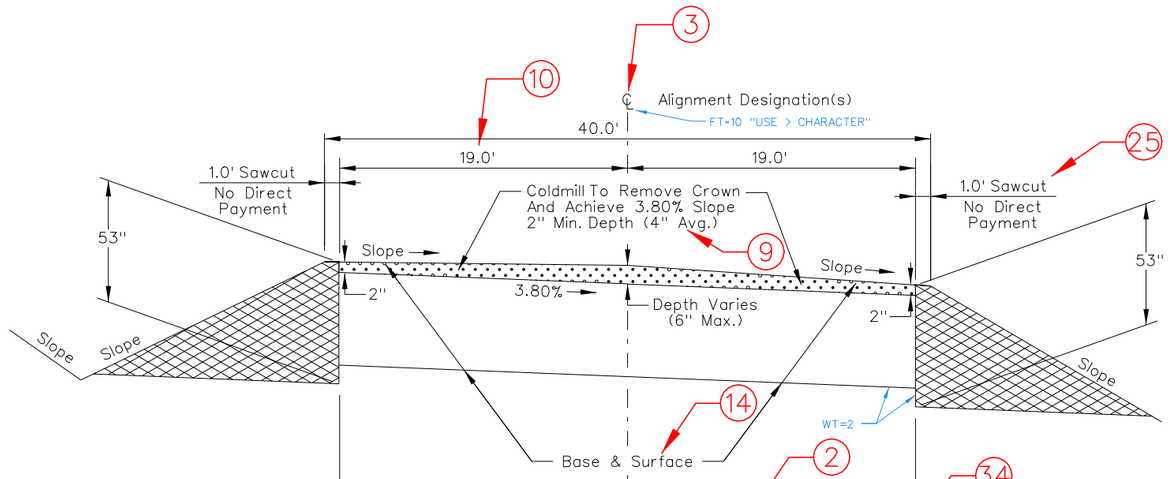


NOTE: SHEETS SHOWING ONLY SECTIONS OF IMPROVEMENT SHALL NOT HAVE A TITLE BLOCK.

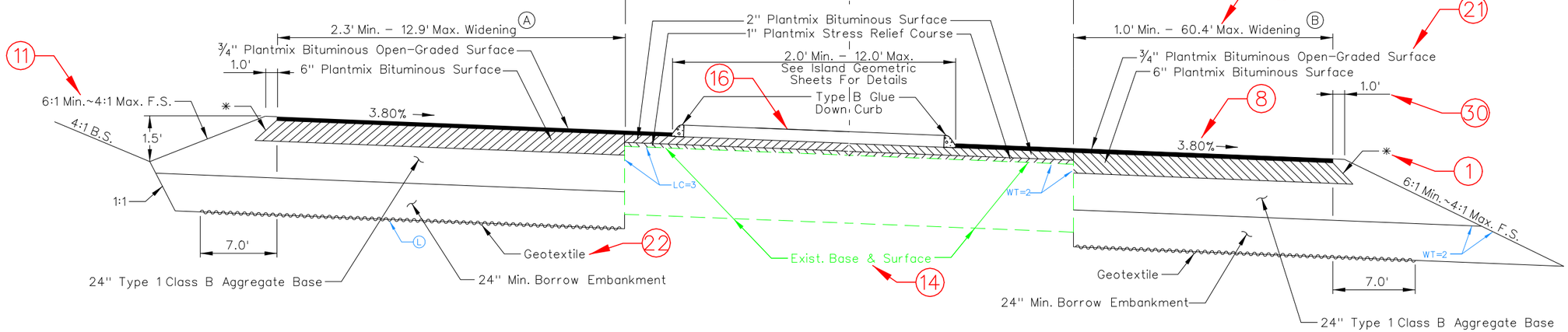
STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	2G

- LEGEND -

- LIMITS OF REMOVAL (COLD MILLING)
- LIMITS OF ROADWAY EXCAVATION
- ANGLE OF REPOSE



AS CONSTRUCTED



SECTION OF IMPROVEMENT

Ⓐ

"LE" 234+77.45 P.O.C.	TO	"LE" 244+66.44 P.O.C.	2.3'	TO	6.0'
"LE" 244+66.44 P.O.C.	TO	"LE" 245+39.12 P.O.C.	6.0'	TO	12.2'
"LE" 245+39.12 P.O.C.	TO	"LE" 251+79.72 P.O.C.	12.2'	TO	12.9'
"LE" 251+79.72 P.O.C.	TO	"LE" 252+99.72 P.O.C.	12.9'	TO	6.9
"LE" 252+99.72 P.O.C.	TO	"LE" 256+03.67 P.O.C.	6.9'	TO	6.6'
"LE" 256+03.67 P.O.C.	TO	"LE" 256+83.29 P.O.C.	6.6'	TO	12.5'
"LE" 256+83.29 P.O.C.	TO	"LE" 257+22.34 P.O.C.	12.5'	TO	12.4'
"LE" 257+22.34 P.O.C.	TO	"LE" 261+36.58 P.O.C.	(STRUCTURE B-1234) (EXCEPTION AREA) SEE SHEET B1-B4		
"LE" 261+36.58 P.O.C.	TO	"LE" 263+55.27 P.O.C.	11.5'	TO	10.8'
"LE" 263+55.27 P.O.C.	TO	"LE" 264+75.27 P.O.C.	10.8'	TO	3.3'
"LE" 264+75.27 P.O.C.	TO	"LE" 265+75.51 P.O.C.	3.3'	TO	2.9'

Ⓑ

"LE" 234+77.45 P.O.C.	TO	"LE" 235+09.76 P.O.C.	43.7'	TO	43.5'
"LE" 235+09.76 P.O.C.	TO	"LE" 236+58.38 P.O.C.	43.5'	TO	49.0'
"LE" 236+58.38 P.O.C.	TO	"LE" 243+11.24 P.O.C.	49.0'	TO	49.3'
"LE" 243+11.24 P.O.C.	TO	"LE" 243+88.06 P.O.C.	49.3'	TO	43.7'
"LE" 243+88.06 P.O.C.	TO	"LE" 244+84.33 P.O.C.	43.7'	TO	44.2'
"LE" 244+84.33 P.O.C.	TO	"LE" 247+27.72 P.O.C.	44.2'	TO	52.0'
"LE" 247+27.72 P.O.C.	TO	"LE" 253+82.46 P.O.C.	52.0'	TO	60.3'
"LE" 253+82.46 P.O.C.	TO	"LE" 254+57.97 P.O.C.	60.3'	TO	55.5'
"LE" 254+57.97 P.O.C.	TO	"LE" 257+22.34 P.O.C.	55.5'	TO	60.4'
"LE" 257+22.34 P.O.C.	TO	"LE" 261+36.58 P.O.C.	(STRUCTURE B-1234) (EXCEPTION AREA) SEE SHEET B1-B4		
"LE" 261+36.58 P.O.C.	TO	"LE" 263+07.11 P.O.C.	1.0'	TO	7.1'
"LE" 263+07.11 P.O.C.	TO	"LE" 265+75.51 P.O.C.	7.1'	TO	8.1'

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: F.Y.I., ALL DETAILS SHOWN ON THIS PAGE WERE DRAWN AT A 1:6 HORIZONTAL TO VERTICAL RATIO. USE AN APPROPRIATE H/V RATIO TO CLEARLY DEPICT THE DETAILS.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

Ⓒ - DENOTES CELL HAS BEEN USED

Ⓓ - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

Ⓛ - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

NOTE: SHEETS SHOWING ONLY SECTIONS OF IMPROVEMENT SHALL NOT HAVE A TITLE BLOCK.

7.9 General Notes, Summaries and Estimate of Quantities.

General. The primary purpose of the summary sheets is to quantify roadway surfacing items such as aggregate base, dense-graded plantmix surfacing, and open-graded surfacing. Other major items of work that are quantified are summary of cold millings, and summary of earthwork (includes roadway excavation, borrow embankment, select borrow, channel excavation, drainage excavation, and shoulder material). Miscellaneous items such as guideposts, mileposts, theoretical application rates, core information, and general notes are also shown in the summaries. Portland Cement Concrete Paving (PCCP) is another material that would be shown in the summaries when placing PCCP.

The estimate of quantities is a complete list of all associated bid items and quantities on the contract and immediately follows the summary sheets. These sheets are generated from the Integrated Financial System (IFS) engineer's estimate. Specifications in conjunction with Administrative Services generate these sheets when the estimate is locked and submitted. For more information See Project Estimation and Estimate Building Procedures..

Account for these sheets as appropriate when compiling the index of sheets, located on the title sheet.

General Notes, Summaries and Estimate of Quantities Guidelines. Electronic versions of these summaries are available on Sharepoint>010 Design Division>Roadway Design Portal>Useful links

Summary sheets are to be arranged so aggregate base, plantmix dense-graded surfacing, and open-graded surfacing quantities are organized in respective columns and rows with corresponding stationing and widths. These sheets may also include a column for cold milling if applicable. Summary sheets are to be arranged in order so the above mentioned items appear first with items described in the paragraph below following after. Summaries are broken out to show quantities left and right of centerline.

Roadway excavation, borrow embankment, select borrow, channel excavation, drainage excavation, and shoulder material items are usually summarized after aggregate base and plantmix products. Miscellaneous items such as guideposts, theoretical application rates, core information, and general notes generally follow after the above-mentioned items.

The summary sheet font type is "Arial" with the headers from 12-15 pt., sub-headers 11-13 pt., and station-to-station entries from 10-12pt. Adjustments to these guidelines are subject to project requirements.

Contracts with multiple projects require the summaries to be broken into their respective projects. Projects spanning over county lines do not need the summary sheets broken out into their respective county.

Quantities are to be shown to a pre-defined level of accuracy. Totals and Use totals are to be shown to the level of accuracy as indicated in Table 4.

Stationing should be rounded to the hundredth of a foot. It is not necessary to accompany stations with P.O.C., P.O.T., P.C, P.T., etc.

Use totals that involve multiple projects would be the sum of the un-boosted project totals. Boost the sum total for multiple projects accordingly.

Widths are to be noted with the respective station-to-station entries. Average widths are noted in areas of width transitions. Accuracy of the widths shall be to 0.1 foot and should match the typical sections.

General Notes, Summaries and Estimate of Quantities Particulars.

1) Aggregate base is to include 8 percent for moisture in the calculation of weight. A note is placed beneath the item to reflect that the quantity includes moisture content.

2) Angle of repose is calculated for the sloughing of the plantmix bituminous material at the outer edge of the bituminous courses. Angle of repose is based on a 2H:1V slope. Where plantmix bituminous material is constructed vertically, around curb and gutter for example, no angle of repose is shown or calculated.

3) Borrow embankment summary is required to show the respective quantities that are generated on the project(s). Mainline alignments, ramps, detours, sign islands, etc., should have a quantity total at each specific location and are to be summarized at the end with a total and use total.

4) Cold milling summary is required when cold milling is performed on the project. The summary is to show the amount of cold millings generated and the amount that will be placed on the project as shoulder material. Any remaining cold millings that are to be disposed of or stockpiled should also be indicated. If multiple cold milling depths are on the project, they should be broken out by depths.

5) Channel excavation is required to show the respective quantities that are generated on the project(s). Mainline alignments, ramps, detours, sign islands, etc., should have a quantity total at each specific location and are to be summarized at the end with a total and use total.

6) Core data sheets are usually provided on cold milling or cold recycling projects. Materials Division provides Roadway Design these sheets on a case-by-case scenario. Core data sheets are inserted between the Summary of Quantity sheets and the Estimate of Quantities.

7) Depth checks are usually provided on roadbed modification projects. Materials Division provides Roadway Design these sheets on a case-by-case scenario. Core data sheets are inserted between the Summary of Quantity sheets and the Estimate of Quantities.

8) Drainage excavation is required to show the respective quantities that are generated on the project(s). Mainline alignments, ramps, detours, sign islands, etc., should have a quantity total at each specific location and are to be summarized at the end with a total and use total.

9) General notes are supplemental information that is not covered in the Standard Specifications or Special Provisions.

10) Guideposts are summarized by type and color.

11) Project Number and county need to be shown in the upper right corner and placed in the appropriate designated boxes.

12) Roadway excavation summary is required when excavation is to be used as embankment or when the material is being disposed. Quantities are to be summarized at the end with a total and use total. Note material that is to be disposed.

7.9 General Notes, Summaries and Estimate of Quantities (Continued).

13) Selected borrow embankment is quantified if used on the project. This material is generally used around bridge abutments. Quantities are to be summarized at the end with a total and use total.

14) Sheet numbering for the summary sheets shall begin with number 3. Multiple summary sheets shall be numbered 3, 3A, 3B, 3C etc.

15) Slope allowance is included in the base aggregate quantities and is to match the typicals or earthwork notes accordingly. Where aggregate base is constructed vertically, around curb and gutter for an example, no slope allowance is shown or calculated.

16) Theoretical application information is provided by the Materials Division***.*** This information is normally shown last in the Summary sheets and placed above the General Notes.

TABLE 4			
Item	**U. S. Standard Units**		
	Unit	**Accuracy**	
		Sum	**Use**
Base & Surface Aggregate	ton	1	10
Concrete	cuyd	0.01	1
Concrete, Elastomeric	cuft	0.01	1
Culverts, PVC Pipe	linft	1	1
Emulsified/Liquid Asphalts	ton	0.1	1
Erosion Control, Clearing & Grubbing	acre	0.1	1
Fence, C & G, Barrier Rail	linft	1	1
Guardrail	linft	1	1
Overhaul	yd-mi	1	10
Painted Striping	mile	0.001	0.01
Paving Asphalts, Mineral Filler	ton	1	10
Pulverize Existing Surface	mile	0.001	0.01
Reinforcing Steel, Structural Steel and Grates	lb	1	10
Roadway and Borrow Excavation, Riprap	cuyd	1	10
Signs and Marking Film	sqft	0.01	1
Cold milling, Sidewalks, Erosion Control	sqyd	0.1	10
Structure and Drainage Excavation, Backfill	cuyd	0.1	10
Trenching	sta	0.01	1
V-Ditches	sta	0.01	1

SUMMARY OF BASE AND SURFACE QUANTITIES

NOTE: QUANTITIES SHOWN IN THE SUMMARIES FOR BASE AND SURFACE MATERIALS ARE THEORETICAL AND USED FOR ESTIMATING PURPOSES ONLY.
ACTUAL SPREADS SHALL BE VARIED AS REQUIRED TO OBTAIN THE DEPTH OF THE VARIOUS COURSES SHOWN ON THE TYPICAL SECTIONS.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	3

LOCATION					LENGTH	PLANTMIX STRESS RELIEF TYPE 3 (WET) INCLUDES ANGLE OF REPOSE (2)				PLANTMIX DENSE GRADE SURFACE TYPE 2C (WET) INCLUDES ANGLE OF REPOSE (2)				PLANTMIX OPEN GRADE SURFACE 3/8-INCH (WET) (11) (14)				COLD MILLING
					STATIONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	UNIT SQYD
US50A MAINLINE EXISTING ROAD																		
LEFT SIDE																		
"LE"	166+37.91	to	"LE"	197+53.35	31.15	19.0 to 19.0	1.0	11.96	373	19.0 to 19.0	1.0	11.96	373	19.0 to 19.0	0.75	8.44	263	6577
"LE"	234+77.45	to	"LE"	265+75.51	30.98	19.0 to 19.0	1.0	11.96	370	19.0 to 19.0	1.0	11.96	370	19.0 to 19.0	0.75	8.44	262	6540
"LE"	303+95.08	to	"LE"	304+97.16	1.02	20.0 to 20.0	1.0	12.59	13	20.0 to 20.0	1.0	12.59	13	20.0 to 20.0	0.75	8.90	10	227
"LE"	304+97.16	to	"LE"	331+92.61	26.95	19.0 to 19.0	1.0	11.96	322	19.0 to 19.0	1.0	11.96	322	19.0 to 19.0	0.75	8.44	228	5690
"LE"	331+92.61	to	"LE"	563+79.31	231.87	20.0 to 20.0	1.0	12.58	2918	20.0 to 20.0	1.0	12.58	2918	20.0 to 20.0	1.75	20.73	4807	51526
"LE"	563+79.31	to	"LE"	569+32.90	5.54	19.0 to 19.0	1.0	11.96	66	19.0 to 19.0	1.0	11.96	66	19.0 to 19.0	0.75	8.44	47	1169
"LE"	569+32.90	to	"LE"	585+30.49	15.98	19.0 to 49.8	1.0	21.60	345	19.0 to 49.8	1.0	21.60	345	19.0 to 49.8	0.75	15.27	244	6103
"LE"	585+30.49	to	"LE"	586+05.49	0.75	50.8 to 50.8	1.0	31.85	24	50.8 to 50.8	1.0	31.85	24	50.8 to 50.8	0.75	22.55	17	423
RIGHT SIDE																		
"LE"	166+37.91	to	"LE"	197+53.35	31.15	19.0 to 19.0	1.0	11.96	373	19.0 to 19.0	2.0	24.03	749	19.0 to 19.0	0.75	8.44	263	6577
"LE"	234+77.45	to	"LE"	257+22.34	22.45	19.0 to 19.0	1.0	11.96	268	19.0 to 19.0	2.0	24.03	539	19.0 to 19.0	0.75	8.44	190	4739
"LE"	257+22.34	to	"LE"	259+98.47	2.76	12.6 to 13.1	1.0	8.11	22	12.6 to 13.1	2.0	16.32	45	12.6 to 13.1	0.75	5.71	16	394
"LE"	259+98.47	to	"LE"	261+36.58	1.38	13.1 to 19.0	1.0	10.12	14	13.1 to 19.0	2.0	20.32	28	13.1 to 19.0	0.75	7.13	10	246
"LE"	303+95.08	to	"LE"	304+97.16	1.02	20.0 to 20.0	1.0	12.59	13	20.0 to 20.0	2.0	25.27	26	20.0 to 20.0	0.75	8.90	10	227
"LE"	304+97.16	to	"LE"	333+13.06	28.16	19.0 to 19.0	1.0	11.96	337	19.0 to 19.0	2.0	24.03	677	19.0 to 19.0	0.75	8.44	238	5945
"LE"	333+13.06	to	"LE"	368+24.44	35.11	20.0 to 20.0	1.0	12.59	442	20.0 to 20.0	2.0	25.28	888	20.0 to 20.0	0.75	8.88	312	7803
"LE"	368+24.44	to	"LE"	398+48.52	30.24	19.0 to 19.0	1.0	11.96	362	19.0 to 19.0	2.0	24.03	727	19.0 to 19.0	0.75	8.44	256	6384
"LE"	398+48.52	to	"LE"	402+00.02	3.52	20.0 to 20.0	1.0	12.58	44	20.0 to 20.0	2.0	25.28	89	20.0 to 20.0	0.75	8.87	32	781
"LE"	402+00.02	to	"LE"	432+24.11	30.24	19.0 to 19.0	1.0	11.96	362	19.0 to 19.0	2.0	24.03	727	19.0 to 19.0	0.75	8.44	256	6384
"LE"	432+24.11	to	"LE"	435+41.73	3.18	20.0 to 20.0	1.0	12.58	40	20.0 to 20.0	2.0	25.28	80	20.0 to 20.0	0.75	8.87	29	706
"LE"	435+41.73	to	"LE"	465+65.83	30.24	19.0 to 19.0	1.0	11.96	362	19.0 to 19.0	2.0	24.03	727	19.0 to 19.0	0.75	8.44	256	6384
"LE"	465+65.83	to	"LE"	486+69.05	21.03	20.0 to 20.0	1.0	12.58	265	20.0 to 20.0	2.0	25.28	532	20.0 to 20.0	0.75	8.88	187	4674
"LE"	486+69.05	to	"LE"	516+93.15	30.24	19.0 to 19.0	1.0	11.96	362	19.0 to 19.0	2.0	24.03	727	19.0 to 19.0	0.75	8.44	256	6384
"LE"	516+93.15	to	"LE"	566+59.85	49.67	20.0 to 20.0	1.0	12.59	625	20.0 to 20.0	2.0	25.28	1256	20.0 to 20.0	0.75	8.88	442	11037
"LE"	566+59.85	to	"LE"	569+32.90	2.73	19.0 to 19.0	1.0	11.96	33	19.0 to 19.0	2.0	24.03	66	19.0 to 19.0	0.75	8.44	24	576
"LE"	569+32.90	to	"LE"	585+30.49	15.98	19.0 to 30.3	1.0	15.49	248	19.0 to 30.3	2.0	31.09	497	19.0 to 30.3	0.75	10.94	175	4374
"LE"	585+30.49	to	"LE"	586+05.49	0.75	31.3 to 31.3	1.0	19.65	15	31.3 to 31.3	2.0	39.41	30	31.3 to 31.3	0.75	13.89	11	261
								TOTAL:	8618									
								USE TOTAL:	**8,620**									

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	3A

1

LOCATION					LENGTH	BASE AGGREGATE (TYPE 1 CLASS B) INCLUDES SLOPE ALLOWANCE AND 1' WIDENING (includes 8% for moisture)				PLANTMIX DENSE GRADE SURFACE TYPE 2C (WET) INCLUDES ANGLE OF REPOSE				PLANTMIX OPEN GRADE SURFACE 3/8-INCH (WET)				COLD MILLING
					STATIONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	UNIT SQYD
US50A MAINLINE WIDENING																		
LEFT SIDE																		
"LE"	144+75.00	to	"LE"	145+25.00	0.50									38.0 to 40.0	0.75	17.30	9	217
"LE"	145+25.00	to	"LE"	147+47.42	2.22									40.0 to 47.0	0.75	19.36	43	1075
"LE"	147+47.42	to	"LE"	162+45.14	14.98									47.0 to 47.0	0.75	20.87	313	7821
"LE"	162+45.14	to	"LE"	164+47.14	2.02									42.6 to 42.6	0.75	18.94	39	957
"LE"	164+47.14	to	"LE"	165+87.91	1.41									47.0 to 47.0	0.75	20.85	30	735
"LE"	165+87.91	to	"LE"	166+37.91	0.50					28.0 to 28.0	3.0	53.10	27	28.0 to 28.0	0.75	12.44	7	156
"LE"	166+37.91	to	"LE"	197+53.35	31.15	28.0 to 28.0	24.0	494.33	15399	28.0 to 28.0	6.0	107.22	3340	47.0 to 47.0	0.75	20.87	121	
"LE"	234+77.45	to	"LE"	244+66.44	9.89	2.3 to 2.3	24.0	131.80	1304	2.3 to 2.3	6.0	10.61	105	21.3 to 25.0	0.75	10.28	102	
"LE"	244+66.44	to	"LE"	245+39.12	0.73	6.0 to 6.0	24.0	183.18	134	6.0 to 6.0	6.0	24.52	18	25.0 to 31.2	0.75	12.44	10	
"LE"	245+39.12	to	"LE"	251+79.72	6.41	12.2 to 12.2	24.0	271.26	1739	12.2 to 12.2	6.0	47.82	306	31.2 to 31.9	0.75	14.00	90	
"LE"	251+79.72	to	"LE"	252+99.72	1.20	12.9 to 12.9	24.0	281.30	338	12.9 to 12.9	6.0	50.44	61	31.9 to 25.9	0.75	12.84	16	
"LE"	252+99.72	to	"LE"	256+03.67	3.04	6.9 to 6.9	24.0	196.64	598	6.9 to 6.9	6.0	27.90	85	25.9 to 25.6	0.75	11.44	35	
"LE"	256+03.67	to	"LE"	256+83.29	0.80	6.6 to 6.6	24.0	191.54	154	6.6 to 6.6	6.0	26.78	21	25.6 to 31.5	0.75	12.61	11	
"LE"	256+83.29	to	"LE"	257+22.34	0.39	12.5 to 12.5	24.0	276.03	108	12.5 to 12.5	6.0	48.96	19	31.5 to 29.8	0.75	13.64	6	
"LE"	257+22.34	to	"LE"	261+36.58	4.14	12.4 to 12.4	24.0	274.41	1137	12.4 to 12.4	6.0	48.57	201	29.8 to 29.8	0.75	12.84	16	
"LE"	261+36.58	to	"LE"	263+55.27	2.19	11.5 to 11.5	24.0	261.19	572	11.5 to 11.5	6.0	45.19	99	29.8 to 29.8	0.75	11.44	35	
"LE"	263+55.27	to	"LE"	264+75.27	1.20	10.8 to 10.8	24.0	251.68	303	10.8 to 10.8	6.0	42.56	51	29.8 to 22.3	0.75	11.58	14	
"LE"	264+75.27	to	"LE"	265+75.51	1.00	3.3 to 3.3	24.0	146.25	147	3.3 to 3.3	6.0	14.36	14	22.3 to 22.0	0.75	13.64	6	
"LE"	304+97.16	to	"LE"	306+97.16	2.00	1.0 to 1.0	24.0	113.47	227	1.0 to 1.0	6.0	5.72	11	20.0 to 28.0	0.75	10.66	22	
"LE"	306+97.16	to	"LE"	330+32.61	23.35	9.0 to 9.0	24.0	226.34	5285	9.0 to 9.0	6.0	35.79	836	28.0 to 28.0	0.75	12.44	291	
"LE"	330+32.61	to	"LE"	331+92.61	1.60	9.0 to 9.0	24.0	226.29	363	9.0 to 9.0	6.0	35.79	57	28.0 to 20.0	0.75	10.66	18	
"LE"	331+92.61	to	"LE"	563+79.31	231.87									20.0 to 20.0	0.75	8.88	2060	
"LE"	563+79.31	to	"LE"	569+32.90	5.54	1.0 to 1.0	24.0	113.38	629	1.0 to 1.0	6.0	5.72	32	20.0 to 27.9	0.75	10.63	59	
"LE"	569+32.90	to	"LE"	585+30.49	15.98	9.0 to 9.0	24.0	226.24	3616	9.0 to 9.0	6.0	35.79	572	27.9 to 50.8	0.75	17.47	280	
"LE"	585+30.49	to	"LE"	589+61.13	4.31									50.8 to 50.8	0.75	22.52	98	
RIGHT SIDE																		
"LE"	144+75.00	to	"LE"	145+25.00	0.50									38.0 to 38.0	0.75	16.88	9	211
"LE"	145+25.00	to	"LE"	147+47.42	2.22									38.0 to 38.0	0.75	16.91	38	939
"LE"	147+47.42	to	"LE"	154+34.90	6.87									39.0 to 39.0	0.75	17.33	120	2979
"LE"	154+34.90	to	"LE"	155+54.90	1.20									39.0 to 45.0	0.75	18.66	23	560
"LE"	155+54.90	to	"LE"	155+72.75	0.18									45.0 to 45.0	0.75	19.83	4	89
"LE"	155+72.75	to	"LE"	160+47.12	4.74									47.0 to 47.0	0.75	20.89	100	2477
"LE"	160+47.12	to	"LE"	163+33.97	2.87									49.0 to 49.0	0.75	21.76	63	1562
"LE"	163+33.97	to	"LE"	164+38.57	1.05									53.0 to 53.0	0.75	23.45	25	616
"LE"	164+38.57	to	"LE"	165+47.05	1.08									49.0 to 49.0	0.75	21.85	24	591
"LE"	165+47.05	to	"LE"	165+87.91	0.41									49.0 to 49.0	0.75	21.66	9	222
"LE"	165+87.91	to	"LE"	166+37.91	0.50					34.0 to 34.0	3.0	64.40	32	45.0 to 45.0	0.75	20.00	10	250
"LE"	166+37.91	to	"LE"	178+00.75	11.63	34.0 to 34.0	24.0	578.81	6732	34.0 to 34.0	6.0	129.77	1509	45.0 to 45.0	0.75	19.99	233	
"LE"	178+00.75	to	"LE"	180+65.05	2.64	36.0 to 36.0	24.0	607.79	1605	36.0 to 36.0	6.0	137.29	363	46.0 to 46.0	0.75	20.45	54	
"LE"	180+65.05	to	"LE"	182+15.02	1.50	36.0 to 30.0	24.0	564.67	848	36.0 to 30.0	6.0	126.02	189	46.0 to 40.0	0.75	19.10	29	
"LE"	182+15.02	to	"LE"	197+53.35	15.38	30.0 to 30.0	24.0	522.58	8038	30.0 to 30.0	6.0	114.74	1765	40.0 to 40.0	0.75	17.77	274	

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	3B

LOCATION					LENGTH	BASE AGGREGATE (TYPE 1 CLASS B) INCLUDES SLOPE ALLOWANCE AND 1' WIDENING (includes 8% for moisture)				PLANTMIX DENSE GRADE SURFACE TYPE 2C (WET) INCLUDES ANGLE OF REPOSE				PLANTMIX OPEN GRADE SURFACE 3/8-INCH (WET)				COLD MILLING
					STATIONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	UNIT SQYD
US50A MAINLINE WIDENING RIGHT CONTINUED																		
"LE"	234+77.45	to	"LE"	235+09.76	0.32	43.7 to 43.5	24.0	721.19	231	43.7 to 43.5	6.0	165.86	54	62.7 to 62.5	0.75	28.06	9	
"LE"	235+09.76	to	"LE"	236+58.38	1.49	43.5 to 49.0	24.0	749.74	1118	43.5 to 49.0	6.0	175.82	261	62.5 to 68.0	0.75	28.91	44	
"LE"	236+58.38	to	"LE"	243+11.24	6.53	49.0 to 49.3	24.0	792.39	5175	49.0 to 49.3	6.0	186.73	1219	68.0 to 68.3	0.75	30.27	198	
"LE"	243+11.24	to	"LE"	243+88.06	0.77	49.3 to 43.7	24.0	753.42	581	49.3 to 43.7	6.0	176.76	136	68.3 to 62.7	0.75	29.04	23	
"LE"	243+88.06	to	"LE"	244+84.33	0.96	43.7 to 44.2	24.0	721.24	693	43.7 to 44.2	6.0	167.18	161	62.7 to 63.2	0.75	28.04	27	
"LE"	244+84.33	to	"LE"	247+27.72	2.43	44.2 to 52.0	24.0	779.00	1893	44.2 to 52.0	6.0	182.78	445	63.2 to 71.0	0.75	29.85	73	
"LE"	247+27.72	to	"LE"	253+82.46	6.55	52.0 to 60.3	24.0	890.93	5836	52.0 to 60.3	6.0	213.04	1395	68.2 to 62.3	0.75	28.97	190	
"LE"	253+82.46	to	"LE"	254+57.97	0.76	60.3 to 55.5	24.0	910.07	692	60.3 to 55.5	6.0	219.61	166	62.3 to 62.5	0.75	27.55	21	
"LE"	254+57.97	to	"LE"	257+22.34	2.64					76.9 to 79.4	3.0	295.74	782	76.9 to 79.4	0.75	34.77	92	2296
"LE"	257+22.34	to	"LE"	261+36.58	4.14	1.0 to 7.1	24.0	156.57	649	1.0 to 1.0	6.0	5.72	24	12.6 to 13.1	0.75	5.71	16	
"LE"	261+36.58	to	"LE"	263+07.11	1.71	1.0 to 7.1	24.0	156.05	267	1.0 to 7.1	6.0	17.18	29	13.1 to 26.1	0.75	8.68	15	
"LE"	263+07.11	to	"LE"	265+75.51	2.68	7.1 to 8.1	24.0	206.85	555	7.1 to 8.1	6.0	30.53	82	26.1 to 27.1	0.75	11.84	32	
"LE"	304+97.16	to	"LE"	306+97.16	2.00	1.0 to 9.0	24.0	169.88	340	1.0 to 9.0	6.0	20.76	42	20.0 to 28.0	0.75	10.66	22	
"LE"	306+97.16	to	"LE"	331+53.06	24.56	9.0 to 9.0	24.0	226.28	5558	9.0 to 9.0	6.0	35.79	879	28.0 to 28.0	0.75	12.44	306	
"LE"	331+53.06	to	"LE"	333+13.06	1.60	9.0 to 1.0	24.0	169.89	272	9.0 to 1.0	6.0	20.76	33	28.0 to 20.0	0.75	10.66	18	
"LE"	333+13.06	to	"LE"	368+24.44	35.11					20.0 to 20.0	3.0	77.14	2709	20.0 to 20.0	0.75	8.88	312	7803
"LE"	368+24.44	to	"LE"	371+84.44	3.60	1.0 to 9.0	24.0	169.88	612	1.0 to 9.0	6.0	20.76	75	20.0 to 28.0	0.75	10.66	39	
"LE"	371+84.44	to	"LE"	380+84.44	9.00	9.0 to 9.0	24.0	226.29	2037	9.0 to 9.0	6.0	35.79	322	28.0 to 28.0	0.75	12.44	112	
"LE"	380+84.44	to	"LE"	385+74.49	4.90	9.0 to 16.0	24.0	275.68	1351	9.0 to 16.0	6.0	48.95	240	28.0 to 35.0	0.75	13.99	69	
"LE"	385+74.49	to	"LE"	389+49.29	3.75	16.0 to 16.0	24.0	324.85	1219	16.0 to 16.0	6.0	62.11	233	35.0 to 35.0	0.75	15.54	59	
"LE"	389+49.29	to	"LE"	390+85.48	1.36	9.0 to 9.0	24.0	226.60	309	9.0 to 9.0	6.0	35.79	49	35.0 to 28.0	0.75	14.01	20	
"LE"	390+85.48	to	"LE"	396+88.47	6.03	9.0 to 9.0	24.0	226.29	1365	9.0 to 9.0	6.0	35.79	216	28.0 to 28.0	0.75	12.44	75	
"LE"	396+88.47	to	"LE"	398+48.52	1.60	9.0 to 1.0	24.0	169.93	272	9.0 to 1.0	6.0	20.75	33	28.0 to 20.0	0.75	10.66	18	
"LE"	398+48.52	to	"LE"	402+00.02	3.52					20.0 to 20.0	3.0	77.15	271	20.0 to 20.0	0.75	8.87	32	781
"LE"	402+00.02	to	"LE"	405+60.02	3.60	1.0 to 9.0	24.0	169.88	612	1.0 to 9.0	6.0	20.76	75	20.0 to 28.0	0.75	10.66	39	
"LE"	405+60.02	to	"LE"	414+60.02	9.00	9.0 to 9.0	24.0	226.29	2037	9.0 to 9.0	6.0	35.79	322	28.0 to 28.0	0.75	12.44	112	
"LE"	414+60.02	to	"LE"	419+50.07	4.90	9.0 to 16.0	24.0	275.68	1351	9.0 to 16.0	6.0	48.95	240	28.0 to 35.0	0.75	13.99	69	
"LE"	419+50.07	to	"LE"	423+24.87	3.75	16.0 to 16.0	24.0	324.85	1219	16.0 to 16.0	6.0	62.11	233	35.0 to 35.0	0.75	15.54	59	
"LE"	423+24.87	to	"LE"	424+61.07	1.36	16.0 to 9.0	24.0	276.07	376	16.0 to 9.0	6.0	48.95	67	35.0 to 28.0	0.75	14.01	20	
"LE"	424+61.07	to	"LE"	430+64.05	6.03	9.0 to 9.0	24.0	226.29	1365	9.0 to 9.0	6.0	35.79	216	28.0 to 28.0	0.75	12.44	75	
"LE"	430+64.05	to	"LE"	432+24.11	1.60	9.0 to 1.0	24.0	169.94	272	9.0 to 1.0	6.0	20.75	33	28.0 to 20.0	0.75	10.66	18	
"LE"	432+24.11	to	"LE"	435+41.73	3.18					20.0 to 20.0	3.0	77.14	245	20.0 to 20.0	0.75	8.87	29	706
"LE"	435+41.73	to	"LE"	439+01.74	3.60	1.0 to 9.0	24.0	169.88	612	9.0 to 9.0	6.0	35.79	129	20.0 to 28.0	0.75	10.66	39	
"LE"	439+01.74	to	"LE"	448+01.75	9.00	9.0 to 9.0	24.0	226.30	2037	9.0 to 9.0	6.0	35.79	322	28.0 to 28.0	0.75	12.44	112	
"LE"	448+01.75	to	"LE"	452+91.79	4.90	9.0 to 16.0	24.0	275.68	1351	9.0 to 16.0	6.0	48.95	240	28.0 to 35.0	0.75	13.99	69	
"LE"	452+91.79	to	"LE"	456+66.59	3.75	16.0 to 16.0	24.0	324.85	1219	16.0 to 16.0	6.0	62.11	233	35.0 to 35.0	0.75	15.54	59	
"LE"	456+66.59	to	"LE"	458+02.78	1.36	16.0 to 9.0	24.0	276.04	376	16.0 to 9.0	6.0	48.95	67	35.0 to 28.0	0.75	14.01	20	
"LE"	458+02.78	to	"LE"	464+05.77	6.03	9.0 to 9.0	24.0	226.29	1365	9.0 to 9.0	6.0	35.79	216	28.0 to 28.0	0.75	12.44	75	
"LE"	464+05.77	to	"LE"	465+65.83	1.60					28.0 to 20.0	3.0	92.18	148	28.0 to 20.0	0.75	10.66	18	427
"LE"	465+65.83	to	"LE"	486+69.05	21.03	1.0 to 9.0	24.0	169.90	3573	1.0 to 9.0	6.0	20.75	437	20.0 to 20.0	0.75	8.88	187	
"LE"	486+69.05	to	"LE"	490+29.05	3.60	1.0 to 9.0	24.0	169.88	612	9.0 to 9.0	6.0	35.79	129	20.0 to 28.0	0.75	10.66	39	
"LE"	490+29.05	to	"LE"	499+29.05	9.00	9.0 to 9.0	24.0	226.29	2037	9.0 to 9.0	6.0	35.79	322	28.0 to 28.0	0.75	12.44	112	
"LE"	499+29.05	to	"LE"	504+19.09	4.90	9.0 to 16.0	24.0	275.68	1351	9.0 to 16.0	6.0	48.95	240	28.0 to 35.0	0.75	13.99	69	
"LE"	504+19.09	to	"LE"	507+93.89	3.75	16.0 to 16.0	24.0	324.85	1219	16.0 to 16.0	6.0	62.11	233	35.0 to 35.0	0.75	15.54	59	
"LE"	507+93.89	to	"LE"	509+30.09	1.36	16.0 to 9.0	24.0	276.07	376	16.0 to 9.0	6.0	48.95	67	35.0 to 28.0	0.75	14.01	20	
"LE"	509+30.09	to	"LE"	515+33.08	6.03	9.0 to 9.0	24.0	226.29	1365	9.0 to 9.0	6.0	35.79	216	28.0 to 28.0	0.75	12.44	75	

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	3C

1

LOCATION					LENGTH	BASE AGGREGATE (TYPE 1 CLASS B) INCLUDES SLOPE ALLOWANCE AND 1' WIDENING (includes 8% for moisture)				PLANTMIX DENSE GRADE SURFACE TYPE 2C (WET) INCLUDES ANGLE OF REPOSE				PLANTMIX OPEN GRADE SURFACE 3/8-INCH (WET)				COLD MILLING
						WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	UNIT SQYD
US50A MAINLINE WIDENING RIGHT CONTINUED					STATIONS													
"LE"	515+33.08	to	"LE"	516+93.15	1.60	9.00 to 1.00	24.0	169.96	272	9.00 to 1.00	6.0	20.76	33	28.0 to 20.0	0.75	10.66	18	
"LE"	516+93.15	to	"LE"	566+59.85	49.67					20.00 to 20.00	3.0	77.14	3832	20.0 to 20.0	0.75	8.88	442	11037
"LE"	566+59.85	to	"LE"	585+30.49	18.71	39.00 to 1.00	24.0	381.36	7136	39.00 to 1.00	6.0	77.14	1443	58.0 to 31.3	0.75	19.83	372	
US50A "VS" LINE																		
LEFT SIDE																		
"VS"	257+36.13	to	"VS"	268+00.00	10.64	28.0 to 28.0	24.0	494.20	5259	28.0 to 28.0	6.0	107.22	1141	28.0 to 28.0	0.75	12.44	133	
"VS"	268+00.00	to	"VS"	271+00.00	3.00	28.0 to 16.0	24.0	409.64	1229	28.0 to 16.0	6.0	84.66	254	28.0 to 16.0	0.75	9.77	30	
"VS"	271+00.00	to	"VS"	279+79.33	8.79	16.0 to 16.0	24.0	325.14	2858	16.0 to 16.0	6.0	62.11	546	16.0 to 16.0	0.75	7.11	63	
"VS"	279+79.33	to	"VS"	283+86.90	4.08	20.5 to 20.5	24.0	388.08	1584	20.5 to 20.5	6.0	79.02	322	18.0 to 18.0	0.75	7.99	33	
"VS"	286+50.02	to	"VS"	287+08.89	0.59	20.5 to 20.5	24.0	387.64	229	20.5 to 20.5	6.0	79.04	47	18.0 to 18.0	0.75	7.97	5	
"VS"	287+08.89	to	"VS"	314+02.05	26.93	16.0 to 16.0	24.0	325.04	8754	16.0 to 16.0	6.0	62.11	1673	16.0 to 16.0	0.75	7.11	192	
"VS"	314+02.05	to	"VS"	316+42.05	2.40	16.0 to 28.0	24.0	409.65	984	16.0 to 28.0	6.0	84.66	203	16.0 to 28.0	0.75	9.77	24	
"VS"	316+42.05	to	"VS"	339+98.07	23.56	28.0 to 28.0	24.0	494.27	11645	28.0 to 28.0	6.0	107.22	2526	28.0 to 28.0	0.75	12.44	294	
"VS"	339+98.07	to	"VS"	342+98.07	3.00	28.0 to 16.0	24.0	409.64	1229	28.0 to 16.0	6.0	84.66	254	28.0 to 16.0	0.75	9.77	30	
"VS"	342+98.07	to	"VS"	566+60.18	223.62	16.0 to 16.0	24.0	325.02	72682	16.0 to 16.0	6.0	62.11	13888	16.0 to 16.0	0.75	7.11	1590	
RIGHT SIDE																		
"VS"	257+36.13	to	"VS"	270+00.00	12.64	20.5 to 20.5	24.0	388.45	4910	22.0 to 22.0	6.0	84.66	1070	22.0 to 22.0	0.75	9.77	124	
"VS"	270+00.00	to	"VS"	272+77.99	2.78	16.0 to 16.0	24.0	325.01	904	22.0 to 35.5	6.0	110.04	306	22.0 to 35.5	0.75	12.77	36	
"VS"	272+77.99	to	"VS"	274+58.75	1.81	16.0 to 28.0	24.0	409.10	741	35.5 to 35.5	6.0	135.42	245	35.5 to 35.5	0.75	15.75	29	
"VS"	274+58.75	to	"VS"	276+89.95	2.31	28.0 to 28.0	24.0	494.69	1143	38.0 to 26.5	6.0	123.20	285	35.5 to 24.0	0.75	13.23	31	
"VS"	276+89.95	to	"VS"	284+25.38	7.35	28.0 to 16.0	24.0	409.88	3013	26.5 to 26.5	6.0	101.58	747	35.5 to 24.0	0.75	13.22	98	
"VS"	286+88.50	to	"VS"	300+00.00	13.12	26.5 to 26.5	24.0	472.93	6205	26.5 to 26.5	6.0	101.58	1332	24.0 to 24.0	0.75	10.66	140	
"VS"	300+00.00	to	"VS"	315+42.63	15.43	22.0 to 22.0	24.0	409.54	6320	22.0 to 22.0	6.0	84.66	1306	22.0 to 22.0	0.75	9.77	151	
"VS"	315+42.63	to	"VS"	316+62.61	1.20	22.0 to 28.0	24.0	451.88	543	22.0 to 28.0	6.0	95.93	115	22.0 to 28.0	0.75	11.10	14	
"VS"	316+62.61	to	"VS"	339+77.61	23.15	28.0 to 28.0	24.0	494.26	11443	28.0 to 28.0	6.0	107.22	2482	28.0 to 28.0	0.75	12.44	288	
"VS"	339+77.61	to	"VS"	341+27.61	1.50	28.0 to 22.0	24.0	451.96	678	28.0 to 22.0	6.0	95.94	144	28.0 to 22.0	0.75	11.11	17	
"VS"	341+27.61	to	"VS"	380+21.51	38.94	22.0 to 22.0	24.0	409.63	15952	22.0 to 22.0	6.0	84.66	3297	22.0 to 22.0	0.75	9.77	381	
"VS"	380+21.51	to	"VS"	381+41.51	1.20	22.0 to 28.0	24.0	451.95	543	22.0 to 28.0	6.0	95.93	115	22.0 to 28.0	0.75	11.10	14	
"VS"	381+41.51	to	"VS"	405+27.27	23.86	28.0 to 28.0	24.0	494.22	11792	28.0 to 28.0	6.0	107.22	2558	28.0 to 28.0	0.75	12.44	297	
"VS"	405+27.27	to	"VS"	406+77.27	1.50	28.0 to 22.0	24.0	451.96	678	28.0 to 22.0	6.0	95.94	144	28.0 to 22.0	0.75	11.11	17	
"VS"	406+77.27	to	"VS"	414+03.33	7.26	22.0 to 22.0	24.0	409.67	2975	22.0 to 22.0	6.0	84.66	615	22.0 to 22.0	0.75	9.77	71	
"VS"	414+03.33	to	"VS"	415+23.33	1.20	22.0 to 28.0	24.0	451.95	543	22.0 to 28.0	6.0	95.93	115	22.0 to 28.0	0.75	11.10	14	
"VS"	415+23.33	to	"VS"	439+08.99	23.86	28.0 to 28.0	24.0	494.19	11792	28.0 to 28.0	6.0	107.22	2558	28.0 to 28.0	0.75	12.44	297	
"VS"	439+08.99	to	"VS"	440+58.99	1.50	28.0 to 22.0	24.0	451.96	678	28.0 to 22.0	6.0	95.94	144	28.0 to 22.0	0.75	11.11	17	
"VS"	440+58.99	to	"VS"	447+41.97	6.83	22.0 to 22.0	24.0	409.63	2798	22.0 to 22.0	6.0	84.66	578	22.0 to 22.0	0.75	9.77	67	
"VS"	447+41.97	to	"VS"	448+61.97	1.20	22.0 to 28.0	24.0	451.95	543	22.0 to 28.0	6.0	95.93	115	22.0 to 28.0	0.75	11.10	14	
"VS"	448+61.97	to	"VS"	472+47.74	23.86	28.0 to 28.0	24.0	494.22	11793	28.0 to 28.0	6.0	107.22	2558	28.0 to 28.0	0.75	12.44	297	
"VS"	472+47.74	to	"VS"	473+97.74	1.50	28.0 to 22.0	24.0	451.96	678	28.0 to 22.0	6.0	95.94	144	28.0 to 22.0	0.75	11.11	17	
"VS"	473+97.74	to	"VS"	499+01.60	25.04	22.0 to 22.0	24.0	409.62	10257	22.0 to 22.0	6.0	84.66	2120	22.0 to 22.0	0.75	9.77	245	
"VS"	499+01.60	to	"VS"	500+21.60	1.20	22.0 to 28.0	24.0	451.95	543	22.0 to 28.0	6.0	95.93	115	22.0 to 28.0	0.75	11.10	14	

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	3D

LOCATION					LENGTH	BASE AGGREGATE (TYPE 1 CLASS B) INCLUDES SLOPE ALLOWANCE AND 1' WIDENING (includes 8% for moisture)				PLANTMIX DENSE GRADE SURFACE TYPE 2C (WET) INCLUDES ANGLE OF REPOSE				PLANTMIX OPEN GRADE SURFACE 3/8-INCH (WET)				COLD MILLING
					STATIONS	WIDTH FEET		DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET		DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET		DEPTH INCH	TONS PER STA.	UNIT TONS	UNIT SQYD
US50A "VS" LINE RIGHT CONTINUED																				
"VS"	500+21.60	to	"VS"	523+36.60	23.15	28.0	to 28.0	24.0	494.26	11443	28.0	to 28.0	6.0	107.22	2482	28.0	to 28.0	0.75	12.44	288	
"VS"	523+36.60	to	"VS"	524+86.60	1.50	28.0	to 22.0	24.0	451.96	678	28.0	to 22.0	6.0	95.94	144	28.0	to 22.0	0.75	11.11	17	
"VS"	524+86.60	to	"VS"	566+60.18	41.74	22.0	to 22.0	24.0	409.60	17097	22.0	to 22.0	6.0	84.66	3533	22.0	to 22.0	0.75	9.77	408	
APPROACHES																				
HAUL RD.																				
"D"	0+35.50	to	"D"	0+91.19	0.56	32.0	to 32.0	12.0	323.20	181	32.0	to 32.0	4.0	81.07	45	32.0	to 32.0	0.75	14.16	8	
"D"	0+91.19	to	"D"	1+71.11	0.80	32.0	to 26.0	12.0	303.58	243	32.0	to 26.0	4.0	73.56	59	32.0	to 26.0	0.75	12.89	11	
"D"	1+71.11	to	"D"	6+58.24	4.87	26.0	to 26.0	12.0	282.78	1378	26.0	to 26.0	4.0	66.03	322	26.0	to 26.0	0.75	11.55	57	
CARR LN.																				
"C"	0+27.79	to	"C"	0+87.04	0.59	32.0	to 32.0	12.0	326.39	193	32.0	to 32.0	4.0	81.06	48	32.0	to 32.0	0.75	14.27	9	
"C"	0+87.04	to	"C"	1+11.35	0.24	32.0	to 26.0	12.0	307.83	74	32.0	to 26.0	4.0	73.55	18	32.0	to 26.0	0.75	13.04	4	
"C"	1+11.35	to	"C"	1+45.95	0.35	26.0	to 26.0	12.0	279.46	98	26.0	to 26.0	4.0	66.01	23	26.0	to 26.0	0.75	11.40	4	
BENCH RD.																				
"B"	0+28.00	to	"B"	0+77.64	0.50	32.0	to 32.0	12.0	322.68	162	32.0	to 32.0	4.0	81.04	40	32.0	to 32.0	0.75	14.12	8	
"B"	0+77.64	to	"B"	1+32.11	0.54	32.0	to 28.0	12.0	313.63	170	32.0	to 28.0	4.0	76.06	41	32.0	to 28.0	0.75	13.43	8	
"B"	1+32.11	to	"B"	2+13.54	0.81	28.0	to 28.0	12.0	298.38	242	28.0	to 28.0	4.0	71.05	58	28.0	to 28.0	0.75	12.51	11	
																			TOTAL:	23532	
																			USE TOTAL:	**23,540**	
APPROACHES (MISC. AREA)																				
"V"	216+41.93							3.0		16			4.0		22						
"V"	229+95.79							3.0		18			4.0		23						
"LE"	243+49.67							3.0		15			4.0		22						
"LE"	245+02.80							3.0		14			4.0		18						
"LE"	254+20.23							3.0		13			4.0		18						
"LE"	256+52.08							3.0		47			4.0		48						
"LE"	323+47.61							3.0		17			4.0		24						
"VS"	323+47.61							3.0		92			4.0		98						
"VS"	388+61.89							3.0		92			4.0		98						
"LE"	419+02.69							3.0		13			4.0		18						
"VS"	507+06.61							3.0		267			4.0		75						
"LE"	514+59.02							3.0		10			4.0		15						
"B"	1+15.50							3.0		15			4.0		21						

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	3E

1

LOCATION		LENGTH	BASE AGGREGATE (TYPE 1 CLASS B) INCLUDES SLOPE ALLOWANCE AND 1' WIDENING (includes 8% for moisture)				PLANTMIX DENSE GRADE SURFACE TYPE 2C (WET) INCLUDES ANGLE OF REPOSE				PLANTMIX OPEN GRADE SURFACE 3/8-INCH (WET)				COLD MILLING
		STATIONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	WIDTH FEET	DEPTH INCH	TONS PER STA.	UNIT TONS	UNIT SQYD
CROSSOVERS															
"LE"	273+40.63			3.0		361		4.0		95					
"LE"	323+47.61			3.0		263		4.0		69					
"LE"	388+61.89			3.0		361		4.0		95					
"LE"	422+33.44			3.0		361		4.0		95					
"LE"	455+77.18			3.0		361		4.0		95					
"LE"	507+50.10			3.0		361		4.0		95					
GUARDRAIL END TREATMENT GRADING															
"LE"	178+00.75			VARIES		14									
"D"	0+96.81			VARIES		14									
"LE"	301+81.25			VARIES		14									
					TOTAL:	349572			TOTAL:	78847					
					USE TOTAL:	**349,580**			**USE TOTAL:**	**78,850**					

SUMMARY OF EARTHWORK

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	3F

ROADWAY EXCAVATION ← 12

MAINLINE

"LE"	166+37.91	to	"LE"	166+37.91	127889.00 CUYD
"VS"	257+36.13	to	"VS"	566+60.18	147105.00 CUYD

"D" LINE

"D"	0+36.00	to	"D"	6+58.24	293.00 CUYD

"B" LINE

"B"	0+28.00	to	"B"	2+14.00	1037.00 CUYD

"C" LINE

"C"	0+28.00	to	"C"	2+14.00	258.00 CUYD

APPROACHES

"V"	216+41.93	RT	21.00 CUYD
"V"	229+95.79	RT	22.00 CUYD
"V"	243+49.67	RT	21.00 CUYD
"V"	245+02.80	LT	17.00 CUYD
"V"	254+20.23	RT	15.00 CUYD
"V"	256+52.08	LT	39.00 CUYD
"V"	323+47.61	LT	19.00 CUYD
"V"	323+47.61	RT	80.00 CUYD
"V"	388+61.89	RT	78.00 CUYD
"V"	419+02.69	LT	15.00 CUYD
"V"	507+06.61	RT	60.00 CUYD
"V"	514+59.02	LT	12.00 CUYD
"B"	1+23.00	RT	17.00 CUYD
		TOTAL:	276998.00 CUYD
		USE TOTAL:	**277,000 CUYD**

CHANNEL EXCAVATION ← 5

"LE"	179+54.00	to	"LE"	182+95.00	1351.00 CUYD
"LE"	365+84.00	to	"LE"	365+84.00	794.00 CUYD
				TOTAL:	2145.00 CUYD
				USE TOTAL:	**2,150 CUYD**

DRAINAGE EXCAVATION ← 8

"LE"	260+93.00	to	"LE"	272+78.00	4975.00 CUYD
				TOTAL:	4975.00 CUYD
				USE TOTAL:	**4,980 CUYD**

BORROW EMBANKMENT ← 3

MAINLINE

"LE"	166+37.91	to	"LE"	585+30.49	197141.00 CUYD
"VS"	257+36.13	to	"VS"	566+60.18	24036.00 CUYD

"D" LINE

"D"	0+36.00	to	"D"	6+58.24	5812.00 CUYD

PIPES

"LE"	166+37.91	to	"VS"	566+60.18	22.00 CUYD
				TOTAL:	227011.00 CUYD
				USE TOTAL:	**227,020 CUYD**

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	3G

SUMMARY OF EARTHWORK CONTINUED

SELECT BORROW EMBANKMENT ← 13

MAINLINE

"LE"	282+50.00	to	"LE"	286+80.00	20324.00 CUYD
"VS"	282+35.00	to	"VS"	287+65.00	20324.00 CUYD
				TOTAL:	40648.00 CUYD
				USE TOTAL:	**40,650 CUYD**

4 → SUMMARY OF COLD MILLINGS

0" to .75" MILLINGS GENERATED		9	TONS
.75" MILLINGS GENERATED		149	TONS
2" MILLINGS GENERATED		13096	TONS
2" to 2.75" MILLINGS GENERATED		76	TONS
2" to 3" MILLINGS GENERATED		37	TONS
3" MILLINGS GENERATED		47	TONS
4" AVG. MILLINGS GENERATED		2,402	TONS
	TOTAL	**15,817**	**TONS**
MILLINGS USED FOR RAILROAD MAINTENANCE RD	**TOTAL**	**49**	**TONS**
MILLINGS FOR SHOULDERING MATERIAL (SLOPE FLATTENING)	**TOTAL**	**15,768**	**TONS**

STATE	PROJECT NO.	COUNTY	SHEET
NEVADA	NH-050-A(004)	CHURCHILL	3H

11 14

10

GUIDEPOSTS	
TYPE 1 REFLECTORS (WHITE)	395
TYPE 1 REFLECTORS (YELLOW)	281
TOTAL	**676**

OBJECT MARKERS	
TYPE 3 OBJECT MARKERS	6
TOTAL	**6**

16

THEORETICAL APPLICATION OF SURFACING MATERIALS		
ASPHALT CEMENT, GRADE PG64-28NV (TYPE 2) (DENSE GRADE)	**6.50%**	
ASPHALT CEMENT, GRADE PG64-28NV (TYPE 3) (STRESS RELIEF COURSE)	**7.00%**	
ASPHALT CEMENT, GRADE PG64-28NV (3/8" SIZE) (OPEN-GRADE)	**8.00%**	
MINERAL FILLER	**1.50%**	
SPECIFIC GRAVITY	**2.57**	
EMULSIFIED ASPHALT, TYPE SS-1H (DILUTED)		
Tack Cold Milled Surface	**0.09**	**gal/yd²**
Tack Open Grade	**0.06**	**gal/yd²**
Tack Plantmix Bituminous Surface Lifts	**0.04**	**gal/yd²**
Seal Coats	**0.12**	**gal/yd²**
AGG.BASE UNIT WEIGHT	**134.00**	**lbs/ft^3**
COLDMILLINGS UNIT WEIGHT	**1.69**	**ton/yd^3**
DENSE-GRADED PLANTMIX WET (TYPE 2)	**140.37**	**ton/yd^3**
DENSE-GRADED PLANTMIX WET (TYPE 3)	**139.48**	**ton/yd^3**
OPEN-GRADED PLANTMIX WET	**132.07**	**ton/yd^3**
Weight Volume Relationship for SS-1h	**240.00**	**gal/ton**

ASPHALT CEMENT AND MINERAL FILLER QUANTITIES (FOR INFORMATIONAL PURPOSES ONLY)	PG 64-28NV TONS	MINERAL FILLER TONS
DENSE GRADE - TYPE2:	6,605	1,516
OPEN GRADE:	1,187	223
TOTAL:	7,800	1,740

GENERAL NOTES

9

1. **Refer to Nevada Department of Transportation Standard Specifications for Road and Bridge Construction, 200* Edition, for specifications except as modified by these plans and special provisions.**
2. ~~**Traffic control devices shall conform to the requirements of the M.U.T.C.D. 200* And Nevada Department of Transportation Standard Plans for road and Bridge Construction 200* English Version.**~~
3. **Depth of base and surface is minimum compacted thickness.**
4. **Remove all existing guide posts and object markers at no direct payment**
5. **Type 3 object markers to be placed as directed.**

* **Current standards used in plan development**

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH 050-A(004)	CHURCHILL	3I

Lane Abbreviations: Cntr Trn = Center Turn Lane Location Abbreviations: Gutter Pan =GP, Right/Left /Between Wheel Path=RWP/LWP/BWP Centerline=CL, EastBound=EB, WestBound=WB, NorthBound=NB, SouthBound=SB =GP, Stripped=Strp, Delaminated=Delm, Broke=Brk, Bottom=BTM, Roadmix=RM, Roadbed Modification=RBM, Plantmix Bituminous Surface=PBS, Cement Treated Base=CTB, Light=LT, Medium=MED, Heavy=HVY Core Abbreviations: Gutter Pan

MATERIALS DIVISION CORE DATA SHEET

6

Limits listed are in County Cummulative Miles

Notes: **US050A FROM US095A TO THE LY/CH COUNTY LINE US050A LY 0.713-7.864**

Core No	County Cum Mile	Distance to CL (ft)	Side	Direction	Lane No	Location Remarks	Total Depth (IN)	PBS Depth (IN)	Core Size (IN)	Core Condition
1	0.20	9.17	RT	EB	Lane 1	RWP	7.75	7.75	4	LT STRP FM 2.75" TO BTM
17	0.50	9.17	LT	WB	Lane 1	RWP	8.50	8.50	4	LT STRP FM 6.25" TO BTM
2	1.00	8.67	RT	EB	Lane 1	RWP	7.50	7.50	4	LT STRP FM 2.25" TO 6.00" / STRP & FELL APART FM 6.00" TO BTM
16	1.50	9.42	LT	WB	Lane 1	RWP	7.88	7.88	4	LT STRP FM 2.50" TO BTM
3	2.00	9.00	RT	EB	Lane 1	RWP	7.75	7.75	4	LT STRP FM 2.25" TO 3.50" / STRP & FELL APART FM 3.50" TO BTM
15	2.50	8.67	LT	WB	Lane 1	RWP	8.25	8.25	4	LT STRP FM 2.50" TO BTM
4	3.00	9.17	RT	EB	Lane 1	RWP	9.50	9.50	4	VERY SOFT RUBBER LAYER @ 5.00" / LT STRP FM 2.63" TO BTM
14	3.50	9.50	LT	WB	Lane 1	RWP	7.50	7.50	4	LT STRP FM 2.75" TO BTM
5	4.00	9.00	RT	EB	Lane 1	RWP	7.63	7.63	4	LT STRP FM 2.38" TO BTM
13	4.50	9.33	LT	WB	Lane 1	RWP	8.88	8.88	4	LT STRP FM 2.75" TO BTM
6	5.00	9.33	RT	EB	Lane 1	RWP	7.88	7.88	4	LT STRP FM 2.00" TO BTM
12	5.50	9.67	LT	WB	Lane 1	RWP	8.25	8.25	4	HVY STRP FM 3.00" TO 4.00" / DELM @ 4.00" / MED STRP FM 4.00" TO BTM
7	6.00	8.83	RT	EB	Lane 1	RWP	9.25	9.25	4	LT STRP FM 3.25" TO BTM
11	6.50	9.33	LT	WB	Lane 1	RWP	10.38	10.38	4	LT STRP FM 7.00" TO BTM
8	7.00	21.50	RT	EB	Lane 2	RWP	9.50	9.50	4	
10	7.50	21.00	LT	WB	Lane 2	RWP	7.00	7.00	4	
9	7.70	20.00	RT	EB	Lane 1	RWP	10.25	10.25	4	LT STRP FM 4.50" TO 8.00" / DELM @ 8.00" / MED STRP FM 8.00" TO BTM

ESTIMATE OF QUANTITIES
Quantities Shown are Approximate Only and are Subject to Increase or Decrease
TO BE CONTRACTED

ITEM NO.	TOTAL	UNIT	ITEM
110 0100	1,000	HOUR	TRAINING (1 TRAINEE)
202 0056	LS	---	REMOVAL OF PORTION OF REINFORCED CONCRETE BOX CULVERT
202 0328	9	EACH	REMOVAL OF DROP INLET
202 0432	3	EACH	REMOVAL OF CATTLE GUARD
202 0436	6	EACH	REMOVAL OF CATTLE GUARD WING
202 1004	697	LINFT	REMOVAL OF EXPANSION JOINTS
202 1020	62,654	LINFT	REMOVE AND RESET GUARDRAIL
202 1080	22	LINFT	REMOVAL OF CULVERT PIPE
202 1104	99,329	LINFT	REMOVAL OF GUARDRAIL
202 1144	1,090	SQYD	REMOVAL OF BITUMINOUS SURFACE
202 1152	119,150	SQYD	REMOVAL OF BITUMINOUS SURFACE (COLD MILLING)
202 1184	10	CUYD	REMOVAL OF COMPOSITE SURFACE
202 1292	14,499	LINFT	REMOVAL OF BITUMINOUS SHOULDER DIKE
203 0508	2,540	CUYD	ROADWAY EXCAVATION
206 0500	5,360	CUYD	STRUCTURE EXCAVATION
207 0500	940	CUYD	BACKFILL
207 0504	2,020	CUYD	GRANULAR BACKFILL
207 0536	1	CUYD	SLURRY CEMENT BACKFILL
302 0500	6,790	TON	TYPE 1 CLASS B AGGREGATE BASE
305 0532	5,260	SQYD	PULVERIZE EXISTING SURFACE
307 0500	163,510	TON	SHOULDERING MATERIAL
402 0660	18,230	SQYD	PLANTMIXING MISCELLANEOUS AREAS
402 0676	122	LINFT	PLANTMIX BITUMINOUS SHOULDER DIKES
402 6002	215,652	TON	PLANTMIX SURFACING (TYPE 2C) (WET)
403 0558	76.48	MILE	MILLED RUMBLE STRIPS
403 6000	37,640	TON	PLANTMIX OPEN-GRADED SURFACING (3/8-INCH) (WET)
404 0553	2,200	TON	LIME (COLD RECYCLE)
404 0570	2,200	TON	EMULSIFIED ASPHALT, TYPE CMS-2S
404 0571	362	TON	EMULSIFIED ASPHALT, TYPE CMS-2S (DILUTED)
404 0581	859,590	SQYD	RECYCLED BITUMINOUS SURFACE (3 1/2-INCH DEPTH)
404 0584	500	TON	PREMIXED BITUMINOUS PAVING MATERIAL
404 0608	500	TON	HAUL AND PLACE PREMIXED BITUMINOUS PAVING MATERIAL
405 0516	571	TON	EMULSIFIED ASPHALT, TYPE SS-1H (DILUTED)
406 0502	10	TON	LIQUID ASPHALT, TYPE MC-70NV
406 0536	6,540	TON	SAND BLOTTER
496 0508	120	SQYD	BRIDGE DECK PREPARATION AND CONCRETE PLACEMENT
496 0524	29,021	POUND	POLYMER CONCRETE AGGREGATE
496 0528	3,484	POUND	POLYMER CONCRETE RESIN
502 0017	FA	---	CONCRETE BRIDGE DECK REPAIR
502 0019	FA	---	CONCRETE SUPERSTRUCTURE REPAIR
502 0021	FA	---	REINFORCED CONCRETE BOX REPAIR
502 0085	FA	---	CRACK SEALING
502 0516	35	CUYD	CLASS AA CONCRETE (MINOR)
502 0632	19,800	LINFT	CONCRETE BARRIER RAIL (TYPE FA)
502 0652	536	LINFT	CONCRETE BARRIER RAIL (TYPE D)
502 0653	456	LINFT	CONCRETE BARRIER RAIL (TYPE D) (MODIFIED)
502 0856	87	CUYD	CLASS DA CONCRETE, MODIFIED (MAJOR)
502 0880	1,360	SQYD	FINE SURFACE FINISH
502 0909	857	LINFT	EXPANSION JOINT SEALANT
505 0105	300	POUND	REINFORCING STEEL (EPOXY COATED) (DOWELED)
505 0500	7,280	POUND	REINFORCING STEEL

ESTIMATE OF QUANTITIES (continued)

ITEM NO.	TOTAL	UNIT	ITEM
505 0502	2,950	POUND	REINFORCING STEEL (DOWELED)
505 0504	500	POUND	REINFORCING STEEL (EPOXY COATED)
603 0520	5,711	LINFT	18-INCH REINFORCED CONCRETE PIPE, CLASS III
603 0840	14	EACH	18-INCH PRECAST END SECTION
609 0190	3	EACH	TYPE 1 MANHOLE (MODIFIED)
609 0500	2,160	POUND	CASTINGS
609 0504	10,530	POUND	STRUCTURAL STEEL GRATES
609 0544	4	EACH	48-INCH PRECAST REINFORCED CONCRETE MANHOLE, TYPE 1
609 0596	880	LINFT	ABANDON PIPE
609 0604	1	EACH	72-INCH PRECAST REINFORCED CONCRETE MANHOLE, TYPE 2
610 0501	20	CUYD	RIPRAP (CLASS 150)
610 0601	10	CUYD	RIPRAP BEDDING (CLASS 150)
618 0038	46	EACH	TRAILING END ANCHOR
618 0073	54	EACH	GUARDRAIL TERMINAL (FLARED)
618 0088	46	EACH	GUARDRAIL-BARRIER RAIL CONNECTION (TRIPLE CORRUGATION)
618 0100	21	EACH	GUARDRAIL-BRIDGE RAIL CONNECTION (TRIPLE CORRUGATION)
618 0528	60,403	LINFT	GALVANIZED GUARDRAIL (TRIPLE CORRUGATION)
619 0040	3,366	EACH	GUIDE POSTS (RIGID)
623 0076	19	EACH	NO. 5 PULL BOX
623 0568	1	EACH	SPECIAL DETECTOR SENSOR PROBES
623 0570	4	EACH	SPECIAL DETECTOR SURFACE SENSOR
623 1020	60	LINFT	2-INCH CONDUIT
623 1028	1,128	LINFT	3-INCH CONDUIT
623 1200	900	LINFT	12 PAIR CONDUCTOR NO 16 MESSENGER CABLE
623 1724	58	EACH	LOOP DETECTOR (6-FOOT X 6-FOOT)
623 2083	60	LINFT	DIRECTIONAL DRILLING
625 0120	LS	---	RENT TRAFFIC CONTROL DEVICES
627 0508	4,026	SQFT	PERMANENT SIGNS (GROUND MOUNTED) (METAL SUPPORTS)
627 0512	96	SQFT	PERMANENT SIGNS (GROUND MOUNTED) (SPECIAL METAL SUPPORTS)
627 0516	340	SQFT	PERMANENT SIGNS (GROUND MOUNTED) (TIMBER SUPPORTS)
627 0532	4,462	SQFT	PERMANENT SIGNS, REMOVE
628 0004	LS	---	MOBILIZATION
632 1124	42.54	MILE	EPOXY PAVEMENT STRIPING (8-INCH BROKEN WHITE)
632 1128	42.47	MILE	EPOXY PAVEMENT STRIPING (8-INCH SOLID WHITE)
632 1132	42.48	MILE	EPOXY PAVEMENT STRIPING (8-INCH SOLID YELLOW)
632 1152	0.87	MILE	EPOXY PAVEMENT STRIPING (DOUBLE SOLID YELLOW)
632 1156	1.76	MILE	EPOXY PAVEMENT STRIPING (SOLID WHITE)
632 1188	11,920	LINFT	EPOXY PAVEMENT STRIPING (12-INCH SOLID WHITE)
632 1200	300	LINFT	EPOXY PAVEMENT STRIPING (24-INCH SOLID WHITE)
632 1224	46	SQFT	EPOXY PAVEMENT STRIPING (VARIES)
637 0003	LS	---	TEMPORARY POLLUTION CONTROL
637 0090	LS	---	DUST CONTROL
641 0552	2	EACH	IMPACT ATTENUATOR (70 MPH)
646 0503	320	GAL	CRACK SEALANT
646 0516	31,926	SQFT	BRIDGE DECK PREPARATION

7.10 Roadway Plans.

General. The purpose of the plan and profile sheets is to convey information necessary to locate and construct the contract's road design elements.

Roadway Plan Guidelines. The use of full plan and profile sheets is generally used for new construction, interchanges, or widening projects. Full plan and profile sheets are where the entire sheet is dedicated to a plan view or profile view. Arrange these sheets so all plan sheets are shown first followed by the profile sheets.

In some cases it may be acceptable to use split plan sheets when less detail is required. These are typically used on simple overlay projects with straight alignments or projects in rural areas that have minimal construction notes. A split plan view is where the sheet is divided with a solid black line lengthwise and contains a plan view on the top and on the bottom.

A combined plan and profile sheet can be used when determined appropriate. These sheets are divided with a plan view on the top and the profile view on the bottom. Where mainline profiles appear on combined plan and profile sheets, full profile sheets shall be used to show profiles of supplemental alignments, such as frontage roads, crossroads, ramps, drainage features, and other roads which cannot be added conveniently to the profile portion of the combined plan and profile sheet.

Each sheet should be arranged such that major construction features appear on one sheet; for example the major portion of an interchange should appear on one sheet. Diagonal placement is satisfactory to obtain better coverage, although this may necessitate breaks in the profile. Match lines should be used to retain accuracy and clarity.

Plan sheets are to be oriented so that stationing progresses from left to right. When stationing runs in the opposite direction from the mileposts, the plans should read in the direction of the stationing.

Sheet layout maps may be used to show sheet layout within the contract. This is used when the plans sheets do not progress in order or when there are several overlapping sheets.

Existing features such as edge of pavement, culverts, right of way, section lines, curve data, and utilities shall be shown in green. New improvements such as roadway widening, cut and fill lines, plan notes, culvert extensions, limits of miscellaneous paving, etc. shall be shown in black. Overlays do not constitute black lines for edge of oil.

Selection of a scale should be adequate to show all the necessary details as governed by the topography and the complexity of the work. Generally, the plan views should be printed to a scale of one-inch equals 100 feet (1" = 100'), although certain cases may require a larger or smaller scale. Profile views should be drawn to the same horizontal scale as the plan view with the vertical scale exaggerated ten times, but may be adjusted to adequately show other features, such as drainage, bridge footings, etc.

Plan sheets shall appear in the following order: mainlines, ramps, cross roads, frontage roads, other roads, bicycle/pedestrian paths, and then detours.

In the absence of location control sheets, the "Bearing Source" must be shown on the first plan sheet in the upper left-hand corner.

Indicate whether the bearing source is from an aerial survey, solar or polaris observations, geodetic azimuth, from other surveys or assumed bearings. If the bearing source changes from one sheet to the other, the new bearing source must be shown on the affected plan sheet.

Show and label boundaries including parks, forests, recreation areas, historic districts, military zones, tribal lands, incorporated townships, counties and states, cities and towns.

The use of control lines for any bikeways, walkways or drainage shall be shown with the appropriate station ties. These are normally office-generated alignments that are tied to a surveyed mainline alignment.

Only features that affect bidding, construction, maintenance, and are essential for field orientation of the plan should be shown. Topography should be confined to that portion within the right-of-way and a small portion outside of those limits as needed for clarity, such as side streets, approaches, parking lots, etc.

Common features that are shown include: buildings, roads, streets, railroads, rivers, streams, utilities, signs, trees, curbs, gutters, sidewalks, etc. In the event that relocation or disposition of these items is included in the project, the plan should show the present and proposed location. Include both horizontal and vertical position and additional details as may be needed to indicate the scope of the work to be performed.

Avoid the practice of using cross-hatching, patterning, or shading to highlight large areas to represent roadway surfaces to be paved, milled or otherwise; the typical cross sections adequately address these improvements. The highlighting of large areas only hides, or detracts, from the rest of the information being displayed on the sheet. Area highlighting should be reserved for small or isolated areas of work that may get lost if not displayed in this manner.

Utilities to be adjusted during construction by either removal or relocation should be annotated and located on the plans.

Plan sheets can become cluttered from the amount of information presented. In such cases, it is beneficial to present some information elsewhere, such as note sheets, removal sheets, geometric sheets, and special details.

In special situations, as built plans may be incorporated into the contract plans as reference sheets. An example where this would apply is when removing certain items such as concrete structures, complex drainage features, or large foundations that are not depicted in the plans with adequate details. This information assists prospective bidders in determining the costs of removals and helps the Resident Engineer verify removal quantities. Each sheet of the original project plans must be identified as "As Built."

Items that are generally labeled and dimensioned on the plans are items that do not have a construction note or are not adequately covered with a legend. Examples of these items are flat bottom ditches, flow lines, existing curb and gutter, edge of pavement, right of way lines, back of sidewalk, etc. Items that do not need to be labeled and dimensioned are items that are adequately described in construction notes such as headwalls, fence, mailboxes, riprap, pull boxes, loops, guardrail, etc.

7.10 Roadway Plans (Continued).

Roadway Plan Particulars. Specific information for components on the plan sheet as follows:

1) Alignments shall be shown on each plan sheet with an arrow and alignment identity pointing to each alignment (“P”, “VE”, etc). On divided highways where independent centerlines are used, the centerline separation distances are to be dimensioned. Frontage roads, ramps, detours, and other roads should have independent alignments with curve data. Alignments from construction limits to project limits are to be shown as a dashed black line. Alignments outside of construction limits are to be shown as green. Check alignments that are used in the plan sheets to ensure they match the location control.

2) Alignment tie points shall be shown on the plans as follows: The designation and station for secondary alignments, such as ramps and crossroads, are listed first. The mainline designation, station and offset information are listed next. The distance (left or right) is referenced from mainline looking ahead on line.

3) Angle points are to be identified and labeled with their respective stationing and a leader extending to the pertinent alignment. The angle of deflection is to be noted.

4) Approaches receiving pavement should have the appropriate radius with an arrow pointing to the spandrel area unless this information is covered in the plans as a detail or if they are covered in the standard plans.

5) Bearings are to be shown on all tangent sections along the alignment. Alignment information along tangents is to include bearing and tangent length, and is shown on each plan sheet.

6) Bearing equations are to be shown where there is a change in alignment heading. Equations are to include the pertinent line designations and information such as P.T., P.O.T., P.C., P.O.C.

7) Bridges (including boxes 10’and greater in span) shall be identified with a flag pointing to the structure and is to include their respective structure numbers and mileposts. The Structures Division assigns the structure number and the mileposts are designated in the milepost index.

8) Construction notes are to be placed on the plans in the order of stationing. They should be arranged in columns when possible rather than scattered randomly over the plans. The plan notes shall match the notes on the structure list and should reference to other sheet numbers, such as special detail sheets, removal sheets, etc. Orient construction notes left or right of the alignment according to the call out of the note. On especially difficult and crowded situations, a note sheet can follow the plan sheet with the corresponding numbered notes. If it is determined to use note sheets, utilize a number schematic to correlate the note to the plan sheet. These sheets would be labeled 4A, 5A, etc. For construction note terminology see Section 21 Structure Lists.

9) Control of access shall be shown on the plans in order to provide details to access openings and locked gates. New control of access shall be shown with the appropriate station/offset for openings and where it begins and ends. It is not necessary to show control of access on other sheets such as striping, traffic control, etc.

10) Culverts that exist in the field are to be labeled with their respective diameter and length. New pipes or pipe extensions do not need to be labeled when a construction note adequately describes the location, size, and skew of the new pipe. Drainage structures with a span 10’ and greater, shall be identified with the appropriate structure number. The Bridge Division assigns the structure numbers to culverts. Span of the culvert is measured along the roadway centerline.

11) Curb and gutter should be labeled with the appropriate type. When calling out new curb and gutter in the construction notes, the offset dimension is measured to the flow line (see Standard Plans). However, when providing dimensions for curb and gutter in the typical sections, dimension from the control line to the lip of gutter to ensure the widths match the typicals and summary sheets.

12) Curb ramps are to be labeled on the plans with the respective type noted. Station/offset dimensions are located at the flow line of the curb, centered within the ramp.

13) Curve data shall contain delta, radius, length, and tangent information. Curve data shall include the alignment designation directly above the list of data. Curve data is to be placed on the inside of the curve. Partial alignment data such as “Curve used” needs to be calculated and shown in the plans if this information is not available on the location control sheets.

14) Cut and fill lines are to be shown to represent the location where they intersect original ground. The cut and fill lines are to have an arrow and leader pointing to the line and labeled “Cut/fill lines.”

15) Ditches and channels are to be shown as a dashed line and labeled with their respective size unless they are adequately depicted on the typical sections. Typically large drainage ditches, such as flat bottom ditches that does not follow the roadway, may require a separate alignment or station/offset information on the plans.

16) Ditch notes may be shown in the plan view if there are no profile sheets in the set of plans. This is usually the case where widening of an existing roadway is done without a change in profile grade. The ditch notes would appear in the lower portion of the plans and have stationing where the ditch section changes.

17) Edge of Pavement should be annotated with a station/offset where the pavement width varies from the alignment. This would be applied predominately on new construction or widening projects. On basic overlays existing edge of pavement would not necessarily need to be annotated with a station/offset unless it clarifies removals or paving limits.

18) Environmental areas such as cultural avoidance areas or regulated wetland areas shall be outlined if within the limits of construction. Areas that can be adequately described in the Special Provisions do not need to be shown.

19) Exception areas are where no work is to be performed. This is usually on bridge decks that do not need any surfacing or repairs. These areas are to have a leader pointing to the alignment along with the stationing depicting these areas of “Begin Exception” or “End Exception.”

20) Islands are to be shown on the plans. However, the geometric sheets depict detailed information such as curve data, bearings, offsets, etc. When modifying islands, show the appropriate station/offset to the connection points where the new meets the existing.

21) Insets can be used to show greater level of detail that cannot otherwise be seen with the scale used on the plan sheet.

22) Legends shall be placed in the upper left corner of the plan sheet when practical. Some examples of these would be plantmixing miscellaneous areas, limits of paving, and removal of bituminous surface. When a structure note identifies what is to be constructed such as shoulder dike, barrier rail, guardrail, riprap, etc, these do not necessarily need legends.

7.10 Roadway Plans (Continued).

23) Match lines are to be used when a section of the view is included on a separate sheet. Include sheet number when referencing a different sheet (e.g. Match line “A” See sheet B-5).

24) Milepost panels (county posts not cumulative miles) shall be shown on the plan sheets in red. These shall be relative to the line of stationing and be annotated with the panel number. The purpose of this indication is to facilitate the correlation of mile-posted data, such as district permits, with the project plans and also to provide a means of relating the plan elements to the milepost panels during field reviews.

25) North arrow must always be shown on each plan sheet and is generally located near the top of the sheet. The arrow should include a notation indicating the township and range and section, unless this information is readily identified elsewhere on the sheet.

26) Permission to construct is additional area necessary for constructing approaches, placing signs, striping, or traffic control outside of right of way. The limits of these areas are to be dimensioned from alignment with station offsets. A dashed line outlining the perimeter of the area is shown in black and labeled “Permission to construct.” Consult the Right of Way Division for the use of permission to construct versus the use of temporary easements.

27) Project Number and county need to be shown in the upper right corner and placed in the appropriate designated boxes.

28) Project construction limits shall be shown on the plans with the appropriate stationing. Begin/end construction is for incidental work that is being performed beyond the project limits, such as additional striping, permanent signing, and pavement transitions. If the construction limits are the same as project limits, there is no need to define Begin/End construction on the plans. Traffic control devices do not need “Begin Construction” and “End Construction.”

29) Right-of-way lines shall be shown on the plans with respective distances from the alignment. Dimension right of way when no right of way sheets are provided. The dimensions are indicated on the left and right extremities of each plan sheet. Right-of-way shall be indicated in a manner that clearly defines its relationship to the control of access and fencing. Where right of way acquisitions are done in advance of the contract, the Right of Way Division will provide right of way sheets with detailed information as to permanent and temporary easements, with all applicable information such as bearings, distances, and offsets. The new right of way lines shall be shown on the plan sheets in green. Roadways with prescriptive rights will generally not show any right of way lines, but shall include the following note: AREAS OF R/W NOT DELINEATED ARE PRESCRIPTIVE RIGHTS ONLY AND ARE LIMITED TO NDOT MAINTAINED AREA OF THE HIGHWAY AND APPURTENANCES SUCH AS SLOPES AND DITCHES. CONTACT LOCAL NDOT MAINTENANCE FORCES FOR LIMITS.

30) Sections are to depict a cross section view or a greater level of detail that cannot be obtained on the plans. Normally the section view is displayed on the same sheet with a border around it to display it as a detail.

31) Section lines**,** township, range, sections, ¼ sections, section corners, and existing right-of-way must be shown and identified. This information will be shown with the north arrow if it does not appear elsewhere on the plan sheet. Sixteenth (1/16) section lines must be shown when they represent a boundary line of a city, town, national forest, game reserve, military reservation, property line, or when they represent a change in right of way. Coordinate the section net with the Right of Way Division when there are right of way acquisitions on the project.

32) Sheet numbering starts with the number 4 and shall be continued with whole numbers. Alpha numeric numbers should not be used on plan or profile views, such as 5A, 6A, etc., unless note sheets are used (See construction notes).

33) Sound walls are to be shown with the appropriate station and offset at each end. The offset distance is measured to the center of the wall.

34) Stationing, including equations, shall be shown as reading from left to right. Station ticks will be at 100’ intervals with every 500’ station having the corresponding station label. If linear equations are present, the designer should use “gap” equations and not “overlap” equations. Overlap equations cause confusion because of the duplication of stationing caused by the overlap. To convert an overlap equation to a gap equation a prefix such as “10” can be added to the ahead station (e.g. 5+00 would become 105+00), or by increasing the first digit of the ahead station by one (e.g. 110+00 would become 210+00). Alignment changes must be made in cooperation with the location engineer and coordinated with the other engineering divisions.

35) Utilities are to be shown when in conflict with proposed construction improvements. Where the location of the utility must be accurate, a task order is prepared to have the utilities designated and potholed as required.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPF-305-1(032)	LANDER	4

- LEGEND -

- LIMITS OF PLANTMIXING MISCELLANEOUS AREAS

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

Ⓒ - DENOTES CELLS HAVE BEEN USED.

Ⓛ - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

Ⓓ - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

EXTRA LARGE TEXT

BEGIN PROJECT SPF-305-1(032)
"E" 417+00.00 P.O.T.

TOWNSHIP, RANGE AND SECTION TEXT SHALL APPEAR ON NORTH ARROW UNLESS THOSE LINES ALREADY APPEAR ON SHEET.

T. 30N., R. 44E., SEC. 6

Sec. 7 Sec. 6

"B" 426+50.00 REMOVE EXISTING END SECTION LT., INSTALL NEW END SECTION LT.

"B" 431+18.75 CONSTRUCT NEW GUARDRAIL WITH
"B" 436+06.25 FLARED END TREATMENTS, LT.

"B" 429+93.75 CONSTRUCT NEW GUARDRAIL WITH
"B" 434+81.25 FLARED END TREATMENTS, RT.

"B" 438+70.00 PAVE EXISTING MODIFIED TYPE 2A APPROACH (W=25'), RT.

R/W
E.O.P.
EXTRA SMALL TEXT
100'
200'
410 415 420 425 430 435
N11° 45'00"W 45110.41'
N11° 00'00"W 2350.00'
"E"
"B"
+18.75 +56.25 +68.75 +06.25
+93.75 +31.25 +43.75 +81.25
8'x6'x48' RCB
24" x 48' CMP
M.P. 15.00

BEGIN CONSTRUCTION
END EXCEPTION
"E" 414+00.00 P.O.T.

"E" 422+00.00 P.O.T. = "B" 422+00.00 P.O.T.

BACK N11° 45'00"W N11° 00'00"W AHEAD
BEARING EQUATION

"F" 547+30.00 CONSTRUCT RIP-RAP APRON, LT., (SEE DRAINAGE DETAIL SHT. XX).

"F" 552+25.00 PAVE EXISTING TYPE 2A APPROACH (W=20'), LT.

PERMISSION TO CONSTRUCT
+85 260' LT +75 260' LT
+85 200' LT +75 200' LT
LC=3

"B" N11° 00'00"W 2350.00'
24" x 48' CMP
N11° 15'00"W 25000.25'
"F"
P.B.
440 445 550 555 560 565
14.0' RT. 30.0' RT. +00 +50
E.O.P.
Cut/Fill Lines
"B" 445+50.00 P.O.T. = "F" 545+50.00 P.O.T.
∠ = 00° 15'00" LT.

Cultural Avoidance Area (Do Not Disturb)

"F" 552+50.00 CONSTRUCT MODIFIED TYPE 2A APPROACH, RT.

"F" 552+37.00 +/- TELEPHONE UNDERGROUND CABLE CROSSING. (DO NOT DISTURB)

"F" 552+57.00 +/- 6" STEEL GAS LINE IN 12¾" CASING. (DO NOT DISTURB)

"F" 558+50.00 INSTALL SPEED DETECTOR LOOPS.

6:1 F.S. Or 6:1 F.S.~1.0' Ditch~6:1 B.S.

D.N. RT.
EXCAVATION yd³
EMBANKMENT yd³
500 (425)
425

"F"
30' R. (Typ.)
AA 4
30.0'
USE PLACE ARROW MARKER

30.0'
4" Plantmix Bituminous Surface With Seal Coat
6:1 F.S. 6:1 F.S.
6" Type 1 Class B Aggregate Base
SECTION A-A

EXTRA LARGE TEXT

END PROJECT SPF-305-1(032)
"F" 560+00.00 P.O.T.

END CONSTRUCTION
"F" 565+00.00 P.O.T.

29 19 31 1 34 5 6 24 25 27 32 28 26 10 17 14 3 18 8 16 21 35 30

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	IM-015-1(100)50	CLARK	5

EXTRA LARGE TEXT

BEGIN PROJECT IM-015-1(100)50
"W" 252+00.00 P.O.T.
"OE" 252+00.00 P.O.T.

TOWNSHIP, RANGE AND SECTION TEXT SHALL APPEAR ON NORTH ARROW UNLESS THOSE LINES ALREADY APPEAR ON SHEET.

T.19S., R.62E.

Sec. 31 Sec. 32

Sec. 29 Sec. 32

IR 15-CL 50.15
I-959

IR 15-CL 50.21
C-1044 S

IR 15-CL 50.22
C=1046

SMALL TEXT
"W" 275+00.00 REMOVE EXISTING TREE, 132.90' LT.
WT=1
FT=3

"R3"
Δ=15° 11'22"
R=1800.00'
L=477.19'
T=240.00'

"R3" 22+90.21 P.C.

"R3" 27+67.40 P.T.

"R3" 13+89.67 P.C.

"R3"
Δ=64° 10'02"
R=550.00'
L=615.96'
T=344.80'

"R3" 20+05.63 P.T.

N63° 58'1"E 284.58'

N48° 46'39"E 519.77'

N44° 46'39"E 2625.09'

N44° 46'39"E 2560.21'

N43° 37'54"E 600.00'

"W"

"OE"

"R4"

"R4" 13+50.82 P.C.C.

"R4"
Δ=12° 52'24"
R=3000.00'
L=674.05'
T=338.45'

"R4" 20+24.87 P.T.
(34' RT.) "OE" 269+44.90 P.O.T.=

"R4"
Δ=30° 57'31"
R=2500.00'
L=1350.82'
T=692.34'

"R4" 0+00.00 P.C.
(16' RT.) "L" 107+09.85 P.O.T.=

"R3" 0+00.00 P.O.T.
(16' LT.) "L" 107+09.85 P.O.T.=

N00° 12'01"W 1389.67'

"L"

MATCH LINE "A"
(SEE SHEET 42)

1/4 Sec. Line

10' F.B. Ditch

+00.00 22.0' RT.

+00.00 22.0' RT.

SW-1

38"x24"x32" RCAP

R/W

E.O.P.

200'

108'

350'

50'

SMALL TEXT
"OE" 252+00.00
"OE" 257+00.00
WT=1

FT=3
CONSTRUCT SOUNDWALL SW-1. SEE RETAINING WALL AND SOUNDWALL SHEETS.

SMALL TEXT
"OE" 265+00.00
WT=1

FT=3
REMOVE EXISTING TREE, 152.06' RT.

EXTRA SMALL TEXT

LARGE TEXT

FT=10

WT=1

WT=4

IR 15-CL 50.21
C-1044

IR 15-CL 50.20
C-1045

NOTE ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT NOTES SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

Ⓒ - DENOTES CELLS HAVE BEEN USED.

Ⓛ - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

Ⓓ - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPG-395-2(19)	DOUGLAS	6

– LEGEND –

LIMITS OF PLANTMIXING MISCELLANEOUS AREAS

* LIMITS OF PAVING

FOR ISLAND GEOMETRICS SEE GEOMETRIC AND ELEVATION CONTROL SHEET 16.

TOWNSHIP, RANGE AND SECTION TEXT SHALL APPEAR ON NORTH ARROW UNLESS THOSE LINES ALREADY APPEAR ON SHEET.

"E" 755+00 INSTALL HIGHWAY LIGHTING SYSTEM AT SR 208 INTERSECTION. (SEE SHEET T-3)

"E" 755+00 PAVE TYPE 2 APPROACH (W=24', R=25'), LT.

"E" 746+73 REMOVE PORTION OF EXISTING DROP INLET IN MEDIAN ISLAND RT. AS NECESSARY. SALVAGE AND RE-USE STEEL GRATE. ADJUST DROP INLET SO GRATE MATCHES NEW DENSE GRADED ELEVATION (RAISE APPROX. 4"). TRANSITION TYPE 8 CURB AND GUTTER TO MATCH ADJUSTED DROP INLET AS DIRECTED BY THE ENGINEER. (SEE SHEET NO. 16)

"E" 754+43 CONSTRUCT NEW TYPE D, ALT. 2, CURB RAMP (A=7'0", B=7'0"), RT.

"E" 767+93 REMOVE EXISTING 36" X 30' CMP UNDER EXISTING APPROACH, LT. INSTALL NEW 57" X 38" X 36' CMAP UNDER APPROACH. BUILD UP APPROACH OVER NEW CMAP AS DIRECTED BY THE ENGINEER.

"E" 771+18 PAVE TYPE 2 APPROACH (W=24', R=25'), LT.

"E" 768+11
"E" 771+06 REGRADE EXISTING F. B. DITCH LT., AND PLACE EXCAVATED MATERIAL ON EAST SIDE OF EXISTING F. B. DITCH. (RENT EQUIPMENT).

"E" 771+55 REMOVE EXISTING 12" X 20' CMP UNDER EXISTING DIKE, LT. INSTALL NEW 18" X 20' CMP AT SAME LOCATION. PLACE NEW INLET INVERT ELEVATION 6" BELOW EXISTING.

"E" 771+18 PAVE TYPE 2 APPROACH (W=24', R=25'), RT.

"E" 755+51
"E" 770+80 REMOVE EXISTING ISLAND CURB AND PORTION OF EXISTING ISLAND. (SEE SHEET NO. 2C & 16)

"E" 755+51
"E" 770+31 CONSTRUCT NEW MEDIAN ISLAND. (SEE SHEET NO. 2C & 16)

"E" 755+58 REMOVE PORTION OF EXISTING DROP INLET IN MEDIAN ISLAND RT., AS NECESSARY. SALVAGE AND RE-USE STEEL GRATE. ADJUST DROP INLET SO GRATE MATCHES NEW DENSE GRADED ELEVATION (RAISE APPROX. 4"). TRANSITION TYPE 8 CURB AND GUTTER TO MATCH ADJUSTED DROP INLET AS DIRECTED BY THE ENGINEER. (SEE SHEET NO. 16)

"E" 771+76
"E" 777+90 REMOVE EXISTING ISLAND CURB AND PORTION OF EXISTING ISLAND. CONSTRUCT NEW MEDIAN ISLAND. (SEE SHEET NO. 2C & 16)

"E" 771+90 REMOVE PORTION OF EXISTING DROP INLET IN MEDIAN ISLAND RT., AS NECESSARY. SALVAGE AND RE-USE STEEL GRATE. ADJUST DROP INLET SO GRATE MATCHES NEW DENSE GRADED ELEVATION (RAISE APPROX. 4"). TRANSITION TYPE 8 CURB AND GUTTER TO MATCH ADJUSTED DROP INLET AS DIRECTED BY THE ENGINEER.(SEE SHEET NO. 16)

"E" 755+00.19 P.O.C.
"H" 0+00.00 P.O.T.=

"E"
Δ=24° 28'10"
R=10000.00'
L=4270.72'
T=2168.42'

"H"
Δ=26° 30'20"
R=5000.00'
L=2313.05'
T=1177.60'

"H" 5+59.49 P.C.

N 78° 19' 40" E 559.49'

1/4 Sec. Line

SEC. 17

SEC. 18

R/W 100' 6'x4'x88' R.C.B. E.O.P. D.I. TYPE 3 CURB TYPE 8 C&G 750 755 760 765 770 775 24"x42" C.M.P. 36"x30' C.M.P. 2.0' F.B. DITCH 12"x20' C.M.P. 24"x54' C.M.P. WT=4 LC=3 LC=4 75' EXTRA SMALL TEXT SMALL TEXT

NOTE ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

Ⓒ – DENOTES CELLS HAVE BEEN USED.

Ⓛ – DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

Ⓓ – DENOTES AN ENTER DATA FIELD EXISTS. TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-050-1(002)	WHITE PINE	7

- LEGEND -

LIMITS OF PLANTMIXING MISCELLANEOUS AREAS

NOTE ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

"P1" 296+75.00 EXISTING APPROACH LT. TO BE OBLITERATED.

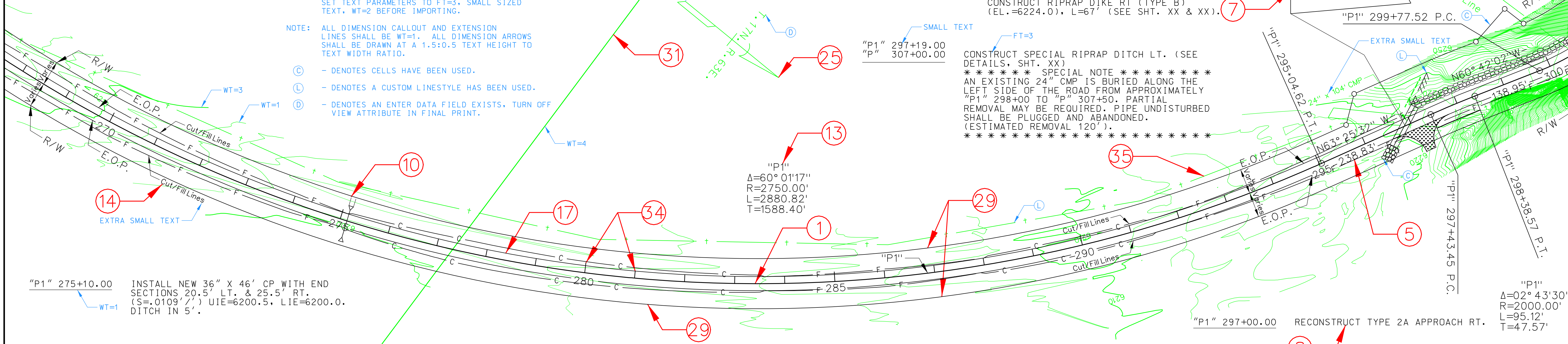
"P1" 296+85.00 EXISTING 24" X 104' CMP. EXTEND 20' RT. (24"X124' CMP). REMOVE EXISTING 24"X124' CMP. INSTALL NEW DOUBLE 8'X4'X90' PRECAST RCB (B-2041) 52 DEG SKEW LT. AHEAD. CONSTRUCT TYPE 1 HEADWALL LT. (0 DEG. SKEW), AND SPECIAL RIPRAP BASIN RT. UIE=6217.5, LIE=6217.3 (S=.0024'/'). CONSTRUCT RIPRAP DIKE RT (TYPE B) (EL.=6224.0), L=67' (SEE SHT. XX & XX).

"P1" 297+19.00
"P" 307+00.00 CONSTRUCT SPECIAL RIPRAP DITCH LT. (SEE DETAILS, SHT. XX)

* * * * * * SPECIAL NOTE * * * * * * * *
AN EXISTING 24" CMP IS BURIED ALONG THE LEFT SIDE OF THE ROAD FROM APPROXIMATELY "P1" 298+00 TO "P" 307+50. PARTIAL REMOVAL MAY BE REQUIRED. PIPE UNDISTURBED SHALL BE PLUGGED AND ABANDONED. (ESTIMATED REMOVAL 120').
* *

"P1" 275+10.00 INSTALL NEW 36" X 46' CP WITH END SECTIONS 20.5' LT. & 25.5' RT. (S=.0109'/') UIE=6200.5, LIE=6200.0. DITCH IN 5'.

"P1" 297+00.00 RECONSTRUCT TYPE 2A APPROACH RT.



D.N. LT.
D.N. RT.

STANDARD DITCH NOTE LT. AND RT.
4:1 F.S.~1.0 DITCH~4:1 B.S. OR
4:1 F.S UNLESS OTHERWISE NOTED.

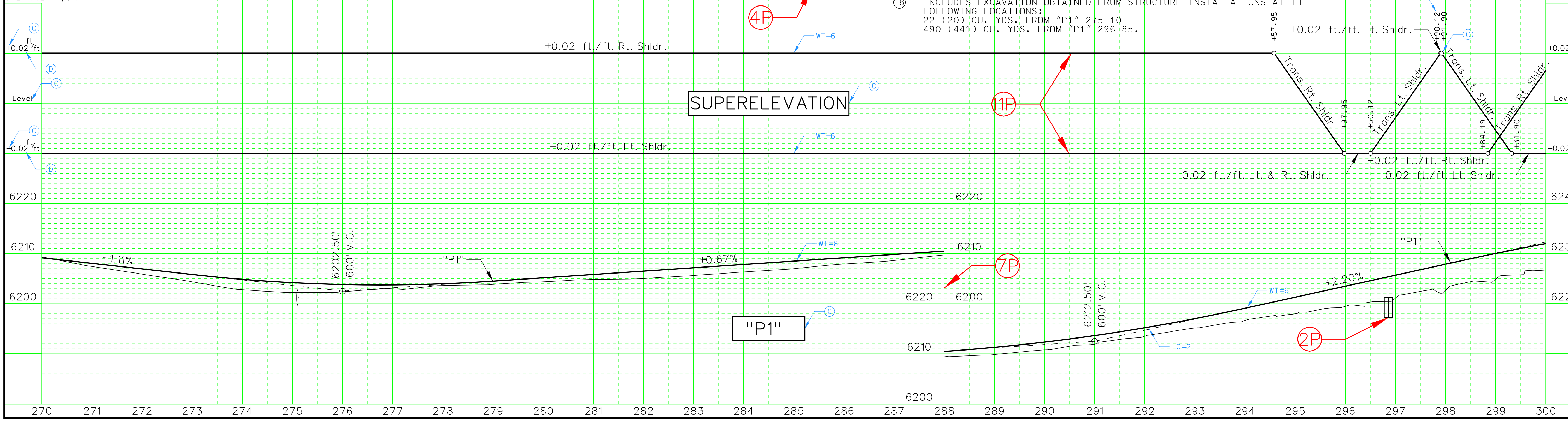
Transition
Transition
2:1 F.S~1.5 Ditch~4:1 B.S. or 2:1 F.S.
2:1 Special Riprap Ditch
2:1 F.S.

EXCAVATION yd³	7355 (6617) (17)
BORROW yd³	0
EMBANKMENT yd³	3478 (18)
OVERHAUL yd³/mi	

(17) 4000 (3600) CU. YDS. EXCAVATION TO BE PLACED BETWEEN "P1" 299+25 TO "P" 335+00.

(18) INCLUDES EXCAVATION OBTAINED FROM STRUCTURE INSTALLATIONS AT THE FOLLOWING LOCATIONS:
22 (20) CU. YDS. FROM "P1" 275+10
490 (441) CU. YDS. FROM "P1" 296+85.

See Next Sheet



STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	BRO-001(7)	CHURCHILL	8

BEARING SOURCE

BEARINGS AND DISTANCES OBTAINED FROM GROUND SURVEY CONDUCTED BY NDOT ON 3/17/94. BASIS OF BEARING ESTABLISHED FROM BACKSIGHT FROM N.E. CORNER OF SECTION 27, 00°00'00" TO 1/4 SECTION CORNER 22/27.

TOWNSHIP, RANGE AND SECTION TEXT SHALL APPEAR ON NORTH ARROW UNLESS THOSE LINES ALREADY APPEAR ON SHEET.

T.19N. R.30E.

"E" 0+00.00
"E" 2+15.00 RESHAPE ROADWAY AND SLOPES LT. AND RT.

"E" 4+10.00
"E" 5+51.55 RESHAPE ROADWAY AND SLOPES LT. AND RT.

"E" 3+13.68 CONSTRUCT NEW DBL. 12' X 6' X 38' RCB AT 18.4 DEG. SKEW RT. AHEAD WITH WINGWALLS RT. AND LT. (UIE=3907.10', LIE=3907.30', S=0.0053 FT./FT.) (SEE BRIDGE SHEETS B9 & B10)

"E" 3+37.00 CONSTRUCT NEW MODIFIED TYPE 2B APPROACH LT. AND CONNECT TO EXISTING T.C.I.D. EASEMENT ROAD W=12', WARP RADII AND SLOPES TO FIT WITHIN T.C.I.D. EASEMENT.

PROJECT BRO-001(7)
"E" 3+13.68 P.O.T.

OFF SYSTEM B-1584

PRIVATE PROPERTY DO NOT DISTURB

PRIVATE PROPERTY DO NOT DISTURB

24" R.C.P.

24" R.C.P.

SR 116

Swope Lane

Sec. 23
Sec. 26
Sec. 22
Sec. 27

EXTRA SMALL TEXT
Irrigation Ditch

R/W

E.O.T.

LARGE TEXT
Triple E Ln.

"E"

+25.00 10.00' LT.
+75.00 17.75' LT.
+50.00 17.75' LT.
+00.00 10.00' LT.

S00°03'48"W 551.55'

+25.00 10.00' RT.
+75.00 17.75' RT.
+50.00 17.75' RT.
+00.00 10.00' RT.

Overhead Telephone Line

"E" 0+00.00 P.O.T.
BEGIN CONSTRUCTION

"E" 1+43.39 P.O.T. = "D" 0+00.00 P.C.

"D"

S2 Canal Flow

U.S. DEPT. OF FISH AND WILDLIFE

U.S. DEPT. OF FISH AND WILDLIFE

TCID Easement

TCID Easement

50'

EXTRA SMALL TEXT

END CONSTRUCTION
"E" 5+51.55 P.O.T.
"D" 4+77.20 P.T. =

NOTE ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

1/4 Sec. Line

Sec. 22
Sec. 27

"E" 2+77.00 CONSTRUCT NEW MODIFIED TYPE 2B APPROACH, RT., AND CONNECT TO EXISTING T.C.I.D. EASEMENT ROAD W=12', WARP RADII AND SLOPES TO FIT WITHIN T.C.I.D. EASEMENT.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

PLAN SHEET & SPECIAL DETAILS

LARGE TEXT — TO BE PERFORMED BY CONTRACTOR

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	BRO-007(7)	CHURCHILL	9

NOTE: FOR RECONSTRUCTION AND PLACEMENT OF PERMANENT FENCE, SEE THE STRUCTURE LIST.

"E" 2+87.00
"E" 3+05.00 REMOVE EXISTING FENCE 14' LT.

"D" 0+00.00
"D" 4+77.20 CONSTRUCT, MAINTAIN AND REMOVE DETOUR ("D" LINE) (SEE SHT. TCX)

"E" 2+51.00
"E" 3+59.00 CONSTRUCT TEMPORARY FENCE 19' LT. OF "E" 2+51.00 TO 35' LT. OF "E" 2+80.00 THENCE TO 35' LT. OF "E" 3+20.00 THENCE TO 22' LT. OF "E" 3+59.00

"E" 3+16.00
"E" 3+59.00 REMOVE EXISTING FENCE 18' LT.

"E" 3+13.68 REMOVE EXISTING EARTH BRIDGE, PIPES, OBJECT MARKERS AND WARNING SIGNS. CLEAR AND GRUB THE BRIDGE CONSTRUCTION SITE AS DIRECTED BY THE FIELD ENGINEER.

END DETOUR
"E" 5+51.55 P.O.T.
"D" 4+77.20 P.T.=

"E" 1+65.00
"E" 2+43.00 REMOVE EXISTING FENCE 25' RT.

"E" 1+65.00
"E" 5+24.00 CONSTRUCT TEMPORARY FENCE 32' RT. OF "D" (DETOUR) ALIGNMENT FROM EXISTING FENCE 25' RT. OF "E" 1+65.00 TO AND ENDING AT 25' RT. OF "E" 5+24.00

"E" 2+69.00
"E" 3+01.00 REMOVE EXISTING FENCE 25' RT.

"E" 4+50.00
"E" 5+24.00 REMOVE EXISTING FENCE 25' RT.

BEGIN DETOUR
"E" 1+43.39 P.O.T.=
"D" 0+00.00 P.C.

"D" 0+71.49 P.T.

"D" 1+55.69 P.C.

"D" 2+27.18 P.T.

"D" 2+59.92 P.C.

"D" 3+47.07 P.T.

"D" 3+90.05 P.C.

"D" +77.20

S41°01'18"W 84.20'

S00°03'48"E 32.74'

S49°52'20"E 42.98'

"D" Δ = 40°57'30" R = 100' L = 71.49' T = 37.35'

"D" Δ = 49°56'08" R = 100' L = 87.15' T = 46.56'

"D" Δ = 49°56'08" R = 100' L = 87.15' T = 46.56'

"D" Δ = 40°57'30" R = 100' L = 71.49' T = 37.35'

Sec. 22 / Sec. 23 / Sec. 26 / Sec. 27

T.19N. R.30E.

TOWNSHIP, RANGE AND SECTION TEXT SHALL APPEAR ON NORTH ARROW UNLESS THOSE LINES ALREADY APPEAR ON SHEET.

SR 116 — Swope Lane — Triple E Ln. — TCID Easement — S2 CANAL FLOW — Irrigation Ditch — R/W — E.O.T. — Cut/Fill Lines

NOTE ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

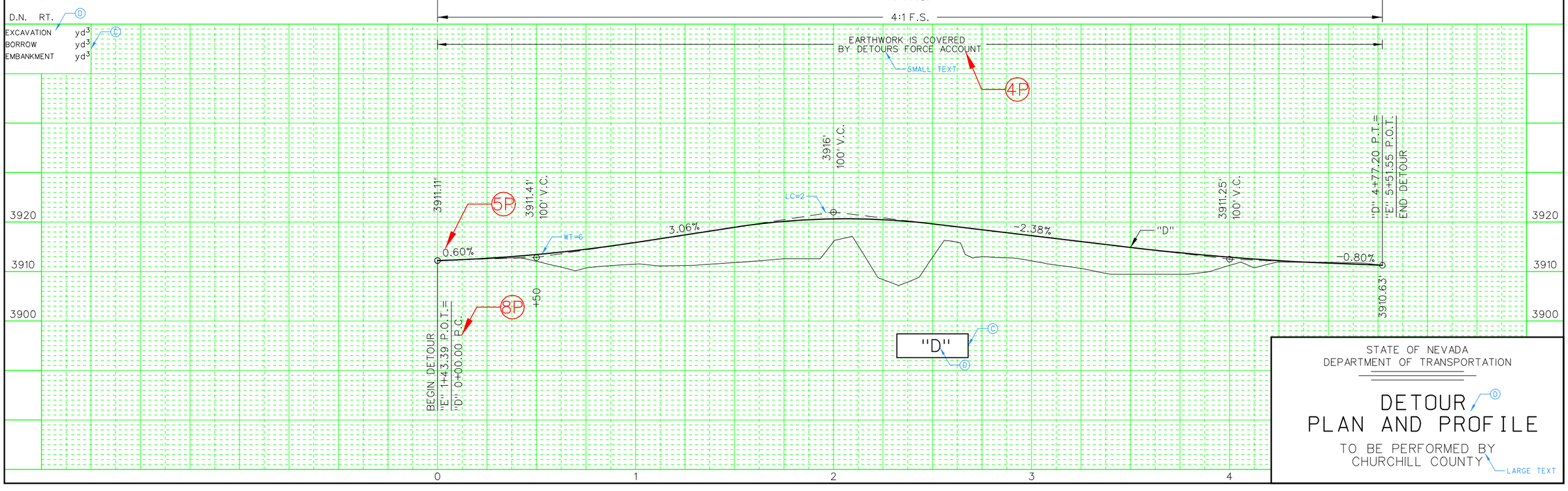
(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

D.N. LT. — 4:1 F.S.

D.N. RT. — 4:1 F.S.

EXCAVATION	yd³
BORROW	yd³
EMBANKMENT	yd³

EARTHWORK IS COVERED BY DETOURS FORCE ACCOUNT



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

DETOUR PLAN AND PROFILE

TO BE PERFORMED BY CHURCHILL COUNTY

7.11 Profiles.

General. Profile sheets include information relating to the vertical disposition of the alignment described in detail below. Profile sheets may contain information such as ditch notes, earthwork notes, and super-elevation transition diagrams. The profile view shall contain information of the original ground as it relates to the alignment. The alignment designation should be identified on each profile sheet in a block near the bottom of the sheet.

In the profile view, it is best that the original ground line extends a few stations beyond the beginning and end of the project. Situate the view in such a fashion so extending the ground line does not add additional sheets. Future grade lines are to be labeled and shown as short dashed lines. Other grade lines, such as ditches, gutters, and pipes are to be shown with distinctive symbols and labeled accordingly.

Roadway profiles are required only when there is a change in the vertical alignment of the roadway under construction. If only a section of the vertical alignment is changed, a profile is required only for that particular area.

On split plan and profile sheets, the station limits within the grid is to match the station limits shown on the corresponding plan view.

Full profile sheets are used to show the profile and profile data of supplemental layout lines, such as frontage roads, crossroads, ramps, ditches, drainage changes, and other roads that cannot be added conveniently to the split plan and profile sheets. Full profile sheets may be used for the mainline profile where a full sheet is needed for the plan layout.

Profile sheets are to be oriented so that stationing progresses from left to right. Where profiles are stacked on a full profile sheet, they are to be arranged so that the stationing progresses from the top of the sheet to the bottom of the sheet.

Names of all major intersected streets, railroads, grade separation structures, streams, etc., are to be labeled along the profile.

Location. The profile of the proposed Section of Improvement shall be shown as it relates to the final lift of dense grade without regard to the wearing course. A note in the bridge sheets should also indicate that profile was established from the final lift of dense grade as described above. This point should be located as follows:

- Two-lane highways: the profile grade point should be at the normal center of the roadway.
- Divided highways: the profile grade point should be as indicated on the project typical sections.
- The profile grade for ramps (where the ramp is under the control of the mainline grade and cross slope) shall be shown as a broken line and annotated accordingly.

The following information will be shown for all vertical alignments:

- The vertical point of intersection (VPI) of the gradients shall show the elevations. A plus station shall be shown when the VPI occurs between stations (e.g. +97.25).
- Gradients between vertical curves (shown as a percentage and carried out two decimal places).
- Length of each vertical curve. When the gradient rate of change does not require a vertical curve it should be stated "No V.C.” in lieu of the length of vertical curve.
- Special ditch grades running parallel to the roadway profile that cannot adequately be shown in the typicals or plans.

Profile Particulars. Specific information for components on the profile sheet as follows:

1P) Bridge structures and their respective structure number shall be shown including the approach slabs, abutments, piers, bottom of deck, and footings, along with the features associated with the crossing such as the top of cross roads, railroads, and bikeways. Show the high water limits of a river crossing. Bridge rails and safety fences are not to be shown. Limits of selected borrow shall be shown and labeled.

2P) Culverts must be shown on the profile sheets at the flow line elevation as it relates to centerline. Show only new culverts on the profiles. Culverts (2’ in diameter or larger) and reinforced concrete boxes (R.C.B.) are shown to scale horizontally, but exaggerated vertically according to the profile. Culverts less than 2’ in diameter are to be shown with no vertical exaggeration.

3P) Ditch notes are to be shown directly above the top grid line of the profile. The cut and fill slopes are to be synchronized to the profile grade stationing. Cut and fill slopes are to be expressed as horizontal to vertical (e.g. 7:1). Use a decimal form for slopes that are not whole numbers (e.g. 3.5:1, 6.5:1, etc.). Do not include “H” or “V” in the labels shown on the plans. Special slope treatments such as benching shall be adequately described and associated to the applicable ditch note. The graph shall only address the slope configurations from the hinge point (usually this point is 1 foot from the edge of pavement) outward to the catch point. Changes in slope ratio should be transitioned a minimum distance along the edge of the road 50 feet for every unit change in ratio. For example, a 200-foot transition length would be required to change from a 2:1 fill slope to a 6:1 fill slope.

4P) Earthwork notes and totals are to be shown near the top of the profile view grid. Quantities will be shown on the profile sheets between stations indicated by arrows. Within the arrow limits, the shrunk or swelled quantities for the earthwork should add up to the embankment balance within the indicated limits. Excavation quantities should be shown on the profile sheets by placing the actual excavated quantity on the profile sheet with the shrunken or swelled quantity immediately to the right in parenthesis. If other excavation such as channel or structure excavation is occurring within the balance limit shown, then those quantities should also be included in the total excavation with the shrunken or swelled quantity immediately to the right. A numeric note number shall be placed to the right of the quantity with a corresponding note number placed below. Where quantities for major ramps or other roads have been calculated separately, they are to be listed with their respective profiles rather than lumping them with the mainline. In such cases, a cross-reference note is desirable. **See additional earthwork information on the next sheet.**

5P) Entry and exit elevations are to be shown when there is no entry or exit gradients provided. An example would be when a project begins on a vertical curve; the entry elevation and station would be noted.

6P) Match existing profile/cross-slope is to be indicated on the profiles when applicable. The alignment is to be dashed and noted “Match Existing Profile” with arrows extending to the limits.

7P) Profile elevation shift is used to break the profile to show elements such as pipes in deep fill that would otherwise not be seen. Other examples of profile shifts are on long steep grades where the profile would go beyond the limits of the profile grid; the profile would be broke and shifted in order to show the information on the same sheet.

7.11 Profiles (Continued).

8P) Project construction limits shall be shown on the profiles with the appropriate stationing.

9P) Sheet numbering for the profile sheets shall be whole numbers following the plan sheets.

10P) Station equations may control arrangement and coverage. Overlap equations shall be plotted in such a way as to permit a gap or space between the back and forward stations.

11P) Super-elevation transition diagram is a graphic plot of the roadway backbone or shoulders that rotate about the alignment. Stationing, super-elevation in percent, and axis of rotation are to be noted. Label the respective shoulders (LT or RT).

7.12 Earthwork Information.

General. The balancing of the earthwork is accomplished through writing notes. The note number is placed to the right of the quantity with the corresponding note. Note numbers should only be unique for the sheet. The reason for this is change management. If notes and numbers are changed on one sheet, it will not affect notes on the other sheets.

Excavation. It is best to think of excavation as the "supply" of the material and the embankment as the "need." Excavation can come from within the balance limits or outside the balance limits. Excavation that is obtained within the balance limits, the note would start with the word "INCLUDES." For excavation that is coming from outside the balance limit, the note would start with the word "ADDITIONAL." Excavation that is obtained outside the balance limits will always require a note.

A note is required for excavation when, 1) the material is being disposed of in an area other than the limits indicated, 2) the material is obtained from a location other than the alignment indicated, 3) the material is coming from a different location along the alignment, 4) when the material used is something other than roadway excavation, 5) when you are including other excavations in your total excavation, the amount of Roadway Excavation needs to be noted for clarity (See Case 4).

Examples of each case are shown below:

Case 1
INCLUDES 1,500 YD^3 OF UNSUITABLE MATERIAL LOCATED BETWEEN STATION "L" 24+00 AND "L" 26+90 TO BE REMOVED FROM THE PROJECT AND DISPOSED OF PER SECTION 107.14.

Case 2
ADDITIONAL 5,000 YD^3 (4,500 YD^3) OF CHANNEL EXCAVATION TO BE OBTAINED FROM "A" 45+00 RT. TO "A" 50+00 RT. (SEE SHEET SD-2 FOR GRADING DETAILS).

Case 3
ADDITIONAL 5,000 YD^3 (4,500 YD^3) OF EXCAVATION
OBTAINED FROM "A" 45+00 TO "A" 50+00.

Case 4
INCLUDES 360 YD^3 (324 YD^3) FROM DRAINAGE EXCAVATION.
INCLUDES 900 YD^3 (810 YD^3) FROM CHANNEL EXCAVATOIN.
INCLUDES 225 YD^3 (202 YD^3) FROM STRUCTURE EXCAVATION.

NOTE: Even though Case 3 and 4 have sometimes in the past been placed as embankment notes, it is appropriate to place the notes as excavation notes. These are first Excavations before they are embankments. Also, in this way the designer can go through his/her project and quickly check excavation totals.

Case 5
INCLUDES 25,000 YD^3 (22,500 YD^3) FROM ROADWAY EXCAVATION.

Borrow. A note is required for borrow when, 1) the material is to be obtained, 2) you are next to a structure and you need select borrow or 3) you are using borrow excavation to construct a detention pond. In all cases a note will be required for borrow. However, if all borrow is coming from one location, then one note can be placed with the notes on the earthwork summary sheet. It does not matter if the borrow being used is borrow embankment or borrow excavation. In both cases, only the amounts of in-place borrow is shown. In the case of borrow excavation, the total non-shrunk amount will be placed on the Summary Sheet and at the bottom a note will be placed showing the shrink factor. It is best to handle borrow this way for change management. If it is decided to switch from borrow embankment to borrow excavation, you don't have to change your plan sheets, you will only have to change the summary sheet.

Examples of each case are shown below:

Case 1
TO BE OBTAINED

Case 2
INCLUDES 10,848 YD^3 SELECT BORROW.

Case 3
TO BE OBTAINED FROM DETENTION BASIN (SEE SHEET SD-4 FOR GRADING DETAILS).

In special circumstances, there may be a need to separate the excavated material into different classifications. Example, Type I Material – Type VI Material. The material may need to be distinguished based on its R-value or PI. These numbers may determine where the material is placed in fill. If this situation should occur, you will need an Embankment Detail Sheet and a Source Sheet.

Embankment. Embankment quantities are shown on the profile sheets by placing the actual volume of embankment required for the roadway prism. If other embankment (such as dikes or sign islands) is required within the balance limit shown, then those volumes should also be included in the total embankment. Balance limits are indicated on the profiles with arrows leading up to the respective station on the profiles.

A note is required for embankment when, 1) the material being placed is not part of the roadway prism.

Case 1
PLACE 600 YD^3 FOR SIGN ISLAND, STATION "A" 18+00 RT.

NOTE: Within any balance limits, the total shrunken amounts of dxcavation and borrow must equal the embankment. If material is being wasted, it must be subtracted out from Excavation prior to summing the excavation with the Borrow.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	ACSTP-095-2(16)	CLARK	10

D.N. LT. — Vertical +66 — 2:1 F.S. — +24 — +89.25 — Structure H-1220 — +05.75 — 2:1 F.S. — +24 — +24 — +02.26

D.N. RT. — 2:1 F.S. — Trans. — 3:1 F.S. — Structure H-1220 — 2:1 F.S. — Trans. — 4:1 F.S.

EXCAVATION	yd^3	747 (1)			285 (3)
BORROW	yd^3	16742 (2)	Structure H-1220		30670 (4)
EMBANKMENT	yd^3	16742			30670

(1) INCLUDES 747 CU. YDS. OF UNSUITABLE MATERIAL (TO BE DISPOSED)
(2) INCLUDES 6441 CU. YDS. SELECT BORROW.
(3) INCLUDES 285 CU. YDS. OF UNSUITABLE MATERIAL (TO BE DISPOSED)
(4) INCLUDES 10848 CU. YDS. SELECT BORROW.

SUPERELEVATION
-.02 ft./ft. LT. & RT.
UNLESS OTHERWISE NOTED

NOTE: ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) -- DENOTES CELLS HAVE BEEN USED.
(L) -- DENOTES A CUSTOM LINESTYLE HAS BEEN USED.
(D) -- DENOTES AN ENTER DATA FIELD EXISTS. TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

2361.78
+55.00
700' V.C.
LC=2
WT=6
℄ "C"
℄ "C"
LC=4
"LM" 14+00.00 P.O.T.
BEGIN CONSTRUCTION
2326.78
300' V.C.
+7.00%
3:1 Slope
For Slope Limits See Bridge Details
Select Borrow
For Slope Limits See Bridge Details
3:1 Slope
-7.00%
2320.67
320' V.C.
+42.26
2319.65
-.064%
+1.62%
2324.27
+55.00
"LM"
"LM" 28+02.26 P.O.T.
END CONSTRUCTION

1P 3P 4P 5P 8P 9P 11P

2360 2355 2350 2345 2340 2335 2330 2325 2320 2315 2310

14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	BRO-011(12)	WASHOE	11

4:1 F.S. Or 4:1 F.S.~2.0' Ditch~2:1 B.S.

4:1 F.S~2.0' Ditch Thence Warp To R/W

4:1 F.S. Or 4:1 F.S.~2.0' Ditch~2:1 B.S.

4:1 F.S. Or 4:1 F.S.~2.0' Ditch~2:1 B.S.

+16.97

D.N. LT.

D.N. RT.

EXCAVATION	yd^3
BORROW	yd^3
EMBANKMENT	yd^3

1754 (1491)
3224
4715

SMALL TEXT

WT=6

EXTRA SMALL TEXT

+0.02 ft./ft. Lt. Shldr.

+0.02 ft./ft. Rt. Shldr.

+0.02 ft./ft. Lt. Shldr.

+62.37

+22.37

+09.84

+69.84

+16.97

Trans. Rt. Shldr.

Trans. Lt. Shldr.

Trans. Lt. Shldr.

Trans. Rt. Shldr.

-0.02 ft./ft. Rt. Shldr.

-0.02 ft./ft. Lt. Shldr.

-0.02 ft./ft. Rt. Shldr.

Level

+0.02 ft/ft

-0.02 ft/ft

3P

4P

9P

11P

SUPERELEVATION

4840

4830

4820

4810

4800

4790

4780

4770

4760

4764.95'

5P

4761.50
200' V.C.

-1.72%

+4.24%

4791'
400' V.C.

"AC"

"AC" 13+00.00 P.O.C.=

"DC" 12+50.00 P.O.C.

10P

+3.30%

"DC"

4823.98
100' V.C.

4818.80
100' V.C.

4830.20'

6P

Match Existing X-Slope

WT=6

LC=2

-3.19%

+4.48%

+50

2P

+12.44

+66.97

"DC" 22+81.97 P.T.=
(125' Rt.)"R" 540+36.80 P.O.C.

"AC" 0+00.00 P.O.T.
(180' RT.) "R" 563+42.76 P.O.T.=

"AC"

"DC"

NOTE: ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

Ⓒ - DENOTES CELLS HAVE BEEN USED.

Ⓛ - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

Ⓓ - DENOTES AN ENTER DATA FIELD EXISTS. TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 13 14 15 16 17 18 19 20 21 22 23 24

7.13 Grading Plan.

General. Grading plans show the configuration of embankments and excavations when these items are variable, warped, or complex.

Other examples of grading plans are blending the paving of opposing cross slopes at intersections, contour fills or cuts, special drainage basins, etc. Grading plans are only used when the plans cannot adequately convey this information through the use of ditch notes, slope catch point lines, super-elevation diagrams, etc.

Grading Plan Guidelines. On large complex projects, contour grading shall be shown on separate sheets. Contour grading, when minimal, may be shown on plan sheets where the addition of the contour grading does not clutter or confuse the plan sheet.

A grading plan must show all completed grading elements for the subject area including any work for constructing traffic barriers, traffic control devices, drainage, landscaping, pioneering or maintenance roads, and structures.

Place the following note on each contour-grading sheet: “Grading plan is accurate for contouring work only.”

Grading Plan Particulars. Specific information for components on the grading plans as follows:

1) Existing contours shall appear in red and the proposed contours shall be shown as solid black lines. Show contour elevations in 1-foot intervals with every two-foot interval with a heavier solid black line with the appropriate elevation. Centerline, stationing, edge of oil, north arrow, right of way, etc., should also be included in the plan for reference. Do not allow existing contours to overlap over the proposed surface contours. Use the same scale and contour intervals for both existing and proposed surfaces.

2) Sheet numbering for the grading sheets shall be whole numbers following the plan and profile sheets.

7.14 Geometrics and Elevation Control.

General. Geometric and elevation control sheets provides detail that cannot be adequately shown on the plans sheets. New interchanges, intersections, islands, curb, gutter, and sidewalk usually require geometric sheets in order to clearly show this information without cluttering the plan sheets.

Geometrics and Elevation Control Guidelines. The location control lines shall be shown with the appropriate line designation. Show only existing infrastructure or topography that is needed to show relationship to the proposed improvements.

Dimension all features with station/offsets where they change in relation to the control line. Display bearings and distances along with curve data. See Standard Plans for referencing dimension offset to the various types of curb and gutter. Identify the type of curb and gutter to be modified or constructed.

For control at flow lines, such as curb and gutter, flat bottom ditches, etc., the information should include the station/offset and elevation. Normally, control for curb and gutter should be displayed every 25 feet. When depicting control for curb and gutter, avoid developing elevations that constructs random slopes between a series of control points. It is best to maintain a constant slope on a given length of curb and gutter.

Accuracy is to be shown to one hundredth of a foot (e.g. +97.30, 23.56’ RT) for stationing, offsets and elevations.

Geometrics and Elevation Control Particulars.

1) Curve data shall contain delta, radius, length, and tangent information respectively. Curve information is usually shown with an alpha or numeric numbering system pointing to the appropriate curve. A corresponding table with the alpha or number character is included with the pertinent curve information.

2) Sheet numbering for the geometric sheets shall be whole numbers following the plan, profile, and grading sheets.

3) Tangent information shall contain bearing and distance. Bearing information is to include the heading and the distance is to be carried out two decimal places (N29^14’26”E 3536.94’) (Note: the ^ symbol translates to the degree sign in Microstation).

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-573(001)	CLARK	13

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

FT=3 SMALL TEXT

NO.	RADIUS	DELTA	LENGTH	TANGENT
7	2.00'	180°00'00"	6.28'	-
8	45.00'	47°59'06"	37.69'	20.03'
9	8.00'	180°00'00"	25.13'	-
10	2.00'	133°22'00"	4.66'	4.64'
11	2.00'	118°11'01"	4.13'	3.34'
12	85.00'	23°05'13"	34.25'	17.36'
13	2.00'	131°32'12"	4.59'	4.44'
14	2.00'	149°37'46"	5.22'	7.37'
15	125.50'	27°14'39"	59.68'	30.41'
16	5.00'	90°00'00"	7.85'	5.00'
17	2.00'	160°58'22"	5.62'	11.93'
18	46.75'	132°18'54"	107.96'	105.78'

T.20S. R.70E. SEC. 16

"R2B" "LS" 1155 "LN" 115 LARGE TEXT

USE PLACE ARROW MARKER LARGE TEXT Craig Rd. (SR 573)

LARGE TEXT DD 13 LC=3

EXTRA SMALL TEXT N88°51'06"E 381.00'

N88°51'06"E 381.00' 130

+52.00 6.00' LT. 7

+52.00 2.00' LT.

TYPE A GLUE DOWN CURB EXTRA SMALL TEXT

SECTION BB 13 SHEET NO.

"R4" 115

+78.35 135.65' LT.

E.O.P.

EXTRA SMALL TEXT +68.40 90.00' LT.

EXTRA SMALL TEXT 18 TYPE 5 C&G 4.5' SIDEWALK N88°51'06"E 220.00'

WT=1

+12.90 57.50' LT.

+31.38 84.67' LT. 11 +34.77 84.08' LT. 12

+53.09 55.42' LT. 13

N39°36'47"E 41.48'

+04.30 53.25' LT. 10 N86°14'47"E 45.89'

+05.91 49.95' LT.

+51.75 52.03' LT. TYPE A GLUE DOWN CURB

CC 12

LARGE TEXT MATCH LINE "YY" (SEE SHT. 14)

"Xe"

+70.21 8.00' LT.

9

+70.21 8.00' RT. TYPE A GLUE DOWN CURB

BB 13

EXTRA SMALL TEXT TYPE A GLUE DOWN CURB +12.19 48.50' RT. 17

+67.03 50.50' RT. 16 N88°03'44"E 145.17'

+12.84 52.39' RT. (MATCH EXIST.)

+62.03 55.50' RT.

N01°08'54"W 22.85'

+62.03 78.35' RT.

15

+48.11 135.80' RT.

14 +50.95 138.41' RT. (MATCH EXIST.)

"R3A" "R3" 20

LIMITS OF REMOVAL (COLD MILLING)

LIMITS OF REMOVAL

SAW CUT Varies ISLAND

EXTRA LARGE TEXT

SECTION B-B (AS CONSTRUCTED)

TYPE A GLUE DOWN CURB 4" CLASS A STAMPED CONCRETE Varies TYPE A GLUE DOWN CURB

2" TYPE 1 CLASS B AGGREGATE BASE

EXTRA LARGE TEXT

SECTION D-D

"Xe" 125+22.40 P.O.T. TO "Xe" 130+52.00 P.O.T.
"Xe" 137+27.40 P.O.T. TO "Xe" 141+51.00 P.O.T.

SMALL TEXT FT=3

1.0' 4" CLASS A STAMPED CONCRETE

TYPE A GLUE DOWN CURB EXISTING ISLAND

2" TYPE 1 CLASS B AGGREGATE BASE

EXTRA LARGE TEXT FT=3

SECTION B-B (MODIFIED)

SMALL TEXT

"Xe" 121+92.62 P.O.T. TO "Xe" 121+97.30 P.O.T.
"Xe" 131+70.21 P.O.T. TO "Xe" 131+70.21 P.O.T.
"Xe" 131+48.11 P.O.T. TO "Xe" 133+12.84 P.O.T.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GEOMETRICS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-573(001)	CLARK	14

MATCH LINE "YY" (SEE SHT. 13)

N88° 51'06"E 220.00'

TYPE 5 C&G

4.5' SIDEWALK

+33.00
57.50' LT.

S86° 51'45"E 180.50'

+13.00
44.00' LT.

USE PLACE ARROW MARKER

LARGE TEXT

CC
12

LARGE TEXT

Craig Rd. (SR 573)

SECTION

DD
13

SHEET NO.

EXTRA SMALL TEXT

+57.00
8.00' LT.

MATCH LINE "ZZ"

+08.00
8.00' LT. (MATCH EXIST.)

EXTRA SMALL TEXT

N88° 51'17"E 349.00'

N88° 51'35"E 367.66'

N88° 51'06"E 55.94'

"Xe"

135

"Xe"

+27.40
4.00' LT.

+83.34
4.00' LT.

TYPE A GLUE DOWN CURB

+08.00
8.00' RT. (MATCH EXIST.)

19

+67.70
2.00' RT.

20

EXTRA SMALL TEXT

"Xe" 137+83.34 Δ=00°00'29" RT.

"R3"

+58.00 (BEGIN TYPE 5 C&G)
60.00' RT.

N88° 51'06"E 352.51'

TYPE 5 C&G

L

L

L

Mitchell St.

LARGE TEXT

LARGE TEXT

Craig Rd. (SR 573)

EXTRA SMALL TEXT

DD
13

+07.00
7.50' LT.

N88° 51'21"E 50.00'

TYPE A GLUE DOWN CURB

N88° 51'18"E 144.00'

+51.00
7.50' LT.

21

"Xe"

"M"

N88° 51'35"E 367.66'

140

+51.00
4.00' LT.

"P"

MATCH LINE "ZZ"

+10.50
60.00' RT.

TYPE 5 C&G

5.0' SIDEWALK

22

TYPE 5 C&G

+85.50
135.00' RT.

LARGE TEXT

Pecos Rd.

FT=3 — SMALL TEXT

NO	RADIUS	DELTA	LENGTH	TANGENT
19	300.00'	11°28'42"	60.10'	30.15'
20	300.00'	11°28'42"	60.10'	30.15'
21	1.75'	180°00'00"	5.50'	-
22	75.00'	90°04'48"	117.91'	75.10'

T.20S. R.70E.
SEC. 16

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GEOMETRICS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0396(003) (D)	PERSHING (D)	15 (D)

NOTE: STATION, OFFSET, ELEVATION IS TO FLOWLINE (FT=3)

NOTE ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

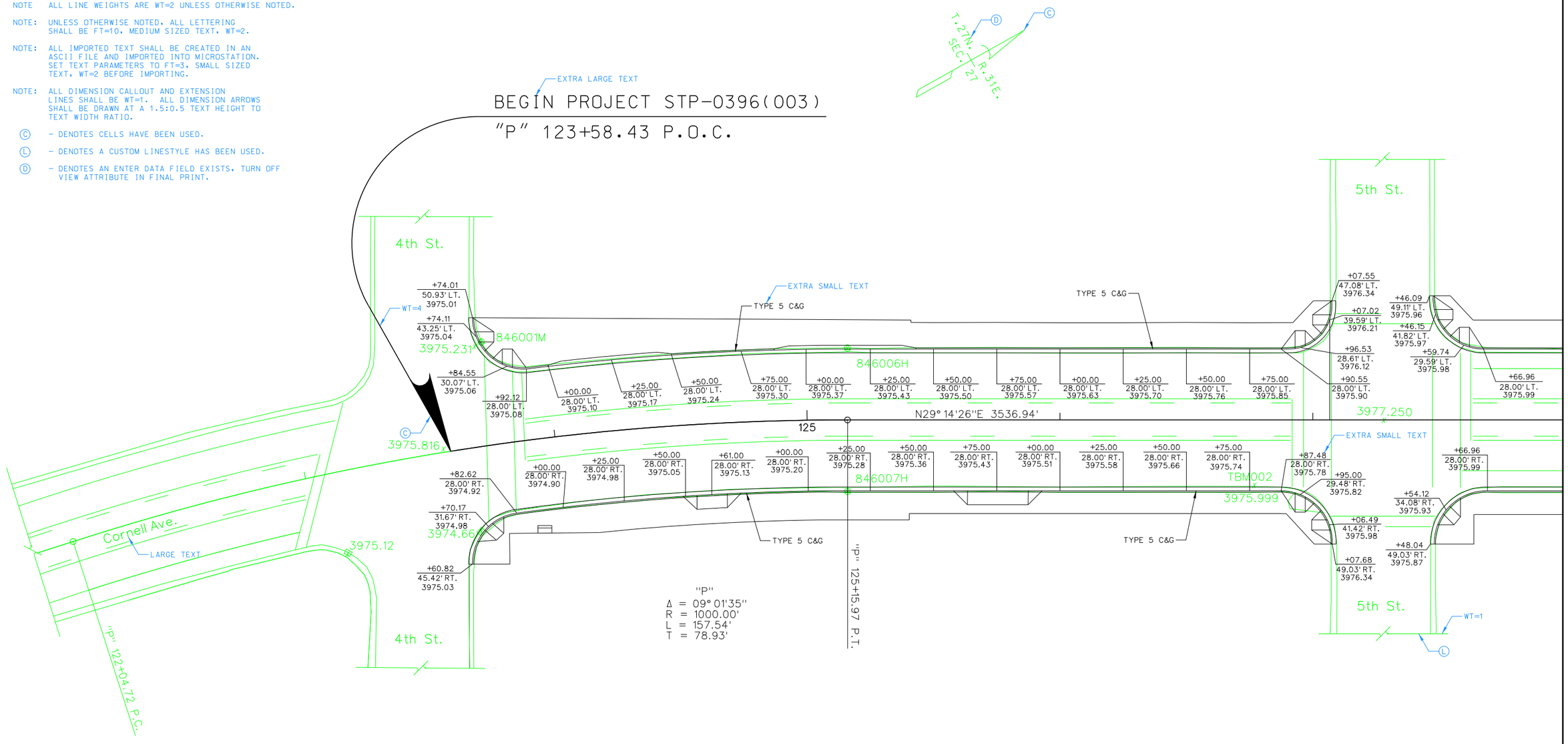
NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

ELEVATION CONTROL (D)

7.15 Location Control.

General. The location control sheet establishes the relationship of the project geometrics to the land in accordance with standard industry practices and state and local laws and regulations.

Location Control Guidelines. The Location Division, in cooperation with the designer, is responsible for producing the location control sheets. The designer is responsible for ensuring that location control is included in the final contract documents for all projects. Any new alignments developed by the designer, and to be adopted in the field, are to be coordinated with the Location Division.

The layout of the location control sheets shall be as established by the Location Engineer.

The Location Division will provide the designer with a mathematic definition of the existing project control line that has been adjusted to current datum and within modern levels of precision.

The information normally contains a description of the basis of bearing, a listing of monuments near the project site and a mathematic definition of the primary project alignments. The location control may constitute a retrace of existing alignments, new alignments or a combination of both.

Location Control Particulars. Specific information for components on the location control as follows:

1) Angle point for a given tangent must show the angle of deflection.

2) Bearings for a given tangent showing heading and distance.

3) Bearing source is provided by the Location Division. Further information can be found on page 34 of the "Special Instructions for Survey, Mapping for GIS Consultants," Current Edition.

4) Cadastral table is provided by the Location Division. Further information can be found on page 22 of the "Special Instructions for Survey, Mapping for GIS Consultants," Current Edition.

5) Center of Curvature is the center of the circular segment.

6) Construction control table is provided by the Location Division. Further information can be found on page 22 of the "Special Instructions for Survey, Mapping for GIS Consultants," Current Edition.

7) Project number and county need to be shown in the upper right corner and placed in the appropriate designated boxes.

8) Delta or intersection angle or degree of curvature is the angle between semi-tangents of a curve or also segment of a circle subtended by a curve.

9) Easting coordinates are calculated by the Location Division.

10) Length of curve is the length of curve from P.C. to P.T.

11) LPN is the Location Project Number and is assigned by the Location Division.

12) Northing coordinates are calculated by the Location Division.

13) PI is the Point of Intersection of the tangents extended.

14) Point of curvature is the beginning of the curve.

15) Point of reverse curve is a point common to two curves in opposite directions and with the same or different radii.

16) Point of tangency is the end of the curve.

17) Radius is the distance from the center point of the curve to the Point of Curvature (P.C.) or Point of Tangency (P.T.).

18) Sheet numbering for the location control sheets shall be numbered LC1, LC2, LC3, etc. In the absence of control sheets, the "Bearing Source" must be established by the plan preparer, approved by the Location Division and shown on the first plan sheet.

19) Special note is provided by the Location Division and is reserved for information that surveyors may need during the execution of the Contract Plans. In the example provided, the perpetuation of PLSS Monuments is described and further information concerning this example can be found on pages 35 - 39 of the "Special Instructions For Survey, Mapping for GIS Consultants," Current Edition.

20) Station equation is a point in stationing where an equation is put in to correct a gap or overlap in stationing.

21) Station equality is a point in stationing where a line name is changed, but the stationing remains unchanged.

22) Tangent distance is the distance from either the Point of Curvature (P.C.) or the Point of Tangency (P.T.) to the Point of Intersection (P.I.).

23) Vertical datum is provided by the Location Division. Further information can be found on page 34 of the "Special Instructions for Survey, Mapping for GIS Consultants," Current Edition.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-395(15)	DOUGLAS	LC1

(23) VERTICAL DATUM: ELEVATIONS ARE BASED UPON NAVD29 HOLDING PUBLISHED USC & GS BENCH MARK AND NDOT CONTROL MONUMENTS: 837025M(4705.273), P 323Z(4693.954), 158207A(4683.518), U 316 RESETZ(4907.529), 158433H(4758.033), 433001M(4735.380), N 323Z(4578.222), 442001M(4663.993), 442003M(4665.086), 158119A(4671.799), AND 158220X(4919.675) AS FIXED.

(3) BEARING SOURCE: BEARINGS OF THIS MAP WERE DERIVED FROM NEVADA STATE PLANE COORDINATES NAD 83/94 DATUM WEST ZONE, WITH A MEAN CONVERGENCY OF 0°45'11". USING LOCAL CONTROL POINTS: 158220X & W 323X AS FIXED AND IS FURTHER ARCHIVED AT NDOT UNDER FILE LPN 1010. COORDINATES AND DISTANCES REFLECT A SINGLE COMBINATION GROUND TO GRID FACTOR OF 0.9997992940 AND HAVE BEEN CONVERTED TO FEET. MONUMENTS ARE STAMPED WITH "NDOT" AND MONUMENT NAME UNLESS NOTED IN DESCRIPTION.

(19) SPECIAL NOTE: PLSS MONUMENTS LISTED IN THIS CONTRACT ARE REQUIRED TO BE PERPETUATED UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF NEVADA TO ASSURE COMPLIANCE WITH NEVADA REVISED STATUTES,CHAPTERS 329 & 625. ANY MONUMENTS FOUND DURING SURVEY, MAPPING, CONSTRUCTION OR MAINTENANCE PHASES OF NEVADA DEPARTMENT OF TRANSPORTATION PROJECTS NOT LISTED FOR PERPETUATION IN THE CONTRACT PLANS SHALL BE PERPETUATED IN ACCORDANCE WITH THE STATE OF NEVADA DEPARTMENT OF TRANSPORTATION, TRANSPORTATION POLICY (TP) 3-1-3, TITLED PERPETUATION OF SURVEY MONUMENTS, DATED JANUARY 13, 1999.

FT = 10 EXTRA LARGE TEXT

FT = 3 SMALL TEXT

(6) CONSTRUCTION CONTROL

NAME	NORTHING	EASTING	ELEV	OLD STATION	EQUATION	DIST(')	NEW STATION	DIST(')	NOTE
837025M	14661412.99	2285113.37	4705.273				"XN" 49+69.91POC	-193.80	NDOT FENO MON
1010001M	14663022.83	2285230.12	4700.578				"XN" 65+18.24POT	71.12	NDOT FENO MON
1010002M	14664565.50	2285255.86	4697.366				"XN" 80+61.12POT	70.06	NDOT FENO MON
1010003M	14666190.17	2285224.84	4694.784				"XN" 97+24.65POC	79.26	NDOT FENO MON
1010004MA	14667761.63	2285194.13	4693.475				"XN" 113+02.90POT	48.37	NDOT FENO MON
1010005M	14669353.55	2285206.59	4691.139				"XN" 128+94.87POT	51.06	NDOT FENO MON
1010006M	14671047.81	2285210.12	4689.134				"XN" 145+89.12POT	44.19	NDOT FENO MON
1010007M	14672691.88	2285219.45	4686.792				"XN" 162+33.21POT	43.43	NDOT FENO MON
1010008M	14674339.58	2285235.59	4683.288				"XN" 178+80.98POT	49.46	NDOT FENO MON
1010009M	14676036.54	2285248.28	4681.690				"XN" 195+77.99POT	51.74	NDOT FENO MON
1010010M	14677587.76	2285244.41	4680.749				"XN" 211+29.15POT	38.35	NDOT FENO MON
1010011M	14679147.15	2285255.05	4680.584				"XN" 226+88.58POT	39.41	NDOT FENO MON
1010012M	14680743.86	2285263.99	4676.743				"XN" 242+85.31POT	38.55	NDOT FENO MON
1010013M	14682303.39	2285274.24	4674.026				"XN" 258+44.88POT	39.23	NDOT FENO MON
1010014M	14683938.47	2285283.04	4667.061				"XN" 274+79.98POT	38.00	NDOT FENO MON
1010015M	14685369.66	2285295.02	4666.251				"XN" 289+11.41POT	38.56	NDOT FENO MON
1010016M	14686908.20	2285311.82	4666.641				"XN" 304+50.04POT	38.62	NDOT FENO MON
1010017M	14688473.07	2285331.93	4664.230				"XN" 320+15.04POT	41.70	NDOT FENO MON
1010018M	14690307.33	2285351.76	4657.435				"XN" 338+49.40POT	41.56	NDOT FENO MON
1010019M	14691915.90	2285369.53	4654.059				"XN" 354+58.07POT	41.82	NDOT FENO MON
1010020M	14693498.44	2285377.82	4654.423				"XN" 370+40.61POT	32.89	NDOT FENO MON
1010021M	14695129.50	2285339.78	4651.126				"XN" 386+71.16POT	-22.90	NDOT FENO MON
1010022M	14696592.81	2285407.85	4650.722				"XN" 401+35.12POT	29.24	NDOT FENO MON
1010023M	14698281.27	2285437.45	4647.934				"XN" 418+23.80POT	40.46	NDOT FENO MON
1010024M	14699910.72	2285456.86	4647.845				"XN" 434+53.37POT	42.13	NDOT FENO MON
1010025M	14701466.84	2285475.45	4648.373				"XN" 450+11.13POC	40.41	NDOT FENO MON
1010026M	14703047.16	2285759.11	4671.634				"XN" 466+38.82POT	54.78	NDOT FENO MON
1010027M	14704743.19	2286101.73	4690.253				"XN" 483+69.04POT	38.76	NDOT FENO MON
1010028M	14706263.44	2286422.96	4729.699				"XN" 499+22.86POT	38.21	NDOT FENO MON
1010029M	14707775.92	2286741.27	4768.980				"XN" 514+68.47POT	36.41	NDOT FENO MON
1010030M	14709257.09	2286999.19	4790.722				"XN" 529+66.20POC	64.65	NDOT FENO MON
1010031M	14711277.47	2287117.56	4915.440				"XN" 549+75.08POT	106.29	NDOT FENO MON
158220X	14711312.12	2287152.06	4919.675				"XN" 550+10.81POT	139.66	NDOT COPPERWELD
1010032M	14712938.12	2287133.46	4909.075				"XN" 566+35.39POT	69.06	NDOT FENO MON
1010033M	14714077.11	2287253.22	4912.231				"XN" 577+99.90POT	109.31	NDOT FENO MON
1010034M	14716068.50	2287507.82	4825.906				"XN" 598+07.26POT	101.66	NDOT FENO MON
1010035M	14717742.76	2287703.77	4756.890				"XN" 614+92.07POT	47.06	NDOT FENO MON

(4) CADASTRAL CONTROL

WT = 2

NAME	NORTHING	EASTING	ELEV	OLD STATION	EQUATION	DIST(')	NEW STATION	DIST(')	NOTE
1010040H	14669158.50	2285019.25	4692.11GP	"N/S"127+00.00POT		-135.00	"XN" 126+98.67POT	-135.08	NDOT BRASS DISC
1010041H	14669157.40	2285199.35	4692.14GP	"N/S"127+00.00POT		45.00	"XN" 126+98.68POT	45.03	NDOT BRASS DISC
1010042H	14674558.53	2285057.38	4682.98GP	"N/S"181+00.00POT		-130.00	"XN" 180+98.83POT	-130.09	NDOT BRASS DISC
1010043H	14674557.49	2285237.38	4682.40GP	"N/S"181+00.00POT		50.00	"XN" 180+98.90POT	49.91	NDOT BRASS DISC
1010044H	14679758.65	2285084.15	4678.21GP	"N/S"233+00.00POT		-135.00	"XN" 232+99.02POT	-135.24	NDOT BRASS DISC
1010045H	14679757.60	2285257.15	4678.77GP	"N/S"233+00.00POT		38.00	"XN" 232+99.03POT	37.77	NDOT BRASS DISC
442004H	14690358.29	2285182.43	4655.69GP				"XN" 338+98.52POT	-128.32	NDOT BRASS DISC
1010046H	14690356.44	2285352.54	4656.41GP	"N/S"339+00.00POT		42.00	"XN" 338+98.52POT	41.81	NDOT BRASS DISC
1010047H	14695458.60	2285238.63	4648.01GP	"N/S"390+00.00POT		-128.00	"XN" 389+99.14POT	-127.63	NDOT BRASS DISC
1010048H	14701285.56	2285320.68	4648.13GP	"N/S"448+28.07PC		-109.00	"XN" 448+26.64POT	-109.00	NDOT BRASS DISC
1010049H	14701283.91	2285474.67	4647.46GP	"N/S"448+28.07PC		45.00	"XN" 448+26.67POT	45.00	NDOT BRASS DISC
1010050H	14702291.21	2285420.50	4659.63GP	"S/N"458+30.44="N" 458+17.74PT		-120.00	"XN" 458+16.20POC	-119.95	NDOT BRASS DISC
1010051H	14705303.57	2286012.00	4725.25GP	"N/S"489+00.00POT		-165.00	"XN" 488+98.69POT	-165.08	NDOT BRASS DISC
1010052H	14705239.62	2286315.35	4693.22GP	"N/S"489+00.00POT		145.00	"XN" 488+98.95POT	144.94	NDOT BRASS DISC
1010053H	14708028.34	2286568.37	4792.15GP	"N/S"516+80.85PC		-185.00	"XN" 516+79.61POT	-185.02	NDOT BRASS DISC
1010054H	14707958.05	2286900.97	4772.27GP	"N/S"516+80.85PC		155.00	"XN" 516+79.72POT	154.93	NDOT BRASS DISC
1010055H	14711789.69	2287132.62	4913.15GP	"N/S"555+00.00POT		105.00	"XN" 554+87.52POT	104.95	NDOT BRASS DISC
1010057H	14713429.59	2287205.31	4892.00GP	"N/S"571+41.38PT		125.00	"XN" 571+28.90POT	125.15	NDOT BRASS DISC
1010056H	14713431.38	2287150.29	4894.72GP	"N/S"571+41.38PT		70.00	"XN" 571+28.93POT	70.10	NDOT BRASS DISC
1010058H	14714035.83	2286944.50	4908.01GP	"N/S"577+25.48POT="N"577+17.99PT		-190.00	"XN" 577+05.66POC	-189.87	NDOT BRASS DISC
1010059H	14713991.34	2287241.19	4913.68GP	"N/S"577+25.48POT="N"577+17.99PT		110.00	"XN" 577+05.67POC	110.14	NDOT BRASS DISC
1010060H	14715184.74	2287147.17	4856.97GP	"N/S"581+91.80PC		-160.00	"XN" 588+79.54POT	-159.89	NDOT BRASS DISC
1010061H	14715144.74	2287414.18	4855.12GP	"N/S"581+91.80PC		110.00	"XN" 588+79.59POC	110.10	NDOT BRASS DISC
1010062H	14715427.68	2287199.76	4842.14GP	"S" 591+39.83PC		-80.00	"XN" 591+34.72POC	-137.60	NDOT BRASS DISC

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

LOCATION CONTROL

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-395(15)	DOUGLAS	LC2

PROJECT ALIGNMENT
CENTERLINE DATA
LPN 1010 - US 395 2D ROTATION/TRANSLATION OF "N" LINE
"XN" 20+00.00 POT TO "XN" 630+27.57 POT 10/25/06
USING LPN158 AND CONTRACT #2135
MP DO-22.86 TO MP CC-0.45
Horz = NAD83/94 FEET g(f) = 0.9997992940

"N" 20+00.00 POT =			

"XN" 20+00.00 POT		14659912.044	2287741.978
	N 62°43'34" W - 2051.79'		
"XN" 40+51.79 PC		14660852.269	2285918.288
	R = 1430.00'		
	D = 63°43'17" Rt		
	PI	14661259.528	2285128.356
	CC	14662123.291	2286573.577
	L = 1590.37'		
	T = 888.74'		
"XN" 56+42.16 PT		14662148.130	2285143.793
	N 0°59'43" E - 2887.37'		
"XN" 85+29.53 AP (1°27'27"Lt) =		14665035.063	2285193.947

"XN" 85+72.31 POT			
	N 0°27'44" W - 445.95'		
"XN" 90+18.26 PC		14665480.996	2285190.349
	R = 5000.00'		
	D = 5°25'05" Lt		
	PI	14665717.572	2285188.440
	CC	14665440.659	2280190.512
	L = 472.81'		
	T = 236.58'		
"XN" 94+91.07 PRC		14665952.910	2285164.202
	R = 5000.00'		
	D = 6°13'55" Rt		
	PI	14666223.666	2285136.317
	CC	14666465.162	2290137.893
	L = 543.84'		
	T = 272.19'		
"XN" 100+34.91 PT =		14666495.849	2285137.987

"XN" 100+36.80 POT			
	N 0°21'06" E - 18320.69'		
"XN" 283+57.49 AP (0°16'19"Rt)		14684816.193	2285250.430
	N 0°37'25" E - 16469.20'		
"XN" 448+26.69 PC		14701284.416	2285429.678
	R = 5006.00'		
	D = 11°19'40" Rt		
	PI	14701780.866	2285435.082
	CC	14701229.932	2290435.381
	L = 989.72'		
	T = 496.48'		
"XN" 458+16.41 PT =		14702266.585	2285537.894

"XN" 458+29.36 POT			
	N 11°57'05" E - 5850.42'		
"XN" 516+79.78 PC		14707990.188	2286749.409
	R = 10064.00'		
	D = 10°07'06" Lt		
	PI	14708861.834	2286933.910
	CC	14710074.259	2276903.559
	L = 1777.28'		
	T = 890.96'		
"XN" 534+57.06 PT =		14709752.334	2286962.409

"XN" 534+45.76 POT		14709752.338	2286962.409
	N 1°49'59" E - 3683.37'		
"XN" 571+29.13 PC		14713433.831	2287080.231
	R = 4932.00'		
	D = 6°41'55" Rt		
	PI	14713722.318	2287089.464
	CC	14713276.069	2292009.707
	L = 576.61'		
	T = 288.64'		
"XN" 577+05.74 PT =		14714007.745	2287132.282

"XN" 577+13.36 POT		14714007.758	2287132.284
	N 8°31'54" E - 1166.22'		
"XN" 588+79.58 PC		14715161.068	2287305.298
	R = 5000.00'		
	D = 4°51'48" Lt		
	PI	14715371.046	2287336.798
	CC	14715902.844	2282360.628
	L = 424.41'		
	T = 212.33'		
"XN" 593+03.99 PRC		14715582.942	2287350.384
	R = 5000.00'		
	D = 4°51'48" Rt		
	PI	14715794.836	2287363.969
	CC	14715263.037	2292340.139
	L = 424.41'		
	T = 212.33'		
"XN" 597+28.40 PT =		14716004.811	2287395.468

"XN" 597+27.61 POT		14716004.816	2287395.469
	N 8°31'54" E - 3299.96'		
"XN" 630+27.57 POT =		14719268.256	2287885.036

"N" 630+40.58 POT (LPN158) =			

46' RT "XS" 630+27.57 POT			

FT=3
SMALL TEXT

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

LOCATION CONTROL

7.16 Special Details.

General. Special details illustrate methods of construction, types of materials and methods of measurement for non-standard designs to ensure the contractor has a clear picture of the work that is to be performed. It is important the details be complete, meaningful, and necessary.

Special details supply supplementary information that cannot be adequately shown on the plan sheets because of their complexity. The Standard Plans are part of the contract plans. Before developing special details, examine the standards to see if the details provided are sufficient. Special details usually cover information that are not found in the Standard Plans or are modifications thereof.

Other examples of construction details are elevation control sheets and geometrics. For more information, see Section 8 for Geometric and Elevation Controls.

Special Detail Guidelines. Special detail sheets should reflect the same drafting standards and level of detail as the standard construction details. All details necessary for the construction and measurement of the subject feature shall be incorporated into the detail. Details must be complete because the contractor is only obligated to provide what is shown on the detail.

These sheets are prepared to a larger scale than the plan sheets, such as 1:20 or larger (They may be labeled not to scale). Items need to be fully dimensioned so that they are constructible and the quantities are calculable. Examples of construction details are curb transitions, sidewalks, driveways, drainage basins, etc.

Normally a top, side and front view should be provided and, for certain details, a perspective view should be used to show the intended result. Notes shall be included as required to further clarify and augment the details in order to control the quality of the methods and materials used for construction.

Modifying a standard construction detail should be considered instead of making a new special detail sheet from scratch. In such cases, showing minimal alteration details in the contract and referring to one or more standard construction details for the remaining information is permitted. However, it must be made explicitly clear what portions of the standard details are, and are not, applicable to the special situation including any general notes.

Each detail shall be assigned an appropriate label. The locations where each detail applies shall be noted by station and offset.

Special details shall convey any conditions specific to the project or site that are necessary for the calculation of quantities and the determination of construction methods.

Only existing infrastructure or topography that is necessary to rationalize the proposed improvements or to indicate the removal of material should be shown.

The details must include any non-standard excavation and backfill requirements.

The details shall be fully dimensioned to provide the exact, or relative when appropriate, proportions needed to construct the feature. Views and details shall be appropriately labeled and related to other views and details.

Materials and work units shall be clearly defined with appropriate symbols and area patterning (stipple). Legends shall be provided to define area patterning (stipple) and symbols where appropriate.

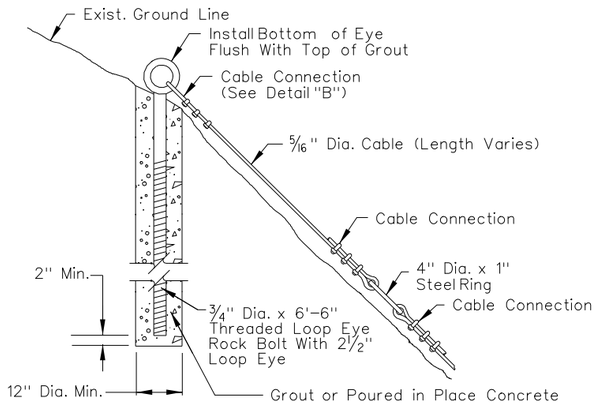
General notes shall be used as necessary to control the general construction facets of the detailed feature. Notes may be placed with individual components of the detail where the note is specific to only that part of the special detail.

Charts may be used to assign conditional values to variables within the detail and to provide supporting information needed for construction.

Special Detail Particulars.

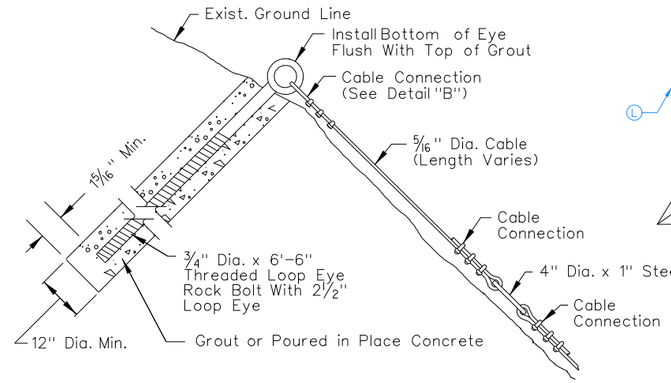
1) Sheet numbering for the Special Detail sheets shall begin with SD1. Multiple sheets shall be numbered SD1, SD2, SD3, etc.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPF-50-1(A)	WASHOE	SD1

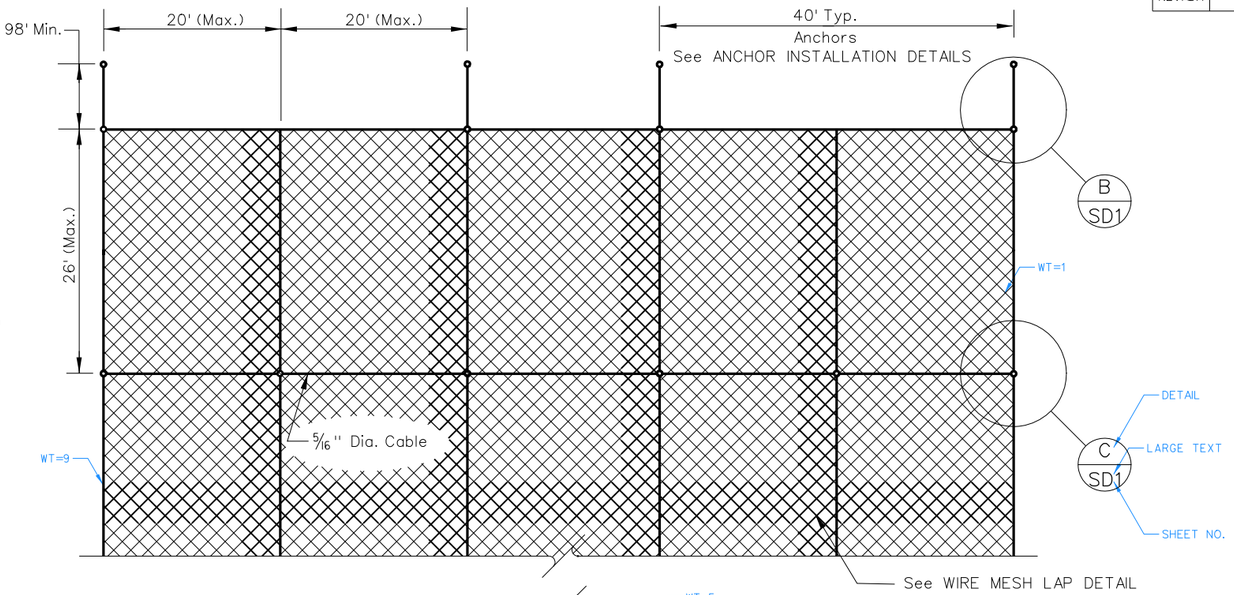


ANCHOR INSTALLATION IN SOIL (TOP)

LARGE TEXT



ANCHOR INSTALLATION IN ROCK (TOP)



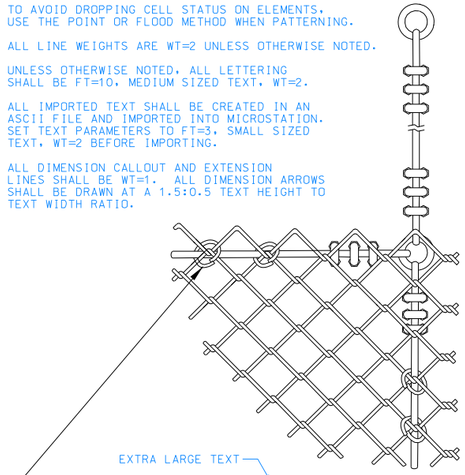
NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

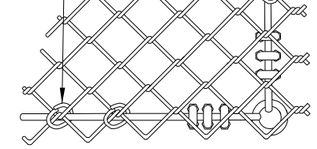
NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

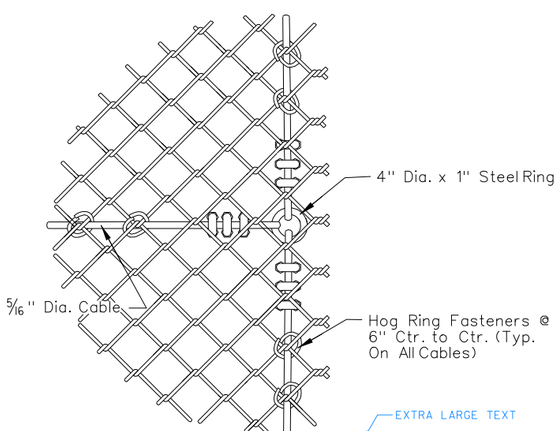


DETAIL "B"

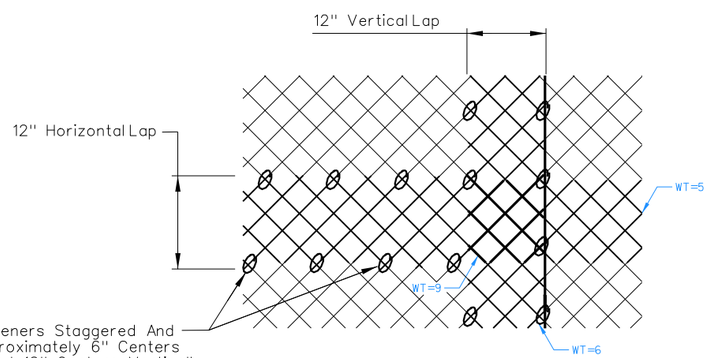
- C - DENOTES CELLS HAVE BEEN USED.
- L - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.
- D - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.



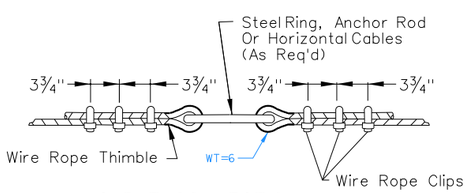
DETAIL "A"



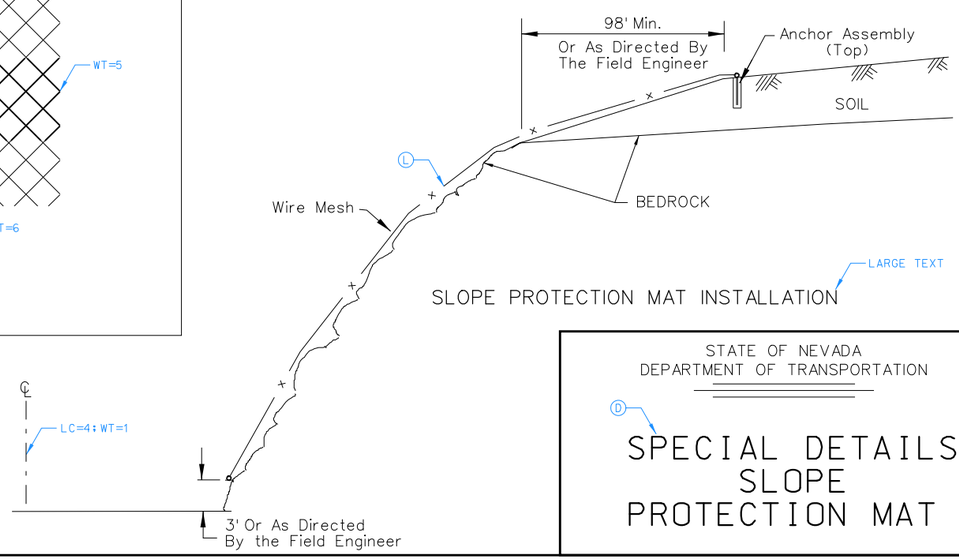
DETAIL "C"



WIRE MESH LAP DETAIL



CABLE CONNECTION



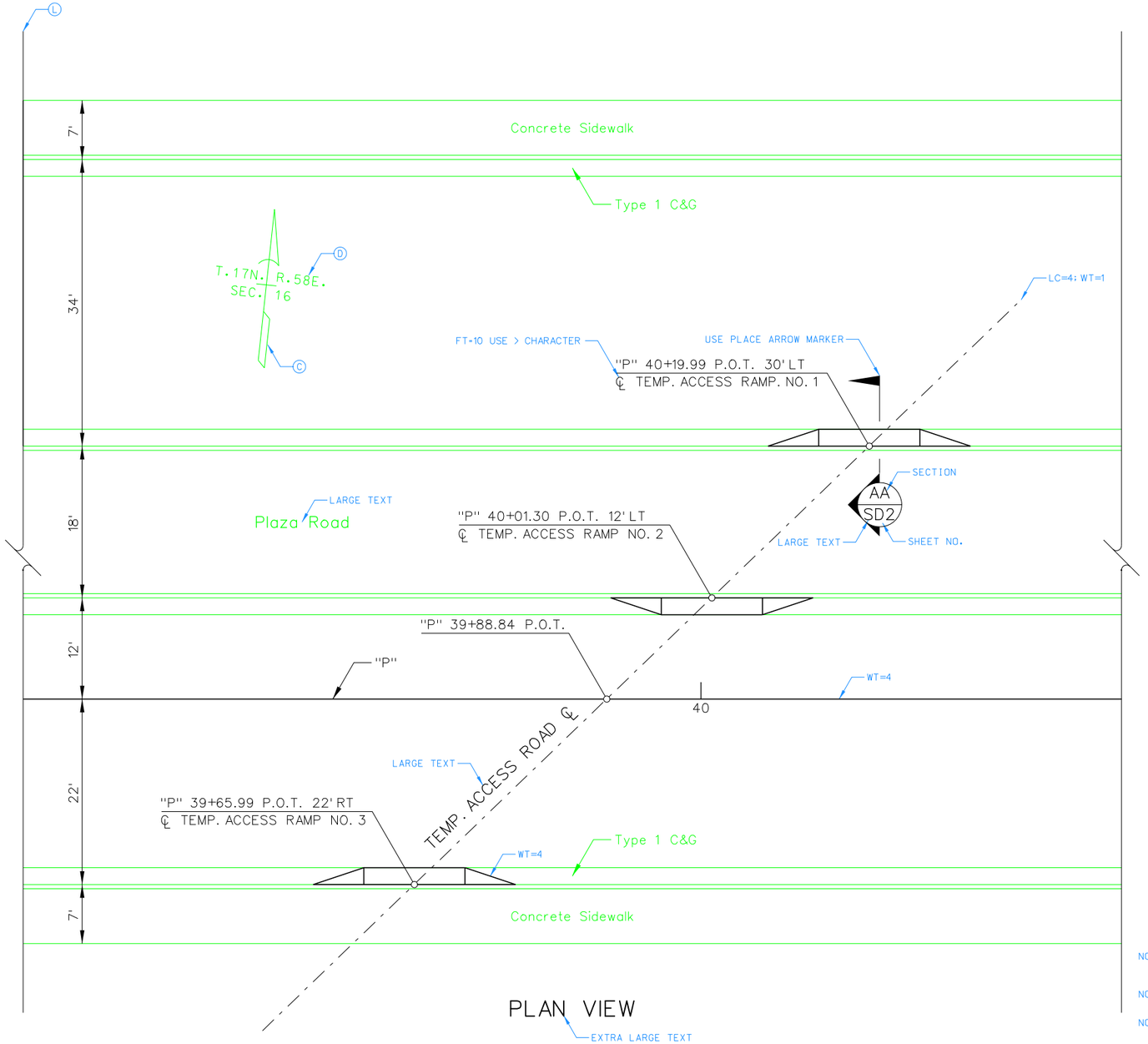
SLOPE PROTECTION MAT INSTALLATION

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

D

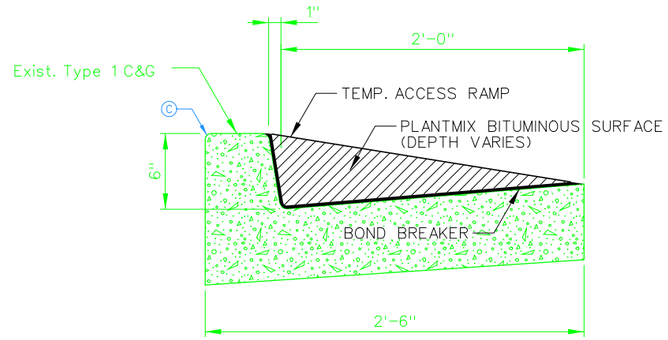
SPECIAL DETAILS SLOPE PROTECTION MAT

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPF-30-1(A)	HUMBOLDT	SD2



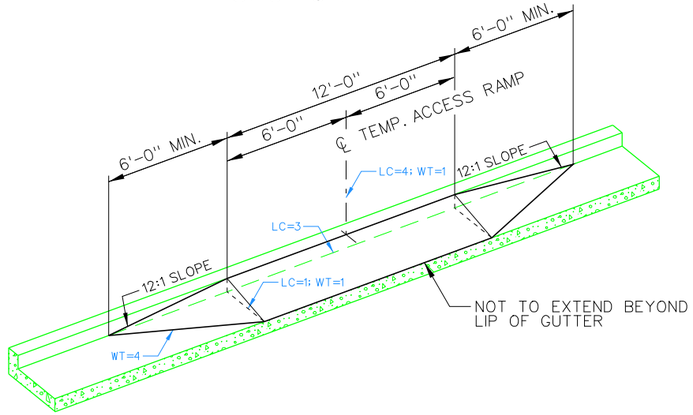
PLAN VIEW

EXTRA LARGE TEXT



SECTION A-A

EXTRA LARGE TEXT



TYPICAL ISOMETRIC DETAIL

EXTRA LARGE TEXT

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

Ⓒ - DENOTES CELLS HAVE BEEN USED.

Ⓛ - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

Ⓓ - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

NOTE: IF SPECIAL DETAILS DO NOT WARRANT USE OF A COMPLETE SHEET, SPECIAL DETAILS MAY BE COMBINED WITH TYPICAL SECTIONS.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SPECIAL DETAILS TEMPORARY ACCESS ROAD

Ⓓ

7.17 Site Preparation Details.

General. Site preparation sheets show the work necessary to prepare the project for construction improvements. This work normally consists of clearing and grubbing, and the removal of structures and obstructions. In urban environments, site preparation sheets could be used to show cold milling areas around islands and auxiliary turn lanes to reduce the complexity of depicting this information on the typicals. The typicals should cross reference these sheets when this is implemented.

Site preparation sheets should only be included in the contract plans when this information would otherwise clutter the plan view sheets.

Site Preparation Guidelines. Site preparation sheets should contain distances, bearings, radiuses, and station/offsets of all longitudinal features and their lateral relationships adequately dimensioned. All features shall be dimensioned relative to the control line.

Show only existing infrastructure or topography that is needed to show relationship of the proposed improvements.

Site Preparation Details.

1) Sheet numbering for the site preparation sheets shall begin with SP1. Multiple sheets shall be numbered SP1, SP2, SP3, etc.

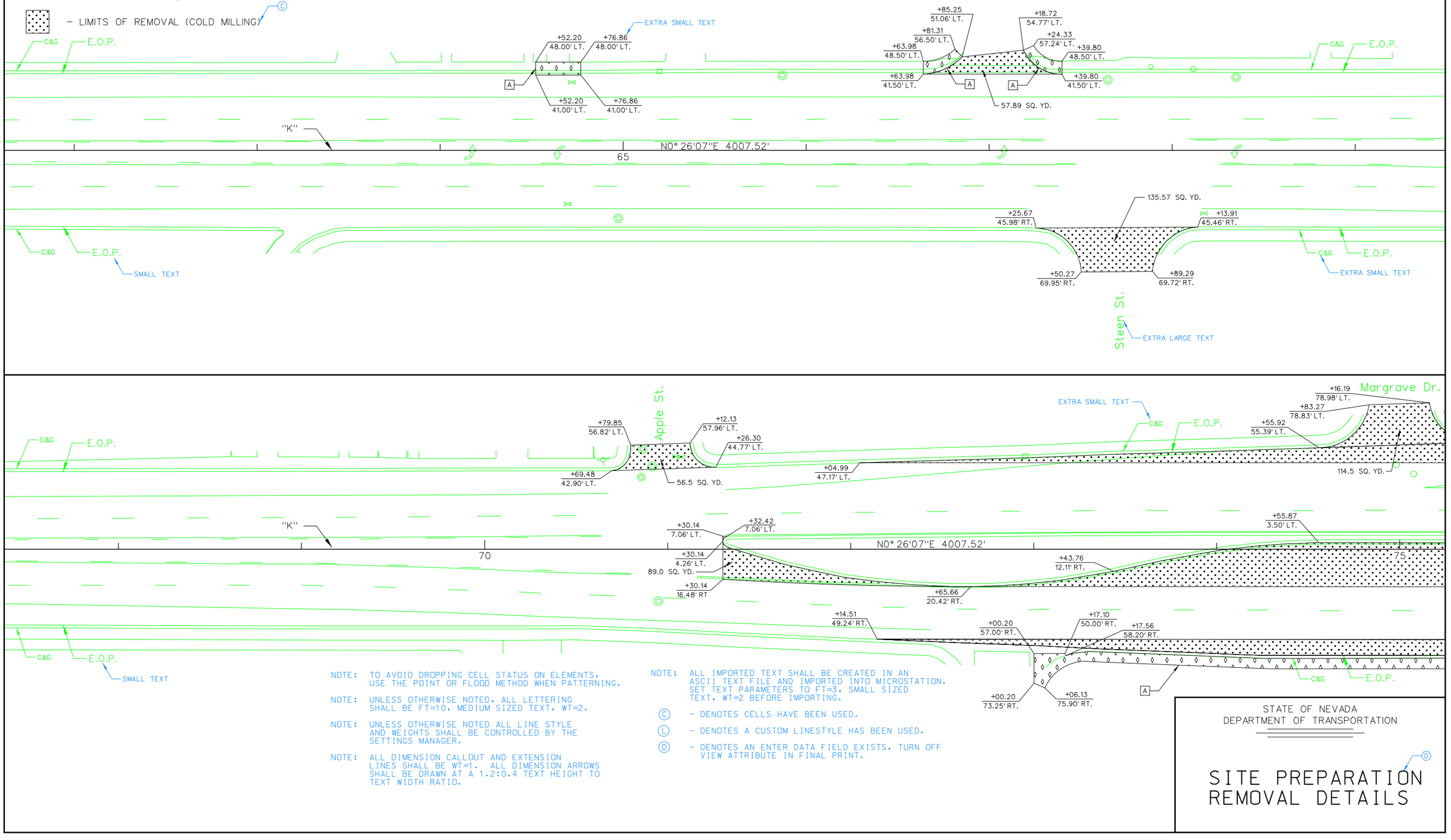
STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-0667(008)	WASHOE	SP1

– LEGEND –

– LIMITS OF REMOVAL (COMPOSITE SURFACE)

[A] – DEPTH = 8" FOR SIDEWALK, 12" FOR CURB & GUTTER, 8" TO 12" FOR RAMPS, 10" TO 12" FOR DRIVEWAYS

– LIMITS OF REMOVAL (COLD MILLING)



NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: UNLESS OTHERWISE NOTED ALL LINE STYLE AND WEIGHTS SHALL BE CONTROLLED BY THE SETTINGS MANAGER.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.2:0.4 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII TEXT FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

(C) – DENOTES CELLS HAVE BEEN USED.

(L) – DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SITE PREPARATION REMOVAL DETAILS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-0667(008)	WASHOE	SP2

– LEGEND –

– LIMITS OF REMOVAL (COMPOSITE SURFACE)

[A] – DEPTH = 8" FOR SIDEWALK, 12" FOR CURB & GUTTER, 8" TO 12" FOR RAMPS

– LIMITS OF REMOVAL (COLD MILLING)
(SEE TYPICAL SECTIONS FOR DEPTHS)

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: UNLESS OTHERWISE NOTED ALL LINE STYLE AND WEIGHTS SHALL BE CONTROLLED BY THE SETTINGS MANAGER.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.2:0.4 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII TEXT FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

(C) – DENOTES CELLS HAVE BEEN USED.

(L) – DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

Margrave Dr.

EXTRA LARGE TEXT

EXTRA SMALL TEXT

E.O.P.

C&G

+16.19 79.98' LT.

+43.29 58.44' LT.

114.5 SQ. YD.

+14.03 69.57' LT.

+11.81 76.43' LT.

+21.33 79.51' LT.

+23.55 72.65' LT.

+30.94 57.22' LT.

+21.38 54.29' LT.

+20.70 47.17' LT.

+22.14 51.80' LT.

+31.70 54.74' LT.

988.7 SQ. YD.

+00.80 246.93' LT.

+07.66 243.95' LT.

+96.81 237.76' LT.

+03.64 234.79' LT.

+09.47 251.07' LT.

+30.63 241.84' LT.

+21.43 224.87' LT.

+23.80 223.60' LT.

+16.78 216.01' LT.

+19.08 214.78' LT.

AA 2F

+44.48 148.50' LT.

+39.07 153.73' LT.

+25.01 140.10' LT.

+30.20 134.33' LT.

+56.08 133.52' LT.

+57.90 131.66' LT.

+44.85 122.85' LT.

+46.68 120.99' LT.

+31.06 70.00' LT.

+33.66 70.00' LT.

+07.51 48.00' LT.

+07.51 46.50' LT.

Plumb Ln.

ONLY ONLY

+36.17 145.63' LT.

+41.94 148.83' LT.

+46.80 140.09' LT.

+20.49 135.59' LT.

+22.54 134.15' LT.

+20.23 132.96' LT.

+24.79 124.07' LT.

+40.15 136.40' LT.

+27.11 125.25' LT.

+67.56 112.15' LT.

+62.32 107.05' LT.

+51.43 92.43' LT.

+49.60 90.61' LT.

+62.45 81.90' LT.

+60.69 79.95' LT.

+98.50 79.19' LT.

+17.21 67.72' LT.

+85.40 61.19' LT.

+14.60 67.72' LT.

+42.26 49.45' LT.

+42.37 46.85' LT.

+93.92 55.95' LT.

+93.70 50.49' LT.

+95.29 58.18' LT.

801.9 SQ. YD.

AA 2F

+82.24 98.89' LT.

+77.71 93.16' LT.

+02.09 85.93' LT.

+11.09 81.10' LT.

+07.50 74.41' LT.

+86.78 63.42' LT.

EXTRA SMALL TEXT

E.O.P.

C&G

"K" 79+03.42
∠= 00°18'12" LT.

+12.57 9.41' LT.

"K"

N0°26'07"E 4007.52'

N00°07'55"E 1244.76'

75

80

+49.11 21.03' RT.

2871.1 SQ. YD.

EXTRA SMALL TEXT

892.8 SQ. YD.

+85.31 49.50' RT.

+05.10 48.00' RT.

+05.10 45.50' RT.

+45.16 45.86' RT.

+45.16 48.46' RT.

+30.49 47.28' RT.

1289.0 SQ. YD.

E.O.P.

C&G

+33.68 72.20' RT.

+31.08 72.20' RT.

+13.67 72.46' RT.

+20.91 72.46' RT.

EXTRA SMALL TEXT

SECTION

USE PLACE ARROW MARKER

LARGE TEXT

SHEET NO.

AA 2F

+61.51 106.14' RT.

+59.65 107.98' RT.

+72.21 116.98' RT.

+70.36 118.80' RT.

+44.67 119.26' RT.

+42.96 121.22' RT.

+57.37 135.18' RT.

+59.26 133.39' RT.

ONLY ONLY

Plumb Ln.

+22.98 198.17' RT.

+25.34 197.15' RT.

+29.33 206.32' RT.

+28.02 206.89' RT.

+06.36 200.86' RT.

+04.10 202.16' RT.

+04.39 216.80' RT.

+12.00 213.81' RT.

+11.31 214.27' RT.

WT=1

+19.74 231.72' RT.

+39.24 241.32' RT.

AA 2F

STATE OF NEVADA
DEPART.MENT OF TRANSPORT.ATION

SITE PREPARATION REMOVAL DETAILS

7.18 Landscape Details.

General. These plans show planting and irrigation layouts, details, and quantities.

Landscape Detail Guidelines. The Landscape section prepares plans and structure lists. Upon completion, these plans are supplied to Roadway Design for incorporation into the contract plans.

Landscape Detail Particulars.

1) Sheet numbering for the landscaping details shall begin with L1. Multiple sheets shall be numbered L1, L2, L3, etc.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-095A(010)	LYON	L1

EX MEDIAN

"NS" 31+00

US-95A

"NS" 30+42.63
LT .26'

"NS" 30+46.84
LT 24.12'

"NS" 30+.40.69
LT 33.17'

"NS" 30+47.77
RT 20.00'

"NS" 30+49.06
RT 23.39'

"NS" 30+46.82
RT 28.91'

EXISTING DRAINAGE STRUCTURE TO REMAIN AND PROTECT

"NS" 30+46.82
RT 28.91'

"NS" 30+41.46
RT 31.20'

"NS" 30+35.92
RT 29.02'

"NS" 30+37.87
RT 36.50'

"NS" 30+26.19
LT 46.76'

R44.61'

"NS" 30+30.64
LT 27.50'

"NS" 30+35.68
LT 1.21'

"NS" 30+31.44
RT 1.08'

"NS" 30+28.40
LT 20.31'

R37.71'

"NS" 30+02.54
LT 50.84'

"NS" 30+22.83
LT 38.05'

"NS" 30+8.06
LT 15.15'

"NS" 30+26.97
RT 2.45'

"NS" 30+19.73
RT 44.97'

"NS" 30+19.74
RT 47.14'

R23.05'

"NS" 30+05.77
LT 34.43'

"NS" 30+22.85
LT 18.63'

"NS" 30+18.12
LT 15.86'

"NS" 30+21.50
RT 14.20'

R21.91'

"NS" 30+20.73
RT 10.61'

"NS" 30+06.18
RT 53.80'

US-50A

"EW" 29+00

EX MEDIAN

"NS" 30+03.68
LT 4.21'

"NS" 29+85.06
LT 40.60'

"NS" 29+98.36
LT 8.87'

"EW" 30+00

"NS" 29+91.15
RT 16.01'

"NS" 29+92.42
LT 48.02'

30+00

R22'

R46'

R40.12'

R13'

EX MEDIAN

"EW" 31+00

US-95A

"NS" 29+77.28
LT 51.99'

"NS" 29+84.10
LT 37.38'

"NS" 29+76.33
LT 50.72'

"NS" 29+71.06
LT 47.94'

"NS" 29+72.04
LT 37.09'

R20'

R41.62'

R57'

"NS" 29+85.14
RT 23.32'

EX "L" CURB/GUTTER

EX ROLLED CURB

EX PAVED INNER CIRCLE

"NS" 29+70.09
LT 45.17'

"NS" 29+69.31
LT 42.39'

LIMIT OF 1-1/2" ROUND RIVER ROCK. SEE GENERAL LAYOUT GP1

"NS" 29+77.83
LT 3.04'

"NS" 29+77.89
LT 0.94'

"NS" 29+44.09
RT 8.13'

"NS" 29+73.63
RT 51.96'

"NS" 29+43.67
LT 7.81'

SR-828/
FARM
DISTRICT
ROAD

"NS" 29+00

EX MEDIAN

EX DRAINAGE STRUCTURE TO REMAIN AND PROTECT

LAYOUT NOTES

"NS" CONTROL LINE, PER CONSTRUCTION PLANS (PROJECT *STP-095A(10)

RT - RIGHT OF CONTROL LINE

LT - LEFT OF CONTROL LINE

PT - POINT OF TANGENCY

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

US-95A / 50A INTERCHANGE

LAYOUT PLAN

Stantec
6980 SIERRA CENTER PKWY
SUITE 100
RENO, NEVADA 89511
PHONE (775) 850-0777
FAX (775) 850-0787

DESIGN BY	PM
DRAWN BY	JR
CHECKED BY	CKB
REVIEWED BY	_

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-095A(010)	LYON	L2

EX MEDIAN

US-95A

TW 4158.00
BW 4152.00

TW 4158.00
BW 41520.00

TW 4157.00
BW 4153.00

TW 4156.00
BW 4153.00

TW 4156.00
BW 4152.00

TC
(4156.76)

FG
4158.50

TC
(4156.70)

TC
(4156.56)

TW 4156.25
BW 4154.00

TW 4156.00
BW 4153.00

TC
(4156.66)

TC
(4156.75)

TW 4157.45
BW 4156.78

TW 4157.45
BW 4155.05

TW 4157.45
BW 4156.67

TW 4156.92
BW 4154.92

TW 4157.45
BW 4155.05

TW 4157.45
BW 4156.56

TW 4157.45
BW 4156.50

EXISTING DRAINAGE
STRUCTURE TO
REMAIN AND PROTECT

TW 4158.00
BW 4152.00

TW 4156.25
BW 4154.00

FG 4158.20

TW 4158.00
BW 4152.00

TC
(4156.33)

FG 4153.94

TW 4156.50
BW 4154.00

TW 4156.50
BW 4154.00

TC
(4156.02)

TW 4158.00
BW 4153.00

FG 4158.20

TW 4158.00
BW 4153.00

TC
(4155.62)

TW 4157.50
BW 4153.00

TC
(4155.35)

TW 4156.00
BW 4153.00

FG
4157.30

US-95A

TW 4157.00
BW 4153.00

TC
(4155.29)

TW 4155.00
BW 4153.00

TW 4155.55
BW 4154.88

TW 4155.55
BW 4154.88

FG
4153.19

TW 4155.55
BW 4153.19

TC
(4155.24)

TW 4155.55
BW 4153.19

TC
(4155.20)

TC
(4155.18)

TC
(4155.16)

FG 4155.50

TW 4156.25
BW 4153.40

TW 4156.25
BW 4153.71

FG 4154.65

TW 4156.25
BW 4155.00

TW 4156.25
BW 4153.00

FG 455.50

TW 4156.25
BW 4153.00

TW 4156.25
BW 4153.50

TW 4154.00
BW 4150.00

FG
4151.85

FG
4151.71

FG
4151.78

FG
4152.56

FG
4152.94

FG
4151.78

FG
4154.82

TW 4155.55
BW 4154.88

TW 4155.55
BW 4154.88

FG
4154.86

FG
4154.93

TC
(4155.16)

TC
(4155.16)

CB (EXISTING)
RIM (4151.61)
INV (4145.77)
FG (4151.36)

TW 4157.00
BW 4154.00

TC
(4156.24)

TW 4157.00
BW 4151.00

TC
(4155.89)

TW 4154.00
BW 4150.00

TW 4153.00
BW 4151.00

TC
(4155.46)

US-50A

EX MEDIAN

"EW" 31+00

EX "L" CURB/GUTTER

EX ROLLED CURB

TC
(4155.30)

EX PAVED
INNER CIRCLE

TC
(4155.25)

TC
(4155.21)

TC
(4155.18)

EX DRAINAGE
STRUCTURE TO REMAIN
AND PROTECT

EX MEDIAN

"EW" 29+00

SR-828/
FARM
DISTRICT ROAD

EX MEDIAN

MATCHLINE – SEE SHEET L20

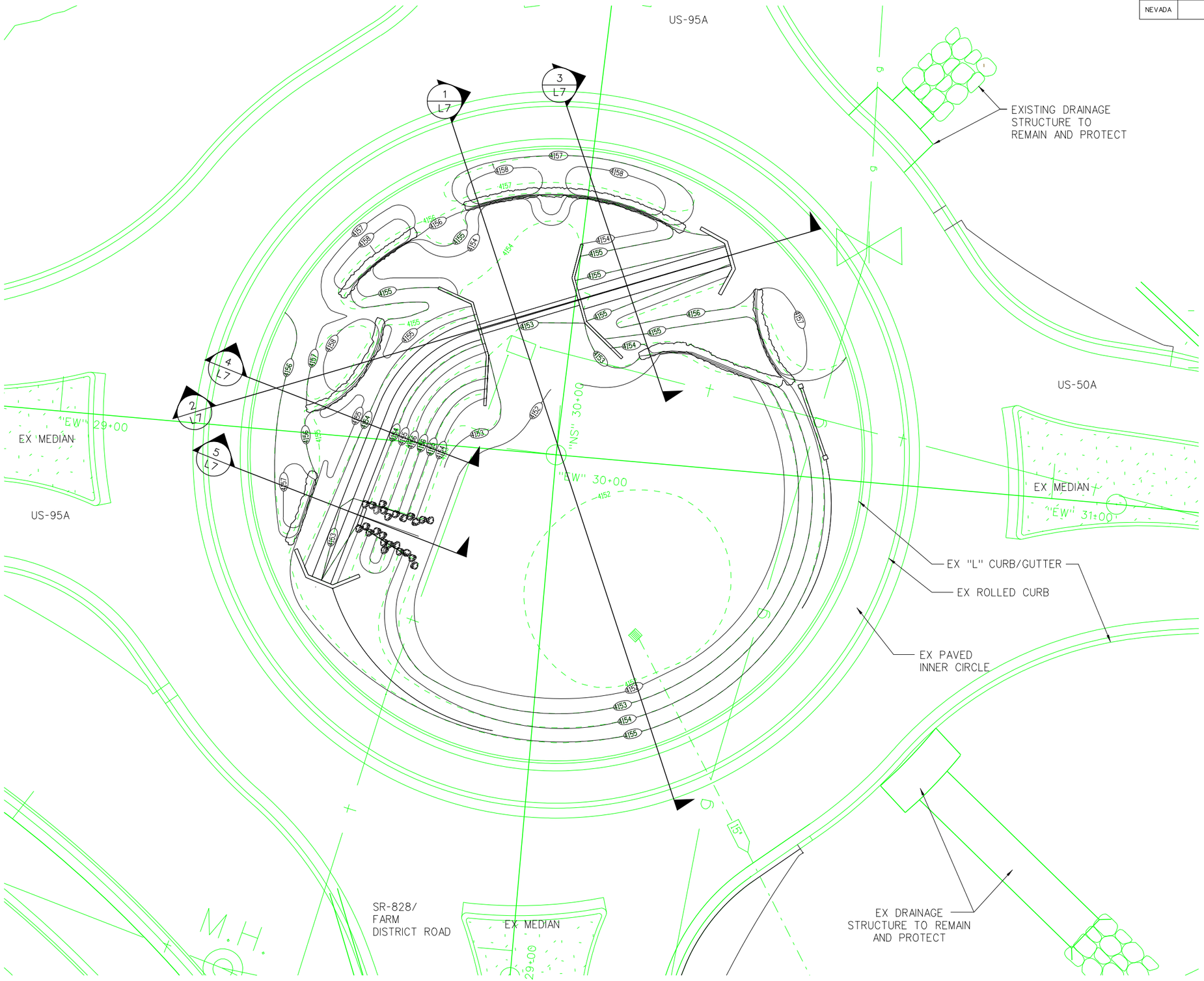
GRADING LEGEND

SYMBOL	ITEM
TC (4156.02)	EXISTING SPOT ELEVATION
FG 4154.60	PROPOSED SPOT ELEVATION
4150	EXISTING CONTOUR
4150	PROPOSED CONTOUR
	CATCH BASIN, EXISTING
	DRAIN PIPE, EXISTING
15"	SIZE AND DIRECTION OF DRAIN FLOW
	DIRECTION OF FLOW
TW	TOP OF WALL
BW	BOTTOM OF WALL
BF	BOTTOM OF FLUME
FG	FINISH GRADE
TC	TOP OF CURB
RIM	RIM ELEVATION
INV	INVERT ELEVATION
CB	CATCH BASIN
	BOULDERS

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GRADING AND DRAINAGE PLAN

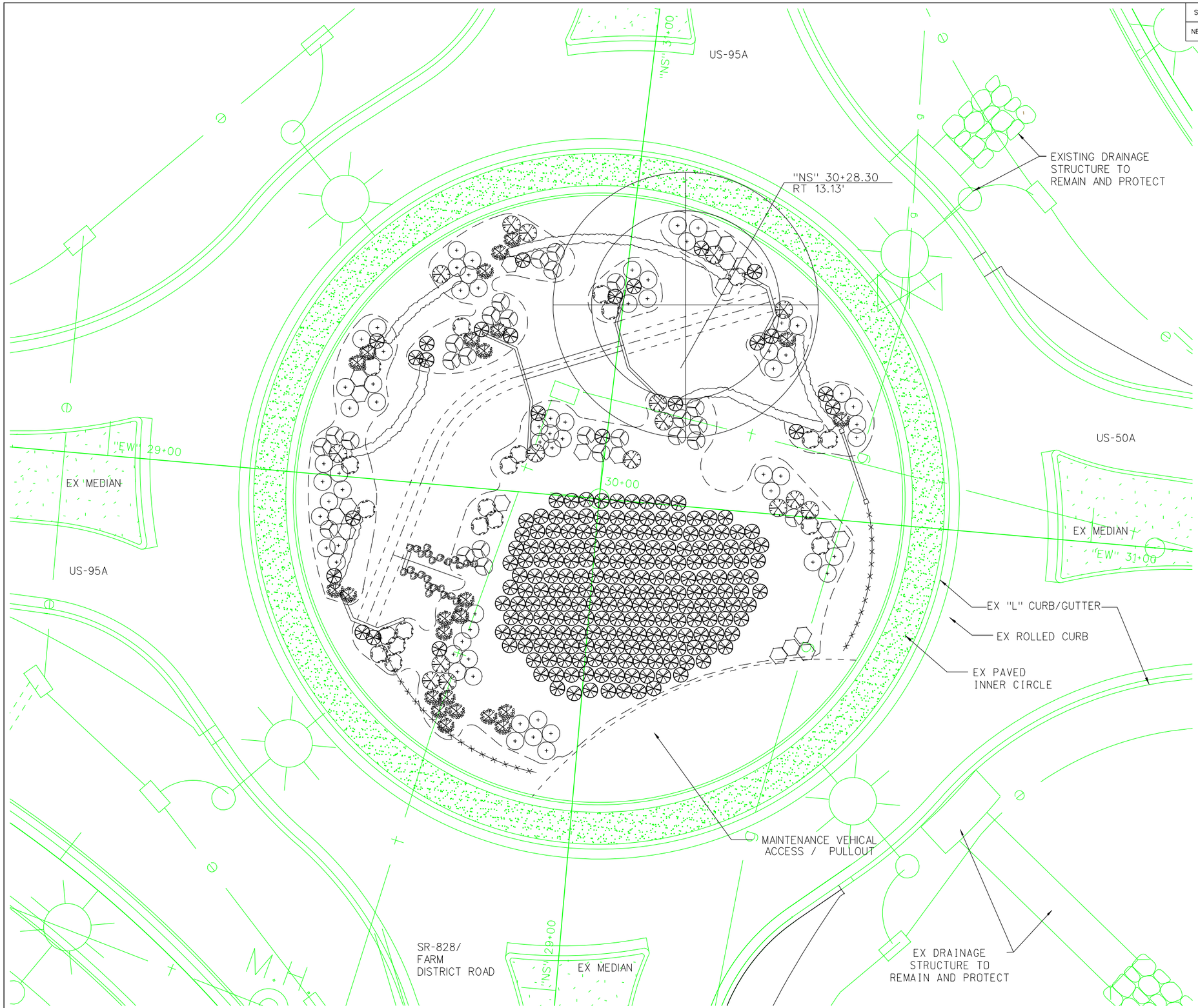
STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-095A(010)	LYON	L3



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SITE SECTION LOCATIONS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-095A(010)	LYON	L4



PLANTING LEGEND

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
	GLEDITSIA TRIACANTHOS	HONEY LOCUST	60" BOX
	PLUMOSA AUREA		5 GAL
	EPHEDRA VIRDIS 'COVILLE'	JOINT FIR	5 GAL
	PENSTEMON PALMERI	PALMERS PENSTEMON	1 GAL
	ARTEMISIA TRIDENTATA	BIG SAGEBRUSH	5 GAL
	SPHAERALCEA AMBIGUA	DESERT GLOBE MALLOW	1 GAL
	ERICAMERIA VISCIDIFLORA	GREEN RABBITBRUSH	5 GAL
	PASCOPYRUM SMITHII	WESTERN WHEATGRASS	1 GAL

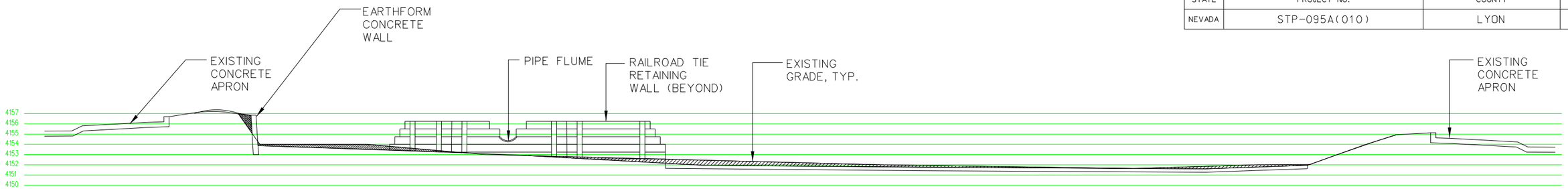
BID ITEM 2121020: PERPARING SOIL (PLANTING BED) WITH WATER RETAINING SOIL AMENDMENT SEE SPECIAL PROVISIONS.

NOTE: CONTRACTOR SHALL FIELD STAKE PLANTING LAYOUT AS SHOWN ON THIS PLAN FOR REVIEW BY ENGINEER & LANDSCAPE ARCHITECT. THE PLANTING PLAN SHOWN IS FOR INTENT ONLY AND WILL BE ADJUSTED IN THE FIELD BY ENGINEER & LANDSCAPE ARCHITECT TO MAXIMIZE PLANTING EFFECTS WANTED TO ACHIEVE FOR THIS PROJECT. NO PLANTING SHALL OCCUR UNTIL FINAL APPROVAL IS ISSUED BASED ON FINAL FIELD LAYOUT.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

PLANTING PLAN

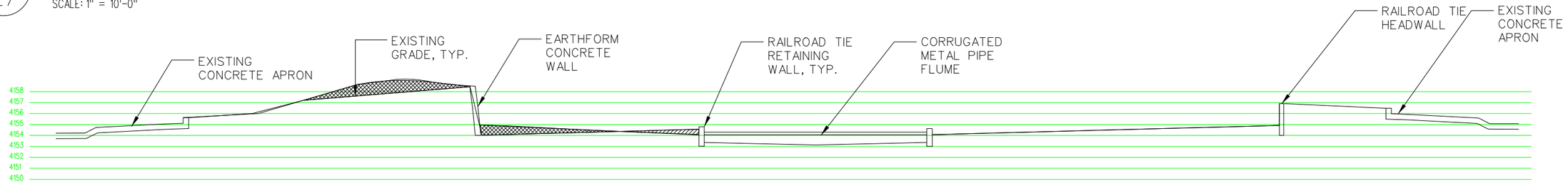
STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-095A(010)	LYON	L5



1 L7 SECTION A-A'

SCALE: 1" = 10'-0"

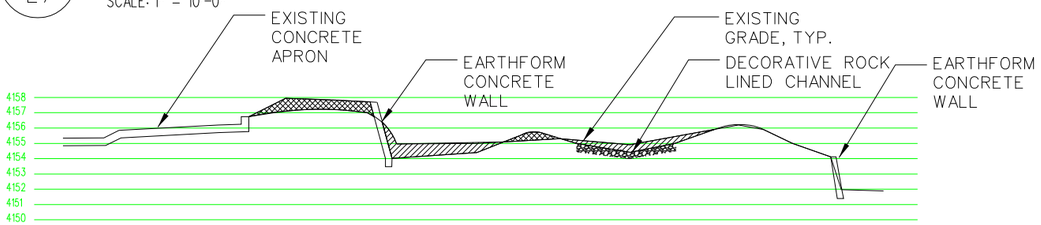
L-DTL_SECTION1.DWG

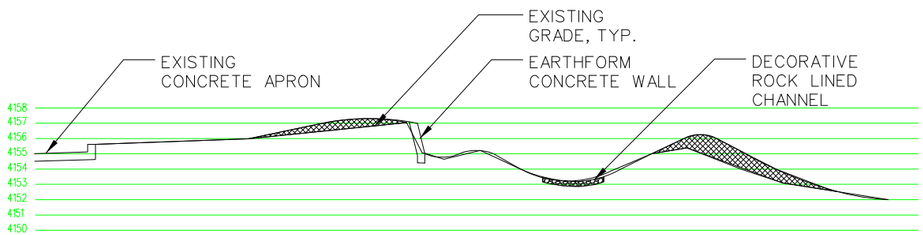


2 L7 SECTION B-B'

SCALE: 1" = 10'-0"

L-DTL_SECTION2

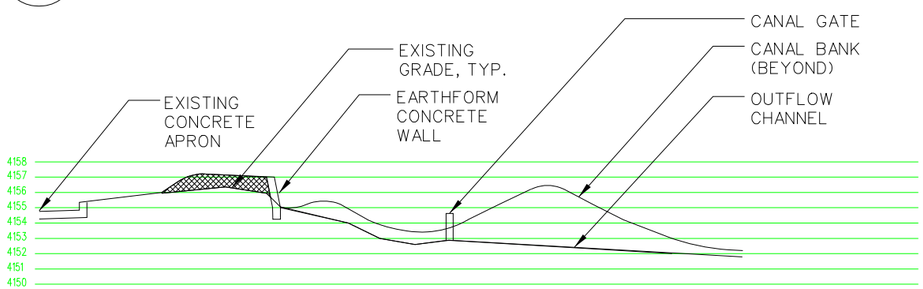




3 L7 SECTION C-C'

SCALE: 1" = 10'-0"

L-DTL_SECTION3.DWG



4 L7 SECTION D-D'

SCALE: 1" = 10'-0"

5 L7 SECTION E-E'

SCALE: 1" = 10'-0"

SECTION LEGEND

BORROW EXCAVATION (BID ITEM 2030528)

FILL

NOTE: ALL GRADING WORK SHALL BE PERFORMED UNDER BORROW EXCAVATION BID ITEM 2030528

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SITE SECTIONS

7.19 Hydraulic Plans.

General. Hydraulic plans are to show location and special details for drainage facilities that are not adequately shown in the plan sheets or standard plans. Subsurface drainage such as underdrains, horizontal drains, edge drains, and subgrade drains may be shown on the Hydraulic Detail sheets.

The Hydraulics Section prepares drainage plans, profiles, special details, temporary erosion control plans, and structure lists.

Hydraulic Plan Guidelines. See NDOT Hydraulics Drainage Manual (Section B.3) for additional information. This manual is available on Sharepoint>010Design Division>Hydraulics Portal.

Use applicable standards from this Plan Preparation Manual for the development of Hydraulic Plans.

Hydraulic Plan Particulars.

1) Sheet numbering for Hydraulic Plans shall be numbered using the following:

D1	Drainage plans
DP1	Drainage profiles
DD1	Drainage details
DS1	Drainage structure lists*
TPC1	Temporary Pollution Control

*- The drainage structure list may be eliminated and combined with the roadway structure list for minor drainage work or when there are few bid items.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	PROJECT NO.	CLARK	D1

NOTE: TO AVOID DROPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

TOWN SHIP, RANGE AND SECTION TEXT SHALL APPEAR ON NORTH ARROW UNLESS THOSE LINES ALREADY APPEAR ON SHEET.

LEGEND

RIPRAP (C)

① "BD" 29+40 CONSTRUCT TYPE 5 EMBANKMENT PROTECTOR ON LINE (39.7' RT) WITH 12" x 20' SLOTTED DRAIN AHEAD ON LINE.

④ "BD" 31+20 CONSTRUCT TYPE 1 ECCENTRIC MANHOLE (60.1' RT) (COVER ELEV.= 2264.55', H= 5.00') INSTALL 24" X 25' RCP (UIE= 2259.55', LIE= 2249.75') INSTALL PRECAST END SECTION AND CLASS 300 RIPRAP APRON AT OUTLET.

⑦ "B" 360+80 CONSTRUCT DOUBLE 10' X 8' X100' RCB FROM "BD" 360+80, (55.7' LT) UIE= 2268.62' TO "BD" 360+80, (44.3' RT) LIE= 2266.75'. TYPE 1 HEADWALL LT AND RT CONSTRUCT RIPRAP BASIN AT OUTLET. (SEE SHEET DD-1)

⑮ "BD" 361+30 INSTALL 24" X 25' RCP FROM "BD" 361+30, 17.5' RT "BD" 361+20 (UIE= 2264.82') TO "BD" 361+20, 41.5' RT (LIE= 2260.50') INSTALL PRECAST END SECTION LT AND RT CONSTRUCT TYPE 2 DROP INLET 60.0' RT (GRATE ELEV.=2275.22', H= 3.75') 275.22', H= 3.75') WITH 12" x 6' SLOTTED DRAIN AHEAD ON LINE.

㉖ "BD" 39+90 INSTALL 15" x 92' RCP (UIE= 2271.47, LIE= 2269.85') CONNECT TO TYPE 2B INLET AT "BD" 39+10, 102' RT

㉙ "BD" 42+50 CONSTRUCT RIPRAP LINED CHANNEL "BD" 38+50 (SEE SHEETS DD-1 AND DP-2)

"R1" 13+15.17 71.66' LT FL= 2266.00'

"R4" 24+43.96 46.84' LT FL= 2265.40'

"BD" 38+05.96 130.84' LT FL= 2265.40'

"BD" 39+65.11 128.47' LT FL= 2264.96'

"BD" 38+75.25 126.84' LT FL= 2263.40'

"BD" 39+60.96 128.32' LT FL= 2265.40'

"BD" 42+49.70 130.34' LT FL= 2269.40'

"BD" 41+18.38 130.71' LT FL= 2268.62'

"R4A" 2+00.00 21.50' LT. FL= 2290.00' FL

"R3" 26+18.22 88.46' RT. FL= 2266.00'

"BD" 40+29.59 132.76' LT FL= 2267.85'

"R2" 0+64.90 81.85' LT FL= 2267.00'

"R2" 1+10.84 77.42' LT FL= 2267.00'

"R3" 27+19.30 89.56' LT FL= 2268.00'

"R3A" 1+73.23 40.50' RT. FL= 2287.59' FL

T.22S., R.61E. SEC. 17

Proposed R/W

R/W

PAVED PARKING

Grade to Drain

I-80

S-766

SD

NOTE: ALL CALLOUT ORDER NUMBERS SHALL BE PLACED IN A REASONABLE SEQUENCE.

NOTE: ALL LINE WEIGHTS ARE WT=2 UNLESS OTHERWISE NOTED.

NOTE: UNLESS OTHERWISE NOTED. ALL LETTERING SHALL BE FT=10. MEDIUM SIZED TEXT. WT=2.

NOTE: ALL STATIONING SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3. SMALL SIZED TEXT. WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1 ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

Ⓒ - DENOTES CELLS HAVE BEEN USED.

Ⓛ - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

Ⓓ - DENOTES AN ENTER DATA FIELD EXIST. TURN OFF VIEW ATTRIBUTES IN FINAL PRINT.

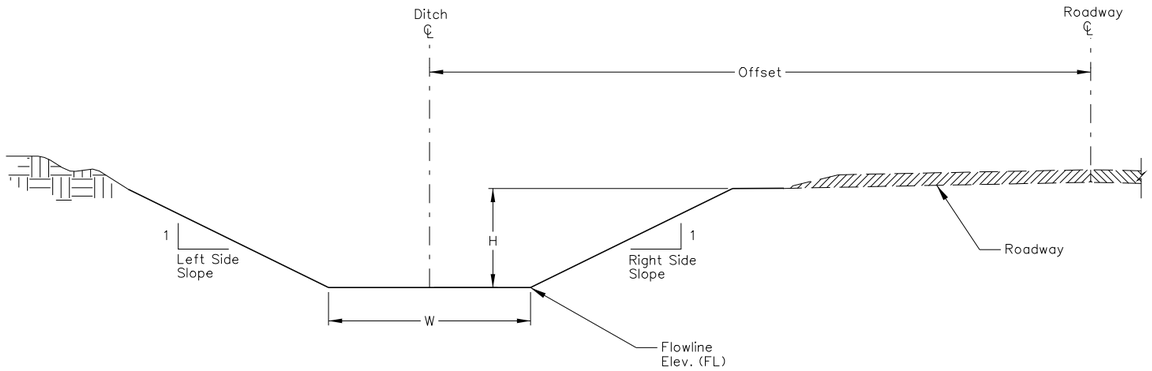
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

DRAINAGE PLANS

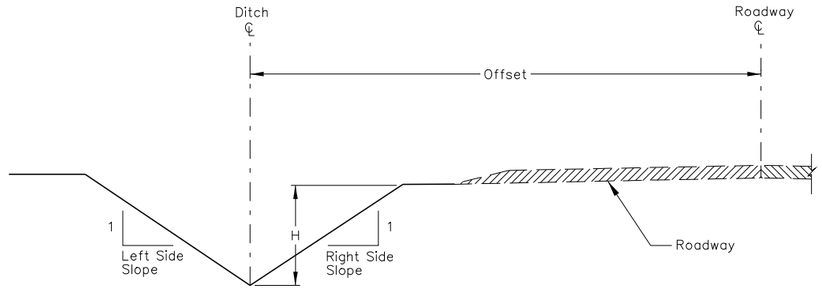
STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	PROJECT NO.	CLARK	DD1

– LEGEND –

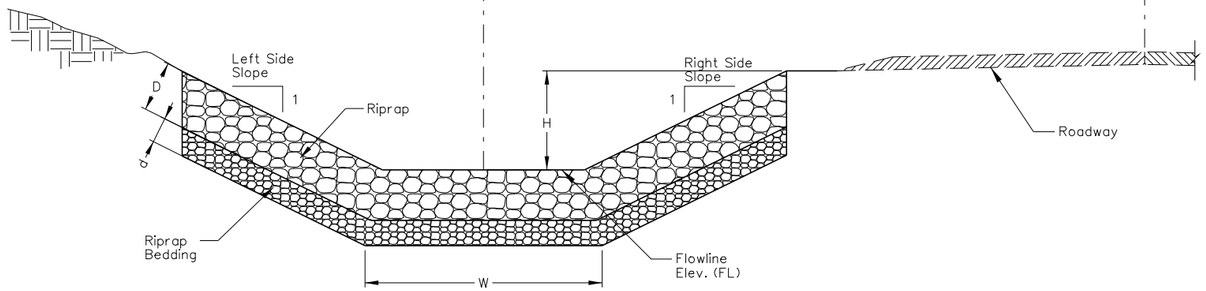
– BEDDING



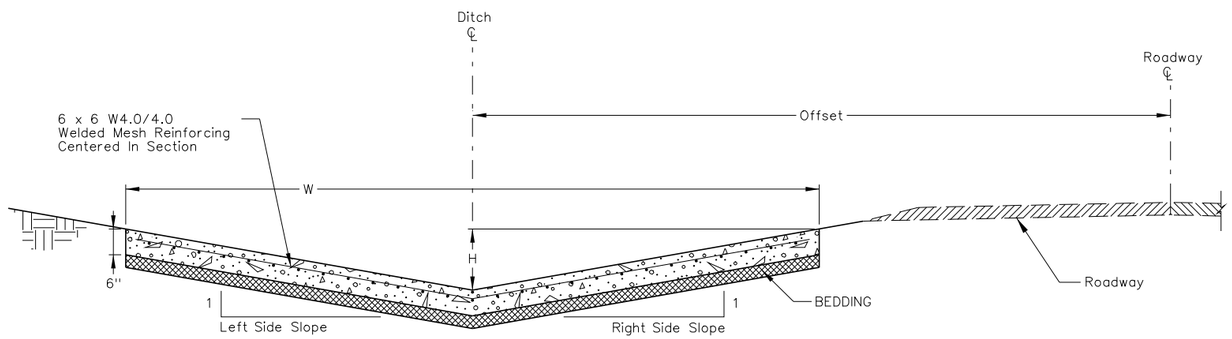
UNLINED FLAT BOTTOM DITCH



V TYPE DITCH



RIPRAP LINED FLAT BOTTOM DITCH



CONCRETE DITCH

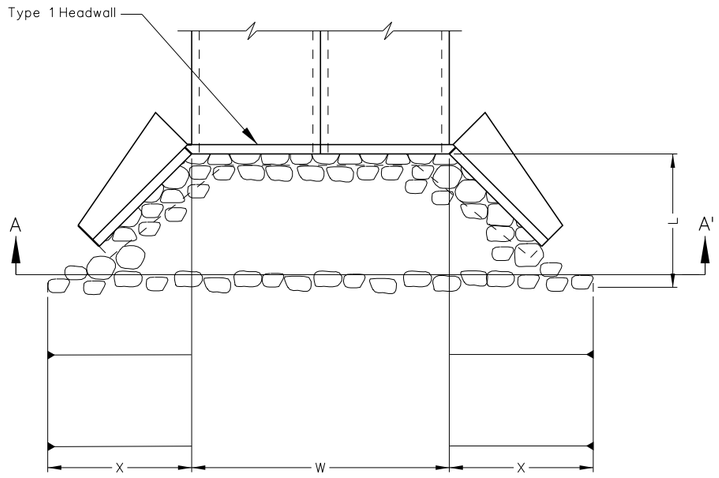
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

RIPRAP CHANNEL SECTION DETAILS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	PROJECT NO.	CLARK	DD2

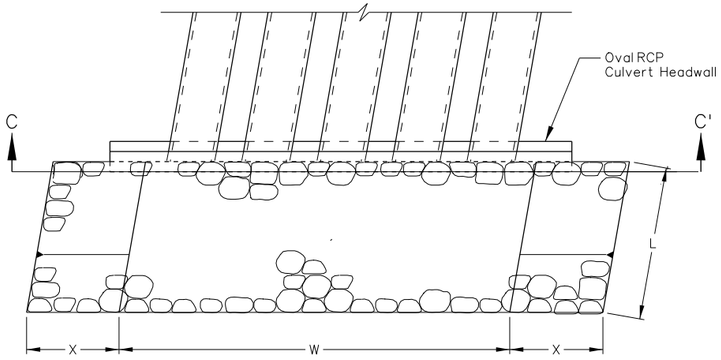
Size	Station	Riprap Class	D in.	d in.	X ft.	W ft.	L ft.	Side Slope X	Height H
6'X4'	"L1" 507+64	550	44	10	7	6	20		
2-11'x8'	"L1" 604+53	550	44	10	8	23	37.5		
10'X6'	"L1 682+85	400	32	10	9	10	24		
5-38"x24"	"L1" 699+76 to "L1 699+98	150	12	8	16	3	8		

NOTE: USE TABLE WHEN USING DETAIL @ MULTIPLE LOCATIONS.



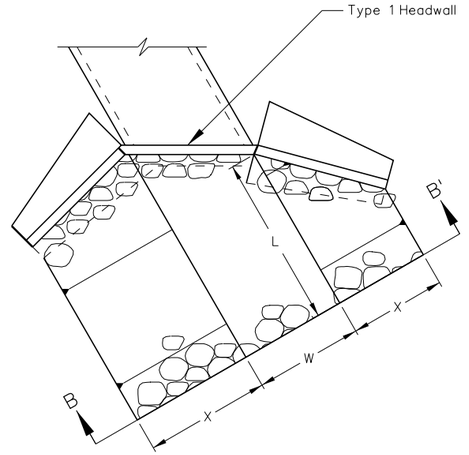
RCB OUTLET DETAIL

"L1" 604+53



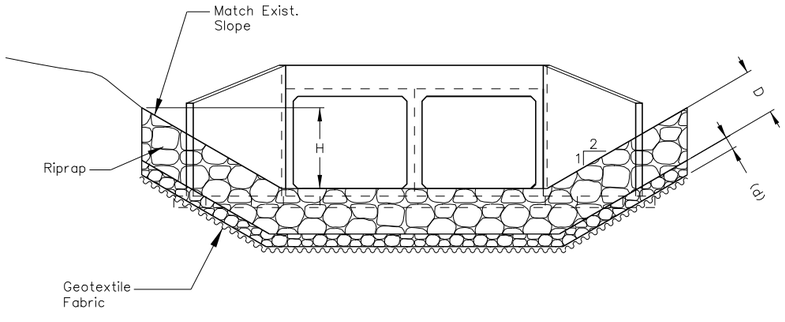
RCP OVAL OUTLET DETAIL

"L1" 699+76 To
"L1" 699+98

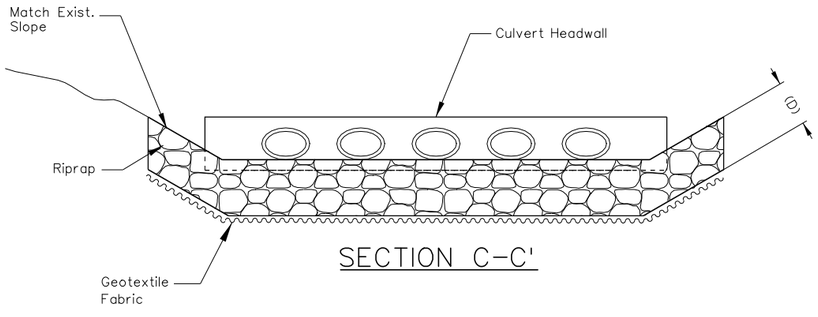


RCB OUTLET DETAIL

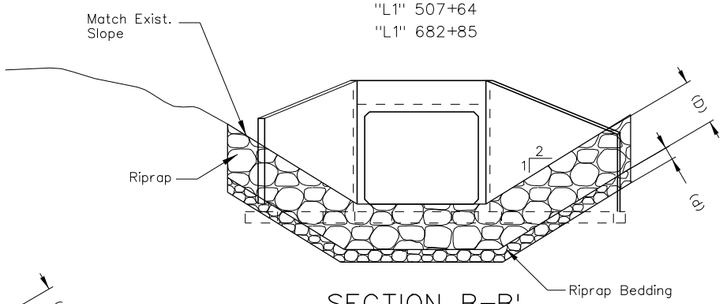
"L1" 507+64
"L1" 682+85



SECTION A-A'



SECTION C-C'

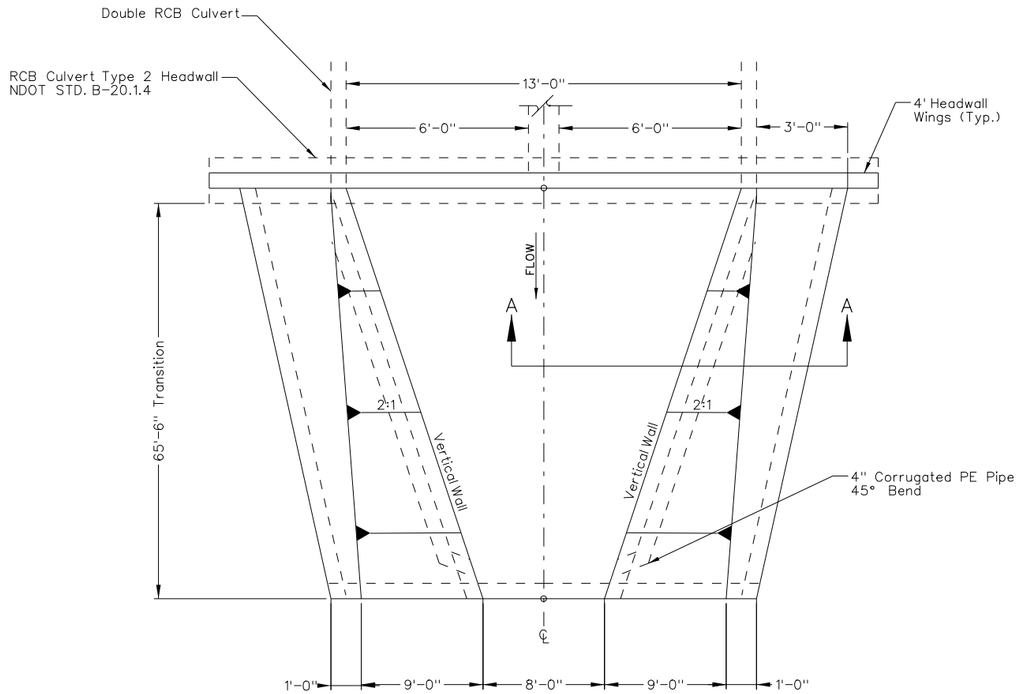


SECTION B-B'

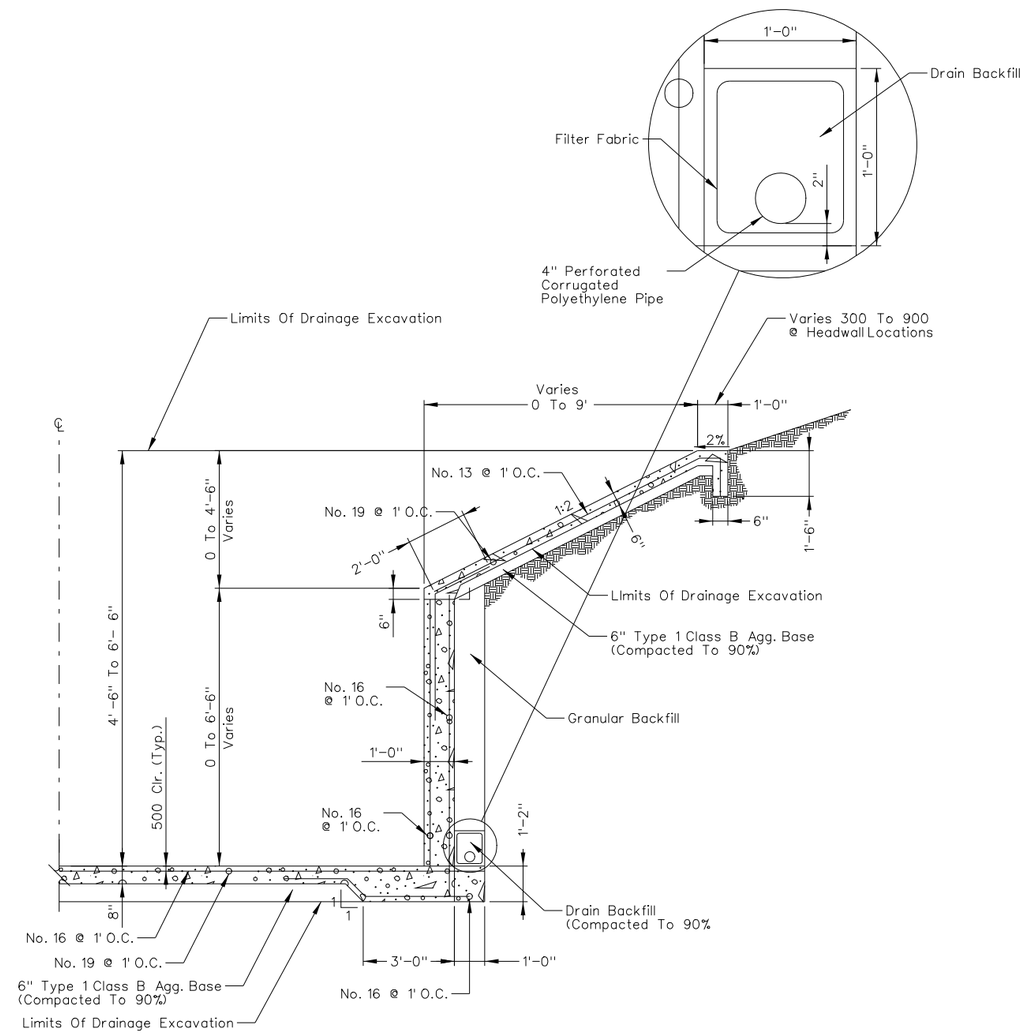
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

RIPRAP APRON & RCB OUTLET DETAILS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	PROJECT NO.	CLARK	DD3



PLAN



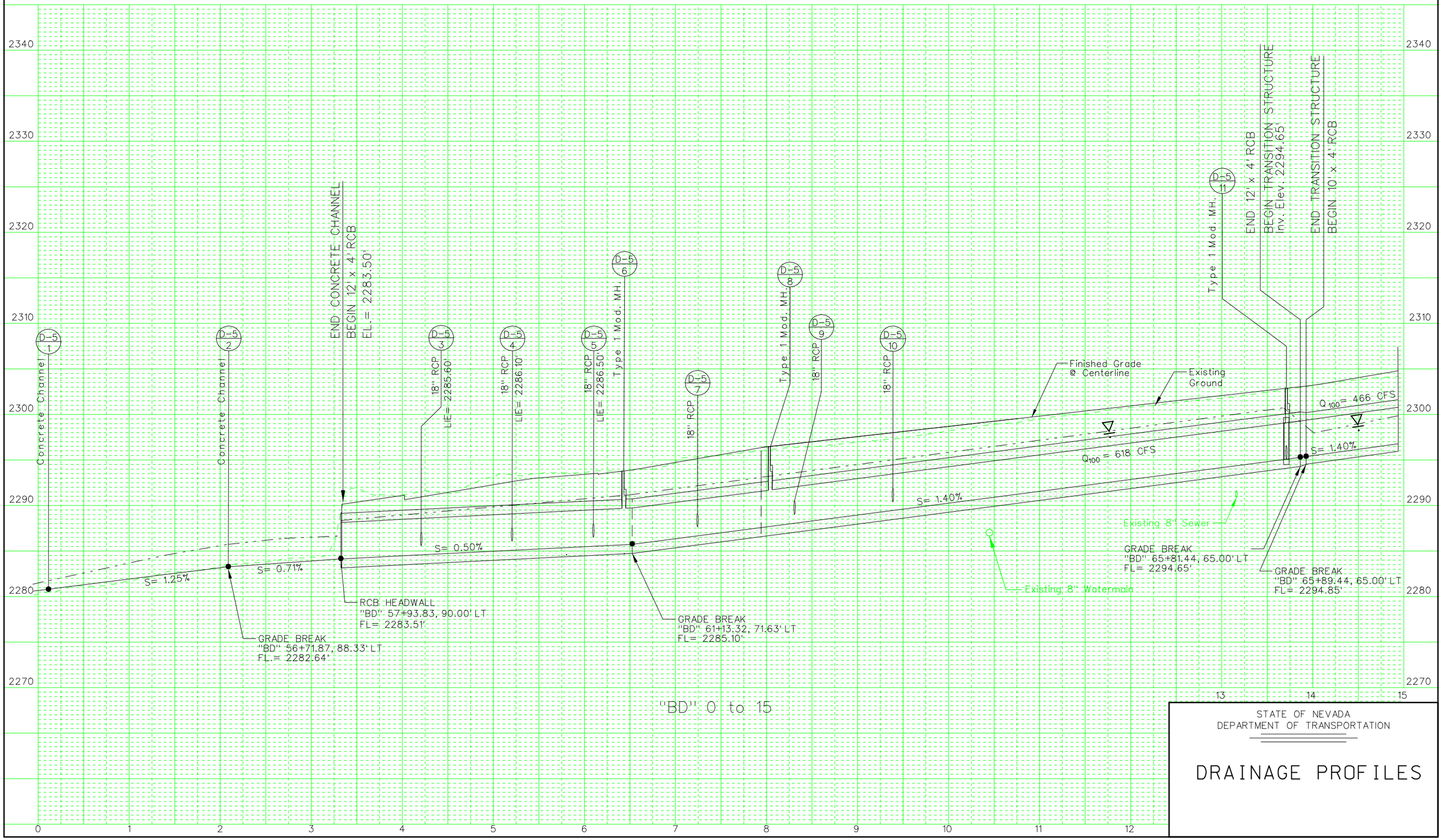
SECTION A-A

CONCRETE CHANNEL
TRANSITION (HALF SECTION)

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

RCB TRANSITION DETAILS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	PROJECT NO.	COUNTY	DP1



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

DRAINAGE PROFILES

7.20 Right of Way Plans.

General. The right of way plans provide construction and maintenance forces with certain information on property rights secured by the Department that is useful to their operations.

Right of way plans should only be included in the contract plans when showing this information on the roadway plan view sheets would create confusion or result in cluttered information.

Where right of way acquisitions are done in advance of the contract, the Right of Way Division will provide right of way sheets with detailed information as to permanent easements, temporary easements, with all applicable information such as bearings, distances, and offsets. The new right of way lines shall also be shown on the plan sheets in green as existing and dimensioned from centerline as necessary, with the exception of the detailed information that would be found in the right of way sheets.

Right of Way Guidelines. The Right of Way Division produces the right of way plan sheets. Upon completion, these plans are supplied to Roadway Design for incorporation into the contract plans.

Right of Way Particulars.

1) Sheet numbering for the right of way plans shall begin with RW1. Multiple sheets shall be numbered RW1, RW2, RW3, etc.

Fed. Rd. Reg. No.	State	Project No.	E.A. No.	County	Sheet No.
9	Nevada	BRF-095A(008)	72487	LYON	RW-1

STATE OF NEVADA

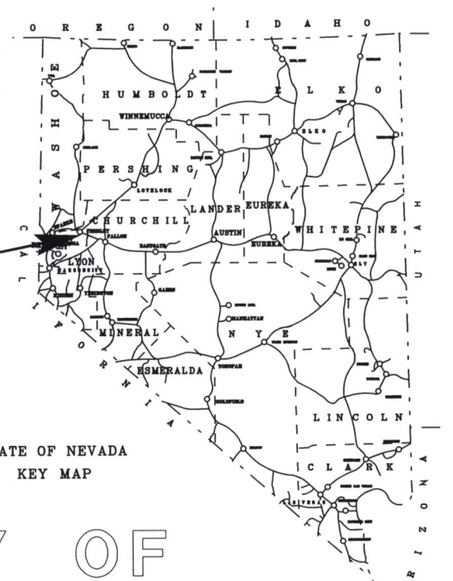
DEPARTMENT OF TRANSPORTATION

RIGHT OF WAY PROJECT

PROJECT: BRF-095A(008)

T. 20 N., R. 24 E.

M.D.M.



STATE OF NEVADA
KEY MAP

CITY OF FERNLEY

T.C.I.D. CANAL

SAGE STREET

TO SILVER SPRINGS

US-95A

"L" 687+34.68 P.O.T. =
"LB" 687+34.68 ∠
∠ = 0°55'35" LT.

680 5 690 5 "LB" ℄ 700 5 710 5

TO SR-427

"L" 680+05.02 P.O.T. =
"C" 680+05.02 P.O.T.

"LB" 717+49.65 P.T. =
"C" 717+47.78 P.T.

T.C.I.D. CANAL

CIRCLE DRIVE

SUNSET SUBDIVISION

COTTONWOOD LANE

23 24

FND. BRASS CAP IN CONCRETE STAMPED
W 1/4 CORNER S24 RLS 2371 (T20N/R24E)

BEGIN ACQUISITION
"LB" 693+85.43 P.O.T.

END ACQUISITION
"LB" 717+49.65 P.T.

FND. CHISELED X IN CONCRETE

14 13 23 24

FND. RR SPIKE

TRACED: KDI

CHECKED: JHH

\Datsrv1\037Engineering\PROJECTS\095Aly72487\Cvrsht.dgn

STATE OF NEVADA
Dept. of Transportation R/W Division

Date: December 2003

US 95A, AT THE TRUCKEE CANAL BRIDGE (B-238)

Scale: 1" = 300'

LEGEND OF RIGHT-OF-WAY SYMBOLS

CONTROL OF ACCESS WITH FENCE	
CONTROL OF ACCESS WITHOUT FENCE	
R/W	RIGHT-OF-WAY
	LOCATION AT WHICH ACCESS TO THE FREEWAY IS PERMITTED BY THE STATE
	SUBDIVISION BOUNDARIES
P. U. E.	PUBLIC UTILITY EASEMENT
P/L	PROPERTY LINE
P.E.	PERMANENT EASEMENT
T.E.	TEMPORARY EASEMENT
R E M.	REMAINDER
P.O.B.	POINT OF BEGINNING

P.O.T.	POINT ON TANGENT
P.O.C.	POINT ON CURVE
P.T.	POINT OF TANGENCY
P.C.	POINT OF CURVE
℄	CENTERLINE
	STATE LINE
	COUNTY LINE
	CITY OR TOWN LIMITS
	SECTION LINE
	1/4 SECTION LINE
	1/16 SECTION LINE
	1/64 SECTION LINE

SECTION CORNER

FOUND UNFOUND

CLOSING SECTION CORNER

FOUND UNFOUND

1/4 SECTION CORNER

FOUND UNFOUND

CLOSING 1/4 SECTION CORNER

FOUND UNFOUND

	FENCE LINE
	CATTLE GUARD
	POWER AND TELEPHONE POLES
	POLE WITH ANCHOR

STATE OF NEVADA

Dept. of Transportation R/W Division

Date: December 2003

R/W Plans

Fed. Rd. Reg. No.	State	Project No.	E.A. No.	County	Sheet No.
9	Nevada	BRF-095A(008)	72487	LYON	RW-3

PARCEL NO. PREFIX: U-95A-LY-

INSET
NOT TO SCALE

SAGE ST.
P.O.B.
N. 89° 01' 38" W. - 42.61'
057.117
CITY OF FERNLEY
057.118
N. 17° 03' 59" W. - 52.58'
S. 89° 01' 38" E. - 43.50'
S. 16° 08' 24" E. - 52.32'

R.O.S.
189564

N. 1/16 SECTION LINE
E. 1/16 SECTION LINE
SAGE STREET
50.00'
P/L
100.00'
100.00'
CANAL R/W
CANAL R/W
T.C.I.D. CANAL
CANAL ℄ & P/L

TIE: N. 13° 42' 13" W. - 4,734.83' FROM THE SE COR. SEC. 23, T. 20 N., R. 24 E., M.D.M.
80.00' LT. "LB" 700+62.75 P.O.T.

057.118
POULSEN, E.G.
"LB" 698+27.30 ∠ = 0° 55' 35" RT.

TIE: N. 13° 12' 28" W. - 4,070.51' FROM THE SE COR. SEC. 23, T. 20 N., R. 24 E., M.D.M.

057.234
FROSSARD TRUST
Δ - 6° 16' 10"
R - 5,485.71'
L - 600.26'
T.C.I.D. "KB" LATERAL DITCH
Δ - 5° 21' 00"
R - 5,050.00'
L - 471.54'
T.B. - S. 10° 47' 24" E.

N. 17° 03' 59" W. - 429.32'
N. 16° 08' 24" W. - 100.81'
N. 16° 08' 24" W. - 135.29'
N. 81° 08' 01" E. - 48.05'
N. 81° 08' 01" E. - 10.08'
N. 16° 08' 24" W. - 103.75'
"LB" 701+65.23 P.C.
89.23' LT "LB" 694+01.63 P.O.T.
P.O.B. - 80.00' LT. "LB" 693+98.62 P.O.T.
R/W
R/W
N. 89° 01' 38" W. - 42.61'
SEE INSET
S. 16° 08' 24" E. - 571.01'
80.00'
70.00' LT. "LB" 700+61.48 P.O.T.
70.00'
S. 16° 08' 24" E. - 329.26'
TO SILVER SPRINGS
100.00'
VARIES
N. 17° 03' 59" W.
PREVIOUSLY ACQUIRED
US-95A "LB" ℄
N. 16° 08' 24" W.
690
690
"A" ℄ & "L" ℄
1120
5
5
700
700
50.00'
50.00'
VARIES
50.00'
1130
"A" ℄
TO SR-427
N. 16° 08' 24" W. - 100.81'
N. 16° 08' 24" W. - 100.81'
P.O.B. - 67.66' RT. "LB" 698+42.29 P.O.T.
R/W
R/W
R/W
"A" 1128+71.52 P.C.
66.32' RT. "LB" 702+86.61 P.O.C.
60.00' RT. "LB" 693+53.02 P.O.T.
S. 81° 08' 01" W. - 100.81'
LOT 5
LOT 3
"L" 702+84.98 P.C.-
"C" 702+84.98 P.C.
P.O.B. - 67.66' RT. "LB" 700+43.91 P.O.T.
Δ - 5° 06' 27"
R - 4,950.00'
L - 441.26'
LOT 2
TIE: N. 11° 42' 57" W. - 4,523.56' FROM THE SE COR. SEC. 23, T. 20 N., R. 24 E., M.D.M.
S. 81° 08' 01" W. - 100.81'
LOT 4
TIE: N. 11° 54' 16" W. - 4,724.60' FROM THE SE COR. SEC. 23, T. 20 N., R. 24 E., M.D.M.
S. 16° 08' 24" E. - 100.81'
S. 16° 08' 24" E. - 100.81'
N. 81° 08' 01" E. - 100.81'
"C" ℄
50.00'
Δ - 16° 45' 45"
R - 5,000.00'
L - 1462.80'
109.75' RT. "LB" 693+36.82 P.O.T.
R/W
057.319
T.C.I.D.
057.336
T.C.I.D.
"LB" ℄
Δ - 16° 45' 45"
R - 5,415.71'
L - 1584.42'
"A" ℄
Δ - 16° 45' 45"
R - 5,000.00'
L - 1462.80'
SUNSET SUBDIVISION
LOT 6
BLOCK "A"
CIRCLE DRIVE
CANAL R/W
FILE NO. 81981
100.00'
100.00'
CANAL R/W
LOT 7
50.00'
CANAL ℄ & P/L

SEC. 23
T. 20 N., R. 24 E.
M.D.M.
N. 1/16 SECTION LINE

BEGIN ACQUISITION
"LB" 693+85.43 P.O.T.

CITY OF FERNLEY

TRACED: KDI
CHECKED: JHH

STATE OF NEVADA
Dept. of Transportation R/W Division
Date: December 23, 2003
R/W Plans
Approved: Halana D. Salangan For Manager, R/W Engineering
Scale: 1" - 100'
Date of last revision: 7/14/2004

\Datsrv1\037Engineering\PROJECTS\095Aly72487\Sht3.dgn

Fed. Rd. Reg. No.	State	Project No.	E.A. No.	County	Sheet No.
9	Nevada	BRF-095A(008)	72487	LYON	RW-4

PARCEL NO. PREFIX: U-95A-LY-

T. 20 N., R. 24 E.

M.D.M.

SEC. 23

SEC. 14

INSET
NOT TO SCALE

057.489
CITY OF FERNLEY

Δ = 0° 32' 34"
R = 4,970.00'
L = 47.08'
T.B. = N. 10° 35' 35" W.

N. 88° 57' 05" W. - 17.15'

Δ = 0° 19' 37"
R = 5,357.80'
L = 30.57'
T.B. = S. 9° 48' 27" E.

S. 88° 57' 05" E. - 0.96'

Δ = 78° 55' 56"
R = 20.00'
L = 27.55'
T.B. = S. 10° 01' 09" E.

057.496

057.496TE

P.O.B. = 57.91' RT.
"LB" 707+63.79 P.O.C.

PM 98067

PM 112113
PARCEL "A"

PM 112113
PARCEL "B"

PM 112113
PARCEL "C"

PM 45184
PARCEL 2

PM 45184
PARCEL 1

TIE: N. 88° 57' 05" W. - 1,282.57' FROM THE SE COR. SEC. 14, T. 20 N., R. 24 E., M.D.M.

057.234
FROSSARD TRUST

P.O.B. = 70.00' LT.
"LB" 707+57.83 P.O.C.

Δ = 6° 16' 10"
R = 5,485.71'
L = 600.26'

E. 1/16 SECTION LINE

Δ = 5° 21' 00"
R = 5,050.00'
L = 471.54'
T.B. = S. 10° 47' 24" E.

T.C.I.D.
"KB" LATERAL DITCH

Δ = 2° 09' 35"
R = 5,050.00'
L = 190.36'
T.B. = S. 8° 37' 49" E.

30.00'

30.00'

057.491
FERREL, C.O., et ux

N. 1° 13' 25" W.
187.14'

45.00' LT. "LB" 709+41.36 P.O.C.

Δ = 3° 38' 27"
R = 5,050.00'
L = 320.90'
T.B. = N. 8° 37' 49" W.

TIE: N. 87° 28' 03" W. - 1,158.48' FROM THE SE COR. SEC. 14, T. 20 N., R. 24 E., M.D.M.

48.16' LT. "LB" 712+59.51 P.O.C.

TIE: N. 66° 53' 14" W. - 1,439.52' FROM THE SE COR. SEC. 14, T. 20 N., R. 24 E., M.D.M.

P.O.B. = 45.00' LT.
"LB" 712+94.98 P.O.C.

057.594
FERREL FAMILY TRUST

Δ = 4° 48' 37"
R = 5,460.71'
L = 458.45'
T.B. = N. 4° 11' 16" W.

Δ = 4° 18' 59"
R = 5,040.00'
L = 379.69'
T.B. = S. 0° 37' 21" W.

45.00' LT. "LB" 717+49.65 P.T.

S. 89° 22' 39" E. - 5.00'

E. 1/16 SECTION LINE

N. 88° 57' 05" W. - 28.11'

R/W

TO SILVER SPRINGS

VARIES

70.00'

US-95A "LB" ℄

710

PREVIOUSLY ACQUIRED

S. 0° 40' 05" W. - 78.57'

"A" ℄

1140

"C" ℄

N. 0° 37' 21" E.

39.90' RT. "LB" 717+16.20 P.O.C.

1143

40.00'

TO SR-427

"A" ℄ N. 0° 37' 21" E.

S. 89° 25' 07" E. - 10.00'

"A" 1143+35.42 P.T.

"LB" 717+49.65 P.T. -
"C" 717+47.78 P.T.

50.00'

50.00'

1130

SEE INSET

30.00' "C" ℄

39.06' RT. "LB" 710+72.30 P.O.C.

S. 11° 42' 09" E. - 306.30'

S. 11° 42' 09" E. - 297.89'

Δ = 3° 50' 45"
R = 4,970.00'
L = 333.60'
T.B. = N. 10° 35' 35" W.

S. 88° 57' 05" E. - 87.86'

S. 1° 02' 55" W. - 10.00'

Δ = 7° 22' 11"
R = 4,970.00'
L = 639.27'
T.B. = N. 6° 44' 50" W.

Δ = 7° 21' 53"
R = 4,960.00'
L = 637.55'
T.B. = S. 0° 37' 21" W.

R/W

57.91' RT. "LB" 707+32.89 P.O.C.

Δ = 5° 06' 27"
R = 4,950.00'
L = 441.26'

LOT 2

LOT 1

B L O C K " A "

LOT 3

CIRCLE DRIVE

50.00'

N. 88° 57' 05" W. - 95.85'

25.00'

30.00'

P/L

COTTONWOOD LANE

057.496TE

057.496
LFWW, LLC

"C" ℄
Δ = 16° 45' 45"
R = 5,000.00'
L = 1,462.80'

"LB" ℄
Δ = 16° 45' 45"
R = 5,415.71'
L = 1,584.42'

"A" ℄
Δ = 16° 45' 45"
R = 5,000.00'
L = 1,462.80'

ROS 297883
PARCEL 1-A
(ADJUSTED)

ROS 297883
PARCEL 3-A
(ADJUSTED)

ROS 297883
PARCEL 4-A
(ADJUSTED)

SUNSET
SUBDIVISION

CITY OF FERNLEY

END ACQUISITION
"LB" 717+49.65 P.T.

TRACED:
KDI
CHECKED:
JHH

\Datsrv1\037Engineering\PROJECTS\095Aly72487\Sht4.dgn

STATE OF NEVADA
Dept. of Transportation R/W Division

Date: December 23, 2003

R/W Plans

Approved: Halana D. Salazar
For Manager, R/W Engineering

Scale: 1" = 100'

Date of last revision: _____

PARCEL NO. PREFIX: U-95A-LY-

PROPERTY SCHEDULE

STATE OF NEVADA DEPT. OF TRANSPORTATION

ALL AREAS ARE SHOWN IN SQUARE FEET UNLESS OTHERWISE NOTED

PROJECT NO.	E. A. NO.	COUNTY	SHEET NO.
BRF-095A(008)	72487	LYON	RW-5

PARCEL NO.	GRANTOR	GROSS AREA OF ACQSN.	PREV. ACQ.	NET AREA	R/W AREA	REMAINDER		ACQUISITION RECORDING DATA			SURPLUS LAND DATA				REMARKS
						LT.	RT.	INST. OR DOC.	BK. PG.	DATE TYPE	AREA	INST. OR DOC.	BK. PG.	DATE TYPE	
057.117	CITY OF FERNLEY	2,153		2,153	2,153			321091		05/19/04 Q.C.					CLEARING CITY OF FERNLEY INTEREST FOR SAGE STREET
057.118	POULSEN, E. GENE	25,529		25,529	25,529	3.14 AC									
057.234	THE FROSSARD FAMILY TRUST	28,343		28,343	28,343	17.01 AC									
057.319	T.C.I.D.	10,081		10,081											LETTER OF CONSENT (NOT RECORDED) CONSTRUCTION, OPERATION & MAINT.
057.336	T.C.I.D.	10,081		10,081											LETTER OF CONSENT (NOT RECORDED) CONSTRUCTION, OPERATION & MAINT.
057.489	CITY OF FERNLEY	572		572	572			321091		05/19/04 Q.C.					CLEARING CITY OF FERNLEY INTEREST FOR COTTONWOOD LANE
057.491	FERREL, CHESTER O., et ux	2,515		2,515	2,515	14,478		321704		05/27/04 DEED					
057.496	LFWW, LLC	3,581		3,581	3,581		10.41 AC								
057.496TE	LFWW, LLC	10,324		10,324											ROADWAY CONSTRUCTION
057.594	THE FERREL FAMILY TRUST	2,283		2,283	2,283	8.71 AC		321703		05/27/04 DEED					

CK'D BY:
JHH

DATE OF LAST REVISION: 09/13/04

STATE OF NEVADA
DEPT. OF TRANSPORTATION R/W DIVISION
DATE: DECEMBER 23, 2003
R/W PLANS

Filename: ly72487.xls

7.21 Permanent Striping Details.

General. The permanent pavement marking sheets show the necessary details for the correct placement of materials used to permanently mark the surfaces of finished public traveled ways. This work normally consists of lane striping, crosswalks, stop and yield bars, words and symbols.

Permanent Striping Detail Guidelines. The permanent pavement marking sheets shall generally be arranged in the same order as the roadway plan sheets. The use of match lines can be used as appropriate.
Indicate the color, pattern, and width of lines (if greater than 4-inches). Double lines such as double solid yellow line, should be indicated.
The striping plan layout should be based on the post construction condition. If the project is staged, each stage must be shown separately and the stages identified in the title block of the associated sheets.

Markings to be placed by state forces shall be shown separately from contracted work and the title blocks shall include the phrase “By State Forces.”

All temporary pavement markings shall be included in the traffic control plans.

Location control lines, stationing, and station designations shall be shown. Lane widths shall be dimensioned from the alignment. The limits of each stripe should be marked with a “plus station” (i.e. +62) to the nearest foot. When alignments are not available, it is acceptable to dimension from edge of pavement.

Show any edges of pavement, curb faces (including channeling islands), intersections, approaches, driveways, curb access ramps and railroad crossings. Also show street names of major driveways or approaches.

Show all stripes, directional arrows, railroad crossing markings, special lane use symbols, chevrons, dual and triple left turn guide lines, dual right turn guide lines, stop bars and crosswalks. Special marking details, such as new types of symbols, should be located in the permanent pavement marking sheets.

Each sheet that contains a crosswalk and/or stop bar shall also include the following note:

The locations of crosswalks and stop bars are controlled by the associated curb ramps per Standard Plan Sheet T-38.1.3 unless indicated otherwise. Refer to the structure list for exact locations of curb ramps.

If applicable, place the following note on each sheet:

Lane widths shall be measured from the control line, shoulder dimensions are for reference only.

Permanent Striping Detail Particulars.

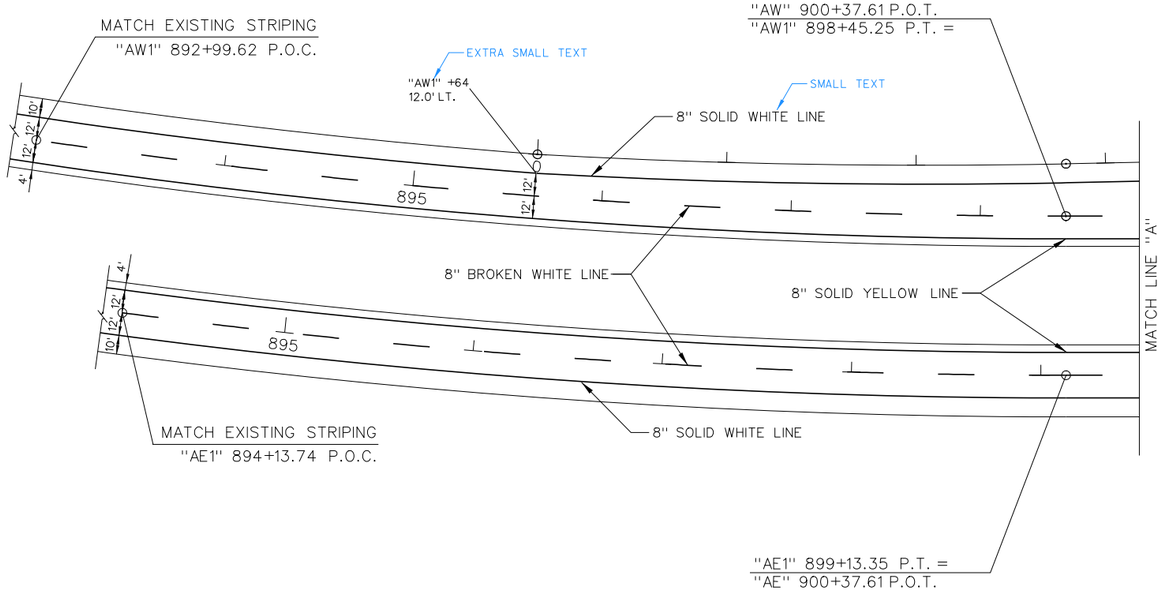
1) Curb ramps shall be shown in conjunction with the crosswalks in a manner that correlates to the proposed location of the curb ramp. Where crosswalks are skewed to the curb line the associated curb ramps or island openings shall be shown as being oriented in the direction of pedestrian travel, not perpendicular to the curb.

2) Sheet numbering for the permanent striping details shall begin with ST1. Multiple sheets shall be numbered ST1, ST2, ST3, etc.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-IR-080-1(114)9	WASHOE	ST1

FT=3 (D) (D) (D)

NOTE - LANE WIDTHS SHALL BE MEASURED FROM THE CONTROL LINE, SHOULDER DIMENSIONS ARE FOR REFERENCE ONLY.



NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: UNLESS OTHERWISE NOTED ALL LINE STYLE AND WEIGHTS SHALL BE CONTROLLED BY THE SETTINGS MANAGER.

NOTE: STRIPING TYPE USED TO BE DETERMINED BY TRAFFIC DIVISION.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.2:0.4 TEXT HEIGHT TO TEXT WIDTH RATIO.

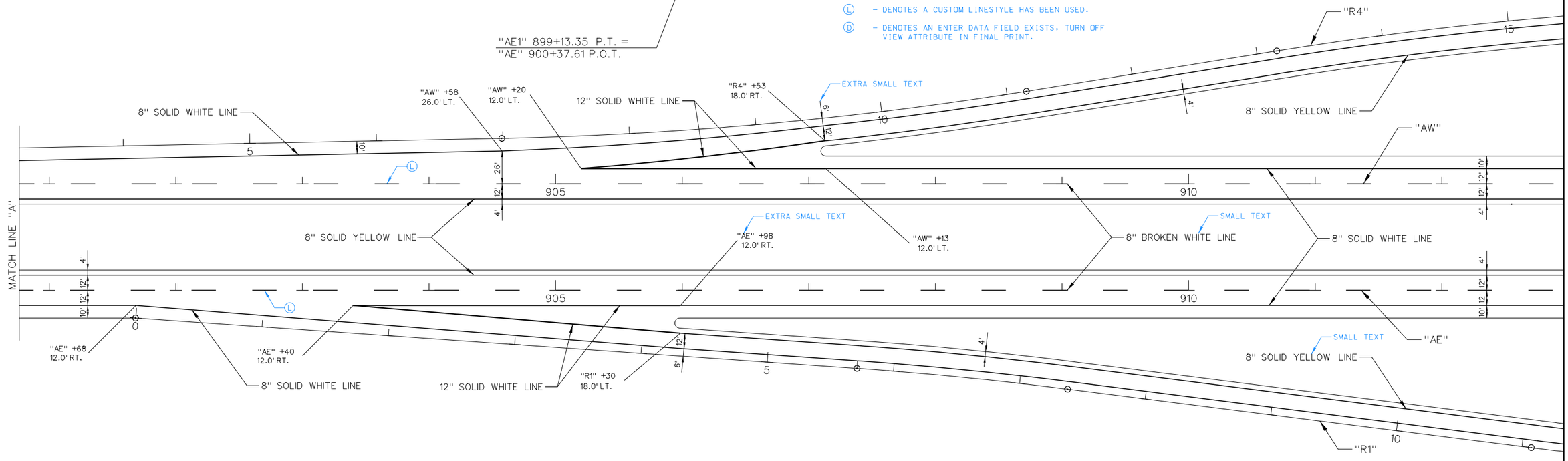
NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CONTROL LINE.

NOTE: THE OFFSETS, AND CORRESPONDING LANE WIDTHS, ONLY NEED TO BE SHOWN IN DECIMAL FORM TO ONE (1) DECIMAL PLACE. THE ACCURACY OF THE OFFSETS SHOULD BE TO THE NEAREST HALF FOOT.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.



RURAL STRIPING

1"=80' TYPICALLY

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

(D)

PERMANENT STRIPING DETAILS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-IR-080-1(114)9	WASHOE	ST2

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: UNLESS OTHERWISE NOTED ALL LINE STYLE AND WEIGHTS SHALL BE CONTROLLED BY THE SETTINGS MANAGER.

NOTE: STRIPING TYPE USED TO BE DETERMINED BY TRAFFIC DIVISION.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.2:0.4 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CONTROL LINE.

NOTE: THE OFFSETS, AND CORRESPONDING LANE WIDTHS, ONLY NEED TO BE SHOWN IN DECIMAL FORM TO ONE (1) DECIMAL PLACE. THE ACCURACY OF THE OFFSETS SHOULD BE TO THE NEAREST HALF FOOT.

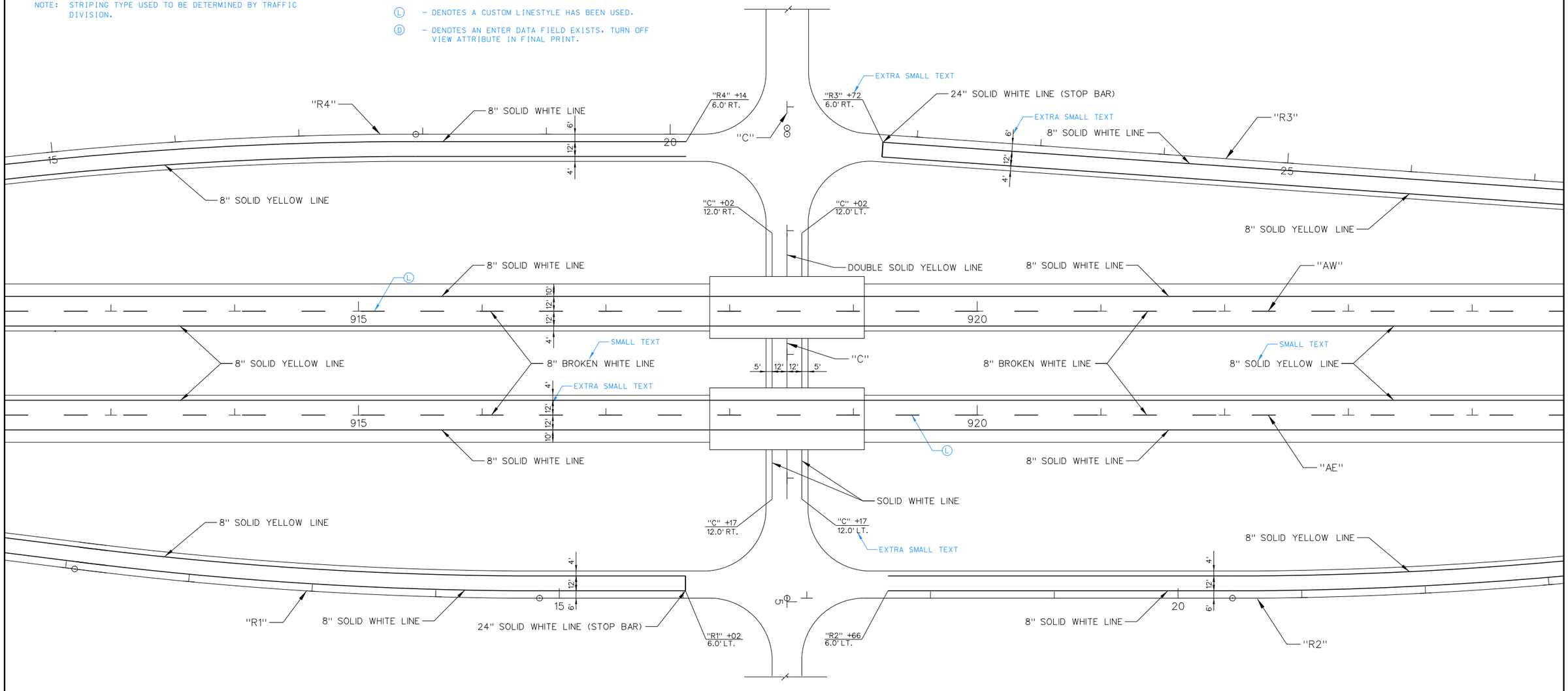
Ⓒ - DENOTES CELLS HAVE BEEN USED.

Ⓛ - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

Ⓓ - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

FT=3

NOTE - LANE WIDTHS SHALL BE MEASURED FROM THE CONTROL LINE, SHOULDER DIMENSIONS ARE FOR REFERENCE ONLY.



RURAL STRIPING
1"=80' TYPICALLY

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

Ⓓ

PERMANENT STRIPING DETAILS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	AC-NH-DE-395-2(034)	CARSON CITY	ST3

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: STRIPING TYPE USED TO BE DETERMINED BY TRAFFIC DIVISION.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.2:0.4 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CONTROL LINE.

NOTE: THE OFFSETS, AND CORRESPONDING LANE WIDTHS, ONLY NEED TO BE SHOWN IN DECIMAL FORM TO ONE (1) DECIMAL PLACE. THE ACCURACY OF THE OFFSETS SHOULD BE TO THE NEAREST HALF FOOT

(C) – DENOTES CELLS HAVE BEEN USED.

(L) – DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

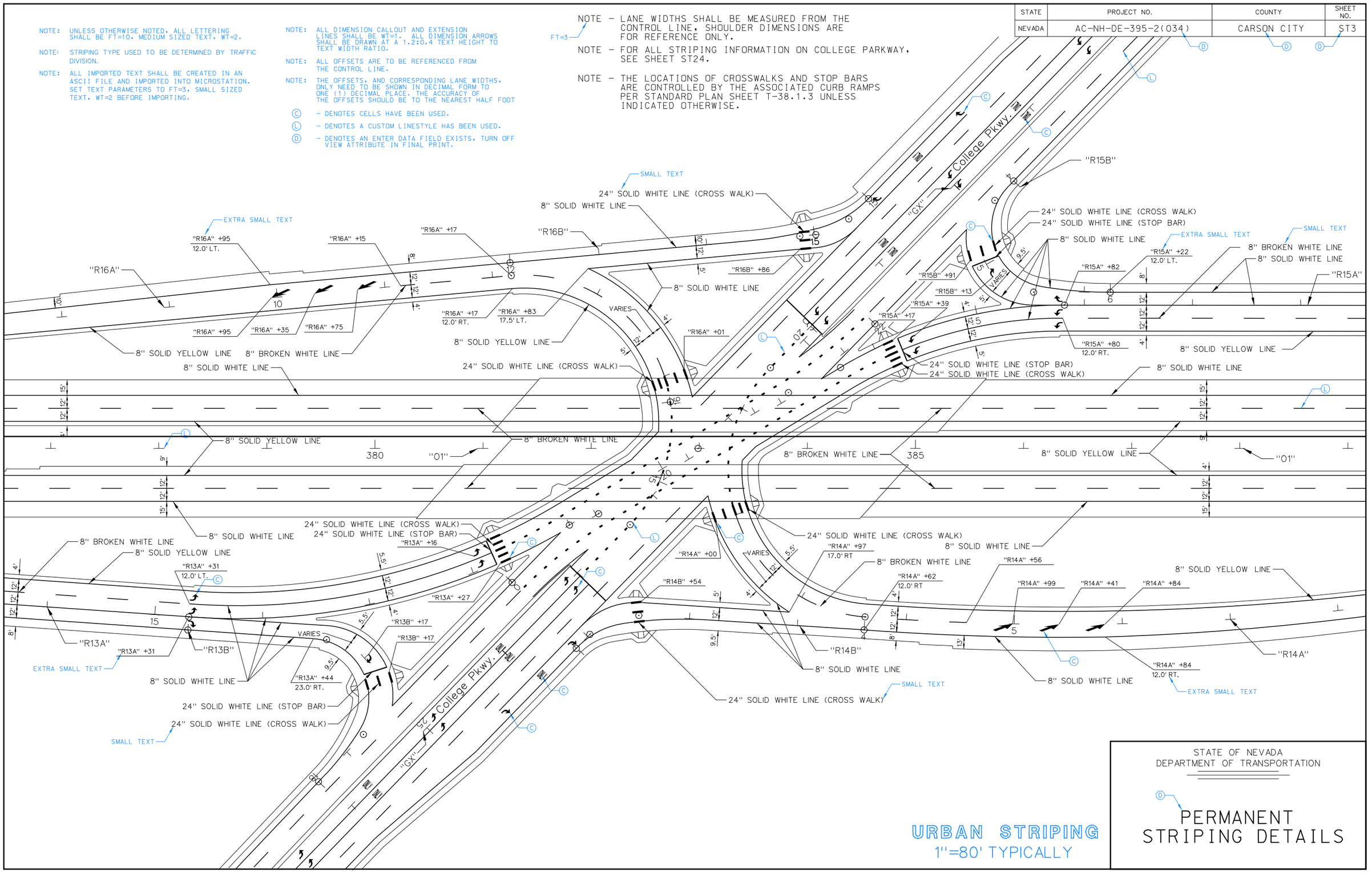
(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

FT=3

NOTE – LANE WIDTHS SHALL BE MEASURED FROM THE CONTROL LINE, SHOULDER DIMENSIONS ARE FOR REFERENCE ONLY.

NOTE – FOR ALL STRIPING INFORMATION ON COLLEGE PARKWAY, SEE SHEET ST24.

NOTE – THE LOCATIONS OF CROSSWALKS AND STOP BARS ARE CONTROLLED BY THE ASSOCIATED CURB RAMPS PER STANDARD PLAN SHEET T-38.1.3 UNLESS INDICATED OTHERWISE.



URBAN STRIPING
1"=80' TYPICALLY

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

(D)

PERMANENT STRIPING DETAILS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPF-050-1(11)9 (D)	WHITE PINE (D)	ST4 (D)

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.2:0.4 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CONTROL LINE.

NOTE: THE OFFSETS, AND CORRESPONDING LANE WIDTHS, ONLY NEED TO BE SHOWN IN DECIMAL FORM TO ONE (1) DECIMAL PLACE. THE ACCURACY OF THE OFFSETS SHOULD BE TO THE NEAREST HALF FOOT

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT TYPE PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: STRIPING TYPE USED TO BE DETERMINED BY TRAFFIC DIVISION.

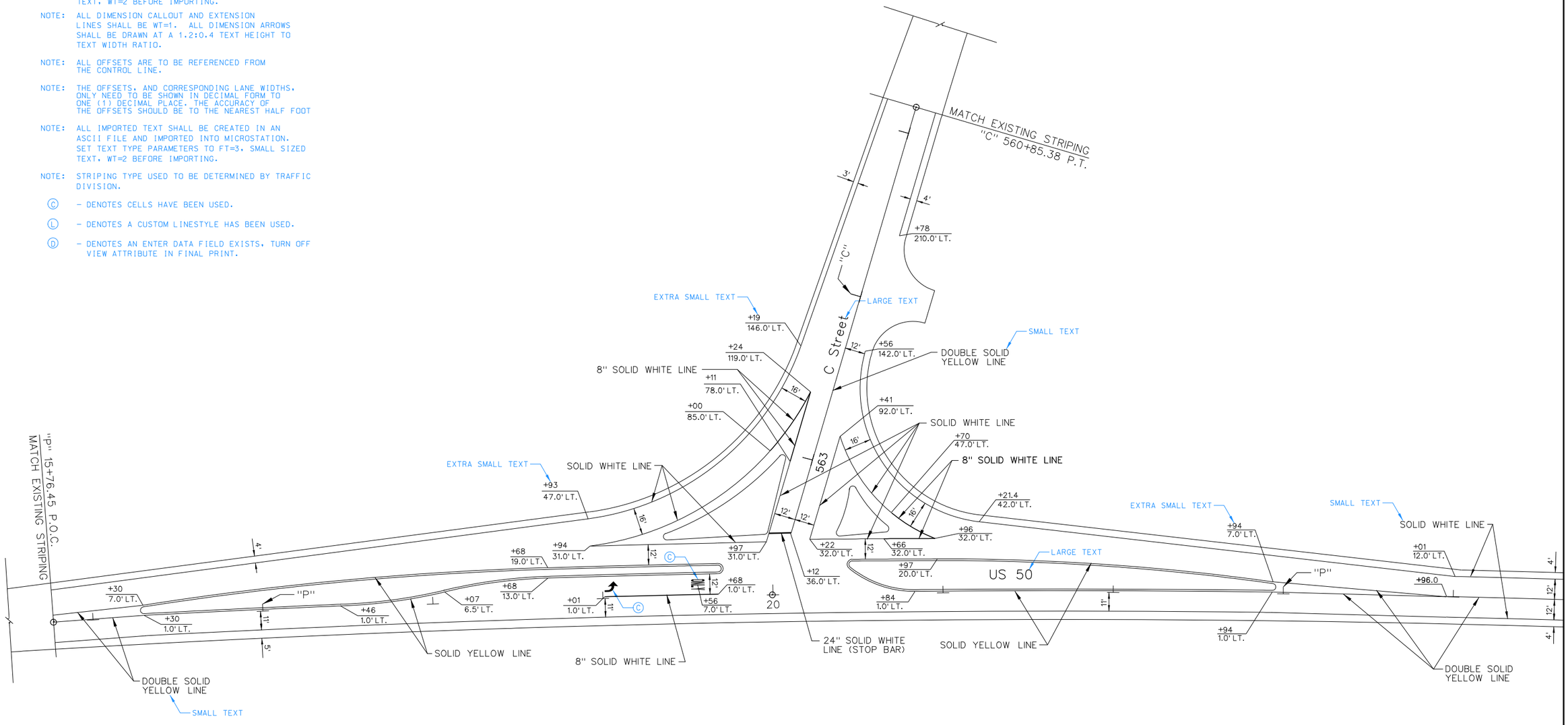
Ⓒ - DENOTES CELLS HAVE BEEN USED.

Ⓛ - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

Ⓓ - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

FT=3

NOTE - LANE WIDTHS SHALL BE MEASURED FROM THE CONTROL LINE, SHOULDER DIMENSIONS ARE FOR REFERENCE ONLY.



RURAL STRIPING

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

(D)

PERMANENT STRIPING DETAILS

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.2:0.4 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: STRIPING TYPE USED TO BE DETERMINED BY TRAFFIC DIVISION.

NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CONTROL LINE.

NOTE: THE OFFSETS, AND CORRESPONDING LANE WIDTHS, ONLY NEED TO BE SHOWN IN DECIMAL FORM TO ONE (1) DECIMAL PLACE. THE ACCURACY OF THE OFFSETS SHOULD BE TO THE NEAREST HALF FOOT

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

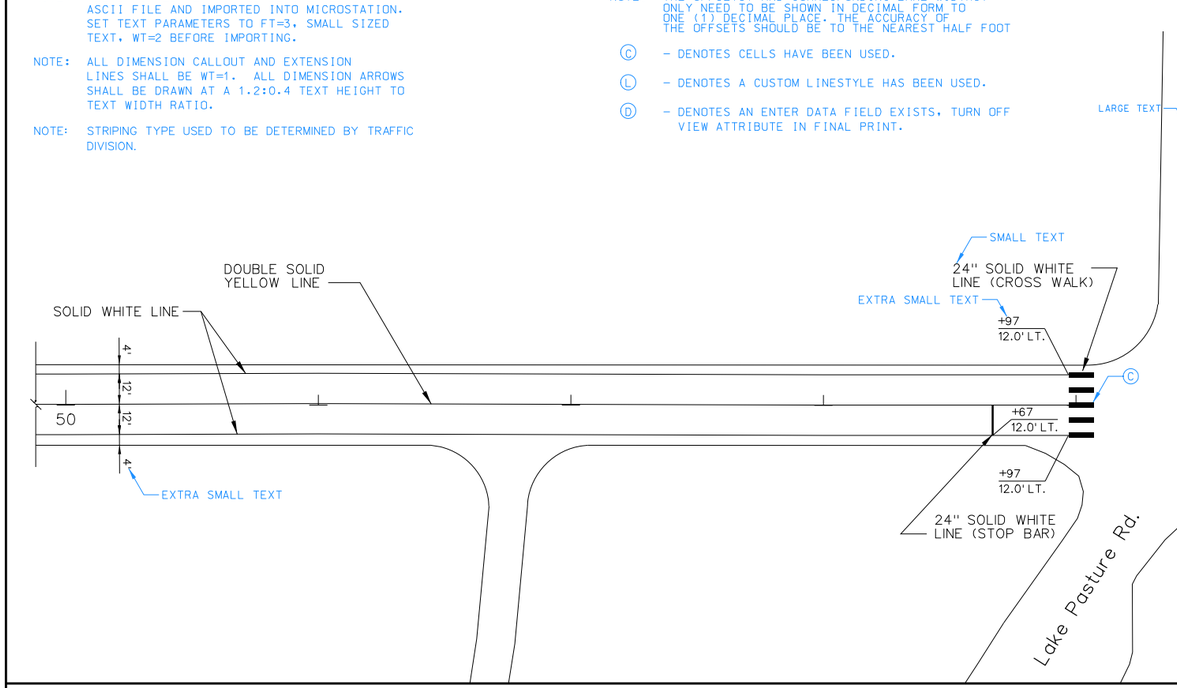
(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

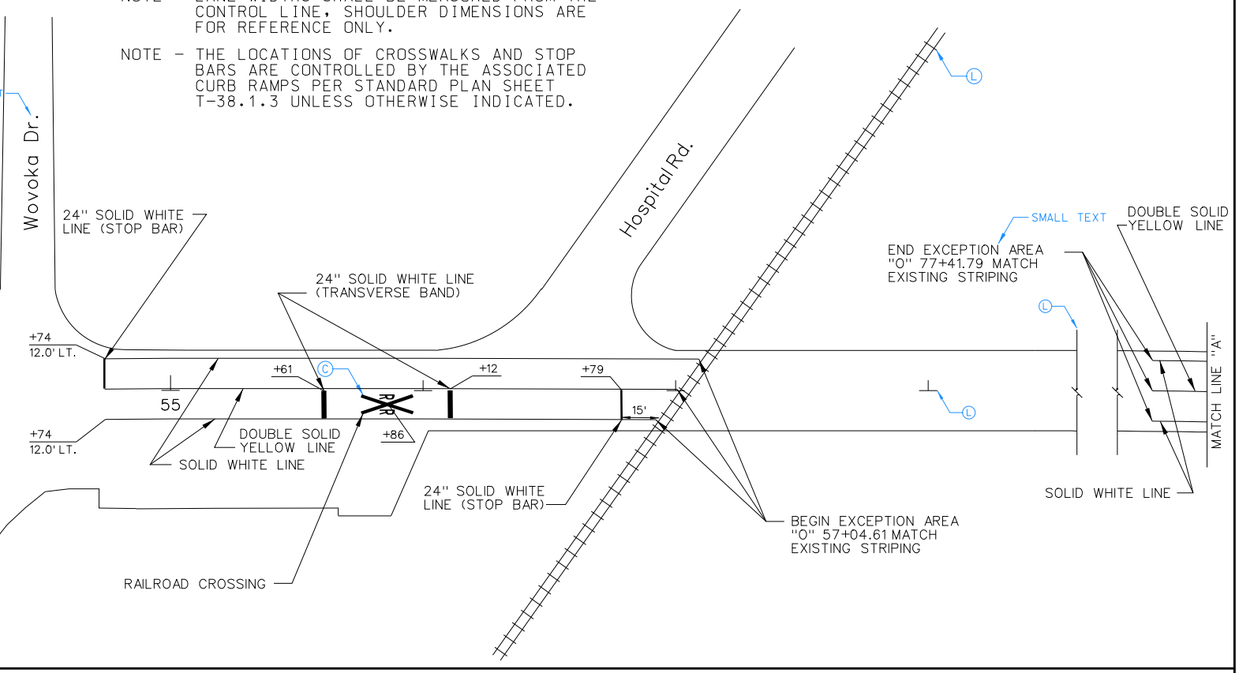
STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPF-095-1(2)	CHURCHILL	ST5

FT=3

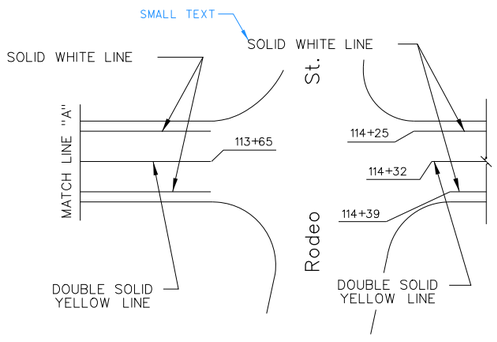
NOTE - LANE WIDTHS SHALL BE MEASURED FROM THE CONTROL LINE, SHOULDER DIMENSIONS ARE FOR REFERENCE ONLY.

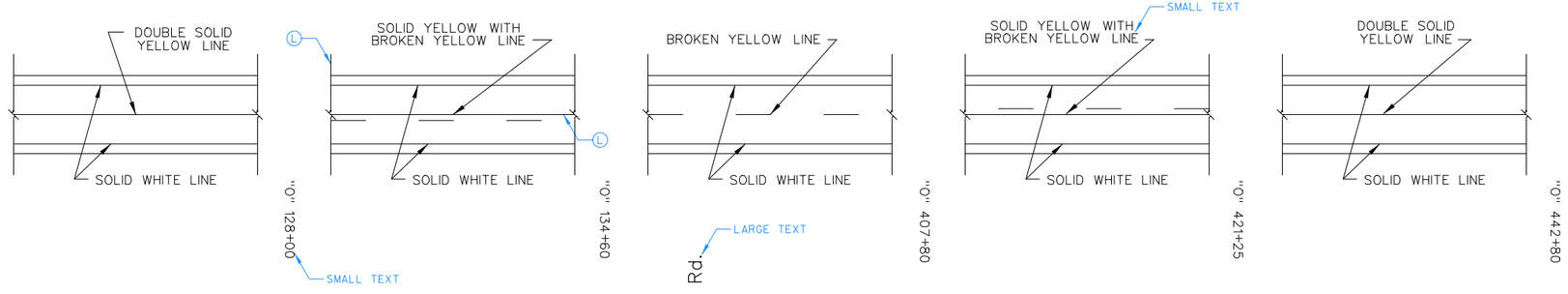
NOTE - THE LOCATIONS OF CROSSWALKS AND STOP BARS ARE CONTROLLED BY THE ASSOCIATED CURB RAMPS PER STANDARD PLAN SHEET T-38.1.3 UNLESS OTHERWISE INDICATED.

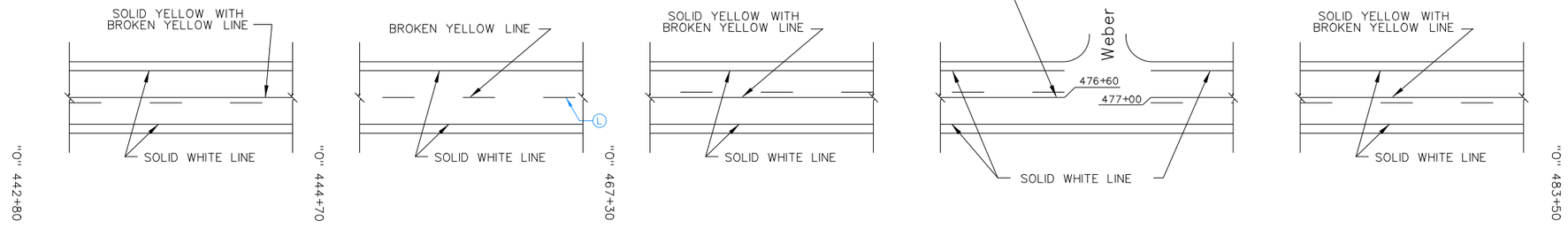




NOTE - LANE WIDTHS ARE 12' TYPICAL AND DIMENSIONED FROM CENTER LINE LT. AND RT. FOR ALL STRIPING







RURAL STRIPING

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

(D)

PERMANENT STRIPING DETAILS

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: STRIPING TYPE USED TO BE DETERMINED BY TRAFFIC DIVISION.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.2:0.4 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: THE OFFSETS, AND CORRESPONDING LANE WIDTHS, ONLY NEED TO BE SHOWN IN DECIMAL FORM TO ONE (1) DECIMAL PLACE. THE ACCURACY OF THE OFFSETS SHOULD BE TO THE NEAREST HALF FOOT

NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CONTROL LINE.

Ⓒ - DENOTES CELLS HAVE BEEN USED.

Ⓛ - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

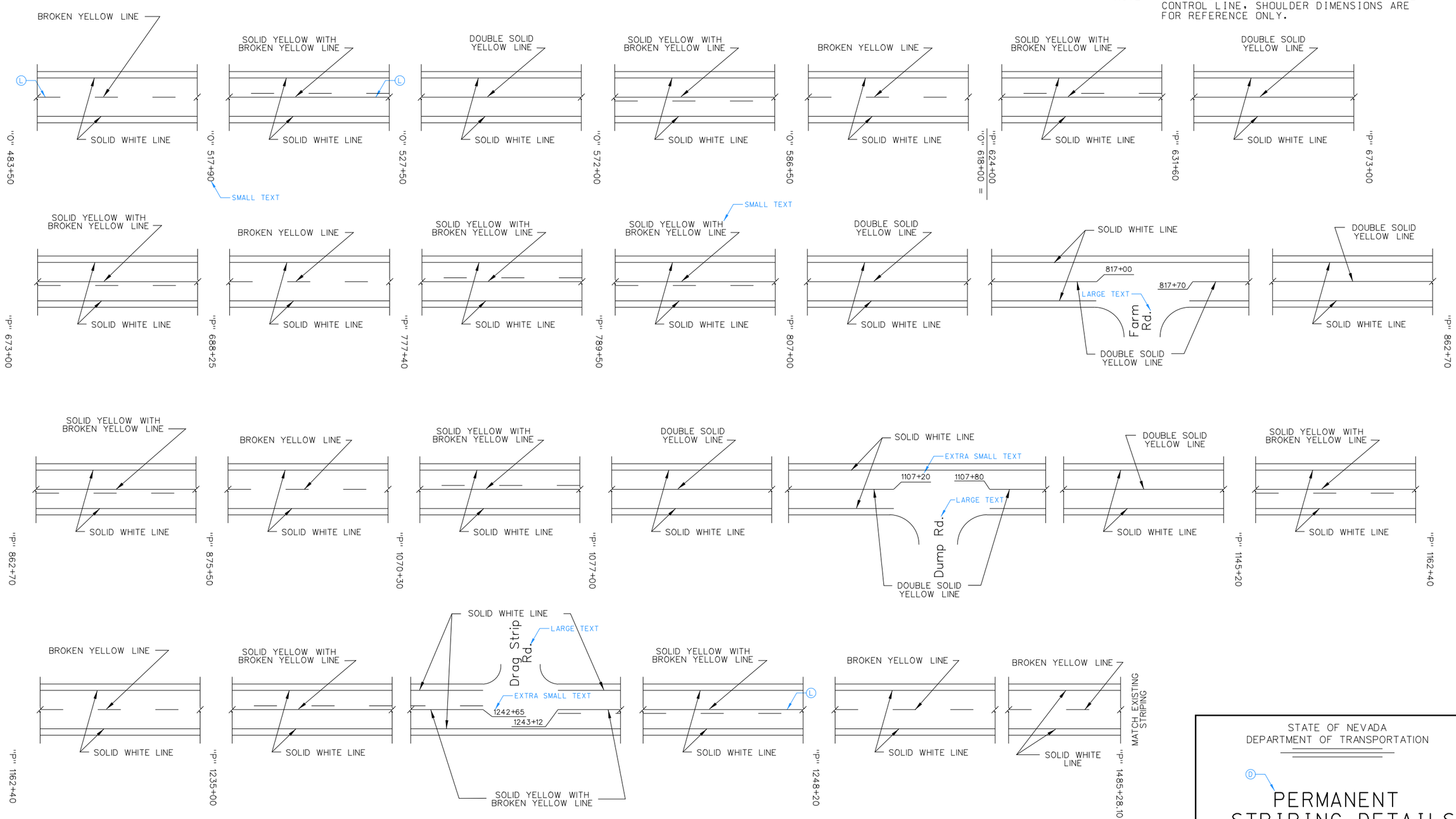
Ⓓ - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPF-095-1(12)	CHURCHILL	ST6

FT=3

NOTE - LANE WIDTHS ARE 12' TYPICAL AND DIMENSIONED FROM CENTER LINE LT. AND RT. FOR ALL STRIPING

NOTE - LANE WIDTHS SHALL BE MEASURED FROM THE CONTROL LINE, SHOULDER DIMENSIONS ARE FOR REFERENCE ONLY.



RURAL STRIPING

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

Ⓓ

PERMANENT STRIPING DETAILS

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: ALL IMPORTED TEXT SHALL BE CREATED IN AN ASCII FILE AND IMPORTED INTO MICROSTATION. SET TEXT PARAMETERS TO FT=3, SMALL SIZED TEXT, WT=2 BEFORE IMPORTING.

NOTE: STRIPING TYPE USED TO BE DETERMINED BY TRAFFIC DIVISION.

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.2:0.4 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CONTROL LINE.

NOTE: THE OFFSETS, AND CORRESPONDING LANE WIDTHS, ONLY NEED TO BE SHOWN IN DECIMAL FORM TO ONE (1) DECIMAL PLACE. THE ACCURACY OF THE OFFSETS SHOULD BE TO THE NEAREST HALF FOOT.

Ⓒ - DENOTES CELLS HAVE BEEN USED.

Ⓛ - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

Ⓓ - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

NOTE - * RAISED PAVEMENT MARKERS (RPM's)

NOTE - ARROWS, ONLYS, CROSSWALKS AND STOP BARS SHALL BE THERMOPLASTIC.

NOTE - ALL RAISED PAVEMENT MARKERS SHALL BE PLACED ACCORDING TO NDOT STANDARDS.

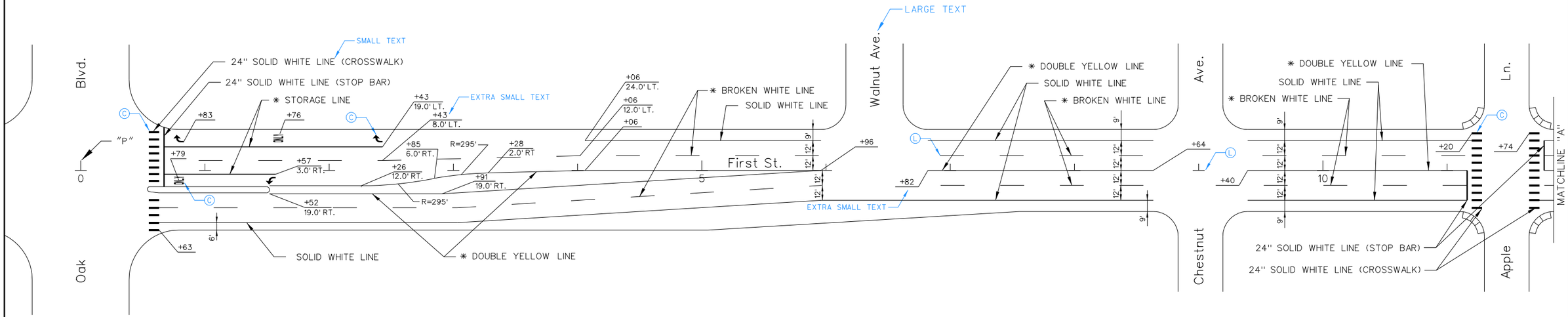
NOTE - ALL BROKEN WHITE LINES SHALL BE PLACED ACCORDING TO NDOT STANDARD T-37.1.1 (URBAN)

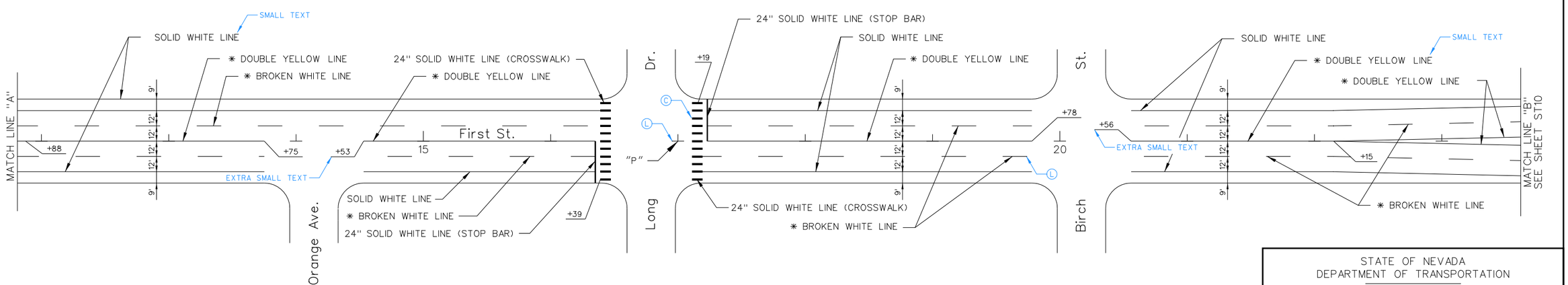
NOTE - THE LOCATIONS OF CROSSWALKS AND STOP BARS ARE CONTROLLED BY THE ASSOCIATED CURB RAMPS PER STANDARD PLAN SHEET T-38.1.3 UNLESS OTHERWISE INDICATED.

FT=3

NOTE - LANE WIDTHS SHALL BE MEASURED FROM THE CONTROL LINE, SHOULDER DIMENSIONS ARE FOR REFERENCE ONLY.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPF-169-1(2)	CLARK	ST7





RAISED PAVEMENT MARKERS

1"=80' TYPICALLY

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

Ⓓ

PERMANENT STRIPING DETAILS

7.22 Traffic Control.

General. The traffic control plans show the sequence of operation, work to be performed, materials to be used, and the traveled way to be used for all movements of traffic during each construction phase.

Traffic Control Guidelines. Traffic control plans should show detours, phasing sequences, staging areas, and traffic operations. The work zones shall be clearly delineated.

Each phase or sequence of construction should show existing roadbeds and those roadbeds completed on a previous phase. Show the construction work zone, number of lanes, and direction of traffic on each respective phase.

Existing roads or detours that have been replaced by permanent construction in previous phases shall not be shown on subsequent phases.

Location control lines, stationing, and station designation shall be shown. Lane widths shall be measured from the control line.

Plans should contain sufficient alignment, profiles, and typical cross sections to construct temporary roadways in the phasing sequence shown. It is not necessary to show profiles and typical cross sections if they are clearly shown elsewhere in the project plans. However, if they are not shown in the traffic control plans, reference should be made to the appropriate sheet.

Show existing infrastructure or topography that is necessary to rationalize the proposed improvements. Work zones and traffic devices shall be clearly defined with appropriate symbols and area patterning. Legends shall be provided to define area patterning and symbols where appropriate.

If utility installation or relocation work by others is to be coordinated with the contractors operations, such work shall be shown on the plans and designated as work to be done by others. Cross-reference should be made to the utility sheet that applies.

The traffic control sheets shall be arranged in the following order:

- Traffic control device matrix
- Phasing and staging diagram (if applicable)
- Traffic control plans
- Special sign details

The traffic control matrix shows the various quantities of materials needed for each phase or stage of the traffic control and is to be included in the plans. The matrix summarizes the totals that will be used on the contract, irrespective of the number of phases and stages on the contract to obtain a use total.

The traffic control plans shall include temporary drainage, temporary signing, temporary striping, pavement widening, and temporary lighting requirements. Modifications of existing traffic signals or installation of temporary signals may be required for each stage of construction. If deemed necessary, electrical plan sheets should be provided to cross-reference the appropriate electrical plans.

Show all traffic control devices, including but not limited to, construction signs, alterations to permanent signs and special sign details, drums and/or cones, barricades, traffic barriers and crash cushions, arrow boards, signal systems and changeable message boards, flagger stations and uniformed traffic control officers, and pavement markings.

Traffic Control Particulars.

1) Sheet numbering for the traffic control sheets shall begin with TC1. Multiple sheets shall be numbered TC1, TC2, TC3, etc.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-0160(013)	CLARK	TC1

SUMMARY OF CONSTRUCTION SIGNS AND DEVICES

RENT CONSTRUCTION SIGN 625 0004		PANEL SIZE	SQFT	PHASE 1		PHASE 2		PHASE 3		PHASE 4		MISC	NO. OF	SQ.FT.
SIGN NO.	MESSAGE	(INxIN)		STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2		SIGNS	TOTAL
NBA-1	BUSINESS ACCESS (RIGHT ARROW)	42 X 42	12.3			1			1	1			1	12.25
NDP-1	30 MINUTE DELAY POSSIBLE	48 X 36	12.0					4	3	3	4		4	48
NPS-1	PERPARE TO STOP	48 X 48	16.0					42	44	42	41		44	704
NTL-1	LEFT TURN LANE	48 X 30	10.0					1					1	10
NWZ-1	BEGIN WORK ZONE	48 X 24	8.0	4	3	3	4	4	3	3	4		4	32
NWZ-2	END WORK ZONE	48 X 24	8.0	4	3	3	4	4	3	3	4		4	32
NWZ-3	DOUBLE PENALITY IN WORK ZONE	48 X 48	16.0	4	3	3	4	4	3	3	4		4	64
R3-7L	LEFT LANE MUST TURN LEFT	30 X 30	6.3								1		1	6.25
R4-7A	KEEP RIGHT	24 X 30	5.0			4		3	4	3	2		4	20
R5-1	DO NOT ENTER	48 X 48	16.0			1			1	1			1	16
W1-4L	REVERSE CURVE (LEFT)	48 X 48	16.0					1			1		1	16
W20-1	ROAD WORK AHEAD	48 X 48	16.0	30	36	38	34	42	44	42	41		44	704
W20-5L	LEFT LANE CLOSED AHEAD	48 X 48	16.0					1	1		1		1	16
W20-5R	RIGHT LANE CLOSED AHEAD	48 X 48	16.0					1		1	1		1	16
W20-7A	FLAGGER SYMBOL	48 X 48	16.0					4	3	3	4		4	64
W21-5	SHOULDER WORK	36 X 36	9.0	5	5	3	4						5	45
W4-2L	LANE ENDS (LEFT)	48 X 48	16.0					1					1	16
W4-2R	LANE ENDS (RIGHT)	48 X 48	16.0					1	1	1	2		2	32
											TOTAL		127	1854

RENT TRAFFIC CONTROL DEVICES			PHASE 1		PHASE 2		PHASE 3		PHASE 4			USE
UNIT OF WORK	ITEM DESCRIPTION		STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	STAGE 1	STAGE 2	MISC.	TOTAL
202-1328	REMOVAL OF PAINTED TRAFFIC LINE	LINFT			12915	12915			12915	12915		51660
625-0072	RENT TRAFFIC DRUMS	EACH	456		456	21	809	674	574	903		903
625-0088	RENT TEMPORARY IMPACT ATTENUATOR	EACH	14	10	26	24						26
625-0512	RENT PORTABLE PRE-CAST CONCRETE BARRIER RAIL	LINFT	986	905	909	1013						1013
634-0646	TEMPORARY PAINTED STRIPING (DOUBLE SOLID YELLOW)	MILE			9.31				9.31			9.31
636-0532	TEMPORARY PAINTED STRIPING (SOLID WHITE)	MILE			9.31				9.31			9.31

NOTES TO DESIGNER

1) DO YOU NEED T.C. OPERATION FOR PLACEMENT OF O.G.

2) TOTAL NUMBER OF TC DEVICES IS BASED ON CONCURRENT WORK AND MISC. TRAFFIC CONTROL DEVICES. (LIST UNDER NOTES)

3) THIS FORMAT MAY BE BE ALTERED TO FIT PROJECT NEEDS

4) INCLUDE TEMPORARY STRIPING WHEN THEY ARE TO BE PAID FOR.

5) USE THE PHASE # / STAGE # NAMING CONVENTION.

6) EXPLAIN QUANTITIES IN THE MISC. COLUMN

NOTES:

1) QUANTITIES SHOWN ARE APPROXIMATED AND ARE SUBJECT TO INCREASE OR DECREASE. ADDITIONAL SIGNS NOT LISTED, MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

2) FOR DETAILS AND DIMENSIONS NOT SHOWN SEE STATE OF NEVADA DEPARTMENT OF TRANSPORTATION STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION. 200* ENGLISH VERSION AND NEVADA SIGN SUPPLEMENT 200* EDITION

3) TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE REQUIREMENTS OF THE M.U.T.C.D. 200* AND NEVADA DEPARTMENT OF TRANSPORTATION STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION 200* ENGLISH VERSION.

4) THE TOTAL NUMBER OF TRAFFIC CONTROL DEVICES IS BASED UPON CONCURRENT WORK ON PHASE X - STAGE X THROUGH PHASE Y - STAGE Y

5) SIGNS IN THE MISC COLUMN ARE NOT SHOWN IN THE TRAFFIC CONTROL PLAN SHEETS.

* Standards used in plan development

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL MATRIX

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	SPSR-1(756)12	DOUGLAS	TC2

– LEGEND –

- TRAFFIC DRUMS @ 65' SPACING
- TEMPORARY IMPACT ATTENUATOR (65 mph)
- TEMPORARY PORTABLE PRECAST CONCRETE BARRIER RAIL
- WORK ZONE
- ARROW BOARD TYPE C

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: DRAFTED TRAFFIC CONTROL SHEETS START AT TC-2 (TC-1 IS RESERVED FOR TRAFFIC CONTROL MATRIX)

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: THE ACTIVE LEVEL MUST BE SET MANUALLY FOR ALL TRAFFIC CONTROL CELLS, DIMENSIONING ETC. THE ACTIVE LEVEL MUST CORRESPOND TO THE PHASE AND STAGE.

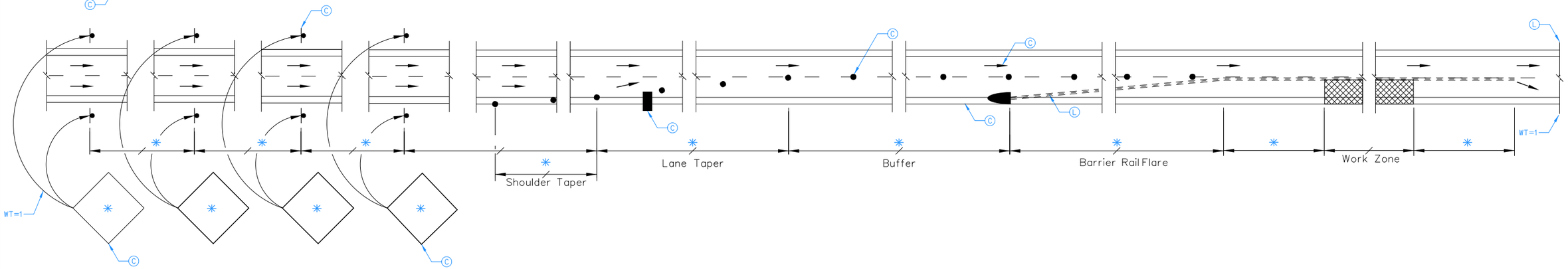
NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CENTERLINE OR WHATEVER LINE OF STATIONING IS USED WHICH WILL REQUIRE A STATION "PLUS" ALONG WITH APPROPRIATE OFFSET WIDTH.

(C) – DENOTES CELLS HAVE BEEN USED.

(L) – DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

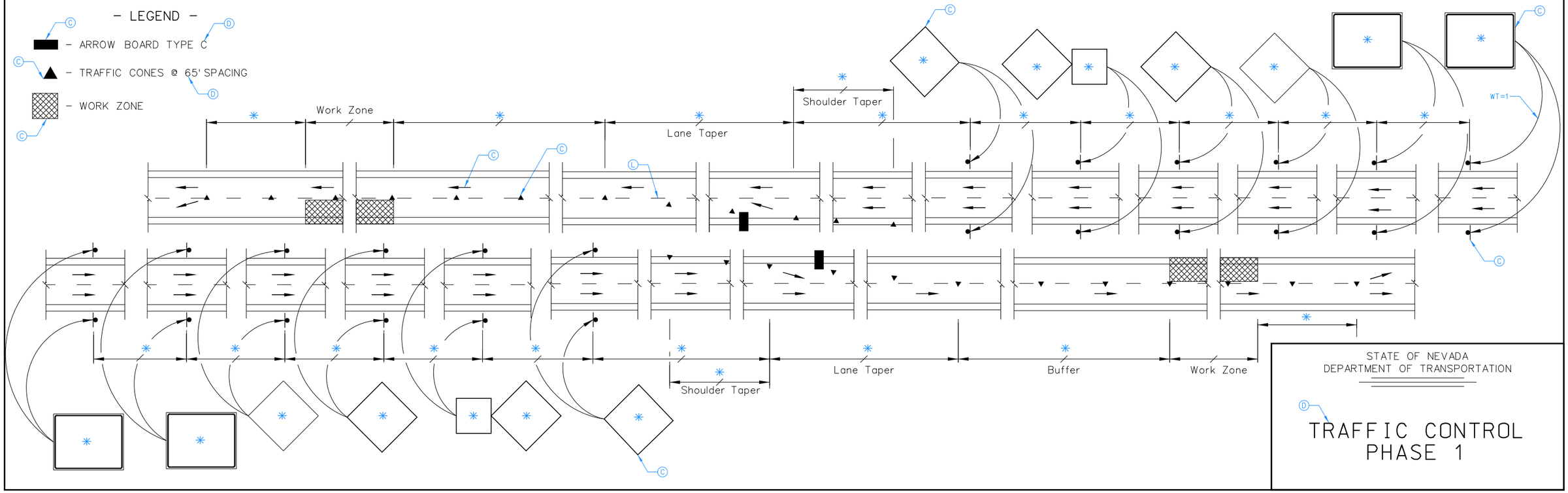
(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

* – REFER TO STANDARD PLANS FOR SIGN USAGE AND SPACING



– LEGEND –

- ARROW BOARD TYPE C
- TRAFFIC CONES @ 65' SPACING
- WORK ZONE



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL PHASE 1

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-IR-080-1(114)9 (D)	WASHOE (D)	TC3 (D)

- LEGEND -

(C) – WORK ZONE

(C) – TRAFFIC DRUMS @ 10' SPACING

(C) – FLAGGER (LOCATION TO BE DETERMINED BY FIELD ENGINEER)

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: DRAFTED TRAFFIC CONTROL SHEETS START AT TC-2 (TC-1 IS RESERVED FOR TRAFFIC CONTROL MATRIX)

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CENTERLINE OR WHATEVER LINE OF STATIONING IS USED WHICH WILL REQUIRE A STATION "PLUS" ALONG WITH APPROPRIATE OFFSET WIDTH.

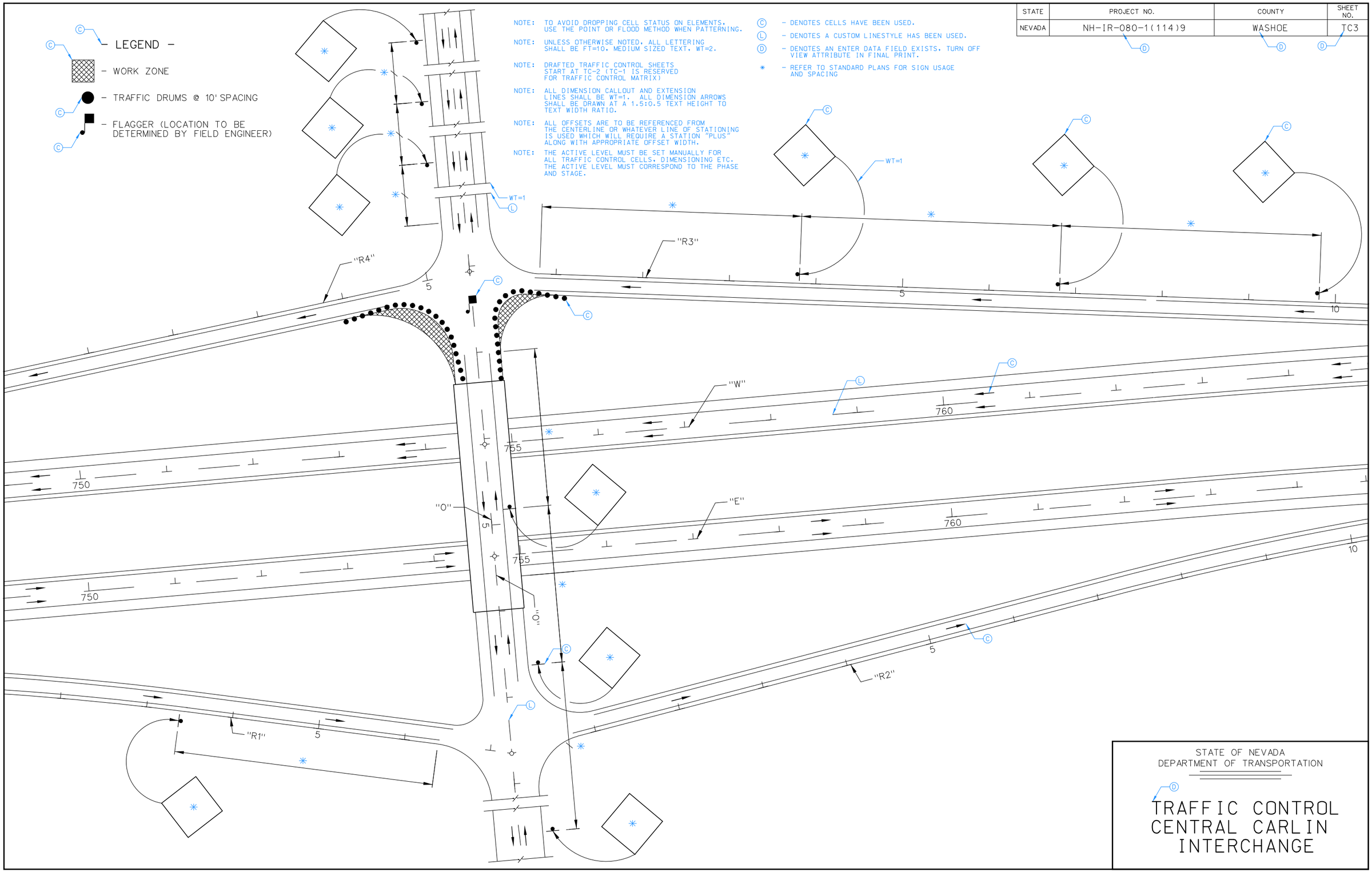
NOTE: THE ACTIVE LEVEL MUST BE SET MANUALLY FOR ALL TRAFFIC CONTROL CELLS, DIMENSIONING ETC. THE ACTIVE LEVEL MUST CORRESPOND TO THE PHASE AND STAGE.

(C) – DENOTES CELLS HAVE BEEN USED.

(L) – DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

* – REFER TO STANDARD PLANS FOR SIGN USAGE AND SPACING



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

(D)

TRAFFIC CONTROL CENTRAL CARLIN INTERCHANGE

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-IR-080-1(114)9	WASHOE	TC4

– LEGEND –

- WORK ZONE
- TRAFFIC DRUMS @ 55' SPACING
- ARROW BOARD TYPE C

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: DRAFTED TRAFFIC CONTROL SHEETS START AT TC-2 (TC-1 IS RESERVED FOR TRAFFIC CONTROL MATRIX)

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: THE ACTIVE LEVEL MUST BE SET MANUALLY FOR ALL TRAFFIC CONTROL CELLS, DIMENSIONING ETC. THE ACTIVE LEVEL MUST CORRESPOND TO THE PHASE AND STAGE.

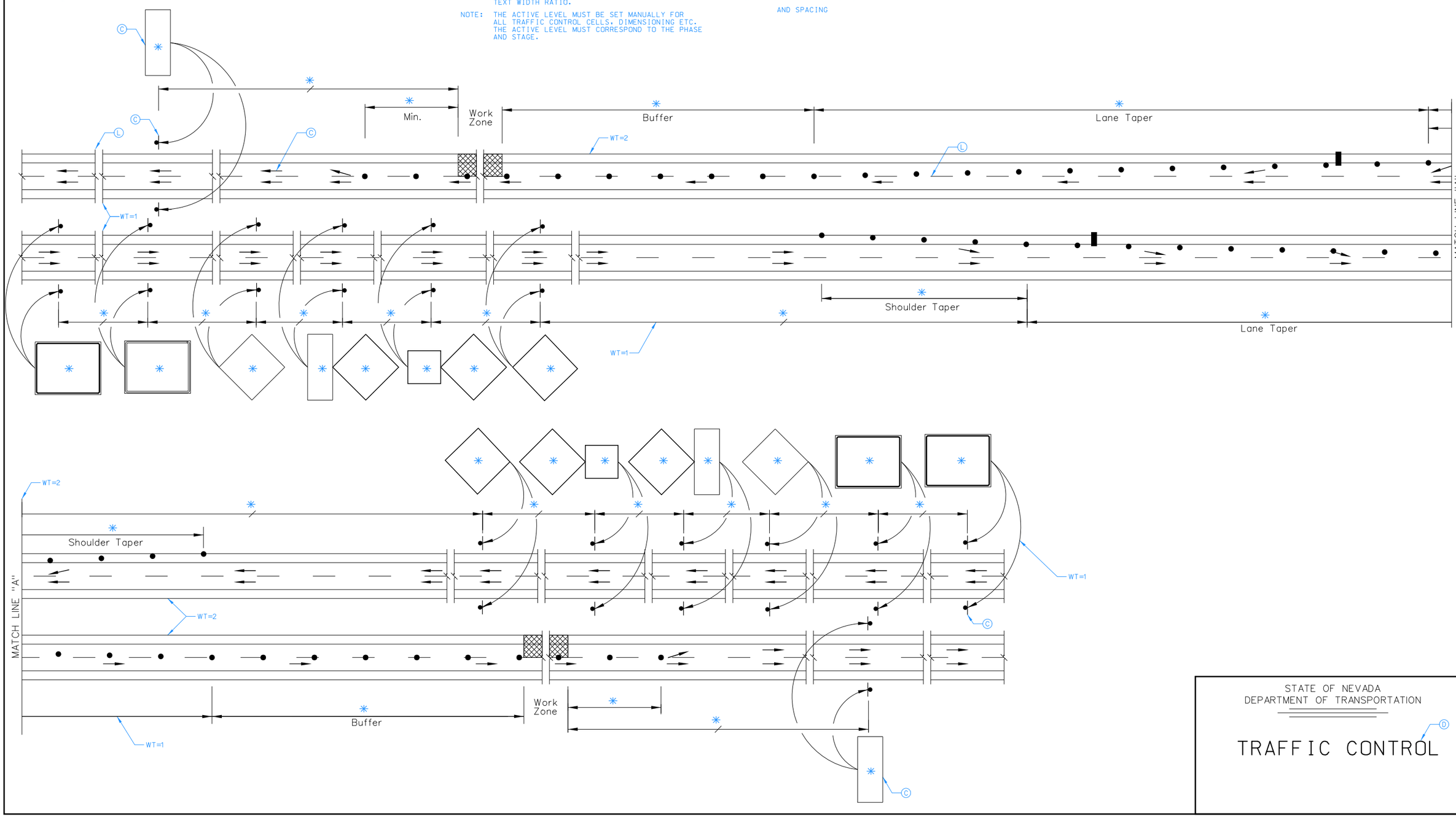
NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CENTERLINE OR WHATEVER LINE OF STATIONING IS USED WHICH WILL REQUIRE A STATION "PLUS" ALONG WITH APPROPRIATE OFFSET WIDTH.

(C) – DENOTES CELLS HAVE BEEN USED.

(L) – DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

* – REFER TO STANDARD PLANS FOR SIGN USAGE AND SPACING



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-IR-080-1(114)9	WASHOE	TC5

- LEGEND -

- WORK ZONE
- TRAFFIC DRUMS @ 55' SPACING
- ARROW BOARD TYPE C
- TEMPORARY PORTABLE PRECAST CONCRETE BARRIER RAIL
- TEMPORARY IMPACT ATTENUATOR (45 mph)

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: DRAFTED TRAFFIC CONTROL SHEETS START AT TC-2 (TC-1 IS RESERVED FOR TRAFFIC CONTROL MATRIX)

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

NOTE: THE ACTIVE LEVEL MUST BE SET MANUALLY FOR ALL TRAFFIC CONTROL CELLS. DIMENSIONING ETC. THE ACTIVE LEVEL MUST CORRESPOND TO THE PHASE AND STAGE.

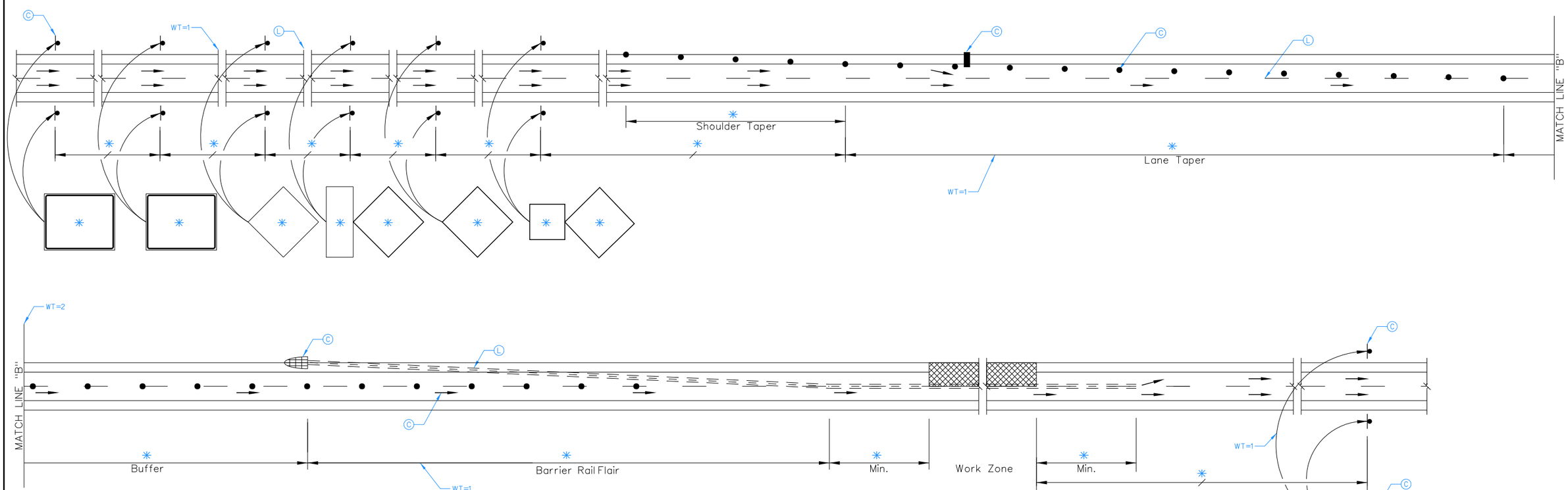
NOTE: ALL OFFSETS ARE TO BE REFERENCED FROM THE CENTERLINE OR WHATEVER LINE OF STATIONING IS USED WHICH WILL REQUIRE A STATION "PLUS" ALONG WITH APPROPRIATE OFFSET WIDTH.

(C) - DENOTES CELLS HAVE BEEN USED.

(L) - DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) - DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.

* - REFER TO STANDARD PLANS FOR SIGN USAGE AND SPACING



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-IR-080-1(114)9	WASHOE	TC6

– LEGEND –

– BARRICADE TYPE III B

– TRAFFIC DRUMS @ 65' SPACING

– WORK ZONE

NOTE: TO AVOID DROPPING CELL STATUS ON ELEMENTS, USE THE POINT OR FLOOD METHOD WHEN PATTERNING.

NOTE: UNLESS OTHERWISE NOTED, ALL LETTERING SHALL BE FT=10, MEDIUM SIZED TEXT, WT=2.

NOTE: DRAFTED TRAFFIC CONTROL SHEETS START AT TC-2 (TC-1 IS RESERVED FOR TRAFFIC CONTROL MATRIX)

NOTE: ALL DIMENSION CALLOUT AND EXTENSION LINES SHALL BE WT=1. ALL DIMENSION ARROWS SHALL BE DRAWN AT A 1.5:0.5 TEXT HEIGHT TO TEXT WIDTH RATIO.

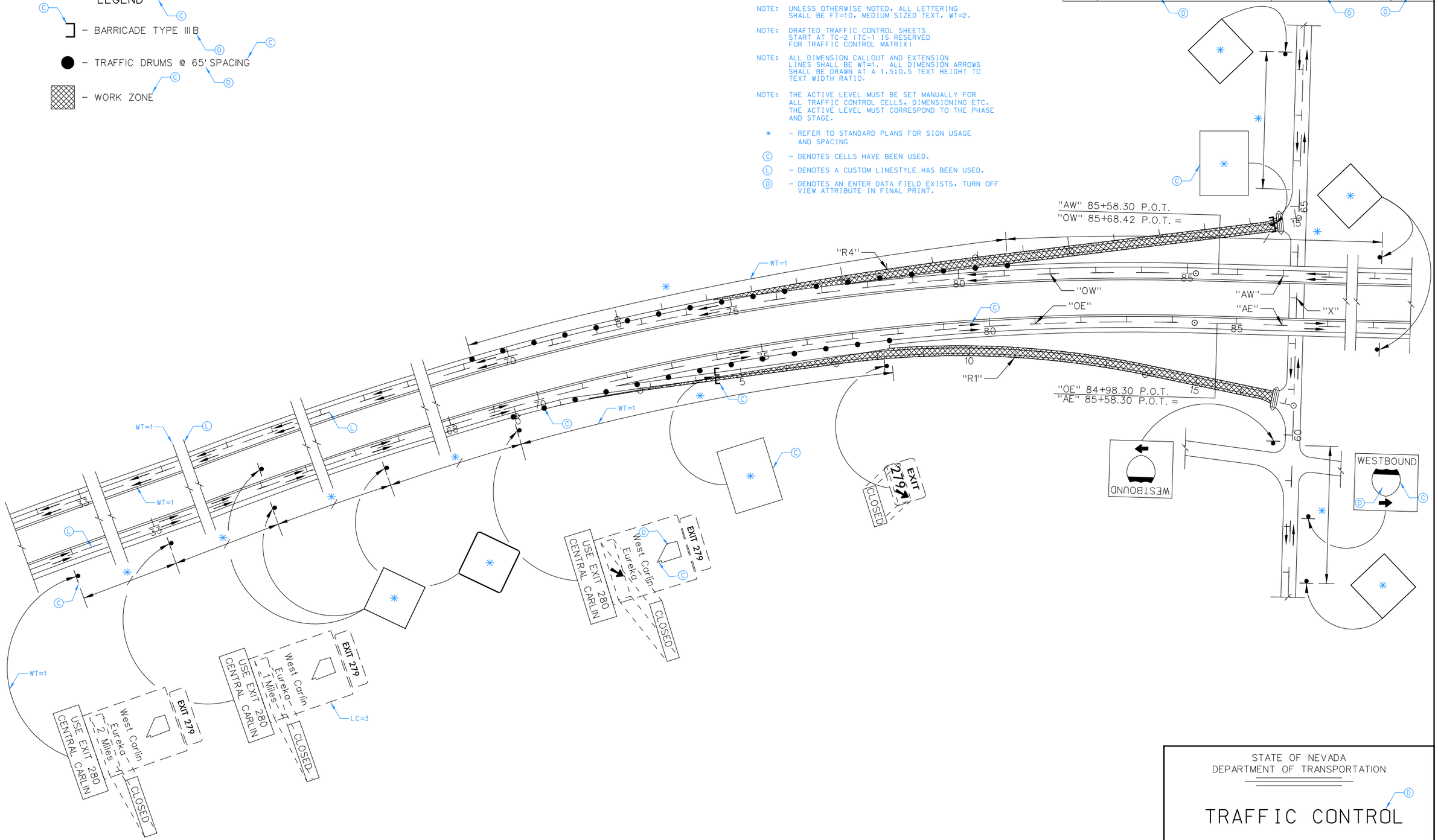
NOTE: THE ACTIVE LEVEL MUST BE SET MANUALLY FOR ALL TRAFFIC CONTROL CELLS, DIMENSIONING ETC. THE ACTIVE LEVEL MUST CORRESPOND TO THE PHASE AND STAGE.

* – REFER TO STANDARD PLANS FOR SIGN USAGE AND SPACING

(C) – DENOTES CELLS HAVE BEEN USED.

(L) – DENOTES A CUSTOM LINESTYLE HAS BEEN USED.

(D) – DENOTES AN ENTER DATA FIELD EXISTS, TURN OFF VIEW ATTRIBUTE IN FINAL PRINT.



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

7.23 Signals, Lighting and Intelligent Transportation Systems.

General. The signals, lighting and ITS sheets show the necessary details for constructing the associated proposed public traffic information systems, signal and lighting systems. This work normally consists of systems requiring energizing and/or special communication and data connections.

Signals, Lighting and Intelligent Transportation Systems Guidelines. The Traffic section of the Traffic and Safety Division or the local agency supplies signal and lighting sheets. Upon completion, these plans are supplied to Roadway Design for incorporation into the contract plans.

The information provided to the traffic designer will show the locations of all new and existing features such as geometrics, right-of-way, drainage, and bridges so that these features can be taken into account in the lighting, signals and ITS design.

Signals, Lighting and Intelligent Transportation Systems Particulars.

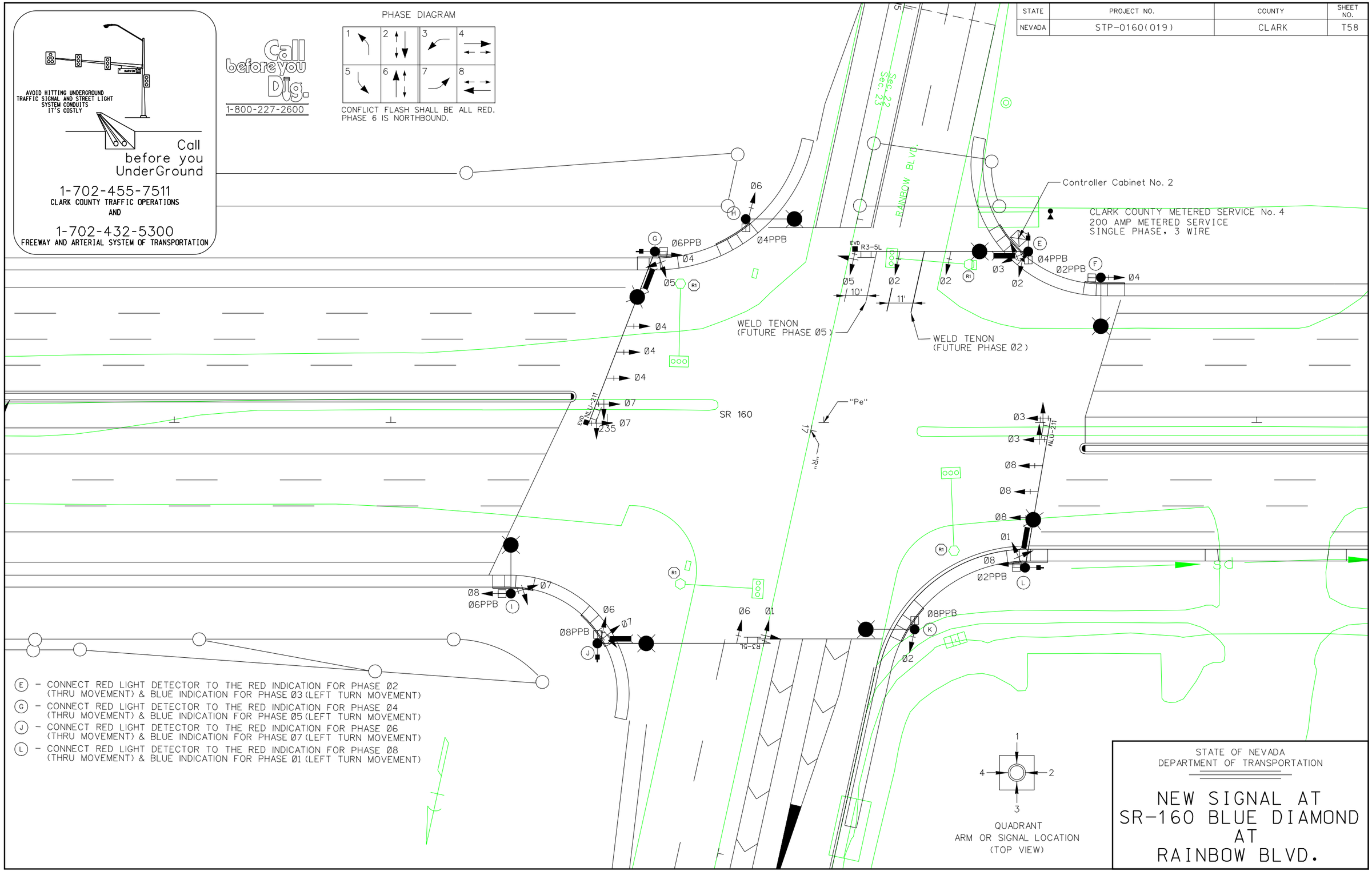
1) Sheet numbering for the signals, lighting, and intelligent transportation systems shall begin with T1. Multiple sheets shall be numbered T1, T2, T3, etc.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T58

Call before you Dig.
1-800-227-2600

PHASE DIAGRAM

CONFLICT FLASH SHALL BE ALL RED.
PHASE 6 IS NORTHBOUND.



(E) – CONNECT RED LIGHT DETECTOR TO THE RED INDICATION FOR PHASE Ø2 (THRU MOVEMENT) & BLUE INDICATION FOR PHASE Ø3 (LEFT TURN MOVEMENT)

(G) – CONNECT RED LIGHT DETECTOR TO THE RED INDICATION FOR PHASE Ø4 (THRU MOVEMENT) & BLUE INDICATION FOR PHASE Ø5 (LEFT TURN MOVEMENT)

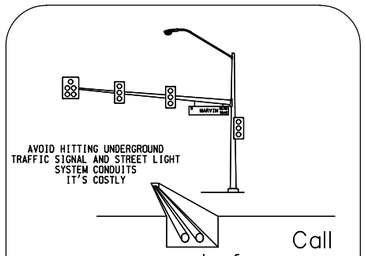
(J) – CONNECT RED LIGHT DETECTOR TO THE RED INDICATION FOR PHASE Ø6 (THRU MOVEMENT) & BLUE INDICATION FOR PHASE Ø7 (LEFT TURN MOVEMENT)

(L) – CONNECT RED LIGHT DETECTOR TO THE RED INDICATION FOR PHASE Ø8 (THRU MOVEMENT) & BLUE INDICATION FOR PHASE Ø1 (LEFT TURN MOVEMENT)

QUADRANT
ARM OR SIGNAL LOCATION
(TOP VIEW)

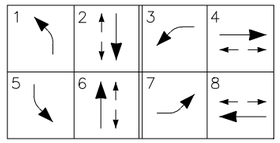
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

NEW SIGNAL AT SR-160 BLUE DIAMOND AT RAINBOW BLVD.



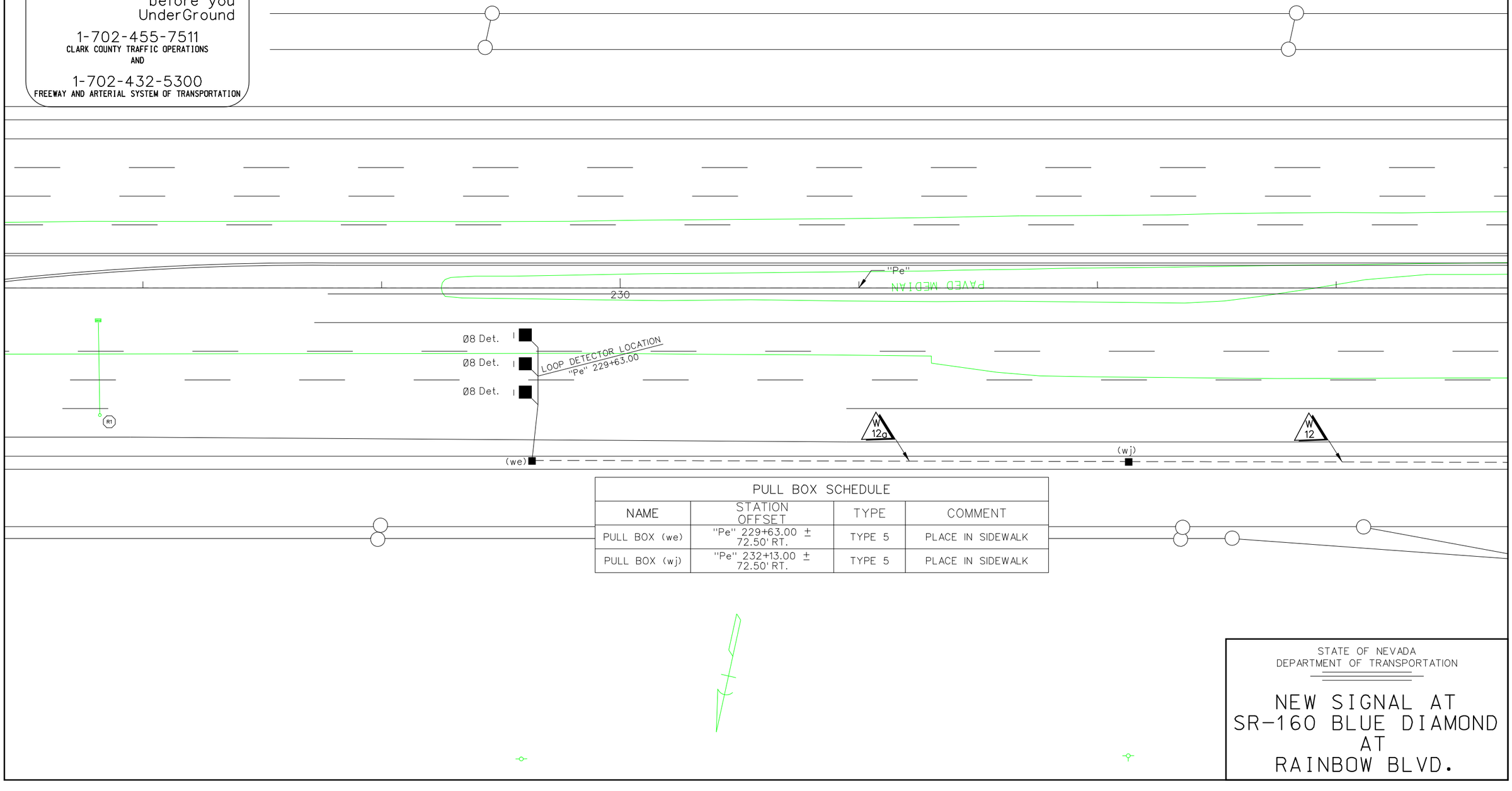
Call before you Dig.
1-800-227-2600

PHASE DIAGRAM



CONFLICT FLASH SHALL BE ALL RED.
PHASE 6 IS NORTHBOUND.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T59

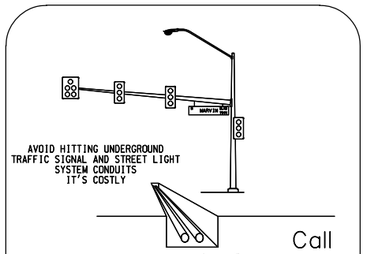


PULL BOX SCHEDULE			
NAME	STATION OFFSET	TYPE	COMMENT
PULL BOX (we)	"Pe" 229+63.00 ± 72.50' RT.	TYPE 5	PLACE IN SIDEWALK
PULL BOX (wj)	"Pe" 232+13.00 ± 72.50' RT.	TYPE 5	PLACE IN SIDEWALK

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

NEW SIGNAL AT SR-160 BLUE DIAMOND AT RAINBOW BLVD.

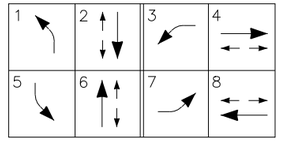
STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T60



Call before you Dig.
1-800-227-2600

CLARK COUNTY METERED SERVICE No. 4
200 AMP METERED SERVICE
SINGLE PHASE, 3 WIRE

PHASE DIAGRAM



CONFLICT FLASH SHALL BE ALL RED.
PHASE 6 IS NORTHBOUND.

Controller Cabinet No. 2

RAINBOW BLVD.

PAVED PARKING

PAVED

SR 160

"Pe"

235

Ø1 Det.

Ø6 Det.

Ø3 Det. k

Ø3 Det. j

Ø8 Det. i

Ø8 Det. h

Ø8 Det. g

Ø4 Det. a

Ø4 Det. b

Ø4 Det. c

Ø7 Det. d

Ø7 Det. e

Ø2 Det. o

Ø2 Det. n

Ø2 Det. m

Ø5 Det. q

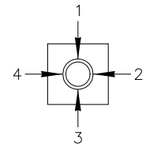
Ø5 Det. p

INTERCEPT EXISTING
CONDUIT FOR ADVANCE LOOPS

(wa) (wb) (wc) (wd) (wf) (wg) (wh) (wi) (wk)

W 1 W 2 W 3 W 4 W 5 W 6 W 7 W 8 W 9 W 10 W 11 W 12 W 13 W 14 W 15 W 16 W 16a W 17 W 18 W 19 W 20 W 21 W 22

R1



QUADRANT
ARM OR SIGNAL LOCATION
(TOP VIEW)

PULL BOX SCHEDULE

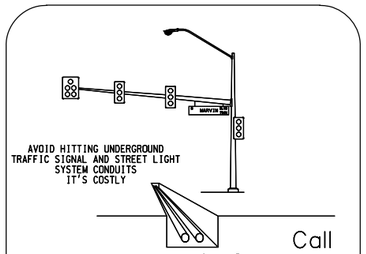
NAME	STATION OFFSET	TYPE	COMMENT
PULL BOX (wa)	"Pe" 236+94.00 ± 74.50' LT.	TYPE 7*	PLACE IN SIDEWALK
PULL BOX (wb)	"Pe" 235+31.00 ± 79.00' LT.	TYPE 7*	PLACE BEHIND SIDEWALK
PULL BOX (wc)	"Pe" 235+68.00 ± 97.50' LT.	TYPE 7*	PLACE BEHIND SIDEWALK
PULL BOX (wd)	"Pe" 234+63.00 ± 79.00' RT.	TYPE 7*	PLACE BEHIND SIDEWALK
PULL BOX (wf)	"Pe" 234+92.50 ± 98.00' RT.	TYPE 7*	PLACE BEHIND SIDEWALK
PULL BOX (wg)	"Pe" 236+45.00 ± 89.50' RT.	TYPE 7*	PLACE BEHIND SIDEWALK
PULL BOX (wh)	"Pe" 236+80.00 ± 67.00' RT.	TYPE 7*	PLACE BEHIND SIDEWALK
PULL BOX (wi)	"Pe" 237+33.50 ± 66.00' LT.	TYPE 7*	PLACE BEHIND SIDEWALK
PULL BOX (wi)	"Pe" 239+83.50 ± 61.00' LT.	TYPE 5	PLACE IN SIDEWALK

* STACKED (DOUBLE DEEP)

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

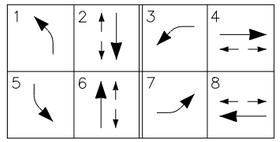
NEW SIGNAL AT SR-160 BLUE DIAMOND AT RAINBOW BLVD.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T61



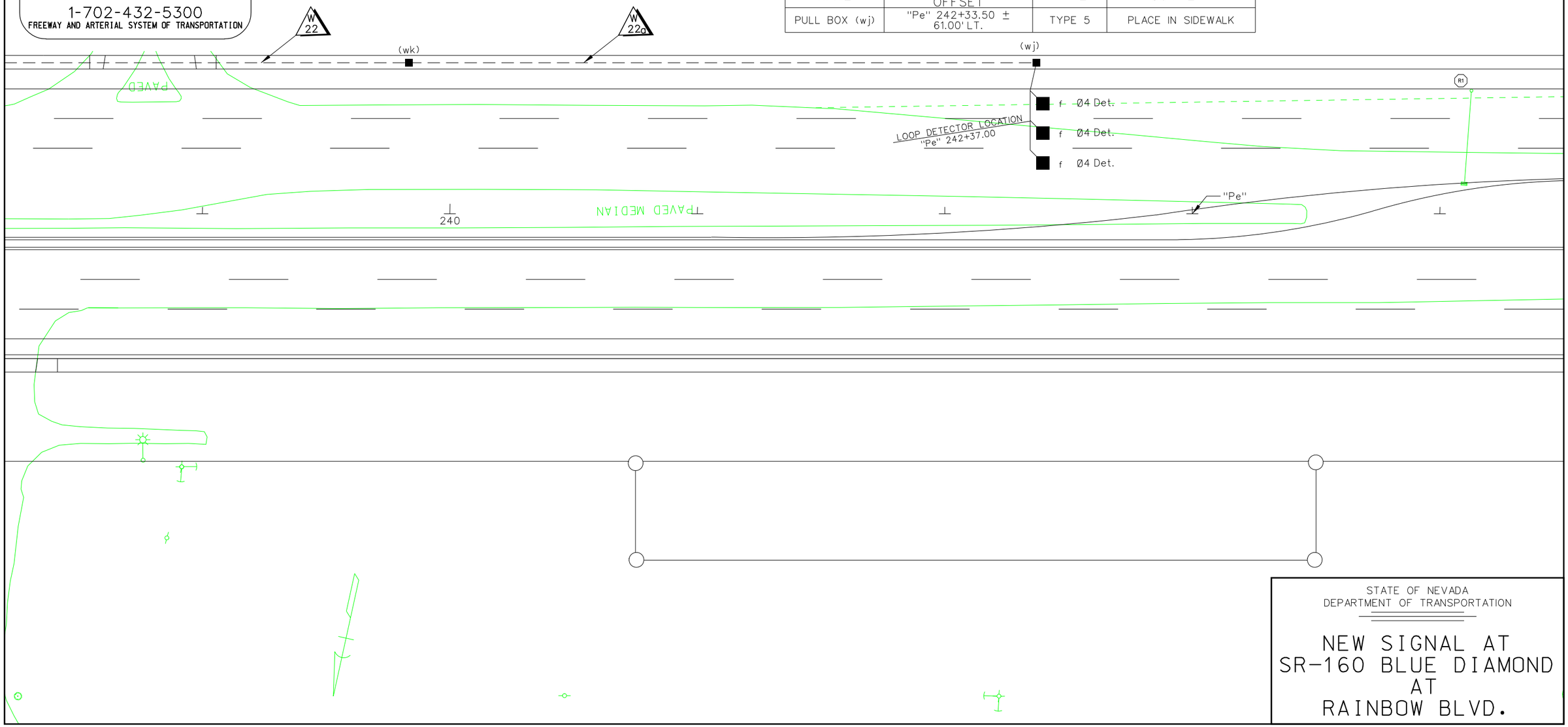
Call before you Dig.
1-800-227-2600

PHASE DIAGRAM



CONFLICT FLASH SHALL BE ALL RED.
PHASE 6 IS NORTHBOUND.

PULL BOX SCHEDULE			
NAME	STATION OFFSET	TYPE	COMMENT
PULL BOX (wj)	"Pe" 242+33.50 ± 61.00' LT.	TYPE 5	PLACE IN SIDEWALK



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

NEW SIGNAL AT SR-160 BLUE DIAMOND AT RAINBOW BLVD.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T63

SIGNAL CONDUIT - CABLE SCHEDULE

RUN NO.	FROM	TO	CONDUIT SIZE	CONDUIT LENGTH	SIGNAL CABLE	LOOP DETECTOR LEAD IN CABLE	LIGHTING CIRCUIT	GROUND WIRE	E.V.D.	SERVICE	COMMENT
T 16	PULL BOX (td)	PULL BOX (tk)	(1) 3"	250'		1					
T 16a	PULL BOX (tk)	PULL BOX (th)	(1) 3"	250'		1					
T 17	PULL BOX (te)	PULL BOX (tl)	(1) 3"	200'		1					
T 17a	PULL BOX (tl)	PULL BOX (ti)	(1) 3"	200'		1					
W 1	POWER SOURCE	CLARK COUNTY METERED SERVICE No. 4	(1) 4"	50'						#4/0	PER POWER COMPANY
W 2	CLARK COUNTY METERED SERVICE No. 4	CONTROLLER CABINET	(1) 3"	20'						(3) # 4	
W 3	CONTROLLER CABINET	PULL BOX (wa)	(4) 3"	15'	(25)(25)(25)(25)(25)(25)(25)(25)	18		(1) # 8	(3)(3)		CCTV FIELD EQUIPMENT 12 PAIR No. 19 CONDUCTOR
W 4	CLARK COUNTY METERED SERVICE No. 4	PULL BOX (wa)	(1) 3"	26'			(8) # 4	(1) # 8			CONDUIT FOR INTERSECTION LIGHTING
W 5	PULL BOX (wa)	POLE E	(2) 3"	5'	(25)		(2) # 4	(1) # 8	(3)		CCTV FIELD EQUIPMENT 12 PAIR No. 19 CONDUCTOR
W 6	PULL BOX (wa)	PULL BOX (wb)	(3) 3"	163'	(25)(25)(25)(25)	9	(4) # 4	(1) # 8	(3)		
W 7	PULL BOX (wb)	PULL BOX (wc)	(2) 3"	42'	(25)	4	(2) # 4	(1) # 8			
W 8	PULL BOX (wc)	POLE H	(2) 3"	5'	(25)		(2) # 4	(1) # 8			
W 9	PULL BOX (wb)	POLE G	(2) 3"	9'	(25)		(2) # 4	(1) # 8	(3)		
W 10	PULL BOX (wb)	PULL BOX (wd)	(3) 3"	172'	(25)(25)	5	(2) # 4	(1) # 8			
W 11	PULL BOX (wd)	POLE I	(2) 3"	8.5'	(25)		(2) # 4	(1) # 8			
W 12	PULL BOX (wd)	PULL BOX (wj)	(1) 3"	250'		1					
W 12a	PULL BOX (wj)	PULL BOX (we)	(1) 3"	250'		1					

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SR-160 BLUE DIAMOND

SIGNAL SCHEDULES

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T64

SIGNAL CONDUIT - CABLE SCHEDULE

RUN NO.	FROM	TO	CONDUIT SIZE	CONDUIT LENGTH	SIGNAL CABLE	LOOP DETECTOR LEAD IN CABLE	LIGHTING CIRCUIT	GROUND WIRE	E.V.D.	SERVICE	COMMENT
W 13	PULL BOX (wd)	PULL BOX (wf)	(2) 3"	35'	25		(2) # 4	(1) # 8			
W 14	PULL BOX (wf)	POLE J	(2) 3"	5'	25		(2) # 4	(1) # 8			
W 15	PULL BOX (wf)	PULL BOX (wg)	(3) 3"	153'				(1) # 8			FOR FUTURE USE
W 16	PULL BOX (wg)	POLE K	(2) 3"	7'	25		(2) # 4	(1) # 8			
W 17	PULL BOX (wg)	PULL BOX (wh)	(2) 3"	42'	25	4	(2) # 4	(1) # 8			
W 18	PULL BOX (wh)	POLE L	(2) 3"	13'	25		(2) # 4	(1) # 8			
W 19	PULL BOX (wh)	PULL BOX (wa)	(3) 3"	143'	25 25	4	(2) # 4	(1) # 8			
W 20	PULL BOX (wa)	PULL BOX (wi)	(2) 3"	43'	25	5	(2) # 4	(1) # 8			
W 21	PULL BOX (wi)	POLE F	(2) 3"	5'	25		(2) # 4	(1) # 8			
W 22	PULL BOX (wi)	PULL BOX (wk)	(1) 3"	250'		1					
W 22	PULL BOX (wk)	PULL BOX (wj)	(1) 3"	250'		1					

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SR-160 BLUE DIAMOND

SIGNAL SCHEDULES

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T65

SIGNAL POLE SCHEDULE

POLE									SIGNALS VEHICLE			PED. SIGNAL		PED. BUTTON		VIDEO CABLE	E.V.D.
POLE NO.	STATION	TYPE	SIGNAL ARM		LUM. ARM		WATT	SIGNAL SIGN	TYPE	MOUNT	QUAD.	MOUNT	QUAD.	QUAD.	ARROW	(3)(C)	(3)
			QUAD.	LENGTH	QUAD.	LENGTH	TYPE	MAST ARM									
(A)	"Pe" 183+01.44 ± 85.70' LT.	35MOD	*4	-----	4 3	15' 15'	400 TYPE 3	-----	(1) 2W3C	B-2A	2	WS-2	2	4 3	RT. LT.	-----	-----
(B)	"Pe" 181+73.17 ± 82.76' LT.	35MOD	3.5	85'	2 3.5	15' 15'	400 TYPE 3	-----	(4) 1W3C (1) 1W3C	M-2 B-1	MAST ARM 1	WS-2	1	3.5 2	RT. LT.	-----	(3)
(C)	"Pe" 181+31.65 ± 81.39' RT.	35MOD	2	70'	1 2	15' 15'	400 TYPE 3	R3-5L	(2) 1W3C	M-2	MAST ARM	WS-2	4	1 2	LT. RT.	-----	(3)
(D)	"Pe" 182+61.50 ± 79.26' RT.	35MOD	1.5	85'	1.5 4	15' 15'	400 TYPE 3	R3-5L	(5) 1W3C (1) 2W3C	M-2 B-2A	MAST ARM 3.5	WS-2	3.5	1.5 4	RT. LT.	-----	-----
(E)	"Pe" 236+94.50 ± 79.00' LT.	35MOD	4	80'	4	15'	400 TYPE 3	R3-5L	(3) 1W3C (1) 2W3C	M-2 B-2A	MAST ARM 2	WS-1	2	3	LT.	-----	(3)
(F)	"Pe" 237+28.00 ± 67.00' LT.	7	-----	-----	3	15'	400 TYPE 3	-----	(1) 1W3C	B-1	1	WS-1	1	4	RT.	-----	-----
(G)	"Pe" 235+22.00 ± 79.00' LT.	35MOD	3.5	85'	3.5	15'	400 TYPE 3	NLU-211	(5) 1W3C (1) 2W3C	M-2 B-2A	MAST ARM 1.5	WS-1	1.5	2	LT.	-----	(3)
(H)	"Pe" 235+64.00 ± 94.00' LT.	7	-----	-----	2	15'	400 TYPE 3	-----	(1) 1W3C	B-1	4	WS-1	4	3	RT.	-----	-----
(I)	"Pe" 234+55.50 ± 79.00' RT.	7	-----	-----	1	15'	400 TYPE 3	-----	(1) 1W3C	B-1	3	WS-1	3	2	RT.	-----	-----
(J)	"Pe" 234+95.50 ± 102.00' RT.	35MOD	2	80'	2	15'	400 TYPE 3	-----	(2) 1W3C (1) 2W3C	M-2 B-2A	MAST ARM 4	WS-1	4	1	LT.	-----	-----
(K)	"Pe" 236+42.00 ± 95.50' RT.	7	-----	-----	4	15'	400 TYPE 3	-----	(1) 1W3C	B-1	2	WS-1	2	1	RT.	-----	-----
(L)	"Pe" 236+93.00± 67.00' RT.	35MOD	1.5	-----	1.5	15'	400 TYPE 3	NLU-211	(5) 1W3C (1) 2W3C	M-2 B-2A	MAST ARM 3.5	WS-1	3.5	4	LT.	-----	-----
	**EXTRA POLE AND MAST ARM FOR CLARK COUNTY	35MOD	-----	85'	-----	-----	----- -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* BUTT PLATE ATTACHMENT ONLY

** DELIVER EXTRA POLE AND MAST ARM TO CLARK COUNTY PUBLIC WORKS TRAFFIC OPERATIONS AT 4315 STEPHANIE STREET, LAS VEGAS, NV 89122. NOTIFY MARVIN HOGGARD AT (702) 455-7544 SEVEN DAYS PRIOR TO DELIVERY.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SR-160 BLUE DIAMOND

SIGNAL SCHEDULES

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T66

LOOP DETECTOR SCHEDULE

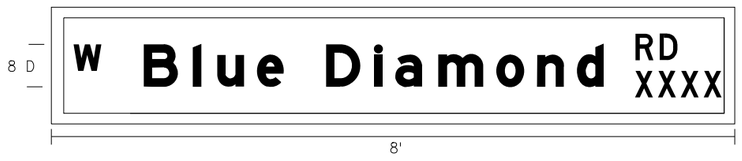
INTERSECTION	AMPLIFIER CHANNEL																			TYPE AND INFORMATION
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	
SR-160. AND JONES BLVD.	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	PREFORMED
	1	1	1	1	6	6	4	1	1	1	1	6	6	4	1	1	1	6	6	TOTAL
	1	1	1	1	*3	*3	1	1	1	1	1	*3	3	1	*1	*1	*1	3	3	LEAD IN CABLES
SR-160 AND RAINBOW BLVD.	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	PREFORMED
	1	1	1	6	6	3	1	1	1	6	6	3	1	1	1	6	6	1	6	TOTAL
	1	1	1	3	3	1	1	1	1	3	3	1	1	*1	1	*3	3	1	3	LEAD IN CABLES

*LEAD IN CABLES FOR FUTURE USE

IN POLE CONDUCTOR - CABLE SCHEDULE

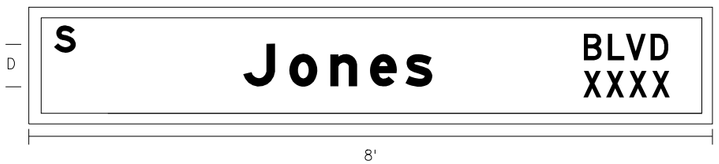
INTERSECTION	No. 14 COND.	25 COND. No. 14	No. 10 COND.	No. 12 COND.	3 COND. No. 20
SR-160. AND JONES	3108'	40'	720'	240'	300'
SR-160 AND RAINBOW	4158'	80'	1480'	240'	395'
TOTAL	7266'	120'	2200'	480'	695'

STREET ILLUMINATED SIGN SPECIAL DETAILS



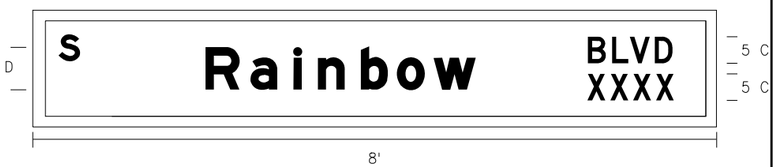
BLOCK NUMBERS

BLUE DIAMOND RD EAST OF JONES BLVD - 6000
BLUE DIAMOND RD WEST OF JONES BLVD - 6100
BLUE DIAMOND RD EAST OF RAINBOW BLVD - 6800
BLUE DIAMOND RD WEST OF RAINBOW BLVD - 6900



BLOCK NUMBERS

JONES BLVD NORTH OF BLUE DIAMOND RD - 8900
JONES BLVD SOUTH OF BLUE DIAMOND RD - 9000



BLOCK NUMBERS

RAINBOW BLVD NORTH OF BLUE DIAMOND RD - 9100
RAINBOW BLVD SOUTH OF BLUE DIAMOND RD - 9200

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SR-160 BLUE DIAMOND
SIGNAL
SCHEDULES

GENERAL NOTES:

1. ASCERTAIN THAT THE LOCATION OF ALL POLES AND PULL BOXES ARE NOT IN CONFLICT WITH THE EXISTING UTILITIES.
2. MEET THE "AMERICAN WITH DISABILITIES ACT" REQUIREMENTS FOR ALL POLE LOCATIONS AND PEDESTRIAN PUSH BUTTONS PLACEMENTS.
3. REMOVE EXISTING STOP SIGNS ONCE TRAFFIC SIGNAL IS OPERATIONAL. (NO DIRECT PAYMENT)
4. CONTACT MARVIN HOGGARD WITH THE CLARK COUNTY TRAFFIC OPERATIONS AT (702) 455-7544, 14 DAYS PRIOR TO THE FOLLOWING: SIGNAL TURN ON AND OPERATIONAL TESTING OF THE EMERGENCY VEHICLE DETECTORS.
5. RIGHT-OF-WAY SHOWN ON PLANS IS FOR REFERENCE ONLY, PLEASE SEE SHEETS RW1 TO RW19 FOR EXACT LOCATION.

SERVICE NOTES:

1. INSTALL FOUR (4) NEW PEDESTALS FOR UNDERGROUND ELECTRICAL SERVICE: CLARK COUNTY METERED SERVICE No. 1, AT "Pe" 154+46.00 +/-, 98.50' LT (SHEET T-51), CLARK COUNTY METERED SERVICE No. 2, AT "Pe" 183+31.00 +/-, 140' LT (SHEET T-54), CLARK COUNTY METERED SERVICE No. 3, AT "Pe" 209+66.50 +/-, 94.50' LT (SHEET T-57), CLARK COUNTY METERED SERVICE No. 4, AT "Pe" 237+04.50 +/-, 97.50' LT (SHEET T-58). ADJUST THE EXACT LOCATION IN THE FIELD AS DIRECTED BY THE ENGINEER.

   INSTALL A 200 AMP, 120/240 VOLT, SINGLE PHASE 3 WIRE NEW SERVICE PEDESTAL WITH A 200 AMP DOUBLE POLE MAIN BREAKER. MEET THE UTILITY COMPANY'S REQUIREMENTS FOR THE INSTALLATION. EQUIP THE SERVICE PEDESTAL WITH AN INTERNAL PHOTO ELECTRIC CELL AND BYPASS TEST SWITCH THAT WILL CONTROL THE LIGHTING. EQUIP THE SERVICE PEDESTAL WITH #2 AWG STRANDED COPPER CONDUCTOR TO GROUND PEDESTAL TO EARTH FOR COMPLIANCE WITH THE NEC. THE INSTALLATION OF THE PEDESTAL AND ANY OTHER MISCELLANEOUS HARDWARE TO BE PAID FOR UNDER BID ITEM 623 0888 "UNDERGROUND ELECTRICAL SERVICE", EACH. SUPPLY THE PEDESTAL WITH THE FOLLOWING GE CIRCUIT BREAKERS:

   ONE (1) 200 AMP DOUBLE POLE CIRCUIT BREAKER (MAIN)
   FOUR (4) 30 AMP, 120 VOLT, SINGLE POLE BREAKER FOR INTERSECTION LIGHTING.
   TWO (2) DOUBLE POLE LIGHTING CONTACTORS WITH 120 VOLT COIL (GE#CR360L40202AAAZ OR APPROVED EQUAL)
   ONE (1) 60 AMP, 120 VOLT, SINGLE POLE BREAKER FOR SIGNAL OR FUTURE SIGNAL
   ONE (1) 15 AMP, 120 VOLT, SINGLE POLE BREAKER FOR PHOTO CELL
   TWO (2) 60 AMP 120 VOLT 2-POLE CIRCUIT BREAKER FOR STREET LIGHTING
   ONE (1) 120 VOLT ELECTRONIC PHOTO ELECTRIC CONTROLS (AREA LIGHTING RESEARCH, INC PART # 2190VP3 OR APPROVED EQUAL)

CONTROLLER NOTES:

1. INSTALL NEW TYPE R, NEMA 8 PHASES CONTROLLER CABINET No. 1, AT "Pe" 183+37.00 +/-, 135.00' LT, CABINET No. 2, AT "Pe" 236+90.00 +/-, 85.00' LT, ADJUST THE EXACT LOCATION IN THE FIELD AS DIRECTED BY THE ENGINEER. INSTALL CONCRETE PAD (4'-2" X 3') IN FRONT OF EACH CONTROLLER CABINET DOOR, PER NDOT STANDARDS T-30.1.5 AND R-5.2.1. EQUIP THE CABINET WITH A 16 POSITION LOAD BASE SWITCH. PROVIDE NEMA 2070N CONTROLLERS, TO BE PAID FOR UNDER BID ITEM 623-0600 "TRAFFIC ACTUATED CONTROLLER", EACH.
2. DELIVER NEMA 2070N CONTROLLERS & TWO (2) 3M MODEL 752 EMERGENCY VEHICLE PHASE DETECTORS FOR EACH CONTROLLER TO CLARK COUNTY DEPARTMENT OF PUBLIC WORKS, TRAFFIC OPERATIONS AT 4315 STEPHANIE ST., LAS VEGAS, NV. 89122 FOURTEEN DAYS PRIOR TO SIGNAL TURN ON FOR TESTING. CALL MARVIN HOGGARD AT (702) 455-7544, SEVEN DAYS PRIOR TO DELIVERY. THE CONTRACTOR SHALL PICK UP CONTROLLER CABINET AT CLARK COUNTY PUBLIC WORKS TRAFFIC OPERATIONS, 4315 STEPHANIE ST., BY APPOINTMENT ONLY.
3. THE CONTROLLER AND THE CABINET SHALL MEET CLARK COUNTY SPECIFICATIONS AS WELL AS THE STATE OF NEVADA STANDARD SPECIFICATION, AS CALLED OUT IN THE SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2001 EDITION.

POLE NOTES:

1. INSTALL SIGNAL LIGHT STEEL POLE, TYPE 14 WITH SAFETY BASE ON ALL SIGNAL LIGHT POLES AS INDICATED ON THE PLANS. TO BE PAID FOR UNDER BID ITEM 623 0364 "STEEL POLE, TYPE 14 WITH SAFETY BASE", EACH.
2. INSTALL SIGNAL LIGHT STEEL POLE, TYPE 35 (MODIFIED) ON ALL SIGNAL LIGHT POLES AS INDICATED ON THE PLANS. TO BE PAID FOR UNDER BID ITEM 623 0412 "STEEL POLE, TYPE 35 (MODIFIED)", EACH.
3. INSTALL 120 VOLT, 400 WATT, HIGH PRESSURE SODIUM VAPOR I.E.S. TYPE III, FULL CUTOFF, MEDIUM DISTRIBUTION, CLEAR FLAT GLASS LENS, P.E. RECEPTACLE, AND AUTOREG BALLAST ON ALL TYPE 14 WITH SAFETY BASES AND TYPE 35A SIGNAL LIGHT POLES. TO BE PAID FOR UNDER BID ITEM 623-0140 "SODIUM VAPOR LUMINAIRE, 400 WATT", EACH.
4. ADJUST THE POLE LOCATIONS IN THE FIELD AS DIRECTED BY THE ENGINEER.
5. SEAL ALL CONDUIT ENDS WITH A DUCT SEALING COMPOUND. USE NSI INDUSTRIES DUCT SEALING COMPOUND OR AN APPROVED EQUAL. (NO DIRECT PAYMENT)
6. INSTALL BY METHOD 2 (SEE STANDARD SHEET T-30.1.3.2), 8 FOOT INTERNALLY ILLUMINATED STREET NAME SIGNS ON POLES: "B", "C", "D", "E", "G", "J", AND "L". TO BE PAID FOR UNDER BID ITEM 623 1288 "ILLUMINATED STREET NAME SIGN, DOUBLE FACE (8-FOOT)", EACH.
7. 8 FOOT INTERNALLY ILLUMINATED STREET NAME SIGN TO BE WHITE WIDE-ANGLE PRISMATIC TRANSLUCENT REFLECTIVE SHEETING, EITHER REVERSE SCREENED WITH MANUFACTURER'S RECOMMENDED GREEN INK AND CLEAR COATING OR OVERLAID WITH GREEN ELECTRONIC CUTTABLE TRANSPARENT OVERLAY FILM APPLIED TO 3/16" LEXAN WT/FRAMED.
8. FOR STREET NAME DESIGNATION ON "ILLUMINATED STREET NAME SIGN, DOUBLE FACE (8-FOOT)" EACH, SEE SHEET T-45. LETTERS SHALL BE 8-INCH SERIES D AND, UNLESS OTHERWISE SPECIFIED BY THE CLARK COUNTY PUBLIC WORKS TRAFFIC ENGINEER, SHALL BE UPPER AND LOWER CASE WITH A STREET NAME SUFFIX. SMALL TEXT SHALL BE 5 INCH SERIES C. KERNING VALUE IS 110%. WIND LOADING SHALL BE 100 MPH. SHEETING SHALL BE APPLIED IN A VERTICAL ORIENTATION IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION. TWO FLUORESCENT SHATTERPROOF LAMPS ARE REQUIRED AND TWO BALLASTS. BALLAST SHALL BE ADVANCED RSM175.
9. MOUNT STANDARD TRAFFIC SIGNAL SIGNS: TWO (2) R3-5L (30" X 36"), "LEFT ONLY", TWO (2) NLU-211 (36" X 30"), "LEFT ONLY LEFT ONLY", ON SIGNAL POLE "C", THREE (3) R3-5L (30" X 36"), "LEFT ONLY", ONE (1) NLU-211 (36" X 30"), "LEFT ONLY LEFT ONLY", ON SIGNAL POLE "K", AND THREE (3) NLU-211 (36" X 30"), "LEFT ONLY LEFT ONLY", ONE (1) R3-5L (30" X 36"), "LEFT ONLY", ON SIGNAL POLE "S". TO BE PAID FOR UNDER BID ITEM 623 1752 "TRAFFIC SIGNAL SIGNS", SQFT.
10. INSTALL BLANK (24" X 30") SIGN HORIZONTAL TO GROUND ON MAST ARMS 60' IN LENGTH OR GREATER, LOCATION TO BE COORDINATED WITH MARVIN HOGGARD AT (702)455-7544.
11. DELIVER EXTRA SIGNAL POLE AND MAST ARM TO THE CLARK COUNTY PUBLIC WORKS TRAFFIC OPERATIONS AT 4315 STEPHANIE ST., LAS VEGAS, NV. 89122. NOTIFY MARVIN HOGGARD AT (702) 455-7544 SEVEN DAYS PRIOR TO DELIVERY.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SR-160 BLUE DIAMOND SIGNAL NOTES

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T70

PULL BOX NOTES:

1. PROVIDE TRAFFIC RATED PULL BOXES (HS20 RATED).
2. ADJUST PULL BOX LOCATIONS IN THE FIELD AS DIRECTED BY THE ENGINEER.
3. ALL TYPE 7 SIGNAL PULL BOXES WILL BE STACKED (DOUBLE DEEP) (NO DIRECT PAYMENT).
4. INSTALL TWO (2) 3" CONDUIT FROM THE PULL BOX TO ALL TYPE 7 AND TYPE 14 SIGNAL LIGHT POLES WITH SAFETY BASES.
5. ALL METAL LIDS SHALL BE GROUNDED. INSTALL A STRANDED #4 (GREEN, 7-STRAND)THW2 OR XHHW-2 WIRE, 4 FEET IN LENGTH, FROM THE LID TO THE BONDING GROUND. FASTEN THE #4 CONDUCTOR TO THE LID BY CAD WELDING. ALL CONDUITS SHALL HAVE A MINIMUM OF 6" CLEARANCE FROM THE TOP OF THE CONDUIT TO THE LID. (NO DIRECT PAYMENT)

SIGNAL HEAD NOTES:

1. INSTALL L.E.D. SIGNAL MODULES IN ALL NEW TRAFFIC SIGNAL HEADS FOR THE RED, YELLOW, AND GREEN INDICATIONS. "AlInGaP" MATERIAL MUST BE USED FOR THE RED AND YELLOW INDICATIONS AND "InGaN" MATERIAL MUST BE USED FOR THE GREEN INDICATION.
2. INSTALL L.E.D. MODULES IN ALL NEW PEDESTRIAN SIGNAL HEADS. THE SYMBOLS SHALL BE ENTIRELY LIGHTED AND NOT HOLLOW.
3. ALL GREEN LED MODULES SHALL APPEAR GREEN WHEN OFF, NO CLEAR LENSES.
4. INSTALL "TUNNEL" VISORS ON ALL SIGNAL HEADS.

EMERGENCY VEHICLE OPTICAL DETECTOR NOTES:

1. INSTALL NEW EMERGENCY VEHICLE DETECTION SYSTEM. SUPPLY TWO (2) 3M MODEL 751 EMERGENCY VEHICLE PHASE SELECTORS WITH THE CONTROLLER CABINET AND DELIVER TO CLARK COUNTY PUBLIC WORKS, TRAFFIC OPERATIONS AT 4315 STEPHANIE ST., LAS VEGAS, NV 89122 FOURTEEN DAYS PRIOR TO SIGNAL TURN ON FOR TESTING.
2. INSTALL 3 CONDUCTOR No. 20 CABLE FROM THE CONTROLLER TO THE OPTICAL DETECTORS. PROVIDE 3M MODEL 138 CABLE, OR AN APPROVED EQUIVALENT, TO BE PAID FOR UNDER BID ITEM 623 1212 "3 CONDUCTOR No. 20 CABLE", LINFT.

RED LIGHT DETECTOR NOTES:

1. CONNECT RED LIGHT DETECTOR DIRECTLY INTO THE TERMINAL COMPARTMENT TO THE PHASE INDICATED ON THE PLAN SHEETS.
2. SEAL THE ENTRY POINT INTO THE SIGNAL POLE AND RED LIGHT DETECTOR WITH SILICONE.
3. PROVIDE A RED LIGHT DETECTOR FROM THE QPL WITH A RED THRU AND BLUE TURN.
4. INSTALL PER CLARK COUNTY SPECIFICATIONS. CONTACT CLARK COUNTY FOR CURRENT COPY OF SPECIFICATIONS.

PEDESTRIAN PUSH BUTTON NOTES:

1. MOUNT PEDESTRIAN PUSH BUTTONS WITH SIGN R10-3b (9" X 12"), "EDUCATIONAL PLAQUE FOR PEDESTRIAN SIGNALS (SYMBOLS)" AS INDICATED ON PLANS. TO BE PAID FOR UNDER BID ITEM 623 0504, "PEDESTRIAN PUSH BUTTON WITH SIGN", EACH.
2. PEDESTRIAN PUSH BUTTONS SHALL MEET "AMERICANS WITH DISABILITIES ACT" REQUIREMENTS.

LOOP DETECTOR NOTES:

1. FOR LOOP DETECTOR INSTALLATION PROCEDURES SEE BOOK OF STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION, 2003 ENGLISH EDITION, SHEET T-30.1.4, AND THE STATE OF NEVADA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2001 EDITION.
2. INSTALL PREFORMED LOOP DETECTORS FOR TURN LANES AND ADVANCE DETECTION AS INDICATED ON THE PLANS. TO BE PAID FOR UNDER BID ITEM 623 1725 "LOOP DETECTOR (6-FT X 6-FT)(PREFORMED)", EACH.
3. INSTALL CUT IN LOOP DETECTORS FOR TURN LANES ON RAINBOW BLVD. (NORTH & SOUTH) AS INDICATED ON THE PLANS. TO BE PAID FOR UNDER BID ITEM 623 1724 "LOOP DETECTOR (6-FOOT X 6-FOOT)", EACH.
4. INSTALL PREFORMED LOOP DETECTORS FOR THRU LANES AS INDICATED ON THE PLANS, TO BE PAID FOR UNDER BID ITEM 623 0512 "LOOP DETECTOR (A) (PREFORMED), EACH.
5. INSTALL CUT IN LOOP DETECTORS FOR THRU LANES ON RAINBOW BLVD. (NORTH & SOUTH) AS INDICATED ON THE PLANS, TO BE PAID FOR UNDER BID ITEM 623 0512 "LOOP DETECTOR (A), EACH.
6. LOCATE THE FRONT OF THE PRESENCE LOOPS TWO (2) FEET IN ADVANCE OF THE STOP LINE.

REMOVAL NOTES:

1. THE TEMPORARY SIGNAL SYSTEM MUST BE OPERATIONAL PRIOR TO THE REMOVAL OF THE EXISTING SIGNAL SYSTEM, SEE TEMPORARY OVERHEAD SIGNAL SYSTEM NOTES ON SHEET T-72, TO BE PAID FOR UNDER BID ITEM 623-0756 "REMOVAL OF EXISTING TRAFFIC SIGNAL SYSTEM", LUMP SUM.
2. RETURN ALL SALVAGED EQUIPMENT TO CLARK COUNTY DEPARTMENT OF PUBLIC WORKS, TRAFFIC OPERATIONS DIVISION, AT 4315 S. STEPHANIE ST., LAS VEGAS, NV. 89122. CONTACT MARVIN HAGGARD WITH THE CLARK COUNTY DEPARTMENT OF PUBLIC WORKS AT (702) 455-7544, 7 DAYS PRIOR.
3. REMOVAL OF EXISTING SIGNAL SYSTEM AT RAINBOW BLVD. INCLUDES ADVANCED WARNING SIGNS, TO BE PAID FOR UNDER BID ITEM 623 0754 "REMOVAL OF EXISTING TRAFFIC SIGNAL SYSTEM", LS.
4. REMOVAL OF EXISTING LIGHTING ALONG SR-160 TO BE PAID FOR UNDER BID ITEM 623 0764 "REMOVAL OF EXISTING LIGHTING SYSTEM", LS.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SR-160 BLUE DIAMOND
SIGNAL
NOTES

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T71

TEMPORARY OVERHEAD SIGNAL SYSTEM NOTES:

1. INSTALL TEMPORARY OVERHEAD SIGNAL SYSTEM TO INCLUDE BUT NOT LIMITED TO: DESIGN, INSTALLATION, ADJUSTMENT OF SIGNAL HEADS AND VIDEO DETECTION PER CONSTRUCTION PHASING, MAINTENANCE, AND REMOVAL. TO BE PAID FOR UNDER BID ITEM 623 0868 "TEMPORARY OVERHEAD SIGNAL SYSTEM", EACH.

2. SUPPLY ANY ADDITIONAL AND OR ALL EQUIPMENT NECESSARY TO INSTALL TEMPORARY OVERHEAD SIGNAL SYSTEM TO INCLUDE BUT NOT LIMITED TO: POLES, FOUNDATIONS, MAST ARMS, LUMINAIRE ARMS, LUMINARIES, CATENARY WIRE, MESSENGER WIRE, TETHER WIRE, GUY WIRE, SIGNAL HEADS, MOUNTING BRACKETS, CONDUIT, PULL BOXES, CABINET AND CONTROLLER, CONDUCTOR, TRAFFIC SIGNAL SIGNS, VIDEO DETECTION, AND ALL OTHER MISCELLANEOUS EQUIPMENT TO MAKE FULLY FUNCTIONING TRAFFIC SIGNAL SYSTEM. TO BE PAID FOR UNDER BID ITEM 623-0868 "TEMPORARY OVERHEAD SIGNAL SYSTEM", EACH.

3. TEMPORARY OVERHEAD SIGNAL SYSTEM SHALL MEET CLARK COUNTY DEPARTMENT OF PUBLIC WORKS AS WELL AS THE NEVADA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2001 EDITION, THE NATIONAL ELECTRIC CODE (NEC), NATIONAL ELECTRIC SAFETY CODE (NESC), THE INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION (IMSA), MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, 2003 EDITION, AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO), 2001 EDITION, AND ALL OTHER APPLICABLE CODES AND ORDINANCES.

4. ANY ADDITIONAL INSTALLED 120 VOLT, 400 WATT, HIGH PRESSURE SODIUM VAPOR I.E.S. TYPE III, FULL CUTOFF, MEDIUM DISTRIBUTION, CLEAR FLAT GLASS LENS, P.E. RECEPTACLE, AND AUTOREG BALLAST ON ALL TEMPORARY SIGNAL LIGHT POLES WITH SAFETY BASES. TO BE PAID FOR UNDER BID ITEM 623-0868 "TEMPORARY OVERHEAD SIGNAL SYSTEM", EACH.

5. ANY ADDITIONAL VIDEO IMAGE DETECTION SYSTEM WILL BE "ITERIS ITC" VANTAGE PLUS OR AUTO SCOPE 2020, OTHER VIDEO IMAGE DETECTION SYSTEMS WILL NOT BE ACCEPTED. THE EQUIPMENT WILL BE CAPABLE OF BEING INTEGRATED INTO AN INTERCONNECTED SYSTEM VIA ONE RS232 PORT, TO BE PAID FOR UNDER BID ITEM 623-0868 "TEMPORARY OVERHEAD SIGNAL SYSTEMS", EACH.

6. ANY ADDITIONAL VIDEO IMAGE DETECTION CAMERAS INSTALLED ON TEMPORARY POLES TO BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS. MANUFACTURER TO VERIFY LOCATION PRIOR TO INSTALLATION. PROVIDE A 6.0' RISER IF MOUNTED ON MAST ARM OR AN I-BRACKET IF MOUNTED ON LUMINAIRE ARM. ALL CAMERAS WILL HAVE A VARIABLE LENS. TO BE PAID FOR UNDER BID ITEM 623-0868 "TEMPORARY OVERHEAD SIGNAL SYSTEMS", EACH.

7. CONTACT RESIDENT ENGINEER 48 HOURS PRIOR TO INSTALLATION OF ANY ADDITIONAL VIDEO DETECTION.

8. THE VIDEO IMAGE DETECTION CAMERAS MUST BE CAPABLE OF DETECTING A MINIMUM OF 220' FROM THE STOP BAR STRIPING AND COVER ALL THROUGH TRAVEL LANES AS WELL AS ANY TURNING MOVEMENTS.

9. SUPPLY POWER FOR THE DETECTION CAMERAS THRU A 25 CONDUCTOR No. 14 CABLE, TO BE PAID FOR UNDER BID ITEM 623-0868 "TEMPORARY OVERHEAD SIGNAL SYSTEM", EACH.

10. INSTALL COAXIAL CABLE TO EACH VIDEO IMAGE DETECTION CAMERA. PROVIDE A TINNED COPPER DOUBLE BRAID SHIELD COAXIAL CABLE WITH 98% SHIELDING AND POLYETHYLENE INSULATION, TO BE PAID FOR UNDER BID ITEM 623-0868 "TEMPORARY OVERHEAD SIGNAL SYSTEM", EACH.

F.A.S.T. CAMERA NOTES:

1. SUPPLY, MAKE OPERATIONAL AND TEST A CCTV CAMERA SYSTEM. SYSTEM SHALL INCLUDE BUT NOT LIMITED TO A CCTV CAMERA, PTZ MOUNT, ANALYZER, VOTR PAIR AND ALL MOUNTING HARDWARE, TO BE PAID FOR UNDER BID ITEM 623 0744, "CCTV FIELD EQUIPMENT", EACH. SUPPLY A CCTV CAMERA "COHU" MODEL 3645-2020-P105 WITH A "PELCO" MODEL PT570P-PP MOUNT AND A "PELCO ANALYZER" MODEL PTZ-KTD125 OR A "COHU" I-VIEW INTEGRATED CAMERA MODEL #3965-3X10-PEDD WITH THE "FAST" PROTOCOL INSTALLED. SUPPLY AND INSTALL A VOTR PAIR (TWO TOTAL) VOTR BY IFS MODEL D19130SHR. INSTALL ONE IN CABINET AND DELIVER ONE TO FAST FOR INSTALLATION IN THE TMC. CONTACT JESUS MARMOLEJO OF FAST AT (702) 432-5300 FOR TESTING AND ACCEPTANCE OF THE CCTV FIELD EQUIPMENT.

2. SUPPLY A COAXIAL CABLE AND A 12PR#19 CABLE FROM THE CCTV CAMERA TO THE TRAFFIC ACTUATED CONTROLLER, TO BE PAID FOR UNDER THE RESPECTIVE BID ITEMS.

3. TEST THE FUNCTIONALITY OF THE SURVEILLANCE CAMERA UPON INSTALLATION, THROUGH DIRECT CONNECTION OF THE FIELD WIRING AT THE CONTROLLER CABINET. NOTIFY THE ENGINEER AND DOCUMENT ALL TESTS. THE ENGINEER RESERVES THE RIGHT TO WITNESS ALL TESTS.

4. UPON COMPLETION OF THE FUNCTIONALITY TEST, INSTALL VIDEO AND DATA CONNECTIONS TO THE LOCAL COMMUNICATIONS INFRASTRUCTURE IN ACCORDANCE WITH F.A.S.T. SPECIFICATIONS AT (702) 432-5300.

5. SURVEILLANCE CAMERA SHALL BE INSTALLED TO F.A.S.T. SATISFACTION.

POWER SOURCE NOTES:

1. CONTACT STAN WICKLIFFE FROM NEVADA POWER COMPANY AT (702) 252-4868 FOR POWER SOURCE DETAILS. REFERENCE PROJECT ID # 177398.

2. PAD FOR (1) SINGLE PHASE COMMERCIAL TRANSFORMER, PER NPC U.G. STD. RS-5. TO BE PAID FOR UNDER BID ITEM 623 0962 "PREFORMED TRANSFORMER PAD", EACH.

3. PULL BOXES NEEDED FOR POWER SOURCE, PER NPC U.G. STD. RS-1. TO BE PAID FOR UNDER BID ITEM 623 0069 "PULL BOX (A), EACH.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SR-160 BLUE DIAMOND
SIGNAL NOTES

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(019)	CLARK	T72

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	STP-0160(017)	CLARK	T-85

LIGHTING, SIGNALS & INTERCONNECT STRUCTURE LIST

NOTE: ALL LOCATIONS ARE APPROXIMATE AND MAY BE ADJUSTED BY THE ENGINEER

DESCRIPTION	TRAFFIC SIGNAL SIGNS 623 1752	LEAD-IN CABLE FOR LOOP DETECTORS 623 1732	LOOP DETECTOR (6-FT X 6-FT) (PREFORMED) 623 1725	LOOP DETECTOR (6-FT X 6-FT) 623 1724	SIGNAL HEAD 1W3C, MAST ARM 623 1584	SIGNAL HEAD 2W3C, BRACKET 623 1572	SIGNAL HEAD 1W3C, BRACKET 623 1564	ILLUMINATED STREET NAME SIGN, DOUBLE FACE (8-FOOT) 623 1288	COAXIAL CABLE 623 1270	SINGLE MODE FIBER OPTIC CABLE (72 FIBER) 623 1269	12 PAIR CONDUCTOR NO. 19 623 1248	3 CONDUCTOR No. 20 CABLE 623 1212	25 CONDUCTOR No. 14 CABLE 623 1196
	SQFT	LINFT	EACH	EACH	EACH	EACH	EACH	EACH	LINFT	LINFT	LINFT	LINFT	LINFT
LIGHTING ALONG SR-160													
LIGHTING ALONG JONES BLVD.													
UNDERDECK LIGHTING													
LIGHTING, CONDUIT & PULL BOXES AT LINDELL													
SIGNAL & LIGHTING AT JONES BLVD.	15	3,452	49		11	2	1	3	110		110	880	960
LIGHTING, CONDUIT & PULL BOXES AT TORREY PINES													
SIGNAL AND LIGHTING AT RAINBOW BLVD.	30	3,975	30	18	15	4	4	4	50		50	605	1,705
INTERCONNECT										11,365			
SIGNAL REMOVAL AT RAINBOW (existing signal or temporary signal (must be used at all times before new signal is installed)													
LIGHTING REMOVALS													
EXTRA SIGNAL POLE AND MAST ARM													
TOTAL	45	7,427	79	18	26	6	5	7	160	11,365	160	1,485	2,665
USE TOTAL*	45	8,920	79	18	26	6	5	7	200	13,640	200	1,790	3,200

DESCRIPTION	No. 14 CONDUCTOR 623 1152	No. 12 CONDUCTOR 623 1148	No. 10 CONDUCTOR 623 1144	No. 8 CONDUCTOR 623 1140	No. 4 CONDUCTOR 623 1132	No. 4/0 CONDUCTOR 623 1104	4-INCH CONDUIT 623 1032	3-INCH CONDUIT 623 1028	1-INCH CONDUIT (METAL) 623 1005	PREFORMED TRANSFORMER PAD 623 0962	UNDERGROUND ELECTRICAL SERVICE 623 0888	TEMPORARY OVERHEAD SIGNAL SYSTEM 623 0868	REMOVAL OF EXISTING LIGHTING SYSTEM 623 0764
	LINFT	LINFT	LINFT	LINFT	LINFT	LINFT	LINFT	LINFT	LINFT	EACH	EACH	EACH	LS
LIGHTING ALONG SR-160			12,880	24,865	47,385	470	470	24,675			4		
LIGHTING ALONG JONES BLVD.			1,440	1,890	3,780			1,890					
UNDERDECK LIGHTING		950		450					450				
LIGHTING, CONDUIT & PULL BOXES AT LINDELL			480	705	2,100	110	110	2,040			1		
SIGNAL & LIGHTING AT JONES BLVD.	3,110	240	720	770	1,945	250	250	3,595		1	1		
LIGHTING, CONDUIT & PULL BOXES AT TORREY PINES			480	610	1,770	50	50	1,605		1	1		
SIGNAL AND LIGHTING AT RAINBOW BLVD.	4,160	240	1,680	895	1,990	100	100	2,935		1	1		
INTERCONNECT				1,530			14,535						
SIGNAL REMOVAL AT RAINBOW (existing signal or temporary signal (must be used at all times before new signal is installed)												1	
LIGHTING REMOVALS													1
EXTRA SIGNAL POLE AND MAST ARM													
TOTAL	7,270	1,430	17,680	31,715	58,970	980	15,515	36,740	450	3	8	1	LS
USE TOTAL*	8,730	1,720	21,220	38,060	70,770	1,180	18,620	44,090	540	3	8	1	LS

DESCRIPTION	REMOVAL OF EXISTING TRAFFIC SIGNAL SYSTEM 623 0754	CCTV FIELD EQUIPMENT 623 0744	TRAFFIC ACTUATED CONTROLLER 2070N 623 0602	LOOP DETECTOR AMPLIFIER CHANNELS (NEW CABINET) 623 0528	RED LIGHT DETECTOR 623 0526	EMERGENCY VEHICLE OPTICAL DETECTOR SYSTEM 623 0524	LOOP DETECTOR (A) (PREFORMED) EACH 623 0514	LOOP DETECTOR (A) EACH 623 0512	PEDESTRIAN PUSH BUTTON WITH SIGN 623 0504	PEDESTRIAN SIGNAL HEAD 2W 623 0484	PEDESTRIAN SIGNAL HEAD 1W 623 0480	STEEL POLE, TYPE 35 MODIFIED 623 0412	STEEL POLE, TYPE 14 WITH SAFETY BASE 623 0364
	LS	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
LIGHTING ALONG SR-160													
LIGHTING ALONG JONES BLVD.													
UNDERDECK LIGHTING													
LIGHTING, CONDUIT & PULL BOXES AT LINDELL													4
SIGNAL & LIGHTING AT JONES BLVD.		1	1	20	6	1	11		8	4		4	
LIGHTING, CONDUIT & PULL BOXES AT TORREY PINES													4
SIGNAL AND LIGHTING AT RAINBOW BLVD.		1	1	19	8	1	5	4	8		8	4	
INTERCONNECT													
SIGNAL REMOVAL AT RAINBOW (existing signal or temporary signal (must be used at all times before new signal is installed)	1												
LIGHTING REMOVALS													
EXTRA SIGNAL POLE AND MAST ARM												1	
TOTAL	LS	2	2	39	14	2	16	4	16	4	8	9	8
USE TOTAL*	LS	2	2	39	14	2	16	4	16	4	8	9	8

DESCRIPTION	STEEL POLE, TYPE 7 (MODIFIED) 623 0324	STEEL POLE, TYPE 7 WITH SAFETY BASE 623 0320	STEEL POLE, TYPE 7 623 0316	UNDERPASS LUMINAIRE, 150 WATT TYPE A 623 0216	SODIUM VAPOR LUMINAIRE, 400 WATT 623 0140	SODIUM VAPOR LUMINAIRE, 250 WATT 623 0136	JUNCTION BOX (A) 623 0092	SPECIAL PULL BOX 623 0086	No. 9 PULL BOX 623 0084	No. 7 PULL BOX 623 0080	No. 5 PULL BOX 623 0076	No. 3 1/2 PULL BOX 623 0072	PULL BOX (A) 623 0069	STATION TO STATION
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	
LIGHTING ALONG SR-160	161				161			3				199		
LIGHTING ALONG JONES BLVD.		12	4			16						16		
UNDERDECK LIGHTING				8			8	2						
LIGHTING, CONDUIT & PULL BOXES AT LINDELL					8					4			1	
SIGNAL & LIGHTING AT JONES BLVD.					8			1		5	6		1	
LIGHTING, CONDUIT & PULL BOXES AT TORREY PINES					8					4			1	
SIGNAL AND LIGHTING AT RAINBOW BLVD.		4			8					8	4		1	
INTERCONNECT									4	30				
SIGNAL REMOVAL AT RAINBOW (existing signal or temporary signal (must be used at all times before new signal is installed)														
LIGHTING REMOVALS														
EXTRA SIGNAL POLE AND MAST ARM														
TOTAL	161	16	4	8	193	16	8	6	4	51	10	215	4	
USE TOTAL*	161	16	4	8	193	16	8	6	4	51	10	215	4	

* USE TOTAL INCLUDES A 20% OVERRUN ON ALL CONDUIT, CONDUCTOR AND CABLE

7.24 Permanent Signing.

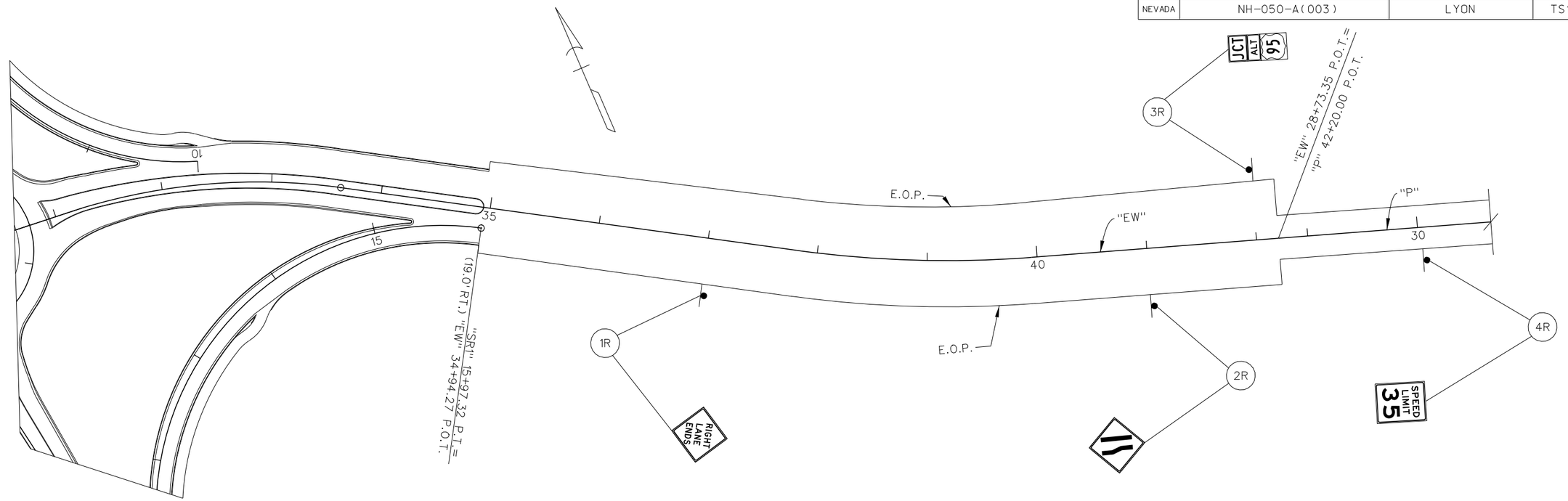
General. The permanent sign plans provide the information necessary to implement the signing portion of the driver information strategy in accordance with the MUTCD.

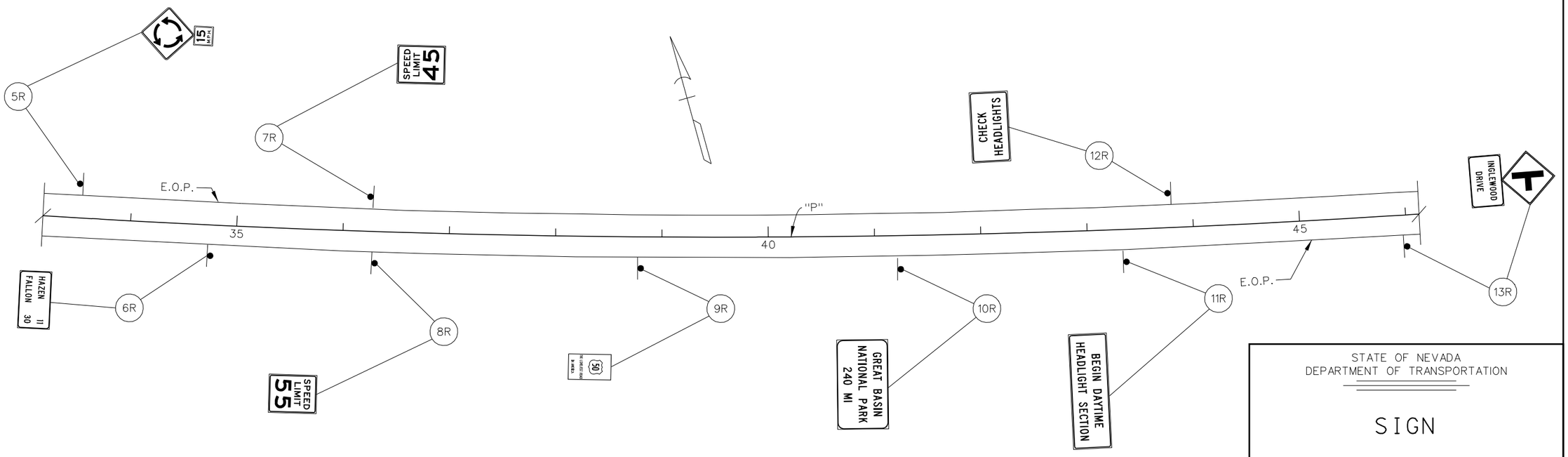
Permanent Signing Guidelines. The Traffic section of the Traffic and Safety Division prepares permanent signing plans, sign removals, and structure lists. Upon completion, these plans are supplied to Roadway Design for incorporation into the contract plans.

Permanent Signing Particulars.

1) Sheet numbering for the permanent signing sheets shall begin with TS1. Multiple sheets shall be numbered TS1, TS2, TS3, etc.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON	TS1

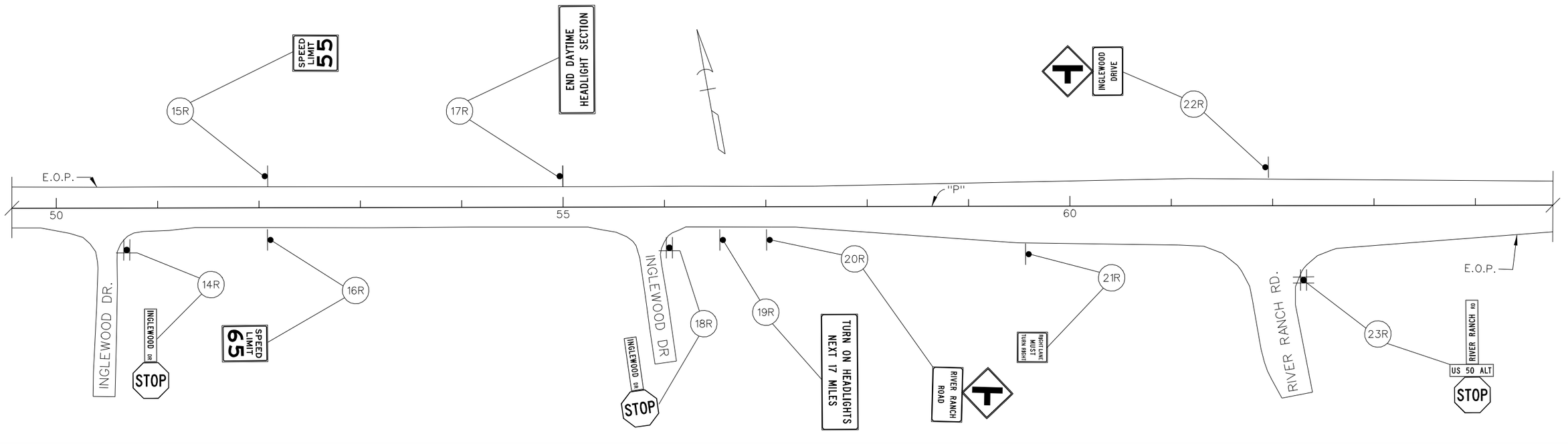


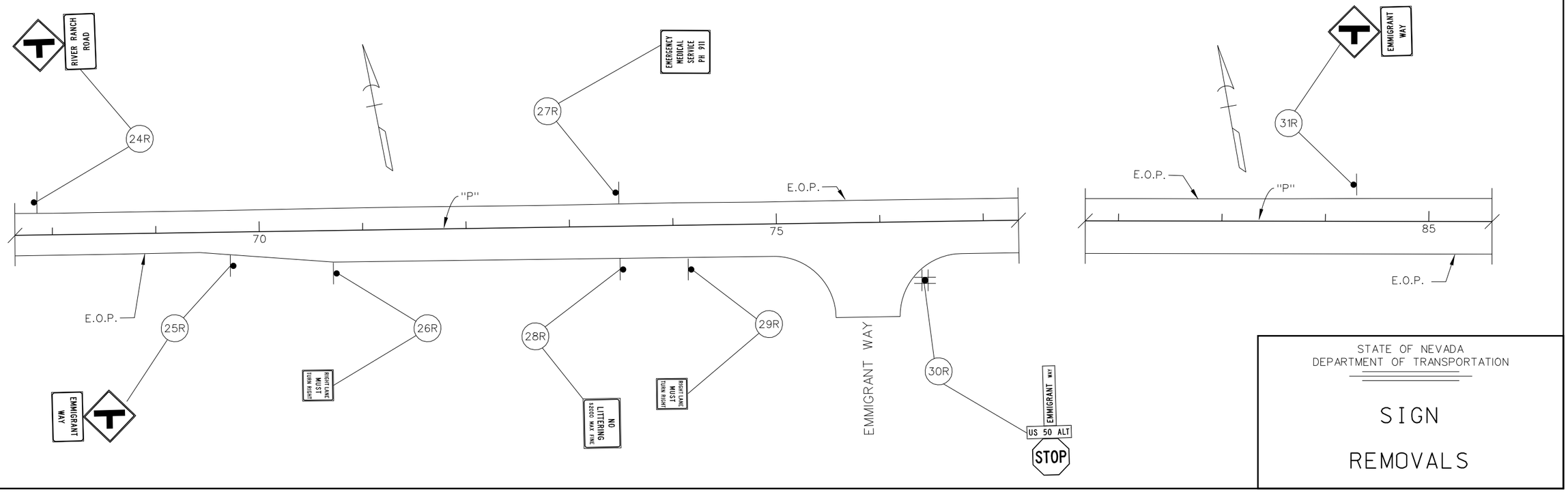


STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SIGN REMOVALS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON	TS2

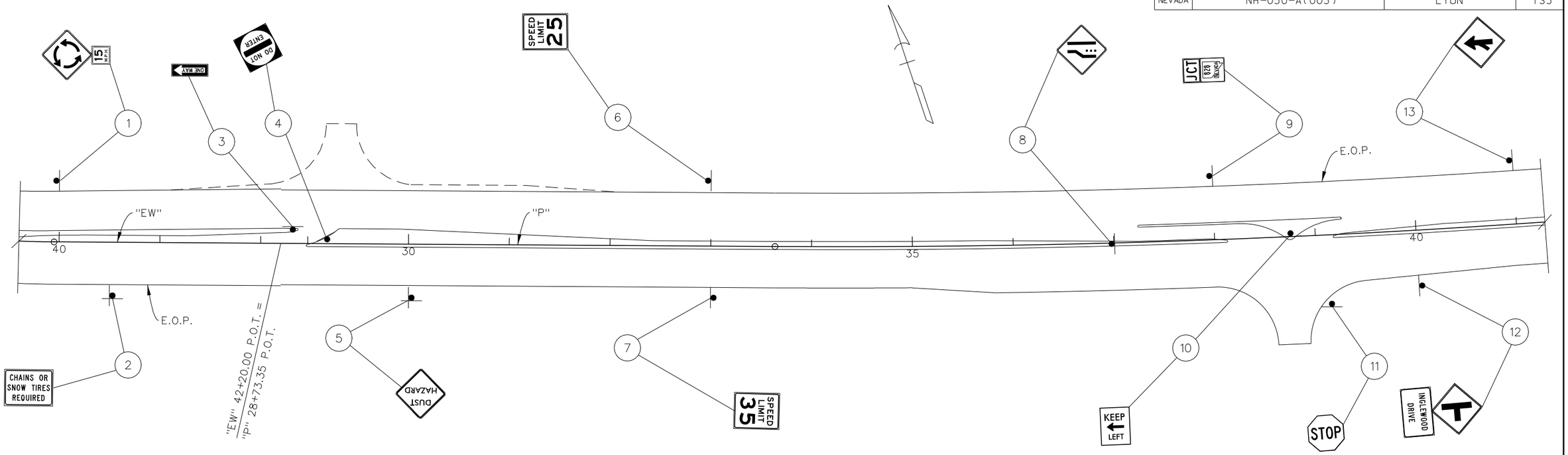


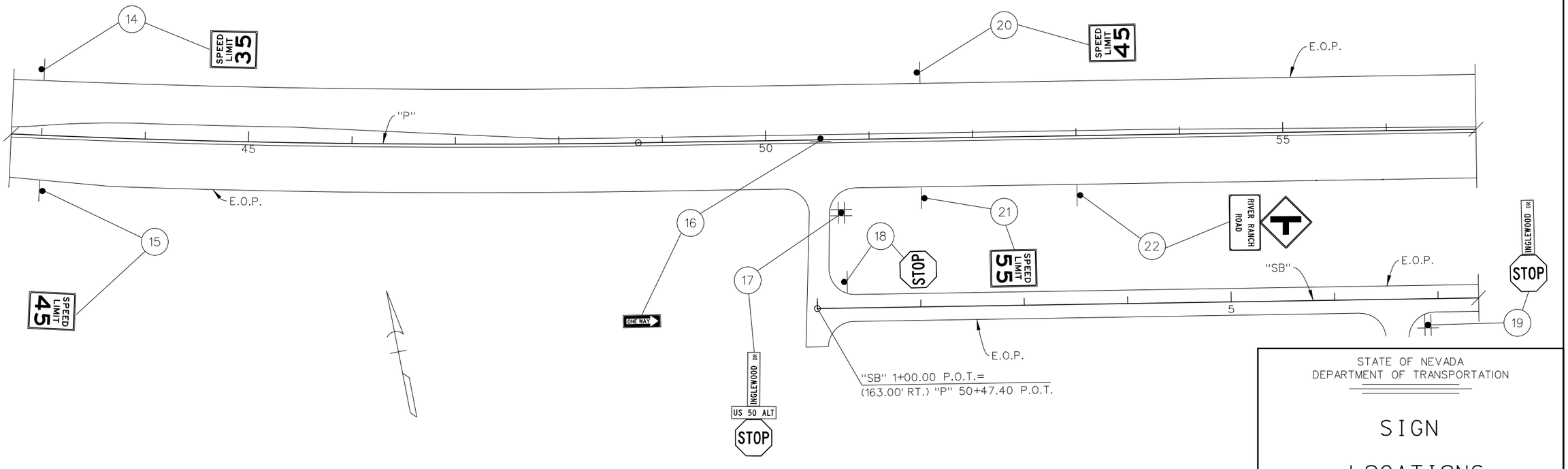


STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SIGN REMOVALS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON	TS3

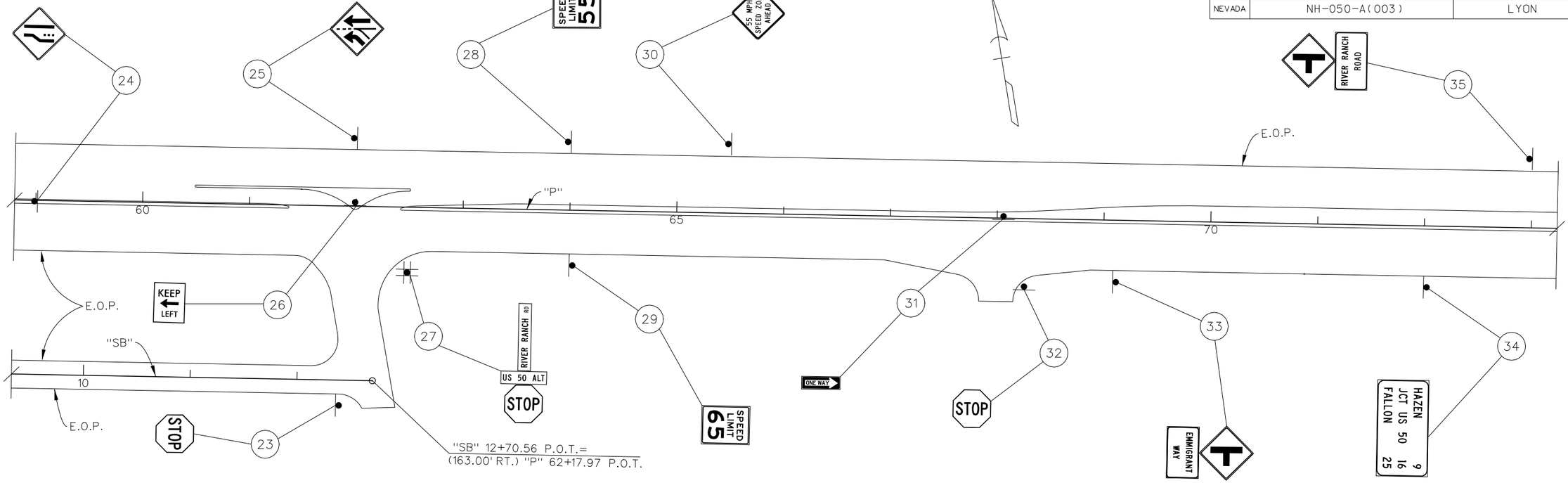


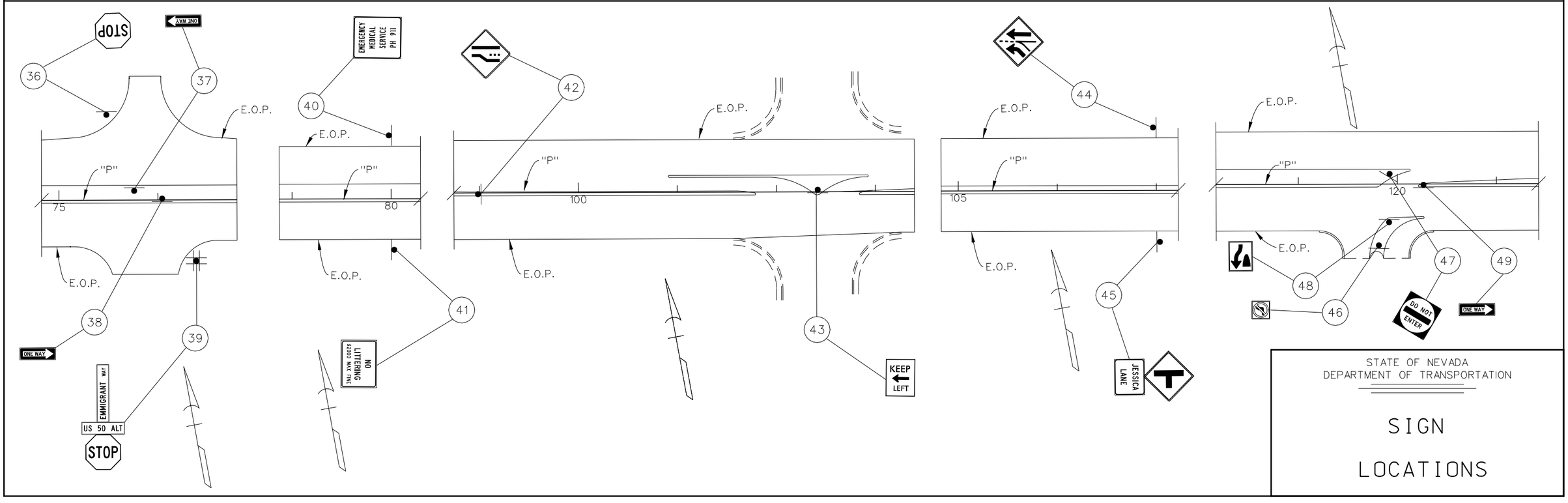


STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SIGN LOCATIONS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON	TS4





STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SIGN LOCATIONS

LYON COUNTY				
ITEM NO.	DESCRIPTION	TOTAL	USE TOTAL	UNIT
627 0508	PERMANENT SIGNS (GROUND MOUNTED) (METAL SUPPORTS)	1361.77	1362.00	SQ FT
627 0512	PERMANENT SIGNS (GROUND MOUNTED) (SPECIAL METAL SUPPORTS)	44.00	44.00	SQ FT
627 0532	PERMANENT SIGNS - REMOVE	1103.87	1104.00	SQ FT

CHURCHILL COUNTY				
ITEM NO.	DESCRIPTION	TOTAL	USE TOTAL	UNIT
627 0508	PERMANENT SIGNS (GROUND MOUNTED) (METAL SUPPORTS)	67.25	68.00	SQ FT
627 0532	PERMANENT SIGNS - REMOVE	68.95	69.00	SQ FT
627 0540	PERMANENT SIGNS - RESET	97.50	98.00	SQ FT

CONTRACT TOTAL				
ITEM NO.	DESCRIPTION	TOTAL	USE TOTAL	UNIT
627 0508	PERMANENT SIGNS (GROUND MOUNTED) (METAL SUPPORTS)	1429.02	1430.00	SQ FT
627 0512	PERMANENT SIGNS (GROUND MOUNTED) (SPECIAL METAL SUPPORTS)	44.00	44.00	SQ FT
627 0532	PERMANENT SIGNS - REMOVE	1172.82	1173.00	SQ FT
627 0540	PERMANENT SIGNS-RESET	97.50	98.00	SQ FT

SIGN GENERAL NOTES

1 Sign numbers are taken from the Manual on Uniform Traffic Control Devices (200* & rev), Standard Highway Signs (200* & rev) and Standard Highway Signs - Nevada Supplement (200*).

2 Post lengths pertain to the type of posts as shown in the Sign Summary. If the Contractor chooses one of the other types as shown in NV Standard Plans, the Contractor must furnish a Sign Summary depicting the appropriate post and corresponding post length. The Sign Summary must be approved by the Traffic Engineering Division prior to the fabrication of these alternate posts.

3 Installation numbers with an R signify removal.

4 Distance from edge of traveled way to near edge of sign shall be as shown on sheet T-31.1.1 of State of Nevada Standard Plans (200*).

5 Mounting height shall be as shown on sheet T-31.1.1 of State of Nevada Standard Plans (200*), except as noted in remarks column of Sign Summary. Post lengths for all ground mounted signs are calculated to the nearest inch.Post lengths are calculated using an **assumed cross-slope** at sign base, as indicated in the column marked "Sign Slope" on the sign summary sheet. **Post lengths noted are for estimated purposes only, and may have to be adjusted.**

6 Type III reflective sheeting shall be used on all installations.

7 All US or Nevada Route Markers shall be black on white and cut out in shape when mounted on a larger panel. All supplemental plates such as arrows, cardinal directions, etc used with these markers shall be black on white. When used independently, the markers shall be square or rectangular in shape.

8 Any Signs not shown in plan sheets are not to be disturbed.

9 All reset sign panels shall be installed on new supports.

10 All Street Name guide signs (sign no. D-3) shall have the same legend both sides, and shall be mounted on the top of the sign post, parallel to the named street.

* Current standards used in plan development

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON/CHURCHILL	TS5

SIGN SUMMARY (REMOVALS)

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON / CHURCHILL	TS6

Bid Item No.	Remarks	Message	Sign Area (Sq. Ft.)	Panel Size (in. x in.) w x h	Loc.	Sign Station	Removal No.
627-0532		RIGHT LANE ENDS	9.00	36 x 36	RT	"EW" 37+00	1R
				x			
627-0532		PAVEMENT WIDTH TRANSITION (RIGHT)	9.00	36 x 36	RT	"EW" 41+00	2R
				x			
627-0532		JCT	2.19	21 x 15	LT	"EW" 42+00	3R
627-0532		ALT	2.00	24 x 12			
627-0532		US 95 (SHIELD)	4.00	24 x 24			
				x			
627-0532		SPEED LIMIT 35	12.00	36 x 48	RT	"P" 30+05	4R
				x			
627-0532		CIRCULAR INTERSECTION	9.00	36 x 36	LT	"P" 33+55	5R
627-0532		15 M. P. H.	2.25	18 x 18			
				x			
627-0532		HAZEN 11 FALLON 30	11.25	54 x 30	RT	"P" 34+75	6R
				x			
627-0532		SPEED LIMIT 45	12.00	36 x 48	LT	"P" 36+27	7R
				x			
627-0532		SPEED LIMIT 55	12.00	36 x 48	RT	"P" 36+27	8R
				x			
627-0532		US 50 LONELEST HIGHWAY	15.00	36 x 60	RT	"P" 38+77	9R
				x			
627-0532		GREAT BASIN NATIONAL PARK 240 MI	13.50	54 x 36	RT	"P" 41+22	10R
				x			
627-0532	RESET PANEL TO INST. # 144	BEGIN DAYTIME HEADLIGHT SECTION	27.00	108 x 36	RT	"P" 43+33	11R
				x			
627-0532	RESET PANEL TO INST. # 143	CHECK HEADLIGHTS	16.50	66 x 36	LT	"P" 43+80	12R
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	RT	"P" 45+97	13R
627-0532		INGLEWOOD DRIVE	10.00	30 x 48			
				x			
627-0532		INGLEWOOD DRIVE	2.00	36 x 8	RT	"P" 50+70	14R
627-0532		STOP	6.25	30 x 30			
				x			
627-0532		SPEED LIMIT 55	12.00	36 x 48	LT	"P" 52+10	15R
				x			
627-0532		SPEED LIMIT 65	12.00	36 x 48	RT	"P" 52+10	16R
				x			
627-0532	RESET PANEL TO INST. # 145	END DAYTIME HEADLIGHT SECTION	27.00	108 x 36	LT	"P" 55+00	17R
				x			
627-0532		INGLEWOOD DRIVE	2.00	36 x 8	RT	"P" 56+05	18R
627-0532		STOP	6.25	30 x 30			
627-0532		TURN ON HEADLIGHTS NEXT 17 MILES	27.00	108 x 36	RT	"P" 56+50	19R
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	RT	"P" 57+00	20R
627-0532		RIVER RANCH ROAD	9.00	36 x 36			
				x			
627-0532		RIGHT LANE MUST TURN RIGHT	6.25	30 x 30	RT	"P" 59+55	21R
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	LT	"P" 61+95	22R
627-0532		INGLEWOOD DRIVE	9.00	36 x 36			
				x			
627-0532		RIVER RANCH ROAD	2.33	42 x 8	RT	"P" 62+30	23R
627-0532		US 50 ALT	1.67	30 x 8			
627-0532		STOP	6.25	30 x 30			
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	LT	"P" 67+85	24R
627-0532		RIVER RANCH ROAD	9.00	36 x 36			
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	RT	"P" 69+85	25R
627-0532		EMMIGRANT WAY	3.00	24 x 18			
				x			
				x			

SIGN SUMMARY (REMOVALS)

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON / CHURCHILL	TS7

Bid Item No.	Remarks	Message	Sign Area (Sq. Ft.)	Panel Size (in. x in.) w x h	Loc.	Sign Station	Removal No.
627-0532		RIGHT LANE MUST TURN RIGHT	6.25	30 x 30	RT	"P" 70+80	26R
				x			
627-0532		EMERGENCY MEDICAL SERVICE PH 911	14.00	42 x 48	LT	"P" 73+50	27R
				x			
627-0532		NO LITTERING	10.00	48 x 30	RT	"P" 73+50	28R
				x			
627-0532		RIGHT LANE MUST TURN RIGHT	6.25	30 x 30	RT	"P" 74+20	29R
				x			
627-0532		EMMIGRANT ROAD	2.33	42 x 8	RT	"P" 76+40	30R
627-0532		US 50 ALT	1.67	30 x 8			
627-0532		STOP	6.25	30 x 30			
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	LT	"P" 84+40	31R
627-0532		EMMIGRANT WAY	3.00	24 x 18			
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	RT	"P" 112+45	32R
				x			
627-0532		RIGHT LANE MUST TURN RIGHT	6.25	30 x 30	RT	"P" 113+50	33R
				x			
627-0532		RIGHT LANE MUST TURN RIGHT	6.25	30 x 30	RT	"P" 117+10	34R
				x			
627-0532		KEEP LEFT (SYM.)	5.00	24 x 30	RT	"P" 119+80	35R
627-0532		CHECK HEADLIGHTS	2.25	18 x 18			
627-0532		STOP	6.25	30 x 30			
				x			
627-0532		JESSICA LANE	1.67	30 x 8	RT	"P" 120+20	36R
627-0532		US 50 ALT	1.67	30 x 8			
627-0532		STOP	6.25	30 x 30			
627-0532		TURN ON YOUR HEADLIGHTS	4.00	24 x 24			
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	LT	"P" 127+15	37R
627-0532		JESSICA LANE	12.00	48 x 36			
				x			
627-0532		SPEED LIMIT 65	12.00	36 x 48	RT	"P" 208+85	38R
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	RT	"P" 217+10	39R
627-0532		DESERT ROSE	3.00	24 x 18			
				x			
627-0532		DESERT ROSE	2.00	36 x 8	RT	"P" 224+40	40R
627-0532		STOP	6.25	30 x 30			
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	RT	"P" 225+05	41R
627-0532		JULIA LANE	5.00	24 x 30			
				x			
627-0532		GOLF COURSE 0 DEG. ARROW	9.00	36 x 36	RT	"P" 226+90	42R
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	LT	"P" 230+05	43R
627-0532		DESERT ROSE	3.00	24 x 18			
				x			
627-0532		STOP	6.25	30 x 30	RT	"P" 231+45	44R
627-0532		TURN ON YOUR HEADLIGHTS	4.00	24 x 24			
				x			
627-0532		GOLF COURSE 180 DEG.ARROW	9.00	36 x 36	LT	"P" 235+20	45R
				x			
627-0532		DAYTIME HEADLIGHT SECTION	22.50	60 x 54	RT	"P" 236+40	46R
				x			
627-0532		SIDE ROAD PERPENDICULAR	6.25	30 x 30	LT	"P" 238+30	47R
627-0532		JULIA LANE	5.00	24 x 30			
				x			
627-0532		PASSING LANE 2 MILES	20.25	54 x 54	RT	"P" 252+80	48R
				x			
				x			
				x			

SIGN SUMMARY (NEW LOCATIONS)

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON / CHURCHILL	TS8

Bid Item No.	Remarks	Brace Length (ft)	Post				Mount Height (ft)	Slope	Curb & Gutter	Sign Island	Message	Sign Area (Sq. Ft.)	Panel Size (in. x in.) w x h	Sign No.	Loc.	Sign Station	Inst. No.
			Length (ft) Inner	Length (ft) Outer	No.	Type and Size (in)											
627-0508			12' 7"		1	3" RND SNGL POST	7	6 : 1			CIRCULAR INTERSECTION	9.00	36 x 36	W2-6	LT	"EW" 40+00	1
627-0508								:			15 M.P.H.	2.25	18 x 18	W13-1			
								:					x				
627-0512			12' 1"		1	PIVOT POST	7	6 : 1			CHAINS OR SNOW TIRES REQUIRED	12.00	48 x 36	NCS-3	RT	"EW" 40+50	2
								:					x				
627-0508			8' 4"		1	2.5" SQ 12 GA POST	7	:	Y		ONE WAY (ENCLOSED IN RIGHT ARROW)	3.00	36 x 12	R6-1R	CNTR	"P" 28+85	3
								:					x				
627-0508			10' 4"		1	2.5" SQ 12 GA POST	7	:	Y		DO NOT ENTER	9.00	36 x 36	R5-1	CNTR	"P" 29+20	4
								:					x				
627-0512			12' 1"		1	PIVOT POST	7	6 : 1			DUST HAZARD	16.00	48 x 48	NDH-1B	RT	"P" 30+00	5
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			SPEED LIMIT 25	12.00	36 x 48	R2-1	LT	"P" 33+00	6
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			SPEED LIMIT 35	12.00	36 x 48	R2-1	RT	"P" 33+00	7
								:					x				
627-0508			9' 10"		1	2.5" SQ 12 GA POST	7	:	Y		PAVEMENT WIDTH TRANSITION LEFT	6.25	30 x 30	W4-2L	CNTR	"P" 37+00	8
								:					x				
627-0508			12' 4"		1	2.5" SQ 12 GA POST	7	6 : 1			JUNCTION MARKER	2.19	21 x 15	M2-1	LT	"P" 38+00	9
627-0508								:			COUNTY ROUTE MARKER	4.00	24 x 24	M1-5			
								:					x				
627-0508			9' 10"		1	2.5" SQ 12 GA POST	7	:	Y		KEEP LEFT (SYMBOL)	5.00	24 x 30	R4-8	CNTR	"P" 38+75	10
								:					x				
627-0508			12' 1"		1	2.5" SQ 12 GA POST	7	6 : 1			STOP	9.00	36 x 36	R1-1	RT	"P" 39+15	11
								:					x				
627-0508			13' 9"		1	3" RND SNGL POST	6	6 : 1			SIDE ROAD (PERPENDICULAR) (RIGHT)	9.00	36 x 36	W2-2R	RT	"P" 40+00	12
627-0508								:			INGLEWOOD DRIVE	10.00	48 x 30	SPCL			
								:					x				
627-0508			12' 1"		1	2.5" SQ 12 GA POST	7	6 : 1			MERGE (LEFT) (SYMBOL)	9.00	36 x 36	W4-1L	LT	"P" 41+00	13
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			SPEED LIMIT 35	12.00	36 x 48	R2-1	LT	"P" 43+00	14
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			SPEED LIMIT 45	12.00	36 x 48	R2-1	RT	"P" 43+00	15
								:					x				
627-0508			8' 4"		1	2.5" SQ 12 GA POST	7	:	Y		ONE WAY (ENCLOSED IN RIGHT ARROW)	3.00	36 x 12	R6-1R	CNTR	"P" 50+55	16
								:					x				
627-0508			13' 4"		1	3" RND SNGL POST	7	6 : 1			INGLEWOOD DR	4.00	48 x 12	D-3	RT	"P" 50+70	17
627-0508								:			US 50 ALT	3.00	36 x 12	D-3			
627-0508								:			STOP	9.00	36 x 36	R1-1			
								:					x				
627-0508			11' 6"		1	2.5" SQ 12 GA POST	7	6 : 1			STOP	6.25	30 x 30	R1-1	LT	"SB" 1+30	18
								:					x				
627-0508			12' 9"		1	2.5" SQ 10 GA POST	7	6 : 1			INGLEWOOD DR	4.00	48 x 12	D-3	RT	"SB" 6+85	19
627-0508								:			STOP	6.25	30 x 30	R1-1			
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			SPEED LIMIT 45	12.00	36 x 48	R2-1	LT	"P" 51+50	20
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			SPEED LIMIT 55	12.00	36 x 48	R2-1	RT	"P" 51+50	21
								:					x				
627-0508			13' 9"		1	3" RND SNGL POST	6	6 : 1			SIDE ROAD (PERPENDICULAR) (RIGHT)	9.00	36 x 36	W2-2R	RT	"P" 53+00	22
627-0508								:			RIVER RANCH ROAD	11.25	54 x 30	SPCL			
								:					x				
627-0508			11' 6"		1	2.5" SQ 12 GA POST	7	6 : 1			STOP	6.25	30 x 30	R1-1	RT	"SB" 12+35	23
								:					x				
627-0508			9' 10"		1	2.5" SQ 12 GA POST	7	:	Y		PAVEMENT WIDTH TRANSITION LEFT	6.25	30 x 30	W4-2L	CNTR	"P" 59+00	24
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			ADDED LANE LEFT	16.00	48 x 48	W4-3L	LT	"P" 62+00	25
								:					x				
627-0508			9' 10"		1	2.5" SQ 12 GA POST	7	:	Y		KEEP LEFT (SYMBOL)	5.00	24 x 30	R4-8	CNTR	"P" 62+00	26
								:					x				
627-0508			13' 4"		1	3" RND SNGL POST	7	6 : 1			RIVER RANCH ROAD	4.00	48 x 12	D-3	RT	"P" 62+45	27
627-0508								:			US 50 ALT	3.00	36 x 12	D-3			
627-0508								:			STOP	9.00	36 x 36	R1-1			
								:					x				

SIGN SUMMARY (NEW LOCATIONS)

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON / CHURCHILL	TS9

Bid Item No.	Remarks	Brace Length (ft)	Post				Mount Height (ft)	Slope	Curb & Gutter	Sign Island	Message	Sign Area (Sq. Ft.)	Panel Size (in. x in.) w x h	Sign No.	Loc.	Sign Station	Inst. No.
			Length (ft) Inner	Length (ft) Outer	No.	Type and Size (in)											
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			SPEED LIMIT 55	12.00	36 x 48	R2-1	LT	"P" 64+00	28
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			SPEED LIMIT 65	12.00	36 x 48	R2-1	RT	"P" 64+00	29
								:					x				
627-0508			12' 1"		1	2.5" SQ 12 GA POST	7	6 : 1			55 MPH SPEED ZONE AHEAD	9.00	36 x 36	W3-5A	LT	"P" 65+50	30
								:					x				
627-0508			8' 4"		1	2.5" SQ 12 GA POST	7	:	Y		ONE WAY (ENCLOSED IN RIGHT ARROW)	3.00	36 x 12	R6-1R	CNTR	"P" 68+10	31
								:					x				
627-0508			12' 1"		1	2.5" SQ 12 GA POST	7	6 : 1			STOP	9.00	36 x 36	R1-1	RT	"P" 68+25	32
								:					x				
627-0508			13'9"		1	3" RND SNGL POST	7	6 : 1			SIDE ROAD (PERPENDICULAR) (RIGHT)	9.00	36 x 36	W2-2R	RT	"P" 69+10	33
627-0508								:			EMMIGRANT WAY	10.00	48 x 30	SPCL			
								:					x				
627-0508		17' 2"	13' 10"	14' 7"	2	3" RND DBL POST BRACED	7	6 : 1			HAZEN 9 JCT US 50 16 FALLON 25	30.00	90 x 48	SPCL	RT	"P" 72+00	34
								:					x				
627-0508			13'9"		1	3" RND SNGL POST	7	6 : 1			SIDE ROAD (PERPENDICULAR) (LEFT)	9.00	36 x 36	W2-2L	LT	"P" 73+00	35
627-0508								:			RIVER RANCH ROAD	11.25	54 x 30	SPCL			
								:					x				
627-0508			12' 1"		1	2.5" SQ 12 GA POST	7	6 : 1			STOP	9.00	36 x 36	R1-1	LT	"P" 75+45	36
								:					x				
627-0508			8' 4"		1	2.5" SQ 12 GA POST	7	:	Y		ONE WAY (ENCLOSED IN RIGHT ARROW)	3.00	36 x 12	R6-1R	CNTR	"P" 75+75	37
								:					x				
627-0508			8' 4"		1	2.5" SQ 12 GA POST	7	:	Y		ONE WAY (ENCLOSED IN RIGHT ARROW)	3.00	36 x 12	R6-1R	CNTR	"P" 76+05	38
								:					x				
627-0508			13' 4"		1	3" RND SNGL POST	7	6 : 1			EMMIGRANT WAY	4.00	48 x 12	D-3	RT	"P" 76+40	39
627-0508								:			US 50 ALT	3.00	36 x 12	D-3			
627-0508								:			STOP	9.00	36 x 36	R1-1			
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			EMERGENCY MEDICAL SERVICE	14.00	42 x 48	NEM-1	LT	"P" 80+00	40
								:					x				
627-0508			12' 1"		1	2.5" SQ 10 GA POST	7	6 : 1			NO LITTERING - CONVENTIONAL	12.00	48 x 36	NNL-1	RT	"P" 80+00	41
								:					x				
627-0508			11' 6"		1	2.5" SQ 12 GA POST	7	6 : 1			PAVEMENT WIDTH TRANSITION LEFT	6.25	30 x 30	W4-2L	CNTR	"P" 99+00	42
								:					x				
627-0508			11' 6"		1	2.5" SQ 12 GA POST	7	6 : 1			KEEP LEFT (SYMBOL)	5.00	24 x 30	R4-8	CNTR	"P" 102+40	43
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			ADDED LANE LEFT	16.00	48 x 48	W4-3L	LT	"P" 107+00	44
								:					x				
627-0508			13'9"		1	3" RND SNGL POST	6	6 : 1			SIDE ROAD (PERPENDICULAR) (RIGHT)	9.00	36 x 36	W2-2R	RT	"P" 107+00	45
627-0508								:			JESSICA LANE	7.50	36 x 30	SPCL			
								:					x				
627-0508			9' 4"		1	2.5" SQ 12 GA POST	7	:	Y		NO LEFT TURN (SYMBOL)	4.00	24 x 24	R3-2	RT	"P" 119+80	46
								:					x				
627-0508			10' 4"		1	2.5" SQ 12 GA POST	7	:	Y		DO NOT ENTER	9.00	36 x 36	R5-1	CNTR	"P" 119+95	47
								:					x				
627-0508			9' 10"		1	2.5" SQ 12 GA POST	7	:	Y		KEEP RIGHT (SYMBOL)	5.00	24 x 30	R4-7	RT	"P" 119+95	48
								:					x				
627-0508			8' 4"		1	2.5" SQ 12 GA POST	7	:	Y		ONE WAY (ENCLOSED IN RIGHT ARROW)	3.00	36 x 12	R6-1R	CNTR	"P" 120+25	49
								:					x				
627-0508			13'9"		1	3" RND SNGL POST	6	6 : 1			SIDE ROAD (PERPENDICULAR) (LEFT)	9.00	36 x 36	W2-2L	LT	"P" 137+15	50
627-0508								:			JESSICA LANE	7.50	36 x 30	SPCL			
								:					x				
627-0508			9' 10"		1	2.5" SQ 12 GA POST	7	:	Y		PAVEMENT WIDTH TRANSITION LEFT	6.25	30 x 30	W4-2L	CNTR	"P" 148+75	51
								:					x				
627-0508			9' 10"		1	2.5" SQ 12 GA POST	7	:	Y		KEEP LEFT (SYMBOL)	5.00	24 x 30	R4-8	CNTR	"P" 151+90	52
								:					x				
627-0508			12' 1"		1	3" RND SNGL POST	7	6 : 1			ADDED LANE LEFT	16.00	48 x 48	W4-3L	LT	"P" 156+55	53
								:					x				
627-0508			8' 4"		1	2.5" SQ 12 GA POST	7	:	Y		ONE WAY (ENCLOSED IN RIGHT ARROW)	3.00	36 x 12	R6-1R	CNTR	"P" 178+80	54
								:					x				
627-0508			12' 1"		1	2.5" SQ 12 GA POST	7	6 : 1			STOP	9.00	36 x 36	R1-1	RT	"P" 179+05	55
								:					x				
								:					x				

7.25 Bridge Plans.

General. The bridge plans show the necessary details for constructing the associated proposed bridge structure improvements. This work normally consists of structures used to convey public traffic over or under significant impediments such as roads, rivers, railroads or drainages.

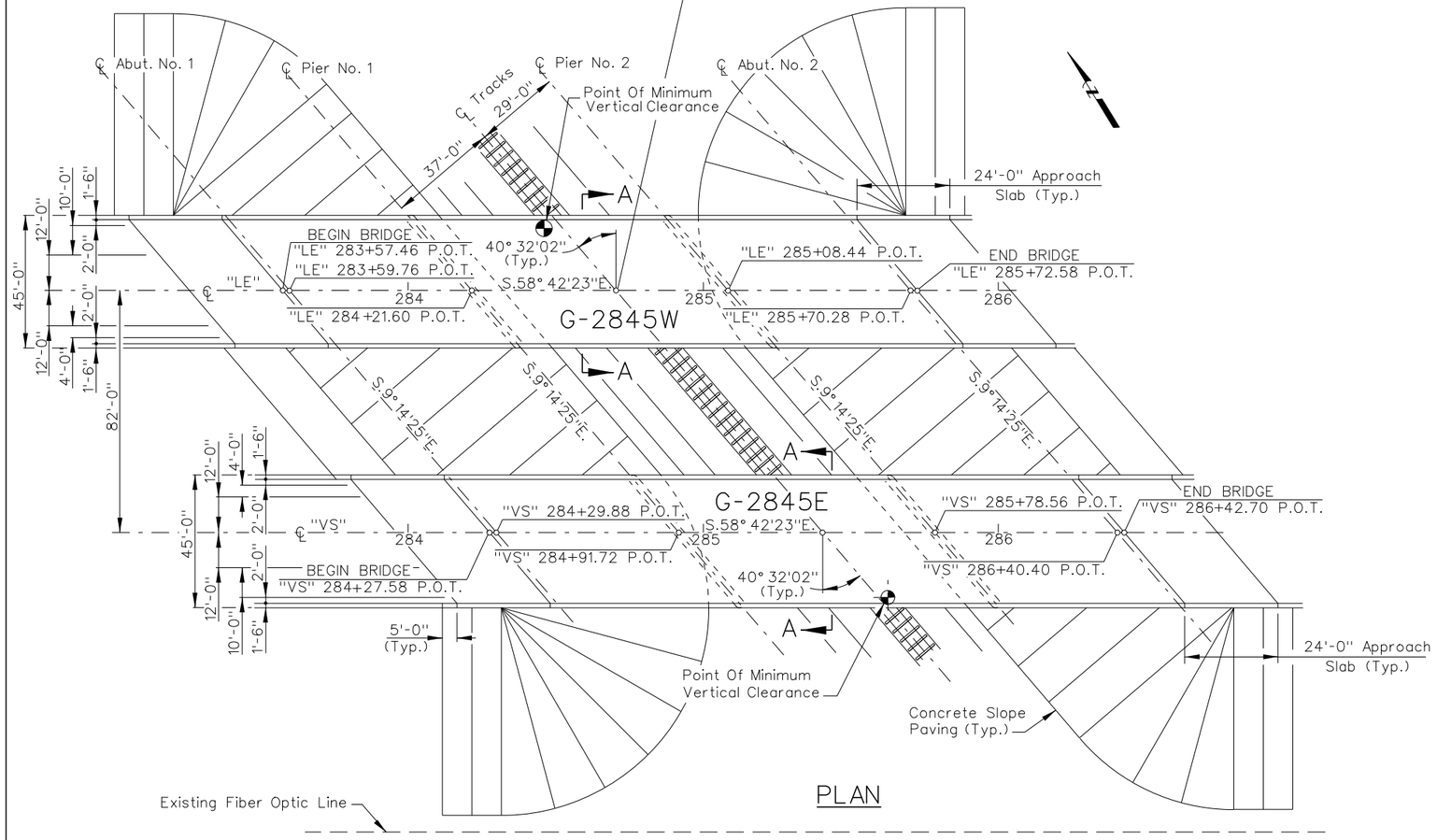
Bridge Plan Guidelines. The Structures Division produces the bridge plans. Upon completion, these plans are supplied to Roadway Design for incorporation into the contract plans.

Bridge Plan Particulars.

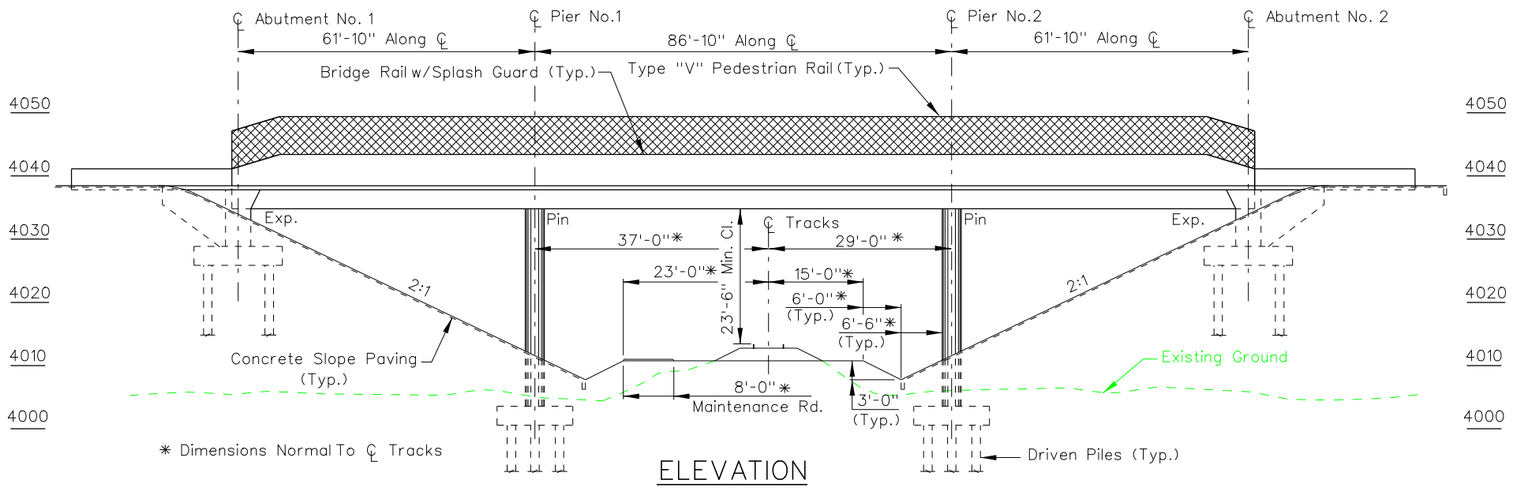
1) Sheet numbering for bridge plans shall begin with B1. Multiple sheets shall be numbered B1, B2, B3, etc.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A (004)	CHURCHILL	B1

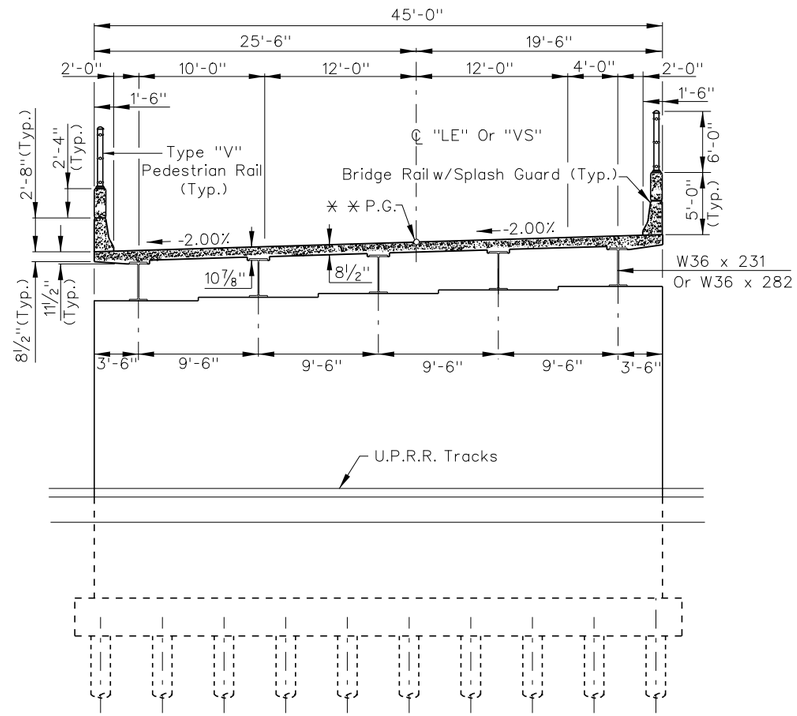
R/R MP 0.52 DOT.#924107F



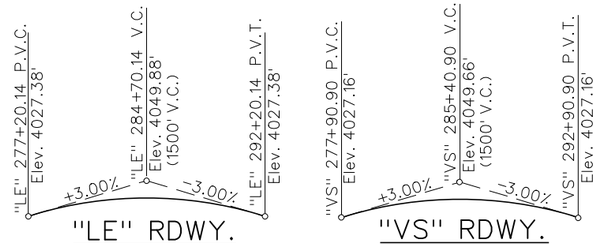
PLAN



ELEVATION



SECTION A-A



PROFILE LINE

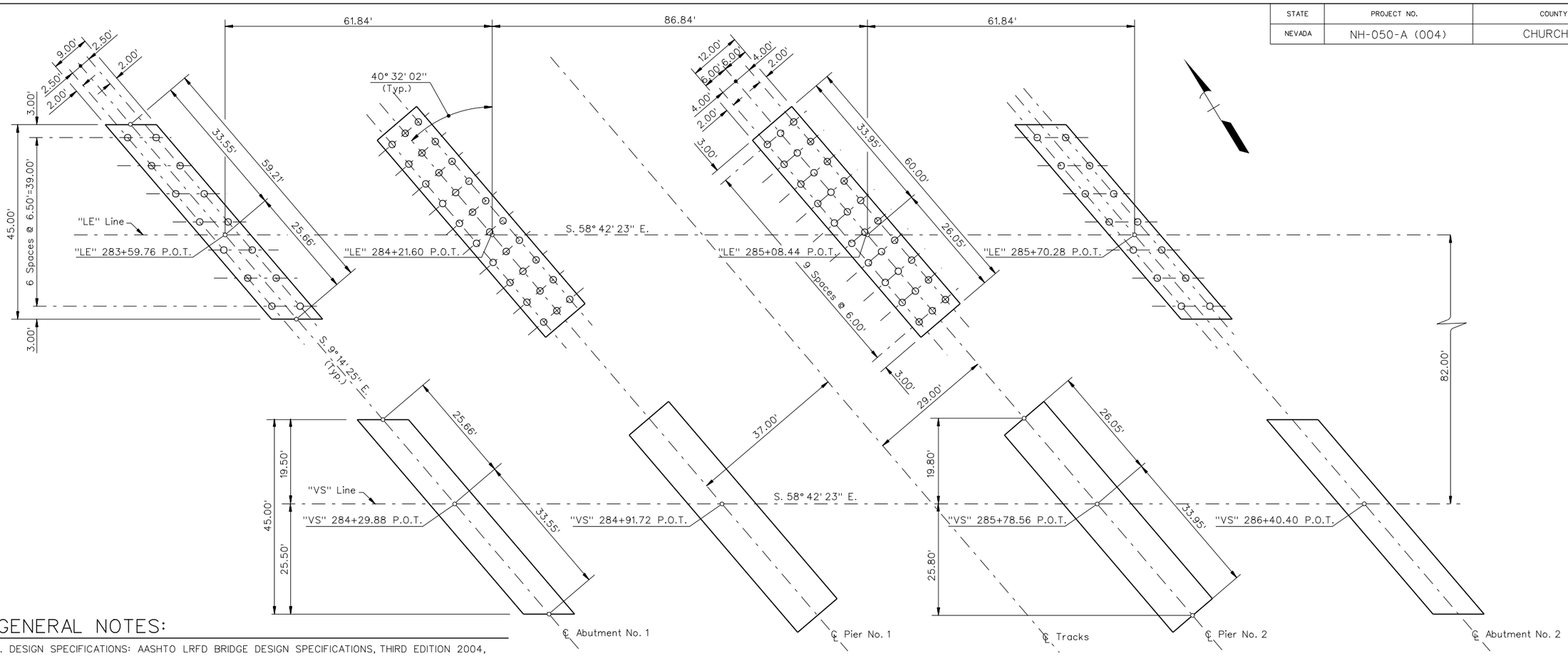
* * - PROFILE GRADE OF BRIDGE DECK AND APPROACH SLABS WILL BE ¾" HIGHER THAN ROADWAY PROFILE GRADE.

STRUCTURAL DESIGN DIVISION	
DESIGNED BY:	MIKE VECCHIARELLI & MYLINH TANG
PRINCIPAL:	NANCY KENNEDY
PHONE:	775-888-7551
GEOTECHNICAL DESIGN	
DESIGNED BY:	CAROL CALLAGHAN
PRINCIPAL:	JEFF PALMER
PHONE:	775-888-7873

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

US 50A-CH 2.960
US 50A - U.P.R.R. GRADE SEPARATION
G-2845 E&W

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A (004)	CHURCHILL	B2



GEOMETRICS

DIMENSIONS SHOWN ARE TYPICAL FOR EACH FOOTING

GENERAL NOTES:

1. DESIGN SPECIFICATIONS: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, THIRD EDITION 2004, AND INTERIMS THRU 2006.
2. CONSTRUCTION SPECIFICATIONS: STATE OF NEVADA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2001" EXCEPT AS NOTED BELOW AND IN THE SPECIAL PROVISIONS FOR THIS CONTRACT.
3. DESIGN LOADS: IN ACCORDANCE WITH SPECIFICATION AND AS FOLLOWS:

   DEAD LOAD: WEIGHT OF STRUCTURE PLUS A FUTURE WEARING SURFACE OF 38.0 PSF.

   LIVE LOAD: AASHTO HL-93. OVERLOAD DESIGN BASED ON CALIFORNIA "STANDARD PERMIT DESIGN VEHICLES" (MAXIMUM OVERLOAD P-13 TRUCK). DECK DESIGN BASED ON THE EQUIVALENT STRIP METHOD WITH A 40.0 KIP AXLE.

   SEISMIC LOAD: DESIGN BASED ON AASHTO RESPONSE SPECTRA FOR TYPE II SOIL. BEDROCK ACCELERATION COEFFICIENT = 0.30g.
4. CONCRETE: CONCRETE SHALL BE CLASS EA MODIFIED IN THE DECK, APPROACH SLABS,AND BRIDGE RAILS. SEE CONCRETE CLASSIFICATION DIAGRAM FOR CONCRETE STRENGTHS AND PLACEMENT LOCATIONS.
5. REINFORCING STEEL: ALL REINFORCING STEEL TO BE ASTM A706 GRADE 60. DIMENSIONS RELATING TO BAR SPACING ARE CENTER TO CENTER. BENDING DIMENSIONS ARE FROM OUT TO OUT OF THE BARS. BARS SIZES THREE (3) TO NINE (9) ARE INDICATED BY THE FIRST NUMBER OF THE MARK, TEN (10) OR LARGER BY THE FIRST TWO NUMBERS. BAR MARKS ENDING WITH THE LETTER "E" INDICATE THAT THE BAR SHALL BE EPOXY COATED THE LENGTH OF THE BAR. ANY ADJUSTMENTS TO REINFORCING STEEL LENGTHS OR SPACING MUST BE APPROVED BY THE ENGINEER.
6. STRUCTURAL STEEL: ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 UNLESS OTHERWISE NOTED ON PLANS. ALL BOLTS SHALL BE AASHTO M164 (ASTM A325) UNLESS OTHERWISE NOTED. THE FABRICATOR FOR THIS PROJECT SHALL HAVE A CATEGORY CBR CERTIFICATION BY THE AMERICAN INSTITUTE FOR STEEL CONSTRUCTION QUALITY CERTIFICATION PROGRAM.
7. CAMBER: CAMBER SHALL BE AS SHOWN ON THE PLANS.
8. FOUNDATION: THE FOUNDATION SHALL BE CONCRETE FILLED 18 INCH DRIVEN PIPE PILES FOR THE ABUTMENT AND PIER FOOTINGS. THE FOUNDATIONS WERE DESIGNED USING THE ALLOWABLE STRESS DESIGN METHOD.
9. SHORING: ALL NECESSARY SHORING MUST COMPLY WITH U.P.R.R. GUIDELINES FOR TEMPORARY SHORING, NO DIRECT PAYMENT FOR SHORING.
10. CONSTRUCTION CODE: X171

QUANTITIES

Item No.	Item	Unit	G-2845W Quantity	G-2845E Quantity	Total Quantity
206 0500	Structure Excavation	CuYd	1,340	1,340	2,680
207 0504	Granular Backfill	CuYd	950	950	1,900
502 0065	Laminated Elastomeric Bearing Pad	Each	20	20	40
502 0840	Class AA Concrete, Modified (Major)	CuYd	738	730	1,468
502 0864	Class EA Concrete, Modified (Major)	CuYd	478	478	956
502 0932	Strip Seal Expansion Joint (3" Movement)	LinFt	125	125	250
502 1008	Groove Concrete Deck Slab	SqYd	1,240	1,240	2,480
502 1010	Bridge Deck Curing Compound	Gal	75	75	150
505 0500	Reinforcing Steel	Lb	164,980	164,120	329,100
505 0504	Reinforcing Steel (Epoxy Coated)	Lb	136,040	136,030	272,070
506 0000	Structural Steel	LS	---	---	---
506 0588	Pedestrian Rail, Type V	LinFt	430	430	860
508 0016	Drive Steel Shells for Piles	Each	88	88	176
508 0023	Restrike Piles	Each	22	22	44
508 0040	Splices	Each	22	22	44
508 0054	Dynamic Load Test	Each	4	4	8
508 1508	Furnish Concrete Filled Steel Shell Piles (18 inch)	LinFt	3,340	3,340	6,680
611 0504	Class AA Concrete Slope Pavement	CuYd	185	185	370

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

GEOMETRICS, GENERAL NOTES AND QUANTITIES

G-2845 E. & W.

7.26 Retaining Walls and Sound Walls.

General. The structural wall plan sheets show the necessary details for constructing the associated proposed wall structure improvements. This work normally consists of walls used for retaining slopes or mitigating noise pollution.

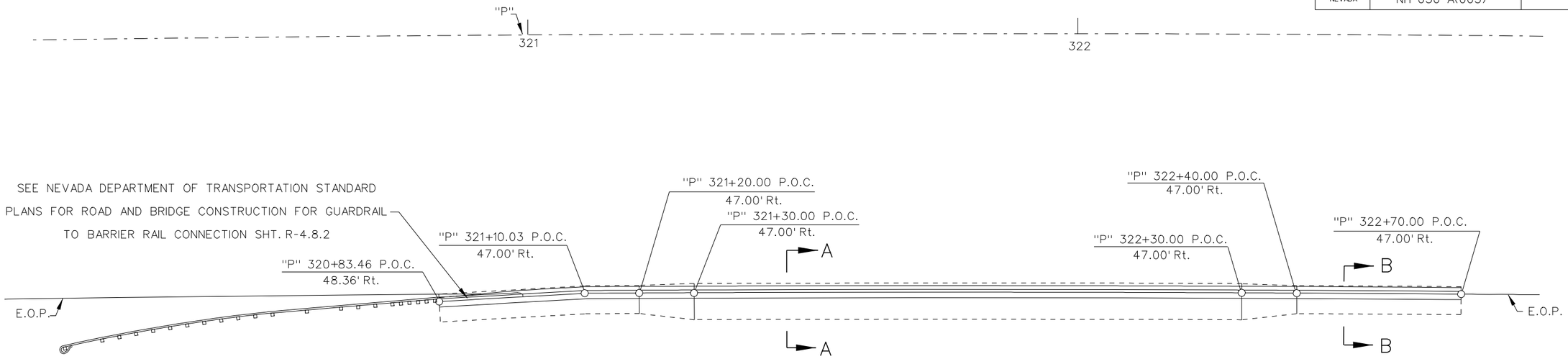
Retaining Walls and Sound Wall Guidelines.

The Structures Division, in cooperation with the roadway designer and environmental engineer, produces the sound wall sheets. The Structures Division normally designs retaining walls. Upon completion, these plans are supplied to Roadway Design for incorporation into the contract plans.

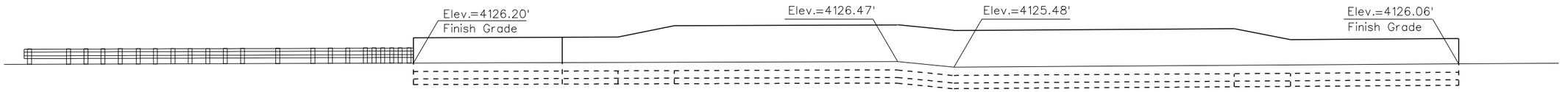
Retaining Walls and Sound Wall Particulars.

1) Sheet numbering for retaining walls and sound wall sheets shall begin with BW1. Multiple sheets shall be numbered BW1, BW2, BW3, etc.

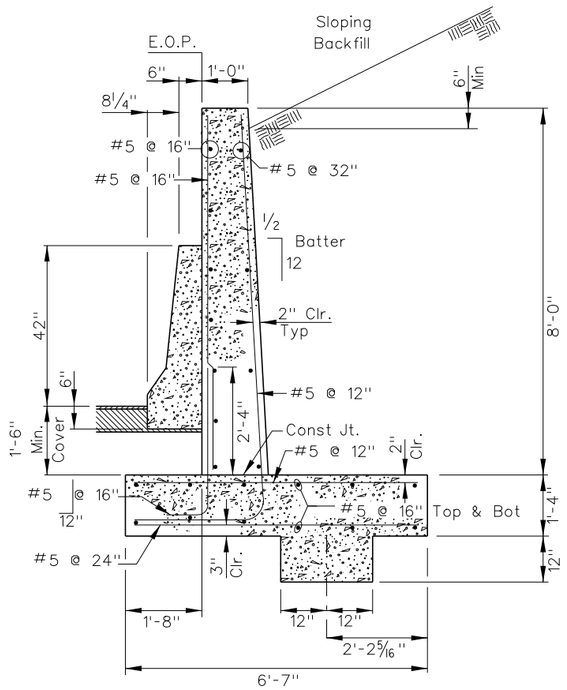
STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON	BW1



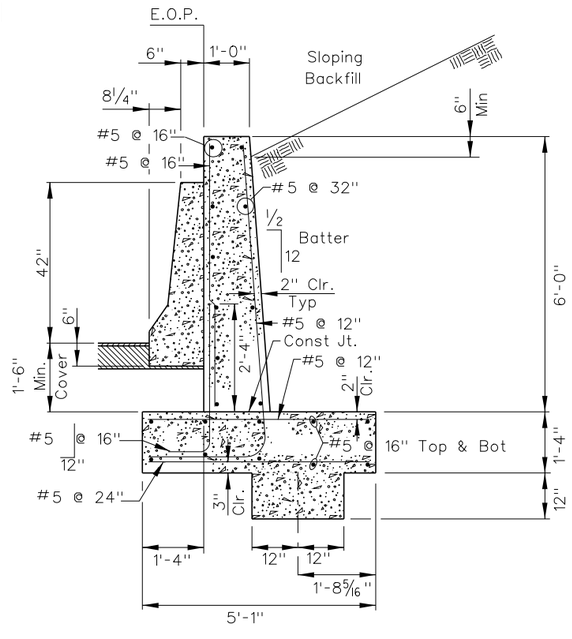
RETAINING WALL PLAN



ELEVATION



SECTION A-A

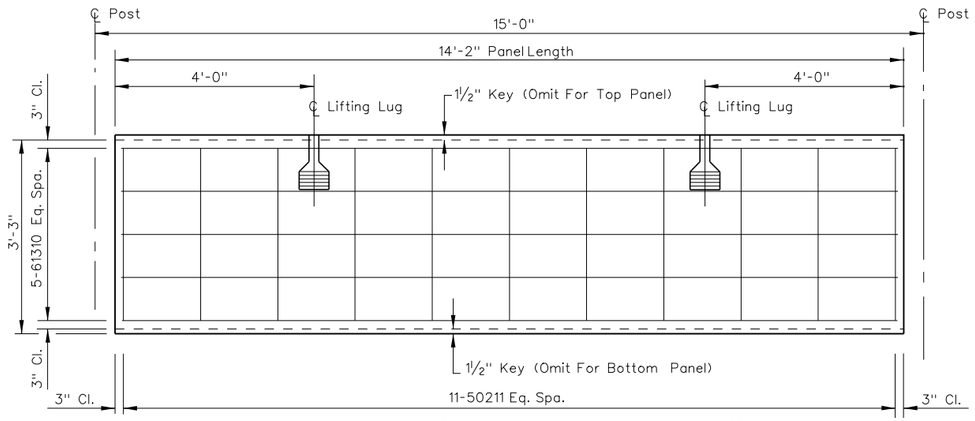


SECTION B-B

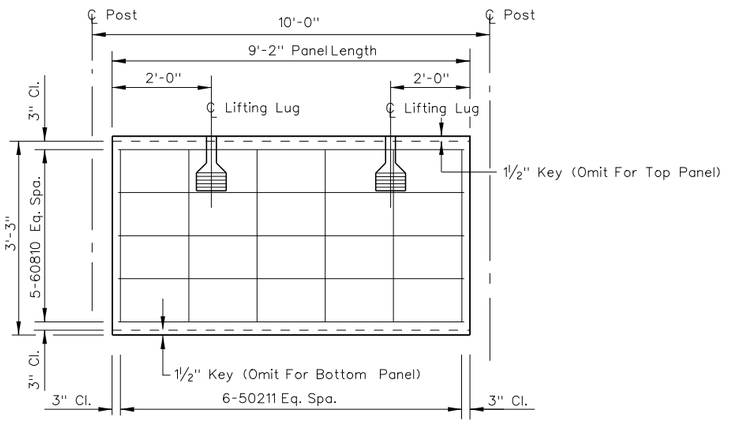
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

RETAINING WALL DETAILS

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON	BW2

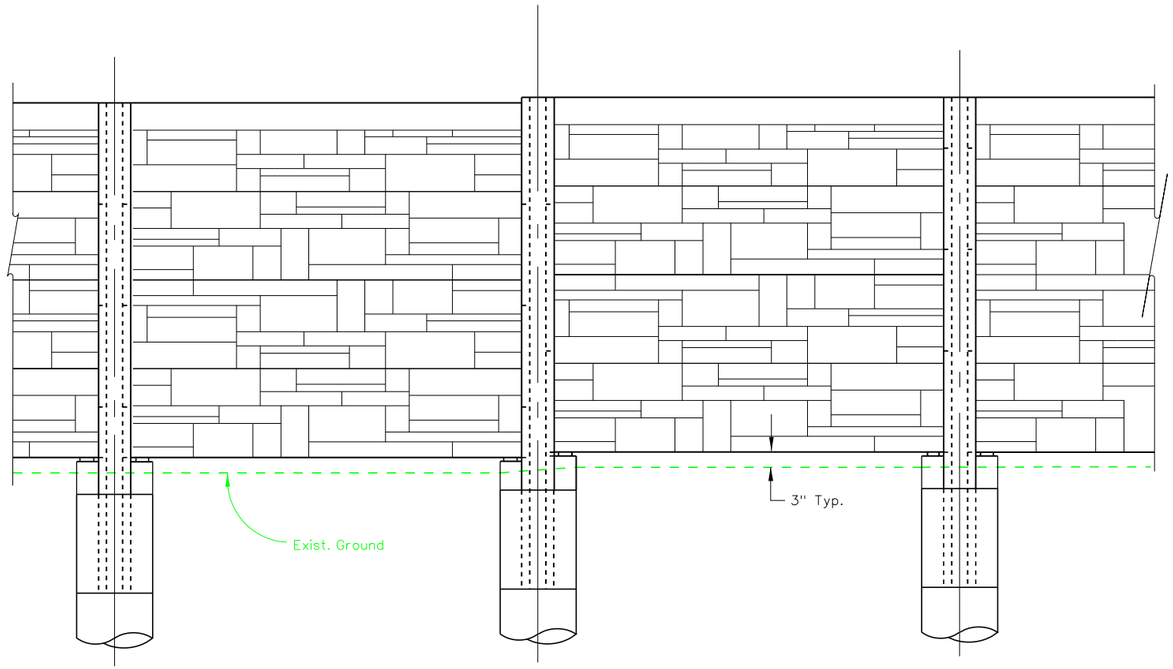


3'-3" x 14'-2" PANEL ELEVATION

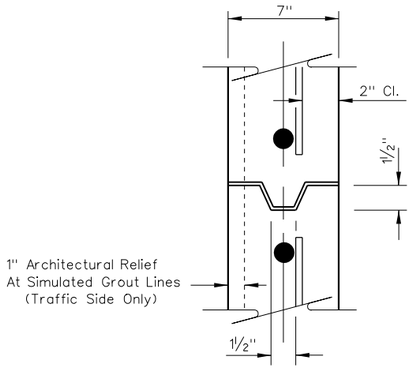


3'-3" x 9'-2" PANEL ELEVATION*

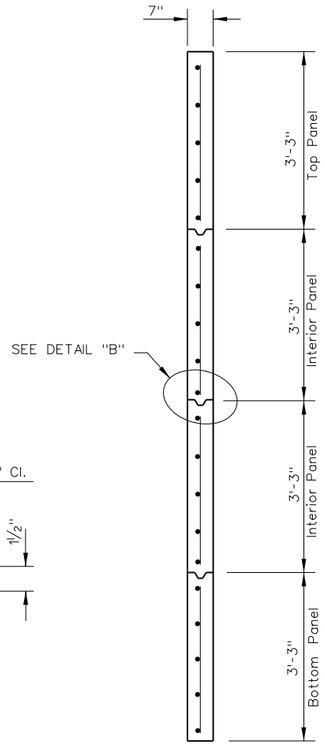
*SHORT PANEL



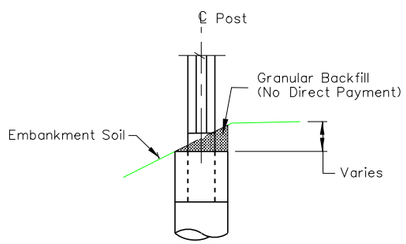
TYPICAL ELEVATION OF SOUND BARRIER WALL



DETAIL "B"



TYPICAL WALL SECTION



EXCAVATION DETAIL
WITHOUT SLOPE PAVING
(FOR SHAFT PLACEMENT)

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

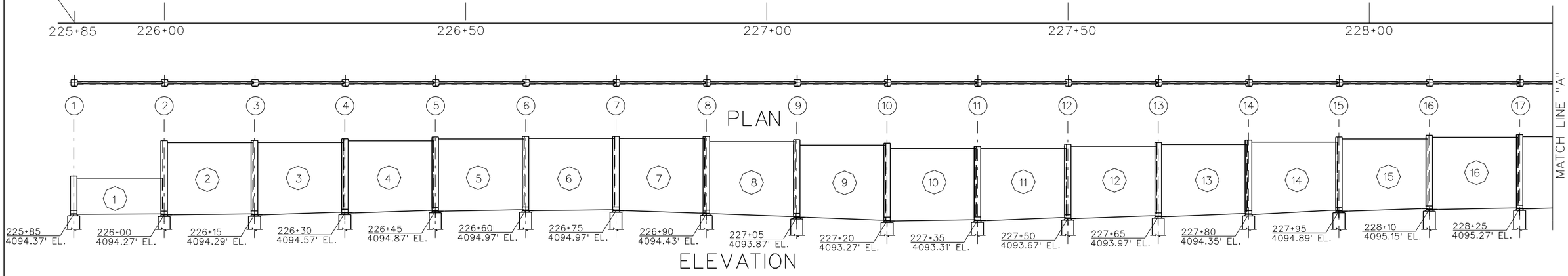
POST AND PANEL SOUNDWALL DETAILS

NOTE: ELEVATIONS SHOWN ARE BOTTOM OF WALL
FOR TOP OF SHAFT ELEV. SEE TABLE SHEET XXX

◯ – POST No. (SEE SHT. XXX)
⬡ – PANEL No. (SEE SHT. XXX)

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(002)	LYON	BW3

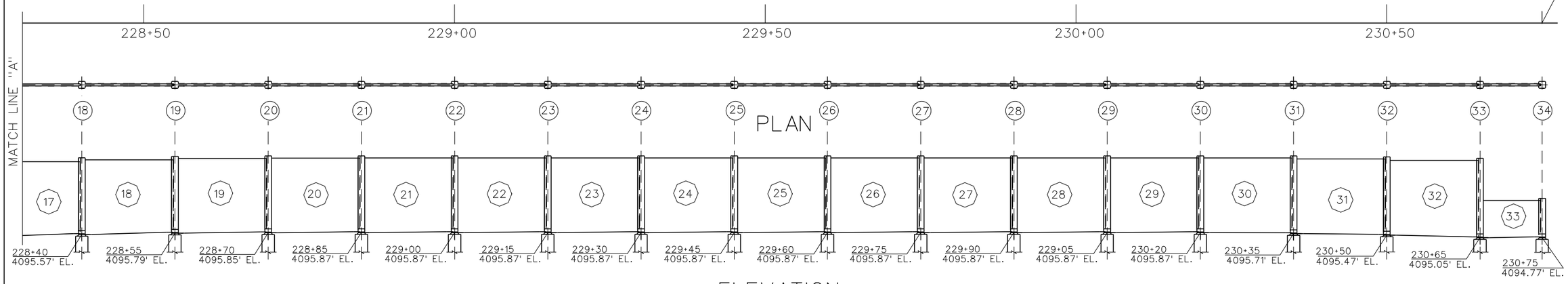
BEGIN SOUNDWALL No. 2
225+85.00 P.O.T. (64.00' RT.)



PLAN

ELEVATION

END SOUNDWALL No. 2
230+75.00 P.O.T. (64.00' RT.)



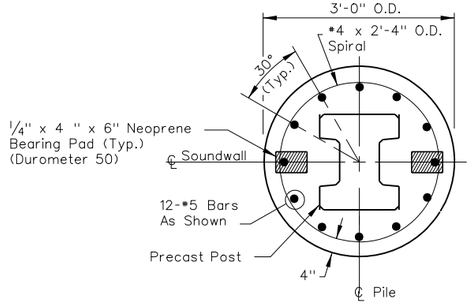
PLAN

ELEVATION

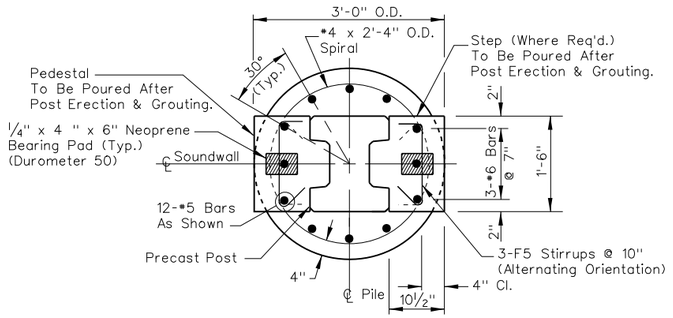
STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

SOUNDWALL NO.2

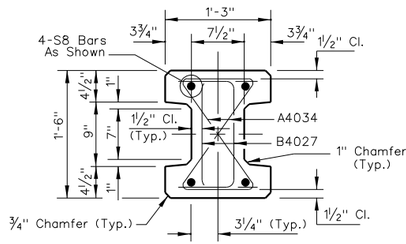
STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(003)	LYON	BW4



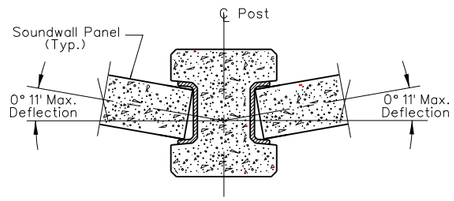
PLAN VIEW



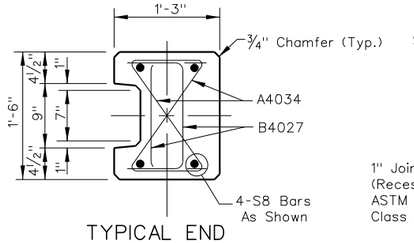
PLAN VIEW



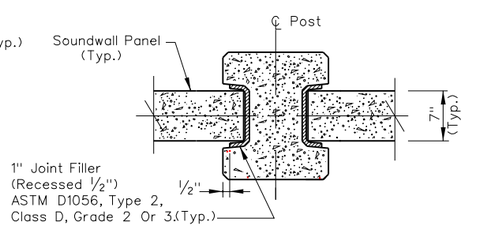
TYPICAL INTERIOR POST SECTION



TYPICAL PANEL INSTALLATION

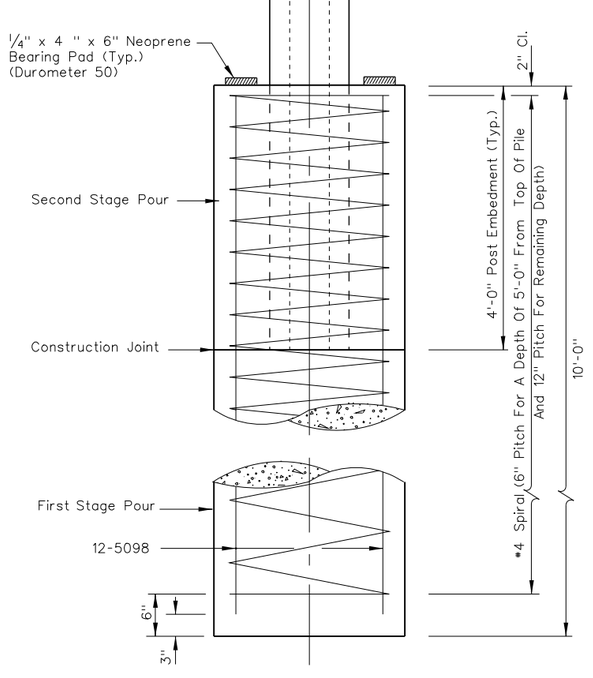


TYPICAL END POST SECTION



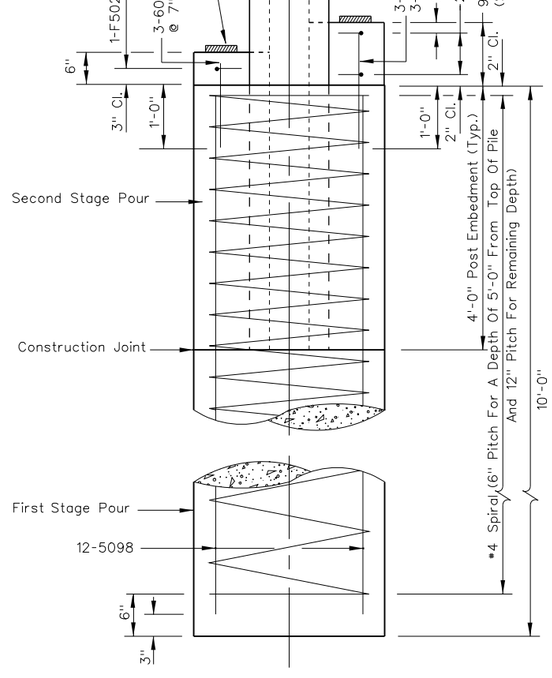
TYPICAL PANEL INSTALLATION

PRECAST POST DETAILS



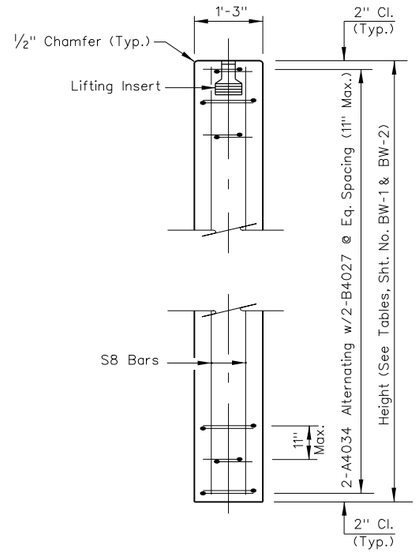
ELEVATION

TYP. 3'-0" DIA. C.I.D.H. PILE

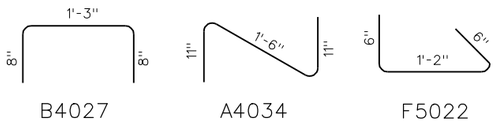


ELEVATION

TYP. 3'-0" DIA. C.I.D.H. PILE w/STEP



TYPICAL POST ELEVATION



BENT BARS

QUANTITIES

ITEM NO.	ITEM	UNIT	QUANTITY
212 1401	AESTHETIC PATTERNING	SQ.YD.	8638
502 0878	CONCRETE STAIN	SQ.YD.	17276
509 0036	DRILLED SHAFT FOUNDATION (36 INCH)	LIN.FT.	4080
640 0152	SOUND BARRIER WALL	SQ.FT.	77745

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

POST AND PANEL SOUNDWALL DETAILS

7.27 Boring Logs.

General. The boring logs provide the design engineers and the contractor with subsurface information for determining appropriate designs and construction methods.

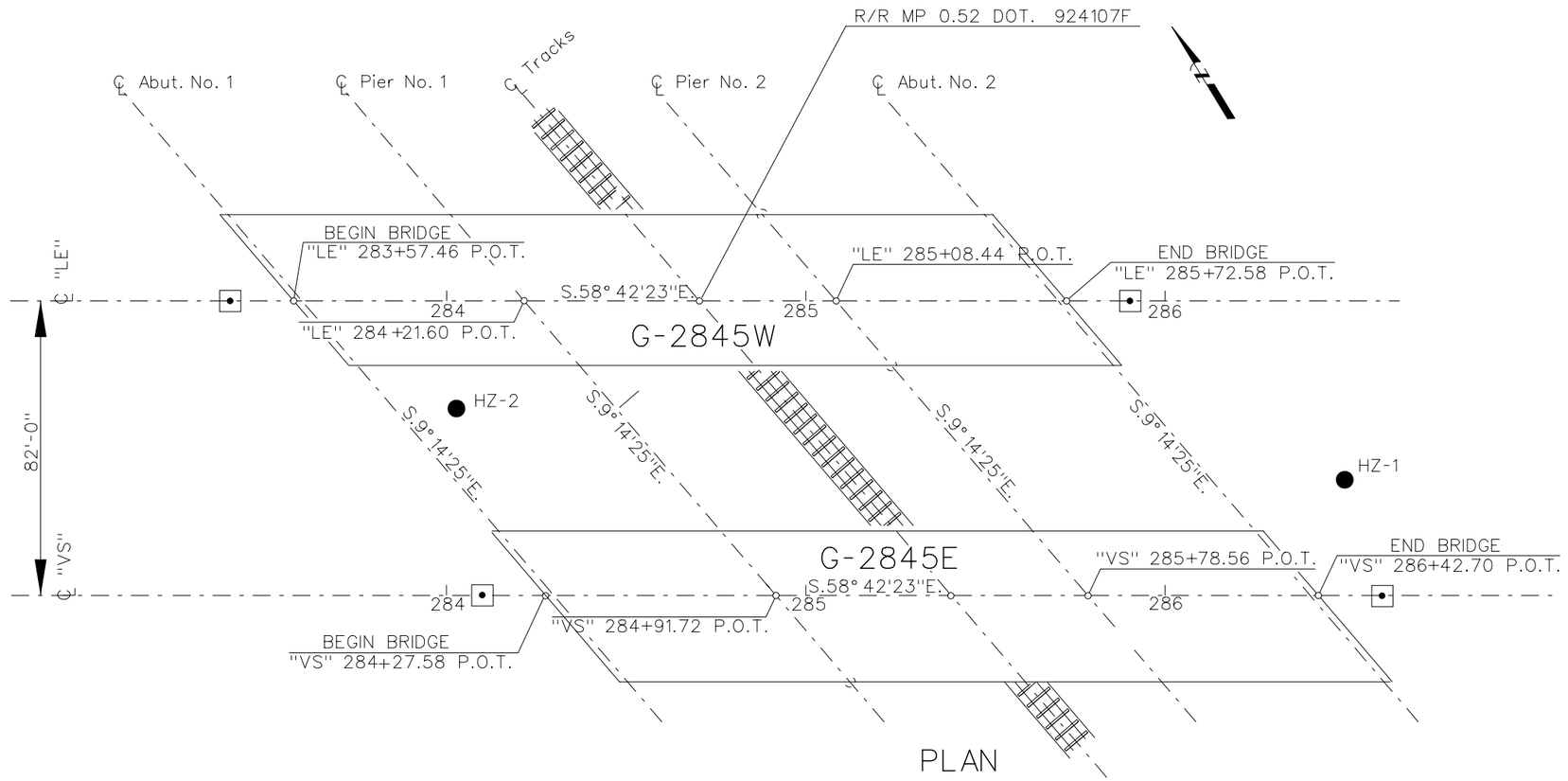
Boring Log Guidelines. The Materials Division produces the boring log sheets. Upon completion, these plans are supplied to Roadway Design for incorporation into the contract plans.

Boring Log Particulars.

1) Sheet numbering for the boring log sheets shall begin with BL1. Multiple sheets shall be numbered BL1, BL2, BL3, etc.

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A (004)	CHURCHILL	BL-1

ALL STATIONS AND DIMENSIONS ARE IN FEET



PLAN

KEY TO BORING LOGS

MOISTURE CONDITION CRITERIA

Description	Criteria
Dry	Absence of moisture, dusty, dry to touch.
Moist	Damp, no visible free water.
Wet	Visible free water, usually below groundwater table.
▼ ▽	Groundwater Elevation Symbols

SOIL CEMENTATION CRITERIA

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Won't break or crumble w/finger pressure.

PARTICLE SIZE LIMITS

CLAY	SILT	SAND			GRAVEL		COBBLES	BOULDERS
		FINE	MEDIUM	COARSE	FINE	COARSE		
.0001 Inch		#200	#40	#10	#4	3/4 Inch	3 Inch	12 Inch

STANDARD PENETRATION CLASSIFICATION *

GRANULAR SOIL		CLAYEY SOIL	
BLOWS / FOOT	DENSITY	BLOWS / FOOT	CONSISTENCY
0-4	VERY LOOSE	0-1	VERY SOFT
5-10	LOOSE	2-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		31-60	HARD
		OVER 60	VERY HARD

* Standard Penetration Test (N) 140 lb hammer 30 inch free fall on 2 inch O.D. x 1.4 inch I.D. sampler

Blow counts on Calif. Modified Sampler (N_{CMS}) can be converted to N_{SPT} by: $(N_{CMS})(0.62)=N_{SPT}$

Blow counts from Automatic or Safety Hammer can be converted to Standard SPT N_{60} by: $(N_{AUTOMATIC})(1.25)=N_{60}$ $(N_{SAFETY})(1.17)=N_{60}$

USCS GROUP	TYPICAL SOIL DESCRIPTION
GW	Well graded gravels, gravel-sand mixtures, little or no fines
GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
GM	Silty gravels, poorly graded gravel-sand-silt mixtures
GC	Clayey gravels, poorly graded gravel-sand-clay mixtures
SW	Well graded sands, gravelly sands, little or no fines
SP	Poorly graded sands, gravelly sands, little or no fines
SM	Silty sands, poorly graded sand-silt mixtures
SC	Clayely sands, poorly graded sand-clay mixtures
ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity
CL	Inorganic clays of low to medium plasticity,gravelly clays, sandy clays, silty clays, lean clays
OL	Organic silts and organic silt-clays of low plasticity
MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
CH	Inorganic clays of high plasticity, fat clays
OH	Organic clays of medium to high plasticity
CE	Caliche
PT	Peat and other highly organic soils

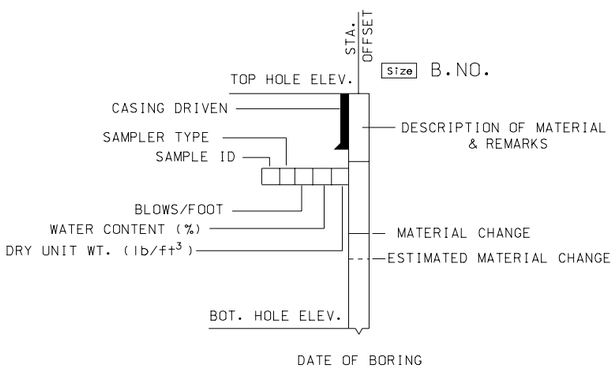
SAMPLER NOTATION

CMS	CALIF. MODIFIED SAMPLER [1]
CPT	CONE PENETRATION
CS	CONTINUOUS SAMPLER [2]
CSS	CALIFORNIA SPLIT SPOON [1]
P	PUSHED (NOT DRIVEN)
PB	PITCHER BARREL
RC	ROCK CORE [3]
SH	SHELBY TUBE [4]
SPT	STANDARD PENETRATION TEST
TP	TEST PIT

1 I.D.=2.42 inch w/rings or 2.5 inch w/o rings
2 I.D.=3.23 inch with tube: 3.5 inch w/o tube
3 N XW
4 I.D.=2.9 inch

TYPE OF DRILLING

- HOLLOW STEM AUGER
- SOLID STEM AUGER
- WET ROTARY
- ROCK CORE
- PLAN OF ANY BORING (ON LOCATION SKETCH)
- SETTLEMENT PLATES



NEVADA DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION
Geotechnical Section

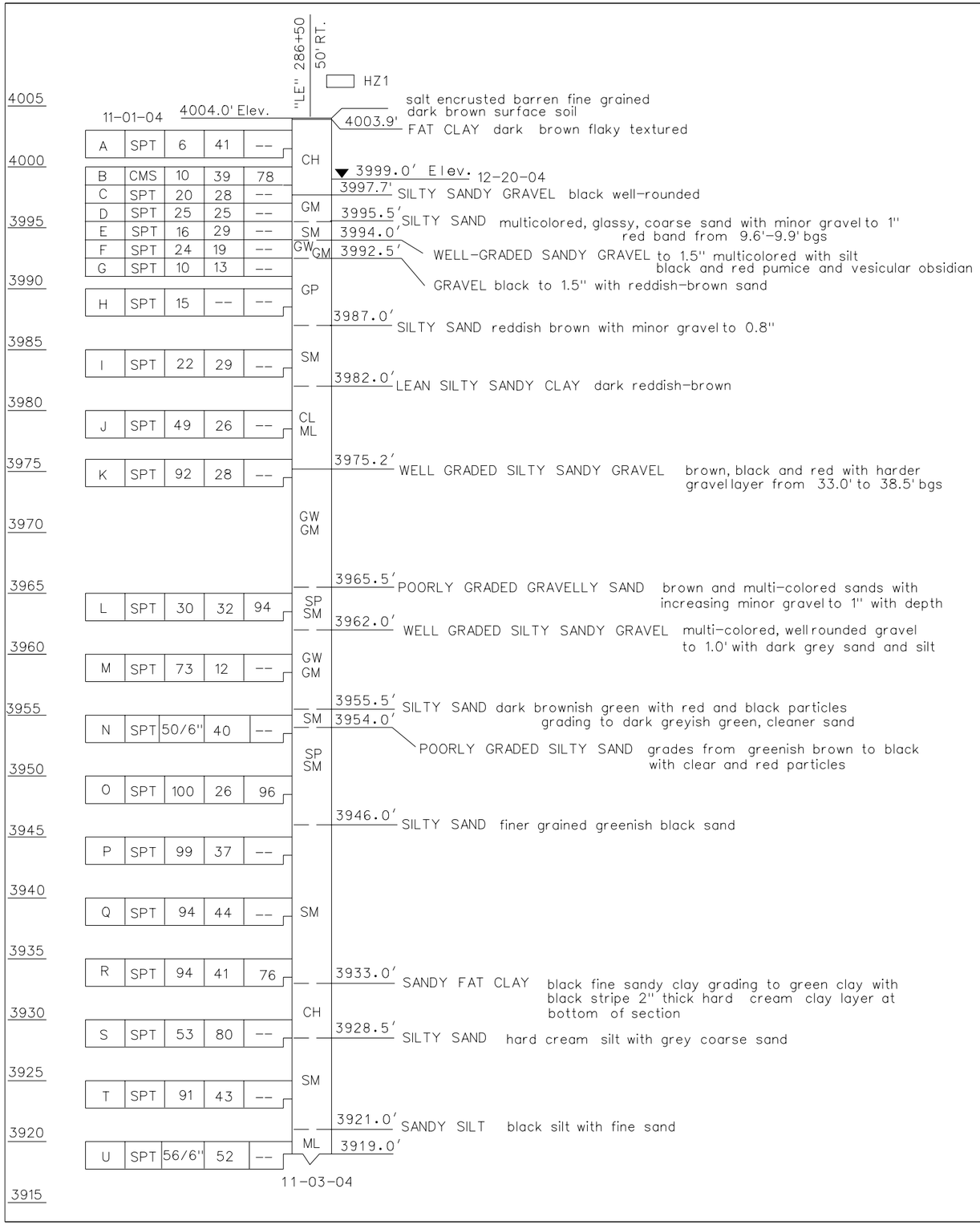
US 50A at MINA CROSSING
HAZEN RR GRADE SEPARATION

LOG OF TEST BORINGS

BRIDGE NO.	MILE POST	E.A. NO.	SHEET	OF
G-2845	CH 2.960	72789	1	3

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A (004)	CHURCHILL	BL-2

ALL STATIONS AND ELEVATIONS ARE IN FEET



NEVADA DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION
Geotechnical Section

US 50A at MINA CROSSING HAZEN RR GRADE SEPARATION

LOG OF TEST BORINGS

BRIDGE NO.	MILE POST	E.A. NO.	SHEET	OF
G-2845	CH 2.960	72789	2	3

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A (004)	CHURCHILL	BL-3

ALL STATIONS AND ELEVATIONS ARE IN FEET

"LE" 284+00 30' RT.

HZ2

12-16-04 4010.0' Elev.

4010 — SILTY SANDY GRAVEL unpaved roadway embankment shoulder, moist medium reddish-brown with gravel to 2"

GW GC — Grades to clayey gravelly sand

4005 — 4005.0' FAT CLAY flaky textured grey-brown,grey-green and rust colored, softens with depth

4000 — CH — ▼ 3999.0' Elev. 12-20-04

A	CMS	11	39	95	CH

3996.5' WELL GRADED GRAVEL WITH SAND rounded wet, brown, clean gravel to 1" Grades to white, red, black and brown, wet glassy gravels

3995

B	CMS	30	7	--	GW

3990.5' POORLY GRADED GRAVEL WITH SILT AND SAND black and red vesicular glassy gravel to 2.5" with medium brownsand and a rusty brown sand layer at 19.5' bgs

3990

C	CMS	31	15	82	GP GM

3987.0' SILT layered grey brown, rusty brown, red and yellow

3985

D	SPT	2	53	--	ML

3982.0' POORLY GRADED FINE SAND WITH SILT multi-colored

3980

E	SPT	27	27	100	SP SM

3976.0' SILT tan rapidly grading to flaky textured reddish-brown

3975

F	SPT	32	39	--	ML

3972.0' POORLY GRADED GRAVEL WITH SILT AND SAND glassy black, red, white, green and brown with gravel to 1.5"

3970

G	SPT	73	17	--	GP GM

3967.0' WELL GRADED GRAVEL WITH SILT AND SAND black, white, brown and green, rounded vesicular glassy gravel to 1.5"

3965

H	SPT	39	14	--	

3960

I	SPT	113	11	--	GW GM

3955.0' POORLY GRADED SAND WITH SILT brown, minor gravel to 2"

J	SPT	30	27	92	SP/SM

3953.5'

12-20-04

NEVADA DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION
Geotechnical Section

US 50A at MINA CROSSING HAZEN RR GRADE SEPARATION

LOG OF TEST BORINGS

BRIDGE NO.	MILE POST	E.A. NO.	SHEET	OF
G-2845	CH 2.960	72789	3	3

7.28 Structure List.

General. The structure list correlates specific construction work with the quantity for each pay item and lists the contract totals for these items. The structure list also contains necessary information to complete work at any location.

The structure list provides the most detailed breakdown of quantities in the contract. Quantities for each location and type of work are listed in a matrix of work units and construction notes. Work units are added to the structure list as required by the construction notes. The structure list provides project subtotals and the contract use total for most work units. The quantities for drainage systems, landscaping, and structures are included in the structure list along with the appropriate roadway items.

The use of separate hydraulic or landscaping structure lists are used when provided by the respective section.

The structure list is available on Sharepoint>010 Design Division>Roadway Design Portal>Useful links.

Structure List Guidelines. The structure list shall be presented in the form of a chart with the units of work along the top and the plan notes along the right side. The associated quantities shall be placed in the grid cells where the top row of the plan note intersects with the appropriate work unit.

The last two rows on the structure list shall contain the contract totals and the use totals for each pay item.

The tabulation of construction work is listed by project in order of increasing stationing along the mainline alignment. Each construction note is identified by stationing and includes a description of work to be done. Major items of work categories may also be used in structuring the list. When there is substantial work such as fencing, guardrail, curb, gutter and sidewalk, etc., it is acceptable to group these items of work and list them in order of stationing.

If one alignment identity heading is used for a series of construction notes, the identity may be omitted from the stationing. The main line sequence should continue through any interchange making the roadway notes read in consecutive order. Interchange notes should be grouped together and should include the appropriate alignment identity. Frontage roads should be treated similarly to interchanges.

Third parties responsible for participating in the cost of construction items should be identified in the associated note.

On federal aid contracts, all non-participating work (such as developer work) shall be indicated in the plans and noted in the structure list.

Miscellaneous work items to be noted in the structure list include utility cover adjustments, survey monuments to be perpetuated, work by others, features that are not to be disturbed, and improvements to permitted approaches.

When calculating lengths of reinforced concrete pipe (RCP), corrugated metal pipe (CMP), and oval metal arch pipe (OMAP), or other types of pipe, and the length is controlled by the distance between drainage structures, then the construction note for this pipe will include the exact length required. The associated quantity in the structure list will be boosted to the next foot greater than that indicated in the note. When calculating the exact pipe length for use in the construction note, measure to the center of round structures (e.g., manholes) and to the inside wall of rectangular structures (e.g., drop inlets). Be sure to account for any skew when calculating the exact pipe length.

Utilities. Adjustment to covers should be consolidated into a separate area of the structure list. Notes pertaining to items such as guardrail, fencing, shoulder dikes, ditches, culverts, etc., may be shown in separate listings within the structure list when there is a large amount of notes under each item of work. These notes may be omitted from the plan sheets when the notes would clutter the plan sheets or placed on a note sheet following the plan sheet (see plan notes).

Work to be performed by utility companies other than the contractor, should be clearly noted on the structure list and include the name of the owner.

Clear, concise, descriptive notes are important and should contain all information needed to accomplish the finished construction. Notes should be brief while conveying the message without possible misunderstanding by any of the parties involved. Associate the station limit(s) to each note. Sheets with applicable details should be referenced. Do not be too general, redundant, or combine actions into one sentence such as:

> “LE” 167+41 +/- INSTALL 24” RCP WITH RIPRAP APRON AT OUTLET.

Instead, be specific and use separate sentences for each activity or work item:

“LE” 167+41.00 “LE” 167+86.00	INSTALL 24” X 135’ RCP FROM “LE” 167+41.00, 71.8’ RT (UIE= 4050.50’) TO “LE” 167+86.00, 55.1’ LT (LIE= 4048.10’). INSTALL PRECAST END SECTION LT AND RT. PLACE CLASS 300 RIPRAP APRON AT OUTLET. SEE SHEET DD-4.

The following are types of work that are usually included in the structure list:

Removals, Approaches, Driveways, Islands, Wheel chair ramps, Retaining Walls, Fencing, Cattle Guards, Curb/Gutter, Sidewalk, Drainage Structures, Culverts, Guardrail, Barrier Rail, Loop Detectors, Valve and Manhole Covers, Landscaping, Fencing.

The following are types of work that are usually not in the structure list:

Traffic Control, Signals and Lighting, Signing, Striping, Base and Surface, Earthwork, Bridges.

Structure List Guidelines (Continued).

Terminology for Construction Notes	
Term	**Definition**
Adjust	To alter existing materials in accordance with the contract specifications. May require the replacement of some worn or broken components exposed during the operation.
Construct	To fabricate in place and on location. Use this for items such as drop inlets, sidewalk, headwalls, riprap basins, traffic islands, concrete traffic barriers and bridge structures.
Install	To properly set or fit prefabricated material into place. Use this for items such as culverts, pre-cast drop inlets, guardrail, object markers, end sections, pull boxes, poles and signs.
Place	To apply material using specialized labor or automated equipment. Use this for items such as surface courses, pavement markings and hydro seeding.
Reset	To construct, install or place in the same location using material salvaged and stockpiled in a prior operation.
Reconstruct	To construct in a new location using material salvaged and stockpiled in a prior operation.
Reinstall	To install in a new location using material salvaged and stockpiled in a prior operation.
Remove	To remove existing material and salvage or dispose of in accordance with the contract specifications.
Remove & reconstruct	To construct in a new location using material salvaged in the same general operation.
Remove and reinstall	To install in a new location using material salvaged in the same general operation.
Remove and replace	To place in a new location using material salvaged in the same general operation.
Remove and reset	To construct, install, or place in the same location using material salvaged from the same general operation.
Replace	To place in a new location using material salvaged and stockpiled in a prior operation.

Structure List Particulars.

1) Bid Items are to match the numbers that are contained in Integrated Financial System (IFS). The description of the bid item along with method of measurement is to be included, such as Plantmix Bituminous Shoulder Dikes; LINFT.

2) Plan notes from the structure list are to be placed on the plan sheets corresponding to the location of the work described in the note. On especially difficult and crowed situations, a numbering system may be used for clarity in which a number corresponds to a structure list note and is placed on the plan sheet. These notes are placed on a note sheet following the plan sheet.

3) Sheet numbering for the structure lists shall begin with S1. Multiple structure lists sheets shall be numbered S1, S2, S3, etc.

4) Totals are the actual sum of the quantities that are added up at the end of the structure list. The accuracy for “Totals” is shown in the sum column in the chart below.

5) Use totals are the quantities used for the contract. The amount used for the “Use totals” are the “Totals” rounded (boosted) to the accuracy listed in the use column in the chart below. On contracts with multiple projects, the project quantities are adjusted accordingly to achieve the contract boost amount.

Item	U. S. Standard Units		
	Unit	Accuracy	
		Sum	Use
Base & Surface Aggregate	ton	1	10
Concrete	cuyd	0.01	1
Concrete, Elastomeric	cuft	0.01	1
Culverts, PVC Pipe	linft	1	1
Erosion Control, Clearing & Grubbing	acre	0.1	1
Fence, C & G, Barrier Rail	linft	1	1
Guardrail	linft	1	1
Painted Striping	mile	0.001	0.01
Pulverize Existing Surface	mile	0.001	0.01
Reinforcing Steel, Structural Steel and Grates	lb	1	10
Roadway and Borrow Excavation, Riprap	cuyd	1	10
Signs and Marking Film	sqft	0.01	1
Slope Paving, Sidewalks, Erosion Control	sqyd	0.1	10
Structure and Drainage Excavation, Backfill	cuyd	0.1	10
Trenching	sta	0.01	1

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	S1

STRUCTURE LIST

641 0552 IMPACT ATTENUATOR (70 MPH)	623 1724 LOOP DETECTOR (6-FOOT X 6-FOOT)	623 1032 4 - INCH CONDUIT	623 0585 PIEZOELECTRIC SENSORS	621 0006 PERPETUATE SURVEY MONUMENTS	618 0528 GALVANIZED GUARDRAIL (TRIPLE CORRUGATION)	618 0088 GUARDRAIL-BARRIER RAIL CONNECTION (TRIPLE CORRUGATION)	618 0073 GUARDRAIL TERMINAL (FLARED)	618 0038 TRAILING END ANCHOR	616 0712 72-INCH CHAIN-LINK FENCE	616 0624 TYPE C-NV-4B FENCE	613 0596 CLASS AA CONCRETE GLUE DOWN CURB (TYPE B)	502 0628 CONCRETE BARRIER RAIL (TYPE A)	502 0520 CLASS AA CONCRETE (ISLAND PAVING)	402 0676 PLANTMIX BITUMINOUS SHOULDER DIKES	402 0660 PLANTMIXING MISCELLANEOUS AREAS	214 0092 MAILBOX SYSTEM (DOUBLE)	202 1304 REMOVAL OF FENCE	202 1152 REMOVAL OF BITUMINOUS SURFACE (COLD MILLING)	202 1144 REMOVAL OF BITUMINOUS SURFACE	202 0152 REMOVE MAILBOX	DESCRIPTION	STATION TO STATION
EACH	EACH	LINFT	EACH	EACH	LINFT	EACH	EACH	EACH	LINFT	LINFT	LINFT	LINFT	CUYD	LINFT	SQYD	EACH	LINFT	SQYD	SQYD	EACH	
																					"LE" 144+75.00
																		14010			REMOVE BITUMINOUS SURFACE (COLD MILLING) (MAINLINE) "LE" 197+53.35
																					"LE" 144+75.00
											3738		15.69		1032.03						CONSTRUCT RAISED MEDIAN ISLAND "LE" 163+33.18
																					(SEE GEOMETRIC SHEETS FOR DETAILS)
																					"LE" 162+46.14
											413		7.47								CONSTRUCT RAISED MEDIAN ISLAND "LE" 164+46.14
																					(SEE GEOMETRIC SHEETS FOR DETAILS)
																					"LE" 164+39.25
											7111		1.92		5200.00						CONSTRUCT RAISED MEDIAN ISLAND "LE" 199+92.45
																					(SEE GEOMETRIC SHEETS FOR DETAILS)
																					"LE" 165+86.03
																				4549	REMOVE BITUMINOUS SURFACE, BLEND AND SCARIFY TO MATCH "LE" 180+33.68
																					ORIGINAL GROUND, RT.
						2093.75		1	1												"LE" 178+00.75
																					CONSTRUCT NEW GUARDRAIL WITH A NEW GUARDRAIL TERMINAL "LE" 198+94.75
																					(FLARED, METHOD C) AND NEW TRAILING END ANCHOR, RT.
															106.66						CONSTRUCT APPROACH, RT. "LE" 216+41.93
																					(SEE SHEET 2I FOR DETAILS)
				1																	PERPETUATE SURVEY MONUMENT, 54.63' LT. "LE" 219+92.72
																1				1	REMOVE EXISTING MAILBOXES 54' RT. INSTALL NEW MAILBOX SYSTEM "LE" 229+85.15
																					(DOUBLE), 65' RT.
															110.00						CONSTRUCT APPROACH, RT. "LE" 229+95.79
																					(SEE SHEET 2I FOR DETAILS)
																					"LE" 234+77.45
																		144880			REMOVE BITUMINOUS SURFACE (COLD MILLING) "N" 22+47.80
															103.33						CONSTRUCT APPROACH, RT. "LE" 243+49.67
																					(SEE SHEET 2I FOR DETAILS)
															87.22						CONSTRUCT APPROACH, LT. "LE" 245+02.80
																					(SEE SHEET 2I FOR DETAILS)

1

2

3

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	S2

STRUCTURE LIST

	IMPACT ATTENUATOR (70 MPH)	LOOP DETECTOR (6-FOOT X 6-FOOT)	4 - INCH CONDUIT	PIEZOELECTRIC SENSORS	PERPETUATE SURVEY MONUMENTS	GALVANIZED GUARDRAIL (TRIPLE CORRUGATION)	GUARDRAIL-BARRIER RAIL CONNECTION (TRIPLE CORRUGATION)	GUARDRAIL TERMINAL (FLARED)	TRAILING END ANCHOR	72-INCH CHAIN-LINK FENCE	TYPE C-NV-4B FENCE	CLASS AA CONCRETE GLUE DOWN CURB (TYPE B)	CONCRETE BARRIER RAIL (TYPE A)	CLASS AA CONCRETE (ISLAND PAVING)	PLANTMIX BITUMINOUS SHOULDER DIKES	PLANTMIXING MISCELLANEOUS AREAS	MAILBOX SYSTEM (DOUBLE)	REMOVAL OF FENCE	REMOVAL OF BITUMINOUS SURFACE (COLD MILLING)	REMOVAL OF BITUMINOUS SURFACE	REMOVE MAILBOX	DESCRIPTION	STATION TO STATION
(1) →	641 0552	623 1724	623 1032	623 0585	621 0006	618 0528	618 0088	618 0073	618 0038	616 0712	616 0624	613 0596	502 0628	502 0520	402 0676	402 0660	214 0092	202 1304	202 1152	202 1144	202 0152		
	EACH	EACH	LINFT	EACH	EACH	LINFT	EACH	EACH	EACH	LINFT	LINFT	LINFT	LINFT	CUYD	LINFT	SQYD	EACH	LINFT	SQYD	SQYD	EACH		
																							"LE" 517+11.79
											2281							2455				REMOVE EXISTING FENCE AND INSTALL TYPE C-NV-4B FENCE ALONG NDOT R/W.	"LE" 539+90.59
					1																	PERPETUATE SURVEY MONUMENT, 84.47' LT.	"LE" 515+33.10
		12	100	8																		INSTALL SPEED DETECTOR LOOPS AND PIEZOELECTRIC SENSORS. CONNECT TO EXISTING CABINET.	"LE" 583+23.95
	2	12	100	8	2	2493	2	3	1	110	3776	15749	5830	136	399	13173.50	1	3795	158890	4549	1	TOTAL (4)	
	2	**12**	**100**	**8**	**2**	**2,493**	**2**	**3**	**1**	**110**	**3,776**	**15,749**	**5,830**	**136**	**399**	**13,180**	**1**	**3,795**	**158,890**	**4,550**	**1**	**USE TOTAL (5)**	

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	S3

HYDRAULIC STRUCTURE LIST

624-0068 RENT EQUIPMENT (DUMP TRUCK) HOUR	624-0052 RENT EQUIPMENT (LOADER) HOUR	624-0036 RENT EQUIPMENT (MOTOR GRADER) HOUR	610-0602 RIPRAP BEDDING (CLASS 300) CUYD	610-0601 RIPRAP BEDDING (CLASS 150) CUYD	610-0502 RIPRAP (CLASS 300) CUYD	610-0501 RIPRAP (CLASS 150) CUYD	609-0800 TRENCH DRAIN LINFT	609-0504 STRUCTURAL STEEL GRATES POUND	608-0504 ANCHOR ASSEMBLY (12-INCH) EA	608-0016 EMBANKMENT PROTECTOR, TYPE 5-2G EA	605-1250 36-INCH HIGH DENSITY POLYETHELENE PIPE, TYPE S LINFT	605-1240 30-INCH HIGH DENSITY POLYETHELENE PIPE, TYPE S LINFT	605-1230 24-INCH HIGH DENSITY POLYETHELENE PIPE, TYPE S LINFT	605-1220 18-INCH HIGH DENSITY POLYETHELENE PIPE, TYPE S LINFT	605-1210 15-INCH HIGH DENSITY POLYETHELENE PIPE, TYPE S LINFT	604-2476 18-INCH SLOTTED CORRUGATED METAL PIPE (16 GAGE) LINFT	604-2182 18-INCH METAL END SECTION (SAFETY TYPE) EA	604-2177 15-INCH METAL END SECTION (SAFETY TYPE) EA	603-0848 24-INCH PRECAST END SECTION EA	603-0836 15-INCH PRECAST END SECTION EA	603-0832 12-INCH PRECAST END SECTION EA	603-0744 45-INCH X 29-INCH OVAL REINFORCED CONC. PIPE, CLASS HE IV LINFT	603-0718 30-INCH X 19-INCH OVAL REINFORCED CONC. PIPE, CLASS HE IV LINFT	603-0648 60-INCH REINFORCED CONCRETE PIPE, CLASS III LINFT	603-0624 48-INCH REINFORCED CONCRETE PIPE, CLASS III LINFT	603-0540 24-INCH REINFORCED CONCRETE PIPE, CLASS III LINFT	603-0508 15-INCH REINFORCED CONCRETE PIPE, CLASS III LINFT	603-0504 12-INCH REINFORCED CONCRETE PIPE, CLASS V LINFT	505-0500 REINFORCING STEEL POUND	502-0516 CLASS AA CONCRETE (MINOR) CUYD	502-0512 CLASS AA CONCRETE (MAJOR) CUYD	211-0604 SOIL STABILIZER ACRE	207-0536 SLURRY CEMENT BACKFILL CUYD	207-0504 GRANULAR BACKFILL CUYD	206-0500 STRUCTURE EXCAVATION CUYD	203-0540 BORROW EMBANKMENT CUYD	203-0520 CHANNEL EXCAVATION CUYD	203-0516 DRAINAGE EXCAVATION CUYD	202-1080 REMOVE CULVERT PIPE LINFT	202-0356 REMOVAL OF HEADWALL EA	202-0076 REMOVE END SECTION EA	202-0044 REMOVAL OF REINFORCED CONCRETE BOX CULVERT EA	DESCRIPTION	STATION TO STATION
																																						68	2		REMOVE EXISTING 18" X 68' CLAY PIPE AND HEADWALLS LT AND RT.	"LE" 425+26.00
2	2	2	2.83		8.44			210												2							155			38	2.45				45.37	66.32	12						INSTALL 24" X 155' RCP FROM 117.0' RT (UIE = 4026.80') TO 38.0' LT (LIE = 4025.30'). INSTALL PRECAST END SECTIONS LT AND RT, CLASS 300 RIPRAP APRON AT OUTLET. GRADE TO DRAIN. CONSTRUCT TYPE 2B DROP INLET WITH CONCRETE APRON AND MEDIAN DIKE 47.0' RT (GRATE ELEV. = 4028.83', INV. ELEV. = 4026.16', H = 2.67'). SEE SHEET DD1, DD2, AND DD4.	"LE" 425+26.00
																																									"LE" 455+16.00
																129			2																9.62	43.32						INSTALL 15" X 129' HDPE FROM "LE" 455+16.00, 47.6' RT (UIE = 4030.20 TO "LE" 456+45.00, 47.2' RT (LIE = 4029.80'). INSTALL METAL END SECTIONS (SAFETY TYPE) AT INLET AND OUTLET.	"LE" 456+45.00
2	2	2														91	2																								"VS" 455+37.00
																																									INSTALL 18" X 91' SLOTTED CMP DRAIN CULVERT FROM "LE" 455+37, 39.0' LT (UIE = 4031.20') TO "VS" 456+28, 39.0' RT (LIE = 4030.90'). INSTALL METAL END SECTIONS (SAFETY TYPE) AT INLET AND OUTLET. GRADE TO DRAIN. SEE SHEET DD6.	"VS" 456+28.00
			2.83		8.44														2							52							6.84	12.63							"B" 1+49.00
																																									INSTALL 15" X 52' RCP FROM "B" 1+49.00, 20.0' RT (UIE=4039.20') TO "B" 1+02.00, 20.0' RT (LIE=4035.40'). INSTALL METAL END SECTIONS (SAFETY TYPE) AT INLET AND OUTLET, CLASS 300 RIPRAP APRON AT OUTLET, SEE SHEET DD-4.	"B" 1+02.00
								257		175																			216	6.75			112.52	163.96							INSTALL 36" X 175' HDPE FROM 125.1' RT (UIE = 4012.00') TO 49.7' LT (LIE = 4011.10'). CONSTRUCT CULVERT HEADWALLS LT AND RT. CONSTRUCT TYPE 2B DROP INLET WITH CONCRETE APRON 43.0' RT (GRATE ELEV. = 4015.30', INV. ELEV. = 4011.59', H = 3.71') SEE SHEET DD1 AND DD2.	"LE" 487+28.00
																																7.68						2		BACKFILL EXISTING DBL 24" X 66' CLAY PIPE AND REMOVE HEADWALLS LT AND RT.	"LE" 488+65.00
																																					80	2		REMOVE EXISTING 18" X 80' CLAY PIPE AND HEADWALLS LT AND RT.	"LE" 495+32.00
								210				200																	170	5.38			165.67	150.08							INSTALL 24" X 200' HDPE FROM 144.0' RT (UIE = 4011.50') TO 56.0' LT (LIE = 4011.00'). CONSTRUCT CULVERT HEADWALLS LT AND RT. CONSTRUCT TYPE 2B DROP INLET WITH CONCRETE APRON 41.5' RT (GRATE ELEV. = 4016.50', INV. ELEV. = 4011.25', H = 5.25') SEE SHEET DD1 AND DD2.	"LE" 495+32.00

STATE	PROJECT NO.	COUNTY	SHEET NO.
NEVADA	NH-050-A(004)	CHURCHILL	S4

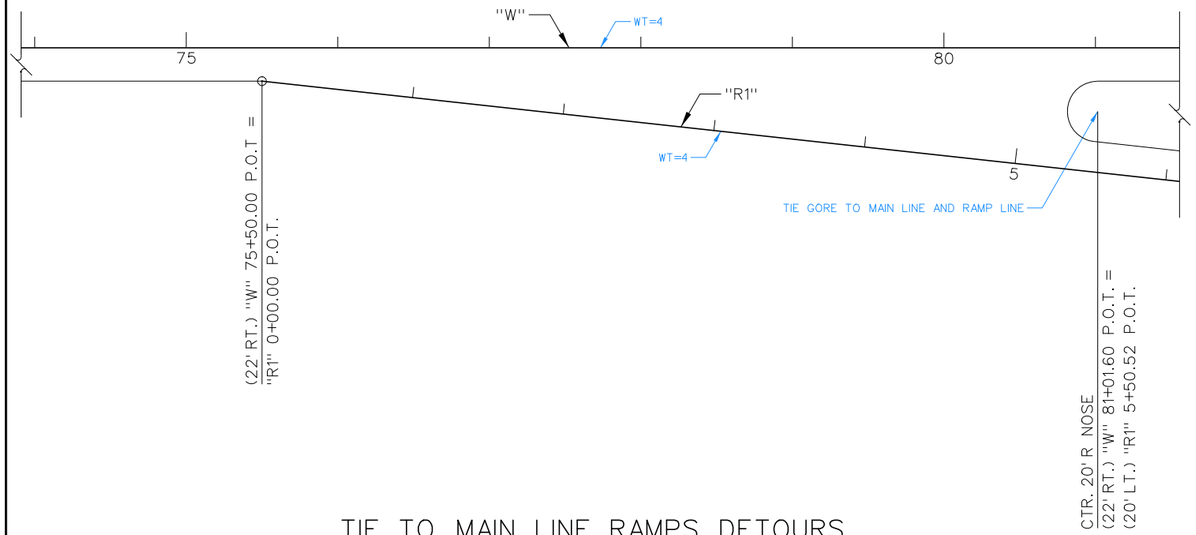
HYDRAULIC STRUCTURE LIST

1	624-0068	624-0052	624-0036	610-0602	610-0601	610-0502	610-0501	609-0800	609-0504	608-0504	608-0016	605-1250	605-1240	605-1230	605-1220	605-1210	604-2476	604-2182	604-2177	603-0848	603-0836	603-0832	603-0744	603-0718	603-0648	603-0624	603-0540	603-0508	603-0504	505-0500	502-0516	502-0512	211-0604	207-0536	207-0504	206-0500	203-0540	203-0520	203-0516	202-1080	202-0356	202-0076	202-0044	DESCRIPTION	STATION TO STATION
	RENT EQUIPMENT (DUMP TRUCK)	RENT EQUIPMENT (LOADER)	RENT EQUIPMENT (MOTOR GRADER)	RIPRAP BEDDING (CLASS 300)	RIPRAP BEDDING (CLASS 150)	RIPRAP (CLASS 300)	RIPRAP (CLASS 150)	TRENCH DRAIN	STRUCTURAL STEEL GRATES	ANCHOR ASSEMBLY (12-INCH)	EMBANKMENT PROTECTOR, TYPE 5-2G	36-INCH HIGH DENSITY POLYETHELENE PIPE, TYPE S	30-INCH HIGH DENSITY POLYETHELENE PIPE, TYPE S	24-INCH HIGH DENSITY POLYETHELENE PIPE, TYPE S	18-INCH HIGH DENSITY POLYETHELENE PIPE, TYPE S	15-INCH HIGH DENSITY POLYETHELENE PIPE, TYPE S	18-INCH SLOTTED CORRUGATED METAL PIPE (16 GAGE)	18-INCH METAL END SECTION (SAFETY TYPE)	15-INCH METAL END SECTION (SAFETY TYPE)	24-INCH PRECAST END SECTION	15-INCH PRECAST END SECTION	12-INCH PRECAST END SECTION	45-INCH X 29-INCH OVAL REINFORCED CONC. PIPE, CLASS HE IV	30-INCH X 19-INCH OVAL REINFORCED CONC. PIPE, CLASS HE IV	60-INCH REINFORCED CONCRETE PIPE, CLASS III	48-INCH REINFORCED CONCRETE PIPE, CLASS III	24-INCH REINFORCED CONCRETE PIPE, CLASS III	15-INCH REINFORCED CONCRETE PIPE, CLASS III	12-INCH REINFORCED CONCRETE PIPE, CLASS V	REINFORCING STEEL	CLASS AA CONCRETE (MINOR)	CLASS AA CONCRETE (MAJOR)	SOIL STABILIZER	SLURRY CEMENT BACKFILL	GRANULAR BACKFILL	STRUCTURE EXCAVATION	BORROW EMBANKMENT	CHANNEL EXCAVATION	DRAINAGE EXCAVATION	REMOVE CULVERT PIPE	REMOVAL OF HEADWALL	REMOVE END SECTION	REMOVAL OF REINFORCED CONCRETE BOX CULVERT		
	HOUR	HOUR	HOUR	CUYD	CUYD	CUYD	CUYD	LINFT	POUND	EA	EA	LINFT	LINFT	LINFT	LINFT	LINFT	LINFT	EA	EA	EA	EA	EA	LINFT	LINFT	LINFT	LINFT	LINFT	LINFT	LINFT	POUND	CUYD	CUYD	ACRE	CUYD	CUYD	CUYD	CUYD	CUYD	CUYD	LINFT	EA	EA	EA		
													498																	159	4.90				362.34	223.17									INSTALL DBL. 30" X 249' HDPE FROM "LE" 503+73.00, 132.9' RT (UIE = 4015.30') TO "LE" 501+97.00, 43.2' LT (LIE = 4014.00'). CONSTRUCT CULVERT HEADWALLS LT AND RT.	"LE" 503+73.00 "LE" 501+97.00
																																7.56									2			BACKFILL EXISTING DBL 24" X 65' CLAY PIPE AND REMOVE HEADWALLS LT AND RT.	"LE" 502+70.00
																			2									121																INSTALL 15" X 121' RCP FROM "LE" 507+66.00, 46.8' RT (UIE = 4019.78') TO "LE" 506+45.00, 47.0' RT (LIE = 4019.46'). INSTALL METAL END SECTIONS (SAFETY TYPE) AT INLET AND OUTLET.	"LE" 507+66.00 "LE" 506+45.00
				1.14		3.41										89			2																23.00									INSTALL 15" X 89' HDPE FROM 34.8' LT (UIE = 4017.80') TO 54.0' RT (LIE = 4014.80'). INSTALL METAL END SECTIONS (SAFETY TYPE) LT AND RT, CLASS 300 RIPRAP APRON AT OUTLET. SEE SHEET DD4.	"VS" 536+80.00
									257			164																			255.81	7.53				118.37	176.55									INSTALL 36" X 164' HDPE FROM 111.0' RT (UIE = 4012.00') TO 53.0' LT (LIE = 4011.20'). CONSTRUCT CULVERT HEADWALLS LT AND RT. CONSTRUCT TYPE 2B DROP INLET WITH CONCRETE APRON 27.4' RT (GRATE ELEV. = 4018.00', INV. ELEV. = 4011.55', H = 6.45') SEE SHEET DD1 AND DD2.	"LE" 551+04.00
																																9.07									1			BACKFILL EXISTING 24" X 78' CLAY PIPE AND REMOVE HEADWALL LT.	"LE" 551+92.00
	22	22	22	38.47	20.91	114.82	31.2	119	2953	12	4	491	498	200	115	534	91	6	24	10	3	1	184	144	447	690	669	778	71	13277.81	79.86	276.35	5.5	32.22	3220.15	5092.6	22	2144.12	4975	795	27	1	4	TOTAL (4)	
	30	**30**	**30**	**40**	**30**	**120**	**40**	**119**	**2,960**	**12**	**4**	**491**	**498**	**200**	**115**	**534**	**91**	**6**	**24**	**10**	**3**	**1**	**184**	**144**	**447**	**690**	**669**	**778**	**71**	**13,280**	**80**	**277**	**6**	**40**	**3,230**	**5,100**	**30**	**2,150**	**4,980**	**795**	**27**	**1**	**4**	**USE TOTAL (5)**	

7.29 Miscellaneous Information.

General. This section contains the following information:

- Station ties to main line ramps, detours and frontage roads.
- Public land surveys.
- Surveyed or Base Line
- Typical angle measurement.
- Methods of showing right of way and control of access.
- North arrow placement.
- Direction of lettering on layout sheets.
- Standard lettering sizes and text weights.



TIE TO MAIN LINE RAMPS, DETOURS, TEMP. CONNECTIONS & FRONTAGE ROADS

THE DIVISION OF A TYPICAL TOWNSHIP INTO NUMBERED SECTIONS

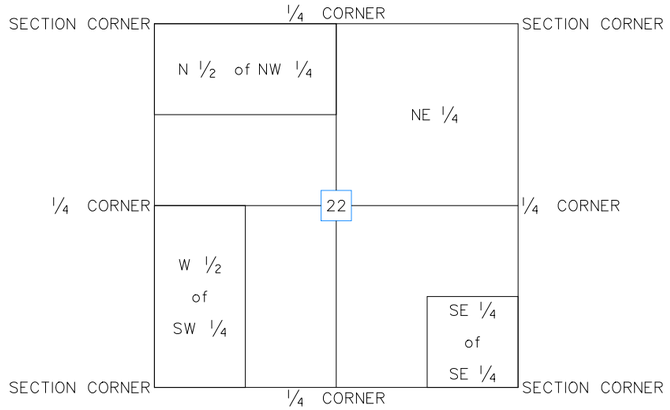
TOWNSHIP LINE (N & S)

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

RANGE LINE (E & W) — RANGE LINE (E & W)

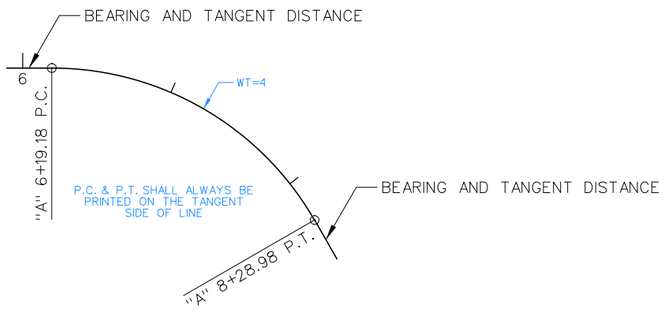
TOWNSHIP LINE (N & S)

TYPICAL SUBDIVISION OF A SECTION

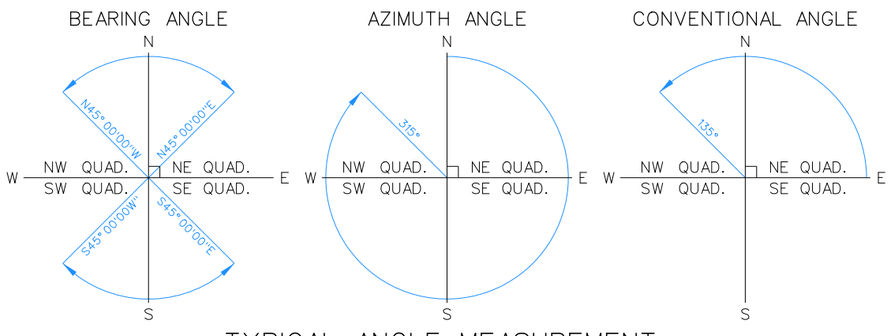


A TYPICAL SECTION CONTAINS ONE SQ. MILE OR 640 ACRES

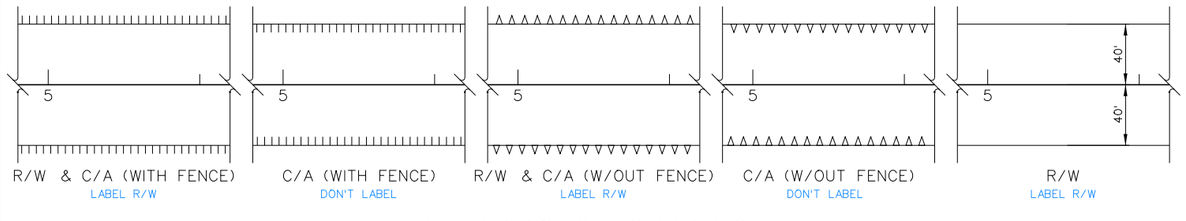
PUBLIC LAND SURVEYS



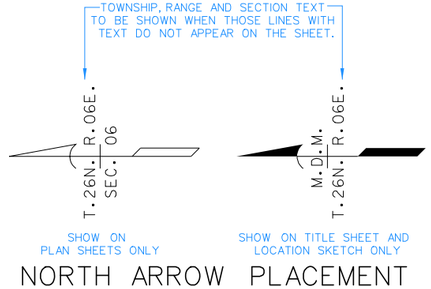
SURVEYED OR BASE LINE



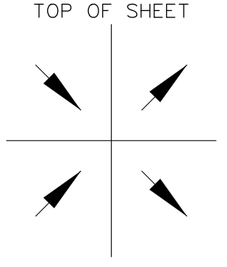
TYPICAL ANGLE MEASUREMENT



METHODS OF SHOWING RIGHT OF WAY AND CONTROL OF ACCESS



NORTH ARROW PLACEMENT



DIRECTION OF LETTERING ON LAYOUT SHEETS

NOTE: TO CALCULATE TEXT SIZES FOR ENGLISH PLOT SCALES NOT SHOWN, USE THE FOLLOWING METHOD.

(PLOT SCALE) X (LEROY SIZE) / (2000) = TEXT SIZE

EXAMPLE:
WHAT IS THE EXTRA LARGE TEXT SIZE FOR A FINAL SCALED PLOT OF 1" = 4000'?

4000 X 240/2000 = 480
EXTRA LARGE TEXT SIZE = 480

Standard Lettering Sizes and Text Weights (11 x 17 Plots)

Weight	2	2	2	3	4	5
Size	Extra Small	Small	Medium	Large	Extra Large	2X Large
Leroy	*100*	*120*	*140*	*175*	*240*	*290*
English Plot Scale 1"= FT						
1	0.0500	0.0600	0.0700	0.0875	0.1200	0.1450
2	0.1000	0.1200	0.1400	0.1750	0.2400	0.2900
3	0.1500	0.1800	0.2100	0.2625	0.3600	0.4350
4	0.2000	0.2400	0.2800	0.3500	0.4800	0.5800
5	0.2500	0.3000	0.3500	0.4375	0.6000	0.7250
6	0.300	0.360	0.420	0.525	0.720	0.870
8	0.400	0.480	0.560	0.700	0.960	1.160
10	0.500	0.600	0.700	0.875	1.200	1.450
20	1.00	1.20	1.40	1.75	2.40	2.90
30	1.50	1.80	2.10	2.625	3.60	4.35
40	2.00	2.40	2.80	3.50	4.80	5.80
50	2.50	3.00	3.50	4.375	6.00	7.25
60	3.00	3.60	4.20	5.25	7.20	8.70
80	4.00	4.80	5.60	7.00	9.60	11.60
100	5.00	6.00	7.00	8.75	12.00	14.50
200	10.00	12.00	14.00	17.50	24.00	29.00
300	15.00	18.00	21.00	26.25	36.00	43.50
400	20.00	24.00	28.00	35.00	48.00	58.00
500	25.00	30.00	35.00	43.75	60.00	72.50
600	30.00	36.00	42.00	52.50	72.00	87.00
1000	50.00	60.00	70.00	87.50	120.00	145.00