



DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: September 21, 2021

TO: Mona Davis
Community Development Director
24301 Roberts Drive
Black Diamond, WA 98010

FROM: Adam Stricker, PE, David Evans and Associates, Inc.
Beau Willert, PE, David Evans and Associates, Inc.

SUBJECT: Lawson Hills MPD SE Connector Analysis

PROJECT: Lawson Hills MPD

CC: Brian Ross, Oakpointe
Justin Wortman, Oakpointe
Tom Matt, PE, David Evans and Associates, Inc.

This memorandum is intended to compare the impacts of constructing secondary access roads for the Lawson MPD. The SE Connector would connect the southeastern portion of the site to SR169 via a new intersection with SR169 at Railroad Ave. An alternative route, called the "SE Connector Alternative" in this memo, has been identified that provides a secondary connection to Lawson Street.

Preliminary design studies of both the SE Connector and SE Connector Alternative have been prepared; copies are attached to this memorandum. Significant right of way, engineering and neighborhood impacts are present in the design. This memorandum compares the two alternatives relative to grading, walls, storm drainage, right of way acquisition and neighborhood impacts.

Alternative Analysis Summary:

Evaluation Parameter	SE Connector	SE Connector Alternative
Max. Roadway Grade (%)	12	2
Road Length	2,600 ft	900 ft
Earthwork Volume	15,920 CY Cut 25,575 CY Fill	650 CY Cut 1,200 CY Fill
Max. Wall Height	25'	No Walls
Wall Square Footage	24,900	No Walls
Storm Drainage	Large vault	Utilizes MPD Facilities
Right of Way Acquisition	16 Properties	1 Parcel
Proximity to Existing Homes	40 feet	250 feet
SR 169 Intersection Improvements	New intersection	No new intersection



These categories will be discussed in greater length below, but as can be seen from the brief summary above, the SE Connector Alternative is a significantly shorter road that requires substantially less impacts to surrounding properties, and will not require an independent off-site stormwater system.

A preliminary design of the SE Connector has been prepared by David Evans Associates and is presented in an engineering exhibit set titled “Lawson South Access Conceptual Plans” and has been attached to this memorandum. A preliminary plan and profile of the SE Connector Alternative has also been prepared and is presented in the attached “SE Connector Alternative” exhibits. The same road section was used in both of these design studies. These plans were created using LIDAR contours, parcel boundaries and aerial photography.

Existing Conditions and Critical Areas

The SE Connector is to be constructed over a steeply sloping forested hillside with existing grades in the range of 20% to 40% in some sections. The soils and slopes found on the SE Connector site suggest the presence of landslide hazards and potential erosion hazard areas. These critical areas are found on the Lawson Hills MPD site near the connection point to the SE Connector. Geotechnical analysis would be required to determine if construction on these slopes could be done safely. The lower portions of the SE Connector are within the 225' core buffer and shoreline zone of Jones Lake and cross Lawson Creek and its associated buffer.

The SE Connector Alternative route is through a relatively flat parcel of land that is outside of mapped landslide hazard areas. There are wetlands in the vicinity of the SE Connector Alternative, however no wetland buffers would need to be encroached upon for the SE Connector Alternative. The SE Connector Alternative will have to cross Lawson Creek, passing through the Lawson Creek Buffer.

Roadway Grade

The SE Connector is approximately 2,600 feet in length and accomplishes an elevation change of approximately 220' over its length. The SE Connector will have a maximum road grade of 12% for a distance of approximately 580'.

The SE Connector Alternative requires a shorter length (approximate 900') of road before connecting to other proposed roads internal to the Lawson Hills MPD. The majority of slopes in the SE Connector Alternative are 2% or less. Total elevation change for the SE Connector Alternative is approximately 10'.

Earthwork Volumes

The SE Connector requires 15,920 cubic yards of cut and 25,575 cubic yards of fill resulting in a net of 9,655 cubic yards fill. It is not known if the soils produced from the cut are suitable for use as fill.

The SE Connector Alternative requires a 650 cubic yards of cut and 2,600 cubic yards of fill for the grading of the SE Connector Alternative.

Wall Height

The SE Connector will require approximately ten retaining walls with several of these walls being over 20' tall. Nearly all of these walls are proposed in areas of extreme slopes, which will complicate design and construction. The walls at stations 7+50, 11+00 and 18+00 are within 50' of existing residences and will



require special design consideration to not undermine the adjacent structures.

The SE Connector Alternative would require no retaining walls except for walls related to the crossing of Lawson Creek.

Wall Square Footage

The SE Connector requires a total of 24,900 Square feet of wall face. Additional sections of wall may be required if geotechnical studies show that the areas of proposed cut and fill slopes are not suitable.

The SE Connector alternative would require no walls or rockeries except as needed for crossing of Lawson Creek .

Bridge

The SE Connector will have to cross Lawson Creek using a 120' long bridge. Likely construction types for this bridge could include wide flange deck girder or steel deck girder with an anticipated structure depth in the range of 50". The allowable structure depth of the future bridge may be limited by the low clearance to the high water elevations of Lawson Creek. The bed of Lawson Creek lies about 12' below the bridge deck and the available freeboard to pass high stream flows precludes the use of a culvert and fill style of crossing.

The SE Connector alternative would also require a similar bridge crossing of Lawson Creek.

Storm Drainage Vault

The SE Connector proposes over 2.5 acres of impervious surfaces; approximately 1.8 acres of this will be pollution generating impervious surfaces. The SE Connector will require a stormwater vault and a water quality treatment train to accomplish flow control and water quality treatment minimum requirements. Preliminary sizing of this system shows that a vault with a live storage volume of 60,800 cubic feet and a water quality volume of 30,400 cubic feet will be required. This results in a vault with a minimum footprint of 44' wide by 196' long by 13' deep. The depth and width of this vault footprint was selected to minimize grading back into the hillside to the north of the vault. The north side of Railroad Ave, although in a steep hillside, is the only possible location for the vault as the south side of Railroad Ave is within the Jones Lake buffer and shoreline setback and would involve the placement of fill within this critical area. A 23' max height wall will be required to grade in the vault location. This stormwater facility would only treat stormwater from the SE Connector.

The SE Connector Alternative will require a similar level of flow control and water quality treatment but will be able to utilize stormwater infrastructure built for other phases of the Lawson Hills MPD. The SE Connector Alternative proposes much less impervious surface than the SE Connector.

The SE Connector Alternative's ability to utilize MPD stormwater facilities reduces the City's maintenance burden compared to the SE Connector which would require a standalone stormwater facility. The SE Connector Alternative provides a way to prevent many of the impacts that the SE Connector presents and provides a much more economic and feasible connection.



Right of Way Acquisition

The SE Connector proposes roadway or grading over 16 privately owned parcels. Of these parcels the SE Connector bisects three and completely envelopes one. Rerouting of utility lines may require disturbances to additional properties. Some of these property owners may not be interested in selling property for ROW and grading. If this is the case the city would have to use eminent domain to make the SE Connector feasible. In total there are seven parcels containing residences that would need to be partially or completely acquired for the construction of the SE Connector.

The SE Connector Alternative can be constructed with the acquisition of a single additional parcel (parcel number 1321069018). This parcel was identified in Figure 3-3 of the Lawson Hills MPD as a potential expansion parcel.

Proximity to Existing Homes

The SE Connector passes within 100' of eight existing structures and three existing structures are within 40' of proposed retaining walls. Significant grading revisions are required for the driveways to six residences that are currently accessed from Pacific Street.

Pacific Street in its existing condition is a minimally traveled, gravel paved, dead end road that serves as the access to eight residences. The SE Connector would replace Pacific Street as the access to six of these existing residences and would route a significant volume of traffic through this neighborhood. Pacific Street would need to be terminated to the north of the SE Connector as the SE Connector must be constructed approximately 6' above the existing grade of Pacific Street at that point for slope criteria to be met.

There is one residence currently on the offsite parcel to be acquired for the SE Connector Alternative. This house could potentially remain after construction of the SE Connector Alternative. The nearest offsite house is 250' from the SE Connector Alternative entry at Lawson street. There would be no encroachments on this off site property.

The SE Connector Alternative provides access to Lawson Street, which is currently a well-utilized route to downtown Black Diamond and SR 169. The SE Connector Alternative is much less impactful to existing residences.

SR 169 Intersection Improvements

The intersection of the SE Connector and State Route 169 presents several design challenges including intersection type selection, grading and pedestrian access. Roundabouts are the intersection type preferred by WSDOT, however the centerline slope of SR 169 in the area of the intersection ranges from 6% to 8% based on LIDAR contours. This is above the ideal range of centerline slopes for roundabout intersections (slopes of up to 4% are typical for roundabouts, 2% being ideal) however, WSDOT has designed and requested non-standard roundabouts in this range of existing slopes. Shown on the conceptual plan is a signal-controlled intersection with two travel lanes along the access and two travel lanes and a center turn lane along SR-169 requiring widening of SR169 at this location. Regrading of SR169 to a lower slope through the intersection can be anticipated. If a roundabout is ultimately required at this location additional impacts and ROW acquisition should be anticipated. The addition of an intersection, whether a roundabout or a signal, will tend to decrease the level of service of SR 169.



The SE Connector Alternative will take access off Lawson Street which intersects SR 169 near downtown Black Diamond. Intersection improvements at Lawson Street and SR 169 are already a requirement of the MPD and would provide far less impacts to traffic than an additional intersection on SR 169 as is necessary with the SE Connector. A new intersection at Lawson Street would be required. It is acknowledged that further traffic impact analysis would need to be conducted to fully understand offsite road improvements that the SE Connector Alternative may trigger.

Conclusion

The SE Connector design has a number of design constraints that make it much more impactful than the SE Connector Alternative. The SE Connector proposes to add a major roadway, several large walls and a bridge in the middle of a quiet neighborhood. The SE Connector requires a new intersection on SR169 and a standalone stormwater facility. This infrastructure and the property acquisition, including possible eminent domain, necessary to construct this alternative would have a major impact on the character of the community.

The SE Connector Alternative is able to accomplish a secondary connection with a significantly shorter length of road through fewer critical areas. The reduction in impervious surfaces that the SE Connector Alternative can provide is in keeping with the overall MPD goals of reducing impervious coverage and impacts to critical areas.

Attachments/Enclosures:

- SE Connector Overall Improvement Plan – Aerial
- SE Connector Overall Improvement Plan & Property Owner Impacts
- SE Connector (Lawson South Access) Profiles
- SE Connector Alternative Improvement Plan & Profile

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OVERALL IMPROVEMENT PLAN
AERIAL

LAWSON SOUTH ACCESS

CONCEPTUAL PLAN

WASHINGTON

CITY OF BLACK DIAMOND

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CITY OF BLACK DIAMOND

OVERALL IMPROVEMENT PLAN

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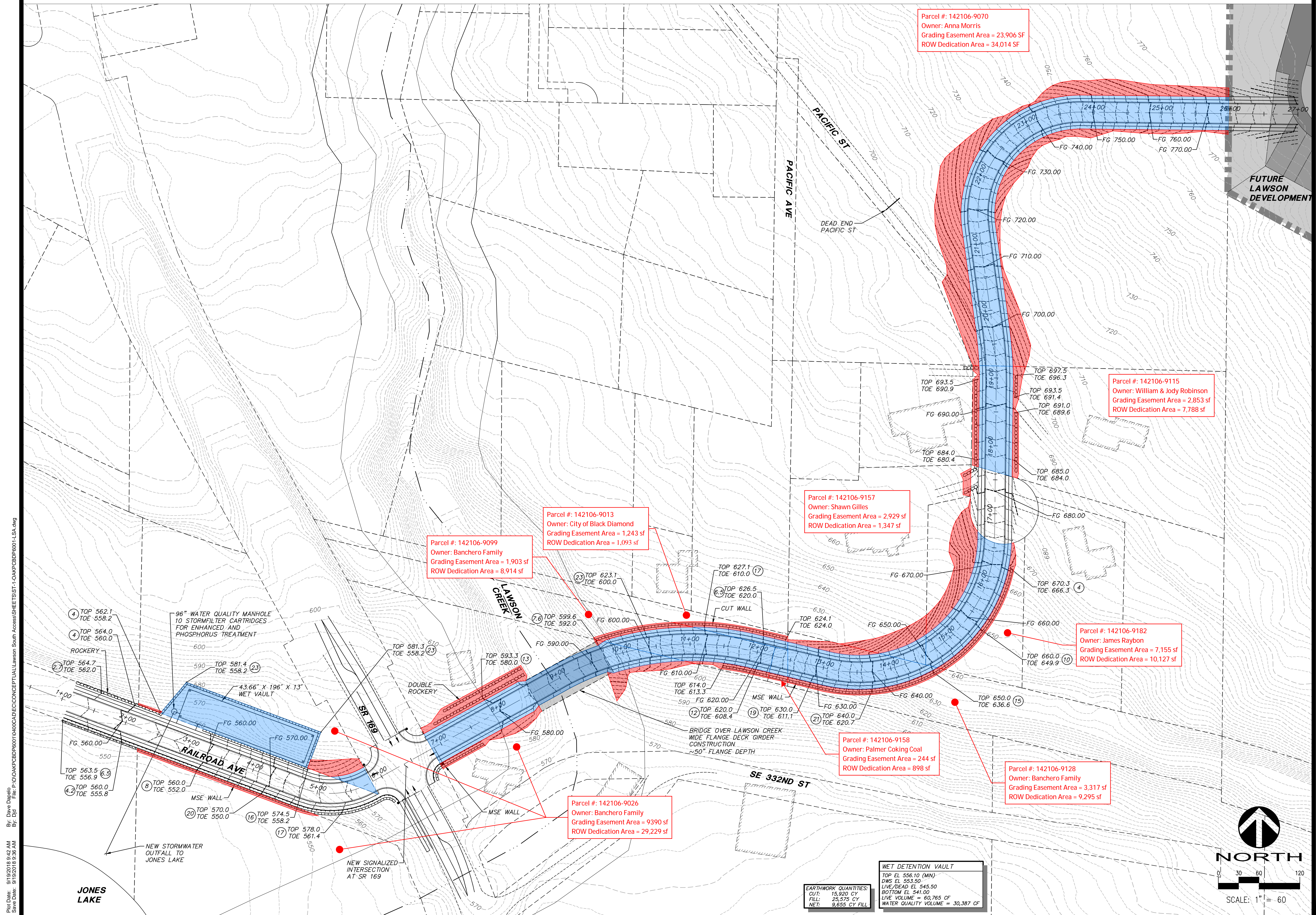
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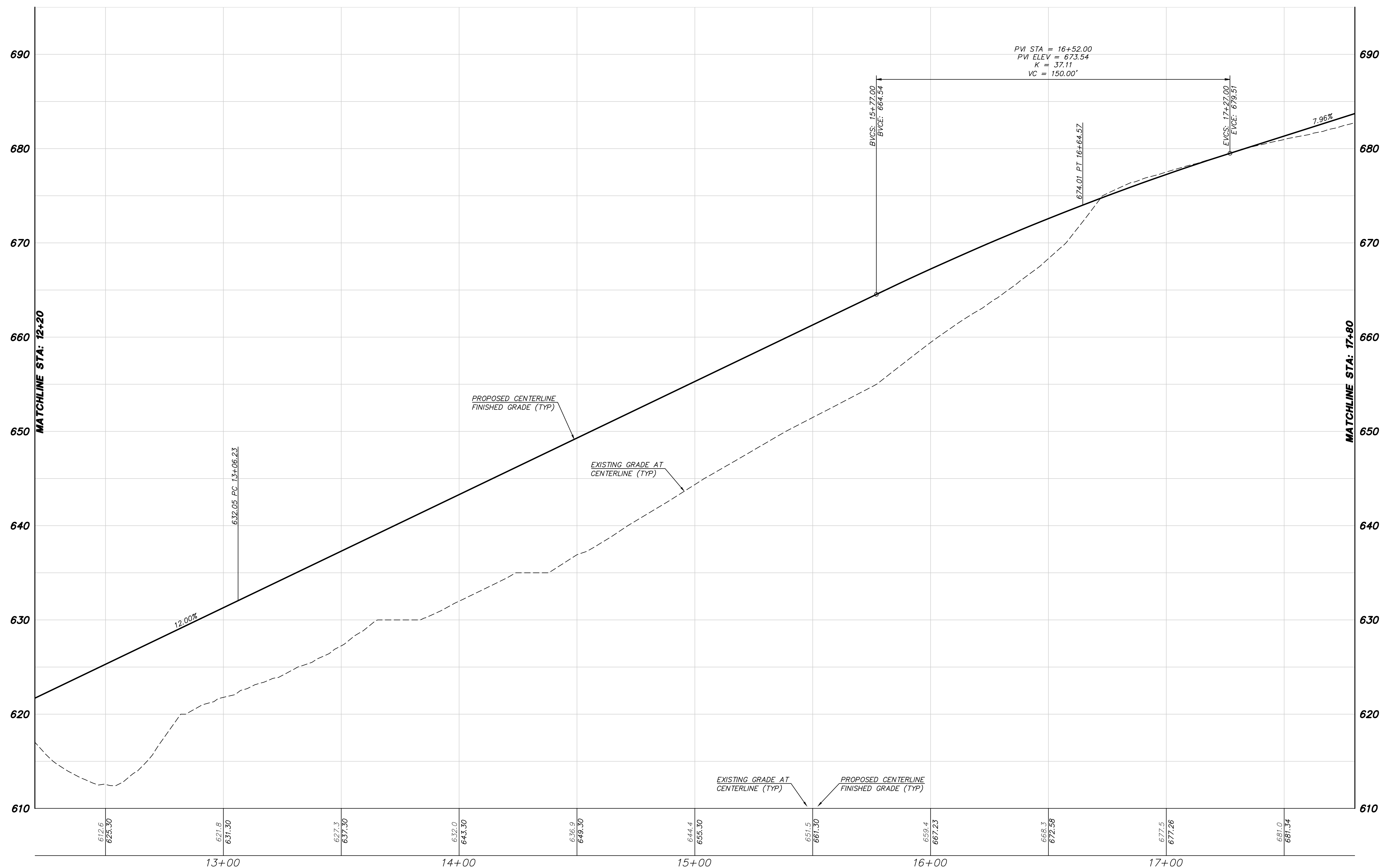
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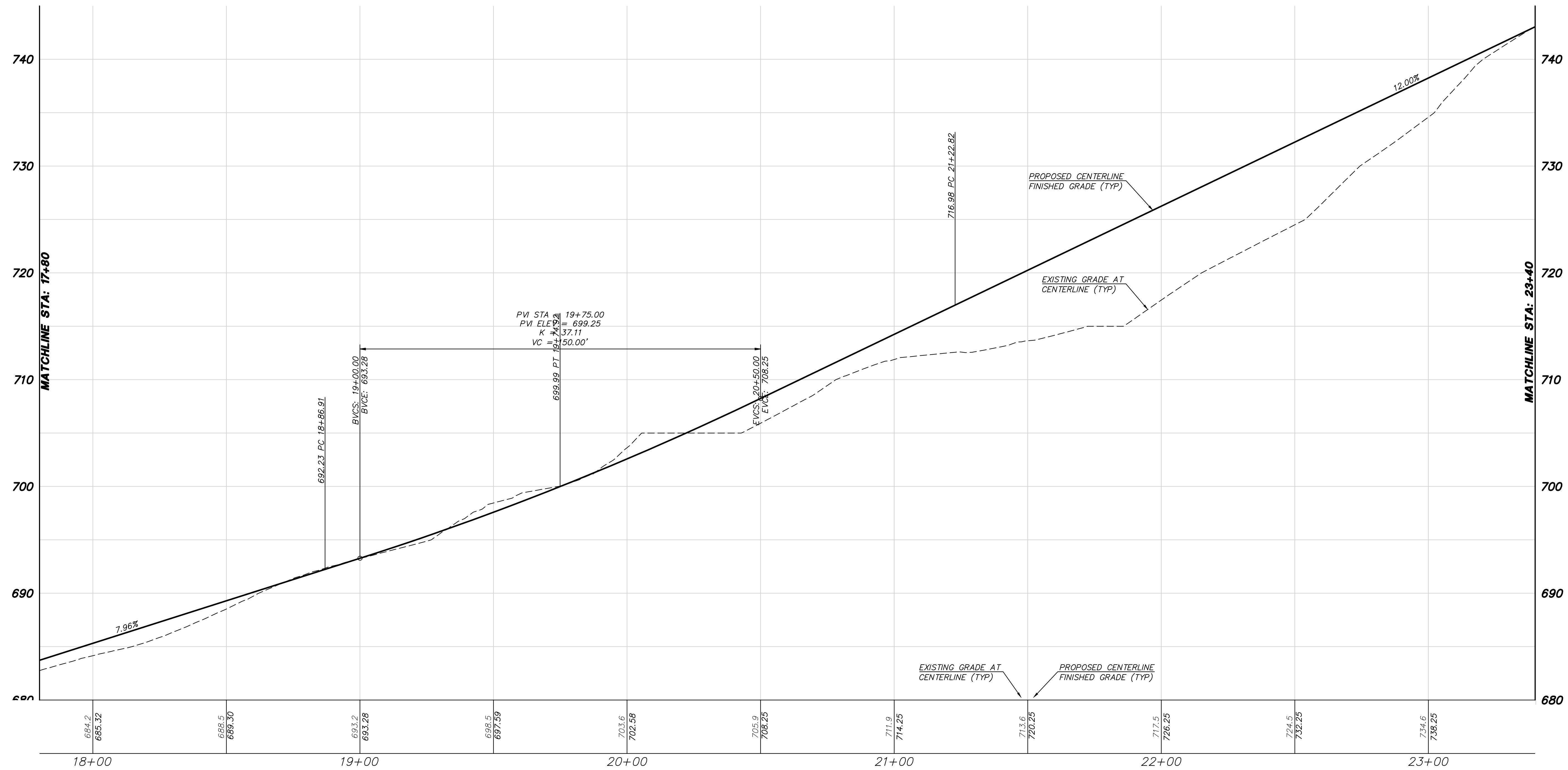
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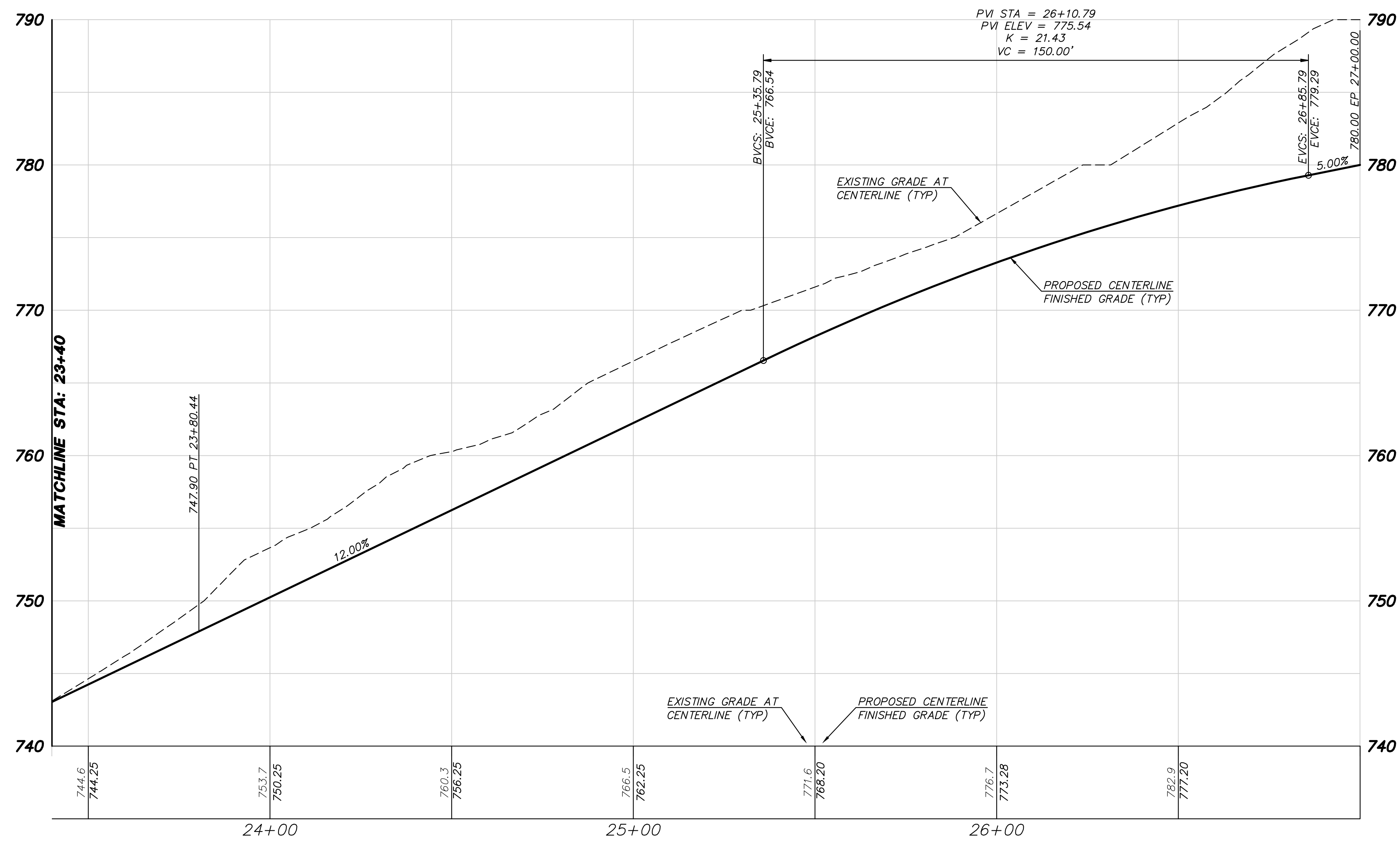




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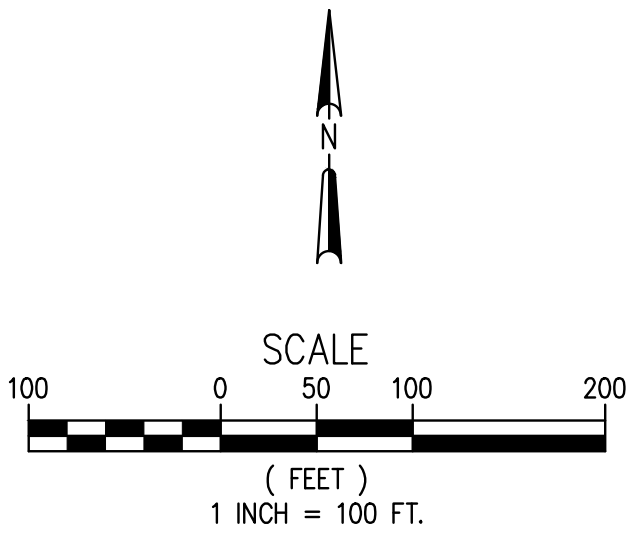
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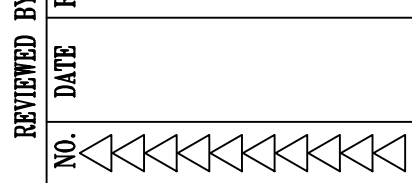
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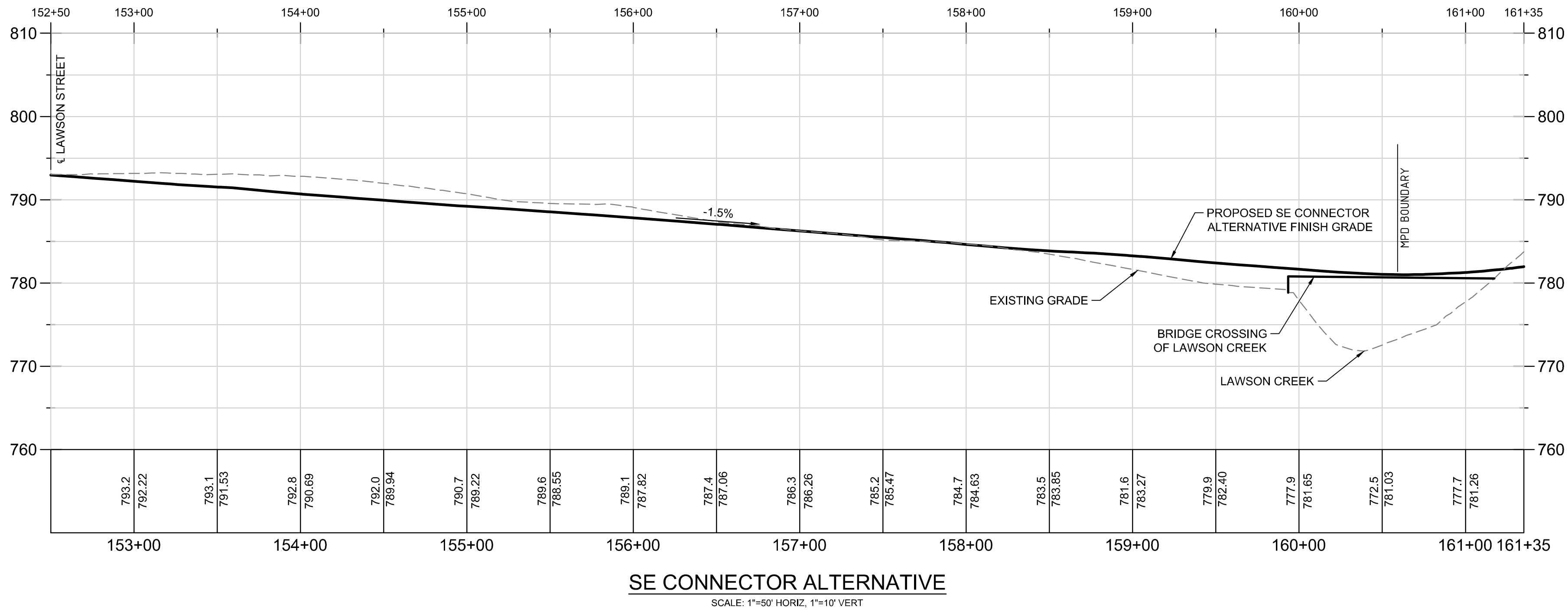
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SE CONNECTOR ALTERNATIVE PROFILE

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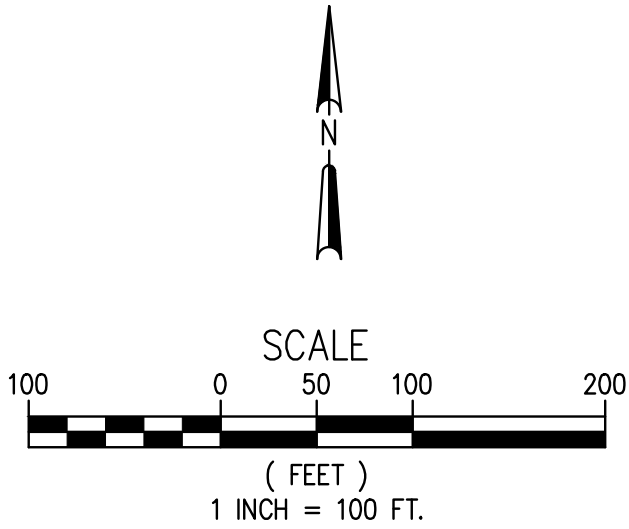
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SE CONNECTOR ALTERNATIVE



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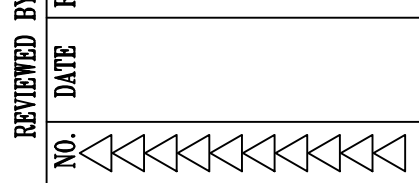
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