OVERVIEW

The following chapter is an outline of preliminary fieldwork as it relates to the identification of project control and construction limits. The Location Division at the Nevada Department of Transportation is responsible for the location and determination of project control prior to construction. Many of the citations within this chapter have been directly referenced from the Location Division’s Special Instructions for Location Consultants. The Location Division publishes this manual for the benefit of contractors wishing to provide consulting services for the Department, but it also serves as a guide for survey standards Department wide.

Monuments encountered within any NDOT contracts are required to be perpetuated in accordance with Transportation Policy (TP) 1-9-3.

FIELD ASSESSMENT OF IN-PLACE ERRORS

A preliminary jobsite visit and exploratory field survey should be conducted prior to the start of construction. This includes a cursory review of any plans or data received to verify that existing features and facilities are correctly depicted. Any errors found in the field should be reported to the Resident Engineer and the Designer of Record to avoid impacts to the contract’s schedule and budget.

FIELD IDENTIFICATION OF MONUMENTS IN LoIS

Information concerning the type and character of specific project control can be found in the Survey Monument Web Map of LoIS.

The database, maintained by the Geodesy Section in the Location Division, contains pertinent information regarding controlling attributes for a particular monument. The type of information that can be found in LoIS is described in Chapter 2 under “Monument Identification” and “Data Input-LoIS File Research”.

Field identification of monuments in LoIS requires an understanding of the point types that are used for control and their character. This information can be found in the Special Instructions for Location Consultants in the Survey Section. The various types of monuments used are shown in Table 4-1.

TABLE 4-1: MONUMENT TYPES

<table>
<thead>
<tr>
<th>Monuments</th>
<th>BASIC</th>
<th>CONSTRUCTION</th>
<th>CADAstral</th>
<th>AERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wooden Hub</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Washer Disc</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rebar Marker</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feno Monument</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete Marker</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional attention must be paid to the point types and their naming convention in order to properly reference the specific monument in LoIS. An example of the naming convention typically found on NDOT control is shown below:

EXAMPLE: LPN1012, first station point number, section corner
Designation = 1012001L

- Numbers 1, 2, 3 and 4 designate the Location Project Number (LPN) assigned by NDOT

State of Nevada Department of Transportation Construction Division
Construction Survey Manual
November 2017
Numbers 5, 6, and 7 designate the sequential station number assigned
Number 8 indicates the point type assigned

Based on survey standards, various point types have been established with differing degrees of control reliability. The letter designations appear on the monument at the end of the point number to differentiate the type of monument found in the field. The list of available point types used is shown below.

## POINT TYPES

A = Traverse point
X = Permanent basic control point
M = Construction control point
K = Construction control point / no spirit level elevations
L = Section corner (PLSS)
H = Highway reference monument
S = Local street monument
P = Property corner
Z = Fixed NGS control (X, Y, & Z)
B = Boundary Control Point
R = Railroad or Reset

For further identification, LoIS contains a field which often includes pictures of the monument in question. You can access this image by clicking on the “View Monument” icon in the LoIS control report for the specific monument. (See Figure 4-1 through Figure 4-9.)
Figure 4-1: A-Traverse Point

Figure 4-2: X-Permanent Basic Control Point
Figure 4-3: M-Construction Control Feno Monument

Figure 4-4: K-Construction Control Point / No Spirit Level Elevations
Figure 4-5: L-Section Corner (PLSS)

Figure 4-6: H-Highway Reference Monument
Figure 4-7: S- Local Street Monument

Figure 4-8: P-Property Corner
Horizontal control and vertical datum information pertinent to a contract will be listed in the contract plans project control sheet, referred to as the “LC” sheet. The project control sheet is prepared by the Geodesy Section of the Location Division. This portion of the contract plans contains valuable metadata concerning specific control for the contract. This includes the control located by station and offset, Horizontal datum, Vertical datum and the area combined ground to grid factor. Any monuments found in the field not included in the project control sheet should be examined by the Location Division prior to use to verify its compatibility with the established control network for the contract.

Construction limits can be verified through the contract plans for a particular contract. Additionally, project limits can also be loaded to the data collectors from Inroads or as a text file. Construction limits are not always the same as the Right of Way limits for a contract. Right of Way limits should always be determined prior to construction to avoid potential trespass onto adjacent property.

NOTE: Determination of legal boundaries must be performed by the Location Division or a licensed and authorized Land Surveyor in the State of Nevada.
Figure 4-10: Right-of-Way Fencing