

#### ITEM FOR ENVIRONMENTAL COMMISSION AGENDA

**COMMISSION MEETING** 

11/17/2021

DATE:

NAME & NUMBER OF PROJECT: Stillwater - Double Creek Phase 2 | SP-2021-0178C

**N**AME OF APPLICANT OR

Lance Rosenfield, Malone Wheeler Inc

**ORGANIZATION:** 

**LOCATION:** 10801 Brezza Lane, Austin, Texas, 78748

COUNCIL DISTRICT: District 5

**ENVIRONMENTAL REVIEW** 

STAFF:

Mel Fuechec, Environmental Review Specialist Senior, DSD - Land Use

Review, 512-974-3036, mel.fuechec@austintexas.gov

WATERSHED: Onion Creek, Suburban, Desired Development Zone

**REQUEST:** Variance request is as follows:

Request to vary from LDC 25-8-261 to allow development in the critical

water quality zone.

**STAFF** Staff recommends this variance, having determined the findings of fact to

**RECOMMENDATION:** have been met.

STAFF CONDITION: 1) Internal low-traffic pedestrian walkways throughout the site shall be

constructed with permeable pavers or porous pavement in accordance with the Environmental Criteria Manual, to decrease overall impervious cover and increase stormwater infiltration onsite and

baseflow in the stream channel.

2) The critical water quality zone will be crossed with a span bridge design instead of the normal box culvert. This will allow for light to

penetrate to the natural ground surface and for vegetation to grow

thus maintaining a more natural stream channel.



## Development Services Department Staff Recommendations Concerning Required Findings

Project Name: Stillwater-Double Creek Phase 2 | SP-2021-0178C | 10801

Brezza Ln

Ordinance Standard: Watershed Protection Ordinance

Variance Request: Request to vary from LDC 25-8-261 to allow development in the

critical water quality zone.

A. Land Use Commission variance determinations from Chapter 25-8-41 of the City Code:

1. The requirement will deprive the applicant of a privilege or the safety of property given to owners of other similarly situated property with approximately contemporaneous development;

<u>Yes</u> The lot is zoned Commercial-Mixed Use, CS-MU-CO as are most of the surrounding lots. A similar existing multifamily development built in 2017 is located directly North of the Stillwater – Double Creek Phase 2 project lot. Without a variance to LDC-25-8-261, the applicant is deprived a privilege to develop this property given to the owners of similarly situated property with approximately contemporaneous development.

#### 2. The variance:

a. Is not based on a condition caused by the method chosen by the applicant to develop the
property, unless the development method provides greater overall environmental
protection than is achievable without the variance;

Yes The variance is necessitated by fire department ingress/egress requirements set forth in the International Fire Code and Wildland-Urban Interface. Two points of emergency ingress and egress are required, and AFD will not accept both to be on Brezza Lane which is currently a dead-end street. There is no other option for a second point of ingress/egress.

- b. Is the minimum change necessary to avoid the deprivation of a privilege given to other property owners and to allow a reasonable use of the property; and
  - Yes As mentioned above, the variance is necessitated by the fire department requirement of having two points of emergency ingress/egress, which will be a bridge crossing and is considered a minimum deviation from the code.
- c. Does not create a significant probability of harmful environmental consequences; and

- Yes The proposed improvements related to the variance do not create a significant probability of harmful environmental consequences. The CWQZ will be crossed by a span bridge design instead of the normal box culvert. This will allow for light to penetrate to the natural ground surface and for vegetation to grow thus maintaining a more natural stream channel.
- 3. Development with the variance will result in water quality that is at least equal to the water quality achievable without the variance.
  - Yes The variance will not decrease the overall water quality associated with the development. The plans will be fully code compliant for water quality treatment. The impervious cover limit in suburban watersheds is 60%; this project is proposing impervious cover of approximately 44%. Internal, low-traffic pedestrian paths will be constructed with permeable material to increase stormwater infiltration and baseflow in the stream channel. Developed runoff will be treated by the proposed onsite water quality ponds.

The Land Use Commission may grant a variance from a requirement of Article 7, Division 1 ( *Critical Water Quality Zone Restrictions* ), after determining that:

- B. Additional Land Use Commission variance determinations for a requirement of Article 7, Division 1 (Critical Water Quality Zone Restrictions):
  - 1. The criteria for granting a variance in Subsection (A) are met;

**Yes** / No All criteria in Subsection A are met.

- 2. The requirement for which a variance is requested prevents a reasonable, economic use of the entire property;
  - Yes / No

    The proposed development is consistent with the applicable zoning and surrounding properties. Austin Fire Department requires two ingress/egress locations. Brezza Lane is not acceptable for both as it is a dead-end road with no immediate plans to be extended. The North end of the site is dense trees and is proposed to be preserved as parkland. No joint use access agreement with a neighboring property for ingress/egress through to I35 is feasible.
- 3. The variance is the minimum deviation from the code requirement necessary to allow a reasonable, economic use of the entire property.
  - <u>Yes</u> / No

    The variance is necessitated by the fire department requirement of having two points of emergency ingress/egress. The emergency ingress/egress proposed across the CWQZ will be a bridge crossing and is considered a minimum deviation from the code.

<u>Staff Determination:</u> Staff determines that the findings of fact have been met. Staff recommends the following conditions:

1) Internal low-traffic pedestrian walkways throughout the site shall be constructed with permeable pavers or porous pavement in accordance with the Environmental Criteria Manual,

- to decrease overall impervious cover and increase stormwater infiltration onsite and baseflow in the stream channel.
- 2) The critical water quality zone will be crossed with a span bridge design instead of the normal box culvert. This will allow for light to penetrate to the natural ground surface and for vegetation to grow thus maintaining a more natural stream channel.

Environmental Reviewer (DSD)	Mel Faechec Mel Fuechec	Date:10/21/2021
Environmental Review Manager (DSD)	Mike McDougal (print name)	Date: <u>11-4-2021</u>
Wetland Biologist / Hydrogeologist Reviewer (WPD)	(print name)	Date
Deputy Environmental Officer (WPD)	Liz Johnston (print name)	Date <u>11/05/2021</u>



# **ENVIRONMENTAL COMMISSION VARIANCE APPLICATION FORM**

PROJECT DESCRIPTION			
<b>Applicant Contact Inform</b>	mation		
7.ppca Contact III.C.			
Name of Applicant	Malone Wheeler Inc (Lance Rosenfield)		
Street Address	5113 SOUTHWEST PKWY, STE 260		
City State ZIP Code	AUSTIN TX 78735		
Work Phone	512-899-0601		
E-Mail Address	lancer@malonewheeler.com		
Variance Case Information			
Case Name	Stillwater - Double Creek Phase 2		
Case Number	SP-2021-0178C		
Address or Location	10801 BREZZA LN		
Environmental Reviewer Name	Mel Fuechec		
Environmental Resource Management Reviewer Name	Andrew Clamann		
Applicable Ordinance	§ 25-8-261 - CRITICAL WATER QUALITY ZONE DEVELOPMENT.		
Watershed Name	Onion Creek		
Watershed Classification	<ul><li>□ Urban X Suburban</li><li>□ Water Supply Suburban</li><li>□ Water Supply Rural</li><li>□ Barton Springs Zone</li></ul>		

trees, any other

characteristics of the

notable or

property)

outstanding

		I			
Edwards Aquifer Recharge Zone		☐ Barton Springs Segment X Not in Edwards Aquifer Zones	☐ Northern Edwards Segment		
Edwards Aquifer Contributing Zone		☐ Yes X No			
Distance to Nearest Classified Waterway		<100-FT			
Water and Waste Wa service to be provided		AUSTIN WATER			
Request		The variance request is as follows (Cite code references:			
Impervious cover		Existing	Proposed		
square footage:		0-SF	320,120-SF		
acreage:		0-AC	7.35-AC		
percentage:		0%	45.9%		
Provide general description of the property (slope					
range, elevation range, summary of vegetation / trees, summary of the geology, CWQZ, WQTZ, CEFs,	The subject site is 16.0-acres of undeveloped land that was previously cultivate for agricultural use. The land slopes at a relatively unform slope of approximat one percent (1%), from north to south, with an elevation range of 637 at the north end, down to 631 at the south end. Having been agricultural land, most the site is free of trees, except for an area about 2.3-acres in size, comprising or primarily cedar, mesquite, and hackberry trees.				
floodplain, heritage	Adjacent to the south property line, on the adjacent lot, is an uniform				

engineered earthen channel constructed in recent years, which is classified as a

minor waterway with an associated floodplain (not yet defined) and CWQZ. The

CWQZ extends onto the subject site.

Clearly indicate in what way the proposed project does not comply with current Code (include maps and exhibits) The proposed project includes a private drive crossing the engineered channel with a culvert system. The private drive makes the vehicular and emergency access connection to a public access easement ultimately connecting to the southbound I-35 access road. The crossing provides compliance with fire department criteria set forth in the Wildland-Urban Interface. Additionally, a water utility connection will be made within the CWQZ, adjacent to Brezza Lane.

## **FINDINGS OF FACT**

As required in LDC Section 25-8-41, in order to grant a variance, the Land Use Commission must make the following findings of fact:

Include an explanation with each applicable finding of fact.

Project: Stillwater – Double Creek Phase 2

Ordinance: § 25-8-261 - CRITICAL WATER QUALITY ZONE DEVELOPMENT

- A. Land Use Commission variance determinations from Chapter 25-8-41 of the City Code:
  - 1. The requirement will deprive the applicant of a privilege available to owners of similarly situated property with approximately contemporaneous development subject to similar code requirements.

Yes / No

The subject site is adjacent to the north of Double Creek Multifamily Phase 1, case number SP-2018-0403C, herein called "Phase 1." Phase 1 is approved and under construction. The existing engineered channel triggering the CWQZ runs within and along the north property line of Phase 1. The approved site plan includes buildings, parking, fire lane, and paved access within the CWQZ.

- 2. The variance:
  - a) Is not necessitated by the scale, layout, construction method, or other design decision made by the applicant, unless the design decision provides greater overall environmental protection than is achievable without the variance;

Yes / No

The variance is necessitated by fire department ingress/egress requirements set forth in the International Fire Code and Wildland-Urban Interface. Two points of emergency ingress and egress are required, and AFD will not accept both to be on the dead end that is Brezza Lane. There is no other option for a second point of ingress/egress.

b) Is the minimum deviation from the code requirement necessary to allow a reasonable use of the property;

#### Yes / No

As mentioned above, the variance is triggered by the fire department requirement of having two points of emergency ingress/egress, which will be a culvert crossing and is considered a minimum deviation from the code.

c) Does not create a significant probability of harmful environmental consequences.

#### <u>Yes</u> / <del>No</del>

The proposed improvements related to the variance do not create a significant probability of harmful environmental consequences.

3. Development with the variance will result in water quality that is at least equal to the water quality achievable without the variance.

#### Yes / No

The variance will not decrease the water quality treatment associated with the improvements. The plans will be fully code compliant for water quality treatment.

- B. Additional Land Use Commission variance determinations for a requirement of Section 25-8-422 (Water Quality Transition Zone), Section 25-8-452 (Water Quality Transition Zone), Article 7, Division 1 (Critical Water Quality Zone Restrictions), or Section 25-8-368 (Restrictions on Development Impacting Lake Austin, Lady Bird Lake, and Lake Walter E. Long):
  - 1. The criteria for granting a variance in Subsection (A) are met;

Yes / No [provide summary of justification for determination]

2. The requirement for which a variance is requested prevents a reasonable, economic use of the entire property;

Yes / No [provide summary of justification for determination]

The variance is the minimum deviation from the code requirement necessary to allow a 3. reasonable, economic use of the entire property.

[provide summary of justification for determination] Yes / No

<sup>\*\*</sup>Variance approval requires all above affirmative findings.



CIVIL ENGINEERING \* DEVELOPMENT CONSULTING \* PROJECT MANAGEMENT

August 31, 2021

Environmental Commission and Land Use Commission City of Austin 301 W 2<sup>nd</sup> Street Austin, Texas 78701

Re: Variance Request for Double Creek Multifamily Phase 2 (SP-2021-0178C)

Dear Commissioners,

In order to provide safe emergency access and with minimal disturbance, a variance to Land Development Code § 25-8-261, which limits development in a critical water quality zone, is hereby requested for Double Creek Multifamily Phase 2 site plan (case number SP-2021-0178C) and the related off-site water main improvements per SER-4280.

#### I. Site Summary

The Double Creek Multifamily Phase 2 project is located approximately 1,300-ft north of the intersection of E FM 1626 Rd and Old San Antonio Road, and is on Lot 3 of Double Creek Subdivision, Section 2, Austin, Travis County, and is in the City's full purpose jurisdiction. The site is zoned CS-MU-CO, per zoning case number C14-03-0053.

The project will consist of 371 multifamily units in three to four-story buildings, with surface and garage parking. Water quality ponds, driveway and fire access, utilities, grading, sidewalks, landscaping, approximately 5.5-acres of parkland dedication, and a culvert crossing will be included.

The site is 16.00 acres, with right-of-way frontage along Brezza Lane, for which road improvements are currently under construction (SP-2019-0161D). One point of driveway access will be on Brezza Lane. The site will also have access from I-35 via a private drive currently under construction with the site plan Double Creek Multifamily (SP-2018-0403C) and Private Roadway easement doc. no. 2018093713 and a proposed joint use access easement of similar alignment. The private drive will provide access the subject site via a proposed culvert crossing over an existing engineered channel.

The property is in the Onion Creek watershed, which is classified as a Suburban Watershed, and is outside of the Edwards Aquifer Recharge Zone. No portion of the site is within the 100-year floodplain, per FEMA map number 48453C0595k, dated January 22, 2020. The site is currently undeveloped with existing impervious cover of 0%, and the proposed impervious cover is less than 50% of the site area. The site currently surface drains from north to south and developed runoff will be treated with proposed water quality ponds and discharge into an existing engineered channel along the south boundary of the site.



During the completeness check review for Double Creek Phase 2, the City provided a comment report in June 2021 in which it was stated that a critical water quality zone is delineated about the engineered channel that was constructed in recent years (dates provided in the timeline in Part II below). Emergency and tenant vehicle access to the site is proposed with a culvert crossing over the channel. A portion of a proposed public water main as required by SER-4280 and a water meter will be within 50-ft of the centerline of the channel. These improvements would not explicitly be in compliance with LDC 25-8-261.

#### II. Variance

The basis for the variance request and substantiation for its approval is as follows:

- A. Under § 25-8-41 Land Use Commission Variances, the following apply
  - 1. Subsequent to the construction of the engineered channel, which was permitted in July 2015 under case number SP-2014-0103D "Stablewood Box Culvert," two site plans in the immediate vicinity were approved and permitted without identifying the artificially engineered channel as a critical water quality zone:
    - i. Double Creek Multifamily Phase 1 (SP-2018-0403C)
    - ii. Brezza Lane Improvements (SP-2019-0161D)

The two projects listed above include substantial improvements in the critical water quality zone, including apartment buildings, pavement for parking, utilities, and public roadway.

Therefore, under § 25-8-41 Land Use Commission Variances, the requirement will deprive the applicant of a privilege available to owners of other similarly situated property with approximately contemporaneous development subject to similar code requirements.

#### 2. The variance:

- (a) is not necessitated by the scale, layout, construction method, or other design decision made by the applicant, unless the design decision provides greater overall environmental protection than is achievable without the variance;
- (b) is the minimum deviation from the code requirement necessary to allow a reasonable use of the property; and
- (c) does not create a significant probability of harmful environmental consequences; and
- 3. The surface run-off from the improvements will be treated with city standard water quality facilities and is therefore equal to the water quality achievable without the variance.
- B. Additional Substantiation
  - 1. Austin Fire Department requires two points of ingress and egress. The applicant met with AFD on 3/17/2021 and has had follow up correspondence via email, from which the following statements were provided by AFD explaining the code related to the requirement:



Brezza Lane is a dead-end street and the project is located directly in a Wildland Urban Interface (WUI) area which is susceptible to wildfires making fire access and evacuation of the development critical during a structure fire or wildfire event.

#### 2015 IFC:

503.1.2 Additional access. The fire code official is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

2015 Wildland Urban Interface Code Amendments (these direct you back to the fire code).

402.1.1 Access. A subdivision described in City Code Chapter 25-4 (Subdivision) that is located within in a wildland-urban interface area and platted after the effective date of this code must provide fire apparatus access roads that comply with the Fire Code.

403.3 Fire Apparatus Access Road. When required, a fire apparatus access road must Comply with the Fire Code.

#### 2. Timeline of key dates described herein:

- July 2015: Stablewood Box Culvert project receives permit (SP-2014-0103D). Construction of the engineered channel begins. See the attached excerpt from the culvert plans, showing the location of the channel improvements.
- March 2019: Water SER-4280 is provided by Austin Water, which includes a water service connection and public improvements in the buffer area defined by the CWQZ. SER-4280 is included as an attachment.
- June 2019: Double Creek Multifamily Phase 1 receives permit (SP-2018-0403C) with meaningful improvements such as buildings and parking within the recently identified critical water quality zone. The Phase 1 Overall Site Plan is enclosed.
- August 2020: Brezza Lane Improvement Plans receive permit (SP-2019-0161D) with the portions of the public roadway now in the critical water quality zoned created by the human-constructed channel.
- June 2021: The CWQZ delineation is brought to our attention via the site plan completeness check comments.
- July 2021: Site Plan submitted formally to the City (SP-2021-0178C) with no buildings within the recently identified CWQZ.



 <u>August 2021</u>: Applicant revised the site plan to further minimize encroachment, specifically removing parking from the CWQZ; the only remaining improvements within the recently-identified CWQZ are the required bridge for emergency services and the water meter that is required by the Service Extension Request.

#### III. Conclusion

In response to the City's determination of the critical water quality zone, the applicant has modified the site plan to remove 27 parking spaces and shifted utilities away from the engineered channel to the fullest extent practical.

Taken in the aggregate, this variance request is logical and reasonable, and will create an outcome that meets the criteria set forth in § 25-8-41 Land Use Commission Variances, and will meet the requirements set forth by Austin Fire Department.

Sincerely,

Malone Wheeler, Inc.

Lance Rosenfield, P.E. Senior Project Manager

**Enclosures:** 

- 1. Completed Variance Application
- 2. Application Exhibit 1a Aerial Photo
- 3. Application Exhibit 1b Aerial Photo
- 4. Application Exhibit 2 Site Photos
- 5. Application Exhibit 3- Vicinity and Context Map
- 6. Application Exhibit 4 Topo and Tree List
- 7. Application Exhibit 5 Revised Site Plan
- 8. Application Exhibit 6 Aerial Photo with CWQZ
- 9. Application Exhibit 7 ERI by Terracon
- 10. Supplemental Exhibit 1 AFD Written Requirement (email)
- 11. Supplemental Exhibit 2 SER-4280 for Water
- 12. Supplemental Exhibit 3 Approved Site Plan "Phase 1"
- 13. Supplemental Exhibit 4 Approved Brezza Lane Excerpt Sheets

# **Property Profile**



# Legend

#### Jurisdiction

- FULL PURPOSE
- LIMITED PURPOSE
- EXTRATERRITORIAL JURISDICTI
- 2 MILE ETJ AGRICULTURAL AGR
- OTHER CITY LIMITS
- OTHER CITIES ETJ

#### Lot Line

#### Jurisdiction

- FULL PURPOSE
- LIMITED PURPOSE
- EXTRATERRITORIAL JURISDICTI
- 2 MILE ETJ AGRICULTURAL AGR
- OTHER CITY LIMITS
- OTHER CITIES ETJ
- Creek Centerlines
- Lakes

#### Notes

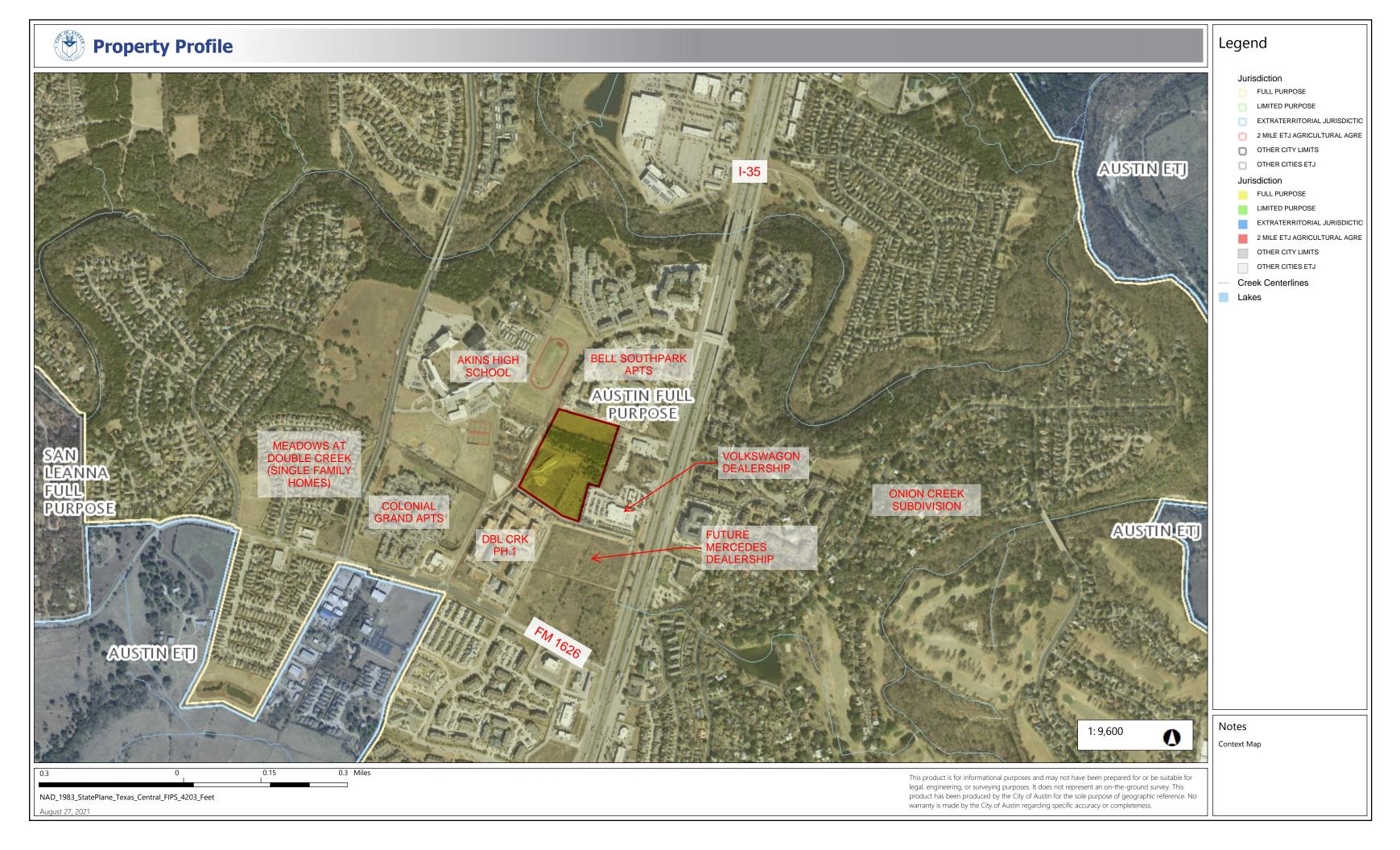
legal, engineering, or surveying purposes. It does not represent an on-the-ground survey. This product has been produced by the City of Austin for the sole purpose of geographic reference. No

warranty is made by the City of Austin regarding specific accuracy or completeness.

Aerial Image of Undeveloped Site for "Double Creek Phase 2"

NAD\_1983\_StatePlane\_Texas\_Central\_FIPS\_4203\_Feet

August 27, 2021



# **Property Profile**

NAD\_1983\_StatePlane\_Texas\_Central\_FIPS\_4203\_Feet

August 27, 2021



# Legend

#### Jurisdiction

- FULL PURPOSE
- LIMITED PURPOSE
- EXTRATERRITORIAL JURISDICTI
- 2 MILE ETJ AGRICULTURAL AGR
- OTHER CITY LIMITS
- OTHER CITIES ETJ

#### Lot Line

#### Jurisdiction

- FULL PURPOSE
- LIMITED PURPOSE
- EXTRATERRITORIAL JURISDICTI
- 2 MILE ETJ AGRICULTURAL AGR
- OTHER CITY LIMITS
- OTHER CITIES ETJ
- OTHER CITIES ETS

#### Creek Buffers/Waterway Setba

- Critical Water Quality Zone
- Water Quality Transition Zone
- Creek Centerlines
- Lakes

**VARIANCE EXHIBIT** 

AERIAL PHOTO WITH CWQZ

#### Notes

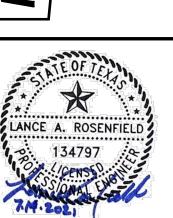
legal, engineering, or surveying purposes. It does not represent an on-the-ground survey. This product has been produced by the City of Austin for the sole purpose of geographic reference. No

warranty is made by the City of Austin regarding specific accuracy or completeness.

Aerial Image of "Double Creek Phase 2" Site and Critical Water Quality Zone



CONDITIONS



DESIGN BY: CHECKED BY: ? APPROVED BY: ?

SHEET 06

TREE LIST 13" HACKBERRY 93 TREE NO. DESCRIPTION 94 12" HACKBERRY 95 13" HACKBERRY 97 9" HACKBERRY 17" MULTI-STEM CEDAR-10",6",4",4" 98 99 13" MULTI-STEM CEDAR-8",6",4" 100 17" MULTI-STEM CEDAR-11",6",4" 101 33" MULTI-STEM CEDAR-10",8",8",6"(X3),4"(X3) 102 22" MULTI-STEM CEDAR-10",6",6",4"(X3) 103 21" MULTI-STEM CEDAR-10",10",4"(X3) 104 19" MULTI-STEM CEDAR-10",6",4"(X3) 24" MULTI-STEM CEDAR-9",6",5"(X4),4" 105 106 9" CEDAR 107 13" CEDAR 108 26" MULTI-STEM CEDAR-12",9",6",6",4",4" 109 17" MULTI-STEM CEDAR-11",4"(X3) 110 8" CEDAR 111 15" MULTI-STEM CEDAR-9",6",6" 112 18" MULTI-STEM CEDAR-12",4"(X3) 113 11" TWIN MESQUITE-8",6" 114 14" MULTI-STEM MESQUITE-8",6",6" 116 21" MULTI-STEM CEDAR-10",6",4"(X4) *117* 32" MULTI-STEM CEDAR-9",6"(X5),4"(X4) 118 23" MULTI-STEM CEDAR-9",8",6"(X3) TREES 45-58, 60 & 62 119 20" MULTI-STEM CEDAR-8",8",4"(X4) 32" MULTI-STEM CEDAR-9",9",6",6",4"(X6) TO BE REMOVED PER 120 25" MULTI-STEM CEDAR-10",6",4"(6) 121 (SP-2019-0161D) 122 26" MULTI-STEM CEDAR-8",6",6",4"(X6) 123 18" MULTI-STEM CEDAR-8",6",6",4",4" 124 10" HACKBERRY 125 9" HACKBERRY 21" MULTI-STEM PECAN-12",7",6",6" 16" TWIN MESQUITE-11",10" 126 34" MULTI-STEM CEDAR-12",7",6"(X3),4"(X5) 127 18" MULTI-STEM CEDAR-11",4"(X3),3" 128 13" HACKBERRY 129 11" TWIN WOOLY BUCKTHORN-8",6" 21" MULTI-STEM CEDAR-10",6",5",5",3",3" 130 23" MULTI-STEM CEDAR-9",6",5",5",4"(X3) 62 17" CEDAR 132 22" MULTI-STEM CEDAR-11",6",4"(X4) 12" TWIN CEDAR-10",4" 63 133 9" MESQUITE 64 8" CEDAR 27" MULTI-STEM-CEDAR-10",6",5",4"(X6) 134 22" MULTI-STEM CEDAR-9",6"(X3),4",4" 135 28" MULTI-STEM CEDAR-9",6"(X3),4"(X5) 14" TWIN HACKBERRY-11",6" 136 8" CEDAR *67* 30" MULTI-STEM CEDAR-12",10",8",6",4"(X3) *137* 24" MULTI-STEM CEDAR-8",8",6",6",4"(X3) 68 29" MULTI-STEM CEDAR-12",6"(X3),4"(X4) 138 33" MULTI-STEM CEDAR-9",9",8",6"(X4),4",4" 13" TWIN MESQUITE-9",9" 69 139 24" MULTI-STEM CEDAR-10",6",6",4"(X4) 70 19" MULTI-STEM CEDAR-11",7",6",4" 140 18" MULTI-STEM CEDAR-12",4"(X3) 71 *15" CEDAR* 11" CEDAR 141 *72* 22" MULTI-STEM CEDAR-9",7",6",5",4",4" 142 9" CEDAR *73 16" CEDAR* 143 15" MULTI-STEM CEDAR-10",6",4" 74 *11" CEDAR* 144 26" MULTI-STEM CEDAR-12",6",6",4"(X4) *75* 15" MULTI-STEM CEDAR-9",4",4",3" 145 30" MULTI-STEM CEDAR-9",6"(X3),4"(X6) 35" MULTI-STEM CEDAR-12",7",7",6",4"(X6) 146 24" MULTI-STEM CEDAR-8",4"(X8) 147 22" MULTI-STEM CEDAR-8",8",6",6",4",4" *78* 148 12" TWIN MESQUITE-9",6" 18" MULTI-STEM CEDAR-8",6",6",4",4" *79* 149 *11" CEDAR* 80 18" MULTI-STEM CEDAR-10",7",6",4" 150 151 22" MULTI-STEM CEDAR-12",8"4"(X3) 27" MULTI-STEM CEDAR-8",8",7",6",5",4"(X3) 81 20" MULTI-STEM CEDAR-11",6",4"(X3) 22" MULTI-STEM CEDAR-10",8",6",5",5" *82 152* 12" TWIN MESQUITE-8",8" *83* 27" MULTI-STEM CEDAR-9",8",8",6",6",4",4" *153* 12" CEDAR 12" HACKBERRY 84 154 10" HACKBERRY 17" TWIN CEDAR-12",9" *85 155* 9" HACKBERRY 10" CHINABERRY 156 20" MULTI-STEM MESQUITE-12",10",6" 13" MULTI-STEM MESQUITE-8",6",4" *157* 8" CHINABERRY 14" MULTI-STEM CEDAR-10",4",4" 158 18" MULTI-STEM CEDAR-9",7",4"(X3) 23" MULTI-STEM CEDAR-9",5"(X3),4"(X3) 89 159 16" TWIN CEDAR-13",6" 27" MULTI-STEM CEDAR-9",8",6",6",4"(X5) 90

32" MULTI-STEM CEDAR-10",8",6",6",4"(X6)

12" HACKBERRY

91

DESCRIPTION

TREE NO.

160 —

NOTE: SURVEYOR MAKES NO GUARANTEE AS TO THE TYPE OF TREES LISTED ABOVE. IF CRITICAL, A CERTIFIED ARBORIST SHOULD VERIFY THIS INFORMATION.

> PHASI 78748 LTIFAMIL' AUSTIN, T REZ 10801

LANCE A. ROSENFIELD 134797

DESIGN BY: ? CHECKED BY: ? APPROVED BY: ? DATE:

SHEET 07

OF 58

#### **GENERAL NOTES:**

- 1. THIS BRIDGE HAS BEEN DESIGNED FOR GENERAL SITE CONDITIONS. THE PROJECT ENGINEER SHALL BE RESPONSIBLE FOR THE STRUCTURE'S SUITABILITY TO THE EXISTING SITE CONDITIONS AND FOR THE HYDRAULIC EVALUATION -- INCLUDING SCOUR AND CONFIRMATION OF SOIL CONDITIONS.
- 2. PRIOR TO CONSTRUCTION, CONTRACTOR MUST VERIFY ALL ELEVATIONS SHOWNTHROUGH THE ENGINEER.
- 3. ONLY CONTECH ENGINEERED SOLUTIONS LLC, THE CON/SPAN® APPROVED PRECASTER IN TEXAS MAY PROVIDE THE STRUCTURE DESIGNED IN ACCORDANCE WITH THESE PLANS.
- 4. THE USE OF ANOTHER PRECAST STRUCTURE WITH THE DESIGN ASSUMPTIONS USED FOR THE CON/SPAN® STRUCTURE MAY LEAD TO SERIOUS DESIGN ERRORS. USE OFANY OTHER PRECAST STRUCTURE WITH THIS DESIGN AND DRAWINGS VOIDS ANY CERTIFICATION OF THIS DESIGN AND WARRANTY. CONTECH Engineered Solutions, LLC ASSUMES NO LIABILITY FOR DESIGN OF ANYALTERNATE OR SIMILAR TYPE STRUCTURES.
- 5. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT DRAWINGS AND CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF TEXAS, EMPLOYED BY THE PRECAST CONCRETE BRIDGE SUPPLIER, ARE SUBMITTED TO THE ENGINEER 2 WEEKS PRIOR TO THE BID DATE FOR REVIEW
- 6. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE ALTERNATE DESIGN DOES NOT REDUCE THE HYDRAULIC OPENING OF THE STRUCTURE AS SHOWN ON THE DRAWINGS. AT A MINIMUM THE ALTERNATE STRUCTURE MUST PROVIDE THE SAME OR LARGER SPAN AND RISE AS THE STRUCTURE SHOWN ON THE
- 7. THE PRECAST ARCH SUPPLIER MUST ATTEND THE PRE-BID MEETING, IF ONE IS HELD.
- 8. SUPPLIER OF PROPOSED ALTERNATES TO A CON/SPAN® BRIDGE SYSTEM MUST SUBMIT AT LEAST TWO (2) INDEPENDENTLY VERIFIED FULL SCALE LOAD TESTS THAT CONFIRM THE PROPOSED DESIGN METHODOLOGY OF THE THREE SIDED/ARCH STRUCTURE(S). THE PROPOSED ALTERNATE, UPON SATISFACTORY CONFIRMATION OF DESIGN METHODOLOGY, MAY BE CONSIDERED AN ACCEPTABLE ALTERNATE.
- 9. PROPOSED ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE PRECAST CONCRETE BRIDGE STRUCTURES ARE PROVIDED BY A SUPPLIER THAT HAS A MINIMUM OF TWO (2) REGISTERED PROFESSIONAL ENGINEERS ON STAFF THAT ARE DEDICATED TO THE DESIGN OF THESE TYPES OF STRUCTURES. SUPPLIER MUST PROVIDE THESE NAMES, P.E. LICENSE NUMBERS AND DATES OF HIRE AT TIME OF ALTERNATE SUBMITTAL.

#### DESIGN DATA

#### **DESIGN LOADING:**

BRIDGE UNITS: HL-93

HEADWALLS: EARTH PRESSURE ONLY

WINGWALLS: EARTH PRESSURE ONLY

DESIGN FILL HEIGHT: 1'-0" TO 4'-0"

FROM TOP OF CROWN TO TOP OF PAVEMENT.

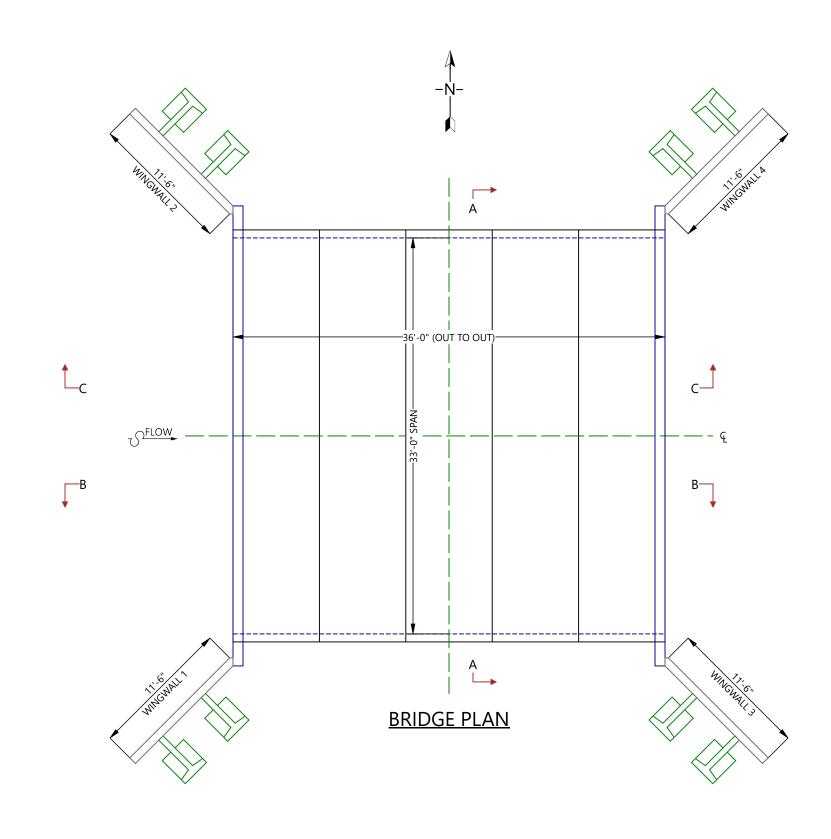
DESIGN METHOD: LOAD RESISTANCE FACTOR DESIGN PER AASHTO LRFD SPECIFICATION ASSUMED NOMINAL

BEARING RESISTANCE: 0 PSF

ASSUMED FACTORED BEARING RESISTANCE: 0 PSF

\*AT THE TIME OF DESIGN, A GEOTECHNICAL REPORT FOR THE PROJECT SITE WAS NOT AVAILABLE. IT IS THE PROJECT ENGINEER'S, OWNER'S AND/OR THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THE ACTUAL SITE CONDITIONS AT THE TIME OF CONSTRUCTION ARE CONSISTENT WITH THE ASSUMED ALLOWABLE SOIL BEARING PRESSURE WITH A GEOTECHNICAL INVESTIGATION FROM A QUALIFIED GEOTECHNICAL ENGINEER.

PRECAST UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CON/SPAN® SPECIFICATIONS. CONCRETE FOR FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSF. REINFORCING STEEL FOR FOOTINGS SHALL CONFORM TO ASTM A615 OR A996-GRADE 60.



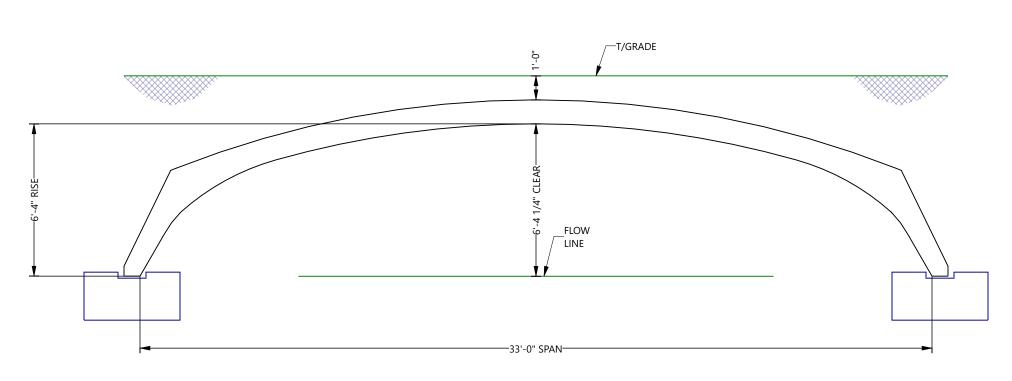
**PRELIMINARY** NOT FOR CONSTRUCTION

**C ENGINEERED SOLUTIONS** 9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069

PROPOSAL 800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN O SERIES O633 - 33'-0" X 6'-4" MALONE WHEELER CHANNEL CROSSING

Project No.:	Seq No.:		Date:	
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# **CROSS SECTION A-A**

Approximate Area: 163 sq. ft. used, 163 sq. ft. total

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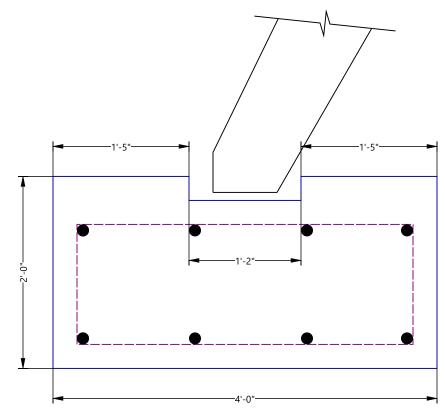
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REVISION DESCRIPTION

PROPOSAL DRAWING

CONSPAN O SERIES O633 - 33'-0" X 6'-4" MALONE WHEELER CHANNEL CROSSING



TYPICAL FOOTING DETAIL

### NOTES

- FOOTING DIMENSIONS AND DETAILS SHOWN ARE CONCEPTUAL ONLY
- FINAL DIMENSIONS & DETAILS TO BE FURNISHED BY THE PROJECT ENGINEERS
- FOUNDATION REINFORCING TO BE DETERMINED

PRELIMINARY NOT FOR CONSTRUCTION

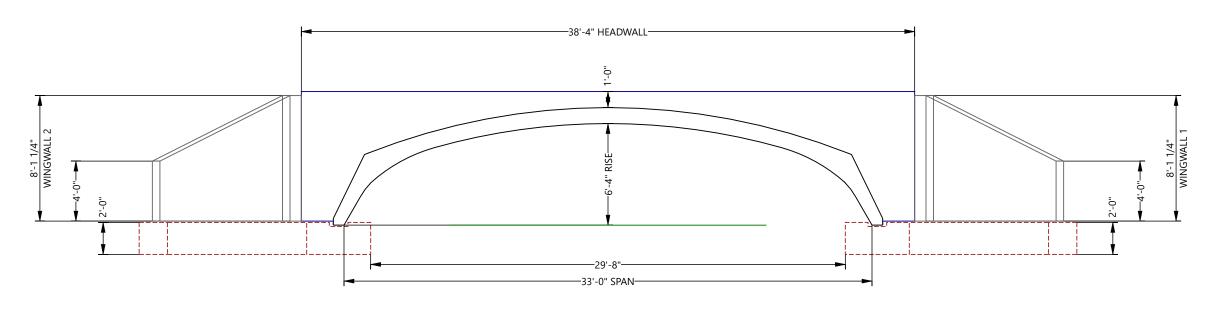
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PROPOSAL DRAWING

CONSPAN O SERIES O633 - 33'-0" X 6'-4" MALONE WHEELER CHANNEL CROSSING

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**INLET END ELEVATION** 

PROPOSAL DRAWING

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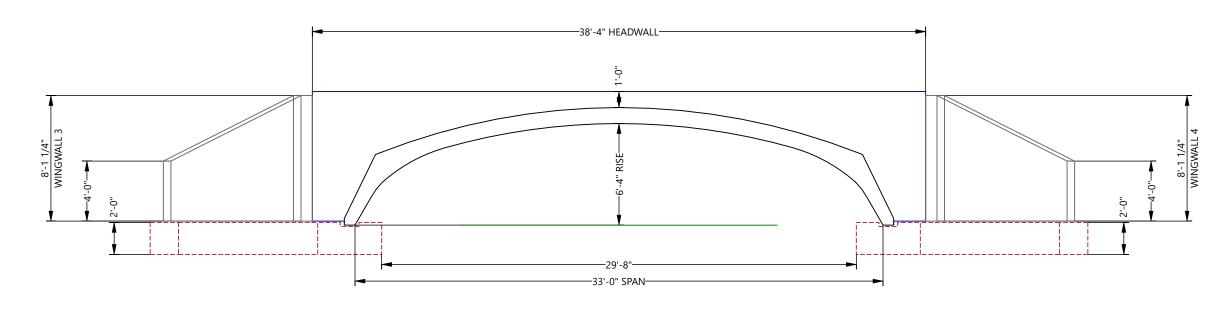
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work progresses, these discrepancies must be reported to ITECH immediately for re-evaluation of the design. CONTECH tepts no liability for designs based on missing, incomplete or		
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CONSPAN O SERIES O633 - 33'-0" X 6'-4"
MALONE WHEELER CHANNEL CROSSING
AUSTIN, TEXAS

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# **OUTLET END ELEVATION**

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CONSPAN O SERIES O633 - 33'-0" X 6'-4" MALONE WHEELER CHANNEL CROSSING

AUSTIN, TEXAS

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 Date:

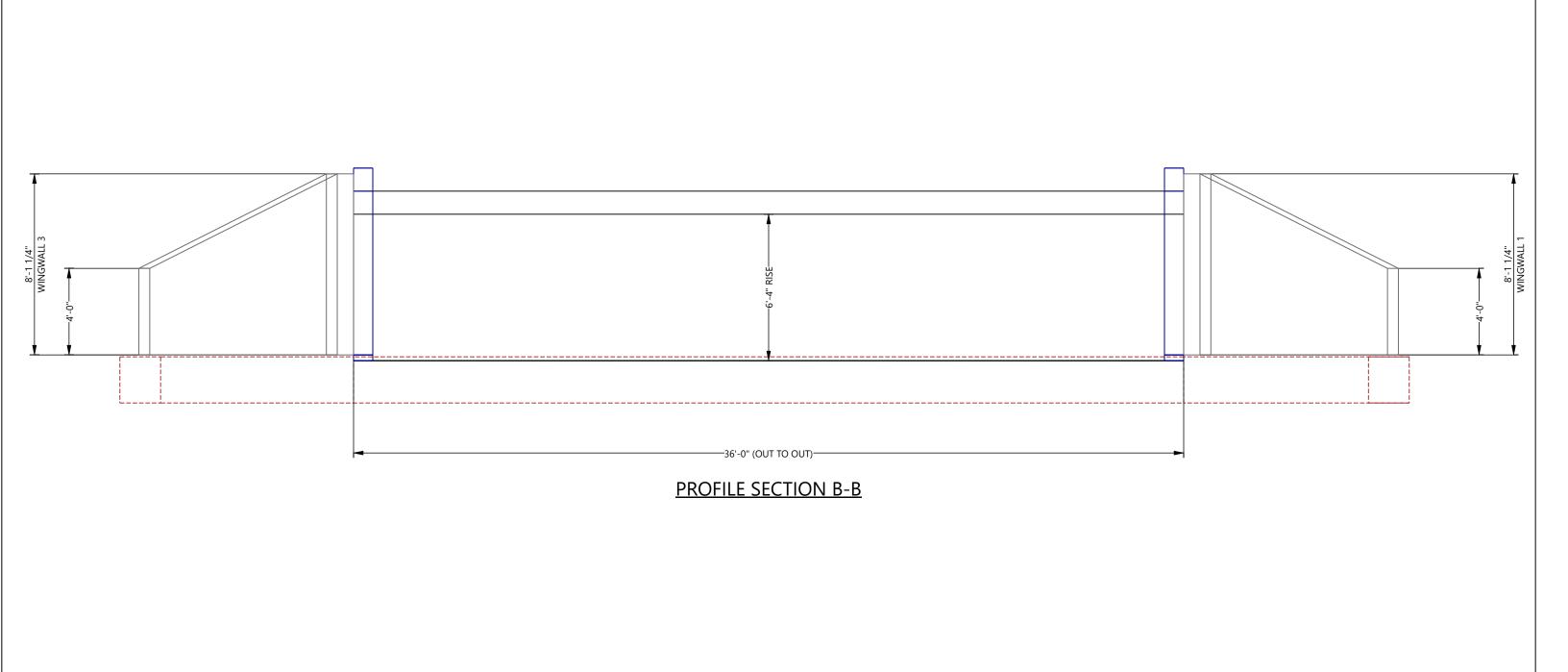
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PROPOSAL DRAWING



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Seq No.: Date: 9/9/2021

6 OF 10

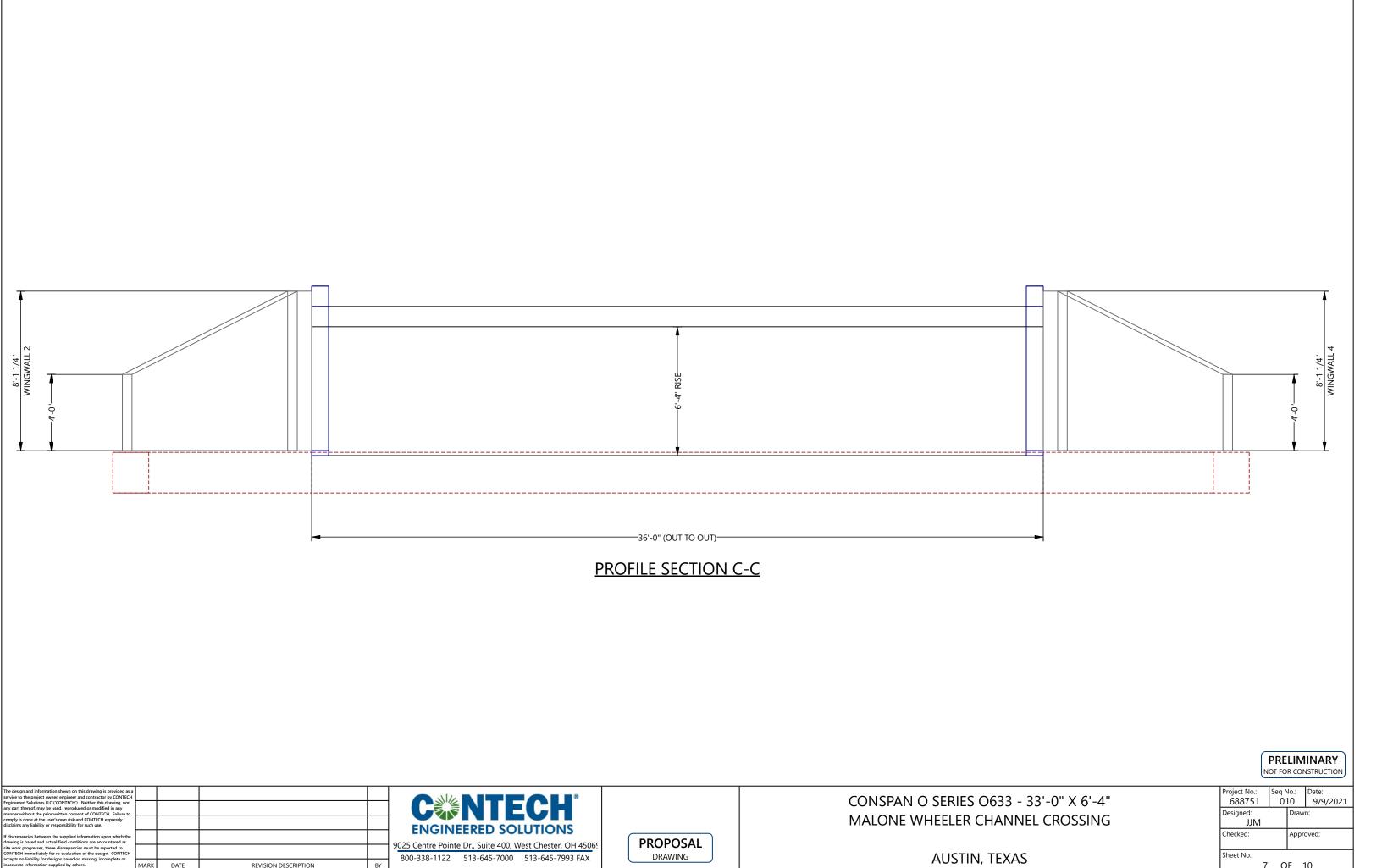
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CONSPAN O SERIES O633 - 33'-0" X 6'-4" MALONE WHEELER CHANNEL CROSSING



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7 OF 10

### LFD new

## SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® O-SERIES BRIDGE SYSTEMS

- DESCRIPTION
   1.1. TYPE THIS WORK SHALL CONSIST OF FURNISHING AND
   CONCERNISHING OSERIES BRIDGE SYSTEM CONSTRUCTING A CON/SPAN® O-SERIES BRIDGE SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES. GRADES DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER. IN SITUATIONS WHERE TWO OR MORE SPECIFICATIONS APPLY TO THIS WORK, THE MOST
- STRINGENT REQUIREMENTS SHALL GOVERN.

  1.2. DESIGNATION PRECAST REINFORCED CONCRETE CON/SPAN® O-SERIES BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY SPAN AND RISE.
  PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE, PRECAST REINFORCED CONCRETE EXPRESS™ FOUNDATION UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT AND

 DESIGN
 2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN
 TOTAL PARTY SPECIFICATIONS FOR ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" 17TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002. A MINIMUM OF ONE FOOT OF COVER ABOVE THE CROWN OF THE BRIDGE UNITS IS REQUIRED IN THE INSTALLED CONDITION. (UNLESS NOTED OTHERWISE ON THE SHOP DRAWINGS AND DESIGNED ACCORDINGLY.)

- 3. MATERIALS
  3.1. CONCRETE THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER, AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR- ENTRAINING ADMIXTURE SHALL CONFORM TO AASHTO M154. THE MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP
  - 3.1.1. PORTLAND CEMENT SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150-TYPE I, TYPE II, OR TYPE III CEMENT.
  - 3.1.2. COARSE AGGREGATE SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
  - 3.1.3. WATER REDUCING ADMIXTURE THE MANUFACTURER MAY SUBMIT, FOR APPROVAL BY THE ENGINEER, A WATER-REDUCING ADMIXTURE FOR THE PURPOSE OF INCREASING WORKABILITY AND REDUCING THE WATER REQUIREMENT FOR THE CONCRETE.
  - 3.1.4. CALCIUM CHLORIDE THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
  - 3.1.5 MIXTURE THE AGGREGATES, CEMENT AND WATER SHALL BE PROPORTIONED AND MIXED IN A BATCH MIXER TO PRODUCE A HOMOGENEOUS CONCRETE MEETING THE STRENGTH REQUIREMENTS OF THIS SPECIFICATION. THE PROPORTION OF PORTLAND CEMENT IN THE MIXTURE SHALL NOT BE LESS THAN 564 POUNDS (6 SACKS) PER CUBIC YARD OF CONCRETE.
    3.2. STEEL REINFORCEMENT

- 3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60.000 PSI UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
  3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS
- SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE
- 3.2.3 REINFORCEMENT SHALL CONSIST OF WELDED WIRE REINFORCING CONFORMING TO ASTM SPECIFICATION A 1064, OR DEFORMED BILLET STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS

- 3.3.1.BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC
- COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
  3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
- 3.3.3.INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE
  ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700 AND
  SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
- 3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800)
- 3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
  3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL
- BE AISI TYPE 304 STAINLESS STEEL, EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON SUPERIOR

- 745-3700, COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL.
  WASHERS USED IN HEADWALL CONNECTIONS SHALL BE
  EITHER AISI TYPE 304 STAINLESS STEEL PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
- 3.3.7. MECHANICAL SPLICES OF REINFORCING BARS SHALL BE MADE USING THE DOWEL BAR SPLICER SYSTEM AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES MIAMISBURG OHIO (800) 745-3700 AND SHALL CONSIST OF THE DOWEL BAR SPLICER (DB-SAE) AND DOWEL-IN (DI).
- 4. MANUFACTURE OF PRECAST ELEMENTS SUBJECT TO THE PROVISIONS OF SECTION 5. BELOW. THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE
- MANUFACTURER:
  4.1. FORMS THE FORMS USED IN MANUFACTURE SHALL BE
  SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE
  REQUIRED PRECAST ELEMENT DIMENSIONS WITHIN THE
  PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. ALL CASTING SURFACES SHALL BE OF A SMOOTH MATERIAL

4.2. PLACEMENT OF REINFORCEMENT

- 4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1½"
  MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS). SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS, WHEN NECESSARY WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALI CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE BRIDGE UNIT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW. THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL BE NOT MORE THAN 3" AND NOT
- LESS THAN 1½" FROM THE ENDS OF THE BRIDGE UNIT.
  4.2.2.BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL
  REINFORCING STEEL FOR THE CORNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER.
- 4.2.3.PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC, OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW
- 4.2.4.PLACEMENT OF REINFORCMENT FOR PRECAST FOUNDATION UNITS - THE COVER OF CONCRETE OVER THE BOTTOM REINFORCEMENT SHALL BE 3 INCHES MINIMUM. THE COVER OF CONCRETE FOR ALL OTHER REINFORCEMENT SHALL BE 2 INCHES MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 2 INCHES NOR MORE THAN 3 INCHES. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC OR A SINGLE LAYER OF DEFOREMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FARRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.

4.3. LAPS, WELDS, SPACING

4.3.1.LAPS, WELDS, AND SPACING FOR PRECAST BRIDGE UNITS TENSION SPLICES IN THE CIRCUMFERENTIAL REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE

- OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.2 AND 5.11.6.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.1 AND 5.11.6.1. THE OVERLAP OF WELDED WIRE FABRIC SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL WIRES OF EACH FABRIC SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.1 FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF 1'-0" FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS. THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
- 4.3.2.LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS HEADWALLS AND FOUNDATIONS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.2 AND 5.11.6.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.1 AND 5.11.6.1. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.1. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".

  4.4. CURING - THE PRECAST CONCRETE ELEMENTS SHALL BE CURED
- FOR A SUFFICIENT LENGTH OF TIME SO THAT THE CONCRETE WILL DEVELOP THE SPECIFIED COMPRESSIVE STRENGTH IN 28 DAYS OR LESS. ANY ONE OF THE FOLLOWING METHODS OF CURING OR COMBINATIONS THERE OF SHALL BE USED: 4.4.1.STEAM CURING - THE PRECAST ELEMENTS MAY BE

LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL

MAINTAIN A MOIST ATMOSPHERE. 4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS

4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 MAY BE APPLIED AND SHALL BE LEFT INTACT UNTIL THE REQUIRED CONCRETE COMPRESSIVE STRENGTH IS ATTAINED. THE CONCRETE TEMPERATURE AT THE TIME OF APPLICATION SHALL BE WITHIN +/- 10 DEGREES F OF THE ATMOSPHERIC TEMPERATURE. ALL SURFACES SHALL BE KEPT MOIST PRIOR TO THE APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.

- 4.5. STORAGE, HANDLING & DELIVERY
  4.5.1.STORAGE PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR DAMAGE. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM OF 2500 PSI, AND THEY SHALL NOT BE STORED IN AN UPRIGHT POSITION
- 4.5.2. HANDLING HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND SETTING, SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
- 4.5.3. DELIVERY PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED, STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.

  4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE
- ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.6.1 OR 4.6.2
- 4.6.1.CERTIFICATION THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED BY THIS SPECIFICATION.

4.6.2.QUALIFICATIONS, TESTING AND INSPECTION
4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A
MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT TESTING AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL ISSUE A REPORT, CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH

INDUSTRY STANDARDS.

4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN INDICATED, TESTS SHALL BE PERFORMED AS

INDICATED IN SECTION 6 OF THESE SPECIFICATIONS

4.6.2.2.1. AIR CONTENT: C231 OR C173 4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C497 4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® ENGINEERED SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST

4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH®

ENGINEERED SOLUTIONS AS REQUIRED.

PERMISSIBLE VARIATIONS
5.1. BRIDGE UNITS

5.1.1.INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS

NOR MORE THAN 1½" WHICHEVER IS LESS.
5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL
THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ¼". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION

5.1.3.LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.

5.1.4.LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT. 5.1.5.POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION

IN POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF THE JOINTS

5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURER'S SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT

5.2. WINGWALLS & HEADWALLS
5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN  $\slash\hspace{-0.4em}Z''$ . 5.2.2.LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN

IN THE DESIGN BY MORE THAN ½".

5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE  $\pm \frac{1}{2}$ ". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT

BE LESS THAN 1½". 5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION. FOR THAT TYPE OF REINFORCING, STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR

REJECTION

5.3.1 WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY

FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".

5.3.2. LENGTH/ HEIGHT/WIDTH OF FOUNDATION SECTIONS - THE LENGTH, HEIGHT AND WIDTH OF THE FOUNDATION UNITS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½". 5.3.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION

IN THE POSITION OF THE REINFORCEMENT SHALL BE  $\pm \frac{1}{N}$ . IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½". 5.3.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN

DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING, STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT, EACH ELEMENT SHALL BE

AND ACCEPTANCE. 6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH IN

ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 6.1.3. ACCEPTABILITY OF CYLINDER TESTS - WHEN THE AVERAGE COMPRESSIVE STRENGTH OF ALL CYLINDERS TESTED IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE

STRENGTH, AND NOT MORE THAN 10% OF THE CYLINDERS TESTED HAVE A COMPRESSIVE STRENGTH LESS THAN THE DESIGN CONCRETE STRENGTH, AND NO CYLINDER TESTED HAS A COMPRESSIVE STRENGTH LESS THAN 80% OF THE DESIGN COMPRESSIVE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA. THE ACCEPTABILITY OF THE ELEMENT MAY BE DETERMINED AS DESCRIBED IN SECTION

6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN THE AVERAGE CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH. WHEN THE COMPRESSIVE STRENGTH OF A CORE TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN MAY BE RE-CORED. WHEN THE COMPRESSIVE STRENGTH OF THE RE-CORE IS FOUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THAT

BRIDGE ELEMENT IS ACCEPTABLE.
6.1.4.1. WHEN THE COMPRESSIVE STRENGTH OF ANY
RECORE IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST FLEMENT FROM WHICH THAT CORE WAS TAKEN SHALL BE REJECTED.
6.1.4.2. PLUGGING CORE HOLES - THE CORE HOLES SHALI

BE PLUGGED AND SEALED BY THE MANUFACTURER IN A MANNER SUCH THAT THE ELEMENTS WILL MEET ALL OF THE TEST REQUIREMENTS OF THIS SPECIFICATION. PRECAST ELEMENTS SO SEALED SHALL BE CONSIDERED SATISFACTORY FOR USE.

6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST

6.2. INSPECTION - THE QUALITY OF MATERIALS. THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

JOINTS
THE BRIDGE UNITS SHALL BE PRODUCED WITH FLAT BUTT ENDS.
THE ENDS OF THE BRIDGE UNITS SHALL BE SUCH THAT WHEN THE
THE ENDS OF THE BRIDGE UNITS SHALL BE SUCH THAT WHEN THE SECTIONS ARE LAID TOGETHER THEY WILL MAKE A CONTINUOUS LINE WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED 3/21

AUJACIENT PRECAST ONT'S SHALL NOT EXCEED %."

WORKMANSHIP/FINISH

THE BRIDGE UNITS, WINGWALLS, HEADWALLS AND FOUNDATION
UNITS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF
THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND
CENTERLINE OF THE BRIDGE SECTION, WITHIN THE LIMITS OF THE
VARIATIONS GIVEN IN SECTION 5, ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED. THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THE LIMITS OF VARIATIONS GIVEN IN SECTION 5. ABOVE, THE SURFACE OF THE PRECAST ELEMENTS SHALL BE A SMOOTH STEEL FORM OR TROWELED SURFACE. TRAPPED AIR POCKETS CAUSING SURFACE DEFECTS SHALL BE CONSIDERED AS PART OF A SMOOTH, STEEL

REPAIRS
PRECAST ELEMENTS MAY BE REPAIRED. IF NECESSARY, BECAUSE OF IMPERFECTIONS IN MANUFACTURE OR HANDLING DAMAGE AND WILL BE ACCEPTABLE IF, IN THE OPINION OF THE PURCHASER, THE REPAIRS ARE SOUND, PROPERLY FINISHED AND CURED, AND THE REPAIRED SECTION CONFORMS TO THE REQUIREMENTS OF THIS SPECIFICATION.

10. REJECTION
THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON NDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING: 10.1 FRACTURES OR CRACKS PASSING THROUGH THE WALL

EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE HALF THE THICKNESS OF THE WALL. 10.2 DEFECTS THAT INDICATE PROPORTIONING MIXING AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE

SPECIFICATIONS.

10.3.HONEYCOMBED OR OPEN TEXTURE.
10.4.DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT

MAKING A SATISFACTORY JOINT.

INOT FOR CONSTRUCTION

Seg No.:

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PROPOSAL DRAWING

CONSPAN O SERIES 0633 - 33'-0" X 6'-4" MALONE WHEELER CHANNEL CROSSING

**AUSTIN, TEXAS** 

688751 010 9/9/2021 JJM Checked Approved: Sheet No.: OF 10

## SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® O-SERIES BRIDGE SYSTEMS (CONT'D)

MARKING
EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF
PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:

BRIDGE SPAN x BRIDGE RISE DATE OF MANUFACTURE

NAME OR TRADEMARK OF THE MANUFACTURER

12. INSTALLATION PREPARATION
TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE

BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, WINGWALL FLEMENTS, EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

FOOTINGS
DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED

THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN X" IN

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND

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13. INSTALLATION
13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.

- LIFTING IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH®
- CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HS20 OR HS25) BE PERMITTED OVER THE BRIDGE UNITS UNI ESS APPROVED BY CONTECH® ENGINEERED SOLUTIONS 13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE

CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO

FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING **OPERATIONS APPLY** 

- NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE
- PRECAST CONCRETE BRIDGE UNIT.

  AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS
- AFTER THE COMPACTED FILL LEVEL HAS REACHED THE DESIGN COVER, OR 2'-0" MINIMUM, OVER THE CROWN OF THE PRECAST CONCRETE BRIDGE, CONSTRUCTION EQUIPMENT WITHIN THE DESIGN LOAD LIMITS FOR THE ROAD MAY CROSS THE PRECAST CONCRETE BRIDGE
- 13.2. LEVELING PAD/SHIMS THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON HARDBOARD SHIMS CONFORMING TO ASTM D1037 OR PLASTIC SHIMS (DAYTON SUPERIOR P-80, P-81 OR APPROVED EQUAL) MEASURING 5" x 5", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS, A MINIMUM GAP OF X" SHALL BE PROVIDED BETWEEN THE FOOTING AND THE BOTTOM OF THE BRIDGE'S

DATE

VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL, ALSO, A SUPPLY OF ¼", ½" AND ½" THICK HARDBOARD OR PLASTIC SHIMS FOR VARIOUS SHIMMING PURPOSES SHALL BE ON SITE.

- 13.3. PLACEMENT OF BRIDGE UNITS THE BRIDGE UNITS SHALL BE PLACED AS SHOWN ON THE ENGINEER'S PLAN DRAWINGS.
  SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED 3/4"
- 13.4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STRUCTURE SPAN DURING ALL PHASES OF INSTALLATION. DUE TO THE ARCH SHAPE, BRIDGE ELEMENTS WILL TEND TO SPREAD UNDER SELF-WEIGHT. IT IS IMPERATIVE THAT ANY LATERAL SPREADING OF THE BRIDGE ELEMENTS BE AVOIDED DURING AND AFTER THEIR PLACEMENT. GENERALLY, HORIZONTAL CABLE TIES OR TIE RODS ARE SHIPPED IN THE LARGER BRIDGE ELEMENTS TO ASSIST IN PREVENTING THIS SPREADING, CABLE TIES/TIE RODS SHALL NOT BE REMOVED UNTILL BRIDGE UNITS ARE GROUTED AND GROUT HAS CURED. IT IS RECOMMENDED THAT TEMPORARY HARDWOOD BLOCKS BE USED IN CONJUNCTION WITH THE CABLE TIES/TIE RODS TO MAINTAIN SPAN. IF, HOWEVER, DUE TO SITE RESTRICTIONS. THESE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO PLACEMENT OF THE BRIDGE ELEMANTS, THE CONTRACTOR MUST NOTIFY CONTECH (MANUFACTURER) AND REQUEST A SUGGESTED INSTALLATION PROCEDURE

IN ADDITION, IF THE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO SETTING ARCH UNITS, THE FOLLOWING QUALITY

1) FIND "MEASURED SPAN" UPON ARCH UNIT'S DELIVERY TO SITE, PRIOR TO LIFTING FROM TRUCK AND REMOVING CABLE TIES/TIE RODS. "MEASURED SPAN" SHALL BE THE AVERAGE OF (3) SPAN MEASUREMENTS ALONG THE LAY LENGTH OF THE

2) AFTER SETTING OF BRIDGE UNIT ON THE FOUNDATION, VERIFY THE SPAN. THIS "INSTALLED SPAN MEASUREMENT' SHALL NOT EXCEED THE MAXIMUM OF:

A) THE NOMINAL SPAN +½" OR
B) THE "MEASURED SPAN"
IF THE "INSTALLED SPAN MEASUREMENT" EXCEEDS THIS AMOUNT, THE ARCH LINIT SHALL BE LIFTED AND RE-SET LINTIL THE

- 13.5. PLACEMENT OF WINGWALLS, HEADWALLS AND FOUNDATION UNITS - THE WINGWALLS, HEADWALLS AND FOUNDATIONS SHALL BE PLACED AS SHOWN ON THE PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE
- 13.6. WATERPROOFING/JOINT PROTECTION AND SUBSURFACE
- 13.6.1. EXTERNAL PROTECTION OF JOINTS THE BUTT JOINT MADE BY TWO ADJOINING BRIDGE UNITS SHALL BE COVERED WITH A 1/8" x 11/8" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" WIDE JOINT WRAP. THE SURFACE SHALL BE FREE OF DIRT BEFORE APPLYING THE JOINT MATERIAL. A PRIMER COMPATIBLE WITH THE JOINT WRAP TO BE USED SHALL BE APPLIED FOR A MINIMUM WIDTH OF 9" ON EACH SIDE OF THE JOINT. THE EXTERNAL WRAP SHALL BE CS212 BY CONCRETE SEALANTS INC., EZ-WRAP RUBBER BY PRESS-SEAL GASKET CORPORATION, SEAL WRAP BY MAR MAC MANUFACTURING CO. INC. OR APPROVED EQUAL. THE JOINT SHALL BE COVERED CONTINUOUSLY FROM THE BOTTOM OF ONE BRIDGE SECTION LEG, ACROSS THE TOP OF THE BRIDGE AND TO THE OPPOSITE BRIDGE SECTION LEG. ANY LAPS THAT RESULT IN THE JOINT WAP SHALL BE A MINIMUM OF 6" LONG WITH THE OVERLAP RUNNING DOWNHILL
- IN ADDITION TO THE JOINTS BETWEEN BRIDGE UNITS, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE HEADWALL SHALL ALSO BE SEALED AS DESCRIBED ABOVE. IF PRECAST WINGWALLS ARE USED, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE WINGWALL SHALL BE SEALED WITH A 2'-0" STRIP OF FILTER FARRIC ALSO, IF LIFT HOLES ARE FORMED IN THE BRIDGE UNITS, SHALL BE PRIMED AND COVERED WITH A 9" x 9" SQUARE OF JOINT
- 13.6.3. DURING THE BACKFILLING OPERATION, CARE SHALL BE TAKEN TO KEEP THE JOINT WRAP IN ITS PROPER LOCATION OVER THE
- SUBSOIL DRAINAGE SHALL BE AS DIRECTED BY THE ENGINEER

- 3.7. GROUTING

  13.7.1. GROUTING SHALL NOT BE PERFORMED WHEN TEMPERATURES
  ARE EXPECTED TO GO BELOW 35° FOR A PERIOD OF 72 HOURS. FILL THE BRIDGE-FOUNDATION KEYWAY WITH CEMENT GROUT (PORTLAND CEMENT AND WATER OR CEMENT MORTAR COMPOSED OF PORTLAND CEMENT, SAND AND WATER) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI, VIBRATE AS REQUIRED TO ENSURE THAT THE ENTIRE KEY AROUND T BRIDGE ELEMENT IS COMPLETELY FILLED. IF BRIDGE ELEMENTS HAVE BEEN SET WITH TEMPORARY TIES (CABLES BARS ETC.) GROUT MUST ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI BEFORE TIES MAY BE REMOVED.
- 13.7.2. ALL GROUT SHALL HAVE A MAXIMUM AGGREGATE SIZE OF ½".
  13.7.3. LIFTING AND ERECTION ANCHOR RECESSES SHALL BE FILLED WITH GROUT
- AFTER GROUT HAS REACHED ITS DESIGN STRENGTH THE TEMPORARY HARDWOOD WEDGES SHALL BE REMOVED AND THEIR HOLES FILLED WITH GROUT.
- 13.8. BACKFILL

  13.8.1. DO NOT PERFORM BACKFILLING DURING WET OR FREEZING

13.8.2. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURA ELEMENTS UNTIL THEY HAVE BEEN APPROVED BY THE ENGINEER.

3.3. BACKFILL SHALL BE CONSIDERED AS ALL REPLACED

EXCAVATION AND NEW EMBANKMENT ADJACENT TO THE PRECAST CONCRETE ELEMENTS. THE PROJECT CONSTRUCTION AND MATERIAL SPECIFICATIONS, WHICH INCLUDE THE SPECIFICATIONS FOR EXCAVATION FOR STRUCTURES AND ROADWAY EXCAVATION AND EMBANKMENT CONSTRUCTION, SHALL APPLY EXCEPT AS MODIFIED IN THIS SECTION.

13.8.4. BACKFILL ZONES:

• IN-SITU SOIL

- ZONE A: CONSTRUCTED EMBANKMENT OR OVERFILL
- ZONE B: FILL THAT IS DIRECTLY ASSOCIATED WITH PRECAST CONCRETE BRIDGE INSTALLATION. ZONE C. ROAD STRUCTURE

REQUIRED BACKFILL PROPERTIES

- 13.8.5.1. IN-SITU SOIL NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE BRIDGE UNITS. AS A GUIDE, THE EXISTING NATURAL GROUND SHOULD BE OF SIMILAR QUALITY AND DENSITY TO ZONE B MATERIAL FOR MINIMUM LATERA DIMENSION OF ONE BRIDGE SPAN OUTSIDE OF THE BRIDGE FOOTING
- 13.8.5.2. ZONE A ZONE A REQUIRES FILL MATERIAL WITH SPECIFICATIONS AND COMPACTING PROCEDURES EQUAL TO
- THAT FOR NORMAL ROAD EMBANKMENTS.

  13.8.5.3. ZONE B GENERALLY, SOILS SHALL BE REASONABLY FREE
  OF ORGANIC MATTER, AND, NEAR CONCRETE SURFACES, FREE OF STONES LARGER THAN 3" IN DIAMETER SEE CHARTS FOR DETAILED DESCRIPTIONS OF ACCEPTABLE SOILS.

13.8.5.4. ZONE C - ZONE C IS THE ROAD SECTION OF GRAVEL ASPHALT OR CONCRETE BUILT IN COMPLIANCE WITH LOCAL ENGINEERING PRACTICES.

- 13.8.5.5. GEOTECHNICAL ENGINEER SHALL REVIEW GRADATIONS OF ALL INTERFACING MATERIALS AND, IF NECESSARY, RECOMMEND GEOTEXTILE FILTER FABRIC (PROVIDED BY
- 13.8.6. PLACING AND COMPACTING BACKFILL DUMPING FOR BACKFILLING IS NOT ALLOWED ANY NEARER THAN 3'-0" FROM THE BRIDGE LEG.

EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST

THE FILL BEHIND WINGWALLS MUST BE PLACED AT THE SAME TIME AS THAT OF THE BRIDGE FILL. IT MUST BE PLACED IN PROGRESSIVELY PLACED HORIZONTAL LAYERS NOT EXCEEDING 8"

THE BACKFILL OF ZONE B SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR, AS REQUIRED BY

SOIL WITHIN 1'-0" OF CONCRETE SURFACES SHALL BE HAND-COMPACTED. ELSEWHERE, USE OF ROLLERS IS ACCEPTABLE. IF VIBRATING ROLLER-COMPACTORS ARE USED, THEY SHALL NOT BE STARTED OR STOPPED WITHIN ZONE B AND THE VIBRATION FREQUENCY SHOULD BE AT LEAST 30 REVOLUTIONS PER SECOND

THE BACKFILL MATERIAL AND COMPACTING BEHIND WINGWALLS SHALL SATISFY THE CRITERIA FOR THE BRIDGE BACKFILL, ZONE B

BACKFILL AGAINST A WATERPROOFED SURFACE SHALL BE PLACED CAREFULLY TO AVOID DAMAGE TO THE WATERPROOFING MATERIAL

FOR FILL HEIGHTS OVER 12 FEET (AS MEASURED FROM TOP CROWN OF BRIDGE TO FINISHED GRADE), NO BACKFILLING MAY BEGIN UNTIL A BACKFILL COMPACTION TESTING PLAN HAS BEEN COORDINATED WITH AND APPROVED BY CONTECH® ENGINEERED 13.8.8. WINGWALLS

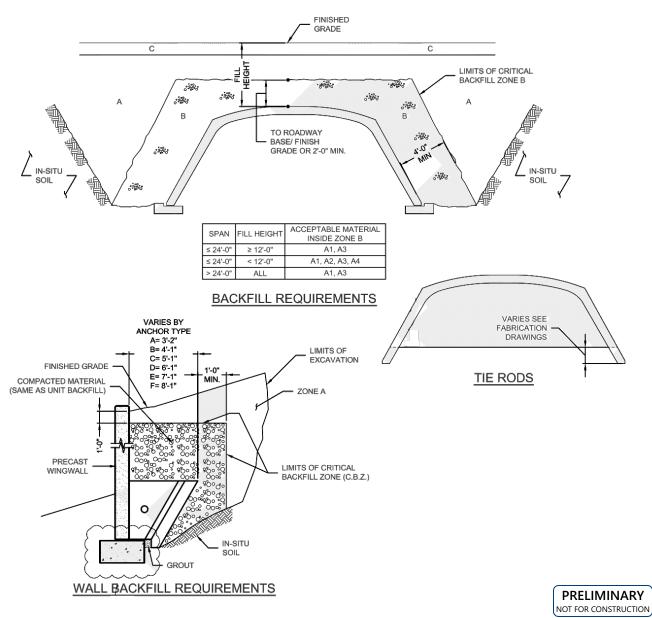
BACKFILL IN FRONT OF WINGWALLS SHALL BE CARRIED TO GROUND LINES SHOWN IN THE PLANS. 13.8.9. MONITORING

THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE

THE FIRST MEASUREMENT SHOULD TAKE PLACE AFTER THE ERECTION OF ALL PRECAST BRIDGE SYSTEM ELEMENTS, A SECOND AFTER COMPLETION OF BACKFILLING, AND A THIRD BEFORE OPENING OF THE BRIDGE TO TRAFFIC, FURTHER MEASUREMENTS MAY BE MADE ACCORDING TO LOCAL

#### ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

TYPICAL USCS	AASHTO GROUP	AASHTO SUBGROUP	PERCENT PASSING US SIEVE NO.			CHARACTER OF FRACTION PASSING NO. 40 SIEVE		SOIL DESRIPTION
MATERIALS			#10	#40	#200	LIQUID LIMIT	PLASTICITY INDEX	SOIL DESKIPTION
GW, GP, SP	A1	A-1a	50 MAX	30 MAX	15 MAX		6 MAX	LARGELY GRAVEL BUT CAN INCLUDE SAND AND FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SM, ML, SP, GP	A2	A-2-4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW- PLASTICITY SILT FINES
SC, GC, GM	AZ	A-2-5			35 MAX	41 MIN	10 MAX	SANDS, GRAVELS WITH PLASTIC SILT FINES
SP, SM, SW	A3			51 MIN	10 MAX		NON- PLASTIC	FINE SANDS
ML, SM, SC	A4				36 MIN	40 MAX	10 MAX	LOW-COMPRESSIBILTY SILTS



ENGINEERED SOLUTIONS

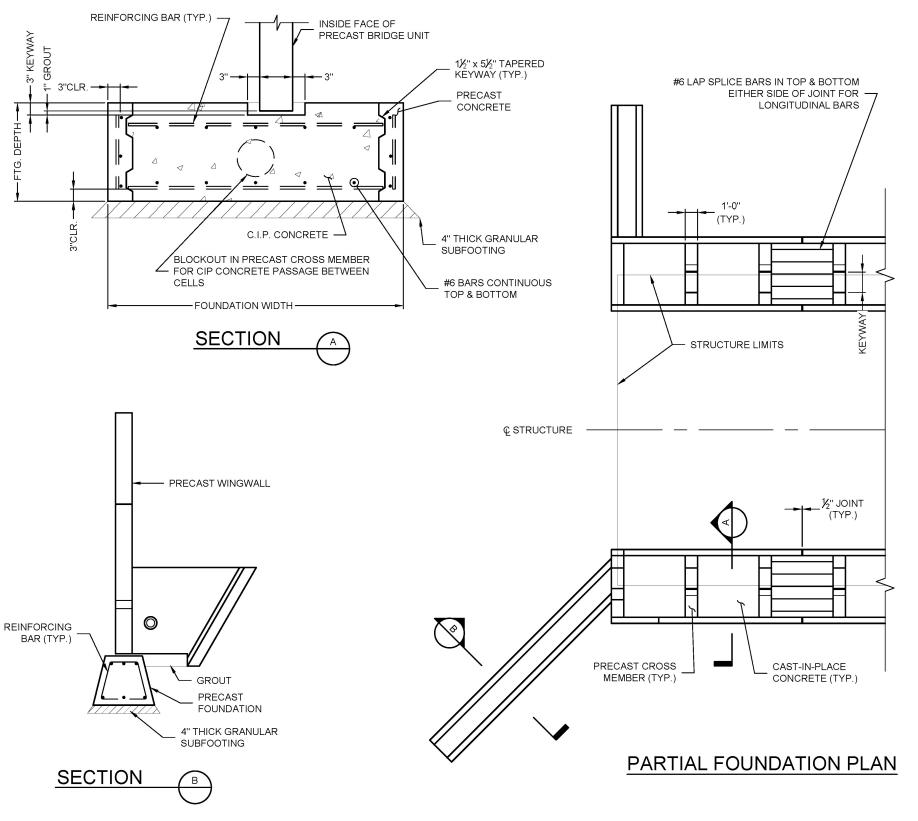
CONSPAN O SERIES O633 - 33'-0" X 6'-4" MALONE WHEELER CHANNEL CROSSING

**AUSTIN, TEXAS** 

Seg No.: 688751 010 9/9/2021 JJM Checked Approved: Sheet No.: OF 10

9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069 800-338-1122 513-645-7000 513-645-7993 FAX

**PROPOSAL** DRAWING







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**ENGINEERED SOLUTIONS** 9025 Centre Pointe Dr., Suite 400, West Chester, OH 4506! 800-338-1122 513-645-7000 513-645-7993 FAX

**PROPOSAL** DRAWING

CONSPAN O SERIES O633 - 33'-0" X 6'-4" MALONE WHEELER CHANNEL CROSSING

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