



# Appendix B

## Technical Memoranda and Reports

### Disclaimer:

Technical memoranda and reports were prepared as independent documents to support the preparation of the Final Environmental Impact Statement (FEIS) for the Dallas CBD Second Light Rail Alignment (D2 Subway). Information from these documents was incorporated into the FEIS to provide information on existing conditions, and in some cases, assess potential impacts to the resources. Information contained in the FEIS is the most current and supersedes information in the technical memoranda and reports.



# **B-16b**

## **Evaluation of Street Modification and Parking Alternatives under Woodall Rodgers Freeway**



# MEMORANDUM

Date: Friday, October 30, 2020

Project: DART General Planning Consultant VI (GPC6)  
TO39 D2 Subway – Traffic Evaluation

To: Kay Shelton – Assistant Vice President, Capital Planning  
Ernie Martinez – Project Manager

From: Reddy Edulakanti, PE, PTOE – HDR

Subject: DART TO39 D2 Subway Project Development  
Evaluation of Street Modification and Parking Alternatives under Woodall Rodgers Freeway and Serving Perot Museum

## INTRODUCTION

As part of the D2 Subway project, Broom Street will be shifted south and rebuilt to accommodate the length of Museum Way Station. Both Broom Street and McKinney Avenue will be lowered slightly at the track crossing as well to accommodate clearance of the train under the Woodall Rodgers Freeway westbound on-ramp. Early street modification concepts anticipated rebuilding street connections under Woodall Rodgers Freeway the same as exist today.

During D2 Subway stakeholder meetings in spring 2020, the concept of extending Old Griffin Street north under Woodall Rodgers Freeway to connect McKinney Avenue and Broom Street was discussed with area stakeholders including Hillwood, Perot Museum, Woods Capital and City of Dallas staff. Extending Griffin Street is desirable to enhance the grid network and property access in this growing area. Related to this concept is the need to mitigate the loss of parking spaces managed and used by Perot Museum under the freeway due to the proposed at-grade LRT alignment, ancillary LRT facilities, and parallel pedestrian pathways. Reconfiguration of parking led DART to explore additional concepts to realign the Laws/Lamar street connector while maintaining or improving existing traffic patterns and property access.

The purpose of this memorandum is to summarize existing traffic circulation, document and assess the range of roadway and parking reconfiguration options developed, summarize stakeholder and City of Dallas input, and provide a recommendation for the Final EIS and 30% design.

## EXISTING CONDITIONS AND TRAFFIC CIRCULATION

Appendix A includes the initial concept design included in the 20% design plans for this area, which were generally the same under Woodall Rodgers Freeway as existing conditions, but included shifting of the Broom Street lanes south toward the freeway and a slight lowering of the street profiles of Broom Street

and McKinney Avenue at the D2 track crossing due to low clearances under the westbound on-ramp from Field Street to Woodall Rodgers Freeway.

Under existing conditions, all westbound traffic on Broom Street desiring to access eastbound McKinney Avenue, southbound Laws Street, or southbound Lamar Street, must take a free left to head south then choose to go towards eastbound McKinney Avenue (toward Field Street) or turn towards Laws Street or Lamar Street. Westbound Broom Street traffic continuing past this free left must turn north onto Lamar Street as there is no connection to Lamar/Continental at this point.

### **Future Traffic Operations**

The Supplemental Draft Environmental Impact Statement (SDEIS) Appendix B.16 includes the traffic analysis conducted for the D2 Subway project. Several intersections were analyzed in this area, including:

1. Broom Street and Laws Street
2. Broom Street and D2 At-Grade LRT Alignment
3. Broom Street and Lamar Street
4. McKinney Avenue and Lamar Street
5. McKinney Avenue and Laws Street
6. McKinney Avenue and Old Griffin Street and
7. McKinney Avenue and D2 At-Grade LRT Alignment.

Based on the analysis, traffic conditions at all intersections are expected to range from LOS A to C in Year 2045 in the peak hour with the D2 Subway project in place.

One nearby intersection, westbound Woodall Rodgers Freeway Service Road/Broom Street and Field Street is projected to operate at LOS E in year 2045, both with and without the D2 Subway project. This is due to the heavy traffic discharged from westbound Woodall Rodgers freeway main lanes exiting ramp 80 feet east of the intersection onto the westbound Service Road/Broom Street. This intersection serves to meter westbound traffic approaching the study area evaluated in this memorandum with most traffic heading southbound on Field Street and thus not entering the area that is the subject of this memorandum.

## **DESCRIPTION AND COMPARATIVE ASSESSMENT OF OPTIONS**

Six options were developed based on March 2020 stakeholder discussion for consideration to include in the 30% design submittal. Appendix B includes exhibits for each of the six options.

Table 1 provides a comparative summary of the pros and cons of the different options compared to the existing conditions, traffic circulation and movements, and parking changes. All options remove the free flow U-turn and extend Old Griffin Street north under the freeway.

Table 1 – Comparative Assessment of Options

Option	Pros	Cons
1A	<ul style="list-style-type: none"><li>• Maintains traffic circulation patterns</li><li>• Traffic barrier islands for free turns allow for continuous auto movement, and minimize auto-with-auto conflicts</li></ul>	<ul style="list-style-type: none"><li>• Traffic barrier islands for free turns may result in higher speeds around pedestrians and result in non-traditional directional travel along Old Griffin Street</li><li>• Creates three individual parking lots</li></ul>

Option	Pros	Cons
	<ul style="list-style-type: none"> <li>Improves accessibility for WB Woodall Rodgers drivers destined to the Field District</li> <li>Continues to accommodate Broom and Skyhouse traffic to West End District (via WB McKinney Avenue, SB Lamar Street, or SB Laws)</li> <li>Continues to accommodate Perot Museum bus traffic and Skyhouse residents destined to EB McKinney/Woodall Rodgers freeway</li> <li>Minimizes confusion of WB Broom drivers to WB McKinney/SB Lamar/SB Laws</li> <li>Maintains comparable number of parking spaces for Perot Museum (302)</li> </ul>	<ul style="list-style-type: none"> <li>Reduces City of Dallas lot from 115 to 64</li> <li>Access into largest Perot lot is from McKinney, not Broom as current access</li> <li>Non-traditional directional traffic flow on Old Griffin extension would preclude the conversion of Old Griffin (south of McKinney) from one-way to two-way traffic</li> <li>Close spacing of intersections is not desirable, and coupled with the driveway entrances on the north and south sides of both McKinney and Broom, produces many conflicts and inefficient system</li> </ul>
1B	<ul style="list-style-type: none"> <li>Maintains or enhances traffic circulation patterns</li> <li>Improves accessibility for WB Woodall Rodgers drivers destined to the Field District</li> <li>Continues to accommodate Perot Museum bus traffic and Skyhouse residents destined to EB McKinney/Woodall Rodgers freeway</li> <li>Continues to accommodate Broom and Skyhouse traffic to West End District (via WB McKinney Avenue or SB Lamar Street or SB Laws)</li> <li>Minimizes confusion of WB Broom drivers to WB McKinney/SB Lamar</li> <li>Maintains comparable number of parking spaces for Perot Museum (302)</li> <li>Stop control access at Old Griffin Extension allows for more pedestrian friendly operations</li> <li>Traditional directional traffic flow on Old Griffin extension allows for potential opportunity for Griffin south of McKinney to be two-way traffic</li> </ul>	<ul style="list-style-type: none"> <li>Creates three individual parking lots</li> <li>Reduces City of Dallas lot from 115 to 64</li> <li>Access into largest Perot lot is from McKinney, not Broom as current access</li> <li>Close spacing of intersections is not desirable, and coupled with the driveway entrances on the north and south sides of both McKinney and Broom, produces many conflicts and inefficient system</li> </ul>
2A	<ul style="list-style-type: none"> <li>Good spacing of intersections</li> <li>Creates two large parking areas and reduces driveway entrances</li> <li>Parking spaces are 199 (east of tracks) and 202 (west of tracks); Perot would support use of both lots</li> </ul>	<ul style="list-style-type: none"> <li>Without Laws connection, no access from Broom Street (including Perot Museum, Skyhouse) to West End District (via WB McKinney Avenue or SB Lamar Street)</li> <li>Traffic barrier islands for free turns may result in higher speeds around</li> </ul>

Option	Pros	Cons
	<ul style="list-style-type: none"> <li>Traffic from Broom can access large parking lot rather than two small lots</li> <li>Traffic barrier islands for free turns allow for continuous auto movement, and minimize auto-with-auto conflicts</li> <li>Improves accessibility for WB Woodall Rodgers drivers destined to DKW Development just south of McKinney Avenue</li> <li>Continues to accommodate Broom to West End District (WB McKinney/SB Lamar/SB Laws)</li> <li>Continues to accommodate Perot Museum bus traffic destined to EB Woodall Rodgers freeway</li> </ul>	<p>pedestrians and result in non-traditional directional travel along Griffin</p> <ul style="list-style-type: none"> <li>Skyhouse loses accessibility to EB Woodall Rodgers freeway</li> <li>Non-traditional directional traffic flow on Old Griffin extension would preclude the conversion of Old Griffin (south of McKinney) from one-way to two-way traffic</li> </ul>
2B	<ul style="list-style-type: none"> <li>Good spacing of intersections</li> <li>Creates two large parking areas and reduces driveway entrances</li> <li>Parking spaces are 199 (east of tracks) and 202 (west of tracks); Perot would support use of both lots</li> <li>Traffic from Broom can access large parking lot rather than two small lots</li> <li>Improves accessibility for WB Woodall Rodgers drivers destined to the Field District</li> <li>Continues to accommodate WB Broom to West End District (WB McKinney/SB Lamar/SB Laws)</li> <li>Continues to accommodate Perot Museum bus traffic destined to EB Woodall Rodgers freeway</li> </ul>	<ul style="list-style-type: none"> <li>Without Laws connection, no access from Broom Street (including Perot Museum, Skyhouse) to West End District (via WB McKinney Avenue or SB Lamar Street)</li> <li>Skyhouse loses accessibility to West End District (via WB McKinney Avenue or SB Lamar Street or SB Laws)</li> <li>Skyhouse loses accessibility to EB Woodall Rodgers freeway</li> </ul>
3	<ul style="list-style-type: none"> <li>Good spacing of intersections</li> <li>Creates two large parking areas and reduces driveway entrances</li> <li>Parking spaces are 199 (east of tracks) and 202 (west of tracks); Perot would support use of both lots</li> <li>Traffic from Broom can access large parking lot rather than two small lots</li> <li>Improves accessibility for WB Woodall Rodgers drivers destined to the Field District</li> <li>Continues to accommodate Perot Museum bus traffic and Skyhouse residents destined to EB McKinney/Woodall Rodgers freeway</li> </ul>	<ul style="list-style-type: none"> <li>Uncommon two-way traffic operations on service roads (Broom Street and McKinney Avenue), coupled with access on both sides of respective roadways could create confusion and affect safety</li> <li>Old Griffin Extension/Broom Intersection design could experience head-on collisions, given that the southernmost EB Broom and WB Broom meet at the Old Griffin Extension without traffic controls (I.e. stop, traffic signals)</li> </ul>

Option	Pros	Cons
	<ul style="list-style-type: none"> <li>Continues to accommodate Broom and Skyhouse traffic to West End District (via WB McKinney Avenue, SB Lamar Street or SB Laws)</li> </ul>	
4	<ul style="list-style-type: none"> <li>Traffic barrier islands for free turns allow for continuous auto movement, and minimize auto-with-auto conflicts</li> <li>Continues to accommodate Perot Museum bus traffic and Skyhouse residents destined to EB McKinney/Woodall Rodgers freeway</li> <li>Continues to accommodate WB Woodall Rodgers traffic destined to the Field District</li> </ul>	<ul style="list-style-type: none"> <li>Without Laws connection, no access from Broom Street or Skyhouse to West End District (via WB McKinney Avenue, SB Lamar Street or SB Laws)</li> <li>Creates two of three inefficiently shaped parking lots</li> <li>Traffic barrier islands for free turns may result in higher speeds around pedestrians and result in non-traditional directional travel along Griffin</li> </ul>

## STAKEHOLDER FEEDBACK

Following are review comments and feedback on the six options described above from the three key coordinating entities representing the immediate area:

### City of Dallas Staff Feedback

- Consensus around removing existing WB Broom to EB McKinney U-turn at Laws St under Woodall Rodgers Freeway
- Pending additional studies as to the traffic impacts, demand, and available right-of-way next to the Hooters property, a modified version of Option 1B is the preference, whereby the free-flow movement from Laws to Lamar is removed and Broom Street is punched through to Continental to allow for that left-turn southbound movement on Lamar.
- Where the extended Broom Street meets Continental, there may need to be a bump-out so the cars on Broom only must cross one of the dedicated left-turn lanes to head southbound on Lamar.
- Per the City's Traffic Signals Senior Program Manager, traffic signals will likely not work. It will likely need to be stop sign controlled.
- If a Broom connection to Lamar/Continental is not feasible, Option 1B as presented is the second preference.

### Downtown Dallas, Inc. Feedback

- Option 1B with the City's proposed changes appears to be most optimal for traffic movement and additional connections via an extended Laws under Woodall Rodgers Freeway and the proposed connection of Broom Street to Continental.

### Perot Museum Feedback

- Representatives of Perot Museum indicated preferred driveway locations into their Lot C north of Broom where a future potential parking garage would be located. That driveway is currently not shown in the design concepts. The driveway may or may not line up with an Old Griffin extension under the freeway.

- They will continue to assess potential refinements to their driveway/loading dock area to ensure it is more pedestrian friendly but also ensure trucks have sufficient access
- They generally prefer Options 2B or 3 for roadway/parking lot reconfigurations which allows for two large parking lots under Woodall Rodgers Freeway. These options also reduce decision points and conflicts for traffic/pedestrians compared to 1A/1B.
- They are interested in an expanded parking lease area with the City. More parking gives them more flexibility on timing for garage expansion and other uses on their property.
- All options would require westbound Broom traffic destined to the eastern parking lot to turn under the freeway onto SB Old Griffin Extension then onto EB McKinney and isn't as visible and accessible from Broom like the second larger lot (west of an Old Griffin extension). Perot Museum is interested in the ability to add an access lane from westbound Broom under the TxDOT ramp prior to DART LRT tracks crossing so there would be an entrance point to their main large lot from Broom. If that is feasible, then two smaller parking lots west of the tracks under options 1A/1B would be acceptable.
- They are interested in working with the City to emphasize pedestrian safety through beacons, striping, signage, etc. in this area.

## **RECOMMENDATION**

Based on the assessment and feedback, DART is advancing a refined version of Option 1B (see Appendix C) in the FEIS and 30% design plans. Refinements made to original Option 1B include:

- Addition of an access point under the TxDOT ramp from Broom Street just east of the D2 tracks into the eastern parking lot under the freeway. This will eliminate the need for museum patrons to turn left onto Griffin and McKinney (crossing the tracks twice) to access the parking lot off McKinney. Signage and technology can be incorporated to provide parking information and space availability.
- Addition of two driveways into Parking Lot C north of Broom Street for buses and a proposed parking garage. These driveways will continue to be refined as necessary based on Perot Museum expansion plans.

## **Future Potential Refinements**

The City of Dallas remains interested in the potential for a connection from Broom Street west to southbound Lamar/Continental that would avoid the need for the Laws/Lamar “J” curve or potentially the need for Laws Street under Woodall Rodgers Freeway. Perot Museum is interested in removing Laws Street to allow for two larger consolidated parking lots under the freeway. Making this connection has a few challenges. First, there would be a need for private property acquisition in front of Hooter’s restaurant to make a connection; second, a left turn onto Lamar would enter into existing double left turn lanes making it difficult for vehicles to shift into southbound through lanes; and third, Lamar/Continental is rising southbound from an underpass posing sight distance issues.

DART will continue to coordinate with the City of Dallas on potential refinements prior to final design, so that any modifications can be incorporated into early final design plans.



## APPENDIX A

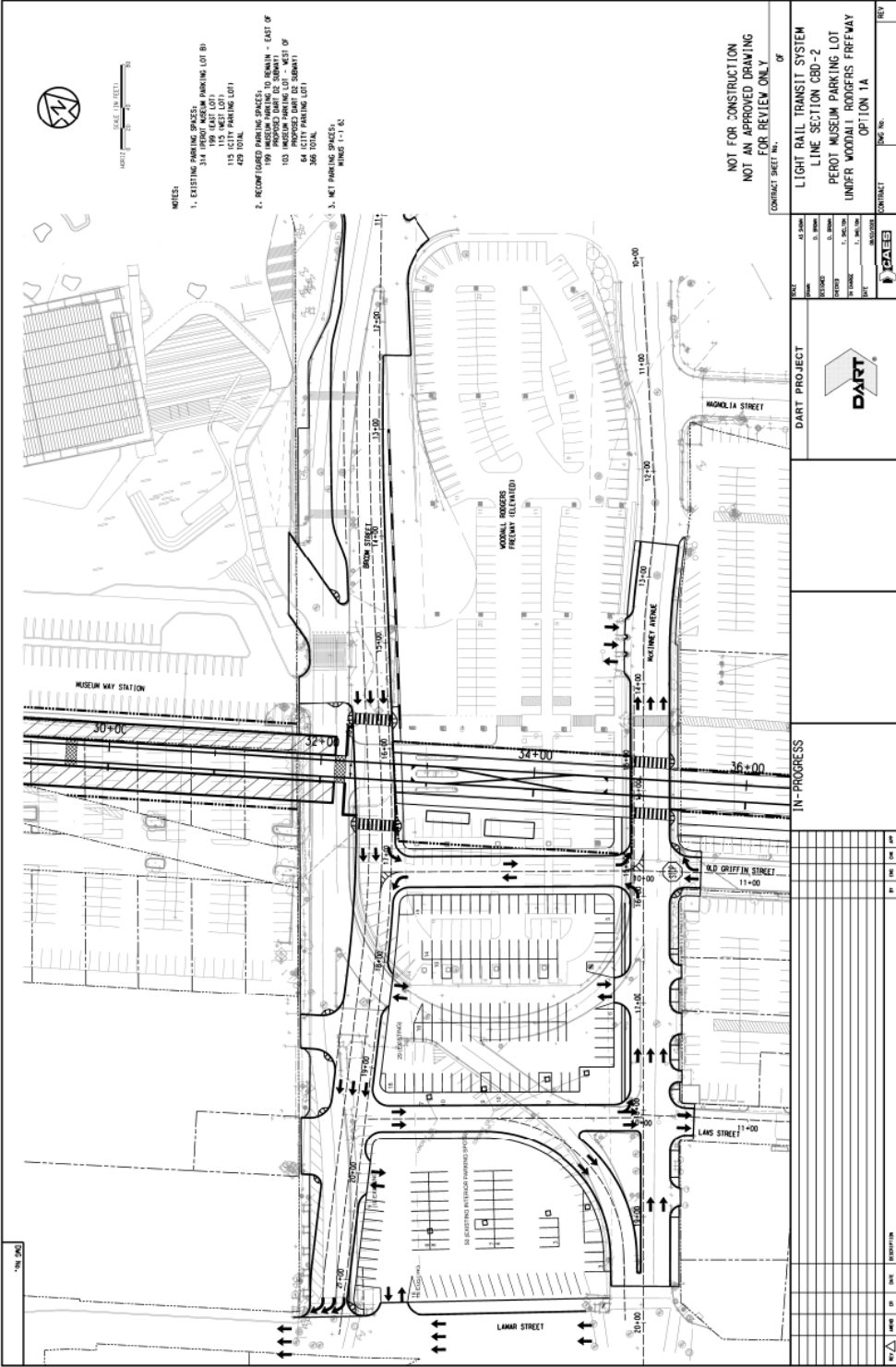
### 20% Design – Maintains Existing Street Patterns Under Freeway



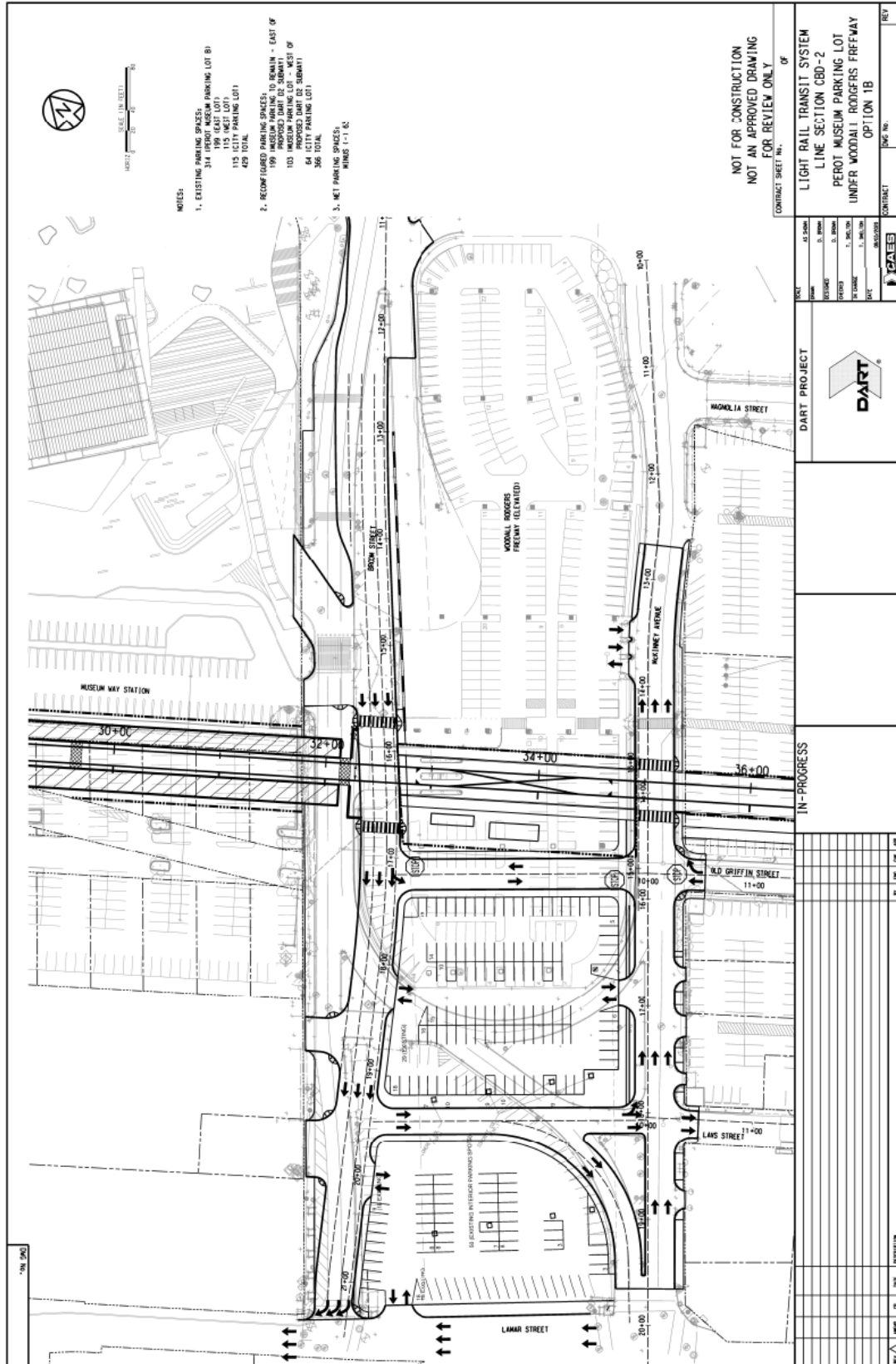
APPENDIX B

SIX ROADWAY AND PARKING CONCEPT OPTIONS

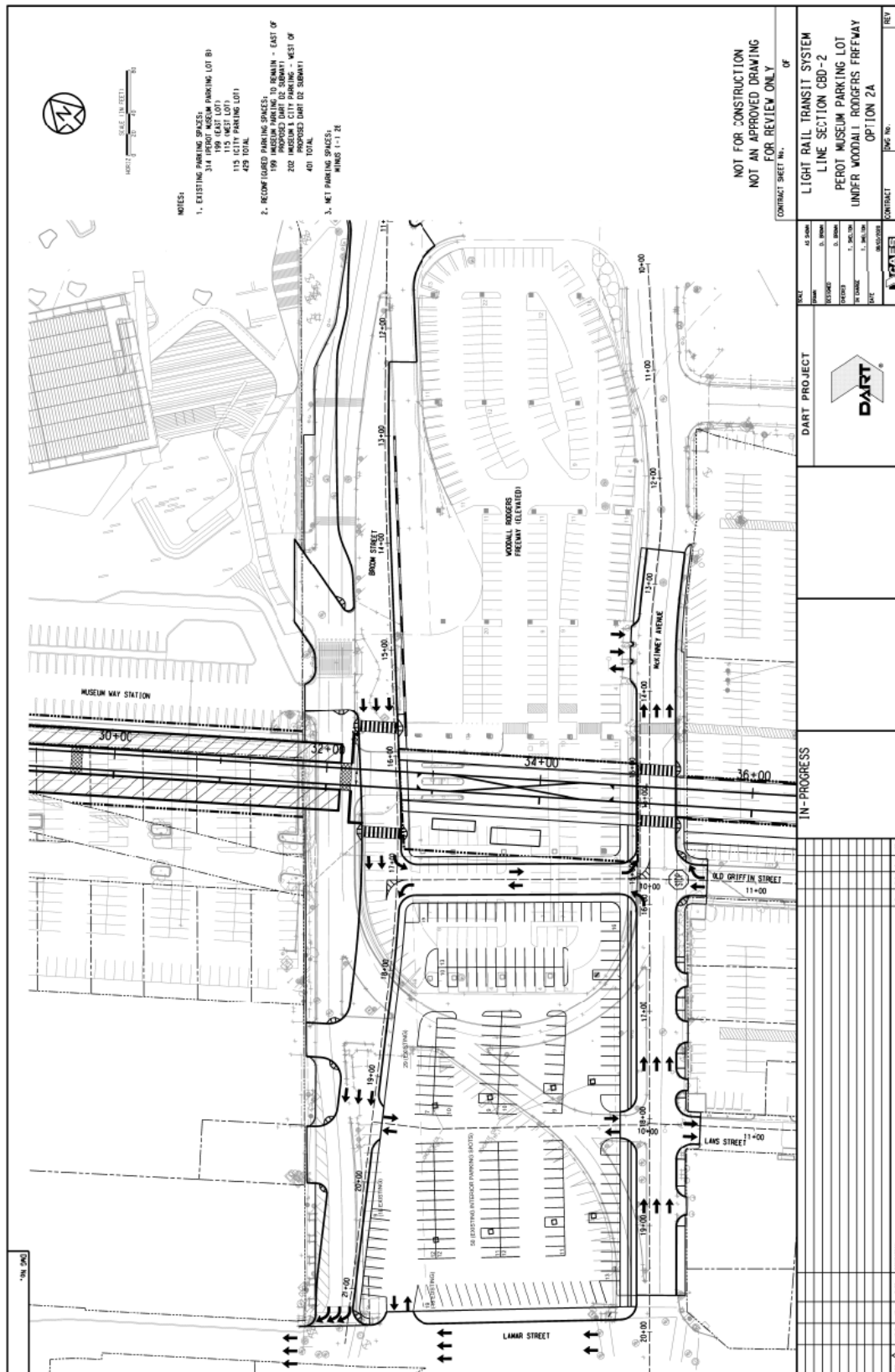
Option 1A



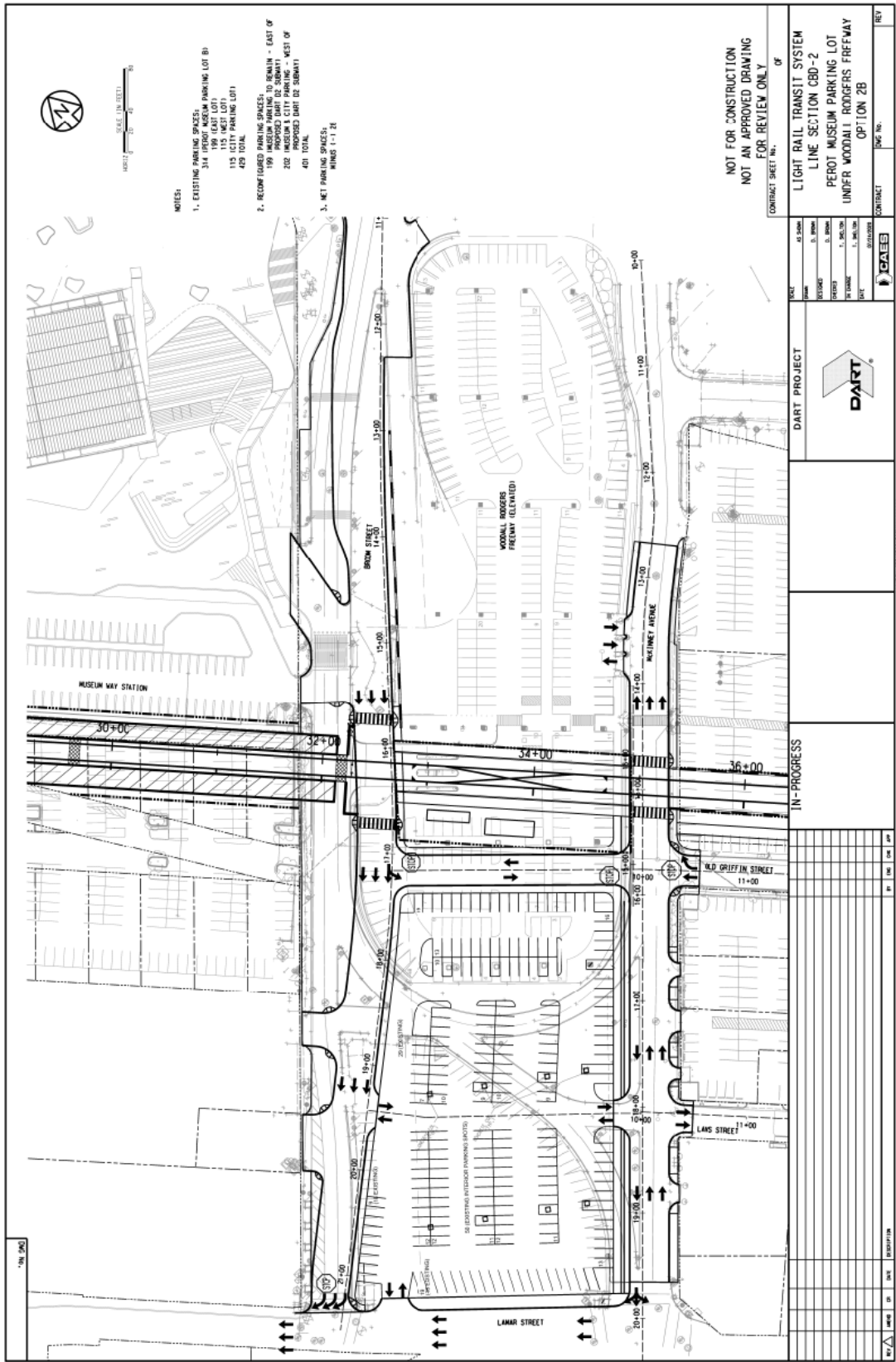
# Option 1B



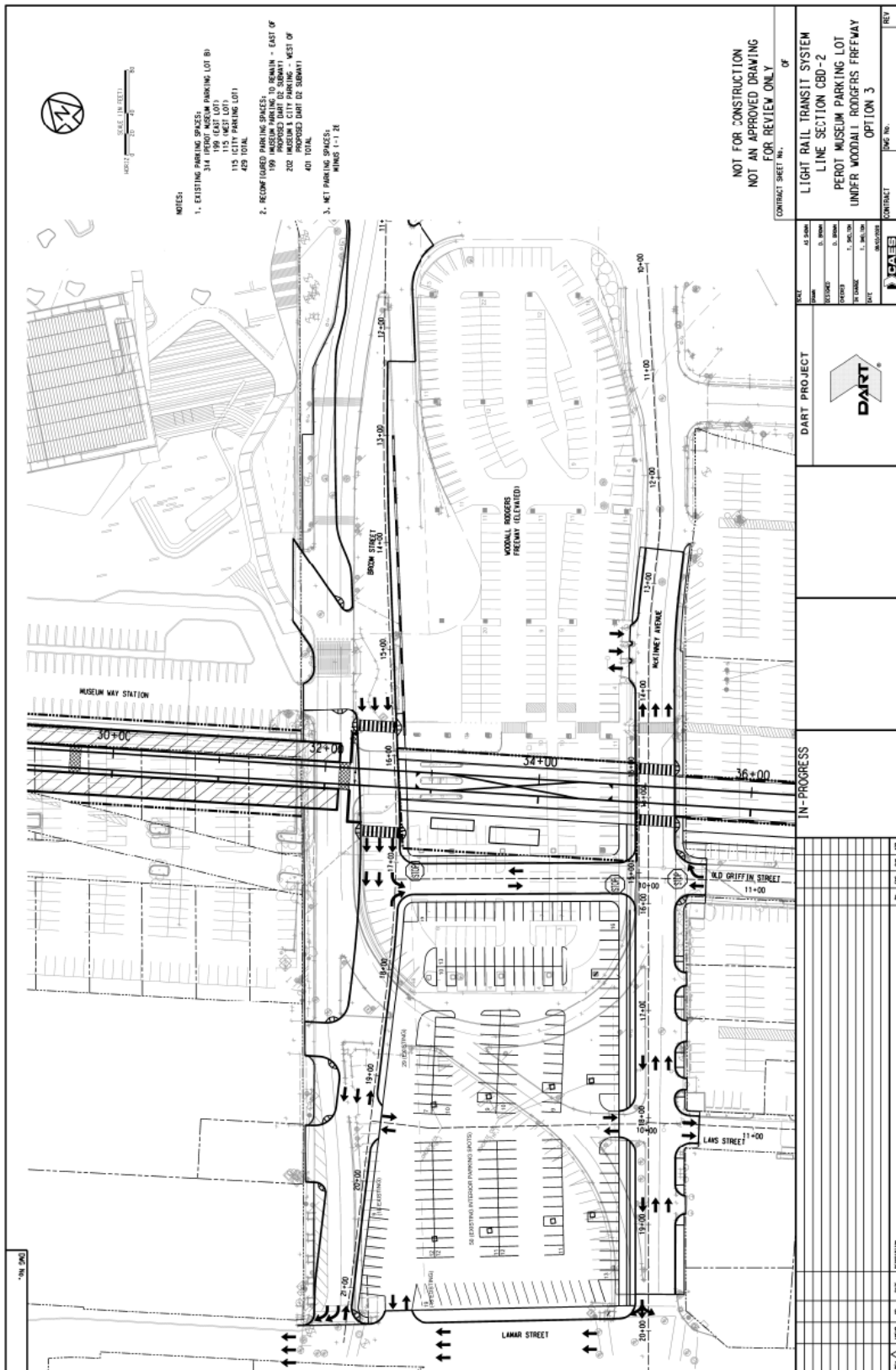
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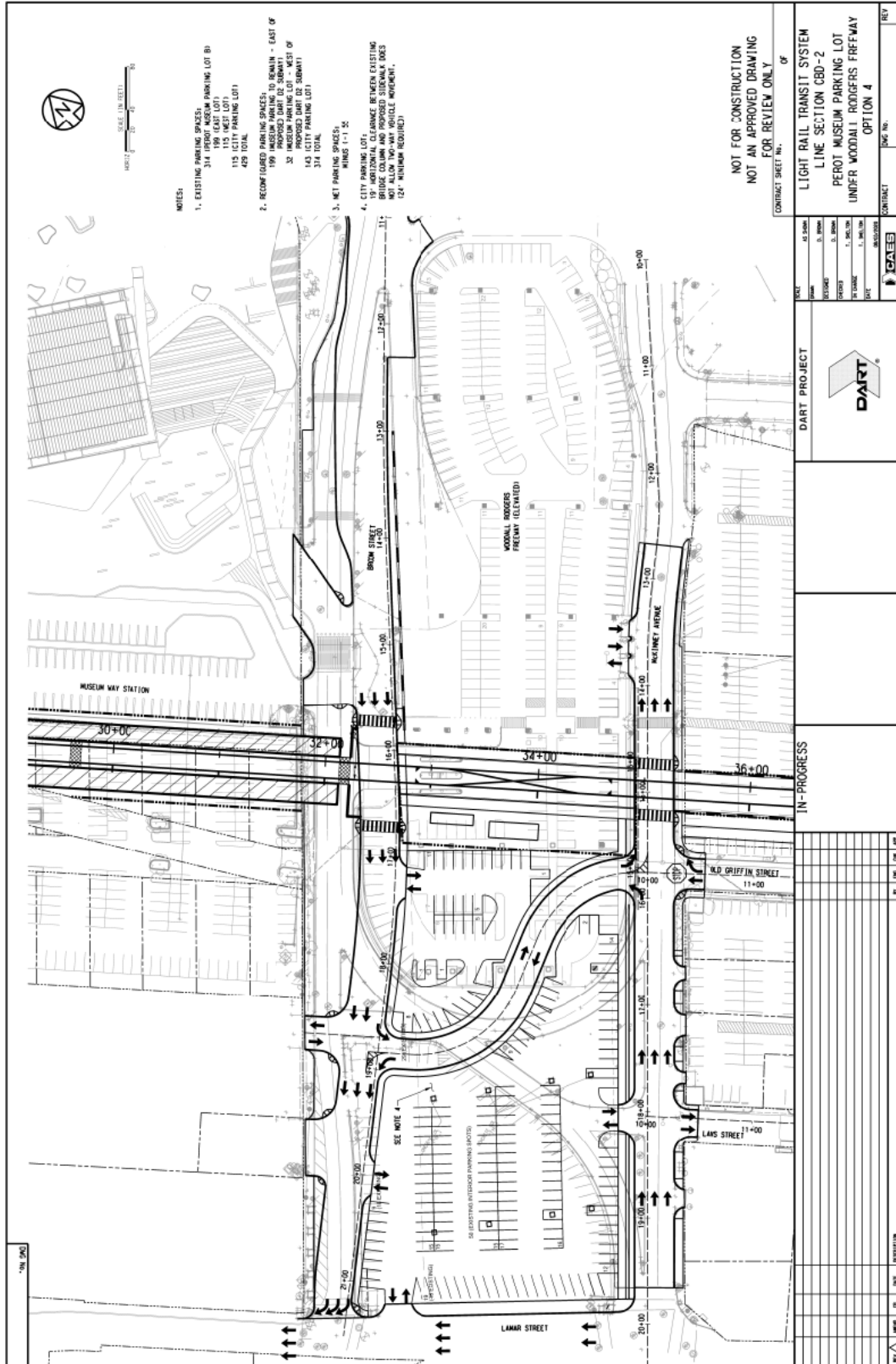
Option 2B



## 12



# Option 4





## APPENDIX C

Refined Option 1B – Old Griffin Street Extension and Realigned Laws/Lamar Connection( with updated Perot Museum parking lot access) - Preferred Option with Perot Museum-recommended driveways

