PEDESTRIAN UNDERPASS ENGINEERING FEASIBILITY STUDY

ARROYO DE LOS CHAMISOS TRAIL CROSSING OF RICHARD'S AVENUE

City Project CIP 876B; NMDOT CN LP50039

Submitted to:

CITY OF SANTA FE

Public Works Department

Submitted by:

WSP

June 10, 2024

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EXECUTIVE SUMMARY

The purpose of this project is to improve and extend Richards Avenue from Rodeo Road to Cerrillos Road in Santa Fe. Richards Avenue is proposed to be extended from approximately GCCC Road to the south side of Siringo Road which will require changes to an existing multi-use trail on the south side of the Arroyo de Los Chamisos (ADLC). WSP was asked to investigate various alignments and geometry for providing a pedestrian underpass across the Richards Avenue extension and concluded that an underpass is feasible (see **Figure 1)**. The proposed pedestrian underpass would be built just south of the proposed bridge over the ADLC and can accommodate the corridor geometric requirements for the multi-use trail and roadway. The underpass incorporates a 10'-0" wide x 9'-0" high path through the pedestrian underpass with clear site lines approaching and through the underpass for the multi-use trail. The underpass would be approximately 80 feet long. An at-grade crossing is also provided.

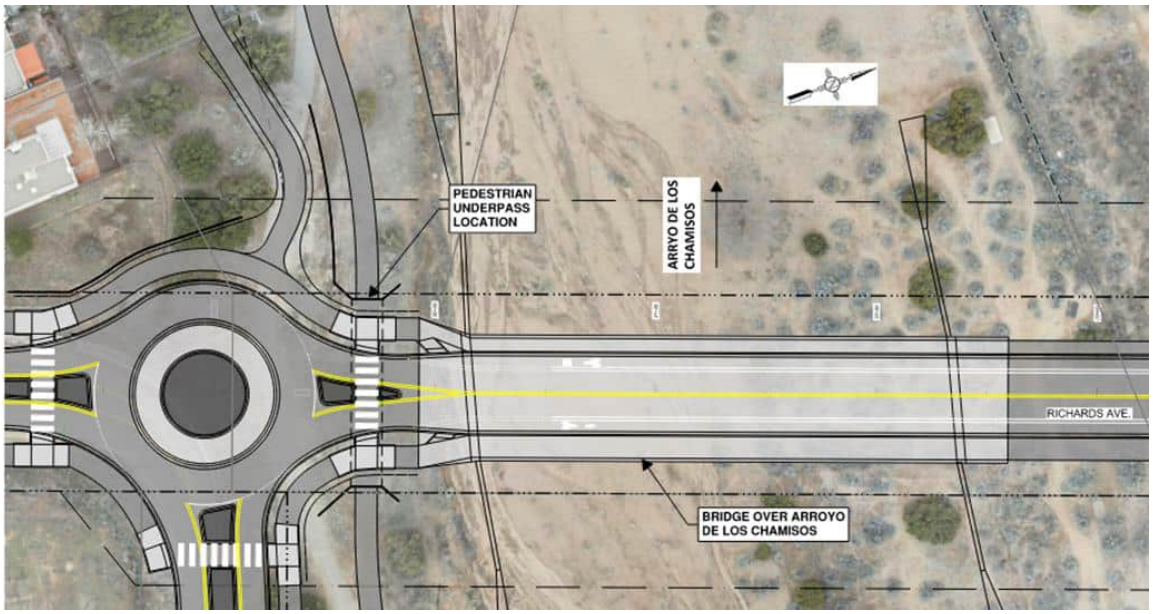


Figure 1: Plan View of Pedestrian Underpass Location

This report documents an engineering feasibility study of a pedestrian underpass. Three pedestrian underpass structure alternatives were considered, which are:

1. Alternative 1 - Structural Steel Plate Underpass
2. Alternative 2 - Reinforced Concrete Box Underpass
3. Alternative 3 - Precast Concrete Arch Underpass

A comparison was made of the pedestrian underpass alternatives listed above based on functional requirements, economics, future maintenance, construction feasibility, and aesthetics per the NMDOT *Bridge Procedures and Design Guide*. A comparison matrix was developed to rank the pedestrian underpass alternatives. The pedestrian underpass types evaluated in detail are known to be serviceable and constructible while meeting the project's functional requirements. The most significant differences between the three alternatives are material type (i.e., structural steel plate, cast-in-place concrete, and precast concrete) and cost. Other aspects of the underpass crossing are similar for each structure type. An at-grade crossing accessible from both sides of Richards Avenue will be provided as a base condition.

An underpass was found to be feasible from an engineering perspective. Based on the evaluation, Alternative 1, Structural Steel Plate, is the highest rated alternative. The pedestrian underpass would consist of a 10' wide x 9' high clear path for the multi-use trail crossing as shown in **Figure 2**. A profile drawing of the structural steel

plate next to the proposed bridge over the ADLC is shown in **Figure 3**. Conceptual drawings of the three pedestrian underpass alternatives and the plan and profile sheets of the horizontal and vertical alignments for Richards Avenue and the ADLC trail can be found in **Appendix A**. Cost estimates for each underpass structure alternative can be found in **Appendix B**.

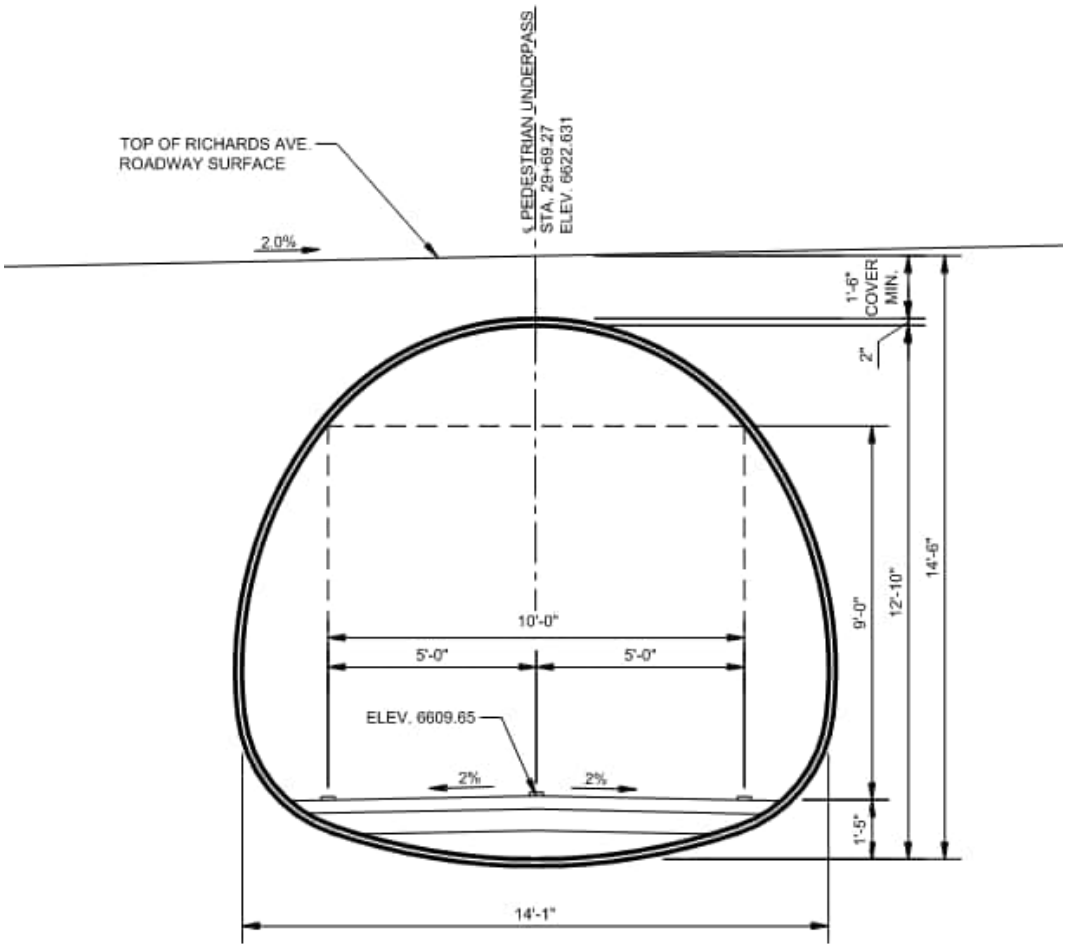


Figure 2: Alternative 1 Typical Section - Structural Steel Plate Pedestrian Underpass Structure

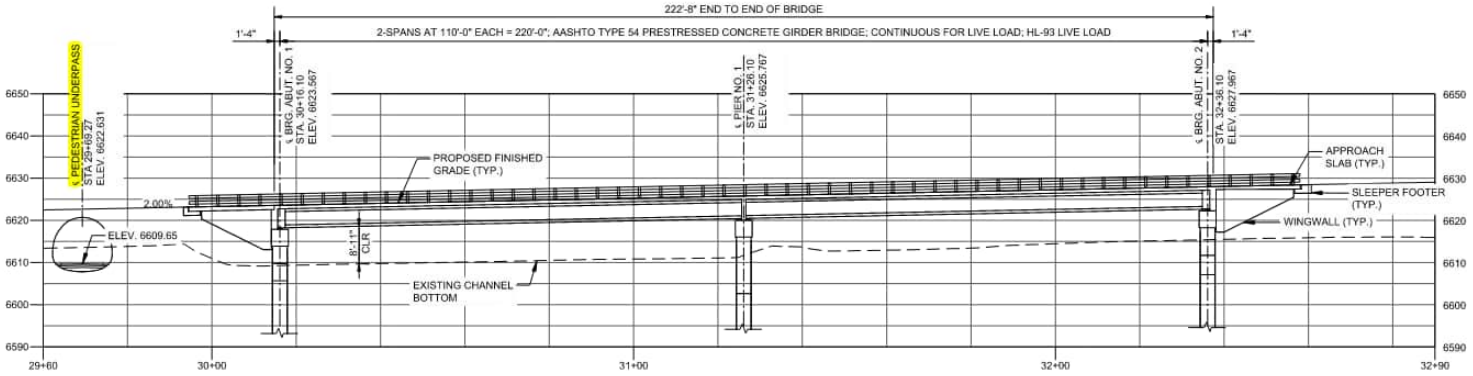


Figure 3: Cross Section of the Alternative 1 Pedestrian Underpass Next to the Proposed ADLC Bridge

INTRODUCTION

The purpose of this project is to improve and extend Richards Avenue from Rodeo Road to Cerrillos Road in Santa Fe, New Mexico. Richards Avenue is proposed to be extended from approximately GCCC Road to south of Siringo Road which will require changes to an existing multi-use trail on the south side of the Arroyo de Los Chamisos (ADLC). WSP was asked to investigate various alignments and geometry for providing a pedestrian underpass under Richards Avenue. The proposed pedestrian underpass would be built normal to the centerline of Richards Avenue and just south of the proposed bridge over the ADLC which would accommodate the corridor geometric requirements for the multi-use trail (see **Figure 1**). The underpass incorporates a 10'-0" wide x 9'-0" high clear path through the pedestrian underpass and would be approximately 80-feet long. The pedestrian underpass types evaluated in detail are known to be serviceable, constructible, and economical while meeting the project's functional requirements. An at-grade crossing accessible from both sides of Richards Avenue will be provided as a base condition.

The purpose of this pedestrian underpass feasibility study is to determine if an underpass is feasible from an engineering perspective, and to provide the City with data needed to determine the underpass type to cross under Richards Avenue if desired. This report evaluates each alternative based on existing conditions and geometric constraints, functional requirements, economics, future maintenance, construction feasibility, and aesthetics. Other aspects of the underpass crossing are the same for each structure type including the multi-use trial alignment through the underpass, the trail connections to the at-grade crossing on the north side of the proposed roundabout on each side of Richards Avenue, the drainage and grading conditions associated with the underpass, and the extent of retaining walls that will be required (see plan and profiles in **Appendix A**).

Note that the potential social issues associated with an underpass are beyond the scope of this engineering feasibility study. With increased activity in the area and a relatively short underpass structure, an underpass is considered reasonable at this location along with the at-grade crossing that will be provided.

DESIGN CRITERIA

The proposed pedestrian underpass would be designed in accordance with the design criteria contained in the following sources:

- AASHTO *LRFD Bridge Design Specifications, 9th Edition,* 2020.
- NMDOT *Bridge Procedures and Design Guide*, February 2018, and Amendments.
- NMDOT *Standard Specifications for Highway and Bridge Construction*, 2019 as modified by current supplemental specifications, special provisions, and Standard Drawings.

In addition to the structural alternatives evaluated, key considerations associated with providing a pedestrian underpass crossing which are applicable to the three structural alternatives include:

- Potential utility conflicts
- Ability to drain effectively without ponding in trail; bottom elevation at or higher than ADLC
- Ability to see through the underpass as users of the trail approach from both sides/directions

PEDESTRIAN UNDERPASS ALTERNATIVES

Three pedestrian underpass alternatives were considered in this feasibility study. They are:

1. Alternative 1 - Structural Steel Plate Underpass
2. Alternative 2 - Reinforced Concrete Box Underpass
3. Alternative 3 - Precast Concrete Arch Underpass

Cross sections of each pedestrian underpass alternative are shown on the next three pages. An evaluation of the alternatives is discussed afterwards.

Pedestrian Underpass Alternative 1 – Structural Steel Plate

This alternative is a structural steel plate with inside dimensions that would fit a 10’-0” span x 9’-0” rise pedestrian trail as shown in **Figure 4**. This alternative is based on discussions with Contech Engineered Solutions LLC to identify the applicable steel structural plate design for this specific location. This alternative does not have a foundation requirement. It is stabilized by direct burial approximately 1.5 feet as shown below and the soil support around it. Based on the preliminary layout, there is 1.5 feet of cover from the top of the structure to the roadway surface.

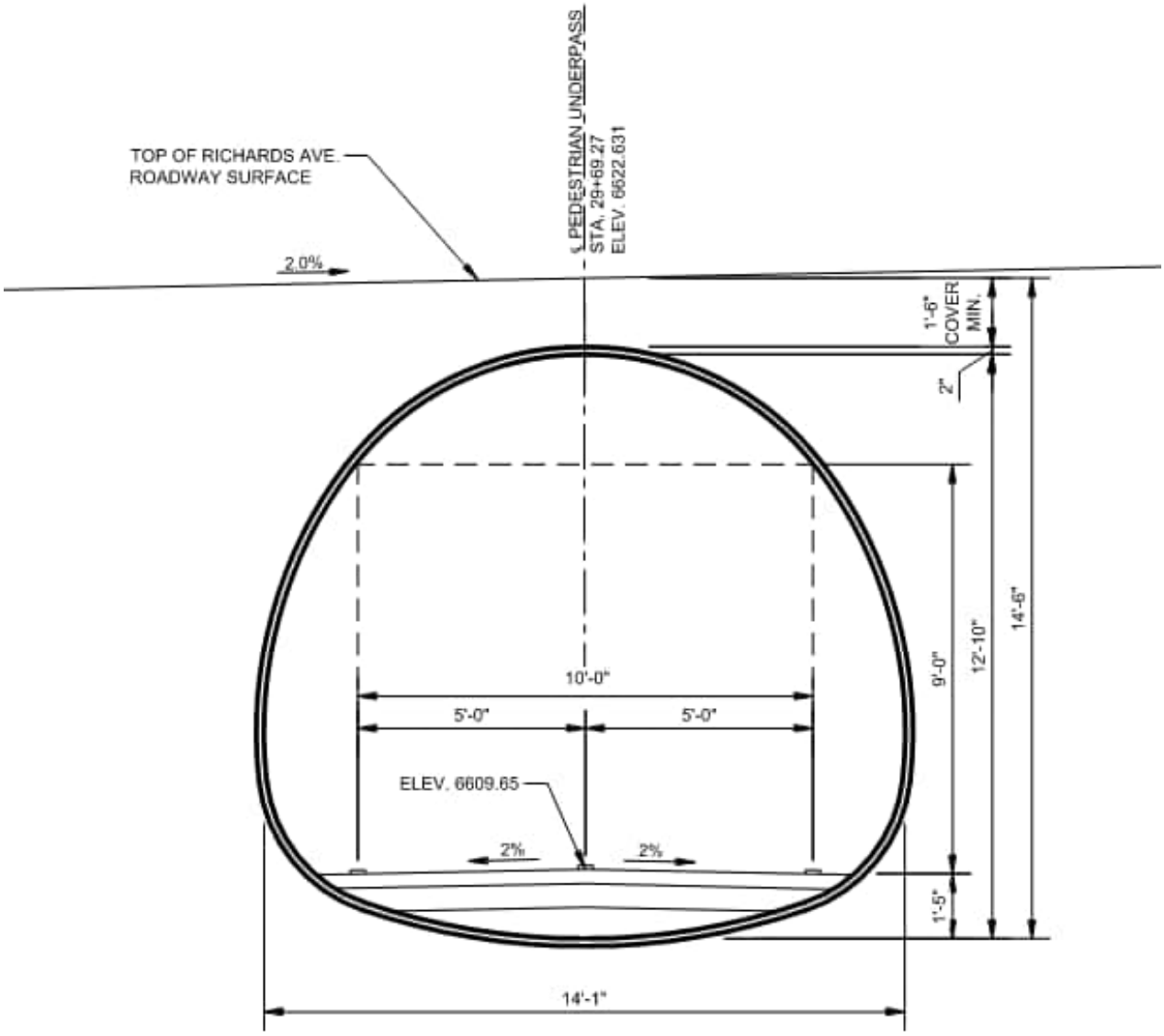


Figure 4: Alternative 1 - Structural Steel Plate Typical Section

Pedestrian Underpass Alternative 2 – Reinforced Concrete Box

This alternative is a reinforced concrete box with inside dimensions that would fit a 10’-0” span x 9’-0” rise pedestrian trail as shown in **Figure 5**. This alternative is based on NMDOT standards for concrete box culverts. This alternative does not have a foundation requirement. It is stabilized by the weight of the structure itself and the soil support around it. Based on the preliminary layout, there is approximately 3 feet of cover from the top of the structure to the roadway surface.

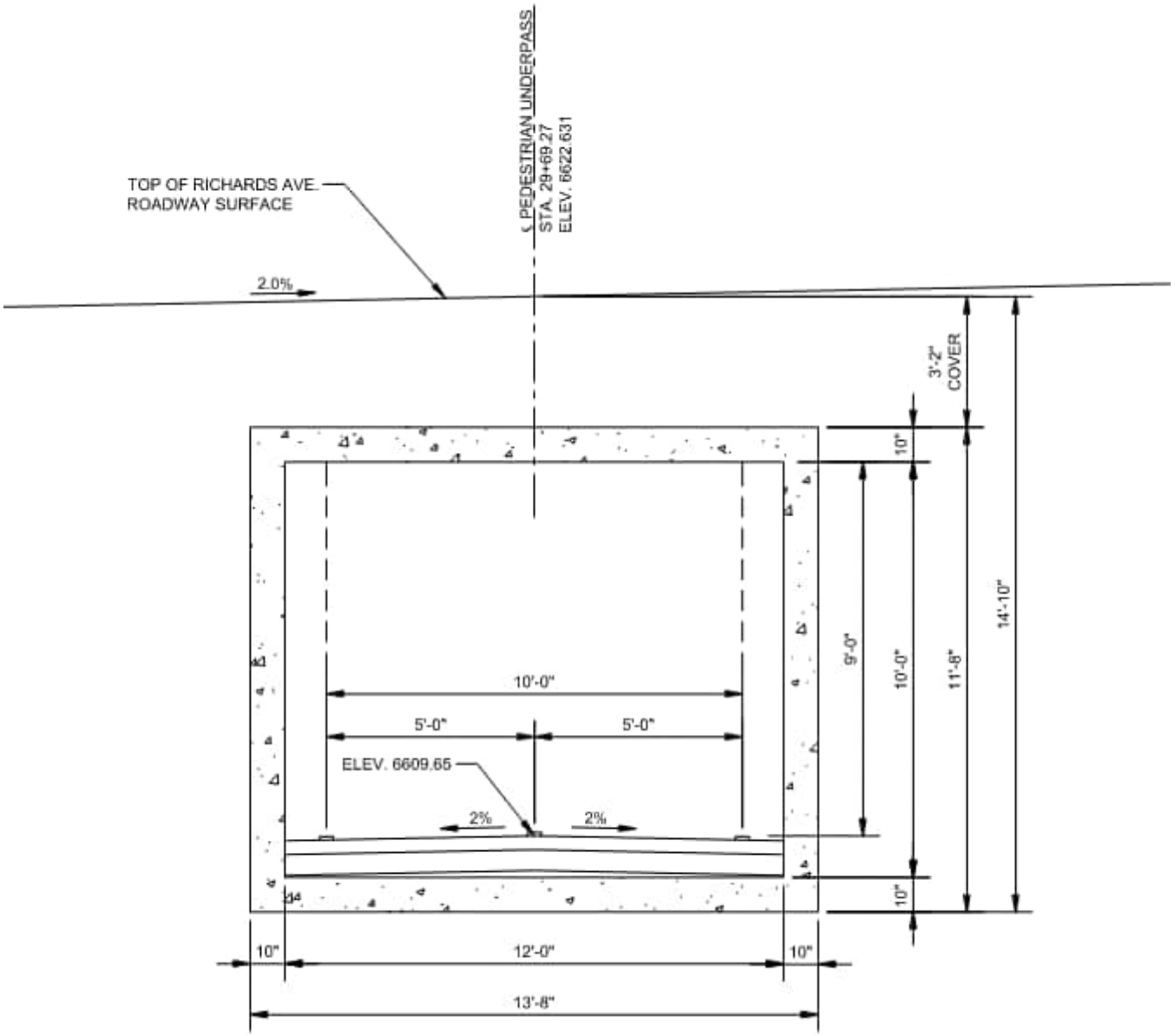


Figure 5: Alternative 2 - Reinforced Concrete Box Typical Section

Pedestrian Underpass Alternative 3 – Precast Concrete Arch

This alternative is a precast concrete arch with inside dimensions that would fit a 10’-0” span x 9’-0” rise pedestrian trail as shown in **Figure 6**. This alternative is based on discussions with Contech Engineered Solutions LLC to identify the applicable precast concrete arch design for this specific location. This alternative is stabilized by a 1-foot slab-footing with grooves the arch sits in as well as the soil support around it. Based on the preliminary layout, there is 2.0 feet of cover from the top of the structure to the roadway surface.

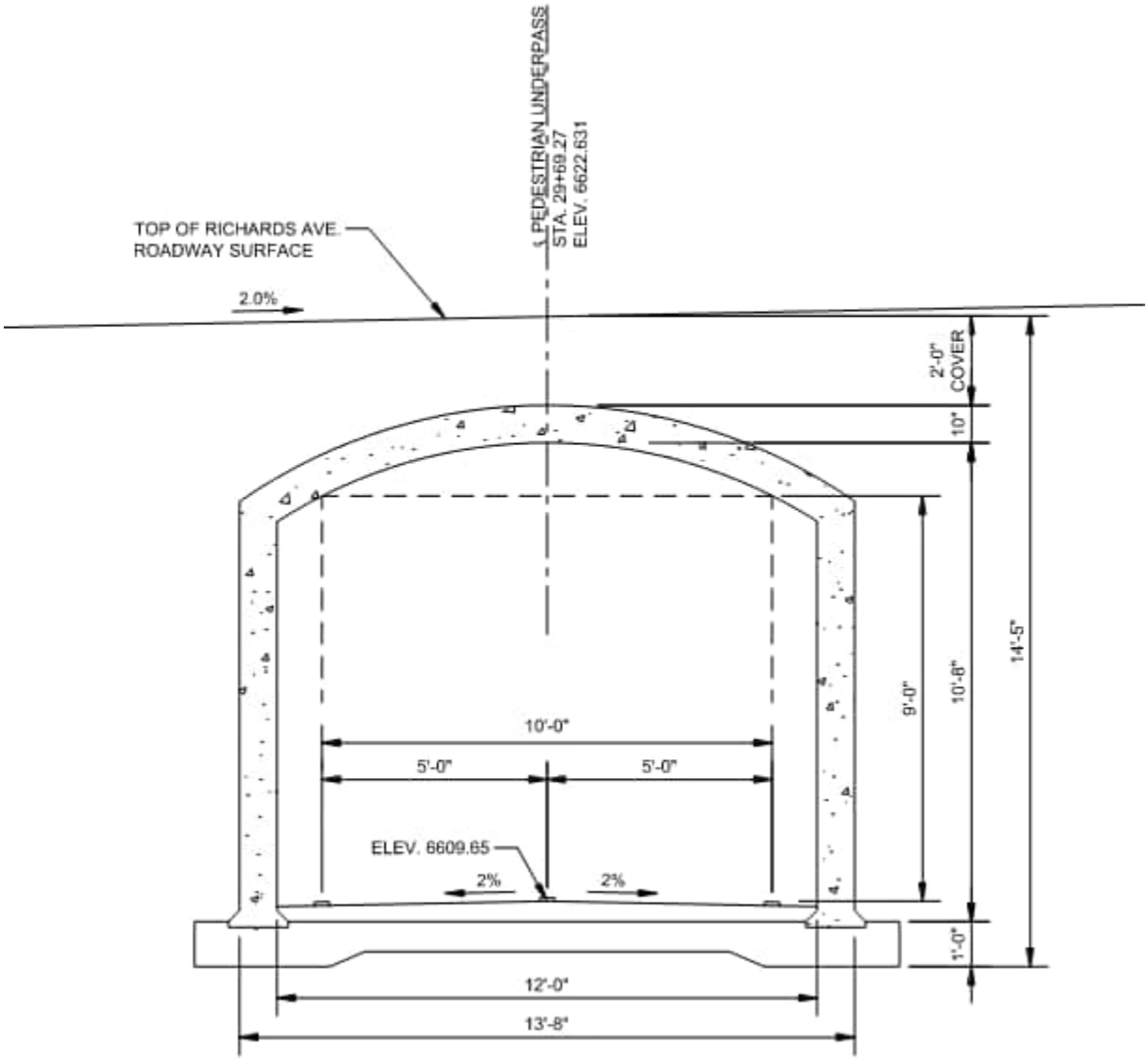


Figure 6: Alternative 3 - Precast Concrete Arch Typical Section

STRUCTURAL EVALUATION OF ALTERNATIVES

The NMDOT *Bridge Procedures and Design Guide* requires a weighted decision matrix that considers, at a minimum, functional requirements, economics, future maintenance, construction feasibility, and aesthetics. These evaluation metrics are described below. The weighted decision matrix rates each underpass structure alternative based on a weighting factor and a raw score scale as shown in **Table 1** and **Table 2**. The ratings start at 5 and adjustments (i.e., Point Deductions) are applied as discussed below.

The weighting factors in **Table 1** are based on engineering judgement considering the site conditions and characteristics of the proposed location. Functional requirements and economics are considered the priorities for this study. Future maintenance, construction feasibility and aesthetics are key considerations with less emphasis. For this underpass, the structure would be constructed with no impact on traffic because the Richards Avenue extension does not exist (construction feasibility). As such, if the City decides to provide an underpass, there is no better time to construct it than with the construction of the Richards Avenue extension.

Table 1: Evaluation Criteria Weighting Factors

Criteria	Weighting Factor
Functional Requirements	10
Economics	10
Future Maintenance	7
Construction Feasibility	7
Aesthetics	7

Table 2: Raw Score Scale

Functional Requirements

The three pedestrian underpass alternatives selected are compatible with the existing topography and each satisfy the required geometric constraints. These constraints include existing conditions, geometric constraints (horizontal and vertical alignment), and the feasibility of passing the multi-use trail under Richards Avenue and draining it. Overall, each of the structure types is equally feasible for functional requirements.

Multi-use trail configuration: The pedestrian underpass is proposed to provide a 10’ wide x 9’ high clear path for the multi-use trail. All three alternatives can accommodate the needed multi-use trail geometry as shown in **Figures 4, 5, and 6** and in **Appendix A**.

Sight distance: A sight distance of several hundred feet from the ends of the pedestrian underpass is provided on both sides. All three alternatives can accommodate the sight distance requirements. The proposed vertical alignment of the trail accommodates the ability to see through the underpass as users of the trail approach from both sides/directions if they are uncomfortable using the underpass.

Drainage: As shown in the trail profile in **Appendix A**, a 3.7% grade is east of the underpass with a 0.3% grade through the underpass. The 0.3% grade is the minimum but is considered feasible without ponding in trail. The bottom elevation of the trail would be at or higher than the arroyo. If advanced, this can be refined in final design.

Lighting: Lighting would be desired for the pedestrian underpass. Lighting can be installed on all three alternatives with no difficulty.

Potential Utility Conflicts: The sanitary storm sewer that crosses the location of the proposed underpass is several feet below the underpass structure based on the invert elevations obtained by utility investigations and is not expected to be impacted by the underpass alternatives.

Point Deduction Summary:
Alternative 1: 0.0 points
Alternative 2: 0.0 points
Alternative 3: 0.0 points

Economics

Costs associated with the pedestrian underpass materials and labor were analyzed. Since Richards Avenue does not currently pass over the multi-use trail, traffic control costs and user delay costs were not included in the weighted decision matrix. There would be not better time to construct the underpass than with the construction of the Richards Avenue extension.

Costs were obtained from a local fabricator of structural steel plate underpasses and precast concrete arches (Contech Engineered Solutions). Costs for the reinforced concrete box alternative were generated based on recent bids for reinforced concrete boxes built on NMDOT projects.

Table 3 shows a summary of the total materials and construction costs for each underpass structure alternative (see **Appendix B** for more details). The total cost is for comparison purposes only and not for budget or funding estimation. It excludes mobilization, roadway paving, trail connections, retaining walls, earthwork, aesthetics, taxes, and contingencies among other things.

The most cost-effective bridge alternative is the Structural Steel Plate alternative which is given a raw score of 5. The other underpass alternatives were then given a raw score relative to the cost difference of the structural steel plate alternative as shown in **Table 3.**

Point Deduction Summary:
Alternative 1: 0.0 points
Alternative 2: 1.17 points
Alternative 3: 1.50 points

Table 3: Summary of Pedestrian Underpass Costs

Bridge Alternative	Materials Cost	Construction Cost	Total Cost
Alternative 1 - Structural Steel Plate	$114,098	$159,736	$273,834
Alternative 2 - Reinforced Concrete Box	$218,748	$328,123	$546,871
Alternative 3 - Precast Concrete Arch	$336,700	$286,195	$622,895

Note: see Appendix B for more information

Future Maintenance

The alternatives included in this study were chosen considering future maintenance.

Alternative 1 would consist of structural steel plates bolted together. Structural steel has a long service live, particularly in New Mexico where the climate is mostly dry. Some corrosion could possibly occur requiring maintenance and recoating. A half-point deduction was given to Alternative 1.

Alternative 2 would be a cast-in-place concrete box culvert, whereas Alternative 3 would be a precast concrete arch underpass. Precast concrete can be fabricated off-site in a controlled environment, resulting in higher quality and more durable concrete versus cast-in-place concrete. The controlled environment also eliminates unknowns related to temperature, humidity, and imprecise tools and equipment. For these reasons, a 1-point deduction was given to Alternative 2 since the cast-in-place concrete would not be as durable as the concrete for Alternative 3. Alternative 3 would be constructed of precast arch pieces that are joined together with keyway joints. Joint leakage could possibly occur, so a half-point deduction was given to Alternative 3.

Point Deduction Summary:
Alternative 1: 0.5 point
Alternative 2: 1.0 point
Alternative 3: 0.5 point

Construction Feasibility

The construction sequence and access (a.k.a., constructability) would be similar for all alternatives. Pedestrians would be detoured around the current pedestrian alignment so that the new pedestrian underpass may be installed. The proposed right-of-way for the extension of Richards Avenue and adjacent City-owned property could be used as a staging and storage area during construction. Construction activities would take place outside of and on the existing pedestrian trail for all alternatives. All pedestrian underpass alternatives are constructible, but some alternatives would take longer to construct.

Alternative 1 would be constructed of prefabricated steel plates that are readily available and bolted together. Alternative 1 would be the fastest to construct and require small equipment to assemble. Alternative 2 would require 3 pour sequences (placement of rebar and concrete for bottom slab, walls, then top slab) and require curing time for each sequence which would result in the most labor and the longest alternative to construct. For these reasons, a 1.5-point deduction from the raw score was given for Alternative 2. Alternative 3 would require precast components to be fabricated ahead of time and would require a longer lead-time versus Alternative 1 and 2. A small crane would be required to erect the precast components to build Alternative 3. For these reasons, a 1-point deduction was given to Alternative 3.

Point Deduction Summary:
Alternative 1: 0.0 points
Alternative 2: 1.5 points
Alternative 3: 1.0 point

Aesthetics

End treatments for each pedestrian underpass alternative can be made aesthetically pleasing. End walls with color treatments may be designed to provide the desired aesthetic treatment. However, to manage costs, simplified end treatments for Alternative 1 and Alternative 2 were assumed for this evaluation with a 1.0-point deduction applied. Alternative 3 has more built-in aesthetic features so no point deduction was applied.

Point Deduction Summary:
Alternative 1: 1.0 point
Alternative 2: 1.0 point
Alternative 3: 0.0 points

EVALUATION MATRIX

The comparative evaluation of the three structure type alternatives is summarized in **Table 4**. As noted in **Table 2**, a raw score of 5 is considered most desirable and a raw score of 1, least desirable. Functional

requirements, economics, future maintenance, construction feasibility, and aesthetics were previously discussed. While the weighting factors could be refined, based on the point deductions applied, Alternative 1 would be the highest-ranked structure type.

Table 4: Pedestrian Underpass Alternative Decision Matrix

Alternatives		Alt 1 - Structural Steel Plate Underpass		Alt 2 - Reinforced Concrete Box Underpass		Alt 3 - Precast Concrete Arch Underpass	
Evaluation Criteria	**Weighting Factor**	**Raw Score**	**Weighted**	**Raw Score**	**Weighted**	**Raw Score**	**Weighted**
Functional Requirements	10	5.00	50.0	5.00	50.0	5.00	50.0
Economics	10	5.00	50.0	3.83	38.3	3.50	35.0
Future Maintenance	7	4.50	31.5	4.00	28.0	4.50	31.5
Construction Feasibility	7	5.00	35.0	3.50	24.5	4.00	28.0
Aesthetics	7	4.00	28.0	4.00	28.0	5.00	35.0
	Total Score	194.5		168.8		179.5	

Note: Raw score will vary from 1 to 5 with 5 being the highest score.

CONCLUSION

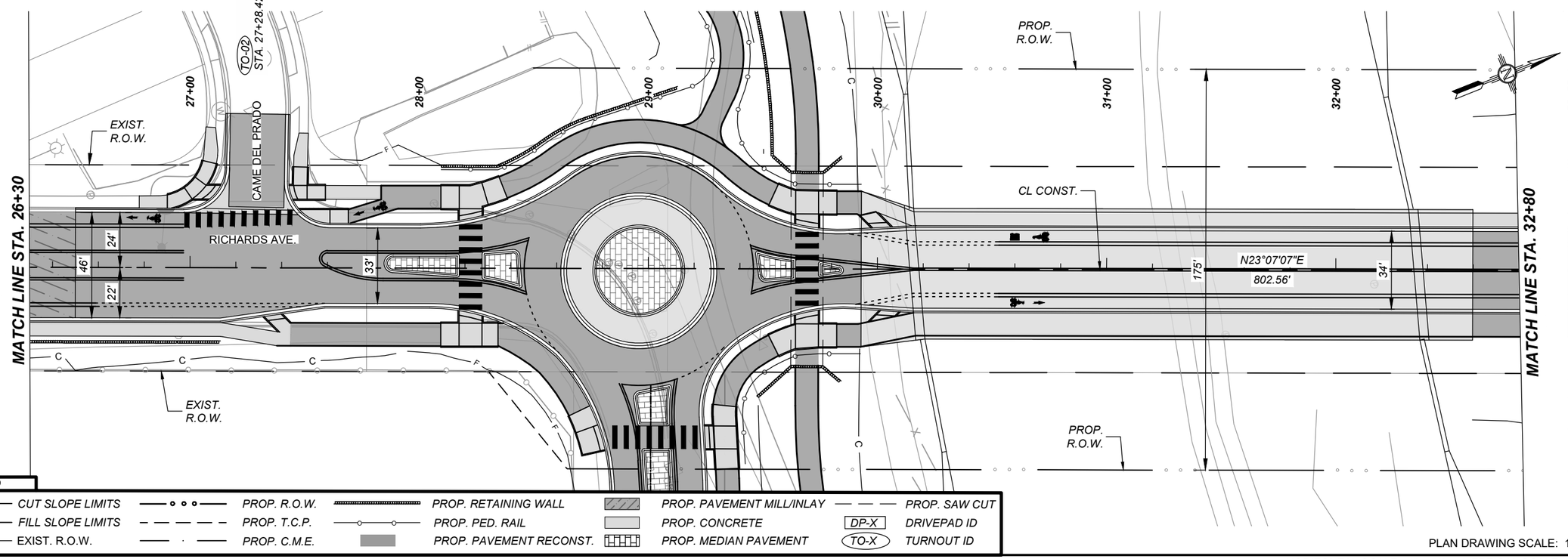
This report documents the engineering feasibility study for a pedestrian underpass crossing the extension of Richards Avenue, south of the Arroyo de los Chamisos. Pedestrian underpass structural alternatives that were considered include:

1. Alternative 1 - Structural Steel Plate Underpass
2. Alternative 2 - Reinforced Concrete Box Underpass
3. Alternative 3 - Precast Concrete Arch Underpass

Based on the evaluation documented herein, an underpass crossing of the Richards Avenue extension is feasible from an engineering perspective. Alternative 1, Structural Steel Plate, is the highest rated alternative. If advanced to final design, the engineering aspects of the underpass and surrounding facilities would be refined. In all cases, in addition to an underpass, an at-grade crossing accessible from both sides of Richards Avenue will be provided as a base condition.

Including the underpass in the project would result in additional costs for design and construction. However, there is no better time to construct it than with the construction of the Richards Avenue extension due to construction efficiency, including lower costs and faster construction, and less impacts on the traveling public. All things considered, the design team will need a definitive decision from the City as to whether the pedestrian underpass will be advanced to final design as well as the type of structure to incorporate.

APPENDIX A
Conceptual Drawings

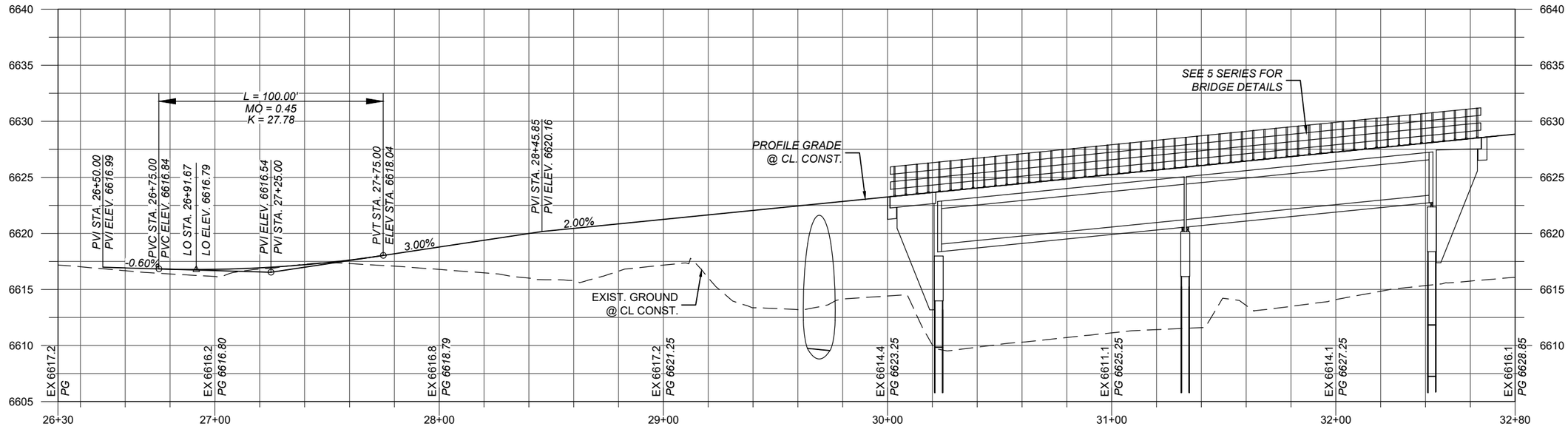


LEGEND

C — CUT SLOPE LIMITS	PROP. R.O.W.	PROP. RETAINING WALL	PROP. PAVEMENT MILL/INLAY	PROP. SAW CUT	
F — FILL SLOPE LIMITS	PROP. T.C.P.	PROP. PED. RAIL	PROP. CONCRETE	DP-X	DRIVEPAD ID
EXIST. R.O.W.	PROP. C.M.E.	PROP. PAVEMENT RECONST.	PROP. MEDIAN PAVEMENT	TO-X	TURNOUT ID

PLAN DRAWING SCALE: 1" = 50'

HORIZONTAL SCALE: 1" = 50' VERTICAL SCALE: 1" = 10'



CITY OF SANTA FE

NO.	DESCRIPTION	DATE	BY
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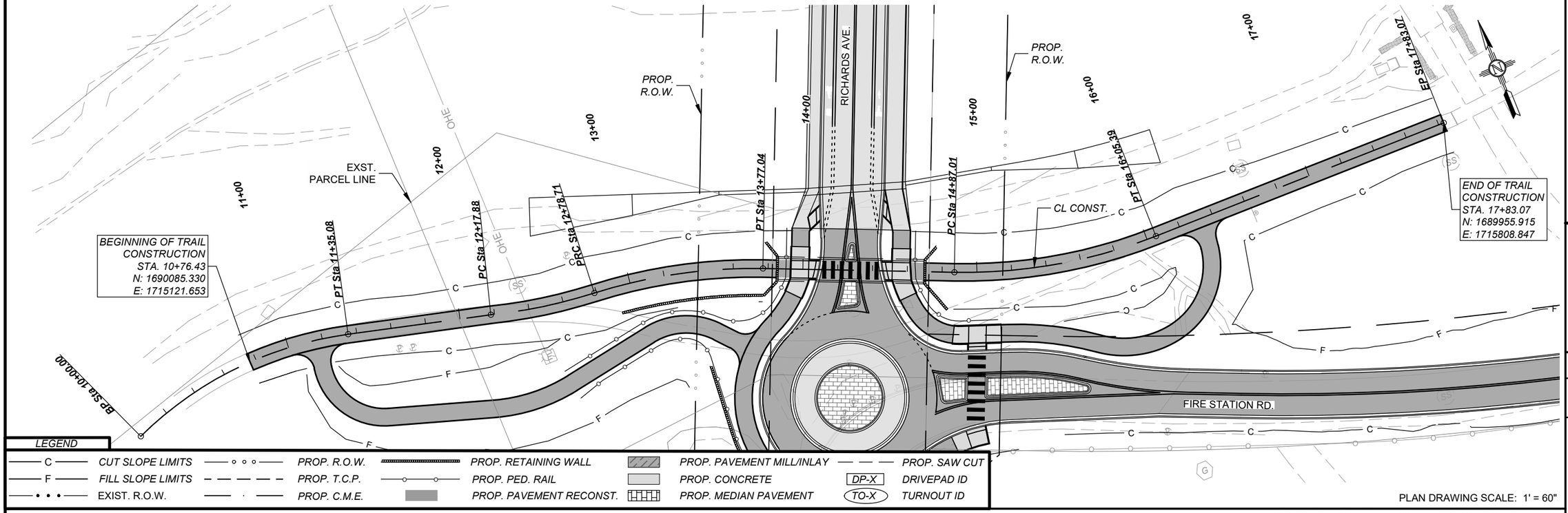
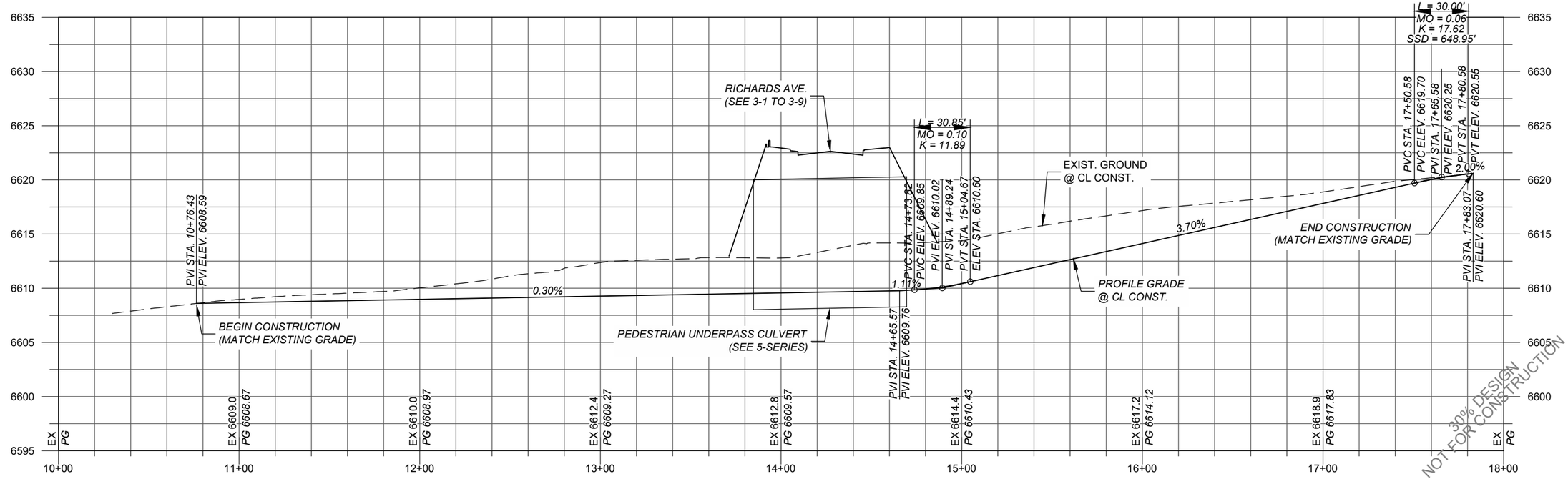
ARROYO DE LOS CHAMISOS CROSSING
ROADWAY PLAN AND PROFILE (RICHARDS)



PLAN DRAWING SCALE: 1' = 60"

HORIZONTAL SCALE: 1' = 60" VERTICAL SCALE: 1" = 10'



CITY OF SANTA FE

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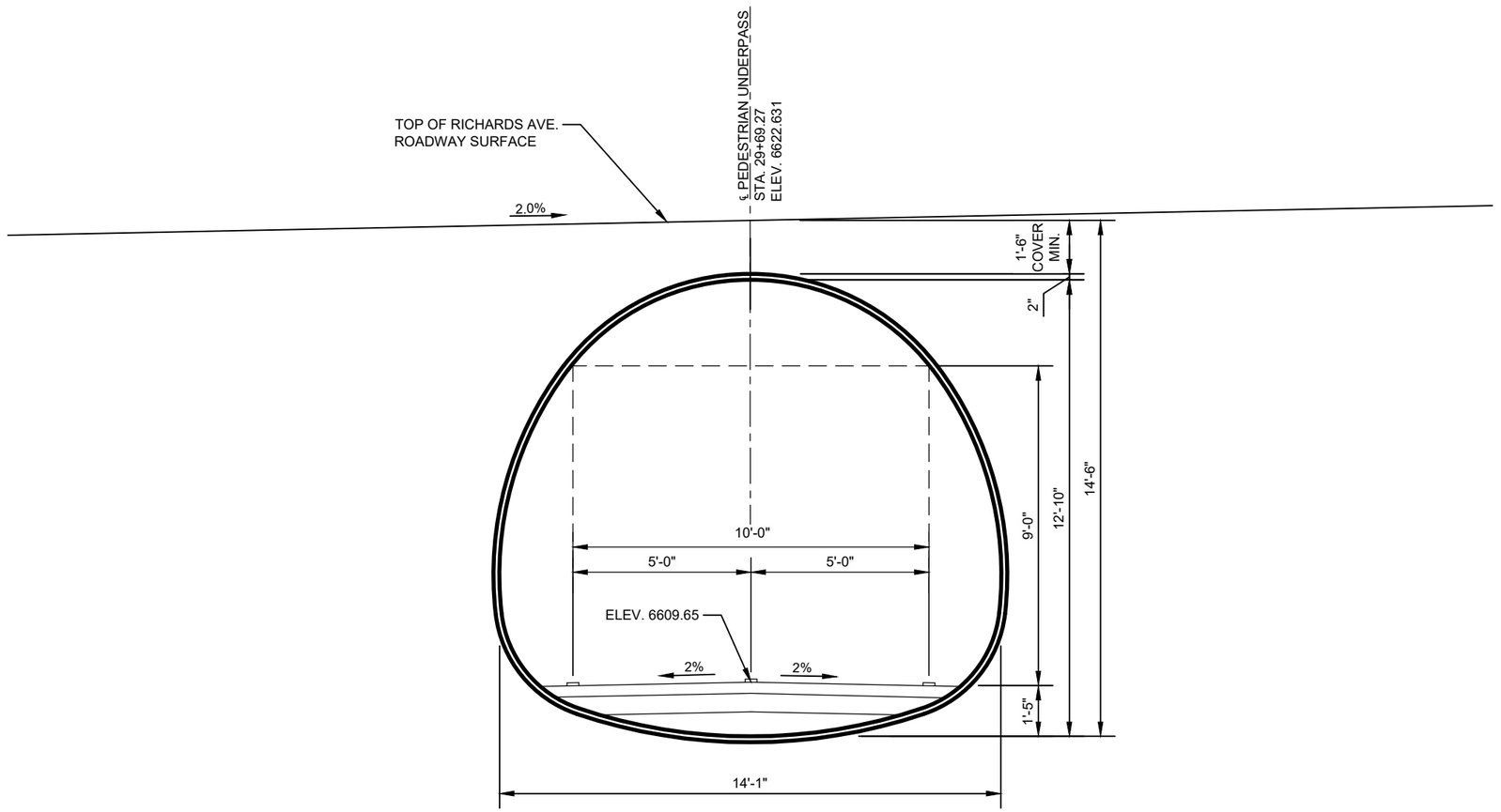
ARROYO DE LOS CHAMISOS CROSSING
ROADWAY PLAN AND PROFILE (TRAIL)



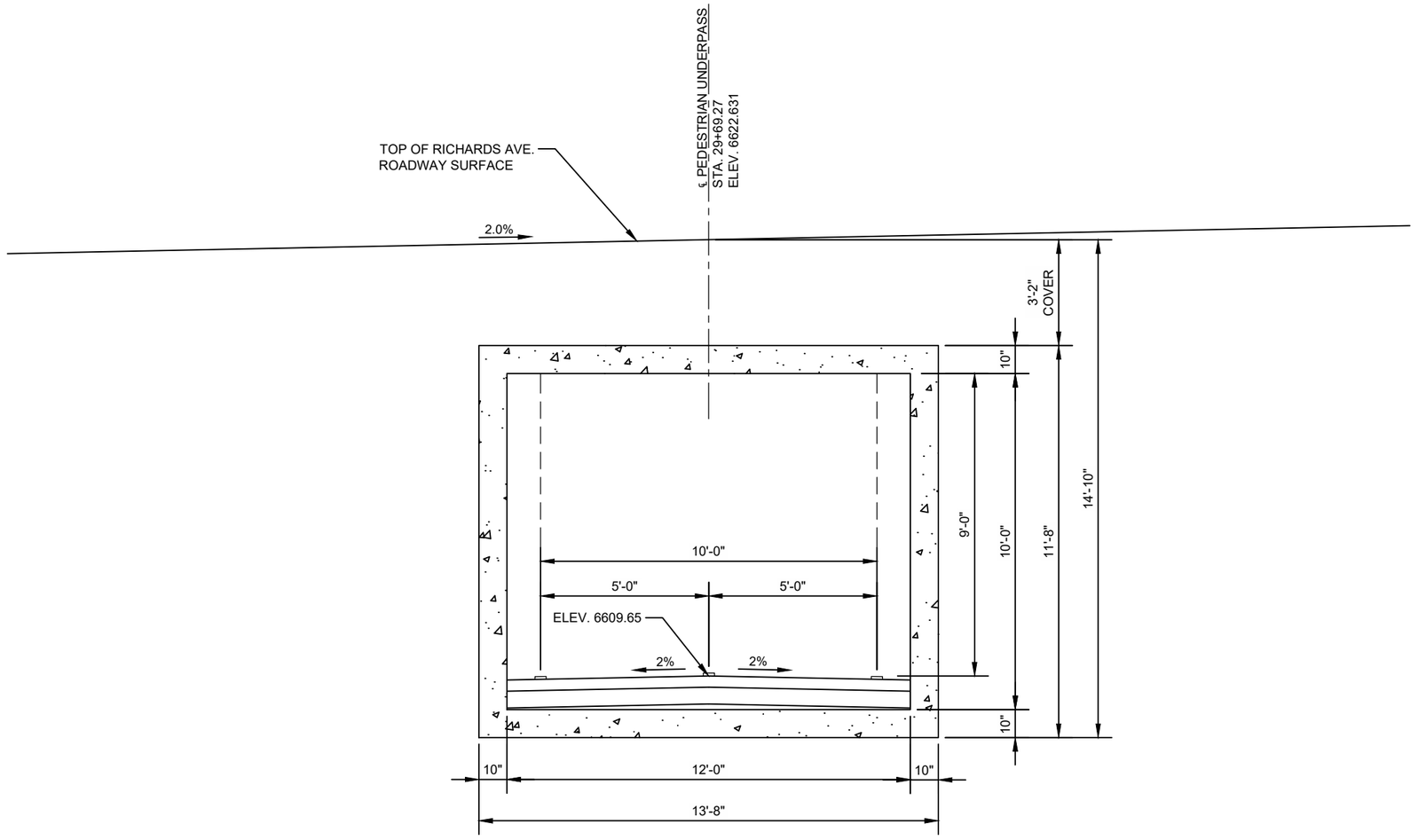
PROPOSED PEDESTRIAN UNDERPASS PROFILE

ALTERNATIVE 1 - STRUCTURAL STEEL PLATE
PROFILE TAKEN ALONG ℄ RICHARDS AVE.

CITY OF SANTA FE

NO.	DESCRIPTION	DATE	BY
1			
2			
3			
4			

RICHARDS AVE. OVER ADLC
PEDESTRIAN UNDERPASS
ALTERNATIVE 1 - STRUCTURAL STEEL PLATE



PROPOSED PEDESTRIAN UNDERPASS PROFILE

ALTERNATIVE 2 - REINFORCED CONCRETE BOX
PROFILE TAKEN ALONG ℄ RICHARDS AVE.

CITY OF SANTA FE

NO.	DESCRIPTION	DATE	BY
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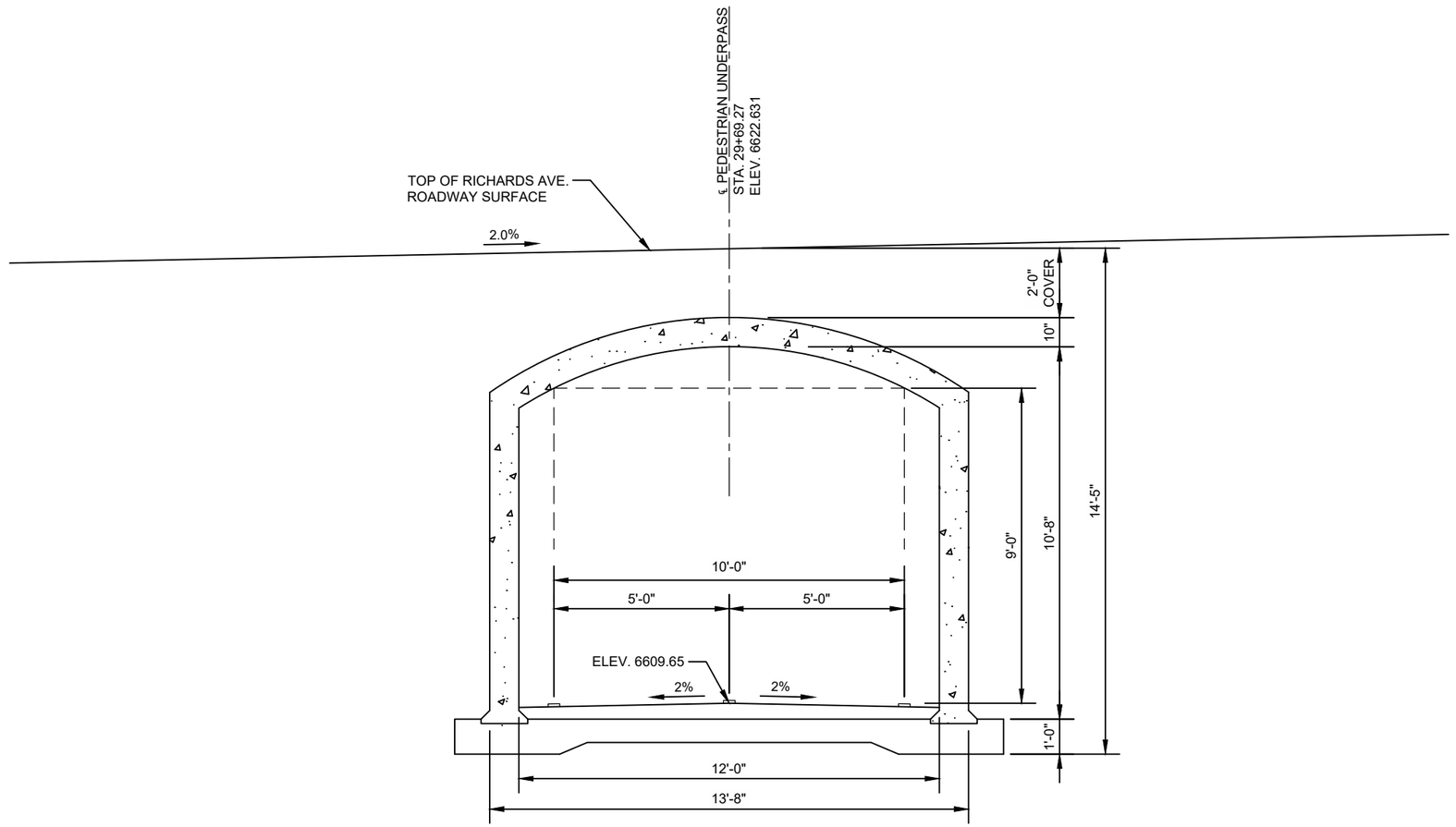
RICHARDS AVE. OVER ADLC
PEDESTRIAN UNDERPASS
ALTERNATIVE 2 - REINFORCED CONCRETE BOX



PROPOSED PEDESTRIAN UNDERPASS PROFILE

ALTERNATIVE 3 - PRECAST CONCRETE ARCH
PROFILE TAKEN ALONG ℄ RICHARDS AVE.

CITY OF SANTA FE

NO.	DESCRIPTION	DATE	BY
1			
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RICHARDS AVE. OVER ADLC
PEDESTRIAN UNDERPASS
ALTERNATIVE 3 - PRECAST CONCRETE ARCH

APPENDIX B
Cost Estimate for Each Structural Alternative

ADLC Pedestrian Underpass Study
Alternative 1 - Structural Steel Plate

Costs for Alternative 1

Cost for materials obtained from Contech Solutions:	$	114,097.53
Labor and installation costs (1.4 x materials cost):	$	159,736.54
Total Cost:	**$**	**273,834.07**

CONTECH ENGINEERED SOLUTIONS

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Fax: (513) 645-7993
www.ContechES.com

June 29, 2023

Gavin Macwilliam
Contech Engineered Solutions
gavin.macwilliam@conteches.com
(303) 715-8534
Denver, CO

Project: Santa Fe, NM; WSP Pedestrian Underpass Structure

As requested, the following is a Contech Multi Plate Underpass System ENGINEER'S COST ESTIMATE for the above referenced project. This ESTIMATE is intended for preliminary estimating purposes only and should **not** be interpreted as a final QUOTATION.

Contech will fabricate and deliver the following described Multi Plate Underpass Structure System components and appurtenances:

DESCRIPTION OF SUPPLIED MATERIALS:

- Contech Multi Plate Underpass Structure
- 70 L.F. of Multiplate Underpass Structure, 15'-9" Span x 15'-1" Rise, HL-93 Loading
- Gage Designation = 10 gage (HL-93 Live Loading with 2.0 (ft) minimum and 13 (ft) maximum cover)
- 2 Aluminum headwalls with anchors and connection hardware
- 4 Aluminum wingwalls with deadman anchors and connection hardware
- Additional engineering fees may need to be added to the estimate amount shown below.

***STRUCTURE ESTIMATE** - $114,097.53 Delivered
Total Weight of Material Supplied = 41,300 LBS

These costs do not include installation costs. As part of the construction process, the contractor is to perform the items listed below in accordance with the installation drawings:

- Unload materials at jobsite location
- Place foundations
- Assemble the plates
- Grout the structure legs into the foundation
- Excavate and backfill the structure

Please contact me at 303-715-8534 should you have any questions or need additional information. Thank you for your interest in the Contech Multi Plate Underpass Structure

Respectfully,

Gavin Macwilliam

**Estimate assumes production facility is within 1350 miles of the jobsite.*

This estimate was prepared using a number of assumptions for design loads, earth cover, freight and other considerations. Sales tax, if applicable is not included. Contact your local Contech representative to request a formal quotation.

ADLC Pedestrian Underpass Study
Alternative 2 - Reinforced Concrete Box

Costs for Alternative 2

12'-0"W X 9'-0"H X 70'-0"L BOX CULVERT					
ITEM NO.	**ITEM DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT COST**	**ITEM COST**
511030	STRUCTURAL CONCRETE, CLASS AA	C.Y.	271.93	$1,300.00	$353,509
540060	REINFORCING BARS GRADE 60	LB	55,246.24	$3.50	$193,362

Total Cost: $546,871

Materials (40% of Total Cost) $218,748
Labor (60% of Total Cost) $328,123

Quantities and cost were calculated using the NMDOT's CBC Quantity Calculations spreadsheet shown below.

Bottom Slab		32.28 CY	18,641.95 lbs
Cuttoff Wall	RT & LT	3.52 CY	497.26 lbs
	Subtotal	35.80 CY	19,139.21 lbs
Outer Walls		37.98 CY	3,689.86 lbs
End Walls and 4x Wall Trans.	RT & LT	1.68 CY	699.55 lbs
	Subtotal	39.66 CY	4,389.41 lbs
Top Slab		29.35 CY	18,641.95 lbs
Headwall	RT & LT	2.34 CY	441.81 lbs
	Subtotal	31.69 CY	19,083.76 lbs
Total Barrel Quantites		**107.15 CY**	**42,612.38 lbs**
MDI Opening			
Footings	RT & LT	83.80 CY	4,843.48 lbs
Wingwalls	RT & LT	35.16 CY	4,311.76 lbs
Apron	RT & LT	45.82 CY	3,478.62 lbs
	Subtotal	164.78 CY	12,633.86 lbs
Total Structure Quantities		**271.93 CY**	**55,246.24 lbs**
Cost of Concrete		$1,300.00/Cu Yrd	$353,509.00
Cost of Rebar		$3.50/Pound	$193,361.84
		Total Cost of CBC	$546,870.84

ADLC Pedestrian Underpass Study
Alternative 3 - Precast Concrete Arch

Costs for Alternative 3

Cost for materials obtained from Contech Solutions:	$ 336,700.00
Labor and installation costs (.85 x materials cost):	$ 286,195.00
Total Cost:	**$ 622,895.00**

CONTECH ENGINEERED SOLUTIONS

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June 29 2023

Gavin Macwilliam
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(303) 715-8534
Denver, CO

Project: Santa Fe, NM; WSP Pedestrian Con/Span B Series; Underpass Structure

The following is a CON/SPAN B-Series Bridge System ENGINEER'S COST ESTIMATE for B Series. This ESTIMATE is intended for preliminary estimating purposes only and should **not** be interpreted as a final QUOTATION. The information presented is based on the most current data made available to CONTECH.

CONTECH will fabricate and deliver the following described CON/SPAN B-Series Bridge components and appurtenances:

DESCRIPTION OF SUPPLIED MATERIALS:

- 70 L.F. of 14'-0" FT. span x 10'-0" FT. rise CON/SPAN B-Series Bridge Precast Concrete units (8 FT. Typical Lay Length)
- 2 precast headwalls
- 4 precast wingwalls with mounting hardware
- Joint sealant material
- Masonite shims
- Filter fabric and perforated drain tile
- On-site consultation during installation

ESTIMATE - $336,700.00 Delivered (F.O.B.)

ESTIMATED HEAVIEST CRANE PICK = 16.25 TONS

These costs do not include the foundation, or installation costs. As part of the construction process, the contractor is to perform the items listed below in accordance with the installation drawings:

- Excavate for the structure & foundations
- Construct cast-in-place foundations
- Unload and set structure utilizing crane
- Grout the unit legs and wingwalls into the keyway
- Apply all joint sealing material
- Backfill the structure

Please contact me at 303-715-8534 should you have any questions or need additional information. Thank you for your interest in the CON/SPAN B-Series Bridge System.

Respectfully,

Gavin Macwilliam

**Estimate assumes production facility is within 390 miles of the jobsite.*

This estimate was prepared using a number of assumptions for design loads, earth cover, freight and other considerations. Sales tax, if applicable is not included. Contact your local Contech representative to request a formal quotation.