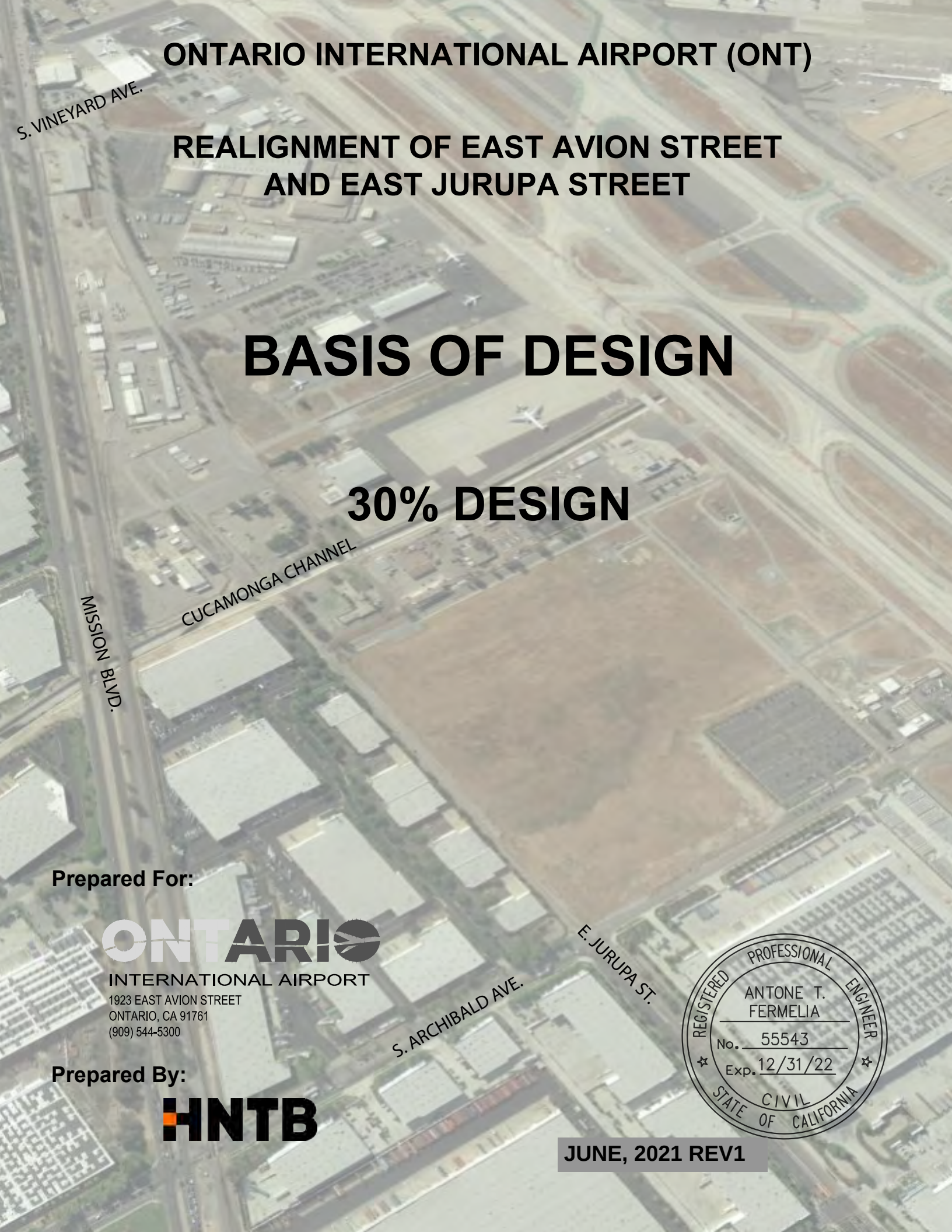
ONTARIO INTERNATIONAL AIRPORT (ONT)

REALIGNMENT OF EAST AVION STREET AND EAST JURUPA STREET

BASIS OF DESIGN

30% DESIGN



Prepared For:

ONTARIO INTERNATIONAL AIRPORT
1923 EAST AVION STREET
ONTARIO, CA 91761
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HNTB

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STATE OF CALIFORNIA

JUNE, 2021 REV1

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Realignment of East Avion Street and East Jurupa Street at Ontario International Airport (ONT) Basis of Design

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APPENDICES

SECTION 1. INTRODUCTION

1.1. Purpose

The purpose of the Basis of Design (BOD) Report for the Realignment of East Avion Street and East Jurupa Street at Ontario International Airport (ONT) is to document the principal engineering findings derived from preliminary studies and design performed for the project.

1.2. Background/Scope of Project

As part of the On-Call Planning and Support Services Contract, the Ontario International Airport Authority (OIAA), owner and operator of ONT, has requested that HNTB Corporation provide preliminary engineering design services for the realignment of East Avion Street and widening of East Jurupa Street. The project will support the Airport's current and future airside and landside needs, including the Golden Bridge freight forwarding facility and the future UPS expansion. See **Figure 1.1**.

Improvements include pavement reconstruction, roadway widening, intersection signalization, striping, signage, utility infrastructure, grading, drainage, and a channel crossing structure.

1.3. Project Purpose and Need Justification

This project reconstructs, widens, and realigns portions of East Jurupa and East Avion Streets within ONT's property to enhance the environmental benefits, safety, efficiency, resiliency, and capacity of this critical roadway. The existing East Avion Street has exceeded its service life and does not meet current roadway design standards. The high volume of truck traffic that traverses the roadway to access Jurupa Street must do so at a very slow speed to safely navigate the non-standard geometry. This project enhances vehicular safety and meets modern roadway design standards by realigning the roadway to eliminate existing sharp curves that require trucks to slow down under 10 miles-per-hour to traverse them. The new roadway will have a speed limit between 30 and 40 miles-per-hour. The roadway realignment includes the creation of a new bridge over the Cucamonga Channel that will have a long (75+ year) service life that meets the current seismic design standards. This project will reduce the amount of slow-moving and idling traffic on-airport, which will reduce emissions and will ensure that critical freight is not delayed by antiquated airport infrastructure. In addition, the roadway will allow the airport to accommodate existing and future air cargo demand, some of which comes into other coastal airports and is trucked, through heavy Southern California traffic, to distribution facilities in the Inland Empire in close proximity to ONT. Providing modernized facilities will reduce the amount of slow moving truck traffic having to traverse clogged freeways to reach their destination.

1.4. Level of Environmental Analysis Required

National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) compliance and certification is required to begin the construction of this project. The OIAA submitted a Section 163 Determination request to the FAA to determine the applicability of NEPA to this project. On April 23, 2021, FAA determined that OIAA would be required to perform an appropriate environmental review under NEPA. On May 4th, 2021, FAA clarified that in addition to the NEPA action related to the release of obligation from the US Government Surplus Property act, subsequent development (i.e. this project) needs to be included as a connected action. Additional information will be provided to the FAA's

Environmental Protection Specialist in the near term to help inform the level of NEPA analysis that will be required by the FAA. From a CEQA perspective, OIAA's Legal Counsel is currently determining the appropriate level of CEQA analysis that will be required for this project.

1.5. Standards and References

The project will be carried out in accordance with policies, standards, and specifications in accordance with applicable

- City of Ontario Standard Drawings, Current Edition
- Standard Specifications for Public Works Construction (SSPWC), "Greenbook", Current Edition
- Caltrans Highway Design Manual, 2020


FIGURE 1.1 SCOPE
JURUPA ST.
S. ARCHIBALD AVE.
PROPOSED CONCEPTUAL UPS EXPANSION AREA
LINDSAY PRIVADO
TOWER DR.
AVION ST.
CUCAMONGA CHANNEL
GOLDEN BRIDGE DEVELOPMENT
S. HELLMAN AVE.
RAILROAD TRACKS
S. CARLOS AVE.
MISSION BLVD.
E. LOCUST ST.
S. VINEYARD AVE.

Figure 1.1

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SECTION 2. DATA COLLECTION

2.1. Introduction

This section briefly describes existing site conditions and summarizes the various forms of data that were compiled and used as the basis for engineering analysis and design of the proposed project, and how the information was compiled into project base maps. Data collected includes, "as-built" or record drawing reviews, topographic surveys, aerial photography, and field investigations.

2.2. Topographic Survey

Topographic survey for the project performed to date is limited to the horizontal alignments of the centerlines for East Avion and East Jurupa Streets. It is noted that detailed topographic survey should be performed prior to the next phases of design. The Preliminary Engineering relied primarily on surveys (photogrammetry and ground) collected from the following sources:

- Topographic Centerline Establishment Survey for Avion and Jurupa Streets – by Psomas, dated January 2021.
- Ontario International Airport (ONT) Airport Layout Plan (ALP) – dated April 2021
- Golden Bridge ALTA Survey – dated October 2020

2.3. Geotechnical Data

At the preliminary design phase, the geotechnical investigation for this project has not yet commenced. The geotechnical data assumed for the preliminary design of the channel crossing structure of this project was from the following report:

- Geotechnical Investigation Report Ontario Cargo Facility – Site Work Ontario International Airport, Ontario, California – by California Testing & Inspections, August 15, 2018. This report focuses on the northside of the airport and is not in the general area of the Jurupa Street Realignment but was used for general soil parameters

2.4. Existing Records

Preliminary Engineering studies relied primarily on existing records of utilities and roadway improvements collected through the review of record drawings and maps listed below:

- City of Ontario Atlas Maps
- City of Ontario Jurupa Street Improvements – 4885-S
- City of Ontario Street Improvement Plans for Tower Drive – 3066-S
- City of Ontario PM 11409 (Jurupa and Archibald)

- City of Ontario Recycled Water Plans for Jurupa Street – PM19341/19342
- San Bernardino County Flood Control – Cucamonga Creek Channel Pomona Freeway to Ontario Airport

SECTION 3. ROADWAY GEOMETRICS

3.1. Introduction

Proposed roadway improvements include the reconstruction and realignment of East Avion and East Jurupa Streets. This section describes the methodology and design criteria used to develop the horizontal and vertical geometries, marking, and signage for the roadway improvements.

Geometric features of the roadway improvements designed under this project were established by using criteria as specified in Caltrans Highway Design Manual (HDM) Chapter 200, Geometric Design and Structure Standards and Chapter 400, Intersections at Grade and City of Ontario Standard Plans.

3.2. Roadway Alignment Alternatives

As part of the preliminary design efforts, HNTB along with OIAA developed and analyzed a series of roadway alignment alternatives shown in **Figure 3.1**. Below is a summary of the alternatives and associated impacts to the airport and surrounding current/future developments.

- Current alignment
  - No impacts to the current Golden Bridge Design.
- Alternative A Alignment
  - Adds approximately 8 acres that could be used for future airside development.
  - Impacts to OIAA's maintenance yard and requires modifications to Golden Bridge design
- Alternative B Alignment.
  - Adds 14.6 acres that could be used for future airside development.
  - Impacts to OIAA's maintenance yard and requires modifications to Golden Bridge design
- Alternative C Alignment.
  - Adds 1.8 acres that could be used for future airside development

Both Alternative Alignments A & B will require additional demolition, grading and residual improvements. This is due to the construction of a new road through an area that is occupied by existing facilities.

Roadway reconstruction following the current East Avion alignment is the most cost-effective alternative. It allows current grading patterns and roadway access to existing facilities to be mostly maintained.

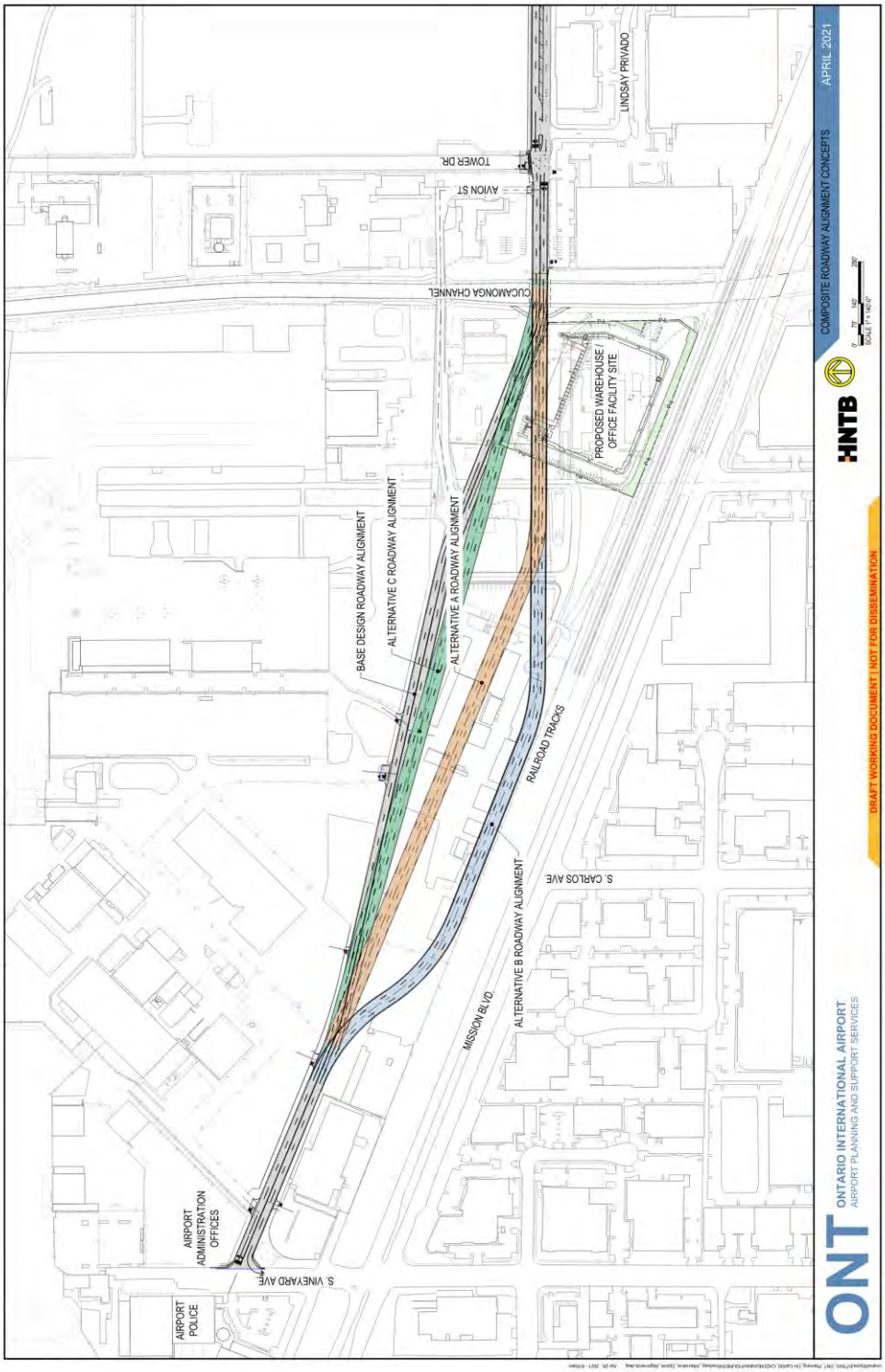

LINDSAY PRIVADO
TOWER DR
AVION ST
CUCAMONGA CHANNEL
PROPOSED WAREHOUSE / OFFICE FACILITY SITE
BASE DESIGN ROADWAY ALIGNMENT
ALTERNATIVE C ROADWAY ALIGNMENT
ALTERNATIVE A ROADWAY ALIGNMENT
RAILROAD TRACKS
S. CARLOS AVE
ALTERNATIVE B ROADWAY ALIGNMENT
MISSION BLVD
AIRPORT ADMINISTRATION OFFICES
S. VINEYARD AVE
AIRPORT POLICE
COMPOSITE ROADWAY ALIGNMENT CONCEPTS
APRIL 2021
HNTB
DRAFT WORKING DOCUMENT | NOT FOR DISSEMINATION
ONT
ONTARIO INTERNATIONAL AIRPORT
AIRPORT PLANNING AND SUPPORT SERVICES

Figure 3.1

3.3. Horizontal Geometry

Design Speeds are as follows:

- E. Avion between S. Vineyard Ave. and Tower Drive = 30 mph
- E. Jurupa Street Tower Drive and S. Archibald Ave. = 30 mph

Horizontal geometry for the roadway improvements follows the guidelines set forth in Chapter 200, Topic 203 – Horizontal Alignment, of the Caltrans HDM. Horizontal alignment shall provide at least the minimum stopping sight distance for the design speed per Caltrans HDM Table 201.1.

Due to the clustered land use along East Avion and East Jurupa Streets, it is common practice to utilize a lower maximum rate of superelevation. Either a low maximum rate of superelevation or no superelevation is employed within areas or where there are turning and crossing movements. In these areas it is difficult to warp crossing pavements.

The minimum radius of curve for the roadway alignments has been designed based on a Normal Crown (NC) or a superelevation rate = 0% per Figure 202.2, Maximum Comfortable Speed on Horizontal Curves, of the HDM. (also shown as **Figure 3.2** below)

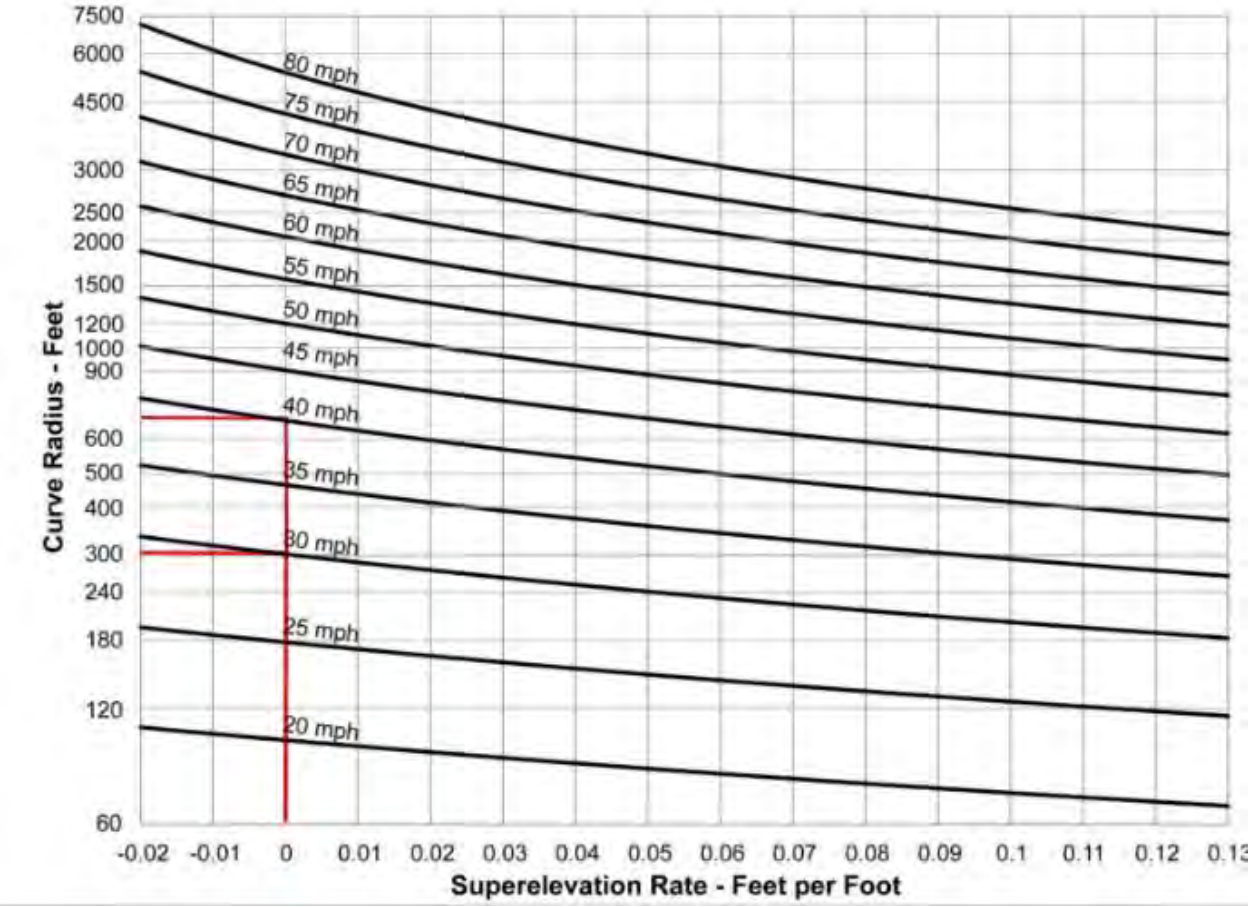


Figure 3.2

3.4. Typical Section

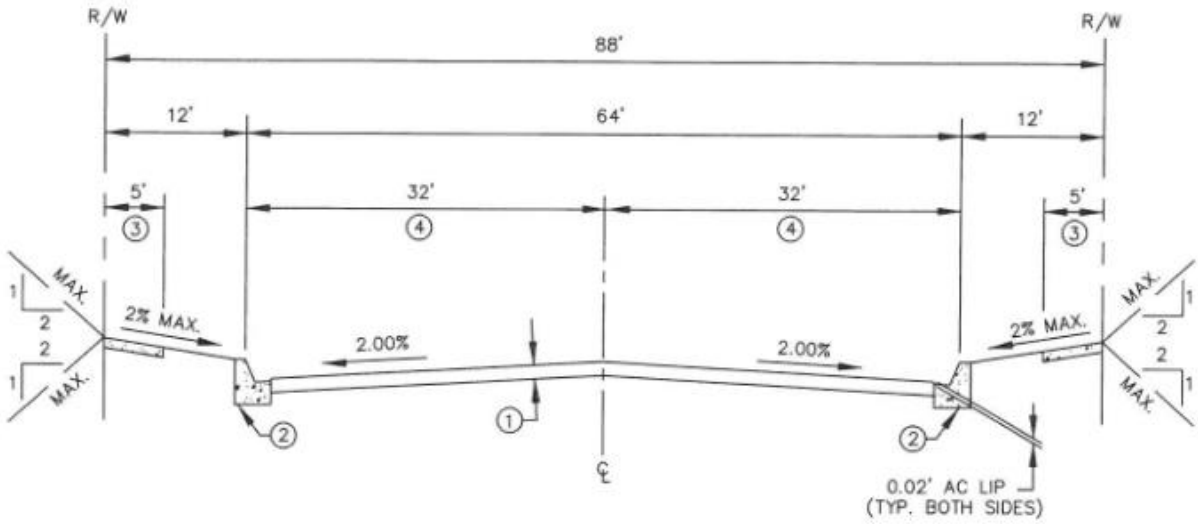
East Avion Street from South Vineyard to Tower Drive will be a 4-lane collector, per City of Ontario Standard Drawing 1054, modified to a 52-foot width.

The typical section transitions from a 52-foot width to the standard 64-foot width at the intersection with Tower Drive. At which point East Avion/East Jurupa Street continues as a 4-lane collector with a 28-foot center median to S. Archibald Avenue.

See **Figure 3.3** below for the City of Ontario Standard Drawing 1054.

Additional design standards include:

- Concrete cross gutter per City of Ontario Std. No. 1208.
- Type "I" and Type "II" concrete ramp per City of Ontario Std. No. 1213.
- Commercial driveway approach per City of Ontario Std. No. 1204



NOTES

① PAVEMENT STRUCTURAL SECTION SHALL BE INDICATED ON THE CONSTRUCTION PLANS AND SHALL BE DETERMINED BY A SOIL TEST UTILIZING THE TRAFFIC INDEX PROVIDED BY THE CITY ENGINEER AND MAXIMUM R-VALUE OF 50. IF THE RECOMMENDED STRUCTURAL SECTION DIFFERS FROM STANDARD DRAWING NO. 1011. THE THICKER SECTION OF THE TWO SHALL BE CONSTRUCTED.

② CONSTRUCT TYPE "B" CURB PER STANDARD DRAWING NO. 1201.

③ CONSTRUCT SIDEWALK PER STANDARD DRAWING NO. 1209.

④ SEE MASTER PLAN OF STREETS AND HIGHWAYS FOR LANE CONFIGURATION.

Figure 3.3

3.5. Vertical Profile

Roadway profiles have been designed to meet or exceed sight distance design controls for crest and sag vertical curves as specified in Chapter 200, Topic 201 Sight Distance, of the Caltrans Highway Design Manual (HDM) See **Figures 3.4 and 3.5** below (Note: S= Site Distance, V=Design Speed).

For algebraic grade differences of 2 percent and greater, and design speeds equal to or greater than 40 miles per hour, the minimum length of vertical curve in feet should be equal to 10V, where V = design speed. For algebraic grade differences of less than 2 percent, or design speeds less than 40 miles per hour, the vertical curve length should be a minimum of 200 feet. Vertical curves are not required where the algebraic difference in grades is 0.5 percent or less. Grade breaks are not closer together than 50 feet and a total of all grade breaks within 200 feet shall not exceed 0.5 percent. Minimum grades shall not be less than 0.3% and maximum grades shall not exceed 4%.

Stopping Sight Distance on Crest Vertical Curves – Caltrans Figure 201.4

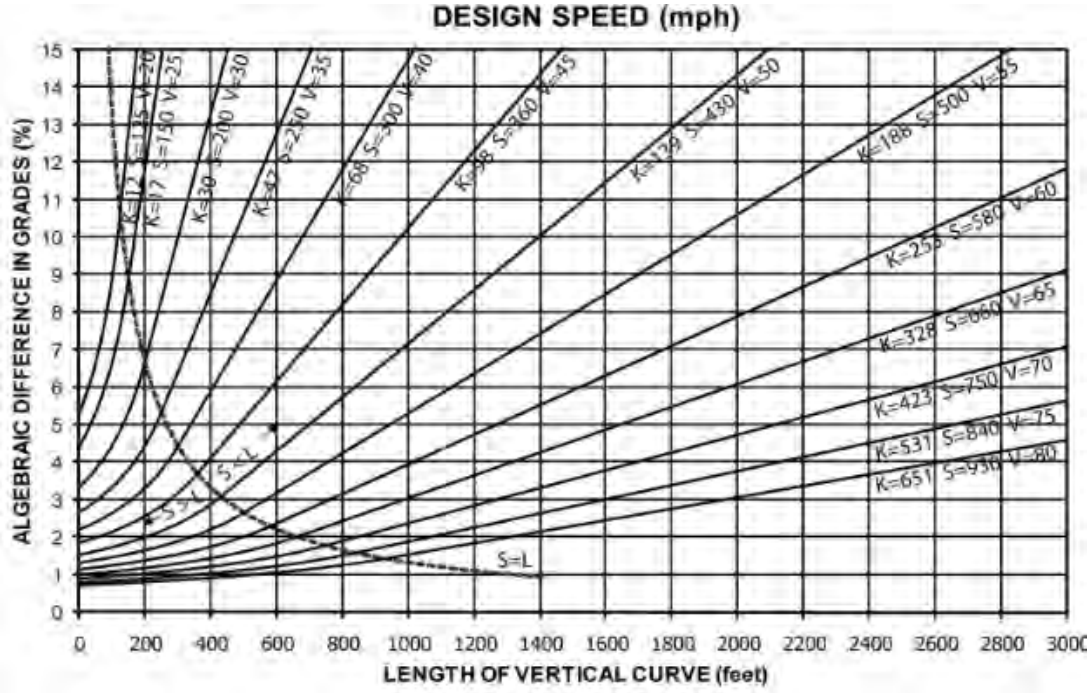


Figure 3.4

Stopping Sight Distance on Sag Vertical Curves – Caltrans Figure 201.5

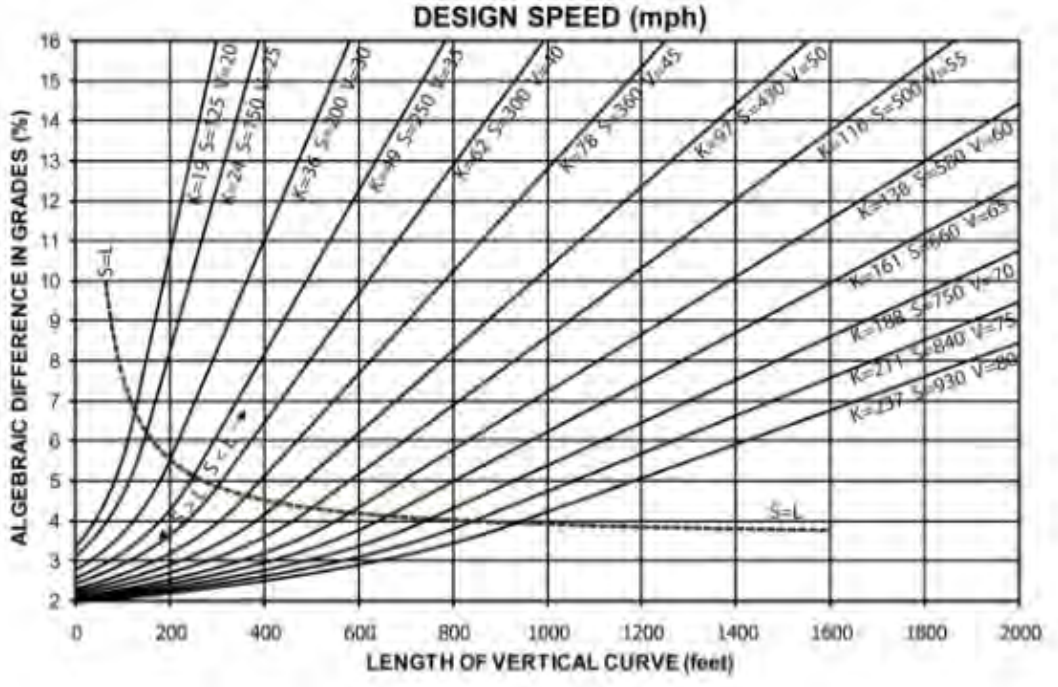


Figure 3.5

3.6. Intersections

The design of at-grade intersections follows the guidelines set forth in Chapter 400, Intersections at Grade of the Caltrans HDM. Intersections along the realignment and widening of East Avion/East. Jurupa occur at South Vineyard Avenue, Tower Drive and Archibald Avenue. The geometric configurations of these intersections are Crossing-Type Intersections - "Tee" and 4-legged intersections.

The intersections at South Vineyard Ave. and Tower Drive are "stop" intersections, the intersection at Archibald is a signalized intersection including offset left and right turn lanes.

3.6.1. Curb Returns

Curb returns for project are designed to meet the minimum standards per City of Ontario Standard Drawing No. 1106 where physically feasible. The following table is a summary of the applicable design standards for the major intersections.

Table: Curb Return Requirements		
Intersection	**Street Classification**	**Curb Return Radius Minimum**
S. Vineyard/E. Avion	Collector/Collector	35'
E. Avion/Tower Drive	Collector/Local Industrial	40'
E. Jurupa/Tower Drive	Collector/Local Industrial	40'
E. Jurupa/S. Archibald	Collector/Collector	35'

3.7. Pavement Markings and Signage

Pavement marking and signage design conforms to Caltrans Standard Plans and City of Ontario Traffic and Transportation Guideline (August 2013). Specific standard plan numbers are indicated on the project drawings.

3.8. ADA Accessibility

The design of the curb ramps at roadway intersections and parking access shall conform to the Americans with Disabilities Act (ADA) requirements.

Grades on accessible ramps shall be limited as follows:

- Maximum slopes of a ramp shall not exceed 1:12 (8.33%) [8.00% Desired]
- Maximum cross slope of ramp surfaces shall not exceed 1:50 (2.00%) [1.70% Desired]
- Maximum slope in any direction on a landing shall not exceed 1:50 (2.00%) [1.50% Desired]
- Minimum landing area shall not be less than 48" x 48"
- The design also follows City of Ontario Standard Drawings.

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SECTION 4. PAVEMENT DESIGN

4.1. Pavement Design Scope

The following discusses the pavement design that was performed for the areas to be reconstructed and newly constructed only as recommended in the 30% design analysis.

4.2. Pavement Design Analysis

As stated in Section 2 DATA COLLECTION, a geotechnical investigation has not yet been performed for the project to determine the subgrade conditions. It is recommended that a full pavement design analysis be performed based on the results of the geotechnical investigation that is to commence prior to final design.

Pavement structural section shall be determined by a soils test prior to construction. The maximum R value allowed is 50. If the recommended structural section differs from the City minimum per standard drawing 1011, the thicker section of the two shall be constructed. TI values are to be provided by the City of Ontario Traffic Section.

4.3. Pavement Design Recommendations

Through discussions with OIAA, the structural pavement section should account for future truck traffic. Although East Avion and East Jurupa Streets are classified as Collector streets, the pavement structural section reflects the City of Ontario Standard Drawing No. 1101 for Arterial/Truck Routes summarized in the following table:

Table: Minimum Pavement Structural Section			
Street Classification	Minimum Traffic Index	Reference City of Ontario Standard Drawing No.	Minimum AC Pavement Section
Other Principal Arterial/Truck Route	12	1058, 1059, 1060, 1061	8" AC/10" CAB

4.4. Pavement Materials

Asphaltic Concrete (AC) and Crushed Aggregate Base (CAB) shall meet the requirements of SSPWC. Specifications have not yet been developed at the 30% level of design.

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SECTION 5. UNDERGROUND UTILIITIES

5.1. Introduction

The following discusses the background and basis of design for the project utilities at a 30% level of design.

As discussed in Section 2 – Data Collection, most of the utility information has been provided via available record drawings. In order to ensure accurate coordination, further investigation in the form of potholing or subsurface sonar will be required in later design phases.

In drafting this report HNTB has accounted for all expected developments within the airport area including the UPS expansion Facility and the Golden Bridge facility. This report addresses the assumed demand for the following utilities: gas, water, recycle water, communications, and sewer. Preliminary sizes have been proposed by HNTB as outlined by this report. All proposed utility layouts will connect to the existing utility infrastructure in the surrounding areas of E. Avion St and E Jurupa St. In this preliminary report HNTB concludes that all utilities have been accounted for to address the future developments in this project area.

5.2. Existing Utilities

In addition to the electrical system discussed in Section 7 – Electrical Power, Lighting and Traffic Signal, there are a few major utilities located throughout the project site which will need to be formally addressed as the design progresses. Refer to **Appendix D, Utility Networks**

5.2.1. Domestic Water line (City of Ontario)

There is an existing 12" water line located along E. Jurupa St and runs west across the Cucamonga Channel towards S. Vineyard Blvd. The existing water line feeds north to Vineyard Avenue and supplies the facilities along East Avion Street. There are two waterlines in S. Vineyard, one of which is a 6" line and the other unknown.

5.2.2. Recycled Water Line (City of Ontario)

There is an existing 8" recycled water along E. Jurupa St that terminates at the intersection of E. Jurupa St. and S. Archibald Ave.

5.2.3. Sewer Line (City of Ontario)

There is an existing 30" VCP sewer line north of Union pacific Railroad tracks that runs east and west along the southern property line of the Ontario Airport. An existing 8" VCP along S. Vineyard Ave. and an existing 15" VCP along S. Archibald Ave.

5.2.4. Gas Line (City of Ontario)

There is an existing 4" high pressure gas line that runs along E. Jurupa St and E. Avion St. There is a separate gas line of unknown size, serving the Guardian Jet Center, along Vineyard Avenue.

5.2.5. Communication lines (Frontier Communications)

There are existing overhead Frontier communication lines that run west to east along E. Jurupa St. across the Cucamonga Channel and then runs north and south along S Hellman Ave. The communication lines connect at S. Hellman Ave and head west along the Railroad tracks. The communication lines are owned and operated by Frontier Communications.

5.2.6. General Electric (GE) Engine Services Test Cell Facility (Former)

A former test cell facility exists at the corner of East Avion Place and Mission Boulevard. Monitoring wells currently exist in and around this site.

5.3. Points of Contact

- **Southern California Edison (SCE**). Todd Wise, todd.wise@sce.com, SCE Service Planner for Ontario Area, 909-930-8539
- **Frontier Communication**: Jim Bollier, Obligatory Engineer, jim.bollier@dynamictelco.com, 626-484-8972
- **City of Ontario:** Jesus Plasencia, P.E., Senior Associate Civil Engineer, City of Ontario, 909-395-2128, jplasencia@ontarioca.gov
- **Golden Bridge Development** Junior Vargas C.E.G. Construction, 562-948-4850 x213**,** jvargas@cegconstruction.com

  Richard Lucas C.E.G. Construction, 562-948-4850, rlucas@cegconstruction.com

  Ignacio Crespo AIA, OC Engineering, 562-942-9804, icrespo@ocengineering.net
- **Army Corp of Engineers:** Sameh Basta, Chief Engineer for the Permitting Division, 909-387-7995

  Dustin Michel, COE questions, 909-387-8129
- **San Bernardino County Flood Control District:** Marty Mish, Flood Control Permit Coordinator, Department of Public Works Permits/Operations Support Division, Phone: 909-387-8005, mmish@dpw.sbcounty.gov.

  Sameh Basta, Engineering Manager, sameh.basta@dpw.sbcounty.gov, 909-387-7995
- **Southern California Gas Company:** Jessie Altamirano, Service Planner for ONT, 909-335-7584

5.4. Proposed Utilities

The proposed utilities within East Avion/East Jurupa Streets are located per City of Ontario Standard Drawing Number 1303, also shown as **Figure 5.1** below. Additionally, refer to **Appendix D, Utility Networks**

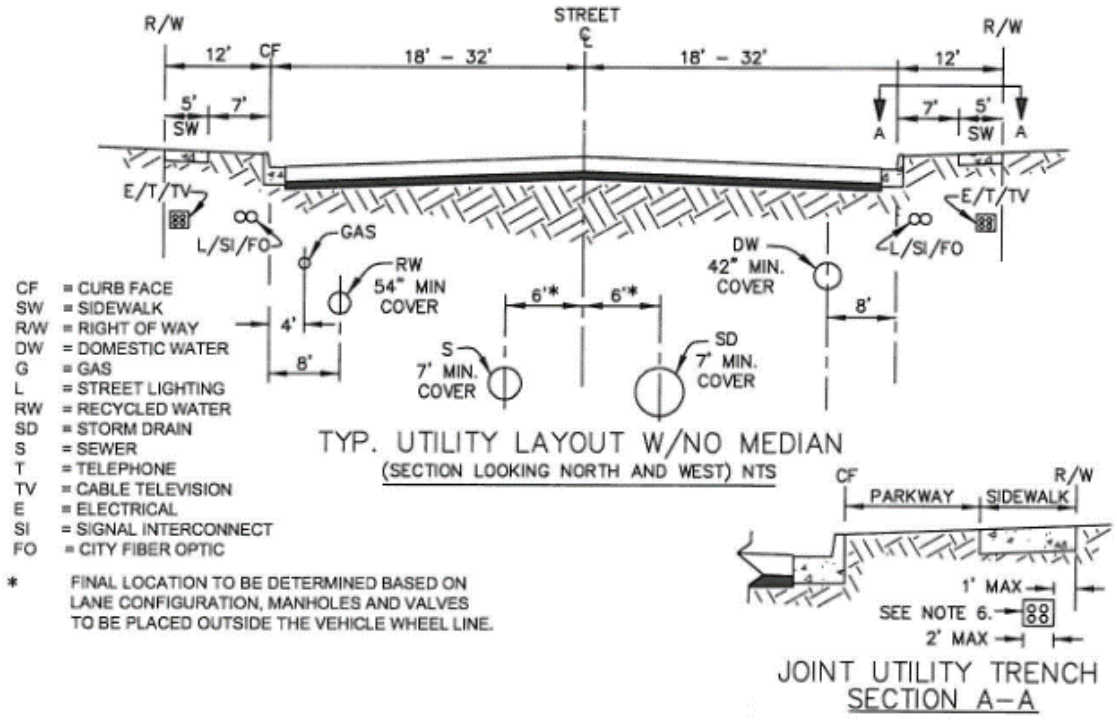

Figure 5.1

5.4.1. Sewer

The proposed sewer system will serve the Golden Bridge and future developments. It is assumed at this level of design that an 8" sewer main is sufficient to support these developments, however design calculations based on demands should be performed as part of the detailed design phase. The new 8" sewer line that will service future developments to the north will be located westbound along E. Avion St, connecting to the existing 30" sanitary sewer line at the regional connection point O-16 adjacent to the Union Pacific railroad tracks. The Golden Bridge development sewer line is planned to connect to the existing 8" sewer main which crosses Mission Boulevard at Hellman Avenue.

The following is a summary of the preliminary design criteria:

- All sewer mains shall be extra strength vitrified clay pipe (VCP) and shall have Type "G" joints (bell and spigot), per Sections 207-8 and 208.2.3 respectively, Standard Specifications for Public Works Construction, Latest Edition.
- Minimum cover of all sewer mains shall be 7 feet from the finished surface.
- The minimum class bedding for VCP sewer shall be Class "C" in accordance with City of Ontario Standard Drawing No. 2104 & 2105.

5.4.2. Domestic Water

As directed by the City, the existing 12-inch water main will be upsized and replaced with a new 16-inch water main located within E. Avion and E. Jurupa Streets. The domestic water servicing the Golden Bridge development will be provided by re-routing a portion of the existing 12-inch water main. As part of the detailed design phase the

proposed water system shall be designed to comply with all regulatory codes and standards and calculations shall be performed to meet the anticipated demands.

The following is a summary of the preliminary design criteria:

- Water mains 16 inches or less shall be C900 Class 200 or C905 PVC.
- Minimum cover of water mains shall be 42 inches from the finished surface for pipes under 12" diameter and 48 inches for pipes 12" diameter and larger, unless otherwise approved by the City Engineer.
- Thrust blocks at every vertical and/or horizontal change of direction shall be installed in accordance with City of Ontario Standard Drawing No. 4004.

5.4.3. Recycled Water

The City has requested the construction of a new 16-inch recycled water (RW) line within the relocated East Avion/East Jurupa Streets alignment and connecting to the existing 8-inch RW at South Archibald Ave.

The following is a summary of the preliminary design criteria:

- Recycled water mains up to 16" shall be Purple C900 or C905 Class 200 PVC.
- Minimum cover of recycled water mains shall be 54 inches from the finished surface for pipe under 12" diameter and 60 inches for pipe 12" diameter and larger, unless otherwise approved by the City Engineer. Recycled water mains are to be at least 12 inches below water main at crossings.
- Thrust blocks at every vertical and/or horizontal change of direction shall be installed in accordance with City of Ontario Standard Drawing No. 4004.

5.4.4. Fire Water and Fire Hydrant

It is assumed Fire Water will be provided and fed from the new 16-inch domestic water line and existing 12-inch water main. Additional fire hydrants are planned at the Golden Bridge Development.

5.4.5. Natural Gas

The proposed natural gas will serve the Golden Bridge and future developments. As part of the detailed design phase the proposed natural gas system shall be designed to comply with all regulatory codes and standards and calculation shall be performed to meet the anticipated demands. The proposed system consists of a 2-inch natural gas lateral and meter. The new 2-inch lateral will connect to the existing 2-inch gas line in Avion Place.

5.4.6. Communication

Currently, overhead Frontier communication lines bisect the proposed Golden Bridge development. As part of this project, these lines will be relocated underground and connect to the existing overhead outside of the development limits.

5.5. Utilities Under Proposed Bridge

To cross the Cucamonga Channel, the new utilities will utilize the proposed bridge structure. The proposed bridge is designed to allow for new utilities will be placed strategically through and under the bridge. All proposed utilities (gas, water, recycle water and electrical) will follow the preliminary design as depicted in **Figure 5.2**

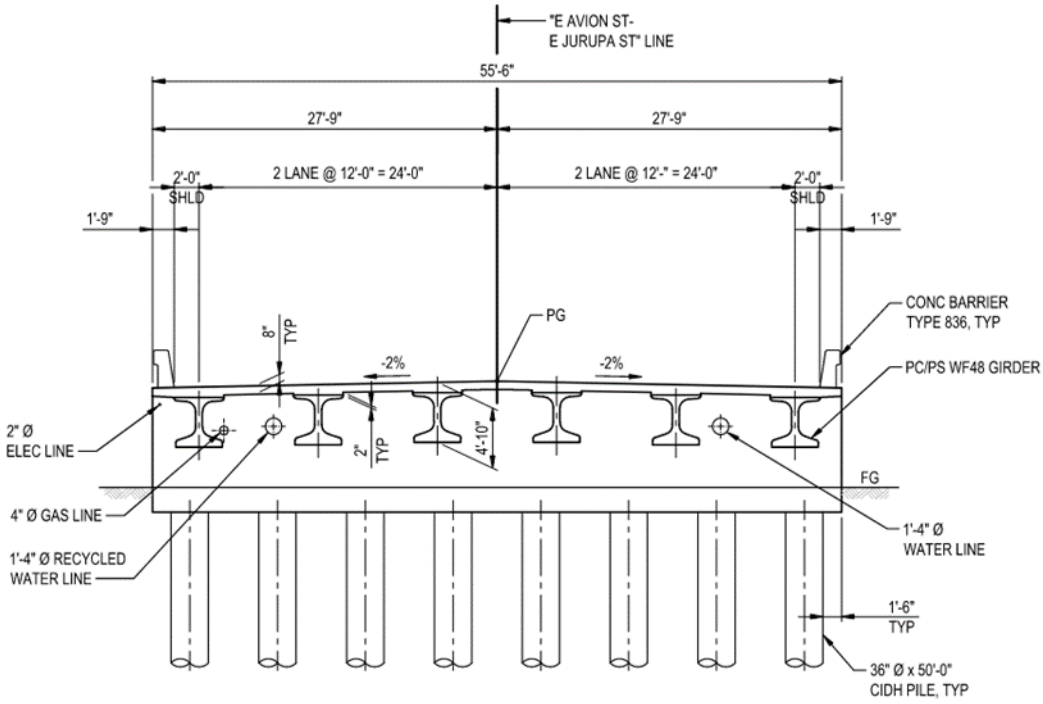
"E AVION ST-
E JURUPA ST" LINE
55'-6"
27'-9"
27'-9"
2'-0"
SHLD
2 LANE @ 12'-0" = 24'-0"
2 LANE @ 12'-" = 24'-0"
2'-0"
SHLD
1'-9"
1'-9"
8"
TYP
-2%
PG
-2%
CONC BARRIER
TYPE 836, TYP
PC/PS WF48 GIRDER
2" Ø
ELEC LINE
2"
TYP
4'-10"
FG
4" Ø GAS LINE
1'-4" Ø RECYCLED
WATER LINE
1'-4" Ø
WATER LINE
1'-6"
TYP
36" Ø x 50'-0"
CIDH PILE, TYP

Figure 5.2

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SECTION 6. GRADING AND DRAINAGE

6.1. Introduction

Drainage design for the project is based on the criteria set forth in the City of Ontario Master Plan of Drainage (March 2012)

Hydrology and hydraulic calculations supporting the storm drain design for the project are included in **Appendix B, Technical Drainage Study**.

6.2. Existing Conditions

6.2.1. East Avion Street

There is an existing airport-owned storm drain system on the south side of East Avion Street. The existing storm drain line collects drainage runoff from the properties south of East Avion Street and some areas along the existing roadway.

The storm drain system south of the roadway connects an existing pipe which drains north to south, traversing the Golden Bridge site, and discharging into a v-ditch. From this point, the drainage flows through a series of culverts and ditches, ultimately discharging into the Cucamonga Channel.

6.2.2. East Jurupa Street

There is an existing city-owned storm drain system within East Jurupa Street. The existing system consists of 51" and 57" Reinforced Concrete Pipes (RCP's) which flow east to west, and ultimately discharge into the Cucamonga Channel.

This system was designed to accommodate future developments to the north of East Jurupa Street and the future roadway widening. Storm drain laterals were installed and left in place for this project. The calculated Q100 value for the system = 103 CFS.

6.3. Grading

The roadways have been designed with an on-center crown, except for when matching the slope direction of the adjacent roadway at intersections. Transverse grades are 2.0%, except for transition areas needed to match existing grades and at intersections.

The curb, gutter, and sidewalk grades are per the referenced city standard details. Grading beyond the limits of curb or sidewalk have not been established at this level of design, however they will match existing with slopes between 0.5% and 5%.

6.4. Hydrology

The following standards were used in the design of the site's storm drain system:

- San Bernardino County Hydrology Manual
- Los Angeles County Department of Public Works (LACDPW)
- City of Ontario Master Plan of Drainage (March 2012)

LACDPW contains a free program to be used for design called HydroCalc (version 1.0.2) that was created and customized for LA County's Hydrological conditions. The City of Ontario

uses this program to calculate proposed condition flows and volumes that are used for the design of the storm drain systems. The HydroCalc software follows the rational method with the following data used for this project:

- 25-year, 24-hr: 4.94in
- 100-year, 24-hr: 6.15 in
- Soil type; Hydrologic Group A: Tujunga Loamy
- Fire Factor: 0

6.5. Hydraulics

Hydraulic Design of storm drain facilities, including pipes, inlets, manholes, junction structures and appurtenances shall be in accordance with SBCFCD Hydraulic Design Manual, current edition.

For Arterial and Collector Streets: (See **Figure 6.1**)

Peak runoff during 25-year return frequency storm events shall be contained within curb-to-curb capacity of the street.

Peak runoff during 100-year return frequency storm events shall be contained within the limits of street rights-of-way, and the water surface elevation of the street flows shall be at least one foot lower than the lowest finished floor elevation of adjacent inhabitable structures.

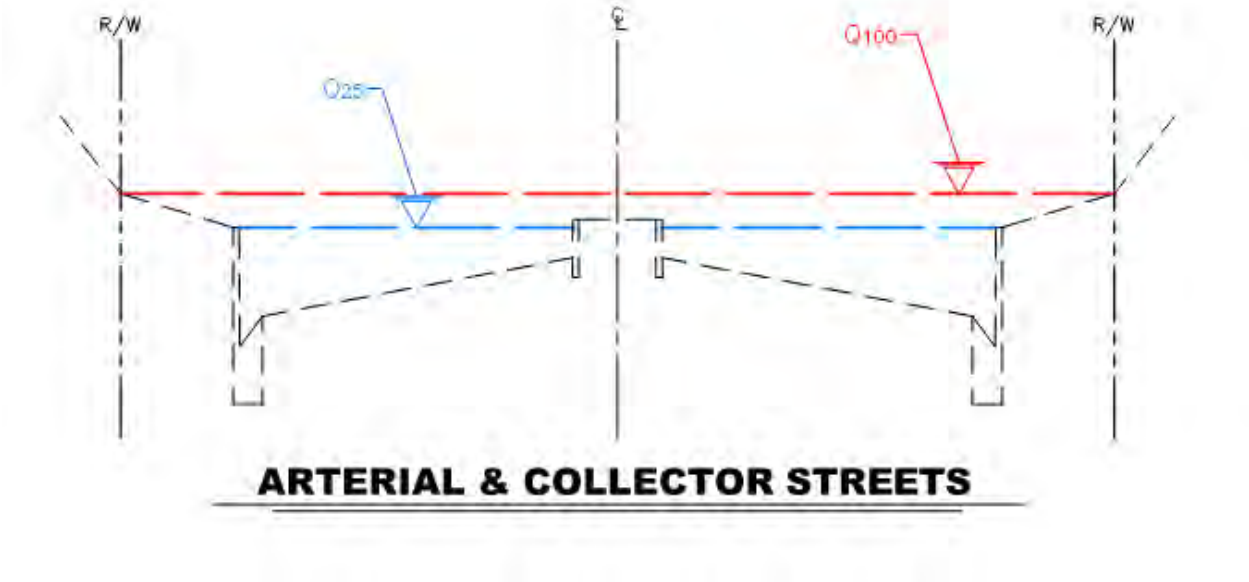

Figure 6.1

Based on the size of each drainage area, the Rational Method was used to calculate peak runoff for storms of 100-year return frequencies (Q100).

The runoff coefficient is based on the surface and sub-surface characteristics of the watershed. Most of the soils in the study area are comprised of well-draining sand and sandy loam, classified as Soil Groups A and B in the San Bernardino County the Hydrology Manual.

The 100-year event hydraulic analysis is performed using the LACDPW HydroCalc Calculator. Manning's Equation was used to determine the velocity and flow capacities of the pipe.

For the preliminary design, street capacities were not calculated. As part of the detailed design efforts, hydraulic capacities of the streets to convey surface flows at concentration nodes should be calculated using the Street Capacity Curves included in Appendix A of the City of Ontario Master Plan of Drainage.

New storm drainpipes are Reinforced Concrete Pipe (RCP) with a D-load capacity of 3750 lbs/ft/ft. The preliminary pipe designs are based on a Manning's roughness coefficient of 0.013, minimum slope of 0.50%, and flows of 75% full.

6.6. Proposed Drainage Improvements

The proposed drainage improvements are described in further detail in the Technical Drainage Study, Appendix B. Below is a summary of the proposed improvements:

6.6.1. East Avion Street

The grading and drainage concept for the preliminary design along East Avion Street maintains the existing flow patterns and drains towards longitudinal PCC gutters that are collected in an underground storm drainpipe network via side inlets. The underground system flows west to east, and ultimately discharges into the Cucamonga Channel.

The proposed drainage network is designed to collect the runoff generated from East Avion Street, and proposed improvements along to the north.

Additionally, the existing system is intercepted at the Golden Bridge site and re-routed into the proposed underground system within East Avion Street

6.6.2. East Jurupa Street

The grading and drainage concept for the preliminary design along East Jurupa Street maintains the existing flow patterns and drains towards proposed and existing side inlets. The inlets drain to the underground system utilizing the existing laterals where feasible.

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SECTION 7. ELECTRICAL POWER, LIGHTING AND TRAFFIC SIGNAL

7.1. Introduction

Electrical improvements for this project consist of street lighting, Southern California Edison (SCE) power relocation, and traffic signal design.

7.2. Southern California Edison (SCE)

Currently, existing SCE overhead power lines and power poles bisect the Golden Bridge Development. SCE will perform the work to relocate the power underground. As part of this project, the preliminary electrical layout plans show the proposed underground routing for these facilities.

HNTB has coordinated with Todd Wise at the Southern California Edison (SCE) previously regarding the potential relocation of an existing SCE overhead line located within the proposed Golden Bridge development footprint. At the time of this submittal SCE was still in the process of developing their preliminary relocation plans.

Figure 7.1 depicts the existing SCE overhead lines within the project limits.

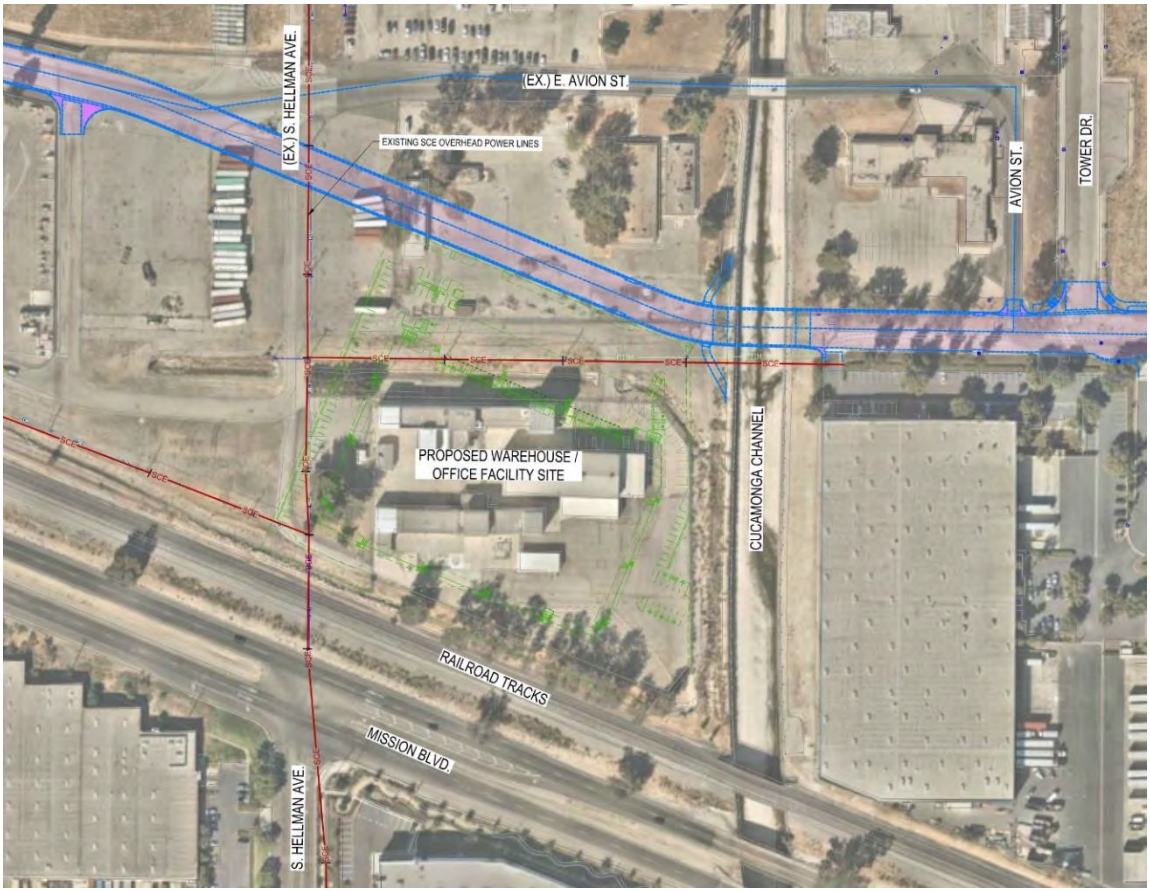

Figure 7.1

7.3. Street Lighting

All street lighting shall be designed in conformance with the current City of Ontario Standard Specifications and Standard Drawings.

For the preliminary design effort, a simple streetlight layout was designed with spacing equal to that of the existing for East Avion and East Jurupa Streets. The street lighting system consists of City of Ontario standard light poles, fixtures, pull boxes with 1-12" Schedule 80 conduit and (2) #8 and 1 #8 ground wires.

7.4. Traffic Signal

Traffic signal plans shall be designed based on the following guidelines and provisions:

- City of Ontario Master Provisions, Special Provisions for Traffic Signal Construction Projects.
- City of Ontario Traffic and Transportation Guidelines (August 2013)
- City of Ontario Approved Material List (AML) Led Luminaires

The traffic signal plan for the intersection of East Jurupa Street and South Archibald Ave was provided by the City of Ontario to be included in the preliminary design documents.

SECTION 8. STRUCTURAL

8.1. Introduction

The Cucamonga Channel Bridge is proposed as part of the realignment of East Avion Street and the widening of East Jurupa Street. The Plan view of the proposed bridge is provided below in **Figure 8.1**.

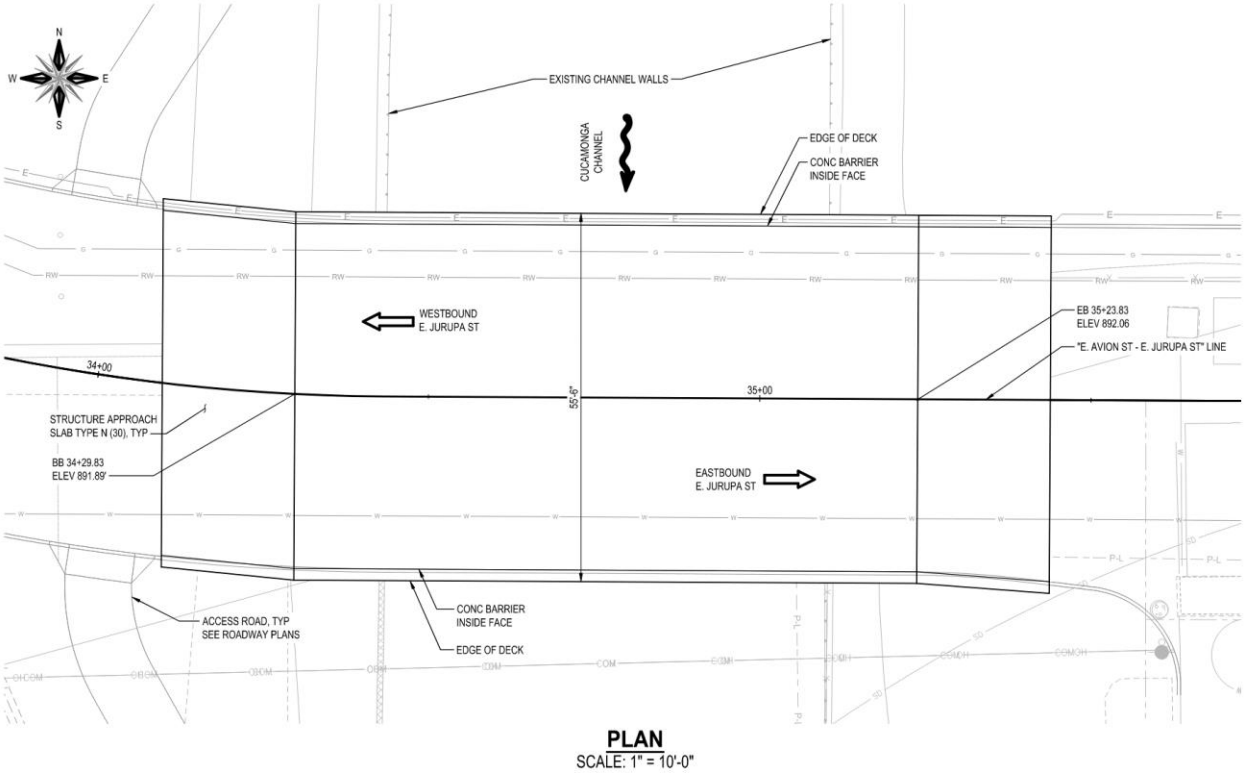

Figure 8.1: Plan view of the proposed Cucamonga Channel Bridge

The proposed Cucamonga Channel Bridge will be a 94'-0" long by 55'-6" wide prestressed and precast (PC/PS) wide flange girder bridge. The PC/PS girders will be standard Caltrans size CA WF48 spaced at 9'-7" for a total of 6 girders and an 8-inch reinforced concrete deck that will be poured once the girders are placed. The abutments will also be cast-in-place reinforced concrete with one row of 36" DIAM CIDH piles spaced at 7'-0". After girder installation, a second pour of concrete will be added to connect the girders to the abutment monolithically. A section view of the proposed bridge is provided in **Figure 8.2.**

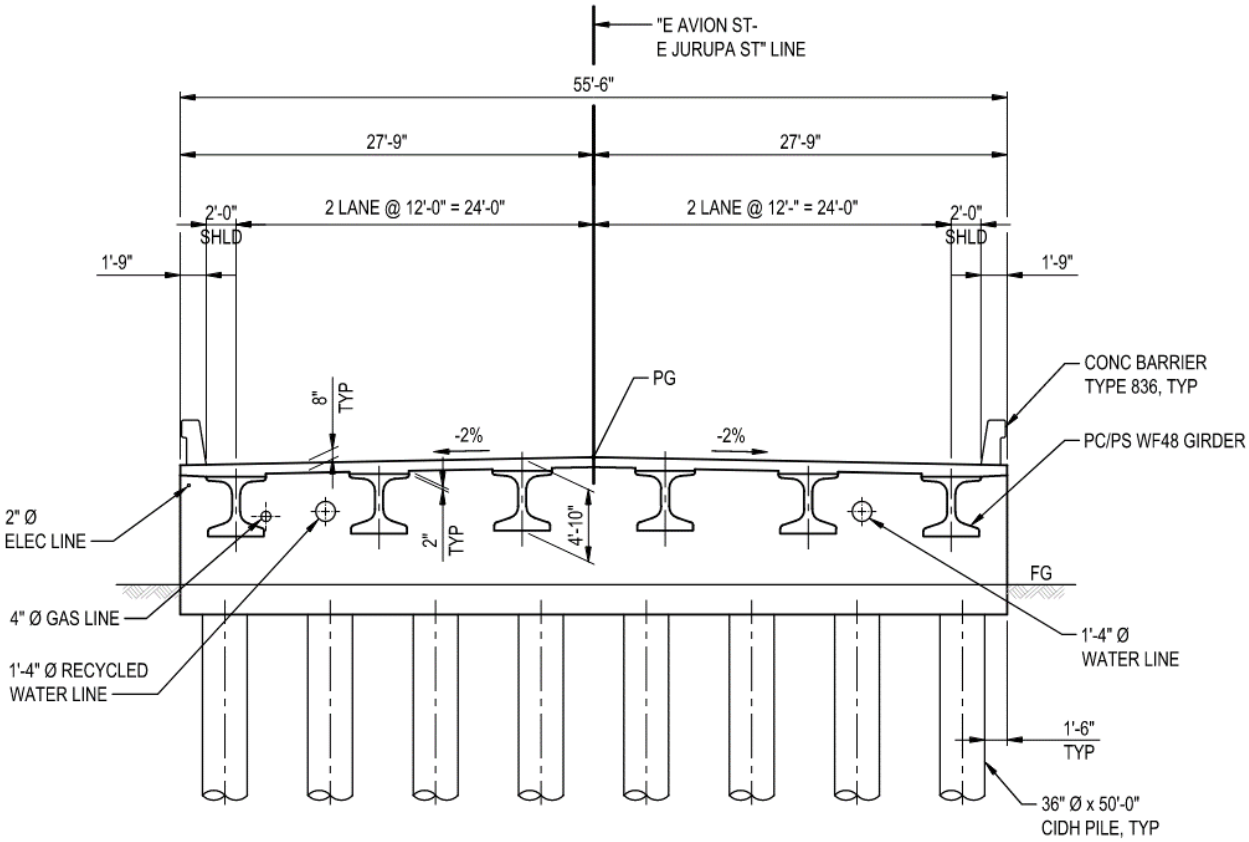

Figure 8.2: Typical section for the proposed Cucamonga Channel Bridge.

8.2. References and Design Assumptions

The preliminary bridge design was performed per the following references:

- AASHTO LFRD 8th Edition with California Amendments
- Caltrans Seismic Design Criteria 2.0
- Caltrans Engineering Manuals

The following are supportive documents and assumptions used in preliminary design:

- Appendix A – Ontario International Airport (ONT) Cucamonga Channel Bridge Type Selection Memorandum
- As-built boring logs as well as logs from a recent geotechnical project on the north side of the airport, used for preliminary design of the abutment and CIDH pile. It is recommended that a formal geotechnical investigation and report for this project site be develop as the next stage of design development
- Utility locations were coordinated with the civil engineer and shown in the typical section and plan view.

- A minimum of 10 ft spacing considered between the bridge substructure face and the Cucamonga Channel exterior, and the interaction between these two structures under various loadings along the bridge longitudinal axis was not considered in design at this stage.

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SECTION 9. ROUGH ORDER OF MAGNITUDE ESTIMATE OF PROBABLE COST AND PRELIMINARY PROJECT SEQUENCING

9.1. Introduction

HNTB retained Connico Incorporated as cost and scheduling consultants to provide an estimate of probable cost and a construction schedule report for the Realignment of East Avion St. and East Jurupa St. project. The estimate and schedule are based on the 30% complete plans and other information.

The Estimate of Probable Cost ant Project Sequencing Report are included herein as **Appendix C.**

9.2. Report Contents Summary

The report included in Appendix C covers the basis for the ROM and project sequencing as well as the following:

- Market Information
- 30% Design Cost Estimate
- Probable Construction Summary Schedule
- Probable Construction Detail Schedule.

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SECTION 10. PERMITTING

10.1. Introduction

Permitting for this project within the City of Ontario limits will largely be under the jurisdiction of the City's Building Department. The new bridge crossing the Cucamonga Channel will require permitting from the San Bernardino County Flood Control District (SBFCD) and the US Army Corp of Engineers

10.2. City of Ontario Permits

It is anticipated that the following City of Ontario permits, and plan checks will be required:

- Demolition Permit
- Grading Permit
- Light Pole Plans and Structural Calculations
- Electrical Plans and Calculations

10.3. County of San Bernardino Permits

It is anticipated that the following County of San Bernardino permits, and plan checks will be required:

- San Bernardino County requires Storm Sewer System Permit (MS4 Permit) and Water Quality Management plans (WQMP) to be prepared for all priority new development
- LID (Low Impact Design) Permit for Reducing Stormwater Runoff
- The SBFCD permitting process is as follows:
    1. Go to the District's website for the EZOP application- http://cms.sbcounty.gov/dpw/Operations/PermitsOperationsSupportDivision/FloodControl.aspx
    2. In addition to submitting a permit application and plans for review, include a letter giving a brief description of the project on letterhead.
    3. Include any environmental documents that have been obtained up to this point (not required at this time, but helpful)
    4. Include anything on the checklist that is applicable to the project

  Expected District review time for each submittal of plans, whether an initial submittal or secondary submittal is 3 to 4 weeks. Upon submitting the application, an acknowledgement email from the District will be sent requesting any applicable permit fees. A 408 permit will be required from the Corps of Engineers. The 408 permit must be issued before the District can issue its permit. All reviews by the Corps related to the 408 permit will be coordinated by the District. In order to initiate a 408-permit review, complete the Corps' Permit Application Checklist. The Corps' process for a 408 permit will take approximately **6 – 12 months** to complete, depending of course on the completeness of submittals.

10.4. Army Corp of Engineers

It is anticipated that the following Army Corp of Engineers permits, and plan checks will be required:

- Application for Department of Army Permit – Section 404 to discharge water
- 408 Permit (See Section 10.3 above)

Appendix A. Ontario International Airport (ONT) Cucamonga Channel Bridge Type Selection Memorandum

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HNTB

The HNTB Companies
Infrastructure Solutions

Ontario International Airport (ONT) Cucamonga Channel Bridge Type Selection Memorandum

March 24, 2021

Background

The Ontario International Airport Authority (OIAA) has engaged HNTB to prepare a 30% preliminary engineering plan set and basis of design for the realignment of East Avion Street (located on airport property) and the widening of Jurupa Street. The proposed realignment will require a new crossing of the U.S. Army Corps of Engineers (USACE)-owned Cucamonga Channel south of the existing East Avion Street bridge. The new crossing will be a longer span (due to its crossing location) and will have a wider roadway segment that crosses the bridge. As a component of the preliminary engineering effort, HNTB has prepared this type selection memorandum to define and evaluate three different structure types to cross the Cucamonga Channel.

Overview and Description of Alternatives

This memorandum evaluates three different alternatives based on the bridge span, construction cost, and vertical clearance, including: Channel Lid Structure, Cast-in-place Prestressed (CIP/PS) Concrete Box Girder, and Precast Prestressed (PC/PS) Concrete Girder. Advantages and drawbacks of each of these options are illustrated in this section. Recommendations are provided in the next section.

The proposed bridge deck will be 55.5 feet wide and will have a constant 2% superelevation. Caltrans standard structure approach Type N(30S) and standard Concrete Barrier Type 836 will be adequate for all proposed alternatives for the Cucamonga Channel overcrossing. The new overcrossing will be within the OIAA property and therefore no property acquisition is needed. USACE permitting is required for this project. In addition, the San Bernardino County Flood Control District will also require a permit if there are any modifications or connections to the channel structure.

The approximate cost of the proposed bridges, including superstructure and substructure are provided below:

- Channel Lid Structure: This type of structure, as noted in the analysis below, was not found to be viable and therefore its cost was not evaluated.
- CIP/PS Concrete Box Girder: $3.6 mil.
- PC/PS Concrete Wide Flange Girder: $3.2 mil.

New and existing utilities will have little significance on the new crossing of the Cucamonga Channel type selection and typical utility installation methods will be used for the new utilities. There will likely be a new water line 12” in diameter to be installed which is a significant consideration for any bridge design, however, it will not have a notable impact on the type selection. In addition, an existing 57” Reinforced Concrete Pipe (RCP) storm water line shown in **Figure 1** may affect abutment and pile locations and will need to be relocated. This is a common issue among all alternatives, but it should be noted that the box structure may be more advantageous as the abutment will be further away from the RCP, resulting in a smaller relocation of the RCP.

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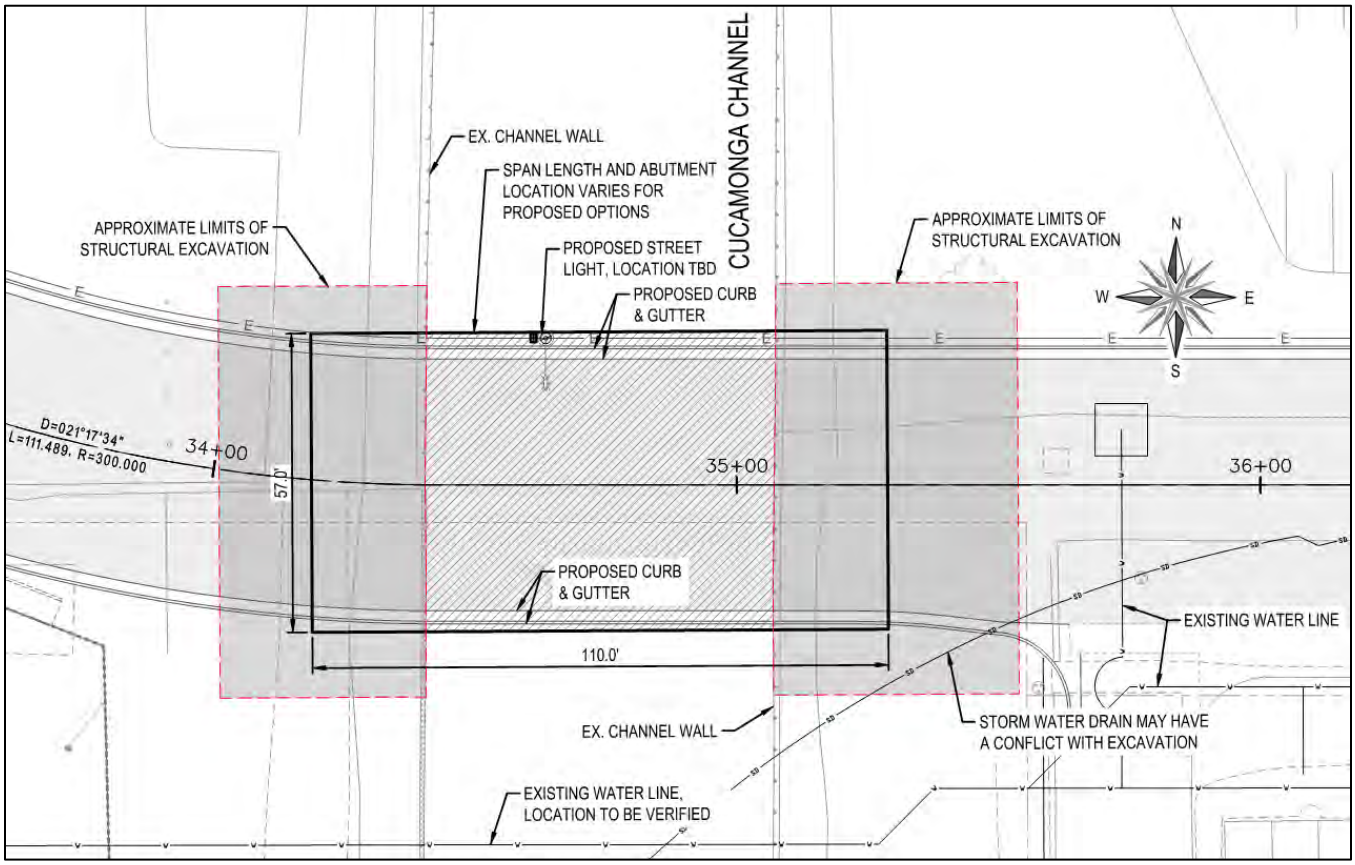
Figure 1: Estimated Location of Utilities in Relation to Proposed Structure



Note: The bridge length and width for proposed Option 2 is shown in this figure.

Option 1: Channel Lid Structure

The channel lid structure sketched in **Figure 2** is investigated for the new overcrossing as it is similar to the existing East Avion Street bridge located 345 ft upstream depicted in **Figure 3**. However, this application is not recommended. The channel at this location is longer, the proposed alignment is higher than the channel, and the channel slab and walls were designed for flood water and soil retaining only. This means that the existing structure cannot be simply copied for this application. Since the alignment, and therefore the bridge elevation, is significantly higher than the top of the channel walls, the channel walls will need to be raised and retrofitted to accommodate the added loads. The advantages of the channel lid structure would be lower impact on the existing utilities and a higher vertical clearance from the maximum water level than the other evaluated options since the girder depth is shallower. Refer to **Figure 1** for a plan view of the existing utilities.

The major drawback of this alternative is the significant level of retrofit for the channel structure to accommodate the additional bridge geometry and loading. The walls and the invert slab (bottom slab of channel) would need to be strengthened by thickening and providing additional reinforcement. Thickening the channel section needs to be done either only on the inside or outside to provide continuity of the reinforcing steel bars. Thickening the inside will require temporary closure of the channel and induce permanent impacts to channel flow. Thickening the outside will require excavation under the current invert, which would likely cause significant issues such as temporary vertical support for the channel during excavation and long-term settlement due to the lack of compaction. Neither retrofit method is deemed feasible because of the significant impact on the channel operation, construction cost, and poor constructability.

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Figure 2: Proposed Channel Lid Structure over Existing Channel

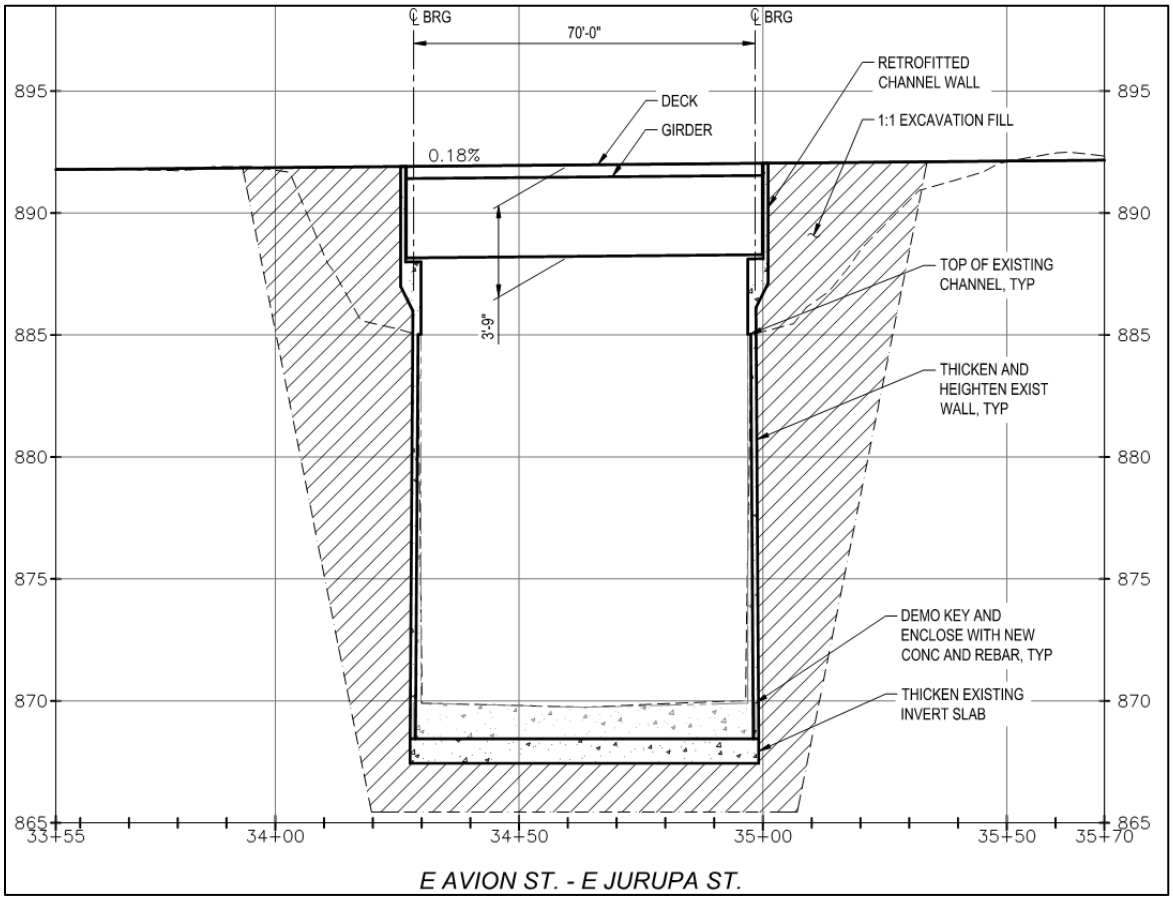
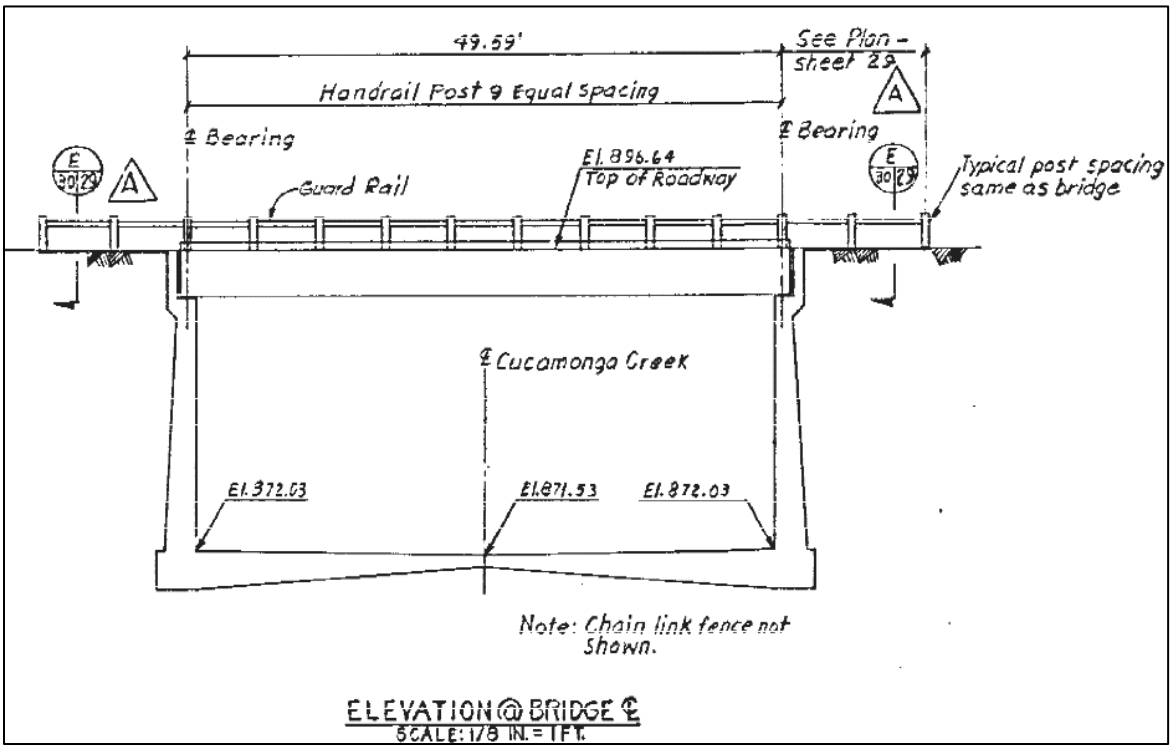


Figure 3: Existing East Avion Street "Box Structure" Cross Section



Note: This structure uses the channel walls as abutments and is significantly shorter in span length than the proposed bridge.

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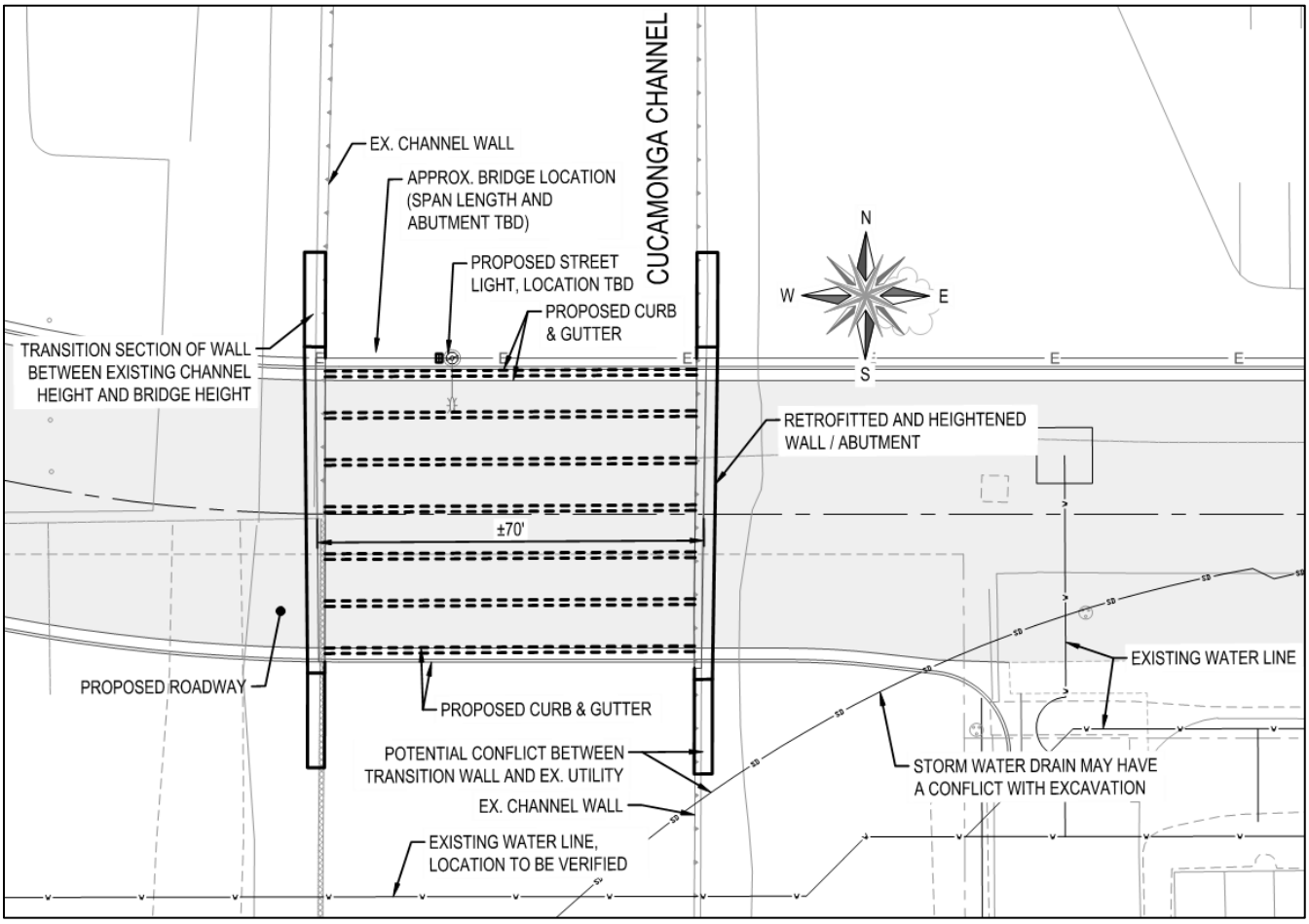
Figure 4: Plan View of Proposed Box Structure



Note: This plan view shows that the extent of channel retrofit extends beyond the bridge width.

Option 2: CIP/PS Concrete Box Girder

As shown in **Figure 5**, the CIP/PS concrete box girder bridge will be a one span bridge utilizing 5'-0" depth with a total length of 110 ft. The proposed superstructure is the most common roadway bridge type in the state of California, and therefore the construction quality is not likely to be a concern. The one-span superstructure will be supported on seat type abutment supported by pile caps and piles at Abutments 1 and 2. A minimum of 10 ft spacing is considered between the bridge substructure face and the Cucamonga Channel exterior to minimize the interaction between these two structures under various loadings along the bridge longitudinal axis. It is important to note that this option will require the longest bridge span length. Therefore, as shown in **Figure 1**, the bridge width shall be slightly increased to 57 ft to accommodate the roadway curvature at the west side of the bridge.

After the abutments and piles are erected, the girders and deck will be cast in place concrete. Unlike precast concrete, falsework will be necessary to support the box girders and deck slab concrete during erection, and the falsework will require temporary closure of the channel. It will also require a longer construction duration in the channel, and therefore it is a less favorable choice compared to the PC/PS concrete girder alternative (Option 3).

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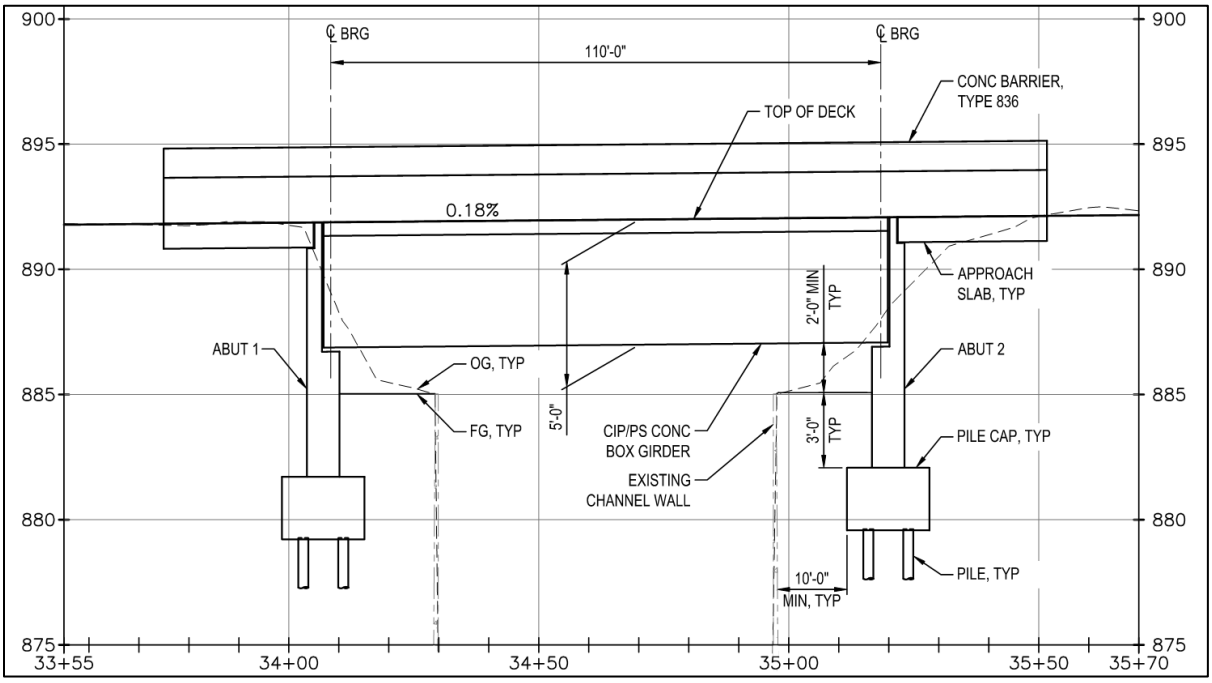
Figure 5: Elevation View of Proposed CIP/PS Concrete Box Girder



Note: This view shows the bridge superstructure and substructure.

Option 3: PC/PS Concrete Girder

As shown in **Figure 6**, the proposed PC/PS concrete girder bridge will be a one span bridge utilizing 5'-0" depth with a total length of 100 ft. The superstructure will be supported on seat type abutment supported on piles at Abutments 1 and 2. Since in PC/PS concrete girder, the superstructure will be connected to the abutments, the abutments can be placed without the pile cap and the number of piles are expected to be less than the CIP/PS concrete girder option. A minimum of 10 ft spacing is considered between the abutment and the Cucamonga Channel exterior to minimize the interaction between these two structures under various loadings along the bridge's longitudinal axis. Since pile cap is not needed in this type of bridge, the span length is reduced to 100 ft.

With the girders being fabricated prior to being transported to the constructions site, the PC/PS construction time is less than the CIP/PS option. In addition, temporary shoring during construction is not required. The bridge deck slab will be cast in place, but falsework is not necessary in the channel since the PC girders will support the deck forms. Therefore, this type of bridge is a viable option for construction over the Cucamonga Channel.

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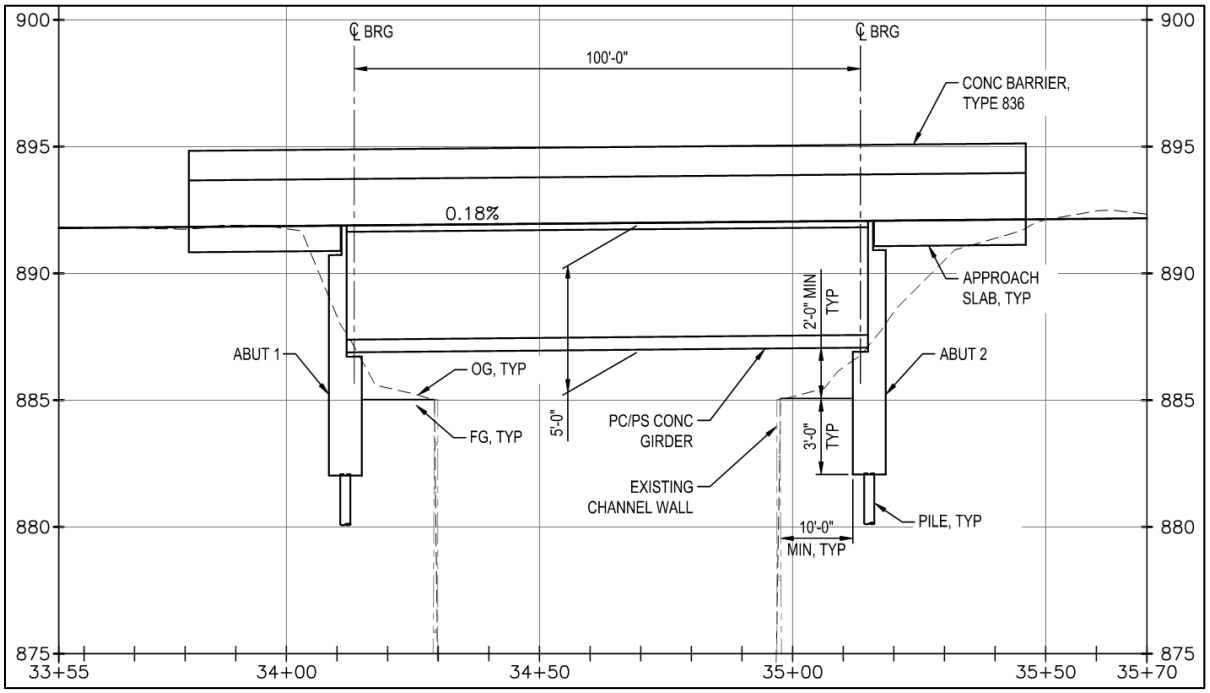
Figure 6: Elevation View of Proposed PC/PS Concrete Girder



Note: This view shows the bridge superstructure and substructure.

Recommendations

Three different crossing types were investigated in this report: Channel Lid Structure, CIP/PS Concrete Box Girder, and PC/PS Concrete Girder. Based on the span length, cost, and construction considerations, the PC/PS Concrete Girder (Option 3) is considered the most favorable superstructure type for the new Cucamonga Channel overcrossing. This type of superstructure does not require falsework and will be the fastest option to construct among the three alternatives identified in this memorandum. In addition, this option is less costly in comparison to the CIP/PS concrete box girder.

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Appendix B. Draft Technical Drainage Study

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PRELIMINARY TECHNICAL DRAINAGE STUDY

Ontario International Airport
Ontario, California

Ontario Planning and Support Services:
Realignment of East Avion and East Jurupa Street

Prepared For:

Prepared By:

HNTB

The HNTB Companies
Infrastructure Solutions

3633 Inland Empire Blvd, Suite 750
Ontario, CA 91764

6/10/2021

TABLE OF CONTENTS

1. INTRODUCTION AND PURPOSE OF REPORT

Ontario International Airport (ONT), under the management of the Ontario International Airport Authority (OIAA), is planning to realign the existing East Avion Street as well as widen the existing East Jurupa Street in anticipation for future development in the area. HNTB is tasked by OIAA to provide preliminary engineering design efforts, which include the development of 30% design plans.

In addition, HNTB is tasked by OIAA to analyze the impacts the proposed improvements described above will have on the existing onsite drainage system and outline any required additions and/or upgrades to ensure positive drainage away from the site. The realigned and widened roadway is approximately 239,813 ft^2 (5.51 acres) and proposes to construct new roadway, curb and gutter, sidewalks, curb ramps, subsurface utilities (including storm drain) and landscaped areas. This report will establish the drainage design improvements, considerations and compliance based on the latest available data (May 2021).

2. PROJECT DESCRIPTION & DRAINAGE AREA OVERVIEW

The project site of East Avion Street and East Jurupa Street is located south of the Ontario International Airport (ONT). East Avion Street is an east/west collector roadway that is roughly bound by south Vineyard Avenue to the west, the Cucamonga Channel to the east, Mission Boulevard to the south, and ONT property to the north. Likewise, East Jurupa Street is an east/west industrial collector roadway that is roughly bound by Cucamonga Channel to the west, Archibald Avenue to the east, Mission Boulevard to the south and Lowell Street to the north. Connecting these two roadways is a bridge structure that runs over the Cucamonga Channel.

The realignment of East Avion Street and widening of East Jurupa Street is collaborated in conjunction with a new proposed warehouse and office facility to the west of the Cucamonga Channel as well as a proposed UPS expansion facility to the north of the existing East Jurupa Street, see ***Figure 2.1.***

Preliminary engineering design services were provided for two components: (1) Realignment of East Avion Street and (2) Widening of East Jurupa Street. The realignment of East Avion Street maintains the existing alignment of East Avion Street between Vineyard Avenue and Hellman Avenue. Afterwards, Avion Street diverges from existing Avion Street, splitting off diagonally to provide a more direct connection to the existing East Jurupa Street. In the process, existing buildings will need to be removed from the site as well as coordination with local utility companies to relocate existing electrical and communication power lines and power poles. A new bridge structure will be constructed to connect the new Avion Street to East Jurupa Street. The widening of East Jurupa St begins to the east of the Cucamonga Channel. East Jurupa Street will be widened from the existing 32’ to a new 64’ roadway along with a new 12’ sidewalk and curb and gutter.

From the topographic survey, it was determined that runoff currently flows from the northwest corner of the site to the south-east. Despite an existing storm drain line on the

South of East Avion Street, however it is unclear the pipe size and tributary areas collected by the existing system. In addition, some of the existing inlets are located behind the existing CMU walls and do not appear to collect runoff for a few areas along East Avion. As such it was assumed in this report that the proposed subsurface drainage system installed underneath East Avion St will be collecting runoff from the new roadway as well as all the areas to the north. This conservative approach was taken to ensure an adequate drainage pipe size for future developments. Ultimately, surface runoff will be conveyed via this subsurface storm drain system and discharge the flow into the Cucamonga Channel that is owned and operated by the US Army Corp of Engineers.

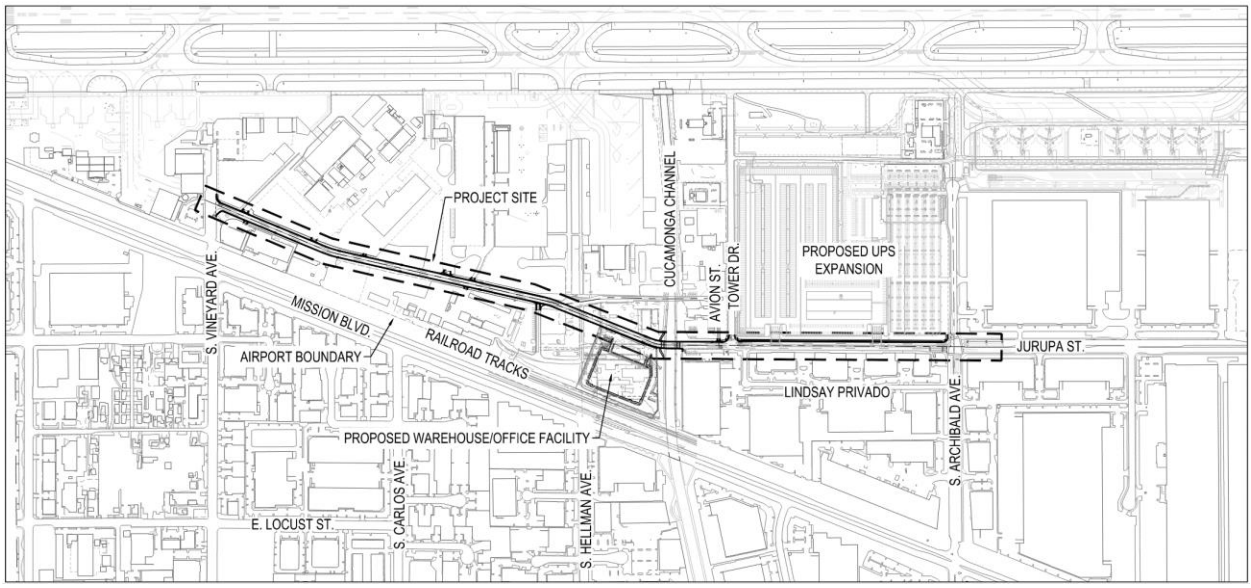

Figure 2.1: Project Vicinity Map

3. FEMA FLOOD ZONE DETERMINATION

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), the project site is located across two community panel numbers: 06071C8636J (effective February 18, 2015) and 06071C8637J (effective September 2nd, 2016). Majority of the project site lies within 06071C8636J, which has a combination of Zone AO, an area inundated by 1% annual chance flooding for which average flood depth is 2', and Zone X, which is described as an area determined to have a 0.2% Annual Chance Flood, see ***Figure 3.1.*** A small portion of this project at the intersection of East Jurupa Street and Archibald Avenue is under 06071C8637J and falls under Zone X. The classification of this project site as Zone AO expresses the importance of the sub-surface drainage system that will be installed as part of this project scope.

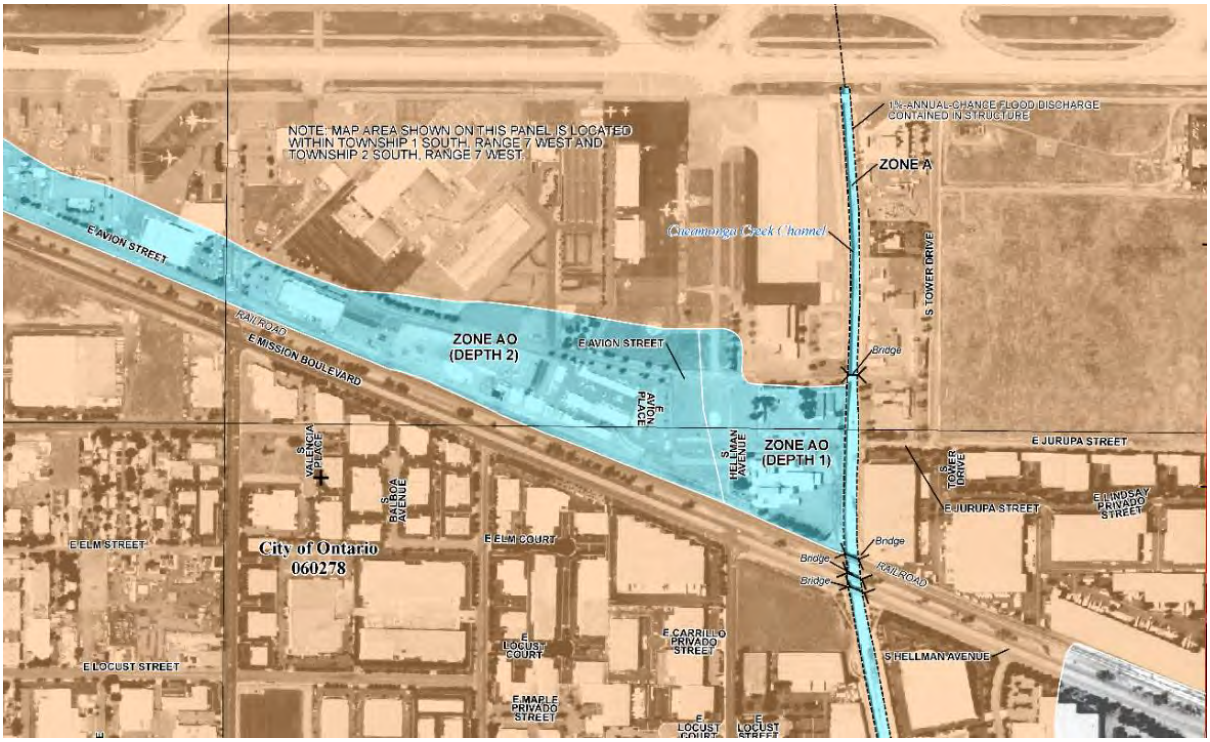

Figure 3.1: FEMA Flood Insurance Rate Map for 06071C8636J

4. DRAINAGE BASIN DESCRIPTIONS

4.1 Site Description

The project is along East Avion and East Jurupa Street, roughly bound by Vineyard Avenue to the west, Archibald to the east, Mission Boulevard to the south and the Ontario International Airport to the north.

4.2 Existing Onsite Drainage Basin Conditions

Based on the existing site topography, the onsite drainage ultimately outflows to the Cucamonga Channel. On East Avion Street, onsite drainage flows from the west to the east,

while on East Jurupa Street onsite drainage flows from the east to the west. The primary soil type for the onsite basin is Hydrologic Group A: Tujunga Loamy Sand (13,033 AC). This is obtained from the Soils Map as provided in the City of Ontario Master Plan of Drainage, see **Figure 4.2.1.**

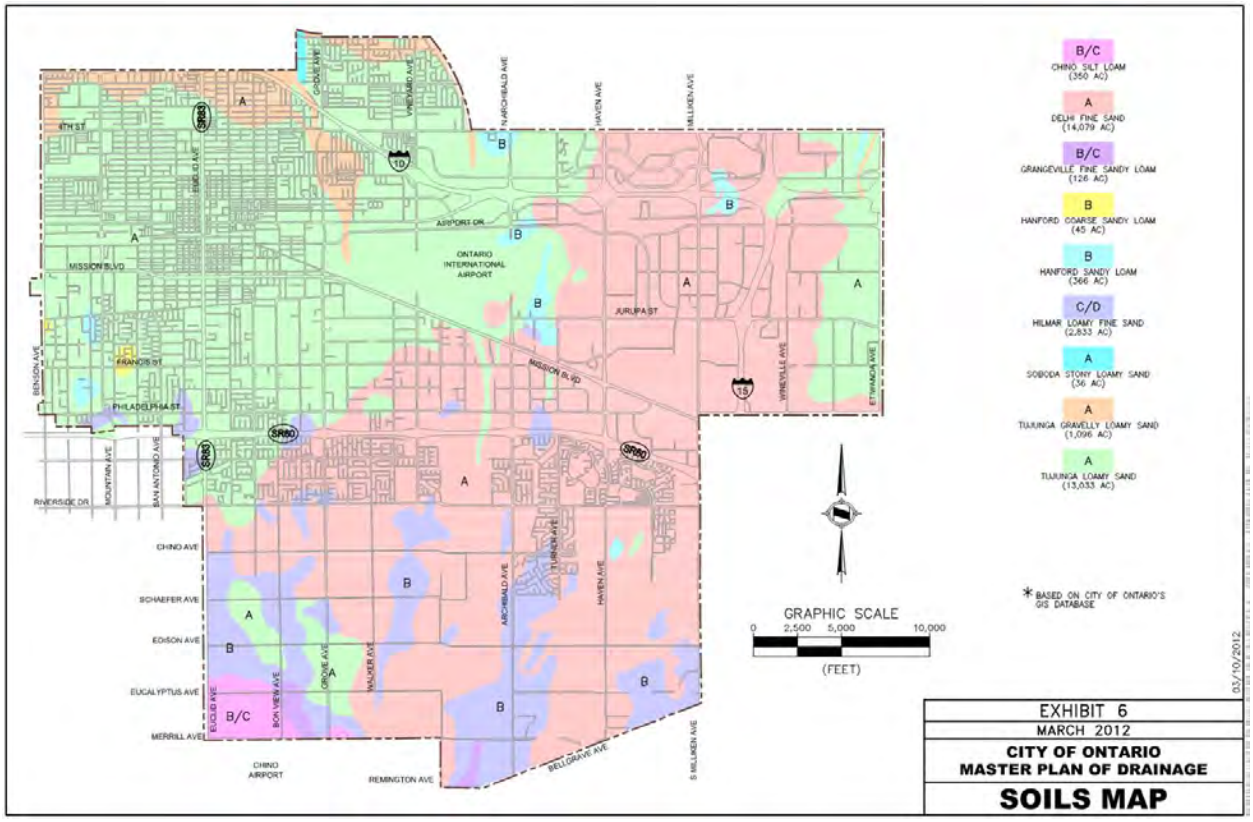

Figure 4.2.1: City of Ontario Master Plan of Drainage Soils Map

4.3 Proposed Onsite Drainage Conditions

Proposed onsite drainage conditions will mirror existing conditions, with the ultimate outflow from the site to the Cucamonga Channel utilizing an existing headwall and outlet at the channel. New catch basins and subsurface drainage systems will be installed along East Avion St, in addition the proposed storm drain system will intercept the existing storm drain system and convey the runoff to the Cucamonga channel. New catch basins and subsurface storm drain laterals will be installed along East Jurupa to ensure proper drainage away from the site.

Figure 4.3.1 breaks down the project site and its subareas.

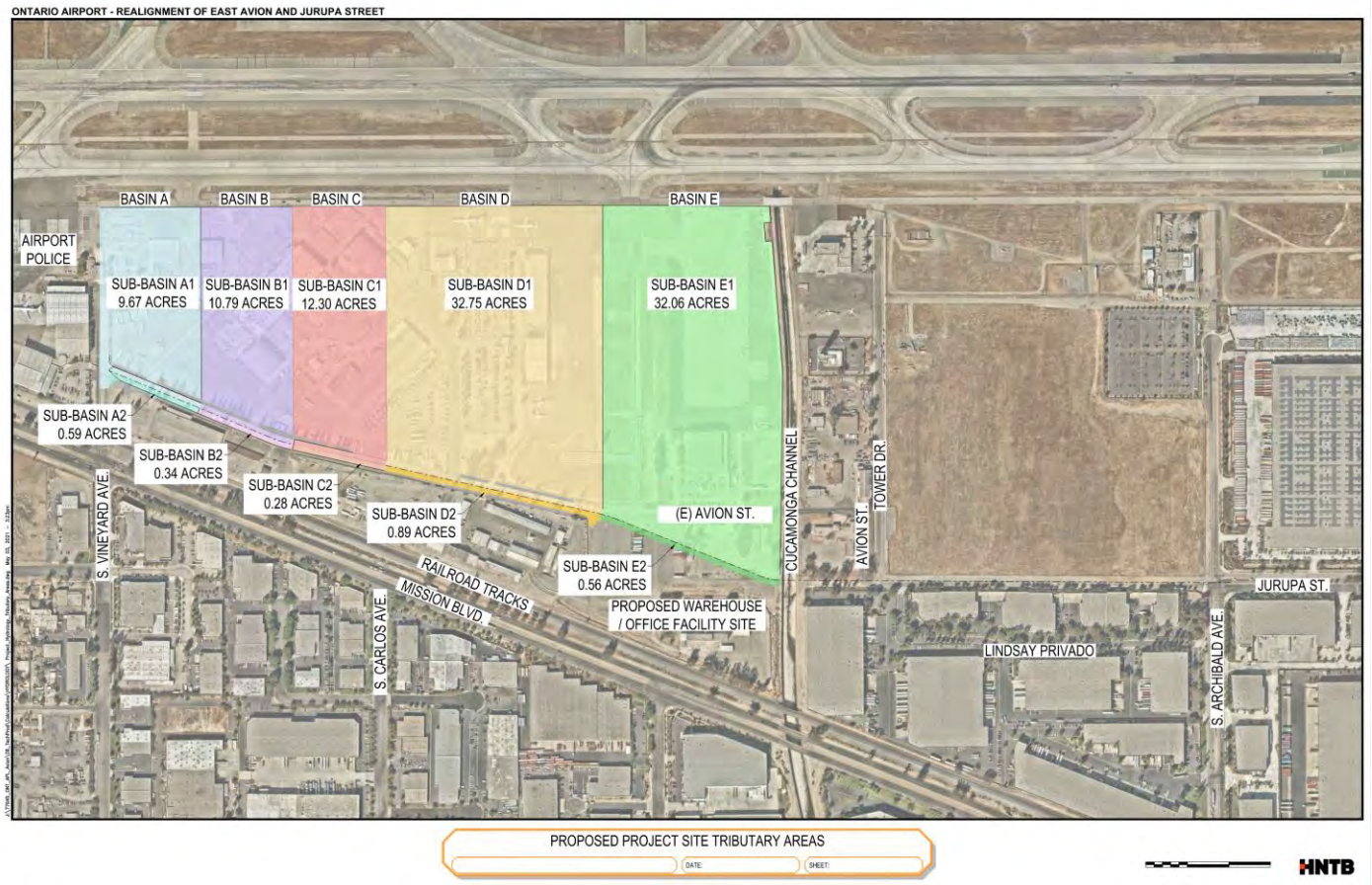

Figure 4.3.1: Proposed Site Basin and Sub-Areas

5. HYDROLOGY CRITERIA

The City of Ontario Master Plan of Drainage and San Bernardino County Hydrology Manual was used to develop the hydrological parameters for the hydrology analyses. The rational method was used for the analyses and the computations were performed using the HydroCalc computer model to simulate the onsite surface runoff and calculate the basin (Q) flow based on a 10-year, 25-year and 100-year storm event.

5.1 Hydrology Parameters

The precipitation values were obtained from the NOAA Atlas 14 Website, which provided the intensity parameter of depth (inches) used for the runoff analyses, see **Figure 5.1 and Table 5.1.**

Storm Event	24-Hour
10-Year	4.11 in
25-Year	4.94 in
100-Year	6.15 in

Table 5.1: Precipitation Values

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.117** (0.097-0.141)	**0.154** (0.128-0.187)	**0.201** (0.167-0.244)	**0.237** (0.195-0.290)	**0.283** (0.225-0.359)	**0.317** (0.247-0.412)	**0.350** (0.266-0.466)	**0.382** (0.282-0.524)	**0.424** (0.299-0.607)	**0.455** (0.310-0.675)
10-min	**0.167** (0.139-0.202)	**0.221** (0.184-0.268)	**0.287** (0.239-0.349)	**0.339** (0.279-0.416)	**0.406** (0.323-0.515)	**0.455** (0.354-0.590)	**0.502** (0.381-0.668)	**0.548** (0.404-0.751)	**0.608** (0.429-0.870)	**0.652** (0.444-0.967)
15-min	**0.202** (0.169-0.245)	**0.267** (0.222-0.324)	**0.348** (0.289-0.423)	**0.410** (0.338-0.503)	**0.491** (0.391-0.623)	**0.550** (0.428-0.713)	**0.607** (0.460-0.808)	**0.663** (0.489-0.909)	**0.735** (0.519-1.05)	**0.788** (0.537-1.17)
30-min	**0.309** (0.258-0.374)	**0.408** (0.340-0.495)	**0.531** (0.442-0.646)	**0.627** (0.517-0.769)	**0.750** (0.597-0.953)	**0.840** (0.654-1.09)	**0.928** (0.704-1.24)	**1.01** (0.747-1.39)	**1.12** (0.793-1.61)	**1.21** (0.821-1.79)
60-min	**0.455** (0.380-0.551)	**0.601** (0.501-0.729)	**0.782** (0.650-0.951)	**0.923** (0.761-1.13)	**1.11** (0.879-1.40)	**1.24** (0.963-1.61)	**1.37** (1.04-1.82)	**1.49** (1.10-2.05)	**1.66** (1.17-2.37)	**1.77** (1.21-2.63)
2-hr	**0.675** (0.563-0.817)	**0.890** (0.742-1.08)	**1.16** (0.960-1.41)	**1.36** (1.12-1.67)	**1.62** (1.29-2.06)	**1.82** (1.41-2.36)	**2.00** (1.52-2.66)	**2.18** (1.61-2.99)	**2.41** (1.70-3.45)	**2.58** (1.76-3.82)
3-hr	**0.840** (0.701-1.02)	**1.11** (0.922-1.34)	**1.44** (1.19-1.75)	**1.69** (1.39-2.07)	**2.01** (1.60-2.56)	**2.25** (1.75-2.92)	**2.47** (1.88-3.29)	**2.70** (1.99-3.69)	**2.98** (2.10-4.26)	**3.18** (2.17-4.72)
6-hr	**1.18** (0.985-1.43)	**1.55** (1.30-1.88)	**2.01** (1.67-2.45)	**2.37** (1.95-2.90)	**2.82** (2.25-3.58)	**3.15** (2.45-4.09)	**3.47** (2.63-4.62)	**3.78** (2.79-5.18)	**4.18** (2.95-5.98)	**4.47** (3.04-6.63)
12-hr	**1.53** (1.27-1.85)	**2.01** (1.67-2.43)	**2.60** (2.16-3.17)	**3.07** (2.53-3.76)	**3.66** (2.91-4.65)	**4.10** (3.19-5.32)	**4.52** (3.43-6.01)	**4.93** (3.63-6.76)	**5.46** (3.85-7.81)	**5.85** (3.98-8.68)
24-hr	**2.01** (1.78-2.32)	**2.66** (2.35-3.07)	**3.48** (3.07-4.02)	**4.11** (3.60-4.80)	**4.94** (4.18-5.96)	**5.55** (4.61-6.83)	**6.15** (4.98-7.75)	**6.74** (5.31-8.73)	**7.51** (5.68-10.1)	**8.08** (5.91-11.3)
2-day	**2.38** (2.10-2.74)	**3.20** (2.83-3.70)	**4.26** (3.75-4.93)	**5.10** (4.46-5.95)	**6.22** (5.26-7.49)	**7.06** (5.85-8.68)	**7.89** (6.39-9.94)	**8.74** (6.88-11.3)	**9.86** (7.46-13.3)	**10.7** (7.83-14.9)
3-day	**2.53** (2.24-2.92)	**3.45** (3.05-3.98)	**4.65** (4.10-5.38)	**5.61** (4.91-6.55)	**6.91** (5.85-8.33)	**7.90** (6.55-9.72)	**8.90** (7.21-11.2)	**9.92** (7.82-12.8)	**11.3** (8.54-15.2)	**12.4** (9.03-17.2)
4-day	**2.72** (2.40-3.13)	**3.73** (3.30-4.31)	**5.06** (4.46-5.85)	**6.13** (5.37-7.16)	**7.60** (6.43-9.15)	**8.72** (7.23-10.7)	**9.86** (7.99-12.4)	**11.0** (8.69-14.3)	**12.6** (9.55-17.0)	**13.9** (10.1-19.3)
7-day	**3.21** (2.84-3.70)	**4.43** (3.92-5.12)	**6.04** (5.33-6.99)	**7.36** (6.44-8.59)	**9.16** (7.76-11.0)	**10.6** (8.76-13.0)	**12.0** (9.70-15.1)	**13.5** (10.6-17.4)	**15.5** (11.7-20.9)	**17.0** (12.5-23.8)
10-day	**3.49** (3.09-4.02)	**4.83** (4.27-5.58)	**6.61** (5.83-7.65)	**8.08** (7.07-9.42)	**10.1** (8.54-12.2)	**11.7** (9.67-14.3)	**13.3** (10.7-16.7)	**14.9** (11.8-19.3)	**17.2** (13.0-23.2)	**19.0** (13.9-26.5)
20-day	**4.22** (3.74-4.87)	**5.93** (5.24-6.84)	**8.22** (7.24-9.51)	**10.1** (8.85-11.8)	**12.8** (10.8-15.4)	**14.8** (12.3-18.3)	**17.0** (13.8-21.4)	**19.3** (15.2-24.9)	**22.4** (16.9-30.2)	**24.9** (18.2-34.7)
30-day	**4.91** (4.34-5.66)	**6.91** (6.11-7.98)	**9.63** (8.49-11.1)	**11.9** (10.4-13.9)	**15.1** (12.8-18.2)	**17.6** (14.6-21.7)	**20.3** (16.4-25.5)	**23.1** (18.2-29.9)	**27.0** (20.4-36.4)	**30.1** (22.0-42.0)
45-day	**5.92** (5.24-6.83)	**8.33** (7.36-9.61)	**11.6** (10.2-13.4)	**14.4** (12.6-16.8)	**18.3** (15.5-22.1)	**21.5** (17.8-26.4)	**24.8** (20.1-31.2)	**28.3** (22.3-36.6)	**33.3** (25.2-44.9)	**37.3** (27.3-52.1)
60-day	**6.94** (6.14-8.00)	**9.68** (8.56-11.2)	**13.4** (11.9-15.6)	**16.7** (14.6-19.4)	**21.2** (18.0-25.6)	**24.9** (20.7-30.6)	**28.8** (23.3-36.3)	**33.0** (26.0-42.8)	**39.0** (29.5-52.6)	**43.8** (32.1-61.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Figure 5.1: Precipitation Values from NOAA Atlas 14

The value of slope of intensity was determined based on the provided topographic files and matched existing/proposed roadway grades. These values varied depending on location and can be found in **Section 7 – HYDRAULIC ANALYSIS: ON-SITE STORM DRAIN FACILITIES.**

6. HydroCalc RATIONAL METHOD RESULTS

6.1 On-Site Rational Method Hydrology

The rational method was used to determine peak flow rates for the proposed project site to properly size new subsurface storm drain systems, laterals and catch basins. The site was modeled as one watershed but was broken down into individual sub-areas to accurately capture runoff in the varying impervious and pervious terrain of this project site. The following table depicts the results from the Rational Method computed via HydroCalc for all sub-surface storm drain systems. As mentioned above, the basin will be dewatered via an existing outlet structure at the Cucamonga Channel.

Storm Drain System	10-Year Peak Flow Rate (cfs)	25-Year Peak Flow Rate (cfs)	100-Year Peak Flow Rate (cfs)
SD Line A1 "SD-A1"	11.9109	15.5954	21.4269
SD Line A2 "SD-A2"	0.7031	0.9948	1.4099
SD Line B "SD-B"	12.614	16.5902	22.8368
SD Line B1 "SD-B1"	12.917	16.8464	23.0258
SD Line B2 "SD-B2"	0.4916	0.647	0.8957
SD Line C "SD-C"	26.0226	34.0836	46.7583
SD Line C1 "SD-C1"	14.3344	18.6302	26.2482
SD Line C2 "SD-C2"	0.4777	0.6255	0.8594
SD Line D "SD-D"	40.8347	53.3393	73.8659
SD Line D1 "SD-D1"	33.3399	43.6533	61.6095
SD Line D2 "SD-D2"	1.0959	1.514	2.0992
SD Line E "SD-E"	75.2705	98.5066	137.5746
SD Line E1 "SD-E1"	32.6375	42.7336	58.7128
SD Line E2 "SD-E2"	0.8226	1.0579	1.5014
SD Line F "SD-F"	108.7306	142.2981	197.7888

Table 6.1: Rational Method Results

7. HYDRAULIC ANALYSIS: ON-SITE STORM DRAIN FACILITIES

The following storm drain systems were strategically designed to capture the 24-hour-100-year peak flow storm water generated by the onsite basin and convey the Q100 to inlet locations with the intent to ultimately discharge the storm drain water to the Cucamonga Channel via an existing outflow structure.

7.1 "SD-A1" & "SD-A2"

"SD-A1" storm drain lateral system consists of 34 LF of 24" Reinforced Concrete Pipe @ 1.50% that connects a proposed side opening catch basin to the proposed mainline "SD Line B". This lateral system will capture runoff generated from Sub-Area A1 (9.67 acres) with a critical travel path of 1410.15', slope of travel at 1.5% and a calculated Q_{100} at 21.43 cfs. Sub-Area A1 was determined to be 98.32% impervious pavement and 1.68% pervious soils.

"SD-A2" storm drain lateral system consists of 23 LF of 18" Reinforced Concrete Pipe that connects a proposed side opening catch basin to the proposed mainline "SD Line B". This

lateral system will capture runoff generated from Sub-Area A2 (0.59 acres) with a critical travel path of 479', slope of travel at 1.50% and a calculated Q_{100} at 1.41 cfs. Sub-Area A2 was determined to be 69.15% impervious pavement and 30.85% pervious soils.

7.2 "SD-B"

"SD-B" is a mainline storm drain system that consists of 475.5 LF of 27" Reinforced Concrete Pipe @ 0.66% slope that connects "SD-A1" and "SD-A2" laterals to mainline "SD-C". "SD-B" conveys runoff generated by Basin A (Q_{100} at 22.84 cfs) and is part of the mainline sub-surface storm drain system that will dewater the project site to the Cucamonga Channel.

7.3 "SD-B1" & "SD-B2"

"SD-B1" storm drain lateral system consists of 32.5 LF of 24" Reinforced Concrete Pipe that connects a proposed side opening catch basin to the proposed mainline "SD Line B". This lateral system will capture runoff generated from Sub-Area B1 (10.79 acres) with a critical travel path of 1540', slope of travel at 1.50% and a calculated Q_{100} at 23.03 cfs. Sub-Area B1 was determined to be 98.39% impervious pavement and 1.61% pervious soils.

"SD-B2" storm drain lateral system consists of 21 LF of 18" Reinforced Concrete Pipe that connects a proposed side opening catch basin to the proposed mainline "SD Line B". This lateral system will capture runoff generated from Sub-Area B2 (0.34 acres) with a critical travel path of 511', slope of travel at 0.71% and a calculated Q_{100} at 0.90 cfs. Sub-Area B2 was determined to be 85.32% impervious pavement and 14.68% pervious soils.

7.4 "SD-C"

"SD-C" is a mainline storm drain system that consists of 460 LF of 42" Reinforced Concrete Pipe @ 0.50% slope that connects "SD-B" and laterals "SD-B1" and "SD-B2" to "SD-D" and laterals "SD-C1" and "SD-C2". "SD-C" conveys runoff generated by Basin A (Q_{100} at 22.84 cfs) and Basin B (Q_{100} at 23.92 cfs) for a cumulative Q_{100} of 46.76 cfs and is part of the mainline sub-surface storm drain system that will dewater the project site to the Cucamonga Channel.

7.5 "SD-C1" & "SD-C2"

"SD-C1" storm drain lateral system consists of 32.5 LF of 24" Reinforced Concrete Pipe that connects a proposed side opening catch basin to the proposed mainline "SD Line C". This lateral system will capture runoff generated from Sub-Area C1 (12.30 acres) with a critical travel path of 1670', slope of travel at 1.50% and a calculated Q_{100} at 26.25 cfs. Sub-Area C1 was determined to be 99.27% impervious pavement and 0.73% pervious soils.

"SD-C2" storm drain lateral system consists of 21 LF of 18" Reinforced Concrete Pipe that connects a proposed side opening catch basin to the proposed mainline "SD Line C". This lateral system will capture runoff generated from Sub-Area C2 (0.28 acres) with a critical travel path of 475', slope of travel at 1.50% and a calculated Q_{100} at 0.86 cfs. Sub-Area C2 was determined to be 100% impervious pavement.

7.6 "SD-D"

"SD-D" is a mainline storm drain system that consists of 600 LF of 48" Reinforced Concrete Pipe @ 0.50% slope that connects "SD-C" and laterals "SD-C1" and "SD-C2" to "SD-E" and laterals "SD-D1" and "SD-D2". "SD-D" conveys runoff generated by Basin A (Q_{100} at 22.84 cfs), Basin B (Q_{100} at 23.92 cfs) and Basin C (Q_{100} at 27.11 cfs) for a cumulative Q_{100} of 73.87 cfs and is part of the mainline sub-surface storm drain system that will dewater the project site to the Cucamonga Channel.

7.7 "SD-D1" & "SD-D2"

"SD-D1" storm drain lateral system consists of 32.5 LF of 36" Reinforced Concrete Pipe that connects a proposed side opening catch basin to the proposed mainline "SD Line D". This lateral system will capture runoff generated from Sub-Area D1 (32.75 acres) with a critical travel path of 2506', slope of travel at 1.50% and a calculated Q_{100} at 61.61 cfs. Sub-Area D1 was determined to be 99.39% impervious pavement and 0.61% pervious soils.

"SD-D2" storm drain lateral system consists of 21 LF of 18" Reinforced Concrete Pipe that connects a proposed side opening catch basin to the proposed mainline "SD Line D". This lateral system will capture runoff generated from Sub-Area D2 (0.89 acres) with a critical travel path of 614', slope of travel at 0.42% and a calculated Q_{100} of 2.10 cfs. Sub-Area D2 was determined to be 78.12% impervious pavement and 21.88% pervious soils.

7.8 "SD-E"

"SD-E" is a mainline storm drain system that consists of 1250 LF of 48" Reinforced Concrete Pipe @ 1.16% slope that connects "SD-D" and laterals "SD-D1" and "SD-D2" to "SD-F" and laterals "SD-E1" and "SD-E2". "SD-E" conveys runoff generated by Basin A (Q_{100} at 22.84 cfs), Basin B (Q_{100} at 23.92 cfs), Basin C (Q_{100} at 27.11 cfs) and Basin D (Q_{100} at 63.71 cfs) for a cumulative Q_{100} of 137.57 cfs and is part of the mainline sub-surface storm drain system that will dewater the project site to the Cucamonga Channel.

7.9 "SD-E1" & "SD-E2"

"SD-E1" storm drain lateral system consists of 37.8 LF of 36" Reinforced Concrete Pipe that connects a proposed side opening catch basin to the proposed mainline "SD Line E". This lateral system will capture runoff generated from Sub-Area E1 (32.06 acres) with a critical travel path of 2645', slope of travel at 1.50% and a calculated Q_{100} at 58.71 cfs. Sub-Area E1 was determined to be 100% impervious pavement.

"SD-E2" storm drain lateral system consists of 28.3 LF of 18" Reinforced Concrete Pipe that connects a proposed side opening catch basin to the proposed mainline "SD Line E". This lateral system will capture runoff generated from Sub-Area E2 (0.56 acres) with a critical travel path of 766', slope of travel at 1.50% and a calculated Q_{100} of 1.50 cfs. Sub-Area E2 was determined to be 100% impervious pavement.

7.10 "SD-F"

"SD-F" is a mainline storm drain system that consists of 229 LF of 66" Reinforced Concrete Pipe @ 0.50% slope that connects "SD-E" and laterals "SD-E1" and "SD-E2" to the existing headwall and outfall structure to the Cucamonga Channel. "SD-F" conveys runoff generated

by Basin A (Q_{100} at 22.84 cfs), Basin B (Q_{100} at 23.92 cfs), Basin C (Q_{100} at 27.11 cfs), Basin D (Q_{100} at 63.71 cfs) and Basin E (Q_{100} at 60.21 cfs) for a cumulative Q_{100} of 197.79 cfs and is the final mainline sub-surface storm drain system that will dewater the entire project site to the Cucamonga Channel.

7.11 Catch Basin Inlets

While catch basin inlet sizing was not completed under this study, future studies will strategically design catch basins to capture the runoff associated with the corresponding basin or sub-basin. The catch basin inlets will be designed based on the anticipated Q_{100} flow rate capacity and grate opening area required. To validate the inlet design, we will take the maximum flow rate, outlet size pipe and minimum grate used on the project as described in the orifice equation below:

Minimum Area Required for Outflow Pipe: $\boldsymbol{Q = C*A_o*(2gh)^{1/2}}$

Where: C = Coefficient of Discharge (assumed to be 0.95)

A_o = Catch Basin area to capture $Q_{100,}$ Minimum required area.

g = Gravity (32.2 ft/s)

h = head (Elevation from top of Grate to outflow pipe invert elevation)

The minimum required catch basin area (A_o) is compared to the outlet pipe (A_p) and the minimum grate design area (A_G), to insure proper drainage capture. As long as the (A_p) and (A_G) are larger than the minimum (A_o), the system will work properly.

7.12 Q-100 Year- Hydraulic Grade line (HGL-100Y)

While the 100 year-HGL was not analyzed on this study, the following section the future steps that will be taken to determine the HGL-100. The 100-year Hydraulic Grade Line (HGL100) is a measure of flow energy, in a closed pipe system under pressure the HGL100 is the level to which water would rise in a vertical tube at any point along the pipe when open to the atmosphere. The HGL100 can be derived in direct relationship the 100-year Energy Grade line (EGL100).

The EGL100 will be determined by starting at the most upstream structure such as a catch basin, since the structure is open to the atmosphere, the EGL100 at that point will be the top of structure/top of grate. The EGL100 is then adjusted along the storm system by evaluating and subtracting minor losses such as bend in pipes, friction losses, entrance losses, exit losses. After all the loses have been taken into account the 100-year Hydraulic Grade Line (HGL100) was derived by subtracting the velocity head ($V^2/2g$) from the Energy Grade Line (EGL100).

$$HGL = EGL - V^2/2g$$

Refer to ***Figure 7.12*** for the EGL100 and HGL100 velocity head ($V^2/2g$) relationship between point 1 and 2.

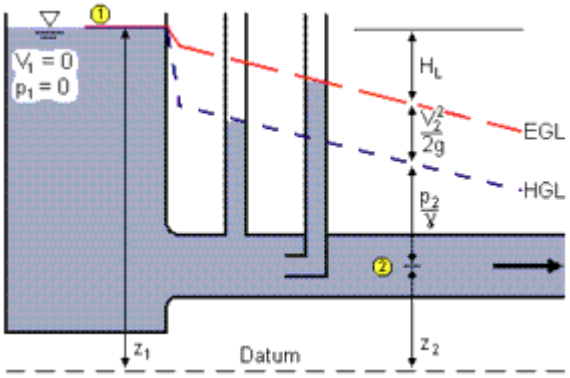

Figure 7.12 – Hydraulic and Energy Grade Line

8. CONCLUSIONS

The following ***Table 8.1*** shows the calculated peak flow (Q_{100} cfs) for the proposed mainline storm drain systems along with the proposed storm drain sizes and the flow crossing allowable ($Q_{allowable}$) at 75% full and 100% full.

The storm drain system was designed to flow 75% full and as the table shows, a Q flowing at 75% is adequate along the entire system to properly dewater this project site. As such, HNTB concludes that the sub-surface storm drain system described in this report and shown on the 30% design plans shall be adequate to convey the calculated peak flow generated by the new basins described under Sections 4 & 5 and conveyed by the storm drain systems described under Section 8 of this report.

STORM DRAIN MAINLINE	Q_{100} (CFS)	PIPE SIZE (in.)	$Q_{allowable}$ @ 75% FLOW (cfs)	$Q_{allowable}$ @ 100% FLOW (cfs)
SD-B	22.84	27	24.88	27.29
SD-C	46.76	42	70.35	77.16
SD-D	73.87	48	100.44	110.16
SD-E	137.57	48	152.98	167.80
SD-F	197.79	66	234.80	257.54

Table 8.1 Storm Drain Mainline Pipe Sizes

Appendix C. Realignment of Avion St. and Jurupa St. 30% Design Estimate and Construction Schedule Report

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Ontario International Airport

Ontario, CA

Realignment of Avion St. and Jurupa St.

30% Design Estimate and

Construction Schedule Report

Report Date:

April 30, 2021

Revision Date:

May 28, 2021

Revision No.:

2

Prepared for:

HNTB
6033 W. Century Blvd., Suite 1050
Los Angeles, CA 90045

2594 N. Mount Juliet Road
Mount Juliet, TN 37122

(615) 758-7474
www.connico.com

May 28, 2021

Mr. Tony Fermelia
HNTB
6033 W. Century Blvd., Suite 1050 Los Angeles, CA 90045

RE: Realignment of Avion St. and Jurupa St.
Ontario International Airport
Ontario, CA
30% Design Estimate and Construction Schedule Report

Dear Mr. Fermelia:

We are pleased to present the revised 30% Design Estimate and Construction Schedule Report for the referenced project. The Estimate and Schedule Report has been drawn from the information noted in Exhibit A.

Included within the report are our Estimate Notes, which outline the criteria and allowances that were used to produce the estimate. Also included are our Schedule Notes, which outline the general comments and criteria that were of note in the review.

We appreciate the opportunity to work with you on this project. Should you have any questions or need additional information, please contact us at your convenience.

Sincerely,
CONNICO INCORPORATED

Charl J. Neser, MRICS, CCP
Director
cjneser@connico.com

Lisa Heckendorn-Blake, PMP
Senior Project Socialist
lhblake@connico.com

CI File No. 4733.21.02

Table of Contents

INTRODUCTION

TASK OUTLINE

- HNTB retained Connico Incorporated as cost and scheduling consultants to provide an estimate of probable cost and a construction schedule report for the Realignment of Avion St. and Jurupa St. project at Ontario International Airport in Ontario, CA . The estimate and schedule are based on plans, specifications and other information, as noted in Exhibit A of this report.

- In providing estimates of probable construction cost, and scheduling services, the Client understands that the Consultant has no control over the cost or activity durations, or availability of labor, equipment, or materials, or over market conditions, or the Contractor's method of pricing and construction. The Consultant's estimates of probable construction costs and opinion of probable durations are made based on the Consultant's professional judgment and experience. The Consultant makes no warranty, express or implied, that the bids, the negotiated cost, or the duration of the Work will not vary from the Consultant's estimate of probable construction cost and submitted schedule.

- The Estimate of Probable Cost and the Probable Construction Schedule Report has been prepared based on information prepared/provided by others. Connico has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions that may be incorporated because of erroneous information provided by others.

PROJECT DESCRIPTION

The project includes the realignment of Avion and Jurupa streets and included approximately 31,400 sy of new asphalt paves roads. Scope of work included demolition of existing roads, building and site improvements together with new roads, utilities marking and a bridge structure over the existing canal.

MARKET INFORMATION

- COVID-19 first started to impact the US economy in February 2020. Economic data suggest that the low point for the recession was in May 2020, and that recovery began in June 2020. As of 4Q 2020 the US economy is slowly recovering but is not close to pre-COVID-19 levels. It is anticipated that this may not occur until 2022. However, this assumes that a viable COVID-19 vaccine is developed and widely adopted. Should that not be the case, or if the COVID-19 pandemic resurges and becomes more widespread, the US economy could be severely impacted, with the possibility of local or regional shutdowns taking effect.

- The construction industry has been impacted by COVID-19 in multiple ways. The shortage of skilled construction labor that existed prior to the COVID-19 pandemic has been exacerbated by the pandemic. Funding for many construction projects has been suspended as State and Local Governments struggle to balance operational necessities against reduced income or tax revenue. Additionally, projects under construction during the pandemic have experienced significant supply

chain disruptions and increases in basic construction material prices. The culmination of all these factors has resulted in fewer bidding opportunities for contractors, leading to bid day pricing inconsistencies that are difficult to forecast.

- The commercial construction sector continues to lag behind the levels set in 2019, and the forecast for 2021 shows only limited growth over 2020 levels. There are clearly political ramifications to be considered as well, as recovery into 2021 and beyond assumes some level of Government intervention with the release of a further funding initiative in 2021. Should this not happen recovery could be delayed. Additionally, Congress may pass an infrastructure bill in 2021 that would provide a significant boost to the construction industry.

- The estimate attempts to incorporate known impacts due to current market conditions, material pricing and labor impacts existing in the current market. However, the estimate cannot, and does not, reflect all potential economic impacts that may affect the construction market or the cost of the work. The impacts on material and labor availability have not been fully realized and the bidding and construction environment is in active flux as we continue to face uncertainty. Construction durations may be impacted by any of these conditions. We would recommend that the Owner carries a contingency fund in their project budget to address market volatility.

ESTIMATE NOTES

GENERAL

- Connico did not perform a limited site observation in preparing this estimate.

MARKUPS AND SOFT COSTS

- The following "direct" markups on the cost of work are included in the estimate, based on traditional design, bid, build:

General Contractor Markups

Estimating Design Evolution	25.0%

- The following "indirect" markups (also known as 'Owner's Soft Costs') are included in the estimate.

Owner's Soft Costs

Program Management	6.0%
Construction Manager	0.0%
Planning & Preconstruction	0.2%
Architectural / Engineering Design	10.0%
Architectural / Engineering Construction Admin	2.0%
Airport Staff	0.0%
Materials Testing/Inspection/Commissioning	2.5%
Plan Check Services	0.1%
Cost Estimating & Scheduling	0.5%
Miscellaneous Owner Costs (i.e. Legal)	1.0%
Artwork	0.0%
Owner's Construction Contingency	0.0%
Project Contingency	0.0%
Escalation	0.0%

- A twenty-five (25%) estimating design evolution has been included in the estimate for unforeseen work and final detailing that may be necessary to accomplish the project scope of work. The design evolution is not intended to be used for additions to the general scope of work.

- An allowance for insurance is included in the unit costs of the estimate. There are many variables that will impact the cost of insurance including, but not limited to, the contractor's performance history, project size, complexity, location and phasing. Additionally, insurance costs will change if the Owner selects an Owner or Contractor Controlled Insurance Policy.

- An allowance for payment and performance bonds is included in the unit costs of the estimate. There are many variables that will impact the cost of payment and performance bonds including, but not limited to, the contractor's performance history, project size, complexity, location and phasing.

- The estimate is costed on the understanding that there will be free and open competition at all levels of contracting, that there will not be a restricted bidders list either for general or trade contractors, that there will be a minimum three general contract bidders and at minimum three sub bids will be available for each trade involved. The Owner can facilitate these conditions by ensuring that the project is publicly advertised for bids in general circulation as well as trade publications where advertisements for bid are regularly posted, that prequalification requirements, if prequalification of either general or sub bidders is contemplated, are not unduly restrictive, and by maintaining good industry relations.

- The estimate does not include an Owner's construction contingency to be utilized for changes and / or additions to the scope of work during construction.

- The estimate does not include a project contingency.

- The estimate is based on second quarter 2021 dollars with no adjustment for escalation.

- The estimate is costed on the understanding that there will not be a requirement to utilize "prevailing wages" on the project, and that the project can be bid as "open shop".

- The estimate includes an allowance for an independent testing agency to provide field and lab testing of construction materials and to provide construction inspections.

- The estimate does not include any allowance for fees normally attributed to the Owner such as Real Estate fees, Impact fees, Tap fees, etc.

- Temporary site storage and parking for contractor is assumed to be within the vicinity of the site.

- Allowances included in the Estimate are amounts the Owner should expect to spend.

- The following items are not included in the estimate:

    - Tenant Relocations
    - Lease Buy-Outs

SCHEDULE NOTES

GENERAL

✈ Connico did not perform a site observation in preparing this schedule.

The realignment of Avion St. and Jurupa St. at the Ontario International Airport will be constructed in 3 phases:

✈ Phase 1: Avion St. in front of Future Golden Bridge Warehouse Development

- ✓ Demolition of existing buildings
- ✓ New roadway improvements for the Cucamonga Channel to the west to approximately Hellman Ave
- ✓ Pavement marking and signage.
- ✓ Utilities improvement will include.
  - RW only within roadway section. Will likely be a dry pipe until downstream connection are completed
  - SS and natural gas will be constructed only within roadway section. Will be capped and a dry pipe until downstream connections are completed
  - Water will be connected at south side of Hellman road but will not be connected across bridge.
  - SD improvements will be construction from Cucamonga channel to Hellman Road.

✈ Phase 2: Jurupa St. in front of Future UPS Development

- ✓ New roadway improvements for the Cucamonga Channel to the East to Archibald.
- ✓ Bridge construction
- ✓ Sidewalk improvements
- ✓ Include traffic signal improvements
- ✓ Pavement marking and signage
- ✓ Utilities improvement will include
  - Street light modifications.
  - RW and Water across bridge. Connect to existing Phase 1 improvements
  - Natural Gas improvements
  - SD improvements

✈ Phase 3: Avion St. from Hellman to Vineyard Ave

- ✓ New roadway improvements from on Avion from Hellman to Vineyard Ave
- ✓ Pavement marking and signage
- ✓ Utilities improvement will include
  - Street light modifications

- RW and SD extension from phase 1
- SS improvements connect from phase 1 and commission line

GENERAL ASSUMPTIONS

- The schedule was developed utilizing Microsoft Project 2016.
- Work week is based on five (5) work days/week with 1 10-hour shift/day.
- The durations shown on the schedule are work days.
- The schedule assumes that weather days will be handled in accordance with the Technical Specifications. No specific weather days have been incorporated as non-work days.
- The quantities included in the detail schedule to determine working day durations were taken off from the 30% Design plan set dated 2021-04-21.
- The following holidays were incorporated into the schedule:
  - ✓ New Year's Day
  - ✓ Martin Luther King Day
  - ✓ President's Day
  - ✓ Cesar Chavez Day
  - ✓ Memorial Day
  - ✓ Independence Day
  - ✓ Labor Day
  - ✓ Columbus Day
  - ✓ Veteran's Day
  - ✓ Thanksgiving
  - ✓ Day After Thanksgiving
  - ✓ Christmas Day
- The following date was incorporated into the schedule, per verbal direction from LAWA based on the above assumption:
  - ✓ Construction Notice to Proceed April 4, 2022
- The schedule assumes that a limited NTP will be issued prior to April 4, 2022 to allow the contractor to mobilize and set up a batch plant and staging areas.
- The Owner will issue a Notice to Proceed prior to initiating construction for each Phase.

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ESTIMATE SUMMARY

Project Title	Realigment of Avion St. & Jurupa St.		
Location	Ontario International Airport (ONT)		
Submittal Stage	30% Design Estimate		
Client Name	HNTB		
Client Project No.		**Revision**	2
Original Date	4/30/2021	**Revision Date**	5/28/2021
Assumed Bid Opening Date		**CI Project No.**	4733.21.02
Project Manager	CJN/DJH	**Checked by**	IDK

Realigment of Avion St. & Jurupa St.

SUMMARY

	DESCRIPTION		TOTAL
	Total Construction Cost	$	15,580,825
25.0%	Estimating Design Evolution	$	3,895,206
	Opinion of Probable Construction Cost	***$***	***19,476,032***
	Owner's Soft Costs		
6.0%	Program Management	$	1,168,562
0.0%	Construction Manager	$	-
0.2%	Planning & Preconstruction	$	38,952
10.0%	Architectural / Engineering Design	$	1,947,603
2.0%	Architectural / Engineering Construction Admin	$	389,521
0.0%	Airport Staff	$	-
2.5%	Materials Testing / Inspection / Commissioning	$	486,901
0.1%	Plan Check Services	$	19,476
0.5%	Cost Estimating & Scheduling	$	97,380
1.0%	Miscellaneous Owner Costs (i.e. Legal)	$	194,760
0.0%	Artwork	$	-
0.0%	Owner's Construction Contingency	$	-
0.0%	Project Contingency	$	-
	Subtotal	***$***	***23,819,187***
0.0%	Escalation	$	-
	Opinion of Probable Project Cost	***$***	***23,819,187***

ESTIMATE DETAIL

Project Title	Realigment of Avion St. & Jurupa St.		
Location	Ontario International Airport (ONT)		
Submittal Stage	30% Design Estimate		
Client Name	HNTB		
Client Project No.		**Revision**	2
Original Date	4/30/2021	**Revision Date**	5/28/2021
Assumed Bid Opening Date		**CI Project No.**	4733.21.02
Project Manager	CJN/DJH	**Checked by**	IDK

Realigment of Avion St. & Jurupa St.

DETAIL

ITEM NO.	SPEC NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1000		**2 - GENERAL CONSTRUCTION ITEMS**				
1001		Contractor Quality Control Program (CQCP)	1	ls	$ 230,300.00	$ 230,300
1002		Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	ls	$ 301,000.00	$ 301,000
1003		Mobilization	1	ls	$ 1,338,000.00	$ 1,338,000
1004		Allowance for Protecting Existing Structures, Utilities est.	1	ls	$ 335,000.00	$ 335,000
1005		**3 - SITEWORK**				
1006		Demo and Remove Existing Asphalt Paving including Base (Hauled Off Site Within 5	26,009	sy	$ 25.00	$ 650,219
1007		Demo and Remove Existing Concrete Curb / AC Dike	7,290	lf	$ 6.50	$ 47,385
1008		Sawcut Existing Asphalt Paving	2,415	lf	$ 3.50	$ 8,453
1009		Remove Existing Traffic Sign	4	ea	$ 250.00	$ 1,000
1010		Demo and Remove Existing Chain Link Fenc	3,156	lf	$ 20.00	$ 63,120
1011		Remove & Relocate Power Line	3	ea	$ 6,580.00	$ 19,740
1012		Demo Existing Single Story Building incl. Foundations	3,072	sf	$ 15.00	$ 46,080
1013		Remove Rock Piles / Stockpiled Material	3	ea	$ 200.00	$ 600
1014		Demo and Remove Power Pole incl. Foundation	9	ea	$ 2,475.00	$ 22,275
1015		Remove & Relocate SCE & Frontier Lines Underground	1,725	lf	$ 25.00	$ 43,125
1016		Remove Existing Precast Concrete F Rail / Barricade	1,323	lf	$ 25.00	$ 33,075
1017		Demo and Remove Existing Curb & Gutter	111	lf	$ 6.50	$ 722
1018		Demo and Remove Existing Remove Tree	1	ea	$ 500.00	$ 500
1019		Remove Existing Sign Post	4	ea	$ 50.00	$ 200
1020		Demo and Remove Existing Metal Guard Rail	193	lf	$ 10.00	$ 1,930
1021		Clearing and Grubbing (Landscape Areas)	2.3	ac	$ 2,500.00	$ 5,750
1022		Unclassified Excavation - Disposed Offsite Within a 5 Mile Radius	15,690	cy	$ 35.00	$ 549,150
1023		**4 – ROAD PAVING & STRUCTURES**				
1024		8" Thick Asphalt Concrete over 10" CAB Pavement (Measured Separately)	14,937	ton	$ 155.00	$ 2,315,235
1025		Crushed Aggregate Base Course	21,687	sy	$ 45.00	$ 975,915
1026		Curb & Gutter - Type "B"	8,875	lf	$ 50.00	$ 443,750
1027		4" Thick Concrete Sidewalk	21,687	sf	$ 15.00	$ 325,305
1028		4" Thick Concrete Sidewalk Ramp incl. Detectable Warning Surface and 12" Border Grooving	5	ea	$ 1,500.00	$ 7,500

Realigment of Avion St. & Jurupa St.

DETAIL

ITEM NO.	SPEC NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1029		8" Thick Concrete Driveway Approach Slab	5,219	sf	$ 18.00	$ 93,942
1030		8" Thick Concrete Cross Gutter	4,140	sf	$ 15.00	$ 62,100
1031		**5- MISCELLANEOUS**				
1032		Bridge Structure Complete	1	ls	$ 2,460,000.00	$ 2,460,000
1033		Install Broken Lines	10,329	lf	$ 0.50	$ 5,165
1034		Install Solid Lines	910	lf	$ 1.50	$ 1,365
1035		Install Solid Double Yellow Lines	3,820	lf	$ 3.00	$ 11,460
1036		Install Stop Line	296	lf	$ 4.00	$ 1,184
1037		Install "STOP" Letters	17	ea	$ 85.00	$ 1,445
1038		Install Arrow	15	ea	$ 25.00	$ 375
1039		Install Double Arrow	9	ea	$ 35.00	$ 315
1040		Install Edge Marking	206	lf	$ 1.50	$ 309
1041		Install Pedestrian Crossing	4,640	sf	$ 1.25	$ 5,800
1042		Install Lane Extension Lines	730	sf	$ 0.25	$ 183
1043		Install Median Island Pedestrian Crossing	15,924	sf	$ 1.25	$ 19,905
1044		**6 - FENCING**				
1045		6' High Chain-Link Fence	1,579	lf	$ 65.00	$ 102,635
1046		**7 - DRAINAGE**				
1047		***Stormwater Drainage***				
1048		Install 18" RCP Storm Drain	130	lf	$ 125.00	$ 16,250
1049		Install 24" RCP Storm Drain	327	lf	$ 165.00	$ 53,955
1050		Install 27" RCP Storm Drain	488	lf	$ 175.00	$ 85,400
1051		Install 36" RCP Storm Drain	210	lf	$ 200.00	$ 42,000
1052		Install 42" RCP Storm Drain	458	lf	$ 275.00	$ 125,950
1053		Install 48" RCP Storm Drain	1,851	LF	$ 310.00	$ 573,810
1054		Install 60" RCP Storm Drain	233	lf	$ 350.00	$ 81,550
1055		Install Side Opening Catch Basin	13	ea	$ 7,500.00	$ 97,500
1056		Install Storm Drain MH	10	ea	$ 8,500.00	$ 85,000
1057		Install RCP Flared End & Rip Rap	1	ea	$ 3,500.00	$ 3,500
1058		Cap & Plug Storm Drain	1	ea	$ 500.00	$ 500
1059		Connect to Existing Strom Drain	2	ea	$ 5,000.00	$ 10,000
1060		Install 36" x36" Catch Basin Inlet	1	ea	$ 2,500.00	$ 2,500
1061		***Main Water Lines***				
1062		Install New 16" Diam AWWA C900 Water Line (PVC)	3,400	lf	$ 185.00	$ 629,000
1063		Install New 16" Diam AWWA C900-DR14 RW Pipe	5,501	lf	$ 225.00	$ 1,237,725
1064		Connect to Existing Waterline	3	ea	$ 25,000.00	$ 75,000
1065		Connect to Existing Recycled Water Line	1	ea	$ 25,000.00	$ 25,000
1066		***Sewer***				
1067		Install 8" VCP Sewer Line	2,035	lf	$ 165.00	$ 335,775
1068		Install Sewer MH	13	ea	$ 6,500.00	$ 84,500
1069		Connect to Existing Sewer Drain Line	2	ea	$ 5,000.00	$ 10,000
1070		Connect to Existing Sewer Line MH	1	ea	$ 5,000.00	$ 5,000
1071		***Natural Gas Line***				
1072		Install 4" Gas Line	1,299	lf	$ 150.00	$ 194,850
1073		Connect to Existing Gas Line	1	ea	$ 5,000.00	$ 5,000
1074		***Miscellaneous Utilities***				
1075		Proposed UG Frontier Comm. Conduit, 2W-4" PVC	575	lf	$ 107.00	$ 61,525
1076		Proposed OH Frontier Comm. Line	235	lf	$ 78.00	$ 18,330
1077		Proposed UG SCE Ductbank, 4W-4" DB-120. Concrete Encased	575	lf	$ 251.00	$ 144,325
1078		Proposed OH SCE Line	235	lf	$ 95.00	$ 22,325
1079		Communication Splice Box	1	ea	$ 10,145.00	$ 10,145

Realigment of Avion St. & Jurupa St.

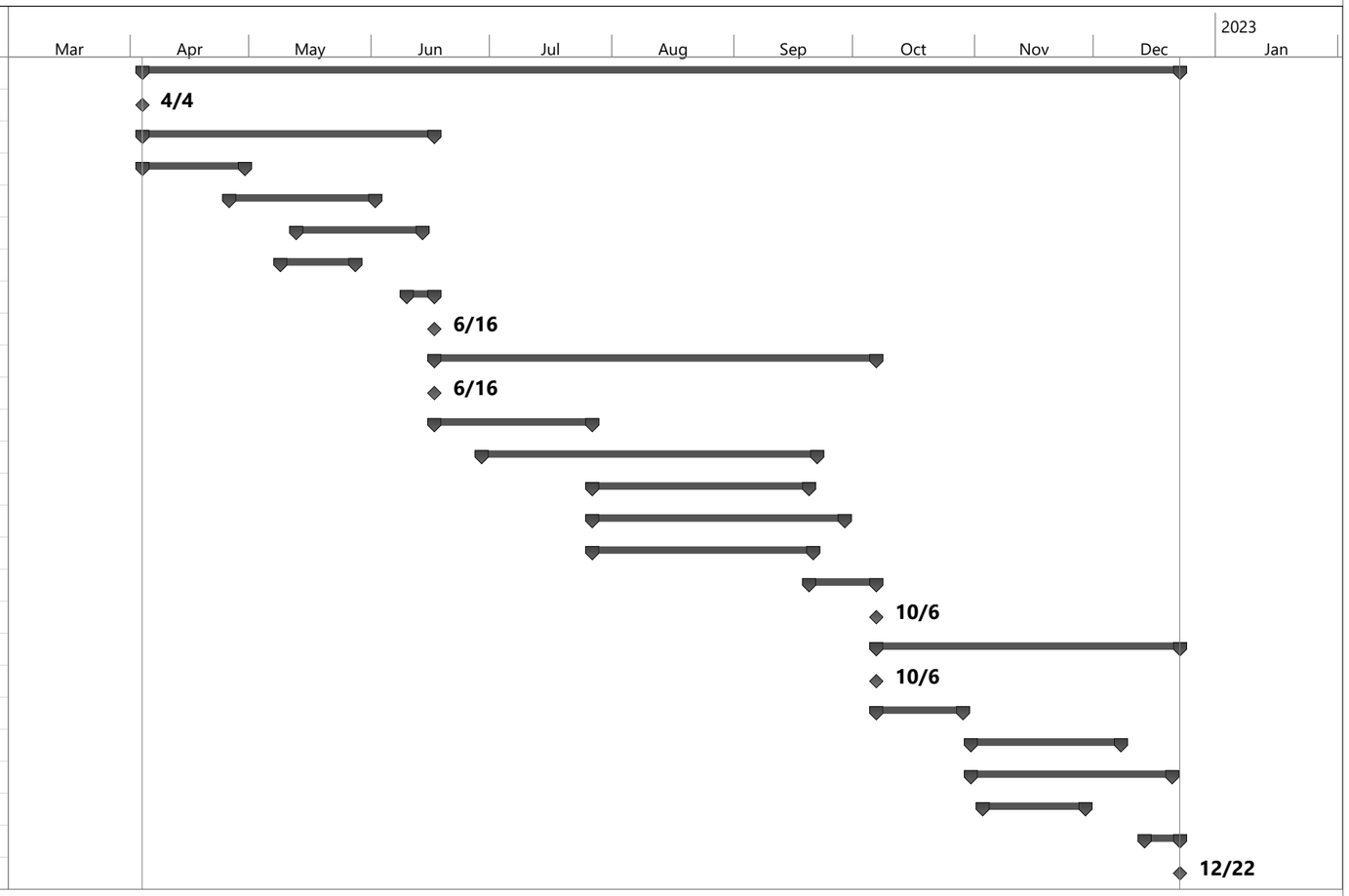
DETAIL

ITEM NO.	SPEC NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1080		Anchor Utilities to U/S of Bridge	1	ea	$ 5,000.00	$ 5,000
1081		**8 - LIGHTING INSTALLATION**				
1082		Traffic Signal System	1	ea	$ 501,000.00	$ 501,000
1083		Vehicle Detection System	1	ea	$ 110,000.00	$ 110,000
1084		Traffic Control	1	ea	$ 30,500.00	$ 30,500
1085		1.5" Sch 80 PVC, (2) #8, #8 Gnd.	5,500	lf	$ 19.00	$ 104,500
1086		Pull Box	30	ea	$ 1,095.00	$ 32,850
1087		Roadway Light, Pole and Base	30	ea	$ 7,635.00	$ 229,050
Subtotal						***$ 15,580,825***
	25.0%	Estimating Design Evolution				$ 3,895,206
Opinion of Probable Construction Cost						***$ 19,476,032***
Owner's Soft Costs						
	6.0%	Program Management				$ 1,168,562
	0.0%	Construction Manager				$ -
	0.2%	Planning & Preconstruction				$ 38,952
	10.0%	Architectural / Engineering Design				$ 1,947,603
	2.0%	Architectural / Engineering Construction Admin				$ 389,521
	0.0%	Airport Staff				$ -
	2.5%	Materials Testing / Inspection / Commissioning				$ 486,901
	0.1%	Plan Check Services				$ 19,476
	0.5%	Cost Estimating & Scheduling				$ 97,380
	1.0%	Miscellaneous Owner Costs (i.e. Legal)				$ 194,760
	0.0%	Artwork				$ -
	0.0%	Owner's Construction Contingency				$ -
	0.0%	Project Contingency				$ -
Subtotal						***$ 23,819,187***
	0.0%	Escalation				$ -
Opinion of Probable Project Cost						***$ 23,819,187***

PROBABLE CONSTRUCTION SCHEDULE SUMMARY

Ontario International Airport
Realignment of Avion St. & Jurupa St.
30% Design Probable Construction
Summary Schedule

ID	Task Name	Duration	Start	Finish
1	**ONT Realignment of Avion St. & Jurupa St.**	**182 days**	**4/4/22**	**12/22/22**
2	Construction Notice to Proceed	0 days	4/4/22	4/4/22
3	**Phase 1: Avion Near Future Golden Bridge Warehouse**	**53 days**	**4/4/22**	**6/16/22**
4	**Demolition**	**20 days**	**4/4/22**	**4/29/22**
16	**Utilities**	**26 days**	**4/26/22**	**6/1/22**
27	**New Roadway**	**21 days**	**5/13/22**	**6/13/22**
35	**Lighting**	**15 days**	**5/9/22**	**5/27/22**
39	**Final Work/Punchlist Items**	**5 days**	**6/10/22**	**6/16/22**
42	**Phase 1: Avion Near Golden Bridge Warehouse Complete**	0 days	6/16/22	6/16/22
43	**Phase 2: Jurupa near Future UPS**	**78 days**	**6/16/22**	**10/6/22**
44	Phase 2 Construction Notice to Proceed	0 days	6/16/22	6/16/22
45	**Demolition**	**27 days**	**6/17/22**	**7/26/22**
52	**Bridge Structure**	**59 days**	**6/29/22**	**9/21/22**
66	**Utilities**	**38 days**	**7/27/22**	**9/19/22**
72	**New Roadway**	**45 days**	**7/27/22**	**9/28/22**
80	**Lighting**	**39 days**	**7/27/22**	**9/20/22**
87	**Final Work/Punchlist Items**	**13 days**	**9/20/22**	**10/6/22**
91	**Phase 2: Jurupa near Future UPS Complete**	0 days	10/6/22	10/6/22
92	**Phase 3: Avion from Hellman to Vineyard Ave**	**51 days**	**10/6/22**	**12/22/22**
93	Phase 3 Construction Notice to Proceed	0 days	10/6/22	10/6/22
94	**Demolition**	**15 days**	**10/7/22**	**10/28/22**
100	**Utilities**	**25 days**	**10/31/22**	**12/7/22**
106	**New Roadway**	**34 days**	**10/31/22**	**12/20/22**
116	**Lighting**	**15 days**	**11/3/22**	**11/28/22**
120	**Final Work/Punchlist Items**	**7 days**	**12/14/22**	**12/22/22**
123	**Phase 3: Avion from Hellman to Vineyard Ave Complete**	0 days	12/22/22	12/22/22



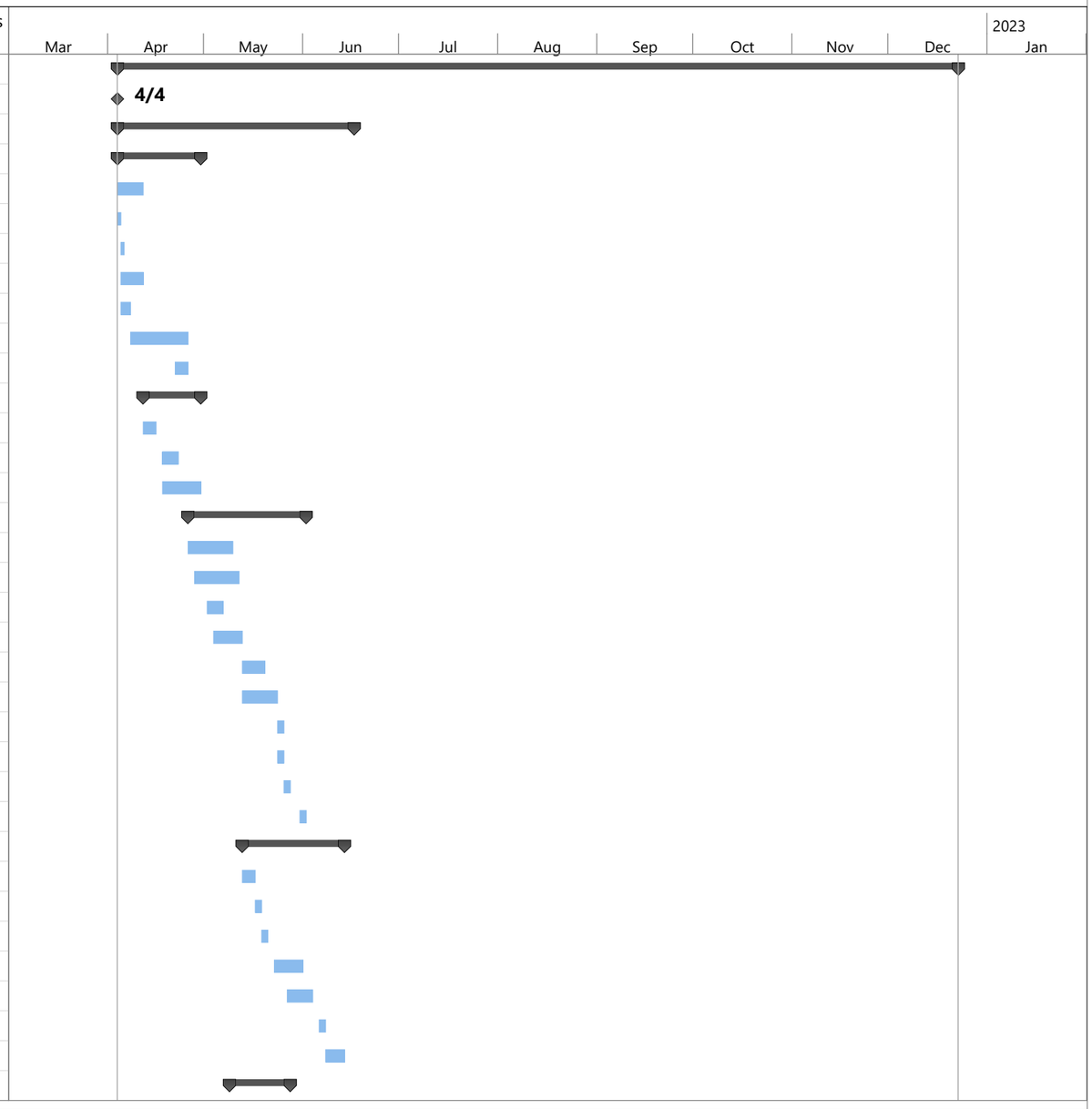
Project: 4733.20.02 ONT Avion & Jurupa St Realign Sch 2021-04-29
Date: 4/30/21

Task Milestone Summary

PROBABLE CONSTRUCTION SCHEDULE DETAILS

Ontario International Airport
Realignment of Avion St. & Jurupa St.
30% Design Probable Construction Schedule

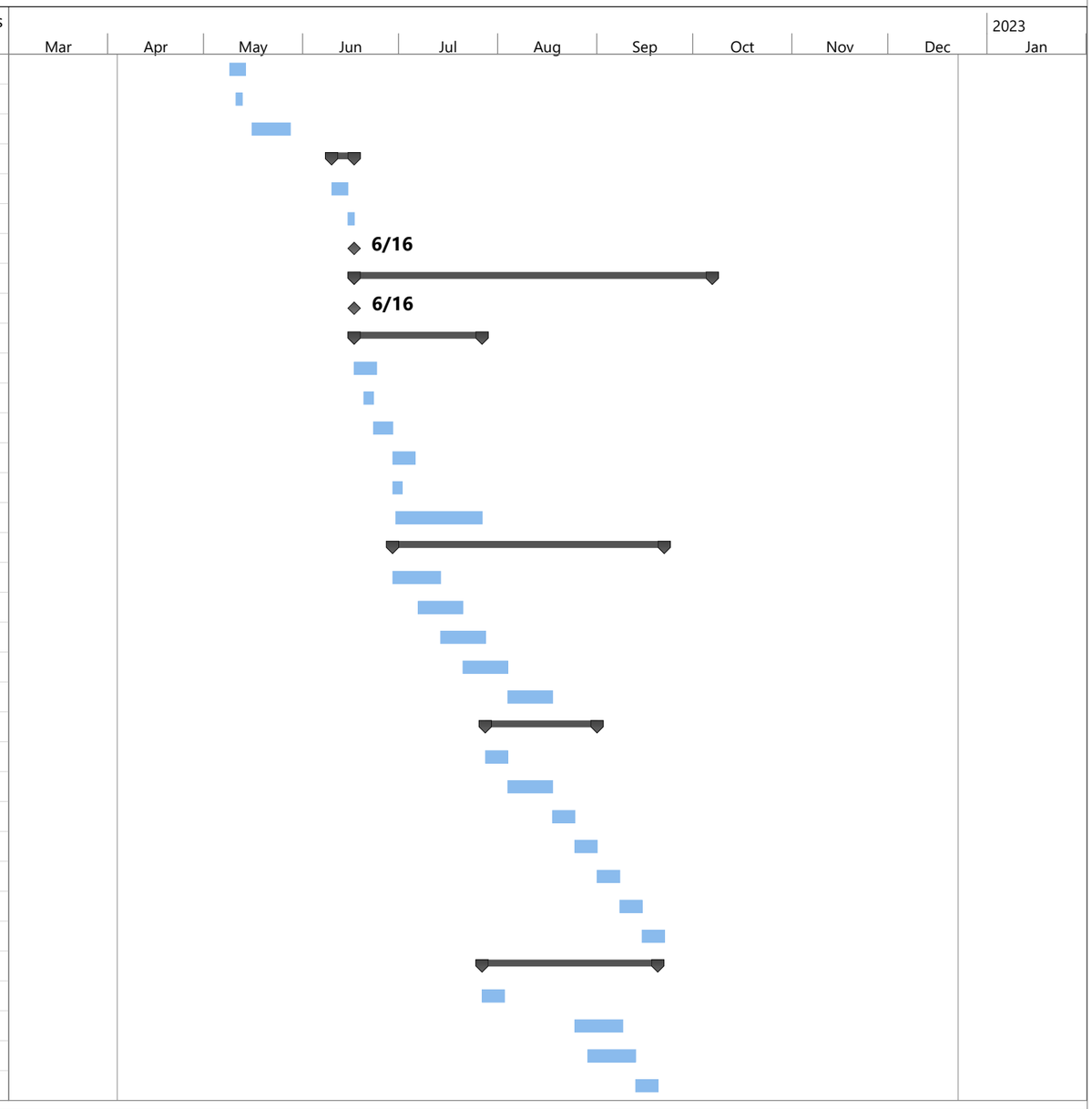
ID	Task Name	Duration	Start	Finish	Quantities	Units
1	**ONT Realignment of Avion St. & Jurupa St.**	**182 days**	**4/4/22**	**12/22/22**		
2	Construction Notice to Proceed	0 days	4/4/22	4/4/22		
3	**Phase 1: Avion Near Future Golden Bridge Warehouse**	**53 days**	**4/4/22**	**6/16/22**		
4	**Demolition**	**20 days**	**4/4/22**	**4/29/22**		
5	Remove Exist. Building	6 days	4/4/22	4/11/22	3,072	SF
6	Remove Fence	1 day	4/4/22	4/4/22	463	LF
7	Clearing & Grubbing	1 day	4/5/22	4/5/22	408	SF
8	Remove Rock Piles	5 days	4/5/22	4/11/22	3	EA
9	Saw cut AC	3 days	4/5/22	4/7/22	1,821	LF
10	Remove Asphalt & Base	12 days	4/8/22	4/25/22	51,416	SF
11	Remove Extst. Curb / AC Dike	2 days	4/22/22	4/25/22	165	LF
12	**Electrical Demolition**	**14 days**	**4/12/22**	**4/29/22**		
13	Remove Power Pole	4 days	4/12/22	4/15/22	9	EA
14	Remove & Relocate Power Pole	5 days	4/18/22	4/22/22	3	EA
15	Remove & Relocate Power Line	10 days	4/18/22	4/29/22		
16	**Utilities**	**26 days**	**4/26/22**	**6/1/22**		
17	Install Storm Drain/Structures	10 days	4/26/22	5/9/22	1150	LF
18	Install Sewer Line/Manholes	10 days	4/28/22	5/11/22	817	LF
19	Install New 16" AWWA C900-DR14 Puroe RW Pipe	5 days	5/2/22	5/6/22	985	LF
20	Install New 16" AWWA C900 Water Line	7 days	5/4/22	5/12/22	1,330	LF
21	Connect to Existing Waterline/Testing	5 days	5/13/22	5/19/22	1	EA
22	Install/Test 4" Gas Line	7 days	5/13/22	5/23/22	834	LF
23	Proposed OH Fontier Communications	2 days	5/24/22	5/25/22	235	LF
24	Proposed UG Fontier Comm. Conduit, 2W-4"	2 days	5/24/22	5/25/22	575	LF
25	Proposed OH SCE Line	2 days	5/26/22	5/27/22	235	LF
26	Proposed UG SCE Conduit, 4W-4"	2 days	5/31/22	6/1/22	575	LF
27	**New Roadway**	**21 days**	**5/13/22**	**6/13/22**		
28	Excavation	2 days	5/13/22	5/16/22	900	SF
29	Subgrade Prep	2 days	5/17/22	5/18/22	900	SF
30	Base Stone	2 days	5/19/22	5/20/22	900	SF
31	10" CAB	6 days	5/23/22	5/31/22	900	SF
32	8" Asphalt Paving	5 days	5/27/22	6/3/22	900	SF
33	Curb & Gutter	2 days	6/6/22	6/7/22	36	LF
34	Concrete Sidewalk/Ramp	4 days	6/8/22	6/13/22	1,400	SF
35	**Lighting**	**15 days**	**5/9/22**	**5/27/22**		



Project: 4733.20.02 ONT Avion & Jurupa St Realign Sch 2021-04-29
Date: 4/30/21

Ontario International Airport
Realignment of Avion St. & Jurupa St.
30% Design Probable Construction Schedule

ID	Task Name	Duration	Start	Finish	Quantities	Units
36	1.5" Sch 80 PVC, (2) #8, #8 Gnd.	5 days	5/9/22	5/13/22	1,000	lf
37	Pull Box	2 days	5/11/22	5/12/22	5	EA
38	Roadway Light, Pole and Base	10 days	5/16/22	5/27/22	5	EA
39	**Final Work/Punchlist Items**	**5 days**	**6/10/22**	**6/16/22**		
40	Marking/Signage	3 days	6/10/22	6/14/22	3,016	LF
41	Punchlist Items	2 days	6/15/22	6/16/22		
42	**Phase 1: Avion Near Golden Bridge Warehouse Complete**	0 days	6/16/22	6/16/22		
43	**Phase 2: Jurupa near Future UPS**	**78 days**	**6/16/22**	**10/6/22**		
44	Phase 2 Construction Notice to Proceed	0 days	6/16/22	6/16/22		
45	**Demolition**	**27 days**	**6/17/22**	**7/26/22**		
46	Remove Fence	5 days	6/17/22	6/23/22	2,159	LF
47	Clearing & Grubbing	3 days	6/20/22	6/22/22		
48	Remove Signs/Guardrail/Barricades	4 days	6/23/22	6/28/22	1,627	LF
49	Remove Extst. Curb/AC Dike	4 days	6/29/22	7/5/22	1,919	LF
50	Saw cut AC	3 days	6/29/22	7/1/22	173	LF
51	Remove Asphalt & Base	18 days	6/30/22	7/26/22	56,147	SF
52	**Bridge Structure**	**59 days**	**6/29/22**	**9/21/22**		
53	Excavate for Piles/footing	10 days	6/29/22	7/13/22		
54	36" Dia Piles 50' Deep	10 days	7/7/22	7/20/22	15	EA
55	Pile Cap/Fdtn	10 days	7/14/22	7/27/22	15	EA
56	Abutments	10 days	7/21/22	8/3/22	2	EA
57	Concrete Wing Walls	10 days	8/4/22	8/17/22	25	CY
58	**Top Deck**	**25 days**	**7/28/22**	**8/31/22**		
59	Beam Pockets for Precast seats	5 days	7/28/22	8/3/22	8	EA
60	Install Precast Concrete Beams 0 4' Deep	10 days	8/4/22	8/17/22	6	EA
61	Install Metal Decking/Formwork	5 days	8/18/22	8/24/22	5,000	SF
62	Bridge Base	5 days	8/25/22	8/31/22	5,000	SF
63	Approach Slabs (2)	4 days	9/1/22	9/7/22	2,000	SF
64	North Concrete Barrier Wall	5 days	9/8/22	9/14/22		
65	South Concrete Barrier Wall	5 days	9/15/22	9/21/22		
66	**Utilities**	**38 days**	**7/27/22**	**9/19/22**		
67	Install Storm Drain/Structures	5 days	7/27/22	8/2/22	104	LF
68	Install 16" AWWA C900-DR14 Puroe RW Pipe	10 days	8/25/22	9/8/22	2,151	LF
69	Install New 16" AWWA C900 Water Line	10 days	8/29/22	9/12/22	2,069	LF
70	Connect to Existing Waterline/Testing	5 days	9/13/22	9/19/22		

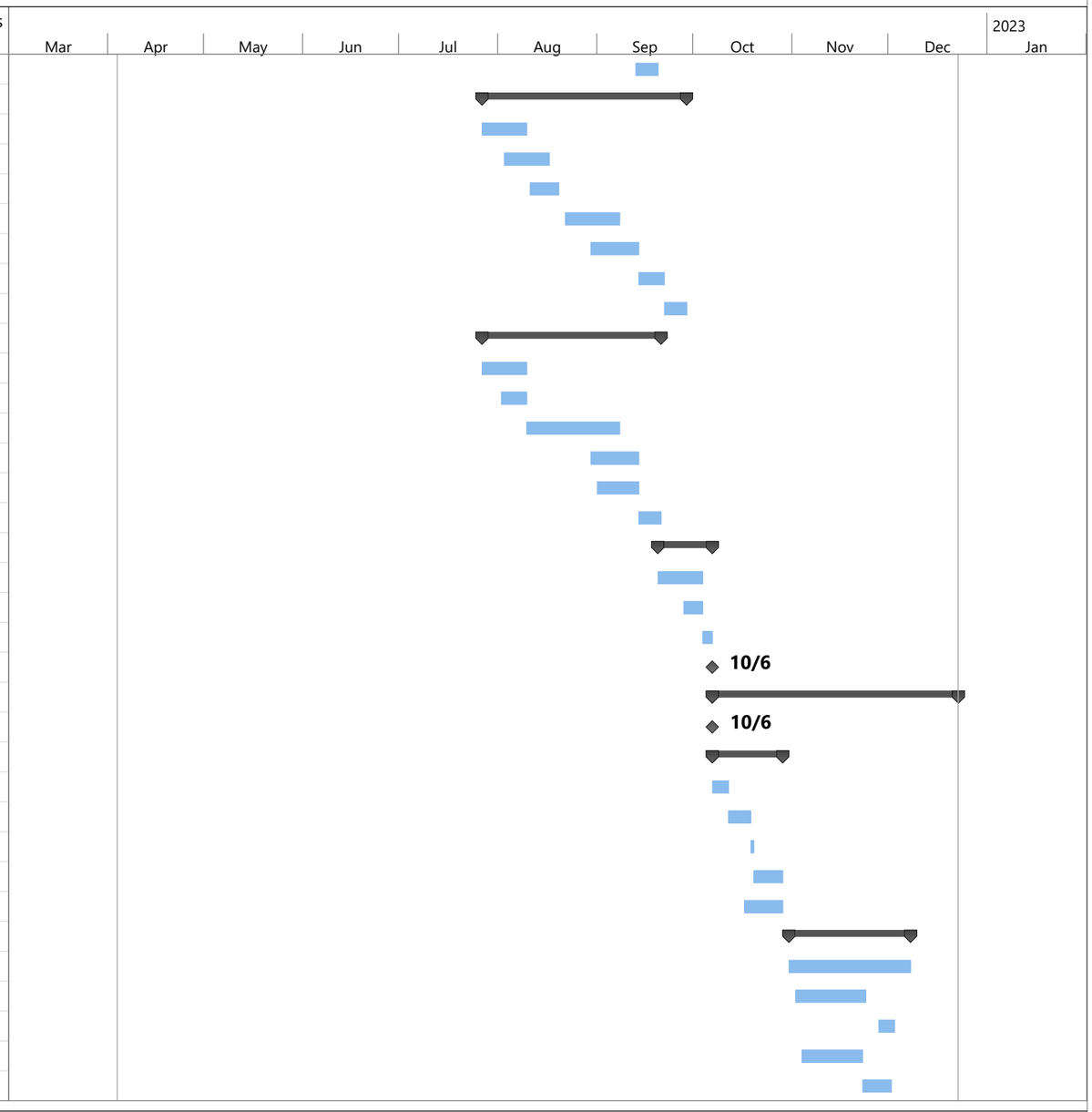


Project: 4733.20.02 ONT Avion & Jurupa St Realign Sch 2021-04-29
Date: 4/30/21

Task Milestone Summary

Ontario International Airport
Realignment of Avion St. & Jurupa St.
30% Design Probable Construction Schedule

ID	Task Name	Duration	Start	Finish	Quantities	Units
71	Install/Test 4" Gas Line	5 days	9/13/22	9/19/22	463	LF
72	**New Roadway**	**45 days**	**7/27/22**	**9/28/22**		
73	Excavation	10 days	7/27/22	8/9/22	18,225	SY
74	Subgrade Prep	10 days	8/3/22	8/16/22	18,225	SY
75	Base Stone	7 days	8/11/22	8/19/22	18,225	SY
76	10" CAB	12 days	8/22/22	9/7/22	18,225	SY
77	8" Asphalt Paving	10 days	8/30/22	9/13/22	18,225	SY
78	Curb & Gutter	6 days	9/14/22	9/21/22	4,000	LF
79	Concrete Sidewalk	5 days	9/22/22	9/28/22	1,400	SF
80	**Lighting**	**39 days**	**7/27/22**	**9/20/22**		
81	1.5" Sch 80 PVC, (2) #8, #8 Gnd.	10 days	7/27/22	8/9/22	1,950	LF
82	Pull Box	6 days	8/2/22	8/9/22	12	EA
83	Roadway Light, Pole and Base	20 days	8/10/22	9/7/22	12	EA
84	Traffic Signal System	10 days	8/30/22	9/13/22		
85	Vehicle Detection System	8 days	9/1/22	9/13/22		
86	Traffic Control/Signs	5 days	9/14/22	9/20/22		
87	**Final Work/Punchlist Items**	**13 days**	**9/20/22**	**10/6/22**		
88	Marking/Signage	10 days	9/20/22	10/3/22	10,450	LF
89	Pedestrian Crossing	4 days	9/28/22	10/3/22	15,924	SF
90	Punchlist Items	3 days	10/4/22	10/6/22		
91	**Phase 2: Jurupa near Future UPS Complete**	0 days	10/6/22	10/6/22		
92	**Phase 3: Avion from Hellman to Vineyard Ave**	**51 days**	**10/6/22**	**12/22/22**		
93	Phase 3 Construction Notice to Proceed	0 days	10/6/22	10/6/22		
94	**Demolition**	**15 days**	**10/7/22**	**10/28/22**		
95	Remove Fence	2 days	10/7/22	10/11/22	534	LF
96	Clearing & Grubbing	5 days	10/12/22	10/18/22	11,353	SF
97	Saw cut AC	1 day	10/19/22	10/19/22	420	LF
98	Remove Asphalt & Base	7 days	10/20/22	10/28/22	126,516	SF
99	Remove Extst. Curb/AC Dike/Signs	10 days	10/17/22	10/28/22	5,207	LF
100	**Utilities**	**25 days**	**10/31/22**	**12/7/22**		
101	Install Storm Drain/Structures(15)	25 days	10/31/22	12/7/22	3,380	LF
102	Install 8" RCP Sewer/Structures (8)	15 days	11/2/22	11/23/22	1,220	LF
103	Connect to Existing Sewer/Testing	5 days	11/28/22	12/2/22		
104	Install New 16" AWWA C900-DR14 Puroe RW Pipe	12 days	11/4/22	11/22/22	2,364	LF
105	Connect to Existing Waterline/Testing	5 days	11/23/22	12/1/22		

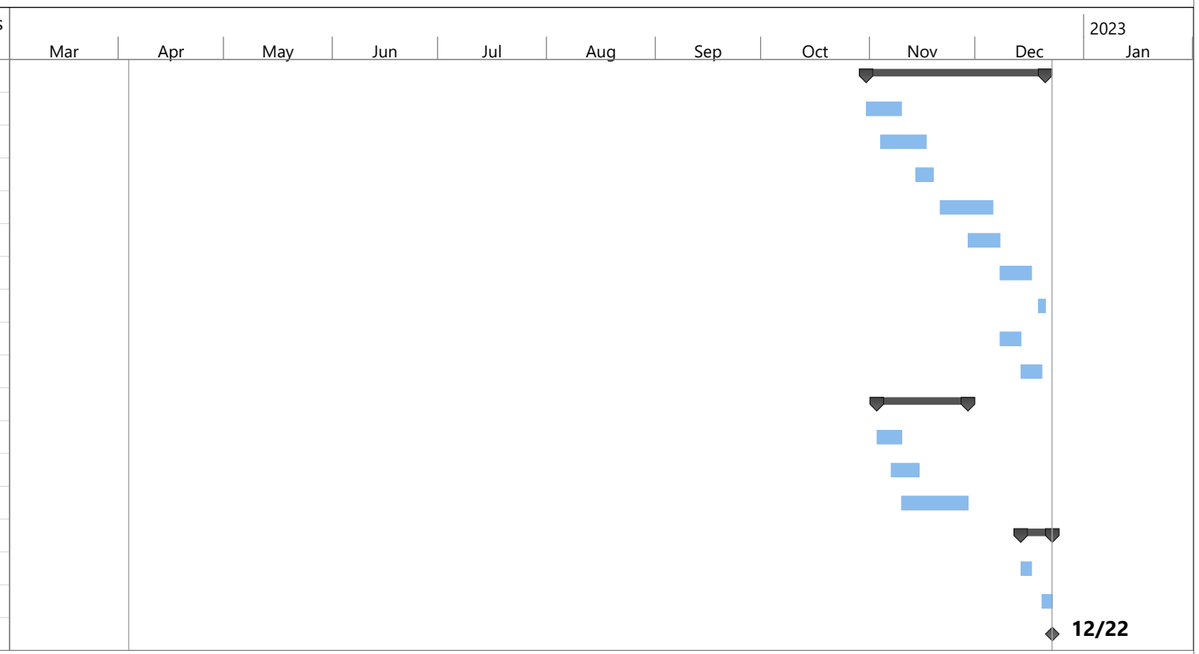


Project: 4733.20.02 ONT Avion & Jurupa St Realign Sch 2021-04-29
Date: 4/30/21

Task Milestone Summary

Ontario International Airport
Realignment of Avion St. & Jurupa St.
30% Design Probable Construction Schedule

ID	Task Name	Duration	Start	Finish	Quantities	Units
106	**New Roadway**	**34 days**	**10/31/22**	**12/20/22**		
107	Excavation	8 days	10/31/22	11/9/22	13,070	SY
108	Subgrade Prep	8 days	11/4/22	11/16/22	13,070	SY
109	Base Stone	5 days	11/14/22	11/18/22	13,070	SY
110	10" CAB	9 days	11/21/22	12/5/22	13,070	SY
111	8" Asphalt Paving	7 days	11/29/22	12/7/22	13,070	SY
112	Curb & Gutter	7 days	12/8/22	12/16/22	4,841	LF
113	Concrete Sidewalk/Ramp	2 days	12/19/22	12/20/22	364	SF
114	Driveway Approach	4 days	12/8/22	12/13/22	3,977	SF
115	Concrete Cross Gutter	4 days	12/14/22	12/19/22	2,626	SF
116	**Lighting**	**15 days**	**11/3/22**	**11/28/22**		
117	1.5" Sch 80 PVC, (2) #8, #8 Gnd.	5 days	11/3/22	11/9/22	1,000	lf
118	Pull Box	5 days	11/7/22	11/14/22	5	EA
119	Roadway Light, Pole and Base	10 days	11/10/22	11/28/22	5	EA
120	**Final Work/Punchlist Items**	**7 days**	**12/14/22**	**12/22/22**		
121	Marking/Signage	3 days	12/14/22	12/16/22	3,016	LF
122	Punchlist Items	3 days	12/20/22	12/22/22		
123	**Phase 3: Avion from Hellman to Vineyard Ave Complete**	0 days	12/22/22	12/22/22		



Project: 4733.20.02 ONT Avion & Jurupa St Realign Sch 2021-04-29
Date: 4/30/21

Task Milestone Summary

EXHIBITS

Exhibit A
Document List

Exhibit A – Document List

✈ The Estimate and Schedule Report reflects the specifications and the drawings listed herein, as well as information received verbally from HNTB.

Description	Date
REALIGMENTT OF AVION ST. & JURUPA ST. – Preliminary Geometrics and Base Mapping	4/21/2021

Appendix D. Utility Networks

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AIRPORT ADMINISTRATION OFFICES

GUARDIAN

(E) 6" WATER

(E) 10" WATER

(E) 10" WATER

(E) 12" WATER

(P) 16" WATER

(E) AVION ST.

CUCAMONGA CHANNEL

AVION ST.

TOWER DR.

(E) 12" WATER

(P) 16" WATER

(E) 12" WATER

JURUPA ST.

(E) 12" WATER, ABANDONED

LINDSAY PRIVADO

S. ARCHIBALD AVE.

S. VINEYARD AVE.

RAILROAD TRACKS

MISSION BLVD.

S. CARLOS AVE.

(E) 12" WATER

PROPOSED WAREHOUSE / OFFICE FACILITY SITE

LEGEND:

PROPOSED ROADWAY ALIGNMENT

PROPOSED WAREHOUSE (BY OTHERS)

EXISTING UTILITY

PROPOSED UTILITY

WATER NETWORK

0' 100' 200' 400'

SCALE 1" = 200'-0"

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AIRPORT ADMINISTRATION OFFICES

GUARDIAN

S. VINEYARD AVE.

RAIL ROAD TRACKS

MISSION BLVD.

S. CARLOS AVE.

(P) 16" RECYCLED WATER LINE, TYP.

(E) AVION ST.

PROPOSED WAREHOUSE / OFFICE FACILITY SITE

CUCAMONGA CHANNEL

AVION ST.

TOWER DR.

(E) 8" RECYCLED WATER

JURUPA ST.

LINDSAY PRIVADO

S. ARCHIBALD AVE.

LEGEND:

PROPOSED ROADWAY ALIGNMENT

PROPOSED WAREHOUSE (BY OTHERS)

EXISTING UTILITY

PROPOSED UTILITY

RECYCLED WATER NETWORK

0' 100' 200' 400'

SCALE 1" = 200'-0"

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AIRPORT ADMINISTRATION OFFICES

GUARDIAN

(E) 8" VCP SS

(E) 30" VCP SS

(E) 36" VCP SS

(P) 8" VCP SS

(E) 8" VCP SS

(E) 30" VCP SS

(E) 8" VCP SS

(E) AVION ST.

S. VINEYARD AVE.

RAILROAD TRACKS

MISSION BLVD.

S. CARLOS AVE.

CUCAMONGA CHANNEL

AVION ST.

TOWER DR.

PROPOSED WAREHOUSE / OFFICE FACILITY SITE

(E) 15" AC SS

JURUPA ST.

LINDSAY PRIVADO

S. ARCHIBALD AVE.

LEGEND:

PROPOSED ROADWAY ALIGNMENT

PROPOSED WAREHOUSE (BY OTHERS)

EXISTING UTILITY

PROPOSED UTILITY

SEWER NETWORK

0' 100' 200' 400'

SCALE 1" = 200'-0"

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AIRPORT ADMINISTRATION OFFICES

GUARDIAN

S. VINEYARD AVE.

(E) 4" GAS

(E) AVION ST.

CUCAMONGA CHANNEL

AVION ST.

TOWER DR.

(E) 4" GAS

JURUPA ST.

RAIL ROAD TRACKS

MISSION BLVD.

(P) 2" GAS

PROPOSED WAREHOUSE / OFFICE FACILITY SITE

(E) 2" GAS

S. CARLOS AVE.

LINDSAY PRIVADO

S. ARCHIBALD AVE.

LEGEND:

PROPOSED ROADWAY ALIGNMENT

PROPOSED WAREHOUSE (BY OTHERS)

EXISTING UTILITY

PROPOSED UTILITY

GAS NETWORK

0' 100' 200' 400'

SCALE 1" = 200'-0"

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AIRPORT ADMINISTRATION OFFICES

GUARDIAN

S. VINEYARD AVE.

(E) COMM

(E) AVION ST.

CUCAMONGA CHANNEL

TOWER DR.

AVION ST.

(E) SCE AND FRONTIER OVERHEAD LINES

(P) COMM RE-ROUTING (BY OTHERS)

RAIL ROAD TRACKS

MISSION BLVD.

PROPOSED WAREHOUSE / OFFICE FACILITY SITE

JURUPA ST.

LINDSAY PRIVADO

S. CARLOS AVE.

S. ARCHIBALD AVE.

LEGEND:

PROPOSED ROADWAY ALIGNMENT

PROPOSED WAREHOUSE (BY OTHERS)

EXISTING UTILITY

PROPOSED UTILITY

COMMUNICATIONS NETWORK

0' 100' 200' 400'

SCALE 1" = 200'-0"

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AIRPORT ADMINISTRATION OFFICES

GUARDIAN

S. VINEYARD AVE.

(E) AVION ST.

CUCAMONGA CHANNEL

AVION ST.

TOWER DR.

(P) ELECTRICAL RE-ROUTING (WORK BY OTHERS)

(E) OVERHEAD ELECTRICAL LINES

RAILROAD TRACKS

MISSION BLVD.

S. CARLOS AVE.

PROPOSED WAREHOUSE / OFFICE FACILITY SITE

(P) STREET LIGHT, TYP.

(E) VERIZON MH

JURUPA ST.

(P) INTERSECTION TRAFFIC RE-SIGNAL AREA

LINDSAY PRIVADO

S. ARCHIBALD AVE.

LEGEND:

- PROPOSED ROADWAY ALIGNMENT
- PROPOSED WAREHOUSE (BY OTHERS)
- EXISTING UTILITY
- PROPOSED UTILITY

ELECTRICAL NETWORK

0' 100' 200' 400'

SCALE 1" = 200'-0"

J:\77645_ONT_APL_Avion\00_CADD\Exhibits\Rev_BOD_Graphics\ BOD_Ex_Utilities_Datadwg Jun 09, 2021 - 3:55pm

AIRPORT ADMINISTRATION OFFICES

GUARDIAN

S. VINEYARD AVE.

SD

(P) 24"

(P) 27"

(P) 24"

(P) 42"

(P) 18"

(P) 18"

(P) 24"

(P) 48"

(P) 18"

(P) 36"

(P) 24"

(E) AVION ST.

RAILROAD TRACKS

MISSION BLVD.

S. CARLOS AVE.

PROPOSED WAREHOUSE / OFFICE FACILITY SITE

(P) 48"

(P) 36"

(P) 18"

(P) 66"

CUCAMONGA CHANNEL

AVION ST.

TOWER DR.

(P) 36"

(E) 57" RCP

(E) 51" RCP

JURUPA ST.

LINDSAY PRIVADO

S. ARCHIBALD AVE.

LEGEND:

PROPOSED ROADWAY ALIGNMENT

PROPOSED WAREHOUSE (BY OTHERS)

EXISTING UTILITY

PROPOSED UTILITY

STORM DRAINAGE NETWORK

0' 100' 200' 400'

SCALE 1" = 200'-0"

J:\77645_ONT_APL_Avion\00_CADD\Exhibits\Rev_BOD_Ex_Utilities_Phase.dwg Jun 06, 2024 - 3:25pm

ONTARIO AIRPORT - REALIGNMENT OF EAST AVION AND JURUPA STREET

E. AVION ST.

(EX.) S. HELLMAN AVE.

(EX.) E. AVION ST.

EXISTING SCE OVERHEAD POWER LINES

AVION ST.

TOWER DR.

JURUPA ST.

PROPOSED WAREHOUSE / OFFICE FACILITY SITE

CUCAMONGA CHANNEL

LINDSAY PRIVADO

RAILROAD TRACKS

MISSION BLVD.

S. HELLMAN AVE.

SCE

SS

G

W

M

ONTARIO INTERNATIONAL AIRPORT

PROPOSED AVION ST. EXTENSION ROADWAY

JURUPA ST.

EX. SCE OVERHEAD POWER LINES

MISSION BLVD.

GENERAL LOCATION MAP

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EXISTING SCE OVERHEAD POWER LINES

OVERHEAD POWER LINE LOCATIONS | DATE: 6/4/2021 | REVISION No.: 1

80' 0 80' 160'

SCALE 1" = 80'-0"

HNTB

Appendix E. OIAA Comments

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Date: February 18, 2021

To: Tony Fermelia, HNTB

From: Jeffrey Smith, OIAA

Subject: Comments to the Avion/Jurupa Realignment Geometrics Plan Set Submittal

Please find below my comments to the recently submitted Geometrics Plan Set for the Avion/Jurupa Realignment plan set. If you have any questions, please let me know.

Comment #	Sheet #	Comment
1	General	Note 4 on the CC sheets seems out of place (What's the existing Sunridge Heights Parkway Project?)
2	CC206	This sheet is missing a north arrow.
3	CC207	This sheet is missing a north arrow
4	CC208	I don't see clearly where the bridge begins and the ends. I would expect there is a difference pavement section (the bridge deck?) across the bridge.
5	"	The very light hash marks for the bridge are not in a legend
6	"	Will we need to maintain some access to the Old Avion Str intersection with Jurupa just west of the Tower/Jurupa intersection?
7	"	Curve C21 should be moved to Sheet CC209
8	CC209	Curve data for C21 should be moved from CC208 to this page
9	CC211	Shouldn't there be a storm drain catch basin on the north side of the road at the low point?
10	"	There is a MH that is shown partly in the sidewalk at about Station 50+50. Does this need to be protected? Adjusted?
11	RM501	Missing Construction Note 6 for stop marking on 1st south driveway at about Sta 2+75
12	RM502	Based on the striping shown, it would appear that the wrong construction note (2) was used at Sta 16+75 – should it a 1 instead of a 2.
13	RM502	We had talked about moving the maintenance yard entrance to be across from the South SAAP roadway and making that intersection a 4-way stop (Sta 18+00)
14	RM503	There is no stop bar and stop paint (construction note 6) on the south driveway to the Maintenance Yard at Sta 19+50
15	RM504	There is no stop bar and painted "Stop" (construction note 6) at the south driveway at Sta 38+75
16	RM505	The striping at Sta 53+40 looks like construction note 1, not 2
17	TS301	Do we need to add a signal on the Southwest corner facing to the east for westbound traffic?

18	General	Is the City of Ontario going to want to widen Archibald to the west, north of Jurupa when UPS does their development? Our Northwest corner at the Archibald/Jurupa intersection is matching up to the existing Archibald roadway alignment. However, with an increase in employee parking and truck traffic, they may want to widen Archibald north of Jurupa. We should check with the City.

JCS

CC Keith Owens

Realignment of East Avion Street and East Jurupa Street
Basis of Design
30% Design
May 2021

Date: May 13, 2021

To: Tony Fermelia, HNTB

From: Jeffrey Smith, OIAA

Subject: 30% Review Comments

Please find below my comments to the Basis of Design (BOD) for the Realignment of East Avion Street and East Jurupa Street. Overall, the BOD was well organized and thorough.

Item #	Reference/Page	Comment	Response	Date
1	General	The Basis of Design and supporting documents should use consistent naming references East Avion Street and East Jurupa Street. This is especially true for the Preliminary Technical Drainage Study.	Documents have been checked and revised	5/20/21
2	Page 3-3, 3rd paragraph	"Due to the clustered land use of along…" - Delete "of".	Corrected	5/20/21
3	Page 3-6, 1st paragraph	"…widening of East Avion/Eeast. Jurupa…" – correct spelling and punctuation.	Corrected	5/20/21
4	Page 5-1	5.2.4 Gas Line (City of Ontario) – a "separate gas line along Vineyard Avenue…" is referenced, but the size of this line is not included in the text.	Currently researching the size of the gas line	5/21/21
5	Page 5-1	5.2.5. communication Lines – delete "comm" and replace it with "communication"	Corrected	5/21/21
6	Page 5-4	5.5. Utilities Under Proposed Bridge – replace **"The proposed bridge was design to allow for new utilities will be placed…"** with **"The proposed bridge is designed to allow for new utilities to be placed …"**	Corrected	5/21/21
7	General - Utilities	Please add the information regarding the monitoring wells that may be encountered in and around the old GE Test Cell site. Information on the monitoring wells was forward to HNTB previously	Information has been added and graphics to Appendix D	5/21/21
Preliminary Technical Drainage Study				

Realignment of East Avion Street and East Jurupa Street
Basis of Design
30% Design
May 2021

8	Page 2	Project Description & Drainage Area overview – last paragraph, second sentence – modify to read "… south side of East Avion Street. However, due to …"	Corrected	5/28/21
9	Page 4	3. FEMA FLOOD ZONE DETERMINATION – 1st paragraph – add a period after "***Figure 3.1"***	Corrected	5/28/21
30% Design Estimate and Construction Schedule Report				
10	Page 2 of 4	Detailed Estimate, line 1025 Crushed Aggregate Base Course – there is no quantity and total here. Line 2024 says 10" CAB is measured separately, but it seems to have been left off.	The quantities for CAB should have been included (21,687 cy), looks like when we issued the revised estimate it was left out by mistake	5/28/21
11	Page 2 of 4	Detailed Estimate, line 1022 Unclassified Excavation – Does this include the grading compaction for the new roadway sub-base? Are the excavated materials disposed of off-site? Reused?	Yes, it included all the grading, and compaction.	5/28/21
12	Page 2 of 4	Detailed Estimate line 1006 Demo and remove existing asphalt paving including Base – is this hauled away? Stock piled/crushed and reused?	Disposed offsite within a 5-mile radius	5/28/21
13	Page 1 of 4	Schedule – items 29-31 – Subgrade prep, base stone and 10" CAB are listed for each phase, but don't seem to accounted for in the estimate.	Hauled off site within 5-mile radius	5/28/21

Realignment of East Avion Street and East Jurupa Street
30% Plan Set
May 2021

Date: May 25, 2021

To: Tony Fermelia, HNTB

From: Jeffrey Smith, OIAA

Subject: 30% Plan Set Review Comments

Please find below my comments to the 30% Plan Set for the Realignment of East Avion Street and East Jurupa Street. Overall, these plans were very was well organized and thorough.

Item #	Reference /Page	Comment	Response	Date
1	T002	• A Property Line symbol is not included in the General Legend. • A Centerline symbol is not included in the General Legend	Added line types to legend	5/27
2	T002	Abbreviations – The following are missing from the list of abbreviated words (these were found throughout the plan set): • FD – FIRE DEPARTMENT • E – EXISTING / EASTING • CONC. - CONCRETE • IP - IRON PIN • CCC – Cucamonga Creek Channel • BK - Book • BEG – BEGINNING • CMU – CONCRETE MASONRY UNIT • CWY – Not on plans - Removed • CH – Not on Plans - Removed • REF – REFERENCE • ST - STREET • R.S.B. – Record of Survey Book • PG - Page • O.R. – Official Record • WLY - WESTERLY • RR - RAILROAD • RS – Record of Survey • PMB – PROCESSED MISCELLANEOUS BASE (• S - SOUTH • PACS – Primary Airport Control Station • SACS – Secondary Airport Control Station • SCE – SOUTHERN CALIFORNIA EDISON • RD ROAD	Added abbreviations to legend	5/27

		• VC – Vertical Curve • R – Radius • PC/PS – Precast/Prestressed • PL – PROPERTY LINE • OG – ORIGINAL GRADE		
3	CD101	• Delete "Airport Police" in the upper left-hand corner and replace with "Guardian"; • Relocate "Airport Administration Offices to the building in the upper right corner of the view • The Roadway Centerline is not included in the Legend (typical throughout)	REVISED	5/27
4	CD104	The "Rock Pile" symbol is missing from the legend	ADDED	5/27
5	CD105	The OIAA property line is not shown on the plans. This is become important when comes time to negotiate easements or dedications when the roadway is completed (same for CD106).	ADDED AND LABELED	5/27
6	CC201	• You use the abbreviation "ELEV" throughout the plans set when "EL" is listed in the list of abbreviations (typical). • At STA: 32+77.40, you use the abbreviation "PIV" instead of "PVI" • Construction Note 16 – the referenced detail in on sheet CC402 (not CC404)(typical for "CC" sheets)	ADDED ELEV TO ABBREVIATIONS AND MADE CORRECTIONS	5/27
7	CC209 - CC212	The chain link fence to be installed north of Jurupa may instead be a decorative fence by the Tenant who develops the property to the north.	Added note indicating to coordinate with UPS development contractor	5/27
8	General	The Grading Sheets don't seem to account for how the roadway grading will match the existing ground contours to the north of Jurupa between Tower and Archibald. How far into the OIAA property will the roadway contractor need to grade/fill/adjust to match grades?	Grading limits have been defined on the plans per detail C1 & C2, typical roadway section, 2:1 max past proposed sidewalk/edge of pavement	5/27
9	CG304	• The access ramps from the bridge to the channel are shown, but not referenced until S101. Also, if the Army Corp requires access	Walk path on west side of channel only,	5/27

		ramps to the channel, are they needed on both sides? With the work we are doing, wouldn't it be better is our Roadway contractor constructs the ramps? • Construction Note 7 – providing rip-rap at that location seems to be a very superficial solution. This will require a more detailed design before this can be bid (this feels like we are dumping into an existing box?)	revised CC208 to ref sidewalk pavement. Added detail for flared end section and rip rap	
10	S101	The plan and profile views do not show the direction of the typical section (it is apparently a section facing east).	Stations are shown, section cut added to plan view to show direction	5/27
11	CU101	Same comment at first bullet of #3 above.	Corrected labels	5/27
12	CU103 – CU104	The relocated COM (and electrical) shown at the bottom right of the view of CU103 and middle left of CU104 is specific work to the proposed Warehouse developer. Shouldn't this work (and construction notes 16 & 17) reflect that this will be done by others?	Revised note to indicate work by others	5/27
13	EL203 – El204	Similar to comment #12 above, the relocated "E" and COM shown on these two sheets is specific to the Warehouse Development. Shouldn't this work (and construction notes 4 & 5) be completed by others (the Warehouse developer)?	Revised notes to reference: work by others, see warehouse development	5/27

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Realignment of East Avion Street and East Jurupa Street
Basis of Design
30% Design
May 2021

8	Page 2	Project Description & Drainage Area overview – last paragraph, second sentence – modify to read "… south side of East Avion Street. However, due to …"	Corrected	5/28/21
9	Page 4	3. FEMA FLOOD ZONE DETERMINATION – 1st paragraph – add a period after "***Figure 3.1"***	Corrected	5/28/21
30% Design Estimate and Construction Schedule Report				
10	Page 2 of 4	Detailed Estimate, line 1025 Crushed Aggregate Base Course – there is no quantity and total here. Line 2024 says 10" CAB is measured separately, but it seems to have been left off.	The quantities for CAB should have been included (21,687 cy), looks like when we issued the revised estimate it was left out by mistake	5/28/21
11	Page 2 of 4	Detailed Estimate, line 1022 Unclassified Excavation – Does this include the grading compaction for the new roadway sub-base? Are the excavated materials disposed of off-site? Reused?	Yes, it included all the grading, and compaction.	5/28/21
12	Page 2 of 4	Detailed Estimate line 1006 Demo and remove existing asphalt paving including Base – is this hauled away? Stock piled/crushed and reused?	Disposed offsite within a 5-mile radius	5/28/21
13	Page 1 of 4	Schedule – items 29-31 – Subgrade prep, base stone and 10" CAB are listed for each phase, but don't seem to accounted for in the estimate.	Hauled off site within 5-mile radius	5/28/21

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