City of Fernley

NEVADA

Members
Jenni McCullar - Chairwoman
Angela Lewis - Vice Chair
Jake VanderHeiden - Commissioner
Humayoon Lodhi - Commissioner
Barry Williams Sr. - Commissioner
Shellie Severa - Commissioner
Cody Wagner - Commissioner

AGENDA
Regular Meeting
Planning Commission
Wednesday, December 13, 2023 • 5:00 PM

Fernley City Council Chambers, 595 Silver Lace Boulevard, Fernley, NV 89408

Zoom information:
Please click the following link to join the webinar: https://us02web.zoom.us/j/82966343247, or one tap mobile: 12532158782, Dial: 669 900 9128, Webinar ID: 829 6634 3247

Public Notice: This agenda has been physically posted in compliance with 241.020 at Fernley City Hall, 595 Silver Lace Blvd. In addition, this agenda has been electronically posted in compliance with NRS 241.020(3) at www.cityoffernley.org and NRS 232.2175 at https://notice.nv.gov/ To obtain further documentation regarding posting, please contact the City Clerk's Office at (775) 784-9830 or cityclerk@cityoffernley.org

Public Comment: Those wishing to address the Planning Commission may submit public comment through the online public comment form found, or by sending an email to cityclerk@cityoffernley.org. Comments received prior to 4:00 pm the day of the meeting will be provided to the Planning Commission and added to the record but will not be read during the live meeting. Public comments received after 4 pm the day of the meeting will be included in the record by may not reach commission members before action is taken. Public comment, whether on action items or public comment, is limited to three (3) minutes per person. Unused time may not be reserved by the speaker, nor allocated to another speaker. The public may comment on any matter that is not specifically included on an agenda as an action item or comment on a specific agenda item. Items not included on the agenda cannot be acted upon other than to place them on a future agenda. Additionally, if you wish you can comment in person at the meeting or use the Raise your Hand feature in Zoom (*9 if you are participating via phone).

Accommodations: The Planning Commission and staff will make reasonable efforts to assist and accommodate individuals with disabilities desiring to attend the meeting. Please contact the City Clerk's Office at (775) 784-9830 in advance so that arrangements can be made.

Supporting Material: Staff reports and supporting material for the meeting are available at the City Clerk's Office, and on the City's website at www.cityoffernley.org Pursuant to NRS 241.020(6), supporting material is made available to the general public at the same time it is provided to the City Council.

Order of Business: The presiding officer shall determine the order of the agenda. The Fernley Planning Commission may combine two or more agenda items for consideration; remove an item from the agenda; or delay discussion relating to an item on the agenda at any time. All items are action items unless otherwise noted. Items scheduled to be heard at a specific time will be heard no earlier than the stated time but may be heard later.

1. INTRODUCTORY ITEMS

1.1. Pledge of Allegiance

1.2. Roll Call

1.3. Public Forum

1.4. (For Possible Action) Approval of Agenda

1.5. (Possible Action) Approval of Minutes

2. STAFF REPORTS

2.1. (For Possible Action) Consideration and possible action to recommend that the City Council conditionally approve TSM 22002, a Tentative Subdivision Map submitted by Mark IV Capital for multiple parcels totaling approximately 2,174 acres generally located south of Interstate 80, east of Nevada Pacific Parkway, and north of US 50A.

3. PUBLIC HEARINGS

A. DISCUSSION WITH PLANNING COMMISSION & STAFF B. PUBLIC INPUT C. ADDITIONAL DISCUSSION WITH PLANNING COMMISSION & STAFF D. COUNCIL ACTION OR DIRECTION TO STAFF

3.1. (For possible action) Consideration of a type I vacation request (T1V23002) and associated order of abandonment by Phelps Engineering Services on behalf of Richard Jackson to abandon the right-of-way known as "Hartsock Avenue", located at approximately 590 West Main Street (APN: 021-071-02).

4. CHAIR AND COMMISSION ITEMS

(SUMMARY OR ACTIVITY REPORTS ON PLANNING ISSUES, ACTIVITIES OR ORGANIZATIONS IN WHICH INDIVIDUAL MEMBERS MAY BE INVOLVED. THIS ITEM IS TO PROVIDE GENERAL INFORMATION TO THE COMMISSION AND PUBLIC. NO DISCUSSION SHALL TAKE PLACE AND NO ACTION WILL BE TAKEN.)

5. PLANNING DIRECTOR ITEMS

(ACTIVITY SUMMARY OR UPDATES ON PROJECTS THAT HAVE BEEN PREVIOUSLY REVIEWED BY THE PLANNING COMMISSION. THIS ITEM IS TO PROVIDE GENERAL INFORMATION TO THE COMMISSION AND PUBLIC. NO DISCUSSION SHALL TAKE PLACE AND NO ACTION WILL BE TAKEN.)

6. ADDRESS REQUEST(S) FOR FUTURE AGENDA ITEMS

7. PUBLIC FORUM

8. ADJOURNMENT

Next Meeting: January 10th @ 5pm

MINUTES OF THE
FERNLEY PLANNING COMMISSION MEETING
NOVEMBER 8, 2023

Chairwoman Jenni McCullar called the Fernley Planning Commission meeting to order at 5:04 pm.

1. INTRODUCTORY ITEMS

1.1. Pledge of Allegiance

1.2. Roll Call

Present: Chairwoman Jenni McCullar, Vice-Chair Angela Lewis, Commissioner Jake VanderHeiden, Commissioner Humayoon Lodhi, Commissioner Barry Williams, Commissioner Shellie Severa, Commissioner Cody Wagner (Zoom), City Engineer Derek Starkey, Assistant Planner Lisa Warner, Planning Director Michelle Rambo, Senior Planner Shay League, City Attorney Aaron Mouritsen, Deputy City Manager Lydia Altick, City Clerk Kim Swanson, Deputy City Clerk Brenda Gosser

1.3. Public Forum

No public input at this time.

1.4. (For Possible Action) Approval of Agenda

Motion: I MOVE TO APPROVE THE AGENDA. **Action**: Approved, **Moved by**: Commissioner Humayoon Lodhi, **Seconded by:** Commissioner Barry Williams. **Vote:** Passed, **Summary:** Yes 7. **Yes:** Commissioner Williams, Commissioner Severa, Chairwoman McCullar, Vice-Chair Lewis, Commissioner Wagner, Commissioner Lodhi, Commissioner VanderHeiden.

1.5. (Possible Action) Approval of Minutes

Motion: I MOVE TO APPROVE THE MINUTES FROM SEPTEMBER 13, 2023, MEETING. **Action:** Approved. **Moved by**: Commissioner Barry Williams, **Seconded by**: Commissioner Humayoon Lodhi. **Vote:** Passed, **Summary:** Yes 7. **Yes:** Commissioner Williams, Commissioner Severa, Chairwoman McCullar, Vice-Chair Lewis, Commissioner Wagner, Commissioner Lodhi, Commissioner VanderHeiden.

2. OATH OF OFFICE

2.1. Administer Oath of Office to new Planning Commissioner Jake VanderHeiden

City Clerk Kim Swanson administered the Oath of Office to new Planning Commissioner Jake VanderHeiden.

3. PUBLIC HEARINGS

3.1. (For Possible Action) Consideration and possible action on TSM 2019-001 EOT, an Extension of Time request by Fernley Land Investment, LLC for not more than two years for Fernley Land Investment, LLC to record a final subdivision map for Sunrise Trails, a 202 single-family attached duplex and townhome subdivision generally located on the southern terminus of Chisholm Trail (APNs: 021-272-41, -42, -43, and -44 on a site 13.9-acres in size.

Lisa Warner, Assistant Planner, presented this item. The applicant is submitting a tentative subdivision map extension of time request. The purpose of this extension of time is to allow the developer an additional two years to record their final subdivision map. NRS 278.360 1. (a) (1) requires that the final subdivision shall be presented to City Council within four years after the approval of a tentative subdivision map. This

section of NRS also authorizes the Planning Commission to grant an extension of time no longer than 2 years. The applicant was unable to finalize preparations for recording the Sunrise Trails map by the October 16, 2023, deadline and is requesting a maximum of up to two-year extension of time. If granted, the applicant must be ready to record the final subdivision map by October 16, 2025.

Commissioner Cody Wagner expressed concerns in regards to condition 12 and the traffic.

There was no public comment at this time.

Motion: I MOVE TO APPROVE A TWO YEAR EXTENSION OF THE TENTATIVE SUBDIVISION MAP ASSOCIATED WITH TSM2019-001 WITH AN EXPIRATION DATE OF OCTOBER 26, 2025. **ACTION**: Approved, MOVED **BY**: Vice-Chair Lewis, **SECONDED BY**: COMMISSIONER HUMAYOON Lodhi. **Vote:** Passed, **Summary:** Yes 7. **Yes:** Chairwoman McCullar, Vice-Chair Lewis, Commissioner VanderHeiden, Commissioner Lodhi, Commissioner Williams, Commissioner Severa, Commissioner Wagner.

3.2. (For Possible Action) Consideration and possible action on Bill # 340—regarding a planned development application (PD22001)—and a tentative subdivision map application (TSM23002), submitted by Phelps Engineering on behalf of Creekwood Group, to rezone a ±42.87-acre parcel generally located south of Farm District Road between Linley and Barker Lanes (APN: 021-303-20) from Single-Family Residential, 20,000 square-foot minimum lot size (SF20) to Planned Development (PD). The Creekwood planned development proposes 77 single-family homes and 132 townhomes with some design standard deviations from Fernley Municipal Code.

Shay League, Senior Planner, presented this item. The Planning Commission must hold a public hearing on this item because staff gave public notice that a hearing on this item would occur at this meeting. Staff has prepared a brief presentation to give context to the public hearing, but asks that the item be continued to the December 13, 2023 meeting for the Commission's discussion, a detailed staff presentation, feedback from the applicant, and a follow-up public hearing. The applicant and staff are still working together to bring forward conditions of approval and agree that a continuation of the item is appropriate.

There was no public input at that time.

Motion: MOVE TO CONTINUE THIS ITEM TO DECEMBER 13, 2023, PLANNING COMMISSION MEETING**. Action**: Approved**. Moved by**: Commissioner Williams Jr., **Seconded by**: Commissioner Lodhi. **Vote:** Passed, **Summary:** Yes 7. **Yes**: Commissioner Williams, Commissioner Severa, Chairwoman McCullar, Vice-Chair Lewis, Commissioner Wagner, Commissioner Lodhi, Commissioner VanderHeiden.

3.3. (For Possible Action) Consideration, discussion, and possible action to recommend that the City Council approve Bill #342, an Ordinance establishing a Development Agreement (DA22001) between the developer (Mark IV Capital) and the City of Fernley in association with Phase 1 of the Victory Logistics District Planned Development relating to improvements of utilities, public services, and other related items.

Michele Rambo, Planning Director, presented this item. The property owner, Mark IV Capital, and the City of Fernley have negotiated a Development Agreement to accompany the development of the Victory Logistics District Planned Development. This agreement outlines requirements for both the developer and the City to follow as the project develops over the next 20 years. Items discussed include a new fire station, water and sewer infrastructure, traffic, and open space.

Doug, representative for Mark IV Capital, stated that the pieces are in place, some of the issues and language need to be fine-tuned.

There was no public input.

Motion: MOVE TO DENY UNTIL WE HAVE THE ACTUAL VERBAGE THEY ARE WANTING TO CHANGE. **Action**: Withdrawn. **Moved by**: Chairwoman McCullar, **Seconded by**: Commissioner Severa.

Motion: I MOVE TO RECOMMEND THAT THE CITY COUNCIL APPROVE BILL #342, AN ORDINANCE ESTABLISHING A DEVELOPMENT AGREEMENT BETWEEN MARK IV CAPITAL AND THE CITY OF FERNLEY REGARDING THE IMPROVEMENTS OF UTILITIES, PUBLIC SERVICES, AND OTHER RELATED ITEMS BASED ON THE FINDINGS OUTLINED IN THE STAFF REPORT WITH THE CONDITION THAT ANY CHANGES COME BACK TO THE PLANNING COMMISSION FOR APPROVAL. **Action:** Approved, **Moved by:** Chairwoman Jenni McCullar, **Seconded by:** Commissioner Shellie Severa. **Vote:** Passed, **Summary:** Yes 7. **Yes:** Commissioner Williams, Commissioner Severa, Chairwoman McCullar, Vice-Chair Lewis, Commissioner Wagner, Commissioner Lodhi, Commissioner VanderHeiden.

4. CHAIR AND COMMISSION ITEMS

Commissioner Cody Wagner welcomed Jake VanderHeiden. He reported that he had reached out to NDOT inquiring what Fernley could do better to coordinate some of the city's plans and there was a very specific response from NDOT. NDOT has a local road safety program that is grant funded. According to NDOT, it would be free for the City to pursue that program with NDOT. He will email the recommendations from NDOT to the City staff.

5. PLANNING DIRECTOR ITEMS

Michele Rambo, Planning Director, discussed the 2 books given to Commissioners as part of board training.

Shay League, Senior Planner, stated that in addition to the books, she printed out the most recent draft of the bylaws and procedural notes. The new bylaws have not yet been adopted or certified by the City Council. If there are any changes, she will bring them before the Commission at the next meeting.

6. ADDRESS REQUEST(S) FOR FUTURE AGENDA ITEMS

None at this time.

7. PUBLIC FORUM

No public input

8. ADJOURNMENT

The next meeting is December 13, 2023, at 5:00.

There being no further business to come before it, the Planning Commission meeting adjourned at 6:06 PM.

Approved by the Fernley Planning Commission on December 13, 2023, by a vote of:

AYES _____ NAYS:_____ ABSTENTIONS:_____ ABSENT:_____

_____ _____

Chairwoman Jenni McCullar Attest:

CITY OF FERNLEY

Planning Commission
AGENDA REPORT

Meeting Date: December 13, 2023

REPORT TO:	Fernley Planning Commission
REPORT FROM:	**Michele Rambo, Planning Director**

FINANCIAL IMPACT:		**CURRENTLY BUDGETED:**		**FUND/ACCOUNT:**
Yes:	No: X	Yes:	No: X	N/A

ACTION REQUESTED: Motion

AGENDA ITEM:

(For Possible Action) Consideration and possible action to recommend that the City Council conditionally approve TSM 22002, a Tentative Subdivision Map submitted by Mark IV Capital for multiple parcels totaling approximately 2,174 acres generally located south of Interstate 80, east of Nevada Pacific Parkway, and north of US 50A.

AGENDA ITEM BRIEF:

Mark IV Capital is going through the approval process for multiple applications to develop Phase 1 of the Victory Logistics District, an industrial development proposed for the east side of Fernley consisting of APNs 021-201-01 and -16; 021-211-02, -03, -04, and -06; 021-242-11 and -17; 021-251-25; 021-261-43 and -44. A Planned Development and associated handbook have previously been approved by the City Council and a Development Agreement is currently being negotiated.

RECOMMENDED MOTION:

I move to recommend that the City Council approve TSM 22002 as presented by staff, based on the findings and conditions of approval outlined in the staff report.

BUSINESS IMPACT (per NRS Chapter 237):

A Business Impact Statement is not required because this is not a rule (term excludes vehicles by which legislative powers are exercised under NRS Chapters 271, 278, 278A, or 278B).

See attached report for background, analysis, alternatives.

ALTERNATIVES:

I move to recommend that the City Council deny TSM 22002 because Finding #____ can not be met for the following reason: _____.

BACKGROUND:

The first phase of Victory Logistics District Planned Development consists of approximately 2,174 acres generally located south of Interstate 80 and east of Nevada Pacific Parkway. The District will consist of mainly industrial uses, but a small amount of commercial is anticipated to be scattered throughout, especially around the Interstate 80/Nevada Pacific Parkway interchange. The existing railroad spur in the southern portion of the development is anticipated to be expanded and used by future buildings.

The Planned Development is envisioned to create a large-scale employment center with an overall positive impact to the local economy by providing jobs to Fernley residents. These jobs will be found through a diverse range of uses extending from distribution warehouses and e-commerce to high end manufacturing and data centers. Commercial uses will be integrated throughout the development to serve residents, employees of the area, and travelers along Interstate 80. The map below shows the extent of the currently proposed Planned Development.

The Tentative Subdivision Map, if approved, will create an industrial subdivision out of the existing lots. Industrial subdivisions are slightly different than a typical residential subdivision in that instead of creating individual lots, the map acts only to dedicate streets, rights-of-way, and/or easements to the City of Fernley. This creates the opportunity to later divide the property in a way more tailored to individual users through a series of Final Maps, which will follow to formally create the individual parcels. As the development occurs,

additional maps and/or boundary adjustments may be requested based on market needs.

Current Conditions

The area in question is currently vacant with some existing industrial uses already operating to the west. The adjoining area north of Interstate 80 is also vacant and falls within the North Fernley Future Area of Development in the City of Fernley Master Plan. An Area Plan is currently being developed for this portion of the city. The land to the east of this project is designated as open space, a portion of which consists of the Fernley Wildlife Management Area. The southern boundary of the development falls across US 50A from a residential subdivision (Donner Trail Estates Phase 5).

The majority of the area proposed for development has historically been zoned Industrial (I) with a small amount of General Commercial (C2) along Interstate 80 at Exit 50. A Planned Development has recently been approved that changes the zoning of all subject parcels to Planned Development (PD). Surrounding zoning includes Rural Residential – 5 Acre (RR5) to the north across Interstate 80, Industrial (I) and General Commercial (C2) to the west, General Rural – 20 Acres (GR20) to the east, and General Commercial (C2) and Single-Family Residential – 6,000 Square Feet (SF6) to the south across US 50A.

The City of Fernley Master Plan also designates most of the development area as Industrial (I) with General Commercial (C2) along Interstate 80 at Exit 50. In addition, the Master Plan designates two parcels on the south edge of the area as Mixed Employment (ME). The new Planned Development (PD) zoning is a corresponding zoning with each of these land use designations. Similar to surrounding zoning, the Master Plan designates the area to the north across Interstate 80 as General Rural (GR), a combination of Industrial (I), Commercial (C), and Mixed Employment (ME) to the west, Open Space and Parks (OSP) to the east, and both Commercial (C) and Single-Family Residential (SFR) to the south across US 50A.

ANALYSIS:

Several studies and reports were submitted as part of this proposed Tentative Map. Topics include water, sewer, drainage, and traffic. These issues have been studied and discussed extensively throughout the process of reviewing the overall development. Details of these studies have been covered in length in previous reports done for both the Planned Development and Development Agreement. A short summary of each is below.

Water: The developer has the water rights to accommodate the anticipated water usage of the development at full buildout. Additional storage capacity will be required and will be phased in with the development of the project.

Sewer: The existing sewage treatment plant will reach capacity at some point during project development and will need to be upgraded and/or expanded. Capacity of the plant will be closely monitored with the addition of each building and/or use.

Drainage: Drainage improvements will convey on-site flows throughout the project by way of pipes, drainage channels, catch basins, and detention basins. Off-site flows will be intercepted, detained, and ultimately released downstream to the Fernley Sink.

Traffic: The increase in traffic created by the project development will impact many of the surrounding streets and intersections, including US 95A and Newlands Drive. Traffic signals, street widening, and the extension of Nevada Pacific Parkway are recommended to minimize these impacts.

FINDINGS:

To approve the Tentative Subdivision Map, the following findings must be met:

TSM1
Compliance with environmental and health laws and regulations concerning water and air pollution, solid waste disposal, water supply facilities, community or public sewage disposal, and, where applicable, individual systems for sewage disposal.

The developer shall comply with all standards, codes, and requirements regarding connection to the City's sanitary sewer and potable water systems, including but not limited to, associated fees, easements, design standards, system looping, development code requirements, and state requirements. Prior to the recordation of a final map for the project, the developer shall provide the City with a utility plan for water and sanitary sewer that is in conformance with the City of Fernley's Municipal Code and Public Works Design Manual to the approval of the City Engineer, Public Works Director, and Administrator. The Map must be reviewed and approved by the Nevada Department of Environmental Protection prior to construction.

TSM2
Availability of water that meets applicable health standards and is sufficient for the reasonably foreseeable needs of the subdivision.

The developer shall comply with all City of Fernley municipal codes regarding the dedication of water rights, including associated fees, for the connection to the city's municipal water system in the amount that is required prior to the issuance of a building permit for the project. The developer shall pay all fees and provide all the information necessary to complete water and sewer modeling of the project. Modeling will be performed by the City of Fernley's consultant and any additional infrastructure or capacity identified by the modeling shall be included in the improvement plans and constructed by the developer.

TSM3
Availability and accessibility of utilities.

The nature and size of the Victory Logistics District Planned Development creates several challenges with providing utilities. The biggest challenge is the sewage treatment plant, which does not currently have the capacity to handle the amount of waste that a project of this size would generate. At some point, the plant will need to be upgraded and/or enlarged. A solution to this problem is currently being negotiated as part of the Development Agreement between Mark IV Capital and the City of Fernley. A condition of approval has been added requiring that the Development Agreement be in place prior to the recordation of the first Final Map.

The increased demand for water can be covered by the developer's existing water rights, but significant infrastructure improvements will need to be made to get the water to the site. Three additional storage tanks and pipe infrastructure to the project site will be installed by the developer as the project develops.

TSM4
Availability and accessibility of public services such as schools, police and fire protection, transportation, recreation facilities, and parks.

The need for a new fire station has been identified by the North Lyon County Fire Protection District as being critical to providing an adequate level of service for this new development. Once this fire station is complete, the project will be consistent with the Master Plan. The details of the fire station's location, funding, and timing will be included in the forthcoming Development Agreement between Mark IV Capital and the City of Fernley. A condition of approval has been added requiring that the Development Agreement be in place prior to the recordation of the first Final Map.

The project will consist of a combination of public and private roads. All public roads to be dedicated to the City of Fernley are required to comply with street standards as outlined in the Planned Development Handbook and/or the City of Fernley street requirements. A traffic study has been submitted which makes recommendations for several necessary improvements including signage, striping, and signaling. The extension of Nevada Pacific Parkway will alleviate many of the overall transportation concerns.

Schools, recreation facilities, and parks will not be impacted due to the industrial nature of the development. The approved Planned Development does require a minimum amount of open space, but most of the open space provided will not be usable by the public.

TSM5
Consistency with the zoning district regulations.

The Victory Logistics District Planned Development is located on the edge of an existing industrial portion of the city. The area has historically been zoned for industrial use and is identified for industrial use in the Master Plan. In addition, a Planned Development has been approved which indicates the use of the area will be predominantly industrial in nature. Therefore, there is no adverse relationship to the area.

TSM6
Conformity with the master streets and highways plan.

Any roadway construction additions or improvements required to serve the project will need to conform to the Master Streets and Highways Plan, and be approved by the City Engineer, Administrator, and Public Works Director.

TSM7
Effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision.

The existing roads in and around the project area are not adequate to handle the significant increase in traffic, especially truck traffic, that would be generated. The submitted traffic study identifies several needed improvements, including an extension of Nevada Pacific Parkway south to US 50A, to mitigate this issue and take the pressure off of some of the other surrounding streets. The developer is currently working with NDOT and the Union Pacific Railroad to get their approval for the extension, which will be required to be constructed when the number of trips reaches a certain threshold outlined in the Development Agreement. A condition of approval has been added requiring that the Development Agreement be in place prior to the recordation of the first Final Map.

TSM8
Physical land characteristics, such as floodplain, slope, soil, and elevation differentials with abutting properties.

A small portion of the southern end of the project area lies within a FEMA designated Flood Zone A. This indicates that the area has a 1 percent chance of flooding annually. Detailed analyses are not performed in these areas so no base flood elevations are indicated. The applicant has submitted an application for a Conditional Letter of Map Revision (CLOMR) which proposes to eliminate the Flood Zone designation through drainage improvements outlined in the project drainage report.

TSM9
Recommendations and comments of review bodies.

The application was distributed to the City's Public Works Department, City Engineer, and several outside agencies for comment. Comments were received and provided to the applicant. The application has been conditioned such that all comments and recommendations of reviewing bodies shall be addressed prior to Final Map Approval.

TSM10
Conformity to the master sewer and water utility plan.

The developer shall comply with all standards, codes, and requirements regarding connection to the City's sanitary sewer and potable water systems, including but not limited to: associated fees, easements, design standards, system looping, development code requirements, and state requirements. Prior to the recordation of a final map for the project, the developer shall provide the City with a utility plan for water and sanitary sewer that is in conformance with the City of Fernley's Municipal Code and Public Works Design Manual to the approval of the City Engineer, Public Works Director, and Zoning Administrator. The project must also be reviewed and approved by the Nevada Department of Environmental Protection prior to construction.

TSM11
Compliance with the Development Code and all other applicable regulations.

The developer shall comply with the design standards and regulations as set forth in the City of Fernley's Development Code and Public Works Design Manual unless otherwise specified in the Planned Development Handbook or where in conflict with the local, state, or federal regulations, in which case the more stringent regulation will take precedence. The developer shall comply with all engineering requirements within the City's Municipal Code Title 32, Planned Development Handbook, and/or Development Agreement, including but not limited to: Compliance with Site Development Standards, Floodplain Management, Roadways, Undergrounding of Utilities, and Water & Wastewater Facilities to the approval of the Zoning Administrator, City Engineer, and Public Works Director, prior to the recordation of a Final Map for the project.

RELEVANT LAWS, STATUTES, AND REGULATIONS:

City of Fernley Development Code Section 32.03.060 (Land Division Applications)
City of Fernley Development Code Chapter 32.12 (Adequate Public Facilities)
NRS 278.325 (Mapping for industrial or commercial development)

FINANCIAL IMPLICATIONS:

None

ATTACHMENTS:

1. Conditions of Approval
2. Tentative Map Plans
3. Planning Report and Signed Applications
4. Water Report Stamped
5. Sewer Report Stamped
6. Victory Traffic Impact Study
7. Traffic Study Appendices
8. Drainage Report Stamped
9. Fiscal Impact Analysis

Conditions of Approval for TSM22002
Tentative Subdivision Map

1. **APPROVAL:**
   THE PROJECT IS APPROVED AS SUBMITTED AND CONDITIONED. ANY SUBSTANTIVE CHANGE SHALL REQUIRE REVIEW AND APPROVAL BY THE PLANNING COMMISSION AND CITY COUNCIL AS AN AMENDMENT TO THIS TENTATIVE MAP.

2. **PROJECT DESCRIPTION:**
   THE PROJECT APPROVAL IS LIMITED TO AN INDUSTRIAL DEVELOPMENT WITH A MAXIMUM OF 11 LOTS ON ± 2,173.64 ACRES.

3. **EXPIRATION DATE:**
   THE TENTATIVE MAP SHALL EXPIRE WITHIN FOUR (4) YEARS OF THE DATE OF THE CITY COUNCIL APPROVAL, UNLESS THE FINAL MAP HAS BEEN RECORDED IN ACCORDANCE WITH NEVADA REVISED STATUTES (N.R.S.) 278.360 AND THE DEVELOPMENT AGREEMENT.

4. **PROJECT CONTACT:**
   THE DEVELOPER SHALL DESIGNATE TO THE CITY A PROJECT CONTACT PERSON RESPONSIBLE/AUTHORIZED TO CORRECT PROBLEMS REGARDING THE PROJECT ON A 24-HOUR/7-DAYS A WEEK BASIS. THE DEVELOPER SHALL DESIGNATE THE PROJECT CONTACT PERSON TO THE CITY PRIOR TO ISSUANCE OF A BUILDING PERMIT FOR THE PROJECT.

5. **DOCUMENT RECORDATION:**
   PRIOR TO RECORDATION OF THE FIRST FINAL MAP, THE ASSOCIATED PLANNED DEVELOPMENT HANDBOOK AND DEVELOPMENT AGREEMENT SHALL BE RECORDED WITH LYON COUNTY.

6. **WATER RIGHTS:**
   THE DEVELOPER SHALL COMPLY WITH ALL CITY OF FERNLEY MUNICIPAL CODES REGARDING THE DEDICATION OF WATER RIGHTS AND ALL ASSOCIATED FEES FOR THE CONNECTION TO THE CITY'S MUNICIPAL WATER SYSTEM IN THE AMOUNT THAT IS REQUIRED PRIOR TO THE RECORDATION OF A FINAL MAP.

7. **SANITARY SEWER REPORT:**
   UNLESS OTHERWISE STATED IN THE DEVELOPMENT AGREEMENT, THE DEVELOPER SHALL BE RESPONSIBLE FOR ANY IMPROVEMENTS DEEMED NECESSARY TO SERVE THE PROJECT TO THE APPROVAL OF THE CITY ENGINEER. THE DEVELOPER SHALL COMPLY WITH ALL CITY OF FERNLEY MUNICIPAL CODES REGARDING THE SANITARY SEWER SYSTEM, INCLUDING ASSOCIATED FEES, FOR THE CONNECTION TO THE CITY'S SANITARY SEWER SYSTEM IN THE AMOUNT THAT IS REQUIRED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT FOR THE PUBLIC IMPROVEMENTS FOR THE PROJECT.

8. **WATER AND SEWER MAINS AND SERVICES:**
   UNLESS OTHERWISE STATED IN THE DEVELOPMENT AGREEMENT, THE DEVELOPER SHALL COMPLY WITH ALL STANDARDS, CODES, AND REQUIREMENTS REGARDING CONNECTION TO THE CITY'S SANITARY SEWER AND POTABLE WATER SYSTEMS, INCLUDING BUT NOT LIMITED TO, ASSOCIATED FEES, EASEMENTS, DESIGN STANDARDS, SYSTEM LOOPING, DEVELOPMENT CODE REQUIREMENTS, AND STATE REQUIREMENTS. PRIOR TO RECORDATION OF A FINAL MAP FOR ANY PHASE OF THE PROJECT, THE DEVELOPER SHALL PROVIDE THE CITY WITH A UTILITY PLAN FOR WATER AND SANITARY SEWER THAT IS IN CONFORMANCE WITH THE PLANNED DEVELOPMENT HANDBOOK, THE CITY OF FERNLEY'S MUNICIPAL CODE, AND PUBLIC WORKS DESIGN MANUAL TO THE APPROVAL OF THE CITY ENGINEER, PUBLIC WORKS DIRECTOR, AND ADMINISTRATOR. EACH PHASE MUST ALSO BE REVIEWED AND APPROVED BY THE NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION PRIOR TO CONSTRUCTION.

9. **UTILITY EASEMENTS:**
   THE DEVELOPER SHALL PROVIDE EASEMENTS TO THE CITY OF FERNLEY FOR THE MAINTENANCE OF THE PUBLIC INFRASTRUCTURE BEING INSTALLED ON PRIVATE PROPERTY. THE EASEMENTS SHALL INCLUDE THE CITY OF FERNLEY'S STANDARD EASEMENT LANGUAGE AND SHALL BE RECORDED ALONG WITH THE FINAL MAP(S).

10. **DESIGN STANDARDS:**
    THE DEVELOPER SHALL COMPLY WITH THE DESIGN STANDARDS AND DEVELOPMENT REGULATIONS AS SET FORTH IN THE PLANNED DEVELOPMENT HANDBOOK AND/OR CITY OF FERNLEY'S DEVELOPMENT CODE AND PUBLIC WORKS DESIGN MANUAL UNLESS IN CONFLICT WITH THE LOCAL, STATE, OR FEDERAL REGULATIONS, IN WHICH CASE THE MORE STRINGENT REGULATION WILL TAKE PRECEDENCE.

11. **ENGINEERING DIVISION**:
    UNLESS OTHERWISE STATED IN THE PLANNED DEVELOPMENT HANDBOOK OR DEVELOPMENT AGREEMENT, THE DEVELOPER SHALL COMPLY WITH ALL ENGINEERING REQUIREMENTS WITHIN THE FERNLEY MUNICIPAL CODE TITLE 32, INCLUDING BUT NOT LIMITED TO, COMPLIANCE WITH SITE DEVELOPMENT STANDARDS, FLOODPLAIN MANAGEMENT, ROADWAYS, UNDERGROUNDING OF UTILITIES, AND WATER AND WASTEWATER FACILITIES TO THE APPROVAL OF THE ADMINISTRATOR, CITY ENGINEER, AND PUBLIC WORKS DIRECTOR PRIOR TO THE RECORDATION OF ANY FINAL MAP(S) FOR THE PROJECT.

12. **LANDSCAPING/IRRIGATION:**
    THE DEVELOPER SHALL SUBMIT A LANDSCAPING AND IRRIGATION PLAN FOR THE PROJECT IN CONFORMANCE WITH TITLE 32 OF THE FERNLEY MUNICIPAL CODE FOR REVIEW AND APPROVAL BY THE ADMINISTRATOR PRIOR TO APPROVAL AND RECORDATION OF A FINAL MAP FOR EACH PHASE. THE LANDSCAPING AND IRRIGATION SHALL BE INSTALLED PER THE APPROVED PLANS TO THE APPROVAL OF THE ADMINISTRATOR.

13. **STREETS:**
    UNLESS OTHERWISE STATED IN THE PLANNED DEVELOPMENT HANDBOOK OR DEVELOPMENT AGREEMENT, THE DEVELOPER SHALL CONSTRUCT ANY ROADWAY IMPROVEMENTS NECESSARY TO SERVE THE PROJECT TO THE APPROVAL OF THE ADMINISTRATOR, CITY ENGINEER, AND PUBLIC WORKS DIRECTOR, PRIOR TO APPROVAL AND RECORDATION OF A FINAL MAP.

14. **DRAINAGE AND GRADING:**
    UNLESS OTHERWISE STATED IN THE DEVELOPMENT AGREEMENT, THE DEVELOPER SHALL COMPLY WITH ALL REQUIREMENTS OF THE FERNLEY MUNICIPAL CODE CHAPTER 32 (DRAINAGE AND GRADING) AND CHAPTER 10 OF THE CITY OF FERNLEY'S PUBLIC WORKS DESIGN MANUAL TO THE APPROVAL OF ADMINISTRATOR, CITY ENGINEER, AND PUBLIC WORKS DIRECTOR. THE DEVELOPER SHALL PROVIDE A DRAINAGE REPORT FOR THE PROJECT IN CONFORMANCE WITH THE CITY'S DEVELOPMENT CODE, MUNICIPAL CODE, AND THE PUBLIC WORKS DESIGN MANUAL FOR REVIEW AND APPROVAL BY THE CITY ENGINEER. EACH SUCCESSIVE PHASE OF THE PROJECT SHALL SUBMIT AN UPDATED DRAINAGE REPORT FOR REVIEW AND APPROVAL BY THE CITY ENGINEER SHOWING THE CUMULATIVE EFFECT OF THE DEVELOPED PORTION OF THE PROJECT ALONG WITH THE PROPOSED PHASE'S EFFECT ON THE TOTAL DISCHARGE INTO THE DRAINAGE SYSTEM. THE DRAINAGE BASIN SHALL BE DEDICATED TO THE CITY OF FERNLEY UPON COMPLETION OF THE PROJECT IN ORDER FOR THE CITY TO MAINTAIN THE STORM DRAIN SYSTEM FOR THE SUBDIVISION.

15. **GRADING PERMIT:**
    THE DEVELOPER SHALL SUBMIT A GRADING PLAN FOR ANY PHASE OF THE PROJECT TO THE APPROVAL OF THE CITY ENGINEER. PRIOR TO THE ISSUANCE OF A GRADING PERMIT

FOR THE DEVELOPMENT, THE DEVELOPER SHALL POST A SURETY BOND FOR REGRADING AND RECLAMATION OF THE SITE. THE DEVELOPER SHALL PROVIDE A STAMPED ENGINEER'S ESTIMATE FOR REGRADING AND RECLAMATION OF THE SITE. UNLESS OTHERWISE STATED IN THE DEVELOPMENT AGREEMENT, THE DEVELOPER SHALL COMPLY WITH ALL GRADING REQUIREMENTS SET FORTH IN THE CITY OF FERNLEY'S DEVELOPMENT CODE AS WELL AS ALL STATE AND FEDERAL REGULATIONS. THE DEVELOPER OR THEIR DESIGNEE SHALL BE RESPONSIBLE FOR OBTAINING AND MAINTAINING A STORM WATER POLLUTION PREVENTION PERMIT WITH THE STATE OF NEVADA AS WELL AS A SURFACE AREA DISTURBANCE.

16. **GEOTECHNICAL REPORT:**
THE DEVELOPER SHALL PROVIDE A FINAL GEOTECHNICAL REPORT FOR THE PROJECT IN CONFORMANCE WITH THE DEVELOPMENT CODE FOR REVIEW AND APPROVAL BY THE ADMINISTRATOR, CITY ENGINEER, AND PUBLIC WORKS DIRECTOR PRIOR TO THE RECORDATION OF A FINAL MAP FOR ANY PORTION OF THE PROJECT.

17. **IMPROVEMENT PLANS:**
WITH THE SUBMITTAL OF ANY FINAL MAP APPLICATION, THE DEVELOPER SHALL SUBMIT THE ASSOCIATED IMPROVEMENT PLANS FOR REVIEW AND APPROVAL. THE IMPROVEMENT PLANS SHALL BE APPROVED PRIOR TO THE APPROVAL AND RECORDATION OF THE FINAL MAP. THE UTILITIES AND INFRASTRUCTURE FOR EACH PHASE MUST OPERATE INDEPENDENTLY OF FUTURE PHASES YET TO BE CONSTRUCTED. UNLESS OTHERWISE STATED IN THE DEVELOPMENT AGREEMENT, PRIOR TO THE APPROVAL AND RECORDATION OF A FINAL MAP FOR THE PROJECT THE DEVELOPER SHALL CONSTRUCT ALL REQUIRED PUBLIC IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO, PUBLIC UTILITY AND ROADWAY INFRASTRUCTURE ASSOCIATED WITH THE PROJECT OR PROVIDE A SURETY BOND IN ACCORDANCE WITH THE PROVISIONS SET FORTH IN FERNLEY MUNICIPAL CODE CHAPTER 32.13, IMPROVEMENTS AND AGREEMENTS, AND MEET THE REQUIREMENTS OF CHAPTER 32.03, LAND DIVISION APPLICATIONS OF THE FERNLEY MUNICIPAL CODE.

18. **NORTH LYON FIRE PROTECTION DISTRICT:**
THE DEVELOPER SHALL COMPLY WITH ALL REQUIREMENTS OF THE NORTH LYON COUNTY FIRE PROTECTION DISTRICT, INCLUDING BUT NOT LIMITED TO CONSTRUCTING A FIRE STATION AS OUTLINED IN THE DEVELOPMENT AGREEMENT, PROVIDING SECONDARY EMERGENCY ACCESS TO THE APPROVAL OF THE ADMINISTRATOR AND FIRE CHIEF PRIOR TO THE ISSUANCE OF ANY FINAL MAP FOR THE PROJECT, OR OTHER ITEMS REQUIRED BY THE APPLICABLE FIRE CODE.

19. **ADDRESSING AND STREET NAMES:**
THE DEVELOPER SHALL SUBMIT A REQUEST FOR ADDRESSING AND STREET NAME RESERVATION TO THE CITY OF FERNLEY FOR REVIEW AND APPROVAL. ALL ADDRESSING OF LOTS SHALL BE COMPLETED BY THE CITY. STREET NAMES SHALL BE APPROVED BY THE CITY PRIOR TO THE SUBMITTAL OF A FINAL MAP FOR THE PROJECT.

20. **TRUCKEE CARSON IRRIGATION DISTRICT (TCID)/BUREAU OF RECLAMATION:**
THE DEVELOPER SHALL COMPLY WITH ALL REQUIREMENTS OF THE TRUCKEE CARSON IRRIGATION DISTRICT AND/OR THE BUREAU OF RECLAMATION RELATED TO ANY FACILITY OR EASEMENT WITHIN THE PROJECT BOUNDARY TO THE APPROVAL OF THE ADMINISTRATOR PRIOR TO THE APPROVAL AND RECORDATION OF A FINAL MAP.

21. **NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION:**
THE DEVELOPER SHALL COMPLY WITH ALL REQUIREMENTS OF THE NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION – BUREAU OF SAFE DRINKING WATER AND BUREAU OF WATER POLLUTION CONTROL FOR THE WATER AND SEWER INFRASTRUCTURE DESIGN AND CONSTRUCTION TO THE APPROVAL OF THE ADMINISTRATOR, CITY ENGINEER, AND PUBLIC

WORKS DIRECTOR.

22. **WASTE MANAGEMENT:**
THE DEVELOPER SHALL PROVIDE A WILL SERVE FROM WASTE MANAGEMENT TO THE APPROVAL OF THE ADMINISTRATOR PRIOR TO THE APPROVAL AND RECORDATION OF A FINAL MAP.

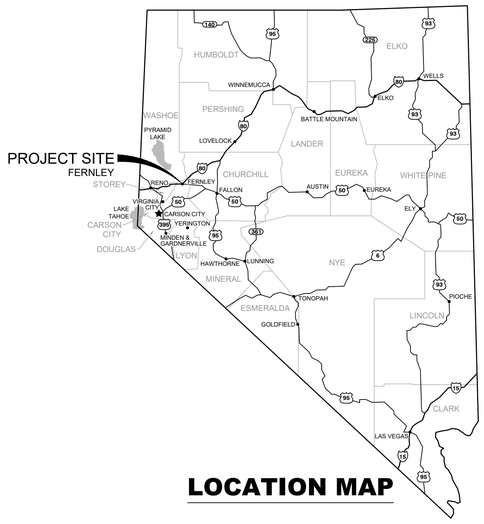
23. **FINAL MAP PHASING:**
IF APPLICABLE, EACH MAP PHASE SUBMITTED MUST BE DESIGNED TO MEET THE PUBLIC FACILITIES AND IMPROVEMENT STANDARDS AND BE ABLE TO OPERATE INDEPENDENTLY AND AS PART OF THE OVERALL DESIGN. CHANGES TO THE PHASING PLAN WILL REQUIRE REVIEW AND APPROVAL BY THE ADMINISTRATOR, CITY ENGINEER, AND PUBLIC WORKS DIRECTOR PRIOR TO BEING IMPLEMENTED.

24. **COVENANTS, CONDITIONS, AND RESTRICTIONS (CC&R'S):**
THE APPLICANT SHALL PROVIDE COVENANTS, CONDITIONS, AND RESTRICTIONS (CC&R'S) WITH THE FIRST FINAL MAP AND SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE ADMINISTRATOR AND CITY ATTORNEY. CC&R'S SHALL BE RECORDED CONCURRENTLY WITH THE FINAL SUBDIVISION MAP. THE APPLICANT SHALL INCLUDE IN THE CC&R'S PROVISIONS OUTLINING MAINTENANCE RESPONSIBILITIES OF COMMON AREAS, SHARED ROADWAYS, LANDSCAPE MEDIANS, OR OTHER COMMON ELEMENTS TO THE APPROVAL OF THE ADMINISTRATOR, CITY ENGINEER, AND PUBLIC WORKS DIRECTOR.

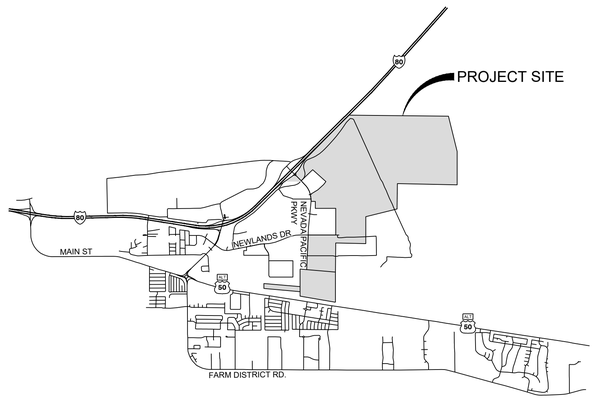
25. **FLOODPLAIN MANAGEMENT AND FEDERAL EMERGENCY MANAGEMENT AGENCY:**
THE DEVELOPER SHALL COMPLY WITH CHAPTER 32.09.060 OF THE CITY OF FERNLEY DEVELOPMENT CODE TITLED: FLOODPLAIN MANAGEMENT AS WELL AS ALL FEDERAL EMERGENCY MANAGEMENT AGENCY, FEMA, NATIONAL FLOOD INSURANCE PROGRAM REQUIREMENTS FOR ALL FLOODPLAIN MODIFICATIONS. THE REQUIRED APPROVALS FROM THE CITY OF FERNLEY AND FEMA SHALL BE OBTAINED PRIOR TO WORK BEGINNING WITHIN THE MAPPED FLOODPLAIN AREA. ALL REQUIRED IMPROVEMENTS SHALL BE CONSTRUCTED AND APPROVED PRIOR TO THE RECORDATION OF A FINAL MAP OR BONDED FOR IN ACCORDANCE WITH FERNLEY DEVELOPMENT CODE CHAPTER 32.13 (IMPROVEMENTS AND AGREEMENTS).

M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS DISTRICT TENTATIVE MAP



LOCATION MAP



VICINITY MAP

OWNER/DEVELOPER

M4 NEW FERNLEY QOZB, LLC
ATTN: ROSS PFAUTZ
4450 MACARTHUR BLVD., 2ND FLOOR
NEWPORT BEACH, CA 92660
TEL.: 949.509.1444

ENGINEER

LUMOS & ASSOCIATES
950 SANDHILL ROAD, SUITE 100
RENO, NEVADA 89521
TEL: 775.827.6111
INFO@LUMOSINC.COM

811
Know what's below.
Call before you dig.

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS PROJECT IS NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE NAD83(94) BASED UPON CITY OF FERNLEY (COF1) CORS BASE STATION COORDINATES AND DISTANCES SHOWN HEREON ARE AT GROUND LEVEL BASED ON A COMBINED GRID TO GROUND FACTOR OF 1.000245.

BASIS OF ELEVATION

THE BASIS OF ELEVATION FOR CONSTRUCTION ON THIS PROJECT IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) BASED UPON GPS OBSERVATIONS UTILIZING GEIOD 12A.

SHEET INDEX:

TITLE SHEET	C1.0
NOTE SHEET	C1.1
TENTATIVE MAP PARCELS	C1.2 - C1.3
PRELIMINARY SITE PLANS	C2.0 - C2.1
PRELIMINARY STREET SECTIONS	C2.2
PRELIMINARY GRADING PLANS	C3.0 - C3.4
PRELIMINARY OVERALL UTILITY PLAN	C4.0
PRELIMINARY UTILITY PLANS	C4.1 - C4.10
PROPOSED HYDROLOGIC CONDITIONS	C5.0
LANDSCAPE TITLE & NOTES	L1.0
LANDSCAPE PLANS	L2.0 - L2.3
LANDSCAPE DETAILS	L5.0
IRRIGATION DETAILS	L5.1

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PROFESSIONAL ENGINEER – STATE OF NEVADA
CAMILLE BUEHLER
Exp: 12-31-24
CIVIL
No. 26240

09/20/2023

M4 NEW FERNLEY QOZB, LLC
VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
TITLE SHEET
LYON COUNTY
NEVADA
FERNLEY

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

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DESIGNED BY:	IKM
CHECKED BY:	CAB
JOB NO.:	10067.008

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LEGEND

EXISTING		PROPOSED
4174	CONTOUR LINE	4174
	EDGE OF PAVEMENT	
	CURB & GUTTER	
	RAIL	
	FLOW LINE	
	STORM DRAIN MANHOLE	Ⓓ
	SEWER MANHOLE	Ⓢ
EX SD	STORM DRAIN	24"SD
EX SS	SEWER LINE	10"SS
EX SS	SANITARY SEWER FORCE MAIN	SSFM
EX WL	WATER LINE	16"W

ABBREVIATIONS

AC	ASPHALT CONCRETE
ACP	ASBESTOS CEMENT PIPE
AGG	AGGREGATE
BC	BEGIN CURVE (HORIZONTAL)
BOW	BOTTOM OF WALL
BF, BOF	BOTTOM OF FOOTING
BV	BUTTERFLY VALVE
BVC	BEGIN VERTICAL CURVE
BW	BACK OF WALK
CB	CATCH BASIN
cfs	CUBIC FEET PER SECOND
CF	CUBIC FEET
C&G	CURB AND GUTTER
℄	CENTER LINE
CL	CLASS / CENTER LINE
CMP	CORRUGATED METAL PIPE
COMP	COMPACTION
CONC	CONCRETE
CONTR	CONTRACTOR
CP	CONCRETE PAD
CTV	CABLE TELEVISION
DI	DROP INLET
DIA	DIAMETER
DWY	DRIVEWAY
E	EAST
EA	EACH
EC	END CURVE (HORIZONTAL)
ELL	ELBOW
ELEC	ELECTRICAL
ELEV	ELEVATION
EVC	END VERTICAL CURVE
EX, (E)	EXISTING
EXT	EXTERIOR
FCA	FLANGE COUPLING ADAPTER
FE	FINISH ELEVATION
FES	FLARED END SECTION
FF	FINISH FLOOR
FFC	FRONT FACE OF CURB
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FLG	FLANGE
fps	FEET PER SECOND
FTG	FOOTING
G	GAS
GALV	GALVANIZED
GB	GRADE BREAK
GDW	GRAVEL DRIVEWAY
GD	GROUND
GV	GATE VALVE
H	HANDICAPPED
HGL	HYDRAULIC GRADE LINE
HORIZ	HORIZONTAL
HP	HIGH POINT
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
INT	INTERSECTION
IRR	IRRIGATION
LAT	LATERAL
LF	LINEAR FEET
LP	LOW POINT
LT	LEFT
MAX	MAXIMUM
MDD	MAXIMUM DRY DENSITY
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
MMD	MAXIMUM MARSHALL DENSITY
MUTCD	MANUAL FOR TRAFFIC CONTROL DEVICES
N	NORTH
NAP	NOT A PART
NIP	NOT IN PROJECT
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD
(P)	PROPOSED
PCC	PORTLAND CEMENT CONCRETE
PG	PAD GRADE
PI	POINT OF INTERSECTION
PIVC	POINT OF INTERSECTION VERTICAL CURVE
PL	PROPERTY LINE
POCC	POINT OF COMPOUND CURVATURE
POT	POINT OF TANGENCY
PP	POWER POLE
PRC	POINT OF REVERSE CURVE
PRS	PRESSURE REDUCING STATION
PRVC	POINT OF REVERSE VERTICAL CURVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
Q 5	5 YEAR PEAK FLOW
Q 100	100 YEAR PEAK FLOW
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
REF	REFERENCE
RET	CURB RETURN
RP	RADIUS POINT
RT	RIGHT
R/W, ROW	RIGHT-OF-WAY
S=	SLOPE
S	SOUTH
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SL	STREET LIGHT
SS	SANITARY SEWER
SSCO	SANITARY SEWER CLEAN OUT
SSMH	SANITARY SEWER MANHOLE
SSPWC	STANDARD SPEC. FOR PUBLIC WORKS CONSTRUCTION
STA	STATION
SW	SIDEWALK
TELE	TELEPHONE
TBO	TEMPORARY BLOW OFF VALVE
TC	TOP OF CURB, TOP OF CONC
TG	TO GRADE
TOB	TOP OF BERM
TF, TOF	TOP OF FOOTING
TOW	TOP OF WALL
TS	TRAFFIC SIGNAL
TSCB	TRAFFIC CONTROL SIGNAL BOX
TR	TOP OF RAIL
TRANS	TRANSITION
TYP	TYPICAL
UG/P	UNDER GROUND POWER
UNO	UNLESS NOTED OTHERWISE
Vs	VELOCITY AT 5 YEAR PEAK
VC	VERTICAL CURVE
VEL	VELOCITY
VERT	VERTICAL
VG	VALLEY GUTTER
W	WEST
W/G	WATER AND GAS
WL	WATER LINE
WM	WATER METER
WS	WATER SURFACE
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
YR	YEAR

NOTES:

GENERAL

1. ALL INFORMATION IS PRELIMINARY IN NATURE AND NOT TO BE TAKEN AS COMPLETE OR ACCURATE.
2. REFERENCE THE PRELIMINARY TRAFFIC ANALYSIS BY HEADWAY TRANSPORTATION DATED FEBRUARY 2022.
3. REFERENCE THE PRELIMINARY GEOTECHNICAL REPORT BY LUMOS & ASSOCIATES DATED JULY 2021.

LUMOS & ASSOCIATES
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PROFESSIONAL ENGINEER – STATE OF NEVADA
CAMILLE BUEHLER
Exp: 12-31-24
CIVIL
No. 26240

09/20/2023

M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
NOTE SHEET

FERNLEY / LYON COUNTY / NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

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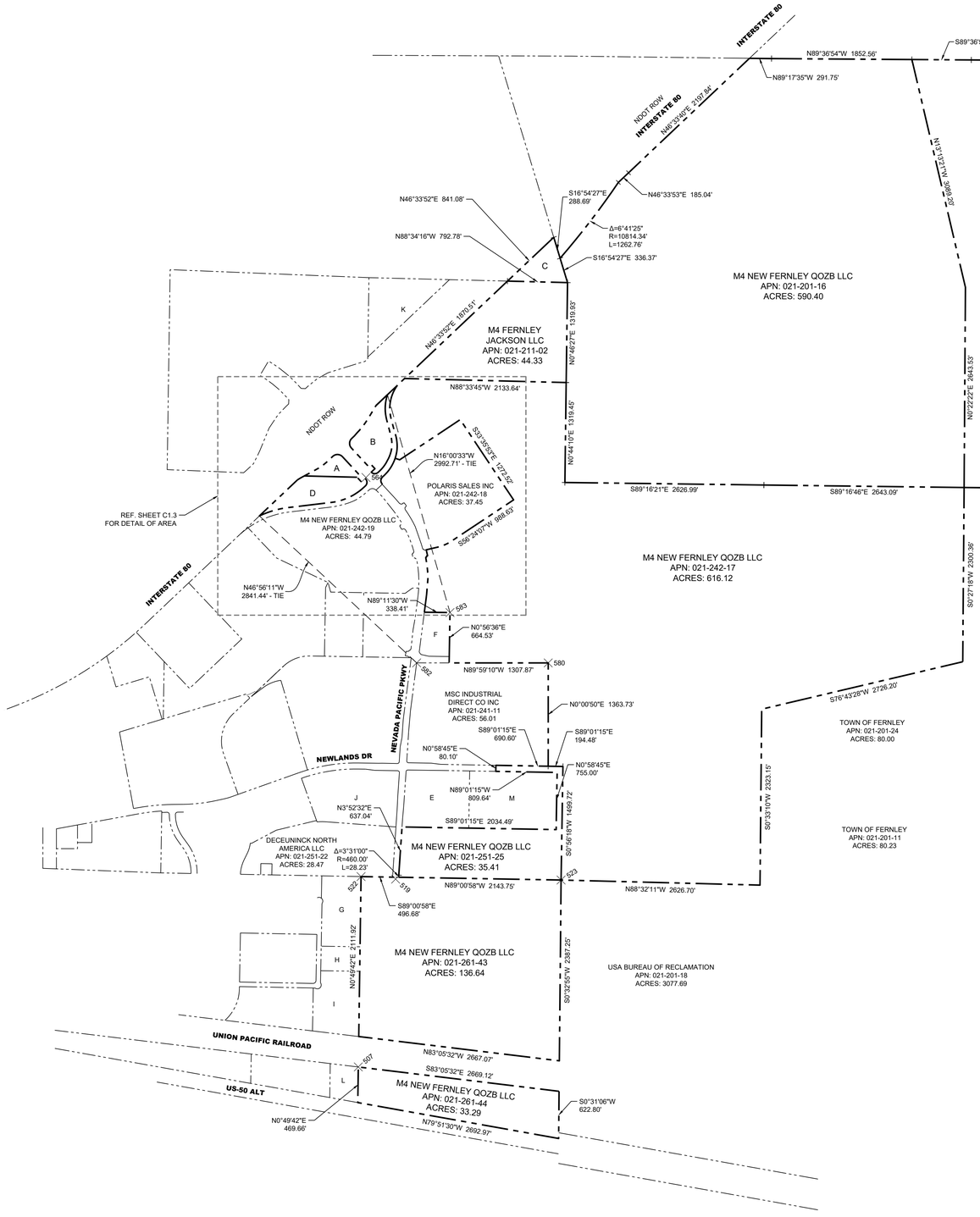

SUBJECT PARCELS

A. M4 NEW FERNLEY QOZB LLC
APN: 021-211-04
ACRES: 2.6

B. M4 NEW FERNLEY QOZB LLC
APN: 021-211-06
ACRES: 7.0

C. JOHNSON, EMMA JANE
APN: 021-211-03
ACRES: 5.0

D. M4 NEW FERNLEY QOZB LLC
APN: 021-242-11
ACRES: 8.4

ADJACENT PARCELS

E. COTTONMILL PROPERTIES LLC
APN: 021-251-16
ACRES: 14.9

F. SOUTHWEST GAS CORP
APN: 021-242-14
ACRES: 5.0

G. INDUSTRIAL HOLDINGS LLC
APN: 021-261-29
ACRES: 10.9

H. M4 FERNLEY RESOURCE LLC
APN: 021-281-28
ACRES: 3.8

I. 575 MILL STREET LLC
APN: 021-261-26
ACRES: 11.1

J. NEW WORLD PROPERTY LLC
APN: 021-251-23
ACRES: 18.9

K. M4 FERNLEY JACKSON LLC
APN: 021-581-06
ACRES: 12.79

L. TORVINEN, MELINDA R TR
APN: 021-261-37
ACRES: 3.89

M. COLE ID FERNLEY NV LLC
APN: 021-251-24
ACRES: 20.00

PROJECT CONTROL

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
507	14893405.78	2451813.49	4112.77	PC RC PL 11178
519	14895885.64	2452305.90	4116.25	MON 1.5"BC PLS 9102
522	14895918.94	2451849.90	4120.95	MON 2.5"BC GLO 1/4 S8 S17 1931
523	14895873.60	2454489.95	4119.33	MON 2"ALCAP S8 S9 S17 S16 PLS 204_1
564	14901188.37	2451914.70	4164.33	MON 1/4 COR 5/8 BRASS CAP PLS 11420
580	14898740.03	2454320.17	4124.52	PC FND RC PLS 4787
582	14898740.55	2452583.51	4125.24	PC FND RC PLS 9102
583	14899404.83	2453023.59	4141.12	PC FND RC PLS 9102

N

0 800' 1600'

22x34 SHEETS: 1" = 800'
11x17 SHEETS: 1" = 1600'

LUMOS & ASSOCIATES
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RENO, NV 89521
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PROFESSIONAL ENGINEER - STATE OF NEVADA
CAMILLE BUEHLER
Exp: 12-31-24
CIVIL
No. 26240

09/20/2023

M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
TENTATIVE MAP PARCELS

FERNLEY — LYON COUNTY — NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

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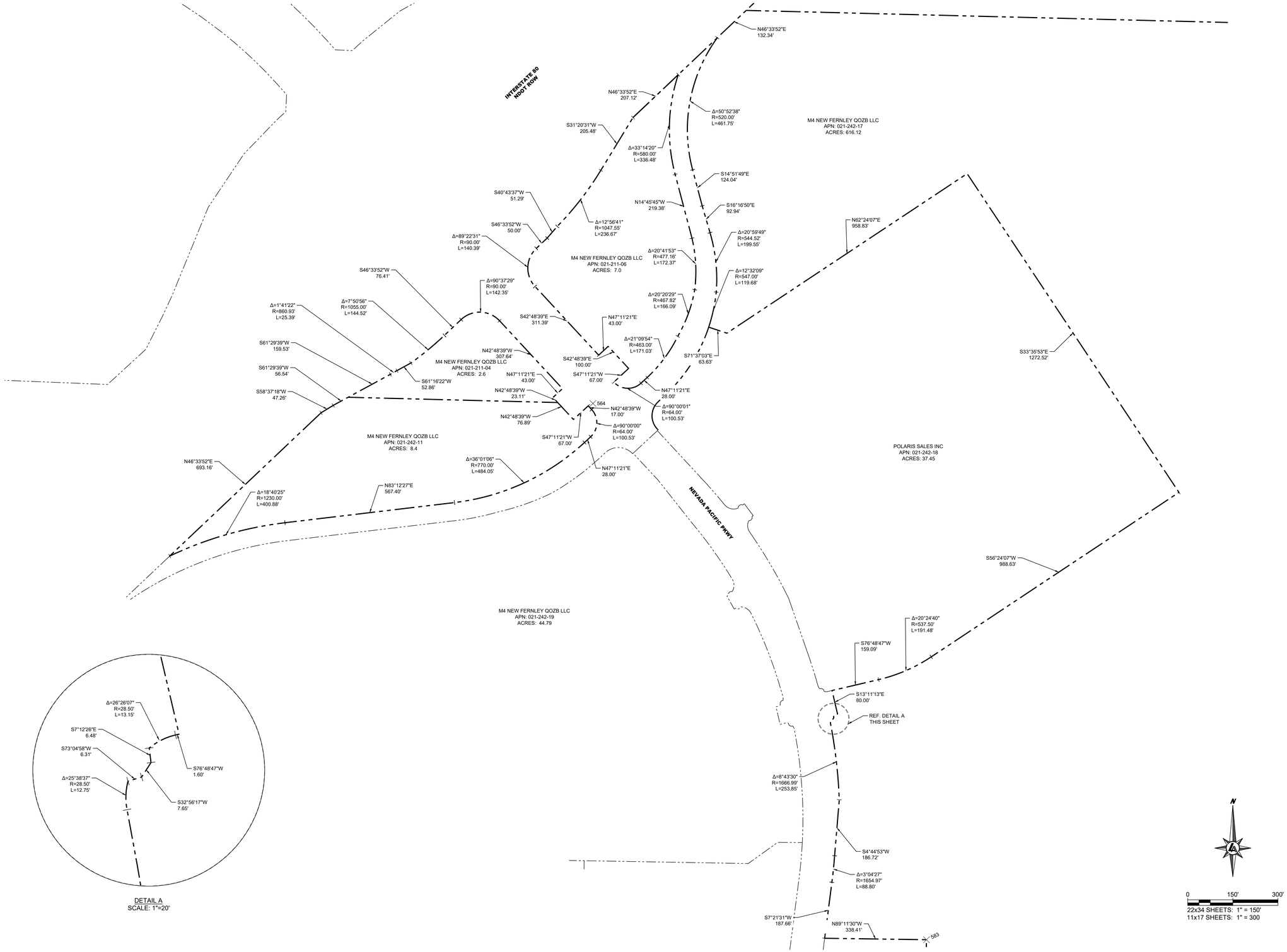

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M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
TENTATIVE MAP PARCELS

FERNLEY — LYON COUNTY — NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

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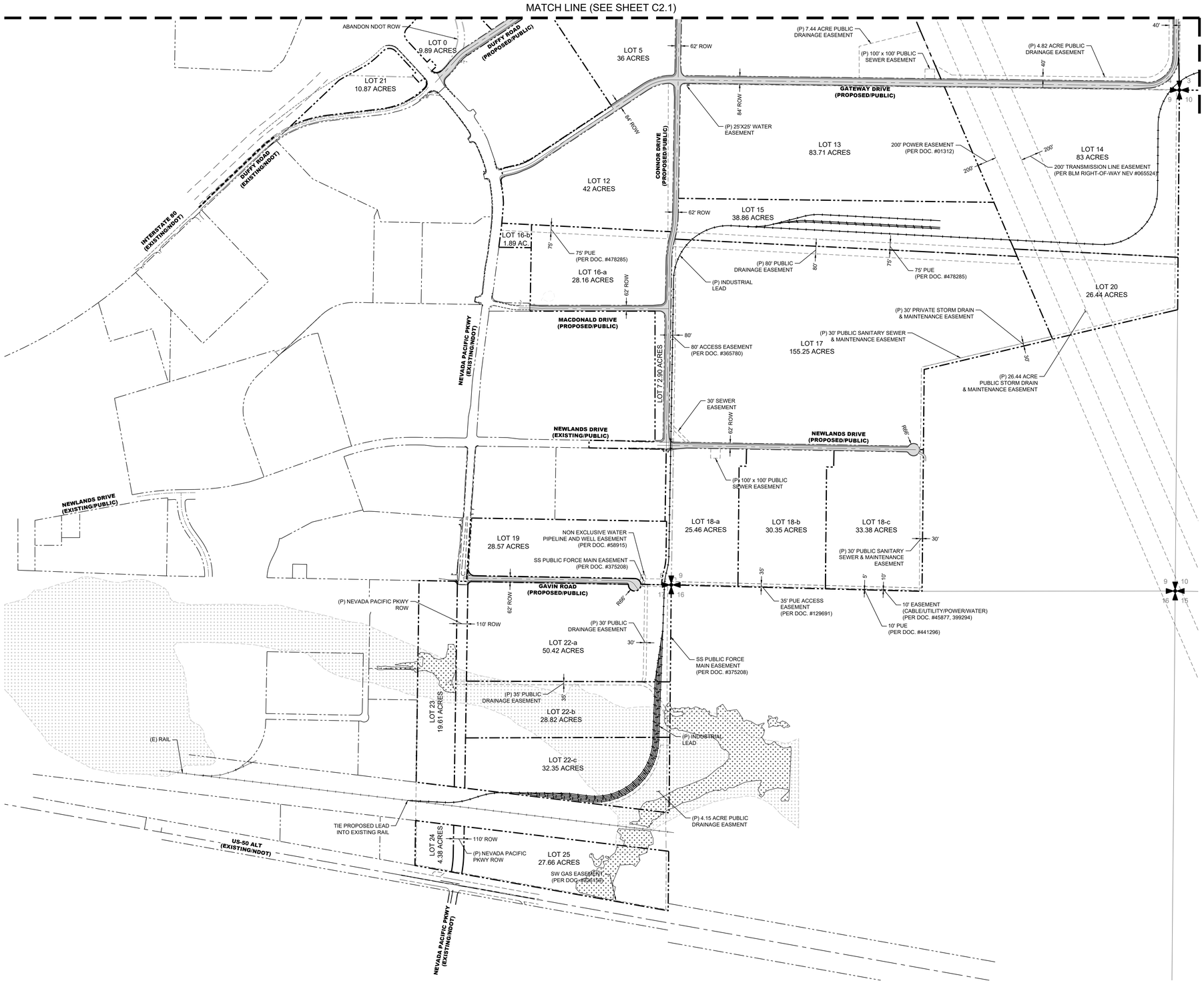


LEGEND

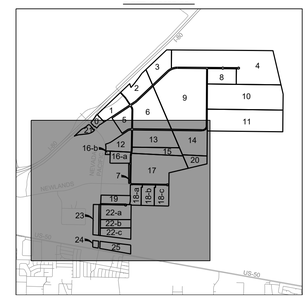
- PROPOSED BOUNDARY LINES
- EXISTING BOUNDARY LINES TO BE ABANDONED
- PROPOSED RIGHT OF WAY/ PROPOSED BOUNDARY LINE
- SECTION LINE
- EXISTING PROPERTY LINE
- EASEMENT
- EXISTING SPECIAL FLOOD HAZARD
- PROPOSED SPECIAL FLOOD HAZARD ZONE

N

0 500' 1000'

22x34 SHEETS: 1" = 500'
11x17 SHEETS: 1" = 1000'

KEYMAP



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PROFESSIONAL ENGINEER - STATE OF NEVADA
CAMILLE BUEHLER
Exp: 12-31-24
CIVIL
No. 26240

09/20/2023

M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
PRELIMINARY SITE PLAN

FERNLEY — LYON COUNTY — NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

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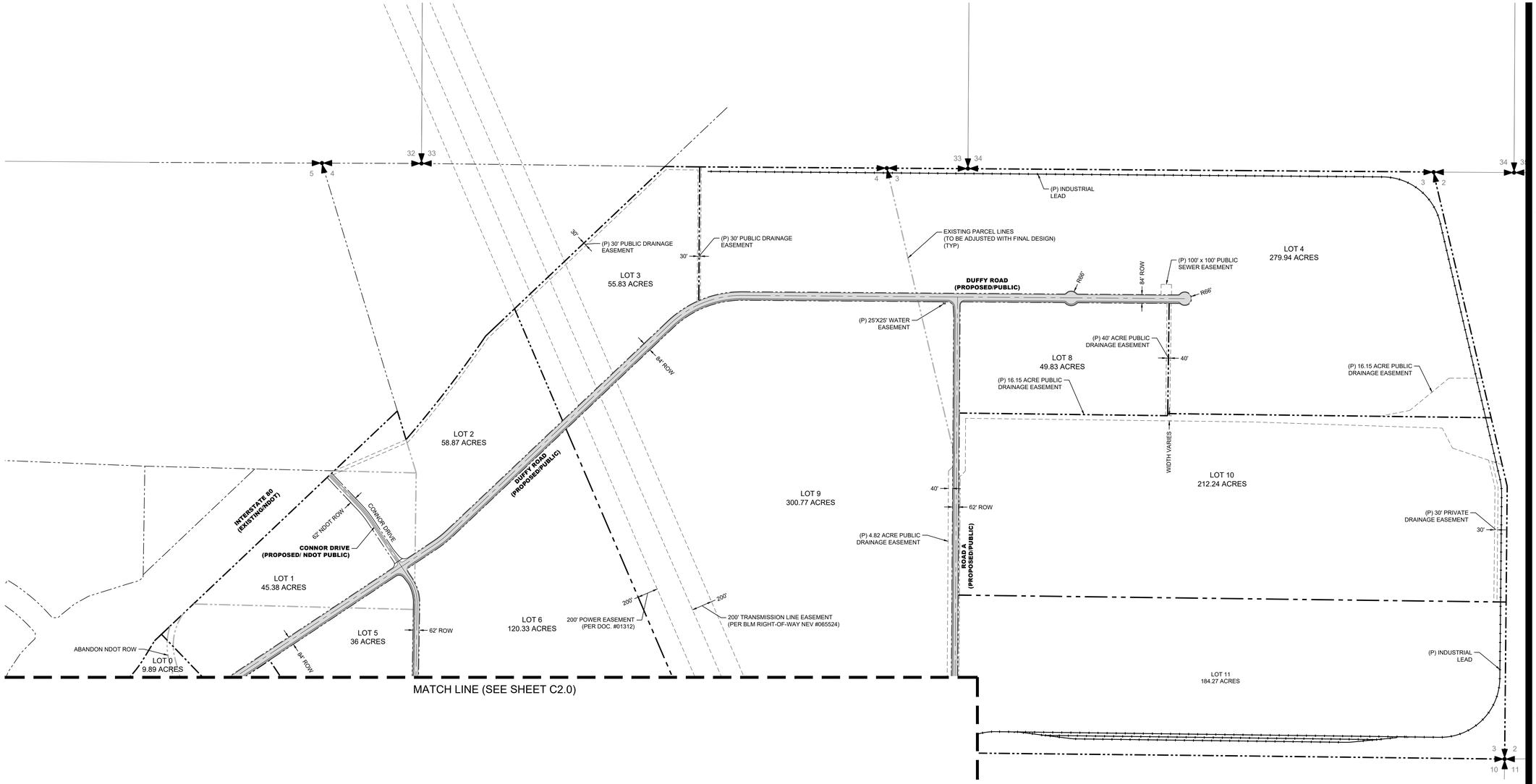

LEGEND

- PROPOSED BOUNDARY LINES
- EXISTING BOUNDARY LINES TO BE ABANDONED
- PROPOSED RIGHT OF WAY/ PROPOSED BOUNDARY LINE
- SECTION LINE
- EXISTING PROPERTY LINE
- EASEMENT
- EXISTING SPECIAL FLOOD HAZARD
- PROPOSED SPECIAL FLOOD HAZARD ZONE

0 500' 1000'

22x34 SHEETS: 1" = 500'
11x17 SHEETS: 1" = 1000'

KEYMAP

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09/20/2023

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VICTORY LOGISTICS DISTRICT

TENTATIVE MAP

PRELIMINARY SITE PLAN

LYON COUNTY NEVADA

FERNLEY

REV	DATE	DESCRIPTION	BY

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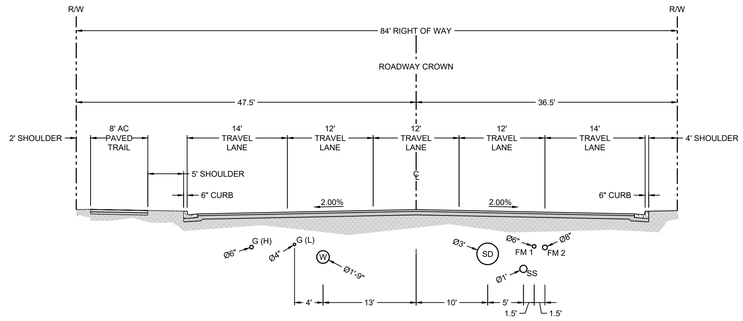
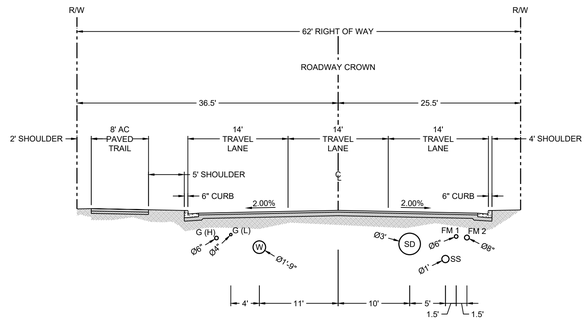


84' ROW STREET SECTION:

MINOR ARTERIAL - 35 MPH

GENERAL

1. THE 84' ROW IS ANTICIPATED TO HAVE UP TO 2 FORCE MAINS, STORM DRAIN, GRAVITY SEWER, WATER, AND UP TO 2 GAS MAINS (HIGH AND LOW PRESSURE ZONES)
2. UTILITIES SHOWN IN SECTION ARE WORST CASE SCENARIO SHOWING THAT ANY DOWNSIZING OR DELETION OF UTILITIES WILL ALLOW FOR MORE CLEARANCES

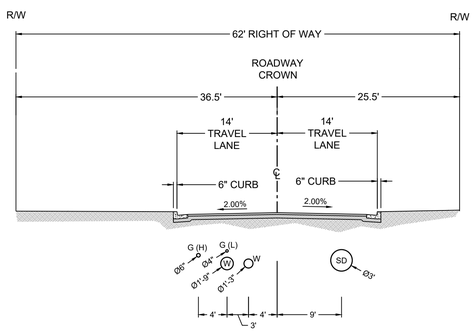


62' ROW STREET SECTION:

COLLECTOR - 30 MPH

GENERAL

1. THE 62' ROW IS ANTICIPATED TO HAVE UP TO 2 FORCE MAINS, STORM DRAIN, GRAVITY SEWER, WATER, AND UP TO 2 GAS MAINS (HIGH AND LOW PRESSURE ZONES)
2. UTILITIES SHOWN IN SECTION ARE WORST CASE SCENARIO SHOWING THAT ANY DOWNSIZING OR DELETION OF UTILITIES WILL ALLOW FOR MORE CLEARANCES

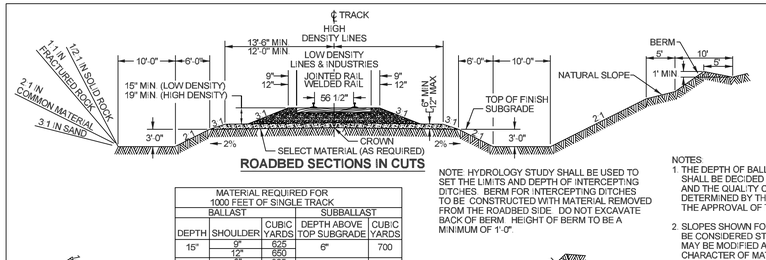


62' NDOT ROW STREET SECTION:

LOCAL - 25 MPH

GENERAL

1. THE 62' ROW IS ANTICIPATED TO HAVE STORM DRAIN, UP TO 2 WATER MAINS, AND UP TO 2 GAS MAINS (HIGH AND LOW PRESSURE ZONES)
2. UTILITIES SHOWN IN SECTION ARE WORST CASE SCENARIO SHOWING THAT ANY DOWNSIZING OR DELETION OF UTILITIES WILL ALLOW FOR MORE CLEARANCES

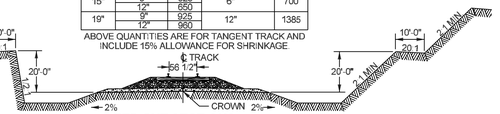


ROADBED SECTIONS IN CUTS

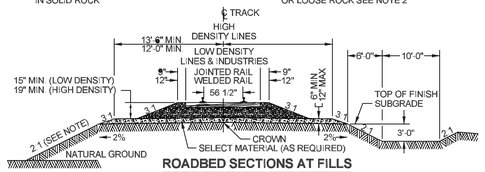
MATERIAL REQUIRED FOR 1000 FEET OF SINGLE TRACK				
BALLAST			SUBBALLAST	
DEPTH	SHOULDER	CUBIC YARDS	DEPTH ABOVE TOP SUBGRADE	CUBIC YARDS
15"	9"	625	6"	700
	12"	650		
19"	9"	925	12"	1385
	12"	960		

ABOVE QUANTITIES ARE FOR TANGENT TRACK AND INCLUDE 15% ALLOWANCE FOR SHRINKAGE.

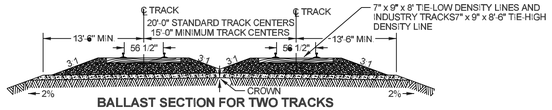
NOTE: HYDROLOGY STUDY SHALL BE USED TO SET THE LIMITS AND DEPTH OF INTERCEPTING DITCHES. BERM FOR INTERCEPTING DITCHES TO BE CONSTRUCTED WITH MATERIAL REMOVED FROM THE ROADBED SIDE. DO NOT EXCAVATE BACK OF BERM. HEIGHT OF BERM TO BE A MINIMUM OF 1'-0".



DEEP CUT SECTIONS



ROADBED SECTIONS AT FILLS



BALLAST SECTION FOR TWO TRACKS

NOTES:
1. THE DEPTH OF BALLAST AND DEPTH OF SELECTED MATERIAL SHALL BE DECIDED ON THE BASIS OF VOLUME OF TRAFFIC AND THE QUALITY OF SELECTED MATERIAL AND SUBGRADE DETERMINED BY THE RAILROAD'S ENGINEER SUBJECT TO THE APPROVAL OF THE AVP.
2. SLOPES SHOWN FOR BANKS IN CUTS AND ON FILLS SHALL BE CONSIDERED STANDARD AND GENERALLY USED, BUT MAY BE MODIFIED AS REQUIRED BY LOCAL CONDITIONS AND CHARACTER OF MATERIAL.
3. BALLAST MUST BE EQUALIZED IN ADVANCE OF DRESSING SO THAT FINAL SECTION WILL CONFORM TO SLOPE REQUIREMENTS AND CHARACTER OF MATERIAL.
4. WHERE OFF-TRACK ROADWAY IS TO BE PROVIDED, ADD 10'-0" ADDITIONAL WIDTH TO THE ROADBED SECTION AT TOP OF SELECTED MATERIAL ELEVATION.
5. ALL FILL SLOPES, BERMS AND OTHER DISTURBED AREAS SHALL BE FACED WITH COVER OF MATERIAL SUITABLE FOR GROWING GRASS AND HAVING A THICKNESS OF APPROXIMATELY 6 INCHES. THE OUTER SURFACE OF THIS COVER SHALL COINCIDE WITH THE DESIGN SLOPE OF THE EMBANKMENT. MATERIAL FOR THIS COVER MAY BE OBTAINED FROM STRIPPING. SEEDING SHALL CONFORM TO THE DEPARTMENT OF TRANSPORTATION SPECIFICATION FOR THAT STATE AND REGION.
6. FLOW LINE ON 0.2% MINIMUM GRADE DITCHES AND BENCHES.
7. FLAT BOTTOM DITCHES ARE REQUIRED FOR HIGH DENSITY LINES, HOWEVER A "V" DITCH IS ACCEPTABLE FOR INDUSTRY TRACKS WHEN RIGHT-OF-WAY IS LIMITED AND WHERE LOCAL CONDITIONS AND CHARACTER OF MATERIAL SO REQUIRE.

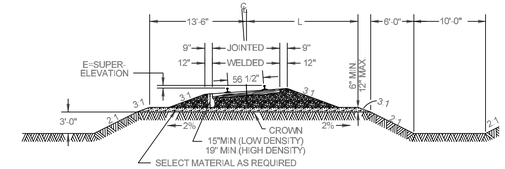
UNION PACIFIC RAILROAD ENGINEERING STANDARDS

ROADBED SECTION FOR WOOD TIE TRACK CONSTRUCTION

UNION PACIFIC

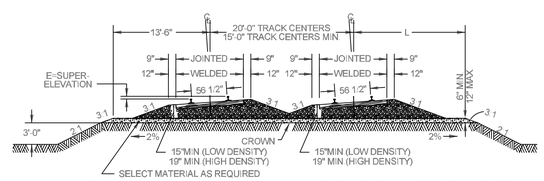
ADOPTED SEP. 21, 2020
REVISED
FILE NO. 0001

STD DWG 0001 PAGE 1 OF 2



BALLAST SECTIONS FOR SINGLE CURVED TRACK WOOD TIE CONSTRUCTION

E (IN.)	L MIN.
0	13'-6"
1	14'-0"
2	14'-6"
3	15'-0"
4	15'-6"
5 OR OVER	16'-0"



BALLAST SECTIONS FOR TWO CURVED TRACKS WOOD TIE CONSTRUCTION

NOTES:
1. SLOPES SHOWN FOR BANKS IN CUTS AND ON FILLS SHALL BE CONSIDERED STANDARD AND GENERALLY USED, BUT MAY BE MODIFIED AS REQUIRED BY LOCAL CONDITIONS AND CHARACTER OF MATERIAL.
2. BALLAST MUST BE EQUALIZED IN ADVANCE OF DRESSING SO THAT FINAL SECTION WILL CONFORM TO SLOPE REQUIREMENTS AND CHARACTER OF MATERIAL.

UNION PACIFIC RAILROAD ENGINEERING STANDARDS

ROADBED SECTION FOR WOOD TIE TRACK CONSTRUCTION

UNION PACIFIC

ADOPTED SEP. 21, 2020
REVISED
FILE NO. 0001

STD DWG 0001 PAGE 2 OF 2

PAGE 2 OF 2

MINIMUM COVER REQUIRED TO THE TOP OF CASING OR CARRIER PIPE:

MAINLINE TRACK - BELOW BASE OF RAIL

-WITH CASING - 5.5 FEET
-HDD INSTALLATION METHOD, WITH CASING - 12 FEET

INDUSTRY/SPUR TRACK - BELOW BASE OF RAIL

-WITH CASING - 4.5 FEET
-WITHOUT CASING - 10 FEET (STEEL CARRIER REQUIRED)
-HDD INSTALLATION METHOD, WITH OR WITHOUT CASING - 12 FEET (STEEL CARRIER REQUIRED WITHOUT CASING)

OTHER AREAS ON RAILROAD RIGHT OF WAY - BELOW GROUND LINE

-WITH CASING - 3 FEET
-WITHOUT CASING - 6 FEET (STEEL CARRIER REQUIRED)
-HDD INSTALLATION METHOD:
-WITH CASING - 5 FEET
-WITHOUT CASING - 6 FEET (STEEL CARRIER REQUIRED)

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CAMILLE BUEHLER
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09/20/2023

M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
PRELIMINARY STREET SECTIONS

FERNLEY — LYON COUNTY — NEVADA

REV	DATE	DESCRIPTION	BY
		TENTATIVE MAP	

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N

0 250' 500'

22x34 SHEETS: 1" = 250'
11x17 SHEETS: 1" = 500'

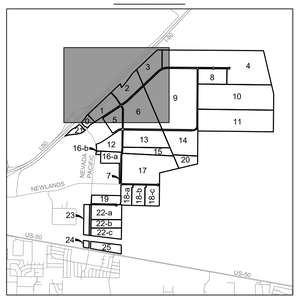
LEGEND

EXISTING AREAS >10% SLOPE

PROPOSED CHANNEL & DIRECTION

PROPOSED BUILDING PAD

KEYMAP



(E) WATER TANK

(P) WATER TANKS

INTERSTATE 80 (EXISTING/NDOT)

TRAPEZOIDAL CHANNEL 1

PAD ELEVATION = ±4108.50

PAD ELEVATION = ±4113.50

LOT 3

PAD ELEVATION = ±4108.00

DUFFY ROAD (PROPOSED/PUBLIC)

200' TRANSMISSION LINE EASEMENT (PER BLM RIGHT-OF-WAY NEV 065524)

200' POWER EASEMENT (PER DOC. 01312)

LOT 2

PAD ELEVATION = ±4124.00

PAD ELEVATION = ±4103.50

LOT 1

PAD ELEVATION = ±4153.00

CONNOR DRIVE (PROPOSED/PUBLIC)

LOT 6

PAD ELEVATION = ±4116.00

LOT 5

PAD ELEVATION = ±4155.50

PAD ELEVATION = ±4132.00

LOT 0

LOT 6

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TENTATIVE MAP
PRELIMINARY GRADING PLAN

FERNLEY — LYON COUNTY — NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

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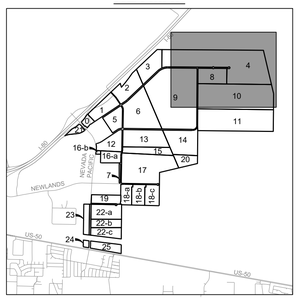

N

0 250' 500'

22x34 SHEETS: 1" = 250'
11x17 SHEETS: 1" = 500'

LEGEND

- EXISTING AREAS >10% SLOPE
- PROPOSED CHANNEL & DIRECTION
- PROPOSED BUILDING PAD

PAD ELEVATION = ±4108.50

PAD ELEVATION = ±4101.00

PAD ELEVATION = ±4093.50

PAD ELEVATION = ±4092.00

LOT 4

DUFFY ROAD (PROPOSED/PUBLIC)

DUFFY ROAD (PROPOSED/PUBLIC)

PAD ELEVATION = ±4088.00

LOT 8

PAD ELEVATION = ±4092.00

PAD ELEVATION = ±4108.00

LOT 9

ROAD A (PROPOSED/PUBLIC)

POND ELEVATION = ±4062.00

TRAPEZOIDAL CHANNEL 2

LOT 10

PAD ELEVATION = ±4090.50

LOT 10

LOT 5

EMERGENCY OVERFLOW PIPE

PAD ELEVATION = ±4101.50

PAD ELEVATION = ±4095.00

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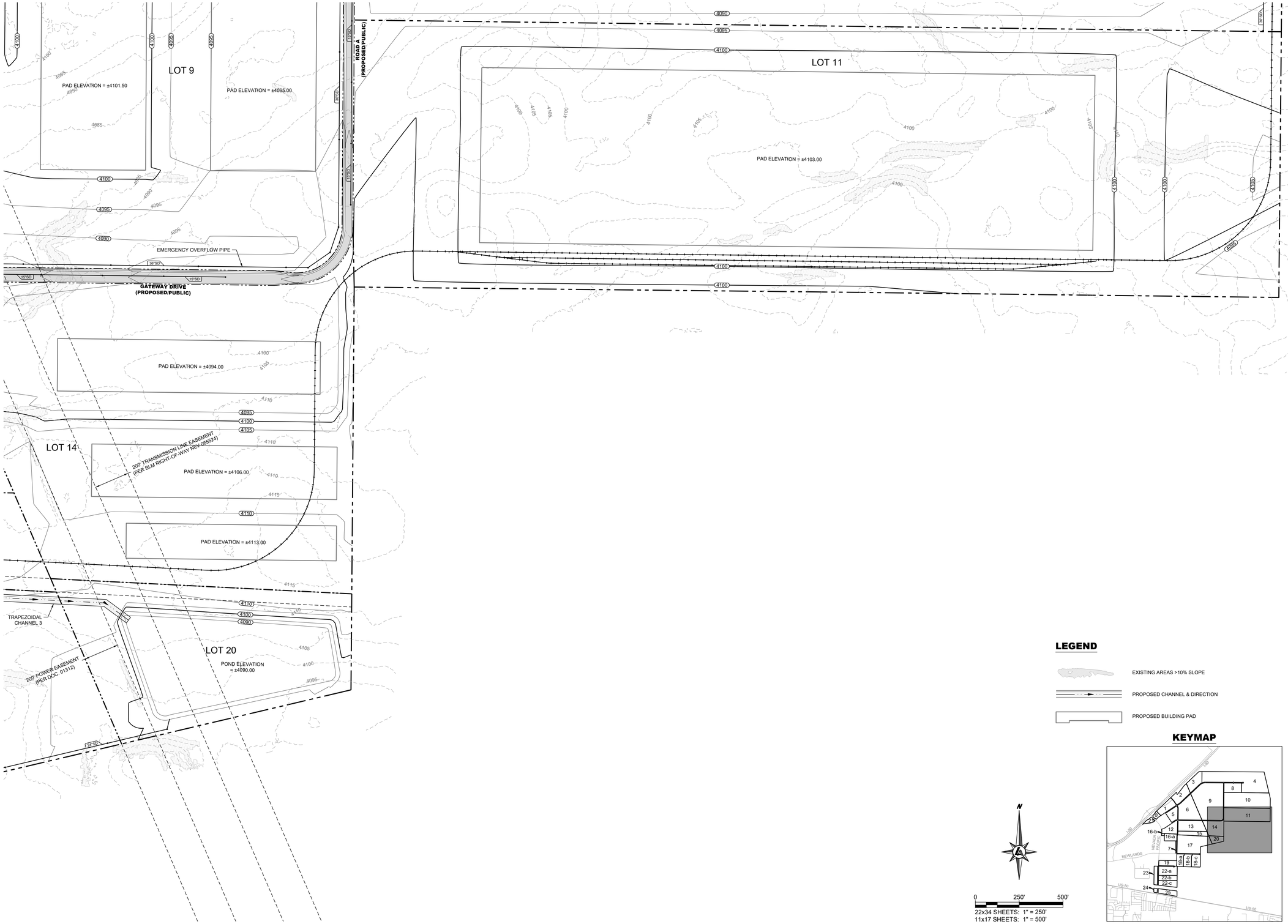

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PRELIMINARY GRADING PLAN

FERNLEY — LYON COUNTY — NEVADA

LEGEND

- EXISTING AREAS >10% SLOPE
- PROPOSED CHANNEL & DIRECTION
- PROPOSED BUILDING PAD

KEYMAP

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22x34 SHEETS: 1" = 250'
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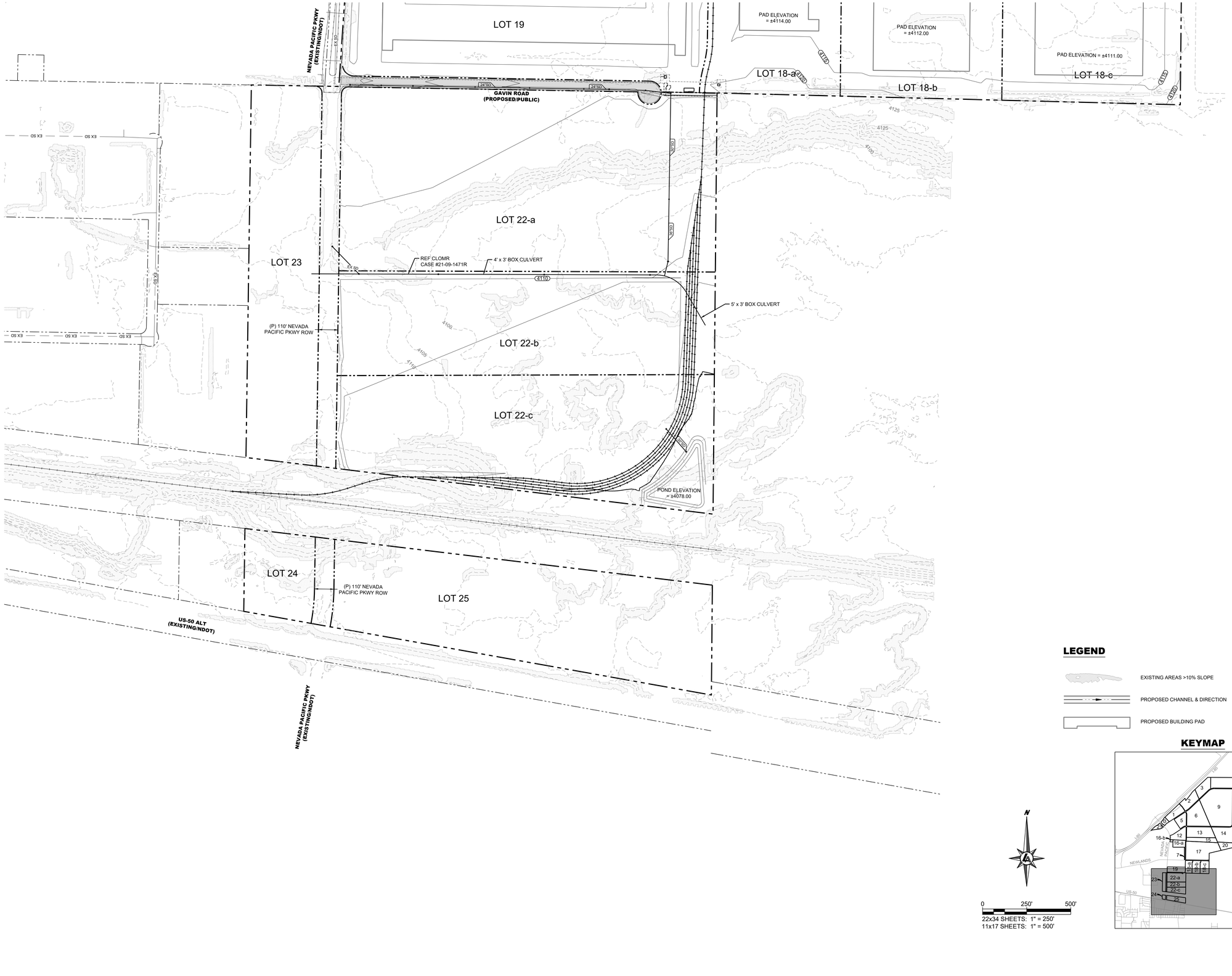

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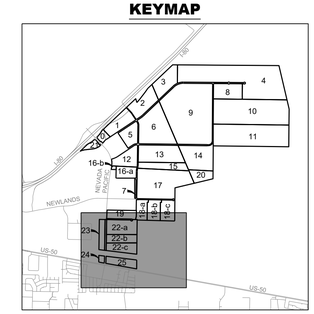

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CIVIL
No. 26240

09/20/2023

M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
PRELIMINARY GRADING PLAN

FERNLEY — LYON COUNTY — NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

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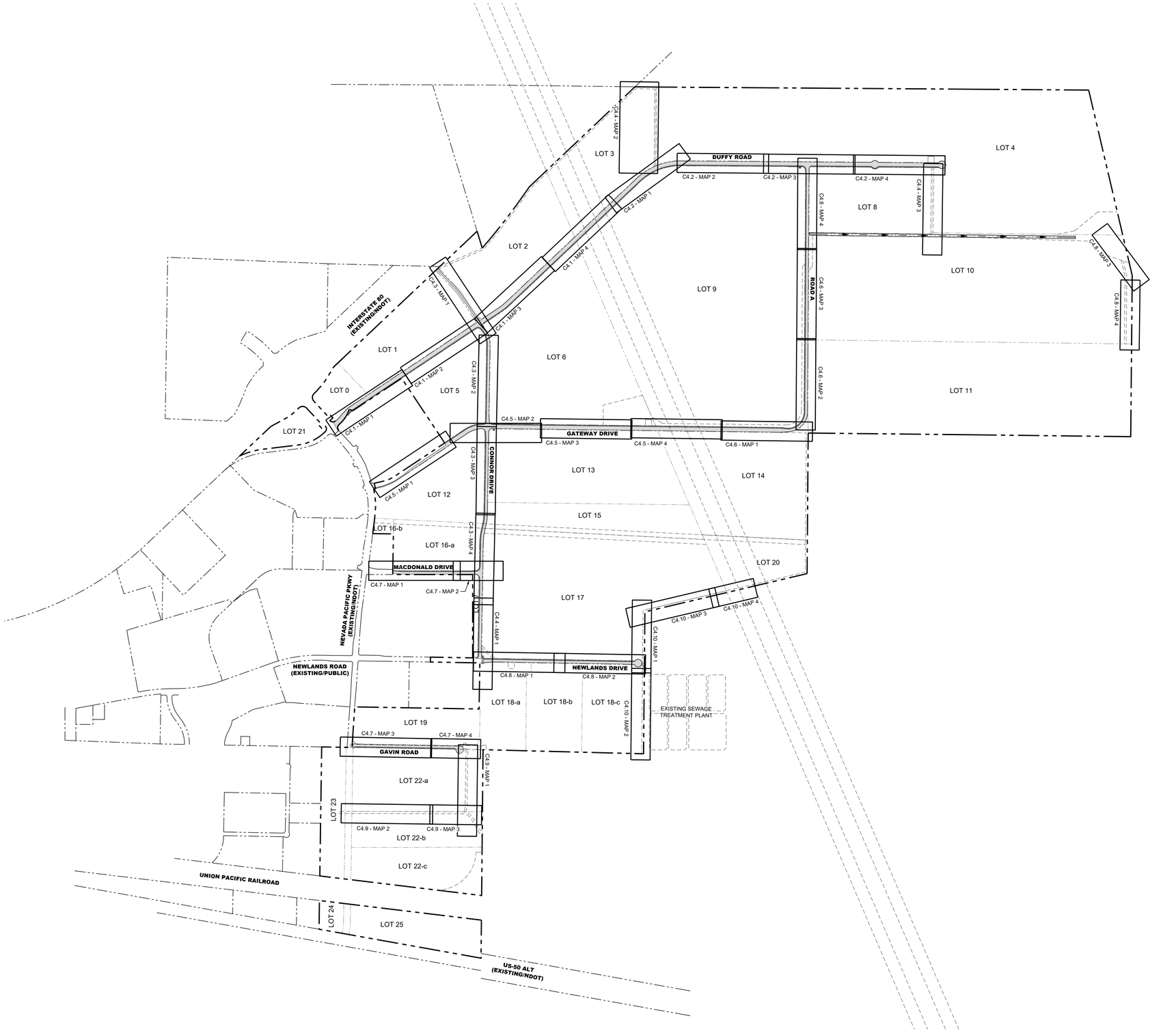

0 800' 1600'

22x34 SHEETS: 1" = 800'
11x17 SHEETS: 1" = 1600'

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VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
PRELIMINARY OVERALL UTILITY PLAN

FERNLEY — LYON COUNTY — NEVADA

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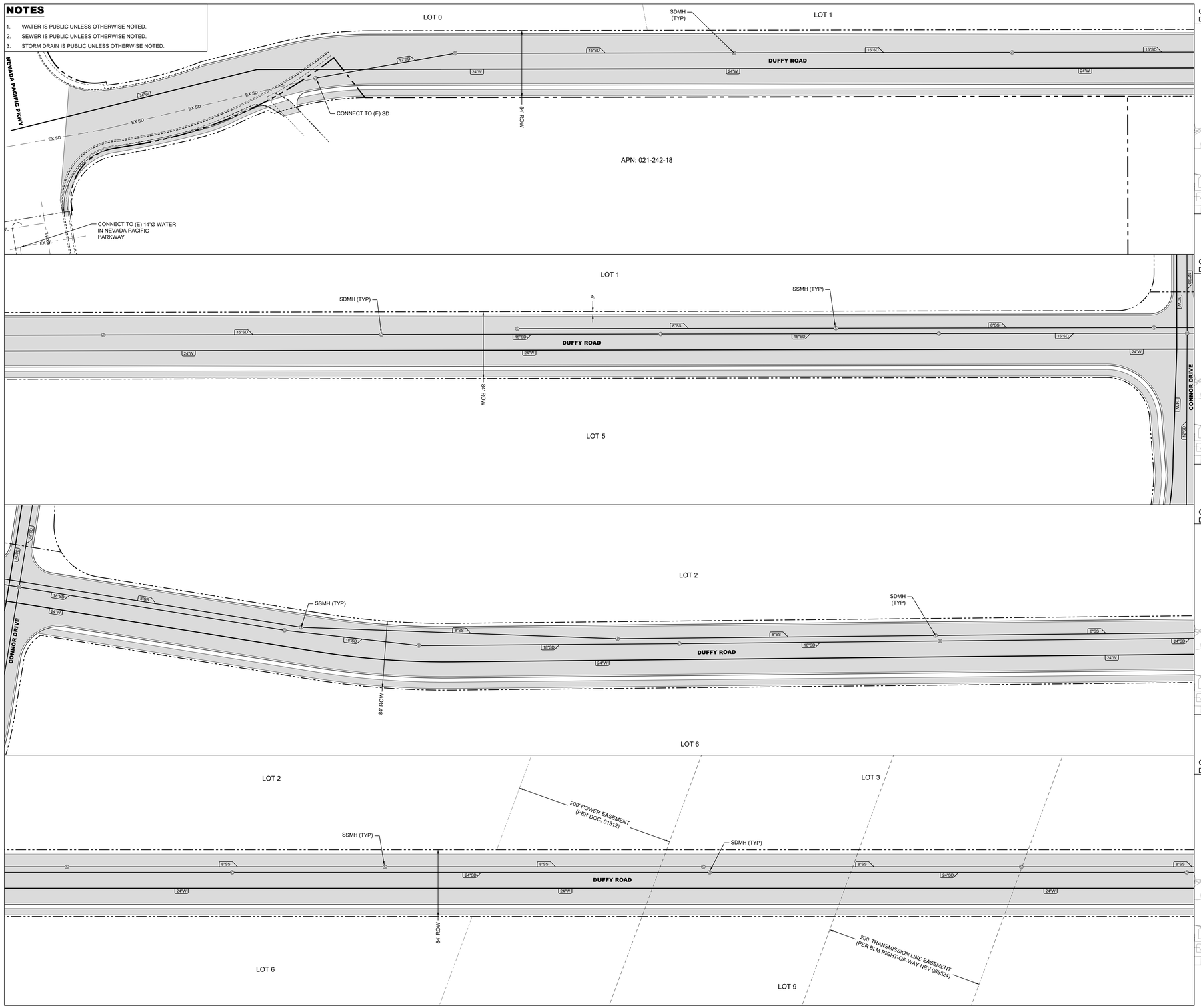
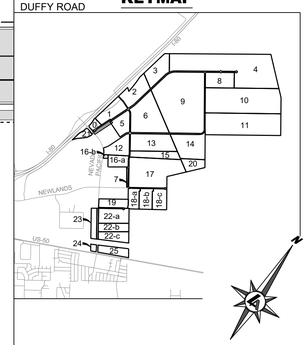


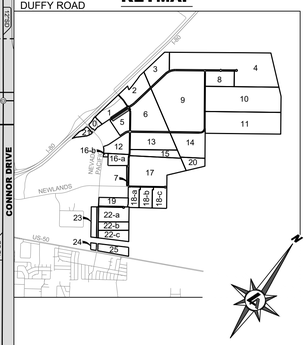
C4.1 - MAP 1
DUFFY ROAD

KEYMAP



C4.1 - MAP 1
DUFFY ROAD

KEYMAP



C4.1 - MAP 1
DUFFY ROAD

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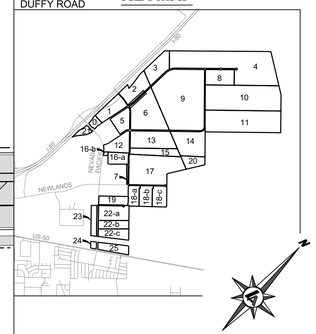

C4.1 - MAP 1
DUFFY ROAD

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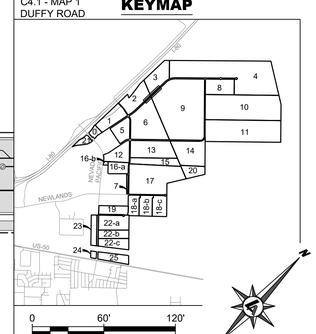

0 60' 120'

22x34 SHEETS: 1" = 60'
11x17 SHEETS: 1" = 120'

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TENTATIVE MAP
PRELIMINARY UTILITY PLAN

FERNLEY — LYON COUNTY, NEVADA

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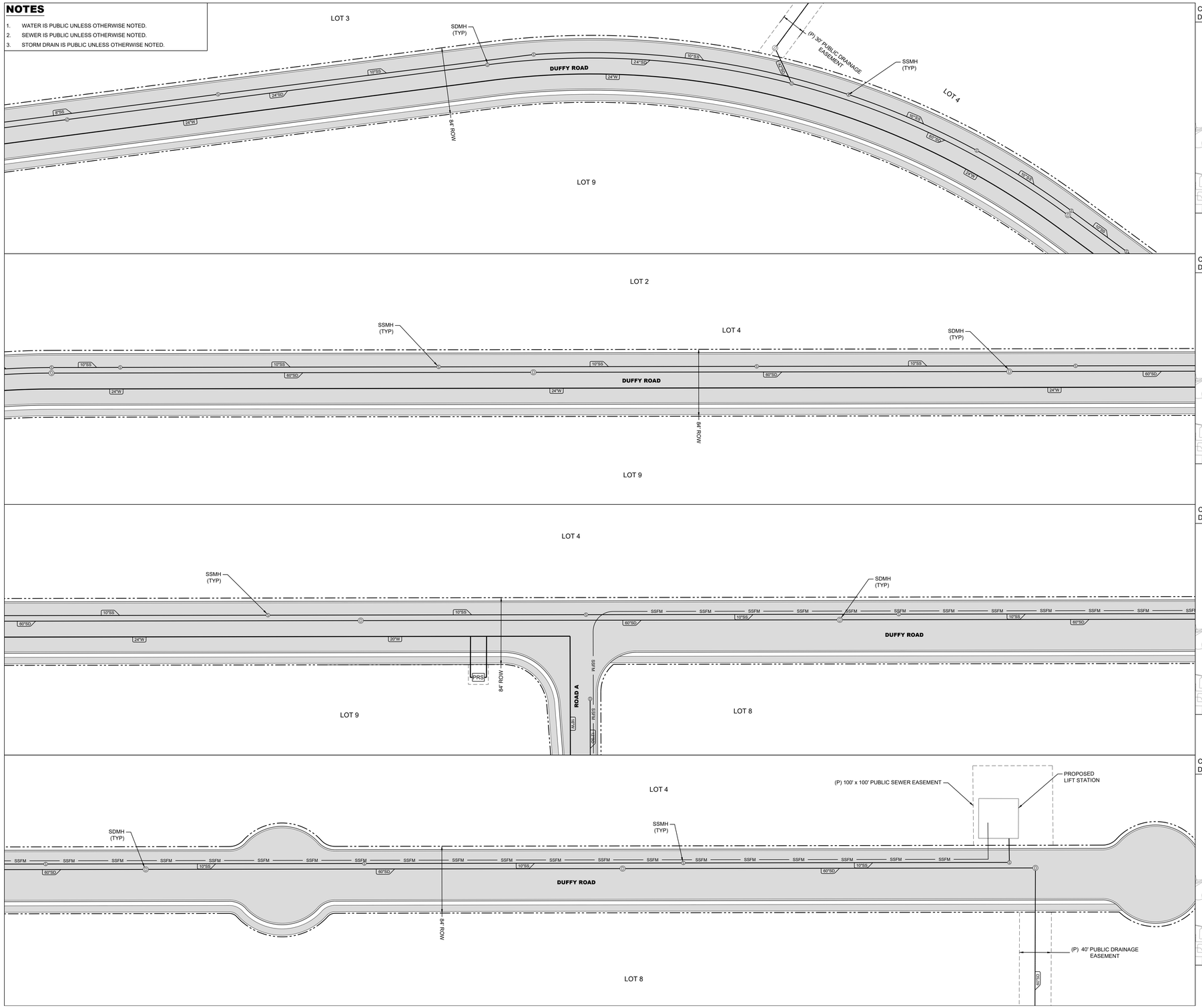
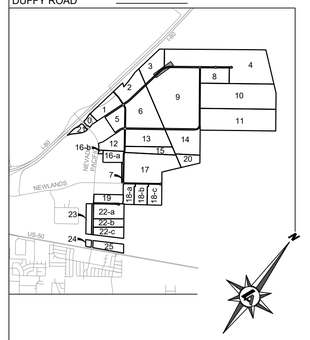


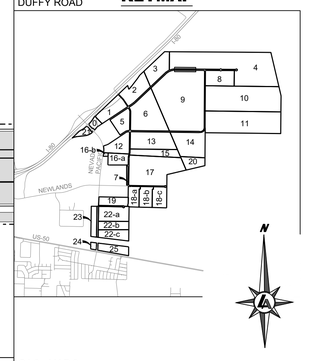
C4.2 - MAP 1
DUFFY ROAD

KEYMAP



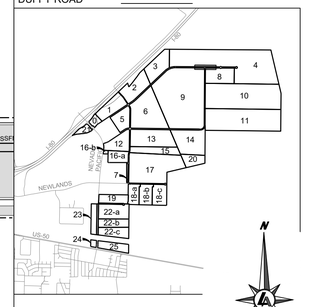
C4.2 - MAP 2
DUFFY ROAD

KEYMAP



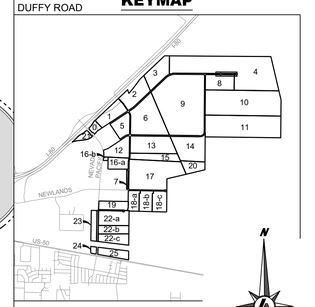
C4.2 - MAP 3
DUFFY ROAD

KEYMAP



C4.2 - MAP 4
DUFFY ROAD

KEYMAP



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TENTATIVE MAP
PRELIMINARY UTILITY PLAN

FERNLEY — LYON COUNTY — NEVADA

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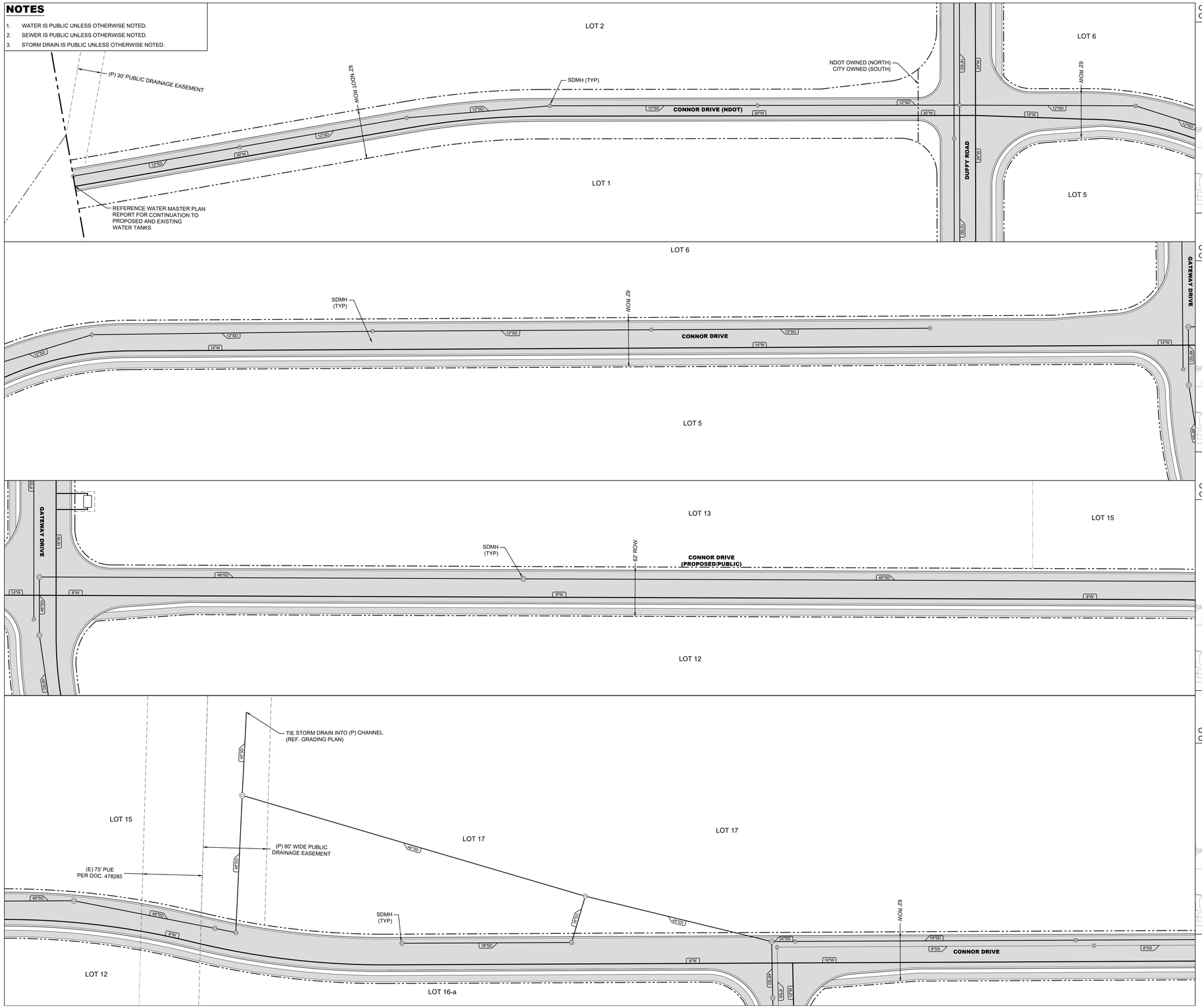
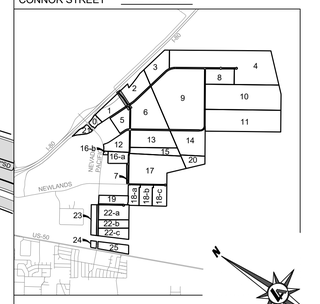


C4.3 - MAP 1 CONNOR STREET **KEYMAP**

C4.3 - MAP 2 CONNOR STREET **KEYMAP**

C4.3 - MAP 3 CONNOR STREET **KEYMAP**

C4.3 - MAP 4 CONNOR STREET **KEYMAP**



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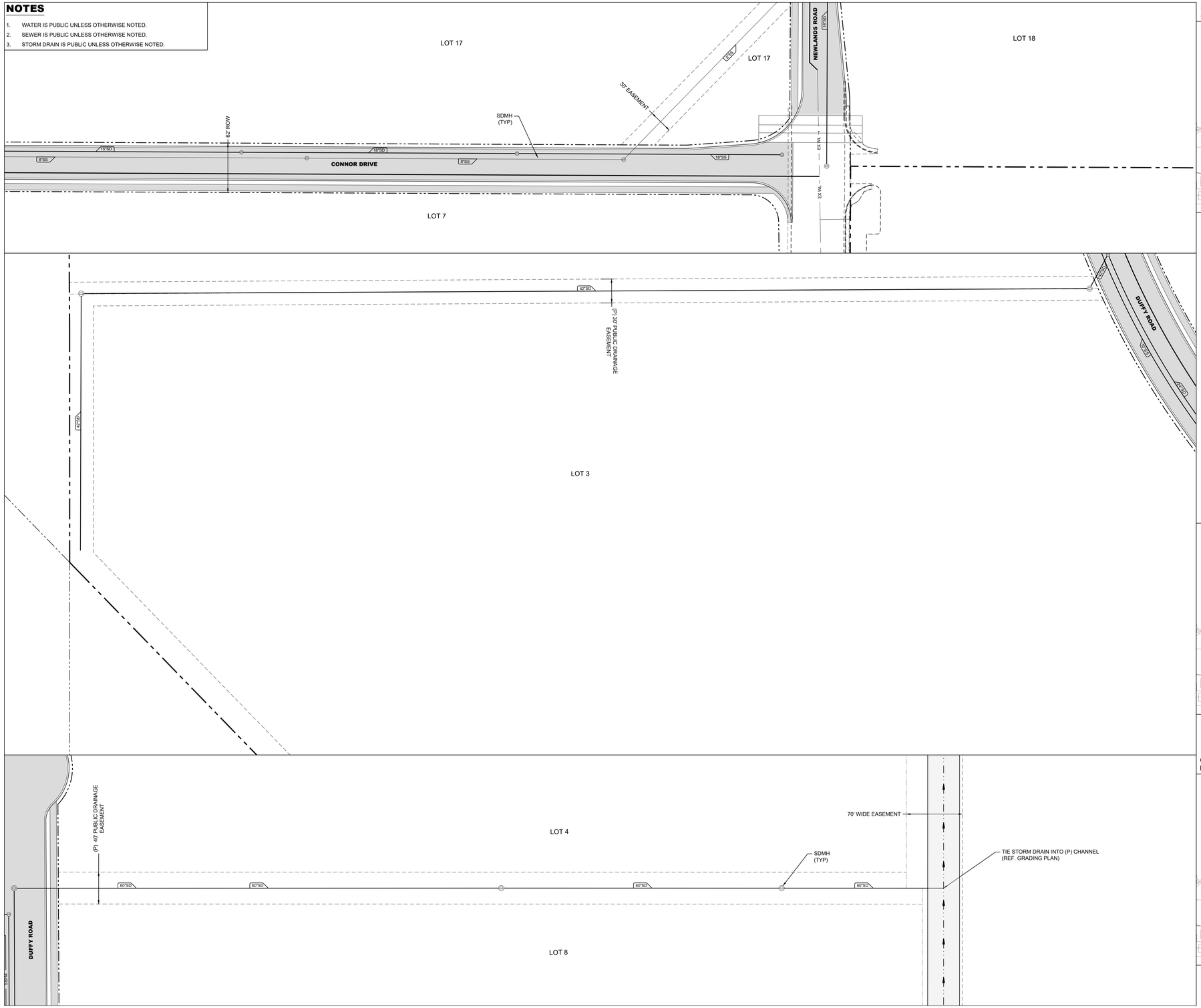
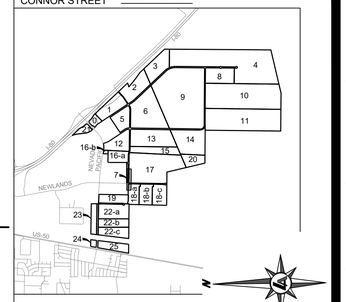


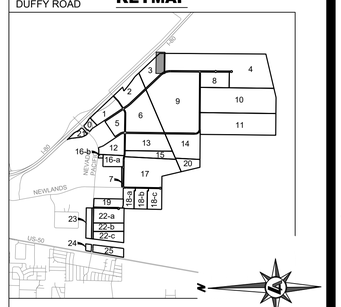
C4.4 - MAP 1
CONNOR STREET

KEYMAP



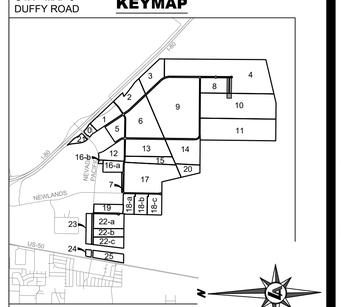
C4.4 - MAP 2
DUFFY ROAD

KEYMAP



C4.4 - MAP 3
DUFFY ROAD

KEYMAP



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FERNLEY — LYON COUNTY — NEVADA

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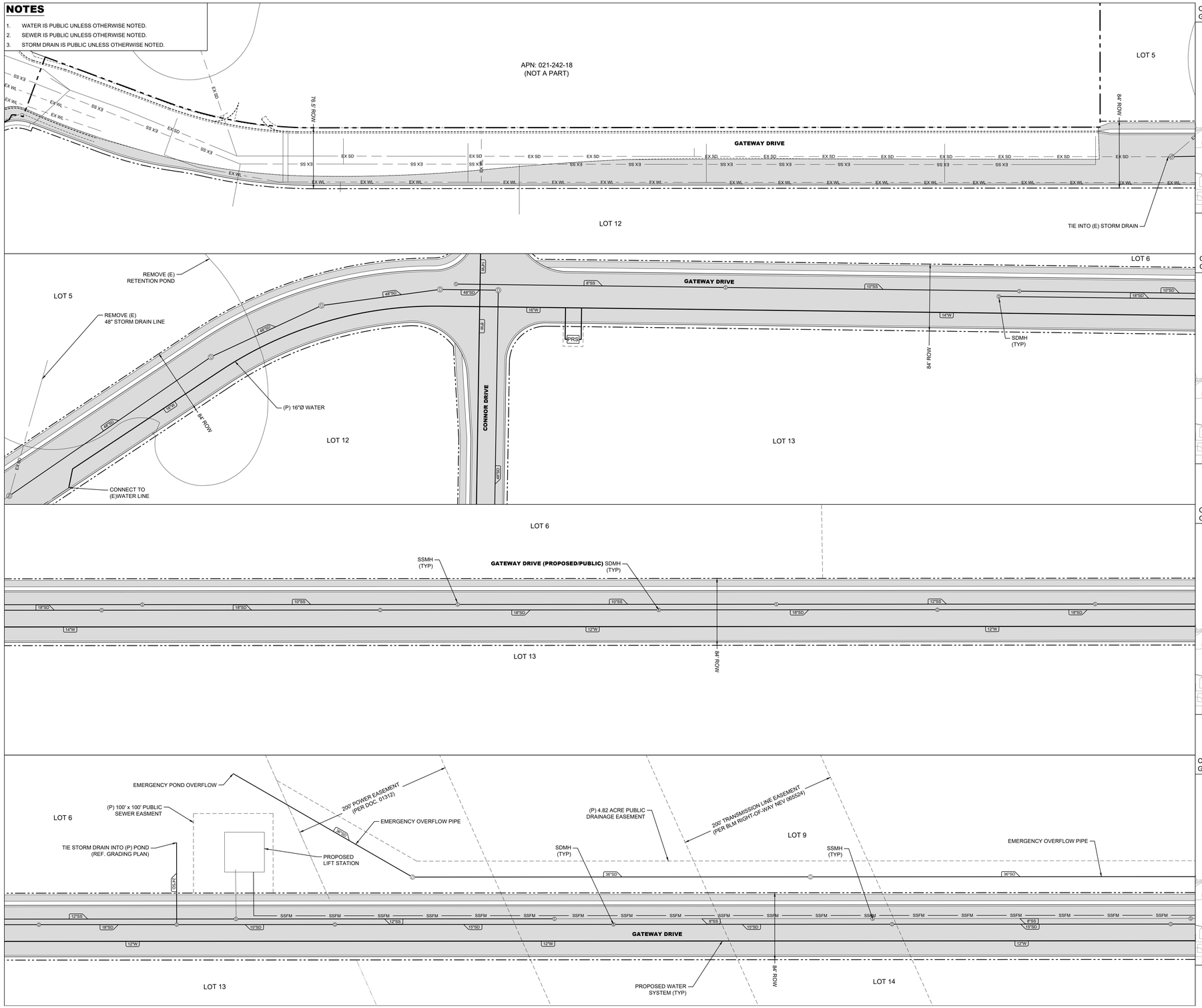
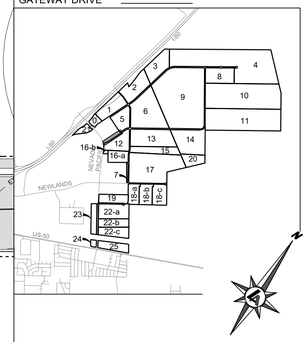


C4.5 - MAP 1
GATEWAY DRIVE

KEYMAP



C4.5 - MAP 2
GATEWAY DRIVE

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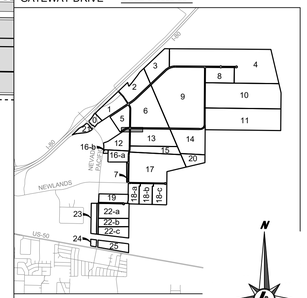
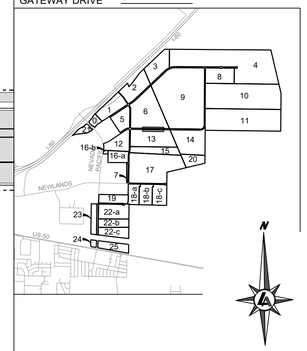


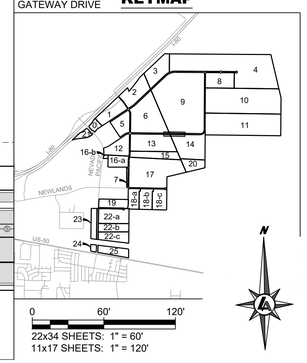
C4.5 - MAP 3
GATEWAY DRIVE

KEYMAP



C4.5 - MAP 4
GATEWAY DRIVE

KEYMAP



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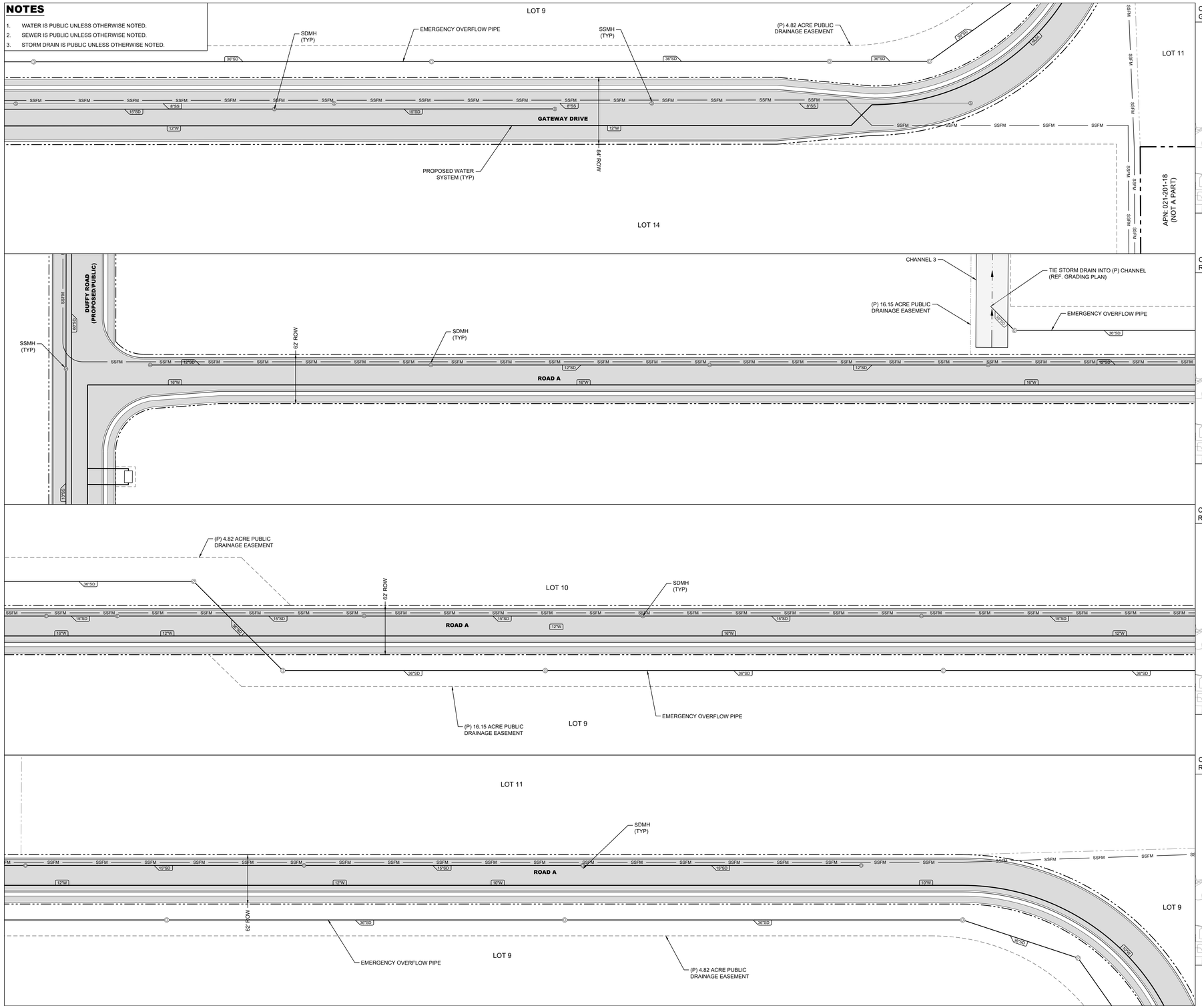
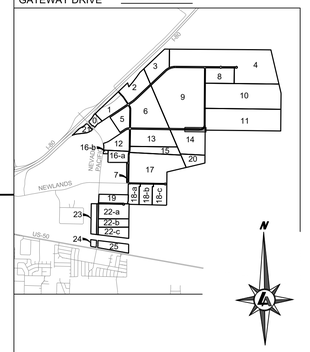


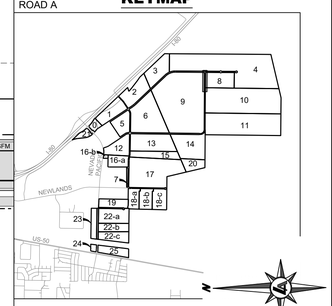
C4.6 - MAP 1
GATEWAY DRIVE

KEYMAP



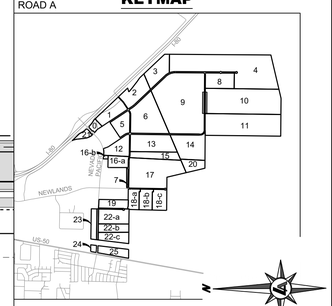
C4.6 - MAP 2
ROAD A

KEYMAP



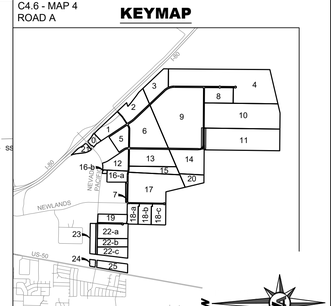
C4.6 - MAP 3
ROAD A

KEYMAP



C4.6 - MAP 4
ROAD A

KEYMAP



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FERNLEY — LYON COUNTY, NEVADA

REV	DATE	DESCRIPTION	BY

TENTATIVE MAP

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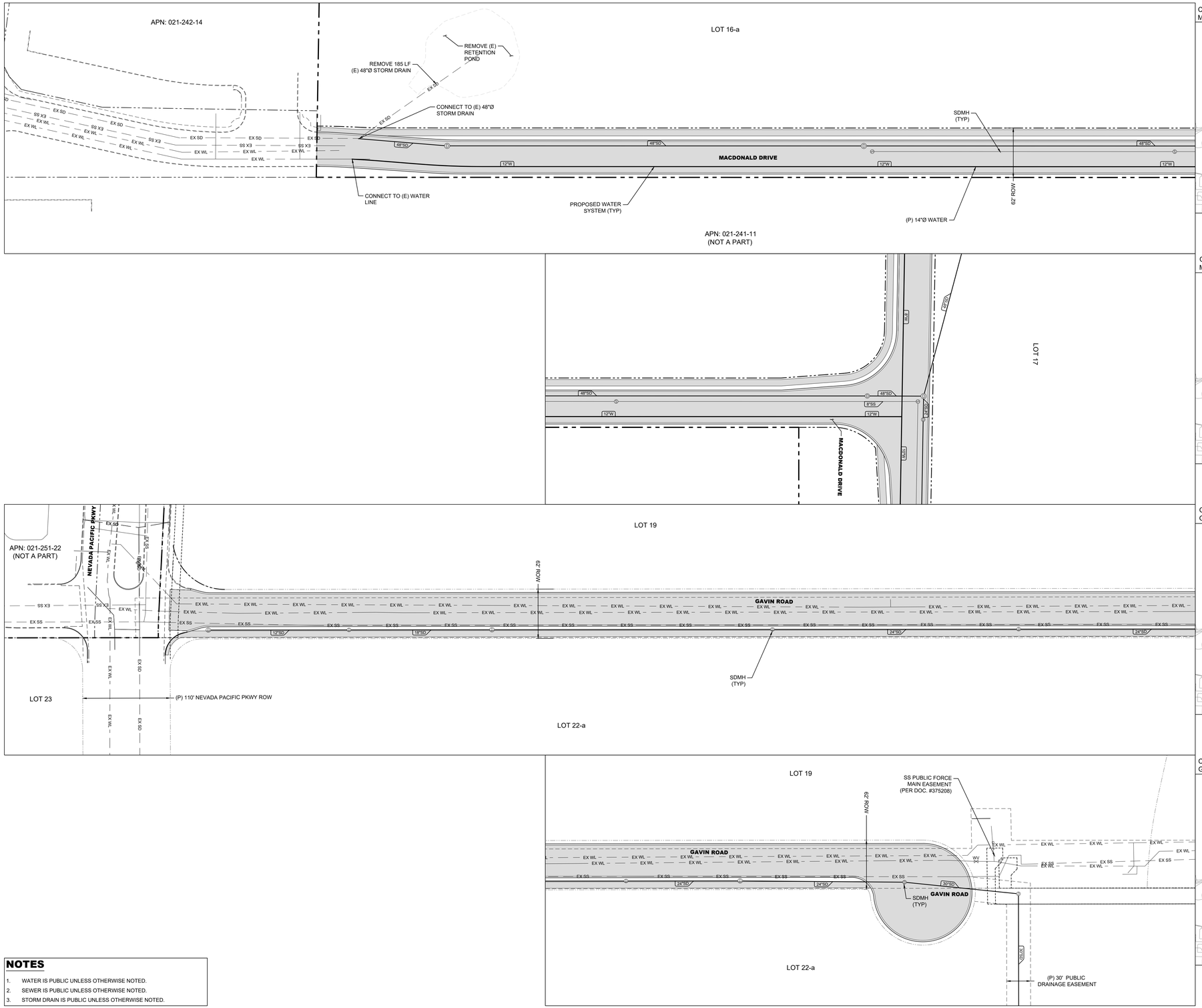

C4.7 - MAP 1
MACDONALD DRIVE

C4.7 - MAP 2
MACDONALD DRIVE

C4.7 - MAP 3
GAVIN ROAD

C4.7 - MAP 4
GAVIN ROAD

KEYMAP

0 60' 120'
22x34 SHEETS: 1" = 60'
11x17 SHEETS: 1" = 120'

NOTES

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2. SEWER IS PUBLIC UNLESS OTHERWISE NOTED.
3. STORM DRAIN IS PUBLIC UNLESS OTHERWISE NOTED.

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PROFESSIONAL ENGINEER - STATE OF NEVADA
CAMILLE BUEHLER
Exp: 12-31-24
CIVIL
No. 26240

09/20/2023

M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
PRELIMINARY UTILITY PLAN

FERNLEY — LYON COUNTY — NEVADA

REV	DATE	DESCRIPTION	BY

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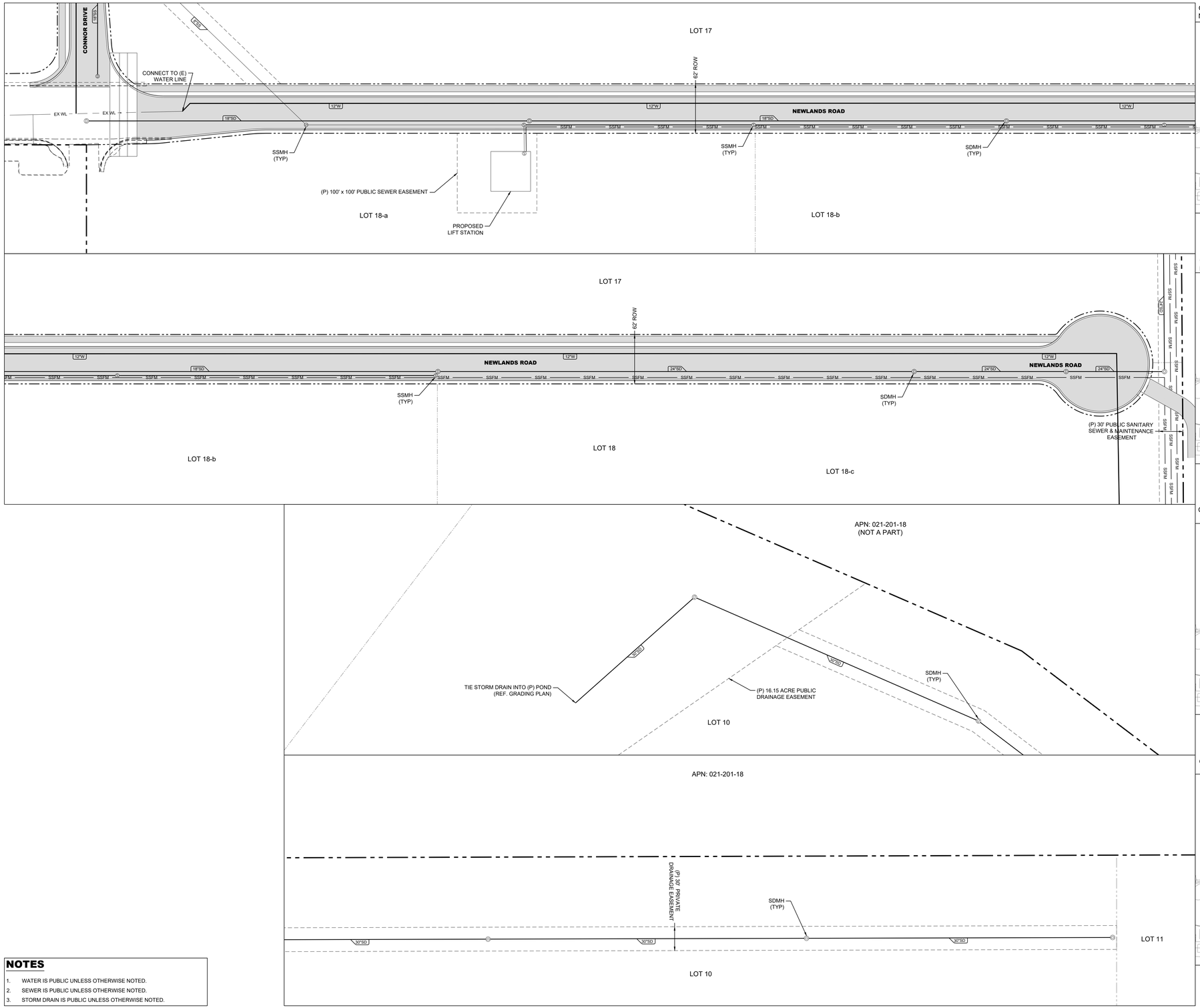


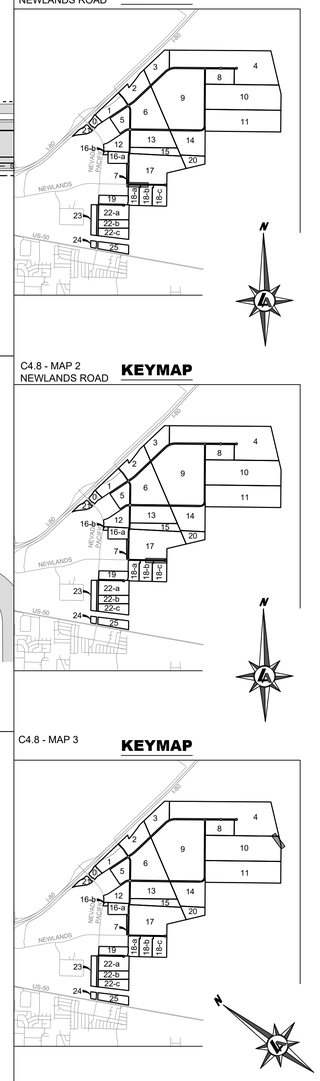
C4.8 - MAP 1
NEWLANDS ROAD

C4.8 - MAP 2
NEWLANDS ROAD

C4.8 - MAP 3

C4.8 - MAP 4

KEYMAP



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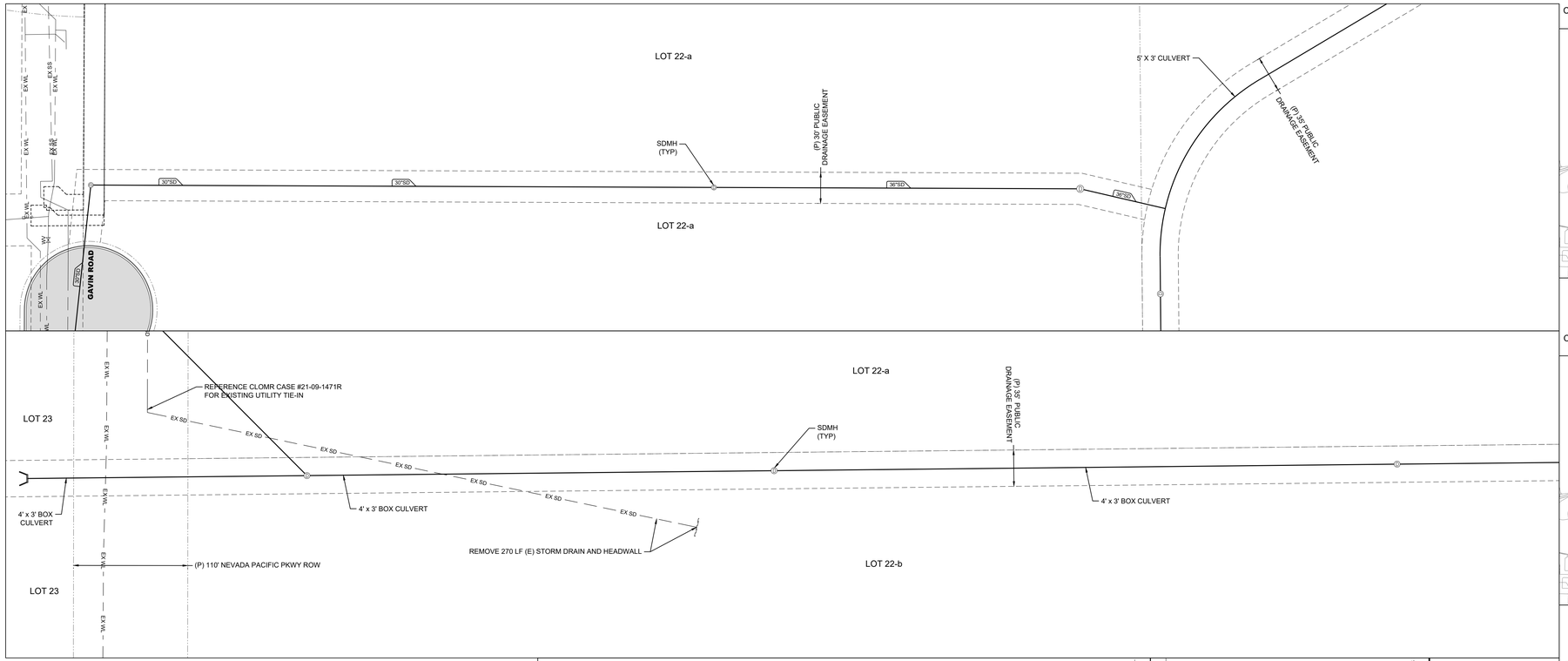
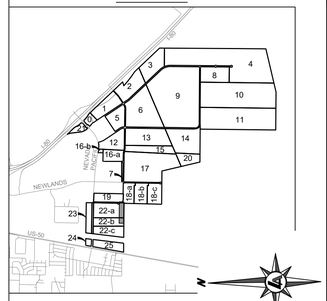


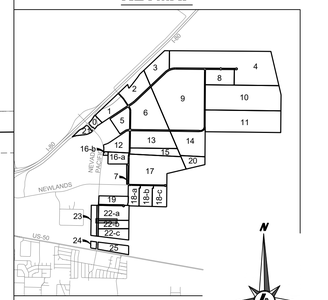
C4.9 - MAP 1

KEYMAP



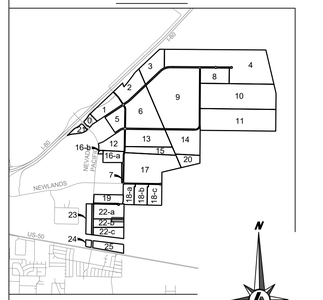
C4.9 - MAP 2

KEYMAP



C4.9 - MAP 3

KEYMAP



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M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
PRELIMINARY UTILITY PLAN

FERNLEY — LYON COUNTY — NEVADA

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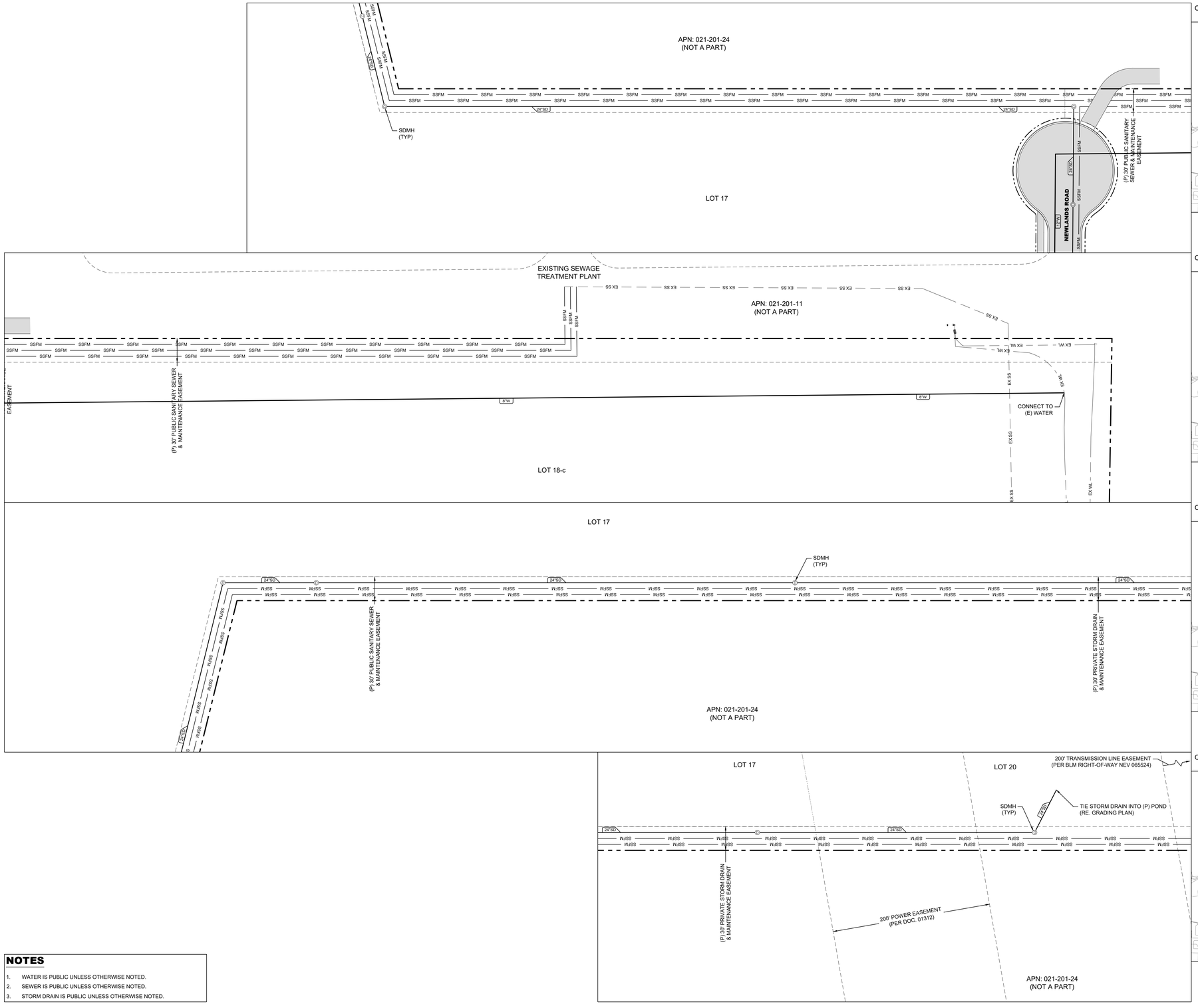
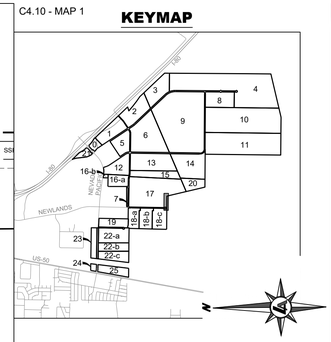


C4.10 - MAP 1

KEYMAP



C4.10 - MAP 2

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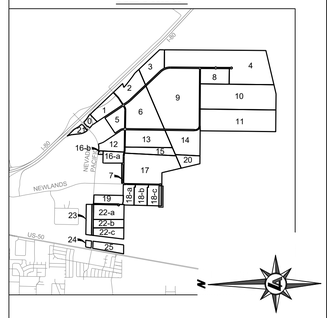
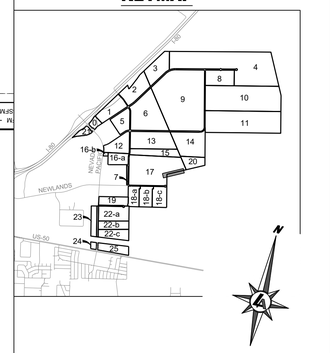


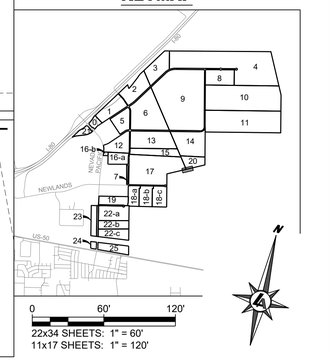
C4.10 - MAP 3

KEYMAP



C4.10 - MAP 4

KEYMAP



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VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
PRELIMINARY UTILITY PLAN

FERNLEY — LYON COUNTY — NEVADA

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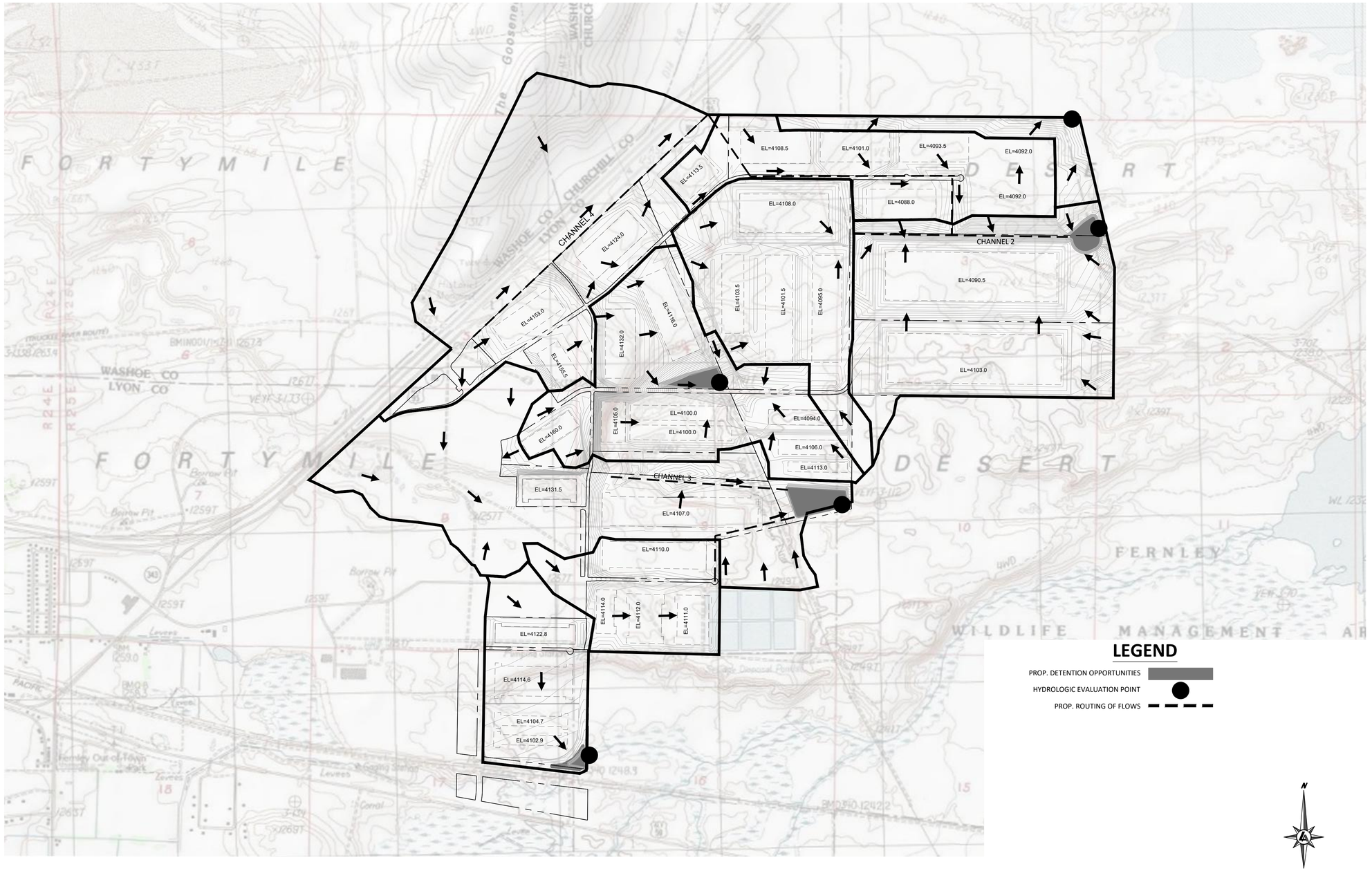

LEGEND

- PROP. DETENTION OPPORTUNITIES
- HYDROLOGIC EVALUATION POINT
- PROP. ROUTING OF FLOWS

N

0 1000' 2000'

22x34 SHEETS: 1" = 1000'
11x17 SHEETS: 1" = 2000

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M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS DISTRICT
TENTATIVE MAP
PROPOSED HYDROLOGIC CONDITIONS

FERNLEY — LYON COUNTY — NEVADA

REV | DATE | DESCRIPTION | BY

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LANDSCAPE SPECIFICATIONS

GENERAL

1. PLAN IS DIAGRAMMATIC ONLY. ALL LOCAL GOVERNING CODES SHALL BE MET. EXACT LOCATION OF TREES AND SHRUBS SHALL BE DETERMINED IN THE FIELD (INSTALL AS PER DETAILS) AND APPROVED BY THE OWNER'S REPRESENTATIVE.

2. A MINIMUM OF TWO WORKING DAYS BEFORE PERFORMING ANY DIGGING, CALL UNDERGROUND SERVICE ALERT FOR INFORMATION ON THE LOCATION OF NATURAL GAS LINES, ELECTRIC CABLES, TELEPHONE CABLES, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATION AND PROTECTION OF ALL UTILITIES, AND REPAIR OF ANY DAMAGE RESULTING FROM HIS WORK AT NO ADDITIONAL COST TO THE OWNER.

3. DAMAGES: CONTRACTOR SHALL PROMPTLY REPAIR ALL DAMAGES TO EXISTING SITE AT NO COST TO OWNER.

4. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES (I.E., PAVING, PLUMBING, ELECTRICAL, ETC.)

5. THE CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY SITE CONDITIONS PRIOR TO CONSTRUCTION AND TO NOTIFY THE OWNER'S REPRESENTATIVE SHOULD CONDITIONS EXIST WHICH PREVENT CONSTRUCTION AS PER THESE PLANS. COMMENCEMENT OF WORK SHALL CONSTITUTE ACCEPTANCE OF CONDITIONS AND RESPONSIBILITY FOR CORRECTIONS.

6. CONTRACTOR AGREES THAT, IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR ASSUMES SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS AND CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD HARMLESS THE OWNER FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THE PROJECT.

PLANTING

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FINISH GRADING THROUGHOUT ALL LANDSCAPE AREAS SUCH THAT THERE ARE NO HUMPS OR DEPRESSIONS AND POSITIVE DRAINAGE OCCURS THROUGHOUT. THE TOP 18" OF ALL PLANTING BEDS SHALL BE CLEAN NATIVE SOIL, FREE OF ALL CONSTRUCTION DEBRIS AND NATIVE ROCKS OVER 1" IN DIAMETER. THE CONTRACTOR SHALL AMEND THE PLANTING BED OR PLANTING HOLES PER PLANS AND SPECIFICATIONS. FINAL GRADE OF ALL PLANTERS (I.E. MULCH SURFACE) SHALL BE FLUSH WITH ADJACENT HARDSCAPE SURFACES.

8. SOIL TEST: CONTRACTOR SHALL PROVIDE SOIL TEST RESULTS FOR EXISTING SITE SOIL AS FOLLOWS:
- ANALYSIS PACKAGE LTP.4 BY SUNLAND ANALYTICAL (916)852-8557 (OAE).
- TEST RESULTS SHALL INCLUDE SOIL SATURATION PERCENT, SOIL TEXTURE, INFILTRATION RATE, pH, CONDUCTIVITY, TOTAL DISSOLVED SALTS, CATION EXCHANGE CAPACITY, POTASSIUM, SODIUM, CALCIUM, MAGNESIUM, NITRATE & PHOSPHORUS, SULFUR, CHLORIDE, BORON, COPPER, IRON, MANGANESE, ZINC & LIME REQUIREMENT OR GYPSUM REQUIREMENT, SODIUM ABSORPTION RATIO, EXCHANGEABLE SODIUM PERCENT & ORGANIC MATTER, ALONG WITH RECOMMENDATIONS FOR SOIL AMENDMENT BASED ON ANALYSIS RESULTS.
- CONTRACTOR SHALL FOLLOW RECOMMENDATIONS OF SOIL TEST.

9. IT IS THE CONTRACTOR'S RESPONSIBILITY TO TOTAL AND CONFIRM ALL MATERIAL QUANTITIES. ITEMS QUANTIFIED BY AN AREA (I.E. SQUARE FEET - SF, SQUARE YARD - SY) OR VOLUME (CUBIC FEET - CU FT, CUBIC YARD - CU YD) SHALL BE CALCULATED AND CONFIRMED BY THE CONTRACTOR. THE QUANTITIES LISTED ON THE PLANT LIST ARE ESTIMATED. IN THE EVENT OF A DISCREPANCY BETWEEN THE TOTALS LISTED ON THE PLANT LIST AND THE QUANTITY OF GRAPHIC PLANT SYMBOLS DEPICTED ON THE DRAWINGS, THE GRAPHIC SYMBOLS ON THE PLANS SHALL GOVERN. THE ACTUAL TOTAL QUANTITIES SHALL BE DETERMINED BY THE CONTRACTOR.

10. SOIL AMENDMENT: UNLESS OTHERWISE INDICATED BY THE SOIL TEST, SOIL AMENDMENT SHALL BE HUMUS COMPOSED OF TOPSOIL, BARK HUMUS, AND COMPOST. SUBMIT TO OWNER'S REPRESENTATIVE FOR APPROVAL.

11. CONTRACTOR IS RESPONSIBLE FOR PROVIDING PLANT MATERIAL PER SYMBOLS AND SPACING INDICATED ON PLAN. SYMBOLS PREVAIL OVER NUMBERS ON PLANT LIST. NO SUBSTITUTIONS WILL BE ACCEPTED WITHOUT EXPRESSED WRITTEN CONSENT OF THE OWNER'S REPRESENTATIVE. SEE SUBMITTALS.

12. ALL PLANTS NOT MEETING OR EXCEEDING REQUIREMENTS AND RECOMMENDATIONS OF THE LATEST EDITION OF THE ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN SHALL BE REJECTED. CONTRACTOR SHALL RECEIVE ON-SITE APPROVAL OF PLANT MATERIAL BY OWNER'S REPRESENTATIVE PRIOR TO PLANTING. FAILURE TO RECEIVE PRIOR APPROVAL MAY RESULT IN REJECTION OF PLANT MATERIAL FOLLOWING INSTALLATION. THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO INSPECT AND EVALUATE PLANT MATERIAL THROUGHOUT THE CONSTRUCTION AND MAINTENANCE PERIOD.

13. ALL PLANTING BEDS SHALL RECEIVE TOP-DRESSING OF MULCH AS FOLLOWS:

- DECOMPOSED GRANITE (DG) - INSTALL 4" MIN. DEPTH OF 5/16" COARSE OXBORROW DG (OAE) - DO NOT INSTALL WEED FABRIC UNDER DG MULCH.
- FRACTURED ROCK (FR) - INSTALL 4" MIN. DEPTH OF 2" X 3" FRACTURED ROCK OVER LANDSCAPE FABRIC.
- LAVA ROCK (LR) - INSTALL 4" MIN. DEPTH OF 1-1/2" LAVA MOCHA ROCK OVER LANDSCAPE FABRIC.
- BLENDED RIVER ROCK (BR) - INSTALL 4" MIN. DEPTH OF BLENDED RIVER ROCK (40% 4" MINUS & 60% 1-1/2" MINUS) OVER LANDSCAPE FABRIC.
- RIVER ROCK (RR) - INSTALL 4" MIN. DEPTH OF 4" MINUS RIVER ROCK OVER LANDSCAPE FABRIC.
- WOOD MULCH (WM) - INSTALL 4" MIN. DEPTH OF PARTIALLY COMPOSTED WOOD MULCH (FULL CIRCLE OAE)
- WALK-ON BARK MULCH FOR WATERING WELLS - INSTALL WALK-ON' BARK MULCH (OAE) IN TREE AND SHRUB WATERING WELLS LOCATED WITHIN ROCK MULCH AREAS. - DO NOT INSTALL LANDSCAPE FABRIC UNDER BARK.
- LANDSCAPE FABRIC - 'DEWITT' PRO-5 WEED BARRIER (OAE), INSTALL IN ACCORDANCE WITH MFG'S SPECIFICATIONS.
- GRANULAR PRE-EMERGENT HERBICIDE - APPLY HERBICIDE TO CONTROL NUISANCE AND NOXIOUS WEEDS TO ALL PLANTING BEDS PER UNR COOPERATIVE EXTENSION'S LATEST RECOMMENDATIONS AND MFG'S SPECIFICATIONS.

DIGITAL PHOTOS OF ALL MULCH SAMPLES SHALL BE SUBMITTED TO OWNER'S REPRESENTATIVE FOR REVIEW AND APPROVAL MIN. 48 HOURS PRIOR TO START OF ANY LANDSCAPE OR IRRIGATION WORK. IF UNACCEPTABLE MULCH IS INSTALLED WITHOUT APPROVAL IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CORRECT THE ISSUES AT HIS EXPENSE.

OBSERVATIONS/APPROVALS/SUBMITTALS

14. CONTRACTOR IS RESPONSIBLE FOR NOTIFYING OWNER'S REPRESENTATIVE, A MINIMUM OF 48 HOURS IN ADVANCE, FOR THE FOLLOWING SITE OBSERVATIONS AND/OR MEETINGS:

A. PRECONSTRUCTION MEETING WITH ALL PARTIES
B. PLANT MATERIAL ON SITE, PRIOR TO INSTALLATION
C. FINAL PROJECT WALK-THROUGH
D. ADDITIONAL SITE OBSERVATIONS AS DEEMED NECESSARY BY THE OWNER'S REPRESENTATIVE.

15. SUBMIT AMENDMENT AND MULCH SAMPLES TO OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO INSTALLATION. FAILURE TO COMPLY MAY RESULT IN REJECTION OF MULCH OR AMENDMENT PRIOR TO OR FOLLOWING INSTALLATION.

16. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND PROVIDE PLANT MATERIAL AS SPECIFIED ON THIS PLAN. THE CONTRACTOR MAY SUBMIT A REQUEST TO PROVIDE SUBSTITUTIONS FOR THE SPECIFIED PLANT MATERIAL UNDER THE FOLLOWING CONDITIONS:

A. ANY SUBSTITUTIONS PROPOSED SHALL BE SUBMITTED TO THE PROJECT OWNER'S REPRESENTATIVE WITHIN TWO WEEKS OF THE AWARD OF CONTRACT. SUBSTITUTIONS MUST MEET EQUIVALENT DESIGN AND FUNCTIONAL GOALS OF THE ORIGINAL MATERIALS AS DETERMINED BY THE OWNER'S REPRESENTATIVE. ANY CHANGES MUST HAVE THE APPROVAL OF THE OWNER'S REPRESENTATIVE.
B. THE REQUEST WILL BE ACCOMPANIED BY AT LEAST THREE NOTICES FROM PLANT MATERIAL SUPPLIERS THAT THE PLANT MATERIAL SPECIFIED IS NOT AVAILABLE AND WILL NOT BE AVAILABLE PRIOR TO CONSTRUCTION.

17. SUBMIT REQUIRED SOIL REPORT, AND SAMPLE OF PROPOSED SOIL AMENDMENTS TO OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.

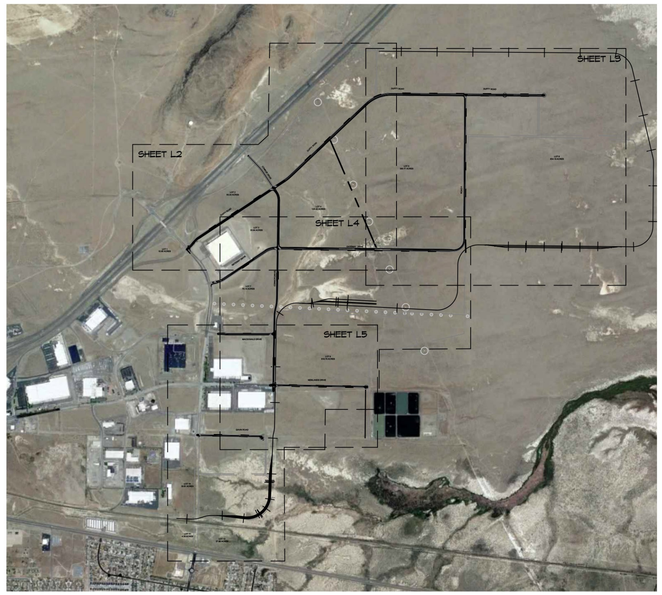
18. RECORD (AS-BUILT) DRAWINGS: FOLLOWING COMPLETION OF PROJECT INSTALLATION, AND PRIOR TO FINAL APPROVAL, CONTRACTOR SHALL PREPARE AND SUBMIT RECORD DRAWINGS DEPICTING A COMPLETE LANDSCAPE AND IRRIGATION INSTALLATION. PROCURE FROM OWNER DIGITAL COPIES OF CONTRACT DRAWINGS. CONSTRUCTION DRAWINGS SHALL BE ON THE PROJECT SITE AT ALL TIMES DURING INSTALLATION. CONTRACTOR SHALL MAKE A DAILY RECORD OF ALL WORK INSTALLED DURING EACH DAY. ACTUAL LOCATION OF TREES AND SHRUB BEDS, IRRIGATION VALVES, AND ALL IRRIGATION AND DRAINAGE PIPING SHALL BE SHOWN ON THE PRINTS BY DIMENSIONS FROM EASILY IDENTIFIED PERMANENT FEATURES, SUCH AS BUILDINGS, CURBS, FENCES, WALKS, OR PROPERTY LINES. DRAWINGS SHALL SHOW MANUFACTURER'S NAME AND CATALOG NUMBER. THE DRAWINGS SHALL BE TO SCALE. ALL INFORMATION NOTED ON THE PRINT SHALL BE TRANSFERRED TO THE COPIES BY CONTRACTOR AND ALL INDICATIONS SHALL BE RECORDED IN A NEAT, ORDERLY WAY. THE RECORD COPIES SHALL BE TURNED OVER TO THE OWNER'S REPRESENTATIVE.

GUARANTEES/WARRANTY

20. ALL PLANTED AREAS SHALL BE MAINTAINED FOR A PERIOD OF SIXTY DAYS FOLLOWING WRITTEN ACCEPTANCE BY OWNER'S REPRESENTATIVE. LANDSCAPE CONTRACTOR WILL GUARANTEE ALL PLANT MATERIAL (INCLUDING BUT NOT LIMITED TO TREES, SHRUBS, GROUNDCOVER, AND GRASSES) FOR A PERIOD OF ONE FULL YEAR FOLLOWING FINAL ACCEPTANCE OF THE LANDSCAPE INSTALLATION BY THE OWNER'S AUTHORIZED REPRESENTATIVE. IN BIDDING AND INSTALLING THE PLANT MATERIAL SPECIFIED ON THESE PLANS, THE LANDSCAPE CONTRACTOR AGREES THAT THE PLANT MATERIAL SPECIFIED IS SUITABLE TO THE PROJECT SITE. FURTHERMORE, THE LANDSCAPE CONTRACTOR AGREES TO HONOR THE WARRANTY AND, IF NECESSARY, REPLACE SPECIES WITH A MORE HARDY PLANT TYPE IF DEEMED NECESSARY DUE TO EXCESSIVE DIE OUT. IF THE LANDSCAPE CONTRACTOR DOES NOT BELIEVE CERTAIN PLANT MATERIAL IS SUITABLE FOR THE SITE AND/OR ITS MICRO-CLIMATES, THE LANDSCAPE CONTRACTOR SHALL REQUEST TO MAKE PLANT MATERIAL SUBSTITUTIONS IN WRITING TO THE LANDSCAPE ARCHITECT PRIOR TO THE START OF INSTALLATION. PROPOSED SUBSTITUTIONS WILL RESULT IN NO ADDED COST.

LANDSCAPING IN PUBLIC RIGHT-OF-WAYS WITHIN THE CITY OF RENO

21. LANDSCAPING IN PUBLIC RIGHTS-OF-WAY (PARKWAY STRIPS, ETC.) WITHIN THE CITY OF RENO REQUIRE A TREE WORK PERMIT (TO BE OBTAINED BY THE LANDSCAPE CONTRACTOR) AND IS SUBJECT TO REVIEW AND APPROVAL BY THE CITY OF RENO'S URBAN FORESTER. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE PERMIT AND THE CITY OF RENO'S URBAN FORESTER INCLUDING, BUT NOT LIMITED TO, IRRIGATION LAYOUT AND MATERIALS, MULCH TYPES, TREE CALIPERS, AND SHRUB SIZES. THE LANDSCAPE CONTRACTOR SHALL SUBMIT ALL SUBSTITUTIONS REQUESTS FOR MATERIALS WITHIN THE PUBLIC RIGHT-OF-WAY DIRECTLY TO THE CITY OF RENO URBAN FORESTER FOR CONSIDERATION. LANDSCAPE CONTRACTOR SHALL NOTIFY THE OWNER'S AUTHORIZED REPRESENTATIVE OF ANY APPROVALS RECEIVED.



0 2,000 4,000 6,000

Scale in Feet

SHEET INDEX

L1 - COVER SHEET
L2 - LANDSCAPE PLAN
L3 - LANDSCAPE PLAN
L4 - LANDSCAPE PLAN
L5 - LANDSCAPE PLAN

LANDSCAPE DATA:

LOT PARAMETERS		
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12	27.66 ACRES	4,849
TOTAL	2,106.59 ACRES	38,118

IRRIGATION SPECIFICATIONS

GENERAL

1. PLAN IS DIAGRAMMATIC ONLY. FINAL LOCATION OF LINES AND HEADS SHALL BE DETERMINED IN THE FIELD AND APPROVED BY THE OWNER'S REPRESENTATIVE. LINES SHALL BE IN A COMMON TRENCH WHEREVER POSSIBLE. THE POINT-OF-CONNECTION SHALL BE AS INDICATED ON THE PLAN.

2. THE CONTRACTOR SHALL VERIFY EXISTING SITE CONDITIONS AND ENSURE THAT ALL LOCAL CODES ARE MET.

3. THE CONTRACTOR SHALL APPLY AND PAY FOR ALL PERMITS REQUIRED FOR INSTALLATION OF THE IRRIGATION SYSTEM AS DEPICTED ON THESE PLANS.

4. CONTRACTOR SHALL VERIFY AVAILABLE FLOW AND PRESSURE DOWNSTREAM FROM THE POINT-OF-CONNECTION PRIOR TO SYSTEM INSTALLATION. CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE IMMEDIATELY IF AVAILABLE FLOW IS LESS THAN REQUIRED TO RUN THE LARGEST ZONE. CONTRACTOR SHALL NOT PROCEED ANY FURTHER WITH INSTALLATION OF THE SYSTEM UNTIL NECESSARY DESIGN REVISIONS HAVE BEEN DETERMINED BY OWNER'S REPRESENTATIVE.

5. THE CONTRACTOR SHALL NOT WILLFULLY INSTALL THE SPRINKLER SYSTEM AS SHOWN ON THE DRAWINGS WHEN IT IS OBVIOUS IN THE FIELD THAT UNKNOWN OBSTRUCTIONS OR DIFFERENCES IN DIMENSIONS EXIST THAT MIGHT HAVE BEEN UNKNOWN DURING ENGINEERING. SUCH OBSTRUCTIONS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S AUTHORIZED REPRESENTATIVE. IN THE EVENT THIS NOTIFICATION IS NOT PERFORMED, THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY REVISIONS NECESSARY AT NO ADDITIONAL COST TO OWNER.

6. ALL SPRINKLER EQUIPMENT NOT OTHERWISE DETAILED OR SPECIFIED SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.

7. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL SPRINKLER MATERIALS, INCLUDING PIPE, WITH THE LANDSCAPE DRAWINGS TO AVOID INTERFERING WITH THE PLANTING OF TREES, SHRUBS, OR OTHER PLANTINGS.

8. ALL VALVES ARE TO BE LOCATED IN PLANTING AREAS WHEREVER POSSIBLE.

9. ALL ELECTRICAL WIRE FROM CONTROLLER TO VALVES SHALL BE 12 GAUGE UL DIRECT BURIAL OR LARGER AS REQUIRED BY LENGTH PER MANUFACTURER'S SPECIFICATIONS.

10. BACKFILL FOR TRENCHING SHALL BE COMPACTED TO A DRY DENSITY EQUAL TO THE UNDISTURBED ADJACENT SOIL AND SHALL CONFORM TO ADJACENT GRADES WITHOUT DIPS, HUMPS, OR OTHER IRREGULARITIES.

11. A MINIMUM OF TWO WORKING DAYS PRIOR TO PERFORMING ANY DIGGING, CALL UNDERGROUND SERVICE ALERT FOR INFORMATION ON THE LOCATION OF NATURAL GAS LINES, ELECTRICAL CABLES, TELEPHONE CABLES, ETC.

12. CONTRACTOR AGREES THAT, IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.

13. INSTALL ALL PIPE AND CONTROL WIRES IN LANDSCAPE BEDS AND IN COMMON TRENCHES WHEREVER POSSIBLE.

14. INSTALL ALL PIPE AND CONTROL WIRE, WHICH RUNS UNDER PAVING, WITHIN SCH. 40 PVC SLEEVES 4" DIA. MINIMUM SIZE AS REQUIRED TO ALLOW INSTALLATION WITHOUT BINDING. PROVIDE (1) SLEEVE PER PIPE. PROVIDE SEPARATE SLEEVES FOR CONTROL WIRE.

15. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE FOR COMPLETE DRAINAGE OF THE MAINLINES BY INSTALLING MANUAL DRAINS AS INDICATED ON PLAN AND AT ALL SYSTEM LOW POINTS.

FLUSHING AND TESTING

16. PIPING SHALL BE COMPLETELY FLUSHED OF FOREIGN PARTICLES BEFORE ATTACHING IRRIGATION COMPONENTS AND DRAIN VALVES.

17. AFTER FLUSHING, AND WHEN ALL VALVES AND QUICK COUPLERS ARE IN PLACE, ALL MAIN SUPPLY LINES SHALL BE TESTED AT 100 POUNDS PER SQUARE INCH (100 PSI) WITH VALVES CLOSED. MAINTAIN PRESSURE FOR A PERIOD OF NOT LESS THAN (4) CONSECUTIVE HOURS. ALL JOINTS SHOWING LEAKS SHALL BE CLEANED, REMADE, AND TESTED.

18. AFTER FLUSHING, LATERAL PIPES SHALL BE TESTED WITH RISERS CAPPED AND DRAIN VALVES CLOSED. THE TEST SHALL BE MADE AT MAXIMUM OPERATING PRESSURE FOR A PERIOD OF NOT LESS THAN (1) HOUR. ALL JOINTS SHOWING LEAKS SHALL BE CLEANED, REMADE, AND TESTED. ALL TESTING SHALL BE DONE IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE PRIOR TO BACKFILLING OVER PIPING.

19. OPERATIONAL TESTING: PERFORM OPERATIONAL TESTING AFTER HYDROSTATIC TESTING IS COMPLETED. DEMONSTRATE TO THE OWNER'S REPRESENTATIVE THAT THE SYSTEM MEETS COVERAGE REQUIREMENTS (100%) AND THAT AUTOMATIC CONTROLS FUNCTION PROPERLY.

20. AFTER COMPLETION OF GRADING AND SOD PLACEMENT, CAREFULLY ADJUST SPRINKLER HEADS TO MEET HEIGHT INDICATED ON DRAWINGS.

SUBMITTALS

21. MATERIALS LIST: WITHIN (15) DAYS AFTER AWARD OF CONTRACT, SUBMIT TO OWNER'S REPRESENTATIVE (3) COPIES OF A COMPLETE MATERIAL LIST (PARTIAL LIST NOT ACCEPTABLE) OF ALL MATERIALS TO BE USED ON THE PROJECT, SPECIFYING MANUFACTURER, GRADE, TRADE NAME, CATALOG NUMBER, SIZE, ETC. THIS SHALL IN NO WAY BE CONSTRUED AS ALLOWING A SUBSTITUTION FOR ANY ITEM SPECIFIED ON THE PLANS. EQUIPMENT OR MATERIALS INSTALLED OR FURNISHED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE MAY BE REJECTED AND THE CONTRACTOR REQUIRED TO REMOVE THE MATERIALS AT HIS OWN EXPENSE.

INSTALLATION AND PERFORMANCE OF APPROVED SUBSTITUTIONS ARE THE CONTRACTORS RESPONSIBILITY. ANY CHANGES REQUIRED FOR INSTALLATION OF ANY APPROVED SUBSTITUTION MUST BE MADE TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE WITHOUT ADDITIONAL COST TO OWNER.

22. PRIOR TO SYSTEM INSTALLATION CONTRACTOR SHALL VERIFY AND SUBMIT TO OWNER'S REPRESENTATIVE IN WRITING, AVAILABLE FLOW AND PRESSURE AT POINT-OF-CONNECTION AS DESCRIBED IN SPECIFICATION #4 ABOVE.

23. COMPLETE WARRANTY CARDS FOR AUTOMATIC CONTROLLER AND OTHER IRRIGATION MATERIAL (CONTROLLER KEYS, ETC.) SHALL BE DELIVERED TO OWNER.

24. CONTRACTOR SHALL PREPARE AND ISSUE TO THE OWNER (AT COMPLETION OF THE INSTALLATION) AN ANNUAL CHART INDICATING LOCATION, OPERATING DATES, CYCLES, AND TIME FOR EACH ZONE.

25. ASBUILT IRRIGATION DRAWINGS: CONTRACTOR SHALL FURNISH ASBUILTS OF THE COMPLETE IRRIGATION SYSTEM. PROCURE FROM OWNER'S REPRESENTATIVE DIGITAL COPIES OF CONTRACT DRAWINGS. CONSTRUCTION DRAWINGS SHALL BE ON THE CONSTRUCTION SITE AT ALL TIMES WHILE THE IRRIGATION SYSTEM IS BEING INSTALLED. CONTRACTOR SHALL MAKE A DAILY RECORD OF ALL WORK INSTALLED DURING EACH DAY. ACTUAL LOCATION OF VALVES AND ALL IRRIGATION AND DRAINAGE PIPING SHALL BE SHOWN ON THE PRINTS BY DIMENSIONS FROM EASILY IDENTIFIED PERMANENT FEATURES, SUCH AS BUILDINGS, CURBS, FENCES, WALKS OR PROPERTY LINES. DRAWINGS SHALL SHOW APPROVED MANUFACTURER'S NAME AND CATALOG NUMBER. THE DRAWINGS SHALL BE TO SCALE AND ALL INDICATIONS SHALL BE NEAT. ALL INFORMATION NOTED ON THE PRINT SHALL BE TRANSFERRED TO THE COPIES BY CONTRACTOR AND ALL INDICATIONS SHALL BE RECORDED IN A NEAT, ORDERLY WAY. THE RECORD COPIES SHALL BE TURNED OVER TO THE OWNER'S REPRESENTATIVE AT OR BEFORE FINAL ACCEPTANCE/APPROVAL OF THE PROJECT.

GUARANTEE/FINAL ACCEPTANCE

26. CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE THE IRRIGATION SYSTEM FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE. MANUFACTURER WARRANTIES SHALL ONLY EXCEED THIS GUARANTEE AND CONTRACTOR SHALL BE LIABLE FOR REPAIRS/REPLACEMENT OF FAILED MATERIAL/WORKMANSHIP.

MAINTENANCE

27. AFTER SYSTEM IS INSTALLED AND APPROVED, INSTRUCT OWNER'S DESIGNATED PERSONNEL IN COMPLETE OPERATION AND MAINTENANCE PROCEDURES. DRAIN ENTIRE SYSTEM AT END OF FIRST WATERING SEASON FOLLOWING INSTALLATION. TRAIN OWNER'S DESIGNATED PERSONNEL BY HAVING THEM ASSIST IN WINTERIZING PROCEDURE.

1. AREA: +/- 2,102.78 AC/ 91,597,097
2. REQUIRED LANDSCAPE AREA CALCULATION 32.40.020(g).
   15% PARKING & CIRCULATION AREA = 91,597,097 SF X 0.15 = 13,739,565 SF (315.42 Ac)
   ARTERIAL FRONTAGE TREES @ 1:50 LF = 76,160 LF / 50 = 1523 TREES, TOTAL MIN.
3. A 10-FOOT WIDE BUFFER ALONG FRONTAGE PER 32.40.020 (n) SHALL BE PROVIDED

- ACTUAL TO BE DETERMINED AT FINAL MAP

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the landscape architecture studio
1552 C Street Sparks, NV 89431 (775) 323-2223 NV RLA #440
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REGISTERED LANDSCAPE ARCHITECT
MARC CHAPELLE
622
Expires: 6/30/2024
8/15/2023
STATE OF NEVADA

Landscape and Irrigation Notes

M4 NEW FERNLEY TENTATIVE MAP

Mark IV Capital

Lyon Co. Nevada

Fernley

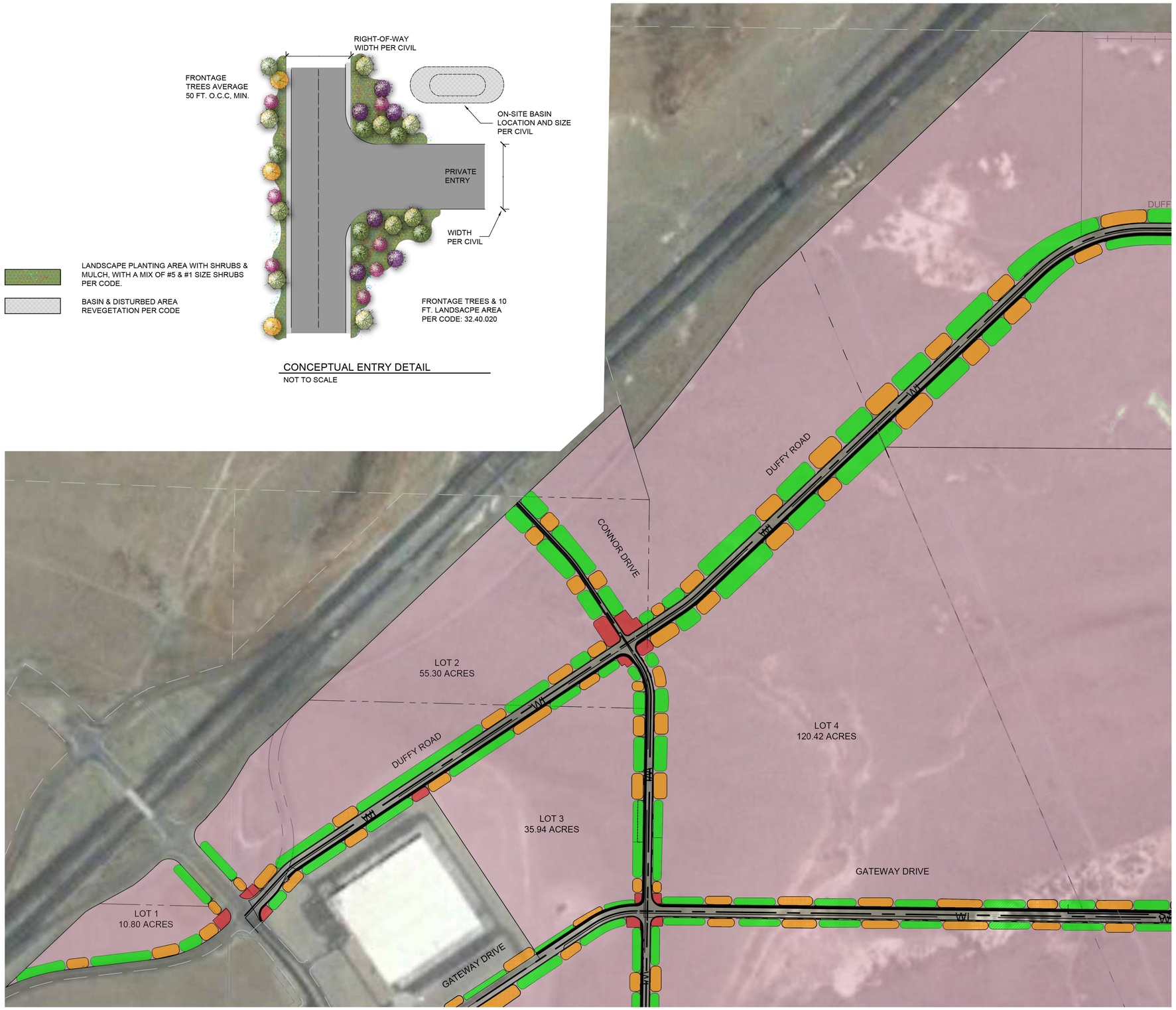
No.	Revision Date

LA No:	886-501-07-22
Designed:	APH
Drawn:	APH
Checked:	MAC
Date:	08/15/2023

Sheet L1 of 5

CONCEPTUAL ENTRY DETAIL

NOT TO SCALE



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   76,160 LF / 50 = +/- 1,523 TREES, MIN*.
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- ACTUAL TO BE DETERMINED AT FINAL MAP

LANDSCAPE NOTES:

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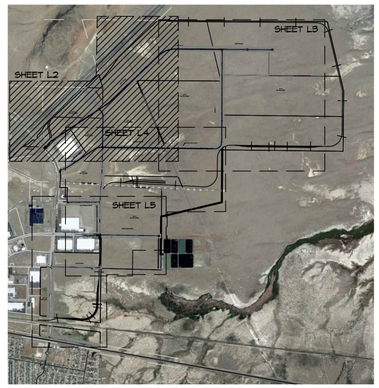
LANDSCAPE LEGEND:

ACCENT TREE - COURTYARD MIN. 24" BOX SIZE

DECIDUOUS TREES MIN. 24" BOX SIZE PER CODE

EVERGREEN TREES 5 FT. HEIGHT MIN.

ZONING - LEGS COLOR CODING FOR INDUSTRIAL, MANUFACTURING AND WASTE RELATED ACTIVITY.



0' 300' 600' 900'

Scale in Feet

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STATE OF NEVADA

Landscape Plan

M4 NEW FERNLEY TENTATIVE MAP

Mark IV Capital

Lyon Co. Nevada

Fernley

No.	Revision Date

LA No: 886-301-07-22
Designed: APH
Drawn: APH
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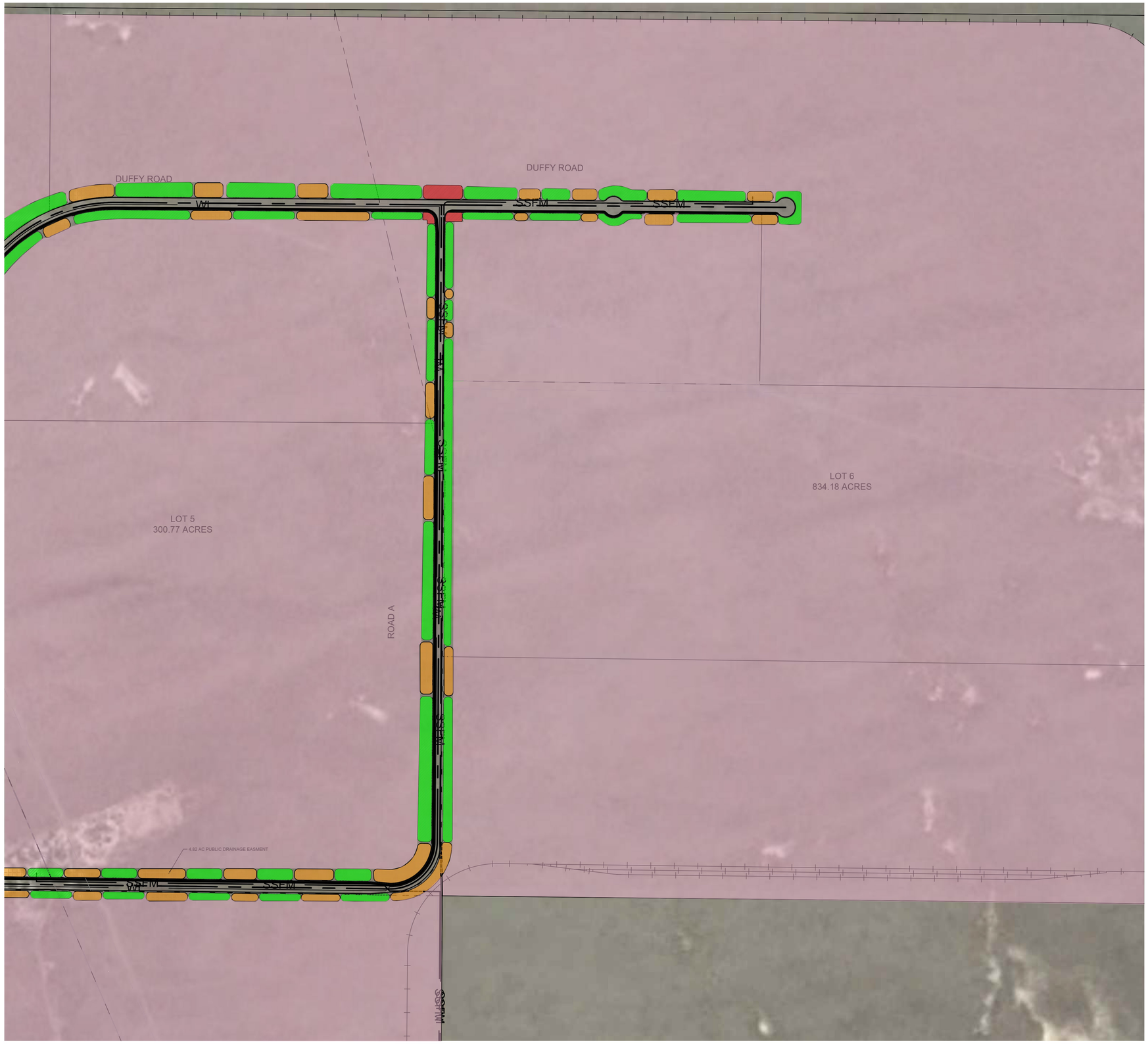
Sheet L2 of 5



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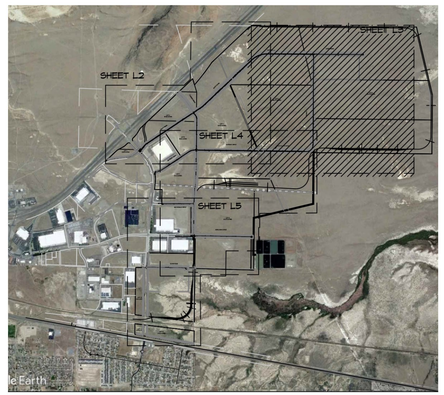

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Mark IV Capital

Lyon Co. Nevada

Fernley

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Sheet L3 of 5

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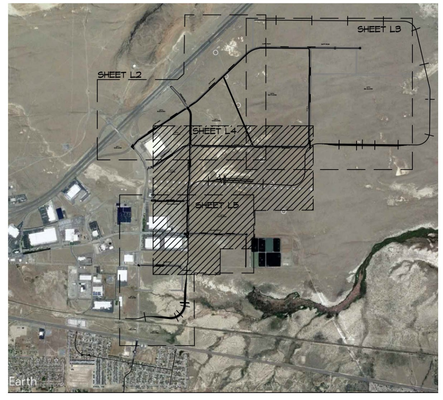
ZONING - LBCS COLOR CODING FOR INDUSTRIAL, MANUFACTURING AND WASTE RELATED ACTIVITY.

LANDSCAPE PLANTING AREA WITH SHRUBS & MULCH, WITH A MIX OF #5 & #1 SIZE SHRUBS PER CODE.

BASIN & DISTURBED AREA REVEGETATION PER CODE

CONCEPTUAL ENTRY DETAIL

NOT TO SCALE



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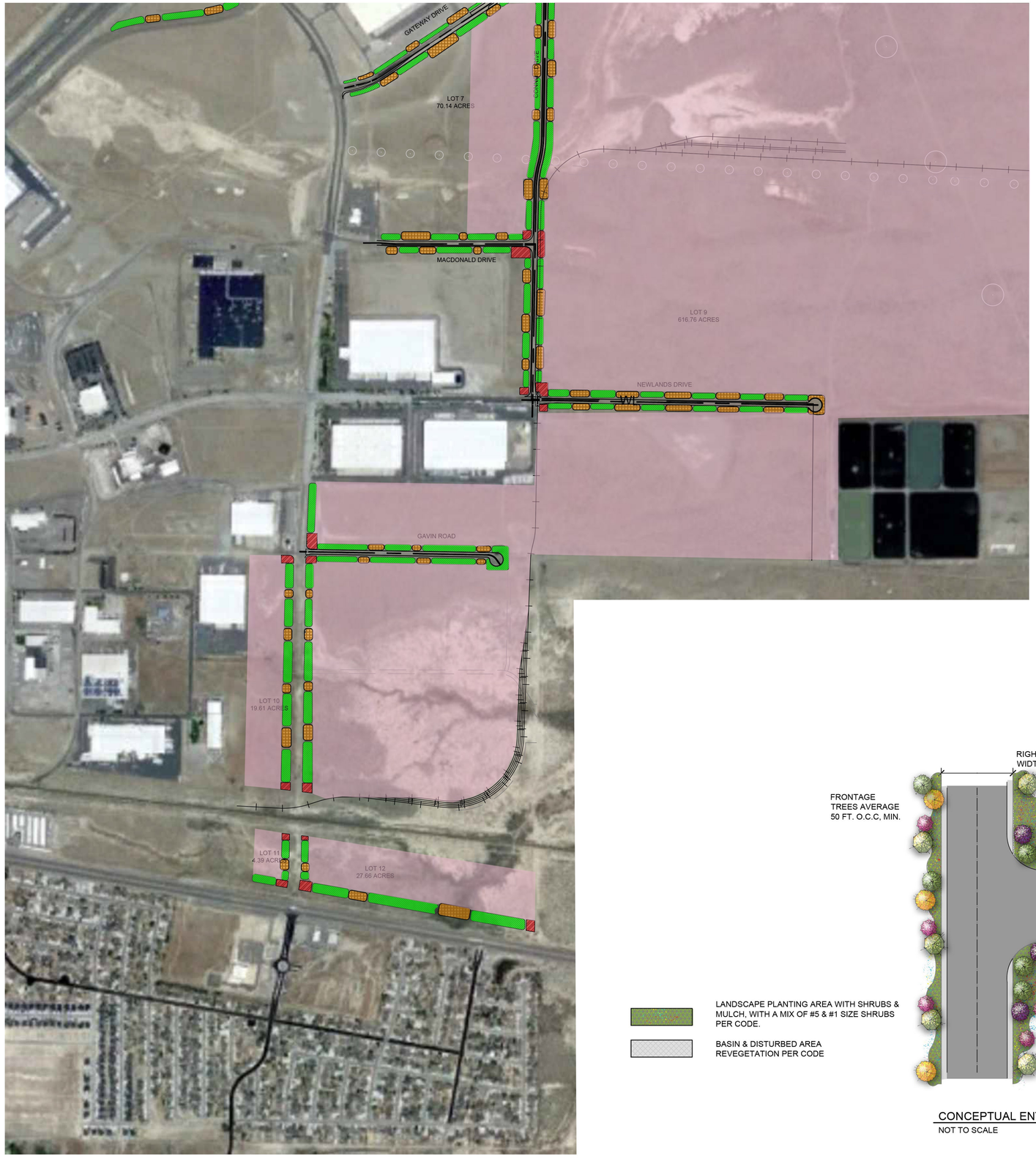

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8	2.93 ACRES	1,466
9	616.79 ACRES	3,906
10	19.61 ACRES	2,934
11	4.39 ACRES	1,280
12	27.66 ACRES	4,849
TOTAL	2,106.59 ACRES	38,118

LANDSCAPE DATA:

1. AREA: +/- 2,102.78 AC / 91,597,097 SF
2. REQUIRED LANDSCAPE AREA CALCULATION. 32.40.020(g):
   15% PARKING & CIRCULATION AREA, WHICH IS ESTIMATED AT 20% OF SITE*
   91,597,097 SF X 0.20 = +/- 18,319,419 SF (420.6 Ac)
   18,319,419 SF X 0.15 = +/- 2,747,913 SF (+/-63 Ac)
   ARTERIAL FRONTAGE TREES @ 1:50 LF =
   76,160 LF / 50 = +/- 1523 TREES, MIN*.
3. A 10-FOOT WIDE BUFFER ALONG FRONTAGE PER 32.04.020 (n) SHALL BE PROVIDED
- ACTUAL TO BE DETERMINED AT FINAL MAP

LANDSCAPE NOTES:

1. DESIGN CRITERIA IS BASED ON THE LATEST CITY OF FERNLEY TITLE 32 ZONING DEVELOPMENT CODE, 32.40.020 SITE LANDSCAPING DESIGN STANDARDS.
2. ALL LANDSCAPE SHALL BE IRRIGATED BY A COMMON METER & AUTOMATIC CONTROLLER.
3. TREES TO BE SET BACK MIN. 5' FROM UNDERGROUND UTILITIES.
4. TREES TO BE SET BACK 10' MIN. FROM OVERHEAD UTILITIES.
5. PROPERTY ZONING: (I) INDUSTRIAL, WITH LAND-USE AS VACANT INDUSTRIAL (ASSESSOR CODE 150)

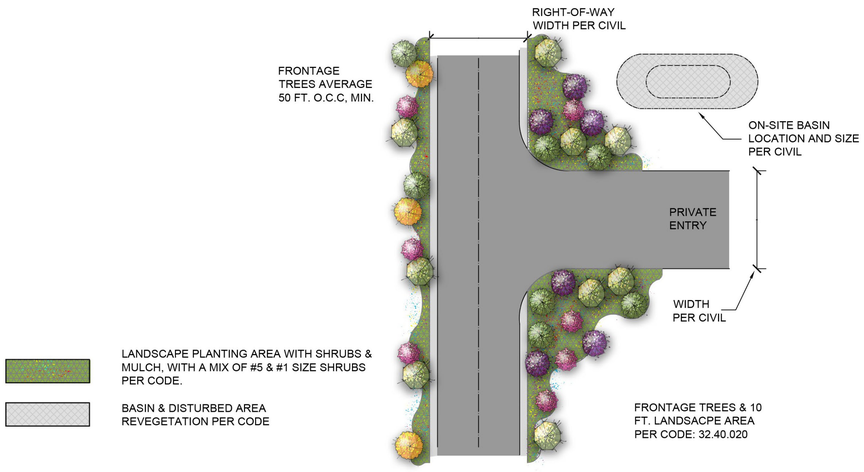
LANDSCAPE LEGEND:

ACCENT TREE - COURTYARD MIN. 24" BOX SIZE

DECIDUOUS TREES MIN. 24" BOX SIZE PER CODE

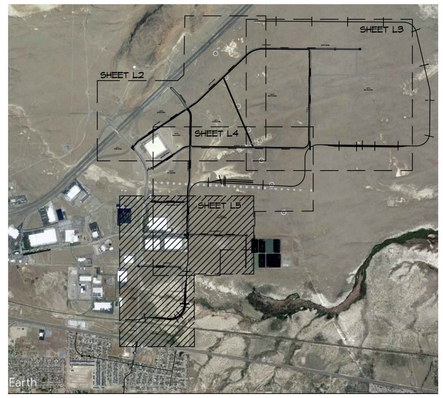
EVERGREEN TREES 5 FT. HEIGHT MIN.

ZONING - LBCS COLOR CODING FOR INDUSTRIAL, MANUFACTURING AND WASTE RELATED ACTIVITY.



CONCEPTUAL ENTRY DETAIL

NOT TO SCALE



0' 300' 600' 900'

Scale in Feet

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1552 C Street Sparks, NV 89431 (775) 323-2223 NV RLA #440
www.lastudionevada.com

REGISTERED LANDSCAPE ARCHITECT
MARC CHAPPELLE
622
Expires: 6/30/2024
8/15/2023
STATE OF NEVADA

Tentative Map
Mark IV Capital
Lyon Co. Nevada

M4 NEW FERNLEY TENTATIVE MAP

Fernley

No.	Revision Date

LA No: 886-501-07-22
Designed: AMH
Drawn: AMH
Checked: MAC
Date: 08/15/2023

Sheet L5 of 5

MARK IV CAPITAL

VICTORY LOGISTICS DISTRICT

INDUSTRIAL SUBDIVISION

Prepared by:

LUMOS & ASSOCIATES

EPS

cfa EST. 1981

HOLLAND&HART

HEADWAY TRANSPORTATION

FEBRUARY 15, 2022

RESUBMITTAL: SEPTEMBER 22, 2023

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City of Fernley Development Application
Letter of Authorization
Ownership Documentation
Tentative Subdivision Map Checklist
Non-Residential Project Data Sheet
Tax Receipts

Attachments:

Preliminary Engineering Plans and Reports (Lumos and Associates)
Preliminary Landscape Plans (LA Studio Nevada)
Preliminary Geotechnical Report (Lumos and Associates)
Preliminary Drainage Report (Lumos and Associates)
Water Report (Lumos and Associates)
Sewer Report Lumos and Associates)
Traffic Impact Analysis (Headway Transportation)
Fiscal Impact Analysis (EPS)
Preliminary Title Reports

Introduction

This application includes the following requests:

- **A tentative map for an Industrial Subdivision Map** covering 2,173.64± acres.

Project Location

Victory consists of 2,173.64± acres of the total 4,300 acres that make up Mark IV Capital's project known as Victory Logistics District. The Victory holdings are generally located south of Interstate 80, east of Nevada Pacific Pkwy, and north of US Highway 50. Approximately 10.9± acres of these land holdings are located on the south side of the 80 Fwy on the west side of Nevada Pacific Pkwy at the north/east bound exit. Figure 1 (below) depicts the project location.

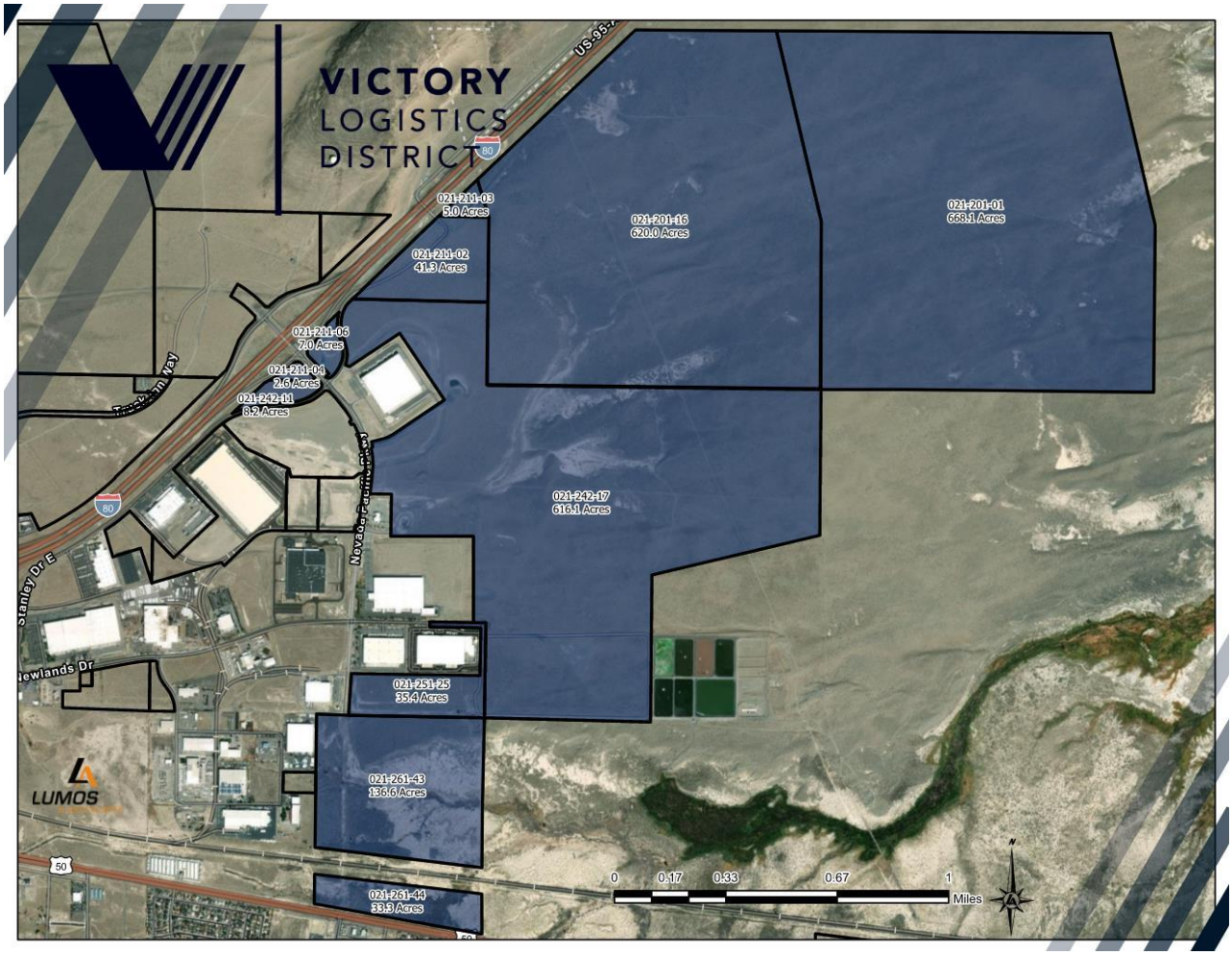


Figure 1 – Vicinity Map

The subject site consists of 11 parcels totaling 2,173.46± acres. Table 1 (below) provides a summary of the parcels included with the Industrial Subdivision request.

Table 1 – Victory Logistics District Parcels

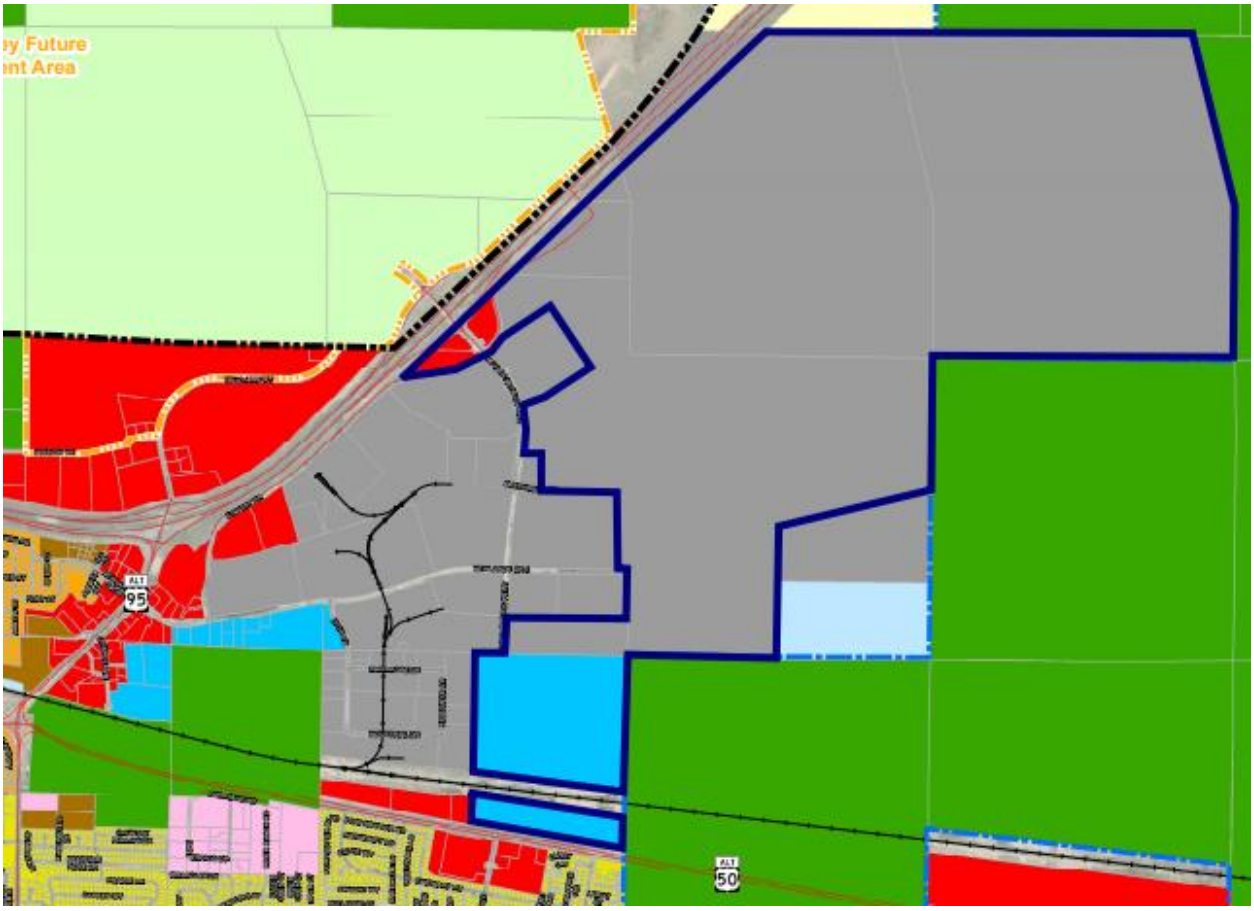
Assessor's Parcel Number (APN)	Area
021-201-01	668.12± acres
021-201-16	620± acres
021-211-02	41.27± acres
021-211-03	5.0± acres
021-211-04	2.57± acres
021-211-06	7.03± acres
021-242-11	8.19± acres
021-242-17	616.12± acres
021-251-25	35.41± acres
021-261-43	136.64± acres
021-261-44	33.29± acres
TOTAL	**2,173.64± acres**

Existing Conditions

The property included within Victory is currently vacant. The entire 2,173.64 acres of the project site is within the City of Fernley. Most of the site is designated as Industrial in the Fernley Comprehensive Master Plan, except for some Commercial at the north end of the site, near the Nevada Pacific Parkway interchange with I-80 and Mixed Employment at the southern end of the site, closer to US Hwy 50.

Zoning patterns generally mimic that of the Master Plan with primarily Industrial zoning. There is General Commercial zoning located at the Nevada Pacific Parkway/Interstate 80 interchange, north of Duffy Road.

Figures 2 and 3 (following pages) depict the existing Master Plan and zoning designations for Victory. Additionally, Table 2 (page 5) provides an overall breakdown of existing land use for each parcel included within the project.



Project boundary is outlined in blue.

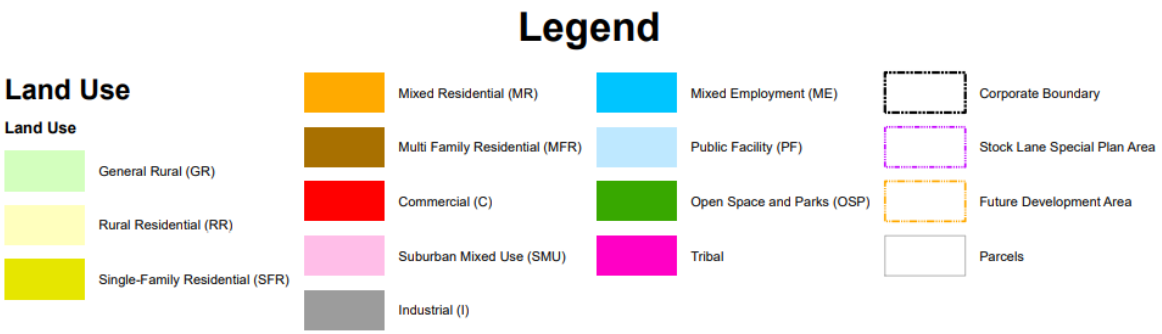
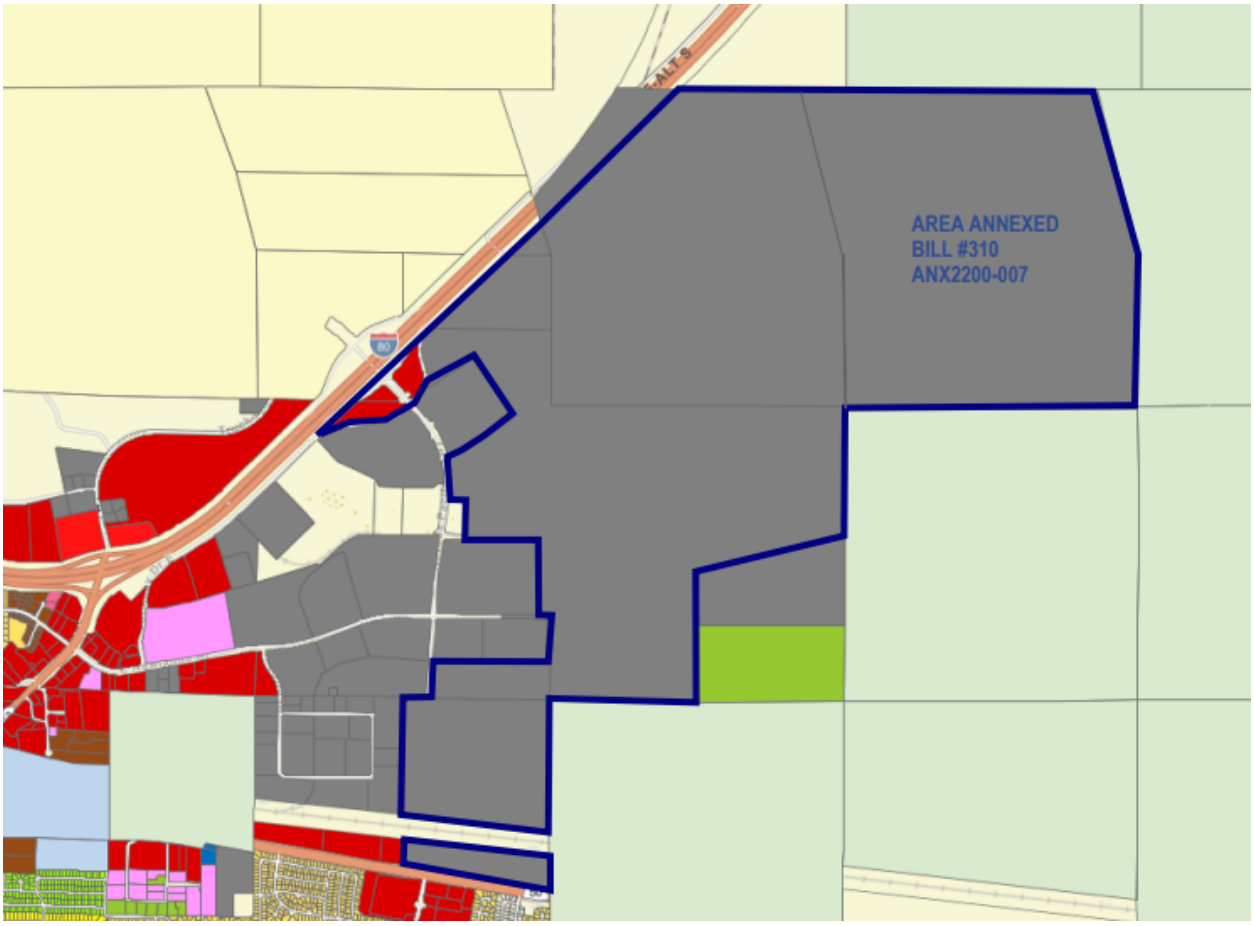


Figure 2 – Comprehensive Master Plan Land Use



Project boundary is outlined in blue.

Figure 3 - Zoning

Table 2 –Land Use Summary

Assessor's Parcel Number (APN)	Area	Master Plan Designation	Zoning
021-201-01	668.12± acres	Industrial	I
021-201-16	620± acres	Industrial	I
021-211-02	41.27± acres	Commercial[2]	I
021-211-03	5± acres	Industrial	I
021-211-04	2.57± acres	Commercial	C2
021-211-06	7.03± acres	Commercial	C2
021-242-11	8.19± acres	Commercial	C2
021-242-17	616.12± acres	Industrial	I
021-251-25	35.41± acres	Industrial	I
021-261-43	136.64± acres	Mixed Employment	I
021-261-44	33.29± acres	Mixed Employment	I
TOTAL	**2,173.64± acres**		

1 – Translates to Industrial upon annexation

2 – Proposed Industrial (future application)

As noted, Victory is currently vacant land and is accessed via Nevada Pacific Parkway, East Newlands Drive, Duffy Road, and US Highway 50. Adjoining parcels are generally developed with industrial use types including warehousing and distribution, manufacturing, etc. Additionally, Southwest Gas operates a facility adjacent to the central portion of the project area. A Union Pacific rail line is located at the southern end of the site and rail infrastructure will be incorporated into the project (as described later in this narrative).

Figures 4 through 6 (following pages) depict the existing onsite conditions.

Figure 4 – Existing Conditions

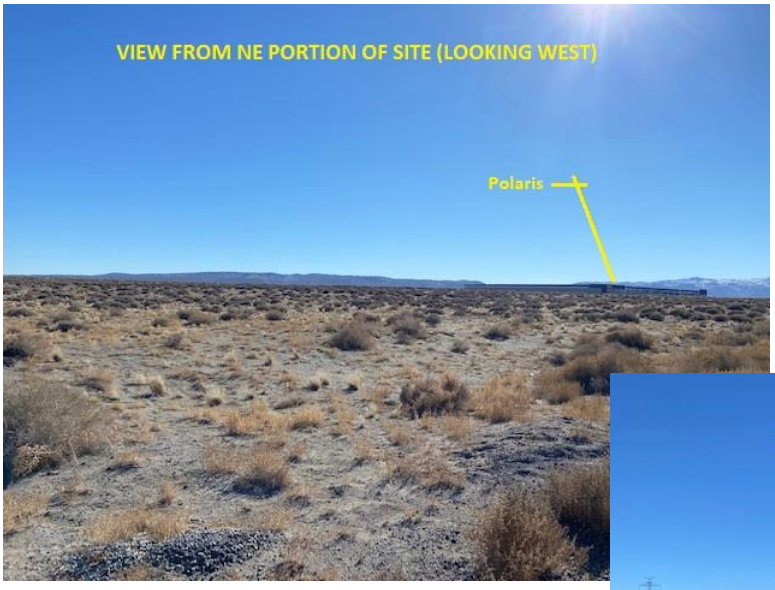


Figure 5 – Existing Conditions

Figure 6 – Existing Conditions

Request Description

The request of this application is described below:

- **A Tentative Map for an Industrial Subdivision**

The request for a Tentative Subdivision Map has been made to allow for the creation of an Industrial Subdivision that will include all the parcels previously identified and totaling 2,173.64+/- Acres. A Development Agreement has been prepared by Holland and Hart and is currently being reviewed and edited between the applicant's attorney and City of Fernley legal staff. Additionally, a Planned Unit Development (PUD) Handbook has been submitted and is in final edits and discussion with the applicant and city staff. These two document applications are running concurrently through City of Fernley review. These accompanying documents, along with applicable sections of the Fernley Municipal Code, NRS and CC&R's to be developed for the project, will guide development of Victory over the next 20+ years.

Unlike a traditional tentative map, the Industrial Subdivision requested with this application is not creating any new parcels at this time. Instead, parcels will be created as new user sites' building specifications and property size demands are identified and established. Individual or groupings of parcels for the project will be final mapped through a Record of Survey (as allowed under NRS 278.235) or other acceptable and advantageous formal mapping process allowed per NRS. The future final mapping must comply with the provisions, requirements, and processing procedures of the defined NRS and to be adopted in the Development Agreement and PUD Handbook.

The Development Agreement approach is advantageous to both the master developer (Mark IV Capital Properties, Inc.) and the City of Fernley. From the developer's perspective, increased flexibility in lotting and parcel configuration affords the ability to quickly adapt to new tenant needs and demands. Additionally, provisions of the Development Agreement and PUD Handbook will help to streamline the development review process to provide quicker parcel creation by the elimination or minimization of further discretionary, as prudent.

From the City's perspective, a Development Agreement and PUD Handbook are beneficial because they identify and define the anticipated level of improvements to be made by the developer for all phases of the project. This includes improvements such as roadway/traffic enhancements, sewer and storm drain systems, etc. The Development Agreement and PUD Handbook define critical project issues such as phasing, backbone infrastructure, financing of improvements, required development standards, etc.

The Development Agreement and PUD Handbook memorialize allowed uses, densities/intensities, public dedications to be made by the master developer. Covenants, conditions, and restrictions (CC&R's) will also be in place to guide the established rules set forth in the Development Agreement and PUD document.

The project Development Agreement and PUD Handbook include a variety of development topics, maps and exhibits that define the long-term development plan. This includes a notice of completion map with

projected timing, identification of development zones, sewer phasing, water phasing, storm drain/stormwater improvement phasing, and backbone roadway infrastructure phasing. The exhibits covering phasing of infrastructure are included as attachments to this application.

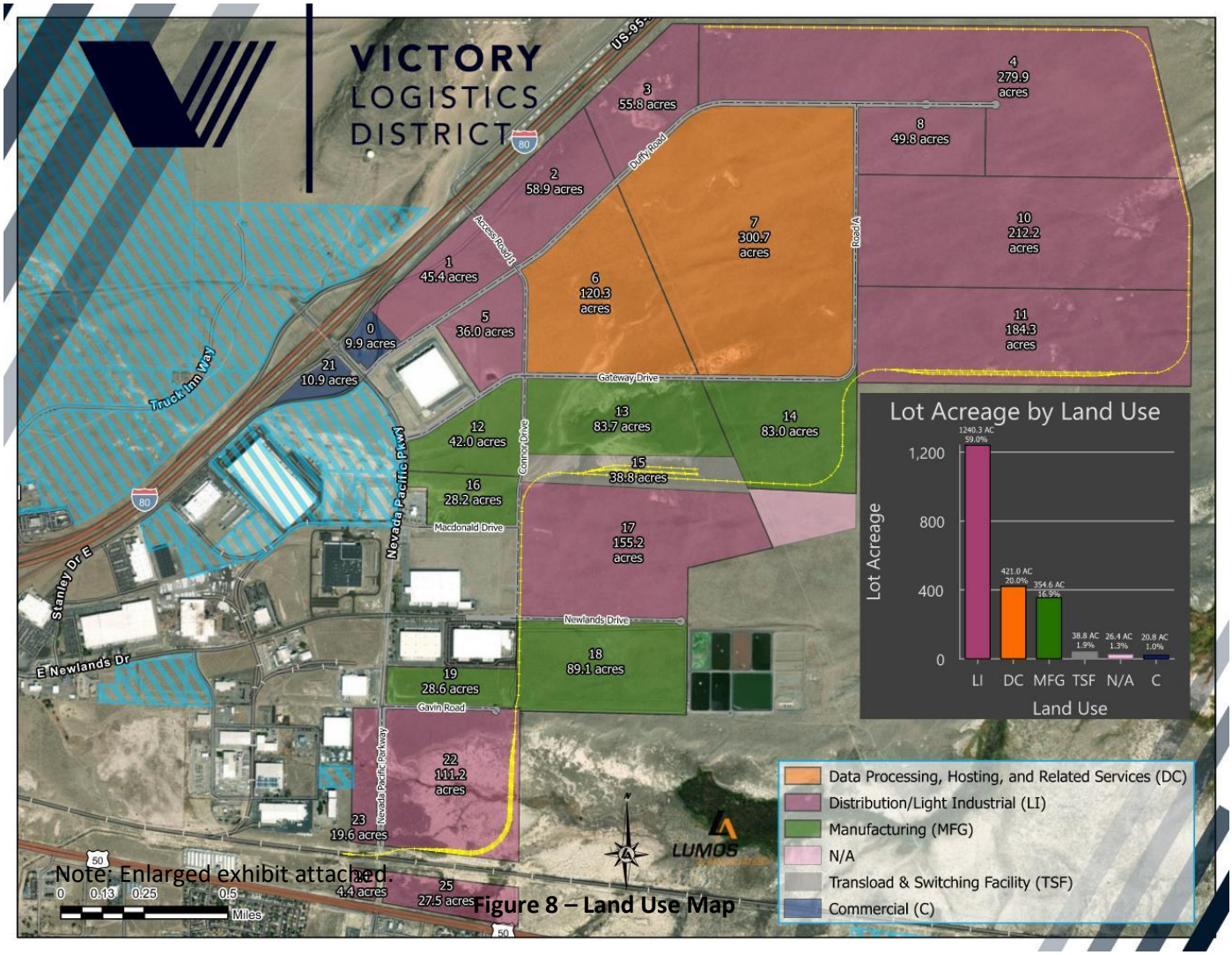
In summary, the Development Agreement and PUD document will guide the future growth, development, and uses within Victory. While the agreement and handbook will help to streamline future permitting and parceling within the project, it does not circumvent the requirements of the Fernley Municipal Code in terms of required improvements, etc. In fact, it more clearly defines the roles and responsibilities of both the developer and the City of Fernley based on detailed engineering, planning, and economic analysis.

Project Summary

As noted, the Tentative Map request included with this application is somewhat unique in that no new parcels are being proposed at this time. The preliminary mapping provided with this application anticipates that 31 future parcels may be necessary and would comprise the future buildout of the project, but the final and ultimate number of parcels is still to be determined. The use of the industrial subdivision process will provide certain flexibilities to the timing, location, size and shape of the future parcels within the development to meet market demands and provide for appropriate timing and phasing of roadways and infrastructure to meet the actual future demands. Future subdivisions and division of property within Victory will occur based on the provisions and requirements of the Development Agreement and PUD Handbook. The Tentative Map process is simply the regulatory mechanism needed for the establishment of the Development Agreement, PUD Handbook, and Industrial Subdivision.

The project tentative mapping provided with this application identifies the existing parcels, preliminary (envisioned) site plans, street sections, preliminary grading, preliminary utilities, preliminary proposed hydrologic conditions, and preliminary landscape plans.

With the Industrial Subdivision, a total of 5 predominant land uses types have been defined within Victory. The PUD Handbook defines all the various land uses that will be allowed within the project Industrial (V-I) land use and Commercial (V-C) land use but the 5 noted and specifically anticipated uses identified in Figure 8, below are expected to make up the lion's share of the project. It should be noted that use types may deviate from this anticipated arrangement as this anticipated land use arrangement was established to help estimate the various phased improvements that are foreseen as necessary to serve the project (as described in the following sections).



Note: Enlarged exhibit attached.

Figure 8 – Land Use Map

Figure 7 – Anticipated Land Use Exhibit

- **Phasing**

While the size and tenant interest in Victory makes it difficult to predict the future phasing of the project, the Phasing Map is the current road map to the buildout of the project and is memorialized within the PUD Handbook. Full buildout is expected to occur in the next 20± years, with infrastructure and improvements to be phased as necessary to support tenant demand/buildout. The intent of the Development Agreement for the subdivision will be to define infrastructure triggers that will adequately serve each tenant upon buildout. Figure 9 (below) depicts the Notice of Completion Map included within the Development Agreement. The map visually depicts the projected phasing of the overall project, but actual phasing will be based on future land use demands and market conditions.

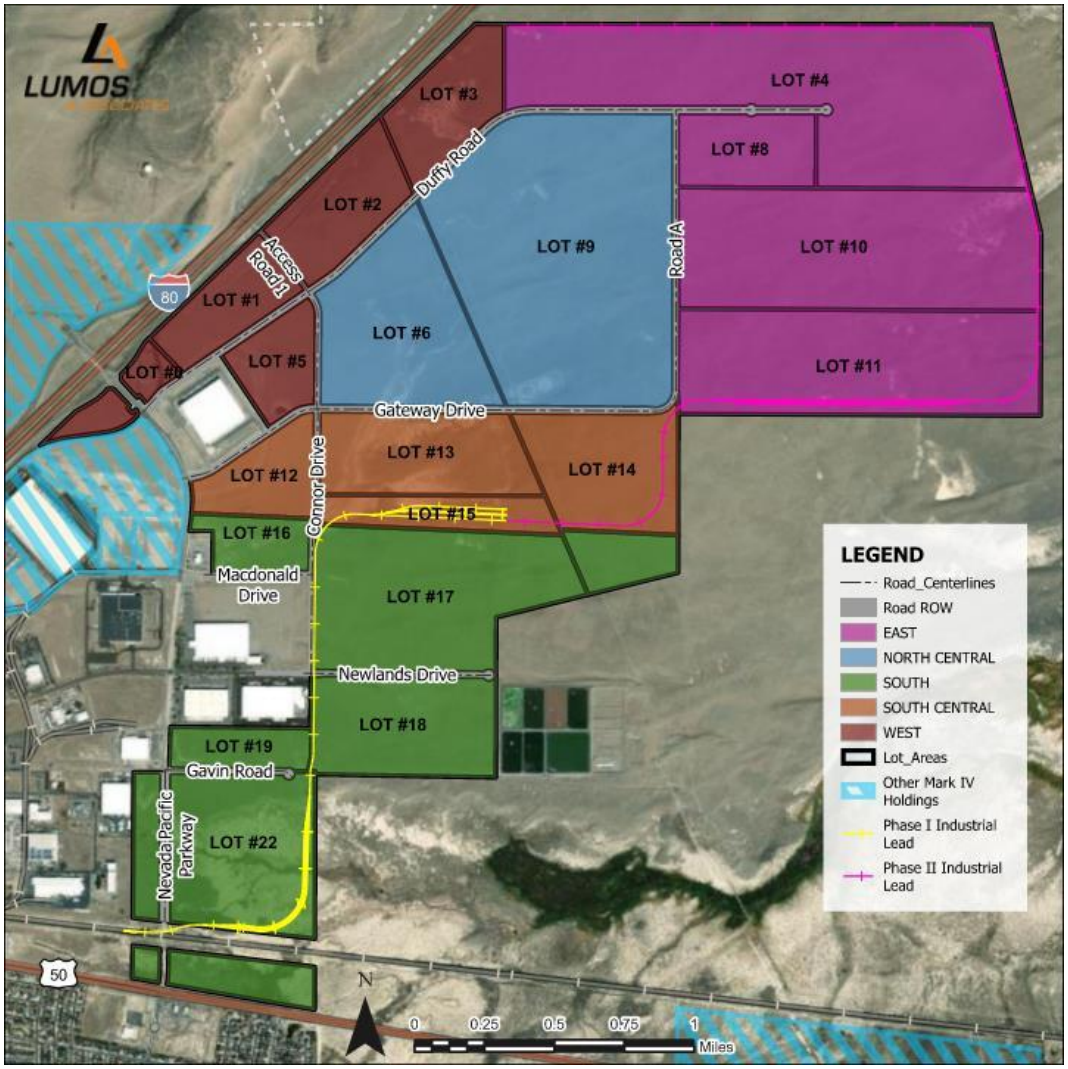


Figure 8 – Notice of Completion Map

- **Utilities**

Major utility infrastructure is anticipated with the development of Victory. A series of conditions have been set in place that trigger different phases of infrastructure for the sanitary sewer, domestic water, and storm drain infrastructure. As addressed in the PUD Handbook, utilities will be sized and installed as buildout occurs to serve final full buildout conditions. The Preliminary Sanitary Sewer Report, Preliminary Water Report, and Preliminary Hydrology Report (all provided with this application) go into more expansive detail about the phased build-out conditions for each utility. Dry utilities will be planned and phased as necessary as the various lots are developed.

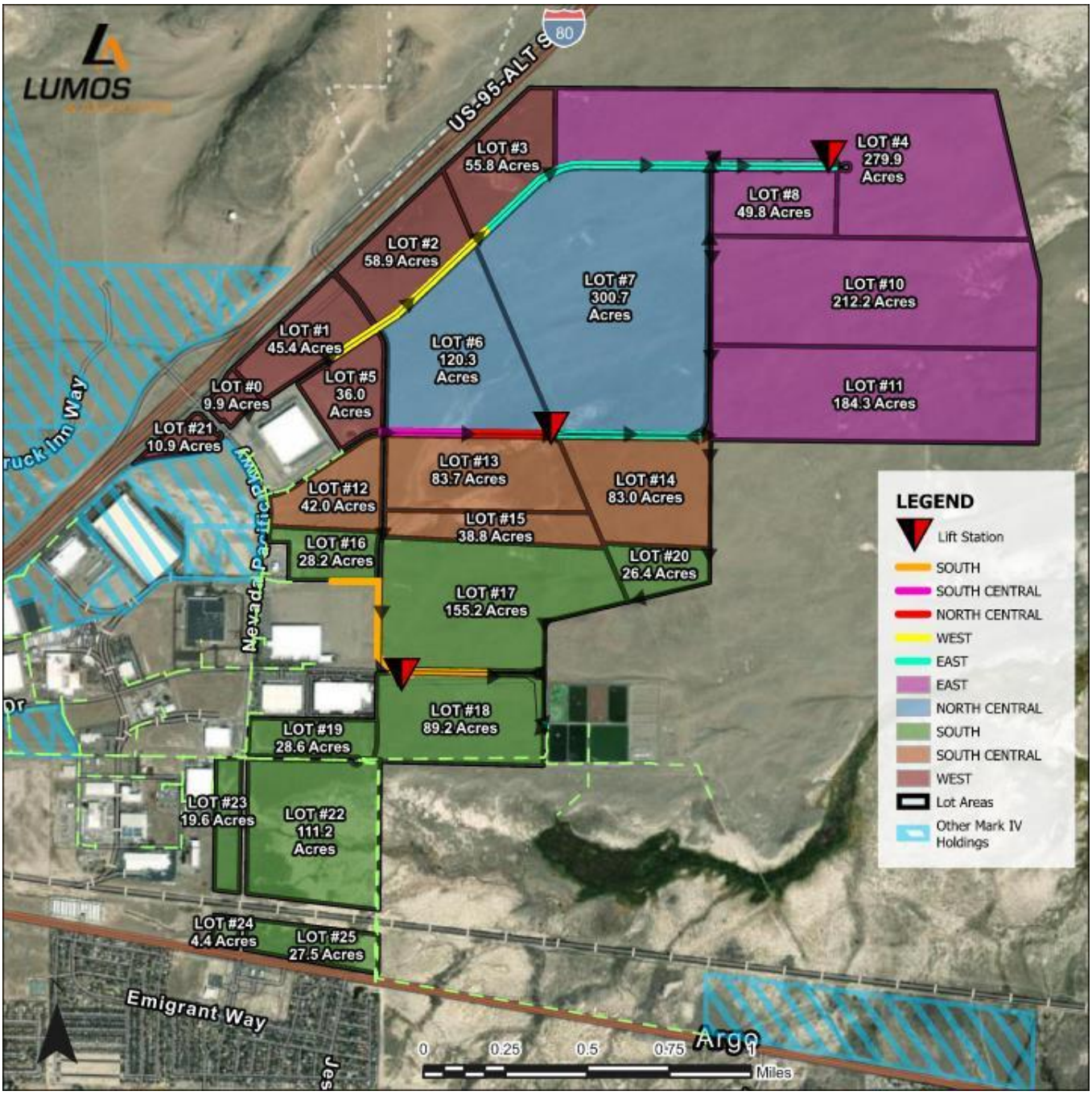
Figures 9 through 11 (following pages) provide a visual depiction of the utility phasing within Victory.

- **Drainage/Flood Zone**

The majority of the Industrial Subdivision is located within the FEMA designated Un-Shaded X Flood Hazard Zone. The southernmost 170 acres of Victory are bisected by a stretch of land which constitutes a Zone A Flood Hazard Zone. A conditional letter of map revision (CLOMR) has been approved by FEMA as Case #21-09-1471R. After undertaking the mitigation measures prescribed by the approved CLOMR, this portion of the Victory will be removed from the flood zone.

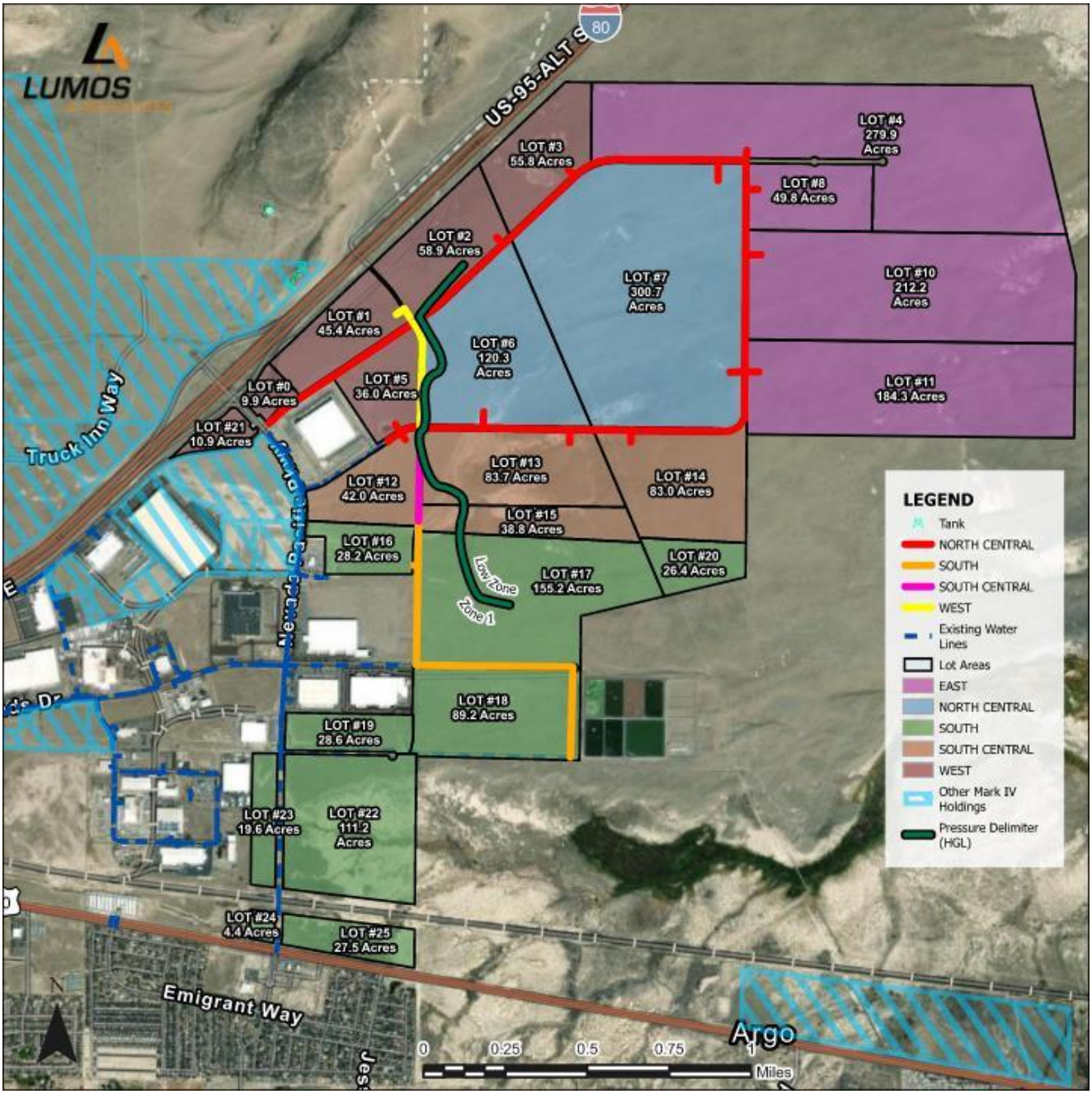
The Industrial Subdivision has been designed with local and major storm drain infrastructure. The local infrastructure is designed to capture runoff in the streets and portions of the lots to prevent localized road flooding. The major infrastructure is designed to mitigate regional flooding and convey offsite flows. Proposed drainage has been directed to one of four regional detention/retention facilities. Each facility has been designed to detain or retain the increase in runoff for the 25-Year 24-Hour storm event. Basin G, has been designed to retain the entire 100-Year 24-Hour storm event. All development will have the option of detaining/retaining onsite or contributing to the regional facilities.

A preliminary drainage study/report, complete with through stormwater analysis (prepared by Lumos and Associates) is included as an attachment to this report.



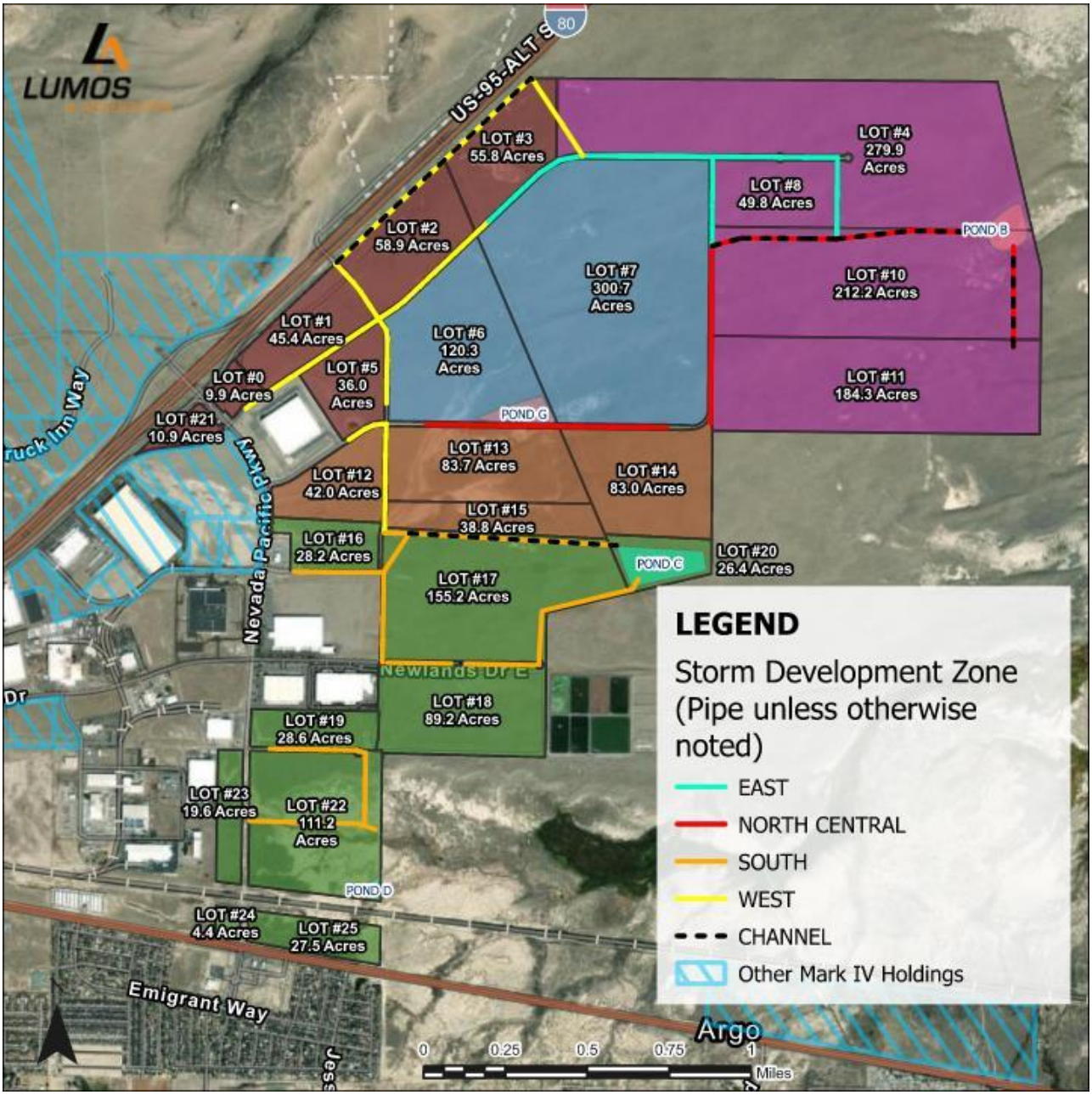
Note: Enlarged exhibit attached.

Figure 9 – Sewer Phasing



Note: Enlarged exhibit attached.

Figure 10 – Water Phasing



Note: Enlarged exhibit attached.

Figure 11 – Storm Phasing

- **Traffic**

Victory is proposing three new right-of-way (ROW) sections; a 62-foot ROW (local street/access road), a 62-foot ROW (collector), and an 84-foot ROW (minor arterial). Nevada Pacific Parkway will be a major arterial ROW and is already partially defined with existing development accessing and fronting this roadway. This major arterial will possess a 110-foot ROW. Each ROW section will have sufficient travel lanes for the anticipated traffic, including a middle turning lane to provide turning movements into tenant facilities. Direct access to Interstate 80 is provided via Nevada Pacific Parkway. As tenants build out the site, phasing of roadways will occur to allow for site accessibility and fire access.

Headway Transportation has completed a highly detailed traffic impact analysis that analyzes the cumulative impacts that Victory will have on the local and regional roadway network. At full buildout, Victory is anticipated to generate 46,347 average daily trips (ADT) with 3,654 am peak and 4,152 pm peak hour trips. While trip generation is significant, the Headway Transportation report (attached) defines improvements that must occur to maintain acceptable levels of service (LOS) on area roadways.

The attached traffic impact report summarizes the anticipated transportation improvements in a table format along with the traffic thresholds that will trigger the various upgrades, etc. These identified improvements and triggers are memorialized in the PUD Handbook, providing the City of Fernley with assurances as to how and when transportation improvements will occur during buildout of the Industrial Subdivision.

- **Rail**

Mark IV, the master developer, is proposing an industrial lead track within the park that will connect to the Union Pacific Railroad (UP) main line. This rail infrastructure, as shown in the attached site plan, will switch off the existing UP mainline on the south end of the project within the UP Right-of-Way. It will then continue northeast and parallel the UP track until it turns north along the eastern border with the Bureau of Reclamation (BOR) land and continue between the City's existing sewer lift station and the current location of Well 9. Plans to relocate Well 9 to a location 300 feet to the northeast are underway, and Mark IV has already completed the required test well in its efforts to relocate Well 9. The industrial lead track will then follow along the east side of the planned course of Connor Drive until it turns and follows along the north side of the Cyrq Energy 75-foot-wide transmission power easement to a switching and possible future transload facility location. Future phases of the industrial lead track will continue the lead to Victory's eastern border, where it is planned to turn north again and follow the eastern border of Victory along BOR land.

Proposed rail standards are included in the Tentative Map plans and the PUD Handbook that include typical design standards for the industrial lead, as well as depths of utilities and necessary cover for any crossings per UP guidelines. Mark IV will utilize UP railroad standards for the rail infrastructure being planned for Victory.

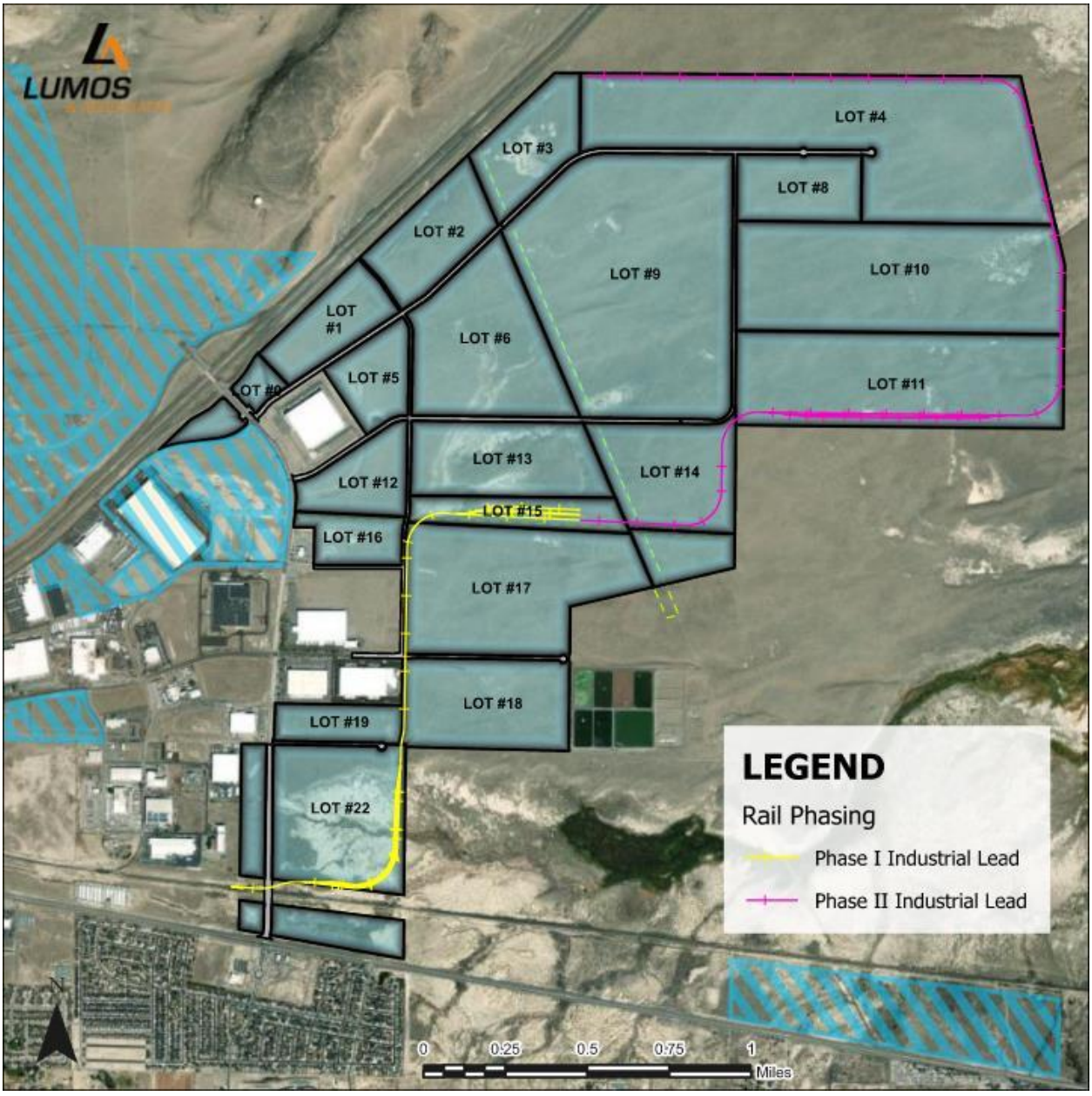


Figure 12 – Industrial Rail Lead Phasing

Fernley Comprehensive Master Plan

The City of Fernley Comprehensive Master Plan includes numerous goals and policies related to land use, transportation, infrastructure, and services, etc. Victory's master plan will be undertaken in a manner that is guided by and as consistent as possible in achieving the City's strategic plan and overall goals so as to best deliver the City's long-term vision for well managed growth over the next 20 years of build out within Victory.

Victory is consistent with or supports the following Master Plan policies. As the project develops, even more policies will be implemented with site-specific projects/uses.

LU.1.1 Encourage and plan for new development in areas where adequate public services and facilities can be provided efficiently.

LU.1.1.1 Require new development to provide its proportionate share of improvements to avoid a degradation of services for existing residents. This requirement will be applied regardless of project size in order to avoid incremental erosion of services and facilities.

LU.1.1.2 Encourage development of vacant or underutilized lands within the community core where adequate infrastructure and facilities currently exists.

LU.1.1.3 Require new development to provide certified, stamped studies demonstrating the impact proposed development will have on existing infrastructure and to provide improvements and/or funding in lieu of improvements in proportion to the impacts of the proposed projects on the city's roadway, sewer and water systems.

LU.1.2 Encourage new development to be in accordance with the Comprehensive Master Plan land use category, and other land use controls to accomplish community principles.

LU.1.2.1 Consistently monitor development applications that intend to utilize the underlying zoning. Modify the Fernley Development Code as necessary to ensure compatible development that reflects the community goals envisioned in the Comprehensive Master Plan.

LU.1.3 Provide a balanced distribution of employment and population.

LU.1.3.1 Encourage land uses and development, which maintains a balance of population, housing, and employment.

LU.1.4 Ensure existing and future land uses are compatible.

LU.1.4.2 Projects shall be evaluated with the intent to promote land use compatibility; community design measures can increase compatibility among adjoining land uses.

LU.1.4.4 Prohibit piecemeal parcelization through the parcel maps to subvert the subdivision map process.

LU.1.4.6 Review all projects in relation to their geographic location, impacts to adjacent communities, fiscal impact, and mitigation measures to protect natural and cultural resources. Apply specific conditions of approval tailored for each development proposal.

LU.1.4.7 Protect viable industrial areas from encroachment by potentially incompatible land uses or conversion to alternate uses.

LU.1.6 Create a growth pattern that assures flexible, feasible and efficient projects.

LU.1.6.1 Support for developmental approval of projects that provide an appropriate balance of population.

LU.1.6.2 The land use designations include minimum service standards that shall apply to proposed developments and land use changes.

LU.1.12 It is the intent of the City of Fernley to provide timely, orderly, and efficient arrangement of adequate public facilities and infrastructure that support existing and planned land use patterns and densities.

LU.1.12.1 Subdivision or intensification of land without adequate public facilities available to serve the new development as it occurs shall not be allowed.

LU.1.12.2 Any land use entitlement applications for subdivision or intensification of land shall also be required to submit a fiscal impact analysis to the approval of the City Manager or their designee.

LU.1.12.4 The City, landowner(s), and/or future developer(s) shall develop Area Plans for the Future Development Areas to efficiently plan for adequate public facilities and infrastructure to support future development of these areas.

T.1.1 Require that roadway facilities be maintained and constructed as needed to ensure high quality and safe travel on major streets and at major intersections.

T.1.1.1 The minimum Level of Service on all city-maintained roadways shall be LOS D. The city will work with representatives from NDOT to ensure timely improvements are planned when NDOT roadways are forecast to fall below LOS D.

T1.1.4 Develop regulations regarding setbacks, signage and right-of-way dedication, and other considerations which preserve and increase roadway capacity and safety.

T.1.1.5 Ensure development of the roadways planned in the Streets and Highways Plan of the Comprehensive Master Plan occurs in a timely manner and with the financial assistance from the

development community.

T.1.1.6 Require all new development to be consistent with the access right-of-way dedication and improvement standards as specified in the Public Works Design Manual and pursuant to the functional classification as defined in this chapter.

T.1.3 Implement Street design and access standards to provide for safe and efficient movement of goods and people.

T.1.3.4 Require proposed new development that intends to connect with an NDOT roadway to incorporate the NDOT Access Management System and Standards into the project design. These standards regulate access onto the roadway network in order to protect health, safety and welfare of the public, maintain the rights-of-way, and to preserve the functional classification level of the roadway network while meeting the needs of the motoring public. The access management standards address the location, spacing and frequency of access points on the roadway network.

T.1.4 Plan for a transportation system that combines a mix of transportation modes and system management techniques while minimizing the impacts upon the environment or upon adjacent development.

T.1.4.5 Work with Southern Pacific Railroad to plan new safe and effective lines and spurs through the city.

T.1.5 The City of Fernley will work with the Nevada Department of Transportation to obtain right-of-way along US 50, US 95A and I-80 for purposes of implementing a frontage road system to minimize direct access onto these state-owned roadways.

PSF.1.1 To provide and maintain a reliable and adequate water supply and delivery system.

PSF.1.1.3 Final maps and building permits will be approved only when adequate water rights have been dedicated to the City of Fernley and applicable service and connections fees have been paid.

PSF.1.2 To the maximum extent possible, the costs of improvement, extension and construction of public facilities should be borne by those whose land development and redevelopment actions made such improvement, extension and construction necessary. A procedure is to be established that defines the responsibility for improvements of individual projects.

PSF.2.1 Insure an efficient, adequate and self-supporting wastewater collection treatment and disposal system that will meet the needs of the public and comply with federal, state and local clean water requirements.

PSF.2.1.2 Final maps and building permits will be approved only when adequate sewer capacity is secured and applicable service and connections fees have been paid.

PSF.2.1.3 Sewer costs directly attributable to new development shall be paid for by the new development. The cost of providing service shall include the cost of extending service lines or other necessary facilities to the individual project site.

PSF.3.1 Develop a regional stormwater drainage system.

PSF.3.2 Ensure major utility lines, such as electric transmission or high pressure gas, are compatible with existing and future development.

PSF.3.2.1 Require that any new major utility lines be placed within existing transmission line corridors or in new corridors defined through a public planning process.

PSF.3.3 Ensure appropriate levels of public services and facilities are continually provided.

PSF.3.3.1 Coordinate the provision of public services with growth and development in Fernley.

PSF.3.3.2 Consider the financial impacts in all growth management decisions.

PSF.3.11 Require large-scale developments to be within adequate fire service areas.

PSF.3.11.2 All development in the City (except for residential densities less than one residence per acre) shall be within a 4-7-minute response time of an existing or planned fire station.

PSF.3.11.3 New Development shall identify and fund facilities and infrastructure necessary to provide adequate fire protection.

PSF.3.11.5 Require water distribution systems to meet the Lyon County Fire District standards for all future development.

Request Findings

The City of Fernley Municipal Code includes findings that must be made by the Planning Commission and/or City Council to approve Tentative Map request. These findings are listed below and addressed in **bold face** type.

- **Tentative Subdivision Map**

Recommendations and decisions on tentative maps shall be based on consideration of all of the following criteria:

1. Compliance with environmental and health laws and regulations concerning water and air pollution, solid waste disposal, water supply facilities, community or public sewage disposal, and, where applicable, individual systems for sewage disposal;

As detailed throughout the reports and plans submitted with this application, Victory complies with all applicable regulations related to health laws, water supply, sewerage, etc. Furthermore, the proposed Development Agreement provides a mechanism to ensure that compliance is maintained, and new facilities are brought online (as needed) throughout the course of development of the project.

2. Availability of water that meets applicable health standards and is sufficient for the reasonably foreseeable needs of the subdivision;

As detailed in the attached engineering reports, plans, and Development Agreement, a comprehensive plan for water service, including phased improvements is included with Victory.

3. Availability and accessibility of utilities;

Comprehensive plans for infrastructure and utilities are included with the attached plans and reports. Additionally, the proposed Development Agreement establishes a mechanism to ensure that adequate facilities are provided throughout buildout of the project.

4. Availability and accessibility of public services such as schools, police and fire protection, transportation, recreation facilities, and parks;

The project is in an area where City services such as police and fire are already occurring. Transportation improvements will occur as the project develops and are called out in the attached traffic report. The Development Agreement provides the long-term assurances as to how these improvements will be implemented and paid for.

5. Consistency with the zoning district regulations;

The project is in direct compliance with the underlying I, ME and GC zoning.

6. Conformity with the master streets and highways plan;

The proposed uses and intensities are consistent with the master streets and highways plan. The Headway Transportation study identifies improvements that will be required as the project develops over time. Triggers for these improvements and funding mechanisms will be memorialized in the Development Agreement.

7. Effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision;

The Headway Transportation study (attached) identifies upgrades and improvements to the transportation network that will be required to maintain acceptable levels of service as the project builds-out. The Development Agreement provides the City of Fernley that these improvements will occur, as necessary, at the appropriate times, ensuring full compliance with City policies.

8. Physical land characteristics, such as floodplain, slope, soil, and elevation differentials with abutting properties;

The proposed land use is appropriate given the physical characteristics of the site. As noted, a CLOMR has been submitted to FEMA for review and approval. This will allow for that small stretch of land within Victory that is within a flood zone to be removed based on the planned infrastructure and drainage improvements.

9. Recommendations and comments of review bodies;

Recommendations and comments from reviewing agencies, boards, and citizens can be incorporated into conditions placed on this Tentative Map request and implemented with future development.

10. Conformity to the master sewer and water utility plan; and

With the improvements proposed and detailed in the attached engineering studies, Victory will comply with the master sewer and water utility plans. This is further reassured with the adoption of the Development Agreement.

11. Compliance with this Code and all other applicable regulations.

As presented and memorialized in the associated Development Agreement and PUD Handbook, Victory will comply with the standards and requirements set forth in those two documents as well as all applicable City codes and regulations.

APPENDICES

Planning Department
595 Silver Lace Blvd, Fernley, NV 89408
Development Application

APPLICATIONS, PLANS, AND/OR SUPPORTING DOCUMENTATION THAT ARE INCOMPLETE OR ILLEGIBLE WILL NOT BE ACCEPTED.
Please complete all sections that apply to you and/or your project. Various applications are only accepted on the application deadline dates. Please call before you submit to verify that someone will be available to assist you at (775) 784-9810.

☐ ADMINISTRATIVE REVIEW ..... (AR)	☐ APPEAL ..... (APP)
☐ ANNEXATION ..... (ANX)	☐ PLANNED DEVELOPMENT ..... (PD)
☐ CONDITIONAL USE PERMIT ..... (CUP)	☐ DEVELOPMENT AGREEMENT ..... (DA)
☐ MAJOR DEVIATION ..... (MJD)	☐ TEMPORARY USE PERMIT ..... (TUP)
☐ MASTER PLAN AMENDMENT ..... (MPA)	☐ VARIANCE ..... (VAR)
☐ MINOR DEVIATION ..... (MND)	☐ REASONABLE ACCOMMODATION ..... (RAD)
☐ ZONING MAP AMENDMENT ..... (ZMA)	☒ OTHER: Tentative Subdivision Map

Applicant's Name: Mark IV Capital | Signature | Primary Contact? Ross Pfautz

Company Name: Mark IV Capital
Address: 200 S. Virginia St., Suite 850
City: Reno | State: NV | Zip Code: 89501 | Email: rpfautz@markiv.com
Phone No.: (949) 293-4802 | Cell No.: (949) 293-4802 | Fax No.:

Property Owners Name: M4 New Fernley QOZB, LLC | Primary Contact? Ross Pfautz

Company Name: Mark IV Capital Prop, LLC
Address: 4450 Macarthur Blvd., 2nd Floor
City: Newport Beach | State: CA | Zip Code 92660 | Email: rpfautz@markiv.com
Phone No.: (949) 293-4802 | Cell No.: (949) 293-4802 | Fax No.:

Engineer / Representative: Lumos & Associates, Inc. | Primary Contact? Camille Buehler

Company Name: Lumos & Associates, Inc.
Address: 9222 Prototype Dr.
City: Reno | State: NV | Zip Code 89521 | Email: cbuehler@lumosinc.com
Phone No.: (7752) 827-6111 | Cell No.: (775) 827-6111 | Fax No.:

Brief Project Type/Description (Attach Detailed Project Type / Description):

This is a request for an Annexation of 668.12 acres along with an Industrial Subdivision Map covering 2,173.64 acres. Refer to attached report for a highly detailed project description.

Subdivision/Project Name And/Or Phase: Victory Logistics District
Project Location (Street Address): Refer to attached vicinity map
Assessor's Parcel Number(s): 021-201-01, 16, 021-211-02, 03, 04, 06, 021-242-11, 17, 021-251-25, 021-261-43, and 44 (see attached table)
Current Zoning: I, GC, RR-1, and M-1 | Comprehensive Plan Land Use Designation: I, C, and ME

Total Project Acreage: 2,173.64 acres | % Commercial: 100% Industrial or Commercial

CITY UTILITIES

Water:	Sewer
☐ Currently Served	☐ Currently Served
☒ Proposed	☒ Proposed

Number of Parcels Proposed: TBD | % Open Space: N/A

Previous Applications For This Site? ☐ Yes ☒ No
List Previous Application No(s) And Names:

2009 Flood Zone Designation: ☐ A ☐ AE ☐ AH ☐ AO See attached report | FEMA Map No.: See attached report

Application Filing Date:	**Office Use Only**	Application Fee:	
Application No.:	Development Review Meeting	Outsource Fee:	
Application Intake By:	Date:	Noticing Fee:	
Planner:	Time:	Total Due:	

LETTER OF AUTHORIZATION

This letter shall serve to notify and verify the I/we am/are the legal owner(s) of the property being considered under this application and do hereby authorize the above representative to file and represent my/our interest in this application.

I/we am/are the legal owner(s) of said property; have read the foregoing "Letter of Authorization" and know the contents thereof; and so hereby certify (or declare) under penalty of perjury under the laws of the State of Nevada that the information contained in this application is true and correct.

OWNER(S) OF RECORD: ***(Include all signatures-provide extra sheets if necessary)***

(Print Name)	(Signature)	(Date)
MARK IV CAPITAL INC B ROSS PFAUTZ		2-9-22

I certify under penalty of perjury that I am the applicant and that the foregoing statements and answers contained herein and the information herein submitted, are in all respects true and correct. I grant permission to City staff and officials to enter the property to conduct inspections/site visits necessary for the review of the project. I also certify that all plans and submittal requirements are in accordance with the Nevada Revised Statues and City Code, have been drawn to a standard engineering scale (e.g. 1"=20', 1"=50', 1"=100') or architectural scale (e.g. ¼"=1', 1/8"=1') that is appropriate to the project size, and clearly define and identify all of the required information.

APPLICANT:

(Print Name)	(Signature)	(Date)
B ROSS PFAUTZ		2-9-22

APPLICANT'S ENGINEER/REPRESENTATIVE:

(Print Name)	(Signature)	(Date)

City of Fernley Development Code, Section 32.03.030, Common Review Procedures: The City will not process incomplete applications. Review for completeness of application forms is solely to determine whether preliminary information required for submission with the application is sufficient to allow further processing. A determination of completeness shall not constitute a decision as to whether an application complies with the City's Development Code.

Note: Development review meetings are preliminary nature and comments expressed by staff should not be construed as being Conditions of Approval for any project application.

ENTITY INFORMATION

ENTITY INFORMATION

Entity Name:

M4 NEW FERNLEY QOZB, LLC

Entity Number:

E0259502019-6

Entity Type:

Domestic Limited-Liability Company (86)

Entity Status:

Active

Formation Date:

06/04/2019

NV Business ID:

NV20191418252

Termination Date:

Perpetual

Annual Report Due Date:

6/30/2022

Series LLC:

☐

Restricted LLC:

☐

REGISTERED AGENT INFORMATION

Name of Individual or Legal Entity:

CORPORATION SERVICE COMPANY

Status:

Active

CRA Agent Entity Type:

Registered Agent Type:

Commercial Registered Agent

NV Business ID:

NV20101844335

Office or Position:

Jurisdiction:

DELAWARE

Street Address:

112 NORTH CURRY STREET, Carson City, NV, 89703, USA

Mailing Address:

Individual with Authority to Act:

GEORGE MASSIH

Fictitious Website or Domain Name:

OFFICER INFORMATION

☐ **VIEW HISTORICAL DATA**

Title	Name	Address	Last Updated	Status
Manager	MARK IV CAPITAL PROPERTIES, INC.	4450 MACARTHUR BLVD., 2ND FLOOR, NEWPORT BEACH, CA, 92660, USA	06/04/2019	Active

Page 1 of 1, records 1 to 1 of 1

Filing History Name History Mergers/Conversions

PETITION

THE UNDERSIGNED, constituting one hundred percent (100%) of the property owners of the property described in the Exhibit attached hereto, marked EXHIBIT "A" and incorporated herein by reference do hereby petition the City Council of the City of Fernley for annexation of the property described in EXHIBIT "A", to the City of Fernley. Petitioners represent that property described in EXHIBIT "A" is held by the undersigned in fee ownership.

DATED this 18 day of JANUARY, 2022.

Name: B Ross Pfautz SRVP

Address: 2005 Virginia Ste 850

Reno NV 89501

Signature: [signature]

Name: _____

Address: _____

_____

Signature: _____

Name: _____

Address: _____

_____

Signature: _____

Name: _____

Address: _____

_____

Signature: _____

Name: _____

Address: _____

_____

Signature: _____

Name: _____

Address: _____

_____

Signature: _____

[signature]

Notary Public in and for said County and State

My commission expires: 01/18/22

CHRISTINE L. MILLER
Notary Public - State of Nevada
Appointment Recorded in Washoe County
No: 92-0840-2 - Expires Jan. 18, 2022

ANNEXATION

APPLICATION CHECKLIST

City of Fernley, Nevada

The following items shall be submitted as a part of the Annexation application:

☒ 1. **Application Fee:** A check or money order payable to the "City of Fernley" for the application fee. **The application fee is due at the time of the application submittal**. See **FEE SCHEDULE** for correct amount.

☒ 2. **Proof of Ownership: Must be original signatures or the application may be rejected.** If the person signing the owner's affidavit is not listed as the property owner in the most recent records of the Lyon County Assessor, proof of ownership acceptable to the administrator must be submitted with the application. If the signer is an agent of the owner, written documentation of that fact acceptable to the administrator must be submitted. If in Corporate ownership, a list of all Corporate Officers must be provided.

☒ 3. **Review Packet: 1 (one) UNBOUND, original hardcopy containing the following:**

- ☒ a. Completed DEVELOPMENT APPLICATION form.
- ☒ b. Completed Petition for Annexation signed by all property owners included in the proposed Annexation area.
- ☒ c. A written description of the Annexation request.
- ☒ d. Written documentation addressing the following factors:
  - (1) Location of the property to be considered for Annexation;
  - (2) The logical extension of City limits;
  - (3) The need for the expansion to accommodate planned regional growth within seven years;
  - (4) The location of existing and planned water and sewer service;
  - (5) Acceptable level of services can be provided;
  - (6) City goals/policies that would be met by U1e proposed annexation;
  - (7) The efficient and cost-effective provision of service areas and capital facilities;
  - (8) Fiscal analysis regarding the proposed annexation demonstrating fiscally positive for 20 years;
  - (9) Whether there are any adopted a plans for the proposed annexation area;
  - (10)Whether the annexation creates any islands; and
  - (11)Any other factors concerning the proposed annexation deemed appropriate for consideration by the City Council.
- ☒ e. A wet-stamped legal description and boundary map (8½" x 11" with 1" margins).
- ☒ f. Two Annexation maps prepared by a registered Land Surveyor depicting the project boundary labeled with bearings, distances and curve data, the names of adjacent property owners, and the annexation dates of the adjacent properties.
  - Once the maps have been reviewed by the City Surveyor an original wet stamped Mylar is required prior to the City Clerk scheduling a 1st Reading of the Annexation.
- ☒ g. Please include a dimensioned site plan pictures of existing buildings, and any additional information that would be helpful to illustrate the existing use of the site. All plans shall be drawn to standard architectural or engineering scale and shall include a north arrow.
- ☒ h. Vicinity Map depicting the respective site and including surrounding roadways
- ☒ a. Property Tax Receipt.
- ☒ b. Preliminary Title Report.
- ☒ c. Miscellaneous, as requested, and all required items as outlined in Appendix A of the City of Fernley's Development Code.
- ☒ d. If drawings larger than 8½" x 11" are included with the application, one 8½" x 11" or 11" x 17" color reproduction of each must be provided.

☒ 4. Original PDF Original PDF documents of the application, broken down into individual sections, including all documents, maps, plans, and technical analyses, shall be provided on a USB flash drive or alternative method as determined by the Administrator. Please note scanned images of the submittal will not be accepted and may result in the delayed processing of the application.

NOTE: Applications filed under Chapter 32.03 of the City of Fernley's Development Code must include the information required by Appendix A of the same code and is not complete until all required items are submitted. The Planning Department or other reviewing departments or agencies may request that additional application materials be submitted depending on the specific project request. The application materials required above shall serve as the minimum requirements necessary to make application submittal to the City of Fernley Planning Department.

TENTATIVE SUBDIVISION MAP

APPLICATION CHECKLIST

City of Fernley, Nevada

The following items shall be submitted as a part of the Tentative Subdivision Map application:

☒ **1. Application Fee:** A check or money order payable to the "City of Fernley" for the application fee. **The application fee is due at the time of the application submittal**. See **FEE SCHEDULE** for correct amount.

☒ **2. Proof of Ownership: Must be original signatures or the application may be rejected.** If the person signing the owner's affidavit is not listed as the property owner in the most recent records of the Lyon County Assessor, proof of ownership acceptable to the administrator must be submitted with the application. If the signer is an agent of the owner, written documentation of that fact acceptable to the administrator must be submitted. If in Corporate ownership, a list of all Corporate Officers must be provided.

☒ **3. Review Packet: 1 (one) UNBOUND, original hardcopy containing the following:**

- ☒ a. Completed LAND DIVISION APPLICATION form
- ☒ b. Completed Residential or Non-Residential Project Data Sheet
- ☒ c. A Tentative Subdivision Map prepared to the attached specifications and in accordance with Development Code Section 32.03.060.
- ☒ d. **If drawings larger than 8½" x 11" are included with the application, one 8½" x 11" or 11" x 17". MUST be provided. Please fold oversized drawings - No rolled plans accepted.**
- ☒ e. Vicinity Map depicting the respective site and including surrounding roadways
- ☒ f. A copy of a preliminary Title Report, prepared within 30 days of application submittal, which includes the names and addresses of all property owners; a legal description of the property, and a description of all liens, easements, and deed restrictions.
- ☒ g. Legal Access
- N/A h. A letter of approval from the City of Fernley listing all street names shown on the Tentative Subdivision Map
- ☒ i. Demonstrate that city services can be provided at an acceptable service level.

☒ **4. Technical Analyses (Two (2) copies of each):** Items outlined in Appendix A-5 of the City of Fernley's Development Code in a form consistent with the adopted policies and design manuals.

- ☒ a. Traffic Study: A complete traffic study as required by the City Engineer.
- ☒ b. A preliminary hydrology and drainage report prepared by a Nevada registered Civil Engineer addressing the 5-year and 100-year return frequency storms and the 5-year and 100-year flows entering and leaving the site.
- ☒ c. A preliminary sewer report prepared by a Nevada registered Civil Engineer.
- ☒ d. A preliminary geotechnical report prepared by an Engineer licensed in the State of Nevada.
- ☒ e. All projects over 20 acres in size shall demonstrate the project is fiscally positive to the city for a period of at least 20 years.
- ☒ f. Any other report as may be necessary to enable the approving agency to determine that the application complies with the standards for approval

☒ **5. Original PDF documents of the application, broken down into individual sections, including all documents, maps, plans, and technical analyses, shall be provided on a USB flash drive or alternative method as determined by the Administrator. Please note scanned images of the submittal will not be accepted and may result in the delayed processing of the application.**

NOTE: Applications filed under Chapter 32.03 of the City of Fernley's Development Code must include the information required by Appendix A of the development code and is not complete until all required items are submitted. The Planning Department or other reviewing departments or agencies may request that additional application materials be submitted depending on the specific project request. The application materials required above shall serve as the minimum requirements necessary to make application submittal to the City of Fernley Planning Department.

NON-RESIDENTIAL PROJECT DATA SHEET
City of Fernley, Nevada

1. Site Area Breakdown

Building Coverage	+/-826 Ac.	+/-38 %
Landscaped Area	TBD Ac.	%
Paved Area	TBD Ac.	%
Undeveloped Area	TBD Ac.	%
Public Right-of-Way	57.23 Ac.	%
TOTAL	2,174.5 Ac.	%

2. Existing Building Information

#1 Description N/A
Floor Area N/A Sq.Ft Height N/A Feet
Type of Construction N/A
#2 Description N/A
Floor Area N/A Sq.Ft Height N/A Feet
Type of Construction N/A

3. Floor Area Ratio

Total Floor Area (Sq. Ft.)	/ Net Site Area (Sq. Ft.)	= Floor Area Ratio
		+/-.38

4. Description of Proposed Use

Industrial and Warehouse Uses.

5. Building Area Breakdown & Parking Calculations

Retail/Office/Financial	TBD Sq. Ft. / 250	=	TBD Spaces
Personal Service	TBD Sq. Ft. / 250	=	TBD Spaces
Veterinary Clinic	TBD Sq. Ft. / 250	=	TBD Spaces
Health Club	TBD Sq. Ft. / 300	=	TBD Spaces
Private Recreation Facility	TBD Sq. Ft. / 200	=	TBD Spaces
Gaming	TBD Sq. Ft. / 100	=	TBD Spaces
Restaurant/Bar	TBD Sq. Ft. / 100	=	TBD Spaces
General Industrial	TBD Sq. Ft. / 500	=	TBD Spaces
Light Industrial	TBD Sq. Ft. / 500	=	TBD Spaces
Food & Beverage Processing	TBD Sq. Ft. / 500	=	TBD Spaces
Vehicle Service Center	TBD Gas pumps x 1.0 + _____ service bays x 3	=	TBD Spaces
Overnight Lodging	TBD Rooms x 1.0 + _____ Rooms/15 + accessory uses	=	TBD Spaces
Theatre/Auditorium	TBD Seats/3 + _____ Employees x 1.0	=	TBD Spaces
Hospitals	TBD Beds x 1.5	=	TBD Spaces
Day Care Center, Large	TBD Children/8 + _____ Employees x 1.0	=	TBD Spaces
Educations Facility	TBD Classrooms x 10	=	TBD Spaces
High School	TBD Classrooms x 10	=	TBD Spaces
Middle School	TBD Classrooms x 3	=	TBD Spaces
Elementary School	TBD Classrooms x 3	=	TBD Spaces
Rest Home	TBD Beds x 0.33 + _____ Employees @ Shift x 1.0	=	TBD Spaces
Church	TBD Sq. Ft. / 30 + accessory uses	=	TBD Spaces

6. Outdoor Uses

Outdoor Storage ✔ Yes ___ No
Outdoor Processing ✔ Yes ___ No
Staging/Loading of Trucks ✔ Yes ___ No

7. Estimated Water Demand (Attach Calculations)

Domestic +/- 1,087 - +/- 7,868 AFY
Irrigation +/- 149 AFY
TOTAL +/- 1236 - +/- 8017 AFY
Source of water supply: Fernley

8. Traffic (Attach Calculations)

Average Daily Trips +/-46,347 Trips
Peak Hour Trips +/-3.654 Trips

9. Estimated Sewage to be Generated

+/- 1,879,180 GPD
(Attach Calculations)

10. Hazardous Materials

Will the use on this site involve the use of hazardous materials? ✔ Yes ___ No

11. Flood Hazard

Portion of site subject to inundation by 100 year flood:
+/-41.4 Ac. +/-1.9 %

12. Portion of Site within the Following Slope Categories:

0% - 10% +/-2161 Ac. +/-99.4 %
10% + +/-13.5 Ac. +/-.6 %

Lyon County
Nevada

Tax Account 021-201-01

Owners

M4 NEW FERNLEY LLC

Account Summary

Account ID	021-201-01
Account Type	Real Estate
Location	0 FERNLEY
Balance	$0.00
Currently Due	$0.00

No payment currently due.

This account has a balance of $0.00.
No payment can be made.

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$2,852.63
Total	$2,852.63
Paid	$2,852.63
Balance	$0.00
Due	$0.00
Ad Valorem Tax Rate	2.9409
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due
1	08/16/2021	08/27/2021	Paid	$713.30	$0.00	$713.30	$713.30	$0.00
2	10/04/2021	10/14/2021	Paid	$713.11	$0.00	$713.11	$713.11	$0.00
3	01/03/2022	01/14/2022	Paid	$713.11	$0.00	$713.11	$713.11	$0.00
4	03/07/2022	03/18/2022	Paid	$713.11	$0.00	$713.11	$713.11	$0.00

Past Years

Description	Original	Penalty	Paid	Balance	Due	Tax Rate
2020/2021 SECURED TAXES	$2,639.77	$0.00	$2,639.77	$0.00	$0.00	2.9395
2019/2020 SECURED TAXES	$2,474.03	$0.00	$2,474.03	$0.00	$0.00	2.9395
2018/2019 SECURED TAXES	$2,473.28	$0.00	$2,473.28	$0.00	$0.00	2.9395

Lyon County
Nevada

Tax Account 021-201-16

Owners

M4 NEW FERNLEY QOZB LLC

Account Summary

Account ID	021-201-16
Account Type	Real Estate
Location	0 FERNLEY
Balance	$813.21
Currently Due	$813.21

$813.21 is due by March 07, 2022.

You can pay any amount up to $813.21 (the current balance).

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$3,252.99
Total	$3,327.74
Paid	$2,514.53
Balance	$813.21
Due	$813.21
Ad Valorem Tax Rate	3.6160
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due	Pay Now
1	08/16/2021	08/27/2021	Paid	$813.36	$0.00	$813.36	$813.36	$0.00	
2	10/04/2021	10/14/2021	Paid	$813.21	$32.53	$813.21	$845.74	$0.00	
3	01/03/2022	01/14/2022	Paid	$813.21	$42.22	$813.21	$855.43	$0.00	
4	03/07/2022	03/18/2022	Due	$813.21	$0.00	$813.21	$0.00	$813.21	Pay $813.21 Now

Past Years

Lyon County
Nevada

Tax Account 021-211-02

Owners

M4 FERNLEY JACKSON LLC

Account Summary

Account ID	021-211-02
Account Type	Real Estate
Location	0 FERNLEY
Balance	$0.00
Currently Due	$0.00

No payment currently due.

This account has a balance of $0.00.
No payment can be made.

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$785.51
Total	$785.51
Paid	$785.51
Balance	$0.00
Due	$0.00
Ad Valorem Tax Rate	3.6160
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due
1	08/16/2021	08/27/2021	Paid	$196.55	$0.00	$196.55	$196.55	$0.00
2	10/04/2021	10/14/2021	Paid	$196.32	$0.00	$196.32	$196.32	$0.00
3	01/03/2022	01/14/2022	Paid	$196.32	$0.00	$196.32	$196.32	$0.00
4	03/07/2022	03/18/2022	Paid	$196.32	$0.00	$196.32	$196.32	$0.00

Past Years

Description	Original	Penalty	Paid	Balance	Due	Tax Rate
2020/2021 SECURED TAXES	$783.28	$0.00	$783.28	$0.00	$0.00	3.6131
2019/2020 SECURED TAXES	$782.89	$0.00	$782.89	$0.00	$0.00	3.6131
2018/2019 SECURED TAXES	$782.50	$68.40	$850.90	$0.00	$0.00	3.6131

Lyon County
Nevada

Tax Account 021-211-03

Owners

JOHNSON, EMMA JANE

Account Summary

Account ID	021-211-03
Account Type	Real Estate
Location	0 FERNLEY
Balance	$0.00
Currently Due	$0.00

No payment currently due.

This account has a balance of $0.00.
No payment can be made.

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$229.84
Total	$229.84
Paid	$229.84
Balance	$0.00
Due	$0.00
Ad Valorem Tax Rate	3.6160
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due
1	08/16/2021	08/27/2021	Paid	$57.58	$0.00	$57.58	$57.58	$0.00
2	10/04/2021	10/14/2021	Paid	$57.42	$0.00	$57.42	$57.42	$0.00
3	01/03/2022	01/14/2022	Paid	$57.42	$0.00	$57.42	$57.42	$0.00
4	03/07/2022	03/18/2022	Paid	$57.42	$0.00	$57.42	$57.42	$0.00

Past Years

Description	Original	Penalty	Paid	Balance	Due	Tax Rate
2020/2021 SECURED TAXES	$227.95	$2.40	$230.35	$0.00	$0.00	3.6131
2019/2020 SECURED TAXES	$227.83	$0.00	$227.83	$0.00	$0.00	3.6131
2018/2019 SECURED TAXES	$227.72	$2.39	$230.11	$0.00	$0.00	3.6131

Lyon County
Nevada

Tax Account 021-211-04

Owners

M4 NEW FERNLEY QOZB LLC

Account Summary

Account ID	021-211-04
Account Type	Real Estate
Location	0 FERNLEY
Balance	$917.64
Currently Due	$917.64

$917.64 is due by March 07, 2022.

You can pay any amount up to $917.64 (the current balance).

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$3,670.79
Total	$3,755.15
Paid	$2,837.51
Balance	$917.64
Due	$917.64
Ad Valorem Tax Rate	3.6160
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due	Pay Now
1	08/16/2021	08/27/2021	Paid	$917.87	$0.00	$917.87	$917.87	$0.00	
2	10/04/2021	10/14/2021	Paid	$917.64	$36.71	$917.64	$954.35	$0.00	
3	01/03/2022	01/14/2022	Paid	$917.64	$47.65	$917.64	$965.29	$0.00	
4	03/07/2022	03/18/2022	Due	$917.64	$0.00	$917.64	$0.00	$917.64	Pay $917.64 Now

Past Years

Lyon County
Nevada

Tax Account 021-211-06

Owners

M4 NEW FERNLEY QOZB LLC

Account Summary

Account ID	021-211-06
Account Type	Real Estate
Location	0 FERNLEY
Balance	$2,230.62
Currently Due	$2,230.62

$2,230.62 is due by . 3/7/22

You can pay any amount up to $2,230.62 (the current balance).

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$8,922.66
Total	$9,127.70
Paid	$6,897.08
Balance	$2,230.62
Due	$2,230.62
Ad Valorem Tax Rate	3.6160
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due	Pay Now
1	08/16/2021	08/27/2021	Paid	$2,230.80	$0.00	$2,230.80	$2,230.80	$0.00	
2	10/04/2021	10/14/2021	Paid	$2,230.62	$89.22	$2,230.62	$2,319.84	$0.00	
3	01/03/2022	01/14/2022	Paid	$2,230.62	$115.82	$2,230.62	$2,346.44	$0.00	
4	03/07/2022	03/18/2022	Due	$2,230.62	$0.00	$2,230.62	$0.00	$2,230.62	Pay $2,230.62 Now

Past Years

Lyon County
Nevada

Tax Account 021-242-11

Owners

M4 NEW FERNLEY QOZB LLC

Account Summary

Account ID	021-242-11
Account Type	Real Estate
Location	0 FERNLEY
Balance	$0.00
Currently Due	$0.00

No payment currently due.

This account has a balance of $0.00.
No payment can be made.

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$438.99
Total	$438.99
Paid	$438.99
Balance	$0.00
Due	$0.00
Ad Valorem Tax Rate	3.6160
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due
1	08/16/2021	08/27/2021	Paid	$109.89	$0.00	$109.89	$109.89	$0.00
2	10/04/2021	10/14/2021	Paid	$109.70	$0.00	$109.70	$109.70	$0.00
3	01/03/2022	01/14/2022	Paid	$109.70	$0.00	$109.70	$109.70	$0.00
4	03/07/2022	03/18/2022	Paid	$109.70	$0.00	$109.70	$109.70	$0.00

Past Years

Description	Original	Penalty	Paid	Balance	Due	Tax Rate
2020/2021 SECURED TAXES	$404.92	$0.00	$404.92	$0.00	$0.00	3.6131
2019/2020 SECURED TAXES	$379.51	$0.00	$379.51	$0.00	$0.00	3.6131
2018/2019 SECURED TAXES	$379.32	$0.00	$379.32	$0.00	$0.00	3.6131

Lyon County
Nevada

Tax Account 021-242-17

Owners

M4 NEW FERNLEY QOZB LLC

Account Summary

Account ID	021-242-17
Account Type	Real Estate
Location	0 NEVADA PACIFIC PKWY FERNLEY
Balance	$9,258.37
Currently Due	$9,258.37

$9,258.37 is due by . 3/7/22

You can pay any amount up to $9,258.37 (the current balance).

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$37,033.57
Total	$37,884.62
Paid	$28,626.25
Balance	$9,258.37
Due	$9,258.37
Ad Valorem Tax Rate	3.6160
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due	Pay Now
1	08/16/2021	08/27/2021	Paid	$9,258.46	$0.00	$9,258.46	$9,258.46	$0.00	
2	10/04/2021	10/14/2021	Paid	$9,258.37	$370.33	$9,258.37	$9,628.70	$0.00	
3	01/03/2022	01/14/2022	Paid	$9,258.37	$480.72	$9,258.37	$9,739.09	$0.00	
4	03/07/2022	03/18/2022	Due	$9,258.37	$0.00	$9,258.37	$0.00	$9,258.37	Pay $9,258.37 Now

Past Years

Lyon County
Nevada

Tax Account 021-251-25

Owners

M4 NEW FERNLEY QOZB LLC

Account Summary

Account ID	021-251-25
Account Type	Real Estate
Location	0 NEWLANDS DR FERNLEY
Balance	$8,742.13
Currently Due	$8,742.13

$8,742.13 is due by . 3/7/22

You can pay any amount up to $8,742.13 (the current balance).

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$34,968.75
Total	$35,772.36
Paid	$27,030.23
Balance	$8,742.13
Due	$8,742.13
Ad Valorem Tax Rate	3.6160
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due	Pay Now
1	08/16/2021	08/27/2021	Paid	$8,742.36	$0.00	$8,742.36	$8,742.36	$0.00	
2	10/04/2021	10/14/2021	Paid	$8,742.13	$349.69	$8,742.13	$9,091.82	$0.00	
3	01/03/2022	01/14/2022	Paid	$8,742.13	$453.92	$8,742.13	$9,196.05	$0.00	
4	03/07/2022	03/18/2022	Due	$8,742.13	$0.00	$8,742.13	$0.00	$8,742.13	Pay $8,742.13 Now

Past Years

Lyon County
Nevada

Tax Account 021-261-43

Owners

M4 NEW FERNLEY QOZB LLC

Account Summary

Account ID	021-261-43
Account Type	Real Estate
Location	0 HWY 50A FERNLEY
Balance	$0.00
Currently Due	$0.00

No payment currently due.

This account has a balance of $0.00.
No payment can be made.

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$3,022.41
Total	$3,022.41
Paid	$3,022.41
Balance	$0.00
Due	$0.00
Ad Valorem Tax Rate	3.6160
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due
1	08/16/2021	08/27/2021	Paid	$755.73	$0.00	$755.73	$755.73	$0.00
2	10/04/2021	10/14/2021	Paid	$755.56	$0.00	$755.56	$755.56	$0.00
3	01/03/2022	01/14/2022	Paid	$755.56	$0.00	$755.56	$755.56	$0.00
4	03/07/2022	03/18/2022	Paid	$755.56	$0.00	$755.56	$755.56	$0.00

Past Years

Description	Original	Penalty	Paid	Balance	Due	Tax Rate
2020/2021 SECURED TAXES	$2,798.54	$0.00	$2,798.54	$0.00	$0.00	3.6131
2019/2020 SECURED TAXES	$5,335.94	$0.00	$5,335.94	$0.00	$0.00	2.9395
2018/2019 SECURED TAXES	$5,334.30	$0.00	$5,334.30	$0.00	$0.00	2.9395

Lyon County
Nevada

Tax Account 021-261-44

Owners

M4 NEW FERNLEY QOZB LLC

Account Summary

Account ID	021-261-44
Account Type	Real Estate
Location	0 HWY 50A FERNLEY
Balance	$1,133.37
Currently Due	$1,133.37

$1,133.37 is due by . 3/7/22

You can pay any amount up to $1,133.37 (the current balance).

Current Year

Description	2021/2022 REAL ESTATE TAXES
Original	$4,533.63
Total	$4,637.81
Paid	$3,504.44
Balance	$1,133.37
Due	$1,133.37
Ad Valorem Tax Rate	3.6160
Tax Cap	100% High 8.0%

Current Year Installments

#	Due Date	Penalty Date	Status	Original Total	Penalty	Total	Paid	Total Due	Pay Now
1	08/16/2021	08/27/2021	Paid	$1,133.52	$0.00	$1,133.52	$1,133.52	$0.00	
2	10/04/2021	10/14/2021	Paid	$1,133.37	$45.33	$1,133.37	$1,178.70	$0.00	
3	01/03/2022	01/14/2022	Paid	$1,133.37	$58.85	$1,133.37	$1,192.22	$0.00	
4	03/07/2022	03/18/2022	Due	$1,133.37	$0.00	$1,133.37	$0.00	$1,133.37	Pay $1,133.37 Now

Past Years

PRELIMINARY WATER REPORT

For

VICTORY

LOGISTICS | DISTRICT

TENTATIVE INDUSTRIAL SUBDIVISION

Prepared For:
M4 New Fernley QOZB, LLC.
4450 MacArthur Boulevard, 2nd Floor
Newport Beach, CA 92660

Prepared By:

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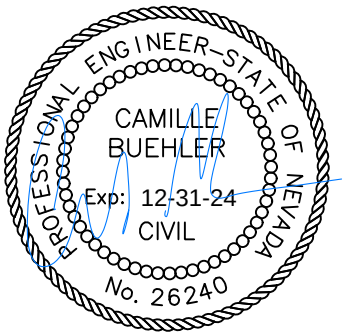

09/15/2023

JN 10067.008
AUGUST, 2023

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Appendix A Water Model Results
Appendix B Shaw Engineering Technical Memorandum

I. INTRODUCTION

The Mark IV Industrial Subdivision is located south of I-80, north of US-50 Alt and adjacent to Nevada Pacific Parkway in Northeast Fernley, Nevada. The Mark IV Subdivision consists of approximately 2,174 acres comprised of the following parcels: 021-201-01, 021-201-16, 021-211-02, 021-211-04, 021-211-06, 021-242-11, 021-242-17, 021-251-25, 021-261-43, 021-261-44, and 021-211-03. The Mark IV properties reside within Sections 3, 4, 5, 6, 7, 8, 17, and 18, T20N, R25E in Fernley, Nevada.

The proposed Mark IV Industrial Subdivision consists of 31 proposed lots to be used for distribution/light industrial, manufacturing, data center/high tech, and retail purposes. As such, 26 Conceptual developable lots were utilized out for the purpose of conceptual connection points.

There is an existing water system adjacent to and within some areas of the subdivision. The proposed water system will tie into the existing system. The purpose of this report is to provide preliminary design recommendations for the conceptual an on-site water system.

Projected water demands and design recommendations presented in this report are at the conceptual level based on preliminary development areas, lot counts, and lot sizes. Water demands and infrastructure design will be updated as necessary during the final planning stages of each development area. The final water demands and design of all infrastructure will ultimately be reviewed by and coordinated with the City of Fernley Public Works Department prior to the issuance of any will-serves or approvals associated with water service/delivery to the project.

II. DESCRIPTION OF DEVELOPMENT

A. Terrain

The terrain of the project site varies from minimal and moderate slopes throughout the majority of the site to steep slopes in the west of the site. The terrain for the Mark IV project has been considered for strategic placement of storage tanks throughout the site.

B. Mark IV Industrial Subdivision

Mark IV is planned to be constructed in up to three possible scenarios, as illustrated in Figure 1. Due to the highly fluid nature of the project's lot development order, phases have been designated based on looping requirements.

Land use designations and preliminary lot sizes planned for the development are as follows:

- Manufacturing
- Light Industrial
- Distribution Center
- General Industrial
- Retail

The following triggers are based on developable area before an additional tank is required to be built. Along with each set of developable area, an associated additional water lines/laterals are to be constructed. All infrastructure is assumed to be a conceptual mixture of water demands, requiring a conceptual amount of storage, pipe sizes, and booster pumps. The nearest point of connection to significant storage is the existing 2.5 million gallon Northeast Tank. The northeast tank storage is available on a first come/first serve basis and is dedicated when will-serves are issued. It has been assumed that The Mark IV Industrial Subdivision will have full access to this tank, and has been included in the storage requirements.

Water Infrastructure – First Trigger

The first trigger of the water system for Mark IV will be constructed in order to provide fire storage for the first 342 acres (17%) of development. This phase ties into the existing 2.5 million gallon (MG) northeast storage tank and loops to a connection point at the intersection of Duffy Road and Nevada Pacific Parkway. This phase will be required for all lots that aren't tying directly into the existing system, regardless of which lot gets developed first, due to storage requirements. An existing storage tank is provided for storage and will be utilized with this portion (pending timing with other developments.) The storage tank has a base elevation of 4,310.65 feet, with a maximum depth of 36 feet, and a diameter of 110 feet.

Water Infrastructure – Second Trigger

The second trigger of the water system will serve an additional 320 acres (16%) of industrial development. This trigger requires the construction of an additional three-million gallon storage tank at an elevation of 4,310.65 feet, and a maximum level of 36'.

Water Infrastructure – Third Trigger

The third trigger of the Mark IV Industrial Subdivision is the final phase of the backbone water infrastructure and serves the additional 1,338 acres (67%) of development. This trigger serves the remaining 1338 acres of development. The third trigger requires the construction of two additional three-million gallon storage tanks. All tanks are constructed to serve the Pressure Zones and corresponding elevation listed in the 2008 Water Master Plan.

III. EXISTING WATER SUPPLY FACILITIES

The off-site facilities and capacities are described below.

A. Municipal Water System

The existing municipal water system is operated by the City of Fernley. Per the NAC 445A Design Report for Victory Logistics Mark IV Building C Phase II [6], The Fernley water system is made up of five storage tanks that provide 7.0 MG of storage, and six groundwater wells with an average day capacity of 8,020 gpm. The City of Fernley has an additional 2.5-million gallon raw water storage tank and a 1.4-million gallon treated storage tank. Based on historical data provided by the City of Fernley operations, the current maximum day demand is 6.5-million gallons per day

(MGD). Further information regarding the existing City of Fernley Water Distribution System will be provided as coordination with Shaw Engineering is conducted.

Two existing wells are located on the site. Well No. 9 has a finish floor of 4,118 ft, and an observed flow of 600 gpm. Well No. 9a has a finish floor of 4,118 ft, and an observed flow of 800 gpm.

The site falls within two pressure zones lined out in the 2008 City of Fernley Water Master Plan: Pressure Zone 1 and Low Zone. The site is anticipated and designed to be served within those two pressure zones without creating any additional.

Reference Appendix B for additional phasing requirements.

IV. WATER DEMAND ESTIMATES

Water demands based on land use were chosen based on the City of Fernley 2008 Water Master Plan, Table 6.17 [3]. The demand estimates are based on metered averages observed from developments in the City of Fernley. The following sections present a detailed methodology for the water demand estimates for use in the conceptual design of on-site and off-site water infrastructure.

Water demand assumptions and calculations for anticipated land uses can be found in Table 1. The Equivalent Residential Connections (ERCs) were utilized to estimate storage capacity requirements. The ERC factor was assumed at 1,000 gpd/ERC [3]. The ERC factor is related to the square footage of an assumed building, with each building being assumed at 38% of each lot area.

A. Mark IV Industrial Demand

Table 1: Mark IV Industrial Land Use Demand Assumptions

Land Use	Avg Day (gpd/SF)	Max Day (gpd/SF)	Peak Hour (gpd/SF)	MDD/ADD[1] (ratio)	PDD/MDD[1] (ratio)
Manufacturing	0.276	0.463	0.695	1.68	1.5
Light Industrial	0.270	0.457	0.686	1.69	1.5
Distribution Center	0.044	0.097	0.146	2.20	1.5
General Industrial	0.270	0.457	0.686	1.69	1.5
Retail	0.560	0.806	1.008	1.44	1.3
Source: 2008 Water Master Plan, Table 6.17					
[1] MDD/PDD Peaking factors back-calculated from 2008 Water Master Plan					

Tables 2 shows the estimated build-out water demand scenarios for the anticipated land uses.

The water demand land uses were chosen for their direct relevance to the 2008 Water Master Plan, Table 6.17. The land uses designated for the Victory Logistics PUD Handbook are correlated as such:

PUD Handbook Land Use	Water Land Use
Data Processing, Hosting, and Related Services (DC)	Distribution Center (DC)
Distribution/Light Industrial (LI)	Light Industrial (LI)
Manufacturing (MFG)	Manufacturing (MFG)
Transload & Switching Facility (TSF)	N/A
Commercial (C)	Retail (RETAIL)

Table 2: Mark IV Domestic Water Demand Estimates Based on Proposed Land Uses

Parcel	Land Use	Total Lot Area	Average Day		Max Day		Peak Hour	
	Code	(ac)	(gpd)	(gpm)	(gpd)	(gpm)	(gpd)	(gpm)
Lot #0	RETAIL	9.89	91,676.0	63.7	131,948.0	91.6	137,514.0	95.5
Lot #1	LI	45.38	202,814.8	140.8	343,282.9	238.4	514,924.3	357.6
Lot #2	LI	58.87	263,105.1	182.7	445,329.7	309.3	667,994.6	463.9
Lot #3	LI	55.83	249,518.6	173.3	422,333.3	293.3	633,499.9	439.9
Lot #4	LI	279.94	1,251,123.5	868.8	2,117,642.4	1,470.6	3,176,463.6	2,205.9
Lot #5	LI	36.00	160,893.2	111.7	272,326.7	189.1	408,490.0	283.7
Lot #6	DC	120.33	87,639.1	60.9	193,204.4	134.2	289,806.7	201.3
Lot #7	DC	204.60	149,014.9	103.5	328,510.2	228.1	492,765.3	342.2
Lot #8	LI	49.83	222,703.0	154.7	376,945.5	261.8	565,418.2	392.7
Lot #10	LI	212.24	948,554.9	658.7	1,605,517.0	1,114.9	2,408,275.5	1,672.4
Lot #11	LI	184.27	823,549.8	571.9	1,393,934.3	968.0	2,090,901.4	1,452.0
Lot #12	MFG	42.00	191,880.1	133.3	321,885.7	223.5	482,828.6	335.3
Lot #13	MFG	83.71	382,435.2	265.6	641,549.0	445.5	962,323.4	668.3
Lot #14	MFG	83.00	379,191.5	263.3	636,107.6	441.7	954,161.3	662.6
Lot #15	N/A	38.84	-	-	-	-	-	-
Lot #16	MFG	28.16	128,651.0	89.3	215,816.7	149.9	323,725.1	224.8
Lot #17	LI	155.20	693,628.5	481.7	1,174,030.5	815.3	1,761,045.8	1,222.9
Lot #18	DC	89.20	64,966.4	45.1	143,221.4	99.5	214,832.2	149.2
Lot #19	MFG	28.57	130,524.1	90.6	218,958.9	152.1	328,438.4	228.1
Lot #20	N/A	26.42	-	-	-	-	-	-
Lot #21	RETAIL	10.87	100,760.2	70.0	145,022.7	100.7	151,140.3	105.0
Lot #22	LI	111.18	496,891.9	345.1	841,035.5	584.1	1,261,553.3	876.1
Lot #23	N/A	19.61	-	-	-	-	-	-
Lot #24	N/A	4.38	-	-	-	-	-	-
Lot #25	N/A	27.47	-	-	-	-	-	-
Total		**2,006**	**7,019,522**	**4,875**	**11,968,603**	**8,312**	**17,826,102**	**12,379**
Assumes 38% of total lot area is building area								

Irrigation

Preliminary irrigation estimates have been calculated based on predicted landscape areas. Tree and shrub counts were estimated based on an assumed 17% landscape cover for each lot. Trees were assumed at one tree per every 500 square feet of landscaped area, and shrubs were assumed at one for every 50 square feet. The demands are based on total number of trees and shrubs with a factor of 2.8 and 1.4-GPD, respectively. The projected irrigation demands are provided in Table 3.

Table 3: Mark IV Irrigation Demands

Parcel	Total Lot Area	Trees	Shrubs	Irrigation Water Demand	
	(acres)	(Count)	(Count)	(gpm)	(gpd)
Lot #0	9.89	244	1,465	0.5	742.0
Lot #1	45.38	1,120	187	2.4	3,404.7
Lot #2	58.87	1,453	242	3.1	4,416.8
Lot #3	55.83	1,378	230	2.9	4,188.7
Lot #4	279.94	6,910	1,152	14.6	21,002.8
Lot #5	36.00	889	148	1.9	2,700.9
Lot #6	120.33	2,970	495	6.3	9,027.9
Lot #7	204.60	5,050	842	5.0	7,209.3
Lot #8	49.83	1,230	205	2.6	3,738.6
Lot #10	212.24	5,239	873	11.1	15,923.6
Lot #11	184.27	4,549	758	9.6	13,825.1
Lot #12	42.00	1,037	173	2.2	3,151.1
Lot #13	83.71	2,066	344	4.4	6,280.4
Lot #14	83.00	2,049	341	4.3	6,227.2
Lot #15	38.84	-	-	-	-
Lot #16	28.16	695	116	1.5	2,112.7
Lot #17	155.20	3,831	638	1.5	2,125.5
Lot #18	89.20	2,202	367	11.3	16,210.9
Lot #19	28.57	705	118	1.5	2,143.5
Lot #20	26.42	-	-	-	-
Lot #21	10.87	268	45	0.6	815.5
Lot #22	111.18	2,744	457	5.8	8,341.4
Lot #23	19.61	-	-	-	-
Lot #24	4.38	-	-	-	-
Lot #25	27.47	-	-	-	-
Total	**2,005.8**	**46,386**	**7,731**	**92.3**	**132,846.6**
Assumes 17% of total lot area is landscape area					

B. Summary of Total Demands

Total domestic (Table 2) and irrigation (Table 3) water demands for Mark IV are summarized in Table 4.

Table 4: Summary of Total Mark IV Demands

Item	ADD		MDD		PHD	
	(gpm)	(mgd)	(gpm)	(mgd)	(gpm)	(mgd)
Domestic	4,874.7	7.02	8,311.5	12.0	12,379.2	17.8
Irrigation	92.3	0.00	92.3	0.0	92.3	0.0
Total	**4,966.9**	**7.02**	**8,403.8**	**11.97**	**12,471.5**	**17.83**

C. Water Rights

The Mark IV development currently owns 2,380 acre-ft (2.1 MGD) of water rights. The site will require an estimated 7.02 MGD (Based on Average Day Demand), depending on water usage. Allocation to individual tenants is currently under discussion. A possible allocation method would be to allocate the water rights per acreage, or square footage of proposed building, and require the tenant to acquire the remaining water rights based on their usage.

D. Fire Flow

Construction type of the proposed buildings is anticipated to be Type IIIB and exceed the 138,301 square foot cap on IFC Table B105.1(2). It will be required that all Mark IV buildings have automatic sprinkler systems, allowing for a reduction of 50% in fire flow requirements. Therefore, the required fire flow is 4,000 gpm for four hours, resulting in a required 960,000 gallons of storage. Currently, the fire flow volume can be provided by the existing City of Fernley system, subject to change at time of dedication. Any additional storage is assumed to be provided on-site in storage tanks, which will be discussed in Section VI. Two pressure reducing stations are proposed onsite to prevent lower elevation areas from experiencing pressures exceeding 100 PSI. The pressure reducing stations will be constructed in a way to allow fire flow will be perpetuated through the lower pressure zone.

V. DESIGN CRITERIA

As the Mark IV water system will be connected to and served as part of an existing public water system, it falls under Nevada Administrative Code (NAC) 445A66.752 through 445A.66755. These sections of the NAC describe requirements for the existing water system. Recommended design criteria for the water system is outlined in the sections to follow.

A. On-Site Water System

Design criteria for the on-site water system is in conformance with the NAC and City of Fernley design standards [4] as follows:

- Supply capacity: Total system capacity (including storage) should be sufficient to meet the MDD and fire demand with all facilities in service per NAC 445A.6672. In addition, total system capacity should be sufficient to meet the ADD and fire demand with the most productive well out of service. Alternative pumping capacity and storage capacity can be considered as sources of supply per NAC 445A.66725.1.
  - A well or booster pump is considered alternative pumping capacity when equipped with a source of backup power (e.g. emergency generator).
- Storage capacity: Storage capacity will include operating storage, emergency reserve, and fire demand per NAC 445A.6674, 445A.66745, 445A.6675, and 445A.66755.
  - Operating Storage: Recommend eight hours of indoor PHD above MDD (on-site pumping and off-site water system will be designed to provide MDD).
  - Emergency Reserve: Recommend 24 hours of indoor and outdoor ADD.
  - Fire Demand: Largest fire storage requirement in each service area.
- Distribution system pressures (NAC 445A.6711):
  - Minimum pressure of 40 psi during MDD.
  - Minimum pressure of 20 psi during MDD + fire flow.
  - Minimum pressure of 30 psi during PHD.
  - Maximum static pressure of 100 psi.
- Distribution system main sizing [4]:
  - Minimum water main size of 8-inch diameter.
  - Maximum velocity of 8-feet per second (fps) during PHD.
  - Maximum velocity of 18 fps during MDD + fire flow.
  - Hazen Williams roughness coefficient ('C' Value) of 130 for pipe diameters greater than or equal to 14-inch diameter and 120 for pipe diameters less than 14-inch diameter.
- Minimum 10-feet horizontal and 18-inch vertical (water main above) separation from sewer, storm, and reclaimed water pipelines, unless approved otherwise with special construction per NAC 445A.6715.
- Isolation valves required at intervals not to exceed 500 ft, at intervals to isolate no more than (2) fire hydrants at any time, at all main intersections, and at tees/crosses.
- Air/vacuum valves required at high points along water pipelines per NAC 445A.67135.
- Fire hydrants spacing in accordance with fire department having jurisdiction.
- Individual pressure reducing valve (PRV) required when static pressure exceeds 80 psi.

VI. EVALUATION OF ON-SITE WATER SYSTEM

A. Supply

Two wells currently supply approximately 50% of the water supply to the City of Fernley. These wells are not directly supplying the Victory Logistics Project, but feed the City of Fernley's water distribution system, which Victory Logistics is connecting to. Mark IV has acquired dedicated water rights and will be served directly by the City of Fernley. Mark IV is in the process of determining the viability of re-drilling one of the wells located on site (Well 9) and relocating it approximately 300-feet NE of its current location. The relocated Well 9 will be tied into the existing City of Fernley water distribution system, but will not directly serve the project.

B. Storage

Four storage tanks will be required to provide operating storage, emergency reserves, and fire demand (as defined by NAC 445A.6674-.66755) for the built-out Mark IV development. One tank is already built and three tanks are proposed. Exact phasing and sizing of tanks will be determined by development needs at the time of final design. Preliminary tank elevations and hydraulic grade lines (HGLs) are summarized in Table 5. Storage tank locations and pressure zone delineations are shown on Figure 2. The existing (e)T5000 tank (Northeast Tank) has a maximum storage of 2.5 MG (per discussion with the City of Fernley.) All tanks are proposed to serve the Pressure Zone One and Low Zone.

Table 5: Preliminary Tank Elevations

Tank	Base Elevation (ft)	Max Height (ft)
(e)T5000	4,310.65	36.0
T5002	4,310.65	36.0
T5004	4,295.00	36.0
T5006	4,275.00	36.0

The operational storage is required at 33 percent MDD at 1,440-GPD per ERC [3]. The emergency reserves is required for the ADD at 720-GPD per ERC [3]. When combined, this can be simplified as 1,200-GPD per ERC. The estimated storage tanks sizes required for Mark IV considering operating storage, emergency reserve, and fire demand are shown in Table 6.

Table 6: Preliminary Storage Tank Requirements

Required Storage		Tank Size Required
Operational + Emergency Storage	Fire Demand	
1,200-gpd/ERC	4,000 gpm for 4 hours	
(gal)		(MG)
9,602,846	720,000	10.32

The storage requirements are based on the 2008 Water Master Plan [3] and will need to be updated to meet the updated City of Fernley Department of Public Works 2022 Water Master Plan during final design.

C. Distribution

Preliminary design of the distribution system considers minimum/maximum pressure and maximum velocity requirements outlined in the design criteria in Section V.A. The distribution system is planned to consist of C900 PVC and Ductile Iron pipe with diameters ranging from 10- to 30-inches. Pressures in the system are anticipated to be regulated via PRVs and tanks as necessary with the final layout and sizing to be determined during final design. Two pressure zones are proposed to be utilized in this development: Pressure Zone 1 and Low Zone.

Total pipeline lengths for the backbone distribution system are summarized in Table 7. The preliminary backbone distribution system is shown in Figure 3.

Table 7: Pipeline Lengths for Backbone Distribution System

Pipe Size (inches)	Pipe Length (LF)
10	11440
12	8800
14	880
16	4290
18	240
20	450
24	8750
30	400
Total	**35250**

[1] Preliminary Quantities are for preliminary distribution system only.

VII. EVALUATION OF OFF-SITE WATER SYSTEM

The Mark IV Industrial Subdivision's water supply has been assumed to be provided by the existing City of Fernley water system, but the majority of the storage and pressure has been provided onsite. Reference Appendix B for Shaw Engineering's Technical Memorandum outlining the required offsite upgrades for different trigger points. These trigger points are in conjunction with the triggers outlined in Section II. B.

VIII. CONCEPTUAL WATER SYSTEM RECOMMENDATIONS

A. System Description

The preliminary on-site water system includes a backbone distribution system with a minimum of two pressure zones, pipe diameters ranging from 10- to 30-inch diameter and three proposed water storage tanks. Additionally, the project anticipates moving Well No. 9 300 feet northwest in order to allow for proper clearances to the proposed transload facility.

B. Opinion of Probable Costs

A Class 5 Engineer's opinion of probable costs is presented in Table 8. The presented Engineer's opinion of probable costs are "whole" project estimates that include construction phase costs. It should be noted that the presented opinions of probable costs are strictly conceptual in nature and may differ significantly from actual construction costs. These costs reflect the Engineer's impression of material, equipment, labor, etc. at the time of the estimate based on experience

and judgement in applying presently available data. The engineer has no control over cost of labor, materials, equipment, competitive bidding practices, market conditions, tariffs, costs associated with funding packages, inflation, etc. Thus, the engineer cannot warrant that the actual project costs will not vary from the Engineer's opinion of probable cost.

Table 8: Preliminary Opinion of Probable Construction Costs: On-Site System

Item	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization & Demobilization	LS	1	$ 1,000,000	$ 1,000,000
2	10-inch Pipeline[1]	LF	11440	$ 112	$ 1,281,280
3	12-inch Pipeline[1]	LF	8800	$ 125	$ 1,100,000
4	14-inch Pipeline[1]	LF	880	$ 150	$ 132,000
5	16-inch Pipeline[1]	LF	4290	$ 200	$ 858,000
6	18-inch Pipeline[1]	LF	240	$ 225	$ 54,000
7	20-inch Pipeline[1]	LF	450	$ 250	$ 112,500
8	24-inch Pipeline[1]	LF	8750	$ 250	$ 2,187,500
9	30-inch Pipeline[1]	LF	400	$ 300	$ 120,000
10	Fire Hydrants[1]	EA	104	$ 8,500	$ 884,000
11	Pressure Reducing Station	EA	2	$ 50,000	$ 100,000
12	Tank 1 - 3 MG Tank[2]	LS	1	$ 3,000,000	$ 3,000,000
13	Tank 2 - 3 MG Tank[2]	LS	1	$ 3,000,000	$ 3,000,000
14	Tank 3 - 3 MG Tank[2]	LS	1	$ 3,000,000	$ 3,000,000
15	Well & Well House	EA	1	$ 1,000,000	$ 1,000,000
				Subtotal	$ 17,829,280
				Contingency (15%)	$ 2,674,392
Total Project Costs					**$ 20,503,672**

[1] Quantities are for public distribution system only. Include air/vacuum valves, isolation valves, restrained joints, fittings, excavation, backfill.

[2] Includes tank foundation, tank accessories, on-site improvements/civil work, and on-site piping.

C. Permitting Requirements

Permits and approvals that may be required for design and construction of the on-site and off-site water systems include, but are not be limited to, the following:

- City Special Use Permits
- City Building Permits
- City SWPPP Permits
- City Erosion Control Permits
- City Encroachment Permit
- Nevada Division of Water Resources Water Right Permits
- Utility Environmental Protection Act (UEPA) Permit from Public Utilities Commission of Nevada (PUDN) for Transmission Main and Storage Tanks
- Nevada Department of Transportation (NDOT) Right-of-Way Occupancy Permit

- Nevada Division of Environmental Protection (NDEP) Bureau of Safe Drinking Water Application for Approval of a Water Project
- Review and Approvals by County, City, and GBWC

D. Construction Considerations

Considerations for design and construction of the on-site water facilities are summarized below:

- Utility conflicts: A thorough investigation of existing utilities along the water main alignments will need to be conducted during design including review of record drawings, coordination with utility companies, and potentially potholing.
- Special construction: Special construction (e.g. concrete encasement) may be required if minimum utility separations cannot be met within existing utility corridors.
- Connection to existing systems: Connection to the existing City of Fernley water mains will need to be coordinated and planned to minimize water service interruptions.
- Traffic control: Traffic control measures will need to be developed and implemented in accordance with the requirements of Fernley, NDOT, and the Manual on Uniform Traffic Control Devices.
- NDOT: Construction requirements and right-of-way occupancy permit terms will need to be incorporated into the design and considered for the project schedule.

IX. CONCLUSIONS

The preliminary water distribution system within the Mark IV Industrial Subdivision was designed using conservative land use estimates and sized to accommodate flows at all stages of development through build-out. The on-site system will connect to two existing pressure zones within the City of Fernley's distribution system (Pressue Zone 1 and Low Zone), will contain 10- to 30-inch diameter pipe, and will have four storage tanks (one existing and three proposed). Hydraulic modeling results and calculations show that the conceptual Mark IV water distribution system will be in compliance with all state and local regulations to meet required ADD, MDD, PHD, and fire flow scenarios. Exact phasing, sizing, and location of on-site infrastructure will be determined by development needs at the time of final design.

X. REFERENCES

[1] Office of Energy Efficiency & Renewable Energy, Federal Water Use Indices (Source: American Water Works Association 1996), May 2016. <http://energy.gov/eere/femp/federal-water-use-indices>

[2] Morales, Miguel A., Heaney, James P., Friedman, Kenneth R., and Martin, Jacqueline M. "*Estimating Commercial, Industrial, and Institutional Water Use on the Basis of Heated Building Area*." Journal American Water Works Association, June 2011, pp. 84-96.

[3] R. Brad Peters, "*City of Fernley Public Works Department 2008 Water Master Plan*", City of Fernley, June 2008

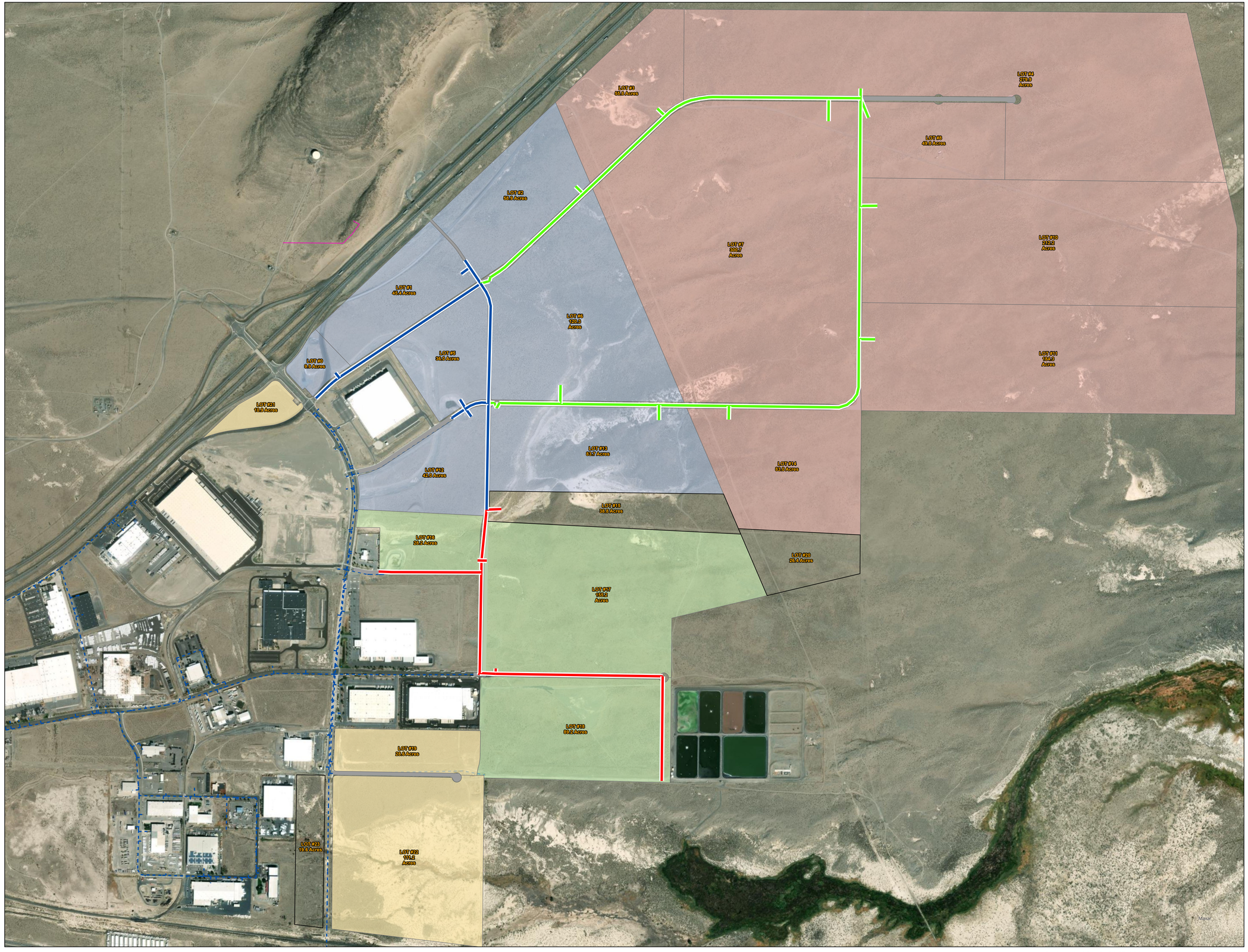
[4] City of Fernley Department of Public Works Design Standards, 4.0 – Potable Water System Distribution and Transmission Facilities, May 2008

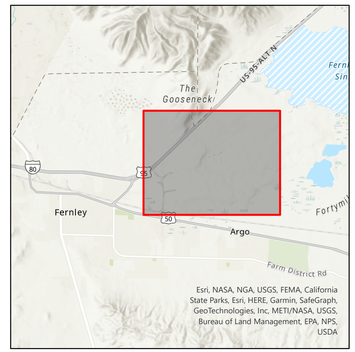
[5] City of Fernley Department of Public Works Design Standards, 7.0 – Water Storage Tanks, May 2008

[6] Cody R. Black, P.E., "NAC 445A Design Report – Victory Logistics Mark IV Building C Phase II", Shaw Engineering, May 2020

FIGURES

Figure 1: Preliminary Phasing





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PHASING MAP

VICTORY LOGISTICS TENTATIVE MAP

PAGE 1 OF 3

LEGEND

Water Pipelines
Scenario
- EAST
- SOUTH
- TANK
- WEST

Conceptual Lot Areas
Water Zone
- Northwest
- South
- Northeast
- Tie Into Existing
- No Water Demand
- Existing Water Infrastructure

N

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Feet

Projection: Transverse Mercator
Grid: NAD 1983 StatePlane Nevada West FIPS 2703 Feet
Datum: North American 1983
Created by: imahaffey

Date:	8/7/2023
Project #:	10067.008
Revision:	

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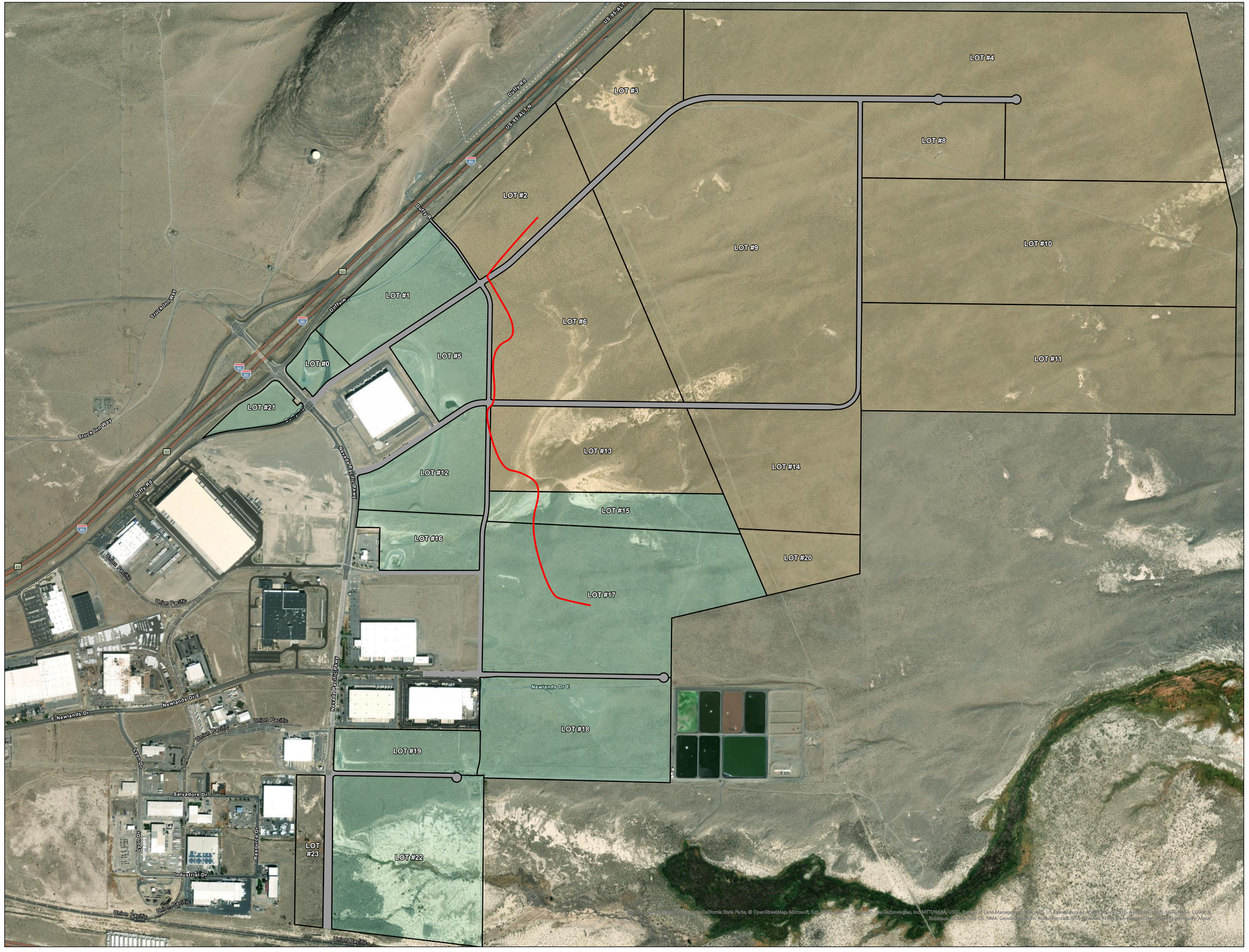
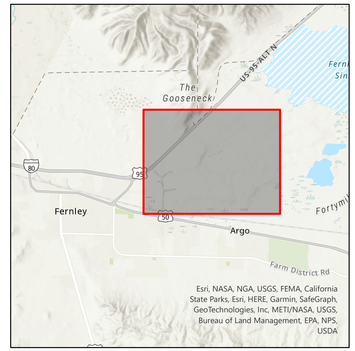
Figure 2: Preliminary Pressure Zones





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PRELIMINARY PRESSURE ZONES MAP

VICTORY LOGISTICS
TENTATIVE MAP

LEGEND

- Pressure Delimiter (HGL)
- Pump
  - Active
  - Inactive
- Reservoir
  - Active
  - Inactive
- Tank
  - Active
  - Inactive
- Valve
  - Active
  - Inactive
- Pipe
  - Active
  - Inactive
- Lot Assigned Pressure Zone
  - 1
  - 2
  - UNDETERMINED

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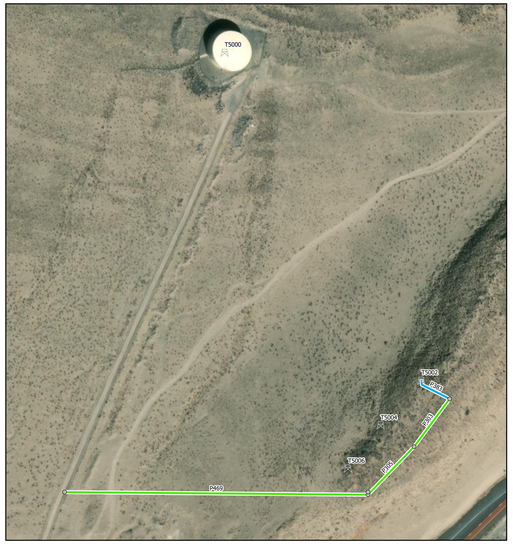
Figure 3: Preliminary On-Site Water System



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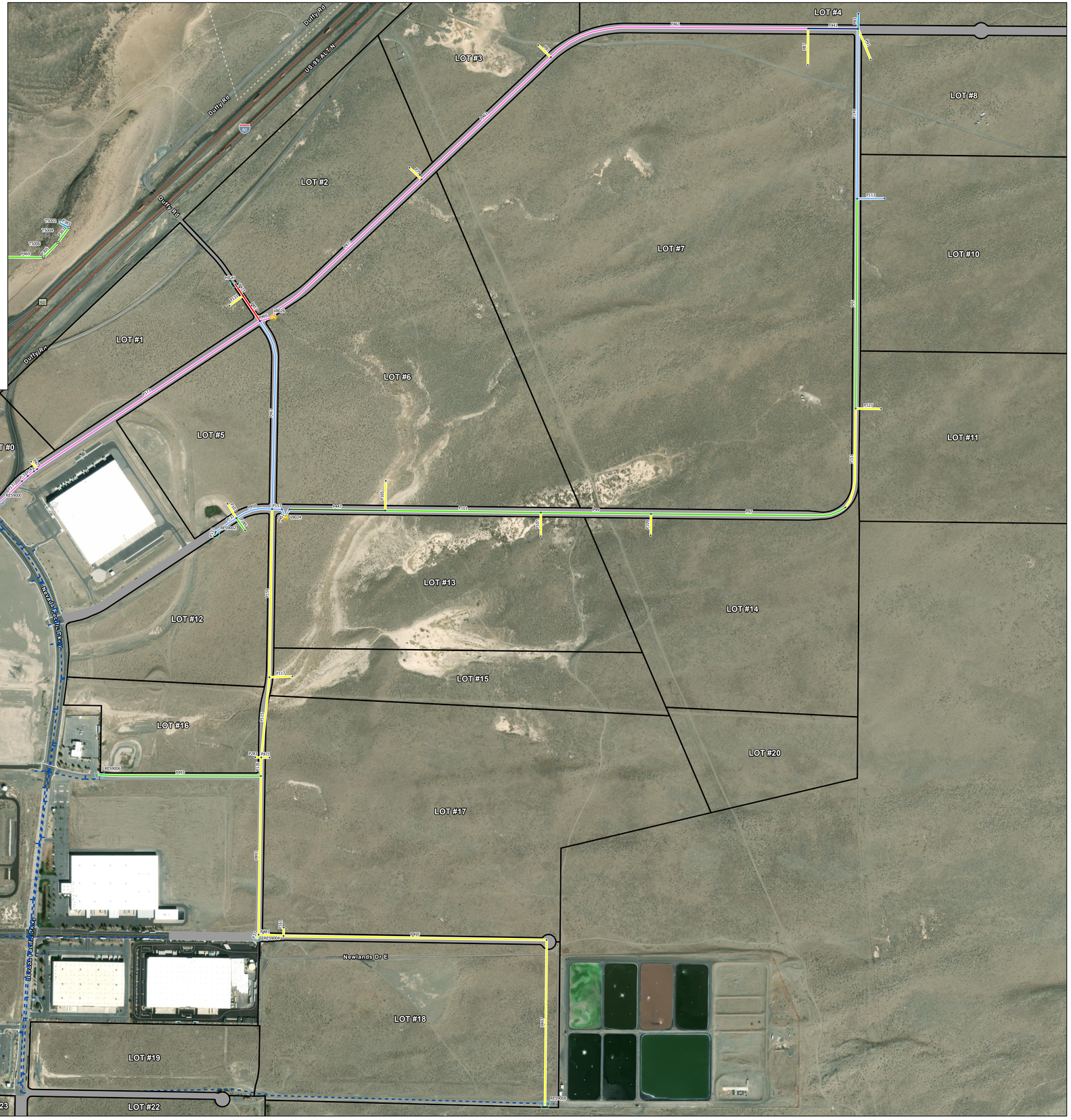

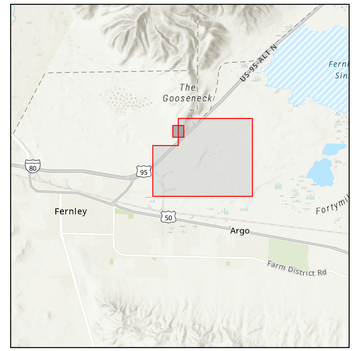

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PRELIMINARY WATER SYSTEM MAP

VICTORY LOGISTICS TENTATIVE MAP

LEGEND

- Lot Areas
- Pump
  - Active
  - Inactive
- Reservoir
  - Active
  - Inactive
- Tank
  - Active
  - Inactive
- Junction
  - Active
  - Inactive
- Valve
  - Active
  - Inactive
- Pipe
  - 10
  - 12
  - 14
  - 16
  - 18
  - 20
  - 24
  - 30
  - Existing Water
- Pipe
  - Pipe

N

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APPENDICES

Appendix A

Water Model Results

ID	Length (ft)	Diameter (in)	Roughness Coefficient	Flow (gpm)	Velocity (fps)
P-3	69.46	24	120	7262.75	5.15
P-31	225	16	130	4287	6.8
P-4	69	24	120	7263	5.2
P-5	35	24	120	7263	5.2
P101	1392	12	130	1320	3.7
P103	151	10	120	290	1.2
P105	266	10	120	222	0.9
P107	212	10	120	683	2.8
P109	191	10	120	677	2.8
P113	247	16	120	1709	2.7
P115	722	10	120	126	0.5
P117	207	10	120	7	0.0
P127	228	10	120	1484	6.1
P131	151	10	120	365	1.5
P133	21	14	130	4287	8.9
P135	166	10	120	-1354	5.5
P137	265	24	120	7263	5.2
P149	1520	16	130	3233	5.2
P151	904	10	130	40	0.2
P157	88	16	130	1542	2.5
P159	1505	10	120	132	0.5
P161	76	10	120	-165	0.7
P173	2395	24	120	7166	5.1
P283	56	10	120	-230	0.9
P285	137	12	120	-343	1.0
P37	32	10	120	-626	2.6
P441	448	20	130	5889	6.0
P447	859	14	130	1542	3.2
P449	75	16	130	1542	2.5
P451	76	16	130	1542	2.5
P457	273	30	130	-1956	0.9
P459	339	16	130	3654	5.8
P461	2375	24	130	6266	4.4
P463	1593	24	130	6716	4.8
P465	128	24	130	7190	5.1
P467	1718	16	100	-1980	3.2
P471	74	10	100	1250	5.1
P473	126	30	130	1590	0.7
P475	86	10	120	-97	0.4
P477	1763	24	130	7190	5.1
P479	54	24	120	7190	5.1
P481	224	10	120	110	0.5
P491	1420	10	120	-515	2.1
P493	1448	12	120	838	2.4

ID	Length (ft)	Diameter (in)	Roughness Coefficient	Flow (gpm)	Velocity (fps)
P495	2356	10	120	-54	0.2
P497	1475	10	120	-54	0.2
P79	153	10	120	474	1.9
P81	157	10	120	450	1.8
P83	137	18	120	2254	2.8
P87	327	10	120	378	1.5
P91	297	10	120	401	1.6
P95	1878	12	130	1524	4.3
P97	1756	12	120	-40	0.1
P99	986	12	130	637	1.8

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J100	0.00	4,086.49	4,246.25	69.23
J104	0.00	4,076.11	4,247.34	74.19
J108	0.00	4,115.98	4,253.23	59.47
J112	0.00	4,153.91	4,326.22	74.66
J120	0.00	4,152.72	4,328.55	76.19
J124	0.00	4,154.09	4,330.63	76.49
J128	0.00	4,124.76	4,325.96	87.18
J132	0.00	4,124.67	4,330.90	89.36
J148	0.00	4,140.16	4,320.01	77.93
J150	0.00	4,123.51	4,325.85	87.67
J24	0.00	4,145.72	4,320.04	75.53
J276	0.00	4,154.49	4,326.09	74.35
J278	0.00	4,154.82	4,255.53	43.64
J282	0.00	4,145.00	4,284.26	60.34
J284	0.00	4,111.06	4,330.95	95.28
J288	0.00	4,123.43	4,330.88	89.89
J296	0.00	4,123.63	4,327.93	88.52
J30	0.00	4,161.41	4,329.27	72.73
J32	0.00	4,161.41	4,329.40	72.79
J34	0.00	4,161.41	4,329.68	72.91
J36	0.00	4,160.04	4,329.95	73.62
J42	0.00	4,116.44	4,278.37	70.16
J58	0.00	4,109.81	4,273.67	71.00
J74	0.00	4,095.48	4,267.52	74.55
J78	0.00	4,092.64	4,265.00	74.68
J88	0.00	4,068.94	4,256.67	81.34
J92	0.00	4,094.80	4,246.28	65.64
J98	0.00	4,102.17	4,246.27	62.43
LOT0	97.21	4,161.00	4,329.26	72.91
LOT1	365.45	4,144.19	4,319.84	76.11
LOT10	1,709.16	4,070.58	4,256.18	80.42
LOT11	1,483.91	4,094.55	4,242.89	64.28
LOT12	342.57	4,151.00	4,328.49	76.91
LOT13	682.77	4,104.17	4,246.59	61.71
LOT14	676.98	4,090.51	4,245.59	67.20
LOT15	6.72	4,127.00	4,325.96	86.21
LOT16	229.69	4,124.40	4,325.82	87.28
LOT17	1,249.82	4,124.40	4,324.73	86.80
LOT18	164.63	4,120.00	4,330.86	91.37
LOT2	474.08	4,121.54	4,278.09	67.83
LOT3	449.60	4,111.37	4,273.42	70.21
LOT4	2,254.35	4,089.65	4,264.75	75.87
LOT5	289.90	4,153.93	4,328.44	75.62
LOT6	222.08	4,119.95	4,253.12	57.70
LOT7	377.62	4,102.00	4,267.13	71.55
LOT8	401.28	4,090.68	4,264.61	75.36

ID	Length (ft)	Diameter (in)	Roughness Coefficient	Flow (gpm)	Velocity (fps)
P-3	69.46	24	120	7218.75	5.12
P-31	224.5	16	130	3267.88	5.21
P-4	69.45	24	120	7218.75	5.12
P-5	34.73	24	120	7218.75	5.12
P101	1392.18	12	130	423.36	1.2
P103	151.16	10	120	195.35	0.8
P105	265.53	10	120	155	0.63
P107	212.01	10	120	460.01	1.88
P109	191.11	10	120	456.11	1.86
P113	247.39	16	120	1151.69	1.84
P115	721.56	10	120	-4.68	0.02
P117	207.32	10	120	6.72	0.03
P127	228.27	10	120	999.91	4.08
P131	150.67	10	120	246.25	1.01
P133	21.14	14	130	3267.88	6.81
P135	166.08	10	120	-1001.6	4.09
P137	265.41	24	120	7218.75	5.12
P149	1520.18	16	130	2644.36	4.22
P151	903.54	10	130	492.76	2.01
P157	87.64	16	130	578.36	0.92
P159	1504.83	10	120	2.04	0.01
P161	76.02	10	120	-114.9	0.47
P173	2394.75	24	120	7125.41	5.05
P283	55.87	10	120	-154.75	0.63
P285	137.14	12	120	-230.8	0.65
P37	32.41	10	120	-457.18	1.87
P441	448.13	20	130	4433.82	4.53
P447	859.19	14	130	578.36	1.21
P449	74.61	16	130	578.36	0.92
P451	75.61	16	130	578.36	0.92
P457	273.25	30	130	-4066.97	1.85
P459	339.16	16	130	2841.73	4.53
P461	2374.59	24	130	4697.37	3.33
P463	1592.83	24	130	5000.33	3.55
P465	128	24	130	5319.77	3.77
P467	1718.18	16	100	-2261.34	3.61
P471	74.06	10	100	842.17	3.44
P473	125.78	30	130	3820.72	1.73
P475	85.87	10	120	-93.34	0.38
P477	1762.53	24	130	5319.77	3.77
P479	54.38	24	120	5319.77	3.77
P481	223.93	10	120	75.75	0.31
P491	1420.3	10	120	-381.43	1.56
P493	1448	12	120	620.17	1.76

INFOWATER PIPE REPORT

ID	Length (ft)	Diameter (in)	Roughness Coefficient	Flow (gpm)	Velocity (fps)
P495	2355.97	10	120	-39.15	0.16
P497	1475.14	10	120	-39.15	0.16
P79	152.87	10	120	319.45	1.3
P81	157.1	10	120	302.96	1.24
P83	136.54	18	120	1519.06	1.92
P87	327.07	10	120	263.55	1.08
P91	297.43	10	120	270.4	1.1

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J100	0.00	4,086.49	4,254.53	72.81
J104	0.00	4,076.11	4,254.52	77.30
J108	0.00	4,115.98	4,255.24	60.34
J112	0.00	4,153.91	4,328.05	75.46
J120	0.00	4,152.72	4,329.52	76.61
J124	0.00	4,154.09	4,330.77	76.56
J128	0.00	4,124.76	4,328.05	88.09
J132	0.00	4,124.67	4,330.95	89.38
J148	0.00	4,140.16	4,320.04	77.94
J150	0.00	4,123.51	4,328.05	88.63
J24	0.00	4,145.72	4,320.15	75.58
J276	0.00	4,154.49	4,328.03	75.19
J278	0.00	4,154.82	4,255.61	43.67
J282	0.00	4,145.00	4,284.35	60.38
J284	0.00	4,111.06	4,330.97	95.29
J288	0.00	4,123.43	4,330.93	89.91
J296	0.00	4,123.63	4,329.24	89.09
J30	0.00	4,161.41	4,329.28	72.74
J32	0.00	4,161.41	4,329.42	72.80
J34	0.00	4,161.41	4,329.69	72.92
J36	0.00	4,160.04	4,329.96	73.63
J42	0.00	4,116.44	4,280.98	71.29
J58	0.00	4,109.81	4,278.26	72.99
J74	0.00	4,095.48	4,274.65	77.64
J78	0.00	4,092.64	4,273.16	78.22
J88	0.00	4,068.94	4,267.42	86.00
J92	0.00	4,094.80	4,257.42	70.47
J98	0.00	4,102.17	4,255.92	66.62
LOT0	93.34	4,161.00	4,329.28	72.91
LOT1	246.25	4,144.19	4,319.96	76.16
LOT10	1,151.69	4,070.58	4,267.18	85.19
LOT11	999.91	4,094.55	4,255.79	69.86
LOT12	230.80	4,151.00	4,329.49	77.34
LOT13	460.01	4,104.17	4,254.16	64.99
LOT14	456.11	4,090.51	4,254.21	70.93
LOT15	6.72	4,127.00	4,328.05	87.12
LOT16	154.75	4,124.40	4,328.04	88.24
LOT17	842.17	4,124.40	4,327.51	88.01
LOT18	114.90	4,120.00	4,330.92	91.39
LOT2	319.45	4,121.54	4,280.85	69.03
LOT3	302.96	4,111.37	4,278.14	72.26
LOT4	1,519.06	4,089.65	4,273.04	79.46
LOT5	195.35	4,153.93	4,329.46	76.06
LOT6	155.00	4,119.95	4,255.18	58.60
LOT7	263.55	4,102.00	4,274.45	74.72

ID	Length (ft)	Diameter (in)	Roughness Coefficient	Flow (gpm)	Velocity (fps)
P-3	69.46	24	120	7138.29	5.06
P-31	224.5	16	130	2539.44	4.05
P-4	69.45	24	120	7138.29	5.06
P-5	34.73	24	120	7138.29	5.06
P101	1392.18	12	130	-81.7	0.23
P103	151.16	10	120	117.96	0.48
P105	265.53	10	120	81.69	0.33
P107	212.01	10	120	280.07	1.14
P109	191.11	10	120	277.7	1.13
P113	247.39	16	120	695.47	1.11
P115	721.56	10	120	-120.32	0.49
P117	207.32	10	120	6.72	0.03
P127	228.27	10	120	603.81	2.47
P131	150.67	10	120	148.7	0.61
P133	21.14	14	130	2539.44	5.29
P135	166.08	10	120	-723.1	2.95
P137	265.41	24	120	7138.29	5.06
P149	1520.18	16	130	1938.74	3.09
P151	903.54	10	130	639.46	2.61
P157	87.64	16	130	0	0
P159	1504.83	10	120	-113.6	0.46
P161	76.02	10	120	-60.56	0.25
P173	2394.75	24	120	7072.91	5.02
P283	55.87	10	120	-94.22	0.38
P285	137.14	12	120	-140.52	0.4
P37	32.41	10	120	-310.8	1.27
P441	448.13	20	130	3019.33	3.08
P447	859.19	14	130	0	0
P449	74.61	16	130	0	0
P451	75.61	16	130	0	0
P457	273.25	30	130	-5933.39	2.69
P459	339.16	16	130	2280.96	3.64
P461	2374.59	24	130	3158.23	2.24
P463	1592.83	24	130	3341.18	2.37
P465	128	24	130	3534.08	2.51
P467	1718.18	16	100	-2394.56	3.82
P471	74.06	10	100	508.56	2.08
P473	125.78	30	130	5784.69	2.63
P475	85.87	10	120	-65.37	0.27
P477	1762.53	24	130	3534.08	2.51
P479	54.38	24	120	3534.08	2.51
P481	223.93	10	120	35.13	0.14
P491	1420.3	10	120	-275.68	1.13
P493	1448	12	120	447.42	1.27

INFOWATER PIPE REPORT

ID	Length (ft)	Diameter (in)	Roughness Coefficient	Flow (gpm)	Velocity (fps)
P495	2355.97	10	120	-25.43	0.1
P497	1475.14	10	120	-25.43	0.1
P79	152.87	10	120	192.9	0.79
P81	157.1	10	120	182.95	0.75
P83	136.54	18	120	917.31	1.16
P87	327.07	10	120	138.9	0.57
P91	297.43	10	120	163.28	0.67
P95	1878.02	12	130	1243.27	3.53

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J100	0.00	4,086.49	4,264.04	76.93
J104	0.00	4,076.11	4,263.66	81.26
J108	0.00	4,115.98	4,263.63	63.98
J112	0.00	4,153.91	4,329.10	75.91
J120	0.00	4,152.72	4,330.07	76.85
J124	0.00	4,154.09	4,330.86	76.60
J128	0.00	4,124.76	4,329.29	88.62
J132	0.00	4,124.67	4,330.97	89.39
J148	0.00	4,140.16	4,320.09	77.97
J150	0.00	4,123.51	4,329.39	89.21
J24	0.00	4,145.72	4,320.31	75.65
J276	0.00	4,154.49	4,329.10	75.65
J278	0.00	4,154.82	4,263.63	47.15
J282	0.00	4,145.00	4,284.42	60.41
J284	0.00	4,111.06	4,330.99	95.29
J288	0.00	4,123.43	4,330.97	89.93
J296	0.00	4,123.63	4,330.04	89.44
J30	0.00	4,161.41	4,329.32	72.76
J32	0.00	4,161.41	4,329.45	72.81
J34	0.00	4,161.41	4,329.72	72.93
J36	0.00	4,160.04	4,329.98	73.64
J42	0.00	4,116.44	4,282.83	72.10
J58	0.00	4,109.81	4,281.55	74.41
J74	0.00	4,095.48	4,279.81	79.87
J78	0.00	4,092.64	4,279.08	80.79
J88	0.00	4,068.94	4,275.85	89.66
J92	0.00	4,094.80	4,268.73	75.36
J98	0.00	4,102.17	4,266.29	71.11
LOT0	65.37	4,161.00	4,329.32	72.93
LOT1	148.70	4,144.19	4,320.06	76.21
LOT10	695.47	4,070.58	4,275.76	88.90
LOT11	603.81	4,094.55	4,268.09	75.19
LOT12	140.52	4,151.00	4,330.06	77.59
LOT13	280.07	4,104.17	4,263.52	69.04
LOT14	277.70	4,090.51	4,263.91	75.14
LOT15	6.72	4,127.00	4,329.29	87.65
LOT16	94.22	4,124.40	4,329.38	88.82
LOT17	508.56	4,124.40	4,329.18	88.73
LOT18	60.56	4,120.00	4,330.97	91.41
LOT2	192.90	4,121.54	4,282.78	69.86
LOT3	182.95	4,111.37	4,281.50	73.72
LOT4	917.31	4,089.65	4,279.04	82.06
LOT5	117.96	4,153.93	4,330.05	76.31
LOT6	81.69	4,119.95	4,263.61	62.25
LOT7	138.90	4,102.00	4,279.75	77.02
LOT8	163.28	4,090.68	4,279.01	81.60

Appendix B

Shaw Engineering Technical Memorandum

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Technical Memorandum

TO: Camille Buehler, P.E., P.L.S

THRU: Derek Starkey, P.E.

FROM: Cody Black, P.E. CB

Owen Wurgler, E.I. OW

RE: Mark IV Industrial Water and Sewer Master Planning Memo

Background

Mark IV Industrial Park is a planned commercial development located North of the existing Wastewater Treatment Plan and east of Nevada Pacific Parkway in Fernley, Nevada. The detailed occupancy of the Industrial Park is estimated to be a mixture of industrial manufacturing, industrial warehouses and limited general commercial. Mark IV Industrial Park is planned to be served by Fernley's Water and Sewer Systems. Offsite infrastructure will be required to accommodate the development and is the subject of this memorandum.

Purpose

The objective of this report is to determine the required onsite and offsite infrastructure required for phased construction and ultimate buildout. This memorandum will accompany sewer and water discoveries under a separate cover. This report elaborates on the plan for the buildout of the offsite infrastructure described in the aforementioned documents.

Discussion

Water System Infrastructure

The City of Fernley currently operates six groundwater wells with a firm production capacity of 8.65 MGD and total production capacity of 12.32 MGD. The groundwater is then conveyed to the City's Water Treatment Plant which has an operating capacity of 20 MGD with the option to upgrade to 30 MGD with the construction of a surface water diversion structure from the TCID Canal and additional treatment facility improvements. The treated water is then stored in 4 tanks totaling 7.0 MG of storage. The City's existing average day demand and maximum day demand are 3.09 MGD and 6.50 MGD, respectively. Utilizing production and storage capacity design criteria from the City of Fernley 2020 Draft Water Master Plan, the required capacity for critical system infrastructure have been calculated and listed in Table 1.

Table 1: Existing Water System Capacity

Item	Existing	Required
Firm Production Capacity	8.65 MGD	MDD = 6.50 MGD
*Total Production Capacity**	12.32 MGD	-
Storage Capacity	7.0 MG	5.475 MG
Treatment Capacity	20 MGD	MDD=6.50 MGD

Mark IV Offsite Phase 1W: Existing System Mark IV Buildout (6% Supply of Manufacturing Scenario)

Mark IV Offsite Phase 1W includes the initial construction Mark IV onsite facilities with no improvements to public infrastructure other than the distribution mains required to serve the buildings. Capacity of the existing system is limited by storage in the tanks and distribution system capacity. The City of Fernley has enough storage capacity to provide service to approximately 411 Equivalent Residential Connections (ERC's). In order to develop without offsite water improvements, the demand of the first phase of buildings must not exceed the fixture unit equivalent of 411 ERC's (600 GPM MDD). Demand of the buildings will depend upon occupancy type and size. Despite having the minimum required storage across the system, The Mark IV Industrial Park is heavily reliant, and therefore restricted by the ability to fill the Northeast Tank which, at this moment, does not have a high pressure main with a PRV nearby to help tank levels recover. Phase 1W correlates with Figure 1 and Report 1 included as attachments. Table 2 below lists the available infrastructure capacity and the required infrastructure capacity after the construction of 411 ERC's.

Table 2: Phase 1W Water System Capacity

Item	Phase 1W System Capacity	Existing System Demand	Excess Capacity	Phase 1W Project Demand	Remaining Capacity
Firm Production Capacity	8.65 MGD	6.50 MGD	2.15 MGD	0.86 MGD	1.26 MGD
Total Production Capacity	12.32 MGD	6.50 MGD	5.82 MGD	0.86 MGD	4.96 MGD
Storage Capacity	7.0 MG	5.48 MG	1.52 MG	1.41 MG	0.11 MG
Treatment Capacity	20 MGD	6.50 MGD	13.5 MG	0.86 MGD	12.64 MG

1) Available capacity must be more than required capacity

Mark IV Offsite Phase 2Wa: High Pressure Main Extension and Water Supply (23% to 33% Supply of Manufacturing Scenario)

Mark IV Offsite Phase 2Wa includes the construction of a high-pressure main extension. In order to increase maximum day demand and fire flow capacities to the Mark IV Industrial Park, the City's high-pressure main must be extended from upstream of the Mesa PRV to Mission Way. This will provide anywhere from 1,250 additional ERC's (1,822 GPM MDD) to 2,000 additional ERC's (2,916 GPM MDD) to the existing system depending on the extent of the high pressure main and distribution main upgrades/extensions. To serve the larger demands, The high-pressure main can be extended to connect directly into the Mark IV industrial Park through a PRV which will provide the additional capacity and allow storage tanks to recover quickly. Should the timing of Phase 2Wa and 2Wb not correlate with the expansion of the Water Treatment Plant, additional groundwater wells will need to be drilled or alternative means of water supply will need to be explored in order to meet the demand of the development and the system.

Mark IV Offsite Phase 2Wb: Mark IV Storage Tanks (23% to 33% Supply of Manufacturing Scenario)

Mark IV Offsite Phase 2Wb includes the construction of multiple storage tanks with phased construction timelines. The extension of the High-Pressure Main is essential to supply the Mark IV Industrial Park; however, the Draft 2020 Water Master Plan dictates minimum storage requirements for the system. The system currently has 0.8 MG of surplus storage which is approximately 475 ERC's.

To meet storage requirements for the system Mark IV must construct Storage Tanks as new services come online. Construction of all storage tanks to supply build-out demand immediately is not required; however, it should be considered by both the City and developer when deciding tank locations and sizes. Phase 2Wa and 2Wb correlates with Figure 2 and Report 2 included as attachments.

Table 3: Phase 2W Water System Capacity

Item	Phase 2W System Capacity	Phase 1W System Demand	Excess Capacity	Phase 2W Project Demand	Remaining Capacity
Firm Production Capacity	8.65 MGD	7.36 MGD	1.29 MGD	4.20 MGD	-2.91 MGD
Total Production Capacity	12.32 MGD	7.36 MGD	4.96 MGD	4.20 MGD	0.76 MGD
Storage Capacity	10.5 MG	6.89 MG	3.61 MG	3.39 MG	0.22 MG
Treatment Capacity	20 MGD	7.36 MGD	12.64 MGD	4.20 MGD	8.44 MGD

1) Available capacity must be more than required capacity

Mark IV Offsite Phase 3W: Water Treatment Plant Surface Water Intake and Treatment Upgrades (100% Supply of Manufacturing Scenario)

The City of Fernley Water Treatment Plant was designed for an operating capacity of 20 MGD, the complete build-out of the Mark IV Industrial Park with 100% manufacturing occupancy would exceed this capacity. When the water treatment plant was designed and constructed, it was planned to be able to be upgraded to 30 MGD in the future. Upgrades to the WTP have been reported on previous studies to include the construction of a surface water intake from the TCID Canal, three additional flocculation and sedimentation basins, four additional microfiltration trains, 2 additional solids handling ponds with a clarifier and thickening unit, an additional clear well tank, and two additional high service pumps. The City is currently constructing a surface water intake from the TCID Canal and work is beginning on updated analysis for treating surface water at the plant. There are many factors which may change in the coming years which will impact the plants ability to both treat surface water as well as treat flow up to and in excess of 20 MGD. It is reasonable to assume there will be some improvements required to the water treatment plant for 100% manufacturing in the Mark IV Industrial Park. Due to current well and surface water delivery plans, additional water resources will also likely be required to meet these higher manufacturing occupancy demands.

Table 4: Phase 3W Water System Capacity

Item	Phase 3W System Capacity	Phase 2W System Demand	Excess Capacity	Phase 3W Project Demand	Remaining Capacity
Intake and Diversion Capacity	30 MGD	11.56 MGD	18.44 MGD	9.57 MGD	8.87 MGD
Storage Capacity	18 MG	11.56 MG	6.44 MG	6.44 MG	0 MG
Treatment Capacity	30 MGD	11.56 MGD	18.44 MGD	9.57 MGD	8.87 MGD

1) Available capacity must be more than required capacity

Sewer System Infrastructure

The City of Fernley currently operates multiple Lift Stations and the City's East Wastewater Treatment Plant. The existing wastewater treatment plant inflow is approximately 1.55 MGD and its maximum

treatment capacity is 3.05 MGD. Per the 2009 Sewer Master Plan, the wastewater treatment plant must begin expansion design once its inflow reaches 2.29 MGD or 75% of design capacity and begin construction once inflow reaches 2.59 MGD or 85% design capacity. The Mark IV Industrial Park will not rely on any existing lift stations for service with the exception of a small portion located south of Newlands Drive which will gravity to the East Lift Station and subsequently the East Wastewater Treatment Plant.

Mark IV Offsite Phase 1S: Existing System (8% of Average Day Flow)

In its current state, the system can provide service to area of the Mark IV industrial Park which can be served via gravity. Lumos and Associates estimated the average day flow via gravity to be 104 gpm (0.15 MGD).

Mark IV Offsite Phase 2S: Lift Station Construction (55% of Average Day Flow)

To serve a majority of the Mark IV Industrial Park, multiple lift stations will need to be constructed. It appears a majority of the Mark IV Industrial Park can be served by 2 or 3 lift stations. The buildout of the Lift Stations and subsequently the Mark IV Industrial Park is dependent on the available capacity of the wastewater treatment Plant. The existing wastewater treatment plant can accommodate an inflow of 514 gpm or 0.74 MGD before the expansion design needs to begin, and construction will need to begin when the Industrial Park reaches an inflow of 722 gpm or 1.04 MGD.

Mark IV Offsite Phase 3S: WWTP Expansion and Lift Station Completion (100% of Average Day Flow)

To accommodate the Average Day Flow from the Mark IV Industrial Park, the East Wastewater Treatment Plant must expand to a minimum capacity of 3.50 MGD. This expansion does not include the construction of any other large developments within the City. Expansion capacity will be determined during the design phase after the inflow has reached 2.29 MGD.

As part of the current sewer master plan update, the City is reviewing potential expansion options for the East Wastewater Treatment Plant. Initially, an expansion of the lagoon treatment ponds appears to be the most cost effective, however options for transitioning to a mechanical plant are also being reviewed.

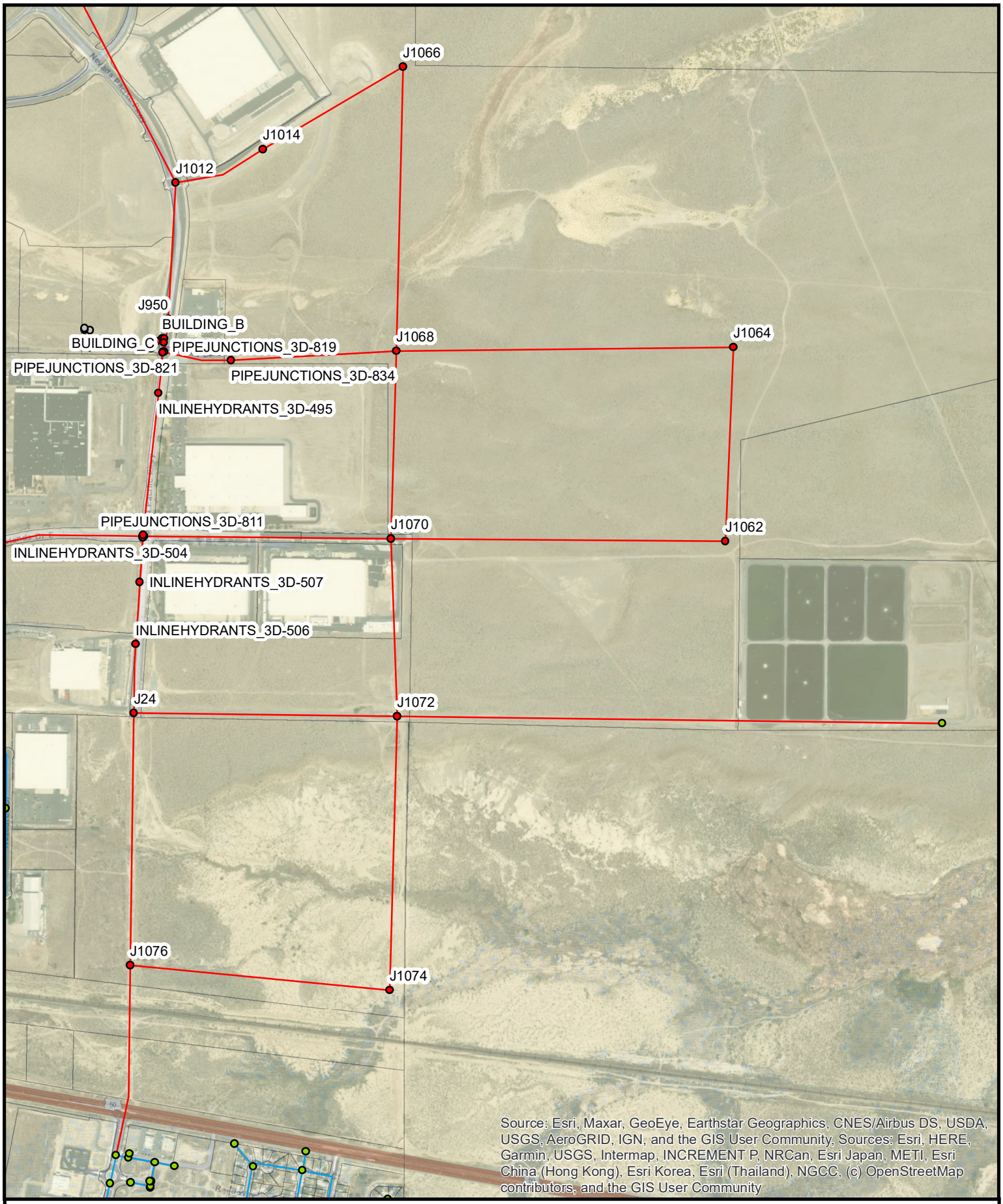
Attachments:

Figure 1: Mark IV Industrial Park 600 GPM Interim Modeling

Figure 2: Mark IV Industrial Park Full Build out Modeling

Report 1: Mark IV Industrial Park 600 GPM Results

Report 2: Mark IV Industrial Park Full Build Out Results



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1 " = 1,000 '

Figure 1: Mark IV Industrial Park 600 GPM Interim Modeling

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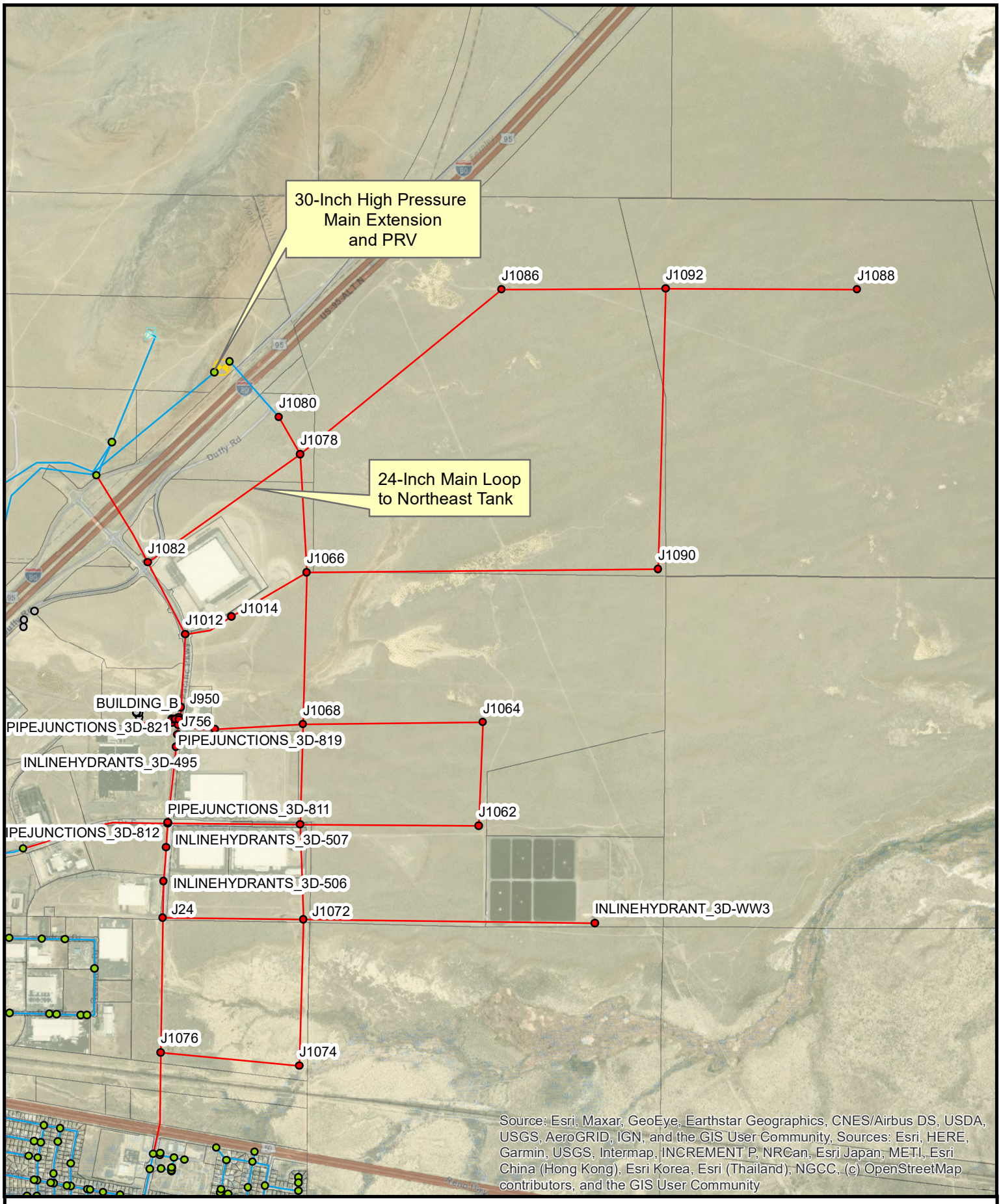

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N

1 " = 1,868 '

Figure 2: Mark IV Industrial Park Build Out Modeling

SHAW ENGINEERING
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Table 1: Mark IV Industrial Park 600 GPM Interim Build out- MDD+FF					
ID	Static Demand (gpm)	Static Pressure (psi)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Hydrant Available Flow (gpm)
INLINEHYDRANTS_3D-495	0	88.04	1,000.00	86.17	12,995.29
INLINEHYDRANTS_3D-502	0	88.24	1,000.00	86.38	13,017.85
INLINEHYDRANTS_3D-504	0	89.06	1,000.00	87.18	13,291.25
INLINEHYDRANTS_3D-505	0	88.84	1,000.00	86.96	13,270.05
INLINEHYDRANTS_3D-506	0	91.39	1,000.00	89.4	12,968.75
INLINEHYDRANTS_3D-507	0	90.55	1,000.00	88.62	13,184.92
J1012	0	84.31	1,000.00	82.55	12,799.68
J1062	99.99	92.97	4,000.00	55.55	6,026.73
J1064	99.99	89.51	4,000.00	52.05	5,857.21
J1066	99.99	74.12	4,000.00	48.7	6,368.17
J1068	99.99	88.31	4,000.00	72.07	9,851.74
J1072	99.99	91.47	4,000.00	71.85	8,916.24
J1074	99.99	99.7	4,000.00	71.82	7,575.23

Table 2: Mark IV Industrial Park Build Out-MDD+FF					
ID	Static Demand (gpm)	Static Pressure (psi)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Hydrant Available Flow (gpm)
INLINEHYDRANTS_3D-495	0	79.59	1,000.00	77.44	15,082.77
INLINEHYDRANTS_3D-502	0	79.81	1,000.00	77.67	15,222.69
INLINEHYDRANTS_3D-504	0	80.49	1,000.00	78.29	14,983.55
INLINEHYDRANTS_3D-505	0	80.28	1,000.00	78.08	14,964.10
INLINEHYDRANTS_3D-506	0	82.7	1,000.00	80.31	14,110.33
INLINEHYDRANTS_3D-507	0	81.93	1,000.00	79.65	14,624.98
INLINEHYDRANT_3D-WW3	2.2	80.93	1,500.00	54.09	2,406.95
J1012	0	77.74	1,000.00	76.22	18,359.42
J1062	675.27	81.9	4,000.00	52.77	7,355.11
J1064	675.27	78.46	4,000.00	49.46	7,121.72
J1066	675.27	67.09	4,000.00	58.44	14,075.23
J1068	675.27	78.73	4,000.00	65.96	12,763.84
J1070	675.27	76.36	4,000.00	62.00	11,551.58
J1072	675.27	81.26	4,000.00	62.96	10,027.14
J1074	675.27	89.56	4,000.00	66.28	9,049.32
J1076	675.27	83.93	4,000.00	69.46	12,521.11
J1078	675.27	78.73	4,000.00	77.73	34,321.27
J1080	675.27	84.25	4,000.00	83.68	35,475.38
J1082	675.27	77.94	4,000.00	76.67	38,542.24
J1086	675.27	87.55	4,000.00	76.84	14,055.01
J1088	675.27	93.44	4,000.00	32.77	5,188.37
J1090	675.27	90.66	4,000.00	62.50	7,844.01
J1092	675.27	97.36	4,000.00	82.98	12,665.67

PRELIMINARY SEWER REPORT

for

VICTORY

LOGISTICS | DISTRICT

TENTATIVE INDUSTRIAL SUBDIVISION

Prepared For:
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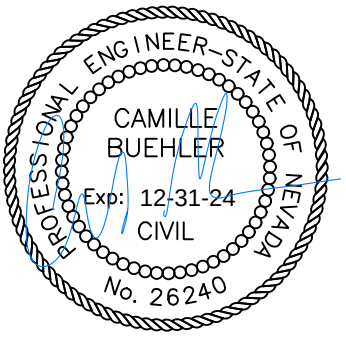

09/15/2023

JN 10067.008
AUGUST 2023

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September 14, 2023

I. INTRODUCTION

The Mark IV Industrial Subdivision is located south of I-80, north of US-50 Alt and east of Nevada Pacific Parkway in Northeast Fernley, Nevada. The Master Developer, M4 New Fernley QOZB, LLC, holds property between I-80 and US-50 Alt. The Mark IV Subdivision consists of approximately 2,174 acres comprised of the following parcels: 021-201-01, 021-201-16, 021-211-02, 021-211-04, 021-211-06, 021-242-11, 021-242-17, 021-251-25, 021-261-43, 021-261-44, and 021-211-03. The Mark IV properties reside within Sections 3, 4, 5, 6, 7, 8, 17, and 18, T20N, R25E in Fernley, Nevada.

The proposed Mark IV Industrial Subdivision consists of 31 proposed lots to be used for distribution/light industrial, manufacturing, data center/high tech, and retail purposes. As such, 26 Conceptual developable lots were utilized out for the purpose of conceptual connection points.

Wastewater generated from Mark IV will be collected through a network of gravity sewer pipelines to 3 public lift stations and ultimately conveyed to the City of Fernley East Wastewater Treatment Facility (EWWTP) on East Newlands Road. The purpose of this report is to provide tentative map design recommendations for the conceptual on-site sewer system.

Projected sewer flows and design recommendations presented in this report are at the conceptual level based on preliminary development areas, lot counts, and lot sizes. Sewer flows and infrastructure design will be updated as necessary during the final planning stages of each development area. The final sewer flows and design of all infrastructure will ultimately be reviewed by and coordinated with the City of Fernley Department of Public Works prior to the issuance of any will-serves or approvals associated with sewer service for the project.

II. EXISTING SEWER SYSTEM

The City of Fernley currently has a network of sewer mains, trunk mains, sewer interceptors, and lift stations that all flow to the City's EWWTP. The EWWTP has a total capacity of 3.05 MGD. The plant currently operates at an average peak flow of 1.70 MGD.

The only location anticipated to tie into the existing gravity system is in the proposed Gavin Road extension. At this location, a 42 inch interceptor runs from west to east. The 42 inch interceptor is discharged into the East Lift Station. The remaining lots will discharge to proposed lift stations, which will eventually discharge and tie into the EWWTP influent splitter box.

III. SEWER FLOWS

Preliminary flow projections to be used in designing the on-site sewer system are described below.

A. Sewer Generation Factors

The Mark IV Industrial Subdivision is in the City of Fernley. Recommended design criteria for sewer generation and peaking factors are based upon the City of Fernley Sewer Master Plan [4] as follows:

- Industrial Average Daily Flow (ADF): 1,000 gallons per day (gpd)/acre
- Gravity System Peaking factor: 2.1 (applied to ADF to establish peak flows for gravity sewer)

1,000 gallon per day per acre is the City of Fernley recommendation for industrial sewer generation, and is therefore utilized at this time. Lumos recognizes that this value is generalized and could lead to under or over estimates of sewer generations. During final design, better estimates should be provided based on land use anticipation. Sewer generation can typically be estimated at 60-80% of the actual water demands. With future information on tenants and building size, this methodology can be utilized to better estimate sewer generation.

Peaking factors from 1.5 to 2.1 were observed based on Industrial flow monitoring provided by Shaw Engineering. 2.1 was chosen to be conservative.

B. Projected Sewer Flows

Projected sewer flows by phase are summarized in Table 1. The total peak flow is estimated at 3.9 million gallons per day (mgd) for the gravity system using a peaking factor of 2.1.

Table 1: Projected Sewer Flows

Lot	Area	Average Flow		Peak Flow		Downstream Connection
	(acres)	(gpd)	(gpm)	(gpd)	(gpm)	
Lot #0	9.89	9,890	6.9	20,769	14.4	Lift Station #1
Lot #1	45.38	45,380	31.5	95,298	66.2	Lift Station #1
Lot #2	58.87	58,870	40.9	123,627	85.9	Lift Station #1
Lot #3	55.83	55,830	38.8	117,243	81.4	Lift Station #1
Lot #4	279.94	279,940	194.4	587,874	408.2	Lift Station #1
Lot #5	36.00	36,000	25.0	75,600	52.5	Lift Station #1
Lot #6	120.33	120,330	83.6	252,693	175.5	Lift Station #2
Lot #7	204.60	204,600	142.1	429,660	298.4	Lift Station #2
Lot #8	49.83	49,830	34.6	104,643	72.7	Lift Station #1
Lot #10	212.24	212,240	147.4	445,704	309.5	Lift Station #1
Lot #11	184.27	184,270	128.0	386,967	268.7	Lift Station #2
Lot #12	42.00	42,000	29.2	88,200	61.3	Lift Station #2
Lot #13	83.71	83,710	58.1	175,791	122.1	Lift Station #2
Lot #14	83.00	83,000	57.6	174,300	121.0	Lift Station #2
Lot #15*	38.84	-	-	-	-	N/A
Lot #16	28.16	28,160	19.6	59,136	41.1	Lift Station #3
Lot #17	155.20	155,200	107.8	325,920	226.3	Lift Station #3
Lot #18	89.20	89,200	61.9	187,320	130.1	Lift Station #3
Lot #19	28.57	28,570	19.8	59,997	41.7	Gravity
Lot #20*	26.42	-	-	-	-	N/A
Lot #21	10.87	10,870	7.5	22,827	15.9	Gravity
Lot #22	111.18	111,180	77.2	233,478	162.1	Private Lift Station
Lot #23*	19.61	-	-	-	-	N/A
Lot #24*	4.38	-	-	-	-	N/A
Lot #25*	27.47	-	-	-	-	N/A
Total	**1,995.90**	**1,879,180**	**1,305.0**	**3,946,278**	**2,740.5**	
*Does not have any sewer generation due being undeveloped (ie. Rail transload)						

IV. DESIGN CRITERIA

A. Gravity Sewer System

The City of Fernley and Mark IV are planning to enter into an agreement whereby the Mark IV on-site gravity sewer system will be owned and maintained by the City of Fernley. For this reason, design criteria for the on-site gravity system are based upon CFDPW Standards [1] as summarized below. In addition to the CFDPW Standards, recommendations in the Ten State Standards will also be considered (e.g. minimum pipeline slopes) [3].

Gravity Pipelines

- Pipe sizing: peak flows for gravity system
- Minimum pipeline diameter: 8-inch

- Minimum velocity: 2.0 feet per second (fps) when flowing half full
- Manning's roughness coefficient "n": 0.012
- Pipe material: SDR 35 PVC pipe
- Maximum depth of flow (depth/diameter: d/D): 0.75

Manholes

- Placed at all intersections, angle points, and grade changes
- Maximum spacing of 400 feet (ft) on straight line runs for pipes 12-inches or less
- Maximum spacing of 500 ft on straight line runs for pipes over 12-inches
- Type and size:
  - 48-inch diameter Type 1 for sewer pipes equal to less than 15-inch diameter at depths less than 18 ft
  - 60-inch diameter Type IA for sewer pipes between 18-inch diameter and greater at depths greater than 5 ft
- Invert elevation (IE):
  - Exit IE should be 0.1 ft below entrance IE(s) for same diameter pipe sizes
  - Crown elevations should match for pipes of different diameter intersecting at a manhole

B. Lift Station

Recommended design criteria for the on-site lift station based on CFDPW Standards [1] and industry standards are provided below:

- Lift station sizing: peak flows for pressure system
- Minimum number of pumps: 2 (1 duty + 1 standby), each designed to pump 100% of peak flow
- Pump type: submersible
- Minimum cycle time between pump starts: 6-10 minutes
- Filling time of wet well: maximum of 30 minutes per 10 State Standards [4]
- Wet well cross-section: to be determined

Additional Lift Station Notes:

- Central Screening at the EWWTP
- Variable Frequency Drives at all lift stations to allow for operational flexibility.
- 2 hours minimum of peak emergency storage in all lift station collection systems.
- Bypass pump connections.
- Generators with ATS at each lift station with Level III sound attenuating enclosures for all generators.
- Odor control systems where warranted.
- Fenced / secure sites with screening (CMU wall or landscaping).
- Cranes systems for pump lift-out for any stations with large pumps/motors
- Materials of construction per City standards and public works director requirements.
- Mixers are required for all lift stations.

C. Sewer Force Main

Recommended design criteria for the off-site sewer force main based on CFDPW [1] and industry standards are provided below:

- Force main sizing: peak flow for pressure system
- Minimum depth of cover: 48-inches
- Velocity: 3 fps minimum / 8 fps maximum
- Pipe material: HDPE or epoxy lined and coated DIP (per City requirements)
- Hazen-Williams roughness coefficient, "C": 140 (HDPE)
- Assumed discharge elevation at City of Fernley Wastewater Treatment Plant: 4,122.8 ft

D. Additional Notes

All interceptor manholes and force main discharge structures shall be lined or otherwise designed to combat hydrogen sulfide attached (lining material shall be to the satisfaction of the Public Works Director.)

V. EVALUATION OF SEWER FACILITIES

A. Gravity Sewer System

The backbone gravity sewer network was designed given preliminary road alignments and finish grades within the Mark IV Development. To size the gravity sewer pipelines, the conceptual network was modeled using Innovyze InfoSWMM Software. Input to the sewer model included physical data (pipe lengths, alignments, and grade elevations) and sanitary loads (peak flows) for each sewer contribution area. The model generated minimum required pipeline sizes and slopes using the design criteria outlined in Section III.A (roughness coefficients, maximum depth of flow, minimum velocities, and minimum depths of cover). The preliminary, on-site, gravity sewer network is presented in Figure 2. In addition, sewer model output is provided in Appendix A. The gravity sewer system will be phased to match the growth of the development; however, all downstream sewer infrastructure will be required to be built out to full-build-out sizes, instead of a reduced/temporary condition. The phasing is shown in Figure 1.

Total preliminary pipeline lengths for the backbone gravity sewer network are summarized in Table 2.

Table 2: Preliminary Pipeline Lengths for Backbone Gravity Sewer Network

Pipe Size (inches)	Pipe Length[1] (LF)
8	8930
10	7990
12	1310
15	50
18[2]	10

[1] Preliminary Quantities for backbone collection system only.
[2] The short length of 18 inch pipe is the anticipated pipe that collects all three lift stations flows and discharges into the EWWTP Splitter.

B. Wet Well Location and Sizing

The preliminary location for the on-site lift stations are within the Mark IV boundary as shown on Figures 1 and 2. Any proposed lift stations located near or within the 100-year flood zone will have the top of the structure and electrical components built above the 100-year flood elevation to mitigate flooding hazards as required by Nevada Division of Environmental Protection (NDEP).

The lift stations will be sized to handle buildout flows from the Mark IV development. Sizing of the lift station wet wells are a factor of the minimum cycle time between pump starts, reserve volume, minimum pump submergence, pump spacing requirements, and the IEs of incoming gravity sewer pipelines. During final design, wet well dimensions will be verified and coordinated with the pump manufacturer (e.g. minimum spacing requirements between pumps could result in larger wet well than anticipated). Ultimate sizing for emergency conditions or backup power/pumping will be coordinated with City of Fernley prior to final design.

C. Sewer Force Main Alignment

Wastewater collected at the on-site lift stations will be pumped to The City of Fernley Wastewater Treatment Plant via force main for distances listed in Table 3. The preliminary force main alignments are presented in Figure 2 and described in Paragraph D below:

Table 3: Preliminary Pipeline Lengths for Force Mains

Pipe Size (inches)	Pipe Length (LF)
4	5,870
6	31,560
8	12,980

D. Pump and Force Main Sizing

Preliminary pump and force main sizing calculations were performed using total pressure system peak flows anticipated for the development. System curves were generated for various combinations of force main diameters and compared with pump curves. A preliminary pump and force main sizing summary is presented in Table 4. Lift Stations 1-3 will have 1 to 2 force mains with 2-3 pumps. The advantage of multiple force mains and duty pumps is to provide operational flexibility in handling a range of sewer flows as each lot is developed. Further variations of the lift station pump arrangement may also be evaluated during the final design to ensure the most efficient and economical pump arrangement.

Table 4: Preliminary Pump and Force Main Sizing Summary

Reference Section IV.A for future pump and force main design requirements.

Initial sewer flows will be significantly lower than total flows projected at full build out due to the Mark IV Industrial Subdivision being developed in phases. To avoid oversized pumps/wet well and high operating costs for initial sewer flows, smaller initial pumping systems and/or interim lift stations will be considered. An upstream manhole could be used as an interim lift station in conjunction with smaller pump(s), or the lift station wet wells could be partitioned to optimize time between pump starts. Additional smaller diameter force mains and the phasing are shown during different phases of peak flow of the development in Table 4.

Additionally, several private lift stations may be necessary based on site layout and actual demands. The private lift stations will be constructed, maintained, and operated privately. Private lift stations are intended to serve single properties, have duplex pumps where each pump is capable of pumping peak flows, backup generators, and emergency storage if gravity overflow isn't available.

E. City of Fernley Waste Water Treatment Plant

The City of Fernley Waste Water Treatment Plant has a total capacity of 3.05 MGD. The plant currently operates at an average peak flow of 1.70 MGD.

The City of Fernley is required to begin planning the expansion of the treatment plant at 85% capacity, which is at 2.59 MPG total average peak flow. In industrial zoning, that is approximately 576 acres of additional development before the planning of the expansion is required. It should be noted that this value is contingent on tenant generation, land use, and building size per lot. The capacity of the EWWTP will be evaluated at each subsequent phase of the development to determine the required steps at the time.

The expansion of the plant will be coordinated with The City of Fernley.

VI. CONCEPTUAL SEWER SYSTEM RECOMMENDATIONS

A. System Description

The on-site backbone sewer system will consist of approximately 3.3 miles of gravity sewer pipeline ranging from 8-inch to 18-inch diameter. Buildout peak flows for the gravity system are estimated at 3.95 mgd. Preliminary options for the lift stations include a square or rectangular wet wells. Final wet well dimensions and shape will be determined during design. A duplex pump system (1 duty + 1 standby) to triplex pump system (2 duty + 1 standby) is proposed with the various lift stations, with preliminary motor sizes ranging from 5 to 60 horsepower (hp) each.

As design of the overall system is furthered, there will need to be additional alternatives for phasing buildout and efficient use of infrastructure. Mark IV is dedicated to providing adequate utility buildout for any tenant, and will work with the City of Fernley to provide infrastructure that is capable of expanding with tenant growth while reducing maintenance and overall costs.

B. Opinion of Probable Costs

A Class 5 Engineer's opinion of probable costs is presented in Table 5. The presented Engineer's opinion of probable costs are "whole" project estimates that include construction phase costs. It should be noted that the presented opinions of probable costs are strictly conceptual in nature and may differ significantly from actual construction costs. These costs reflect the Engineer's impression of material, equipment, labor, etc. at the time of the estimate based on experience and judgement in applying presently available data. The engineer has no control over cost of labor, materials, equipment, competitive bidding practices, market conditions, tariffs, costs associated with funding packages, inflation, etc. Thus, the engineer cannot warrant that the actual project costs will not vary from the Engineer's opinion of probable cost.

Table 5: Preliminary Opinion of Probable Construction Costs

Item	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization and Demobilization	LS	1	$ 500,000	$ 500,000
2	8-inch Gravity Pipeline	LF	8,930	$ 100	$ 893,000
3	10-inch Gravity Pipeline[1]	LF	7,990	$ 112	$ 894,880
4	12-inch Gravity Pipeline[1]	LF	1,310	$ 125	$ 163,750
5	15-inch Gravity Pipeline[1]	LF	50	$ 150	$ 7,500
6	18-inch Gravity Pipeline[1]	LF	10	$ 200	$ 2,000
7	Manholes[1]	EA	56	$ 7,000	$ 392,000
8	Lift Station #1	LS	1	$ 1,500,000	$ 1,500,000
9	Lift Station #2	LS	1	$ 1,300,000	$ 1,300,000
10	Lift Station #3	LS	1	$ 1,000,000	$ 1,000,000
11	4-inch Force Main[2]	LF	5,868	$ 70	$ 410,760
12	6-inch Force Main[2]	LF	31,554	$ 80	$ 2,524,320
13	8-inch Force Main[2]	LF	12,972	$ 100	$ 1,297,200
				Subtotal Sewer	$ 10,885,410
				Contingency (15%)	$ 1,632,812
				Total	**$ 12,518,222**

[1] Quantities are for backbone collection system only. Includes fittings, excavation, backfill, restoration to finish grade, connection to structures.

[2] Includes restrained joints, fittings, excavation, backfill, restoration to finish grade/pavement replacement, traffic control.

C. Permitting Requirements

Permits and approvals that may be required for construction of the on-site and off-site sewer system will include, but not be limited to, the following:

- City Special Use Permits
- City Building Permits
- City SWPPP Permits
- City Erosion Control Permits
- City Encroachment Permit

D. Construction Considerations

Considerations for design and construction of the on-site and off-site sewer system are summarized below:

- Phasing: Sewer infrastructure will be phased to match the growth of the development, with the lift stations planned for construction with the initial phase.
- Easements: Utility easements will need to be obtained for any portions of the force main alignment through public property.
- Utility conflicts: A thorough investigation of existing utilities along the force main alignment will need to be conducted during design including review of record drawings, coordination with utility companies, and potentially potholing.

- Connection at EFWWTP: Available capacity and discharge location at the EWWTP will need to be coordinated with The City of Fernley.
- Traffic control: Traffic control measures will need to be developed and implemented in accordance with the requirements of City of Fernley, and the Manual on Uniform Traffic Control Devices.
- NDOT: Construction requirements and right-of-way occupancy permit terms will need to be incorporated into the design and considered for the project schedule.

VII. CONCLUSIONS

Wastewater generated from The Mark IV Industrial Subdivision will be collected by a gravity sewer network and conveyed to several on-site lift stations. From the on-site lift stations, wastewater will be conveyed to EWWTP, just east of the southern portion of the project via various force mains during different phases of the project. Sewer infrastructure will be phased to match the growth of the development, with the lift stations sized with initial phases. The final layout and sizing of sewer infrastructure will be determined during final design. Future expansion of the existing EWWTP will be required with the development of this project, as well as coordination with the City of Fernley.

VIII. REFERENCES

[1] City of Fernley Department of Public Works, *Design Standards & Review Guidelines,* May 2008.
< https://www.cityoffernley.org/DocumentCenter/View/2017/08-Sanitary-Sewer-System >

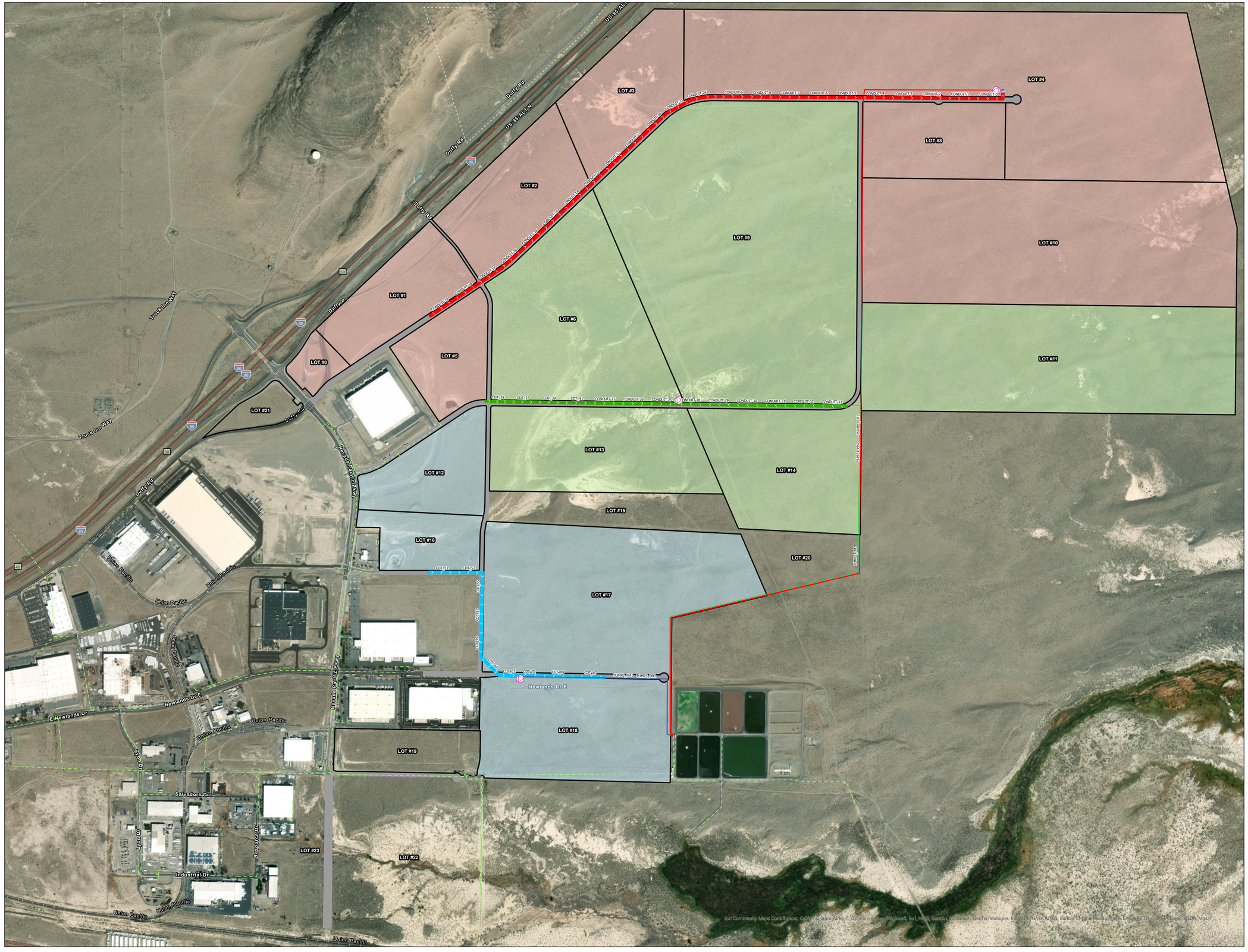
[2] Metcalf & Eddy, *Wastewater Engineering: Treatment and Resource Recovery,* 2014.

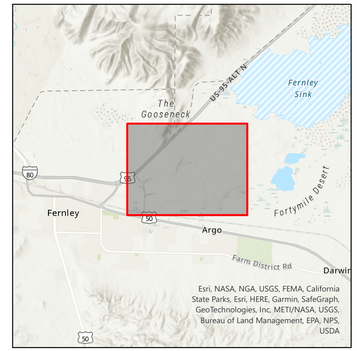
[3] Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, *Recommended Standards for Wastewater Facilities (10 State Standards)*, Health Research, Inc., 2014.

[4] City of Fernley Department of Public Works, 2009 Sewer Master Plan, February 2009

FIGURES

Figure 1: Preliminary Sewer Phasing Map





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PHASING MAP

VICTORY LOGISTICS TENTATIVE MAP

LEGEND

- Sewer Outfall
- Sewer Lift Station
- Sewer Storage

Sewer Alignments

Sewer Grouped Scenarios

- Central Lift Station - Gravity
- Central Lift Station - FM
- North Lift Station - Gravity
- North Lift Station - FM
- South Lift Station - Gravity
- South Lift Station - FM
- Existing Sewer Lines

Sewer Lot Phasing

- North Lift Station
- Central Lift Station
- South Lift Station
- Tie into Existing Gravity

N

Paper Size: 24" x 36"

0 250 500

Feet

Projection: Transverse Mercator
Grid: NAD 1983 StatePlane Nevada West FIPS 2703 Feet
Datum: North American 1983
Created by: imahaffey

Date:	Aug, 2023
Project #:	10067.008
Revision:	

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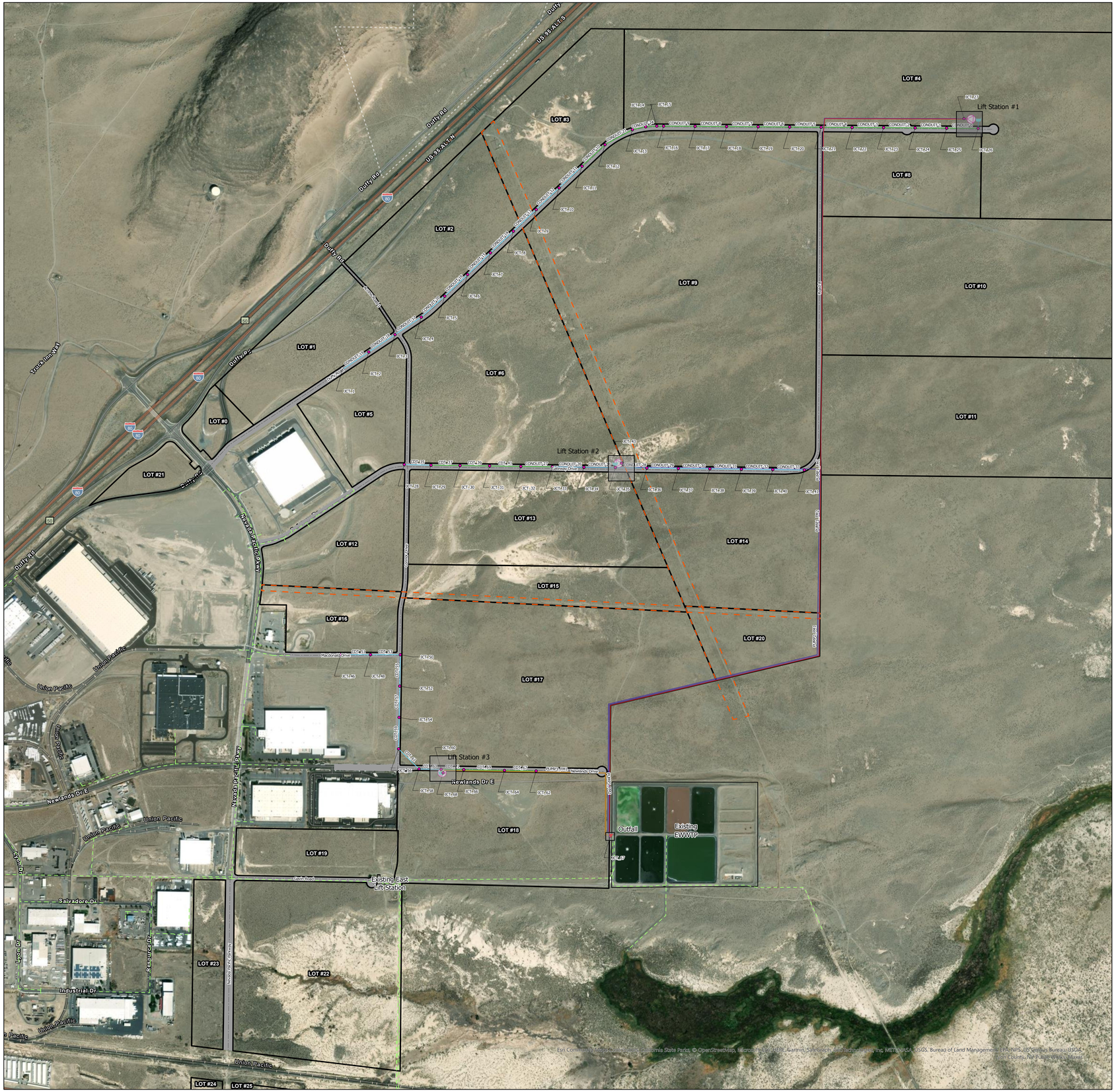
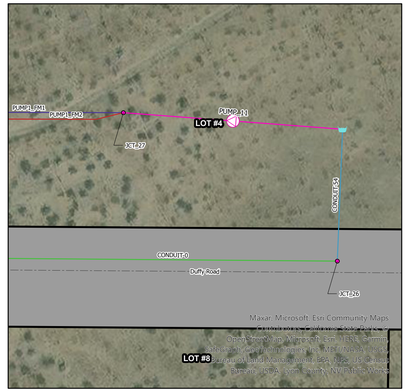
Figure 2: Preliminary Sanitary Sewer Layout





Lift Station #1
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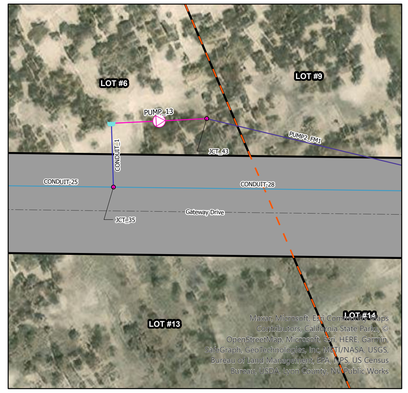

Lift Station #2
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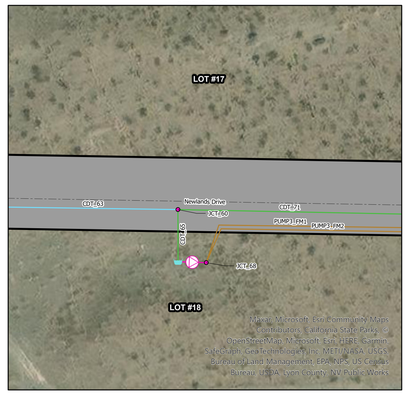

Lift Station #3
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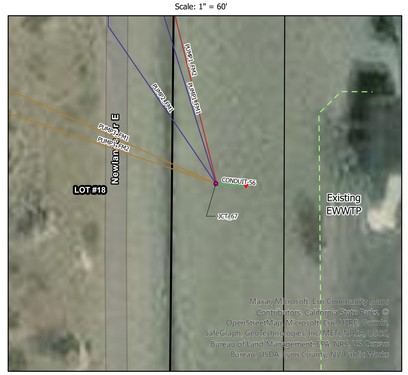

Outfall
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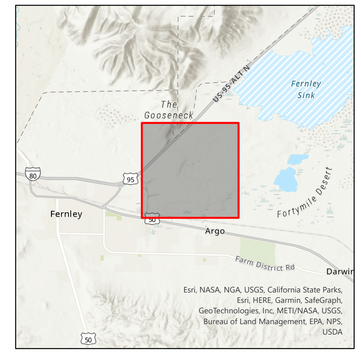

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PRELIMINARY SANITARY SEWER LAYOUT MAP

VICTORY LOGISTICS TENTATIVE MAP

LEGEND

- 8" Gravity
- 10" Gravity
- 12" Gravity
- 15" Gravity
- 18" Gravity
- 4" Force Main
- 6" Force Main
- 8" Force Main

Lot Areas
- Lot Areas
- Easements
- Sewer Outfall
- Sewer Storage
- Sewer Lift Station
- Existing Sewer Lines
- Road_Centerlines

N

Paper Size: 24" x 36"

0 600 1,200
Feet

Projection: Transverse Mercator
Grid: NAD 1983 StatePlane Nevada West FIPS 2703 Feet
Datum: North American 1983
Created by: imahaffey

Date:	Aug, 2023
Project #:	10067.008
Revision:	

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APPENDICES

Appendix A

Sewer Model Output

Mark IV Tentative Map

INFOSWMM Output

ID	Length (ft)	Slope (%)	Flow (cfs)	Velocity (ft/s)	Capacity d/D
CDT_35	339	4.0	0.1	4.0	0.16
CDT_37	369	4.0	0.1	3.7	0.12
CDT_39	375	4.0	0.1	3.7	0.12
CDT_41	396	4.0	0.1	1.4	0.24
CDT_51	379	0.5	0.1	1.8	0.22
CDT_53	379	0.5	0.1	1.6	0.22
CDT_55	399	0.5	0.1	1.6	0.22
CDT_57	397	0.5	0.1	1.6	0.23
CDT_59	400	0.5	0.1	1.9	0.20
CDT_61	364	1.9	0.1	2.7	0.15
CDT_63	281	3.0	0.1	2.0	0.19
CDT_65	44	24.5	0.9	2.6	0.60
CDT_67	401	0.5	0.8	3.2	0.51
CDT_69	517	0.5	0.8	2.9	0.55
CDT_71	287	0.5	0.8	4.0	0.39
CONDUIT_1	53	1.0	2.3	4.8	0.42
CONDUIT-0	400	0.4	0.7	2.6	0.48
CONDUIT-1	400	0.4	0.7	2.5	0.49
CONDUIT-10	400	0.4	0.5	2.1	0.44
CONDUIT-11	400	0.4	0.5	2.5	0.55
CONDUIT-12	400	0.4	0.5	2.3	0.58
CONDUIT-13	400	0.4	0.5	2.4	0.57
CONDUIT-14	400	0.4	0.5	2.4	0.57
CONDUIT-15	400	0.6	0.5	2.5	0.54
CONDUIT-16	400	2.5	0.3	2.4	0.39
CONDUIT-17	400	2.9	0.3	4.2	0.26
CONDUIT-18	400	0.9	0.3	3.2	0.31
CONDUIT-19	400	0.5	0.3	2.5	0.39
CONDUIT-2	400	0.4	0.7	2.6	0.48
CONDUIT-20	400	2.9	0.3	4.2	0.26
CONDUIT-21	400	0.4	0.7	2.5	0.49
CONDUIT-22	87	0.6	0.7	2.7	0.46
CONDUIT-23	140	0.4	0.7	2.7	0.47
CONDUIT-24	173	0.4	0.7	2.5	0.50
CONDUIT-25	399	0.5	0.4	1.4	0.40
CONDUIT-26	401	0.5	0.4	2.4	0.27
CONDUIT-27	400	0.5	0.4	2.5	0.34
CONDUIT-28	400	1.2	1.5	4.2	0.48
CONDUIT-29	400	1.3	0.6	3.0	0.55
CONDUIT-3	400	0.4	0.7	2.6	0.48
CONDUIT-30	400	1.3	0.6	3.9	0.46
CONDUIT-31	400	1.0	0.6	3.6	0.48
CONDUIT-32	399	0.4	0.6	2.7	0.61
CONDUIT-33	401	0.4	0.8	4.2	0.69
CONDUIT-4	393	0.4	0.7	2.6	0.48

Mark IV Tentative Map

INFOSWMM Output

ID	Length (ft)	Slope (%)	Flow (cfs)	Velocity (ft/s)	Capacity d/D
CONDUIT-5	400	0.4	0.7	2.6	0.48
CONDUIT-54	110	5.0	2.4	8.9	0.38
CONDUIT-56	8	2.4	4.6	5.8	0.47
CONDUIT-6	400	0.4	0.7	2.5	0.49
CONDUIT-7	400	0.4	0.7	2.5	0.49
CONDUIT-8	400	0.4	0.7	2.5	0.49
CONDUIT-9	400	0.4	0.7	2.5	0.49
PUMP1_FM1	12998	0.3	0.6	3.1	1.00
PUMP1_FM2	12973	0.3	1.3	3.7	1.00
PUMP2_FM1	9292	0.7	1.9	4.8	1.00
PUMP3_FM1	2934	1.3	0.4	5.1	1.00

TRAFFIC IMPACT STUDY

FOR

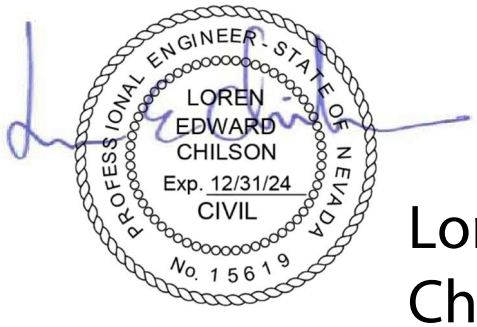
VICTORY

August 3, 2023

PREPARED FOR:

Mark IV Capital, Inc.

PREPARED BY:



Loren E Chilson

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Headway Transportation, LLC
5482 Longley Lane, Suite B, Reno, Nevada 89511
775.322.4300
www.HeadwayTransportation.com

YOUR QUESTIONS ANSWERED QUICKLY

Why did you perform this study?

This Traffic Impact Study evaluates the potential traffic impacts associated with the proposed Victory tentative map project in Fernley, Nevada. This study of potential transportation impacts was undertaken for planning purposes and to assist in determining what traffic controls or mitigations may be needed to reduce potential impacts.

What does the project consist of?

For the purposes of the traffic impact study, the project consists of approximately:

- 574 acres of Manufacturing
- 39 acres of Transload and Switching Facility
- 1,129 acres of Distribution/Fulfillment Center
- 288 acres of Data Center
- 16 acres of Retail/Commercial
- 5 acres of Gas Station

The project is anticipated to be constructed in phases over a 20 year period.

How much traffic will the project generate?

The project is expected to generate up to 46,347 Daily, 3,654 AM peak hour, and 4,152 PM peak hour net new trips to the adjacent roadway network. It should be noted that the land use mix, quantities, and location of specific uses will change as this large scale project develops over roughly 20 years. Any mix of land uses/quantities generating less than the number of peak hour trips above is considered equivalent from a traffic impact perspective.

What improvements will be needed?

The following **Improvement List & Timing Table**, and **Figures 14 through 16**, list the traffic improvements needed for build-out of the tentative map area, the timing of the recommended improvements, and the funding category for each. The recommended lane configurations and controls at the study intersections are shown on **Figure 11** and the number of lanes and roadway configuration for Nevada Pacific Parkway are shown on **Figures 12A** and **12B**.

Several roadways will be constructed and/or widened with the project. Adequate right-of-way width should be dedicated within the tentative map boundaries to accommodate anticipated improvements. The project roadways should be built with the right-of-way widths and classifications shown on **Figure 13**. Note that additional right-of-way will be necessary at intersections for turn lanes and on specific segments of Nevada Pacific Parkway for the lane configurations shown on **Figures 11, 12A,** and **12B**.

Victory: Traffic System Phasing Plan

ID	Location	Improvement	Trigger	Funding Category
1	US 95A/US 50A/Main St (Roundabout)	Construct traffic signal and the lane configurations shown in Exhibit 2	When constructed by NDOT	Excluded (NDOT)
2	Nevada Pacific Parkway/ I-80 WB Ramps	Construct traffic signal	When warranted and approved by NDOT	Regional
3	Nevada Pacific Parkway/ Duffy Road	Construct traffic signal	When warranted and approved by NDOT	
4	Nevada Pacific Parkway/ Gateway Drive	Construct traffic signal	Prior to exceeding LOS D, subject to warrants being met	
5	Nevada Pacific Parkway/ E. Newlands Drive	Construct traffic signal	Prior to exceeding LOS D, subject to warrants being met	
6	Nevada Pacific Parkway Extension – between E. Newlands Drive and US 50A	Complete connector road with 110 feet of right-of-way to include 3 through lanes in each direction plus left- and right-turn lanes per cross sections provided in **Appendix G**	Prior to exceeding PM peak hour project trip generation of 1,480 trips (approximately 35 percent of the total project trips)	
7	Nevada Pacific Parkway/ US 50A	Construct intersection including the following lane configurations: - NB – 2 left-turn lanes, 1 through lane, 1 right-turn lane - SB – 2 left-turn lanes (1 pocket), 1 through lane, 1 free right-turn lane - EB – 2 left-turn lanes, 2 through lanes, 1 right-turn lane - WB – 1 left-turn lane, 2 through lanes, 1 free right-turn lane	Prior to exceeding PM peak hour project trip generation of 1,480 trips (approximately 35 percent of the total project trips) This improvement is anticipated to occur with construction of the Nevada Pacific Parkway Extension	
8	Nevada Pacific Parkway/ E. Newlands Drive	Add a northbound lane transitioning to a drop right-turn lane at Newlands	Prior to exceeding PM peak hour project trip generation of 1,480 trips (approximately 35 percent of the total project trips) This improvement is anticipated to occur with construction of the Nevada Pacific Parkway Extension	
9	Nevada Pacific Parkway/ Gavin Road	Construct the following lane configurations: - NB 1 left-turn lane, 2 through lanes, 1 shared through/right-turn lane - SB – 1 left-turn pocket, 2 through lane, 1 shared through/right-turn lane - EB – 1 left-turn lane, 1 shared through/right-turn lane - WB – 1 left-turn lane, 1 shared through/right-turn lane	Prior to exceeding PM peak hour project trip generation of 1,480 trips (approximately 35 percent of the total project trips) This improvement is anticipated to occur with construction of the Nevada Pacific Parkway Extension	
10	US 95A/E. Newlands Drive	Add overlap phasing for the northbound right-turn movement and optimize signal timing	Prior to intersection exceeding LOS D	

ID	Location	Improvement	Trigger	Funding Category
11	US 95A/Fremont Street	Add a southbound right-turn pocket	When constructed by NDOT	Excluded (NDOT)
12	Nevada Pacific Parkway/ I-80 WB Ramps (east half of bridge)	Construct second bridge at interchange Add second northbound left-turn lane and northbound through lane across the I-80 bridge	When constructed by NDOT, ideally prior to exceeding LOS D or PM peak hour trip generation of 1,480 project trips	
13	Nevada Pacific Parkway/ I-80 EB Ramps	Construct traffic signal	When warranted and approved by NDOT	Regional
14	Nevada Pacific Parkway I-80 EB Ramps to Duffy Rd	Add a second northbound through lane	After the Nevada Pacific Parkway Extension is constructed, then prior to exceeding LOS D or PM peak hour trip generation of 1,480 project trips	
15	Nevada Pacific Parkway/ Duffy Road	Add a second southbound left-turn lane Add a southbound right-turn pocket Add a second westbound left-turn lane Add a channelized (yield controlled) westbound right-turn lane	After the Nevada Pacific Parkway Extension is constructed, then prior to exceeding LOS D or PM peak hour trip generation of 1,480 project trips	
16	Nevada Pacific Parkway Duffy Rd to Gateway Dr	Add a third northbound through lane	After the Nevada Pacific Parkway Extension is constructed, then prior to exceeding LOS D or PM peak hour trip generation of 1,480 project trips	
17	Nevada Pacific Parkway/ Gavin Road	Construct traffic signal	Prior to exceeding LOS D, subject to warrants being met	
18	Nevada Pacific Parkway/ Gateway Drive	Add a second southbound left-turn lane Add a second westbound left-turn lane Add a channelized (yield controlled) westbound right-turn lane Add an eastbound left-turn lane	Prior to exceeding LOS D or PM peak hour trip generation of 2,300 project trips	
19	Connor Drive/Duffy Road	Construct traffic signal	If/when signal warrant criteria is met	Required
20	Connor Drive/Gateway Drive	Construct traffic signal	If/when signal warrant criteria is met	
21	Duffy Road	Construct / Widen Roadway Nevada Pacific Pkwy to Connor Drive	With adjacent development	Regional
22	Duffy Road	Construct Roadway East of Connor Drive	With adjacent development	Required
23	Gateway Drive	Construct / Widen Roadway Nevada Pacific Pkwy to Connor Drive	With adjacent development	Regional
24	Gateway Drive	Construct Roadway East of Connor Drive	With adjacent development	Required
25	MacDonald Drive	Construct / Widen Roadway Nevada Pacific Pkwy to Connor Drive	With adjacent development	Regional
26	E. Newlands Drive	Construct Roadway East of Connor Drive	With adjacent development	Required
27	Gavin Road	Construct Roadway East of Nevada Pacific Parkway	With adjacent development	Required
28	Access Road 1	Roadway Improvements - Realigned Duffy Road to Victory property line R/W to remain NDOT's	Concurrent with Duffy Road realignment	Regional
29	Connor Drive	Construct Roadway Duffy Rd to E. Newlands Drive	With adjacent development	Required
30	Road A	Construct Roadway Duffy Road to Gateway Drive	With adjacent development	Required

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INTRODUCTION

This report presents the findings of a Traffic Impact Study completed to assess the potential traffic impacts on local intersections associated with the Victory tentative map project in Fernley, Nevada. This traffic impact study has been prepared to document existing traffic conditions, quantify traffic volumes generated by the proposed project, identify potential impacts, document findings, and make recommendations to mitigate impacts. The location of the project is shown on **Figure 1** and the conceptual land use plan is shown on **Figure 2**.

Study Area and Evaluated Scenarios

The tentative map area consists of 2,174 acres of which 2,050 acres is parcels anticipated to be developed with data center, distribution/fulfillment center, warehousing/manufacturing, and commercial uses. The project is located east and west of Nevada Pacific Parkway, south of Interstate 80 (I-80), and north of US 50A. The study intersections were identified as the locations most likely to be impacted by project traffic and are shown on **Figure 1**. The following intersections are included in this study:

- US 95A/I-80 Westbound Ramps
- US 95A/I-80 Eastbound Ramps
- US 95A/E. Newlands Drive
- US 95A/Fremont Street
- US 95A/US 50A/Main Street
- E. Newlands Drive/Stanley Drive
- Nevada Pacific Parkway/I-80 Westbound Ramps
- Nevada Pacific Parkway/I-80 Eastbound Ramps
- Nevada Pacific Parkway/Duffy Road
- Nevada Pacific Parkway/Gateway Drive
- Nevada Pacific Parkway/MacDonald Drive
- Nevada Pacific Parkway/E. Newlands Drive
- Nevada Pacific Parkway/Gavin Road
- Nevada Pacific Parkway/US 50A
- Connor Drive/Duffy Road *(plus project only)*
- Connor Drive/Gateway Drive *(plus project only)*

This study includes analysis of both the weekday AM and PM peak hours as these are the periods of time in which peak traffic is anticipated to occur. The evaluated development scenarios are:

- Baseline Conditions – includes existing traffic volumes plus traffic generated by approved/in process, but not yet built projects described in the following reports:
  - *Traffic Impact Study for Victory Logistics District Phase 1 (Buildings A, B, & C)*, Headway Transportation, January 2020
  - *Traffic Impact Study for Victory Logistics District Building D-2,* Headway Transportation, December 2021

- *Traffic Impact Study for 1200 Fremont Street Apartments,* Headway Transportation, July 2021
- *Traffic Impact Study for Nevada Pacific Boulevard Commercial Development,* Headway Transportation, January 2022 (south of US 50A)

- Baseline Plus Project Conditions
- Future Year Conditions (20-year horizon) – assumes completion of the Nevada Pacific Parkway extension from E. Newlands Drive to US 50A
- Future Year Plus Project Conditions

ANALYSIS METHODOLOGY

Level of service (LOS) is a term commonly used by transportation practitioners to measure and describe the operational characteristics of intersections, roadway segments, and other facilities. This term equates seconds of delay per vehicle at intersections to letter grades "A" through "F" with "A" representing optimum conditions and "F" representing breakdown or over capacity flows.

Intersections

The complete methodology for intersection level of service analysis is established in the *Highway Capacity Manual (HCM), 6th Edition*, published by the Transportation Research Board (TRB). **Table 1** presents the delay thresholds for each level of service grade at signalized and unsignalized intersections.

Table 1: Level of Service Definition for Intersections

Level of Service	Brief Description	Average Delay (seconds per vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Free flow conditions.	< 10	< 10
B	Stable conditions with some affect from other vehicles.	10 to 20	10 to 15
C	Stable conditions with significant affect from other vehicles.	20 to 35	15 to 25
D	High density traffic conditions still with stable flow.	35 to 55	25 to 35
E	At or near capacity flows.	55 to 80	35 to 50
F	Over capacity conditions.	> 80	> 50

Source: *Highway Capacity Manual, 6th Edition*

Level of service calculations were performed for the study intersections using the Synchro 11 software package with analysis and results reported in accordance with *HCM* methodology.

Level of Service Policy

City of Fernley

The *City of Fernley Comprehensive Master Plan* (August 15, 2018) includes the following level of service policy:

The minimum Level of Service on all city maintained roadways shall be LOS D. The City will work with representatives from NDOT to ensure timely improvements are planned when NDOT roadways are forecast to fall below LOS D.

Nevada Department of Transportation

The Nevada Department of Transportation (NDOT) *Traffic Impact Study Requirements* publication states:

Level of service "C" will be the design objective for capacity and under no circumstances will less than level of service "D" be accepted for site and non-site traffic

Hence, LOS "D" was used as the threshold criteria for this analysis. Note, this policy is not specific to side street movements, as traffic engineering practitioners recognize that LOS E/F conditions for a side street approach, during peak hour(s), do not necessarily indicate an intersection failure or the need for mitigation. Context of the volumes and intersection location are important in these cases.

EXISTING CONDITIONS

Roadway Facilities

A brief description of the key roadways in the study area is provided below.

Interstate 80 (I-80) is an east-west interstate highway with four lanes through Fernley. There are three existing interchanges in Fernley, at W. Main Street (Exit 46), US 95A (Exit 48), and Nevada Pacific Parkway (Exit 50). The posted speed limit in the project area is 70 miles per hour (mph).

Nevada Pacific Parkway is generally a north-south, four-lane roadway. Between Duffy Road and MacDonald Drive, the northbound and southbound lanes are separated by a median island. South of MacDonald Drive, Nevada Pacific Parkway has a two-way left-turn lane. NDOT classifies Nevada Pacific Parkway as a Minor Arterial. The posted speed limit is 35 mph.

US 95A is a north-south roadway that connects I-80 to US 50A in Fernley. NDOT classifies US 95A as Minor Arterial. Between I-80 and US 50A, US 95A has four lanes and traffic signals at E. Newlands Drive and Fremont Street. The posted speed limit is 35 mph.

US 50A is an east-west highway that connects US 95A in Fernley to US 50 west of Fallon, NV. In the project area, US 50A is a four-lane separated roadway with a posted speed limit of 65 mph. NDOT classifies US 50A as a Minor Arterial.

Duffy Road is a two-lane roadway that is owned by NDOT and classified as a Frontage Road (FRLY01). Duffy Road generally parallels the south side of I-80 east and west of Nevada Pacific Parkway. Duffy Road has a two-way left-turn lane east of Nevada Pacific Parkway for approximately 1,450 feet, and west of Nevada Pacific Parkway for approximately 2,700 feet (including along the project frontage). The posted speed limit is 35 mph. South/west of the Walmart and Lowe's stores, the name changes to Stanley Drive.

E. Newlands Drive is generally a five-lane roadway with two lanes in each direction with a two-way left-turn lane (TWLTL) east of Stanley Drive. West of Stanley Drive, E. Newlands Drive has four lanes (no TWLTL). NDOT classifies E. Newlands Drive as a Minor Arterial. The posted speed limit is 35 mph.

Bicycle & Pedestrian Facilities

Bicycle and pedestrian facilities exist along the project frontage on Nevada Pacific Parkway, including bicycle lanes and sidewalks along both sides of the roadway from Duffy Road to MacDonald Drive. Currently bicycle lanes and sidewalks do not exist on Nevada Pacific Parkway south of MacDonald Drive or on Duffy Road.

Bicycle and pedestrian facilities on E. Newlands Drive are limited. Sidewalks exist on both sides of E. Newlands Drive west of Stanley Drive, but there are no bicycle lanes. There are no bicycle lanes or sidewalks east of Stanley Drive.

Crash History

Vehicle crash data is available from NDOT and includes information from the 2015 to 2019 five-year period (the most current data available). Crashes are summarized below based on intersection location (not including those on I-80) and crash severity. Crashes between intersection are summarized with the nearest intersection.

- US 95A/I-80 Interchange – 17 Property Damage Only (PDO), 8 Injury
- US 95A/E. Newlands Drive – 35 PDO, 18 Injury, 1 Fatality
- US 95A/Fremont Street – 47 PDO, 23 Injury
- US 95A/US 50A/Main Street – 31 PDO, 6 Injury
- E. Newlands Drive/Stanley Drive – 9 PDO, 2 Injury
- Nevada Pacific Parkway/I-80 Interchange – 1 PDO
- Nevada Pacific Parkway/Duffy Road – 3 Injury
- Nevada Pacific Parkway/E. Newlands Drive – 2 PDO

The crash data is shown in **Exhibit 1** (crashes in the same location overlap on the image). None of the study intersections have a significant number of crashes (all locations have less than 10 crashes per year) or repetitive accident types that would indicate a need for modifications.

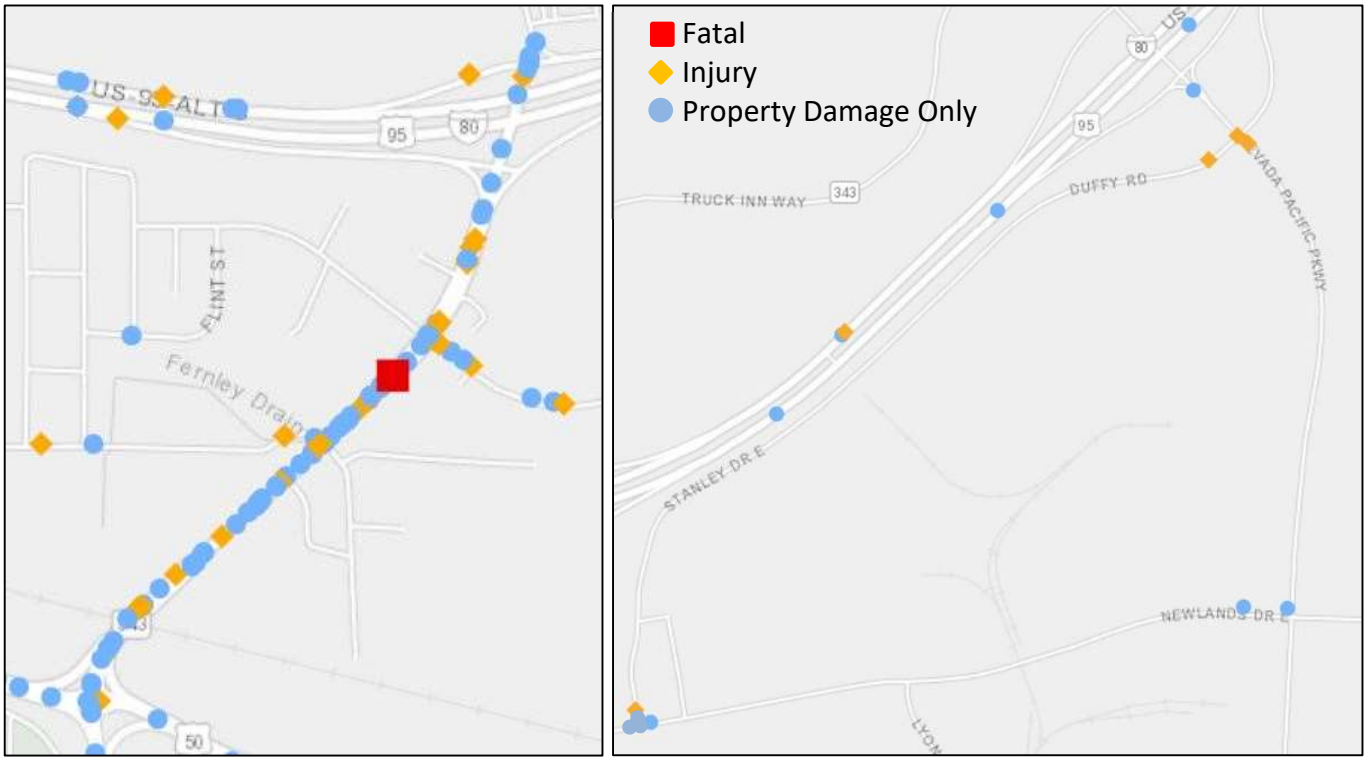


Exhibit 1: NDOT Crash Data (2015 – 2019)

BASELINE CONDITIONS

The Baseline conditions analysis includes existing traffic volumes plus traffic generated by approved/in process, but not yet built projects described in the following reports:

- *Traffic Impact Study for Victory Logistics District Phase 1 (Buildings A, B, & C)*, Headway Transportation, January 2020
- *Traffic Impact Study for Victory Logistics District Building D-2,* Headway Transportation, December 2021
- *Traffic Impact Study for 1200 Fremont Street Apartments,* Headway Transportation, July 2021
- *Traffic Impact Study for Nevada Pacific Boulevard Commercial Development,* Headway Transportation, January 2022

Traffic Volumes

The Baseline conditions AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak hour traffic volumes build upon the analysis conducted for Buildings A, B, & C (Phase 1) and Building D-2. Traffic volumes were collected for the Phase 1 project in January 2020. New AM and PM peak hour turning movement counts

were collected at the study intersections in October 2021 and December 2021. The highest volumes from the three count sources were used as the existing traffic volumes and balanced between intersections. A review of NDOT's Annual Traffic Reports including the *2018 Seasonal Growth Factors* and *2020 Seasonal Growth Factors* reports show that traffic volumes in January and December tend to be lower than the annual average. Therefore, seasonality factors were applied to increase the traffic volumes as appropriate (by about 10 percent).

For the Baseline conditions analysis, traffic generated by Victory Logistics Buildings A, B, & C (currently being constructed), Building D-2, the 1200 Fremont Street Apartments, and the Nevada Pacific Boulevard Development were added to the adjusted existing traffic volumes at the study intersections. **Figure 3** shows the Baseline conditions traffic volumes.

Intersection Level of Service Analysis

AM and PM peak hour intersection level of service analysis was performed using the Synchro 11 software package, with results reported based on *HCM* methodology. The existing intersection lane configurations and controls were assumed at all of the study intersections except for the US 95A/Fremont Street and US 50A/Nevada Pacific Parkway intersections. Improvements have been conditioned at the US 95A/Fremont Street intersection as part of another project and include an eastbound right-turn lane and permitted plus overlap right-turn signal phasing for the eastbound right-turn movement. A traffic signal is planned for construction at the US 50A/Nevada Pacific Parkway intersection in 2022. The intersection lane configurations and controls used in the analysis are shown on **Figure 4**. **Table 2** shows the Baseline conditions level of service results. The technical calculations are provided in **Appendix A**.

Table 2: Baseline Intersection Level of Service

Intersection	Control	AM		PM	
		Delay[1] (v/c Ratio[2])	LOS	Delay[1] (v/c Ratio[2])	LOS
US 95A/I-80 WB Ramps	Side Street Stop				
Westbound Approach		15	B	16	C
Southbound Approach		20	C	18	C
US 95A/I-80 EB Ramps	Side Street Stop				
Eastbound Approach		17	C	17	C
Southbound Left		9	A	9	A
US 95A/E. Newlands Dr	Signal				
Overall		25	C	34	C
US 95A/Fremont St	Signal				
Overall		22	C	38	D
US 95A/US 50A/Main St	RAB				
Northbound Approach		**47 (0.91)**	**E**	**93 (1.07)**	**F**
Southbound Approach		5 (0.45)	A	**83 (1.22)**	**F**
Eastbound Approach		19 (0.74)	C	**90 (1.15)**	**F**
Westbound Approach		4 (0.40)	A	3 (0.36)	A
E. Newlands Dr/Stanley Dr	Signal				
Overall		11	B	18	B
Nevada Pacific Pkwy/I-80 WB Ramps					

Table 2: Baseline Intersection Level of Service

Intersection	Control	AM		PM	
		Delay[1] (v/c Ratio[2])	LOS	Delay[1] (v/c Ratio[2])	LOS
Westbound Approach	Side Street Stop	10	A	13	B
Northbound Left		8	A	8	A
Nevada Pacific Pkwy /I-80 EB Ramps	Side Street Stop				
Eastbound Approach		9	A	10	B
Southbound Left		8	A	8	A
Nevada Pacific Pkwy/Duffy Rd	Side Street Stop				
Eastbound Approach		12	B	12	B
Westbound Approach		13	B	11	B
Northbound Left		8	A	8	A
Southbound Left		8	A	8	A
Nevada Pacific Pkwy/Gateway Dr	Side Street Stop				
Eastbound Approach		10	A	10	A
Westbound Approach		10	A	10	A
Northbound Left		8	A	8	A
Southbound Left		8	A	8	A
Nevada Pacific Pkwy/MacDonald Dr	Side Street Stop				
Eastbound Approach		10	A	10	A
Westbound Approach		9	A	9	A
Northbound Left		8	A	8	A
Southbound Left		7	A	7	A
Nevada Pacific Pkwy/E. Newlands Dr[3]	All way Stop				
Overall		10	A	10	B
Nevada Pacific Pkwy/Gavin Rd[4]	Side Street Stop				
Eastbound Approach		9	A	9	A
Westbound Approach		0	A	0	A
Northbound Left		0	A	0	A
Southbound Left		0	A	0	A
US 50A/Nevada Pacific Pkwy	Signal				
Overall		9	A	10	B

Notes: RAB = roundabout
1. Delay is reported in seconds per vehicle for the overall intersection for signalized and all way stop controlled intersections, and for the worst approach/movement for side street stop controlled intersections.
2. v/c Ratio = volume-to-capacity ratio (for roundabout intersections only).
3. This intersection was analyzed with a shared left-turn/through lane and a shared through/right-turn lane on each approach because *HCM* does not allow analysis of stop controlled intersections with more than two lanes on each approach.
4. Reported based on *HCM 2000* methodology.
Source: Headway Transportation, 2022

As shown in the table, the US 95A/US 50A/Main Street roundabout intersection is expected to operate at LOS F with volume-to-capacity ratios above 1.0 (over capacity) during the PM peak hour under Baseline conditions (without the project). The *City of Fernley TMP* identifies a need for improvements at this location in the 5-year timeframe. The other study intersections are expected to operate at LOS C or better.

PROJECT CONDITIONS

Trip Generation

Trip generation estimates for the 2,050 acres of developable parcels were calculated using trip rates from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 11th Edition*. The project is anticipated to consist of a variety of uses including data center, distribution/fulfillment center, warehousing/manufacturing, and commercial uses (shown on **Figure 2**). Trip generation estimates were calculated using a floor area ratio (FAR) of 0.25 for each land use. **Table 3** shows the Daily, AM peak hour, and PM peak hour trip generation estimates for the project including pass-by trips for the retail and gas station uses.

Table 3: Trip Generation Estimates

Land Use (ITE Code)	Size	Trips[1]				
		Daily	AM	AM In/Out	PM	PM In/Out
Manufacturing (150)	6,254 ksf	10,694	1,062	818 / 244	1,125	315 / 810
Transload & Switching Facility (154)	421 ksf	590	34	26 / 8	42	12 / 30
Distribution (155)	12,298 ksf	22,261	1,846	1,496 / 350	1,968	768 / 1,200
Data Center (160)	3,132 ksf	3,101	345	190 / 155	282	85 / 197
Retail (821)	178 ksf	11,985	307	190 / 117	921	451 / 470
Gas Station (945)	14 pumps	4,841	442	221 / 221	376	188 / 188
Total Trips		**53,472**	**4,036**	**2,941 / 1,095**	**4,714**	**1,819 / 2,895**
Pass-By Trips (Retail & Gas Station)		*7,125*	*382*	*191 / 191*	*562*	*281 / 281*
Net New Trips		***46,347***	***3,654***	***2,750 / 904***	***4,152***	***1,538 / 2,614***

Notes: ksf = 1,000 square feet
1. Detailed trip generation calculations are provided in **Appendix B**.
Source: Headway Transportation, 2022

As shown in the table, the project is expected to generate approximately 46,347 Daily, 3,654 AM peak hour, and 4,152 PM peak hour net new trips to the adjacent roadway network. It should be noted that the land use mix, quantities, and location of specific uses will change as this large scale project develops over roughly 20 years. Any mix of land uses/quantities generating less than the number of peak hour trips above is considered equivalent from a traffic impact perspective.

Trip Distribution

Project generated traffic was distributed to the surrounding roadway network based on existing traffic volumes and travel patterns and the location of the project in relation to complimentary land uses, major activity centers, and local roadway connections. The following trip distribution percentages were used (shown on **Figure 5**):

- 40% to/from the west on Interstate 80 (I-80)
- 10% to/from the east on Interstate 80 (I-80)
- 20% to/from the west to downtown Fernley
- 15% to/from the south on Farm District Road
- 15% to/from the east on US 50A

BASELINE PLUS PROJECT CONDITIONS

The Baseline and Baseline Plus Project conditions analyses assume the Nevada Pacific Parkway connection to US 50A would not yet be complete and regional traffic will continue to use US 95A and the US 95A/US 50A/Main Street roundabout intersection to travel between I-80 and US 50A. Additionally, the US 95A/US 50A/Main Street roundabout intersection is currently over capacity (operating at LOS F) and the addition of project traffic would exacerbate conditions. Therefore, improvements are needed (as outlined in the *City of Fernley Transportation Master Plan)* and were assumed to be in place for the Baseline Plus Project conditions analysis. A two-lane roundabout with right-turn bypass lanes on each leg was analyzed but found to operate at LOS F (volume-to-capacity greater than 1.0). A traffic signal with the lane configurations shown in **Exhibit 2** was assumed in the analysis as this the configuration that will provide acceptable level of service in the Future Year Plus Project conditions.

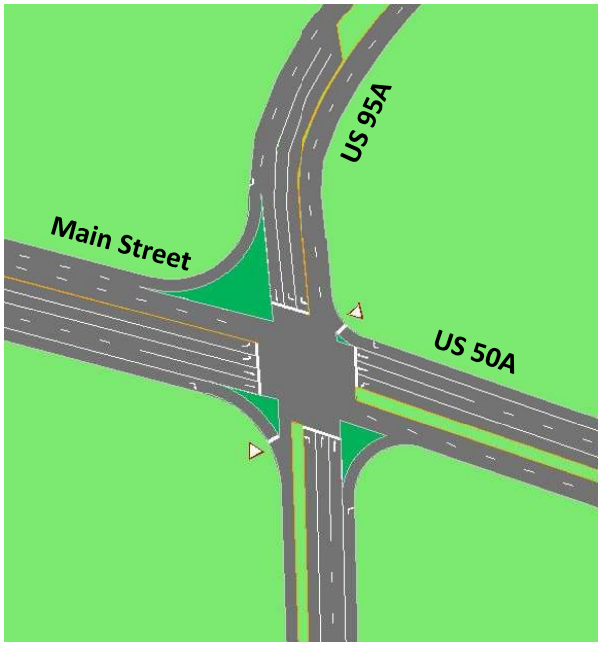


Exhibit 2: US 95A/US 50A/Main Street (Traffic Signal)

Connor Drive and the extension of Duffy Road and Gateway Drive would also be built with the project as needed to serve the project phases. The analysis includes five lanes (two lanes in each direction and a two-way left-turn lane) on Duffy Road and Gateway Drive and three lanes (one lane in each direction and a two-way left-turn lane) on Connor Drive.

Traffic Volumes

The Baseline Plus Project conditions analysis was initially conducted using the trip generation of the full tentative map project, but the results showed that the Baseline conditions roadway network (shown on **Figure 4**) does not have the capacity to handle the full project without the Nevada Pacific Parkway connection to US 50A. Therefore, the Baseline Plus Project conditions analysis was conducted at varying levels to determine how much of the project could be built prior to the completion of the Nevada Pacific Parkway connection. The US 95A/I-80 Westbound Ramps, 95A/E. Newlands Drive, and US 95A/Fremont Street intersections were found to be the controlling intersections. Approximately 35 percent of the project, or a land use amount that generates up to 1,480 PM peak hour trips, could be built before the Nevada Pacific Parkway connection is needed. **Figure 6** shows the Baseline Plus Project conditions traffic volumes with approximately 35 percent of the project trips.

Intersection Level of Service Analysis

Table 4 shows the AM and PM peak hour level of service results assuming approximately 35 percent of the project trips. The analysis uses the lane configurations shown on **Figure 4** for all of the intersections except the US 95A/US 50A/Main Street intersection which was analyzed based on the lane configurations and control shown in **Exhibit 2** and **Figure 8**. The technical calculations are provided in **Appendix D**.

Table 4: Baseline Plus Project Intersection Level of Service

Intersection	Control	Baseline				Baseline Plus Project (with 35% of project trips)			
		AM		PM		AM		PM	
		Delay[1] (v/c[2])	LOS	Delay[1] (v/c[2])	LOS	Delay[1] (v/c[2])	LOS	Delay[1] (v/c[2])	LOS
US 95A/I-80 WB Ramps	Side Street Stop								
Westbound Approach		15	B	16	C	22	C	38	E
Southbound Approach		20	C	18	C	20	C	18	C
US 95A/I-80 EB Ramps	Side Street Stop								
Eastbound Approach		17	C	17	C	18	C	21	C
Southbound Left		9	A	9	A	9	A	9	A
US 95A/E. Newlands Dr	Signal								
Overall		25	C	21	C	30	C	33	C
US 95A/Fremont St	Signal								
Overall		21	C	26	C	21	C	38	D
US 95A/US 50A/Main St	RAB								
Northbound Approach		**47 (0.91)**	**E**	**93 (1.07)**	**F**	LOS F (v/c > 1.0)			
Southbound Approach		5 (0.45)	A	**83 (1.22)**	**F**				
Eastbound Approach		19 (0.74)	C	**90 (1.15)**	**F**				
Westbound Approach		4 (0.40)	A	3 (0.36)	A				
US 95A/US 50A/Main St	Signal								
Overall		NA				20	C	24	C
E. Newlands Dr/Stanley Dr	Signal								
Overall		11	B	18	B	12	B	21	C
Nevada Pacific Pkwy/I-80 WB Ramps	Side Street Stop								
Westbound Approach		10	A	13	B	31	D	**>500**	**F**
Northbound Left		8	A	8	A	9	A	11	B
Nevada Pacific Pkwy /I-80 EB Ramps	Side Street Stop								
Eastbound Approach		9	A	10	B	13	B	19	C
Southbound Left		8	A	8	A	8	A	10	B
Nevada Pacific Pkwy/Duffy Rd	Side Street Stop								
Eastbound Approach		12	B	12	B	**>500**	**F**	**>500**	**F**
Westbound Approach		13	B	11	B	**100**	**F**	33	D
Northbound Left		8	A	8	A	15	C	10	A
Southbound Left		8	A	8	A	9	A	10	B
Nevada Pacific Pkwy/Gateway Dr	Side Street Stop								
Eastbound Approach		10	A	10	A	**61**	**F**	15	C
Westbound Approach		10	A	10	A	**92**	**F**	19	C
Northbound Left		8	A	8	A	10	B	8	A
Southbound Left		8	A	8	A	11	B	10	A

Table 4: Baseline Plus Project Intersection Level of Service

Intersection	Control	Baseline				Baseline Plus Project (with 35% of project trips)			
		AM		PM		AM		PM	
		Delay[1] (v/c[2])	LOS	Delay[1] (v/c[2])	LOS	Delay[1] (v/c[2])	LOS	Delay[1] (v/c[2])	LOS
Nevada Pacific Pkwy/ MacDonald Dr	Side Street Stop								
Eastbound Approach		10	A	10	A	26	D	16	C
Westbound Approach		9	A	9	A	13	B	11	B
Northbound Left		8	A	8	A	8	A	8	A
Southbound Left		7	A	7	A	9	A	8	A
Nevada Pacific Pkwy/E. Newlands Dr[3]	All way Stop								
Overall		10	A	10	B	22	C	**63**	**F**
Nevada Pacific Pkwy/Gavin Rd	Side Street Stop								
Eastbound Approach		9	A	9	A	13	B	11	B
Westbound Approach		0	A	0	A	9	A	9	A
Northbound Left		0	A	0	A	0	A	0	A
Southbound Left		0	A	0	A	8	A	7	A
US 50A/Nevada Pacific Pkwy	Signal								
Overall		9	A	10	B	11	B	11	B
Connor Dr/Duffy Rd	Side Street Stop								
Northbound Approach		NA				NA[4]			
Southbound Approach									
Eastbound Left									
Westbound Left									
Connor Dr/Gateway Dr	Side Street Stop								
Northbound Approach		NA				10	B	10	A
Southbound Approach						10	A	9	A
Eastbound Left						7	A	7	A
Westbound Left						8	A	7	A

Notes: RAB = roundabout; 1. Delay is reported in seconds per vehicle for the overall intersection for signalized and all way stop controlled intersections, and for the worst approach/movement for side street stop controlled intersections.
2. v/c Ratio = volume-to-capacity ratio (for roundabout intersections only).
3. This intersection was analyzed with a shared left-turn/through lane and a shared through/right-turn lane on each approach because *HCM* does not allow analysis of stop controlled intersections with more than two lanes on each approach.
4. The Connor Drive/Duffy Road intersection would not have any significant traffic with approximately 35 percent of the project.
Source: Headway Transportation, 2022

As shown in the table, four study intersections on Nevada Pacific Parkway are expected to degrade to LOS F during the AM and/or PM peak hours with approximately 35 percent of the project traffic. All other study intersections would operate within policy level of service at 35 percent build out trip generation.

A traffic signal at each of the following intersections is recommended:

- Nevada Pacific Parkway/I-80 Westbound Ramps (NDOT)
- Nevada Pacific Parkway/Duffy Road (NDOT)
- Nevada Pacific Parkway/Gateway Drive

- Nevada Pacific Parkway/E. Newlands Drive

With signalization and the lane configurations shown on **Figure 4** and **Exhibit 2**, the study intersections on Nevada Pacific Parkway are expected to operate at LOS C or better during the AM and PM peak hours. **Table 5** shows the level of service results and the technical calculations are provided in **Appendix D**.

Table 5: Baseline Plus Project Intersection Level of Service (with Mitigation)

Intersection	Control	AM		PM	
		Delay[1]	LOS	Delay[1]	LOS
Nevada Pacific Pkwy/I-80 WB Ramps	Signal				
Overall		13	B	12	B
Nevada Pacific Pkwy/Duffy Rd	Signal				
Overall		31	C	26	C
Nevada Pacific Pkwy/Gateway Dr	Signal				
Overall		12	B	8	A
Nevada Pacific Pkwy/E. Newlands Dr	Signal				
Overall		16	B	30	C

Notes: 1. Delay is reported in seconds per vehicle for the overall intersection for signalized intersections.
Source: Headway Transportation, 2022

FUTURE YEAR CONDITIONS

The Future Year analysis evaluates the 20-year horizon and assumes the Nevada Pacific Parkway connection to US 50A is complete.

Planned Roadway Improvements

The *City of Fernley Comprehensive Master Plan* and *City of Fernley Transportation Master Plan (TMP)* outline planned future roadway facilities. The following roadway projects are planned within the project vicinity:

Comprehensive Master Plan

- North Industrial Connector – Provide connectivity from Main Street north of I-80 to the Nevada Pacific Parkway Interchange, providing access to planned industrial centers in the north
- Nevada Pacific Parkway – Extend existing Nevada Pacific Parkway south over the UPRR railroad to existing US 50A to provide additional north/south and I-80 connectivity

Transportation Master Plan

5-Year Improvements

- Nevada Pacific Parkway – Roadway Improvement: extension of Nevada Pacific Parkway between E. Newlands Drive and US 50A (same as above)
- Nevada Pacific Parkway/US 50A ICE – Intersection Control Evaluation. However, NDOT is in the process of constructing a traffic signal at this location.

- US 95A/US 50A Improvements – Roadway Capacity and Safety
- US 95A/US 50A/Main Street Intersection – Roundabout Improvements. However, this analysis shows that a traffic signal is needed for the intersection to function within policy level of service thresholds.

20-Year Improvements

- North Fernley Roadway – New Roadway: connecting Main Street north of I-80 to Nevada Pacific Parkway (same as North Industrial Connector above)

The Nevada Pacific Parkway extension, US 95A/US 50A improvements, and US 95A/US 50A/Main Street intersection improvements are assumed in the Future Year conditions analysis. The North Industrial Connector timing and adjacent land uses are unknown and will be evaluated in future studies. This study includes a 2 percent annual traffic volume growth rate per the Comprehensive Master Plan to address regional growth north of I-80.

Traffic Volumes

Future Year (20-year horizon) traffic volumes were developed using regional growth rates and considering traffic redistribution assuming Nevada Pacific Parkway would be connected to US 50A south of the project site. When the Nevada Pacific Parkway connection is complete, it is expected that some traffic travelling between US 50A to the east and I-80 will shift from US 95A to Nevada Pacific Parkway. For analysis purposes, it was assumed that approximately 40 percent of the existing traffic on US 50A east of Nevada Pacific Parkway would use Nevada Pacific Parkway rather than US 95A. This re-routed traffic (approximately 5,080 daily trips) was assumed on Nevada Pacific Parkway in the Future Year forecasts.

Historical traffic volume data in the project area was used to develop a regional background annual growth rate. **Table 6** shows the historical traffic volume data.

Table 6: NDOT Historical Traffic Volume Data

Roadway – Location	Annual Average Daily Traffic (AADT) Volumes										Annual Growth Rate
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
US 50A – East of NPP[1]	9,100	9,000	11,000	10,500	11,000	12,000	12,000	12,700	13,000	12,500	4.2%
US 95A – North of US 50A	25,000	24,500	25,000	25,500	28,000	29,000	28,000	32,500	31,000	29,900	2.2%
Farm District Rd – South of US 50A	9,500	8,900	9,200	9,100	7,800	7,700	8,300	10,300	9,900	9,200	-0.4%
										Average	***2.0%***

Notes: 1. NPP = Nevada Pacific Parkway
Source: Headway Transportation, 2022

As shown in the table, the historical average annual growth rate is approximately 2 percent per year, which is consistent with the annual growth rate used in the *Comprehensive Master Plan* and the *Transportation Master Plan*.

Future Year traffic volumes were developed by factoring the existing traffic volumes (plus the shift in volume from the connection of Nevada Pacific Parkway) up by 2 percent per year. Traffic from other development projects, as described in the following studies, was also added to the Future Year forecasts for background conditions:

- *Traffic Impact Study for Victory Logistics District Phase 1 (Buildings A, B, & C)*, Headway Transportation, January 2020
- *Traffic Impact Study for Victory Logistics District Building D-2,* Headway Transportation, December 2021
- *Traffic Impact Study for 1200 Fremont Street Apartments,* Headway Transportation, July 2021
- *Traffic Impact Study for Nevada Pacific Boulevard Commercial Development,* Headway Transportation, January 2022

Figure 7 shows the Future Year (20-year horizon) background traffic volumes at the study intersections.

Intersection Level of Service Analysis

Future Year intersection level of service analysis was performed using the Synchro 11 software package, with results reported based on *HCM* methodology. The Future Year intersection lane configurations and controls (without the project) are shown on **Figure 8**. **Table 7** shows the Future Year conditions level of service results. The technical calculations are provided in **Appendix E**.

Table 7: Future Year Intersection Level of Service

Intersection	Control	AM		PM	
		Delay[1]	LOS	Delay[1]	LOS
US 95A/I-80 WB Ramps	Side Street Stop				
Westbound Approach		19	C	25	C
Southbound Approach		36	E	33	D
US 95A/I-80 EB Ramps	Side Street Stop				
Eastbound Approach		22	C	24	C
Southbound Left		10	B	10	A
US 95A/E. Newlands Dr	Signal				
Overall		25	C	48	D
US 95A/Fremont St	Signal				
Overall		42	D	**93**	**F**
US 95A/US 50A/Main St	Signal/ Reconfigured				
Overall		19	B	29	C
E. Newlands Dr/Stanley Dr	Signal				
Overall		11	B	20	C
Nevada Pacific Pkwy/I-80 WB Ramps	Side Street Stop				
Westbound Approach		29	D	**56**	**F**
Northbound Left		9	A	9	A
Nevada Pacific Pkwy /I-80 EB Ramps	Side Street Stop				
Eastbound Approach		12	B	14	B
Southbound Left		9	A	9	A
Nevada Pacific Pkwy/Duffy Rd	Side Street Stop				
Eastbound Approach		19	C	27	D
Westbound Approach		26	D	20	C
Northbound Left		9	A	9	A
Southbound Left		9	A	9	A
Nevada Pacific Pkwy/Gateway Dr	Side Street Stop				
Eastbound Approach		14	B	17	C
Westbound Approach		16	C	17	C
Northbound Left		8	A	9	A
Southbound Left		9	A	9	A
Nevada Pacific Pkwy/MacDonald Dr	Side Street Stop				
Eastbound Approach		15	B	19	C
Westbound Approach		18	C	18	C
Northbound Left		8	A	9	A
Southbound Left		9	A	9	A
Nevada Pacific Pkwy/E. Newlands Dr[2]	All way Stop				
Overall		14	B	15	B
Nevada Pacific Pkwy/Gavin Rd	Side Street Stop				
Eastbound Approach		15	C	18	C
Westbound Approach		15	B	16	C

Table 7: Future Year Intersection Level of Service

Intersection	Control	AM		PM	
		Delay[1]	LOS	Delay[1]	LOS
Northbound Left		8	A	9	A
Southbound Left		9	A	9	A
US 50A/Nevada Pacific Pkwy	Signal				
Overall		18	B	21	B

Notes: 1. Delay is reported in seconds per vehicle for the overall intersection for signalized and all way stop controlled intersections, and for the worst approach/movement for side street stop controlled intersections.
2. This intersection was analyzed with a shared left-turn/through lane and a shared through/right-turn lane on each approach because *HCM* does not allow analysis of stop controlled intersections with more than two lanes on each approach.
Source: Headway Transportation, 2022

As shown in the table, the US 95A/Fremont Street and Nevada Pacific Parkway/I-80 Westbound Ramps intersections are expected to operate at LOS F during the PM peak hour without the project. The other study intersections are expected to operate within policy level of service thresholds under Future Year (20-year horizon) conditions.

FUTURE YEAR PLUS PROJECT CONDITIONS

Traffic Volumes

With the connection of Nevada Pacific Parkway to US 50A, project traffic would change travel routes compared to Baseline Plus Project conditions, with fewer drivers using E. Newlands Drive and US 95A, and more continuing south on Nevada Pacific Parkway to US 50A. While the overall project trip distribution (shown on **Figure 5**) would not change, the project travel routes and trip assignment would change. Future Year conditions project generated trips (**Figure 9**) were added to the Future Year background traffic volumes at the study intersections (**Figure 7**) to develop Future Year Plus Project traffic volumes at the study intersections, shown on **Figure 10**.

Intersection Level of Service Analysis

Table 8 shows the Future Year Plus Project intersection level of service results at the study intersections. The analysis assumes the lane configurations and controls shown on **Figure 8**. The lane configurations and controls at the Connor Drive/Duffy Road and Connor Drive/Gateway Drive intersections were determined based on the analysis and capacity needs and are shown on **Figure 11**. The technical calculations are provided in **Appendix F**.

Table 8: Future Year Plus Project Intersection Level of Service

Intersection	Control	Future Year				Future Year Plus Project			
		AM		PM		AM		PM	
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS
US 95A/I-80 WB Ramps	Side Street Stop								
Westbound Approach		19	C	25	C	19	C	29	D
Southbound Approach		36	E	33	D	37	E	34	D
US 95A/I-80 EB Ramps	Side Street Stop								
Eastbound Approach		22	C	24	C	22	C	25	C
Southbound Left		10	B	10	A	10	B	10	A
US 95A/E. Newlands Dr	Signal								
Overall		25	C	48	D	43	D	**102**	**F**
US 95A/Fremont St	Signal								
Overall		42	D	**93**	**F**	43	D	**130**	**F**
US 95A/US 50A/Main St	Signal								
Overall		19	B	29	C	30	C	53	D
E. Newlands Dr/Stanley Dr	Signal								
Overall		11	B	20	C	12	B	31	C
Nevada Pacific Pkwy/I-80 WB Ramps	Side Street Stop								
Westbound Approach		29	D	**56**	**F**	**>500**	**F**	**>500**	**F**
Northbound Left		9	A	9	A	11	B	**80**	**F**
Nevada Pacific Pkwy/I-80 EB Ramps	Side Street Stop								
Eastbound Approach		12	B	14	B	25	C	**62**	**F**
Southbound Left		9	A	9	A	10	B	16	C
Nevada Pacific Pkwy/Duffy Rd	Side Street Stop								
Eastbound Approach		19	C	27	D	**>500**	**F**	**>500**	**F**
Westbound Approach		26	D	20	C	**>500**	**F**	**>500**	**F**
Northbound Left		9	A	9	A	14	B	14	B
Southbound Left		9	A	9	A	**375**	**F**	**99**	**F**
Nevada Pacific Pkwy/Gateway Dr	Side Street Stop								
Eastbound Approach		14	B	17	C	**>500**	**F**	**>500**	**F**
Westbound Approach		16	C	17	C	**>500**	**F**	**>500**	**F**
Northbound Left		8	A	9	A	10	B	12	B
Southbound Left		9	A	9	A	**260**	**F**	**36**	**E**
Nevada Pacific Pkwy/ MacDonald Dr	Side Street Stop								
Eastbound Approach		15	B	19	C	**406**	**F**	**>500**	**F**
Westbound Approach		18	C	18	C	**>500**	**F**	**>500**	**F**
Northbound Left		8	A	9	A	11	B	18	C
Southbound Left		9	A	9	A	31	D	14	B
Nevada Pacific Pkwy/E. Newlands Dr[2]	All way Stop								
Overall		14	B	15	B	**265**	**F**	**370**	**F**
Nevada Pacific Pkwy/Gavin Rd	Side Street Stop								
Eastbound Approach		15	C	18	C	**165**	**F**	**366**	**F**
Westbound Approach		15	B	16	C	**>500**	**F**	**>500**	**F**
Northbound Left		8	A	9	A	10	A	16	B
Southbound Left		9	A	9	A	19	C	12	B
US 50A/Nevada Pacific Pkwy	Signal								
Overall		18	B	21	C	29	C	37	D
Connor Dr/Duffy Rd									
Northbound Approach		NA				**72**	**F**	**37**	**E**

Table 8: Future Year Plus Project Intersection Level of Service

Intersection	Control	Future Year				Future Year Plus Project			
		AM		PM		AM		PM	
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS
Southbound Approach	Side Street Stop					11	B	12	B
Eastbound Left						8	A	9	A
Westbound Left						12	B	8	A
Connor Dr/Gateway Dr									
Northbound Approach	Side Street Stop	NA				26	D	**78**	**F**
Southbound Approach						11	B	14	B
Eastbound Left						8	A	10	B
Westbound Left						10	A	9	A

Notes: 1. Delay is reported in seconds per vehicle for the overall intersection for signalized and all way stop controlled intersections, and for the worst approach/movement for side street stop controlled intersections.
2. This intersection was analyzed with a shared left-turn/through lane and a shared through/right-turn lane on each approach because *HCM* does not allow analysis of stop controlled intersections with more than two lanes on each approach.
Source: Headway Transportation, 2022

As shown in the table, eleven study intersections are expected to operate at LOS F during the AM and PM peak hours. The other study intersections would operate within policy level of service thresholds during the AM and PM peak hours under Future Year Plus Project conditions.

Although the side street approaches of the Nevada Pacific Parkway/MacDonald Drive intersection are expected to operate at LOS F during the peak hours, the anticipated traffic volumes are not expected to meet signal warrant criteria. Traffic signals are recommended at the upstream and downstream intersections (Gateway Drive and E. Newlands Drive) that drivers would be able to access during peak hours. It is not appropriate to signalize every intersection along the Nevada Pacific Parkway corridor and the LOS F condition on the side streets is manageable at the MacDonald Drive intersection with alternate routes and access points available. Improvements are not recommended at the Nevada Pacific Parkway/MacDonald Drive intersection.

IMPROVEMENTS LIST & PHASING

As shown in **Table 8**, intersection and roadway improvements are needed for full project build out. Based on the Anticipated Notice of Completion Map (provided in **Appendix C**), it will take approximately 20 years for the project to be fully completed. Hence, the capacity of the transportation network should also be improved/increased in incremental phases. Roadway and intersection improvements should be built in stages in accordance with the amount of traffic generated by the project through those various phases. **Table 9 and Figures 14 through 16** list phasing, timing recommendations, and funding category for all the proposed improvements generally based on the development sequence shown in **Appendix C**. **Figure 11** shows the recommended lane configurations and controls at the study intersections and **Figures 12A** and **12B** show the number of lanes and roadway configuration for Nevada Pacific Parkway.

Table 9: Traffic System Phasing Plan

ID	Location	Improvement	Trigger	Funding Category
1	US 95A/US 50A/Main St (Roundabout)	Construct traffic signal and the lane configurations shown in Exhibit 2	When constructed by NDOT	Excluded (NDOT)
2	Nevada Pacific Parkway/ I-80 WB Ramps	Construct traffic signal	When warranted and approved by NDOT	Regional
3	Nevada Pacific Parkway/ Duffy Road	Construct traffic signal	When warranted and approved by NDOT	
4	Nevada Pacific Parkway/ Gateway Drive	Construct traffic signal	Prior to exceeding LOS D, subject to warrants being met	
5	Nevada Pacific Parkway/ E. Newlands Drive	Construct traffic signal	Prior to exceeding LOS D, subject to warrants being met	
6	Nevada Pacific Parkway Extension – between E. Newlands Drive and US 50A	Complete connector road with 110 feet of right-of-way to include 3 through lanes in each direction plus left- and right-turn lanes per cross sections provided in **Appendix G**	Prior to exceeding PM peak hour project trip generation of 1,480 trips (approximately 35 percent of the total project trips)	
7	Nevada Pacific Parkway/ US 50A	Construct intersection including the following lane configurations: - NB – 2 left-turn lanes, 1 through lane, 1 right-turn lane - SB – 2 left-turn lanes (1 pocket), 1 through lane, 1 free right-turn lane - EB – 2 left-turn lanes, 2 through lanes, 1 right-turn lane - WB – 1 left-turn lane, 2 through lanes, 1 free right-turn lane	Prior to exceeding PM peak hour project trip generation of 1,480 trips (approximately 35 percent of the total project trips) This improvement is anticipated to occur with construction of the Nevada Pacific Parkway Extension	
8	Nevada Pacific Parkway/ E. Newlands Drive	Add a northbound lane transitioning to a drop right-turn lane at Newlands	Prior to exceeding PM peak hour project trip generation of 1,480 trips (approximately 35 percent of the total project trips) This improvement is anticipated to occur with construction of the Nevada Pacific Parkway Extension	
9	Nevada Pacific Parkway/ Gavin Road	Construct the following lane configurations: - NB 1 left-turn lane, 2 through lanes, 1 shared through/right-turn lane - SB – 1 left-turn pocket, 2 through lane, 1 shared through/right-turn lane - EB – 1 left-turn lane, 1 shared through/right-turn lane - WB – 1 left-turn lane, 1 shared through/right-turn lane	Prior to exceeding PM peak hour project trip generation of 1,480 trips (approximately 35 percent of the total project trips) This improvement is anticipated to occur with construction of the Nevada Pacific Parkway Extension	
10	US 95A/E. Newlands Drive	Add overlap phasing for the northbound right-turn movement and optimize signal timing	Prior to intersection exceeding LOS D	

ID	Location	Improvement	Trigger	Funding Category
11	US 95A/Fremont Street	Add a southbound right-turn pocket	When constructed by NDOT	Excluded (NDOT)
12	Nevada Pacific Parkway/ I-80 WB Ramps (east half of bridge)	Construct second bridge at interchange Add second northbound left-turn lane and northbound through lane across the I-80 bridge	When constructed by NDOT, ideally prior to exceeding LOS D or PM peak hour trip generation of 1,480 project trips	
13	Nevada Pacific Parkway/ I-80 EB Ramps	Construct traffic signal	When warranted and approved by NDOT	Regional
14	Nevada Pacific Parkway I-80 EB Ramps to Duffy Rd	Add a second northbound through lane	After the Nevada Pacific Parkway Extension is constructed, then prior to exceeding LOS D or PM peak hour trip generation of 1,480 project trips	
15	Nevada Pacific Parkway/ Duffy Road	Add a second southbound left-turn lane Add a southbound right-turn pocket Add a second westbound left-turn lane Add a channelized (yield controlled) westbound right-turn lane	After the Nevada Pacific Parkway Extension is constructed, then prior to exceeding LOS D or PM peak hour trip generation of 1,480 project trips	
16	Nevada Pacific Parkway Duffy Rd to Gateway Dr	Add a third northbound through lane	After the Nevada Pacific Parkway Extension is constructed, then prior to exceeding LOS D or PM peak hour trip generation of 1,480 project trips	
17	Nevada Pacific Parkway/ Gavin Road	Construct traffic signal	Prior to exceeding LOS D, subject to warrants being met	
18	Nevada Pacific Parkway/ Gateway Drive	Add a second southbound left-turn lane Add a second westbound left-turn lane Add a channelized (yield controlled) westbound right-turn lane Add an eastbound left-turn lane	Prior to exceeding LOS D or PM peak hour trip generation of 2,300 project trips	
19	Connor Drive/Duffy Road	Construct traffic signal	If/when signal warrant criteria is met	Required
20	Connor Drive/Gateway Drive	Construct traffic signal	If/when signal warrant criteria is met	
21	Duffy Road	Construct / Widen Roadway Nevada Pacific Pkwy to Connor Drive	With adjacent development	Regional
22	Duffy Road	Construct Roadway East of Connor Drive	With adjacent development	Required
23	Gateway Drive	Construct / Widen Roadway Nevada Pacific Pkwy to Connor Drive	With adjacent development	Regional
24	Gateway Drive	Construct Roadway East of Connor Drive	With adjacent development	Required
25	MacDonald Drive	Construct / Widen Roadway Nevada Pacific Pkwy to Connor Drive	With adjacent development	Regional
26	E. Newlands Drive	Construct Roadway East of Connor Drive	With adjacent development	Required
27	Gavin Road	Construct Roadway East of Nevada Pacific Parkway	With adjacent development	Required
28	Access Road 1	Roadway Improvements - Realigned Duffy Road to Victory property line R/W to remain NDOT's	Concurrent with Duffy Road realignment	Regional
29	Connor Drive	Construct Roadway Duffy Rd to E. Newlands Drive	With adjacent development	Required
30	Road A	Construct Roadway Duffy Road to Gateway Drive	With adjacent development	Required

Table **10** shows the AM and PM peak hour level of service results with the improvements listed in **Table 9**.

Table 10: Future Year Plus Project Intersection Level of Service (with Mitigation)

Intersection	Control	AM		PM	
		Delay[1]	LOS	Delay[1]	LOS
US 95A/E. Newlands Dr	Signal				
Overall		40	D	41	D
US 95A/Fremont St	Signal				
Overall		42	D	49	D
Nevada Pacific Pkwy/I-80 WB Ramps	Signal				
Overall		10	A	16	B
Nevada Pacific Pkwy /I-80 EB Ramps	Signal				
Overall		5	A	5	A
Nevada Pacific Pkwy/Duffy Rd	Signal				
Overall		32	C	48	D
Nevada Pacific Pkwy/Gateway Dr	Signal				
Overall		29	C	28	C
Nevada Pacific Pkwy/E. Newlands Dr	Signal				
Overall		46	D	20	B
Nevada Pacific Pkwy/Gavin Rd	Signal				
Eastbound Approach		13	B	12	B
Connor Drive/Duffy Road	Signal				
Overall		12	B	19	B
Connor Drive/Gateway Dr	Signal				
Overall		10	A	12	B

Notes: 1. Delay is reported in seconds per vehicle for the overall intersection for signalized.
Source: Headway Transportation, 2022

As shown in the table, the study intersections are expected to operate within policy level of service thresholds with the improvements listed in **Table 9**.

ROADWAY CLASSIFICATION & RIGHT-OF-WAY WIDTH

Several roadways will be constructed and/or widened with the project. Adequate right-of-way width should be dedicated within the tentative map boundaries to accommodate anticipated improvements. The project roadways should be built with the following right-of-way widths and classifications (also shown on **Figure 13**):

- Nevada Pacific Parkway – Major Arterial with 110 foot minimum right-of-way, 7-lane roadway with three lanes in each direction plus turn lanes at intersections (per **Figures 12A** and **12B**)
- Duffy Road – Minor Arterial with 84 foot right-of-way, 5-lane roadway with two lanes in each direction and a two-way left-turn lane
- Gateway Drive – Minor Arterial with 84 foot right-of-way, 5-lane roadway with two lanes in each direction and a two-way left-turn lane
- MacDonald Drive – Industrial Collector with 62 foot right-of-way, 3-lane roadway with one lane in each direction and a two-way left-turn lane

- E. Newlands Drive (east of Connor Drive) – Industrial Collector with 62 foot right-of-way, 3-lane roadway with one lane in each direction and a two-way left-turn lane
- Gavin Road – Industrial Collector with 62 foot right-of-way, 3-lane roadway with one lane in each direction and a two-way left-turn lane
- Connor Drive – Industrial Collector with 62 foot right-of-way, 3-lane roadway with one lane in each direction and a two-way left-turn lane
- Road A – Industrial Collector with 62 foot right-of-way, 3-lane roadway with one lane in each direction and a two-way left-turn lane
- Access Road 1 north of Duffy Road to north property line – Local Street with 37 foot right-of-way/width and 2 lanes

Typical cross sections for each roadway type are provided in **Appendix G**. Note that additional right-of-way will be necessary at intersections and in specific segments of Nevada Pacific Parkway for turn lanes and additional lanes as shown on **Figures 11, 12A,** and **12B**.

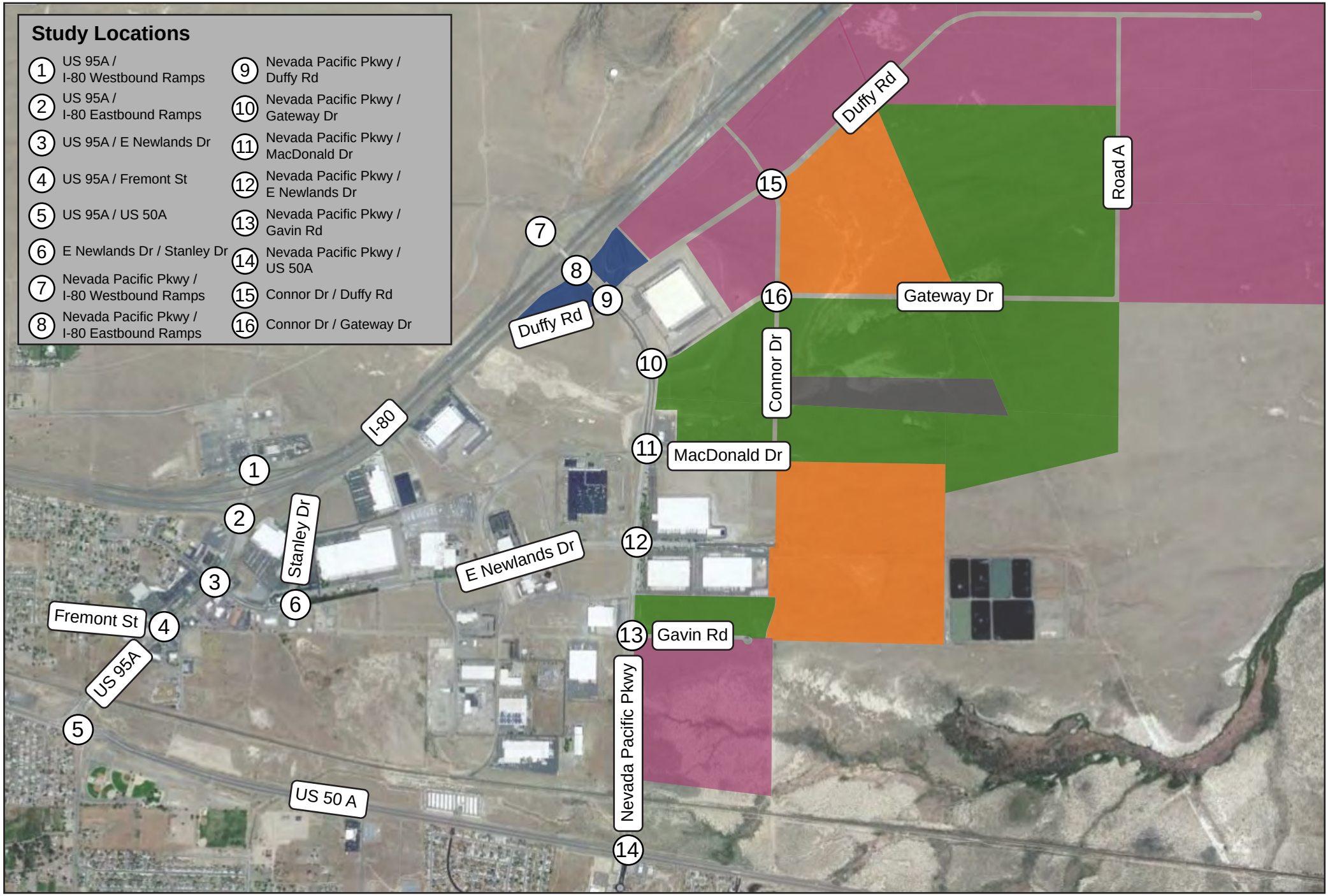
CONCLUSIONS & RECOMMENDATIONS

The Victory tentative map consists of 2,174 acres including public right-of-way. The total area includes 2,050 acres of development parcels for industrial uses, including less than 21 acres of retail/commercial zoned property. The following is a list of the key study findings:

- The project will be constructed incrementally over a 20-year period. Accordingly, the capacity of the transportation network should also be improved/increased in incremental phases.
- The US 95A/US 50A/Main Street roundabout intersection is currently over capacity (operating at LOS F). Preliminary analysis shows that the roundabout would continue to operate at LOS F with increased capacity (modifying it to a two-lane roundabout with right-turn bypass lanes on all approaches). Therefore, a traffic signal is recommended at the intersection with the lane configurations shown in **Exhibit 2**. This improvement is deemed NDOT's responsibility as resolution of an existing deficiency.
- Under Baseline Plus Project conditions (with roughly 35 percent of the project trips), traffic signals are recommended at the following intersections and should be constructed when warrants are met and NDOT approval is granted for locations within NDOT jurisdiction:
  - Nevada Pacific Parkway/I-80 Westbound Ramps (NDOT)
  - Nevada Pacific Parkway/Duffy Road (NDOT)
  - Nevada Pacific Parkway/Gateway Drive
  - Nevada Pacific Parkway/E. Newlands Drive
- The Baseline conditions roadway network (existing conditions plus the signals listed above plus the traffic signal at US 95A/US 50A/Main Street) is expected to accommodate approximately 35 percent of the estimated PM peak hour project trips (1,480 peak hour trips) before the Nevada Pacific Parkway Extension is needed. The intersection improvements at the Nevada Pacific Parkway/E. Newlands Drive, Nevada Pacific Parkway/Gavin Road, and US

50A/Nevada Pacific Parkway intersections are anticipated to be constructed in conjunction with the Nevada Pacific Parkway extension.

- A second northbound left-turn lane and northbound through lane at the Nevada Pacific Parkway/I-80 Westbound Ramps intersection across the I-80 bridge will be needed. Completion of the interchange is deemed an NDOT responsibility for accommodation of background/regional traffic and timing is dependent on NDOT.
- Prior to build out of the project and exceeding LOS D, the following capacity improvements are expected to be needed on US 95A:
  - US 95A/E. Newlands Drive: add overlap phasing for the northbound right-turn movement and optimize signal timing
  - US 95A/Fremont Street: add a southbound right-turn pocket. This is deemed a NDOT responsibility for resolution of poor operations in future years unrelated to the project.
- After the Nevada Pacific Parkway Extension is constructed, then prior to exceeding a PM peak hour trip generation of 1,480 project trips, intersections improvements should be constructed at the following intersections (see **Table 9**):
  - Nevada Pacific Parkway/I-80 Eastbound Ramps
  - Nevada Pacific Parkway/Duffy Road
  - Nevada Pacific Parkway/Gavin Road
- After the Nevada Pacific Parkway Extension is constructed, then prior to exceeding a PM peak hour trip generation of 2,300 project trips, intersections improvements should be constructed at the following intersections (see **Table 9**):
  - Nevada Pacific Parkway/Gateway Drive
- Traffic signals should be installed at the Connor Drive/Duffy Road and Connor Drive/Gateway Drive intersection if/when signal warrant criteria are met.
- New roadways within the tentative map area will generally be constructed concurrently with development of the adjacent parcels.



HEADWAY TRANSPORTATION

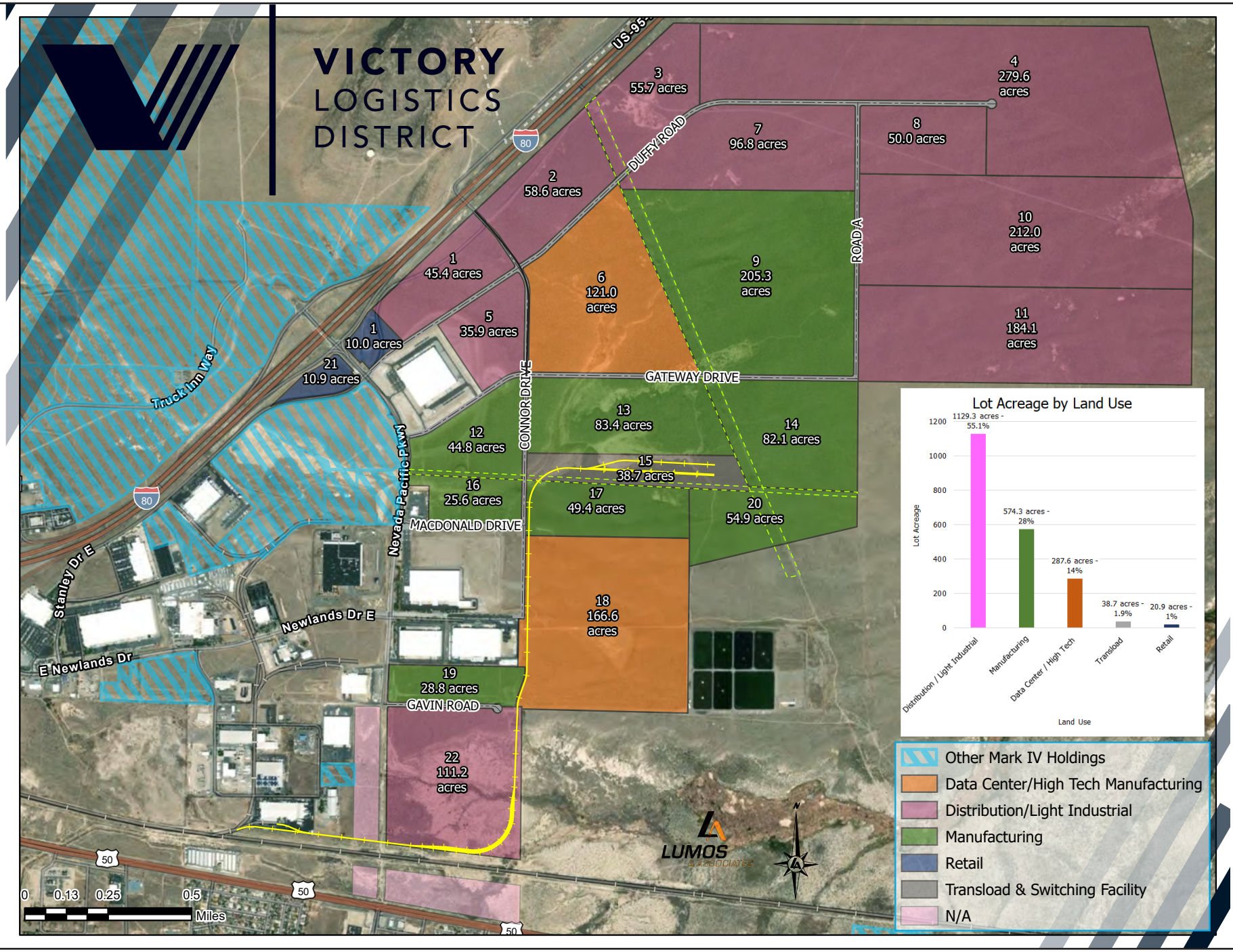
NO SCALE

- Project Location by Land Use*
*refer to Figure 2 - Land Use Plan

(#) - Study Intersection

Figure 1

Victory
Traffic Impact Study
Project Location



HEADWAY TRANSPORTATION

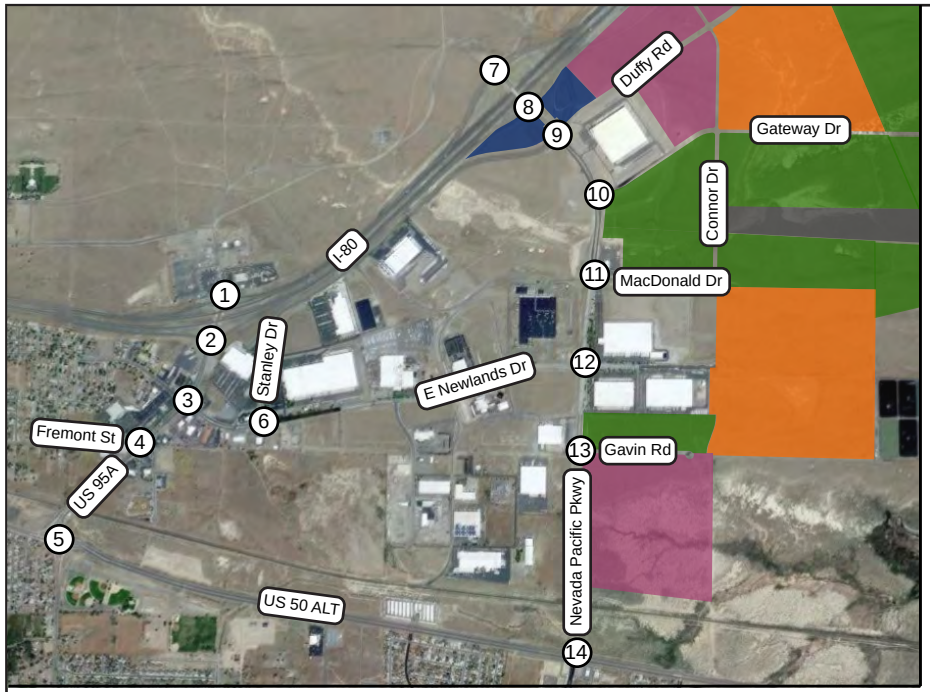
NO SCALE

Figure 2

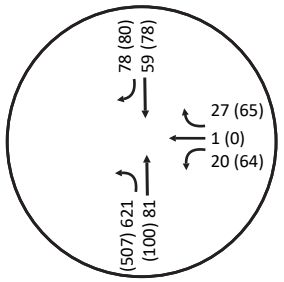
Victory

Traffic Impact Study

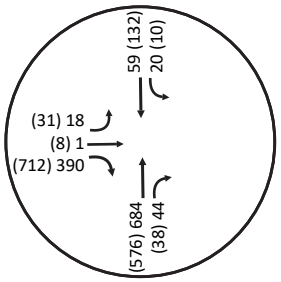
Conceptual Land Use Plan



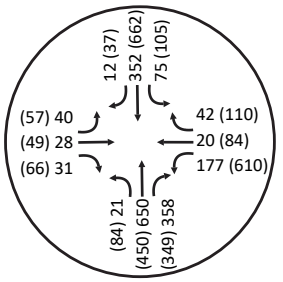
1 US 95A / I-80 Westbound Ramps



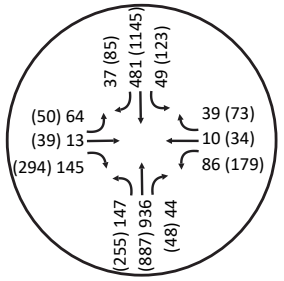
2 US 95A / I-80 Eastbound Ramps



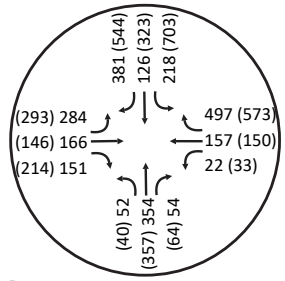
3 US 95A / E Newlands Dr



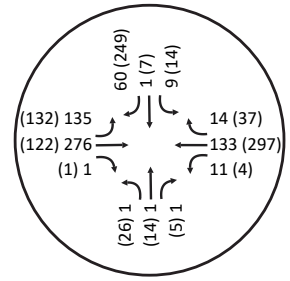
4 US 95A / Fremont St



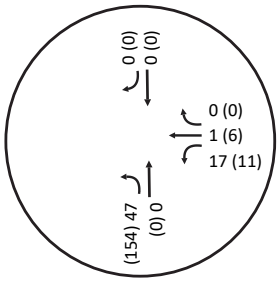
5 US 95A / US 50A



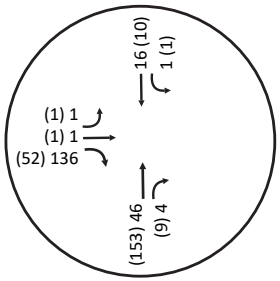
6 E Newlands Dr / Stanley Dr



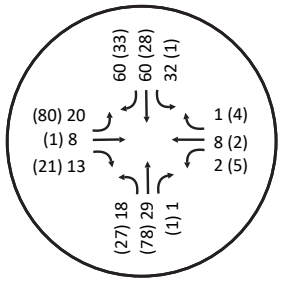
7 Nevada Pacific Pkwy / I-80 Westbound Ramps



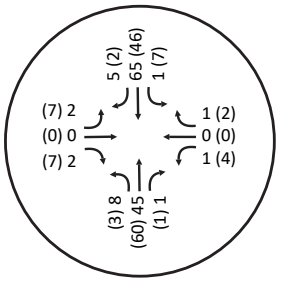
8 Nevada Pacific Pkwy / I-80 Eastbound Ramps



9 Nevada Pacific Pkwy / Duffy Rd



10 Nevada Pacific Pkwy / Gateway Dr



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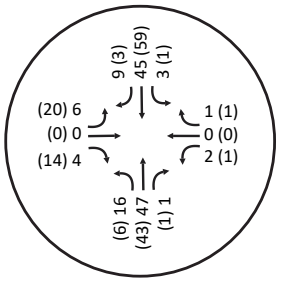
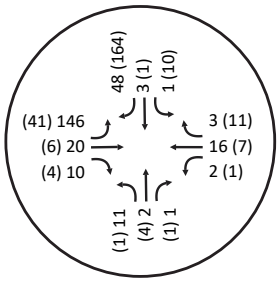
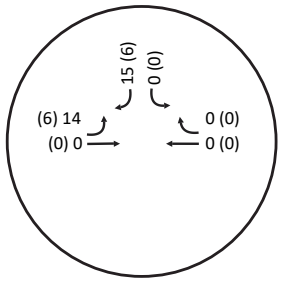


12 Nevada Pacific Pkwy / E Newlands Dr



13 Nevada Pacific Pkwy / Gavin Rd



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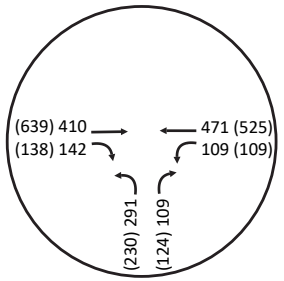
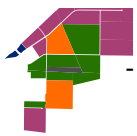


HEADWAY TRANSPORTATION

NO SCALE



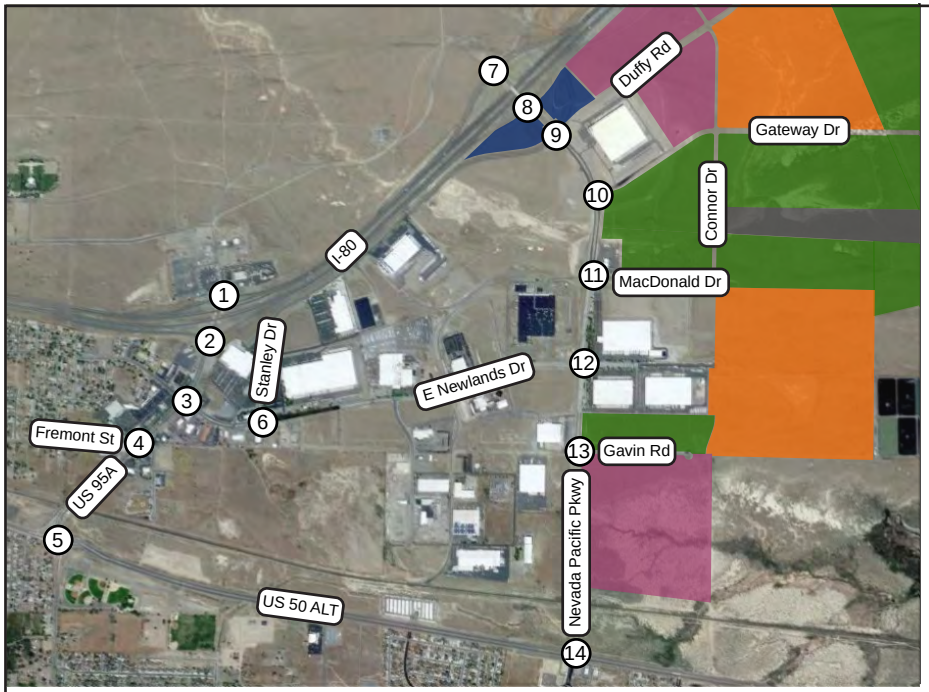
- Project Location by Land Use*
*refer to Figure 2 - Land Use Plan

(#) - Study Intersection

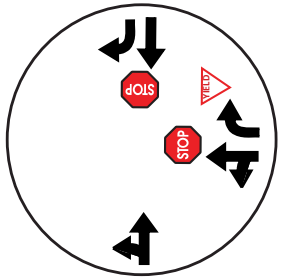
AM (PM) Turning Movement Volumes

Figure 3

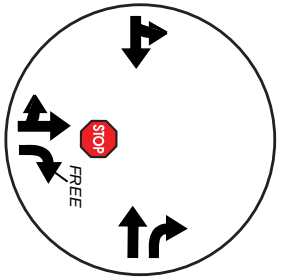
Victory
Traffic Impact Study
Baseline Traffic Volumes



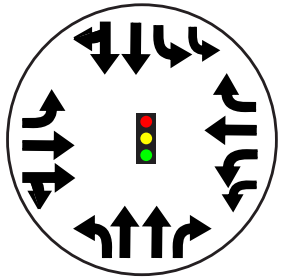
1 US 95A / I-80 Westbound Ramps



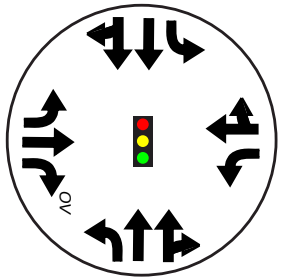
2 US 95A / I-80 Eastbound Ramps



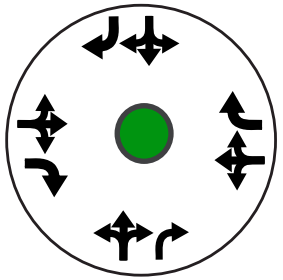
3 US 95A / E Newlands Dr



4 US 95A / Fremont St



5 US 95A / US 50A



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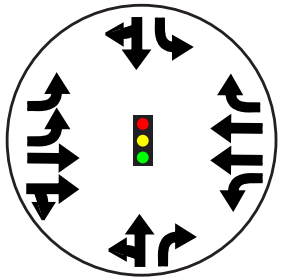
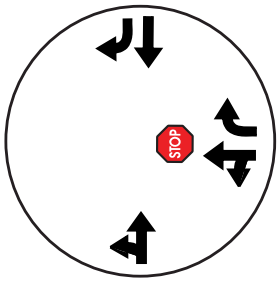
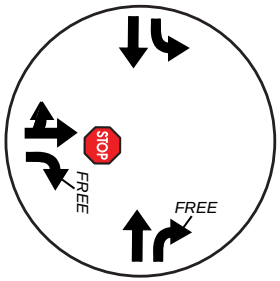


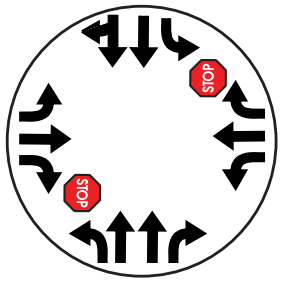
7 Nevada Pacific Pkwy / I-80 Westbound Ramps



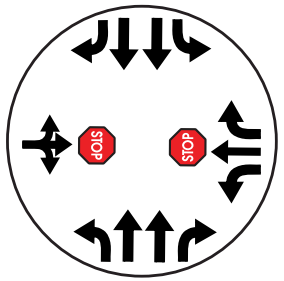
8 Nevada Pacific Pkwy / I-80 Eastbound Ramps



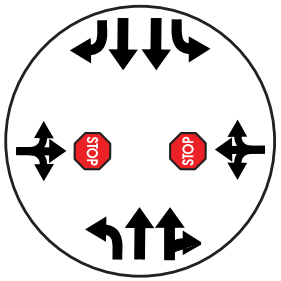
9 Nevada Pacific Pkwy / Duffy Rd



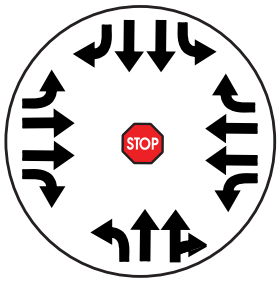
10 Nevada Pacific Pkwy / Gateway Dr



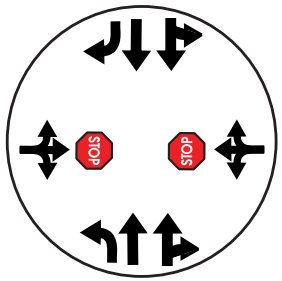
11 Nevada Pacific Pkwy / MacDonald Dr



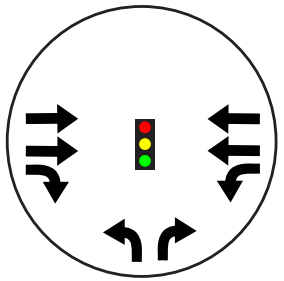
12 Nevada Pacific Pkwy / E Newlands Dr



13 Nevada Pacific Pkwy / Gavin Rd



14 Nevada Pacific Pkwy / US 50A



HEADWAY TRANSPORTATION

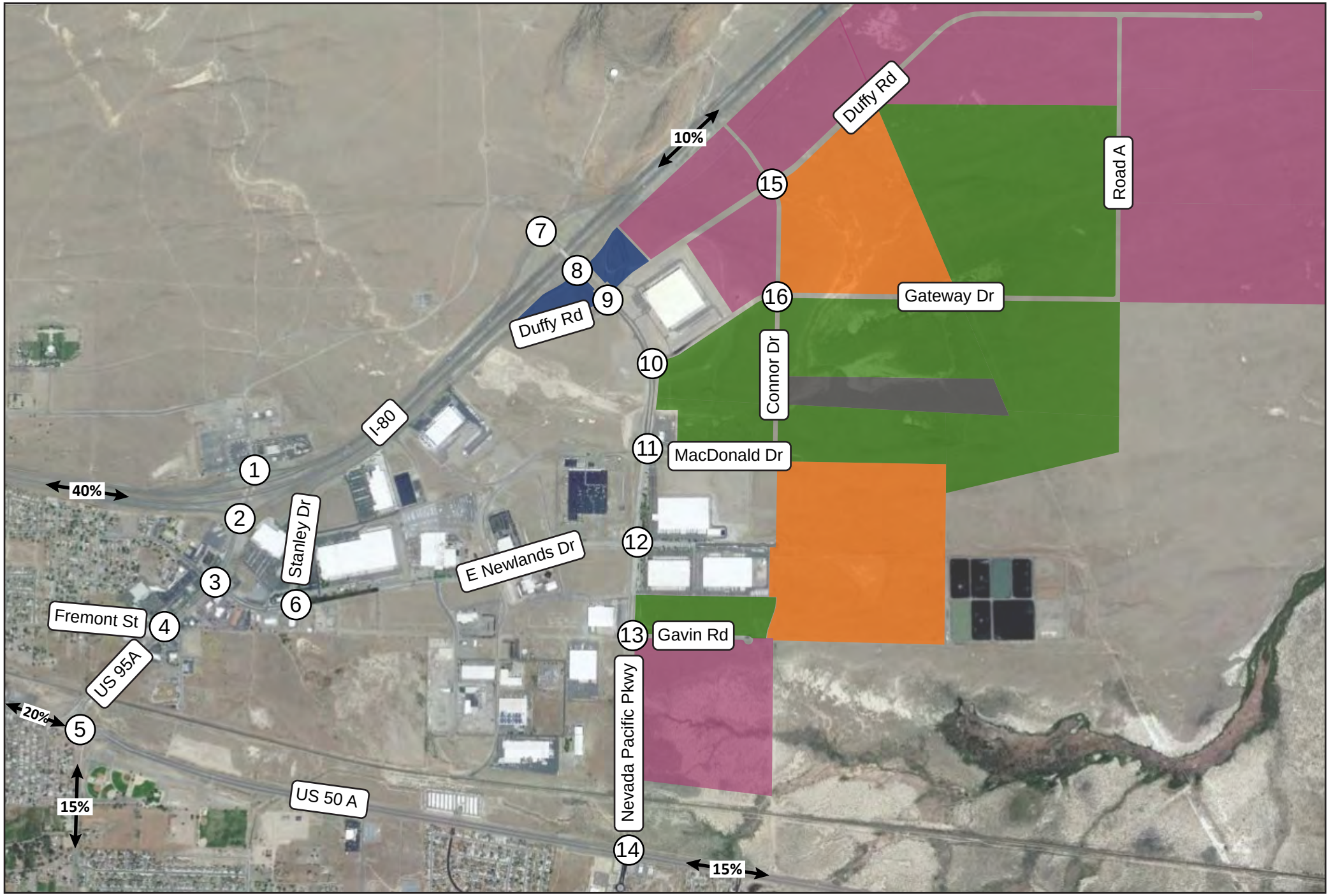
NO SCALE

- Project Location by Land Use*
*refer to Figure 2 - Land Use Plan

- Roundabout
- Stop
- Study Intersection
- Signal

Figure 4

Victory
Traffic Impact Study
Baseline Lane Configurations & Controls



HEADWAY TRANSPORTATION

NO SCALE

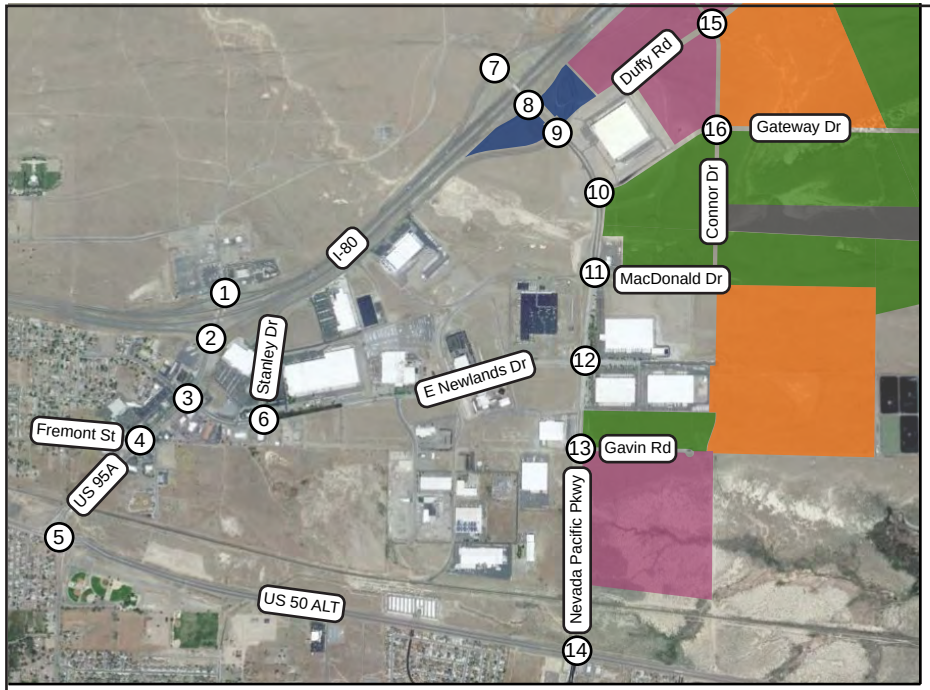
- Project Location by Land Use*
*refer to Figure 2 - Land Use Plan

(#) - Study Intersection

XX% - Trip Distribution

Figure 5

Victory
Traffic Impact Study
Trip Distribution



1 US 95A / I-80 Westbound Ramps

78 (80)
59 (78)
27 (65)
2 (4)
88 (247)
(512) 624
(100) 81

2 US 95A / I-80 Eastbound Ramps

127 (315)
20 (10)
(31) 18
(8) 1
(715) 396
(581) 687
(139) 213

3 US 95A / E Newlands Dr

12 (37)
420 (845)
81 (108)
(57) 40
(54) 37
(66) 31
45 (115)
24 (94)
304 (903)
(84) 21
(551) 819
(503) 652

4 US 95A / Fremont St

37 (85)
676 (1595)
49 (123)
(50) 64
(39) 13
(294) 145
39 (73)
10 (34)
86 (179)
(255) 147
(1142) 1400
(48) 44

5 US 95A / US 50A

456 (728)
183 (459)
281 (859)
(392) 464
(146) 166
(214) 151
649 (655)
157 (150)
22 (33)
(40) 52
(431) 486
(64) 54

6 E Newlands Dr / Stanley Dr

72 (269)
1 (7)
9 (14)
(152) 150
(264) 571
(1) 1
14 (37)
255 (585)
11 (4)
(26) 1
(14) 1
(5) 1

7 Nevada Pacific Pkwy / I-80 Westbound Ramps

0 (0)
0 (0)
0 (0)
1 (6)
112 (63)
(716) 271
(0) 0

8 Nevada Pacific Pkwy / I-80 Eastbound Ramps

111 (62)
1 (1)
(1) 1
(1) 1
(359) 676
(715) 270
(105) 44

9 Nevada Pacific Pkwy / Duffy Rd

165 (172)
591 (248)
32 (1)
(222) 103
(1) 8
(43) 25
1 (4)
8 (2)
2 (5)
(48) 34
(595) 210
(1) 1

10 Nevada Pacific Pkwy / Gateway Dr

5 (2)
430 (218)
180 (77)
(7) 2
(0) 0
(7) 2
51 (170)
0 (0)
35 (116)
(3) 8
(430) 191
(44) 112

11 Nevada Pacific Pkwy / MacDonald Dr

9 (3)
217 (254)
229 (91)
(20) 6
(0) 0
(14) 4
77 (228)
0 (0)
12 (20)
(6) 16
(221) 227
(8) 19

12 Nevada Pacific Pkwy / E Newlands Dr

104 (317)
110 (53)
20 (19)
(113) 292
(25) 64
(55) 115
18 (31)
52 (52)
2 (1)
(92) 41
(97) 38
(1) 1

13 Nevada Pacific Pkwy / Gavin Rd

15 (6)
31 (15)
154 (75)
(6) 14
(0) 0
(0) 0
52 (135)
0 (0)
0 (0)
(0) 0
(26) 8
(0) 0

14 Nevada Pacific Pkwy / US 50A

(785) 470
(148) 145
613 (603)
109 (109)
(234) 302
(124) 109

15 Connor Dr / Duffy Rd

N/A

16 Connor Dr / Gateway Dr

0 (0)
0 (0)
0 (0)
(0) 0
(56) 143
(36) 94
0 (0)
43 (143)
0 (0)
(94) 28
(0) 0
(0) 0

AM (PM) Turning Movement Volumes (*with approximately 35% of project trips)*

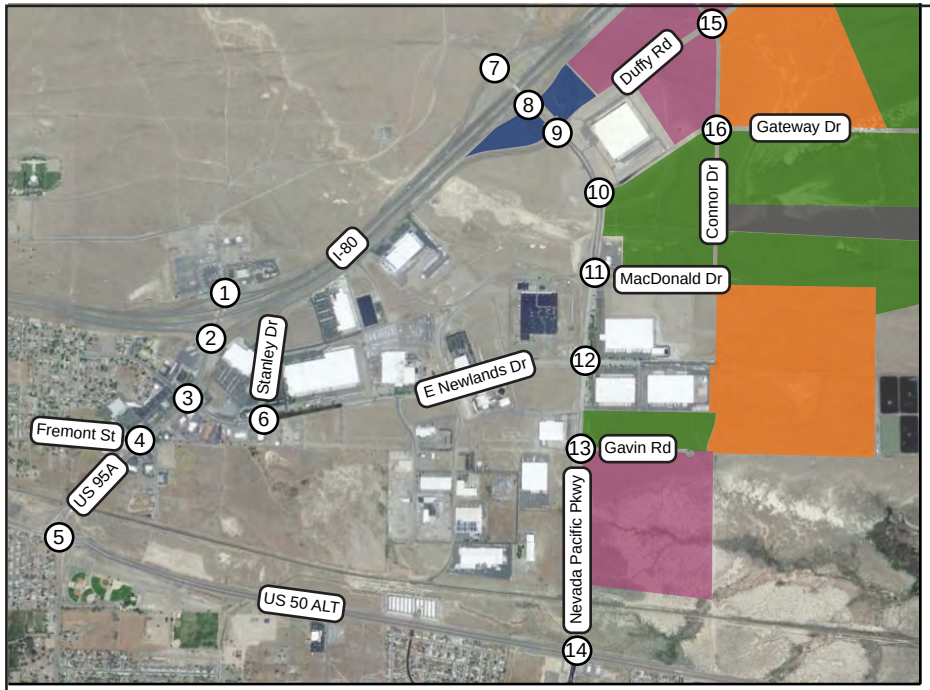
NO SCALE

- Project Location by Land Use*
*refer to Figure 2 - Land Use Plan

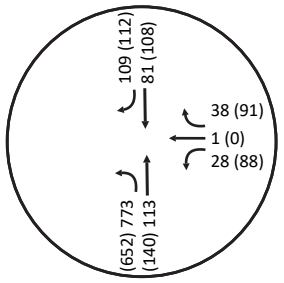
(#) - Study Intersection

Figure 6

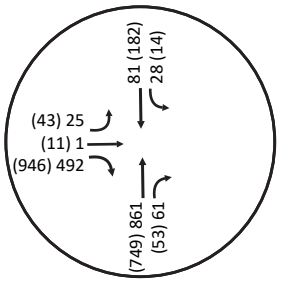
Victory
Traffic Impact Study
Baseline Plus Project Traffic Volumes



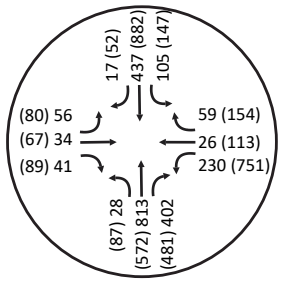
1 US 95A / I-80 Westbound Ramps



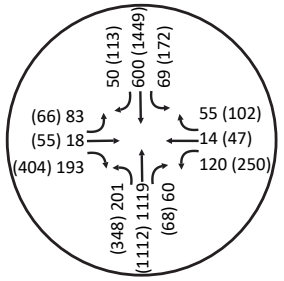
2 US 95A / I-80 Eastbound Ramps



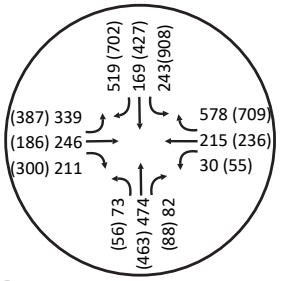
3 US 95A / E Newlands Dr



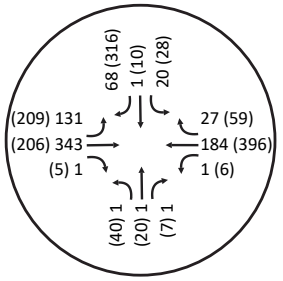
4 US 95A / Fremont St



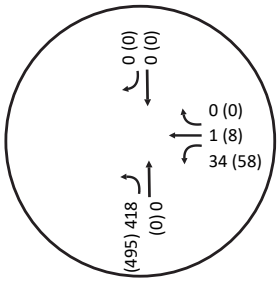
5 US 95A / US 50A



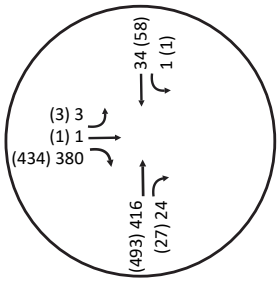
6 E Newlands Dr / Stanley Dr



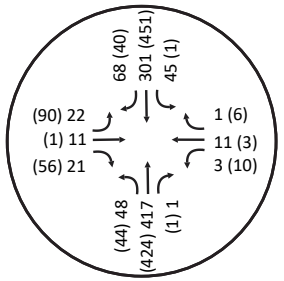
7 Nevada Pacific Pkwy / I-80 Westbound Ramps



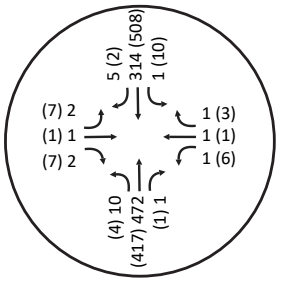
8 Nevada Pacific Pkwy / I-80 Eastbound Ramps



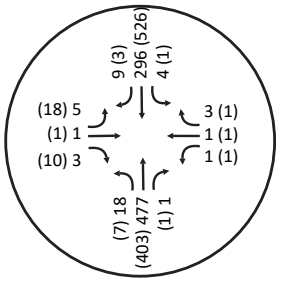
9 Nevada Pacific Pkwy / Duffy Rd



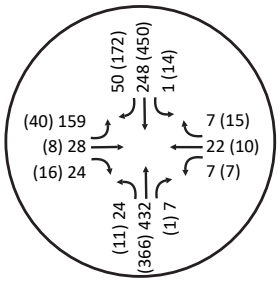
10 Nevada Pacific Pkwy / Gateway Dr



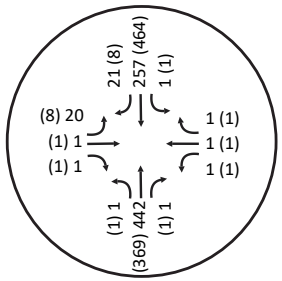
11 Nevada Pacific Pkwy / MacDonald Dr



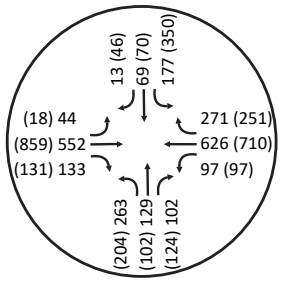
12 Nevada Pacific Pkwy / E Newlands Dr



13 Nevada Pacific Pkwy / Gavin Rd



14 Nevada Pacific Pkwy / US 50A



HEADWAY TRANSPORTATION

NO SCALE

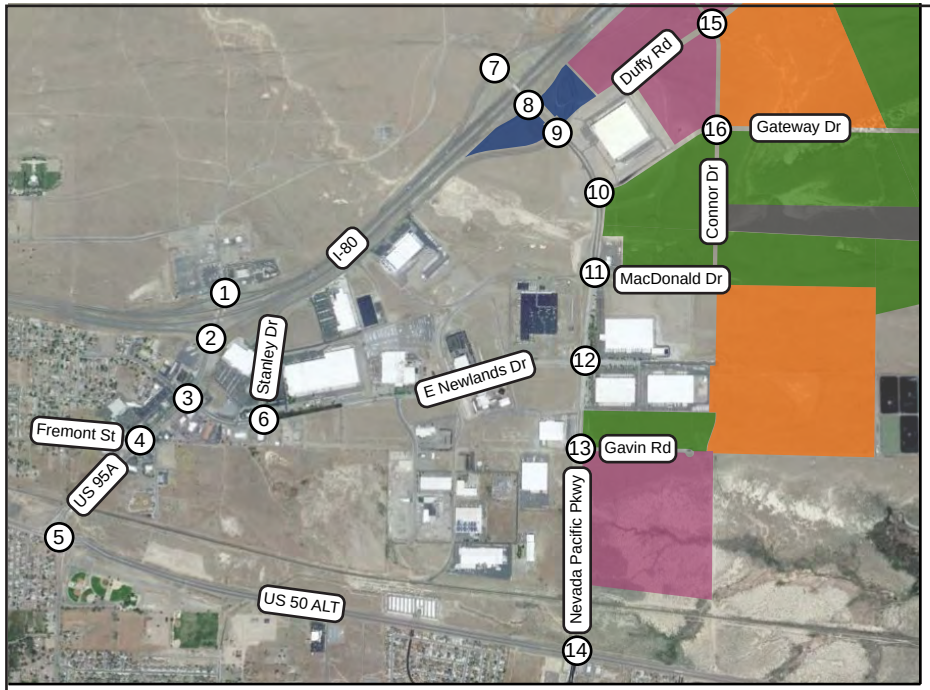
AM (PM) Turning Movement Volumes

- Project Location by Land Use*
*refer to Figure 2 - Land Use Plan

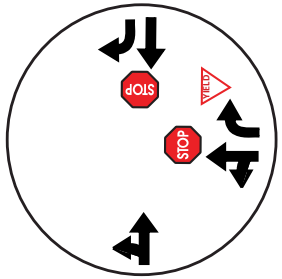
(#) - Study Intersection

Figure 7

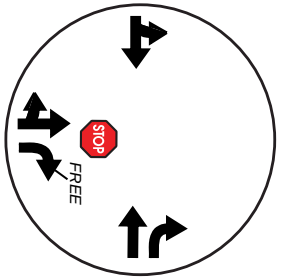
Victory
Traffic Impact Study
Future Year Traffic Volumes



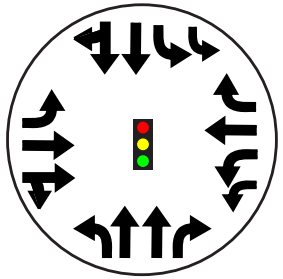
1 US 95A / I-80 Westbound Ramps



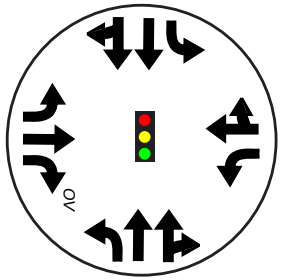
2 US 95A / I-80 Eastbound Ramps



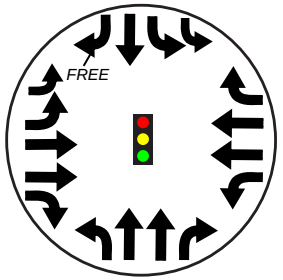
3 US 95A / E Newlands Dr



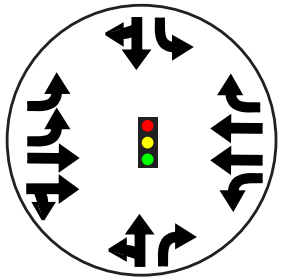
4 US 95A / Fremont St



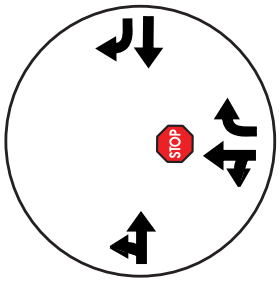
5 US 95A / US 50A



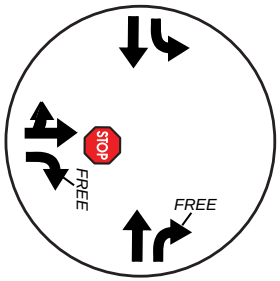
6 E Newlands Dr / Stanley Dr



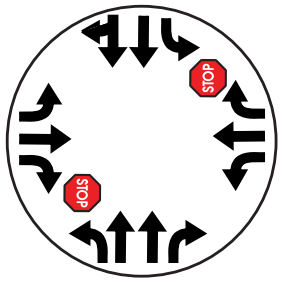
7 Nevada Pacific Pkwy / I-80 Westbound Ramps



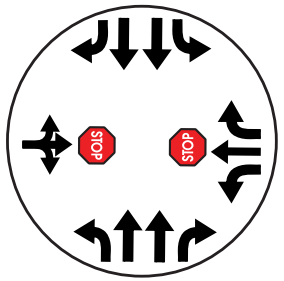
8 Nevada Pacific Pkwy / I-80 Eastbound Ramps



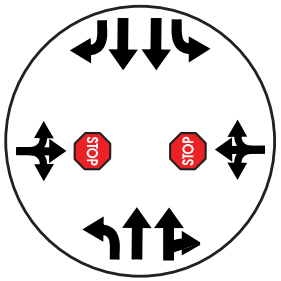
9 Nevada Pacific Pkwy / Duffy Rd



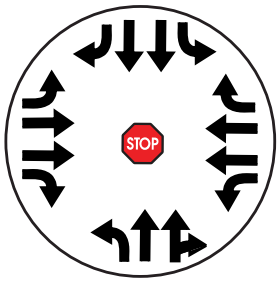
10 Nevada Pacific Pkwy / Gateway Dr



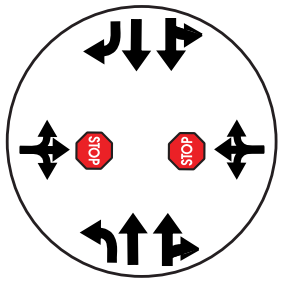
11 Nevada Pacific Pkwy / MacDonald Dr



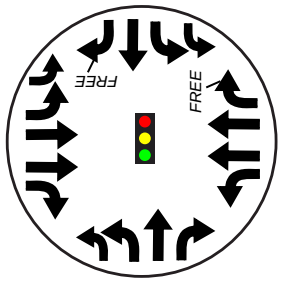
12 Nevada Pacific Pkwy / E Newlands Dr



13 Nevada Pacific Pkwy / Gavin Rd



14 Nevada Pacific Pkwy / US 50A



HEADWAY TRANSPORTATION

NO SCALE

- Project Location by Land Use*
*refer to Figure 2 - Land Use Plan

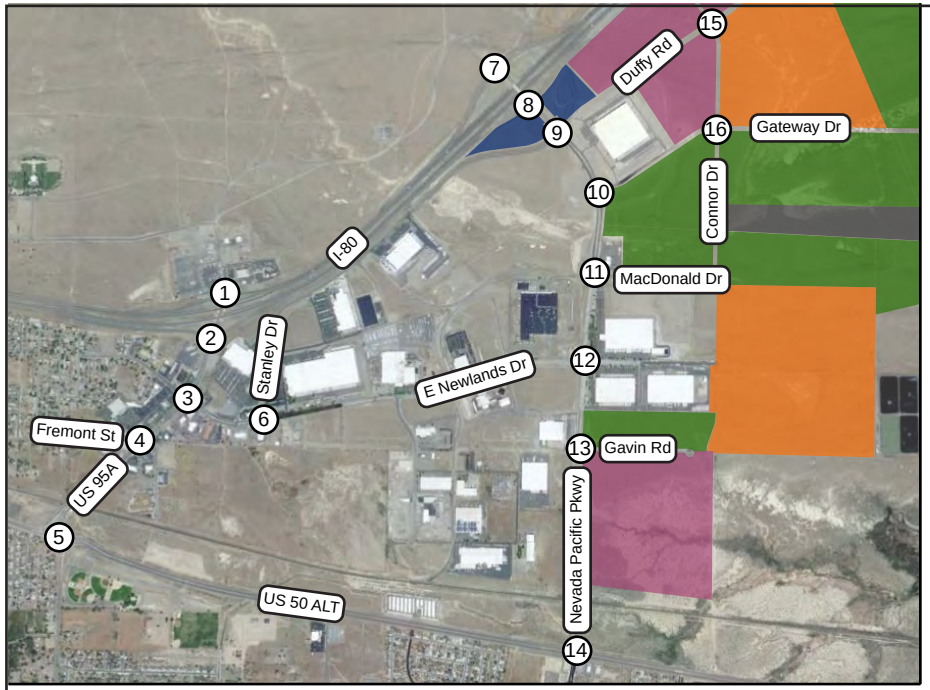
(#) - Study Intersection

STOP - Stop

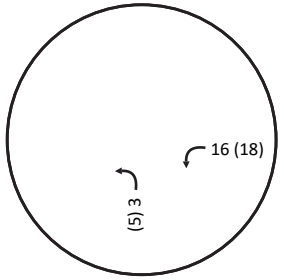
- Signal

Figure 8

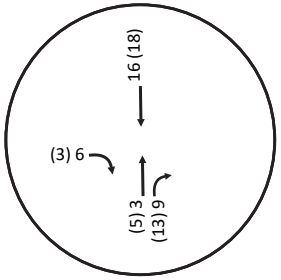
Victory
Traffic Impact Study
Future Year Lane Configurations & Controls



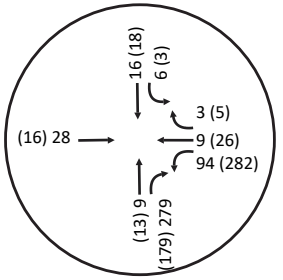
1 US 95A / I-80 Westbound Ramps



2 US 95A / I-80 Eastbound Ramps



3 US 95A / E Newlands Dr



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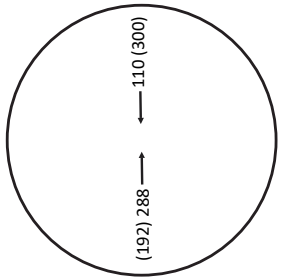
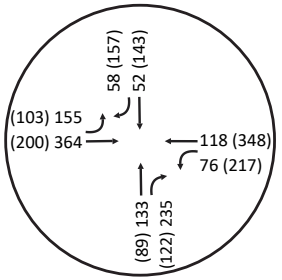
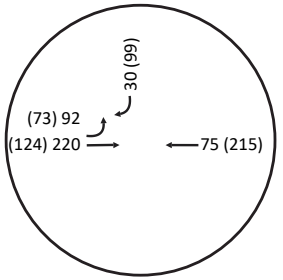


5 US 95A / US 50A



6 E Newlands Dr / Stanley Dr



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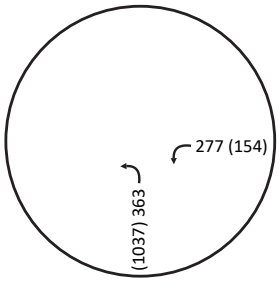

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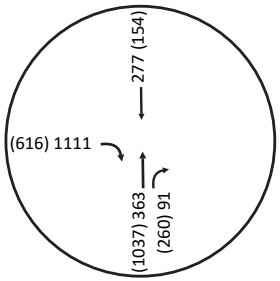

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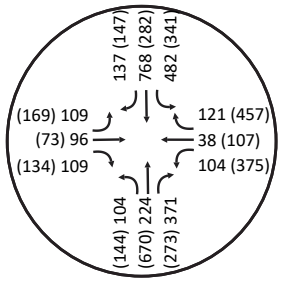

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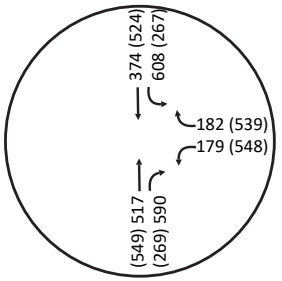
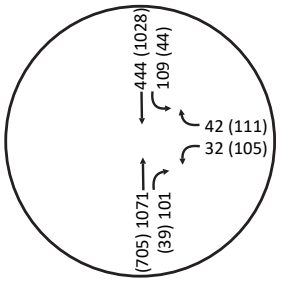
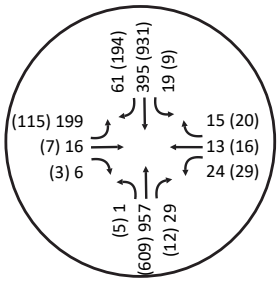


11 Nevada Pacific Pkwy / MacDonald Dr



12 Nevada Pacific Pkwy / E Newlands Dr



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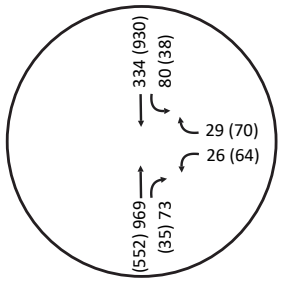

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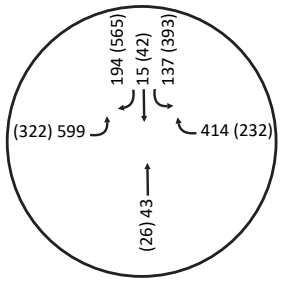
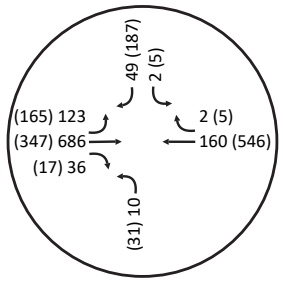
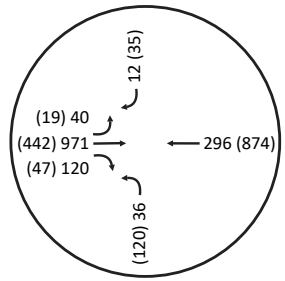


15 Connor Dr / Duffy Rd

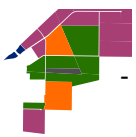


16 Connor Dr / Gateway Dr



HEADWAY TRANSPORTATION

NO SCALE



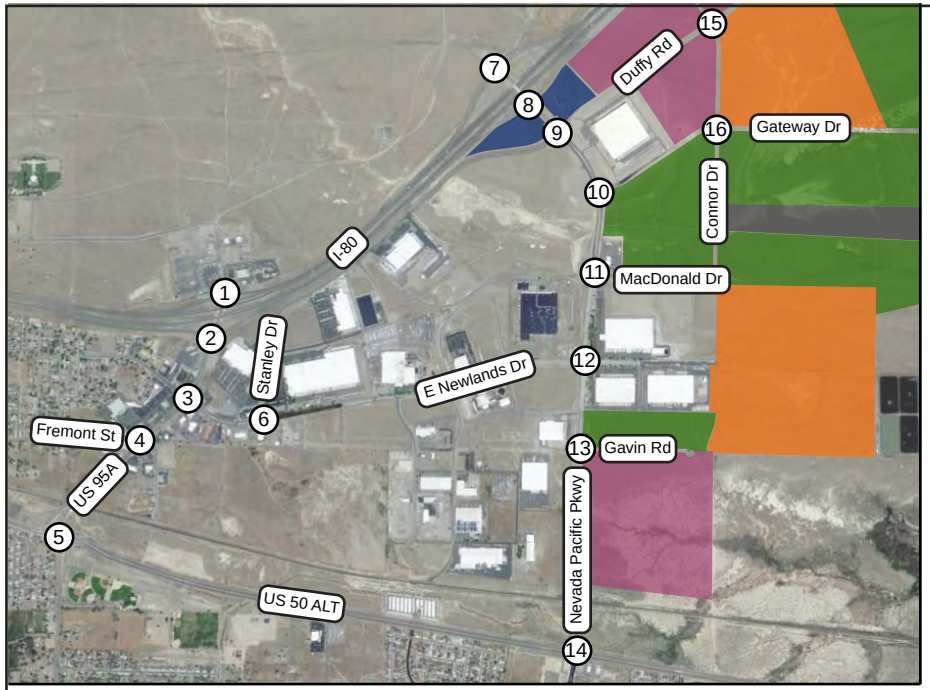
AM (PM) Turning Movement Volumes

- Project Location by Land Use*
*refer to Figure 2 - Land Use Plan

(#) - Study Intersection

Figure 9

Victory
Traffic Impact Study
Project Trips - Future Year Plus Project



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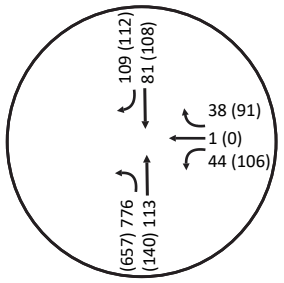

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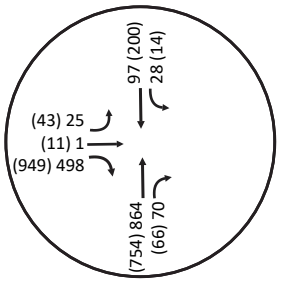

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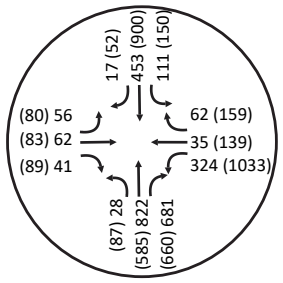

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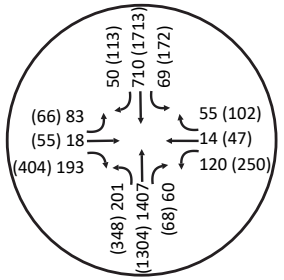

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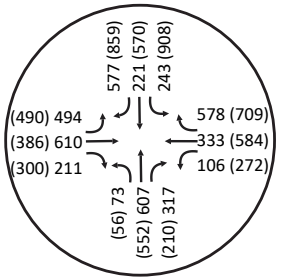
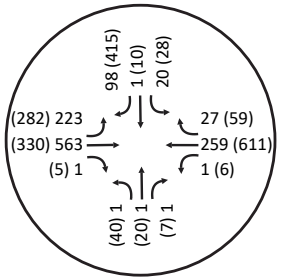
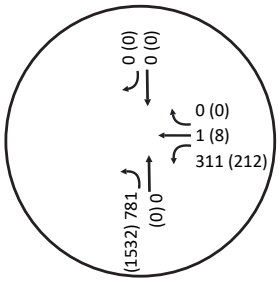


6 E Newlands Dr / Stanley Dr



7 Nevada Pacific Pkwy / I-80 Westbound Ramps



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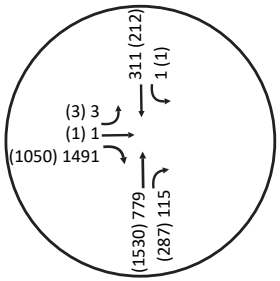

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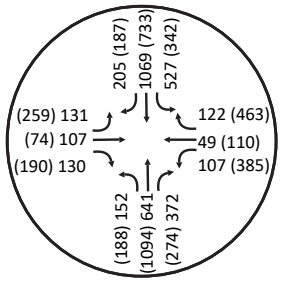

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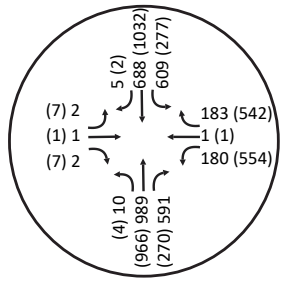
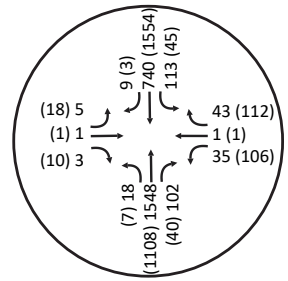


11 Nevada Pacific Pkwy / MacDonald Dr



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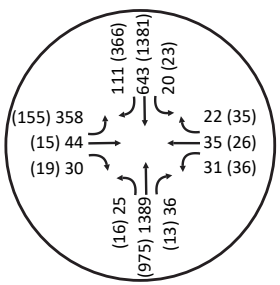

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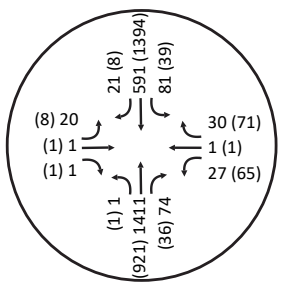

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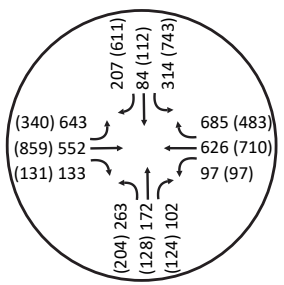
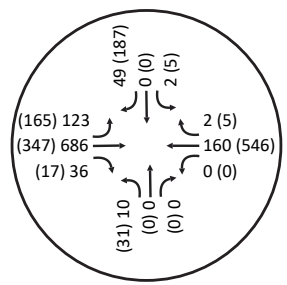


15 Connor Dr / Duffy Rd



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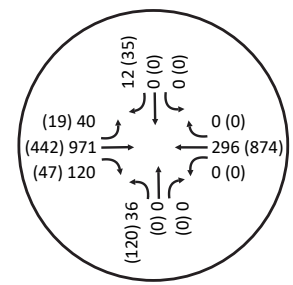


AM (PM) Turning Movement Volumes

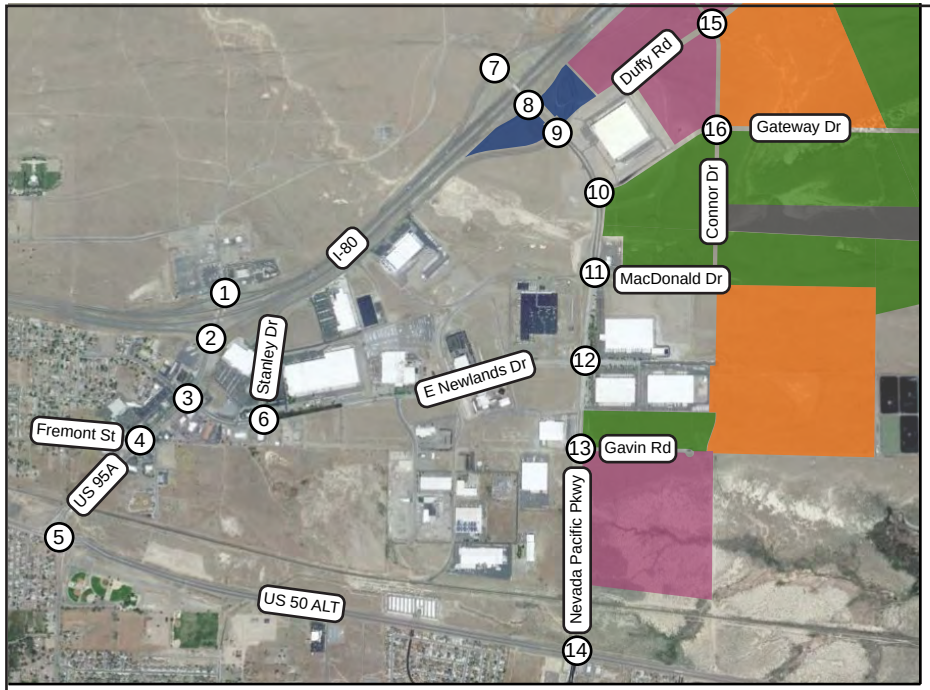
NO SCALE

- Project Location by Land Use*
*refer to Figure 2 - Land Use Plan

(#) - Study Intersection

Figure 10

Victory
Traffic Impact Study
Future Year Plus Project Traffic Volumes



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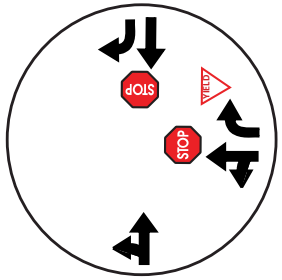

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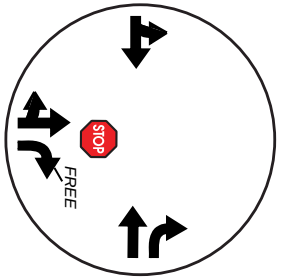

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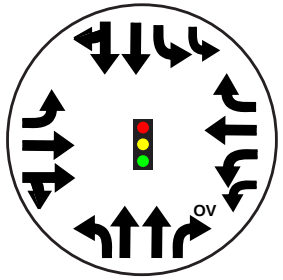

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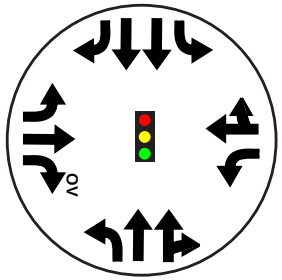

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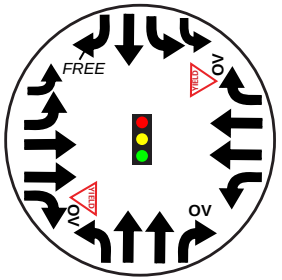

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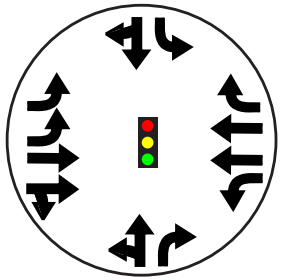

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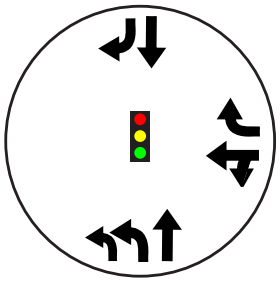

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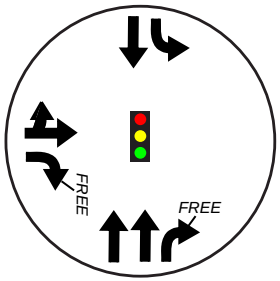
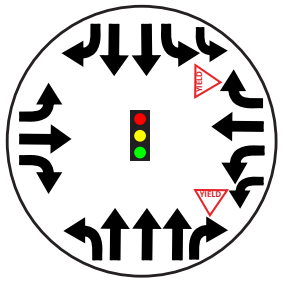
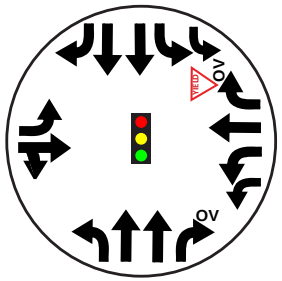


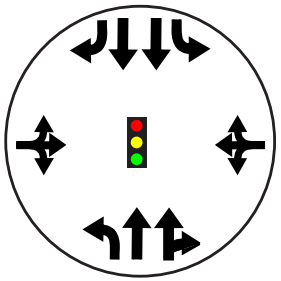
9 Nevada Pacific Pkwy / Duffy Rd



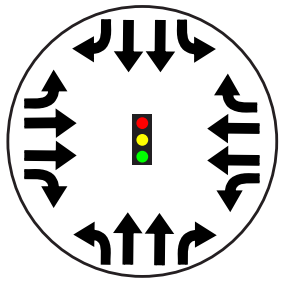
10 Nevada Pacific Pkwy / Gateway Dr



11 Nevada Pacific Pkwy / MacDonald Dr



12 Nevada Pacific Pkwy / E Newlands Dr



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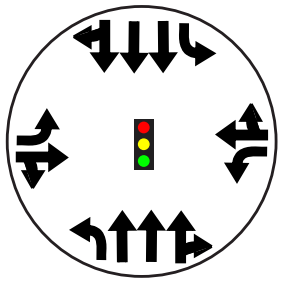

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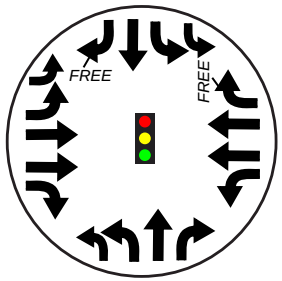

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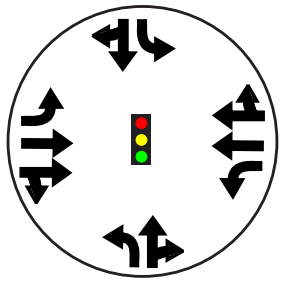

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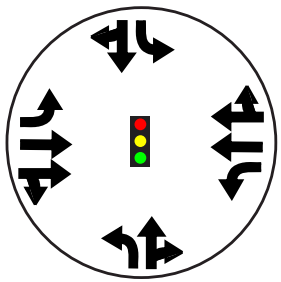


HEADWAY TRANSPORTATION

NO SCALE

- Project Location by Land Use*
*refer to Figure 2 - Land Use Plan

(#) - Study Intersection

OV - Right Turn Overlap Phase

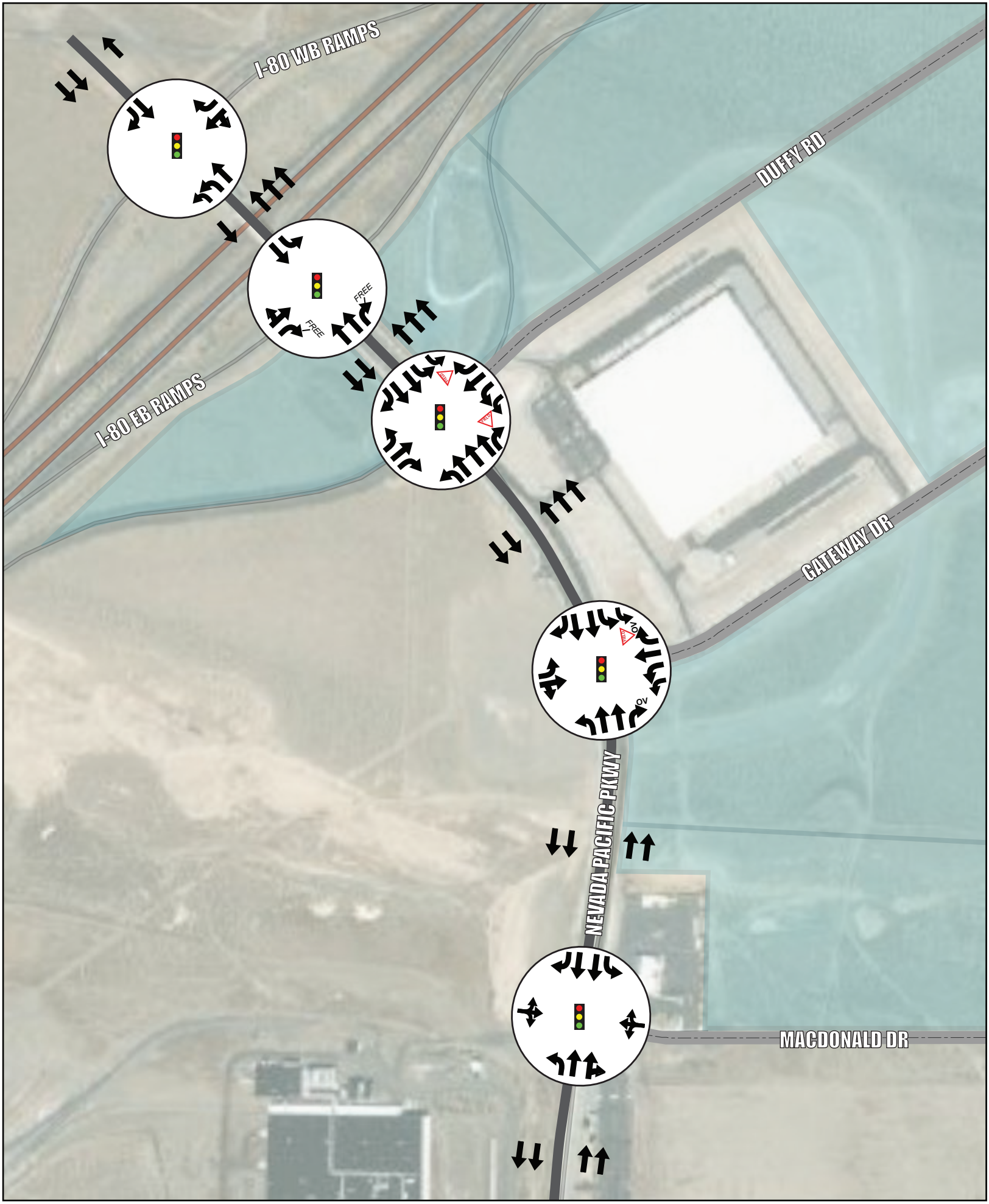
STOP - Stop

- Signal

Figure 11

Victory
Traffic Impact Study

Ultimate Intersection Lane Configurations & Controls



HEADWAY TRANSPORTATION

NO SCALE

Figure 12A
Victory
Traffic Impact Study
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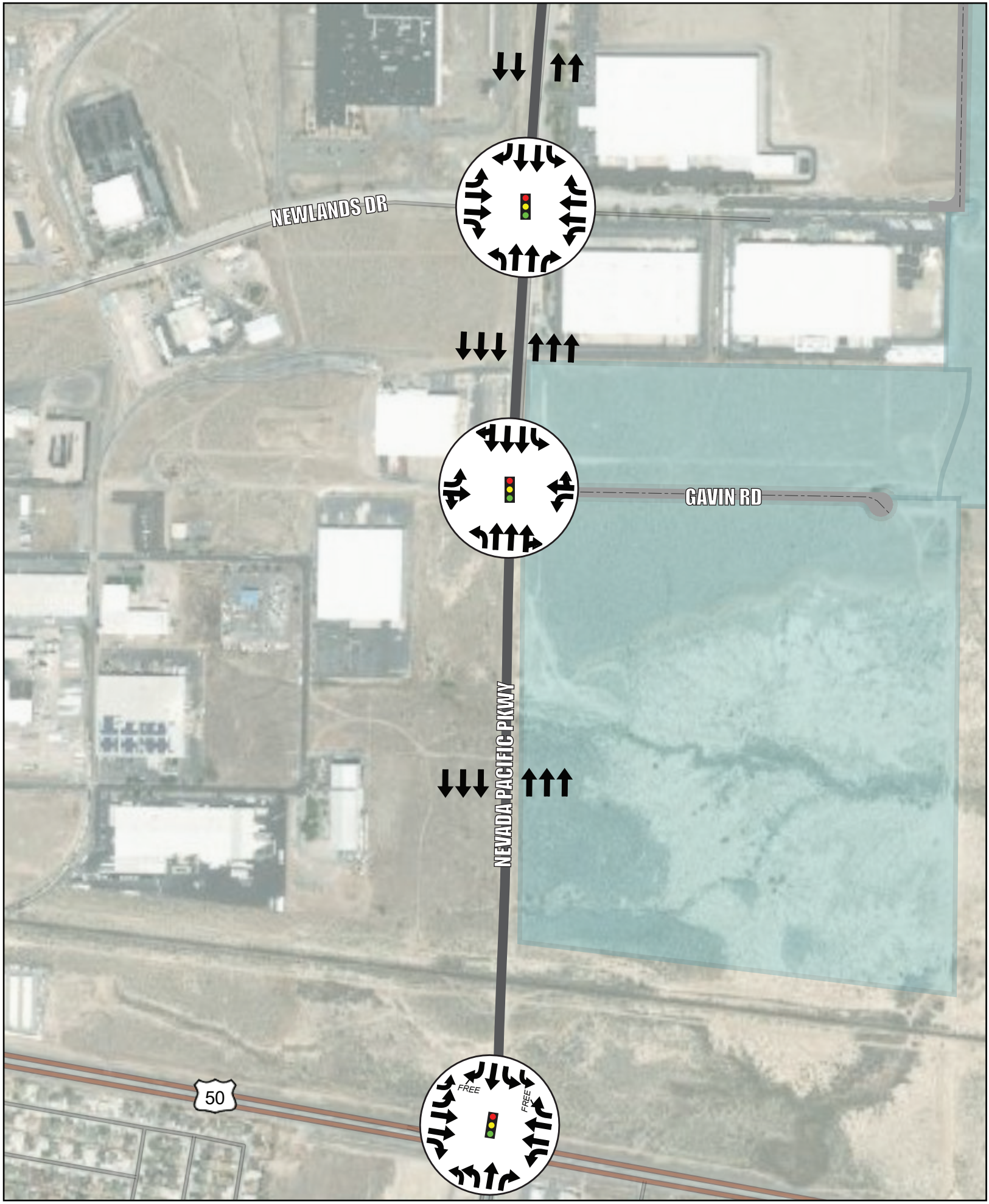
Number of Lanes and Roadway Configuration – Nevada Pacific Parkway



HEADWAY TRANSPORTATION

NO SCALE

Figure 12B
Victory
Traffic Impact Study
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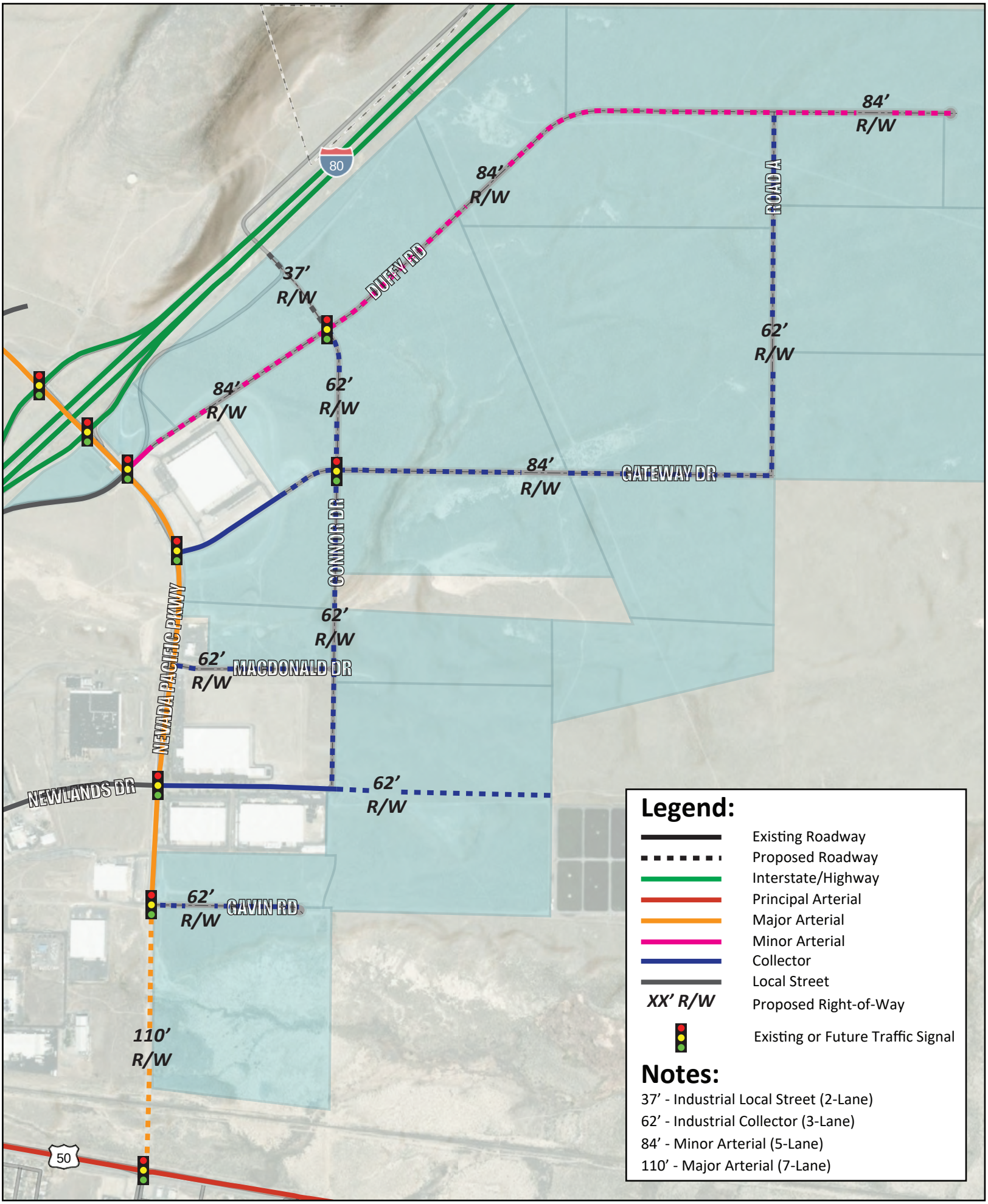
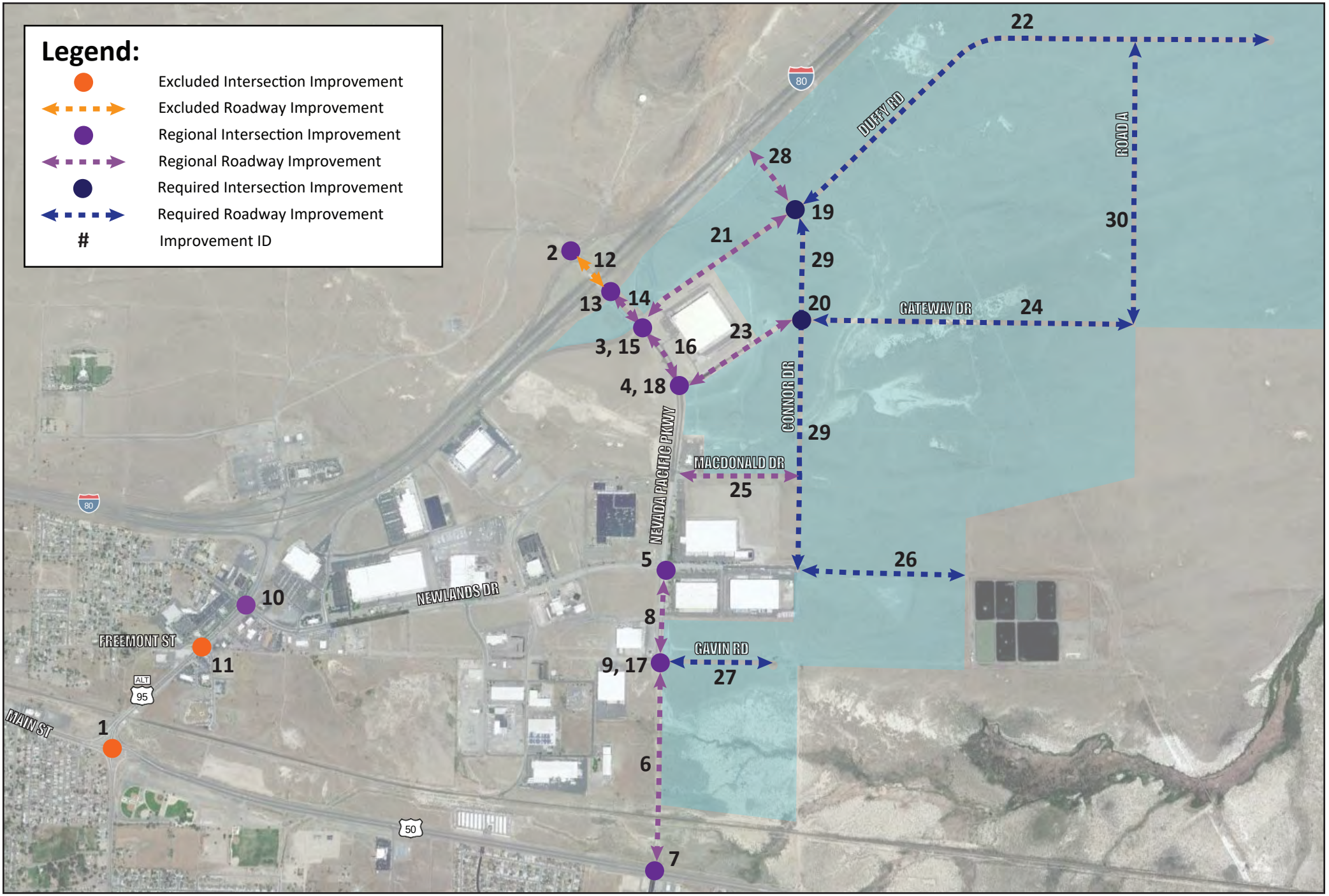
Number of Lanes and Roadway Configuration – Nevada Pacific Parkway



NO SCALE

Figure 13
Victory Logistics Tentative Map
Traffic Impact Study
Roadway Classification & Right-of-Way Width



HEADWAY TRANSPORTATION

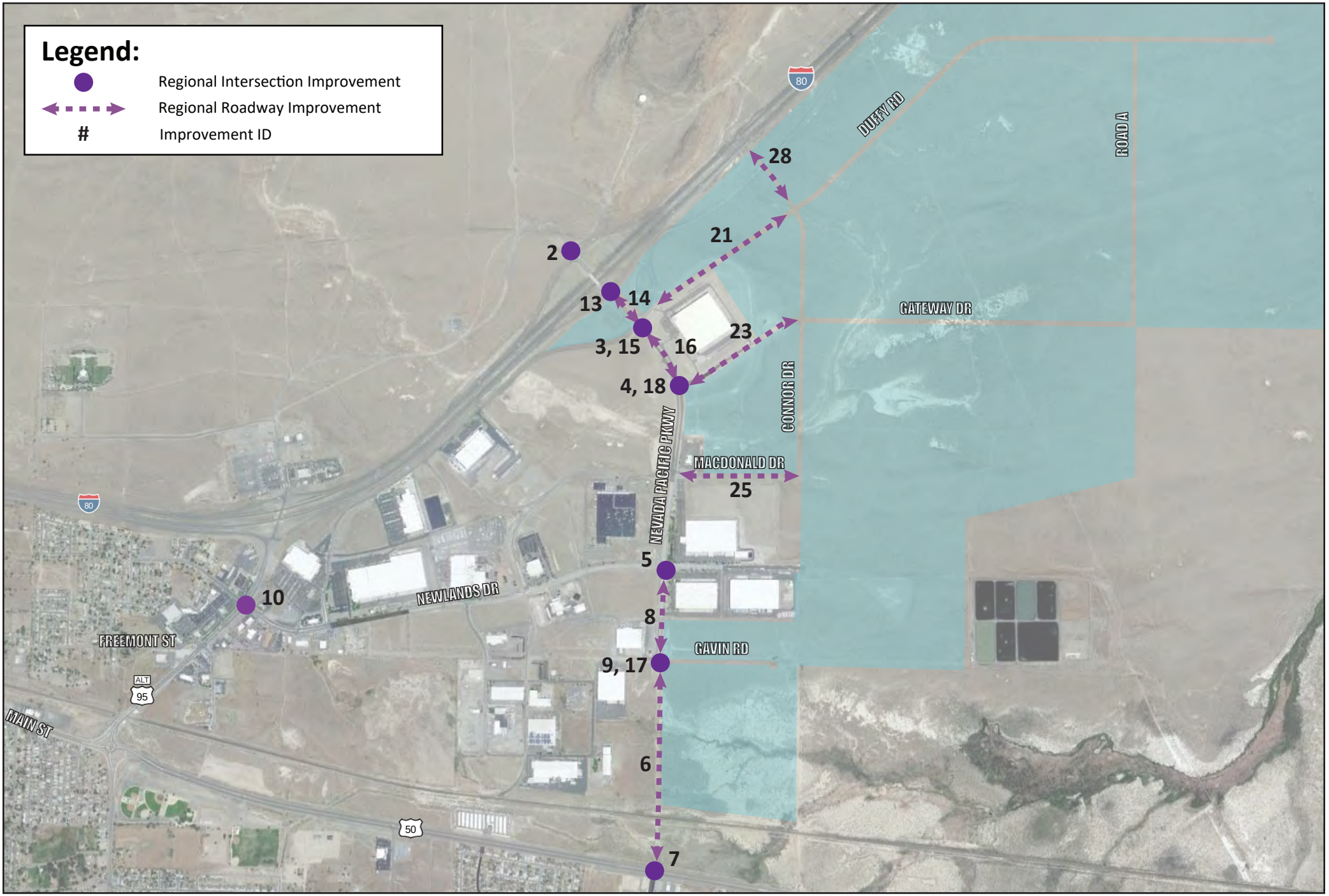
NO SCALE

Figure 14

Victory

Traffic Impact Study

Required Roadway Infrastructure



HEADWAY TRANSPORTATION

NO SCALE

Figure 15

Victory

Traffic Impact Study

Regional Roadway Infrastructure

HEADWAY TRANSPORTATION

NO SCALE

Figure 16

Victory

Traffic Impact Study

Excluded Roadway Infrastructure

Appendix A
Baseline LOS Calculations

Intersection Level Of Service Report
Intersection 1: US 95A/I-80 WB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	20.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.176

Intersection Setup

Name	US 95A			US 95A						I-80 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	350.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	US 95A			US 95A						I-80 WB Ramps		
Base Volume Input [veh/h]	621	81	0	0	59	78	0	0	0	20	1	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	13.00	13.00	2.00	2.00	13.00	13.00	2.00	2.00	2.00	13.00	13.00	13.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	621	81	0	0	59	78	0	0	0	20	1	27
Peak Hour Factor	0.9500	0.9500	1.0000	1.0000	0.9500	0.9500	1.0000	1.0000	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	163	21	0	0	16	21	0	0	0	5	0	7
Total Analysis Volume [veh/h]	654	85	0	0	62	82	0	0	0	21	1	28
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Stop	Free	Stop
Flared Lane		No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance		No		No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.18	0.19	0.00	0.00	0.00	0.08	0.00	0.05
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	20.57	18.84	0.00	0.00	0.00	19.49	19.42	11.16
Movement LOS	A	A			C	C				C	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	1.67	1.67	0.00	0.00	0.00	0.26	0.26	0.14
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	41.78	41.78	0.00	0.00	0.00	6.58	6.58	3.58
d_A, Approach Delay [s/veh]	0.00			19.59			0.00			14.82		
Approach LOS	A			C			A			B		
d_I, Intersection Delay [s/veh]	3.82											
Intersection LOS	C											

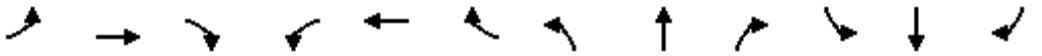
Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	1	390	0	0	0	0	684	44	20	59	0
Future Vol, veh/h	18	1	390	0	0	0	0	684	44	20	59	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	250	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	9	9	9	9	9	9
Mvmt Flow	19	1	406	0	0	0	0	713	46	21	61	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	816	816	-	-	0	0	713	0	0
Stage 1	103	103	-	-	-	-	-	-	-
Stage 2	713	713	-	-	-	-	-	-	-
Critical Hdwy	6.49	6.59	-	-	-	-	4.19	-	-
Critical Hdwy Stg 1	5.49	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.49	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.581	4.081	-	-	-	-	2.281	-	-
Pot Cap-1 Maneuver	337	304	0	0	-	-	855	-	0
Stage 1	904	796	0	0	-	-	-	-	0
Stage 2	473	425	0	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	329	0	-	-	-	-	855	-	-
Mov Cap-2 Maneuver	329	0	-	-	-	-	-	-	-
Stage 1	904	0	-	-	-	-	-	-	-
Stage 2	461	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6	0	2.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	329	-	855	-
HCM Lane V/C Ratio	-	-	0.06	-	0.024	-
HCM Control Delay (s)	-	-	16.6	0	9.3	0
HCM Lane LOS	-	-	C	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	28	31	177	20	42	21	650	358	75	352	12
Future Volume (veh/h)	40	28	31	177	20	42	21	650	358	75	352	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	43	30	33	190	22	45	23	699	385	81	378	13
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	66	119	105	246	189	159	46	2332	1039	156	2367	81
Arrive On Green	0.04	0.07	0.07	0.07	0.10	0.10	0.02	0.45	0.45	0.05	0.70	0.70
Sat Flow, veh/h	1725	1721	1521	3346	1811	1526	1725	3441	1534	3346	3394	116
Grp Volume(v), veh/h	43	30	33	190	22	45	23	699	385	81	191	200
Grp Sat Flow(s),veh/h/ln	1725	1721	1521	1673	1811	1526	1725	1721	1534	1673	1721	1790
Q Serve(g_s), s	3.0	2.0	2.5	6.7	1.3	3.3	1.6	15.4	19.8	2.8	4.5	4.6
Cycle Q Clear(g_c), s	3.0	2.0	2.5	6.7	1.3	3.3	1.6	15.4	19.8	2.8	4.5	4.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	66	119	105	246	189	159	46	2332	1039	156	1200	1248
V/C Ratio(X)	0.65	0.25	0.31	0.77	0.12	0.28	0.50	0.30	0.37	0.52	0.16	0.16
Avail Cap(c_a), veh/h	158	588	520	307	619	521	158	2332	1039	307	1200	1248
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.89	0.89	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.9	52.9	53.2	54.6	48.7	49.6	58.1	14.8	16.0	55.9	6.2	6.2
Incr Delay (d2), s/veh	10.5	1.1	1.7	9.2	0.3	1.0	7.2	0.3	0.9	2.7	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.9	1.0	3.1	0.6	1.3	0.8	6.7	7.8	1.3	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.5	54.0	54.8	63.9	49.0	50.5	65.3	15.1	16.9	58.5	6.5	6.5
LnGrp LOS	E	D	D	E	D	D	E	B	B	E	A	A
Approach Vol, veh/h		106			257			1107			472	
Approach Delay, s/veh		59.7			60.3			16.7			15.4	
Approach LOS		E			E			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	85.3	12.8	12.3	7.2	87.7	8.6	16.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	41.0	11.0	41.0	11.0	41.0	11.0	41.0
Max Q Clear Time (g_c+I1), s	4.8	21.8	8.7	4.5	3.6	6.6	5.0	5.3
Green Ext Time (p_c), s	0.1	6.3	0.1	0.3	0.0	2.5	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	13	145	86	10	39	147	936	44	49	481	37
Future Volume (veh/h)	64	13	145	86	10	39	147	936	44	49	481	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	68	14	154	91	11	41	156	996	47	52	512	39
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	87	196	331	113	41	154	185	2179	103	71	1896	144
Arrive On Green	0.05	0.11	0.11	0.07	0.12	0.12	0.11	0.65	0.65	0.08	1.00	1.00
Sat Flow, veh/h	1725	1811	1535	1725	335	1250	1725	3345	158	1725	3240	246
Grp Volume(v), veh/h	68	14	154	91	0	52	156	512	531	52	271	280
Grp Sat Flow(s),veh/h/ln	1725	1811	1535	1725	0	1586	1725	1721	1782	1725	1721	1766
Q Serve(g_s), s	4.7	0.8	10.5	6.2	0.0	3.6	10.6	17.7	17.7	3.5	0.0	0.0
Cycle Q Clear(g_c), s	4.7	0.8	10.5	6.2	0.0	3.6	10.6	17.7	17.7	3.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.79	1.00		0.09	1.00		0.14
Lane Grp Cap(c), veh/h	87	196	331	113	0	196	185	1121	1161	71	1007	1033
V/C Ratio(X)	0.78	0.07	0.47	0.80	0.00	0.27	0.84	0.46	0.46	0.73	0.27	0.27
Avail Cap(c_a), veh/h	302	468	562	158	0	278	374	1121	1161	158	1007	1033
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	56.3	48.1	41.0	55.3	0.0	47.7	52.5	10.4	10.4	54.4	0.0	0.0
Incr Delay (d2), s/veh	13.7	0.2	1.0	18.0	0.0	0.7	9.8	1.3	1.3	13.1	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.4	4.1	3.3	0.0	1.5	5.1	6.8	7.0	1.7	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.0	48.2	42.0	73.2	0.0	48.4	62.3	11.7	11.7	67.5	0.6	0.6
LnGrp LOS	E	D	D	E	A	D	E	B	B	E	A	A
Approach Vol, veh/h		236			143			1199			603	
Approach Delay, s/veh		50.5			64.2			18.3			6.4	
Approach LOS		D			E			B			A	

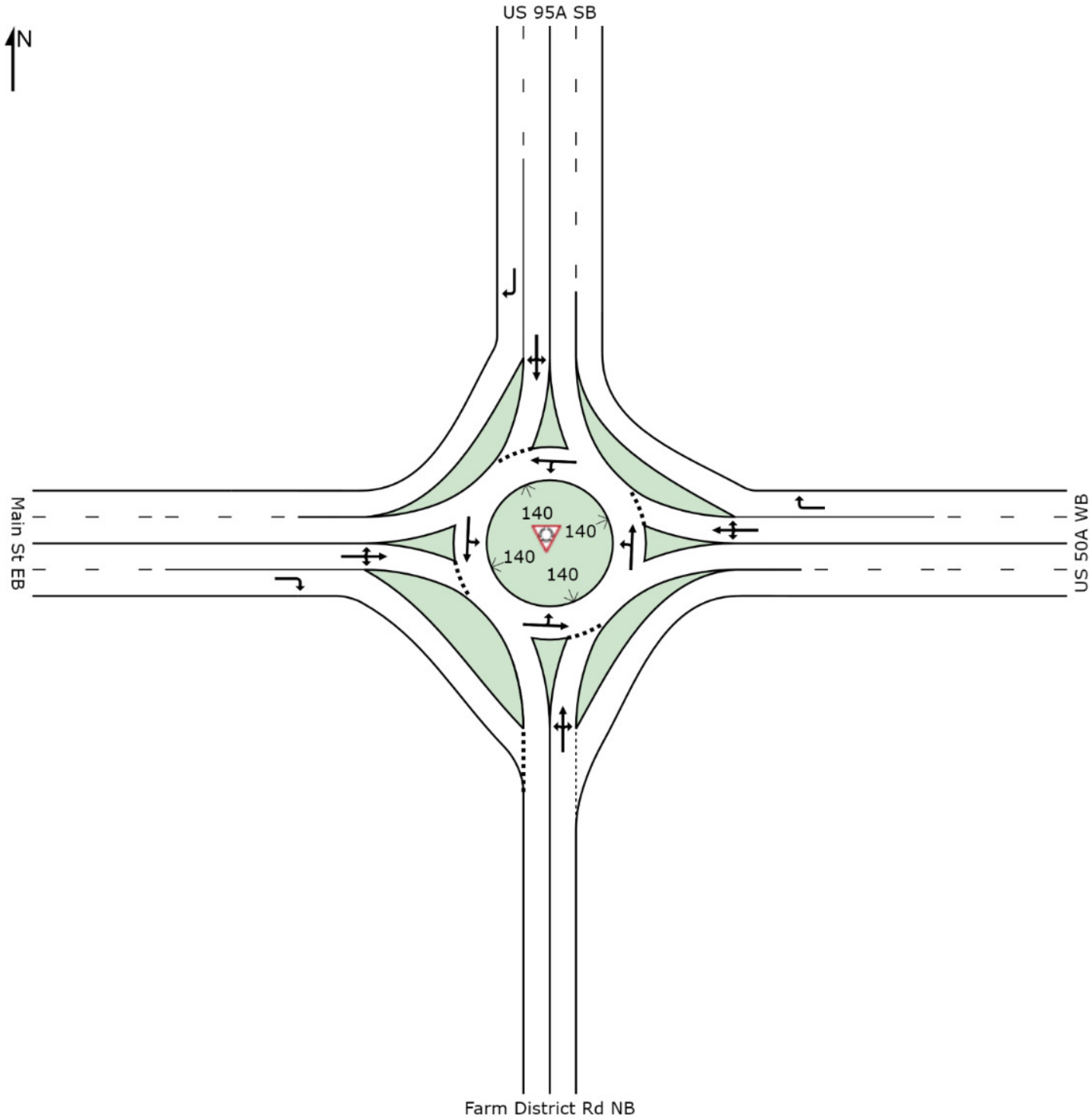
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	82.2	11.9	17.0	16.9	74.2	10.1	18.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	51.0	11.0	31.0	26.0	36.0	21.0	21.0
Max Q Clear Time (g_c+I1), s	5.5	19.7	8.2	12.5	12.6	2.0	6.7	5.6
Green Ext Time (p_c), s	0.0	8.2	0.0	0.5	0.3	3.7	0.1	0.2

Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

SITE LAYOUT

Site: US 95A/US 50A/Main Street/Farm District Rd

Baseline Conditions
AM Peak
Roundabout



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MOVEMENT SUMMARY

Site: US 95A/US 50A/Main Street/Farm District Rd

Baseline Conditions
AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Farm District Rd NB											
3	L2	56	6.0	0.911	47.0	LOS E	11.4	298.9	1.00	1.40	21.8
8	T1	381	6.0	0.911	47.0	LOS E	11.4	298.9	1.00	1.40	21.7
18	R2	58	6.0	0.911	47.0	LOS E	11.4	298.9	1.00	1.40	21.3
Approach		495	6.0	0.911	47.0	LOS E	11.4	298.9	1.00	1.40	21.7
East: US 50A WB											
1	L2	24	6.0	0.396	14.2	LOS B	1.6	40.7	0.67	0.71	31.6
6	T1	169	6.0	0.396	14.2	LOS B	1.6	40.7	0.67	0.71	31.4
16	R2	534	6.0	0.338	0.1	LOS A	0.0	0.0	0.00	0.00	37.7
Approach		727	6.0	0.396	3.8	LOS A	1.6	40.7	0.18	0.19	35.8
North: US 95A SB											
7	L2	234	6.0	0.451	10.2	LOS B	2.1	54.9	0.50	0.43	31.9
4	T1	135	6.0	0.451	10.2	LOS B	2.1	54.9	0.50	0.43	31.7
14	R2	410	6.0	0.259	0.0	LOS A	0.0	0.0	0.00	0.00	37.8
Approach		780	6.0	0.451	4.9	LOS A	2.1	54.9	0.24	0.20	34.6
West: Main St EB											
5	L2	305	6.0	0.738	21.8	LOS C	5.9	154.6	0.78	0.90	27.6
2	T1	178	6.0	0.738	21.8	LOS C	5.9	154.6	0.78	0.90	27.5
12	R2	162	6.0	0.738	9.0	LOS A	5.9	154.6	0.43	0.37	32.3
Approach		646	6.0	0.738	18.6	LOS C	5.9	154.6	0.69	0.77	28.6
All Vehicles		2647	6.0	0.911	15.8	LOS C	11.4	298.9	0.47	0.56	30.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SIDRA INTERSECTION 6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	276	1	11	133	14	1	1	1	9	1	60
Future Volume (veh/h)	135	276	1	11	133	14	1	1	1	9	1	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693
Adj Flow Rate, veh/h	152	310	1	12	149	16	1	1	1	10	1	67
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	14	14	14	14	14	14	14	14	14	14	14	14
Cap, veh/h	381	915	3	26	555	247	3	3	6	130	2	114
Arrive On Green	0.12	0.28	0.28	0.02	0.17	0.17	0.00	0.00	0.00	0.08	0.08	0.08
Sat Flow, veh/h	3127	3288	11	1612	3216	1434	826	826	1434	1612	21	1416
Grp Volume(v), veh/h	152	152	159	12	149	16	2	0	1	10	0	68
Grp Sat Flow(s),veh/h/ln	1564	1608	1691	1612	1608	1434	1651	0	1434	1612	0	1438
Q Serve(g_s), s	1.3	2.2	2.2	0.2	1.2	0.3	0.0	0.0	0.0	0.2	0.0	1.3
Cycle Q Clear(g_c), s	1.3	2.2	2.2	0.2	1.2	0.3	0.0	0.0	0.0	0.2	0.0	1.3
Prop In Lane	1.00		0.01	1.00		1.00	0.50		1.00	1.00		0.99
Lane Grp Cap(c), veh/h	381	448	471	26	555	247	7	0	6	130	0	116
V/C Ratio(X)	0.40	0.34	0.34	0.47	0.27	0.06	0.29	0.00	0.17	0.08	0.00	0.59
Avail Cap(c_a), veh/h	1025	1970	2071	278	3440	1534	1795	0	1559	1669	0	1488
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.7	8.3	8.3	14.1	10.4	10.0	14.4	0.0	14.4	12.3	0.0	12.9
Incr Delay (d2), s/veh	0.7	0.4	0.4	12.7	0.3	0.1	22.3	0.0	13.0	0.3	0.0	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.5	0.5	0.1	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	8.8	8.8	26.9	10.7	10.1	36.7	0.0	27.4	12.6	0.0	17.5
LnGrp LOS	B	A	A	C	B	B	D	A	C	B	A	B
Approach Vol, veh/h		463			177			3			78	
Approach Delay, s/veh		10.0			11.7			33.6			16.9	
Approach LOS		A			B			C			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	4.6	5.0	12.6	6.8	8.0	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	5.0	35.5	30.0	9.5	31.0
Max Q Clear Time (g_c+I1), s	2.0	2.2	4.2	3.3	3.3	3.2
Green Ext Time (p_c), s	0.0	0.0	1.8	0.4	0.2	0.9

Intersection Summary	
HCM 6th Ctrl Delay	11.2
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	17	1	0	47	0	0	0	0	0
Future Vol, veh/h	0	0	0	17	1	0	47	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	53	53	53	53	53	53	53	53	53	53	53	53
Mvmt Flow	0	0	0	20	1	0	57	0	0	0	0	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	115	115	0	1	0	-	-	-	0
Stage 1	114	114	-	-	-	-	-	-	-
Stage 2	1	1	-	-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73	4.63	-	-	-	-	-
Critical Hdwy Stg 1	5.93	6.03	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-	-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777	2.677	-	-	-	-	-
Pot Cap-1 Maneuver	773	689	-	1344	-	0	0	-	0
Stage 1	798	713	-	-	-	0	0	-	0
Stage 2	904	803	-	-	-	0	0	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	741	0	-	1344	-	-	-	-	-
Mov Cap-2 Maneuver	741	0	-	-	-	-	-	-	-
Stage 1	764	0	-	-	-	-	-	-	-
Stage 2	904	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	7.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT
Capacity (veh/h)	1344	-	741	-	-
HCM Lane V/C Ratio	0.042	-	0.029	-	-
HCM Control Delay (s)	7.8	0	10	0	-
HCM Lane LOS	A	A	B	A	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	136	0	0	0	0	46	4	1	16	0
Future Vol, veh/h	1	1	136	0	0	0	0	46	4	1	16	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	415	-	-	-	-	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	23	23	23	23	23	23	23	23	23	23	23	23
Mvmt Flow	1	1	194	0	0	0	0	66	6	1	23	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	91	91	-	-	0	-	66	0	0
Stage 1	25	25	-	-	-	-	-	-	-
Stage 2	66	66	-	-	-	-	-	-	-
Critical Hdwy	6.63	6.73	-	-	-	-	4.33	-	-
Critical Hdwy Stg 1	5.63	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.63	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	-	-	-	-	2.407	-	-
Pot Cap-1 Maneuver	860	761	0	0	-	0	1412	-	0
Stage 1	946	834	0	0	-	0	-	-	0
Stage 2	906	800	0	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	859	0	-	-	-	-	1412	-	-
Mov Cap-2 Maneuver	859	0	-	-	-	-	-	-	-
Stage 1	946	0	-	-	-	-	-	-	-
Stage 2	905	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	859	-	1412	-
HCM Lane V/C Ratio	-	0.003	-	0.001	-
HCM Control Delay (s)	-	9.2	0	7.6	-
HCM Lane LOS	-	A	A	A	-
HCM 95th %tile Q(veh)	-	0	-	0	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	8	13	2	8	1	18	29	1	32	60	60
Future Vol, veh/h	20	8	13	2	8	1	18	29	1	32	60	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	170	-	170	325	-	-	250	-	250	225	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	59	59	59	59	59	59	59	59	59	59	59
Heavy Vehicles, %	31	31	31	31	31	31	31	31	31	31	31	31
Mvmt Flow	34	14	22	3	14	2	31	49	2	54	102	102

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	355	374	102	277	423	25	204	0	0	51	0	0
Stage 1	261	261	-	111	111	-	-	-	-	-	-	-
Stage 2	94	113	-	166	312	-	-	-	-	-	-	-
Critical Hdwy	8.12	7.12	7.52	8.12	7.12	7.52	4.72	-	-	4.72	-	-
Critical Hdwy Stg 1	7.12	6.12	-	7.12	6.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.12	6.12	-	7.12	6.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.31	3.61	3.81	4.31	3.61	2.51	-	-	2.51	-	-
Pot Cap-1 Maneuver	509	495	848	584	461	958	1178	-	-	1365	-	-
Stage 1	645	624	-	804	739	-	-	-	-	-	-	-
Stage 2	824	737	-	742	589	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	471	463	848	529	431	958	1178	-	-	1365	-	-
Mov Cap-2 Maneuver	471	463	-	529	431	-	-	-	-	-	-	-
Stage 1	628	599	-	783	720	-	-	-	-	-	-	-
Stage 2	786	718	-	678	565	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	12.8	3.1	1.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1178	-	-	471	463	848	529	431	958	1365	-	-
HCM Lane V/C Ratio	0.026	-	-	0.072	0.029	0.026	0.006	0.031	0.002	0.04	-	-
HCM Control Delay (s)	8.1	-	-	13.2	13	9.4	11.8	13.6	8.8	7.7	-	-
HCM Lane LOS	A	-	-	B	B	A	B	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	0.1	0	0.1	0	0.1	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	2	1	0	1	8	45	1	1	65	5
Future Vol, veh/h	2	0	2	1	0	1	8	45	1	1	65	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	225	-	250	200	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	59	59	59	59	59	59	59	59	59	59	59
Heavy Vehicles, %	32	32	32	32	32	32	32	32	32	32	32	32
Mvmt Flow	3	0	3	2	0	2	14	76	2	2	110	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	180	220	55	163	226	38	118	0	0	78	0	0
Stage 1	114	114	-	104	104	-	-	-	-	-	-	-
Stage 2	66	106	-	59	122	-	-	-	-	-	-	-
Critical Hdwy	8.14	7.14	7.54	8.14	7.14	7.54	4.74	-	-	4.74	-	-
Critical Hdwy Stg 1	7.14	6.14	-	7.14	6.14	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.14	6.14	-	7.14	6.14	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.32	3.62	3.82	4.32	3.62	2.52	-	-	2.52	-	-
Pot Cap-1 Maneuver	689	613	911	710	608	936	1274	-	-	1325	-	-
Stage 1	798	734	-	810	742	-	-	-	-	-	-	-
Stage 2	856	741	-	865	728	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	681	605	911	701	600	936	1274	-	-	1325	-	-
Mov Cap-2 Maneuver	681	605	-	701	600	-	-	-	-	-	-	-
Stage 1	789	733	-	801	734	-	-	-	-	-	-	-
Stage 2	845	733	-	860	727	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	9.5	1.2	0.1
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1274	-	-	779	701	-	936	1325	-	-
HCM Lane V/C Ratio	0.011	-	-	0.009	0.002	-	0.002	0.001	-	-
HCM Control Delay (s)	7.9	-	-	9.7	10.1	0	8.9	7.7	-	-
HCM Lane LOS	A	-	-	A	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	-	0	0	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	0	4	2	0	1	16	47	1	3	45	9
Future Vol, veh/h	6	0	4	2	0	1	16	47	1	3	45	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	100	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	92	70	92	92	92	70	70	92	92	70	70
Heavy Vehicles, %	25	2	25	2	2	2	25	25	2	2	25	25
Mvmt Flow	9	0	6	2	0	1	23	67	1	3	64	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	150	184	32	152	197	34	77	0	0	68	0	0
Stage 1	70	70	-	114	114	-	-	-	-	-	-	-
Stage 2	80	114	-	38	83	-	-	-	-	-	-	-
Critical Hdwy	8	6.54	7.4	7.54	6.54	6.94	4.6	-	-	4.14	-	-
Critical Hdwy Stg 1	7	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.02	3.55	3.52	4.02	3.32	2.45	-	-	2.22	-	-
Pot Cap-1 Maneuver	743	709	965	801	697	1032	1367	-	-	1531	-	-
Stage 1	869	836	-	879	800	-	-	-	-	-	-	-
Stage 2	856	800	-	972	825	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	732	696	965	785	684	1032	1367	-	-	1531	-	-
Mov Cap-2 Maneuver	732	696	-	785	684	-	-	-	-	-	-	-
Stage 1	854	834	-	864	786	-	-	-	-	-	-	-
Stage 2	841	786	-	964	823	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	9.2	1.9	0.3
HCM LOS	A	A		

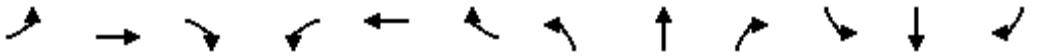
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1367	-	-	810	853	1531	-	-
HCM Lane V/C Ratio	0.017	-	-	0.018	0.004	0.002	-	-
HCM Control Delay (s)	7.7	-	-	9.5	9.2	7.4	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0	0	-	-

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	146	20	10	2	16	3	11	2	1	1	3	48
Future Vol, veh/h	146	20	10	2	16	3	11	2	1	1	3	48
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	203	28	14	3	22	4	15	3	1	1	4	67
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	10.4	7.9	8.8	8
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	92%	0%	94%	0%	20%	0%	40%	0%
Vol Thru, %	8%	50%	6%	50%	80%	73%	60%	3%
Vol Right, %	0%	50%	0%	50%	0%	27%	0%	97%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	2	156	20	10	11	3	50
LT Vol	11	0	146	0	2	0	1	0
Through Vol	1	1	10	10	8	8	2	2
RT Vol	0	1	0	10	0	3	0	48
Lane Flow Rate	17	3	217	28	14	15	3	69
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.028	0.004	0.329	0.036	0.02	0.021	0.005	0.092
Departure Headway (Hd)	6.002	5.189	5.462	4.642	5.279	4.987	5.692	4.809
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	598	691	663	776	679	719	631	747
Service Time	3.722	2.909	3.162	2.342	3.001	2.708	3.409	2.526
HCM Lane V/C Ratio	0.028	0.004	0.327	0.036	0.021	0.021	0.005	0.092
HCM Control Delay	8.9	7.9	10.8	7.5	8.1	7.8	8.4	8
HCM Lane LOS	A	A	B	A	A	A	A	A
HCM 95th-tile Q	0.1	0	1.4	0.1	0.1	0.1	0	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	0	0	0	0	0	0	0	0	0	15
Future Volume (Veh/h)	14	0	0	0	0	0	0	0	0	0	0	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	0	0	0	0	0	0	0	0	0	0	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0	0	0	0	16	0	16			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	0	0	0	16	0	16			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	1023	896	1084	1023	878	1084	1600			1622		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	15	0	0	0	0	0	16
Volume Left	15	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	16
cSH	1023	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.01	0.00	0.00	0.00	0.00	0.01	0.01
Queue Length 95th (ft)	1	0	0	0	0	0	0
Control Delay (s)	8.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A	A					
Approach Delay (s)	8.6	0.0	0.0		0.0		
Approach LOS	A	A					

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	6.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	410	142	109	471	291	109
Future Volume (veh/h)	410	142	109	471	291	109
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	466	161	124	535	331	124
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	8	8	8	8	8	8
Cap, veh/h	899	401	484	1613	458	408
Arrive On Green	0.27	0.27	0.08	0.48	0.27	0.27
Sat Flow, veh/h	3474	1510	1697	3474	1697	1510
Grp Volume(v), veh/h	466	161	124	535	331	124
Grp Sat Flow(s),veh/h/ln	1692	1510	1697	1692	1697	1510
Q Serve(g_s), s	3.7	2.8	1.5	3.1	5.6	2.1
Cycle Q Clear(g_c), s	3.7	2.8	1.5	3.1	5.6	2.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	899	401	484	1613	458	408
V/C Ratio(X)	0.52	0.40	0.26	0.33	0.72	0.30
Avail Cap(c_a), veh/h	1716	765	556	2573	967	861
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.9	9.5	6.5	5.1	10.4	9.2
Incr Delay (d2), s/veh	0.5	0.6	0.3	0.1	2.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.7	0.3	0.6	1.6	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.3	10.2	6.8	5.3	12.6	9.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	627			659	455	
Approach Delay, s/veh	10.3			5.5	11.8	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	12.5	6.7	12.4	19.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	18.0	4.0	16.0	24.0
Max Q Clear Time (g_c+I1), s	7.6	3.5	5.7	5.1
Green Ext Time (p_c), s	1.1	0.0	2.7	3.5

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

Notes

Unsignalized Delay for [WBT] is excluded from calculations of the approach delay and intersection delay.

Intersection Level Of Service Report
Intersection 1: US 95A/I-80 WB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	20.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	US 95A			US 95A						I-80 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	350.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	US 95A			US 95A						I-80 WB Ramps		
Base Volume Input [veh/h]	507	100	0	0	78	80	0	0	0	64	1	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	11.00	11.00	2.00	2.00	11.00	11.00	2.00	2.00	2.00	11.00	11.00	11.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	507	100	0	0	78	80	0	0	0	64	1	65
Peak Hour Factor	0.9400	0.9400	1.0000	1.0000	0.9400	0.9400	1.0000	1.0000	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	135	27	0	0	21	21	0	0	0	17	0	17
Total Analysis Volume [veh/h]	539	106	0	0	83	85	0	0	0	68	1	69
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Stop	Free	Stop
Flared Lane		No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance		No		No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.20	0.17	0.00	0.00	0.00	0.22	0.00	0.11
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	18.66	17.17	0.00	0.00	0.00	20.21	20.36	11.22
Movement LOS	A	A			C	C				C	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	1.73	1.73	0.00	0.00	0.00	0.85	0.85	0.36
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	43.30	43.30	0.00	0.00	0.00	21.30	21.30	8.90
d_A, Approach Delay [s/veh]	0.00			17.91			0.00			15.72		
Approach LOS	A			C			A			C		
d_I, Intersection Delay [s/veh]	5.44											
Intersection LOS	C											

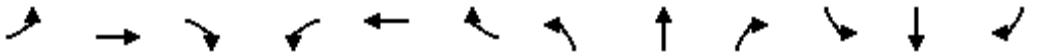
Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	8	712	0	0	0	0	576	38	10	132	0
Future Vol, veh/h	31	8	712	0	0	0	0	576	38	10	132	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	250	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	6	6	6	6	6	6	6	6	6	6	6	6
Mvmt Flow	34	9	782	0	0	0	0	633	42	11	145	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	800	800	-	-	0	0	633	0	0
Stage 1	167	167	-	-	-	-	-	-	-
Stage 2	633	633	-	-	-	-	-	-	-
Critical Hdwy	6.46	6.56	-	-	-	-	4.16	-	-
Critical Hdwy Stg 1	5.46	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.46	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	-	-	-	-	2.254	-	-
Pot Cap-1 Maneuver	349	314	0	0	-	-	931	-	0
Stage 1	853	753	0	0	-	-	-	-	0
Stage 2	522	467	0	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	344	0	-	-	-	-	931	-	-
Mov Cap-2 Maneuver	344	0	-	-	-	-	-	-	-
Stage 1	853	0	-	-	-	-	-	-	-
Stage 2	515	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	344	-	931	-
HCM Lane V/C Ratio	-	-	0.125	-	0.012	-
HCM Control Delay (s)	-	-	16.9	0	8.9	0
HCM Lane LOS	-	-	C	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	49	66	610	84	110	84	450	349	105	662	37
Future Volume (veh/h)	57	49	66	610	84	110	84	450	349	105	662	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	60	52	69	642	88	116	88	474	367	111	697	39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	77	112	100	685	408	346	108	1997	890	161	1873	105
Arrive On Green	0.04	0.06	0.06	0.20	0.22	0.22	0.12	1.00	1.00	0.05	0.55	0.55
Sat Flow, veh/h	1767	1763	1572	3428	1856	1572	1767	3526	1571	3428	3394	190
Grp Volume(v), veh/h	60	52	69	642	88	116	88	474	367	111	362	374
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1856	1572	1767	1763	1571	1714	1763	1821
Q Serve(g_s), s	4.4	3.7	5.6	24.0	5.0	8.1	6.3	0.0	0.0	4.1	15.0	15.1
Cycle Q Clear(g_c), s	4.4	3.7	5.6	24.0	5.0	8.1	6.3	0.0	0.0	4.1	15.0	15.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	77	112	100	685	408	346	108	1997	890	161	973	1005
V/C Ratio(X)	0.78	0.46	0.69	0.94	0.22	0.34	0.81	0.24	0.41	0.69	0.37	0.37
Avail Cap(c_a), veh/h	150	556	496	686	799	677	122	1997	890	237	973	1005
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	0.89	0.89	0.89	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.5	58.7	59.6	51.2	41.5	42.7	56.3	0.0	0.0	61.0	16.4	16.4
Incr Delay (d2), s/veh	15.3	2.9	8.1	19.1	0.2	0.5	27.1	0.2	1.3	5.2	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	1.7	2.5	12.1	2.4	3.2	3.5	0.1	0.3	1.9	6.3	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.9	61.6	67.7	70.3	41.8	43.2	83.4	0.2	1.3	66.2	17.5	17.5
LnGrp LOS	E	E	E	E	D	D	F	A	A	E	B	B
Approach Vol, veh/h		181			846			929			847	
Approach Delay, s/veh		69.0			63.6			8.5			23.9	
Approach LOS		E			E			A			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	77.6	30.0	12.3	12.0	75.8	9.7	32.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	9.0	38.0	26.0	41.0	9.0	38.0	11.0	56.0
Max Q Clear Time (g_c+I1), s	6.1	2.0	26.0	7.6	8.3	17.1	6.4	10.1
Green Ext Time (p_c), s	0.1	5.1	0.0	0.7	0.0	4.7	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	33.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	39	294	179	34	73	255	887	48	123	1119	85
Future Volume (veh/h)	50	39	294	179	34	73	255	887	48	123	1119	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	52	40	303	185	35	75	263	914	49	127	1154	88
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	70	344	548	151	121	260	291	1800	97	149	1491	114
Arrive On Green	0.04	0.18	0.18	0.08	0.23	0.23	0.16	0.52	0.52	0.17	0.89	0.89
Sat Flow, veh/h	1781	1870	1577	1781	529	1133	1781	3430	184	1781	3346	255
Grp Volume(v), veh/h	52	40	303	185	0	110	263	473	490	127	612	630
Grp Sat Flow(s),veh/h/ln	1781	1870	1577	1781	0	1661	1781	1777	1837	1781	1777	1824
Q Serve(g_s), s	3.8	2.3	20.2	11.0	0.0	7.1	18.8	22.4	22.4	9.0	15.7	15.8
Cycle Q Clear(g_c), s	3.8	2.3	20.2	11.0	0.0	7.1	18.8	22.4	22.4	9.0	15.7	15.8
Prop In Lane	1.00		1.00	1.00		0.68	1.00		0.10	1.00		0.14
Lane Grp Cap(c), veh/h	70	344	548	151	0	381	291	933	964	149	792	813
V/C Ratio(X)	0.75	0.12	0.55	1.23	0.00	0.29	0.91	0.51	0.51	0.85	0.77	0.77
Avail Cap(c_a), veh/h	151	446	635	151	0	396	356	933	964	151	792	813
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.76	0.76	0.76
Uniform Delay (d), s/veh	61.8	44.3	34.3	59.5	0.0	41.4	53.4	20.0	20.0	53.3	4.8	4.8
Incr Delay (d2), s/veh	14.6	0.1	0.9	147.2	0.0	0.4	22.8	2.0	1.9	27.9	5.6	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.1	7.9	11.1	0.0	3.0	10.3	9.7	10.0	4.9	3.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.4	44.4	35.2	206.7	0.0	41.8	76.2	22.0	21.9	81.2	10.4	10.3
LnGrp LOS	E	D	D	F	A	D	E	C	C	F	B	B
Approach Vol, veh/h		395			295			1226			1369	
Approach Delay, s/veh		41.6			145.2			33.6			16.9	
Approach LOS		D			F			C			B	

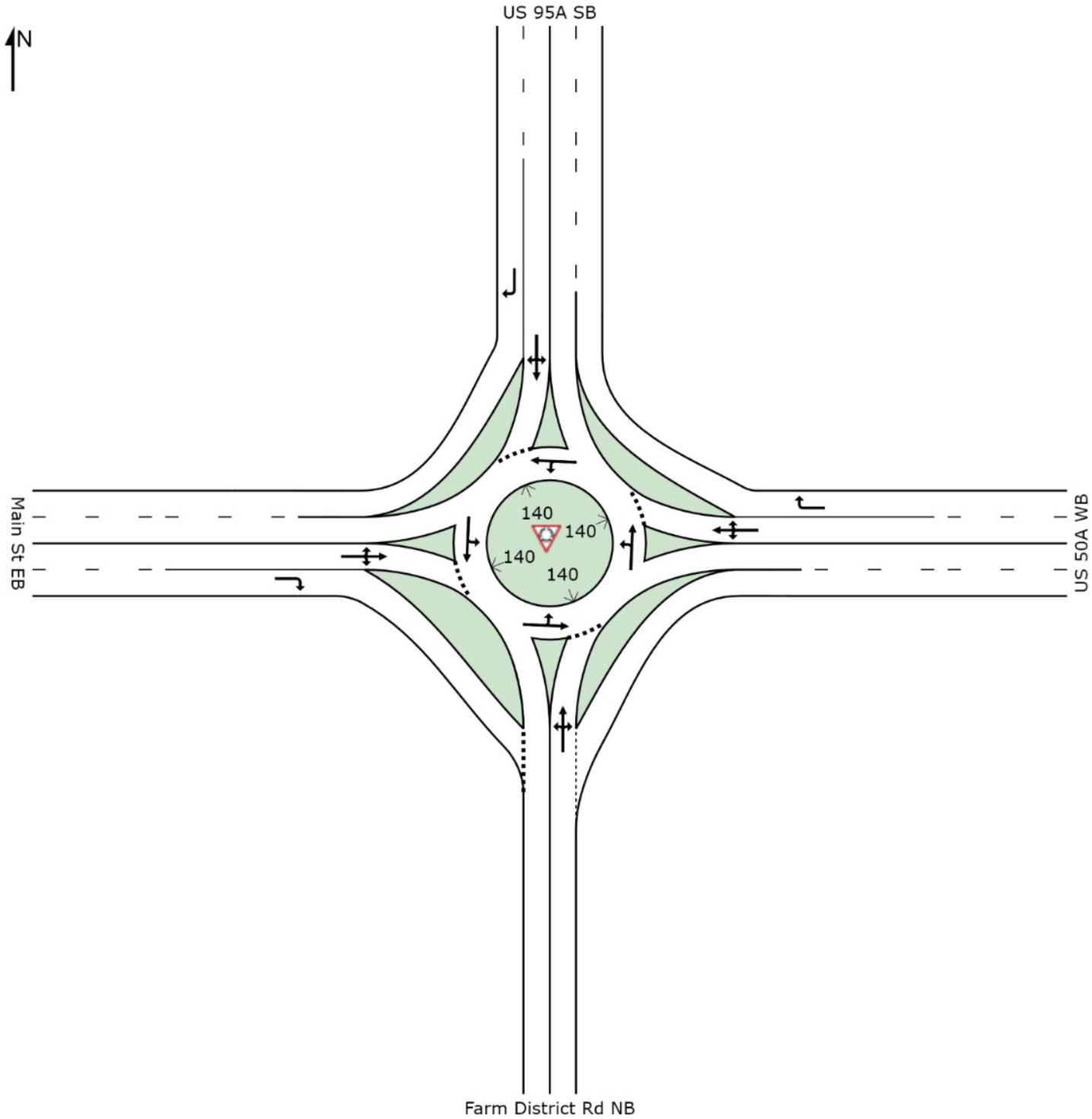
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	72.2	15.0	27.9	25.2	61.9	9.1	33.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	61.0	11.0	31.0	26.0	46.0	11.0	31.0
Max Q Clear Time (g_c+I1), s	11.0	24.4	13.0	22.2	20.8	17.8	5.8	9.1
Green Ext Time (p_c), s	0.0	7.6	0.0	0.9	0.4	10.2	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	37.6
HCM 6th LOS	D

SITE LAYOUT

Site: US 95A/US 50A/Main Street/Farm District Rd

Baseline Conditions
Roundabout



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MOVEMENT SUMMARY

Site: US 95A/US 50A/Main Street/Farm District Rd - PM

Baseline Conditions
PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Farm District Rd NB											
3	L2	42	2.0	1.070	92.7	LOS F	22.4	568.2	1.00	2.03	15.2
8	T1	372	2.0	1.070	92.7	LOS F	22.4	568.2	1.00	2.03	15.2
18	R2	67	2.0	1.070	92.7	LOS F	22.4	568.2	1.00	2.03	15.0
Approach		480	2.0	1.070	92.7	LOS F	22.4	568.2	1.00	2.03	15.2
East: US 50A WB											
1	L2	34	2.0	0.356	11.6	LOS B	1.4	36.4	0.63	0.65	32.8
6	T1	156	2.0	0.356	11.6	LOS B	1.4	36.4	0.63	0.65	32.5
16	R2	597	2.0	0.356	0.3	LOS A	1.4	36.4	0.01	0.01	37.7
Approach		787	2.0	0.356	3.0	LOS A	1.4	36.4	0.16	0.17	36.2
North: US 95A SB											
7	L2	732	2.0	1.219	126.9	LOS F	85.2	2162.8	1.00	2.77	12.4
4	T1	336	2.0	1.219	126.9	LOS F	85.2	2162.8	1.00	2.77	12.3
14	R2	567	2.0	0.345	0.1	LOS A	0.0	0.0	0.00	0.00	37.8
Approach		1635	2.0	1.219	82.9	LOS F	85.2	2162.8	0.65	1.81	15.9
West: Main St EB											
5	L2	305	2.0	1.146	118.8	LOS F	30.1	763.9	1.00	2.48	12.9
2	T1	152	2.0	1.146	118.8	LOS F	30.1	763.9	1.00	2.48	12.9
12	R2	223	2.0	1.146	29.7	LOS F	30.1	763.9	0.57	0.83	25.0
Approach		680	2.0	1.146	89.6	LOS F	30.1	763.9	0.86	1.94	15.2
All Vehicles		3583	2.0	1.219	68.0	LOS F	85.2	2162.8	0.63	1.50	17.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SIDRA INTERSECTION 6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	122	1	4	297	37	26	14	5	14	7	249
Future Volume (veh/h)	132	122	1	4	297	37	26	14	5	14	7	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	163	151	1	5	367	46	32	17	6	17	9	307
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	316	985	7	12	665	297	63	33	84	466	12	404
Arrive On Green	0.09	0.28	0.28	0.01	0.19	0.19	0.05	0.05	0.05	0.27	0.27	0.27
Sat Flow, veh/h	3346	3504	23	1725	3441	1535	1145	608	1535	1725	44	1498
Grp Volume(v), veh/h	163	74	78	5	367	46	49	0	6	17	0	316
Grp Sat Flow(s),veh/h/ln	1673	1721	1807	1725	1721	1535	1754	0	1535	1725	0	1542
Q Serve(g_s), s	2.2	1.5	1.5	0.1	4.5	1.2	1.3	0.0	0.2	0.3	0.0	8.7
Cycle Q Clear(g_c), s	2.2	1.5	1.5	0.1	4.5	1.2	1.3	0.0	0.2	0.3	0.0	8.7
Prop In Lane	1.00		0.01	1.00		1.00	0.65		1.00	1.00		0.97
Lane Grp Cap(c), veh/h	316	484	508	12	665	297	96	0	84	466	0	416
V/C Ratio(X)	0.52	0.15	0.15	0.43	0.55	0.16	0.51	0.00	0.07	0.04	0.00	0.76
Avail Cap(c_a), veh/h	685	1315	1381	186	2297	1025	1190	0	1041	1114	0	996
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	12.5	12.5	23.0	16.9	15.6	21.3	0.0	20.8	12.5	0.0	15.6
Incr Delay (d2), s/veh	1.3	0.1	0.1	23.3	0.7	0.2	4.2	0.0	0.4	0.0	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.5	0.5	0.1	1.6	0.4	0.6	0.0	0.1	0.1	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	12.7	12.7	46.3	17.6	15.8	25.5	0.0	21.2	12.5	0.0	18.4
LnGrp LOS	C	B	B	D	B	B	C	A	C	B	A	B
Approach Vol, veh/h		315			418			55			333	
Approach Delay, s/veh		17.1			17.8			25.0			18.1	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	7.0	4.8	17.5	17.0	8.9	13.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	5.0	35.5	30.0	9.5	31.0
Max Q Clear Time (g_c+I1), s	3.3	2.1	3.5	10.7	4.2	6.5
Green Ext Time (p_c), s	0.2	0.0	0.8	2.0	0.2	2.5

Intersection Summary	
HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱		↰			↑	↱
Traffic Vol, veh/h	0	0	0	11	6	1	154	1	0	0	1	2
Future Vol, veh/h	0	0	0	11	6	1	154	1	0	0	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	22	22	22	22	22	22	22	22	22	22	22	22
Mvmt Flow	0	0	0	16	9	1	220	1	0	0	1	3

Major/Minor	Minor1		Major1			Major2			
Conflicting Flow All	442	442	1	1	0	-	-	-	0
Stage 1	441	441	-	-	-	-	-	-	-
Stage 2	1	1	-	-	-	-	-	-	-
Critical Hdwy	6.62	6.72	6.42	4.32	-	-	-	-	-
Critical Hdwy Stg 1	5.62	5.72	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.62	5.72	-	-	-	-	-	-	-
Follow-up Hdwy	3.698	4.198	3.498	2.398	-	-	-	-	-
Pot Cap-1 Maneuver	537	481	1028	1500	-	0	0	-	0
Stage 1	608	544	-	-	-	0	0	-	0
Stage 2	972	857	-	-	-	0	0	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	458	0	1028	1500	-	-	-	-	-
Mov Cap-2 Maneuver	458	0	-	-	-	-	-	-	-
Stage 1	519	0	-	-	-	-	-	-	-
Stage 2	972	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	7.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT
Capacity (veh/h)	1500	-	458	1028	-
HCM Lane V/C Ratio	0.147	-	0.053	0.001	-
HCM Control Delay (s)	7.8	0	13.3	8.5	-
HCM Lane LOS	A	A	B	A	-
HCM 95th %tile Q(veh)	0.5	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1	52	0	0	0	0	153	9	1	11	0
Future Vol, veh/h	2	1	52	0	0	0	0	153	9	1	11	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	415	-	-	-	-	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	21	21	21	21	21	21	21	21	21	21	21	21
Mvmt Flow	3	1	74	0	0	0	0	219	13	1	16	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	237	237	-	-	0	-	219	0	0
Stage 1	18	18	-	-	-	-	-	-	-
Stage 2	219	219	-	-	-	-	-	-	-
Critical Hdwy	6.61	6.71	-	-	-	-	4.31	-	-
Critical Hdwy Stg 1	5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy	3.689	4.189	-	-	-	-	2.389	-	-
Pot Cap-1 Maneuver	711	632	0	0	-	0	1246	-	0
Stage 1	958	844	0	0	-	0	-	-	0
Stage 2	774	688	0	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	710	0	-	-	-	-	1246	-	-
Mov Cap-2 Maneuver	710	0	-	-	-	-	-	-	-
Stage 1	958	0	-	-	-	-	-	-	-
Stage 2	773	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	710	-	1246	-
HCM Lane V/C Ratio	-	0.006	-	0.001	-
HCM Control Delay (s)	-	10.1	0	7.9	-
HCM Lane LOS	-	B	A	A	-
HCM 95th %tile Q(veh)	-	0	-	0	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	1	21	5	2	4	27	78	1	1	28	34
Future Vol, veh/h	80	1	21	5	2	4	27	78	1	1	28	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	170	-	170	325	-	-	250	-	250	225	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	29	29	29	29	29	29	29	29	29	29	29	29
Mvmt Flow	127	2	33	8	3	6	43	124	2	2	44	54

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	225	287	49	237	312	62	98	0	0	126	0	0
Stage 1	75	75	-	210	210	-	-	-	-	-	-	-
Stage 2	150	212	-	27	102	-	-	-	-	-	-	-
Critical Hdwy	8.08	7.08	7.48	8.08	7.08	7.48	4.68	-	-	4.68	-	-
Critical Hdwy Stg 1	7.08	6.08	-	7.08	6.08	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.08	6.08	-	7.08	6.08	-	-	-	-	-	-	-
Follow-up Hdwy	3.79	4.29	3.59	3.79	4.29	3.59	2.49	-	-	2.49	-	-
Pot Cap-1 Maneuver	644	563	928	631	544	909	1316	-	-	1282	-	-
Stage 1	852	773	-	701	665	-	-	-	-	-	-	-
Stage 2	765	664	-	914	750	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	620	543	928	591	525	909	1316	-	-	1282	-	-
Mov Cap-2 Maneuver	620	543	-	591	525	-	-	-	-	-	-	-
Stage 1	824	771	-	678	643	-	-	-	-	-	-	-
Stage 2	731	642	-	878	749	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.6	10.5	2	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1316	-	-	620	543	928	591	525	909	1282	-	-
HCM Lane V/C Ratio	0.033	-	-	0.205	0.003	0.036	0.013	0.006	0.007	0.001	-	-
HCM Control Delay (s)	7.8	-	-	12.3	11.6	9	11.2	11.9	9	7.8	-	-
HCM Lane LOS	A	-	-	B	B	A	B	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0	0.1	0	0	0	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	7	4	0	2	3	60	1	7	46	2
Future Vol, veh/h	7	0	7	4	0	2	3	60	1	7	46	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	225	-	250	200	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	45	45	45	45	45	45	45	45	45	45	45	45
Mvmt Flow	8	0	8	5	0	2	3	68	1	8	52	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	108	143	26	116	144	34	54	0	0	69	0	0
Stage 1	68	68	-	74	74	-	-	-	-	-	-	-
Stage 2	40	75	-	42	70	-	-	-	-	-	-	-
Critical Hdwy	8.4	7.4	7.8	8.4	7.4	7.8	5	-	-	5	-	-
Critical Hdwy Stg 1	7.4	6.4	-	7.4	6.4	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.4	6.4	-	7.4	6.4	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4.45	3.75	3.95	4.45	3.75	2.65	-	-	2.65	-	-
Pot Cap-1 Maneuver	751	658	920	740	657	908	1286	-	-	1266	-	-
Stage 1	822	747	-	815	742	-	-	-	-	-	-	-
Stage 2	858	741	-	855	746	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	744	653	920	729	652	908	1286	-	-	1266	-	-
Mov Cap-2 Maneuver	744	653	-	729	652	-	-	-	-	-	-	-
Stage 1	820	743	-	813	741	-	-	-	-	-	-	-
Stage 2	854	740	-	842	742	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	9.7	0.4	1
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1286	-	-	823	729	-	908	1266	-	-
HCM Lane V/C Ratio	0.003	-	-	0.019	0.006	-	0.003	0.006	-	-
HCM Control Delay (s)	7.8	-	-	9.5	10	0	9	7.9	-	-
HCM Lane LOS	A	-	-	A	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	-	0	0	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	0	14	1	0	1	6	43	1	1	59	3
Future Vol, veh/h	20	0	14	1	0	1	6	43	1	1	59	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	100	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	92	85	92	92	92	85	85	92	92	85	85
Heavy Vehicles, %	30	2	30	2	2	2	30	30	2	2	30	30
Mvmt Flow	24	0	16	1	0	1	7	51	1	1	69	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	111	137	35	103	141	26	73	0	0	52	0	0
Stage 1	71	71	-	66	66	-	-	-	-	-	-	-
Stage 2	40	66	-	37	75	-	-	-	-	-	-	-
Critical Hdwy	8.1	6.54	7.5	7.54	6.54	6.94	4.7	-	-	4.14	-	-
Critical Hdwy Stg 1	7.1	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.1	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.8	4.02	3.6	3.52	4.02	3.32	2.5	-	-	2.22	-	-
Pot Cap-1 Maneuver	782	753	946	866	749	1044	1343	-	-	1552	-	-
Stage 1	855	835	-	937	839	-	-	-	-	-	-	-
Stage 2	894	839	-	974	832	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	777	748	946	847	745	1044	1343	-	-	1552	-	-
Mov Cap-2 Maneuver	777	748	-	847	745	-	-	-	-	-	-	-
Stage 1	851	834	-	932	835	-	-	-	-	-	-	-
Stage 2	888	835	-	956	831	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	8.9	0.9	0.1
HCM LOS	A	A		

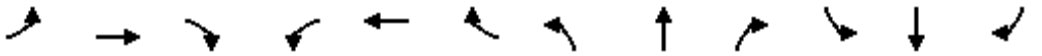
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1343	-	-	839	935	1552	-	-
HCM Lane V/C Ratio	0.005	-	-	0.048	0.002	0.001	-	-
HCM Control Delay (s)	7.7	-	-	9.5	8.9	7.3	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	41	6	4	1	7	11	1	4	1	10	1	164
Future Vol, veh/h	41	6	4	1	7	11	1	4	1	10	1	164
Peak Hour Factor	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Heavy Vehicles, %	26	26	26	26	26	26	26	26	26	26	26	26
Mvmt Flow	79	12	8	2	13	21	2	8	2	19	2	315
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	9.9	8.5	8.4	10.5
HCM LOS	A	A	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	33%	0%	93%	0%	22%	0%	95%	0%
Vol Thru, %	67%	67%	7%	43%	78%	24%	5%	0%
Vol Right, %	0%	33%	0%	57%	0%	76%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	3	44	7	5	15	11	165
LT Vol	1	0	41	0	1	0	10	0
Through Vol	2	2	3	3	4	4	1	1
RT Vol	0	1	0	4	0	11	0	164
Lane Flow Rate	6	6	85	13	9	28	20	316
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.009	0.009	0.148	0.02	0.014	0.042	0.033	0.409
Departure Headway (Hd)	5.811	5.408	6.291	5.42	6.026	5.38	5.836	4.659
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	616	662	570	660	593	664	615	775
Service Time	3.544	3.142	4.028	3.157	3.768	3.121	3.555	2.378
HCM Lane V/C Ratio	0.01	0.009	0.149	0.02	0.015	0.042	0.033	0.408
HCM Control Delay	8.6	8.2	10.1	8.3	8.9	8.4	8.8	10.6
HCM Lane LOS	A	A	B	A	A	A	A	B
HCM 95th-tile Q	0	0	0.5	0.1	0	0.1	0.1	2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	0	0	0	0	0	0	0	0	0	6
Future Volume (Veh/h)	6	0	0	0	0	0	0	0	0	0	0	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	0	0	0	0	0	0	0	0	0	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0	0	0	0	7	0	7			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	0	0	0	7	0	7			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	1023	896	1084	1023	888	1084	1612			1622		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	7	0	0	0	0	0	7
Volume Left	7	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	7
cSH	1023	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.01	0.00	0.00	0.00	0.00	0.01	0.00
Queue Length 95th (ft)	1	0	0	0	0	0	0
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A	A					
Approach Delay (s)	8.5	0.0	0.0		0.0		
Approach LOS	A	A					

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	6.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	410	142	109	471	291	109
Future Volume (veh/h)	410	142	109	471	291	109
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	466	161	124	535	331	124
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	8	8	8	8	8	8
Cap, veh/h	899	401	484	1613	458	408
Arrive On Green	0.27	0.27	0.08	0.48	0.27	0.27
Sat Flow, veh/h	3474	1510	1697	3474	1697	1510
Grp Volume(v), veh/h	466	161	124	535	331	124
Grp Sat Flow(s),veh/h/ln	1692	1510	1697	1692	1697	1510
Q Serve(g_s), s	3.7	2.8	1.5	3.1	5.6	2.1
Cycle Q Clear(g_c), s	3.7	2.8	1.5	3.1	5.6	2.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	899	401	484	1613	458	408
V/C Ratio(X)	0.52	0.40	0.26	0.33	0.72	0.30
Avail Cap(c_a), veh/h	1716	765	556	2573	967	861
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.9	9.5	6.5	5.1	10.4	9.2
Incr Delay (d2), s/veh	0.5	0.6	0.3	0.1	2.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.7	0.3	0.6	1.6	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.3	10.2	6.8	5.3	12.6	9.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	627			659	455	
Approach Delay, s/veh	10.3			5.5	11.8	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	12.5	6.7	12.4	19.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	18.0	4.0	16.0	24.0
Max Q Clear Time (g_c+I1), s	7.6	3.5	5.7	5.1
Green Ext Time (p_c), s	1.1	0.0	2.7	3.5

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

Notes

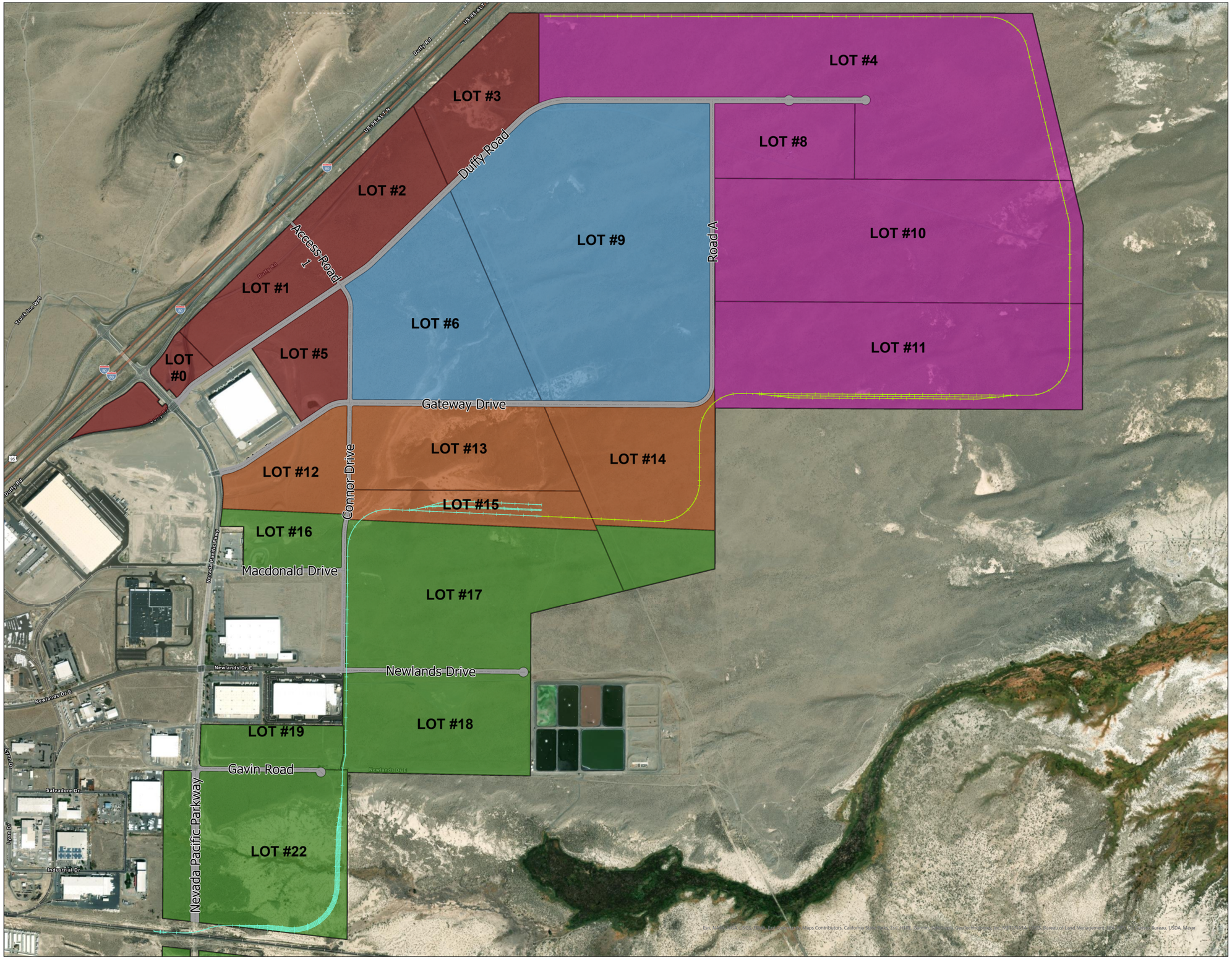
Unsignalized Delay for [WBT] is excluded from calculations of the approach delay and intersection delay.

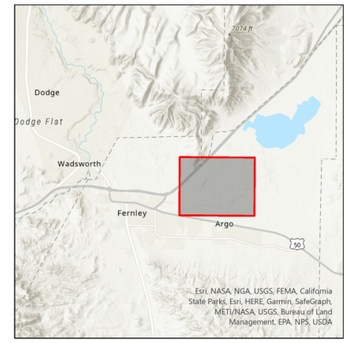
Appendix B
Trip Generation Calculations

			FAR	0.25														
Parcel	Land Use	ITE Land Use	Size (acres)	Size (ksf)	Trip Rates							Trips						
					Daily	AM	AM In	AM Out	PM	PM In	PM Out	Daily	AM	AM In	AM Out	PM	PM In	PM Out
1	Retail	821	10	108.90	67.52	1.73	1.07	0.66	5.19	2.54	2.65	7353	188	117	72	565	277	288
1	Distribution	155	45.4	494.41	1.81	0.15	0.12	0.03	0.16	0.06	0.10	895	74	60	14	79	31	48
2	Distribution	155	58.6	638.15	1.81	0.15	0.12	0.03	0.16	0.06	0.10	1155	96	78	18	102	40	62
3	Distribution	155	55.7	606.57	1.81	0.15	0.12	0.03	0.16	0.06	0.10	1098	91	74	17	97	38	59
4	Distribution	155	279.6	3044.84	1.81	0.15	0.12	0.03	0.16	0.06	0.10	5511	457	370	87	487	190	297
5	Distribution	155	35.9	390.95	1.81	0.15	0.12	0.03	0.16	0.06	0.10	708	59	48	11	63	24	38
6	Data Center	160	121	1317.69	0.99	0.11	0.06	0.05	0.09	0.03	0.06	1305	145	80	65	119	36	83
7	Distribution	155	96.8	1054.15	1.81	0.15	0.12	0.03	0.16	0.06	0.10	1908	158	128	30	169	66	103
8	Distribution	155	50	544.50	1.81	0.15	0.12	0.03	0.16	0.06	0.10	986	82	66	16	87	34	53
9	Manufacturing	150	205.3	2235.72	1.71	0.17	0.13	0.04	0.18	0.05	0.13	3823	380	293	87	402	113	290
10	Distribution	155	212	2308.68	1.81	0.15	0.12	0.03	0.16	0.06	0.10	4179	346	281	66	369	144	225
11	Distribution	155	184.1	2004.85	1.81	0.15	0.12	0.03	0.16	0.06	0.10	3629	301	244	57	321	125	196
12	Manufacturing	150	44.8	487.87	1.71	0.17	0.13	0.04	0.18	0.05	0.13	834	83	64	19	88	25	63
13	Manufacturing	150	83.4	908.23	1.71	0.17	0.13	0.04	0.18	0.05	0.13	1553	154	119	36	163	46	118
14	Manufacturing	150	82.1	894.07	1.71	0.17	0.13	0.04	0.18	0.05	0.13	1529	152	117	35	161	45	116
15	Transload & Switching Facility	154	38.7	421.44	1.40	0.08	0.06	0.02	0.10	0.03	0.07	590	34	26	8	42	12	30
16	Manufacturing	150	25.6	278.78	1.71	0.17	0.13	0.04	0.18	0.05	0.13	477	47	36	11	50	14	36
17	Manufacturing	150	49.4	537.97	1.71	0.17	0.13	0.04	0.18	0.05	0.13	920	91	70	21	97	27	70
18	Data Center	160	166.6	1814.27	0.99	0.11	0.06	0.05	0.09	0.03	0.06	1796	200	110	90	163	49	114
19	Manufacturing	150	28.8	313.63	1.71	0.17	0.13	0.04	0.18	0.05	0.13	536	53	41	12	56	16	41
20	Manufacturing	150	54.9	597.86	1.71	0.17	0.13	0.04	0.18	0.05	0.13	1022	102	78	23	108	30	77
21	Gas Station	945	4.6	14.00	345.75	31.6	15.8	15.8	26.9	13.45	13.45	4841	442	221	221	377	188	188
21	Retail	821	6.3	68.61	67.52	1.73	1.07	0.66	5.19	2.54	2.65	4632	119	74	45	356	174	182
22	Distribution	155	111.2	1210.97	1.81	0.15	0.12	0.03	0.16	0.06	0.10	2192	182	147	35	194	76	118

Raw Total	**53472**	**4036**	**2942**	**1096**	**4715**	**1820**	**2895**
Pass-By Trips (Gas Station)	*3050*	*278*	*139*	*139*	*249*	*124*	*124*
Pass-By Trips (Retail)	*4075*	*104*	*52*	*52*	*313*	*157*	*157*
Net New Trips	***46347***	***3654***	***2751***	***905***	***4153***	***1540***	***2615***

Appendix C
Anticipated Notice of Completion Map





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NOTICE OF COMPLETION MAP

MARK IV
MASTER PLAN

PAGE 1 OF 1

LEGEND

Proposed Railroad
Phase
- PHASE 1 RAIL
- PHASE 2 RAIL
- Road_Centerlines

Development Zone
- EAST
- NORTH CENTRAL
- SOUTH
- SOUTH CENTRAL
- WEST

N

Paper Size: 24" x 36"

0 800 1,600
Feet

Projection: Mercator Auxiliary Sphere
Grid: WGS 1984 Web Mercator Auxiliary Sphere
Datum: WGS 1984
Created by: mshults

Date:	8/1/2023
Project #:	10067.008
Revision:	XX

Path: L:\LAProj\10067.008 - Victory Logistics Tentative Map\Civil\GIS\Workmap\10067010_Workmap.aprx

Appendix D
Baseline Plus Project LOS Calculations

Intersection Level Of Service Report
Intersection 1: US 95A/I-80 WB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	25.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.345

Intersection Setup

Name	US 95A			US 95A						I-80 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	350.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	US 95A			US 95A						I-80 WB Ramps		
Base Volume Input [veh/h]	624	81	0	0	59	78	0	0	0	88	1	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	13.00	13.00	2.00	2.00	13.00	13.00	2.00	2.00	2.00	13.00	13.00	13.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	624	81	0	0	59	78	0	0	0	88	1	27
Peak Hour Factor	0.9500	0.9500	1.0000	1.0000	0.9500	0.9500	1.0000	1.0000	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	164	21	0	0	16	21	0	0	0	23	0	7
Total Analysis Volume [veh/h]	657	85	0	0	62	82	0	0	0	93	1	28
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Stop	Free	Stop
Flared Lane		No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance		No		No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.18	0.19	0.00	0.00	0.00	0.35	0.00	0.05
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	20.67	18.93	0.00	0.00	0.00	25.38	25.31	11.17
Movement LOS	A	A			C	C				D	D	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	1.68	1.68	0.00	0.00	0.00	1.51	1.51	0.14
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	42.02	42.02	0.00	0.00	0.00	37.65	37.65	3.59
d_A, Approach Delay [s/veh]	0.00			19.68			0.00			22.12		
Approach LOS	A			C			A			C		
d_I, Intersection Delay [s/veh]	5.49											
Intersection LOS	D											

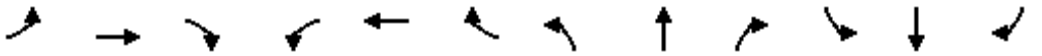
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↑	↱		↰	
Traffic Vol, veh/h	18	1	396	0	0	0	0	687	213	20	127	0
Future Vol, veh/h	18	1	396	0	0	0	0	687	213	20	127	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	250	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	9	9	9	9	9	9
Mvmt Flow	19	1	413	0	0	0	0	716	222	21	132	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	890	890	-	-	0	0	716	0	0
Stage 1	174	174	-	-	-	-	-	-	-
Stage 2	716	716	-	-	-	-	-	-	-
Critical Hdwy	6.49	6.59	-	-	-	-	4.19	-	-
Critical Hdwy Stg 1	5.49	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.49	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.581	4.081	-	-	-	-	2.281	-	-
Pot Cap-1 Maneuver	305	275	0	0	-	-	853	-	0
Stage 1	840	742	0	0	-	-	-	-	0
Stage 2	472	424	0	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	297	0	-	-	-	-	853	-	-
Mov Cap-2 Maneuver	297	0	-	-	-	-	-	-	-
Stage 1	840	0	-	-	-	-	-	-	-
Stage 2	459	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18	0	1.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	297	-	853	-
HCM Lane V/C Ratio	-	-	0.067	-	0.024	-
HCM Control Delay (s)	-	-	18	0	9.3	0
HCM Lane LOS	-	-	C	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	37	31	304	24	45	21	819	652	81	420	12
Future Volume (veh/h)	40	37	31	304	24	45	21	819	652	81	420	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	43	40	33	327	26	48	23	881	701	87	452	13
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	66	130	95	307	222	187	46	2266	1010	158	2320	67
Arrive On Green	0.04	0.07	0.07	0.09	0.12	0.12	0.03	0.66	0.66	0.05	0.68	0.68
Sat Flow, veh/h	1725	1888	1381	3346	1811	1527	1725	3441	1534	3346	3416	98
Grp Volume(v), veh/h	43	36	37	327	26	48	23	881	701	87	227	238
Grp Sat Flow(s),veh/h/ln	1725	1721	1548	1673	1811	1527	1725	1721	1534	1673	1721	1793
Q Serve(g_s), s	3.0	2.4	2.7	11.0	1.5	3.4	1.6	14.1	34.5	3.1	5.9	5.9
Cycle Q Clear(g_c), s	3.0	2.4	2.7	11.0	1.5	3.4	1.6	14.1	34.5	3.1	5.9	5.9
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	66	119	107	307	222	187	46	2266	1010	158	1168	1218
V/C Ratio(X)	0.65	0.30	0.35	1.07	0.12	0.26	0.50	0.39	0.69	0.55	0.19	0.20
Avail Cap(c_a), veh/h	158	588	529	307	619	522	158	2266	1010	307	1168	1218
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	0.70	0.70	0.70	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.9	53.1	53.3	54.5	46.9	47.7	57.6	9.4	12.9	55.9	7.1	7.1
Incr Delay (d2), s/veh	10.5	1.4	1.9	69.2	0.2	0.7	5.7	0.4	2.8	3.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.1	1.1	7.6	0.7	1.3	0.8	5.1	11.7	1.4	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.5	54.5	55.2	123.7	47.1	48.4	63.3	9.7	15.6	58.9	7.5	7.5
LnGrp LOS	E	D	E	F	D	D	E	A	B	E	A	A
Approach Vol, veh/h		116			401			1605			552	
Approach Delay, s/veh		59.5			109.7			13.1			15.6	
Approach LOS		E			F			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	83.0	15.0	12.3	7.2	85.5	8.6	18.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	41.0	11.0	41.0	11.0	41.0	11.0	41.0
Max Q Clear Time (g_c+I1), s	5.1	36.5	13.0	4.7	3.6	7.9	5.0	5.4
Green Ext Time (p_c), s	0.1	3.3	0.0	0.4	0.0	3.0	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	13	145	86	10	39	147	1400	44	49	676	37
Future Volume (veh/h)	64	13	145	86	10	39	147	1400	44	49	676	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	68	14	154	91	11	41	156	1489	47	52	719	39
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	87	196	331	113	41	154	185	2218	70	71	1942	105
Arrive On Green	0.05	0.11	0.11	0.07	0.12	0.12	0.11	0.65	0.65	0.05	0.78	0.78
Sat Flow, veh/h	1725	1811	1535	1725	335	1250	1725	3405	107	1725	3319	180
Grp Volume(v), veh/h	68	14	154	91	0	52	156	751	785	52	373	385
Grp Sat Flow(s),veh/h/ln	1725	1811	1535	1725	0	1586	1725	1721	1791	1725	1721	1778
Q Serve(g_s), s	4.7	0.8	10.5	6.2	0.0	3.6	10.6	32.4	32.6	3.6	8.1	8.1
Cycle Q Clear(g_c), s	4.7	0.8	10.5	6.2	0.0	3.6	10.6	32.4	32.6	3.6	8.1	8.1
Prop In Lane	1.00		1.00	1.00		0.79	1.00		0.06	1.00		0.10
Lane Grp Cap(c), veh/h	87	196	331	113	0	196	185	1121	1167	71	1007	1041
V/C Ratio(X)	0.78	0.07	0.47	0.80	0.00	0.27	0.84	0.67	0.67	0.73	0.37	0.37
Avail Cap(c_a), veh/h	302	468	562	158	0	278	374	1121	1167	158	1007	1041
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.44	0.44	0.44	0.91	0.91	0.91
Uniform Delay (d), s/veh	56.3	48.1	41.0	55.3	0.0	47.7	52.5	12.9	13.0	56.1	6.4	6.4
Incr Delay (d2), s/veh	13.7	0.2	1.0	18.0	0.0	0.7	4.6	1.4	1.4	12.4	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.4	4.1	3.3	0.0	1.5	4.8	12.1	12.7	1.8	2.7	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.0	48.2	42.0	73.2	0.0	48.4	57.1	14.4	14.3	68.4	7.4	7.3
LnGrp LOS	E	D	D	E	A	D	E	B	B	E	A	A
Approach Vol, veh/h		236			143			1692			810	
Approach Delay, s/veh		50.5			64.2			18.3			11.3	
Approach LOS		D			E			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	82.2	11.9	17.0	16.9	74.2	10.1	18.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	51.0	11.0	31.0	26.0	36.0	21.0	21.0
Max Q Clear Time (g_c+I1), s	5.6	34.6	8.2	12.5	12.6	10.1	6.7	5.6
Green Ext Time (p_c), s	0.0	10.1	0.0	0.5	0.3	5.2	0.1	0.2

Intersection Summary	
HCM 6th Ctrl Delay	21.2
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	464	166	151	22	157	649	52	486	54	281	183	456
Future Volume (veh/h)	464	166	151	22	157	649	52	486	54	281	183	456
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	488	175	0	23	165	0	55	512	0	296	193	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	641	907		47	343		93	768		447	549	
Arrive On Green	0.19	0.26	0.00	0.03	0.10	0.00	0.05	0.22	0.00	0.13	0.30	0.00
Sat Flow, veh/h	3374	3469	1547	1739	3469	1547	1739	3469	1547	3374	1826	1547
Grp Volume(v), veh/h	488	175	0	23	165	0	55	512	0	296	193	0
Grp Sat Flow(s),veh/h/ln	1687	1735	1547	1739	1735	1547	1739	1735	1547	1687	1826	1547
Q Serve(g_s), s	6.9	2.0	0.0	0.7	2.3	0.0	1.6	6.8	0.0	4.2	4.2	0.0
Cycle Q Clear(g_c), s	6.9	2.0	0.0	0.7	2.3	0.0	1.6	6.8	0.0	4.2	4.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	641	907		47	343		93	768		447	549	
V/C Ratio(X)	0.76	0.19		0.48	0.48		0.59	0.67		0.66	0.35	
Avail Cap(c_a), veh/h	837	1721		190	1239		245	1267		877	884	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.3	14.5	0.0	24.2	21.5	0.0	23.3	17.9	0.0	20.8	13.8	0.0
Incr Delay (d2), s/veh	3.0	0.1	0.0	7.4	1.0	0.0	5.9	1.0	0.0	1.7	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.7	0.0	0.3	0.9	0.0	0.7	2.5	0.0	1.6	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	14.6	0.0	31.6	22.5	0.0	29.3	18.9	0.0	22.5	14.2	0.0
LnGrp LOS	C	B		C	C		C	B		C	B	
Approach Vol, veh/h		663	A		188	A		567	A		489	A
Approach Delay, s/veh		20.3			23.6			19.9			19.2	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	15.7	5.9	17.7	7.2	19.7	14.1	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.1	18.4	5.5	25.0	7.1	24.4	12.5	18.0
Max Q Clear Time (g_c+I1), s	6.2	8.8	2.7	4.0	3.6	6.2	8.9	4.3
Green Ext Time (p_c), s	0.6	2.4	0.0	1.0	0.0	0.9	0.7	0.7

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	571	1	11	255	14	1	1	1	9	1	72
Future Volume (veh/h)	150	571	1	11	255	14	1	1	1	9	1	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693
Adj Flow Rate, veh/h	169	642	1	12	287	16	1	1	1	10	1	81
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	14	14	14	14	14	14	14	14	14	14	14	14
Cap, veh/h	375	1136	2	25	774	345	3	3	6	139	2	123
Arrive On Green	0.12	0.34	0.34	0.02	0.24	0.24	0.00	0.00	0.00	0.09	0.09	0.09
Sat Flow, veh/h	3127	3294	5	1612	3216	1434	826	826	1434	1612	18	1419
Grp Volume(v), veh/h	169	313	330	12	287	16	2	0	1	10	0	82
Grp Sat Flow(s),veh/h/ln	1564	1608	1692	1612	1608	1434	1651	0	1434	1612	0	1437
Q Serve(g_s), s	1.6	5.2	5.2	0.2	2.4	0.3	0.0	0.0	0.0	0.2	0.0	1.8
Cycle Q Clear(g_c), s	1.6	5.2	5.2	0.2	2.4	0.3	0.0	0.0	0.0	0.2	0.0	1.8
Prop In Lane	1.00		0.00	1.00		1.00	0.50		1.00	1.00		0.99
Lane Grp Cap(c), veh/h	375	554	583	25	774	345	7	0	6	139	0	124
V/C Ratio(X)	0.45	0.57	0.57	0.47	0.37	0.05	0.29	0.00	0.17	0.07	0.00	0.66
Avail Cap(c_a), veh/h	906	1741	1831	246	3040	1356	1586	0	1378	1475	0	1315
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.4	8.7	8.7	16.0	10.4	9.6	16.3	0.0	16.3	13.8	0.0	14.5
Incr Delay (d2), s/veh	0.9	0.9	0.9	12.9	0.3	0.1	22.4	0.0	13.0	0.2	0.0	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.2	1.3	0.2	0.6	0.1	0.1	0.0	0.0	0.1	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	9.7	9.6	28.9	10.7	9.6	38.6	0.0	29.3	14.0	0.0	20.3
LnGrp LOS	B	A	A	C	B	A	D	A	C	B	A	C
Approach Vol, veh/h		812			315			3			92	
Approach Delay, s/veh		10.6			11.3			35.5			19.7	
Approach LOS		B			B			D			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	4.6	5.0	15.8	7.3	8.4	12.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	5.0	35.5	30.0	9.5	31.0
Max Q Clear Time (g_c+I1), s	2.0	2.2	7.2	3.8	3.6	4.4
Green Ext Time (p_c), s	0.0	0.0	4.1	0.4	0.2	1.9

Intersection Summary	
HCM 6th Ctrl Delay	11.5
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	112	1	0	271	0	0	0	0	0
Future Vol, veh/h	0	0	0	112	1	0	271	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	53	53	53	53	53	53	53	53	53	53	53	53
Mvmt Flow	0	0	0	135	1	0	327	0	0	0	0	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	655	655	0	1	0	-	-	-	0
Stage 1	654	654	-	-	-	-	-	-	-
Stage 2	1	1	-	-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73	4.63	-	-	-	-	-
Critical Hdwy Stg 1	5.93	6.03	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-	-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777	2.677	-	-	-	-	-
Pot Cap-1 Maneuver	360	327	-	1344	-	0	0	-	0
Stage 1	433	393	-	-	-	0	0	-	0
Stage 2	904	803	-	-	-	0	0	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	273	0	-	1344	-	-	-	-	-
Mov Cap-2 Maneuver	273	0	-	-	-	-	-	-	-
Stage 1	328	0	-	-	-	-	-	-	-
Stage 2	904	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30.6	8.5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT
Capacity (veh/h)	1344	-	273	-	-
HCM Lane V/C Ratio	0.243	-	0.499	-	-
HCM Control Delay (s)	8.5	0	30.6	0	-
HCM Lane LOS	A	A	D	A	-
HCM 95th %tile Q(veh)	1	-	2.6	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	676	0	0	0	0	270	44	1	111	0
Future Vol, veh/h	1	1	676	0	0	0	0	270	44	1	111	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	415	-	-	-	-	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	23	23	23	23	23	23	23	23	23	23	23	23
Mvmt Flow	1	1	966	0	0	0	0	386	63	1	159	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	547	547	-	-	0	-	386	0	0
Stage 1	161	161	-	-	-	-	-	-	-
Stage 2	386	386	-	-	-	-	-	-	-
Critical Hdwy	6.63	6.73	-	-	-	-	4.33	-	-
Critical Hdwy Stg 1	5.63	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.63	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	-	-	-	-	2.407	-	-
Pot Cap-1 Maneuver	464	417	0	0	-	0	1067	-	0
Stage 1	819	727	0	0	-	0	-	-	0
Stage 2	644	575	0	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	464	0	-	-	-	-	1067	-	-
Mov Cap-2 Maneuver	464	0	-	-	-	-	-	-	-
Stage 1	819	0	-	-	-	-	-	-	-
Stage 2	643	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	464	-	1067	-
HCM Lane V/C Ratio	-	0.006	-	0.001	-
HCM Control Delay (s)	-	12.8	0	8.4	-
HCM Lane LOS	-	B	A	A	-
HCM 95th %tile Q(veh)	-	0	-	0	-

Intersection	
Int Delay, s/veh	162.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	103	8	25	2	8	1	34	210	1	32	590	165
Future Vol, veh/h	103	8	25	2	8	1	34	210	1	32	590	165
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	170	-	170	325	-	-	250	-	250	225	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	59	59	59	59	59	59	59	59	59	59	59
Heavy Vehicles, %	31	31	31	31	31	31	31	31	31	31	31	31
Mvmt Flow	175	14	42	3	14	2	58	356	2	54	1000	280

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1549	1722	640	1087	1860	178	1280	0	0	358	0	0
Stage 1	1248	1248	-	472	472	-	-	-	-	-	-	-
Stage 2	301	474	-	615	1388	-	-	-	-	-	-	-
Critical Hdwy	8.12	7.12	7.52	8.12	7.12	7.52	4.72	-	-	4.72	-	-
Critical Hdwy Stg 1	7.12	6.12	-	7.12	6.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.12	6.12	-	7.12	6.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.31	3.61	3.81	4.31	3.61	2.51	-	-	2.51	-	-
Pot Cap-1 Maneuver	~ 58	65	355	137	53	751	405	-	-	1014	-	-
Stage 1	~ 144	193	-	472	490	-	-	-	-	-	-	-
Stage 2	608	489	-	381	162	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 38	53	355	83	43	751	405	-	-	1014	-	-
Mov Cap-2 Maneuver	~ 38	53	-	83	43	-	-	-	-	-	-	-
Stage 1	~ 123	183	-	405	420	-	-	-	-	-	-	-
Stage 2	503	419	-	294	153	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	1394.8	99.8	2.1	0.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	405	-	-	38	53	355	83	43	751	1014	-	-
HCM Lane V/C Ratio	0.142	-	-	4.594	0.256	0.119	0.041	0.315	0.002	0.053	-	-
HCM Control Delay (s)	15.4	-	-	$ 1830.3	94.8	16.5	50.2	123.4	9.8	8.8	-	-
HCM Lane LOS	C	-	-	F	F	C	F	F	A	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	20.3	0.9	0.4	0.1	1.1	0	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	10.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	2	35	0	51	8	191	112	180	430	5
Future Vol, veh/h	2	0	2	35	0	51	8	191	112	180	430	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	225	-	250	200	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	59	59	59	59	59	59	59	59	59	59	59
Heavy Vehicles, %	32	32	32	32	32	32	32	32	32	32	32	32
Mvmt Flow	3	0	3	59	0	86	14	324	190	305	729	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1529	1881	365	1327	1699	162	737	0	0	514	0	0
Stage 1	1339	1339	-	352	352	-	-	-	-	-	-	-
Stage 2	190	542	-	975	1347	-	-	-	-	-	-	-
Critical Hdwy	8.14	7.14	7.54	8.14	7.14	7.54	4.74	-	-	4.74	-	-
Critical Hdwy Stg 1	7.14	6.14	-	7.14	6.14	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.14	6.14	-	7.14	6.14	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.32	3.62	3.82	4.32	3.62	2.52	-	-	2.52	-	-
Pot Cap-1 Maneuver	60	50	553	87	67	768	693	-	-	865	-	-
Stage 1	124	171	-	562	561	-	-	-	-	-	-	-
Stage 2	714	450	-	219	169	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	38	32	553	62	42	768	693	-	-	865	-	-
Mov Cap-2 Maneuver	38	32	-	62	42	-	-	-	-	-	-	-
Stage 1	122	111	-	551	550	-	-	-	-	-	-	-
Stage 2	621	441	-	141	109	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	61	92.3	0.3	3.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	693	-	-	71	62	-	768	865	-	-
HCM Lane V/C Ratio	0.02	-	-	0.095	0.957	-	0.113	0.353	-	-
HCM Control Delay (s)	10.3	-	-	61	211.8	0	10.3	11.4	-	-
HCM Lane LOS	B	-	-	F	F	A	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	4.6	-	0.4	1.6	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	0	4	12	0	77	16	227	19	229	217	9
Future Vol, veh/h	6	0	4	12	0	77	16	227	19	229	217	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	100	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	92	70	92	92	92	70	70	92	92	70	70
Heavy Vehicles, %	25	2	25	2	2	2	25	25	2	2	25	25
Mvmt Flow	9	0	6	13	0	84	23	324	21	249	310	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1016	1199	155	1034	1202	173	323	0	0	345	0	0
Stage 1	808	808	-	381	381	-	-	-	-	-	-	-
Stage 2	208	391	-	653	821	-	-	-	-	-	-	-
Critical Hdwy	8	6.54	7.4	7.54	6.54	6.94	4.6	-	-	4.14	-	-
Critical Hdwy Stg 1	7	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.02	3.55	3.52	4.02	3.32	2.45	-	-	2.22	-	-
Pot Cap-1 Maneuver	163	184	795	186	183	840	1083	-	-	1211	-	-
Stage 1	295	392	-	613	612	-	-	-	-	-	-	-
Stage 2	713	606	-	423	387	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	122	143	795	153	142	840	1083	-	-	1211	-	-
Mov Cap-2 Maneuver	122	143	-	153	142	-	-	-	-	-	-	-
Stage 1	289	311	-	600	599	-	-	-	-	-	-	-
Stage 2	628	593	-	334	307	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.2	13.4	0.5	3.8
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1083	-	-	184	523	1211	-	-
HCM Lane V/C Ratio	0.021	-	-	0.078	0.185	0.206	-	-
HCM Control Delay (s)	8.4	-	-	26.2	13.4	8.7	-	-
HCM Lane LOS	A	-	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.7	0.8	-	-

Intersection	
Intersection Delay, s/veh	21.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	292	64	115	2	52	18	41	38	1	20	110	104
Future Vol, veh/h	292	64	115	2	52	18	41	38	1	20	110	104
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	406	89	160	3	72	25	57	53	1	28	153	144
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	28.9	10.7	12	13.4
HCM LOS	D	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	68%	0%	90%	0%	7%	0%	27%	0%
Vol Thru, %	32%	95%	10%	22%	93%	59%	73%	35%
Vol Right, %	0%	5%	0%	78%	0%	41%	0%	65%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	60	20	324	147	28	44	75	159
LT Vol	41	0	292	0	2	0	20	0
Through Vol	19	19	32	32	26	26	55	55
RT Vol	0	1	0	115	0	18	0	104
Lane Flow Rate	83	28	450	204	39	61	104	221
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.182	0.058	0.848	0.328	0.079	0.118	0.21	0.408
Departure Headway (Hd)	7.872	7.487	6.786	5.776	7.271	6.941	7.26	6.658
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	453	476	531	621	490	513	493	539
Service Time	5.66	5.274	4.543	3.532	5.059	4.729	5.032	4.43
HCM Lane V/C Ratio	0.183	0.059	0.847	0.329	0.08	0.119	0.211	0.41
HCM Control Delay	12.4	10.7	36.8	11.4	10.7	10.7	12	14
HCM Lane LOS	B	B	E	B	B	B	B	B
HCM 95th-tile Q	0.7	0.2	8.9	1.4	0.3	0.4	0.8	2

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	0	0	0	0	52	0	8	0	154	31	15
Future Vol, veh/h	14	0	0	0	0	52	0	8	0	154	31	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	0	0	0	0	57	0	9	0	167	34	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	373	377	17	360	393	5	50	0	0	9	0	0
Stage 1	368	368	-	9	9	-	-	-	-	-	-	-
Stage 2	5	9	-	351	384	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	559	553	1058	571	542	1076	1555	-	-	1609	-	-
Stage 1	624	620	-	1011	888	-	-	-	-	-	-	-
Stage 2	1016	888	-	639	610	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	486	494	1058	524	484	1076	1555	-	-	1609	-	-
Mov Cap-2 Maneuver	486	494	-	524	484	-	-	-	-	-	-	-
Stage 1	624	554	-	1011	888	-	-	-	-	-	-	-
Stage 2	963	888	-	571	545	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.6	8.5	0	5.8
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1555	-	-	486	1076	1609	-	-
HCM Lane V/C Ratio	-	-	-	0.031	0.053	0.104	-	-
HCM Control Delay (s)	0	-	-	12.6	8.5	7.5	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0.3	-	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	470	145	109	613	302	109
Future Volume (veh/h)	470	145	109	613	302	109
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	534	165	124	697	343	124
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	8	8	8	8	8	8
Cap, veh/h	927	414	164	1662	455	405
Arrive On Green	0.27	0.27	0.10	0.49	0.27	0.27
Sat Flow, veh/h	3474	1510	1697	3474	1697	1510
Grp Volume(v), veh/h	534	165	124	697	343	124
Grp Sat Flow(s),veh/h/ln	1692	1510	1697	1692	1697	1510
Q Serve(g_s), s	5.1	3.3	2.7	4.9	6.9	2.4
Cycle Q Clear(g_c), s	5.1	3.3	2.7	4.9	6.9	2.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	927	414	164	1662	455	405
V/C Ratio(X)	0.58	0.40	0.75	0.42	0.75	0.31
Avail Cap(c_a), veh/h	1629	727	386	2806	907	807
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	11.1	16.5	6.1	12.6	10.9
Incr Delay (d2), s/veh	0.6	0.6	6.9	0.2	2.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.9	1.2	1.1	2.3	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.3	11.7	23.3	6.3	15.1	11.3
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	699			821	467	
Approach Delay, s/veh	12.1			8.8	14.1	
Approach LOS	B			A	B	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		14.5	8.1	14.7		22.9
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		20.0	8.5	18.0		31.0
Max Q Clear Time (g_c+I1), s		8.9	4.7	7.1		6.9
Green Ext Time (p_c), s		1.2	0.1	3.2		5.1

Intersection Summary	
HCM 6th Ctrl Delay	11.2
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBT] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	143	94	1	43	1	28	1	1	1	1	1
Future Vol, veh/h	1	143	94	1	43	1	28	1	1	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	155	102	1	47	1	30	1	1	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	48	0	0	257	0	0	234	258	129	130	309	24
Stage 1	-	-	-	-	-	-	208	208	-	50	50	-
Stage 2	-	-	-	-	-	-	26	50	-	80	259	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1557	-	-	1305	-	-	701	645	897	830	604	1047
Stage 1	-	-	-	-	-	-	775	729	-	957	853	-
Stage 2	-	-	-	-	-	-	988	853	-	919	692	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1557	-	-	1305	-	-	699	644	897	827	603	1047
Mov Cap-2 Maneuver	-	-	-	-	-	-	699	644	-	827	603	-
Stage 1	-	-	-	-	-	-	774	728	-	956	852	-
Stage 2	-	-	-	-	-	-	985	852	-	916	691	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	10.4	9.6
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	699	750	1557	-	-	1305	-	-	827	765
HCM Lane V/C Ratio	0.044	0.003	0.001	-	-	0.001	-	-	0.001	0.003
HCM Control Delay (s)	10.4	9.8	7.3	-	-	7.8	-	-	9.4	9.7
HCM Lane LOS	B	A	A	-	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0	-	-	0	0

Intersection Level Of Service Report
Intersection 1: US 95A/I-80 WB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	46.4
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	US 95A			US 95A						I-80 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	350.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	US 95A			US 95A						I-80 WB Ramps		
Base Volume Input [veh/h]	512	100	0	0	78	80	0	0	0	214	1	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	11.00	11.00	2.00	2.00	11.00	11.00	2.00	2.00	2.00	11.00	11.00	11.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	512	100	0	0	78	80	0	0	0	214	1	65
Peak Hour Factor	0.9400	0.9400	1.0000	1.0000	0.9400	0.9400	1.0000	1.0000	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	136	27	0	0	21	21	0	0	0	57	0	17
Total Analysis Volume [veh/h]	545	106	0	0	83	85	0	0	0	228	1	69
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Stop	Free	Stop
Flared Lane		No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance		No		No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.21	0.17	0.00	0.00	0.00	0.75	0.00	0.11
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	18.83	17.33	0.00	0.00	0.00	46.22	46.35	11.25
Movement LOS	A	A			C	C				E	E	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	1.75	1.75	0.00	0.00	0.00	5.75	5.75	0.36
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	43.80	43.80	0.00	0.00	0.00	143.87	143.87	8.94
d_A, Approach Delay [s/veh]	0.00			18.07			0.00			38.12		
Approach LOS	A			C			A			E		
d_I, Intersection Delay [s/veh]	12.89											
Intersection LOS	E											

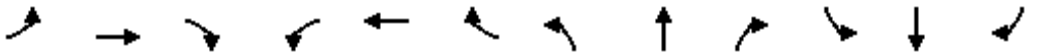
Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↑	↱		↰	
Traffic Vol, veh/h	31	8	715	0	0	0	0	581	139	10	315	0
Future Vol, veh/h	31	8	715	0	0	0	0	581	139	10	315	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	250	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	6	6	6	6	6	6	6	6	6	6	6	6
Mvmt Flow	34	9	786	0	0	0	0	638	153	11	346	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1006	1006	-	-	0	0	638	0	0
Stage 1	368	368	-	-	-	-	-	-	-
Stage 2	638	638	-	-	-	-	-	-	-
Critical Hdwy	6.46	6.56	-	-	-	-	4.16	-	-
Critical Hdwy Stg 1	5.46	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.46	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	-	-	-	-	2.254	-	-
Pot Cap-1 Maneuver	263	237	0	0	-	-	927	-	0
Stage 1	691	614	0	0	-	-	-	-	0
Stage 2	519	465	0	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	259	0	-	-	-	-	927	-	-
Mov Cap-2 Maneuver	259	0	-	-	-	-	-	-	-
Stage 1	691	0	-	-	-	-	-	-	-
Stage 2	511	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.6	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	259	-	927	-
HCM Lane V/C Ratio	-	-	0.165	-	0.012	-
HCM Control Delay (s)	-	-	21.6	0	8.9	0
HCM Lane LOS	-	-	C	A	A	A
HCM 95th %tile Q(veh)	-	-	0.6	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	54	66	903	94	115	84	551	503	108	845	37
Future Volume (veh/h)	57	54	66	903	94	115	84	551	503	108	845	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	60	57	69	951	99	121	88	580	529	114	889	39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	90	127	113	1088	628	533	216	1332	593	209	1089	48
Arrive On Green	0.05	0.07	0.07	0.32	0.34	0.34	0.12	0.38	0.38	0.06	0.32	0.32
Sat Flow, veh/h	1767	1763	1572	3428	1856	1572	1767	3526	1570	3428	3440	151
Grp Volume(v), veh/h	60	57	69	951	99	121	88	580	529	114	456	472
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1856	1572	1767	1763	1570	1714	1763	1828
Q Serve(g_s), s	3.1	2.9	4.0	24.4	3.5	5.1	4.3	11.4	29.5	3.0	22.2	22.2
Cycle Q Clear(g_c), s	3.1	2.9	4.0	24.4	3.5	5.1	4.3	11.4	29.5	3.0	22.2	22.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	90	127	113	1088	628	533	216	1332	593	209	558	579
V/C Ratio(X)	0.67	0.45	0.61	0.87	0.16	0.23	0.41	0.44	0.89	0.54	0.82	0.82
Avail Cap(c_a), veh/h	190	776	692	1399	1374	1165	216	1476	657	221	719	746
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.4	41.4	41.9	30.0	21.5	22.1	37.8	21.6	27.2	42.5	29.3	29.3
Incr Delay (d2), s/veh	8.3	2.5	5.2	5.2	0.1	0.2	1.2	0.2	13.6	2.5	5.7	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	1.3	1.7	10.5	1.5	1.9	1.9	4.6	12.8	1.3	10.0	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	43.9	47.1	35.3	21.6	22.3	39.0	21.8	40.8	44.9	35.0	34.8
LnGrp LOS	D	D	D	D	C	C	D	C	D	D	D	C
Approach Vol, veh/h		186			1171			1197			1042	
Approach Delay, s/veh		47.6			32.8			31.5			36.0	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	39.2	33.6	10.7	15.4	33.5	8.7	35.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	39.0	38.0	41.0	7.0	38.0	10.0	69.0
Max Q Clear Time (g_c+I1), s	5.0	31.5	26.4	6.0	6.3	24.2	5.1	7.1
Green Ext Time (p_c), s	0.0	3.6	3.1	0.7	0.0	5.1	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	34.1
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	39	294	179	34	73	255	1142	48	123	1595	85
Future Volume (veh/h)	50	39	294	179	34	73	255	1142	48	123	1595	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	52	40	303	185	35	75	263	1177	49	127	1644	88
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	134	367	211	78	168	286	2043	85	155	1763	94
Arrive On Green	0.04	0.07	0.07	0.12	0.15	0.15	0.16	0.59	0.59	0.09	0.51	0.51
Sat Flow, veh/h	1781	1870	1565	1781	528	1131	1781	3477	145	1781	3432	183
Grp Volume(v), veh/h	52	40	303	185	0	110	263	601	625	127	847	885
Grp Sat Flow(s),veh/h/ln	1781	1870	1565	1781	0	1659	1781	1777	1844	1781	1777	1837
Q Serve(g_s), s	3.4	2.4	4.3	12.1	0.0	7.2	17.2	24.9	25.0	8.3	52.3	53.4
Cycle Q Clear(g_c), s	3.4	2.4	4.3	12.1	0.0	7.2	17.2	24.9	25.0	8.3	52.3	53.4
Prop In Lane	1.00		1.00	1.00		0.68	1.00		0.08	1.00		0.10
Lane Grp Cap(c), veh/h	74	134	367	211	0	246	286	1044	1084	155	913	944
V/C Ratio(X)	0.70	0.30	0.83	0.88	0.00	0.45	0.92	0.58	0.58	0.82	0.93	0.94
Avail Cap(c_a), veh/h	136	301	506	211	0	337	286	1044	1084	256	932	964
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.9	52.1	23.6	51.3	0.0	45.9	48.9	15.2	15.2	53.1	26.7	27.0
Incr Delay (d2), s/veh	11.4	1.2	7.8	31.4	0.0	1.3	32.7	0.8	0.8	10.2	14.8	15.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.2	6.5	7.2	0.0	3.0	10.2	9.9	10.3	4.1	24.9	26.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.4	53.3	31.5	82.6	0.0	47.2	81.6	16.0	16.0	63.2	41.5	42.9
LnGrp LOS	E	D	C	F	A	D	F	B	B	E	D	D
Approach Vol, veh/h		395			295			1489			1859	
Approach Delay, s/veh		38.4			69.4			27.6			43.7	
Approach LOS		D			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	73.5	18.0	12.5	23.0	64.8	8.9	21.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	64.0	14.0	19.0	19.0	62.0	9.0	24.0
Max Q Clear Time (g_c+I1), s	10.3	27.0	14.1	6.3	19.2	55.4	5.4	9.2
Green Ext Time (p_c), s	0.2	10.9	0.0	1.0	0.0	5.3	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	39.1
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	392	146	214	33	150	655	40	431	64	859	459	728
Future Volume (veh/h)	392	146	214	33	150	655	40	431	64	859	459	728
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	408	152	0	34	156	0	42	449	0	895	478	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	520	706		63	297		73	642		1054	832	
Arrive On Green	0.15	0.20	0.00	0.04	0.08	0.00	0.04	0.18	0.00	0.31	0.44	0.00
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	3554	1585	3456	1870	1585
Grp Volume(v), veh/h	408	152	0	34	156	0	42	449	0	895	478	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	1777	1585	1728	1870	1585
Q Serve(g_s), s	7.3	2.3	0.0	1.2	2.7	0.0	1.5	7.6	0.0	15.6	12.2	0.0
Cycle Q Clear(g_c), s	7.3	2.3	0.0	1.2	2.7	0.0	1.5	7.6	0.0	15.6	12.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	520	706		63	297		73	642		1054	832	
V/C Ratio(X)	0.78	0.22		0.54	0.53		0.57	0.70		0.85	0.57	
Avail Cap(c_a), veh/h	619	1295		169	996		178	1051		1265	1051	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.3	21.5	0.0	30.5	28.2	0.0	30.2	24.7	0.0	20.9	13.3	0.0
Incr Delay (d2), s/veh	5.6	0.2	0.0	7.0	1.4	0.0	6.9	1.4	0.0	4.9	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.9	0.0	0.6	1.2	0.0	0.8	3.1	0.0	6.5	4.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	21.7	0.0	37.4	29.6	0.0	37.2	26.1	0.0	25.8	13.9	0.0
LnGrp LOS	C	C		D	C		D	C		C	B	
Approach Vol, veh/h		560	A		190	A		491	A		1373	A
Approach Delay, s/veh		29.1			31.0			27.0			21.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.1	16.1	6.8	17.2	7.1	33.1	14.2	9.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.5	19.0	6.1	23.4	6.4	36.1	11.5	18.0
Max Q Clear Time (g_c+I1), s	17.6	9.6	3.2	4.3	3.5	14.2	9.3	4.7
Green Ext Time (p_c), s	2.0	2.0	0.0	0.8	0.0	3.1	0.4	0.7

Intersection Summary	
HCM 6th Ctrl Delay	24.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	264	1	4	585	37	26	14	5	14	7	269
Future Volume (veh/h)	152	264	1	4	585	37	26	14	5	14	7	269
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	188	326	1	5	722	46	32	17	6	17	9	332
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	290	1310	4	11	1006	449	57	30	77	469	11	408
Arrive On Green	0.09	0.37	0.37	0.01	0.29	0.29	0.05	0.05	0.05	0.27	0.27	0.27
Sat Flow, veh/h	3346	3519	11	1725	3441	1535	1145	608	1535	1725	41	1500
Grp Volume(v), veh/h	188	159	168	5	722	46	49	0	6	17	0	341
Grp Sat Flow(s),veh/h/ln	1673	1721	1809	1725	1721	1535	1754	0	1535	1725	0	1541
Q Serve(g_s), s	3.3	3.9	3.9	0.2	11.3	1.3	1.6	0.0	0.2	0.4	0.0	12.4
Cycle Q Clear(g_c), s	3.3	3.9	3.9	0.2	11.3	1.3	1.6	0.0	0.2	0.4	0.0	12.4
Prop In Lane	1.00		0.01	1.00		1.00	0.65		1.00	1.00		0.97
Lane Grp Cap(c), veh/h	290	640	673	11	1006	449	88	0	77	469	0	419
V/C Ratio(X)	0.65	0.25	0.25	0.44	0.72	0.10	0.56	0.00	0.08	0.04	0.00	0.81
Avail Cap(c_a), veh/h	473	886	932	143	1572	701	903	0	791	860	0	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	13.1	13.1	29.8	19.1	15.5	27.9	0.0	27.3	16.1	0.0	20.5
Incr Delay (d2), s/veh	2.4	0.2	0.2	23.8	1.0	0.1	5.5	0.0	0.4	0.0	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.3	1.4	0.1	4.1	0.4	0.8	0.0	0.1	0.2	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.0	13.3	13.3	53.6	20.1	15.6	33.4	0.0	27.7	16.1	0.0	24.3
LnGrp LOS	C	B	B	D	C	B	C	A	C	B	A	C
Approach Vol, veh/h		515			773			55			358	
Approach Delay, s/veh		19.0			20.0			32.8			23.9	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	7.5	4.9	26.9	20.9	9.7	22.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.0	5.0	31.0	30.0	8.5	27.5
Max Q Clear Time (g_c+I1), s	3.6	2.2	5.9	14.4	5.3	13.3
Green Ext Time (p_c), s	0.2	0.0	1.8	2.0	0.2	4.3

Intersection Summary	
HCM 6th Ctrl Delay	21.0
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	106

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	54	6	0	637	0	0	0	0	0
Future Vol, veh/h	0	0	0	54	6	0	637	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	22	22	22	22	22	22	22	22	22	22	22	22
Mvmt Flow	0	0	0	77	9	0	910	0	0	0	0	0

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	1821	1821	0	1	0	-	-	-	0
Stage 1	1820	1820	-	-	-	-	-	-	-
Stage 2	1	1	-	-	-	-	-	-	-
Critical Hdwy	6.62	6.72	6.42	4.32	-	-	-	-	-
Critical Hdwy Stg 1	5.62	5.72	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.62	5.72	-	-	-	-	-	-	-
Follow-up Hdwy	3.698	4.198	3.498	2.398	-	-	-	-	-
Pot Cap-1 Maneuver	~ 76	69	-	1500	-	0	0	-	0
Stage 1	126	115	-	-	-	0	0	-	0
Stage 2	972	857	-	-	-	0	0	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	~ 30	0	-	1500	-	-	-	-	-
Mov Cap-2 Maneuver	~ 30	0	-	-	-	-	-	-	-
Stage 1	~ 50	0	-	-	-	-	-	-	-
Stage 2	972	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 1116.3	11	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT
Capacity (veh/h)	1500	-	30	-	-
HCM Lane V/C Ratio	0.607	-	2.857	-	-
HCM Control Delay (s)	11	-	$ 1116.3	0	-
HCM Lane LOS	B	A	F	A	-
HCM 95th %tile Q(veh)	4.4	-	10.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	328	0	0	0	0	636	94	1	53	0
Future Vol, veh/h	1	1	328	0	0	0	0	636	94	1	53	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	415	-	-	-	-	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	21	21	21	21	21	21	21	21	21	21	21	21
Mvmt Flow	1	1	469	0	0	0	0	909	134	1	76	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	987	987	-	-	0	-	909	0	0
Stage 1	78	78	-	-	-	-	-	-	-
Stage 2	909	909	-	-	-	-	-	-	-
Critical Hdwy	6.61	6.71	-	-	-	-	4.31	-	-
Critical Hdwy Stg 1	5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy	3.689	4.189	-	-	-	-	2.389	-	-
Pot Cap-1 Maneuver	253	230	0	0	-	0	676	-	0
Stage 1	899	794	0	0	-	0	-	-	0
Stage 2	364	329	0	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	253	0	-	-	-	-	676	-	-
Mov Cap-2 Maneuver	253	0	-	-	-	-	-	-	-
Stage 1	899	0	-	-	-	-	-	-	-
Stage 2	364	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.4	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	253	-	676	-
HCM Lane V/C Ratio	-	0.011	-	0.002	-
HCM Control Delay (s)	-	19.4	0	10.3	-
HCM Lane LOS	-	C	A	B	-
HCM 95th %tile Q(veh)	-	0	-	0	-

Intersection	
Int Delay, s/veh	142.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	222	1	43	5	2	4	48	504	1	1	208	172
Future Vol, veh/h	222	1	43	5	2	4	48	504	1	1	208	172
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	170	-	170	325	-	-	250	-	250	225	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	29	29	29	29	29	29	29	29	29	29	29	29
Mvmt Flow	352	2	68	8	3	6	76	800	2	2	330	273

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1025	1425	302	1122	1559	400	603	0	0	802	0	0
Stage 1	471	471	-	952	952	-	-	-	-	-	-	-
Stage 2	554	954	-	170	607	-	-	-	-	-	-	-
Critical Hdwy	8.08	7.08	7.48	8.08	7.08	7.48	4.68	-	-	4.68	-	-
Critical Hdwy Stg 1	7.08	6.08	-	7.08	6.08	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.08	6.08	-	7.08	6.08	-	-	-	-	-	-	-
Follow-up Hdwy	3.79	4.29	3.59	3.79	4.29	3.59	2.49	-	-	2.49	-	-
Pot Cap-1 Maneuver	~ 156	106	620	130	86	530	807	-	-	664	-	-
Stage 1	477	495	-	231	281	-	-	-	-	-	-	-
Stage 2	422	280	-	743	423	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 138	96	620	106	78	530	807	-	-	664	-	-
Mov Cap-2 Maneuver	~ 138	96	-	106	78	-	-	-	-	-	-	-
Stage 1	432	494	-	209	255	-	-	-	-	-	-	-
Stage 2	373	254	-	657	422	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s$	645.2	32.9	0.9	0
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	807	-	-	138	96	620	106	78	530	664	-	-
HCM Lane V/C Ratio	0.094	-	-	2.553	0.017	0.11	0.075	0.041	0.012	0.002	-	-
HCM Control Delay (s)	9.9	-	-	$ 770.7	43.1	11.5	41.7	53.1	11.9	10.4	-	-
HCM Lane LOS	A	-	-	F	E	B	E	F	B	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	31.1	0.1	0.4	0.2	0.1	0	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	7	90	0	129	3	381	34	58	197	2
Future Vol, veh/h	7	0	7	90	0	129	3	381	34	58	197	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	225	-	250	200	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	45	45	45	45	45	45	45	45	45	45	45	45
Mvmt Flow	8	0	8	102	0	147	3	433	39	66	224	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	579	834	112	683	797	217	226	0	0	472	0	0
Stage 1	356	356	-	439	439	-	-	-	-	-	-	-
Stage 2	223	478	-	244	358	-	-	-	-	-	-	-
Critical Hdwy	8.4	7.4	7.8	8.4	7.4	7.8	5	-	-	5	-	-
Critical Hdwy Stg 1	7.4	6.4	-	7.4	6.4	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.4	6.4	-	7.4	6.4	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4.45	3.75	3.95	4.45	3.75	2.65	-	-	2.65	-	-
Pot Cap-1 Maneuver	319	233	798	263	247	670	1077	-	-	835	-	-
Stage 1	530	531	-	466	480	-	-	-	-	-	-	-
Stage 2	650	458	-	629	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	234	214	798	244	227	670	1077	-	-	835	-	-
Mov Cap-2 Maneuver	234	214	-	244	227	-	-	-	-	-	-	-
Stage 1	528	489	-	465	479	-	-	-	-	-	-	-
Stage 2	506	457	-	574	488	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.4	19.3	0.1	2.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1077	-	-	362	244	-	670	835	-	-
HCM Lane V/C Ratio	0.003	-	-	0.044	0.419	-	0.219	0.079	-	-
HCM Control Delay (s)	8.4	-	-	15.4	30	0	11.9	9.7	-	-
HCM Lane LOS	A	-	-	C	D	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.9	-	0.8	0.3	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	0	14	20	0	179	6	211	8	70	228	3
Future Vol, veh/h	20	0	14	20	0	179	6	211	8	70	228	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	100	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	92	85	92	92	92	85	85	92	92	85	85
Heavy Vehicles, %	30	2	30	2	2	2	30	30	2	2	30	30
Mvmt Flow	24	0	16	22	0	195	7	248	9	76	268	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	558	691	134	553	691	129	272	0	0	257	0	0
Stage 1	420	420	-	267	267	-	-	-	-	-	-	-
Stage 2	138	271	-	286	424	-	-	-	-	-	-	-
Critical Hdwy	8.1	6.54	7.5	7.54	6.54	6.94	4.7	-	-	4.14	-	-
Critical Hdwy Stg 1	7.1	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.1	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.8	4.02	3.6	3.52	4.02	3.32	2.5	-	-	2.22	-	-
Pot Cap-1 Maneuver	357	366	808	416	366	897	1108	-	-	1305	-	-
Stage 1	512	588	-	715	687	-	-	-	-	-	-	-
Stage 2	775	684	-	697	585	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	266	343	808	388	343	897	1108	-	-	1305	-	-
Mov Cap-2 Maneuver	266	343	-	388	343	-	-	-	-	-	-	-
Stage 1	509	554	-	711	683	-	-	-	-	-	-	-
Stage 2	603	680	-	643	551	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16	11.2	0.2	1.7
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1108	-	-	368	793	1305	-	-
HCM Lane V/C Ratio	0.006	-	-	0.109	0.273	0.058	-	-
HCM Control Delay (s)	8.3	-	-	16	11.2	7.9	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	1.1	0.2	-	-

Intersection	
Intersection Delay, s/veh	63.3
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	103	25	55	1	52	31	92	97	1	19	53	291
Future Vol, veh/h	103	25	55	1	52	31	92	97	1	19	53	291
Peak Hour Factor	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Heavy Vehicles, %	26	26	26	26	26	26	26	26	26	26	26	26
Mvmt Flow	198	48	106	2	100	60	177	187	2	37	102	560
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	19.5	14.6	22.2	118.2
HCM LOS	C	B	C	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	65%	0%	89%	0%	4%	0%	42%	0%
Vol Thru, %	35%	98%	11%	19%	96%	46%	58%	8%
Vol Right, %	0%	2%	0%	81%	0%	54%	0%	92%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	141	50	116	68	27	57	46	318
LT Vol	92	0	103	0	1	0	19	0
Through Vol	49	49	13	13	26	26	27	27
RT Vol	0	1	0	55	0	31	0	291
Lane Flow Rate	270	95	222	130	52	110	88	611
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.628	0.212	0.542	0.28	0.129	0.26	0.194	1.204
Departure Headway (Hd)	8.823	8.47	9.35	8.295	9.552	9.135	7.969	7.097
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	413	426	389	436	377	396	448	507
Service Time	6.523	6.17	7.05	5.995	7.252	6.835	5.765	4.892
HCM Lane V/C Ratio	0.654	0.223	0.571	0.298	0.138	0.278	0.196	1.205
HCM Control Delay	25.3	13.4	22.6	14.2	13.7	15	12.7	133.3
HCM Lane LOS	D	B	C	B	B	B	B	F
HCM 95th-tile Q	4.2	0.8	3.1	1.1	0.4	1	0.7	22.7

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	0	0	0	0	135	0	26	0	75	15	6
Future Vol, veh/h	6	0	0	0	0	135	0	26	0	75	15	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	0	0	0	147	0	28	0	82	16	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	194	208	8	200	215	14	23	0	0	28	0	0
Stage 1	180	180	-	28	28	-	-	-	-	-	-	-
Stage 2	14	28	-	172	187	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	748	688	1072	741	682	1062	1591	-	-	1584	-	-
Stage 1	804	749	-	985	871	-	-	-	-	-	-	-
Stage 2	1004	871	-	813	744	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	619	652	1072	711	647	1062	1591	-	-	1584	-	-
Mov Cap-2 Maneuver	619	652	-	711	647	-	-	-	-	-	-	-
Stage 1	804	710	-	985	871	-	-	-	-	-	-	-
Stage 2	865	871	-	771	705	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.9	8.9	0	5.8
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1591	-	-	619	1062	1584	-	-
HCM Lane V/C Ratio	-	-	-	0.011	0.138	0.051	-	-
HCM Control Delay (s)	0	-	-	10.9	8.9	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.5	0.2	-	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	470	145	109	613	302	109
Future Volume (veh/h)	470	145	109	613	302	109
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	534	165	124	697	343	124
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	8	8	8	8	8	8
Cap, veh/h	927	414	164	1662	455	405
Arrive On Green	0.27	0.27	0.10	0.49	0.27	0.27
Sat Flow, veh/h	3474	1510	1697	3474	1697	1510
Grp Volume(v), veh/h	534	165	124	697	343	124
Grp Sat Flow(s),veh/h/ln	1692	1510	1697	1692	1697	1510
Q Serve(g_s), s	5.1	3.3	2.7	4.9	6.9	2.4
Cycle Q Clear(g_c), s	5.1	3.3	2.7	4.9	6.9	2.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	927	414	164	1662	455	405
V/C Ratio(X)	0.58	0.40	0.75	0.42	0.75	0.31
Avail Cap(c_a), veh/h	1629	727	386	2806	907	807
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	11.1	16.5	6.1	12.6	10.9
Incr Delay (d2), s/veh	0.6	0.6	6.9	0.2	2.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.9	1.2	1.1	2.3	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.3	11.7	23.3	6.3	15.1	11.3
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	699			821	467	
Approach Delay, s/veh	12.1			8.8	14.1	
Approach LOS	B			A	B	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		14.5	8.1	14.7		22.9
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		20.0	8.5	18.0		31.0
Max Q Clear Time (g_c+I1), s		8.9	4.7	7.1		6.9
Green Ext Time (p_c), s		1.2	0.1	3.2		5.1

Intersection Summary	
HCM 6th Ctrl Delay	11.2
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBT] is excluded from calculations of the approach delay and intersection delay.

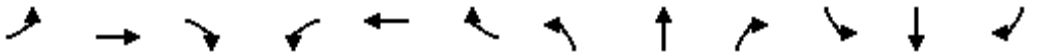
Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	38	25	1	103	1	67	1	1	1	1	1
Future Vol, veh/h	1	38	25	1	103	1	67	1	1	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	41	27	1	112	1	73	1	1	1	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	113	0	0	68	0	0	116	172	34	138	185	57
Stage 1	-	-	-	-	-	-	57	57	-	115	115	-
Stage 2	-	-	-	-	-	-	59	115	-	23	70	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1474	-	-	1531	-	-	848	720	1032	819	708	997
Stage 1	-	-	-	-	-	-	948	847	-	877	799	-
Stage 2	-	-	-	-	-	-	946	799	-	992	836	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1474	-	-	1531	-	-	845	719	1032	817	707	997
Mov Cap-2 Maneuver	-	-	-	-	-	-	845	719	-	817	707	-
Stage 1	-	-	-	-	-	-	947	846	-	876	798	-
Stage 2	-	-	-	-	-	-	943	798	-	989	835	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	9.7	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	845	848	1474	-	-	1531	-	-	817	827
HCM Lane V/C Ratio	0.086	0.003	0.001	-	-	0.001	-	-	0.001	0.003
HCM Control Delay (s)	9.7	9.3	7.4	-	-	7.4	-	-	9.4	9.4
HCM Lane LOS	A	A	A	-	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0	0	-	-	0	-	-	0	0



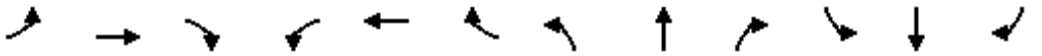
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	112	1	0	271	0	0	0	0	0
Future Volume (veh/h)	0	0	0	112	1	0	271	0	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1115	1115	1115	1115	1115	0	0	1115	1115
Adj Flow Rate, veh/h				135	1	0	327	0	0	0	0	0
Peak Hour Factor				0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %				53	53	53	53	53	0	0	53	53
Cap, veh/h				147	1		711	0	0	0	547	
Arrive On Green				0.14	0.14	0.00	0.49	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h				1054	8	945	845	0	0	0	1115	945
Grp Volume(v), veh/h				136	0	0	327	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln				1062	0	945	845	0	0	0	1115	945
Q Serve(g_s), s				3.1	0.0	0.0	7.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s				3.1	0.0	0.0	7.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane				0.99		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				148	0		711	0	0	0	547	
V/C Ratio(X)				0.92	0.00		0.46	0.00	0.00	0.00	0.00	
Avail Cap(c_a), veh/h				791	0		1440	0	0	0	1509	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh				10.3	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh				19.7	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.3	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				30.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0
LnGrp LOS				C	A		A	A	A	A	A	
Approach Vol, veh/h					136	A		327			0	A
Approach Delay, s/veh					30.0			5.6			0.0	
Approach LOS					C			A				

Timer - Assigned Phs	2			6		8						
Phs Duration (G+Y+Rc), s	16.4			16.4		7.9						
Change Period (Y+Rc), s	4.5			4.5		4.5						
Max Green Setting (Gmax), s	32.9			32.9		18.1						
Max Q Clear Time (g_c+I1), s	9.8			0.0		5.1						
Green Ext Time (p_c), s	2.1			0.0		0.6						

Intersection Summary		
HCM 6th Ctrl Delay	12.8	
HCM 6th LOS	B	

Notes

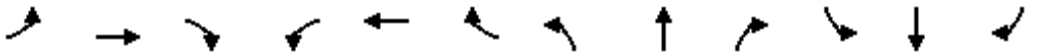
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	8	25	2	8	1	34	210	1	32	590	165
Future Volume (veh/h)	103	8	25	2	8	1	34	210	1	32	590	165
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1441	1441	1441	1441	1441	1441	1441	1441	1441	1441	1441	1441
Adj Flow Rate, veh/h	175	14	42	3	14	2	58	356	2	54	1000	280
Peak Hour Factor	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59
Percent Heavy Veh, %	31	31	31	31	31	31	31	31	31	31	31	31
Cap, veh/h	202	280	237	6	73	62	67	1449	646	62	1112	310
Arrive On Green	0.15	0.19	0.19	0.00	0.05	0.05	0.05	0.53	0.53	0.05	0.53	0.53
Sat Flow, veh/h	1372	1441	1221	1372	1441	1221	1372	2737	1221	1372	2114	589
Grp Volume(v), veh/h	175	14	42	3	14	2	58	356	2	54	646	634
Grp Sat Flow(s),veh/h/ln	1372	1441	1221	1372	1441	1221	1372	1369	1221	1372	1369	1335
Q Serve(g_s), s	9.9	0.6	2.3	0.2	0.7	0.1	3.3	5.6	0.1	3.1	33.6	34.1
Cycle Q Clear(g_c), s	9.9	0.6	2.3	0.2	0.7	0.1	3.3	5.6	0.1	3.1	33.6	34.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	202	280	237	6	73	62	67	1449	646	62	720	702
V/C Ratio(X)	0.86	0.05	0.18	0.54	0.19	0.03	0.87	0.25	0.00	0.87	0.90	0.90
Avail Cap(c_a), veh/h	233	481	408	86	327	277	92	1449	646	187	780	760
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	26.0	26.7	39.4	36.1	35.8	37.5	10.1	8.8	37.7	16.9	17.0
Incr Delay (d2), s/veh	24.5	0.1	0.4	63.6	1.2	0.2	44.2	0.1	0.0	28.7	12.5	13.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.2	0.7	0.2	0.3	0.0	1.9	1.5	0.0	1.5	11.8	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.6	26.1	27.0	103.1	37.3	36.0	81.7	10.2	8.8	66.4	29.4	30.5
LnGrp LOS	E	C	C	F	D	D	F	B	A	E	C	C
Approach Vol, veh/h		231			19			416			1334	
Approach Delay, s/veh		50.1			47.6			20.2			31.4	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	46.5	4.8	19.9	8.3	46.2	16.2	8.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.8	39.7	5.0	26.5	5.3	45.2	13.5	18.0
Max Q Clear Time (g_c+I1), s	5.1	7.6	2.2	4.3	5.3	36.1	11.9	2.7
Green Ext Time (p_c), s	0.0	2.5	0.0	0.1	0.0	5.7	0.1	0.0

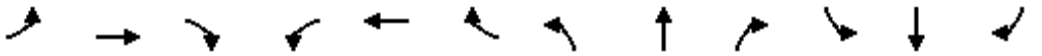
Intersection Summary	
HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	2	35	0	51	8	191	112	180	430	5
Future Volume (veh/h)	2	0	2	35	0	51	8	191	112	180	430	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1426	1426	1426	1426	1426	1426	1426	1426	1426	1426	1426	1426
Adj Flow Rate, veh/h	3	0	3	59	0	86	14	324	190	305	729	8
Peak Hour Factor	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59
Percent Heavy Veh, %	32	32	32	32	32	32	32	32	32	32	32	32
Cap, veh/h	185	27	63	316	154	130	25	683	305	364	1360	607
Arrive On Green	0.11	0.00	0.11	0.11	0.00	0.11	0.02	0.25	0.25	0.27	0.50	0.50
Sat Flow, veh/h	339	248	588	1078	1426	1208	1358	2709	1208	1358	2709	1208
Grp Volume(v), veh/h	6	0	0	59	0	86	14	324	190	305	729	8
Grp Sat Flow(s),veh/h/ln	1175	0	0	1078	1426	1208	1358	1354	1208	1358	1354	1208
Q Serve(g_s), s	0.0	0.0	0.0	1.7	0.0	2.5	0.4	3.7	5.1	7.7	6.7	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.0	1.8	0.0	2.5	0.4	3.7	5.1	7.7	6.7	0.1
Prop In Lane	0.50		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	275	0	0	316	154	130	25	683	305	364	1360	607
V/C Ratio(X)	0.02	0.00	0.00	0.19	0.00	0.66	0.57	0.47	0.62	0.84	0.54	0.01
Avail Cap(c_a), veh/h	701	0	0	734	707	600	187	1344	600	580	2128	949
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.5	0.0	0.0	15.2	0.0	15.5	17.7	11.5	12.0	12.5	6.2	4.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	5.6	19.0	0.5	2.1	6.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.4	0.0	0.7	0.2	0.9	1.2	2.3	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	0.0	0.0	15.5	0.0	21.2	36.6	12.0	14.1	18.6	6.5	4.5
LnGrp LOS	B	A	A	B	A	C	D	B	B	B	A	A
Approach Vol, veh/h		6			145			528			1042	
Approach Delay, s/veh		14.5			18.9			13.4			10.0	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.2	13.7		8.4	5.2	22.7		8.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	15.5	18.0		18.0	5.0	28.5		18.0				
Max Q Clear Time (g_c+I1), s	9.7	7.1		2.1	2.4	8.7		4.5				
Green Ext Time (p_c), s	0.5	2.1		0.0	0.0	5.0		0.4				

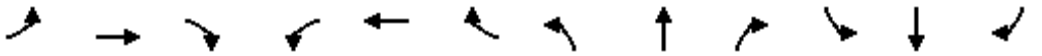
Intersection Summary												
HCM 6th Ctrl Delay			11.8									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	64	115	2	52	18	41	38	1	20	110	104
Future Volume (veh/h)	292	64	115	2	52	18	41	38	1	20	110	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707
Adj Flow Rate, veh/h	406	89	160	3	72	25	57	53	1	28	153	144
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %	13	13	13	13	13	13	13	13	13	13	13	13
Cap, veh/h	482	1306	583	7	358	160	92	514	10	53	434	623
Arrive On Green	0.30	0.40	0.40	0.00	0.11	0.11	0.06	0.16	0.16	0.03	0.13	0.13
Sat Flow, veh/h	1626	3244	1447	1626	3244	1447	1626	3257	61	1626	3244	1447
Grp Volume(v), veh/h	406	89	160	3	72	25	57	26	28	28	153	144
Grp Sat Flow(s),veh/h/ln	1626	1622	1447	1626	1622	1447	1626	1622	1696	1626	1622	1447
Q Serve(g_s), s	10.5	0.8	3.3	0.1	0.9	0.7	1.5	0.6	0.6	0.8	1.9	2.8
Cycle Q Clear(g_c), s	10.5	0.8	3.3	0.1	0.9	0.7	1.5	0.6	0.6	0.8	1.9	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	482	1306	583	7	358	160	92	256	268	53	434	623
V/C Ratio(X)	0.84	0.07	0.27	0.45	0.20	0.16	0.62	0.10	0.10	0.52	0.35	0.23
Avail Cap(c_a), veh/h	746	2431	1084	182	1306	582	182	671	702	182	1342	1028
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	8.2	9.0	22.2	18.1	18.0	20.6	16.1	16.1	21.3	17.6	8.1
Incr Delay (d2), s/veh	5.3	0.0	0.3	41.2	0.3	0.5	6.6	0.2	0.2	7.7	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.2	0.8	0.1	0.3	0.2	0.7	0.2	0.2	0.4	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0	8.2	9.2	63.4	18.4	18.5	27.2	16.3	16.3	29.0	18.1	8.2
LnGrp LOS	C	A	A	E	B	B	C	B	B	C	B	A
Approach Vol, veh/h		655			100			111			325	
Approach Delay, s/veh		15.8			19.7			21.9			14.7	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	11.6	4.7	22.5	7.0	10.5	17.8	9.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.5	5.0	33.5	5.0	18.5	20.5	18.0
Max Q Clear Time (g_c+I1), s	2.8	2.6	2.1	5.3	3.5	4.8	12.5	2.9
Green Ext Time (p_c), s	0.0	0.1	0.0	1.1	0.0	1.2	0.9	0.3

Intersection Summary	
HCM 6th Ctrl Delay	16.4
HCM 6th LOS	B



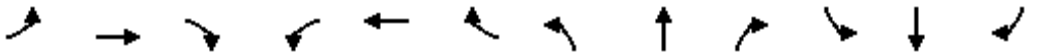
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	54	6	0	637	0	0	0	0	0
Future Volume (veh/h)	0	0	0	54	6	0	637	0	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1574	1574	1574	1574	1574	0	0	1574	1574
Adj Flow Rate, veh/h				77	9	0	910	0	0	0	0	0
Peak Hour Factor				0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Percent Heavy Veh, %				22	22	22	22	22	0	0	22	22
Cap, veh/h				97	11		1057	0	0	0	1262	
Arrive On Green				0.07	0.07	0.00	0.80	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h				1349	158	1334	1193	0	0	0	1574	1334
Grp Volume(v), veh/h				86	0	0	910	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln				1507	0	1334	1193	0	0	0	1574	1334
Q Serve(g_s), s				4.0	0.0	0.0	45.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s				4.0	0.0	0.0	45.4	0.0	0.0	0.0	0.0	0.0
Prop In Lane				0.90		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				108	0		1057	0	0	0	1262	
V/C Ratio(X)				0.79	0.00		0.86	0.00	0.00	0.00	0.00	
Avail Cap(c_a), veh/h				381	0		1660	0	0	0	2056	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh				32.5	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh				12.2	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.8	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				44.7	0.0	0.0	8.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS				D	A		A	A	A	A	A	
Approach Vol, veh/h					86	A		910			0	A
Approach Delay, s/veh					44.7			8.8			0.0	
Approach LOS					D			A				

Timer - Assigned Phs	2			6		8						
Phs Duration (G+Y+Rc), s	61.6			61.6		9.6						
Change Period (Y+Rc), s	4.5			4.5		4.5						
Max Green Setting (Gmax), s	93.0			93.0		18.0						
Max Q Clear Time (g_c+I1), s	47.4			0.0		6.0						
Green Ext Time (p_c), s	9.6			0.0		0.3						

Intersection Summary		
HCM 6th Ctrl Delay	11.9	
HCM 6th LOS	B	

Notes

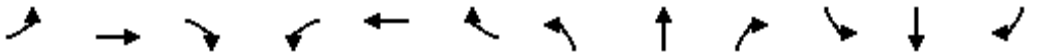
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	222	1	43	5	2	4	48	504	1	1	208	172
Future Volume (veh/h)	222	1	43	5	2	4	48	504	1	1	208	172
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1470	1470	1470	1470	1470	1470	1470	1470	1470	1470	1470	1470
Adj Flow Rate, veh/h	352	2	68	8	3	6	76	800	2	2	330	273
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Percent Heavy Veh, %	29	29	29	29	29	29	29	29	29	29	29	29
Cap, veh/h	396	494	419	15	93	79	88	984	439	4	428	347
Arrive On Green	0.28	0.34	0.34	0.01	0.06	0.06	0.06	0.35	0.35	0.00	0.29	0.29
Sat Flow, veh/h	1400	1470	1246	1400	1470	1246	1400	2793	1246	1400	1465	1188
Grp Volume(v), veh/h	352	2	68	8	3	6	76	800	2	2	314	289
Grp Sat Flow(s),veh/h/ln	1400	1470	1246	1400	1470	1246	1400	1397	1246	1400	1397	1256
Q Serve(g_s), s	14.5	0.1	2.3	0.3	0.1	0.3	3.2	15.7	0.1	0.1	12.4	12.7
Cycle Q Clear(g_c), s	14.5	0.1	2.3	0.3	0.1	0.3	3.2	15.7	0.1	0.1	12.4	12.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.95
Lane Grp Cap(c), veh/h	396	494	419	15	93	79	88	984	439	4	408	367
V/C Ratio(X)	0.89	0.00	0.16	0.55	0.03	0.08	0.86	0.81	0.00	0.52	0.77	0.79
Avail Cap(c_a), veh/h	522	865	733	116	439	372	193	1227	547	116	537	483
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	13.3	14.1	29.7	26.5	26.6	28.0	17.7	12.7	30.1	19.5	19.6
Incr Delay (d2), s/veh	13.8	0.0	0.2	28.6	0.1	0.4	20.5	3.5	0.0	80.9	4.9	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	0.0	0.6	0.2	0.0	0.1	1.5	4.8	0.0	0.1	4.2	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	13.3	14.2	58.3	26.6	27.0	48.5	21.2	12.7	111.0	24.5	25.9
LnGrp LOS	C	B	B	E	C	C	D	C	B	F	C	C
Approach Vol, veh/h		422			17			878			605	
Approach Delay, s/veh		31.2			41.6			23.6			25.5	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	25.8	5.1	24.8	8.3	22.1	21.6	8.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	26.5	5.0	35.5	8.3	23.2	22.5	18.0
Max Q Clear Time (g_c+I1), s	2.1	17.7	2.3	4.3	5.2	14.7	16.5	2.3
Green Ext Time (p_c), s	0.0	3.6	0.0	0.2	0.0	2.5	0.6	0.0

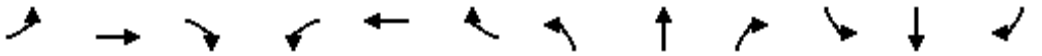
Intersection Summary	
HCM 6th Ctrl Delay	26.0
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	7	90	0	129	3	381	34	58	197	2
Future Volume (veh/h)	7	0	7	90	0	129	3	381	34	58	197	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1233	1233	1233	1233	1233	1233	1233	1233	1233	1233	1233	1233
Adj Flow Rate, veh/h	8	0	8	102	0	147	3	433	39	66	224	2
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	45	45	45	45	45	45	45	45	45	45	45	45
Cap, veh/h	226	30	96	399	242	205	585	1255	560	476	1255	560
Arrive On Green	0.20	0.00	0.20	0.20	0.00	0.20	0.54	0.54	0.54	0.54	0.54	0.54
Sat Flow, veh/h	334	154	488	928	1233	1045	761	2343	1045	608	2343	1045
Grp Volume(v), veh/h	16	0	0	102	0	147	3	433	39	66	224	2
Grp Sat Flow(s),veh/h/ln	976	0	0	928	1233	1045	761	1171	1045	608	1171	1045
Q Serve(g_s), s	0.0	0.0	0.0	2.8	0.0	4.4	0.1	3.5	0.6	2.3	1.6	0.0
Cycle Q Clear(g_c), s	0.4	0.0	0.0	3.2	0.0	4.4	1.7	3.5	0.6	5.9	1.6	0.0
Prop In Lane	0.50		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	0	0	399	242	205	585	1255	560	476	1255	560
V/C Ratio(X)	0.05	0.00	0.00	0.26	0.00	0.72	0.01	0.34	0.07	0.14	0.18	0.00
Avail Cap(c_a), veh/h	664	0	0	714	661	560	585	1255	560	476	1255	560
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	0.0	0.0	12.1	0.0	12.6	4.4	4.4	3.8	6.1	4.0	3.6
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	4.6	0.0	0.8	0.2	0.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.5	0.0	1.0	0.0	0.5	0.1	0.2	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.1	0.0	0.0	12.4	0.0	17.3	4.5	5.2	4.0	6.7	4.3	3.6
LnGrp LOS	B	A	A	B	A	B	A	A	A	A	A	A
Approach Vol, veh/h		16			249			475			292	
Approach Delay, s/veh		11.1			15.3			5.1			4.9	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		11.1		22.5		11.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		5.5		2.4		7.9		6.4				
Green Ext Time (p_c), s		2.4		0.0		1.4		0.8				

Intersection Summary		
HCM 6th Ctrl Delay		7.6
HCM 6th LOS		A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	25	55	1	52	31	92	97	1	19	53	291
Future Volume (veh/h)	103	25	55	1	52	31	92	97	1	19	53	291
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1515	1515	1515	1515	1515	1515	1515	1515	1515	1515	1515	1515
Adj Flow Rate, veh/h	198	48	106	2	100	60	177	187	2	37	102	560
Peak Hour Factor	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Percent Heavy Veh, %	26	26	26	26	26	26	26	26	26	26	26	26
Cap, veh/h	235	710	317	4	249	111	211	1220	13	55	893	608
Arrive On Green	0.16	0.25	0.25	0.00	0.09	0.09	0.15	0.42	0.42	0.04	0.31	0.31
Sat Flow, veh/h	1443	2878	1284	1443	2878	1284	1443	2917	31	1443	2878	1284
Grp Volume(v), veh/h	198	48	106	2	100	60	177	92	97	37	102	560
Grp Sat Flow(s),veh/h/ln	1443	1439	1284	1443	1439	1284	1443	1439	1509	1443	1439	1284
Q Serve(g_s), s	8.2	0.8	4.2	0.1	2.0	2.7	7.3	2.4	2.4	1.6	1.6	19.0
Cycle Q Clear(g_c), s	8.2	0.8	4.2	0.1	2.0	2.7	7.3	2.4	2.4	1.6	1.6	19.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	235	710	317	4	249	111	211	602	631	55	893	608
V/C Ratio(X)	0.84	0.07	0.33	0.51	0.40	0.54	0.84	0.15	0.15	0.67	0.11	0.92
Avail Cap(c_a), veh/h	318	1246	556	118	846	377	271	602	631	167	893	608
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	17.7	18.9	30.5	26.5	26.8	25.4	11.1	11.1	29.1	15.1	15.1
Incr Delay (d2), s/veh	14.0	0.0	0.6	75.8	1.0	4.0	16.6	0.1	0.1	13.3	0.1	19.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.2	1.2	0.1	0.7	0.9	3.3	0.7	0.7	0.7	0.5	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.8	17.7	19.5	106.3	27.5	30.8	42.0	11.2	11.2	42.4	15.1	34.7
LnGrp LOS	D	B	B	F	C	C	D	B	B	D	B	C
Approach Vol, veh/h		352			162			366			699	
Approach Delay, s/veh		30.1			29.7			26.1			32.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	30.1	4.7	19.6	13.4	23.5	14.5	9.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.1	23.4	5.0	26.5	11.5	19.0	13.5	18.0
Max Q Clear Time (g_c+I1), s	3.6	4.4	2.1	6.2	9.3	21.0	10.2	4.7
Green Ext Time (p_c), s	0.0	0.9	0.0	0.6	0.1	0.0	0.2	0.6

Intersection Summary	
HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

Appendix E
Future Year LOS Calculations

Intersection Level Of Service Report
Intersection 1: US 95A/I-80 WB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	37.5
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.307

Intersection Setup

Name	US 95A			US 95A						I-80 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	350.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	US 95A			US 95A						I-80 WB Ramps		
Base Volume Input [veh/h]	773	113	0	0	81	109	0	0	0	28	1	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	13.00	13.00	2.00	2.00	13.00	13.00	2.00	2.00	2.00	13.00	13.00	13.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	773	113	0	0	81	109	0	0	0	28	1	38
Peak Hour Factor	0.9500	0.9500	1.0000	1.0000	0.9500	0.9500	1.0000	1.0000	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	203	30	0	0	21	29	0	0	0	7	0	10
Total Analysis Volume [veh/h]	814	119	0	0	85	115	0	0	0	29	1	40
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Stop	Free	Stop
Flared Lane		No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance		No		No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.31	0.34	0.00	0.00	0.00	0.16	0.01	0.08
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	37.54	35.32	0.00	0.00	0.00	27.96	27.38	12.40
Movement LOS	A	A			E	E				D	D	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	4.26	4.26	0.00	0.00	0.00	0.56	0.56	0.25
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	106.46	106.46	0.00	0.00	0.00	13.96	13.96	6.15
d_A, Approach Delay [s/veh]	0.00			36.26			0.00			19.06		
Approach LOS	A			E			A			C		
d_I, Intersection Delay [s/veh]	7.14											
Intersection LOS	E											

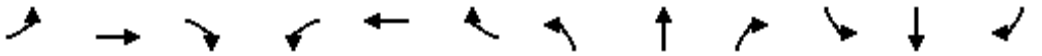
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	1	492	0	0	0	0	861	61	28	81	0
Future Vol, veh/h	25	1	492	0	0	0	0	861	61	28	81	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	250	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	9	9	9	9	9	9
Mvmt Flow	26	1	513	0	0	0	0	897	64	29	84	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1039	1039	-	-	0	0	897	0	0
Stage 1	142	142	-	-	-	-	-	-	-
Stage 2	897	897	-	-	-	-	-	-	-
Critical Hdwy	6.49	6.59	-	-	-	-	4.19	-	-
Critical Hdwy Stg 1	5.49	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.49	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.581	4.081	-	-	-	-	2.281	-	-
Pot Cap-1 Maneuver	248	224	0	0	-	-	728	-	0
Stage 1	868	766	0	0	-	-	-	-	0
Stage 2	387	349	0	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	238	0	-	-	-	-	728	-	-
Mov Cap-2 Maneuver	238	0	-	-	-	-	-	-	-
Stage 1	868	0	-	-	-	-	-	-	-
Stage 2	371	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.1	0	2.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	238	-	728	-
HCM Lane V/C Ratio	-	-	0.114	-	0.04	-
HCM Control Delay (s)	-	-	22.1	0	10.2	0
HCM Lane LOS	-	-	C	A	B	A
HCM 95th %tile Q(veh)	-	-	0.4	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	34	41	230	26	59	28	813	402	105	437	17
Future Volume (veh/h)	56	34	41	230	26	59	28	813	402	105	437	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	60	37	44	247	28	63	30	874	432	113	470	18
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	77	119	105	299	207	174	55	2265	1010	166	2286	87
Arrive On Green	0.04	0.07	0.07	0.09	0.11	0.11	0.03	0.66	0.66	0.05	0.68	0.68
Sat Flow, veh/h	1725	1721	1521	3346	1811	1527	1725	3441	1534	3346	3379	129
Grp Volume(v), veh/h	60	37	44	247	28	63	30	874	432	113	239	249
Grp Sat Flow(s),veh/h/ln	1725	1721	1521	1673	1811	1527	1725	1721	1534	1673	1721	1788
Q Serve(g_s), s	4.1	2.5	3.3	8.7	1.7	4.6	2.1	14.0	16.1	4.0	6.3	6.3
Cycle Q Clear(g_c), s	4.1	2.5	3.3	8.7	1.7	4.6	2.1	14.0	16.1	4.0	6.3	6.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	77	119	105	299	207	174	55	2265	1010	166	1164	1209
V/C Ratio(X)	0.78	0.31	0.42	0.83	0.14	0.36	0.55	0.39	0.43	0.68	0.21	0.21
Avail Cap(c_a), veh/h	158	588	520	307	619	522	158	2265	1010	307	1164	1209
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.78	0.78	0.78	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.8	53.1	53.5	53.7	47.8	49.1	57.3	9.4	9.7	56.1	7.3	7.3
Incr Delay (d2), s/veh	15.7	1.5	2.6	16.2	0.3	1.2	6.6	0.4	1.0	4.8	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.1	1.3	4.3	0.8	1.8	1.0	5.1	5.4	1.8	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.5	54.6	56.2	69.9	48.1	50.4	63.9	9.8	10.8	60.9	7.7	7.7
LnGrp LOS	E	D	E	E	D	D	E	A	B	E	A	A
Approach Vol, veh/h		141			338			1336			601	
Approach Delay, s/veh		62.7			64.5			11.3			17.7	
Approach LOS		E			E			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	83.0	14.7	12.3	7.8	85.2	9.3	17.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	41.0	11.0	41.0	11.0	41.0	11.0	41.0
Max Q Clear Time (g_c+I1), s	6.0	18.1	10.7	5.3	4.1	8.3	6.1	6.6
Green Ext Time (p_c), s	0.1	8.6	0.0	0.4	0.0	3.2	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	18	193	120	14	55	201	1119	60	69	600	50
Future Volume (veh/h)	83	18	193	120	14	55	201	1119	60	69	600	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	88	19	205	128	15	59	214	1190	64	73	638	53
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	110	242	422	129	47	183	244	1369	74	423	1661	138
Arrive On Green	0.06	0.13	0.13	0.08	0.14	0.14	0.14	0.41	0.41	0.25	0.52	0.52
Sat Flow, veh/h	1725	1811	1535	1725	321	1263	1725	3320	178	1725	3216	267
Grp Volume(v), veh/h	88	19	205	128	0	74	214	616	638	73	341	350
Grp Sat Flow(s),veh/h/ln	1725	1811	1535	1725	0	1584	1725	1721	1778	1725	1721	1762
Q Serve(g_s), s	6.0	1.1	13.4	8.9	0.0	5.0	14.6	39.3	39.4	4.0	14.3	14.4
Cycle Q Clear(g_c), s	6.0	1.1	13.4	8.9	0.0	5.0	14.6	39.3	39.4	4.0	14.3	14.4
Prop In Lane	1.00		1.00	1.00		0.80	1.00		0.10	1.00		0.15
Lane Grp Cap(c), veh/h	110	242	422	129	0	230	244	709	733	423	889	910
V/C Ratio(X)	0.80	0.08	0.49	0.99	0.00	0.32	0.88	0.87	0.87	0.17	0.38	0.38
Avail Cap(c_a), veh/h	187	468	613	129	0	356	359	832	859	423	889	910
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.60	0.60	0.60	0.94	0.94	0.94
Uniform Delay (d), s/veh	55.4	45.5	36.4	55.5	0.0	46.0	50.5	32.3	32.3	35.7	17.5	17.5
Incr Delay (d2), s/veh	12.2	0.1	0.9	75.7	0.0	0.8	9.9	8.8	8.6	0.2	1.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.5	5.1	6.6	0.0	2.0	7.0	17.8	18.4	1.7	5.9	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.6	45.6	37.2	131.2	0.0	46.8	60.4	41.0	40.9	35.9	18.7	18.7
LnGrp LOS	E	D	D	F	A	D	E	D	D	D	B	B
Approach Vol, veh/h		312			202			1468			764	
Approach Delay, s/veh		46.3			100.3			43.8			20.3	
Approach LOS		D			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.5	53.5	13.0	20.1	21.0	66.0	11.7	21.4
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	58.0	9.0	31.0	25.0	39.0	13.0	27.0
Max Q Clear Time (g_c+I1), s	10.0	41.4	10.9	15.4	16.6	16.4	8.0	7.0
Green Ext Time (p_c), s	0.0	8.0	0.0	0.7	0.4	4.5	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	41.7
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	246	211	30	215	578	73	474	82	243	169	519
Future Volume (veh/h)	339	246	211	30	215	578	73	474	82	243	169	519
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	357	259	0	32	226	0	77	499	0	256	178	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	521	844		63	434		117	771		408	504	
Arrive On Green	0.15	0.24	0.00	0.04	0.13	0.00	0.07	0.22	0.00	0.12	0.28	0.00
Sat Flow, veh/h	3374	3469	1547	1739	3469	1547	1739	3469	1547	3374	1826	1547
Grp Volume(v), veh/h	357	259	0	32	226	0	77	499	0	256	178	0
Grp Sat Flow(s),veh/h/ln	1687	1735	1547	1739	1735	1547	1739	1735	1547	1687	1826	1547
Q Serve(g_s), s	4.8	2.9	0.0	0.9	2.9	0.0	2.1	6.2	0.0	3.4	3.7	0.0
Cycle Q Clear(g_c), s	4.8	2.9	0.0	0.9	2.9	0.0	2.1	6.2	0.0	3.4	3.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	521	844		63	434		117	771		408	504	
V/C Ratio(X)	0.69	0.31		0.51	0.52		0.66	0.65		0.63	0.35	
Avail Cap(c_a), veh/h	884	1818		200	1309		259	1338		926	934	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.1	14.8	0.0	22.6	19.5	0.0	21.7	16.9	0.0	20.0	13.9	0.0
Incr Delay (d2), s/veh	1.6	0.2	0.0	6.2	1.0	0.0	6.2	0.9	0.0	1.6	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.0	0.0	0.4	1.1	0.0	1.0	2.3	0.0	1.3	1.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.7	15.0	0.0	28.8	20.5	0.0	28.0	17.8	0.0	21.5	14.3	0.0
LnGrp LOS	C	B		C	C		C	B		C	B	
Approach Vol, veh/h		616	A		258	A		576	A		434	A
Approach Delay, s/veh		18.3			21.5			19.1			18.6	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	15.1	6.2	16.1	7.7	17.7	11.9	10.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.1	18.4	5.5	25.0	7.1	24.4	12.5	18.0
Max Q Clear Time (g_c+I1), s	5.4	8.2	2.9	4.9	4.1	5.7	6.8	4.9
Green Ext Time (p_c), s	0.5	2.4	0.0	1.5	0.0	0.9	0.7	1.1

Intersection Summary	
HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	343	1	1	184	27	1	1	1	20	1	68
Future Volume (veh/h)	131	343	1	1	184	27	1	1	1	20	1	68
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693
Adj Flow Rate, veh/h	142	373	1	1	200	29	1	1	1	22	1	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	14	14	14	14	14	14	14	14	14	14	14	14
Cap, veh/h	366	942	3	6	549	245	3	3	6	150	2	132
Arrive On Green	0.12	0.29	0.29	0.00	0.17	0.17	0.00	0.00	0.00	0.09	0.09	0.09
Sat Flow, veh/h	3127	3290	9	1612	3216	1434	826	826	1434	1612	19	1418
Grp Volume(v), veh/h	142	182	192	1	200	29	2	0	1	22	0	75
Grp Sat Flow(s),veh/h/ln	1564	1608	1691	1612	1608	1434	1651	0	1434	1612	0	1437
Q Serve(g_s), s	1.2	2.7	2.7	0.0	1.6	0.5	0.0	0.0	0.0	0.4	0.0	1.5
Cycle Q Clear(g_c), s	1.2	2.7	2.7	0.0	1.6	0.5	0.0	0.0	0.0	0.4	0.0	1.5
Prop In Lane	1.00		0.01	1.00		1.00	0.50		1.00	1.00		0.99
Lane Grp Cap(c), veh/h	366	461	484	6	549	245	7	0	6	150	0	134
V/C Ratio(X)	0.39	0.40	0.40	0.18	0.36	0.12	0.29	0.00	0.17	0.15	0.00	0.56
Avail Cap(c_a), veh/h	1015	1950	2051	275	3406	1519	1777	0	1543	1652	0	1473
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.0	8.4	8.4	14.6	10.7	10.3	14.5	0.0	14.5	12.2	0.0	12.7
Incr Delay (d2), s/veh	0.7	0.6	0.5	15.1	0.4	0.2	22.3	0.0	13.0	0.4	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.6	0.7	0.0	0.4	0.1	0.1	0.0	0.0	0.1	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.6	9.0	8.9	29.6	11.1	10.5	36.8	0.0	27.5	12.6	0.0	16.3
LnGrp LOS	B	A	A	C	B	B	D	A	C	B	A	B
Approach Vol, veh/h		516			230			3			97	
Approach Delay, s/veh		10.0			11.1			33.7			15.5	
Approach LOS		A			B			C			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	4.6	4.5	12.9	7.2	7.9	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	5.0	35.5	30.0	9.5	31.0
Max Q Clear Time (g_c+I1), s	2.0	2.0	4.7	3.5	3.2	3.6
Green Ext Time (p_c), s	0.0	0.0	2.2	0.4	0.2	1.3

Intersection Summary	
HCM 6th Ctrl Delay	11.0
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	10.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	35	1	0	419	0	0	0	0	0
Future Vol, veh/h	0	0	0	35	1	0	419	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	0	0	0	38	1	0	455	0	0	0	0	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	911	911	0	1	0	-	-	-	0
Stage 1	910	910	-	-	-	-	-	-	-
Stage 2	1	1	-	-	-	-	-	-	-
Critical Hdwy	6.65	6.75	6.45	4.35	-	-	-	-	-
Critical Hdwy Stg 1	5.65	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.65	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4.225	3.525	2.425	-	-	-	-	-
Pot Cap-1 Maneuver	277	251	-	1483	-	0	0	-	0
Stage 1	358	324	-	-	-	0	0	-	0
Stage 2	965	851	-	-	-	0	0	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	192	0	-	1483	-	-	-	-	-
Mov Cap-2 Maneuver	192	0	-	-	-	-	-	-	-
Stage 1	248	0	-	-	-	-	-	-	-
Stage 2	965	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.5	8.5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT
Capacity (veh/h)	1483	-	192	-	-
HCM Lane V/C Ratio	0.307	-	0.204	-	-
HCM Control Delay (s)	8.5	0	28.5	0	-
HCM Lane LOS	A	A	D	A	-
HCM 95th %tile Q(veh)	1.3	-	0.7	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	380	0	0	0	0	416	24	1	34	0
Future Vol, veh/h	3	1	380	0	0	0	0	416	24	1	34	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	415	-	-	-	-	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	3	1	413	0	0	0	0	452	26	1	37	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	491	491	-	-	0	-	452	0	0
Stage 1	39	39	-	-	-	-	-	-	-
Stage 2	452	452	-	-	-	-	-	-	-
Critical Hdwy	6.65	6.75	-	-	-	-	4.35	-	-
Critical Hdwy Stg 1	5.65	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.65	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4.225	-	-	-	-	2.425	-	-
Pot Cap-1 Maneuver	498	446	0	0	-	0	997	-	0
Stage 1	928	819	0	0	-	0	-	-	0
Stage 2	595	533	0	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	498	0	-	-	-	-	997	-	-
Mov Cap-2 Maneuver	498	0	-	-	-	-	-	-	-
Stage 1	928	0	-	-	-	-	-	-	-
Stage 2	594	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	498	-	997	-
HCM Lane V/C Ratio	-	0.009	-	0.001	-
HCM Control Delay (s)	-	12.3	0	8.6	-
HCM Lane LOS	-	B	A	A	-
HCM 95th %tile Q(veh)	-	0	-	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	11	21	3	11	1	48	417	1	45	301	68
Future Vol, veh/h	22	11	21	3	11	1	48	417	1	45	301	68
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	170	-	170	325	-	-	250	-	250	225	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	24	12	23	3	12	1	52	453	1	49	327	74

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	799	1020	201	825	1056	227	401	0	0	454	0	0
Stage 1	462	462	-	557	557	-	-	-	-	-	-	-
Stage 2	337	558	-	268	499	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	240	201	740	229	190	710	1006	-	-	956	-	-
Stage 1	493	509	-	428	457	-	-	-	-	-	-	-
Stage 2	591	456	-	653	488	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	210	181	740	195	171	710	1006	-	-	956	-	-
Mov Cap-2 Maneuver	210	181	-	195	171	-	-	-	-	-	-	-
Stage 1	467	483	-	406	433	-	-	-	-	-	-	-
Stage 2	544	432	-	586	463	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.1	25.7	0.9	1
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1006	-	-	210	181	740	195	171	710	956	-	-
HCM Lane V/C Ratio	0.052	-	-	0.114	0.066	0.031	0.017	0.07	0.002	0.051	-	-
HCM Control Delay (s)	8.8	-	-	24.3	26.3	10	23.8	27.6	10.1	9	-	-
HCM Lane LOS	A	-	-	C	D	B	C	D	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.4	0.2	0.1	0.1	0.2	0	0.2	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1	2	1	1	1	10	472	1	1	314	5
Future Vol, veh/h	2	1	2	1	1	1	10	472	1	1	314	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	225	-	250	200	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	2	1	2	1	1	1	11	513	1	1	341	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	622	879	171	708	883	257	346	0	0	514	0	0
Stage 1	343	343	-	535	535	-	-	-	-	-	-	-
Stage 2	279	536	-	173	348	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	327	246	775	281	245	677	1060	-	-	903	-	-
Stage 1	586	582	-	442	468	-	-	-	-	-	-	-
Stage 2	643	468	-	749	578	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	322	243	775	277	242	677	1060	-	-	903	-	-
Mov Cap-2 Maneuver	322	243	-	277	242	-	-	-	-	-	-	-
Stage 1	580	581	-	438	463	-	-	-	-	-	-	-
Stage 2	634	463	-	745	577	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	16.1	0.2	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1060	-	-	387	277	242	677	903	-	-
HCM Lane V/C Ratio	0.01	-	-	0.014	0.004	0.004	0.002	0.001	-	-
HCM Control Delay (s)	8.4	-	-	14.4	18	19.9	10.3	9	-	-
HCM Lane LOS	A	-	-	B	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	1	3	3	1	1	18	477	1	4	296	9
Future Vol, veh/h	5	1	3	3	1	1	18	477	1	4	296	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	100	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	5	1	3	3	1	1	20	518	1	4	322	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	630	889	161	729	899	260	332	0	0	519	0	0
Stage 1	330	330	-	559	559	-	-	-	-	-	-	-
Stage 2	300	559	-	170	340	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	323	243	788	271	239	674	1074	-	-	899	-	-
Stage 1	597	590	-	427	456	-	-	-	-	-	-	-
Stage 2	624	456	-	753	584	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	316	237	788	264	234	674	1074	-	-	899	-	-
Mov Cap-2 Maneuver	316	237	-	264	234	-	-	-	-	-	-	-
Stage 1	586	588	-	419	447	-	-	-	-	-	-	-
Stage 2	610	447	-	745	582	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	17.6	0.3	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1074	-	-	377	292	899	-	-
HCM Lane V/C Ratio	0.018	-	-	0.026	0.019	0.005	-	-
HCM Control Delay (s)	8.4	-	-	14.8	17.6	9	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.1	0	-	-

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	159	28	24	7	22	7	24	432	7	1	248	50
Future Vol, veh/h	159	28	24	7	22	7	24	432	7	1	248	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	173	30	26	8	24	8	26	470	8	1	270	54
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	14.6	10.9	14.5	12.2
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	10%	0%	92%	0%	39%	0%	1%	0%
Vol Thru, %	90%	97%	8%	37%	61%	61%	99%	71%
Vol Right, %	0%	3%	0%	63%	0%	39%	0%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	240	223	173	38	18	18	125	174
LT Vol	24	0	159	0	7	0	1	0
Through Vol	216	216	14	14	11	11	124	124
RT Vol	0	7	0	24	0	7	0	50
Lane Flow Rate	261	242	188	41	20	20	136	189
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.47	0.432	0.403	0.078	0.043	0.041	0.253	0.341
Departure Headway (Hd)	6.486	6.413	7.712	6.794	7.949	7.471	6.695	6.487
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	556	560	466	526	449	477	535	552
Service Time	4.238	4.165	5.469	4.55	5.727	5.248	4.453	4.245
HCM Lane V/C Ratio	0.469	0.432	0.403	0.078	0.045	0.042	0.254	0.342
HCM Control Delay	14.9	14	15.6	10.1	11.1	10.6	11.7	12.6
HCM Lane LOS	B	B	C	B	B	B	B	B
HCM 95th-tile Q	2.5	2.2	1.9	0.3	0.1	0.1	1	1.5

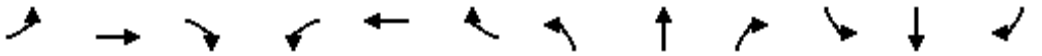
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	1	1	1	1	1	1	442	1	1	257	21
Future Vol, veh/h	20	1	1	1	1	1	1	442	1	1	257	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	22	1	1	1	1	1	1	480	1	1	279	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	536	776	151	625	787	241	302	0	0	481	0	0
Stage 1	293	293	-	483	483	-	-	-	-	-	-	-
Stage 2	243	483	-	142	304	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	381	286	800	326	282	694	1105	-	-	932	-	-
Stage 1	630	615	-	478	497	-	-	-	-	-	-	-
Stage 2	677	497	-	784	607	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	379	285	800	324	281	694	1105	-	-	932	-	-
Mov Cap-2 Maneuver	379	285	-	324	281	-	-	-	-	-	-	-
Stage 1	629	614	-	478	497	-	-	-	-	-	-	-
Stage 2	674	497	-	781	606	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.1	14.8	0	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1105	-	-	382	371	932	-	-
HCM Lane V/C Ratio	0.001	-	-	0.063	0.009	0.001	-	-
HCM Control Delay (s)	8.3	-	-	15.1	14.8	8.9	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	552	133	97	626	271	263	129	102	177	69	13
Future Volume (veh/h)	44	552	133	97	626	271	263	129	102	177	69	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	48	600	145	105	680	0	286	140	111	192	75	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	161	981	437	133	1082		430	248	210	318	187	
Arrive On Green	0.05	0.29	0.29	0.08	0.32	0.00	0.13	0.14	0.14	0.10	0.11	0.00
Sat Flow, veh/h	3237	3328	1485	1668	3328	1485	3237	1752	1485	3237	1752	1485
Grp Volume(v), veh/h	48	600	145	105	680	0	286	140	111	192	75	0
Grp Sat Flow(s),veh/h/ln	1618	1664	1485	1668	1664	1485	1618	1752	1485	1618	1752	1485
Q Serve(g_s), s	0.7	7.2	3.6	2.9	8.1	0.0	3.9	3.5	3.2	2.7	1.9	0.0
Cycle Q Clear(g_c), s	0.7	7.2	3.6	2.9	8.1	0.0	3.9	3.5	3.2	2.7	1.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	161	981	437	133	1082		430	248	210	318	187	
V/C Ratio(X)	0.30	0.61	0.33	0.79	0.63		0.67	0.56	0.53	0.60	0.40	
Avail Cap(c_a), veh/h	1352	2018	900	454	1533		749	732	620	797	758	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.4	14.2	12.9	21.1	13.4	0.0	19.3	18.7	18.6	20.2	19.4	0.0
Incr Delay (d2), s/veh	1.0	0.6	0.4	9.8	0.6	0.0	1.8	2.0	2.0	1.8	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.4	1.1	1.4	2.6	0.0	1.4	1.4	1.1	1.0	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	14.8	13.3	30.9	14.0	0.0	21.0	20.7	20.6	22.0	20.8	0.0
LnGrp LOS	C	B	B	C	B		C	C	C	C	C	
Approach Vol, veh/h		793			785	A		537			267	A
Approach Delay, s/veh		15.0			16.2			20.9			21.7	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.1	11.1	8.2	18.3	10.7	9.5	6.8	19.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	19.5	12.7	28.3	10.8	20.2	19.5	21.5
Max Q Clear Time (g_c+I1), s	4.7	5.5	4.9	9.2	5.9	3.9	2.7	10.1
Green Ext Time (p_c), s	0.3	0.9	0.1	4.5	0.4	0.2	0.1	3.6

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection Level Of Service Report
Intersection 1: US 95A/I-80 WB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	36.4
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.454

Intersection Setup

Name	US 95A			US 95A						I-80 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	350.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	US 95A			US 95A						I-80 WB Ramps		
Base Volume Input [veh/h]	652	140	0	0	107	112	0	0	0	88	1	91
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	11.00	11.00	2.00	2.00	11.00	11.00	2.00	2.00	2.00	11.00	11.00	11.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	652	140	0	0	107	112	0	0	0	88	1	91
Peak Hour Factor	0.9400	0.9400	1.0000	1.0000	0.9400	0.9400	1.0000	1.0000	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	173	37	0	0	28	30	0	0	0	23	0	24
Total Analysis Volume [veh/h]	694	149	0	0	114	119	0	0	0	94	1	97
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Stop	Free	Stop
Flared Lane		No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance		No		No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.35	0.31	0.00	0.00	0.00	0.45	0.00	0.18
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	34.12	32.21	0.00	0.00	0.00	36.38	36.12	12.91
Movement LOS	A	A			D	D				E	E	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	4.51	4.51	0.00	0.00	0.00	2.20	2.20	0.63
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	112.71	112.71	0.00	0.00	0.00	55.03	55.03	15.82
d_A, Approach Delay [s/veh]	0.00			33.15			0.00			24.52		
Approach LOS	A			D			A			C		
d_I, Intersection Delay [s/veh]	9.80											
Intersection LOS	E											

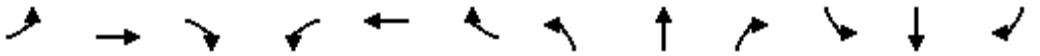
Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	11	946	0	0	0	0	749	53	14	181	0
Future Vol, veh/h	43	11	946	0	0	0	0	749	53	14	181	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	250	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	6	6	6	6	6	6	6	6	6
Mvmt Flow	47	12	1028	0	0	0	0	814	58	15	197	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1041	1041	-	-	0	0	814	0	0
Stage 1	227	227	-	-	-	-	-	-	-
Stage 2	814	814	-	-	-	-	-	-	-
Critical Hdwy	6.46	6.56	-	-	-	-	4.16	-	-
Critical Hdwy Stg 1	5.46	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.46	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	-	-	-	-	2.254	-	-
Pot Cap-1 Maneuver	250	226	0	0	-	-	796	-	0
Stage 1	801	709	0	0	-	-	-	-	0
Stage 2	429	386	0	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	245	0	-	-	-	-	796	-	-
Mov Cap-2 Maneuver	245	0	-	-	-	-	-	-	-
Stage 1	801	0	-	-	-	-	-	-	-
Stage 2	420	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.3	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	245	-	796	-
HCM Lane V/C Ratio	-	-	0.24	-	0.019	-
HCM Control Delay (s)	-	-	24.3	0	9.6	0
HCM Lane LOS	-	-	C	A	A	A
HCM 95th %tile Q(veh)	-	-	0.9	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	67	89	751	113	154	87	572	481	147	882	52
Future Volume (veh/h)	80	67	89	751	113	154	87	572	481	147	882	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	84	71	94	791	119	162	92	602	506	155	928	55
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	105	144	128	686	412	349	113	1888	841	206	1798	107
Arrive On Green	0.06	0.08	0.08	0.20	0.22	0.22	0.13	1.00	1.00	0.06	0.53	0.53
Sat Flow, veh/h	1767	1763	1572	3428	1856	1572	1767	3526	1571	3428	3381	200
Grp Volume(v), veh/h	84	71	94	791	119	162	92	602	506	155	484	499
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1856	1572	1767	1763	1571	1714	1763	1819
Q Serve(g_s), s	6.1	5.0	7.6	26.0	6.9	11.6	6.6	0.0	0.0	5.8	23.0	23.0
Cycle Q Clear(g_c), s	6.1	5.0	7.6	26.0	6.9	11.6	6.6	0.0	0.0	5.8	23.0	23.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	105	144	128	686	412	349	113	1888	841	206	937	967
V/C Ratio(X)	0.80	0.49	0.73	1.15	0.29	0.46	0.82	0.32	0.60	0.75	0.52	0.52
Avail Cap(c_a), veh/h	150	556	496	686	799	677	122	1888	841	237	937	967
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.85	0.85	0.85	0.73	0.73	0.73	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.4	57.1	58.3	52.0	42.1	43.9	56.0	0.0	0.0	60.1	19.6	19.6
Incr Delay (d2), s/veh	17.6	2.6	7.9	83.1	0.3	0.8	24.5	0.3	2.3	11.0	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	2.3	3.3	19.1	3.2	4.6	3.6	0.1	0.5	2.8	9.9	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.0	59.8	66.2	135.1	42.4	44.7	80.4	0.3	2.3	71.2	21.7	21.6
LnGrp LOS	E	E	E	F	D	D	F	A	A	E	C	C
Approach Vol, veh/h		249			1072			1200			1138	
Approach Delay, s/veh		68.3			111.1			7.3			28.4	
Approach LOS		E			F			A			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	73.6	30.0	14.6	12.3	73.1	11.7	32.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	9.0	38.0	26.0	41.0	9.0	38.0	11.0	56.0
Max Q Clear Time (g_c+I1), s	7.8	2.0	28.0	9.6	8.6	25.0	8.1	13.6
Green Ext Time (p_c), s	0.1	7.2	0.0	1.0	0.0	5.3	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	48.4
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	55	404	250	47	102	348	1112	68	172	1413	113
Future Volume (veh/h)	66	55	404	250	47	102	348	1112	68	172	1413	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	57	416	258	48	105	359	1146	70	177	1457	116
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	87	166	694	151	65	142	623	2106	129	151	1180	93
Arrive On Green	0.05	0.09	0.09	0.08	0.12	0.12	0.35	0.62	0.62	0.17	0.71	0.71
Sat Flow, veh/h	1781	1870	1569	1781	520	1136	1781	3402	208	1781	3335	264
Grp Volume(v), veh/h	68	57	416	258	0	153	359	598	618	177	773	800
Grp Sat Flow(s),veh/h/ln	1781	1870	1569	1781	0	1656	1781	1777	1833	1781	1777	1823
Q Serve(g_s), s	4.9	3.7	5.4	11.0	0.0	11.6	21.3	25.1	25.2	11.0	46.0	46.0
Cycle Q Clear(g_c), s	4.9	3.7	5.4	11.0	0.0	11.6	21.3	25.1	25.2	11.0	46.0	46.0
Prop In Lane	1.00		1.00	1.00		0.69	1.00		0.11	1.00		0.14
Lane Grp Cap(c), veh/h	87	166	694	151	0	206	623	1100	1134	151	629	645
V/C Ratio(X)	0.78	0.34	0.60	1.71	0.00	0.74	0.58	0.54	0.54	1.17	1.23	1.24
Avail Cap(c_a), veh/h	151	446	928	151	0	395	623	1100	1134	151	629	645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.49	0.49	0.49	0.51	0.51	0.51
Uniform Delay (d), s/veh	61.1	55.7	14.2	59.5	0.0	54.9	34.4	14.2	14.2	54.0	19.0	19.0
Incr Delay (d2), s/veh	14.0	1.2	0.8	346.8	0.0	5.2	0.6	1.0	0.9	108.2	110.3	115.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	1.8	6.4	19.5	0.0	5.1	9.4	10.1	10.4	9.0	29.5	31.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.1	56.9	15.1	406.3	0.0	60.1	35.1	15.2	15.2	162.2	129.3	134.3
LnGrp LOS	E	E	B	F	A	E	D	B	B	F	F	F
Approach Vol, veh/h		541			411			1575			1750	
Approach Delay, s/veh		27.0			277.4			19.7			134.9	
Approach LOS		C			F			B			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	84.5	15.0	15.5	49.5	50.0	10.4	20.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	61.0	11.0	31.0	26.0	46.0	11.0	31.0
Max Q Clear Time (g_c+I1), s	13.0	27.2	13.0	7.4	23.3	48.0	6.9	13.6
Green Ext Time (p_c), s	0.0	10.5	0.0	1.9	0.3	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	92.5
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	387	186	300	55	236	709	56	463	88	908	427	702
Future Volume (veh/h)	387	186	300	55	236	709	56	463	88	908	427	702
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	403	194	0	57	246	0	58	482	0	946	445	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	500	736		85	390		86	653		1062	829	
Arrive On Green	0.14	0.21	0.00	0.05	0.11	0.00	0.05	0.18	0.00	0.31	0.44	0.00
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	3554	1585	3456	1870	1585
Grp Volume(v), veh/h	403	194	0	57	246	0	58	482	0	946	445	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	1777	1585	1728	1870	1585
Q Serve(g_s), s	8.0	3.2	0.0	2.2	4.7	0.0	2.3	9.1	0.0	18.5	12.3	0.0
Cycle Q Clear(g_c), s	8.0	3.2	0.0	2.2	4.7	0.0	2.3	9.1	0.0	18.5	12.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	500	736		85	390		86	653		1062	829	
V/C Ratio(X)	0.81	0.26		0.67	0.63		0.68	0.74		0.89	0.54	
Avail Cap(c_a), veh/h	562	1175		154	904		161	954		1148	954	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.3	23.5	0.0	33.2	30.1	0.0	33.1	27.3	0.0	23.4	14.4	0.0
Incr Delay (d2), s/veh	7.6	0.2	0.0	8.9	1.7	0.0	9.0	1.7	0.0	8.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	1.3	0.0	1.1	2.0	0.0	1.2	3.8	0.0	8.2	4.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.9	23.7	0.0	42.0	31.8	0.0	42.1	29.0	0.0	31.9	14.9	0.0
LnGrp LOS	D	C		D	C		D	C		C	B	
Approach Vol, veh/h		597	A		303	A		540	A		1391	A
Approach Delay, s/veh		32.6			33.7			30.4			26.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	36.2	17.5	7.9	19.1	7.9	35.8	14.7	12.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.5	19.0	6.1	23.4	6.4	36.1	11.5	18.0
Max Q Clear Time (g_c+I1), s	20.5	11.1	4.2	5.2	4.3	14.3	10.0	6.7
Green Ext Time (p_c), s	1.3	1.9	0.0	1.0	0.0	2.8	0.3	1.1

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	209	206	5	6	396	59	40	20	7	28	10	316
Future Volume (veh/h)	209	206	5	6	396	59	40	20	7	28	10	316
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	227	224	5	7	430	64	43	22	8	30	11	343
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	348	1038	23	16	711	317	72	37	95	499	14	432
Arrive On Green	0.10	0.30	0.30	0.01	0.21	0.21	0.06	0.06	0.06	0.29	0.29	0.29
Sat Flow, veh/h	3346	3441	77	1725	3441	1535	1160	593	1535	1725	48	1494
Grp Volume(v), veh/h	227	112	117	7	430	64	65	0	8	30	0	354
Grp Sat Flow(s),veh/h/ln	1673	1721	1797	1725	1721	1535	1753	0	1535	1725	0	1542
Q Serve(g_s), s	3.5	2.6	2.6	0.2	6.0	1.8	1.9	0.0	0.3	0.7	0.0	11.3
Cycle Q Clear(g_c), s	3.5	2.6	2.6	0.2	6.0	1.8	1.9	0.0	0.3	0.7	0.0	11.3
Prop In Lane	1.00		0.04	1.00		1.00	0.66		1.00	1.00		0.97
Lane Grp Cap(c), veh/h	348	519	542	16	711	317	109	0	95	499	0	446
V/C Ratio(X)	0.65	0.22	0.22	0.44	0.60	0.20	0.60	0.00	0.08	0.06	0.00	0.79
Avail Cap(c_a), veh/h	597	1147	1198	162	2004	894	1037	0	908	972	0	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.9	13.9	13.9	26.2	19.1	17.5	24.3	0.0	23.5	13.7	0.0	17.5
Incr Delay (d2), s/veh	2.1	0.2	0.2	17.9	0.8	0.3	5.2	0.0	0.4	0.0	0.0	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.9	0.9	0.2	2.2	0.6	0.9	0.0	0.1	0.2	0.0	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	14.1	14.1	44.1	20.0	17.8	29.5	0.0	23.9	13.7	0.0	20.7
LnGrp LOS	C	B	B	D	B	B	C	A	C	B	A	C
Approach Vol, veh/h		456			501			73			384	
Approach Delay, s/veh		19.5			20.0			28.9			20.2	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	7.8	5.0	20.6	19.9	10.0	15.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	5.0	35.5	30.0	9.5	31.0
Max Q Clear Time (g_c+I1), s	3.9	2.2	4.6	13.3	5.5	8.0
Green Ext Time (p_c), s	0.3	0.0	1.3	2.2	0.3	3.0

Intersection Summary	
HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	14.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	59	8	0	496	0	0	0	0	0
Future Vol, veh/h	0	0	0	59	8	0	496	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	0	0	0	64	9	0	539	0	0	0	0	0

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	1079	1079	0	1	0	-	-	-	0	
Stage 1	1078	1078	-	-	-	-	-	-	-	
Stage 2	1	1	-	-	-	-	-	-	-	
Critical Hdwy	6.65	6.75	6.45	4.35	-	-	-	-	-	
Critical Hdwy Stg 1	5.65	5.75	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.65	5.75	-	-	-	-	-	-	-	
Follow-up Hdwy	3.725	4.225	3.525	2.425	-	-	-	-	-	
Pot Cap-1 Maneuver	219	199	-	1483	-	0	0	-	0	
Stage 1	295	268	-	-	-	0	0	-	0	
Stage 2	965	851	-	-	-	0	0	-	0	
Platoon blocked, %					-			-		
Mov Cap-1 Maneuver	140	0	-	1483	-	-	-	-	-	
Mov Cap-2 Maneuver	140	0	-	-	-	-	-	-	-	
Stage 1	188	0	-	-	-	-	-	-	-	
Stage 2	965	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	55.7	8.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT
Capacity (veh/h)	1483	-	140	-	-
HCM Lane V/C Ratio	0.364	-	0.52	-	-
HCM Control Delay (s)	8.8	0	55.7	0	-
HCM Lane LOS	A	A	F	A	-
HCM 95th %tile Q(veh)	1.7	-	2.5	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	434	0	0	0	0	493	27	1	58	0
Future Vol, veh/h	3	1	434	0	0	0	0	493	27	1	58	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	415	-	-	-	-	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	3	1	472	0	0	0	0	536	29	1	63	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	601	601	-	-	0	-	536	0	0
Stage 1	65	65	-	-	-	-	-	-	-
Stage 2	536	536	-	-	-	-	-	-	-
Critical Hdwy	6.65	6.75	-	-	-	-	4.35	-	-
Critical Hdwy Stg 1	5.65	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.65	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4.225	-	-	-	-	2.425	-	-
Pot Cap-1 Maneuver	428	385	0	0	-	0	925	-	0
Stage 1	902	798	0	0	-	0	-	-	0
Stage 2	543	488	0	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	428	0	-	-	-	-	925	-	-
Mov Cap-2 Maneuver	428	0	-	-	-	-	-	-	-
Stage 1	902	0	-	-	-	-	-	-	-
Stage 2	542	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	428	-	925	-
HCM Lane V/C Ratio	-	0.01	-	0.001	-
HCM Control Delay (s)	-	13.5	0	8.9	-
HCM Lane LOS	-	B	A	A	-
HCM 95th %tile Q(veh)	-	0	-	0	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	90	1	56	10	3	6	44	424	1	1	451	40
Future Vol, veh/h	90	1	56	10	3	6	44	424	1	1	451	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	170	-	170	325	-	-	250	-	250	225	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	98	1	61	11	3	7	48	461	1	1	490	43

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	842	1072	267	805	1092	231	533	0	0	462	0	0
Stage 1	514	514	-	557	557	-	-	-	-	-	-	-
Stage 2	328	558	-	248	535	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	222	186	666	237	180	705	887	-	-	949	-	-
Stage 1	456	480	-	428	457	-	-	-	-	-	-	-
Stage 2	599	456	-	673	468	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	208	176	666	205	170	705	887	-	-	949	-	-
Mov Cap-2 Maneuver	208	176	-	205	170	-	-	-	-	-	-	-
Stage 1	431	480	-	405	432	-	-	-	-	-	-	-
Stage 2	557	431	-	609	468	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.9	19.8	0.9	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	887	-	-	208	176	666	205	170	705	949	-	-
HCM Lane V/C Ratio	0.054	-	-	0.47	0.006	0.091	0.053	0.019	0.009	0.001	-	-
HCM Control Delay (s)	9.3	-	-	36.8	25.6	10.9	23.5	26.6	10.2	8.8	-	-
HCM Lane LOS	A	-	-	E	D	B	C	D	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.3	0	0.3	0.2	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	1	7	6	1	3	4	417	1	10	508	2
Future Vol, veh/h	7	1	7	6	1	3	4	417	1	10	508	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	225	-	250	200	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	8	1	8	7	1	3	4	453	1	11	552	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	809	1036	276	760	1037	227	554	0	0	454	0	0
Stage 1	574	574	-	461	461	-	-	-	-	-	-	-
Stage 2	235	462	-	299	576	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	235	196	657	257	196	710	869	-	-	956	-	-
Stage 1	418	448	-	493	509	-	-	-	-	-	-	-
Stage 2	685	509	-	625	447	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	193	657	250	193	710	869	-	-	956	-	-
Mov Cap-2 Maneuver	230	193	-	250	193	-	-	-	-	-	-	-
Stage 1	416	443	-	491	506	-	-	-	-	-	-	-
Stage 2	677	506	-	609	442	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	17.3	0.1	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	869	-	-	324	250	193	710	956	-	-
HCM Lane V/C Ratio	0.005	-	-	0.05	0.026	0.006	0.005	0.011	-	-
HCM Control Delay (s)	9.2	-	-	16.7	19.8	23.8	10.1	8.8	-	-
HCM Lane LOS	A	-	-	C	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	1	10	1	1	1	7	403	1	1	526	3
Future Vol, veh/h	18	1	10	1	1	1	7	403	1	1	526	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	100	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	20	1	11	1	1	1	8	438	1	1	572	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	810	1029	286	744	1032	220	575	0	0	439	0	0
Stage 1	574	574	-	455	455	-	-	-	-	-	-	-
Stage 2	236	455	-	289	577	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	235	198	646	264	197	718	852	-	-	970	-	-
Stage 1	418	448	-	498	513	-	-	-	-	-	-	-
Stage 2	684	513	-	634	446	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	232	196	646	256	195	718	852	-	-	970	-	-
Mov Cap-2 Maneuver	232	196	-	256	195	-	-	-	-	-	-	-
Stage 1	414	448	-	494	508	-	-	-	-	-	-	-
Stage 2	675	508	-	621	446	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.7	17.6	0.2	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	852	-	-	295	288	970	-	-
HCM Lane V/C Ratio	0.009	-	-	0.107	0.011	0.001	-	-
HCM Control Delay (s)	9.3	-	-	18.7	17.6	8.7	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	-

Intersection	
Intersection Delay, s/veh	14.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	8	16	7	10	15	11	366	1	14	450	172
Future Vol, veh/h	40	8	16	7	10	15	11	366	1	14	450	172
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	43	9	17	8	11	16	12	398	1	15	489	187
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	11.3	10.5	12.2	16.5
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	6%	0%	91%	0%	58%	0%	6%	0%
Vol Thru, %	94%	99%	9%	20%	42%	25%	94%	57%
Vol Right, %	0%	1%	0%	80%	0%	75%	0%	43%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	194	184	44	20	12	20	239	397
LT Vol	11	0	40	0	7	0	14	0
Through Vol	183	183	4	4	5	5	225	225
RT Vol	0	1	0	16	0	15	0	172
Lane Flow Rate	211	200	48	22	13	22	260	432
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.362	0.341	0.107	0.042	0.029	0.043	0.425	0.666
Departure Headway (Hd)	6.178	6.146	8.046	7.01	7.991	7.156	5.892	5.557
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	584	586	446	511	448	500	616	656
Service Time	3.908	3.875	5.786	4.75	5.733	4.897	3.592	3.257
HCM Lane V/C Ratio	0.361	0.341	0.108	0.043	0.029	0.044	0.422	0.659
HCM Control Delay	12.4	12	11.8	10.1	11	10.2	12.9	18.6
HCM Lane LOS	B	B	B	B	B	B	B	C
HCM 95th-tile Q	1.6	1.5	0.4	0.1	0.1	0.1	2.1	5

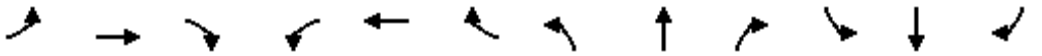
Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	1	1	1	1	1	1	369	1	1	464	8
Future Vol, veh/h	8	1	1	1	1	1	1	369	1	1	464	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	9	1	1	1	1	1	1	401	1	1	504	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	714	915	257	659	919	201	513	0	0	402	0	0
Stage 1	511	511	-	404	404	-	-	-	-	-	-	-
Stage 2	203	404	-	255	515	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	278	234	677	307	232	740	904	-	-	1005	-	-
Stage 1	458	481	-	536	543	-	-	-	-	-	-	-
Stage 2	718	543	-	666	479	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	276	234	677	305	232	740	904	-	-	1005	-	-
Mov Cap-2 Maneuver	276	234	-	305	232	-	-	-	-	-	-	-
Stage 1	458	481	-	535	542	-	-	-	-	-	-	-
Stage 2	715	542	-	663	479	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18	15.8	0	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	904	-	-	288	336	1005	-	-
HCM Lane V/C Ratio	0.001	-	-	0.038	0.01	0.001	-	-
HCM Control Delay (s)	9	-	-	18	15.8	8.6	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	859	131	97	710	251	204	102	124	350	70	46
Future Volume (veh/h)	18	859	131	97	710	251	204	102	124	350	70	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	20	934	142	105	772	0	222	111	135	380	76	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	80	1196	534	134	1381		334	237	201	501	327	
Arrive On Green	0.02	0.34	0.34	0.08	0.40	0.00	0.10	0.13	0.13	0.15	0.18	0.00
Sat Flow, veh/h	3374	3469	1547	1739	3469	1547	3374	1826	1547	3374	1826	1547
Grp Volume(v), veh/h	20	934	142	105	772	0	222	111	135	380	76	0
Grp Sat Flow(s),veh/h/ln	1687	1735	1547	1739	1735	1547	1687	1826	1547	1687	1826	1547
Q Serve(g_s), s	0.3	14.5	4.0	3.6	10.3	0.0	3.8	3.4	5.0	6.5	2.1	0.0
Cycle Q Clear(g_c), s	0.3	14.5	4.0	3.6	10.3	0.0	3.8	3.4	5.0	6.5	2.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	80	1196	534	134	1381		334	237	201	501	327	
V/C Ratio(X)	0.25	0.78	0.27	0.79	0.56		0.66	0.47	0.67	0.76	0.23	
Avail Cap(c_a), veh/h	281	1417	632	188	1504		568	594	503	647	636	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.8	17.6	14.2	27.2	14.0	0.0	26.1	24.2	24.9	24.5	21.1	0.0
Incr Delay (d2), s/veh	1.6	2.4	0.3	13.3	0.4	0.0	2.3	1.4	3.9	3.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	5.5	1.3	1.9	3.6	0.0	1.5	1.5	1.9	2.7	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	20.1	14.4	40.5	14.4	0.0	28.3	25.6	28.7	28.4	21.4	0.0
LnGrp LOS	C	C	B	D	B		C	C	C	C	C	
Approach Vol, veh/h		1096			877	A		468			456	A
Approach Delay, s/veh		19.5			17.5			27.8			27.2	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	12.3	9.1	25.2	10.4	15.3	5.9	28.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	19.5	6.5	24.5	10.1	20.9	5.0	26.0
Max Q Clear Time (g_c+I1), s	8.5	7.0	5.6	16.5	5.8	4.1	2.3	12.3
Green Ext Time (p_c), s	0.4	0.8	0.0	4.2	0.3	0.3	0.0	4.5

Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Appendix F

Future Year Plus Project LOS Calculations

Intersection Level Of Service Report
Intersection 1: US 95A/I-80 WB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	37.9
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.308

Intersection Setup

Name	US 95A			US 95A						I-80 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	350.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	US 95A			US 95A						I-80 WB Ramps		
Base Volume Input [veh/h]	776	113	0	0	81	109	0	0	0	28	1	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	13.00	13.00	2.00	2.00	13.00	13.00	2.00	2.00	2.00	13.00	13.00	13.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	776	113	0	0	81	109	0	0	0	28	1	38
Peak Hour Factor	0.9500	0.9500	1.0000	1.0000	0.9500	0.9500	1.0000	1.0000	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	204	30	0	0	21	29	0	0	0	7	0	10
Total Analysis Volume [veh/h]	817	119	0	0	85	115	0	0	0	29	1	40
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Stop	Free	Stop
Flared Lane		No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance		No		No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.31	0.35	0.00	0.00	0.00	0.16	0.01	0.08
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	37.86	35.63	0.00	0.00	0.00	28.09	27.49	12.42
Movement LOS	A	A			E	E				D	D	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	4.29	4.29	0.00	0.00	0.00	0.56	0.56	0.25
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	107.22	107.22	0.00	0.00	0.00	14.04	14.04	6.16
d_A, Approach Delay [s/veh]	0.00			36.57			0.00			19.13		
Approach LOS	A			E			A			C		
d_I, Intersection Delay [s/veh]	7.18											
Intersection LOS	E											

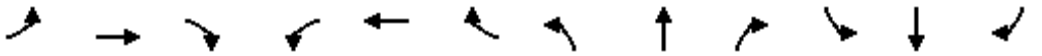
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	1	498	0	0	0	0	864	61	28	81	0
Future Vol, veh/h	25	1	498	0	0	0	0	864	61	28	81	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	250	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	9	9	9	9	9	9	9	9	9	9	9	9
Mvmt Flow	26	1	519	0	0	0	0	900	64	29	84	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1042	1042	-	-	0	0	900	0	0
Stage 1	142	142	-	-	-	-	-	-	-
Stage 2	900	900	-	-	-	-	-	-	-
Critical Hdwy	6.49	6.59	-	-	-	-	4.19	-	-
Critical Hdwy Stg 1	5.49	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.49	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.581	4.081	-	-	-	-	2.281	-	-
Pot Cap-1 Maneuver	247	223	0	0	-	-	726	-	0
Stage 1	868	766	0	0	-	-	-	-	0
Stage 2	386	348	0	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	237	0	-	-	-	-	726	-	-
Mov Cap-2 Maneuver	237	0	-	-	-	-	-	-	-
Stage 1	868	0	-	-	-	-	-	-	-
Stage 2	370	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.1	0	2.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	237	-	726	-
HCM Lane V/C Ratio	-	-	0.114	-	0.04	-
HCM Control Delay (s)	-	-	22.1	0	10.2	0
HCM Lane LOS	-	-	C	A	B	A
HCM 95th %tile Q(veh)	-	-	0.4	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	61	41	357	35	62	28	813	781	111	437	17
Future Volume (veh/h)	56	61	41	357	35	62	28	813	781	111	437	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	60	66	44	384	38	67	30	874	840	119	470	18
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	77	152	93	307	220	186	55	2233	996	173	2261	86
Arrive On Green	0.04	0.07	0.07	0.09	0.12	0.12	0.03	0.65	0.65	0.05	0.67	0.67
Sat Flow, veh/h	1725	2048	1247	3346	1811	1527	1725	3441	1534	3346	3379	129
Grp Volume(v), veh/h	60	54	56	384	38	67	30	874	840	119	239	249
Grp Sat Flow(s),veh/h/ln	1725	1721	1575	1673	1811	1527	1725	1721	1534	1673	1721	1788
Q Serve(g_s), s	4.1	3.6	4.1	11.0	2.3	4.8	2.1	14.3	51.0	4.2	6.4	6.4
Cycle Q Clear(g_c), s	4.1	3.6	4.1	11.0	2.3	4.8	2.1	14.3	51.0	4.2	6.4	6.4
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	77	128	117	307	220	186	55	2233	996	173	1151	1196
V/C Ratio(X)	0.78	0.43	0.47	1.25	0.17	0.36	0.55	0.39	0.84	0.69	0.21	0.21
Avail Cap(c_a), veh/h	158	588	538	307	619	522	158	2233	996	307	1151	1196
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.94	0.94	0.94	0.63	0.63	0.63	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.8	53.1	53.3	54.5	47.3	48.4	57.3	9.9	16.3	55.9	7.6	7.6
Incr Delay (d2), s/veh	15.7	2.2	3.0	136.2	0.3	1.1	5.4	0.3	5.7	4.8	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.6	1.7	10.4	1.0	1.9	1.0	5.3	17.9	1.9	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.5	55.3	56.3	190.7	47.6	49.5	62.6	10.2	22.0	60.7	8.0	8.0
LnGrp LOS	E	E	E	F	D	D	E	B	C	E	A	A
Approach Vol, veh/h		170			489			1744			607	
Approach Delay, s/veh		61.7			160.2			16.8			18.4	
Approach LOS		E			F			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	81.9	15.0	12.9	7.8	84.3	9.3	18.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	41.0	11.0	41.0	11.0	41.0	11.0	41.0
Max Q Clear Time (g_c+I1), s	6.2	53.0	13.0	6.1	4.1	8.4	6.1	6.8
Green Ext Time (p_c), s	0.1	0.0	0.0	0.6	0.0	3.2	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	43.0
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	18	193	120	14	55	201	1498	60	69	727	50
Future Volume (veh/h)	83	18	193	120	14	55	201	1498	60	69	727	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	88	19	205	128	15	59	214	1594	64	73	773	53
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	110	242	422	129	47	183	244	1630	65	301	1687	116
Arrive On Green	0.06	0.13	0.13	0.08	0.14	0.14	0.14	0.48	0.48	0.17	0.52	0.52
Sat Flow, veh/h	1725	1811	1535	1725	321	1263	1725	3372	135	1725	3267	224
Grp Volume(v), veh/h	88	19	205	128	0	74	214	811	847	73	407	419
Grp Sat Flow(s),veh/h/ln	1725	1811	1535	1725	0	1584	1725	1721	1786	1725	1721	1770
Q Serve(g_s), s	6.0	1.1	13.4	8.9	0.0	5.0	14.6	55.2	56.0	4.4	18.0	18.0
Cycle Q Clear(g_c), s	6.0	1.1	13.4	8.9	0.0	5.0	14.6	55.2	56.0	4.4	18.0	18.0
Prop In Lane	1.00		1.00	1.00		0.80	1.00		0.08	1.00		0.13
Lane Grp Cap(c), veh/h	110	242	422	129	0	230	244	832	863	301	889	914
V/C Ratio(X)	0.80	0.08	0.49	0.99	0.00	0.32	0.88	0.97	0.98	0.24	0.46	0.46
Avail Cap(c_a), veh/h	187	468	613	129	0	356	359	832	863	301	889	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.41	0.41	0.41	0.86	0.86	0.86
Uniform Delay (d), s/veh	55.4	45.5	36.4	55.5	0.0	46.0	50.5	30.3	30.5	42.7	18.4	18.4
Incr Delay (d2), s/veh	12.2	0.1	0.9	75.7	0.0	0.8	7.1	14.9	15.7	0.4	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.5	5.1	6.6	0.0	2.0	6.8	25.4	26.9	1.9	7.4	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.6	45.6	37.2	131.2	0.0	46.8	57.6	45.2	46.2	43.1	19.8	19.8
LnGrp LOS	E	D	D	F	A	D	E	D	D	D	B	B
Approach Vol, veh/h		312			202			1872			899	
Approach Delay, s/veh		46.3			100.3			47.0			21.7	
Approach LOS		D			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.9	62.0	13.0	20.1	21.0	66.0	11.7	21.4
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	58.0	9.0	31.0	25.0	39.0	13.0	27.0
Max Q Clear Time (g_c+I1), s	10.4	58.0	10.9	15.4	16.6	20.0	8.0	7.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.4	5.2	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	43.3
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	535	572	211	92	323	578	73	657	269	243	230	585
Future Volume (veh/h)	535	572	211	92	323	578	73	657	269	243	230	585
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	563	602	0	97	340	0	77	692	0	256	242	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	661	913		125	483		99	1102		360	671	
Arrive On Green	0.20	0.26	0.00	0.07	0.14	0.00	0.06	0.32	0.00	0.11	0.37	0.00
Sat Flow, veh/h	3374	3469	1547	1739	3469	1547	1739	3469	1547	3374	1826	1547
Grp Volume(v), veh/h	563	602	0	97	340	0	77	692	0	256	242	0
Grp Sat Flow(s),veh/h/ln	1687	1735	1547	1739	1735	1547	1739	1735	1547	1687	1826	1547
Q Serve(g_s), s	12.0	11.6	0.0	4.1	7.0	0.0	3.3	12.7	0.0	5.5	7.2	0.0
Cycle Q Clear(g_c), s	12.0	11.6	0.0	4.1	7.0	0.0	3.3	12.7	0.0	5.5	7.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	661	913		125	483		99	1102		360	671	
V/C Ratio(X)	0.85	0.66		0.78	0.70		0.78	0.63		0.71	0.36	
Avail Cap(c_a), veh/h	744	1095		253	835		232	1102		699	671	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.0	24.6	0.0	34.1	30.7	0.0	34.8	21.7	0.0	32.3	17.2	0.0
Incr Delay (d2), s/veh	8.6	1.1	0.0	10.0	1.9	0.0	12.4	2.7	0.0	2.6	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	4.7	0.0	2.0	3.0	0.0	1.7	5.3	0.0	2.3	3.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	25.7	0.0	44.1	32.6	0.0	47.2	24.5	0.0	34.9	18.7	0.0
LnGrp LOS	D	C		D	C		D	C		C	B	
Approach Vol, veh/h		1165	A		437	A		769	A		498	A
Approach Delay, s/veh		31.5			35.2			26.7			27.0	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	28.3	9.9	24.2	8.7	32.0	19.1	14.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	22.0	10.9	23.6	10.0	27.5	16.5	18.0
Max Q Clear Time (g_c+I1), s	7.5	14.7	6.1	13.6	5.3	9.2	14.0	9.0
Green Ext Time (p_c), s	0.5	2.7	0.1	2.9	0.1	1.3	0.6	1.4

Intersection Summary	
HCM 6th Ctrl Delay	30.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	238	648	1	1	286	27	1	1	1	20	1	105
Future Volume (veh/h)	238	648	1	1	286	27	1	1	1	20	1	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693	1693
Adj Flow Rate, veh/h	259	704	1	1	311	29	1	1	1	22	1	114
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	14	14	14	14	14	14	14	14	14	14	14	14
Cap, veh/h	421	1194	2	5	737	329	3	3	6	183	1	162
Arrive On Green	0.13	0.36	0.36	0.00	0.23	0.23	0.00	0.00	0.00	0.11	0.11	0.11
Sat Flow, veh/h	3127	3295	5	1612	3216	1434	826	826	1434	1612	12	1424
Grp Volume(v), veh/h	259	344	361	1	311	29	2	0	1	22	0	115
Grp Sat Flow(s),veh/h/ln	1564	1608	1692	1612	1608	1434	1651	0	1434	1612	0	1436
Q Serve(g_s), s	2.7	6.0	6.0	0.0	2.9	0.6	0.0	0.0	0.0	0.4	0.0	2.7
Cycle Q Clear(g_c), s	2.7	6.0	6.0	0.0	2.9	0.6	0.0	0.0	0.0	0.4	0.0	2.7
Prop In Lane	1.00		0.00	1.00		1.00	0.50		1.00	1.00		0.99
Lane Grp Cap(c), veh/h	421	583	613	5	737	329	7	0	6	183	0	163
V/C Ratio(X)	0.62	0.59	0.59	0.22	0.42	0.09	0.29	0.00	0.17	0.12	0.00	0.71
Avail Cap(c_a), veh/h	856	1645	1730	232	2872	1281	1499	0	1302	1393	0	1241
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.2	9.0	9.0	17.3	11.4	10.5	17.2	0.0	17.2	13.8	0.0	14.8
Incr Delay (d2), s/veh	1.5	1.0	0.9	21.7	0.4	0.1	22.4	0.0	13.0	0.3	0.0	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.5	1.6	0.0	0.8	0.1	0.1	0.0	0.0	0.1	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	9.9	9.9	38.9	11.8	10.6	39.6	0.0	30.3	14.1	0.0	20.3
LnGrp LOS	B	A	A	D	B	B	D	A	C	B	A	C
Approach Vol, veh/h		964			341			3			137	
Approach Delay, s/veh		11.4			11.8			36.5			19.3	
Approach LOS		B			B			D			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	4.6	4.5	17.1	8.4	9.2	12.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	5.0	35.5	30.0	9.5	31.0
Max Q Clear Time (g_c+I1), s	2.0	2.0	8.0	4.7	4.7	4.9
Green Ext Time (p_c), s	0.0	0.0	4.6	0.7	0.4	2.1

Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1076.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	310	1	0	781	0	0	0	0	0
Future Vol, veh/h	0	0	0	310	1	0	781	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	0	0	0	337	1	0	849	0	0	0	0	0

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	1699	1699	0	1	0	-	-	-	0	
Stage 1	1698	1698	-	-	-	-	-	-	-	
Stage 2	1	1	-	-	-	-	-	-	-	
Critical Hdwy	6.65	6.75	6.45	4.35	-	-	-	-	-	
Critical Hdwy Stg 1	5.65	5.75	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.65	5.75	-	-	-	-	-	-	-	
Follow-up Hdwy	3.725	4.225	3.525	2.425	-	-	-	-	-	
Pot Cap-1 Maneuver	~ 89	81	-	1483	-	0	0	-	-	
Stage 1	~ 143	131	-	-	-	0	0	-	-	
Stage 2	965	851	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	~ 38	0	-	1483	-	-	-	-	-	
Mov Cap-2 Maneuver	~ 38	0	-	-	-	-	-	-	-	
Stage 1	~ 61	0	-	-	-	-	-	-	-	
Stage 2	965	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	$ 3756.6	10.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1483	-	38	-	-	-
HCM Lane V/C Ratio	0.572	-	8.896	-	-	-
HCM Control Delay (s)	10.6	$	3756.6	0	-	-
HCM Lane LOS	B	A	F	A	-	-
HCM 95th %tile Q(veh)	3.8	-	40.6	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	1468	0	0	0	0	778	116	1	309	0
Future Vol, veh/h	3	1	1468	0	0	0	0	778	116	1	309	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	415	-	-	-	-	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	3	1	1596	0	0	0	0	846	126	1	336	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1184	1184	-	-	0	-	846	0	0
Stage 1	338	338	-	-	-	-	-	-	-
Stage 2	846	846	-	-	-	-	-	-	-
Critical Hdwy	6.65	6.75	-	-	-	-	4.35	-	-
Critical Hdwy Stg 1	5.65	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.65	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4.225	-	-	-	-	2.425	-	-
Pot Cap-1 Maneuver	188	171	0	0	-	0	701	-	0
Stage 1	674	602	0	0	-	0	-	-	0
Stage 2	384	348	0	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	188	0	-	-	-	-	701	-	-
Mov Cap-2 Maneuver	188	0	-	-	-	-	-	-	-
Stage 1	674	0	-	-	-	-	-	-	-
Stage 2	384	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	188	-	701	-
HCM Lane V/C Ratio	-	0.023	-	0.002	-
HCM Control Delay (s)	-	24.6	0	10.1	-
HCM Lane LOS	-	C	A	B	-
HCM 95th %tile Q(veh)	-	0.1	-	0	-

Intersection	
Int Delay, s/veh	76.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	78	105	66	144	37	194	101	622	506	734	910	133
Future Vol, veh/h	78	105	66	144	37	194	101	622	506	734	910	133
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	170	-	170	325	-	-	250	-	250	225	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	85	114	72	157	40	211	110	676	550	798	989	145

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3236	4104	567	3044	3626	338	1134	0	0	1226	0	0
Stage 1	2658	2658	-	896	896	-	-	-	-	-	-	-
Stage 2	578	1446	-	2148	2730	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	~ 3	~ 1	413	~ 4	~ 3	595	495	-	-	~ 452	-	-
Stage 1	~ 16	~ 33	-	259	308	-	-	-	-	-	-	-
Stage 2	415	159	-	~ 37	~ 30	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	413	-	0	595	495	-	-	~ 452	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	~ 12	0	-	202	240	-	-	-	-	-	-	-
Stage 2	173	124	-	-	0	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1.2	154.8
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	495	-	-	-	-	413	-	-	595	~ 452	-	-
HCM Lane V/C Ratio	0.222	-	-	-	-	0.174	-	-	0.354	1.765	-	-
HCM Control Delay (s)	14.3	-	-	-	-	15.5	-	-	14.3	$ 374.7	-	-
HCM Lane LOS	B	-	-	-	-	C	-	-	B	F	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-	-	0.6	-	-	1.6	49.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	33.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1	2	138	1	111	10	1124	453	375	735	5
Future Vol, veh/h	2	1	2	138	1	111	10	1124	453	375	735	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	225	-	250	200	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	2	1	2	150	1	121	11	1222	492	408	799	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2249	3351	400	2460	2864	611	804	0	0	1714	0	0
Stage 1	1615	1615	-	1244	1244	-	-	-	-	-	-	-
Stage 2	634	1736	-	1216	1620	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	17	5	539	~ 11	11	385	683	-	-	~ 279	-	-
Stage 1	86	129	-	152	203	-	-	-	-	-	-	-
Stage 2	382	110	-	159	128	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	539	-	0	385	683	-	-	~ 279	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	85	0	-	150	200	-	-	-	-	-	-	-
Stage 2	257	108	-	-	0	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.1	87.6
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	683	-	-	-	-	-	385	~ 279	-	-
HCM Lane V/C Ratio	0.016	-	-	-	-	-	0.313	1.461	-	-
HCM Control Delay (s)	10.4	-	-	-	-	-	18.6	260.3	-	-
HCM Lane LOS	B	-	-	-	-	-	C	F	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-	1.3	22.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	96.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	1	3	35	1	43	18	1546	102	113	745	9
Future Vol, veh/h	5	1	3	35	1	43	18	1546	102	113	745	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	100	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	5	1	3	38	1	47	20	1680	111	123	810	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1937	2887	405	2428	2842	896	820	0	0	1791	0	0
Stage 1	1056	1056	-	1776	1776	-	-	-	-	-	-	-
Stage 2	881	1831	-	652	1066	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	30	11	535	~ 12	12	242	672	-	-	258	-	-
Stage 1	203	255	-	67	105	-	-	-	-	-	-	-
Stage 2	265	98	-	372	252	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	13	6	535	~ 6	6	242	672	-	-	258	-	-
Mov Cap-2 Maneuver	13	6	-	~ 6	6	-	-	-	-	-	-	-
Stage 1	197	133	-	65	102	-	-	-	-	-	-	-
Stage 2	205	95	-	192	132	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 406.3	$ 3096.8	0.1	4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	672	-	-	16	13	258	-	-
HCM Lane V/C Ratio	0.029	-	-	0.611	6.605	0.476	-	-
HCM Control Delay (s)	10.5	-	-	$ 406.3	$ 3096.8	31	-	-
HCM Lane LOS	B	-	-	F	F	D	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.6	11.8	2.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	264.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	442	44	30	31	35	22	25	1303	36	20	622	138
Future Vol, veh/h	442	44	30	31	35	22	25	1303	36	20	622	138
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	480	48	33	34	38	24	27	1416	39	22	676	150
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	211.8	14.9	398	94
HCM LOS	F	B	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	4%	0%	95%	0%	64%	0%	6%	0%
Vol Thru, %	96%	95%	5%	42%	36%	44%	94%	69%
Vol Right, %	0%	5%	0%	58%	0%	56%	0%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	677	688	464	52	49	40	331	449
LT Vol	25	0	442	0	31	0	20	0
Through Vol	652	652	22	22	18	18	311	311
RT Vol	0	36	0	30	0	22	0	138
Lane Flow Rate	735	747	504	57	53	43	360	488
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	1.802	1.82	1.409	0.144	0.159	0.121	0.887	1.17
Departure Headway (Hd)	9.774	9.717	12.074	11.172	10.884	10.057	8.709	8.456
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	382	381	308	323	334	359	417	434
Service Time	7.474	7.417	9.774	8.872	8.501	7.757	6.409	6.156
HCM Lane V/C Ratio	1.924	1.961	1.636	0.176	0.159	0.12	0.863	1.124
HCM Control Delay	394.1	401.9	233.8	15.7	15.5	14.1	50.2	126.3
HCM Lane LOS	F	F	F	C	C	B	F	F
HCM 95th-tile Q	42.7	43.8	22.3	0.5	0.6	0.4	9.2	18.9

Intersection	
Int Delay, s/veh	16.1

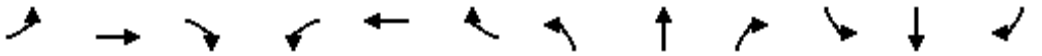
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	1	1	27	1	30	1	1324	74	81	570	21
Future Vol, veh/h	20	1	1	27	1	30	1	1324	74	81	570	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	22	1	1	29	1	33	1	1439	80	88	620	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1530	2329	322	1968	2300	760	643	0	0	1519	0	0
Stage 1	808	808	-	1481	1481	-	-	-	-	-	-	-
Stage 2	722	1521	-	487	819	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	64	27	611	~ 28	28	302	798	-	-	338	-	-
Stage 1	295	342	-	106	152	-	-	-	-	-	-	-
Stage 2	336	145	-	475	337	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	44	20	611	~ 21	21	302	798	-	-	338	-	-
Mov Cap-2 Maneuver	44	20	-	~ 21	21	-	-	-	-	-	-	-
Stage 1	295	253	-	106	152	-	-	-	-	-	-	-
Stage 2	297	145	-	349	249	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	164.7	$ 508.6	0	2.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	798	-	-	43	40	338	-	-
HCM Lane V/C Ratio	0.001	-	-	0.556	1.576	0.26	-	-
HCM Control Delay (s)	9.5	-	-	164.7	$ 508.6	19.4	-	-
HCM Lane LOS	A	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0	-	-	2	6.5	1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	558	552	133	97	626	684	263	172	102	316	85	183
Future Volume (veh/h)	558	552	133	97	626	684	263	172	102	316	85	183
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	607	600	145	105	680	0	286	187	111	343	92	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	719	1308	583	133	835		377	251	213	434	282	
Arrive On Green	0.22	0.39	0.39	0.08	0.25	0.00	0.12	0.14	0.14	0.13	0.16	0.00
Sat Flow, veh/h	3237	3328	1485	1668	3328	1485	3237	1752	1485	3237	1752	1485
Grp Volume(v), veh/h	607	600	145	105	680	0	286	187	111	343	92	0
Grp Sat Flow(s),veh/h/ln	1618	1664	1485	1668	1664	1485	1618	1752	1485	1618	1752	1485
Q Serve(g_s), s	12.9	9.6	4.7	4.5	13.9	0.0	6.2	7.4	5.0	7.4	3.4	0.0
Cycle Q Clear(g_c), s	12.9	9.6	4.7	4.5	13.9	0.0	6.2	7.4	5.0	7.4	3.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	719	1308	583	133	835		377	251	213	434	282	
V/C Ratio(X)	0.84	0.46	0.25	0.79	0.81		0.76	0.74	0.52	0.79	0.33	
Avail Cap(c_a), veh/h	875	1308	583	294	992		485	474	401	516	491	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.8	16.2	14.7	32.6	25.4	0.0	30.9	29.6	28.6	30.2	26.8	0.0
Incr Delay (d2), s/veh	6.4	0.3	0.2	9.8	4.6	0.0	5.1	4.3	2.0	6.9	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	3.4	1.5	2.1	5.7	0.0	2.6	3.2	1.8	3.1	1.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	16.5	14.9	42.4	30.0	0.0	36.0	34.0	30.6	37.2	27.5	0.0
LnGrp LOS	C	B	B	D	C		D	C	C	D	C	
Approach Vol, veh/h		1352			785	A		584			435	A
Approach Delay, s/veh		23.9			31.7			34.3			35.1	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.2	14.8	10.3	32.8	12.9	16.1	20.5	22.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	19.5	12.7	28.3	10.8	20.2	19.5	21.5
Max Q Clear Time (g_c+I1), s	9.4	9.4	6.5	11.6	8.2	5.4	14.9	15.9
Green Ext Time (p_c), s	0.3	1.0	0.1	4.3	0.3	0.3	1.1	2.2

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	106	1051	43	1	273	1	13	1	1	1	1	39
Future Vol, veh/h	106	1051	43	1	273	1	13	1	1	1	1	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	115	1142	47	1	297	1	14	1	1	1	1	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	298	0	0	1189	0	0	1547	1696	595	1102	1719	149
Stage 1	-	-	-	-	-	-	1396	1396	-	300	300	-
Stage 2	-	-	-	-	-	-	151	300	-	802	1419	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.7	6.7	7.1	7.7	6.7	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.7	5.7	-	6.7	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.7	5.7	-	6.7	5.7	-
Follow-up Hdwy	2.3	-	-	2.3	-	-	3.6	4.1	3.4	3.6	4.1	3.4
Pot Cap-1 Maneuver	1204	-	-	540	-	-	72	84	428	156	82	846
Stage 1	-	-	-	-	-	-	138	192	-	662	645	-
Stage 2	-	-	-	-	-	-	813	645	-	327	187	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1204	-	-	540	-	-	63	76	428	142	74	846
Mov Cap-2 Maneuver	-	-	-	-	-	-	63	76	-	142	74	-
Stage 1	-	-	-	-	-	-	125	174	-	598	644	-
Stage 2	-	-	-	-	-	-	770	644	-	293	169	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	72.1	11.2
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	63	129	1204	-	-	540	-	-	142	671
HCM Lane V/C Ratio	0.224	0.017	0.096	-	-	0.002	-	-	0.008	0.065
HCM Control Delay (s)	78	33.4	8.3	-	-	11.7	-	-	30.5	10.7
HCM Lane LOS	F	D	A	-	-	B	-	-	D	B
HCM 95th %tile Q(veh)	0.8	0.1	0.3	-	-	0	-	-	0	0.2

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	600	120	1	183	1	36	1	1	1	1	12
Future Vol, veh/h	40	600	120	1	183	1	36	1	1	1	1	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	43	652	130	1	199	1	39	1	1	1	1	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	200	0	0	782	0	0	905	1005	391	615	1070	100
Stage 1	-	-	-	-	-	-	803	803	-	202	202	-
Stage 2	-	-	-	-	-	-	102	202	-	413	868	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.7	6.7	7.1	7.7	6.7	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.7	5.7	-	6.7	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.7	5.7	-	6.7	5.7	-
Follow-up Hdwy	2.3	-	-	2.3	-	-	3.6	4.1	3.4	3.6	4.1	3.4
Pot Cap-1 Maneuver	1313	-	-	781	-	-	219	227	586	359	207	911
Stage 1	-	-	-	-	-	-	326	376	-	758	714	-
Stage 2	-	-	-	-	-	-	870	714	-	566	350	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1313	-	-	781	-	-	209	219	586	348	200	911
Mov Cap-2 Maneuver	-	-	-	-	-	-	209	219	-	348	200	-
Stage 1	-	-	-	-	-	-	315	364	-	733	713	-
Stage 2	-	-	-	-	-	-	855	713	-	545	338	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.1	25.7	10.5
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	209	319	1313	-	-	781	-	-	348	715
HCM Lane V/C Ratio	0.187	0.007	0.033	-	-	0.001	-	-	0.003	0.02
HCM Control Delay (s)	26.2	16.4	7.8	-	-	9.6	-	-	15.4	10.1
HCM Lane LOS	D	C	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.7	0	0.1	-	-	0	-	-	0	0.1

Intersection Level Of Service Report
Intersection 1: US 95A/I-80 WB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	42.5
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.551

Intersection Setup

Name	US 95A			US 95A						I-80 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	350.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	US 95A			US 95A						I-80 WB Ramps		
Base Volume Input [veh/h]	657	140	0	0	107	112	0	0	0	106	1	91
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	11.00	11.00	2.00	2.00	11.00	11.00	2.00	2.00	2.00	11.00	11.00	11.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	657	140	0	0	107	112	0	0	0	106	1	91
Peak Hour Factor	0.9400	0.9400	1.0000	1.0000	0.9400	0.9400	1.0000	1.0000	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	175	37	0	0	28	30	0	0	0	28	0	24
Total Analysis Volume [veh/h]	699	149	0	0	114	119	0	0	0	113	1	97
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Stop	Free	Stop
Flared Lane		No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance		No		No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.36	0.31	0.00	0.00	0.00	0.55	0.00	0.18
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	34.61	32.69	0.00	0.00	0.00	42.48	42.20	12.94
Movement LOS	A	A			D	D				E	E	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	4.56	4.56	0.00	0.00	0.00	2.97	2.97	0.64
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	114.11	114.11	0.00	0.00	0.00	74.35	74.35	15.88
d_A, Approach Delay [s/veh]	0.00			33.63			0.00			28.90		
Approach LOS	A			D			A			D		
d_I, Intersection Delay [s/veh]	10.78											
Intersection LOS	E											

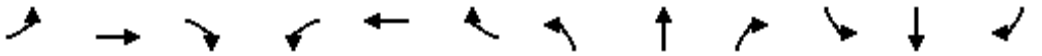
Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱					↑	↱		↰	
Traffic Vol, veh/h	43	11	949	0	0	0	0	754	66	14	199	0
Future Vol, veh/h	43	11	949	0	0	0	0	754	66	14	199	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	250	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	6	6	6	6	6	6	6	6	6
Mvmt Flow	47	12	1032	0	0	0	0	820	72	15	216	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1066	1066	-	-	0	0	820	0	0
Stage 1	246	246	-	-	-	-	-	-	-
Stage 2	820	820	-	-	-	-	-	-	-
Critical Hdwy	6.46	6.56	-	-	-	-	4.16	-	-
Critical Hdwy Stg 1	5.46	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.46	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	-	-	-	-	2.254	-	-
Pot Cap-1 Maneuver	242	219	0	0	-	-	792	-	0
Stage 1	786	695	0	0	-	-	-	-	0
Stage 2	426	383	0	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	237	0	-	-	-	-	792	-	-
Mov Cap-2 Maneuver	237	0	-	-	-	-	-	-	-
Stage 1	786	0	-	-	-	-	-	-	-
Stage 2	417	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.1	0	0.6
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	237	-	792	-
HCM Lane V/C Ratio	-	-	0.248	-	0.019	-
HCM Control Delay (s)	-	-	25.1	0	9.6	0
HCM Lane LOS	-	-	D	A	A	A
HCM 95th %tile Q(veh)	-	-	0.9	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	83	89	1033	139	159	87	585	660	150	900	52
Future Volume (veh/h)	80	83	89	1033	139	159	87	585	660	150	900	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	84	87	94	1087	146	167	92	616	695	158	947	55
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	105	145	129	686	413	350	113	1882	838	209	1797	104
Arrive On Green	0.06	0.08	0.08	0.20	0.22	0.22	0.11	0.89	0.89	0.06	0.53	0.53
Sat Flow, veh/h	1767	1763	1572	3428	1856	1572	1767	3526	1571	3428	3386	197
Grp Volume(v), veh/h	84	87	94	1087	146	167	92	616	695	158	493	509
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1856	1572	1767	1763	1571	1714	1763	1820
Q Serve(g_s), s	6.1	6.2	7.6	26.0	8.6	12.0	6.6	3.5	23.9	5.9	23.7	23.7
Cycle Q Clear(g_c), s	6.1	6.2	7.6	26.0	8.6	12.0	6.6	3.5	23.9	5.9	23.7	23.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	105	145	129	686	413	350	113	1882	838	209	936	966
V/C Ratio(X)	0.80	0.60	0.73	1.59	0.35	0.48	0.81	0.33	0.83	0.76	0.53	0.53
Avail Cap(c_a), veh/h	150	556	496	686	799	677	122	1882	838	237	936	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.72	0.72	0.72	0.60	0.60	0.60	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.4	57.6	58.2	52.0	42.6	44.0	57.3	3.5	4.6	60.1	19.9	19.9
Incr Delay (d2), s/veh	17.6	4.0	7.6	268.4	0.4	0.7	20.5	0.3	5.8	11.5	2.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	2.9	3.3	36.7	4.0	4.8	3.5	1.1	3.9	2.9	10.2	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.0	61.5	65.8	320.4	43.0	44.7	77.8	3.8	10.4	71.6	22.0	21.9
LnGrp LOS	E	E	E	F	D	D	E	A	B	E	C	C
Approach Vol, veh/h		265			1400			1403			1160	
Approach Delay, s/veh		68.3			258.6			11.9			28.7	
Approach LOS		E			F			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	73.4	30.0	14.7	12.3	73.0	11.7	32.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	9.0	38.0	26.0	41.0	9.0	38.0	11.0	56.0
Max Q Clear Time (g_c+I1), s	7.9	25.9	28.0	9.6	8.6	25.7	8.1	14.0
Green Ext Time (p_c), s	0.1	5.7	0.0	1.1	0.0	5.2	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	101.7
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	55	404	250	47	102	348	1304	68	172	1713	113
Future Volume (veh/h)	66	55	404	250	47	102	348	1304	68	172	1713	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	57	416	258	48	105	359	1344	70	177	1766	116
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	87	423	674	151	136	298	356	1656	86	151	1241	81
Arrive On Green	0.05	0.23	0.23	0.08	0.26	0.26	0.20	0.48	0.48	0.17	0.73	0.73
Sat Flow, veh/h	1781	1870	1579	1781	521	1140	1781	3436	179	1781	3387	220
Grp Volume(v), veh/h	68	57	416	258	0	153	359	694	720	177	918	964
Grp Sat Flow(s),veh/h/ln	1781	1870	1579	1781	0	1661	1781	1777	1838	1781	1777	1831
Q Serve(g_s), s	4.9	3.2	26.7	11.0	0.0	9.7	26.0	43.2	43.4	11.0	47.6	47.6
Cycle Q Clear(g_c), s	4.9	3.2	26.7	11.0	0.0	9.7	26.0	43.2	43.4	11.0	47.6	47.6
Prop In Lane	1.00		1.00	1.00		0.69	1.00		0.10	1.00		0.12
Lane Grp Cap(c), veh/h	87	423	674	151	0	435	356	856	886	151	651	671
V/C Ratio(X)	0.78	0.13	0.62	1.71	0.00	0.35	1.01	0.81	0.81	1.17	1.41	1.44
Avail Cap(c_a), veh/h	151	446	693	151	0	435	356	856	886	151	651	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.38	0.38	0.38	0.09	0.09	0.09
Uniform Delay (d), s/veh	61.1	40.2	29.1	59.5	0.0	39.0	52.0	28.6	28.7	54.0	17.4	17.4
Incr Delay (d2), s/veh	14.0	0.1	1.6	346.8	0.0	0.5	31.3	3.3	3.2	85.1	185.5	197.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	1.5	10.4	19.5	0.0	4.1	14.7	18.8	19.5	8.0	43.0	46.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.1	40.3	30.7	406.3	0.0	39.5	83.3	31.9	31.9	139.1	202.9	214.8
LnGrp LOS	E	D	C	F	A	D	F	C	C	F	F	F
Approach Vol, veh/h		541			411			1773			2059	
Approach Delay, s/veh		37.3			269.8			42.3			203.0	
Approach LOS		D			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	66.6	15.0	33.4	30.0	51.6	10.4	38.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	61.0	11.0	31.0	26.0	46.0	11.0	31.0
Max Q Clear Time (g_c+I1), s	13.0	45.4	13.0	28.7	28.0	49.6	6.9	11.7
Green Ext Time (p_c), s	0.0	8.9	0.0	0.5	0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	130.4
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	490	386	300	272	584	709	56	552	210	908	570	859
Future Volume (veh/h)	490	386	300	272	584	709	56	552	210	908	570	859
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	510	402	0	283	608	0	58	575	0	946	594	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	547	605		303	648		75	728		991	841	
Arrive On Green	0.16	0.17	0.00	0.17	0.18	0.00	0.04	0.20	0.00	0.29	0.45	0.00
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	3554	1585	3456	1870	1585
Grp Volume(v), veh/h	510	402	0	283	608	0	58	575	0	946	594	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	1777	1585	1728	1870	1585
Q Serve(g_s), s	15.7	11.4	0.0	16.8	18.1	0.0	3.5	16.5	0.0	28.9	27.5	0.0
Cycle Q Clear(g_c), s	15.7	11.4	0.0	16.8	18.1	0.0	3.5	16.5	0.0	28.9	27.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	547	605		303	648		75	728		991	841	
V/C Ratio(X)	0.93	0.66		0.93	0.94		0.77	0.79		0.95	0.71	
Avail Cap(c_a), veh/h	547	605		303	648		171	1145		991	959	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.6	41.7	0.0	43.9	43.3	0.0	50.9	40.5	0.0	37.6	23.8	0.0
Incr Delay (d2), s/veh	23.1	2.7	0.0	34.4	21.4	0.0	15.4	2.0	0.0	18.6	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	5.2	0.0	10.3	9.8	0.0	1.9	7.3	0.0	14.5	12.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	44.4	0.0	78.3	64.7	0.0	66.3	42.5	0.0	56.2	25.9	0.0
LnGrp LOS	E	D		E	E		E	D		E	C	
Approach Vol, veh/h		912	A		891	A		633	A		1540	A
Approach Delay, s/veh		57.4			69.0			44.7			44.5	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.3	26.5	22.8	22.8	9.0	52.8	21.5	24.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	30.8	34.6	18.3	18.3	10.3	55.1	17.0	19.6
Max Q Clear Time (g_c+I1), s	30.9	18.5	18.8	13.4	5.5	29.5	17.7	20.1
Green Ext Time (p_c), s	0.0	3.5	0.0	1.1	0.0	4.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	53.0
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	282	330	5	6	611	59	40	20	7	28	10	415
Future Volume (veh/h)	282	330	5	6	611	59	40	20	7	28	10	415
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	307	359	5	7	664	64	43	22	8	30	11	451
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	390	1272	18	16	889	397	61	31	81	576	12	502
Arrive On Green	0.12	0.37	0.37	0.01	0.26	0.26	0.05	0.05	0.05	0.33	0.33	0.33
Sat Flow, veh/h	3346	3475	48	1725	3441	1535	1160	593	1535	1725	37	1504
Grp Volume(v), veh/h	307	178	186	7	664	64	65	0	8	30	0	462
Grp Sat Flow(s),veh/h/ln	1673	1721	1802	1725	1721	1535	1753	0	1535	1725	0	1540
Q Serve(g_s), s	6.8	5.5	5.5	0.3	13.4	2.4	2.8	0.0	0.4	0.9	0.0	21.6
Cycle Q Clear(g_c), s	6.8	5.5	5.5	0.3	13.4	2.4	2.8	0.0	0.4	0.9	0.0	21.6
Prop In Lane	1.00		0.03	1.00		1.00	0.66		1.00	1.00		0.98
Lane Grp Cap(c), veh/h	390	630	660	16	889	397	93	0	81	576	0	515
V/C Ratio(X)	0.79	0.28	0.28	0.45	0.75	0.16	0.70	0.00	0.10	0.05	0.00	0.90
Avail Cap(c_a), veh/h	420	807	846	114	1410	629	730	0	639	684	0	611
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.5	17.0	17.0	37.3	25.8	21.7	35.3	0.0	34.1	17.1	0.0	24.0
Incr Delay (d2), s/veh	9.0	0.2	0.2	18.9	1.3	0.2	9.3	0.0	0.5	0.0	0.0	14.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	2.1	2.2	0.2	5.3	0.9	1.4	0.0	0.1	0.3	0.0	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	17.2	17.2	56.2	27.0	21.9	44.5	0.0	34.6	17.1	0.0	38.4
LnGrp LOS	D	B	B	E	C	C	D	A	C	B	A	D
Approach Vol, veh/h		671			735			73			492	
Approach Delay, s/veh		28.3			26.9			43.4			37.1	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	8.5	5.2	32.2	29.8	13.3	24.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	5.0	35.5	30.0	9.5	31.0
Max Q Clear Time (g_c+I1), s	4.8	2.3	7.5	23.6	8.8	15.4
Green Ext Time (p_c), s	0.3	0.0	2.1	1.7	0.1	4.1

Intersection Summary	
HCM 6th Ctrl Delay	30.5
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	69.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱		↰			↑	↱
Traffic Vol, veh/h	0	0	0	212	8	1	1532	1	0	0	1	3
Future Vol, veh/h	0	0	0	212	8	1	1532	1	0	0	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	0	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	0	0	0	230	9	1	1665	1	0	0	1	3

Major/Minor	Minor1		Major1			Major2			
Conflicting Flow All	3332	3332	1	1	0	-	-	-	0
Stage 1	3331	3331	-	-	-	-	-	-	-
Stage 2	1	1	-	-	-	-	-	-	-
Critical Hdwy	6.65	6.75	6.45	4.35	-	-	-	-	-
Critical Hdwy Stg 1	5.65	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.65	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4.225	3.525	2.425	-	-	-	-	-
Pot Cap-1 Maneuver	~ 7	~ 7	1020	~ 1483	-	0	0	-	-
Stage 1	~ 18	17	-	-	-	0	0	-	-
Stage 2	965	851	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	0	0	1020	~ 1483	-	-	-	-	-
Mov Cap-2 Maneuver	0	0	-	-	-	-	-	-	-
Stage 1	0	0	-	-	-	-	-	-	-
Stage 2	965	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		79.6	0
HCM LOS	-		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	~ 1483	-	-	1020	-	-
HCM Lane V/C Ratio	1.123	-	-	0.001	-	-
HCM Control Delay (s)	79.7	0	-	8.5	-	-
HCM Lane LOS	F	A	-	A	-	-
HCM 95th %tile Q(veh)	38.9	-	-	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	1050	0	0	0	0	1530	287	1	212	0
Future Vol, veh/h	3	1	1050	0	0	0	0	1530	287	1	212	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	415	-	-	-	-	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	3	1	1141	0	0	0	0	1663	312	1	230	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1895	1895	-	-	0	-	1663	0	0
Stage 1	232	232	-	-	-	-	-	-	-
Stage 2	1663	1663	-	-	-	-	-	-	-
Critical Hdwy	6.65	6.75	-	-	-	-	4.35	-	-
Critical Hdwy Stg 1	5.65	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.65	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.725	4.225	-	-	-	-	2.425	-	-
Pot Cap-1 Maneuver	67	61	0	0	-	0	331	-	0
Stage 1	755	672	0	0	-	0	-	-	0
Stage 2	149	136	0	0	-	0	-	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	67	0	-	-	-	-	331	-	-
Mov Cap-2 Maneuver	67	0	-	-	-	-	-	-	-
Stage 1	755	0	-	-	-	-	-	-	-
Stage 2	149	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	62.4	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	67	-	331	-
HCM Lane V/C Ratio	-	0.065	-	0.003	-
HCM Control Delay (s)	-	62.4	0	15.9	-
HCM Lane LOS	-	F	A	C	-
HCM 95th %tile Q(veh)	-	0.2	-	0	-

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	181	56	131	355	84	443	116	1193	248	310	822	130
Future Vol, veh/h	181	56	131	355	84	443	116	1193	248	310	822	130
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	170	-	170	325	-	-	250	-	250	225	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	197	61	142	386	91	482	126	1297	270	337	893	141

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2584	3457	517	2700	3257	649	1034	0	0	1567	0	0
Stage 1	1638	1638	-	1549	1549	-	-	-	-	-	-	-
Stage 2	946	1819	-	1151	1708	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	~ 9	~ 4	447	~ 7	~ 6	~ 362	546	-	-	~ 323	-	-
Stage 1	~ 83	125	-	~ 95	140	-	-	-	-	-	-	-
Stage 2	240	99	-	~ 176	114	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	447	-	0	~ 362	546	-	-	~ 323	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	~ 64	0	-	~ 73	108	-	-	-	-	-	-	-
Stage 2	-	76	-	-	0	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1	24.3
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	546	-	-	-	-	447	-	-	362	~ 323	-	-
HCM Lane V/C Ratio	0.231	-	-	-	-	0.319	-	-	1.33	1.043	-	-
HCM Control Delay (s)	13.6	-	-	-	-	16.8	-	-	196.3	98.9	-	-
HCM Lane LOS	B	-	-	-	-	C	-	-	F	F	-	-
HCM 95th %tile Q(veh)	0.9	-	-	-	-	1.4	-	-	22.8	12.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	10481.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	1	7	554	1	542	4	966	270	277	1032	2
Future Vol, veh/h	7	1	7	554	1	542	4	966	270	277	1032	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	225	-	250	200	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	8	1	8	602	1	589	4	1050	293	301	1122	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2258	3075	561	2222	2784	525	1124	0	0	1343	0	0
Stage 1	1724	1724	-	1058	1058	-	-	-	-	-	-	-
Stage 2	534	1351	-	1164	1726	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	17	8	417	~ 18	13	~ 442	500	-	-	403	-	-
Stage 1	72	112	-	~ 202	254	-	-	-	-	-	-	-
Stage 2	443	178	-	~ 172	112	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	2	417	~ 4	3	~ 442	500	-	-	403	-	-
Mov Cap-2 Maneuver	-	2	-	~ 4	3	-	-	-	-	-	-	-
Stage 1	71	28	-	~ 200	252	-	-	-	-	-	-	-
Stage 2	-	177	-	~ 41	28	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 34988.8	0	7.6
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	500	-	-	-	4	3	442	403	-	-
HCM Lane V/C Ratio	0.009	-	-	150.543	0.362	1.333	0.747	-	-	
HCM Control Delay (s)	12.3	-	-	$ 69093.3	$ 1526.5	190.5	36	-	-	
HCM Lane LOS	B	-	-	-	F	F	F	E	-	-
HCM 95th %tile Q(veh)	0	-	-	-	77.7	0.5	26.7	6	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	291.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	1	10	106	1	112	7	1108	40	45	1554	3
Future Vol, veh/h	18	1	10	106	1	112	7	1108	40	45	1554	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	100	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	20	1	11	115	1	122	8	1204	43	49	1689	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2406	3050	845	2185	3032	624	1692	0	0	1247	0	0
Stage 1	1787	1787	-	1242	1242	-	-	-	-	-	-	-
Stage 2	619	1263	-	943	1790	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	~ 12	8	263	~ 19	9	377	285	-	-	443	-	-
Stage 1	66	103	-	153	204	-	-	-	-	-	-	-
Stage 2	391	199	-	241	103	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 7	7	263	~ 14	8	377	285	-	-	443	-	-
Mov Cap-2 Maneuver	~ 7	7	-	~ 14	8	-	-	-	-	-	-	-
Stage 1	64	92	-	149	198	-	-	-	-	-	-	-
Stage 2	256	193	-	203	92	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	1525.5	$ 3800.2	0.1	0.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	285	-	-	11	27	443	-	-
HCM Lane V/C Ratio	0.027	-	-	2.866	8.816	0.11	-	-
HCM Control Delay (s)	18	-	-	$ 1525.5	$ 3800.2	14.1	-	-
HCM Lane LOS	C	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	5	29.4	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	369.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	155	15	19	36	26	35	16	975	13	23	1381	366
Future Vol, veh/h	155	15	19	36	26	35	16	975	13	23	1381	366
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	168	16	21	39	28	38	17	1060	14	25	1501	398
Number of Lanes	0	2	0	0	2	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	28.8	17.6	143	554
HCM LOS	D	C	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	3%	0%	95%	0%	73%	0%	3%	0%
Vol Thru, %	97%	97%	5%	28%	27%	27%	97%	65%
Vol Right, %	0%	3%	0%	72%	0%	73%	0%	35%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	504	501	163	27	49	48	714	1057
LT Vol	16	0	155	0	36	0	23	0
Through Vol	488	488	8	8	13	13	691	691
RT Vol	0	13	0	19	0	35	0	366
Lane Flow Rate	547	544	177	29	53	52	776	1148
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	1.218	1.206	0.498	0.073	0.152	0.136	1.726	2.474
Departure Headway (Hd)	8.727	8.692	14.476	13.482	13.158	12.263	8.344	8.079
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	421	424	251	268	274	294	442	459
Service Time	6.427	6.392	12.176	11.182	10.858	9.963	6.044	5.779
HCM Lane V/C Ratio	1.299	1.283	0.705	0.108	0.193	0.177	1.756	2.501
HCM Control Delay	145.3	140.6	30.7	17.2	18.2	16.9	356.5	687.4
HCM Lane LOS	F	F	D	C	C	C	F	F
HCM 95th-tile Q	20.5	20	2.6	0.2	0.5	0.5	45.3	86.9

Intersection	
Int Delay, s/veh	46.9

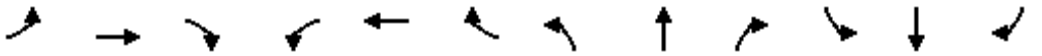
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	1	1	65	1	71	1	921	36	39	1394	8
Future Vol, veh/h	8	1	1	65	1	71	1	921	36	39	1394	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	25	25	25	25	25	25	25	25	25	25	25	25
Mvmt Flow	9	1	1	71	1	77	1	1001	39	42	1515	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2107	2646	762	1865	2631	520	1524	0	0	1040	0	0
Stage 1	1604	1604	-	1023	1023	-	-	-	-	-	-	-
Stage 2	503	1042	-	842	1608	-	-	-	-	-	-	-
Critical Hdwy	8	7	7.4	8	7	7.4	4.6	-	-	4.6	-	-
Critical Hdwy Stg 1	7	6	-	7	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7	6	-	7	6	-	-	-	-	-	-	-
Follow-up Hdwy	3.75	4.25	3.55	3.75	4.25	3.55	2.45	-	-	2.45	-	-
Pot Cap-1 Maneuver	22	16	301	~ 35	17	445	337	-	-	543	-	-
Stage 1	87	130	-	214	265	-	-	-	-	-	-	-
Stage 2	464	259	-	280	130	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	16	15	301	~ 31	16	445	337	-	-	543	-	-
Mov Cap-2 Maneuver	16	15	-	~ 31	16	-	-	-	-	-	-	-
Stage 1	87	120	-	213	264	-	-	-	-	-	-	-
Stage 2	381	258	-	255	120	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 365.5	$ 841.2	0	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	337	-	-	18	59	543	-	-
HCM Lane V/C Ratio	0.003	-	-	0.604	2.524	0.078	-	-
HCM Control Delay (s)	15.7	-	-	$ 365.5	$ 841.2	12.2	-	-
HCM Lane LOS	C	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.6	15	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	859	131	97	710	483	204	128	124	743	112	611
Future Volume (veh/h)	340	859	131	97	710	483	204	128	124	743	112	611
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	370	934	142	105	772	0	222	139	135	808	122	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	448	1068	476	133	872		311	220	187	894	536	
Arrive On Green	0.13	0.31	0.31	0.08	0.25	0.00	0.09	0.12	0.12	0.26	0.29	0.00
Sat Flow, veh/h	3374	3469	1547	1739	3469	1547	3374	1826	1547	3374	1826	1547
Grp Volume(v), veh/h	370	934	142	105	772	0	222	139	135	808	122	0
Grp Sat Flow(s),veh/h/ln	1687	1735	1547	1739	1735	1547	1687	1826	1547	1687	1826	1547
Q Serve(g_s), s	8.4	19.9	5.5	4.6	16.8	0.0	5.0	5.7	6.6	18.1	4.0	0.0
Cycle Q Clear(g_c), s	8.4	19.9	5.5	4.6	16.8	0.0	5.0	5.7	6.6	18.1	4.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	448	1068	476	133	872		311	220	187	894	536	
V/C Ratio(X)	0.83	0.87	0.30	0.79	0.89		0.71	0.63	0.72	0.90	0.23	
Avail Cap(c_a), veh/h	453	1100	491	138	910		479	451	382	936	698	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.0	25.6	20.6	35.5	28.2	0.0	34.5	32.7	33.1	27.8	20.9	0.0
Incr Delay (d2), s/veh	11.9	7.9	0.3	25.4	10.1	0.0	3.0	3.0	5.2	11.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	8.9	1.9	2.9	7.9	0.0	2.1	2.6	2.7	8.4	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	33.5	21.0	60.9	38.3	0.0	37.5	35.7	38.3	39.5	21.1	0.0
LnGrp LOS	D	C	C	E	D		D	D	D	D	C	
Approach Vol, veh/h		1446			877	A		496			930	A
Approach Delay, s/veh		35.2			41.0			37.2			37.1	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.2	13.9	10.5	28.6	11.7	27.4	14.9	24.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.7	19.3	6.2	24.8	11.1	29.9	10.5	20.5
Max Q Clear Time (g_c+I1), s	20.1	8.6	6.6	21.9	7.0	6.0	10.4	18.8
Green Ext Time (p_c), s	0.6	0.9	0.0	1.8	0.3	0.6	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	122	352	17	1	551	1	31	1	1	1	1	144
Future Vol, veh/h	122	352	17	1	551	1	31	1	1	1	1	144
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	133	383	18	1	599	1	34	1	1	1	1	157

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	600	0	0	401	0	0	960	1260	201	1060	1269	300
Stage 1	-	-	-	-	-	-	658	658	-	602	602	-
Stage 2	-	-	-	-	-	-	302	602	-	458	667	-
Critical Hdwy	4.2	-	-	4.2	-	-	7.6	6.6	7	7.6	6.6	7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.6	-	6.6	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.6	-	6.6	5.6	-
Follow-up Hdwy	2.25	-	-	2.25	-	-	3.55	4.05	3.35	3.55	4.05	3.35
Pot Cap-1 Maneuver	953	-	-	1133	-	-	207	165	797	174	163	687
Stage 1	-	-	-	-	-	-	413	452	-	446	480	-
Stage 2	-	-	-	-	-	-	674	480	-	544	448	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	953	-	-	1133	-	-	142	142	797	154	140	687
Mov Cap-2 Maneuver	-	-	-	-	-	-	142	142	-	154	140	-
Stage 1	-	-	-	-	-	-	355	389	-	384	480	-
Stage 2	-	-	-	-	-	-	519	480	-	466	385	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0	37	12.1
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	142	241	953	-	-	1133	-	-	154	669
HCM Lane V/C Ratio	0.237	0.009	0.139	-	-	0.001	-	-	0.007	0.236
HCM Control Delay (s)	38.1	20.1	9.4	-	-	8.2	-	-	28.5	12
HCM Lane LOS	E	C	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.9	0	0.5	-	-	0	-	-	0	0.9

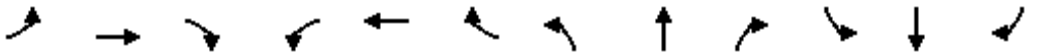
Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	442	47	1	874	1	120	1	1	1	1	35
Future Vol, veh/h	19	442	47	1	874	1	120	1	1	1	1	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	21	480	51	1	950	1	130	1	1	1	1	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	951	0	0	531	0	0	1026	1501	266	1236	1526	476
Stage 1	-	-	-	-	-	-	548	548	-	953	953	-
Stage 2	-	-	-	-	-	-	478	953	-	283	573	-
Critical Hdwy	4.2	-	-	4.2	-	-	7.6	6.6	7	7.6	6.6	7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	5.6	-	6.6	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	5.6	-	6.6	5.6	-
Follow-up Hdwy	2.25	-	-	2.25	-	-	3.55	4.05	3.35	3.55	4.05	3.35
Pot Cap-1 Maneuver	700	-	-	1012	-	-	185	117	723	129	113	527
Stage 1	-	-	-	-	-	-	481	508	-	273	329	-
Stage 2	-	-	-	-	-	-	529	329	-	692	495	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	700	-	-	1012	-	-	166	113	723	125	109	527
Mov Cap-2 Maneuver	-	-	-	-	-	-	166	113	-	125	109	-
Stage 1	-	-	-	-	-	-	467	493	-	265	329	-
Stage 2	-	-	-	-	-	-	489	329	-	669	480	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	77.5	13.8
HCM LOS			F	B

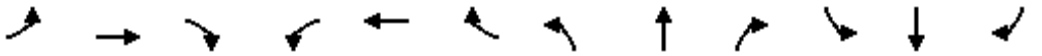
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	166	195	700	-	-	1012	-	-	125	476
HCM Lane V/C Ratio	0.786	0.011	0.03	-	-	0.001	-	-	0.009	0.082
HCM Control Delay (s)	78.4	23.7	10.3	-	-	8.6	-	-	34.1	13.2
HCM Lane LOS	F	C	B	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	5.1	0	0.1	-	-	0	-	-	0	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	61	41	357	35	62	28	813	781	111	437	17
Future Volume (veh/h)	56	61	41	357	35	62	28	813	781	111	437	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	60	66	44	384	38	67	30	874	840	119	470	18
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	77	152	93	307	220	186	55	2233	1136	173	2261	86
Arrive On Green	0.04	0.07	0.07	0.09	0.12	0.12	0.03	0.65	0.65	0.05	0.67	0.67
Sat Flow, veh/h	1725	2048	1247	3346	1811	1527	1725	3441	1534	3346	3379	129
Grp Volume(v), veh/h	60	54	56	384	38	67	30	874	840	119	239	249
Grp Sat Flow(s),veh/h/ln	1725	1721	1575	1673	1811	1527	1725	1721	1534	1673	1721	1788
Q Serve(g_s), s	4.1	3.6	4.1	11.0	2.3	4.8	2.1	14.3	37.7	4.2	6.4	6.4
Cycle Q Clear(g_c), s	4.1	3.6	4.1	11.0	2.3	4.8	2.1	14.3	37.7	4.2	6.4	6.4
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	77	128	117	307	220	186	55	2233	1136	173	1151	1196
V/C Ratio(X)	0.78	0.43	0.47	1.25	0.17	0.36	0.55	0.39	0.74	0.69	0.21	0.21
Avail Cap(c_a), veh/h	158	588	538	307	619	522	158	2233	1136	307	1151	1196
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.94	0.94	0.94	0.63	0.63	0.63	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.8	53.1	53.3	54.5	47.3	48.4	57.3	9.9	8.9	55.9	7.6	7.6
Incr Delay (d2), s/veh	15.7	2.2	3.0	136.2	0.3	1.1	5.4	0.3	2.8	4.8	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.6	1.7	10.4	1.0	1.9	1.0	5.3	11.5	1.9	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.5	55.3	56.3	190.7	47.6	49.5	62.6	10.2	11.7	60.7	8.0	8.0
LnGrp LOS	E	E	E	F	D	D	E	B	B	E	A	A
Approach Vol, veh/h		170			489			1744			607	
Approach Delay, s/veh		61.7			160.2			11.8			18.4	
Approach LOS		E			F			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	81.9	15.0	12.9	7.8	84.3	9.3	18.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	41.0	11.0	41.0	11.0	41.0	11.0	41.0
Max Q Clear Time (g_c+I1), s	6.2	39.7	13.0	6.1	4.1	8.4	6.1	6.8
Green Ext Time (p_c), s	0.1	1.1	0.0	0.6	0.0	3.2	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	40.1
HCM 6th LOS	D



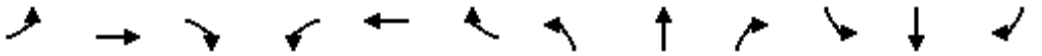
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	18	193	120	14	55	201	1498	60	69	727	50
Future Volume (veh/h)	83	18	193	120	14	55	201	1498	60	69	727	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	88	19	0	128	15	59	214	1594	64	73	773	53
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	110	98		129	21	82	244	1630	65	439	2052	913
Arrive On Green	0.06	0.05	0.00	0.08	0.07	0.07	0.14	0.48	0.48	0.25	0.60	0.60
Sat Flow, veh/h	1725	1811	1535	1725	321	1263	1725	3372	135	1725	3441	1531
Grp Volume(v), veh/h	88	19	0	128	0	74	214	811	847	73	773	53
Grp Sat Flow(s),veh/h/ln	1725	1811	1535	1725	0	1584	1725	1721	1786	1725	1721	1531
Q Serve(g_s), s	6.0	1.2	0.0	8.9	0.0	5.5	14.6	55.2	56.0	4.0	14.0	1.7
Cycle Q Clear(g_c), s	6.0	1.2	0.0	8.9	0.0	5.5	14.6	55.2	56.0	4.0	14.0	1.7
Prop In Lane	1.00		1.00	1.00		0.80	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	110	98		129	0	103	244	832	863	439	2052	913
V/C Ratio(X)	0.80	0.19		0.99	0.00	0.72	0.88	0.97	0.98	0.17	0.38	0.06
Avail Cap(c_a), veh/h	187	468		129	0	356	359	832	863	439	2052	913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.40	0.40	0.40	0.93	0.93	0.93
Uniform Delay (d), s/veh	55.4	54.3	0.0	55.5	0.0	55.0	50.5	30.3	30.5	34.8	12.6	10.1
Incr Delay (d2), s/veh	12.2	1.0	0.0	75.7	0.0	9.0	6.9	14.6	15.5	0.2	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.6	0.0	6.6	0.0	2.5	6.8	25.4	26.9	1.7	5.4	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.6	55.2	0.0	131.2	0.0	64.0	57.4	44.9	46.0	35.0	13.1	10.2
LnGrp LOS	E	E		F	A	E	E	D	D	C	B	B
Approach Vol, veh/h		107	A		202			1872			899	
Approach Delay, s/veh		65.4			106.6			46.8			14.7	
Approach LOS		E			F			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.5	62.0	13.0	10.5	21.0	75.6	11.7	11.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	58.0	9.0	31.0	25.0	39.0	13.0	27.0
Max Q Clear Time (g_c+I1), s	6.0	58.0	10.9	3.2	16.6	16.0	8.0	7.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.4	5.9	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	42.0
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	311	1	0	782	0	0	0	0	0
Future Volume (veh/h)	0	0	0	311	1	0	782	0	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1530	1530	1530	1530	1530	0	0	1530	1530
Adj Flow Rate, veh/h				338	1	0	850	0	0	0	0	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				25	25	25	25	25	0	0	25	25
Cap, veh/h				451	1		1177	637	0	0	5	
Arrive On Green				0.31	0.31	0.00	0.42	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h				1453	4	1296	2826	1530	0	0	-68828	1296
Grp Volume(v), veh/h				339	0	0	850	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln				1457	0	1296	1413	1530	0	0	1530	1296
Q Serve(g_s), s				6.9	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s				6.9	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				453	0		1177	637	0	0	5	
V/C Ratio(X)				0.75	0.00		0.72	0.00	0.00	0.00	0.00	
Avail Cap(c_a), veh/h				1038	0		2570	1391	0	0	1067	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh				10.2	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh				2.5	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.8	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				12.7	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0
LnGrp LOS				B	A		A	A	A	A	A	
Approach Vol, veh/h					339	A		850			0	A
Approach Delay, s/veh					12.7			8.9			0.0	
Approach LOS					B			A				

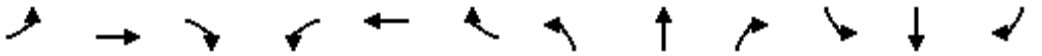
Timer - Assigned Phs	2			6		8						
Phs Duration (G+Y+Rc), s	18.2			0.0		14.7						
Change Period (Y+Rc), s	4.5			4.5		4.5						
Max Green Setting (Gmax), s	30.0			23.0		23.5						
Max Q Clear Time (g_c+I1), s	10.3			0.0		8.9						
Green Ext Time (p_c), s	3.5			0.0		1.8						

Intersection Summary		
HCM 6th Ctrl Delay		10.0
HCM 6th LOS		A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



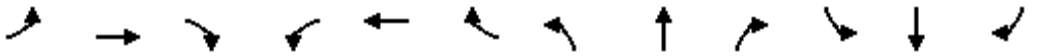
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	1491	0	0	0	0	779	115	1	310	0
Future Volume (veh/h)	3	1	1491	0	0	0	0	779	115	1	310	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530				0	1530	1530	1530	1530	0
Adj Flow Rate, veh/h	3	1	0				0	847	0	1	337	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25				0	25	25	25	25	0
Cap, veh/h	6	2					0	1416		5	1005	0
Arrive On Green	0.01	0.01	0.00				0.00	0.49	0.00	0.00	0.66	0.00
Sat Flow, veh/h	1106	369	1296				0	2983	1296	1457	1530	0
Grp Volume(v), veh/h	4	0	0				0	847	0	1	337	0
Grp Sat Flow(s),veh/h/ln	1474	0	1296				0	1453	1296	1457	1530	0
Q Serve(g_s), s	0.1	0.0	0.0				0.0	5.6	0.0	0.0	2.6	0.0
Cycle Q Clear(g_c), s	0.1	0.0	0.0				0.0	5.6	0.0	0.0	2.6	0.0
Prop In Lane	0.75		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	8	0					0	1416		5	1005	0
V/C Ratio(X)	0.50	0.00					0.00	0.60		0.18	0.34	0.00
Avail Cap(c_a), veh/h	1050	0					0	2450		273	1834	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.2	0.0	0.0				0.0	5.0	0.0	13.3	2.0	0.0
Incr Delay (d2), s/veh	40.2	0.0	0.0				0.0	0.4	0.0	15.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0				0.0	0.6	0.0	0.0	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.5	0.0	0.0				0.0	5.4	0.0	28.6	2.2	0.0
LnGrp LOS	D	A					A	A		C	A	A
Approach Vol, veh/h		4	A					847	A		338	
Approach Delay, s/veh		53.5						5.4			2.3	
Approach LOS		D						A			A	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	4.5	17.5		4.6		22.0
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	5.0	22.5		19.0		32.0
Max Q Clear Time (g_c+I1), s	2.0	7.6		2.1		4.6
Green Ext Time (p_c), s	0.0	5.4		0.0		2.2

Intersection Summary	
HCM 6th Ctrl Delay	4.6
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.



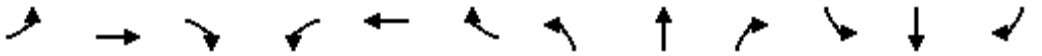
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	107	130	107	49	122	152	641	372	527	1069	205
Future Volume (veh/h)	131	107	130	107	49	122	152	641	372	527	1069	205
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Adj Flow Rate, veh/h	142	116	141	116	53	0	165	697	0	573	1162	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25	25	25	25	25	25	25	25	25	25
Cap, veh/h	167	212	179	169	128		192	1562		668	1390	620
Arrive On Green	0.11	0.14	0.14	0.06	0.08	0.00	0.13	0.37	0.00	0.24	0.48	0.48
Sat Flow, veh/h	1457	1530	1296	2826	1530	1296	1457	4176	1296	2826	2906	1296
Grp Volume(v), veh/h	142	116	141	116	53	0	165	697	0	573	1162	223
Grp Sat Flow(s),veh/h/ln	1457	1530	1296	1413	1530	1296	1457	1392	1296	1413	1453	1296
Q Serve(g_s), s	9.0	6.7	9.9	3.8	3.1	0.0	10.4	11.8	0.0	18.3	32.7	10.2
Cycle Q Clear(g_c), s	9.0	6.7	9.9	3.8	3.1	0.0	10.4	11.8	0.0	18.3	32.7	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	167	212	179	169	128		192	1562		668	1390	620
V/C Ratio(X)	0.85	0.55	0.79	0.68	0.42		0.86	0.45		0.86	0.84	0.36
Avail Cap(c_a), veh/h	214	687	582	345	650		255	1721		1033	1750	781
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	37.8	39.2	43.4	41.0	0.0	40.0	22.1	0.0	34.4	21.3	15.5
Incr Delay (d2), s/veh	21.7	2.2	7.4	4.8	2.1	0.0	19.4	0.2	0.0	4.6	3.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	2.6	3.4	1.4	1.2	0.0	4.7	3.7	0.0	6.6	11.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.5	40.0	46.6	48.2	43.1	0.0	59.4	22.3	0.0	39.0	24.3	15.8
LnGrp LOS	E	D	D	D	D		E	C		D	C	B
Approach Vol, veh/h		399			169	A		862	A		1958	
Approach Delay, s/veh		50.4			46.6			29.4			27.7	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.7	39.7	10.1	17.5	16.9	49.5	15.3	12.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	34.4	38.8	11.5	42.3	16.5	56.7	13.8	40.0
Max Q Clear Time (g_c+I1), s	20.3	13.8	5.8	11.9	12.4	34.7	11.0	5.1
Green Ext Time (p_c), s	2.0	5.1	0.1	1.1	0.2	10.3	0.1	0.2

Intersection Summary	
HCM 6th Ctrl Delay	31.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.



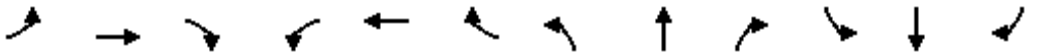
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	2	180	1	183	10	989	591	609	688	5
Future Volume (veh/h)	2	1	2	180	1	183	10	989	591	609	688	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Adj Flow Rate, veh/h	2	1	2	196	1	0	11	1075	642	662	748	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25	25	25	25	25	25	25	25	25	25
Cap, veh/h	9	3	6	262	142		19	1372	732	728	2083	929
Arrive On Green	0.01	0.01	0.01	0.09	0.09	0.00	0.01	0.47	0.47	0.26	0.72	0.72
Sat Flow, veh/h	1457	455	910	2826	1530	1296	1457	2906	1296	2826	2906	1296
Grp Volume(v), veh/h	2	0	3	196	1	0	11	1075	642	662	748	5
Grp Sat Flow(s),veh/h/ln	1457	0	1366	1413	1530	1296	1457	1453	1296	1413	1453	1296
Q Serve(g_s), s	0.1	0.0	0.2	7.1	0.1	0.0	0.8	32.6	44.9	23.9	10.3	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.2	7.1	0.1	0.0	0.8	32.6	44.9	23.9	10.3	0.1
Prop In Lane	1.00		0.67	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	9	0	9	262	142		19	1372	732	728	2083	929
V/C Ratio(X)	0.21	0.00	0.34	0.75	0.01		0.58	0.78	0.88	0.91	0.36	0.01
Avail Cap(c_a), veh/h	194	0	182	993	537		69	1394	742	819	2098	936
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	0.0	52.1	46.6	43.4	0.0	51.7	23.3	19.7	37.9	5.7	4.2
Incr Delay (d2), s/veh	10.8	0.0	21.2	4.2	0.0	0.0	24.8	3.0	11.4	13.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	2.6	0.0	0.0	0.4	11.1	18.0	9.4	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.9	0.0	73.3	50.8	43.4	0.0	76.4	26.2	31.2	51.0	5.8	4.2
LnGrp LOS	E	A	E	D	D		E	C	C	D	A	A
Approach Vol, veh/h		5			197	A		1728			1415	
Approach Delay, s/veh		69.1			50.8			28.4			27.0	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.6	54.2		5.2	5.9	80.0		14.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	30.5	50.5		14.0	5.0	76.0		37.0				
Max Q Clear Time (g_c+I1), s	25.9	46.9		2.2	2.8	12.3		9.1				
Green Ext Time (p_c), s	1.2	2.8		0.0	0.0	6.3		0.7				

Intersection Summary		
HCM 6th Ctrl Delay		29.2
HCM 6th LOS		C

Notes

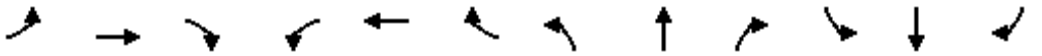
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	358	44	30	31	35	22	25	1389	36	20	643	111
Future Volume (veh/h)	358	44	30	31	35	22	25	1389	36	20	643	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Adj Flow Rate, veh/h	389	48	33	34	38	24	27	1510	39	22	699	121
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25	25	25	25	25	25	25	25	25	25
Cap, veh/h	360	760	339	42	126	56	37	1545	689	32	1536	685
Arrive On Green	0.25	0.26	0.26	0.03	0.04	0.04	0.03	0.53	0.53	0.02	0.53	0.53
Sat Flow, veh/h	1457	2906	1296	1457	2906	1296	1457	2906	1296	1457	2906	1296
Grp Volume(v), veh/h	389	48	33	34	38	24	27	1510	39	22	699	121
Grp Sat Flow(s),veh/h/ln	1457	1453	1296	1457	1453	1296	1457	1453	1296	1457	1453	1296
Q Serve(g_s), s	28.5	1.4	2.2	2.7	1.5	2.1	2.1	58.4	1.7	1.7	17.2	5.6
Cycle Q Clear(g_c), s	28.5	1.4	2.2	2.7	1.5	2.1	2.1	58.4	1.7	1.7	17.2	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	360	760	339	42	126	56	37	1545	689	32	1536	685
V/C Ratio(X)	1.08	0.06	0.10	0.81	0.30	0.43	0.74	0.98	0.06	0.69	0.46	0.18
Avail Cap(c_a), veh/h	360	1313	585	106	806	360	95	1549	691	63	1536	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.4	32.0	32.3	55.7	53.5	53.8	55.8	26.3	13.0	56.0	16.9	14.1
Incr Delay (d2), s/veh	70.7	0.0	0.1	29.6	1.3	5.1	24.8	17.6	0.0	23.1	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.2	0.5	0.7	1.3	0.6	0.8	1.0	22.5	0.5	0.8	5.7	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	114.2	32.0	32.4	85.3	54.8	58.9	80.7	44.0	13.1	79.1	17.1	14.3
LnGrp LOS	F	C	C	F	D	E	F	D	B	E	B	B
Approach Vol, veh/h		470			96			1576			842	
Approach Delay, s/veh		100.0			66.6			43.8			18.3	
Approach LOS		F			E			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	65.8	7.8	34.7	7.4	65.5	33.0	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	61.5	8.4	52.1	7.5	59.0	28.5	32.0
Max Q Clear Time (g_c+I1), s	3.7	60.4	4.7	4.2	4.1	19.2	30.5	4.1
Green Ext Time (p_c), s	0.0	0.9	0.0	0.4	0.0	6.4	0.0	0.2

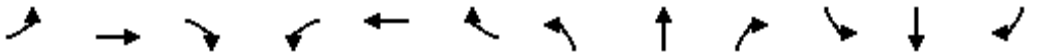
Intersection Summary	
HCM 6th Ctrl Delay	46.2
HCM 6th LOS	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1	1	27	1	30	1	1411	74	81	591	21
Future Volume (veh/h)	20	1	1	27	1	30	1	1411	74	81	591	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Adj Flow Rate, veh/h	22	1	1	29	1	33	1	1534	80	88	642	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25	25	25	25	25	25	25	25	25	25
Cap, veh/h	38	38	38	48	2	76	3	2062	108	104	2389	85
Arrive On Green	0.03	0.05	0.05	0.03	0.06	0.06	0.00	0.51	0.51	0.07	0.58	0.58
Sat Flow, veh/h	1457	702	702	1457	38	1264	1457	4063	212	1457	4139	148
Grp Volume(v), veh/h	22	0	2	29	0	34	1	1051	563	88	431	234
Grp Sat Flow(s),veh/h/ln	1457	0	1403	1457	0	1302	1457	1392	1491	1457	1392	1503
Q Serve(g_s), s	0.8	0.0	0.1	1.1	0.0	1.4	0.0	16.1	16.1	3.2	4.2	4.2
Cycle Q Clear(g_c), s	0.8	0.0	0.1	1.1	0.0	1.4	0.0	16.1	16.1	3.2	4.2	4.2
Prop In Lane	1.00		0.50	1.00		0.97	1.00		0.14	1.00		0.10
Lane Grp Cap(c), veh/h	38	0	76	48	0	79	3	1413	757	104	1607	868
V/C Ratio(X)	0.58	0.00	0.03	0.61	0.00	0.43	0.37	0.74	0.74	0.85	0.27	0.27
Avail Cap(c_a), veh/h	138	0	472	138	0	438	135	1683	901	171	1750	945
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	0.0	24.1	25.7	0.0	24.4	26.8	10.5	10.5	24.7	5.7	5.7
Incr Delay (d2), s/veh	13.2	0.0	0.1	11.9	0.0	3.7	67.8	1.5	2.8	18.5	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.5	0.0	0.5	0.1	3.9	4.4	1.5	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	0.0	24.2	37.6	0.0	28.1	94.6	12.0	13.3	43.2	5.8	5.9
LnGrp LOS	D	A	C	D	A	C	F	B	B	D	A	A
Approach Vol, veh/h		24			63			1615			753	
Approach Delay, s/veh		37.9			32.4			12.5			10.2	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	31.8	6.3	7.4	4.6	35.5	5.9	7.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.3	32.5	5.1	18.1	5.0	33.8	5.1	18.1
Max Q Clear Time (g_c+I1), s	5.2	18.1	3.1	2.1	2.0	6.2	2.8	3.4
Green Ext Time (p_c), s	0.0	9.2	0.0	0.0	0.0	4.6	0.0	0.1

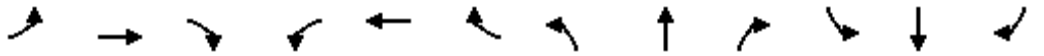
Intersection Summary	
HCM 6th Ctrl Delay	12.5
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	686	36	1	160	2	10	1	1	2	1	49
Future Volume (veh/h)	123	686	36	1	160	2	10	1	1	2	1	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	134	746	39	1	174	2	11	1	1	2	1	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	181	1173	61	5	869	10	24	60	60	5	2	92
Arrive On Green	0.11	0.36	0.36	0.00	0.26	0.26	0.01	0.07	0.07	0.00	0.06	0.06
Sat Flow, veh/h	1668	3218	168	1668	3370	39	1668	804	804	1668	28	1461
Grp Volume(v), veh/h	134	386	399	1	86	90	11	0	2	2	0	54
Grp Sat Flow(s),veh/h/ln	1668	1664	1722	1668	1664	1745	1668	0	1607	1668	0	1489
Q Serve(g_s), s	2.5	6.2	6.2	0.0	1.3	1.3	0.2	0.0	0.0	0.0	0.0	1.1
Cycle Q Clear(g_c), s	2.5	6.2	6.2	0.0	1.3	1.3	0.2	0.0	0.0	0.0	0.0	1.1
Prop In Lane	1.00		0.10	1.00		0.02	1.00		0.50	1.00		0.98
Lane Grp Cap(c), veh/h	181	607	628	5	429	450	24	0	120	5	0	93
V/C Ratio(X)	0.74	0.64	0.64	0.19	0.20	0.20	0.45	0.00	0.02	0.39	0.00	0.58
Avail Cap(c_a), veh/h	310	978	1012	258	926	971	258	0	895	258	0	829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.0	8.5	8.5	16.1	9.4	9.4	15.8	0.0	13.9	16.1	0.0	14.7
Incr Delay (d2), s/veh	5.9	1.1	1.1	17.3	0.2	0.2	12.6	0.0	0.1	41.5	0.0	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.5	1.5	0.0	0.3	0.4	0.2	0.0	0.0	0.1	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.9	9.6	9.6	33.4	9.6	9.6	28.4	0.0	13.9	57.6	0.0	20.3
LnGrp LOS	B	A	A	C	A	A	C	A	B	E	A	C
Approach Vol, veh/h		919			177			13			56	
Approach Delay, s/veh		11.1			9.7			26.2			21.6	
Approach LOS		B			A			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	6.9	4.5	16.3	5.0	6.5	8.0	12.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	5.0	19.0	5.0	18.0	6.0	18.0
Max Q Clear Time (g_c+I1), s	2.0	2.0	2.0	8.2	2.2	3.1	4.5	3.3
Green Ext Time (p_c), s	0.0	0.0	0.0	3.6	0.0	0.2	0.0	0.7

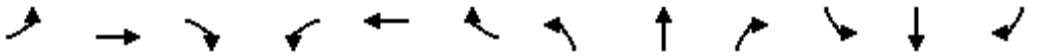
Intersection Summary	
HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	971	120	1	296	1	36	1	1	1	1	12
Future Volume (veh/h)	40	971	120	1	296	1	36	1	1	1	1	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	43	1055	130	1	322	1	39	1	1	1	1	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	79	1472	181	4	1524	5	73	51	51	4	2	30
Arrive On Green	0.05	0.49	0.49	0.00	0.45	0.45	0.04	0.06	0.06	0.00	0.02	0.02
Sat Flow, veh/h	1668	2983	367	1668	3404	11	1668	804	804	1668	107	1394
Grp Volume(v), veh/h	43	588	597	1	157	166	39	0	2	1	0	14
Grp Sat Flow(s),veh/h/ln	1668	1664	1686	1668	1664	1750	1668	0	1607	1668	0	1501
Q Serve(g_s), s	1.0	11.3	11.4	0.0	2.4	2.4	0.9	0.0	0.0	0.0	0.0	0.4
Cycle Q Clear(g_c), s	1.0	11.3	11.4	0.0	2.4	2.4	0.9	0.0	0.0	0.0	0.0	0.4
Prop In Lane	1.00		0.22	1.00		0.01	1.00		0.50	1.00		0.93
Lane Grp Cap(c), veh/h	79	822	832	4	745	784	73	0	103	4	0	32
V/C Ratio(X)	0.55	0.72	0.72	0.25	0.21	0.21	0.53	0.00	0.02	0.25	0.00	0.43
Avail Cap(c_a), veh/h	265	1143	1157	208	1086	1141	208	0	734	208	0	686
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	8.1	8.1	20.4	6.9	6.9	19.2	0.0	18.0	20.4	0.0	19.8
Incr Delay (d2), s/veh	5.8	1.3	1.3	28.6	0.1	0.1	5.9	0.0	0.1	28.6	0.0	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.7	2.8	0.0	0.6	0.6	0.4	0.0	0.0	0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	9.4	9.4	49.0	7.0	7.0	25.1	0.0	18.0	49.0	0.0	28.7
LnGrp LOS	C	A	A	D	A	A	C	A	B	D	A	C
Approach Vol, veh/h		1228			324			41			15	
Approach Delay, s/veh		10.0			7.2			24.8			30.1	
Approach LOS		A			A			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	7.1	4.6	24.7	6.3	5.4	6.4	22.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.1	18.7	5.1	28.1	5.1	18.7	6.5	26.7
Max Q Clear Time (g_c+I1), s	2.0	2.0	2.0	13.4	2.9	2.4	3.0	4.4
Green Ext Time (p_c), s	0.0	0.0	0.0	6.8	0.0	0.0	0.0	1.7

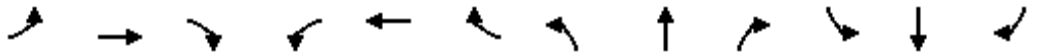
Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	83	89	1033	139	159	87	585	660	150	900	52
Future Volume (veh/h)	80	83	89	1033	139	159	87	585	660	150	900	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	84	87	94	1087	146	167	92	616	695	158	947	55
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	105	139	124	1148	657	556	114	1418	1158	210	1350	78
Arrive On Green	0.06	0.08	0.08	0.33	0.35	0.35	0.04	0.27	0.27	0.06	0.40	0.40
Sat Flow, veh/h	1767	1763	1572	3428	1856	1572	1767	3526	1570	3428	3386	197
Grp Volume(v), veh/h	84	87	94	1087	146	167	92	616	695	158	493	509
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1856	1572	1767	1763	1570	1714	1763	1820
Q Serve(g_s), s	6.1	6.2	7.6	40.1	7.2	10.0	6.7	18.8	26.3	5.9	30.4	30.4
Cycle Q Clear(g_c), s	6.1	6.2	7.6	40.1	7.2	10.0	6.7	18.8	26.3	5.9	30.4	30.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	105	139	124	1148	657	556	114	1418	1158	210	703	726
V/C Ratio(X)	0.80	0.63	0.76	0.95	0.22	0.30	0.81	0.43	0.60	0.75	0.70	0.70
Avail Cap(c_a), veh/h	163	258	230	1187	742	629	122	1418	1158	264	703	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.72	0.72	0.72	0.60	0.60	0.60	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.3	58.0	58.7	42.1	29.5	30.4	61.4	35.3	9.7	60.0	32.6	32.6
Incr Delay (d2), s/veh	13.9	4.6	9.1	11.7	0.1	0.2	19.6	0.6	1.4	9.0	5.8	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.0	3.4	18.7	3.3	3.9	3.7	8.6	10.0	2.8	14.0	14.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.2	62.6	67.8	53.8	29.6	30.6	81.0	35.8	11.1	69.0	38.4	38.2
LnGrp LOS	E	E	E	D	C	C	F	D	B	E	D	D
Approach Vol, veh/h		265			1400			1403			1160	
Approach Delay, s/veh		68.1			48.5			26.6			42.5	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	56.3	47.5	14.2	12.4	55.8	11.8	50.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	10.0	40.0	45.0	19.0	9.0	41.0	12.0	52.0
Max Q Clear Time (g_c+I1), s	7.9	28.3	42.1	9.6	8.7	32.4	8.1	12.0
Green Ext Time (p_c), s	0.1	5.6	1.4	0.6	0.0	4.1	0.1	1.5

Intersection Summary	
HCM 6th Ctrl Delay	40.8
HCM 6th LOS	D



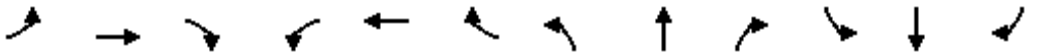
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	55	404	250	47	102	348	1304	68	172	1713	113
Future Volume (veh/h)	66	55	404	250	47	102	348	1304	68	172	1713	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	57	0	258	48	105	359	1344	70	177	1766	116
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	87	142		151	58	127	356	2171	113	151	1835	819
Arrive On Green	0.05	0.08	0.00	0.08	0.11	0.11	0.20	0.63	0.63	0.17	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	1781	519	1136	1781	3436	179	1781	3554	1585
Grp Volume(v), veh/h	68	57	0	258	0	153	359	694	720	177	1766	116
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1655	1781	1777	1838	1781	1777	1585
Q Serve(g_s), s	4.9	3.8	0.0	11.0	0.0	11.8	26.0	30.7	30.8	11.0	0.0	0.0
Cycle Q Clear(g_c), s	4.9	3.8	0.0	11.0	0.0	11.8	26.0	30.7	30.8	11.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.69	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	87	142		151	0	185	356	1123	1161	151	1835	819
V/C Ratio(X)	0.78	0.40		1.71	0.00	0.83	1.01	0.62	0.62	1.17	0.96	0.14
Avail Cap(c_a), veh/h	151	446		151	0	395	356	1123	1161	151	1835	819
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	0.38	0.38	0.38	0.39	0.39	0.39
Uniform Delay (d), s/veh	61.1	57.3	0.0	59.5	0.0	56.5	52.0	14.5	14.5	54.0	0.0	0.0
Incr Delay (d2), s/veh	14.0	1.8	0.0	346.8	0.0	9.1	31.3	1.0	1.0	102.5	6.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	1.9	0.0	19.5	0.0	5.4	14.7	12.2	12.6	8.8	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.1	59.1	0.0	406.3	0.0	65.6	83.3	15.4	15.4	156.5	6.9	0.1
LnGrp LOS	E	E		F	A	E	F	B	B	F	A	A
Approach Vol, veh/h		125	A		411			1773			2059	
Approach Delay, s/veh		67.8			279.5			29.2			19.4	
Approach LOS		E			F			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	86.1	15.0	13.9	30.0	71.1	10.4	18.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	61.0	11.0	31.0	26.0	46.0	11.0	31.0
Max Q Clear Time (g_c+I1), s	13.0	32.8	13.0	5.8	28.0	2.0	6.9	13.8
Green Ext Time (p_c), s	0.0	12.3	0.0	0.2	0.0	23.4	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	49.2
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.



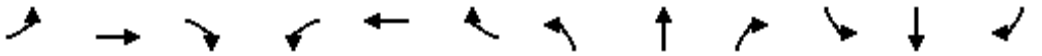
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	213	8	0	1533	0	0	0	0	0
Future Volume (veh/h)	0	0	0	213	8	0	1533	0	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1530	1530	1530	1530	1530	0	0	1530	1530
Adj Flow Rate, veh/h				232	9	0	1666	0	0	0	0	0
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				25	25	25	25	25	0	0	25	25
Cap, veh/h				275	11		1867	1011	0	0	2	
Arrive On Green				0.20	0.20	0.00	0.66	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h				1405	54	1296	2826	1530	0	0	-68828	1296
Grp Volume(v), veh/h				241	0	0	1666	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln				1459	0	1296	1413	1530	0	0	1530	1296
Q Serve(g_s), s				10.0	0.0	0.0	30.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s				10.0	0.0	0.0	30.6	0.0	0.0	0.0	0.0	0.0
Prop In Lane				0.96		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				286	0		1867	1011	0	0	2	
V/C Ratio(X)				0.84	0.00		0.89	0.00	0.00	0.00	0.00	
Avail Cap(c_a), veh/h				372	0		2501	1354	0	0	122	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh				24.3	0.0	0.0	8.8	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh				12.9	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.2	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				37.2	0.0	0.0	12.3	0.0	0.0	0.0	0.0	0.0
LnGrp LOS				D	A		B	A	A	A	A	
Approach Vol, veh/h					241	A		1666			0	A
Approach Delay, s/veh					37.2			12.3			0.0	
Approach LOS					D			B				

Timer - Assigned Phs	2			6		8						
Phs Duration (G+Y+Rc), s	45.9			0.0		16.8						
Change Period (Y+Rc), s	4.5			4.5		4.5						
Max Green Setting (Gmax), s	55.5			5.0		16.0						
Max Q Clear Time (g_c+I1), s	32.6			0.0		12.0						
Green Ext Time (p_c), s	8.9			0.0		0.5						

Intersection Summary		
HCM 6th Ctrl Delay	15.5	
HCM 6th LOS	B	

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	1050	0	0	0	0	1530	287	1	212	0
Future Volume (veh/h)	3	1	1050	0	0	0	0	1530	287	1	212	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530				0	1530	1530	1530	1530	0
Adj Flow Rate, veh/h	3	1	0				0	1663	0	1	230	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25				0	25	25	25	25	0
Cap, veh/h	6	2					0	2137		3	1258	0
Arrive On Green	0.01	0.01	0.00				0.00	0.74	0.00	0.00	0.82	0.00
Sat Flow, veh/h	1106	369	1296				0	2983	1296	1457	1530	0
Grp Volume(v), veh/h	4	0	0				0	1663	0	1	230	0
Grp Sat Flow(s),veh/h/ln	1474	0	1296				0	1453	1296	1457	1530	0
Q Serve(g_s), s	0.1	0.0	0.0				0.0	18.5	0.0	0.0	1.6	0.0
Cycle Q Clear(g_c), s	0.1	0.0	0.0				0.0	18.5	0.0	0.0	1.6	0.0
Prop In Lane	0.75		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	8	0					0	2137		3	1258	0
V/C Ratio(X)	0.50	0.00					0.00	0.78		0.36	0.18	0.00
Avail Cap(c_a), veh/h	535	0					0	2913		139	1810	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.0	0.0	0.0				0.0	4.3	0.0	26.1	1.0	0.0
Incr Delay (d2), s/veh	41.7	0.0	0.0				0.0	1.0	0.0	64.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0				0.0	2.2	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.6	0.0	0.0				0.0	5.2	0.0	90.3	1.0	0.0
LnGrp LOS	E	A					A	A		F	A	A
Approach Vol, veh/h		4	A					1663	A		231	
Approach Delay, s/veh		67.6						5.2			1.4	
Approach LOS		E						A			A	

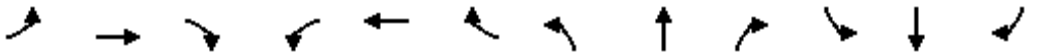
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	4.6	43.0		4.8		47.6
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	5.0	52.5		19.0		62.0
Max Q Clear Time (g_c+I1), s	2.0	20.5		2.1		3.6
Green Ext Time (p_c), s	0.0	18.0		0.0		1.5

Intersection Summary	
HCM 6th Ctrl Delay	4.9
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.



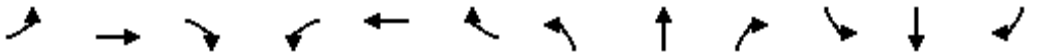
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	74	190	385	110	463	188	1095	274	342	733	187
Future Volume (veh/h)	259	74	190	385	110	463	188	1095	274	342	733	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Adj Flow Rate, veh/h	282	80	207	418	120	0	204	1190	0	372	797	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25	25	25	25	25	25	25	25	25	25
Cap, veh/h	307	280	238	483	219		228	1391		424	949	423
Arrive On Green	0.21	0.18	0.18	0.17	0.14	0.00	0.16	0.33	0.00	0.15	0.33	0.33
Sat Flow, veh/h	1457	1530	1296	2826	1530	1296	1457	4176	1296	2826	2906	1296
Grp Volume(v), veh/h	282	80	207	418	120	0	204	1190	0	372	797	203
Grp Sat Flow(s),veh/h/ln	1457	1530	1296	1413	1530	1296	1457	1392	1296	1413	1453	1296
Q Serve(g_s), s	21.0	5.0	17.2	15.9	8.1	0.0	15.2	29.4	0.0	14.3	28.2	13.8
Cycle Q Clear(g_c), s	21.0	5.0	17.2	15.9	8.1	0.0	15.2	29.4	0.0	14.3	28.2	13.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	307	280	238	483	219		228	1391		424	949	423
V/C Ratio(X)	0.92	0.29	0.87	0.86	0.55		0.90	0.86		0.88	0.84	0.48
Avail Cap(c_a), veh/h	362	576	488	659	553		257	1547		472	1051	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	38.9	43.9	44.6	44.0	0.0	45.8	34.4	0.0	46.0	34.6	29.7
Incr Delay (d2), s/veh	25.5	0.6	9.5	8.9	2.1	0.0	28.6	4.6	0.0	15.8	5.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	1.9	6.0	6.1	3.2	0.0	7.2	10.2	0.0	5.9	10.5	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	39.5	53.4	53.5	46.2	0.0	74.4	39.0	0.0	61.8	40.3	30.6
LnGrp LOS	E	D	D	D	D		E	D		E	D	C
Approach Vol, veh/h		569			538	A		1394	A		1372	
Approach Delay, s/veh		58.8			51.9			44.2			44.7	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.1	41.3	23.4	24.8	21.8	40.6	27.8	20.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.5	41.0	25.8	41.7	19.5	40.0	27.5	40.0
Max Q Clear Time (g_c+I1), s	16.3	31.4	17.9	19.2	17.2	30.2	23.0	10.1
Green Ext Time (p_c), s	0.3	5.4	1.0	1.1	0.1	4.5	0.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, WBR] is excluded from calculations of the approach delay and intersection delay.



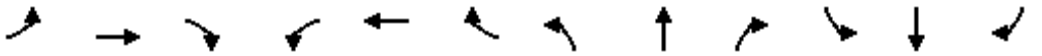
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	1	7	554	1	542	4	966	270	277	1032	2
Future Volume (veh/h)	7	1	7	554	1	542	4	966	270	277	1032	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Adj Flow Rate, veh/h	8	1	8	602	1	0	4	1050	293	301	1122	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25	25	25	25	25	25	25	25	25	25
Cap, veh/h	28	3	22	697	377		8	1218	863	362	1575	702
Arrive On Green	0.02	0.02	0.02	0.25	0.25	0.00	0.01	0.42	0.42	0.13	0.54	0.54
Sat Flow, veh/h	1457	147	1172	2826	1530	1296	1457	2906	1296	2826	2906	1296
Grp Volume(v), veh/h	8	0	9	602	1	0	4	1050	293	301	1122	2
Grp Sat Flow(s),veh/h/ln	1457	0	1319	1413	1530	1296	1457	1453	1296	1413	1453	1296
Q Serve(g_s), s	0.5	0.0	0.6	19.6	0.0	0.0	0.3	31.6	9.4	10.0	27.7	0.1
Cycle Q Clear(g_c), s	0.5	0.0	0.6	19.6	0.0	0.0	0.3	31.6	9.4	10.0	27.7	0.1
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	28	0	25	697	377		8	1218	863	362	1575	702
V/C Ratio(X)	0.29	0.00	0.36	0.86	0.00		0.52	0.86	0.34	0.83	0.71	0.00
Avail Cap(c_a), veh/h	212	0	192	1088	589		76	1394	941	438	1693	755
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.5	0.0	46.6	34.7	27.3	0.0	47.7	25.4	6.9	40.9	16.4	10.1
Incr Delay (d2), s/veh	5.6	0.0	8.5	4.6	0.0	0.0	45.5	5.2	0.2	11.0	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.3	6.9	0.0	0.0	0.2	11.1	4.8	4.0	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.1	0.0	55.1	39.2	27.3	0.0	93.2	30.6	7.2	51.9	17.8	10.1
LnGrp LOS	D	A	E	D	C		F	C	A	D	B	B
Approach Vol, veh/h		17			603	A		1347			1425	
Approach Delay, s/veh		53.7			39.2			25.7			25.0	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.8	44.8		6.3	5.0	56.6		28.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	14.9	46.1		14.0	5.0	56.0		37.0				
Max Q Clear Time (g_c+I1), s	12.0	33.6		2.6	2.3	29.7		21.6				
Green Ext Time (p_c), s	0.3	6.7		0.0	0.0	9.3		2.1				

Intersection Summary			
HCM 6th Ctrl Delay		27.9	
HCM 6th LOS		C	

Notes

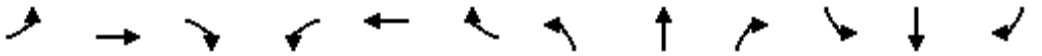
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	15	19	36	26	35	16	975	13	23	1381	366
Future Volume (veh/h)	155	15	19	36	26	35	16	975	13	23	1381	366
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Adj Flow Rate, veh/h	168	16	21	39	28	38	17	1060	14	25	1501	398
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25	25	25	25	25	25	25	25	25	25
Cap, veh/h	194	437	195	48	146	65	27	1776	792	36	1795	800
Arrive On Green	0.13	0.15	0.15	0.03	0.05	0.05	0.02	0.61	0.61	0.03	0.62	0.62
Sat Flow, veh/h	1457	2906	1296	1457	2906	1296	1457	2906	1296	1457	2906	1296
Grp Volume(v), veh/h	168	16	21	39	28	38	17	1060	14	25	1501	398
Grp Sat Flow(s),veh/h/ln	1457	1453	1296	1457	1453	1296	1457	1453	1296	1457	1453	1296
Q Serve(g_s), s	11.3	0.5	1.4	2.7	0.9	2.9	1.2	22.3	0.4	1.7	40.8	16.9
Cycle Q Clear(g_c), s	11.3	0.5	1.4	2.7	0.9	2.9	1.2	22.3	0.4	1.7	40.8	16.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	194	437	195	48	146	65	27	1776	792	36	1795	800
V/C Ratio(X)	0.86	0.04	0.11	0.81	0.19	0.59	0.62	0.60	0.02	0.69	0.84	0.50
Avail Cap(c_a), veh/h	257	1131	505	156	931	415	73	2179	972	109	2251	1004
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	36.3	36.7	48.0	45.5	46.4	48.7	11.9	7.6	48.3	15.1	10.5
Incr Delay (d2), s/veh	20.3	0.0	0.2	26.2	0.6	8.1	20.6	0.3	0.0	20.3	2.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.2	0.5	1.3	0.3	1.1	0.6	6.5	0.1	0.8	12.6	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.7	36.3	36.9	74.2	46.2	54.6	69.3	12.2	7.6	68.6	17.5	11.0
LnGrp LOS	E	D	D	E	D	D	E	B	A	E	B	B
Approach Vol, veh/h		205			105			1091			1924	
Approach Delay, s/veh		58.0			59.6			13.0			16.8	
Approach LOS		E			E			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	65.6	7.8	19.5	6.4	66.2	17.8	9.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	74.9	10.7	38.9	5.0	77.4	17.6	32.0
Max Q Clear Time (g_c+I1), s	3.7	24.3	4.7	3.4	3.2	42.8	13.3	4.9
Green Ext Time (p_c), s	0.0	10.1	0.0	0.1	0.0	18.9	0.2	0.2

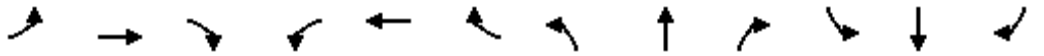
Intersection Summary	
HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	1	1	65	1	71	1	921	36	39	1394	8
Future Volume (veh/h)	8	1	1	65	1	71	1	921	36	39	1394	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
Adj Flow Rate, veh/h	9	1	1	71	1	77	1	1001	39	42	1515	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	25	25	25	25	25	25	25	25	25	25	25	25
Cap, veh/h	17	49	49	91	2	155	3	1928	75	64	2185	13
Arrive On Green	0.01	0.07	0.07	0.06	0.12	0.12	0.00	0.47	0.47	0.04	0.51	0.51
Sat Flow, veh/h	1457	702	702	1457	17	1282	1457	4124	160	1457	4283	25
Grp Volume(v), veh/h	9	0	2	71	0	78	1	675	365	42	985	539
Grp Sat Flow(s),veh/h/ln	1457	0	1403	1457	0	1299	1457	1392	1501	1457	1392	1525
Q Serve(g_s), s	0.3	0.0	0.1	2.4	0.0	2.8	0.0	8.6	8.7	1.4	13.6	13.6
Cycle Q Clear(g_c), s	0.3	0.0	0.1	2.4	0.0	2.8	0.0	8.6	8.7	1.4	13.6	13.6
Prop In Lane	1.00		0.50	1.00		0.99	1.00		0.11	1.00		0.02
Lane Grp Cap(c), veh/h	17	0	99	91	0	157	3	1301	701	64	1420	778
V/C Ratio(X)	0.53	0.00	0.02	0.78	0.00	0.50	0.35	0.52	0.52	0.65	0.69	0.69
Avail Cap(c_a), veh/h	147	0	502	164	0	480	147	1694	913	213	1820	997
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	21.9	23.4	0.0	20.8	25.2	9.5	9.5	23.8	9.4	9.4
Incr Delay (d2), s/veh	22.8	0.0	0.1	13.5	0.0	2.4	59.8	0.3	0.6	10.7	0.8	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.1	0.0	0.9	0.1	2.1	2.3	0.6	3.2	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.7	0.0	22.0	36.8	0.0	23.2	85.0	9.8	10.1	34.6	10.2	10.8
LnGrp LOS	D	A	C	D	A	C	F	A	B	C	B	B
Approach Vol, veh/h		11			149			1041			1566	
Approach Delay, s/veh		43.0			29.7			10.0			11.1	
Approach LOS		D			C			A			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	28.2	7.7	8.1	4.6	30.3	5.1	10.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.4	30.8	5.7	18.1	5.1	33.1	5.1	18.7
Max Q Clear Time (g_c+I1), s	3.4	10.7	4.4	2.1	2.0	15.6	2.3	4.8
Green Ext Time (p_c), s	0.0	7.3	0.0	0.0	0.0	10.3	0.0	0.3

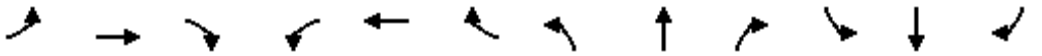
Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	347	17	1	546	5	31	1	1	5	1	187
Future Volume (veh/h)	165	347	17	1	546	5	31	1	1	5	1	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	179	377	18	1	593	5	34	1	1	5	1	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	217	1269	60	4	892	8	67	174	174	12	1	271
Arrive On Green	0.12	0.38	0.38	0.00	0.25	0.25	0.04	0.21	0.21	0.01	0.18	0.18
Sat Flow, veh/h	1739	3371	160	1739	3525	30	1739	838	838	1739	8	1541
Grp Volume(v), veh/h	179	193	202	1	292	306	34	0	2	5	0	204
Grp Sat Flow(s),veh/h/ln	1739	1735	1797	1739	1735	1821	1739	0	1675	1739	0	1549
Q Serve(g_s), s	4.4	3.5	3.5	0.0	6.7	6.7	0.8	0.0	0.0	0.1	0.0	5.5
Cycle Q Clear(g_c), s	4.4	3.5	3.5	0.0	6.7	6.7	0.8	0.0	0.0	0.1	0.0	5.5
Prop In Lane	1.00		0.09	1.00		0.02	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	217	653	676	4	439	461	67	0	348	12	0	272
V/C Ratio(X)	0.83	0.30	0.30	0.25	0.66	0.66	0.51	0.00	0.01	0.43	0.00	0.75
Avail Cap(c_a), veh/h	217	727	753	197	708	743	197	0	702	197	0	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.8	9.7	9.7	22.0	14.8	14.8	20.8	0.0	13.9	21.8	0.0	17.3
Incr Delay (d2), s/veh	22.3	0.3	0.2	30.7	1.7	1.7	5.8	0.0	0.0	22.7	0.0	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	1.1	1.1	0.0	2.4	2.5	0.4	0.0	0.0	0.1	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.1	9.9	9.9	52.7	16.5	16.5	26.6	0.0	13.9	44.6	0.0	21.4
LnGrp LOS	D	A	A	D	B	B	C	A	B	D	A	C
Approach Vol, veh/h		574			599			36			209	
Approach Delay, s/veh		19.6			16.6			25.9			21.9	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	13.7	4.6	21.1	6.2	12.3	10.0	15.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.5	5.0	18.5	5.0	18.5	5.5	18.0
Max Q Clear Time (g_c+I1), s	2.1	2.0	2.0	5.5	2.8	7.5	6.4	8.7
Green Ext Time (p_c), s	0.0	0.0	0.0	1.9	0.0	0.9	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	18.8
HCM 6th LOS	B



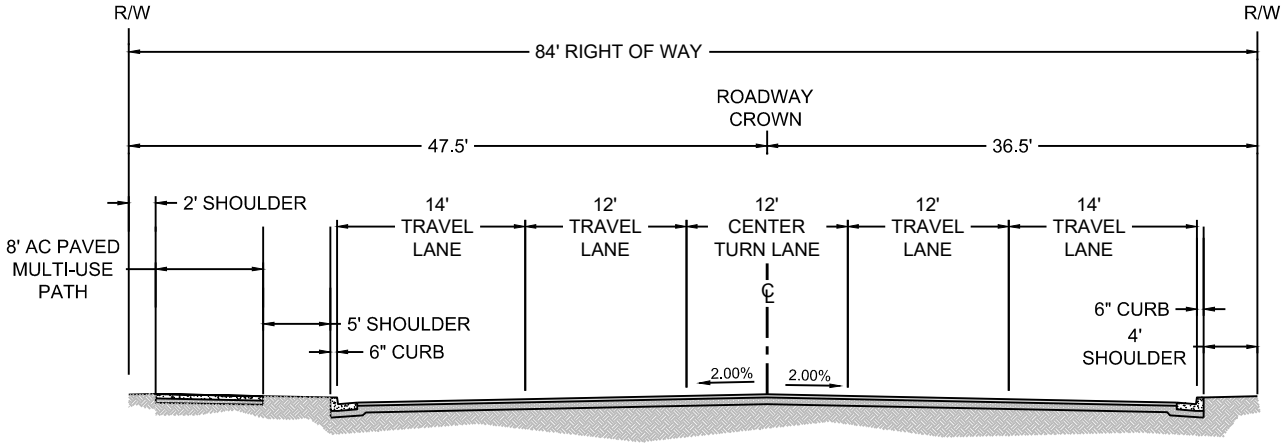
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	442	47	1	874	1	120	1	1	1	1	35
Future Volume (veh/h)	19	442	47	1	874	1	120	1	1	1	1	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	21	480	51	1	950	1	130	1	1	1	1	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	45	1296	137	4	1368	1	166	118	118	4	2	70
Arrive On Green	0.03	0.41	0.41	0.00	0.38	0.38	0.10	0.14	0.14	0.00	0.05	0.05
Sat Flow, veh/h	1739	3165	335	1739	3556	4	1739	838	838	1739	40	1514
Grp Volume(v), veh/h	21	262	269	1	463	488	130	0	2	1	0	39
Grp Sat Flow(s),veh/h/ln	1739	1735	1766	1739	1735	1825	1739	0	1675	1739	0	1553
Q Serve(g_s), s	0.5	4.2	4.3	0.0	9.0	9.0	2.9	0.0	0.0	0.0	0.0	1.0
Cycle Q Clear(g_c), s	0.5	4.2	4.3	0.0	9.0	9.0	2.9	0.0	0.0	0.0	0.0	1.0
Prop In Lane	1.00		0.19	1.00		0.00	1.00		0.50	1.00		0.97
Lane Grp Cap(c), veh/h	45	710	723	4	667	702	166	0	235	4	0	72
V/C Ratio(X)	0.46	0.37	0.37	0.23	0.69	0.69	0.79	0.00	0.01	0.23	0.00	0.54
Avail Cap(c_a), veh/h	216	927	944	216	927	975	281	0	854	216	0	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.3	8.3	8.3	20.0	10.4	10.4	17.8	0.0	14.9	20.0	0.0	18.8
Incr Delay (d2), s/veh	7.2	0.3	0.3	25.2	1.3	1.2	7.9	0.0	0.0	25.2	0.0	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.2	1.2	0.0	2.8	2.9	1.4	0.0	0.0	0.0	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	8.6	8.6	45.3	11.7	11.6	25.7	0.0	14.9	45.3	0.0	24.9
LnGrp LOS	C	A	A	D	B	B	C	A	B	D	A	C
Approach Vol, veh/h		552			952			132			40	
Approach Delay, s/veh		9.3			11.7			25.6			25.4	
Approach LOS		A			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	10.1	4.6	21.0	8.3	6.4	5.5	20.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	20.5	5.0	21.5	6.5	19.0	5.0	21.5
Max Q Clear Time (g_c+I1), s	2.0	2.0	2.0	6.3	4.9	3.0	2.5	11.0
Green Ext Time (p_c), s	0.0	0.0	0.0	2.8	0.0	0.1	0.0	4.5

Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B

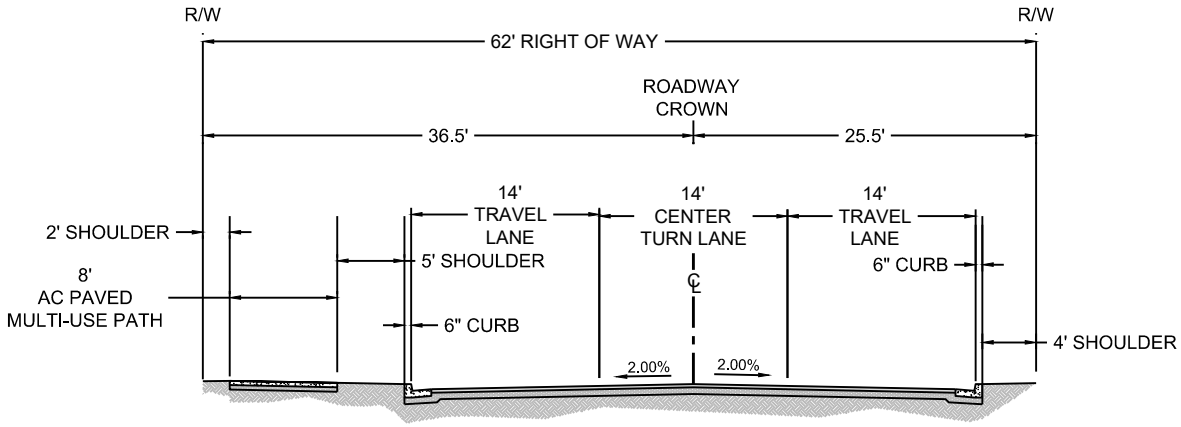
Appendix G
Roadway Cross Sections

84' ROW STREET SECTION:
MINOR ARTERIAL



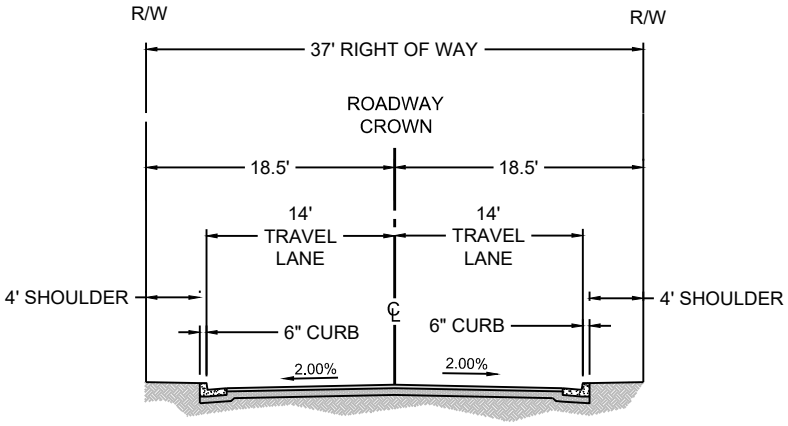
DUFFY ROAD, GATEWAY DRIVE

62' ROW STREET SECTION:
COLLECTOR



CONNOR DRIVE, ROAD A, MACDONALD DRIVE,
GAVIN ROAD, NEWLANDS DRIVE

37' ROW STREET SECTION:
ACCESS ROAD



ACCESS ROAD 1

DRAINAGE REPORT
For

VICTORY

LOGISTICS | DISTRICT

A TENTATIVE MAP FOR AN INDUSTRIAL SUBDIVISION

Prepared For:
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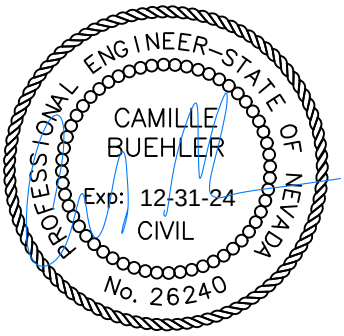

09/15/2023

JN 10067.008
Revised September 2023

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APPENDIX A

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FIGURE 2 – BASIN FLOWRATES EXHIBIT (Existing Conditions)

FIGURE 3 – SUB-BASIN FLOWRATES EXHIBIT (Existing Conditions)

FIGURE 4 – BASIN FLOWRATES EXHIBIT (Proposed Conditions)

FIGURE 5 – SUB-BASIN FLOWRATES EXHIBIT (Proposed Conditions)

FIGURE 6 – BASIN RETENTION VOLUME EXHIBIT

FIGURE 7 – SUB-BASIN RETENTION VOLUME EXHIBIT

FIGURE 8 – PRELIMINARY LOCAL STORM DRAIN PLAN

FIGURE 9 – DOWNSTREAM CONNECTION PLAN

FIGURE 10 – LOTS & REGIONAL BASINS

FIGURE 11 – HYDROLOGIC SOIL GROUP EXHIBIT (Existing Conditions)

APPENDIX B

ATTACH 1 – NOAA PRECIPITATION FREQUENCY ESTIMATES

ATTACH 2 – FEMA FIRM PANELS

ATTACH 3 – CN DETERMINATION CRITERIA (Input Data)

ATTACH 4 – HYDRAFLOW MODELING (Output Data)

I. INTRODUCTION

A. Project Location

The Mark IV Industrial Subdivision is located south of U.S. Interstate 80 (I-80), north of U.S. Highway 50 Alternate (US-50 Alt), and primarily east of Nevada Pacific Parkway (NPP) in Northeast Fernley, Nevada. The Master Developer, M4 New Fernley QOZB, LLC, holds property between I-80 and US-50 Alt. The Mark IV Subdivision consists of approximately 2,174 acres comprised of the following parcels: 021-201-01, 021-201-16, 021-211-02, 021-211-04, 021-211-06, 021-242-11, 021-242-17, 021-251-25, 021-261-43, 021-261-44, and 021-211-03. The Mark IV properties reside within Sections 3, 4, 5, 6, 7, 8, 17, and 18, T20N, R25E in Fernley, Nevada.

The proposed Mark IV Industrial Subdivision consists of 31 lots to be used for distribution/light industrial, manufacturing, data center/high tech, and retail purposes.

B. Existing Site Description

The Mark IV Industrial Subdivision is located south of I-80 and north of US-50 Alt. The southern portion of the project is bound by an existing main line railroad that is owned and maintained by Union Pacific (UPRR). Also within the site are two main power lines: one within a 200-ft easement and the other within a 75-ft easement. Please refer to Figure 1 of Appendix A for the Site Overview Exhibit.

The topography of the project area ranges from flat to mildly sloping. Offsite flow generation originates at I-80 and from above the interstate along the northern-most portion of the project. In the north half of the project, runoff generally sweeps from the northwest to the southeast across the project area, and finally to the northeast at an average grade of 1.0% across poorly defined and discontinuous channels. This northern portion of the project is delineated as Basins A, B, and G shown in Figures 2 and 3 of Appendix A. The south half of the project area generally drains from northwest to southeast, also at an average grade of 1.0% and is shown as runoff Basins C through D in Figures 2 and 3 of Appendix A.

Runoff reaching the project area, including runoff generated from within the Mark IV Industrial Subdivision, totals just over 3,000 acres. Most of this drainage area is undeveloped with groundcover consisting of medium-density, native, desert shrubs, along with low-growing native desert weeds and grasses. There are a few lots within the contributing drainage area which are presently developed, as well. These lots are primarily comprised of industrial, manufacturing, and warehouse facilities.

C. FEMA Mapping of Project Area

Historical drainage conditions are based on FEMA FIRM Panels 32019C0110E, 32019C0050E, and 32019C0105E, which are included in this report in Attachment 2, Appendix B.

The majority of the project is located in Zone X, defined by FEMA as "areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood."

The single exception to this zoning is the southern portion of the project, being located within Zone A designated as an area of special flood hazard that is subject to the 1% annual chance flood (100-year flood), also known as the base flood, and without base flood elevations determined.

A FEMA application for a Conditional Letter of Map Revision (CLOMR) for the lots within drainage Basin D was submitted in May of 2020. This application proposes to intercept flows entering on the western edge of drainage Basin D and discharge them at the downstream eastern edge of this drainage basin.

D. Previous Studies & Data

An updated Storm Drain Master Plan for Fernley, Lyon County, NV was prepared by Lumos & Associates in September 2013. This report shows the storm drains, retention ponds, and related features along Nevada Pacific Parkway.

Topographic information used to generate the existing surface of the project area is based on LiDAR surface data obtained from CFA and supplemented with Lumos & Associates LiDAR data. In addition, a topographic survey of nearby existing drainage facilities to determine locations, inverts, and lengths was obtained from CFA. The remaining existing facilities and corresponding locations were obtained from the City of Fernley GIS database.

II. HYDROLOGIC MODELING METHODOLOGY

A. Criteria

According to the drainage guidelines for City of Fernley Department of Public Works Design Standards, the following guidelines for methodologies and criteria apply to Mark IV Industrial Subdivision development:

- The SCS method, SCS TR-55 "Urban Hydrology for Small Watersheds", HEC-1/HEC-HMS, or the methods outlined in the City of Fernley Design Standards shall be used for larger watersheds (Section 10.3.2)

- Time of concentration (T_c) was evaluated based on the SCS TR-55 methodology for the following flow classifications: sheet flow, shallow concentrated flow and channel flow.

- 24-hour storm intensities and depths for the 5-year, 25-year, and 100-year storm events were used. The rainfall time-intensity-frequency curves used are assumed identical throughout the zone and based on the point rainfall at the centroid of the entire project site. Reference NOAA Atlas.

The calculations have been performed for the 5, 25, and 100-year, 24-hour storm events using the Autodesk Hydraflow Hydrographs extension for AutoCad Civil 3D 2022 computer program. This computer program is based upon the Soils Conservation Service (SCS) TR-20 and TR-55 computer models and uses the SCS Curvilinear Unit rainfall distribution.

The maximum drainage area recommended for analysis using this methodology is 25 square miles, and the minimum time of concentration is 0.1 hours. As such, all drainage basins computed within the Mark IV Industrial Subdivision fall within appropriate limits of use for this methodology.

Rainfall intensity frequency estimates were obtained from National Oceanic and Atmospheric Administration (NOAA) Atlas 14. The rainfall depth used in the Hydrology Model was determined by obtaining the point rainfall at the centroid of the entire project model for the case of a 5, 25, and 100-year, 24-hour storm event. The latitude and longitude of the point was used as the input value to NOAA's data set for the intensity or total rainfall at that point. The selected NOAA data for the study is found in Attachment 1 of Appendix B.

Curve numbers were developed with reference to the NRCS Soil Map Units (refer to Figure 11 of Appendix A) and their corresponding Hydrologic Soil Groups (refer to Figure 12 of Appendix A). Weighted averages of each Sub-Basin were calculated based on the curve numbers listed in the TR-55 "Urban Hydrology for Small Watersheds". Attachment 3 is the curve number development and assumptions for the proposed conditions. The site's soils are primarily mapped as hydrologic soil group A with the exception of the offsite runoff contribution north of I-80 and the soils located in Basin D.

III. EXISTING CONDITIONS ANALYSIS

A. Existing Basin Delineation

As depicted in Figures 2 & 3 of Appendix A, drainage Basins A, B, and G combine downstream of the project area to flow through various undulated paths that lead directly to the Fernley Sink, whereas drainage Basins C and D combine downstream of the project area to flow to the wash south of the project area. This southern wash also drains to the Fernley Sink.

B. Existing Peak Flowrates

Several existing facilities within the project area currently have their own onsite detention facilities in various stages of condition. For simplicity, consistency, and to be conservative, these existing onsite flow attenuation facilities have been eliminated from the existing conditions analysis of the report. This enables the capability of including these facilities in the proposed overall solution for detention on a regional level as discussed in Section V-D of this report.

Hydraflow results for the existing conditions analysis can be found in Attachment 4 of Appendix B. Resulting flowrates for the 5-year, 25-year, and 100-year 24-hour storm events of the existing condition analysis are summarized as follows:

Table 1. Existing Peak Flowrates

BASIN	SUB-BASIN	AREA	CN	PEAK FLOWRATE PER SUB-BASIN			PEAK FLOWRATE PER BASIN		
				5-YR	25-YR	100-YR	5-YR	25-YR	100-YR
		(acres)		(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
A	XA1	66	55	0.00	0.05	0.34	0.00	0.05	0.34
B	XB1	440	55	0.00	0.30	2.21	0.03	3.47	18.96
	XB2	255	55	0.00	0.16	1.26			
	XB3	303	55	0.00	0.21	1.52			
	XB4	546	62	0.03	2.81	13.97			
C	XC1	509	55	0.00	0.34	2.50	0.00	0.45	3.32
	XC2	161	55	0.00	0.11	0.82			
D	XD1	178	72	1.40	13.35	35.72	1.40	13.35	35.72
G	XG1	364	55	0.00	0.25	1.85	0.00	0.25	1.85

C. Existing Peak Runoff Volumes

Corresponding runoff volumes for the 5-year, 25-year, and 100-year, 24-hour storm events were generated using Hydraflow and are summarized as follows:

Table 2. Existing Peak Runoff Volumes

BASIN	SUB-BASIN	AREA	RUNOFF VOLUME PER SUB-BASIN			RUNOFF VOLUME PER BASIN		
			5-YR	25-YR	100-YR	5-YR	25-YR	100-YR
		(acres)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)
A	XA1	66	0.0	0.0	0.3	0.0	0.0	0.3
B	XB1	440	0.0	0.1	1.8	0.0	2.4	11.1
	XB2	255	0.0	0.1	1.0			
	XB3	303	0.0	0.1	1.2			
	XB4	546	0.0	2.2	7.1			
C	XC1	509	0.0	0.1	2.1	0.0	0.1	2.7
	XC2	161	0.0	0.0	0.6			
D	XD1	178	0.8	3.1	6.3	0.8	3.1	6.3
H	XG1	364	0.0	0.1	1.5	0.0	0.1	1.5

IV. PROPOSED CONDITIONS OVERVIEW

A. Development Description

The project area consists of 31 lots on approximately 2,174 acres. As such, 25 conceptual developable lots were utilized out for the purpose of conceptual connection points to the proposed basins and channels. Proposed lot development will maintain the natural attributes of the site as closely as possible. Also maintained in the proposed developed condition is the general drainage from west to east and ultimate discharge of runoff to the Fernley Sink.

Developers will have the option to detain differences in peak flow generated by the 25-year, 24-hour storm event either locally or utilizing a combination of local and regional facilities. If regional detention is chosen, individual lots will contribute a portion of regional mitigation required based on sub-basin increase in runoff. All detention facilities will incorporate emergency overflows for the 100-year, 24-hour event to the eastern edge of the Mark IV development which will ultimately drain to the Fernley Sink. Final discharge of each Sub-Basin system which eventually reaches the Fernley Sink shall be discharged within the property limits of the Mark IV subdivision and sufficient land shall be provided to dissipate the energy and return flows to their existing conditions regime prior to exiting Mark IV project boundaries. See Figure 4 for proposed flowrates per Basin and Figure 5 for the proposed flowrates per Sub-Basin.

B. Piping & Open Channel Flow

The SCS method was used to size all storm drain piping for the Mark IV development to convey the 25-yr, 24-hour event. The majority of onsite piping will be located within the proposed public right-of-way, generally beginning near the highpoints and gravity feeding toward low points and leaving the piped system. Storm drain capacity was sized based on the runoff in the right-of-way and 50% of contributing lots at each corresponding tie-in point.

A number of channels will also be proposed to capture offsite drainage as well as convey runoff to detention ponds.

C. Detention System

The Master Plan groups proposed lots into regions (or Sub-Basins) enabling manageable flow mitigation to occur per Basin. These regions are depicted as drainage Basins A-G as illustrated in Figures 4-7 of Appendix A. When feasible based on location and phasing, lots may release up to 50% of runoff into major storm drain infrastructure (referred to in this report as a regional detention or retention basin). The remaining storm water will be detained/retained onsite (referred to in this report as localized detention or retention basins). All retention facilities proposed are to be owned and maintained by the property owner. Reference Section VI for specific lot requirements.

D. Streets

The preliminary design shall feature a storm drain system located within public right-of-way to convey flows generated on within the right-of-way and discharge to regional detention/retention facilities.

V. PROPOSED DRAINAGE SYSTEM

A. Proposed Flow Routing

As depicted in Figures 4 and 5 of Appendix A, drainage Basins A and B combine downstream of the project area to flow through various undulated paths that lead to the Fernley Sink, whereas drainage Basins C and D combine downstream of the project area to flow to the wash south of the project area. This southern wash also drains to the Fernley Sink. Basin G does not drain to the Fernley Sink and is instead mitigated through onsite retention of the full proposed 100-year, 24-hour storm event.

Lots within these drainage basins will have the option of handling the increase in peak flow on either the local or a combination of regional and local level, as long as the sum of those efforts amount to flow attenuation as shown in Table 6 of this report.

Five sections of local storm drain are proposed to tie into the regional storm drain system. Sections B-1 and B-2 both drain into Channel 2, which terminates at Pond B. Section G discharges directly into Pond G. Section C ties into existing storm drain at Macdonald and Gateway Drive and conveys storm water to Channel 3 which terminates at Pond C. Section D starts within the proposed Gavin Road section and conveys runoff to the CLOMR pipe and Pond D. Reference Figure 8.

Each section of storm drain shall be built to full build out capacity where permanent infrastructure is being placed, or phased where an interim condition can meet the requirements set forth in the latest City of Fernley Drainage Manual for the current and proposed development. For any pipe infrastructure being placed in roadways, full buildout sizing and design must be followed. Detention and retention basins could be sized in an interim condition to handle only developed flow with each tenant build if approved by the City of Fernley and Mark IV.

Existing interim conditions for retention currently exist around the perimeter of the Mark IV holdings. Entering the site on Gateway Drive is an existing 48" concrete pipe that discharges into a private retention facility. This 48" pipe will be extended further into the project area at Section C and the interim retention basin removed. Design flows entering the system from this segment were not readily available, so the capacity of the upstream storm drain was used to size the extension. The 48" pipe will be continued through Section G and tied into Channel 3 with a termination point in Pond C. On Macdonald Drive, there is also an existing 48" pipe that discharges into a private retention facility. This pipe will also be extended at Section C. Based on "Victory Logistics- Building A, B and C Final Drainage Report" by CFA, dated August 2020, the pipe has a flow of approximately 60 cfs for the 100-year, 6-hour storm. The interim retention basin will be removed, and flow will ultimately release into Pond C.

There is an existing 30" pipe east of the Nevada Pacific Parkway/Duffy Road intersection that will be continued east under the proposed Duffy Road to tie into the proposed system.

The preliminary drainage plan will require flows entering the site from the northwest corner to be conveyed in a channel along the northern edge of the project. This channel (Channel 1) intercepts flows perpetuated under I-80 and will route these flows along the edge of the project area to discharge to its historic destination (the Fernley Sink).

Channel 2 conveys runoff from the storm drain in eastern Duffy Road, Road A, and portions of Lot 2 to Pond B. Channel 3 conveys runoff from the storm drain for Gateway Drive, Macdonald Drive, Connor Drive and adjacent drainage in Lot 6 Pond C.

There is a 36" HDPE pipe proposed to act as an emergency overflow path for Pond G designed to avoid flooding adjacent lots in case of a storm event larger than the 100-year.

Table 3. Proposed Channels[1]

Channel	Shape	Side Slopes	Bottom Width (ft)	Total Depth (ft)	Velocity (ft/s)	Freeboard (ft)
1	Trapezoidal	3:1	4	3	3.87	1.12
2	Trapezoidal	3:1	9	4	6.54	1.32
3	Trapezoidal	3:1	5	4	3.9	1.28

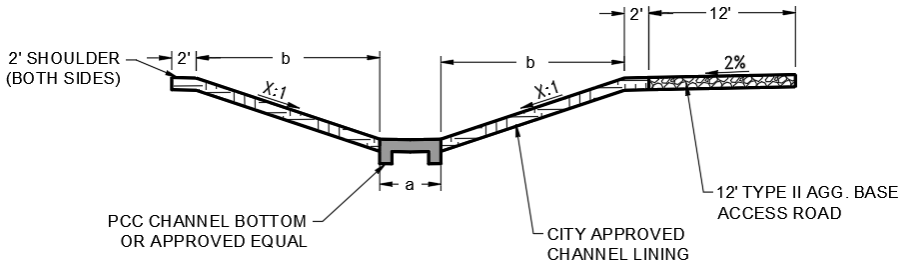
Note 1: Preliminary channel sections - subject to change with final design.

The proposed catch basins were spaced at intervals to intake the peak flow for the 5-year storm with a spread not exceeding half of the adjacent lane per the City of Fernley design standards. The Rational Method was used, and it was assumed that the right-of-way would drain to the catch basins. The lots will tie in to local storm drain at designated points. The spacing varied from 250' to 700', based on factors including right-of-way width and slope.

Additional storm drain infrastructure including channels, swales, inlets, and underground storm drain will be required on-site for each lot as individual mass grading and design is completed.

Figure 1 is a proposed typical cross section for a major drainage channel within the planned unit development. The channel cross section implements a concrete bottom, and a city approved side slope lining for slope stabilization and scour protection. The side slope protection will be designed on a case by case basis for adequate resistance to shear stress. A 12 foot wide access road is provided for maintenance.

Figure 1: Typical Channel Cross Section



TYPICAL CHANNEL CROSS SECTION

Proposed Peak Flowrates

Hydraflow results for the proposed conditions analysis can be viewed in Attachment 4 of Appendix B. Resulting flowrates for the 5-year, 25-year, and 100-year storm, 24-hour events of the proposed condition analysis are as follows:

Table 4. Proposed Peak Flowrates

BASIN	SUB-BASIN	AREA	CN	PEAK FLOWRATE PER SUB-BASIN			PEAK FLOWRATE PER BASIN		
				5-YR	25-YR	100-YR	5-YR	25-YR	100-YR
		(acres)		(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
A	PA1	66	81	2.76	8.10	14.64	2.76	8.10	14.64
B	PB1	440	81	17.30	50.41	90.91	47.02	156.86	298.54
	PB2	255	81	20.56	64.40	116.66			
	PB3	303	81	15.67	47.27	85.80			
	PB4	546	73	4.82	29.56	70.15			
C	PC1	509	81	19.39	56.32	101.46	26.94	78.13	139.76
	PC2	161	81	8.75	26.52	48.17			
D	PD1	178	86	19.14	44.02	70.52	19.14	44.02	70.52
G	PG1	364	81	26.90	83.94	152.12	26.90	83.94	152.12

Drainage Basins A-G were analyzed for future buildout using assumptions that can be found in Attachment 3, Appendix B. Reference Table 7 for allowable peak flow release rates into downstream connections.

B. Proposed Peak Runoff Volume Calculations (Sub-Basin and Basin)

Hydraflow results for the proposed conditions analysis can be viewed in Attachment 4 of Appendix B. Resulting flowrates for the 5-year, 25-year, and 100-year, 24-hour storm events of the proposed condition analysis are as follows:

Table 5. Proposed Peak Runoff Volumes

BASIN	SUB-BASIN	AREA	RUNOFF VOLUME PER SUB-BASIN			RUNOFF VOLUME PER BASIN		
			5-YR	25-YR	100-YR	5-YR	25-YR	100-YR
		(acres)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)
A	PA1	66	1.1	2.6	4.4	1.1	2.6	4.4
B	PB1	440	7.2	17.5	29.2	19.1	50.2	87.1
	PB2	255	4.2	10.2	17.1			
	PB3	303	4.9	12.0	20.1			
	PB4	546	2.8	10.5	20.7			
C	PC1	509	8.3	20.1	33.7	10.9	26.6	44.4
	PC2	161	2.6	6.4	10.7			
D	PD1	178	5.0	10.4	16.0	5.0	10.4	16.0
G	PG1	364	5.9	14.4	24.1	5.9	14.4	24.1

See Figure 6 and 7 for proposed volume.

C. Proposed Retention/Detention Volume Requirements

The runoff volumes have been computed in order to compare them to the fully developed condition volumes generated through the proposed conditions analysis. The resulting flow increase due to development shall be retained or detained in order to maintain these existing runoff conditions. Potential regional detention/retention facility locations/footprints are depicted in Figures 6 and 7 of Appendix A on both a Basin and Sub-Basin level respectively, and were selected as the best possible location based on safety and the capability of receiving flows requiring mitigation. Regional detention facility footprints are depicted at a size adequate to detain half of the 25-year, 24-hour event and bypass the 100-year, 24-hour event except in the case of Basin G, which shows a regional retention facility capable of retaining the entire 100-year/24-hour event. Since the timing and specific final layout of each lot will vary as development takes place within the Mark IV Industrial Subdivision, individual lots undergoing buildout will have to contribute to detention requirements on a sub-Basin level. As such, depending on which Basin the current construction is taking place within, the developer will be responsible for one of the following options:

1. Local Detention: Provide detention for 50% to 100% of the 25-yr, 24-hr storm event within the bounds of the lot itself. Each constructed local basin shall include an emergency overflow to either the regional facility or the final outfall of the sub-Basin system. Emergency overflows shall be sized for the 100-year, 24-hour event and the system's final discharge shall take place within the property bounds of the Mark IV Industrial Subdivision.

2. Regional Detention: Contribute up to 50% of proposed runoff of the 25-year, 24-hr to the corresponding regional basin. The remainder of increase in volume must be detained on site within the lot. Regional detention facilities shall be sized for the 50% of 25-year, 24-hour event unless otherwise noted. Regional detention facilities shall contain emergency overflows that shall be constructed and sized for the 100-year, 24-hour event. The system's final discharge shall take place within the property bounds of the Mark IV Industrial Subdivision.

   Contribution to the construction of a regional facility will occur from downstream to upstream. Land for the entire regional basin's maximum anticipated footprint shall be allocated until all development upstream has taken place. The regional facility's emergency overflow shall be constructed such that expansion to its maximum capacity is possible as lots continue to be developed, including energy dissipation for the full build-out condition. See Figures 6 and 7 in Appendix A for Runoff Volume requirements per Basin and Sub-Basin, respectively.

3. Local Retention – Basin G Only: Provide retention for 0 to 100% of the 100-yr, 24-hr storm runoff event within the bounds of the lot. The entire volume will need to be considered, not just the increase.

4. Regional Retention – Basin G Only: Contribute to the overall detention required within Basin G in an amount proportional (0 to 100%) to the lot's contribution of impervious surface in the developed condition. Because this facility does not have an outfall, the regional detention facility shall be sized for the entire 100-year, 24-hour event.

Land for the entire regional basin's maximum anticipated footprint shall be allocated until all development upstream has taken place. Regardless of the selection of localized versus regional solutions to attenuating flow, individual volumes must add up to the required retention/detention volumes as discussed in this report and illustrated in Figures 6 and 7 of Appendix A.

Two existing retention ponds will be removed. The first pond is located near the northeast corner of the Gateway Drive and Nevada Pacific Parkway intersection and the second pond is located just west of the Gateway Drive and Connor Drive intersection. Both existing ponds are located in Basin C. Reference Figure 1 for the two existing pond locations. The volume analysis considered existing conditions prior to any development, and the proposed conditions included industrial area outside the Mark IV development for the increase in runoff. Therefore, the required volume from these two ponds will be replaced with the construction of Pond C.

The following volumes area that are required to be retained/detained are as follows:

Table 6. Regional Retention/Detention Volume Requirements

BASIN	SUB-BASIN	SUB-BASIN (ac-ft)	REQUIRED POND VOLUME (ac-ft)	STORM EVENT	DETENTION/ RETENTION
A	PA1	1.3	1.3	50% of 25-yr/24-hr	DETENTION
B	PB1 PB2 PB3 PB4	8.7 5.05 5.95 4.2	23.9	50% of 25-yr/24-hr	DETENTION
C	PC1 PC2	10 3.2	13.25	50% of 25-yr/24-hr	DETENTION
D	PD1	3.65	3.65	50% of 25-yr/24-hr	DETENTION
G	PG1	24.1	24.1	100% of 100-yr/24-hr	RETENTION

All storm drain improvements will be private until construction is complete, and then dedicated to the City of Fernley at time of completion.

VI. LOT SPECIFC RELEASE RATES AND VOLUMES

Individual lots will have the option to release up to 50% of the increase in runoff. Lots within Basin G may release up to 100%. Details of the maximum use of regional facilities by lot are as follows:

Table 7. Allowable Release Flow and Volume for Each Lot

Lot	Downstream Connection Point	Percentage of Site Allowed to Discharge Downstream	Mitigation Requirement	Allowable Peak Flow Release Rate (cfs)	Allowable Volume Release (ac-ft)	Curve Number
1	30" SD - Duffy Road	50%	Detention	17.87	1.13	81
2	Channel 1	50%	Detention	17.16	1.09	81
3	Channel 1	50%	Detention	17.96	1.14	81
4	Pond B	50%	Detention	49.89	5.62	81
5	18" SD - Connor Drive	50%	Detention	11.59	0.74	81
6*	Pond G	100%	Retention	67.14	7.83	81
7	Channel 2	50%	Detention	22.17	1.96	81
8	60" SD - Duffy Road/Channel 2	50%	Detention	13.87	0.97	81
10	Pond B	50%	Detention	48.54	4.28	81
11	Lot 10	50%	Detention	46.29	3.65	81
12	48" SD - Connor Drive	50%	Detention	14.46	0.92	81
13*	18" SD - Gateway Drive	100%	Retention	38.17	5.63	81
14*	18" SD - Gateway Drive	100%	Retention	41.30	5.45	81
15	Channel 3	50%	Detention	20.65	1.63	81
16	48" SD - Connor Drive	50%	Detention	8.27	0.53	81
17	Channel 3	50%	Detention	7.13	1.54	81
18	Channel 3	50%	Detention	44.77	3.25	81
19	12" SD - Gavin Road	50%	Detention	9.30	0.59	81
20	Pond C	50%	Detention	8.52	0.54	81
21	18" SD - Duffy Road	50%	Detention	3.48	0.22	81
22	Pond D	50%	Detention	55.01	3.97	81

1. All lots without the * were designed with the 25-year, 24-hour storm event.
*These lots were designed with the 100-year, 24-hour storm event.

Flows for all lots are based on the 25-year, 24-hour storm event. Volumes are also based on the 25-year 24-hour storm, except for Lots 6, 13, and 14 (Basin G) volumes are based on the 100-year, 24-hour storm event. Reference Figure 10.

Lots 23-25 have not been included in the regional analysis. Lot 23 will drain to the proposed CLOMR pipe and will not include detention. Lots 24 and 25 are located adjacent to an existing drainage way. Any necessary mitigation will be determined in a future analysis once land uses are determined. Reference Figure 10 for preliminary flow rates based on the 25-year, 24-hour storm event.

VII. OPINION OF PROBABLE COSTS

A Class 5 Engineer's opinion of probable costs is presented in Table 8. The presented Engineer's opinion of probable costs are "whole" project estimates that include construction phase costs. It should be noted that the presented opinions of probable costs are strictly conceptual in nature and may differ significantly from actual construction costs. These costs reflect the Engineer's impression of material, equipment, labor, etc. at the time of the estimate based on experience and judgement in applying presently available data. The engineer has no control over cost of labor, materials, equipment, competitive bidding practices, market conditions, tariffs, costs associated with funding packages, inflation, etc. Thus, the engineer cannot warrant that the actual project costs will not vary from the Engineer's opinion of probable cost.

Table 8. Preliminary Opinion of Probable Construction Costs: On-site System

Item	Description	Unit	Quantity	Unit Cost	Total Cost
1	Mobilization and Demobilization	LS	1	$500,000	$500,000
2	12-inch PVC	LF	3696	$125	$462,000
3	15-inch PVC	LF	4790	$150	$718,500
4	18-inch PVC	LF	5524	$200	$1,104,800
5	24-inch PVC	LF	4966	$260	$1,291,160
6	30-inch PVC	LF	5215	$300	$1,564,500
7	36-inch RCP	LF	4319	$350	$1,511,650
8	48-inch RCP	LF	8942	$400	$3,576,800
9	60-inch RCP	LF	5678	$600	$3,406,800
10	36-inch HDPE	LF	5667	$390	$2,210,130
11	48" Manhole	EA	66	$8,000	$528,000
12	60" Manhole	EA	33	$10,000	$330,000
13	72" Manhole	EA	24	$13,000	$312,000
14	Rip-Rap Lined Channel	LF	12375	$800	$9,900,000
15	Rip-Rap Lined Detention Pond	EA	4	$1,000,000	$4,000,000
				Subtotal Storm	$31,416,340
				Contingency (15%)	$4,712,451
				Total	**$36,128,791**

[1] Quantities are for backbone collection system only. Includes fittings, excavation, backfill, restoration to finish grade, connection to structures.

[2] Includes restrained joints, fittings, excavation, backfill, restoration to finish grade/pavement replacement, traffic control.

VIII. CONCLUSIONS

A. Benefits

The development, as proposed, will allow for the construction of an industrial subdivision. Drainage improvements to the site shall convey anticipated onsite flows throughout the project area via a network of pipes, drainage channels, catch basins, and detention basins. Offsite flows will be intercepted, detained, and released downstream of the project area to its original destination (the Fernley Sink). The plan will provide an adequate drainage and storage system for the 5-year, 25-year, and 100-year storm, 24-hour events to ensure no adverse effects occur downstream or to onsite facilities.

B. Adverse Effects with Solutions

The design and hydrologic analysis of the proposed development are conducted in compliance with the drainage guidelines for the City of Fernley, as well as the standard engineering practices as outlined in the USDA NRCS National Engineering Handbook, Part 630. Adverse effects to the drainage system due to increased storm runoff generated from the construction of this industrial development are mitigated through the construction of regional detention and retention facilities that capture the increase in runoff volumes indicated in this report.

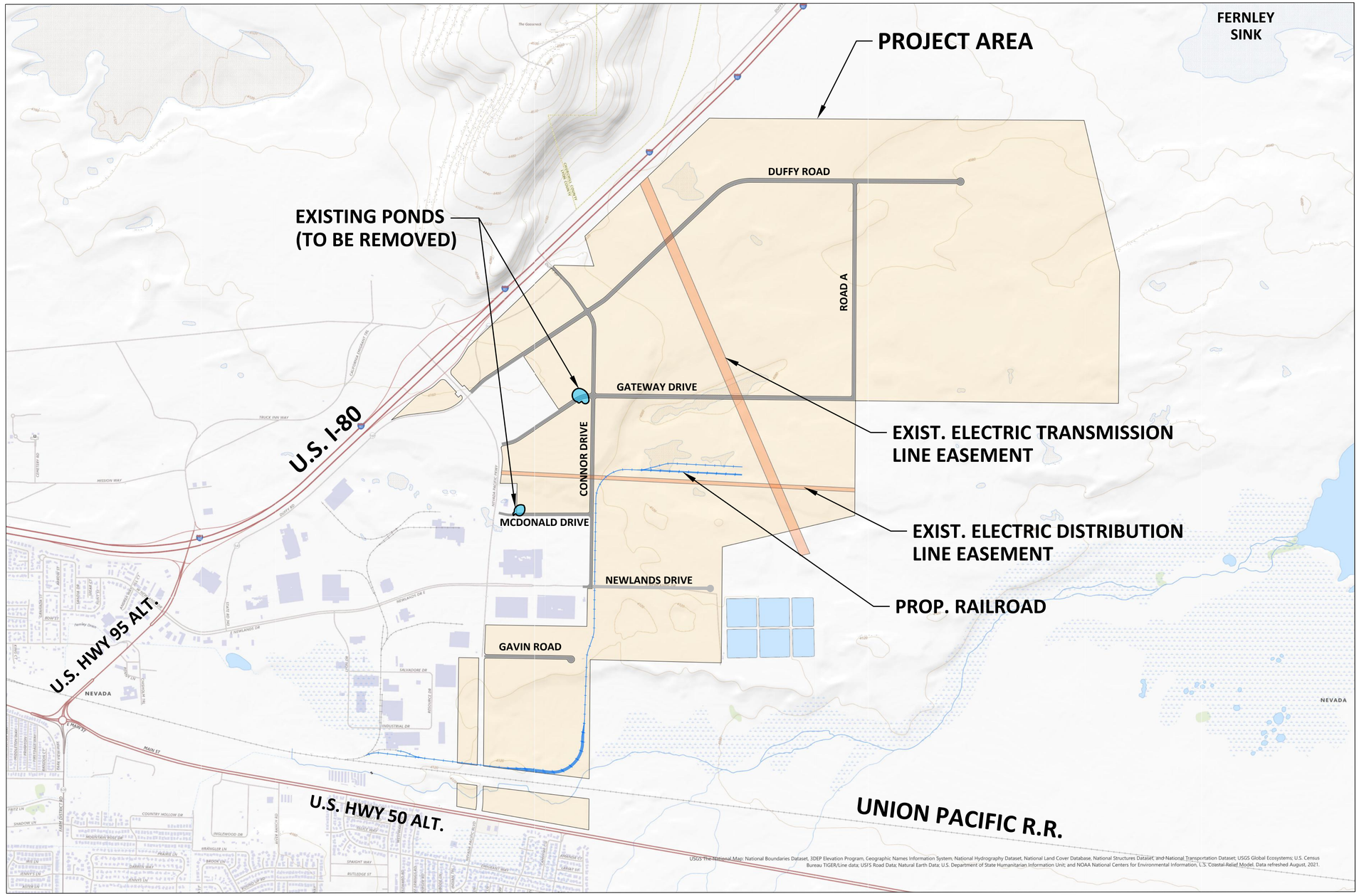
VIII. REFERENCES

- U.S. Department of Commerce, National Oceanic and Atmospheric Administration NOAA Atlas 14 Precipitation-Frequency Atlas of the Western United States: Semiarid Southwest, Volume 1, Version 5.0, Silver Spring, Maryland, 2011.
- Federal Emergency Management Agency (FEMA), FIRM Panels 32019C0110E, 32019C0105E, and 32019C0050E.
- USDA Natural Resource Conservation Service Win TR-55 Watershed Hydrology with Win TR-20, Version 1.00.10.
- City of Fernley Public Works Design Standards & Review Guidelines for Streets, Potable Water, Sewer, Storm Drains & Alternative Water, May 2008.

Appendix A

FIGURES

SITE OVERVIEW EXHIBIT:



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2021.

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VICTORY LOGISTICS
TENTATIVE MAP - DRAINAGE
SITE OVERVIEW

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FIG-1

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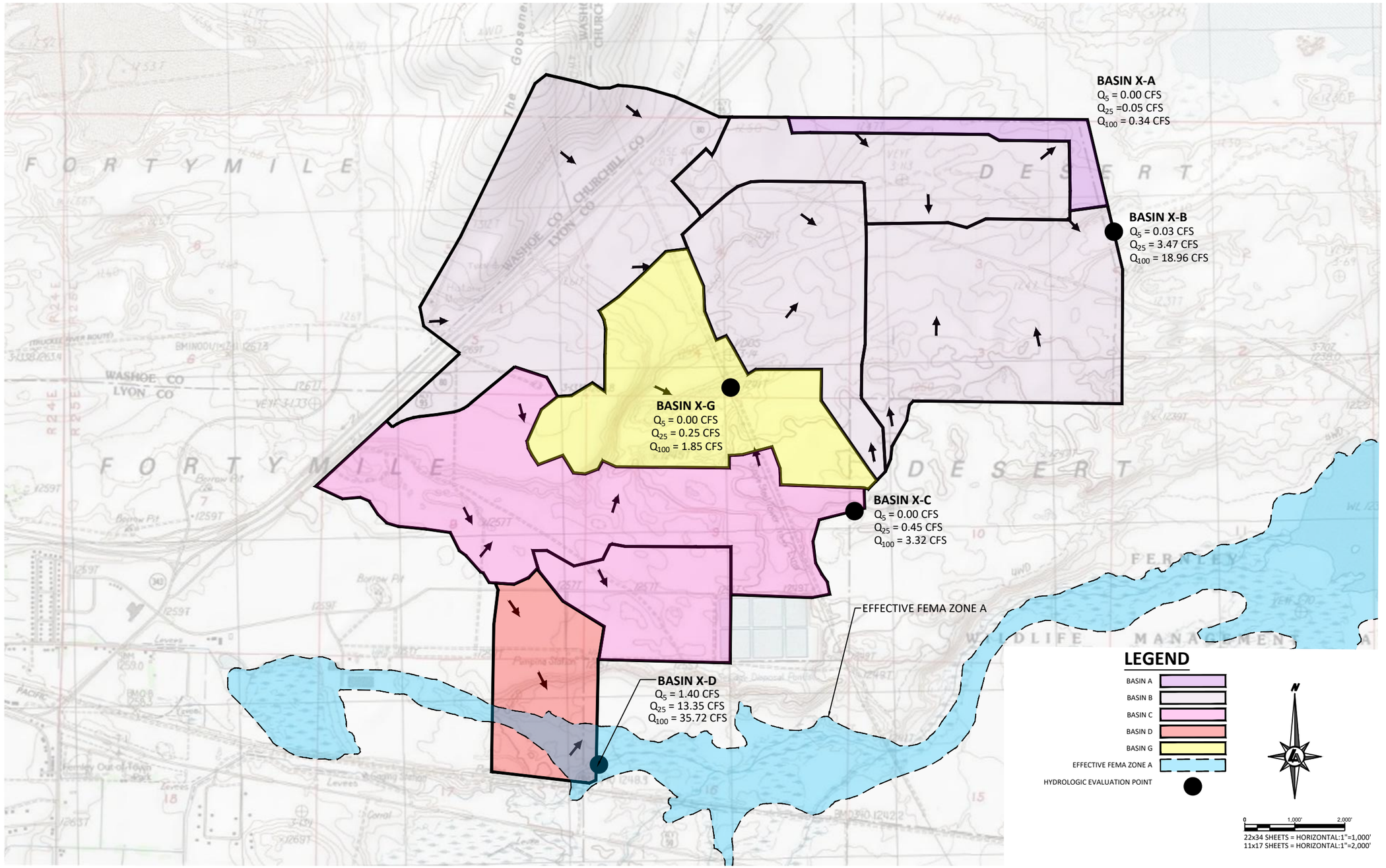
L:\LAProj\10067.008 - Victory Logistics Tentative Map\Civil\Hydrology\DWG\Master Plan\10067002_Hydro-FLOWS.dwg,FIG-1, 08/11/2023 10:16 am mshults

EXISTING CONDITIONS EXHIBIT - BASIN FLOW RATES:



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VICTORY LOGISTICS

TENTATIVE MAP - DRAINAGE

EXISTING CONDITIONS EXHIBIT - BASIN FLOW RATES

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FIG-2

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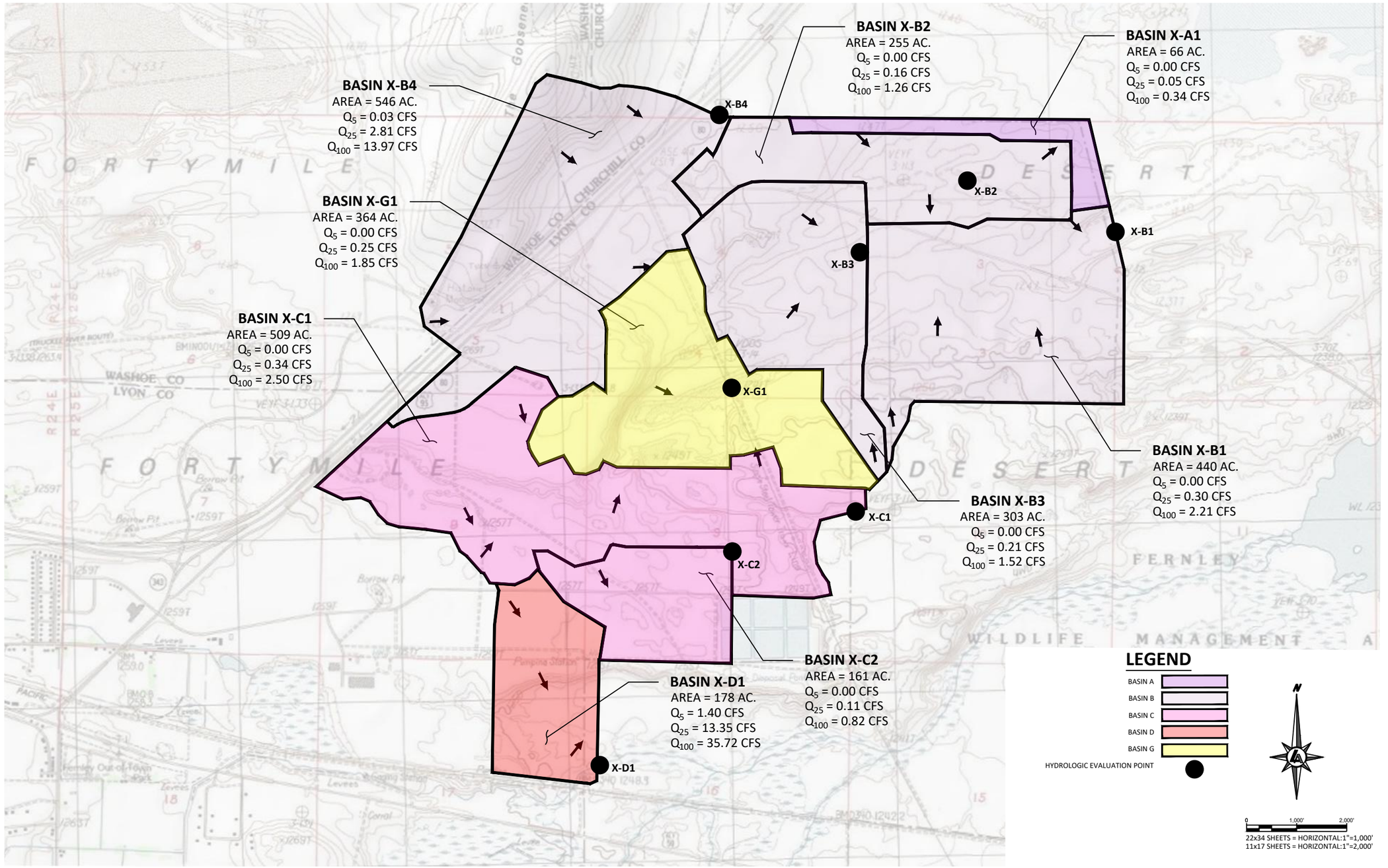
EXISTING CONDITIONS EXHIBIT - SUBBASIN FLOW RATES:



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VICTORY LOGISTICS

TENTATIVE MAP - DRAINAGE

EXISTING CONDITIONS EXHIBIT - SUBBASIN FLOW RATES

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FIG-3

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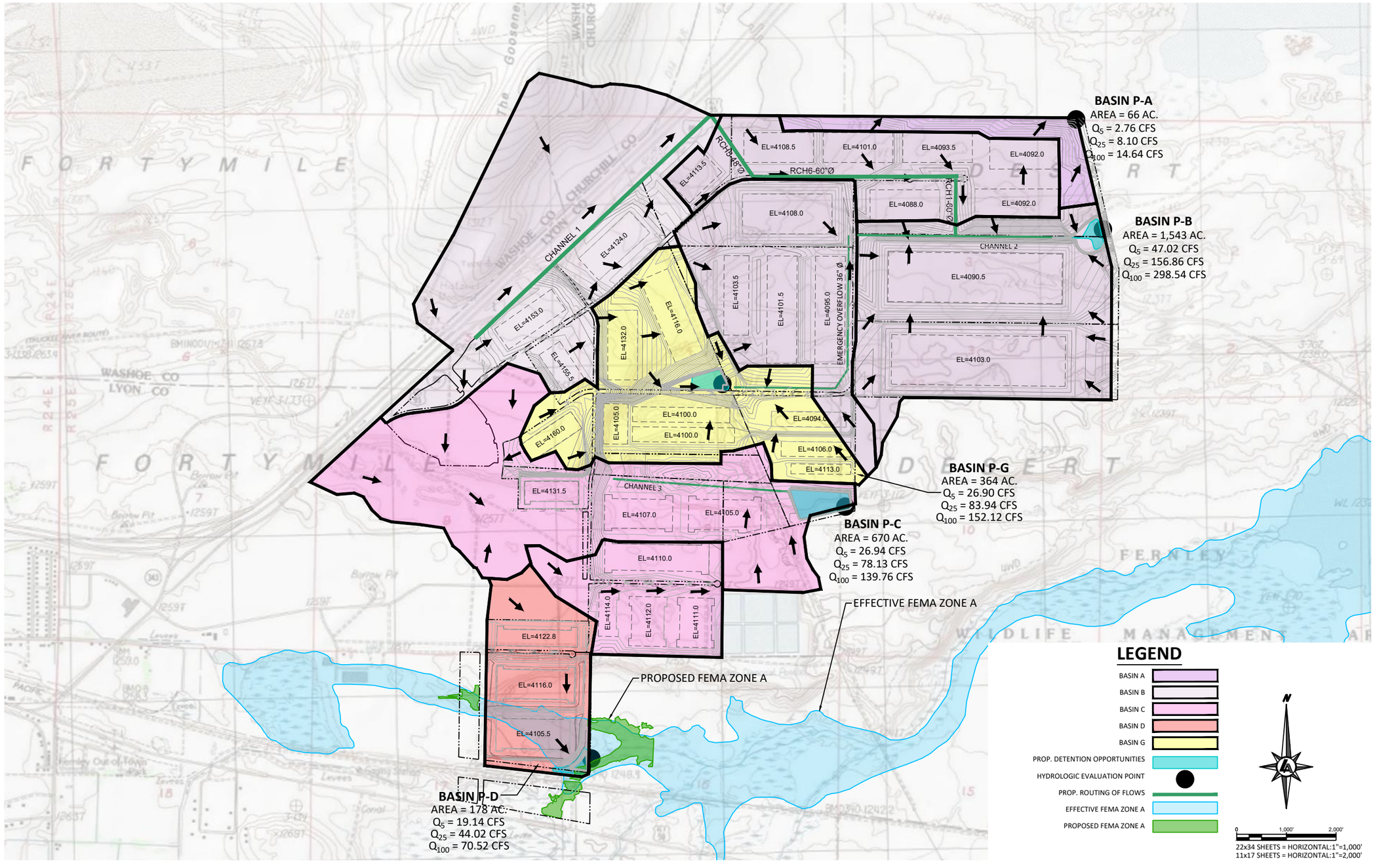
PROPOSED CONDITIONS EXHIBIT - BASIN FLOW RATES:



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VICTORY LOGISTICS

TENTATIVE MAP - DRAINAGE

PROPOSED CONDITIONS EXHIBIT - FLOW RATES

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FIG-4

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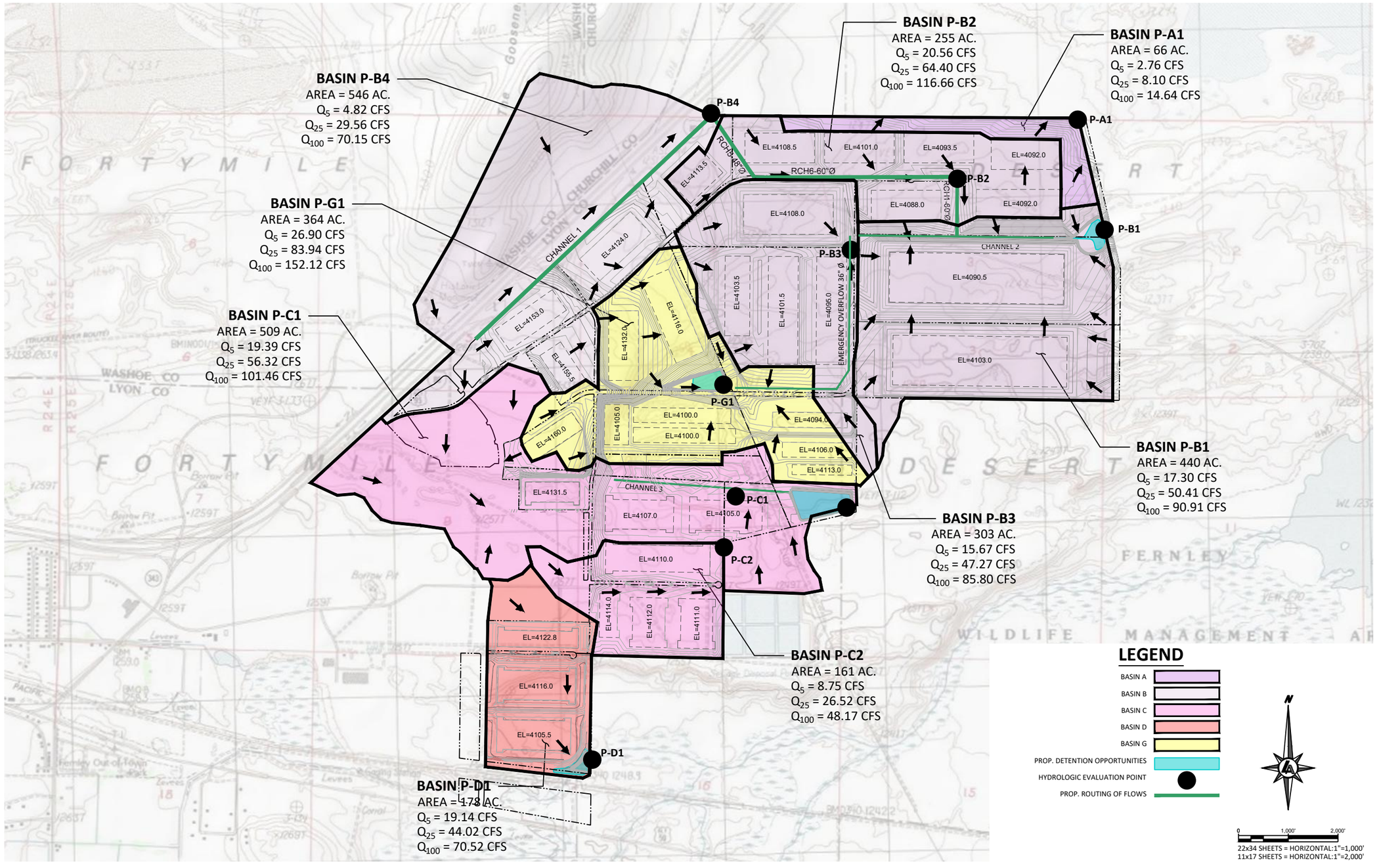
PROPOSED CONDITIONS - SUBBASIN FLOW RATES:



LEGEND

- BASIN A
- BASIN B
- BASIN C
- BASIN D
- BASIN G
- PROP. DETENTION OPPORTUNITIES
- HYDROLOGIC EVALUATION POINT
- PROP. ROUTING OF FLOWS

N

0 1,000' 2,000'

22x34 SHEETS = HORIZONTAL:1"=1,000'
11x17 SHEETS = HORIZONTAL:1"=2,000'

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VICTORY LOGISTICS

TENTATIVE MAP - DRAINAGE

PROPOSED CONDITIONS - SUBBASIN FLOW RATES

LYON COUNTY, NEVADA

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FIG-5

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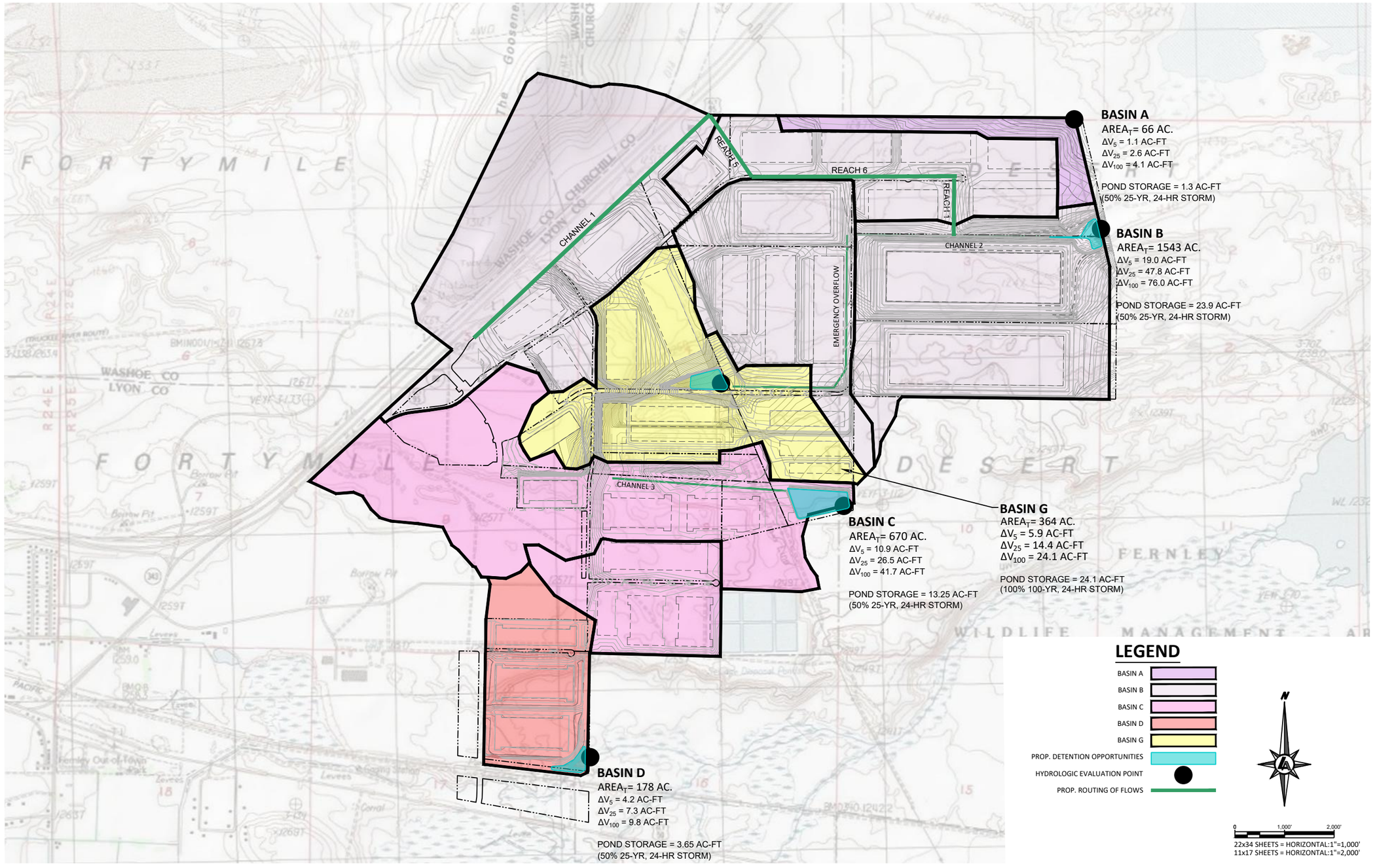
BASIN RETENTION VOLUME REQUIREMENTS:



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VICTORY LOGISTICS

TENTATIVE MAP - DRAINAGE

BASIN RETENTION VOLUME REQUIREMENTS

FERNLEY LYON NEVADA

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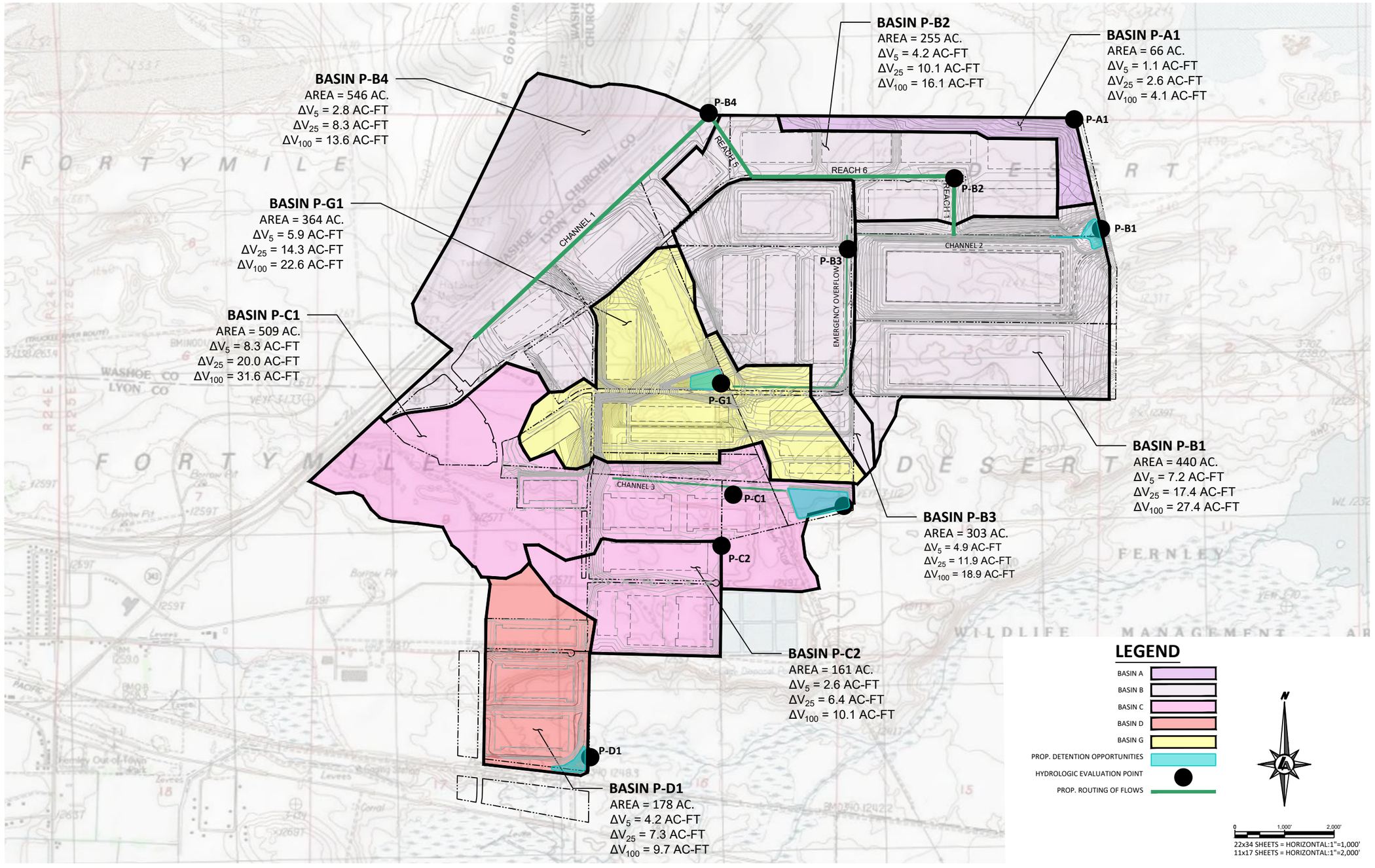
BAR IS 1 INCH ON ORIGINAL DRAWING
0 1000'
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

FIG-6

DRAWN BY:	VG/CJ
DESIGNED BY:	VG/CJ/IM
CHECKED BY:	CB
JOB NO.:	10067.008

L:\LAProj\10067.008 - Victory Logistics Tentative Map\Civil\Hydrology\DWG\Master Plan\10067002_Hydro-VOLUMES.dwg,FIG-6, 08/02/2023 01:10 pm cjaynes

SUBBASIN RETENTION VOLUME REQUIREMENTS:



LUMOS & ASSOCIATES
950 SANDHILL ROAD, SUITE 100
RENO, NV 89521
TEL: 775.827.6111
WWW.LUMOSINC.COM

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M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS

TENTATIVE MAP - DRAINAGE

SUBBASIN RETENTION VOLUME REQUIREMENTS

FERNLEY LYON NEVADA

REV	DATE	DESCRIPTION	BY

PRELIMINARY
NOT FOR CONSTRUCTION

BAR IS 1 INCH ON ORIGINAL DRAWING
0 1000'
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

FIG-7

DRAWN BY:	VG/CJ
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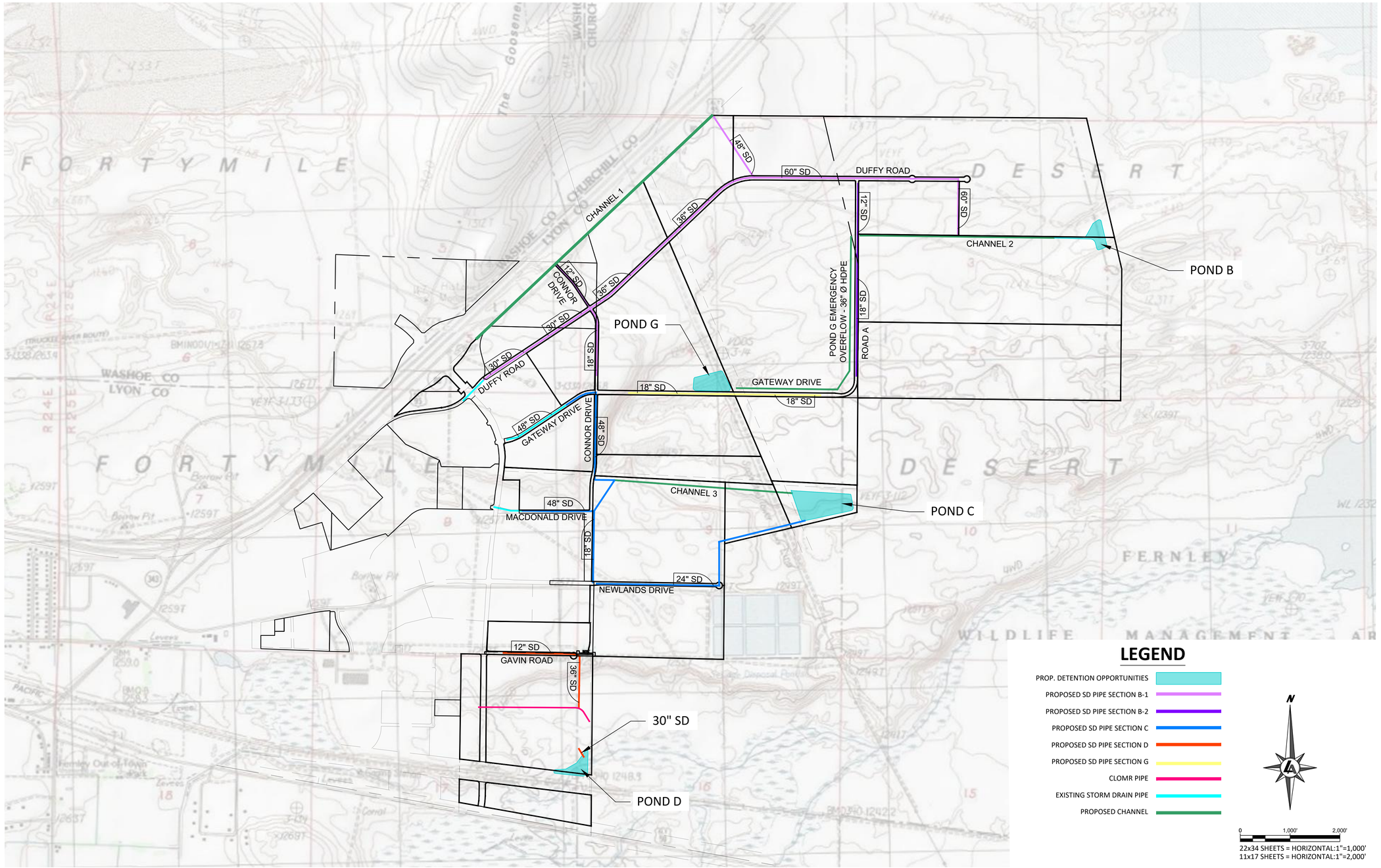
CHECKED BY:	CB
JOB NO.:	10067.008

L:\LAProj\10067.008 - Victory Logistics Tentative Map\Civil\Hydrology\DWG\Master Plan\10067002_Hydro-VOLUMES.dwg,FIG-7, 08/02/2023 01:11 pm cpynes

PRELIMINARY LOCAL STORM DRAIN PLAN:



LEGEND

- PROP. DETENTION OPPORTUNITIES
- PROPOSED SD PIPE SECTION B-1
- PROPOSED SD PIPE SECTION B-2
- PROPOSED SD PIPE SECTION C
- PROPOSED SD PIPE SECTION D
- PROPOSED SD PIPE SECTION G
- CLOMR PIPE
- EXISTING STORM DRAIN PIPE
- PROPOSED CHANNEL

N

0 1,000' 2,000'

22x34 SHEETS = HORIZONTAL:1"=1,000'
11x17 SHEETS = HORIZONTAL:1"=2,000'

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M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS

TENTATIVE MAP - DRAINAGE

PRELIMINARY LOCAL STORM DRAIN PLAN

FERNLEY LYON NEVADA

REV	DATE	DESCRIPTION	BY

PRELIMINARY
NOT FOR CONSTRUCTION

BAR IS 1 INCH ON ORIGINAL DRAWING
0 1000'

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

FIG-8

DRAWN BY:	VG/CJ
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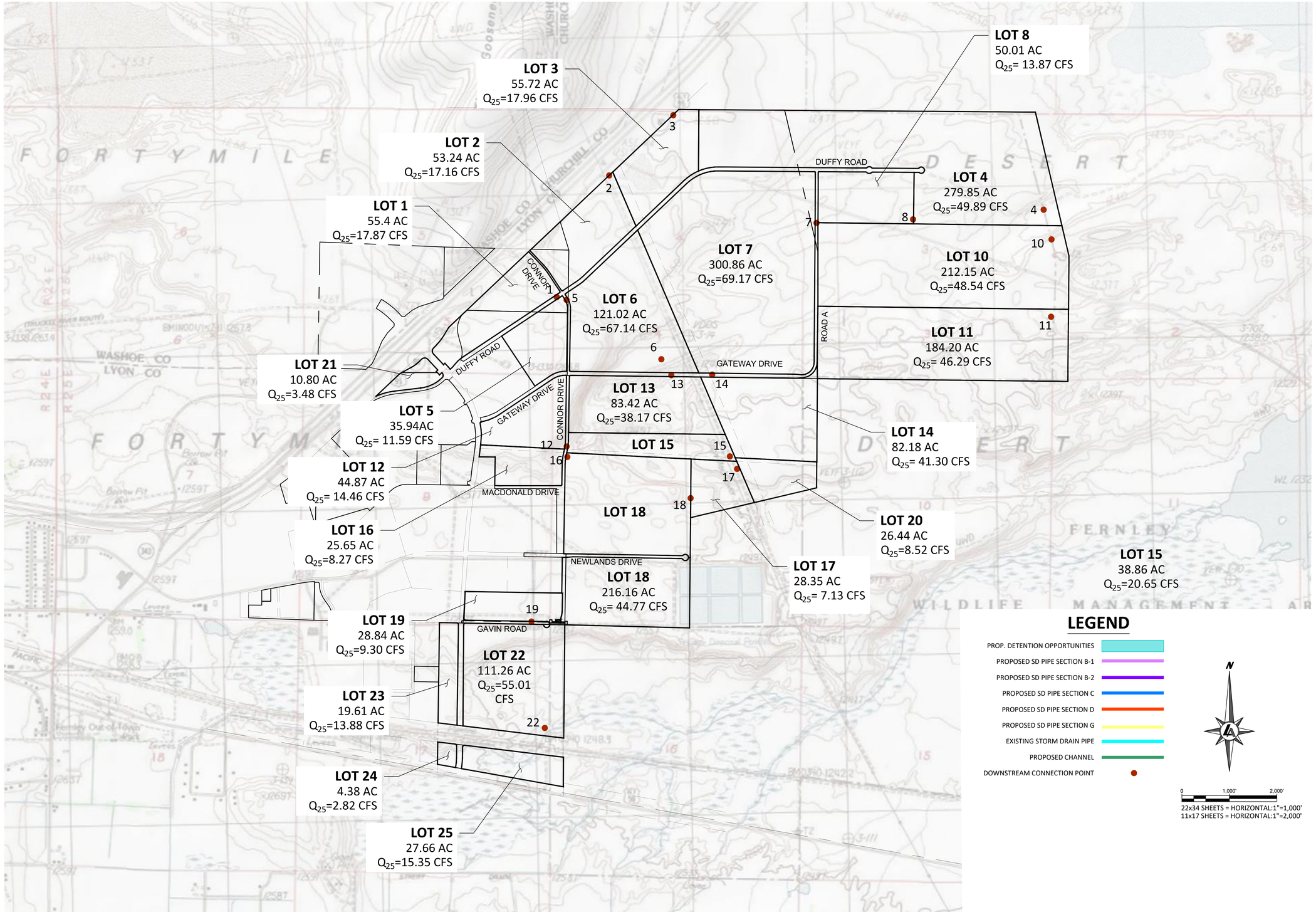
CHECKED BY:	CB
JOB NO.:	10067.008

L:\APro\10067.008 - Victory Logistics Tentative Map\Civil\Hydrology\DWG\FIGURE 10 & 11_REVISED.dwg,FIG-8, 08/11/2023 10:36 am mshults

DOWNSTREAM CONNECTION PLAN:



LEGEND

- PROP. DETENTION OPPORTUNITIES
- PROPOSED SD PIPE SECTION B-1
- PROPOSED SD PIPE SECTION B-2
- PROPOSED SD PIPE SECTION C
- PROPOSED SD PIPE SECTION D
- PROPOSED SD PIPE SECTION G
- EXISTING STORM DRAIN PIPE
- PROPOSED CHANNEL
- DOWNSTREAM CONNECTION POINT

N

0 1,000' 2,000'

22x34 SHEETS = HORIZONTAL:1"=1,000'
11x17 SHEETS = HORIZONTAL:1"=2,000'

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M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS

TENTATIVE MAP - DRAINAGE

DOWNSTREAM CONNECTION PLAN

FERNLEY LYON NEVADA

REV	DATE	DESCRIPTION	BY

PRELIMINARY
NOT FOR CONSTRUCTION

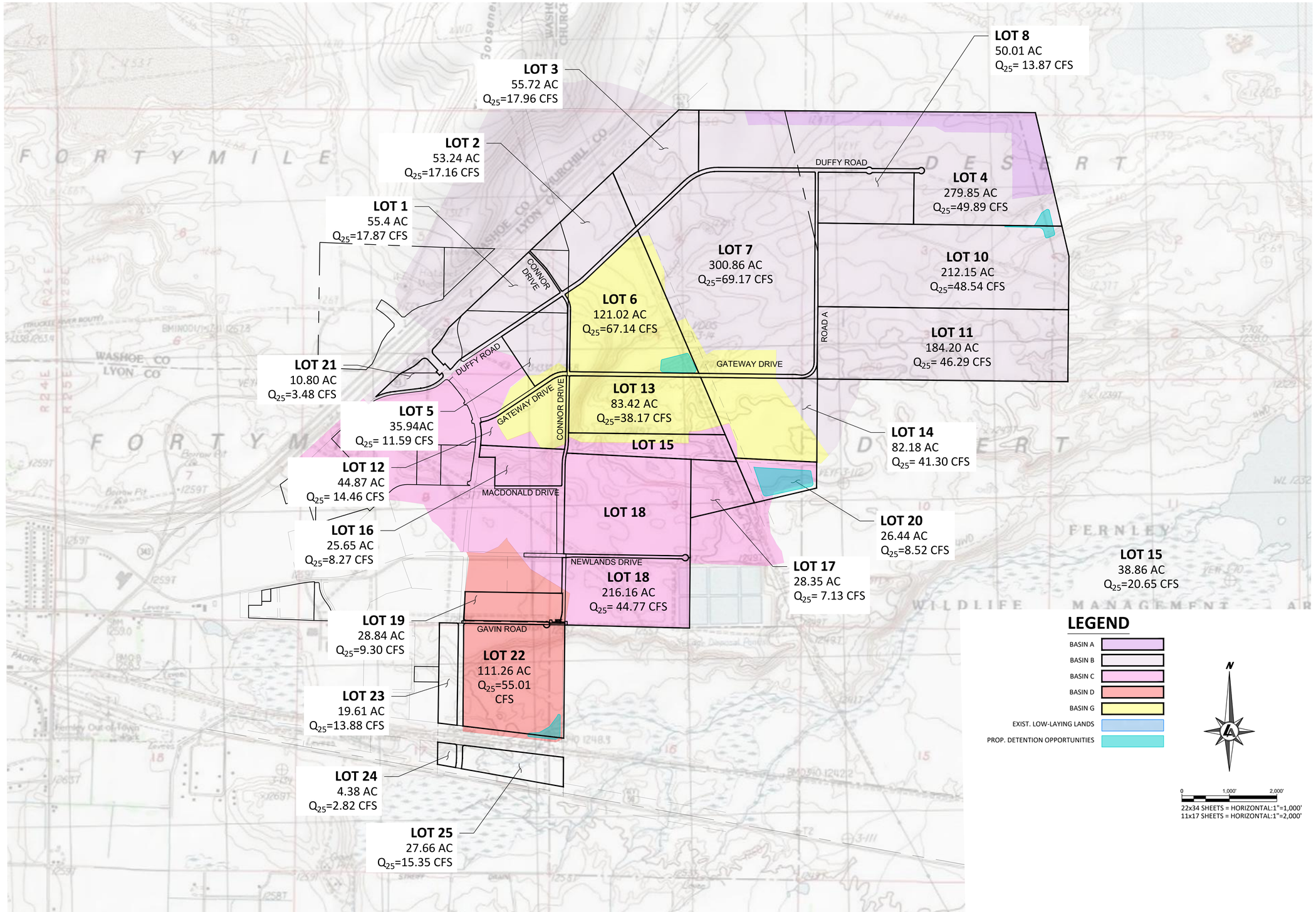
BAR IS 1 INCH ON ORIGINAL DRAWING
0 1000'
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

FIG-9

DRAWN BY:	VG/CJ
DESIGNED BY:	VG/CJ/IM
CHECKED BY:	CB
JOB NO.:	10067.008

L:\LAProj\10067.008 - Victory Logistics Tentative Map\Civil\Hydrology\DWG\FIGURE 10 & 11_REVISED.dwg,FIG-9, 09/14/2023 04:40 pm mshults

LOTS & REGIONAL BASINS:



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M4 NEW FERNLEY QOZB, LLC

VICTORY LOGISTICS

TENTATIVE MAP - DRAINAGE

LOTS & REGIONAL BASINS

LYON

FERNLEY

NEVADA

REV	DATE	DESCRIPTION	BY

PRELIMINARY
NOT FOR CONSTRUCTION

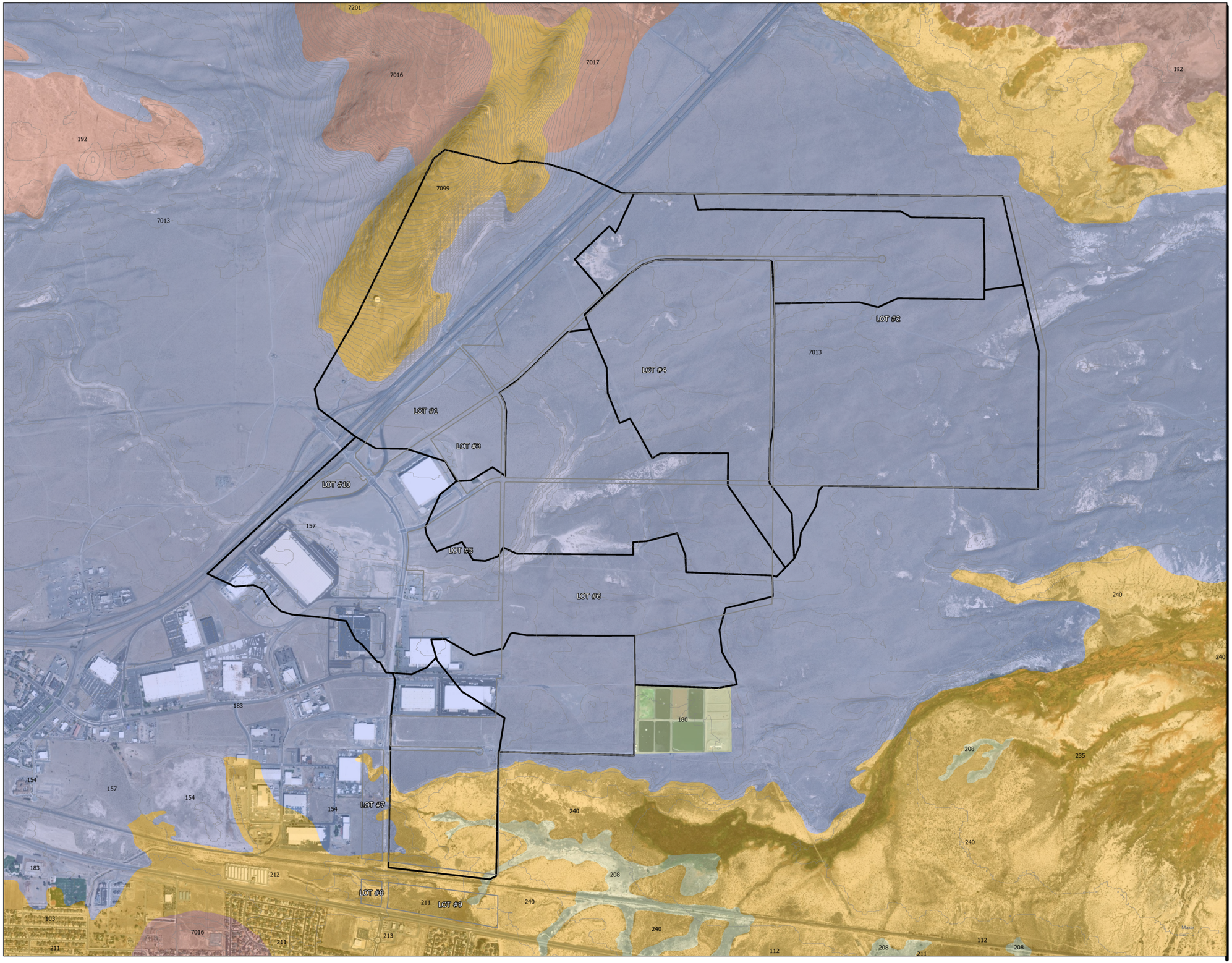
BAR IS 1 INCH ON ORIGINAL DRAWING
0 1000'

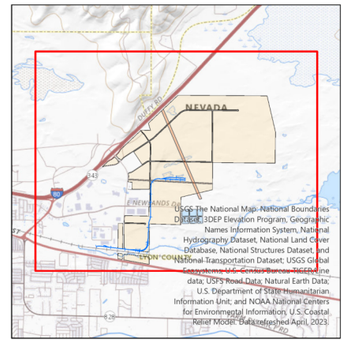
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

FIG-10

DRAWN BY:	VG/CJ
DESIGNED BY:	VG/CJ/IM
CHECKED BY:	CB
JOB NO.:	10067.008

L:\LAProj\10067.008 - Victory Logistics Tentative Map\Civil\Hydrology\DWG\FIGURE 10 & 11_REVISED.dwg,FIG-10, 09/14/2023 04:41 pm mshults





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HYDROLOGIC SOIL GROUPS
VICTORY LOGISTICS
TENTATIVE MAP

FIG. 11

LEGEND

- USGS_Contours
- TM_Lots
- Hydrologic Basins

FernleySoil

HYDROLOGICAL SOIL GROUP

- GROUP A
- GROUP B
- GROUP C
- GROUP D

N

Paper Size: 24" x 36"

Projection: Transverse Mercator
Grid: NAD 1983 StatePlane Nevada West FIPS 2703 Feet
Datum: North American 1983
Created by: mshults

Date:	AUG. 2023
Project #:	10067.008
Revision:	XX

Path: L:\LAProj\10067.008 - Victory Logistics Tentative Map\Civil\GIS\Workmap\STORM DRAIN EXHIBIT.aprx

Appendix B

ATTACHMENTS

ATTACH 1

NOAA Atlas 14, Volume 1, Version 5
Location name: Fernley, Nevada, USA*
Latitude: 39.6167°, Longitude: -119.1864°
Elevation: 4117.12 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point 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	**0.101** (0.082-0.121)	**0.126** (0.103-0.153)	**0.170** (0.139-0.207)	**0.209** (0.170-0.255)	**0.273** (0.216-0.337)	**0.332** (0.255-0.413)	**0.401** (0.299-0.502)	**0.483** (0.346-0.618)	**0.613** (0.416-0.813)	**0.731** (0.473-0.989)
10-min	**0.153** (0.125-0.185)	**0.192** (0.157-0.233)	**0.258** (0.212-0.315)	**0.318** (0.258-0.389)	**0.416** (0.328-0.513)	**0.506** (0.389-0.628)	**0.610** (0.454-0.764)	**0.735** (0.527-0.940)	**0.932** (0.634-1.24)	**1.11** (0.720-1.51)
15-min	**0.190** (0.155-0.229)	**0.238** (0.194-0.289)	**0.320** (0.262-0.391)	**0.394** (0.320-0.481)	**0.515** (0.407-0.636)	**0.627** (0.482-0.778)	**0.756** (0.564-0.947)	**0.911** (0.654-1.17)	**1.16** (0.786-1.53)	**1.38** (0.892-1.87)
30-min	**0.256** (0.209-0.309)	**0.321** (0.262-0.389)	**0.431** (0.353-0.526)	**0.531** (0.431-0.649)	**0.694** (0.548-0.856)	**0.844** (0.649-1.05)	**1.02** (0.759-1.28)	**1.23** (0.880-1.57)	**1.56** (1.06-2.07)	**1.86** (1.20-2.51)
60-min	**0.317** (0.259-0.382)	**0.397** (0.324-0.482)	**0.534** (0.437-0.651)	**0.657** (0.534-0.803)	**0.859** (0.678-1.06)	**1.05** (0.803-1.30)	**1.26** (0.939-1.58)	**1.52** (1.09-1.94)	**1.93** (1.31-2.56)	**2.30** (1.49-3.11)
2-hr	**0.395** (0.332-0.482)	**0.494** (0.417-0.602)	**0.641** (0.534-0.784)	**0.765** (0.631-0.937)	**0.954** (0.765-1.18)	**1.12** (0.879-1.39)	**1.32** (1.01-1.66)	**1.57** (1.17-2.00)	**1.97** (1.40-2.58)	**2.34** (1.60-3.14)
3-hr	**0.450** (0.380-0.541)	**0.563** (0.479-0.680)	**0.716** (0.602-0.863)	**0.838** (0.700-1.02)	**1.01** (0.834-1.23)	**1.17** (0.944-1.43)	**1.37** (1.08-1.69)	**1.61** (1.24-2.01)	**2.00** (1.50-2.61)	**2.35** (1.72-3.17)
6-hr	**0.555** (0.472-0.660)	**0.697** (0.593-0.835)	**0.883** (0.749-1.06)	**1.03** (0.866-1.24)	**1.23** (1.02-1.48)	**1.37** (1.12-1.66)	**1.53** (1.24-1.87)	**1.76** (1.39-2.18)	**2.12** (1.64-2.66)	**2.44** (1.85-3.20)
12-hr	**0.645** (0.557-0.751)	**0.817** (0.704-0.957)	**1.05** (0.904-1.23)	**1.23** (1.05-1.44)	**1.47** (1.24-1.73)	**1.66** (1.39-1.97)	**1.85** (1.52-2.22)	**2.04** (1.65-2.48)	**2.31** (1.82-2.85)	**2.59** (1.99-3.25)
24-hr	**0.771** (0.686-0.868)	**0.975** (0.868-1.10)	**1.25** (1.12-1.41)	**1.47** (1.31-1.66)	**1.79** (1.57-2.00)	**2.03** (1.77-2.28)	**2.29** (1.98-2.58)	**2.55** (2.19-2.89)	**2.92** (2.47-3.32)	**3.21** (2.69-3.68)
2-day	**0.855** (0.757-0.964)	**1.08** (0.956-1.22)	**1.40** (1.24-1.57)	**1.64** (1.44-1.84)	**1.99** (1.74-2.23)	**2.26** (1.97-2.54)	**2.54** (2.20-2.87)	**2.84** (2.42-3.22)	**3.24** (2.73-3.71)	**3.56** (2.97-4.12)
3-day	**0.920** (0.819-1.04)	**1.16** (1.04-1.31)	**1.51** (1.34-1.70)	**1.78** (1.57-1.99)	**2.15** (1.89-2.42)	**2.45** (2.14-2.76)	**2.76** (2.40-3.12)	**3.09** (2.65-3.50)	**3.54** (2.99-4.05)	**3.90** (3.25-4.49)
4-day	**0.986** (0.882-1.11)	**1.25** (1.12-1.41)	**1.62** (1.44-1.82)	**1.91** (1.70-2.15)	**2.32** (2.05-2.60)	**2.64** (2.31-2.97)	**2.99** (2.60-3.37)	**3.34** (2.88-3.78)	**3.84** (3.24-4.38)	**4.23** (3.52-4.87)
7-day	**1.14** (1.01-1.29)	**1.44** (1.27-1.64)	**1.86** (1.65-2.12)	**2.20** (1.94-2.50)	**2.67** (2.34-3.04)	**3.04** (2.64-3.46)	**3.43** (2.96-3.92)	**3.84** (3.28-4.39)	**4.40** (3.70-5.08)	**4.85** (4.03-5.63)
10-day	**1.25** (1.10-1.44)	**1.60** (1.41-1.83)	**2.08** (1.83-2.38)	**2.45** (2.14-2.80)	**2.96** (2.57-3.39)	**3.35** (2.90-3.84)	**3.77** (3.23-4.32)	**4.19** (3.56-4.84)	**4.76** (4.00-5.55)	**5.21** (4.31-6.12)
20-day	**1.48** (1.31-1.68)	**1.89** (1.66-2.15)	**2.43** (2.15-2.76)	**2.85** (2.51-3.23)	**3.40** (2.97-3.86)	**3.82** (3.32-4.34)	**4.24** (3.66-4.83)	**4.66** (4.00-5.33)	**5.22** (4.43-6.02)	**5.65** (4.74-6.55)
30-day	**1.65** (1.46-1.87)	**2.09** (1.86-2.38)	**2.70** (2.39-3.07)	**3.15** (2.78-3.58)	**3.75** (3.29-4.26)	**4.20** (3.66-4.78)	**4.66** (4.04-5.32)	**5.12** (4.40-5.87)	**5.72** (4.87-6.59)	**6.17** (5.21-7.15)
45-day	**1.92** (1.70-2.16)	**2.44** (2.16-2.75)	**3.14** (2.77-3.52)	**3.66** (3.22-4.10)	**4.33** (3.80-4.86)	**4.83** (4.22-5.43)	**5.32** (4.63-6.00)	**5.80** (5.01-6.56)	**6.41** (5.49-7.29)	**6.84** (5.83-7.81)
60-day	**2.18** (1.94-2.45)	**2.79** (2.47-3.13)	**3.58** (3.17-4.01)	**4.15** (3.67-4.64)	**4.87** (4.29-5.45)	**5.39** (4.73-6.05)	**5.88** (5.15-6.62)	**6.35** (5.54-7.17)	**6.93** (6.01-7.85)	**7.34** (6.33-8.36)

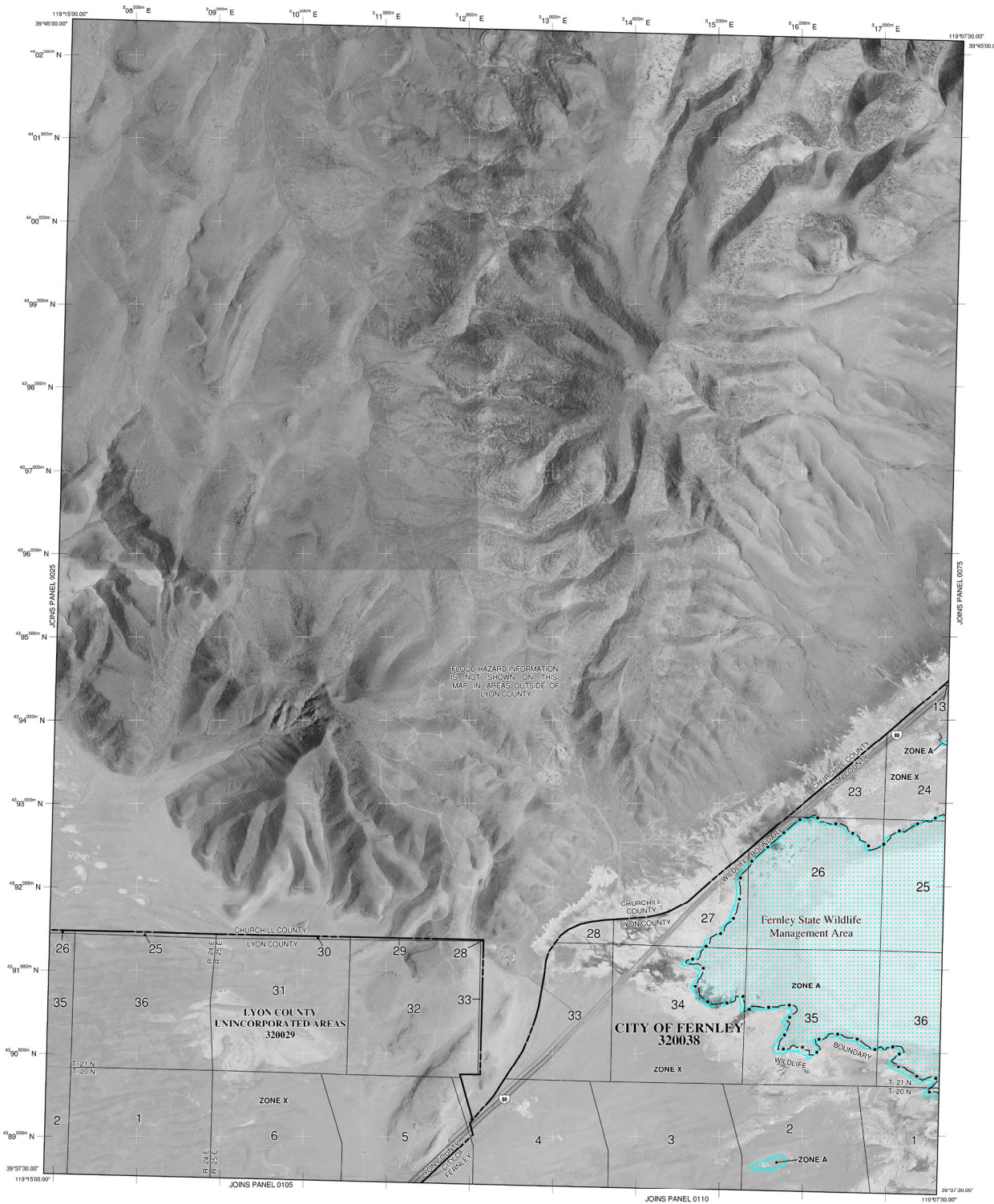
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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.

Back to Top

PF graphical



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'30", 39°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4279000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 11
- 6000000 M — 5000-foot grid ticks: Nevada State Plane coordinate system, west zone (FIPSZONE 2703), Transverse Mercator
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 16, 2009
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET

600 0 600 1200 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0050E

FIRM

FLOOD INSURANCE RATE MAP

LYON COUNTY, NEVADA

AND INCORPORATED AREAS

PANEL 50 OF 1375

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

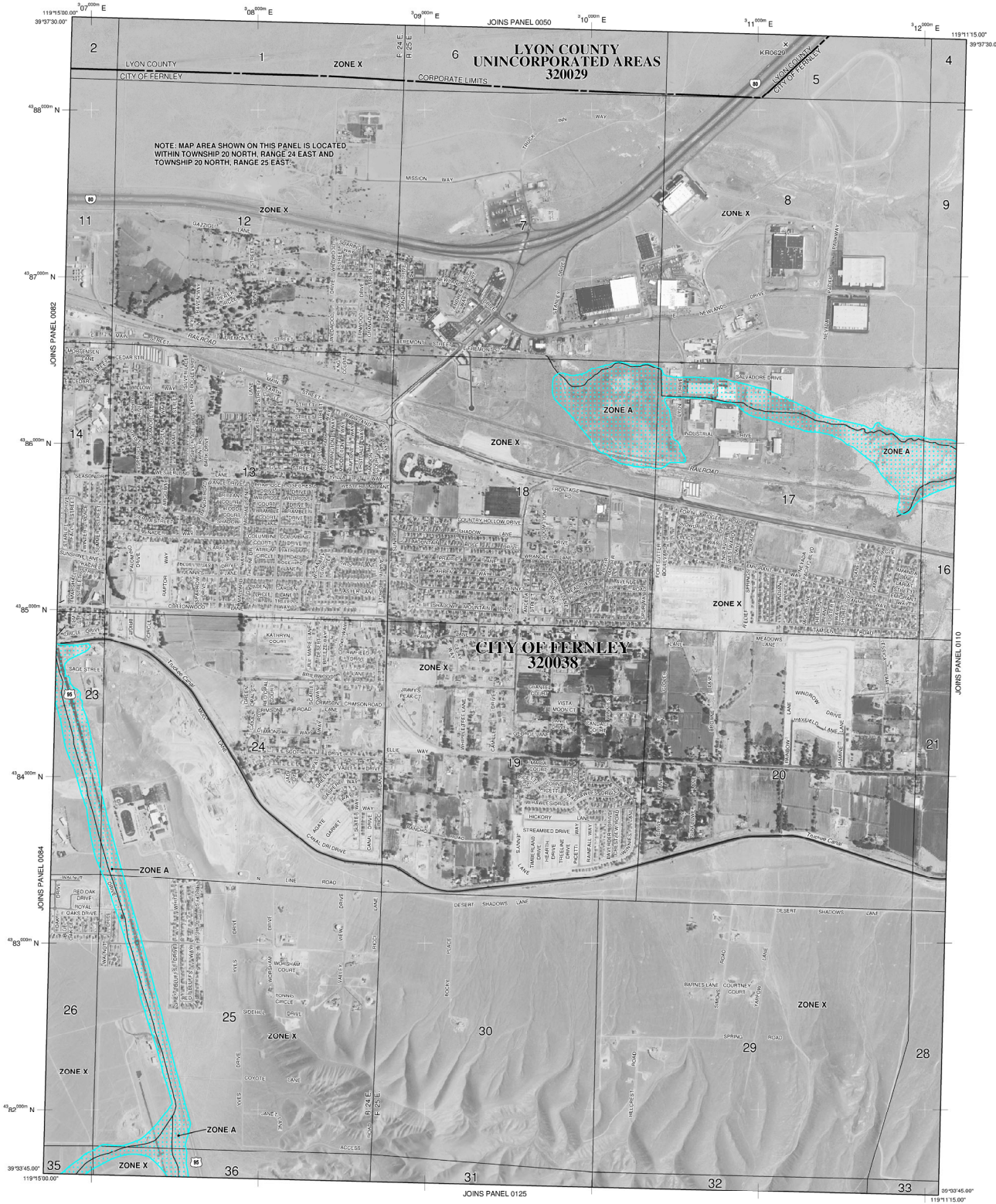
COMMUNITY	NUMBER	PANEL	SUFFIX
LYON COUNTY	320029	0050	E
FERNLEY, CITY OF	320038	0050	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
32019C0050E

EFFECTIVE DATE
JANUARY 16, 2009

Federal Emergency Management Agency



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 11
- 6000000 M — 5000-foot grid ticks: Nevada State Plane coordinate system, west zone (FIPSZONE 2703), Transverse Mercator
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 16, 2009
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0105E

FIRM
FLOOD INSURANCE RATE MAP
LYON COUNTY, NEVADA
AND INCORPORATED AREAS

PANEL 105 OF 1375
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

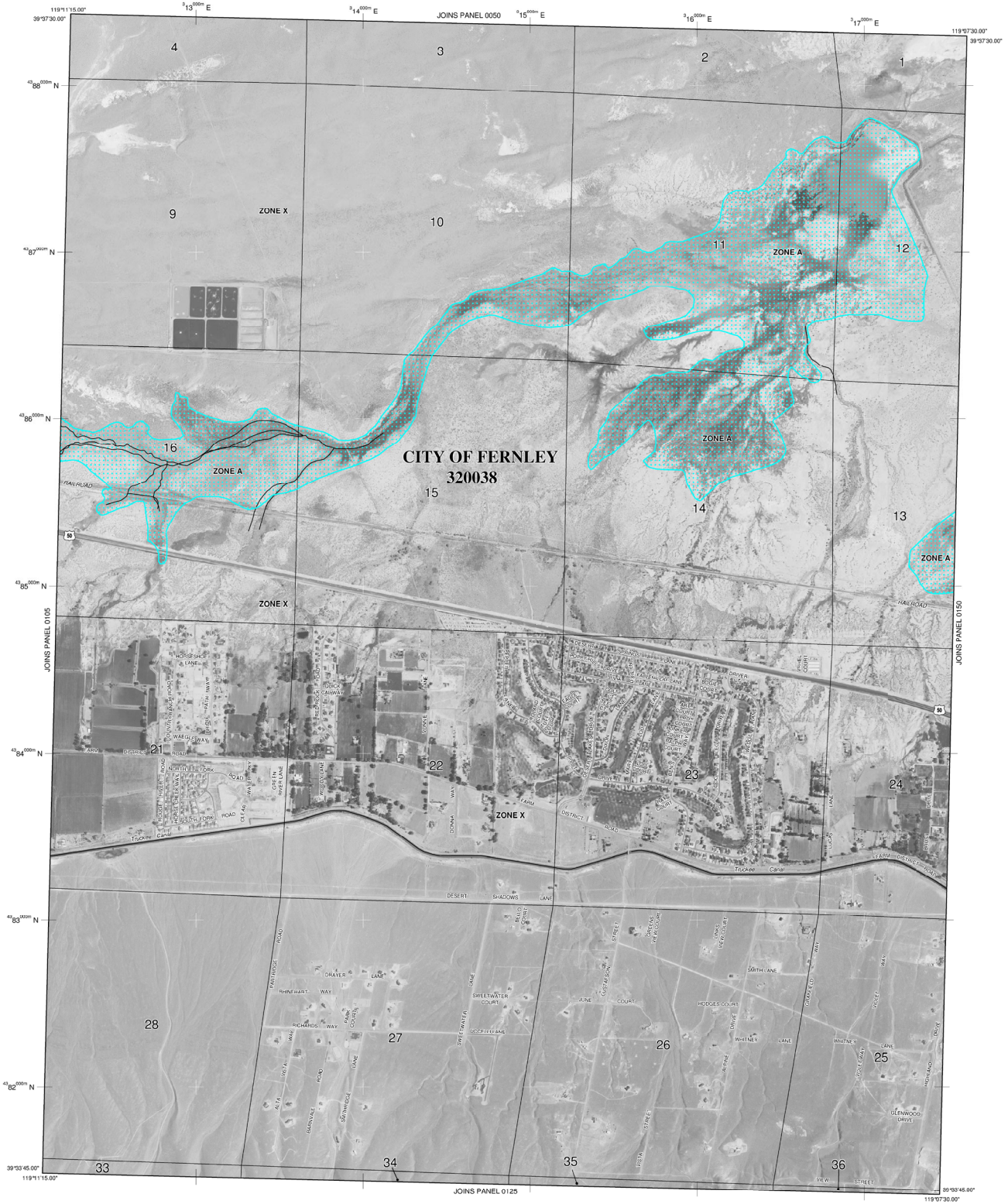
COMMUNITY	NUMBER	PANEL	SUFFIX
LYON COUNTY	320029	0105	E
FERNLEY, CITY OF	320038	0105	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
32019C0105E

EFFECTIVE DATE
JANUARY 16, 2009

Federal Emergency Management Agency



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
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ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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- 1% annual chance floodplain boundary
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* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

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- 23 — 23 — Transect line
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- 4275000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 11
- 6000000 M — 5000-foot grid ticks: Nevada State Plane coordinate system, west zone (FIPSZONE 2703), Transverse Mercator
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 16, 2009
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0110E

FIRM

FLOOD INSURANCE RATE MAP

LYON COUNTY, NEVADA

AND INCORPORATED AREAS

PANEL 110 OF 1375

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FERNLEY, CITY OF	320038	0110	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
32019C0110E

EFFECTIVE DATE
JANUARY 16, 2009

Federal Emergency Management Agency

CURVE NUMBER DEVELOPMENT – EXISTING CONDITIONS

Basin A
Fair Soil Desert Shrub: Table Table 2.2d (Soil Group A) = 55

Basin B1-B3
Fair Soil Desert Shrub: Table Table 2.2d (Soil Group A) = 55

Basin B4
Open Space North of I-80: Fair Soil Desert Shrub Table Table 2.2d (Soil Group A) = 55
Open Space North of I-80: Fair Soil Desert Shrub Table Table 2.2d (Soil Group C) = 81
Fair Soil Desert Shrub: Table Table 2.2d (Soil Group A) = 55

Basin C1
Fair Soil Desert Shrub: Table Table 2.2d (Soil Group A) = 55

Basin C2
Fair Soil Desert Shrub: Table Table 2.2d (Soil Group A) = 55

Basin D
Existing Industrial: Table 2.2a (Soil Group A) = 81
Fair Soil Desert Shrub: Table Table 2.2d (Soil Group A) = 55
Fair Soil Desert Shrub: Table Table 2.2d (Soil Group C) = 81
Fair Soil Desert Shrub: Table Table 2.2d (Soil Group D) = 86

Basin G
Fair Soil Desert Shrub: Table Table 2.2d (Soil Group A) = 55

CURVE NUMBER DEVELOPMENT – PROPOSED CONDITIONS

Basin A
Industrial: Table 2.2a (Soil Group A) = 81

Basin B1-B3
Industrial: Table 2.2a (Soil Group A) = 81

Basin B4
Open Space North of I-80: Fair Soil Desert Shrub Table Table 2.2d (Soil Group A) = 55
Open Space North of I-80: Fair Soil Desert Shrub Table Table 2.2d (Soil Group C) = 81
Industrial South of I-80: Table 2.2a (Soil Group A) = 81

Basin C1
Industrial: Table 2.2a (Soil Group A) = 81

Basin C2
Industrial: Table 2.2a (Soil Group A) = 81

Basin D
Industrial: Table 2.2a (Soil Group A) = 81
Industrial: Table 2.2a (Soil Group C) = 91
Industrial: Table 2.2a (Soil Group D) = 93

Basin G
Industrial: Table 2.2a (Soil Group A) = 81

Hydrograph Report

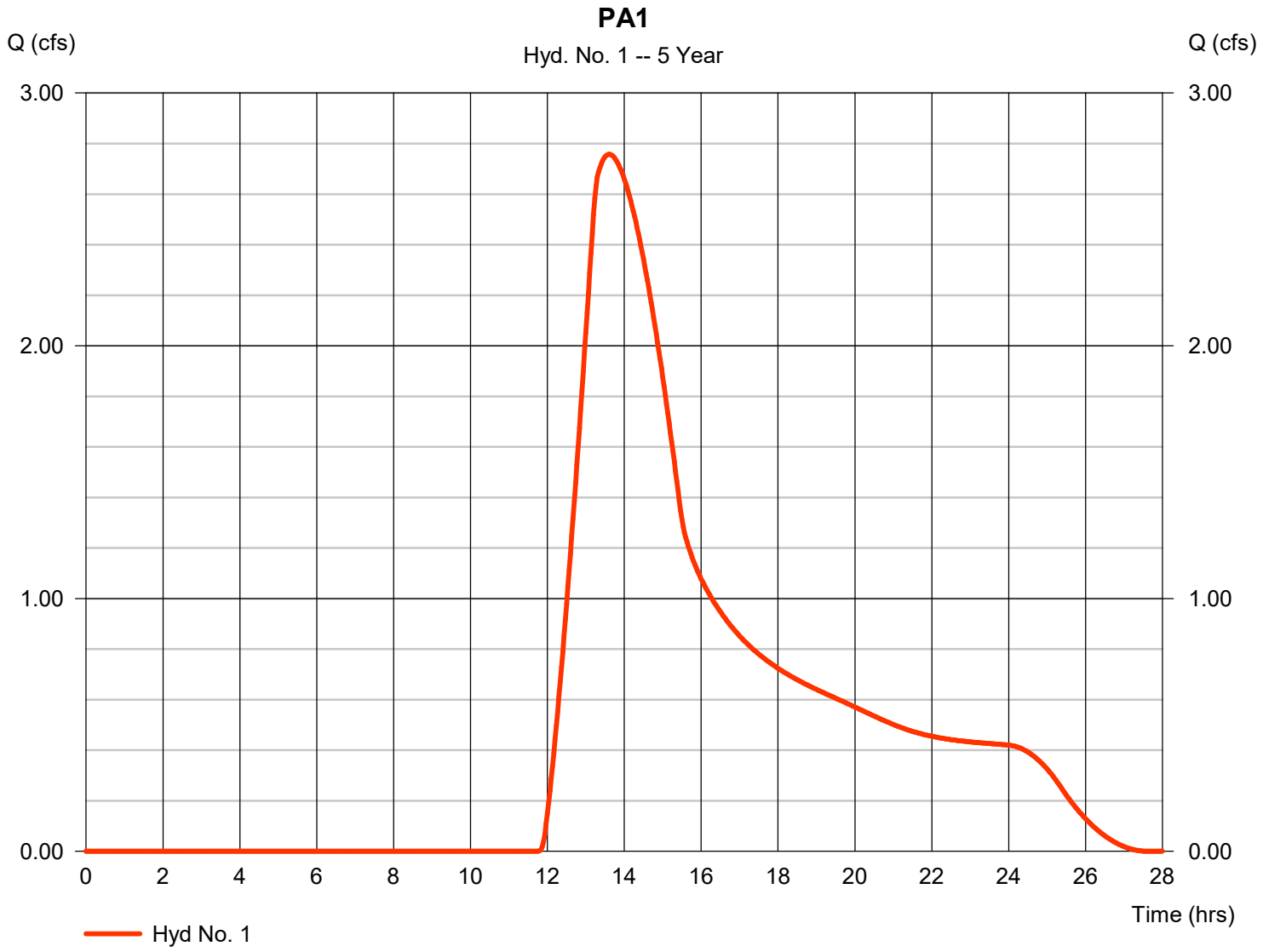
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Tuesday, 01 / 25 / 2022

Hyd. No. 1

PA1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.758 cfs
Storm frequency	= 5 yrs	Time to peak	= 13.60 hrs
Time interval	= 2 min	Hyd. volume	= 46,581 cuft
Drainage area	= 66.000 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 137.10 min
Total precip.	= 1.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(66.000 x 63)] / 66.000



Hydrograph Report

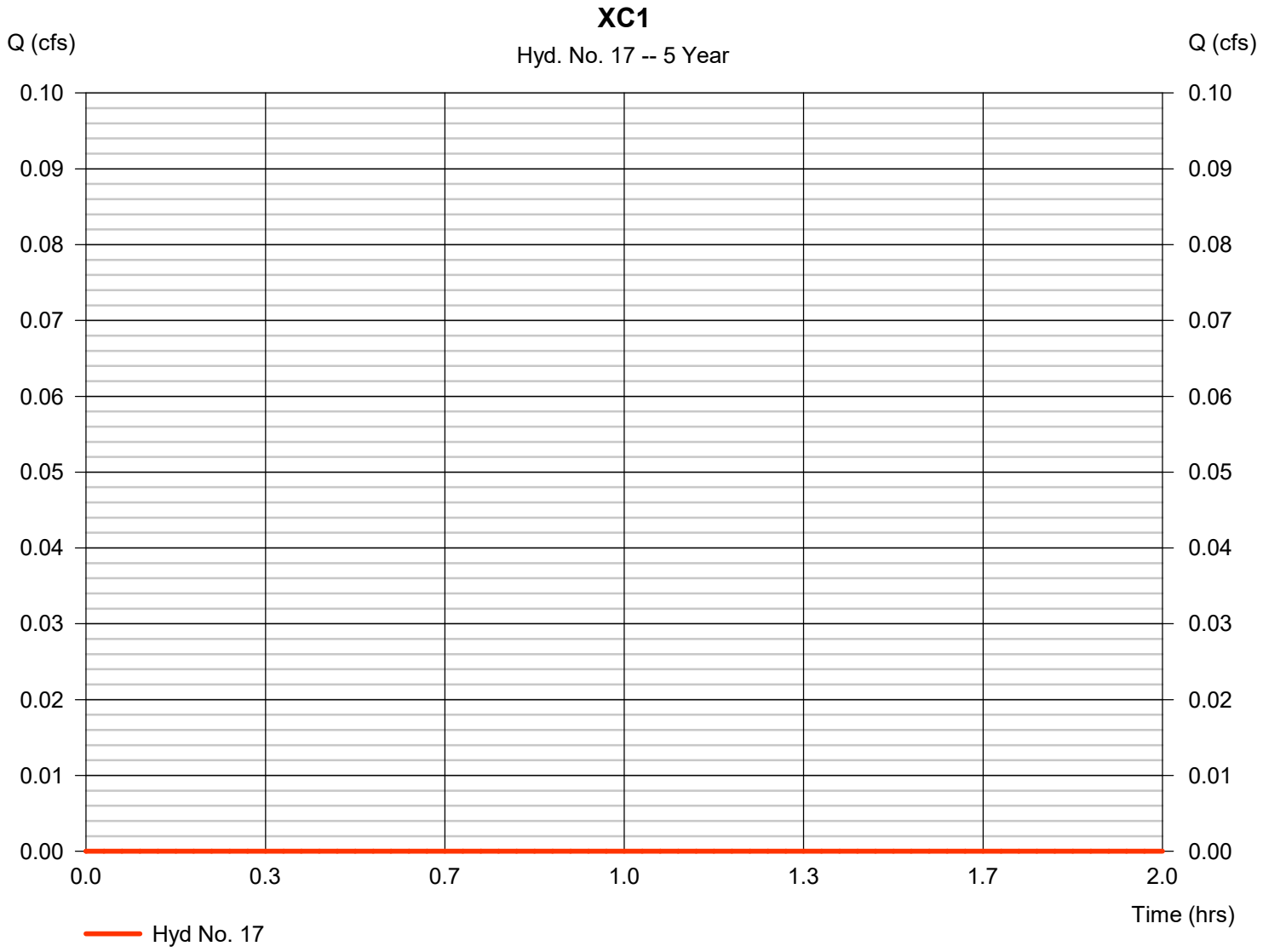
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Tuesday, 07 / 26 / 2022

Hyd. No. 17

XC1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 5 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Drainage area	= 509.000 ac	Curve number	= 55*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 162.10 min
Total precip.	= 1.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.600 x 81) + (455.800 x 55) + (42.600 x 81)] / 509.000



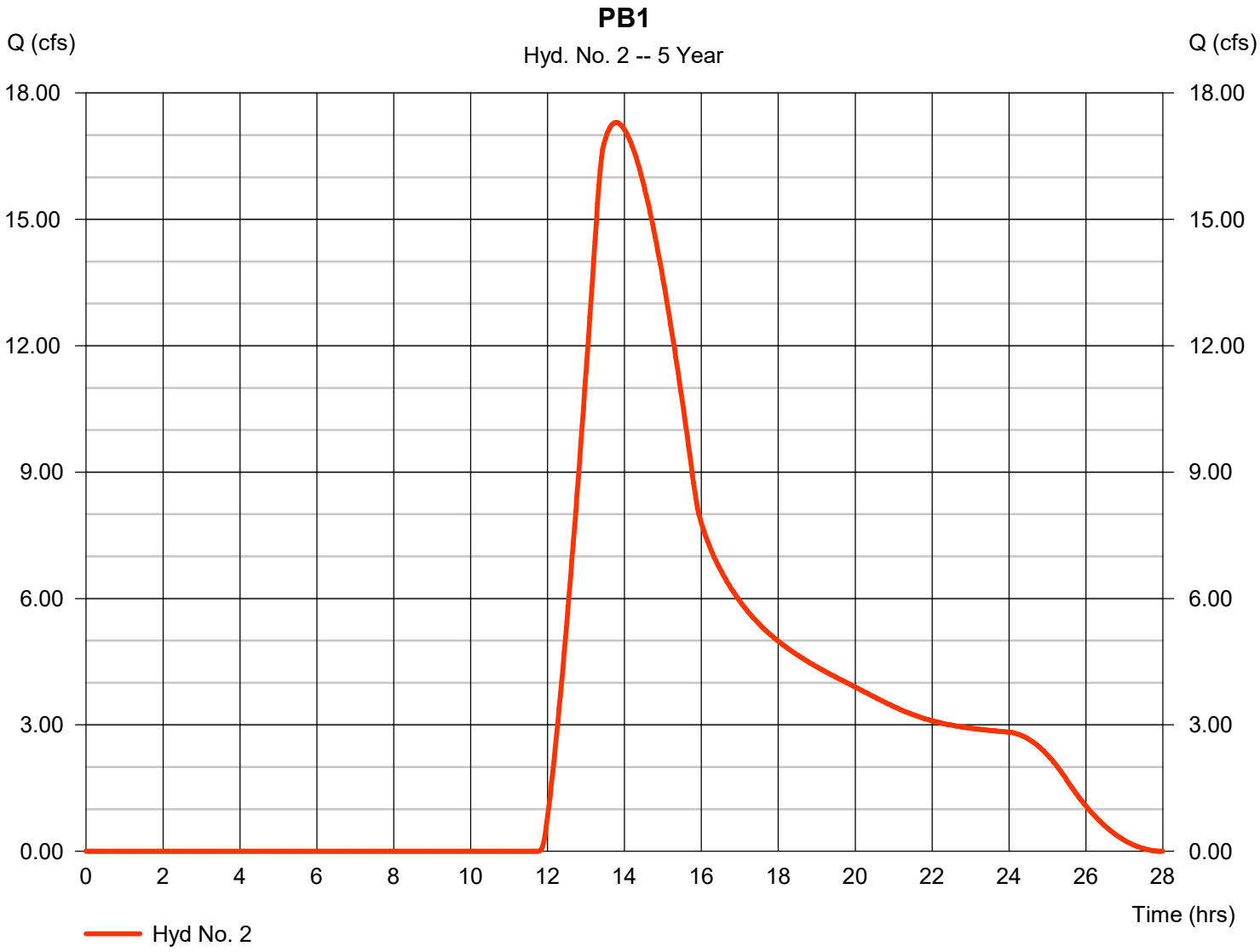
Hydrograph Report

Hyd. No. 2

PB1

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.30 cfs
Storm frequency	=	5 yrs	Time to peak	=	13.80 hrs
Time interval	=	2 min	Hyd. volume	=	311,987 cuft
Drainage area	=	440.700 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	150.30 min
Total precip.	=	1.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(211.500 x 98) + (229.300 x 63)] / 440.700



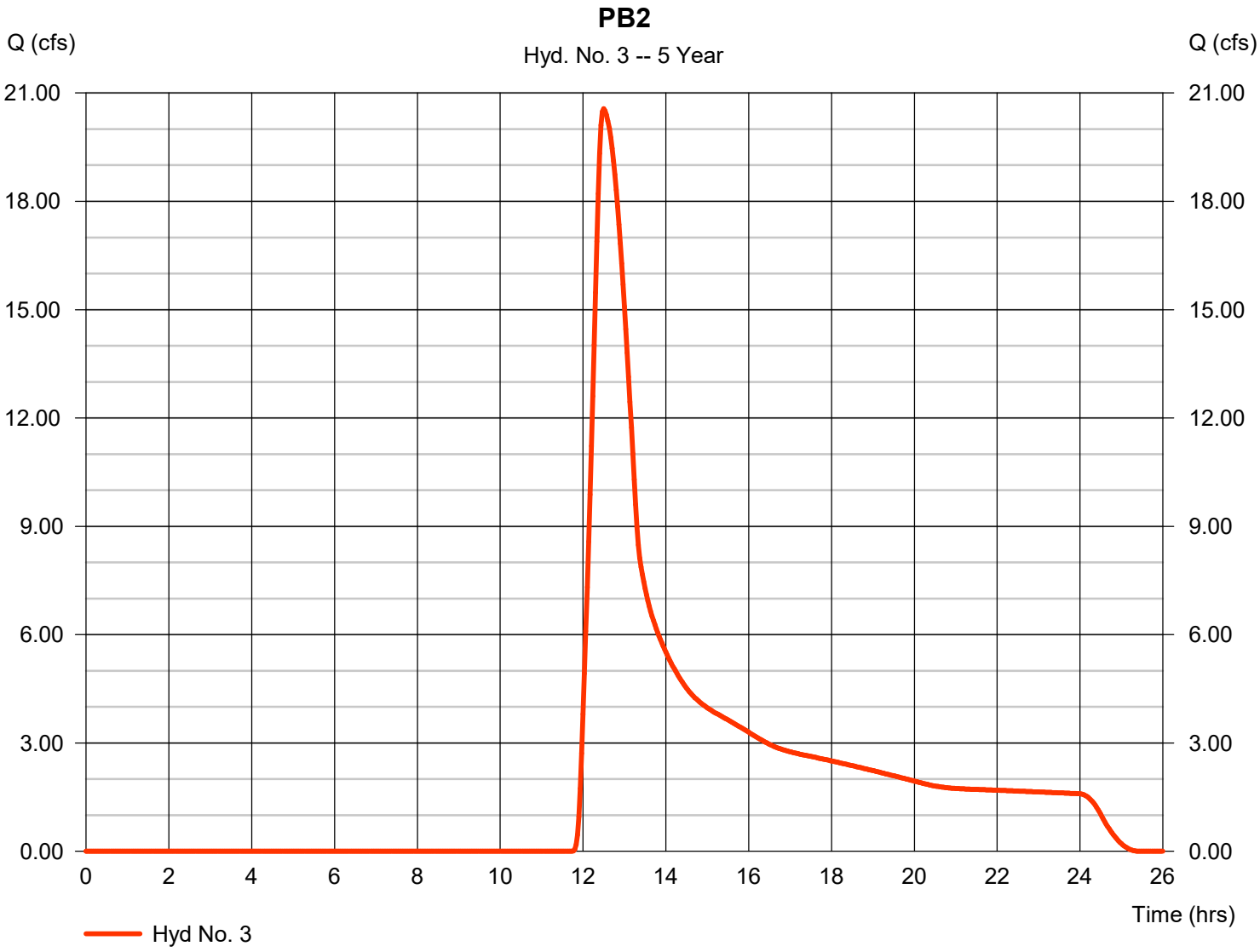
Hydrograph Report

Hyd. No. 3

PB2

Hydrograph type	=	SCS Runoff	Peak discharge	=	20.56 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.50 hrs
Time interval	=	2 min	Hyd. volume	=	182,148 cuft
Drainage area	=	255.300 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	51.20 min
Total precip.	=	1.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(162.900 x 98) + (92.400 x 63)] / 255.300



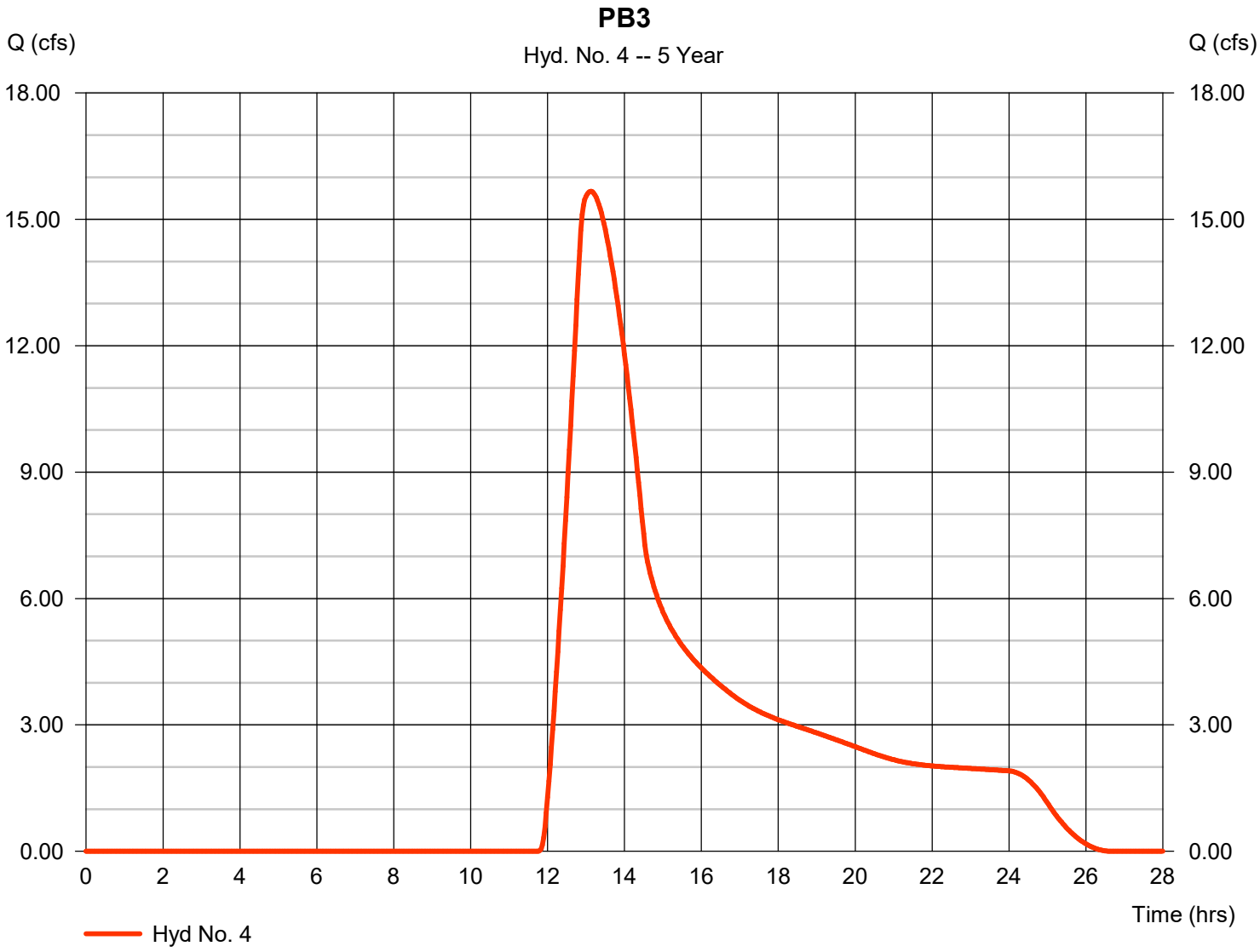
Hydrograph Report

Hyd. No. 4

PB3

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.67 cfs
Storm frequency	=	5 yrs	Time to peak	=	13.13 hrs
Time interval	=	2 min	Hyd. volume	=	214,504 cuft
Drainage area	=	303.000 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	99.90 min
Total precip.	=	1.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(136.200 x 98) + (166.800 x 63)] / 303.000



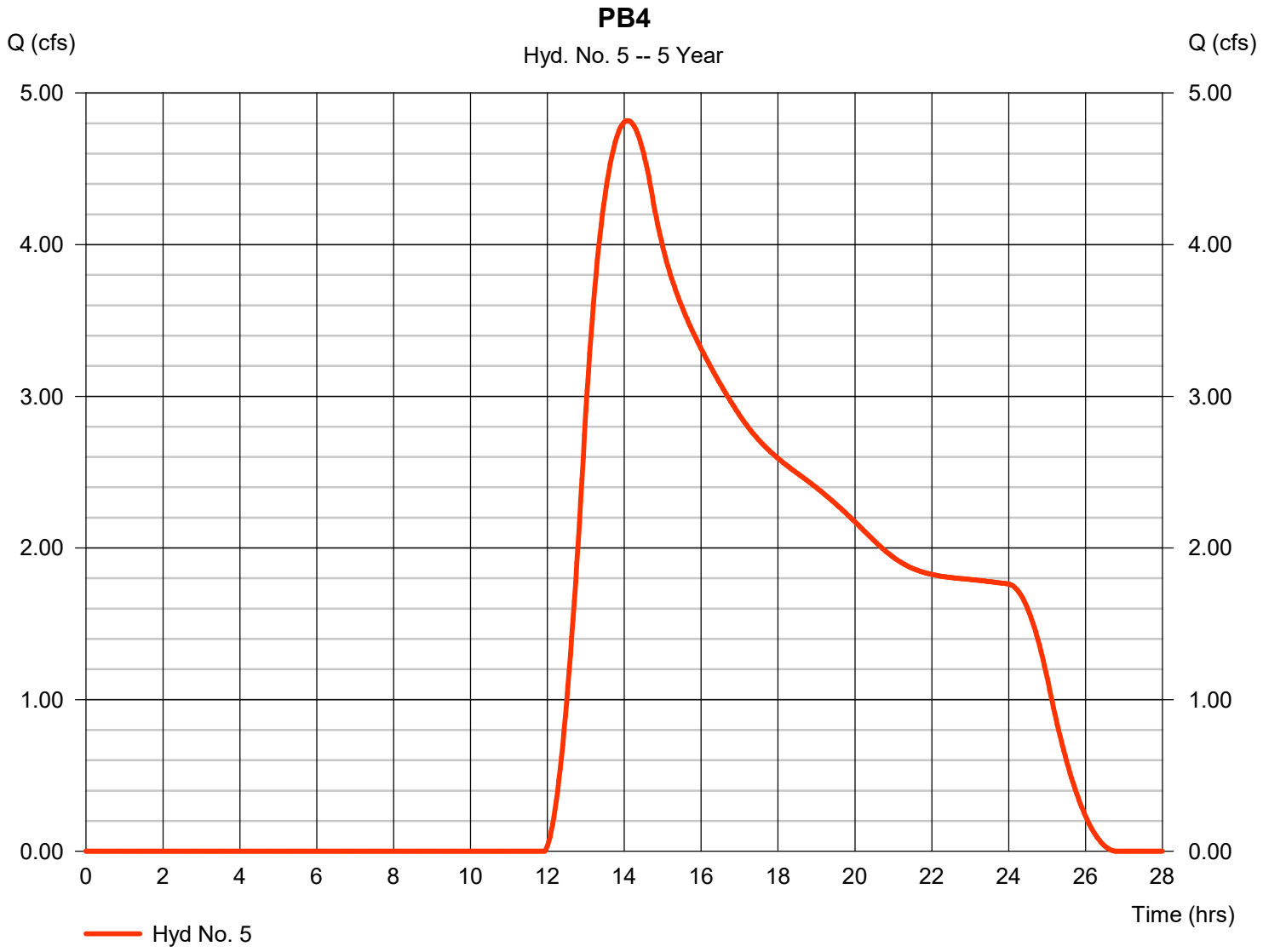
Hydrograph Report

Hyd. No. 5

PB4

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.818 cfs
Storm frequency	=	5 yrs	Time to peak	=	14.10 hrs
Time interval	=	2 min	Hyd. volume	=	121,607 cuft
Drainage area	=	545.800 ac	Curve number	=	73*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	108.30 min
Total precip.	=	1.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(93.800 x 98) + (131.300 x 63) + (173.700 x 55) + (147.000 x 81)] / 545.800

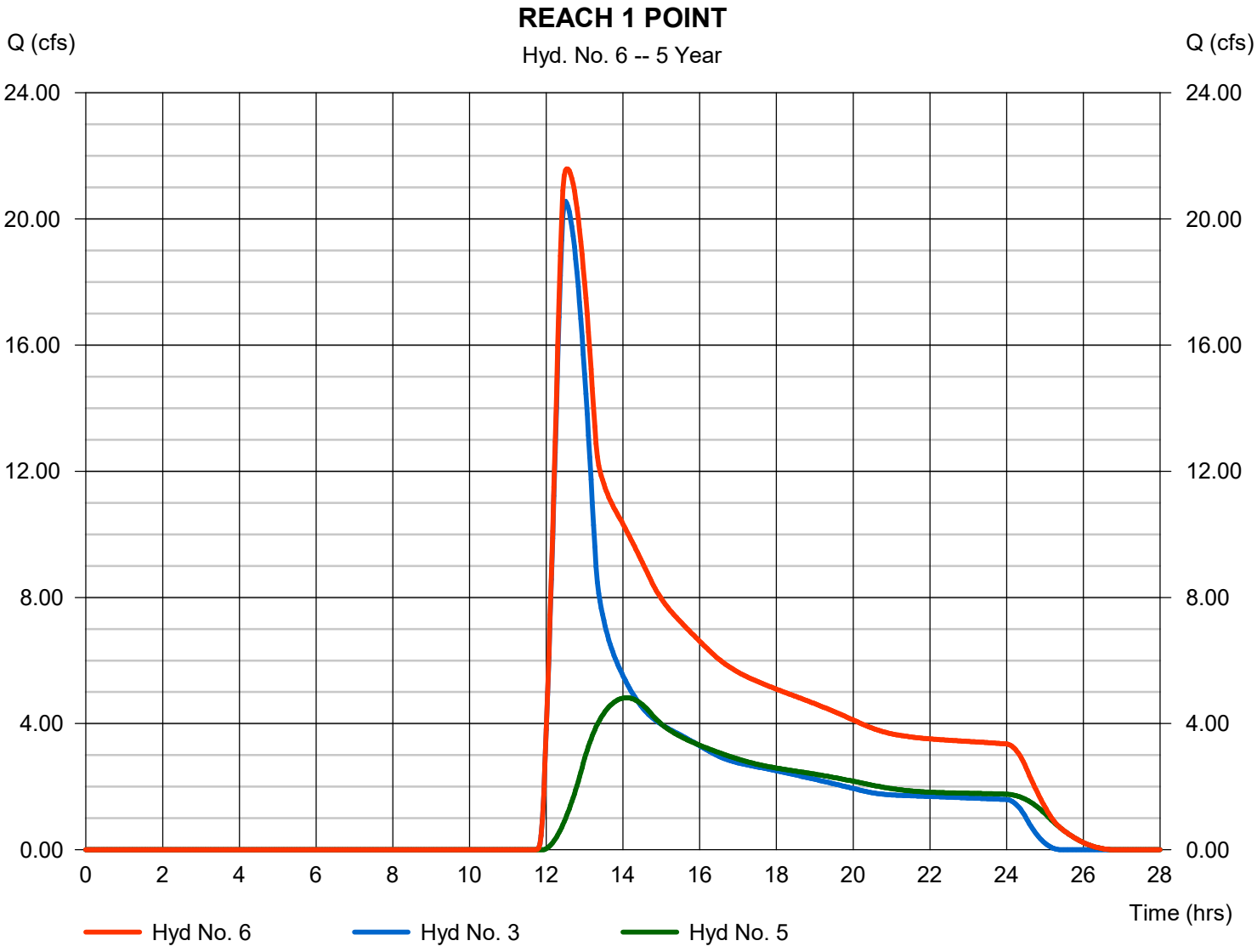


Hydrograph Report

Hyd. No. 6

REACH 1 POINT

Hydrograph type	= Combine	Peak discharge	= 21.59 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.53 hrs
Time interval	= 2 min	Hyd. volume	= 303,755 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 801.100 ac



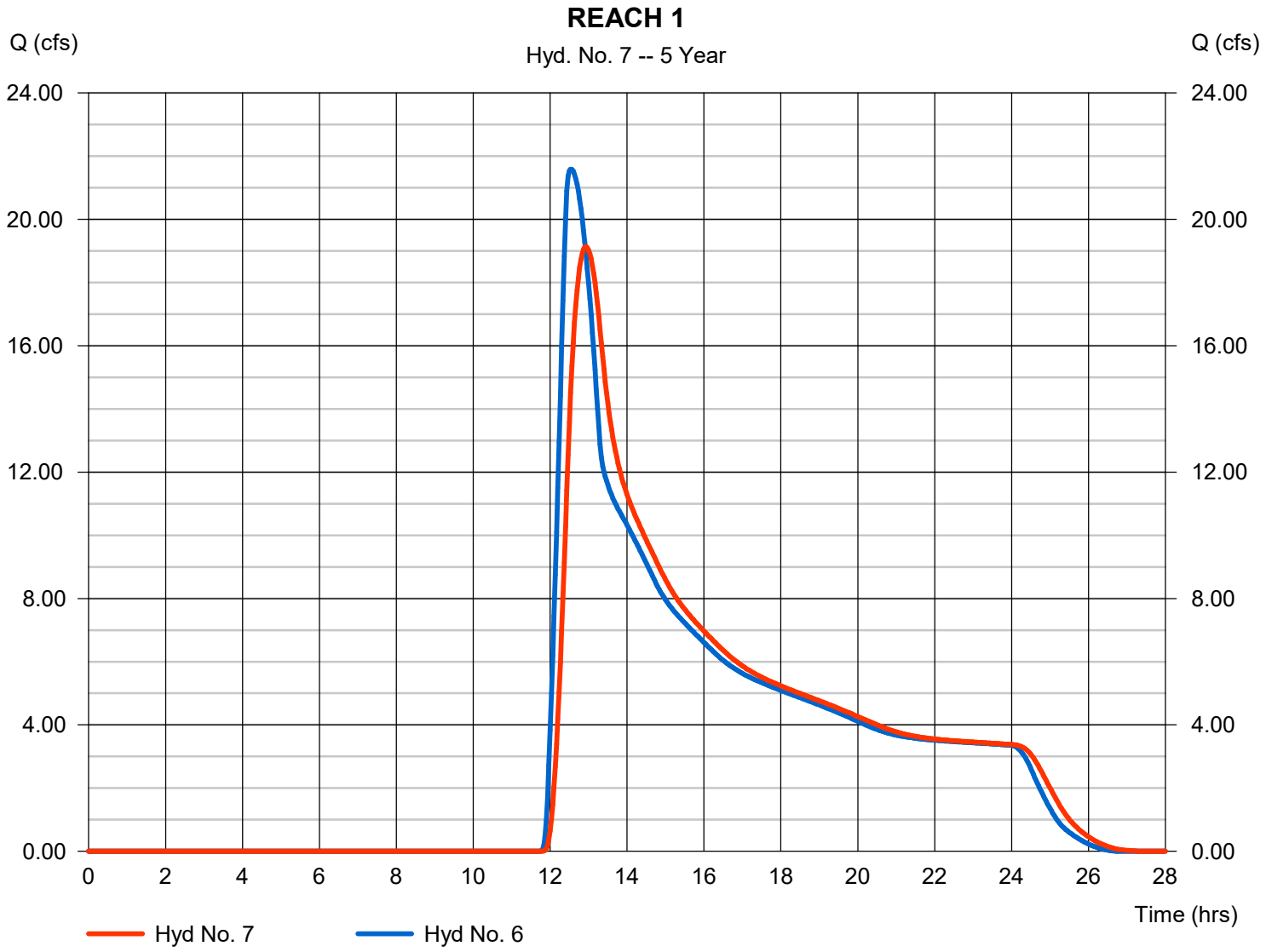
Hydrograph Report

Hyd. No. 7

REACH 1

Hydrograph type	=	Reach	Peak discharge	=	19.14 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.93 hrs
Time interval	=	2 min	Hyd. volume	=	303,745 cuft
Inflow hyd. No.	=	6 - REACH 1 POINT	Section type	=	Circular
Reach length	=	1318.0 ft	Channel slope	=	0.4 %
Manning's n	=	0.013	Bottom width	=	5.0 ft
Side slope	=	0.0:1	Max. depth	=	0.0 ft
Rating curve x	=	5.115	Rating curve m	=	1.250
Ave. velocity	=	1.10 ft/s	Routing coeff.	=	0.1178

Modified Att-Kin routing method used.



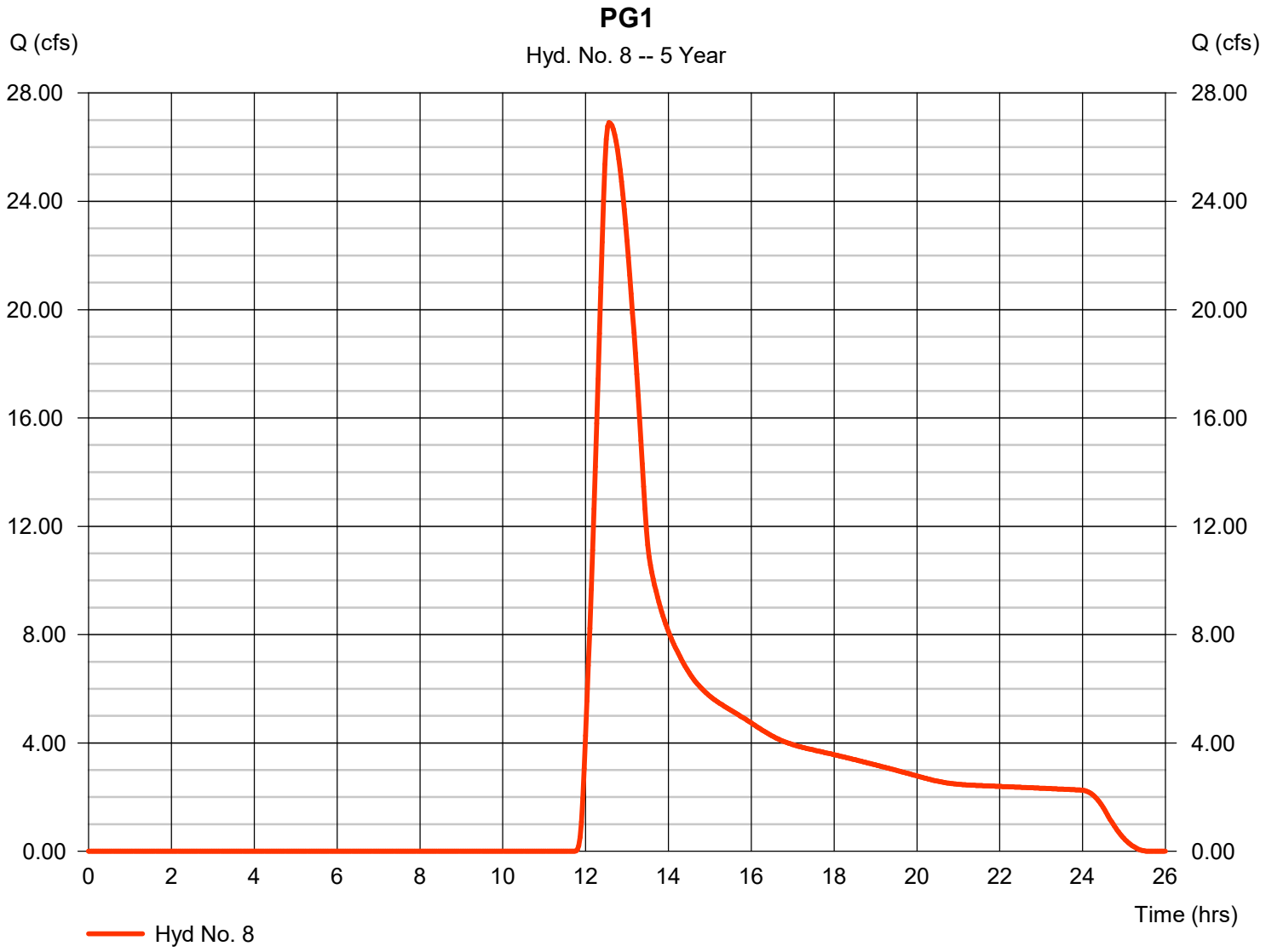
Hydrograph Report

Hyd. No. 8

PG1

Hydrograph type	=	SCS Runoff	Peak discharge	=	26.90 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.57 hrs
Time interval	=	2 min	Hyd. volume	=	257,617 cuft
Drainage area	=	363.900 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	59.50 min
Total precip.	=	1.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(132.600 x 98) + (231.300 x 63)] / 363.900



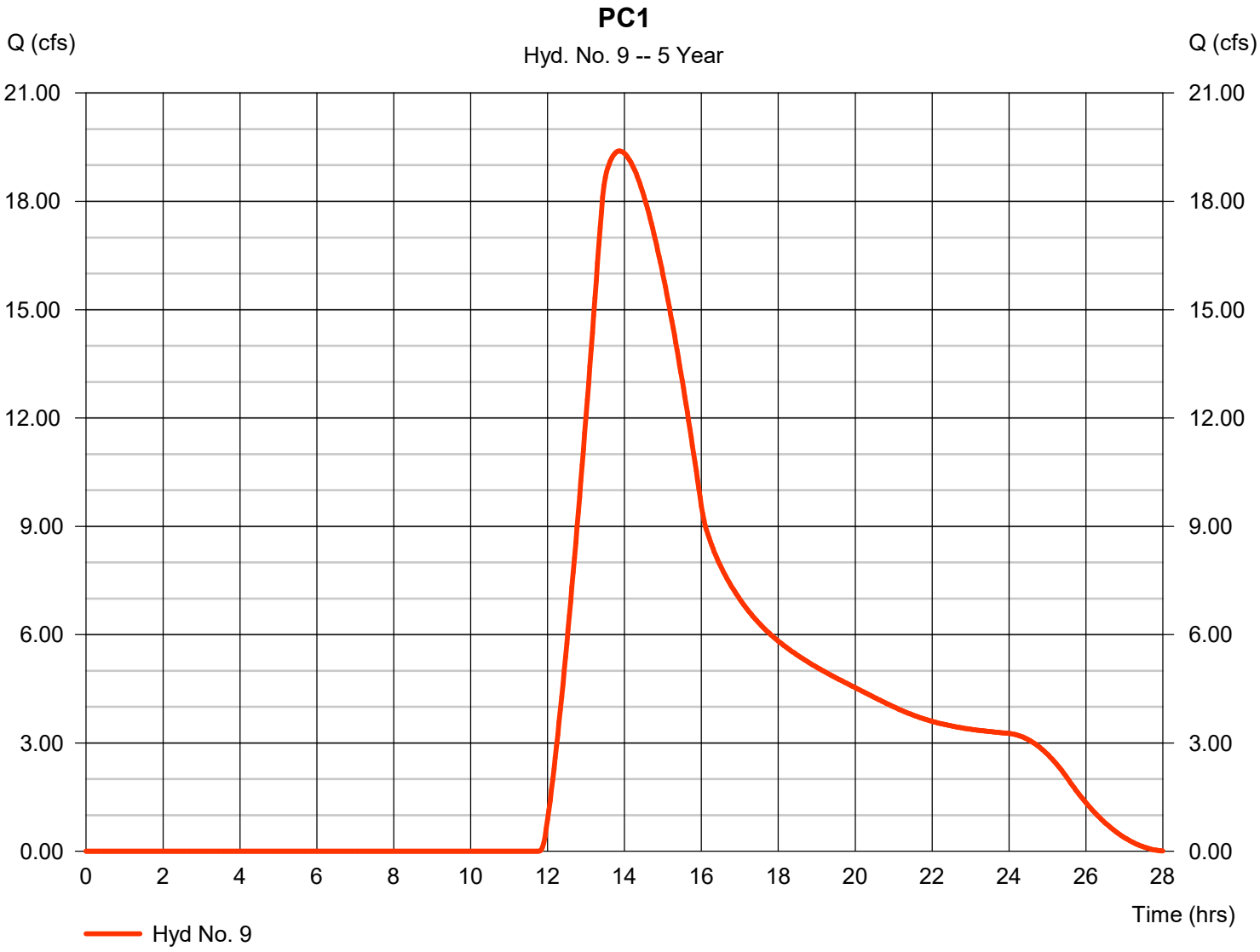
Hydrograph Report

Hyd. No. 9

PC1

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.39 cfs
Storm frequency	=	5 yrs	Time to peak	=	13.87 hrs
Time interval	=	2 min	Hyd. volume	=	359,381 cuft
Drainage area	=	509.000 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	156.50 min
Total precip.	=	1.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(423.800 x 98) + (85.200 x 63)] / 509.000



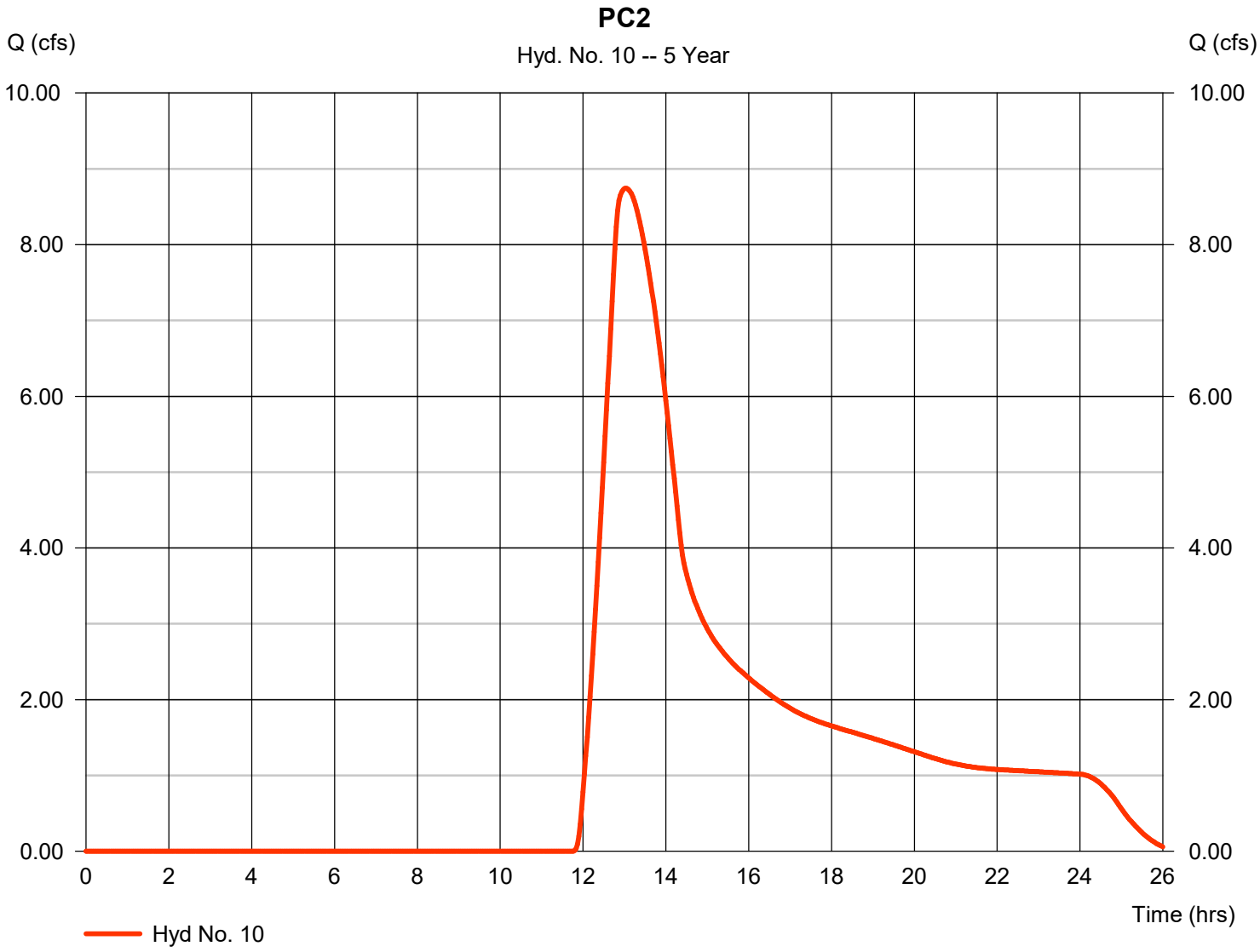
Hydrograph Report

Hyd. No. 10

PC2

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.745 cfs
Storm frequency	=	5 yrs	Time to peak	=	13.03 hrs
Time interval	=	2 min	Hyd. volume	=	114,629 cuft
Drainage area	=	161.200 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	92.10 min
Total precip.	=	1.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(152.700 x 98) + (8.500 x 63)] / 161.200



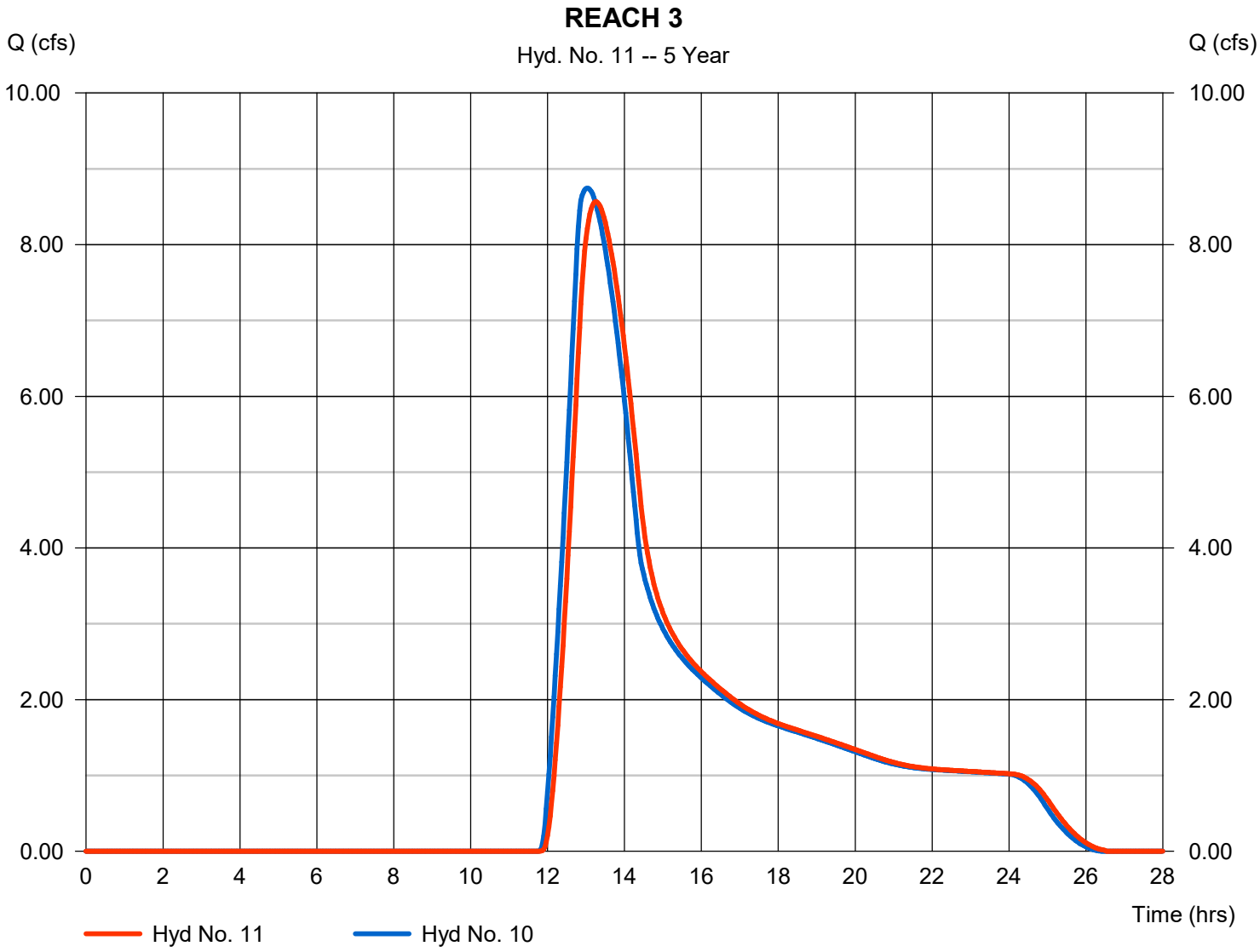
Hydrograph Report

Hyd. No. 11

REACH 3

Hydrograph type	=	Reach	Peak discharge	=	8.567 cfs
Storm frequency	=	5 yrs	Time to peak	=	13.27 hrs
Time interval	=	2 min	Hyd. volume	=	114,623 cuft
Inflow hyd. No.	=	10 - PC2	Section type	=	Circular
Reach length	=	1197.0 ft	Channel slope	=	0.5 %
Manning's n	=	0.013	Bottom width	=	2.5 ft
Side slope	=	0.0:1	Max. depth	=	0.0 ft
Rating curve x	=	5.095	Rating curve m	=	1.250
Ave. velocity	=	1.78 ft/s	Routing coeff.	=	0.2008

Modified Att-Kin routing method used.

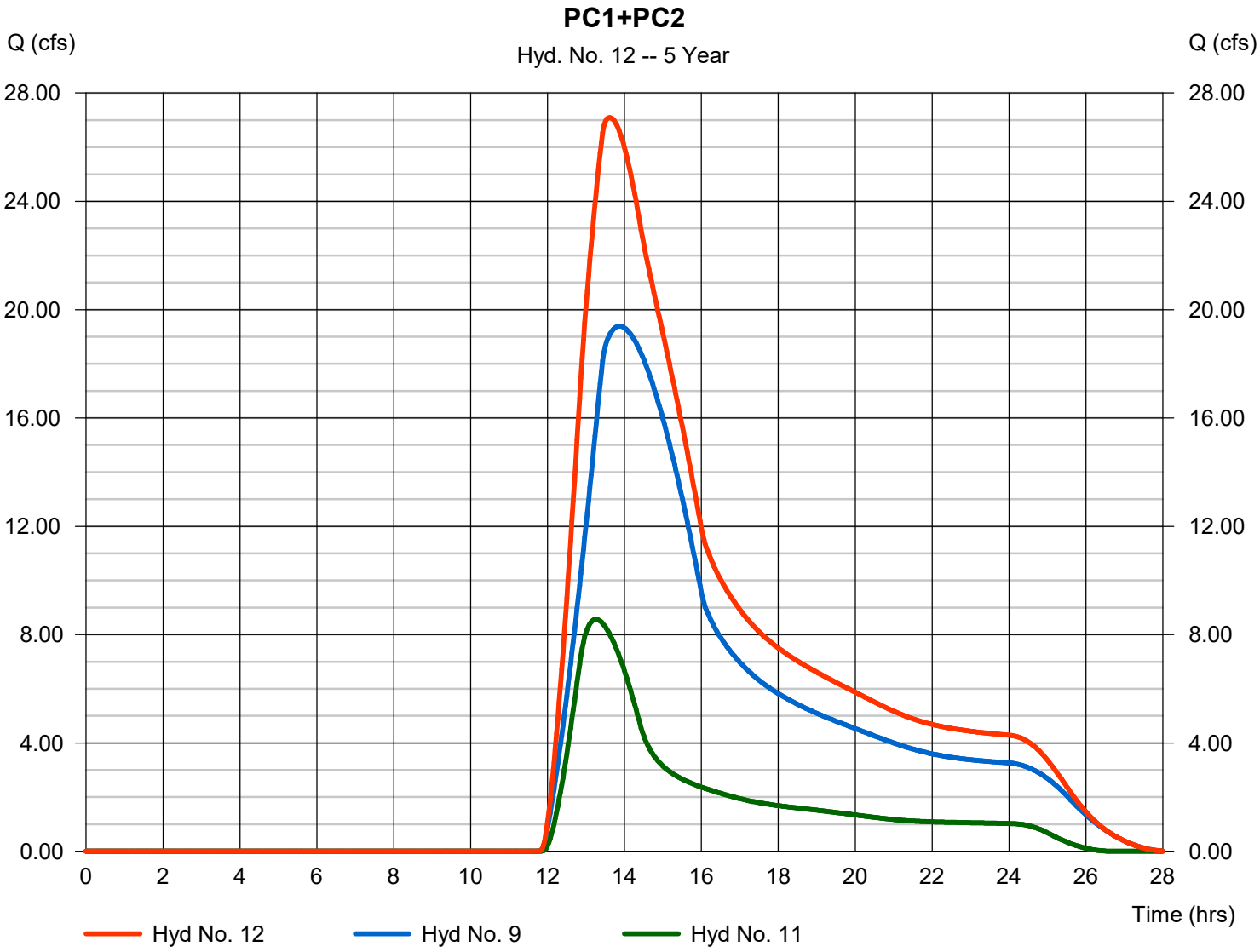


Hydrograph Report

Hyd. No. 12

PC1+PC2

Hydrograph type	= Combine	Peak discharge	= 27.09 cfs
Storm frequency	= 5 yrs	Time to peak	= 13.60 hrs
Time interval	= 2 min	Hyd. volume	= 474,004 cuft
Inflow hyds.	= 9, 11	Contrib. drain. area	= 509.000 ac



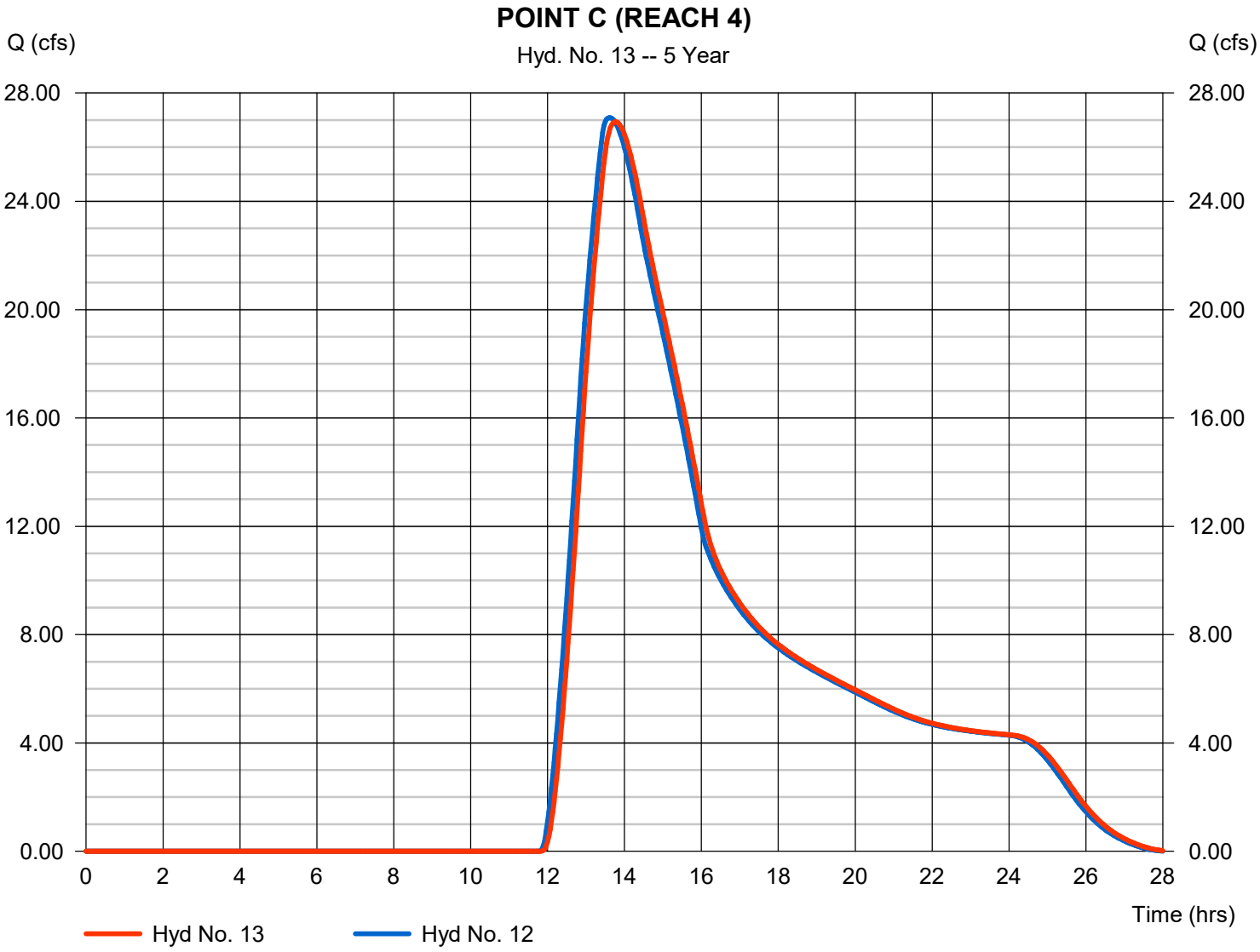
Hydrograph Report

Hyd. No. 13

POINT C (REACH 4)

Hydrograph type	=	Reach	Peak discharge	=	26.94 cfs
Storm frequency	=	5 yrs	Time to peak	=	13.77 hrs
Time interval	=	2 min	Hyd. volume	=	474,000 cuft
Inflow hyd. No.	=	12 - PC1+PC2	Section type	=	Trapezoidal
Reach length	=	1010.0 ft	Channel slope	=	0.5 %
Manning's n	=	0.035	Bottom width	=	9.0 ft
Side slope	=	3.0:1	Max. depth	=	3.5 ft
Rating curve x	=	0.695	Rating curve m	=	1.394
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.2792

Modified Att-Kin routing method used.



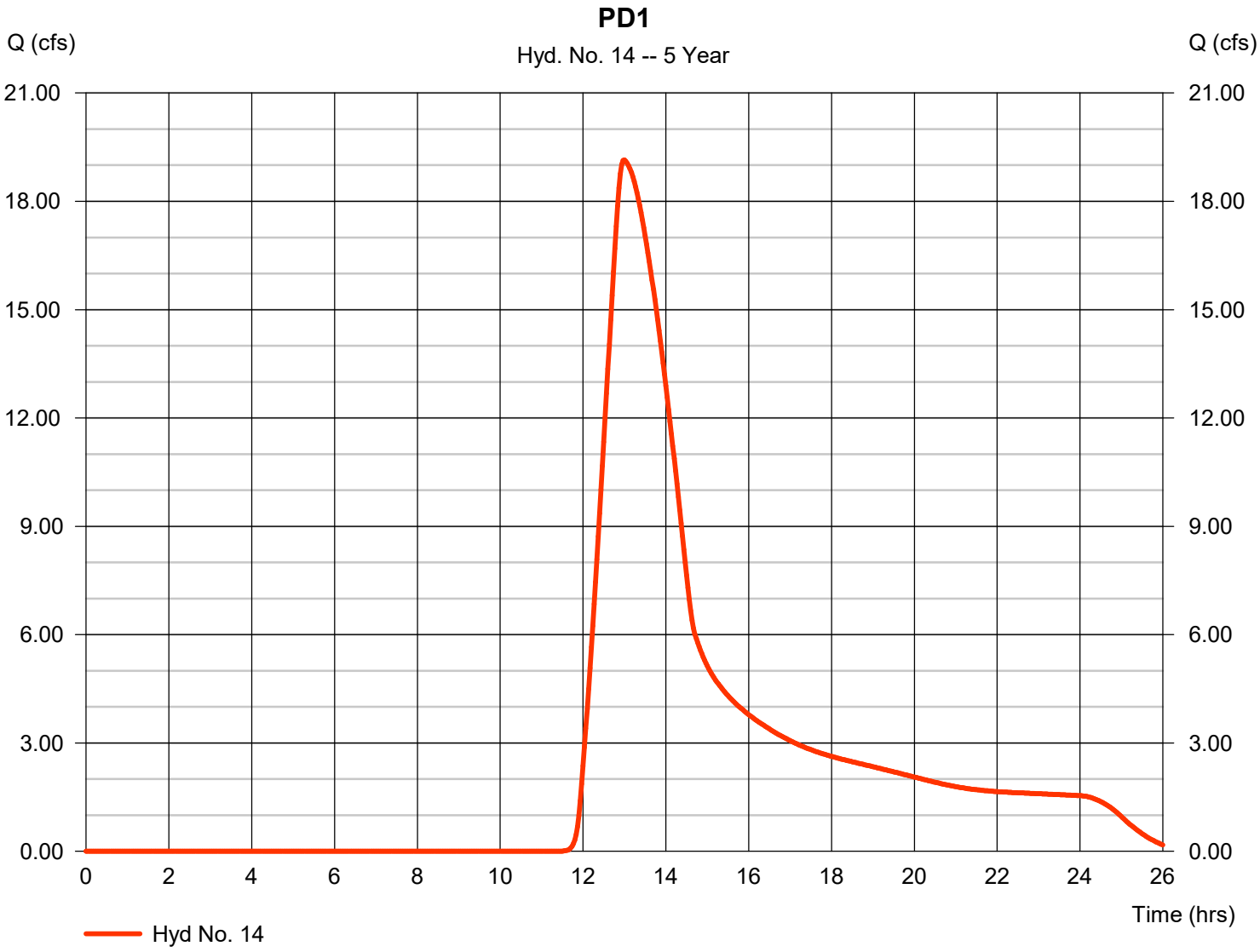
Hydrograph Report

Hyd. No. 14

PD1

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.14 cfs
Storm frequency	=	5 yrs	Time to peak	=	13.00 hrs
Time interval	=	2 min	Hyd. volume	=	217,574 cuft
Drainage area	=	178.300 ac	Curve number	=	86*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	104.50 min
Total precip.	=	1.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(92.300 x 81) + (80.000 x 91) + (5.800 x 93)] / 178.300



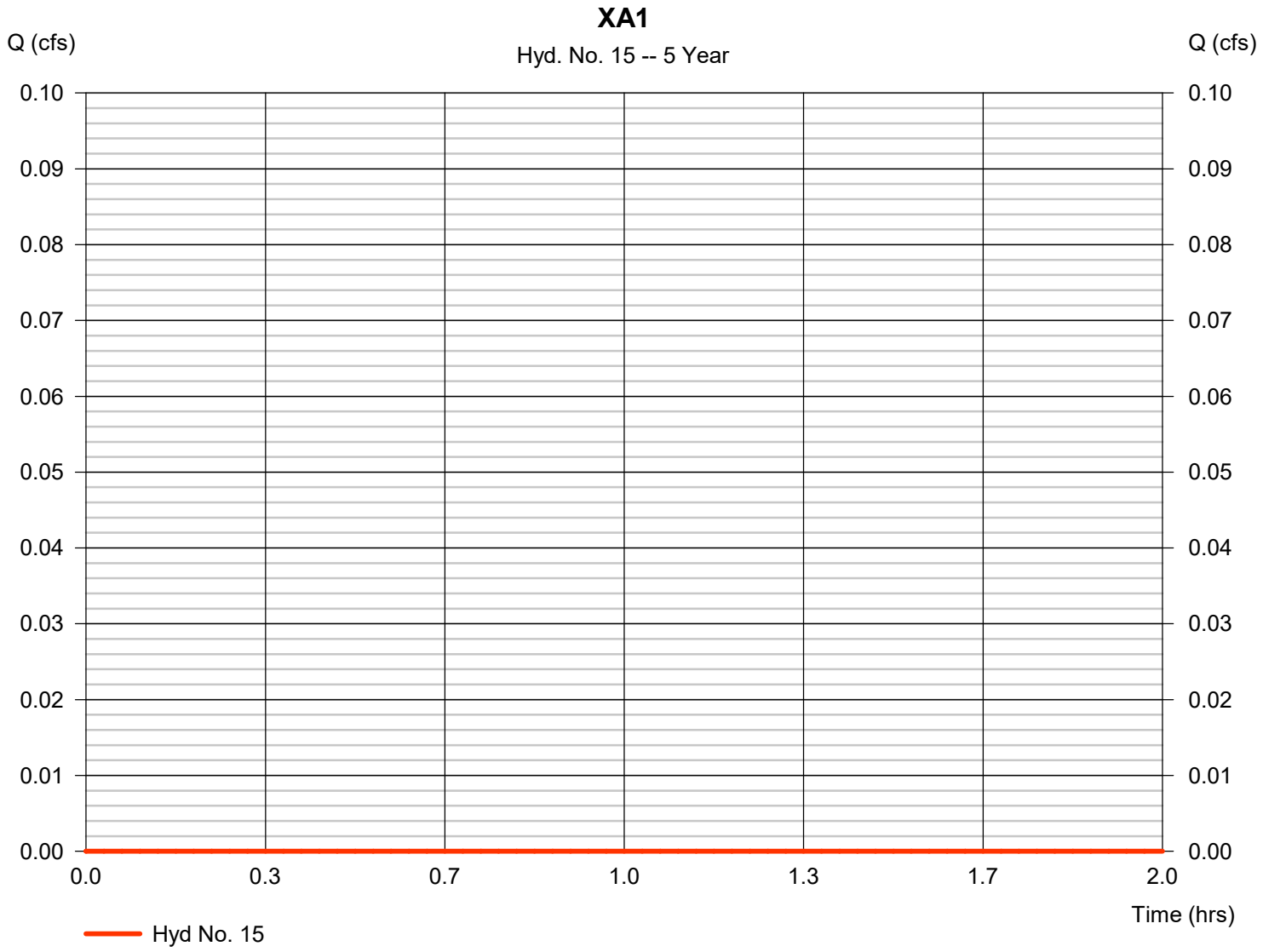
Hydrograph Report

Hyd. No. 15

XA1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 5 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 66.000 ac	Curve number	= 55*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 52.60 min
Total precip.	= 1.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(66.000 x 55)] / 66.000



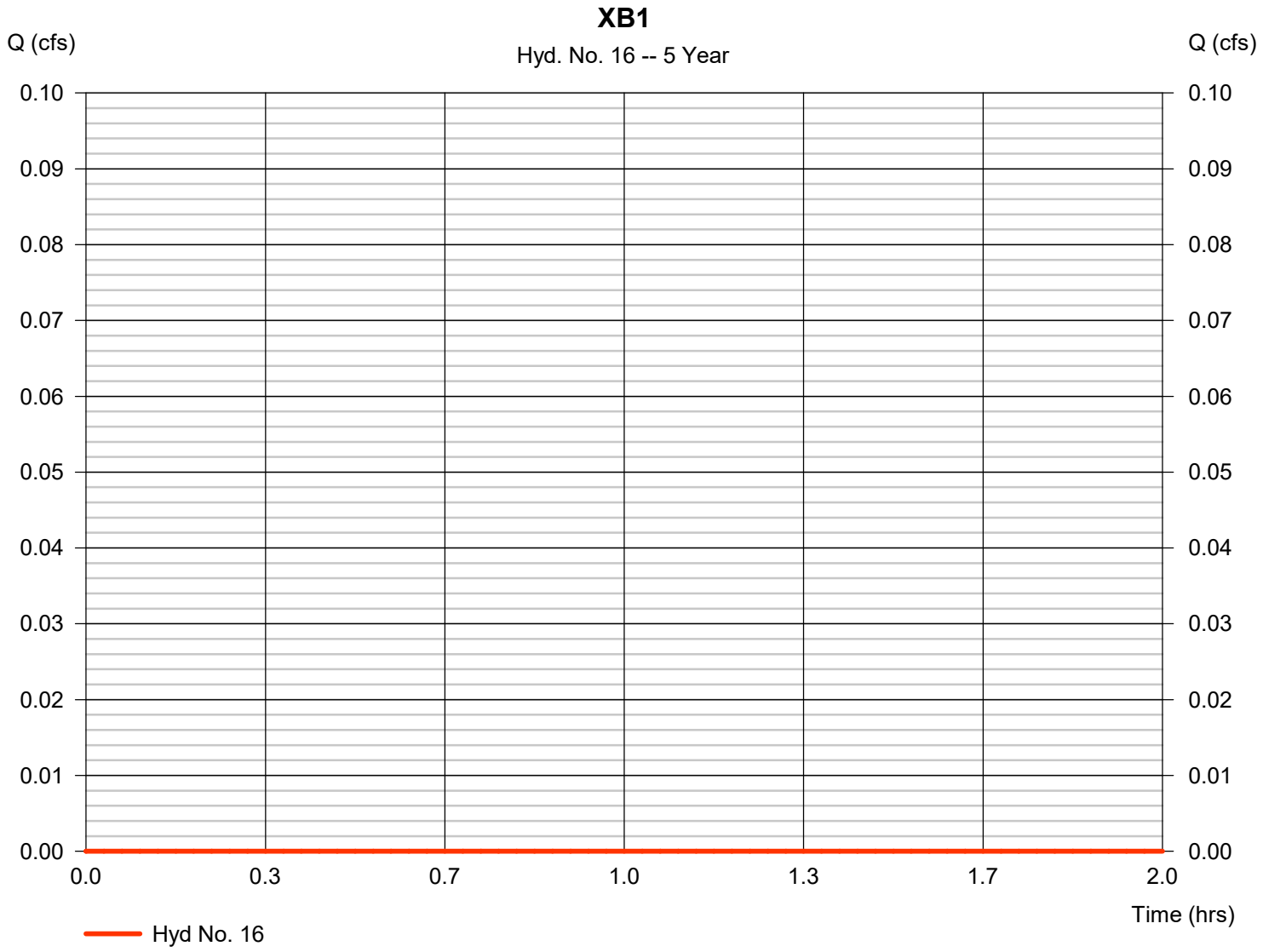
Hydrograph Report

Hyd. No. 16

XB1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 5 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 440.700 ac	Curve number	= 55*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 64.80 min
Total precip.	= 1.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(440.700 x 55)] / 440.700



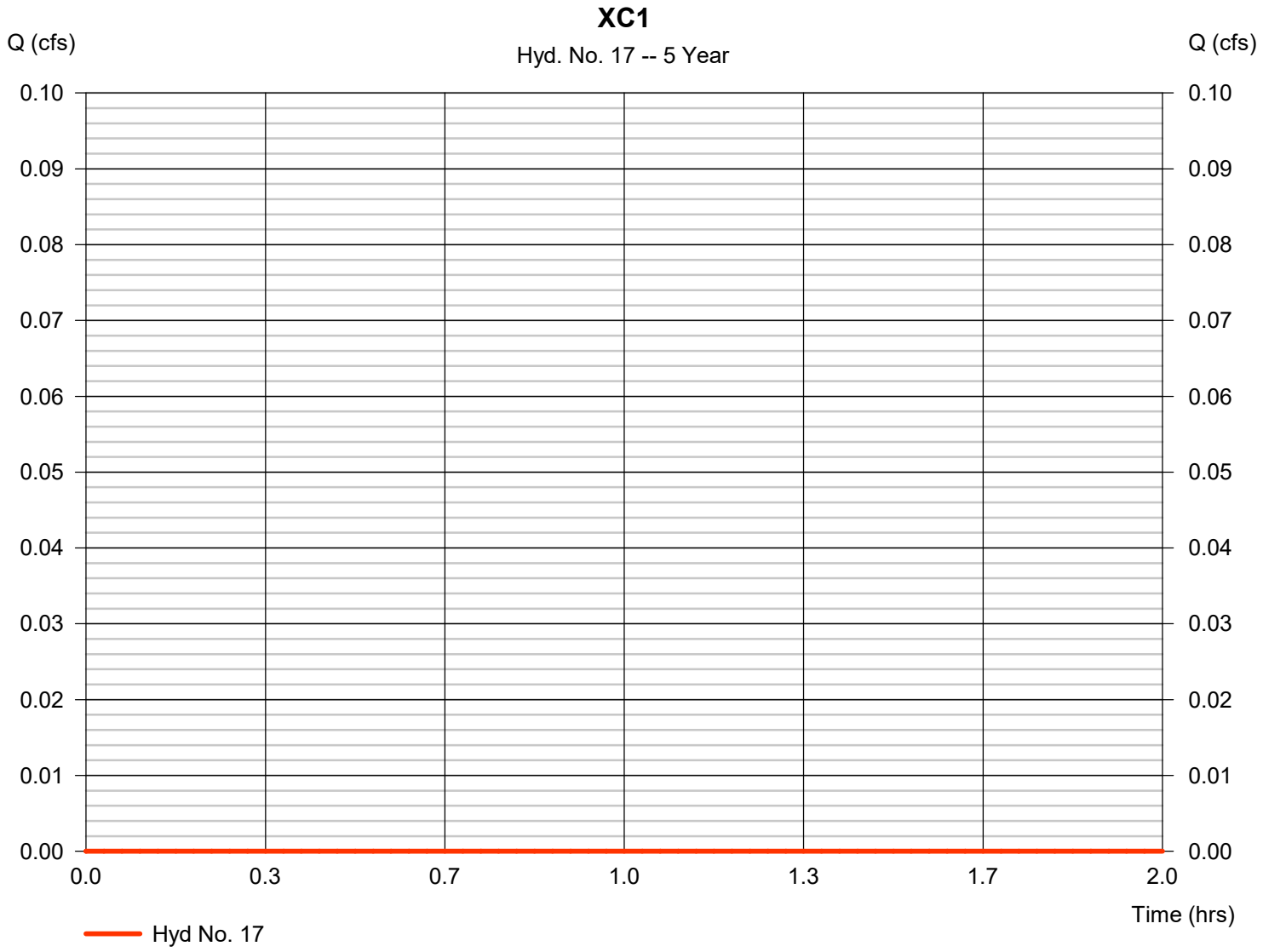
Hydrograph Report

Hyd. No. 17

XC1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 5 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 509.000 ac	Curve number	= 58*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 162.10 min
Total precip.	= 1.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.600 x 81) + (455.800 x 55) + (42.600 x 81)] / 509.000



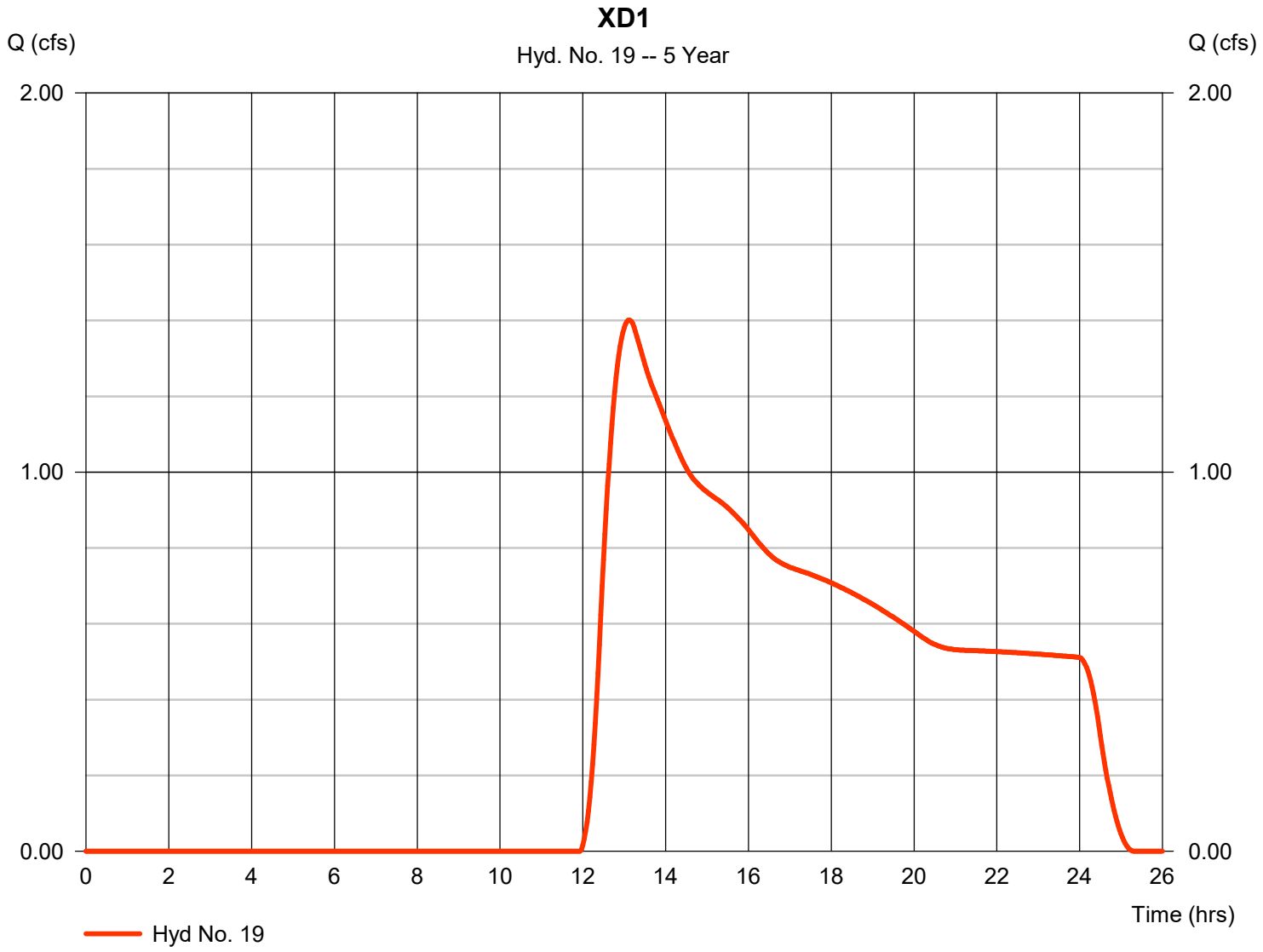
Hydrograph Report

Hyd. No. 19

XD1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.401 cfs
Storm frequency	=	5 yrs	Time to peak	=	13.13 hrs
Time interval	=	2 min	Hyd. volume	=	33,029 cuft
Drainage area	=	178.000 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	50.10 min
Total precip.	=	1.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(24.800 x 81) + (6.200 x 81) + (62.000 x 55) + (80.000 x 81) + (5.000 x 86)] / 178.000



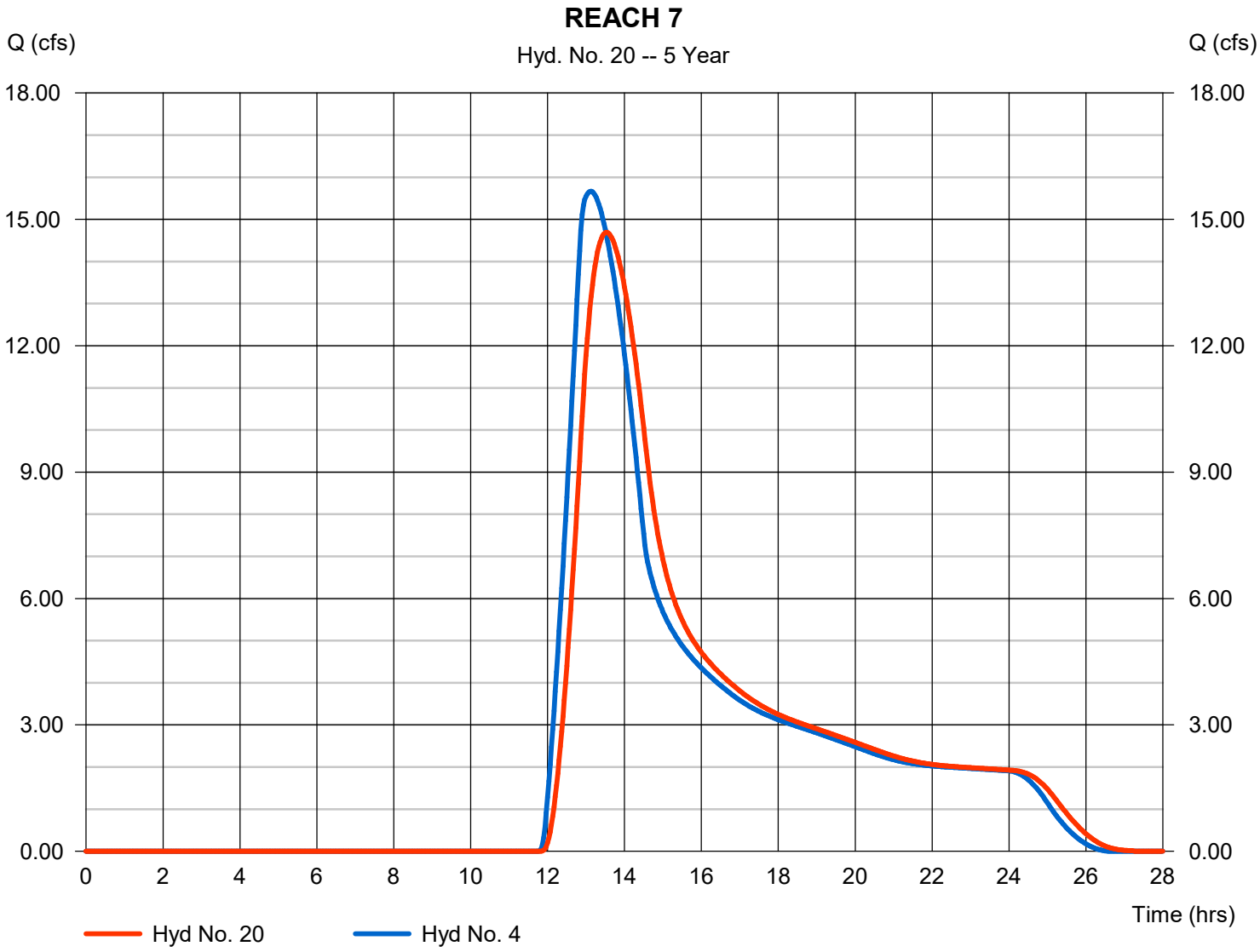
Hydrograph Report

Hyd. No. 20

REACH 7

Hydrograph type	=	Reach	Peak discharge	=	14.69 cfs
Storm frequency	=	5 yrs	Time to peak	=	13.53 hrs
Time interval	=	2 min	Hyd. volume	=	214,494 cuft
Inflow hyd. No.	=	4 - PB3	Section type	=	Circular
Reach length	=	2153.0 ft	Channel slope	=	0.4 %
Manning's n	=	0.013	Bottom width	=	3.5 ft
Side slope	=	0.0:1	Max. depth	=	0.0 ft
Rating curve x	=	4.820	Rating curve m	=	1.250
Ave. velocity	=	1.63 ft/s	Routing coeff.	=	0.1073

Modified Att-Kin routing method used.

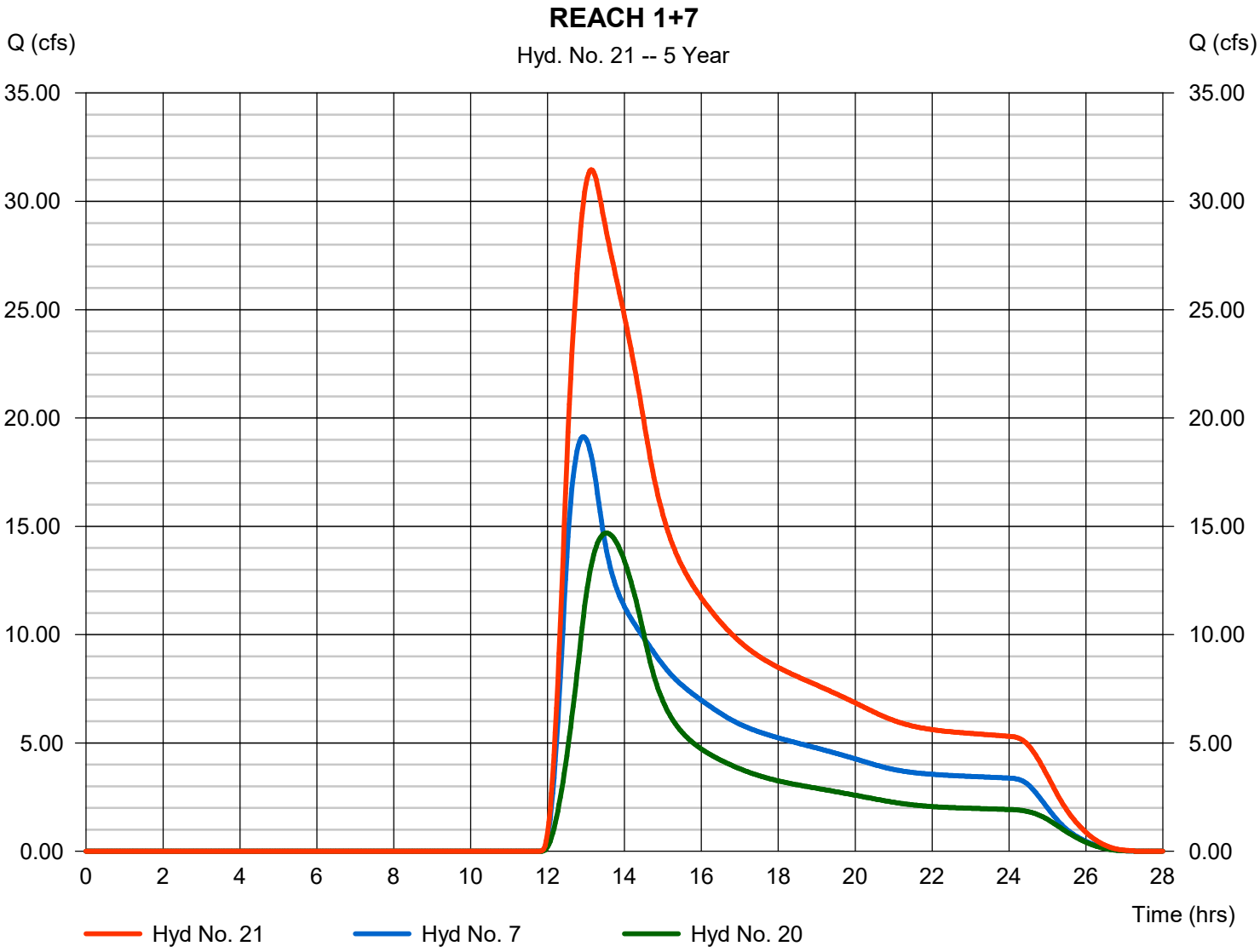


Hydrograph Report

Hyd. No. 21

REACH 1+7

Hydrograph type	= Combine	Peak discharge	= 31.45 cfs
Storm frequency	= 5 yrs	Time to peak	= 13.13 hrs
Time interval	= 2 min	Hyd. volume	= 518,239 cuft
Inflow hyds.	= 7, 20	Contrib. drain. area	= 0.000 ac



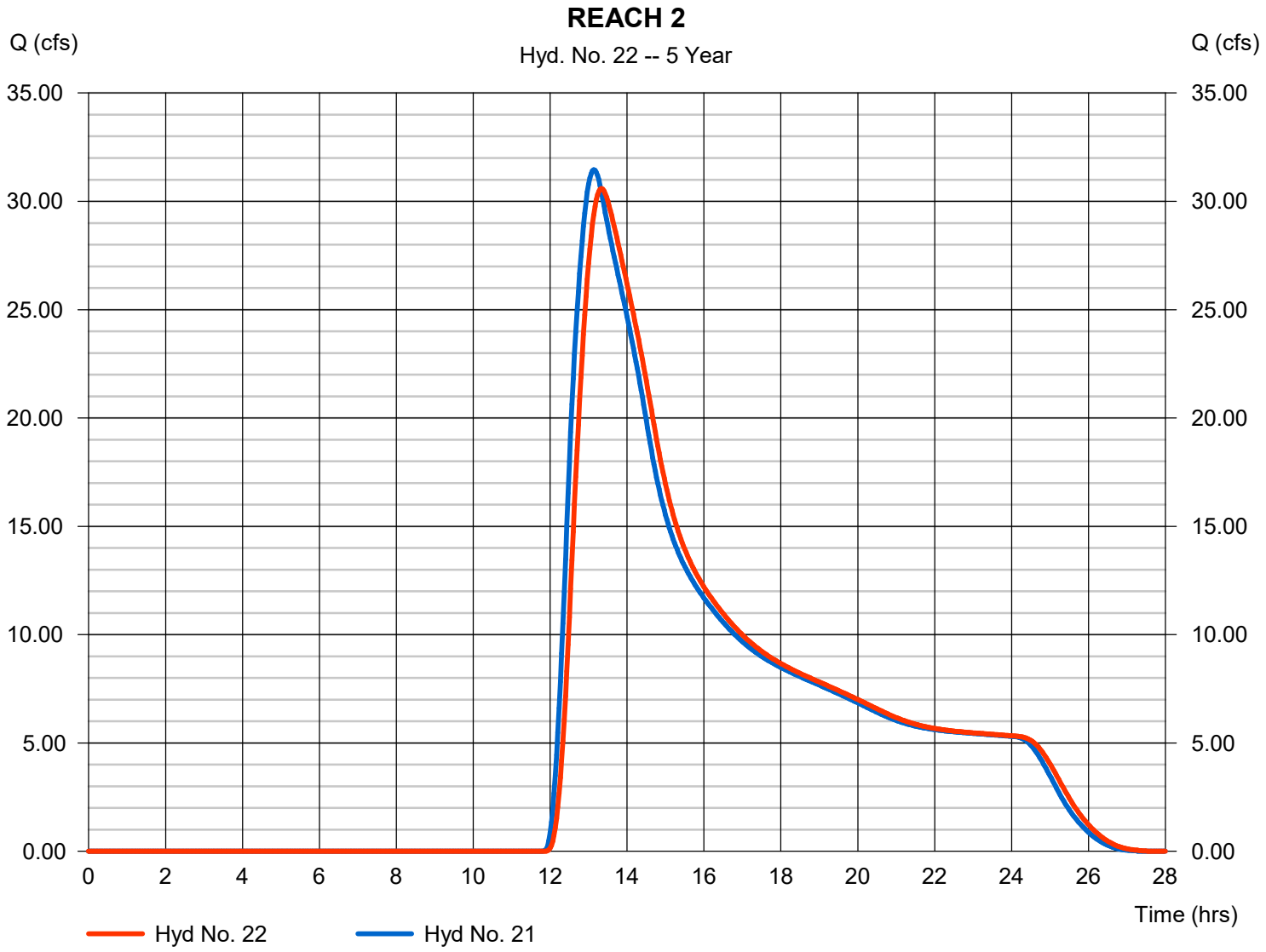
Hydrograph Report

Hyd. No. 22

REACH 2

Hydrograph type	= Reach	Peak discharge	= 30.59 cfs
Storm frequency	= 5 yrs	Time to peak	= 13.33 hrs
Time interval	= 2 min	Hyd. volume	= 518,233 cuft
Inflow hyd. No.	= 21 - REACH 1+7	Section type	= Trapezoidal
Reach length	= 2187.0 ft	Channel slope	= 1.0 %
Manning's n	= 0.035	Bottom width	= 9.0 ft
Side slope	= 3.0:1	Max. depth	= 3.5 ft
Rating curve x	= 0.983	Rating curve m	= 1.394
Ave. velocity	= 2.62 ft/s	Routing coeff.	= 0.1822

Modified Att-Kin routing method used.

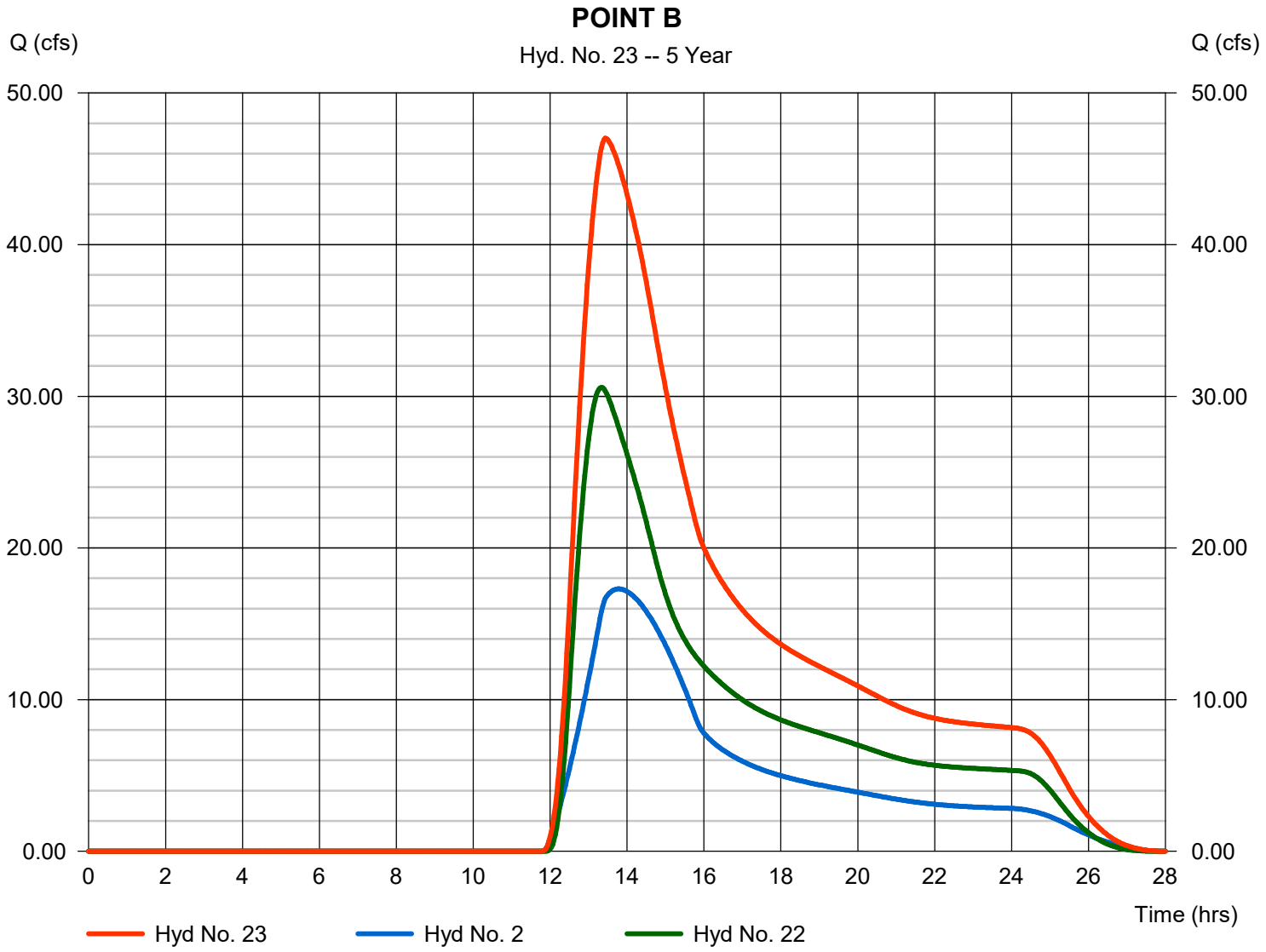


Hydrograph Report

Hyd. No. 23

POINT B

Hydrograph type	= Combine	Peak discharge	= 47.02 cfs
Storm frequency	= 5 yrs	Time to peak	= 13.43 hrs
Time interval	= 2 min	Hyd. volume	= 830,220 cuft
Inflow hyds.	= 2, 22	Contrib. drain. area	= 440.700 ac



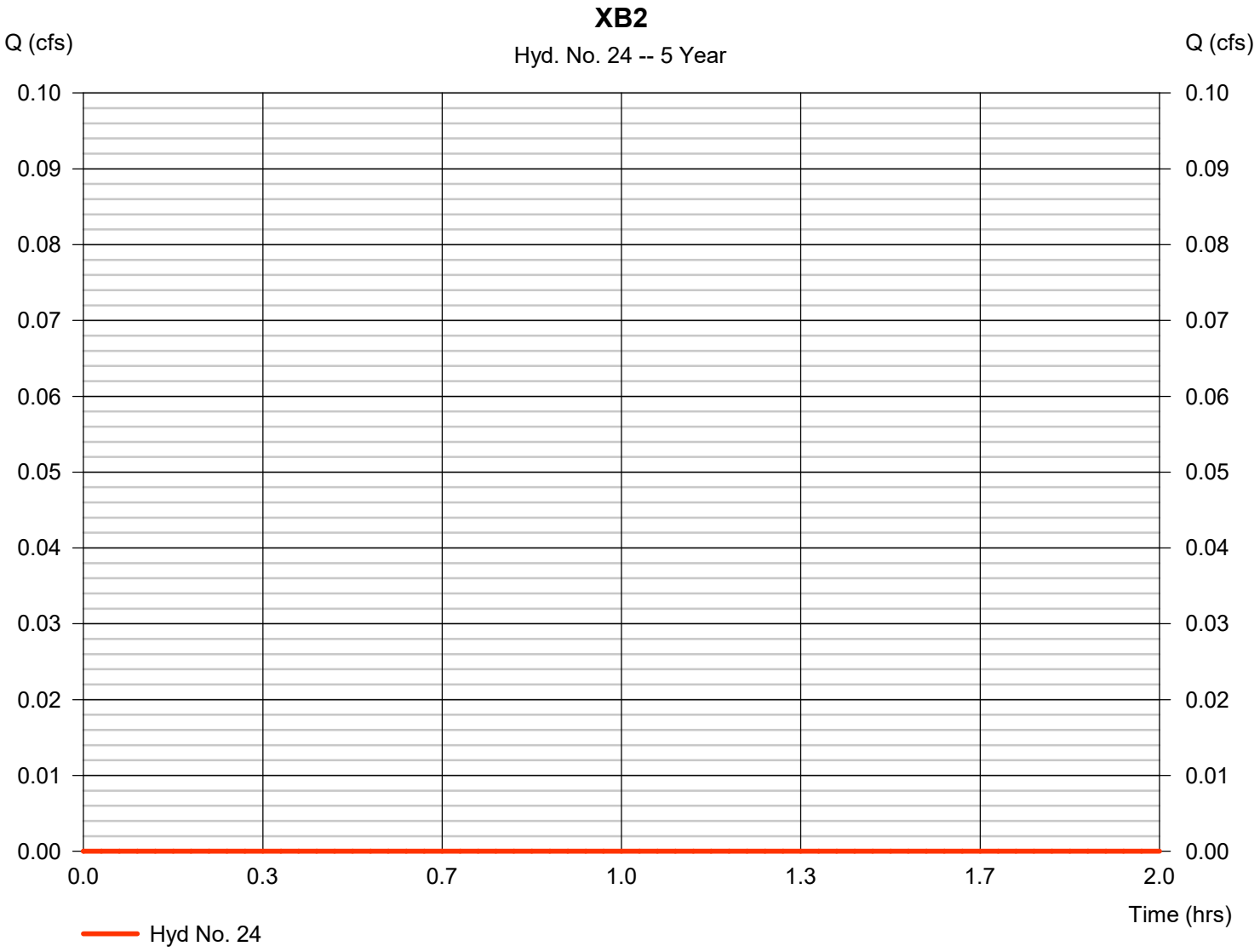
Hydrograph Report

Hyd. No. 24

XB2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 5 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 255.200 ac	Curve number	= 55*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 150.60 min
Total precip.	= 1.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(255.200 x 55)] / 255.200



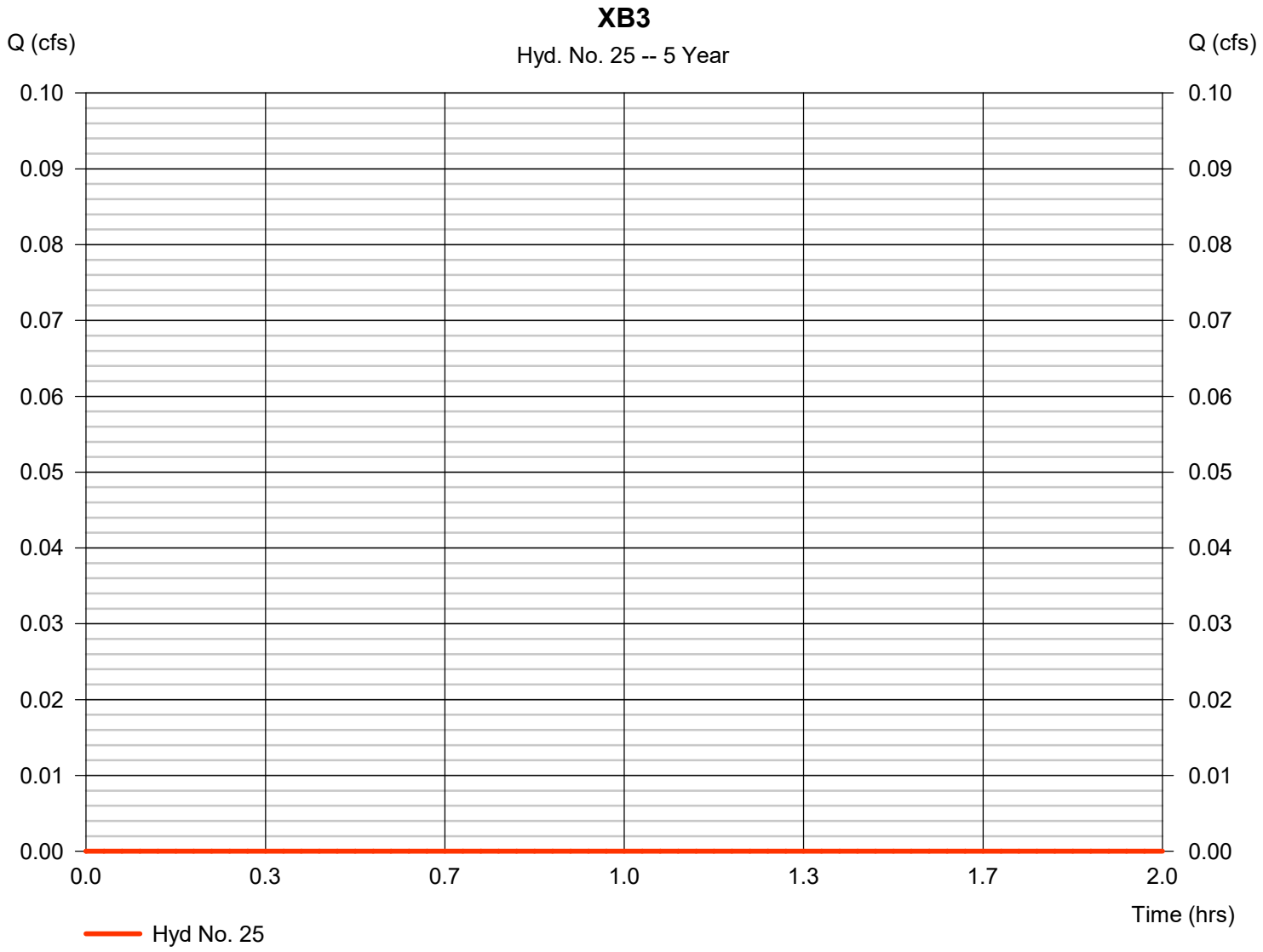
Hydrograph Report

Hyd. No. 25

XB3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 5 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 302.900 ac	Curve number	= 55*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 56.10 min
Total precip.	= 1.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(302.900 x 55)] / 302.900



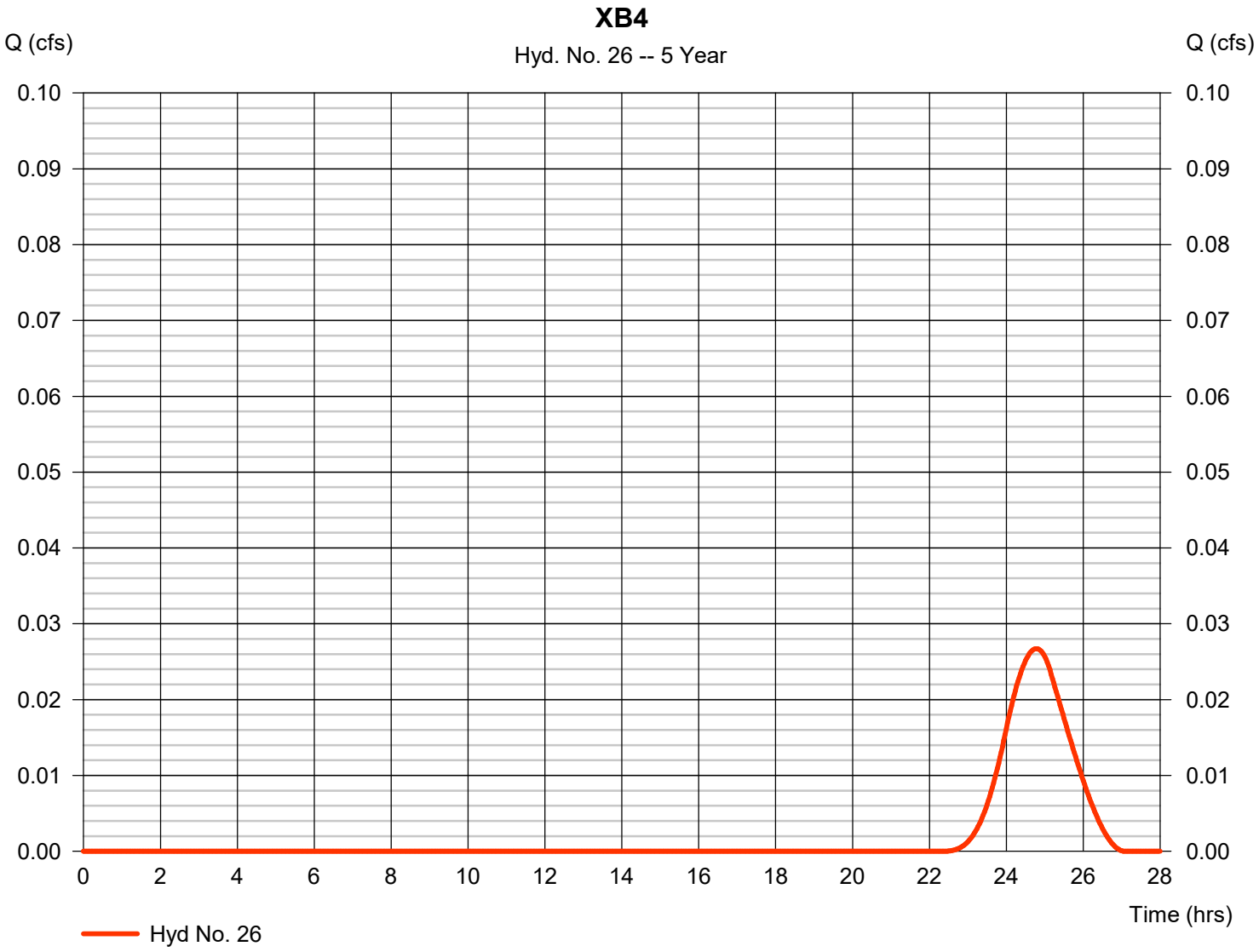
Hydrograph Report

Hyd. No. 26

XB4

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.027 cfs
Storm frequency	=	5 yrs	Time to peak	=	24.77 hrs
Time interval	=	2 min	Hyd. volume	=	188 cuft
Drainage area	=	545.900 ac	Curve number	=	62*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	117.20 min
Total precip.	=	1.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(224.200 x 55) + (173.700 x 55) + (147.000 x 81) + (0.800 x 81) + (0.200 x 81)] / 545.900

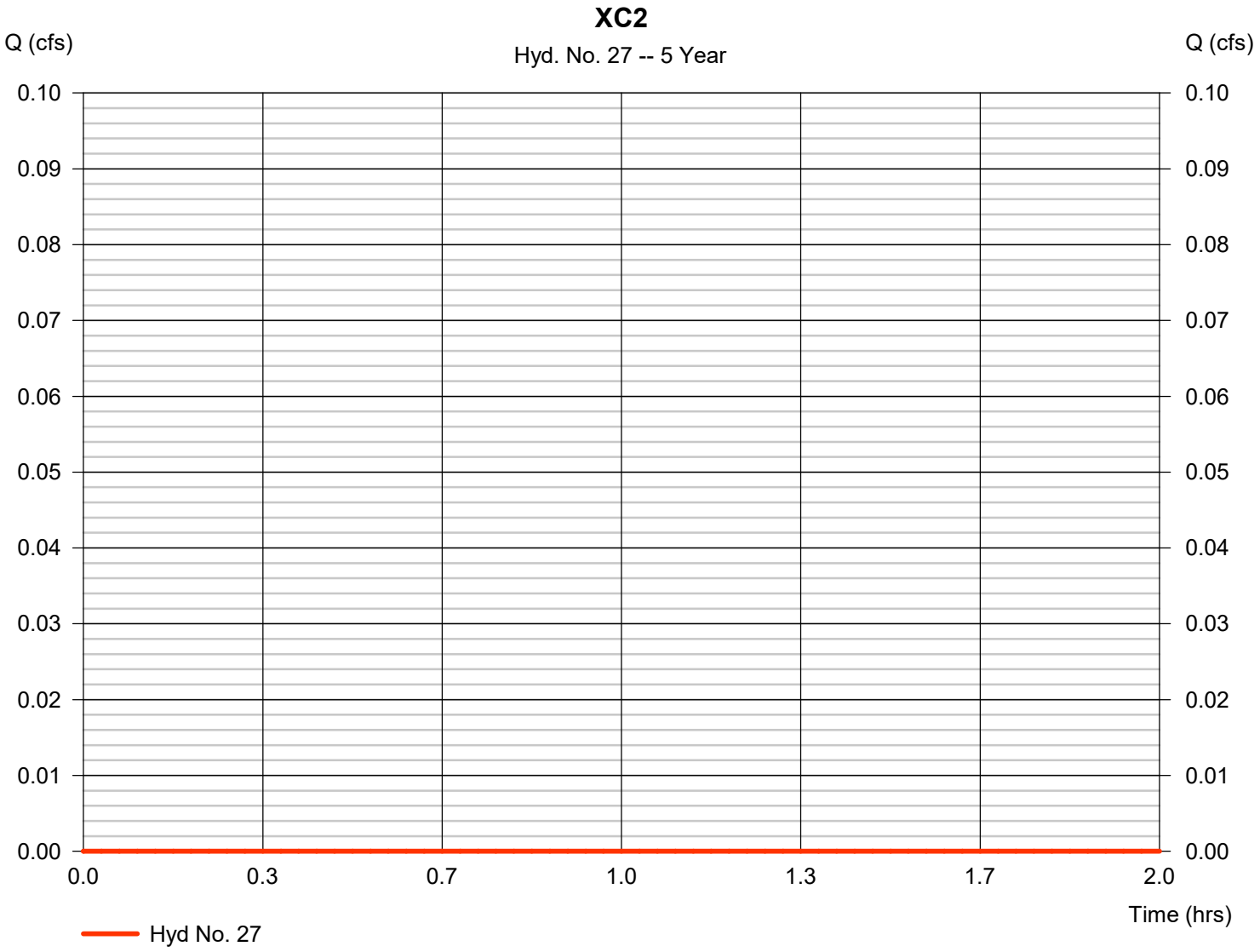


Hydrograph Report

Hyd. No. 27

XC2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 5 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 161.100 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 57.80 min
Total precip.	= 1.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



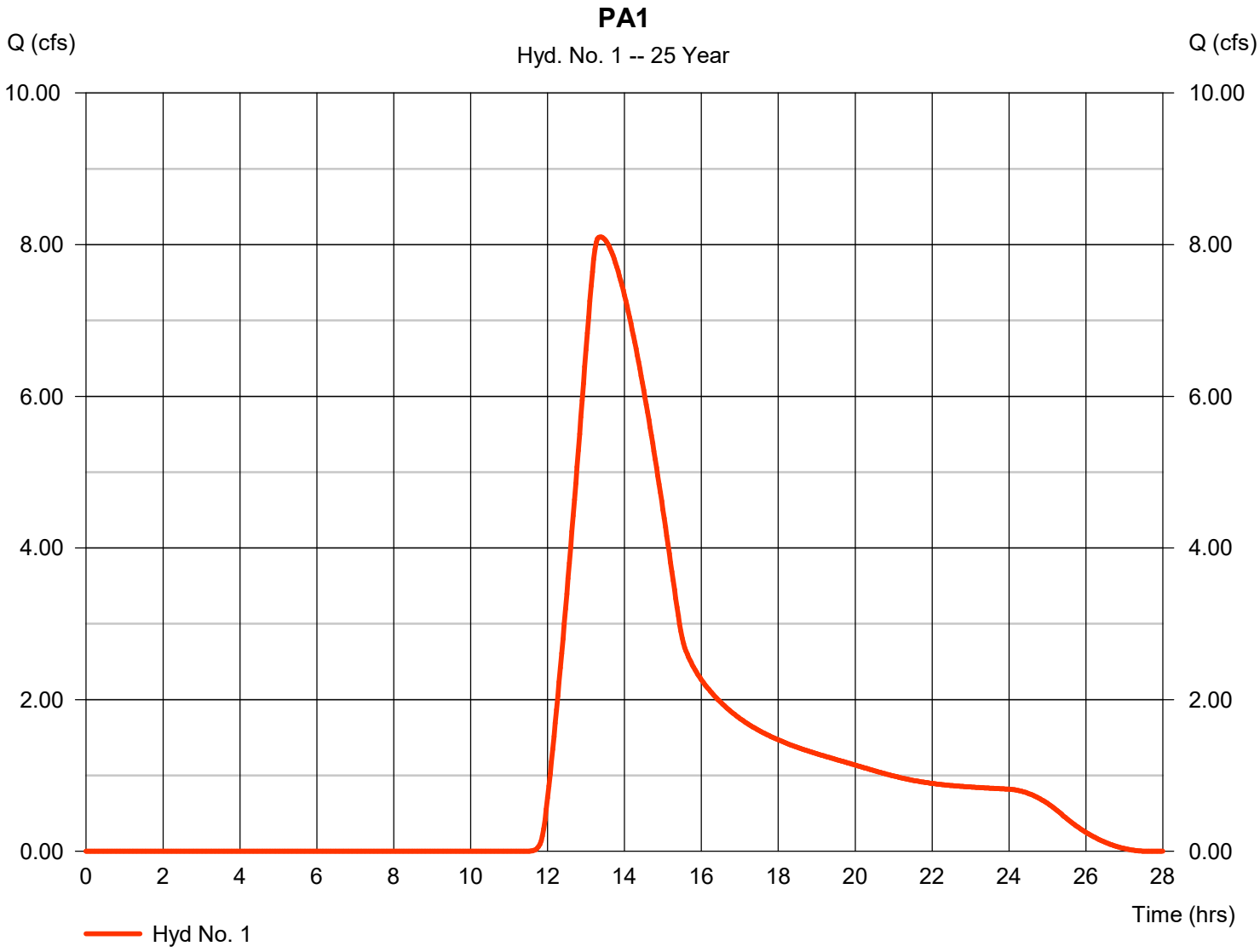
Hydrograph Report

Hyd. No. 1

PA1

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.102 cfs
Storm frequency	=	25 yrs	Time to peak	=	13.37 hrs
Time interval	=	2 min	Hyd. volume	=	113,653 cuft
Drainage area	=	66.000 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	137.10 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(66.000 x 63)] / 66.000



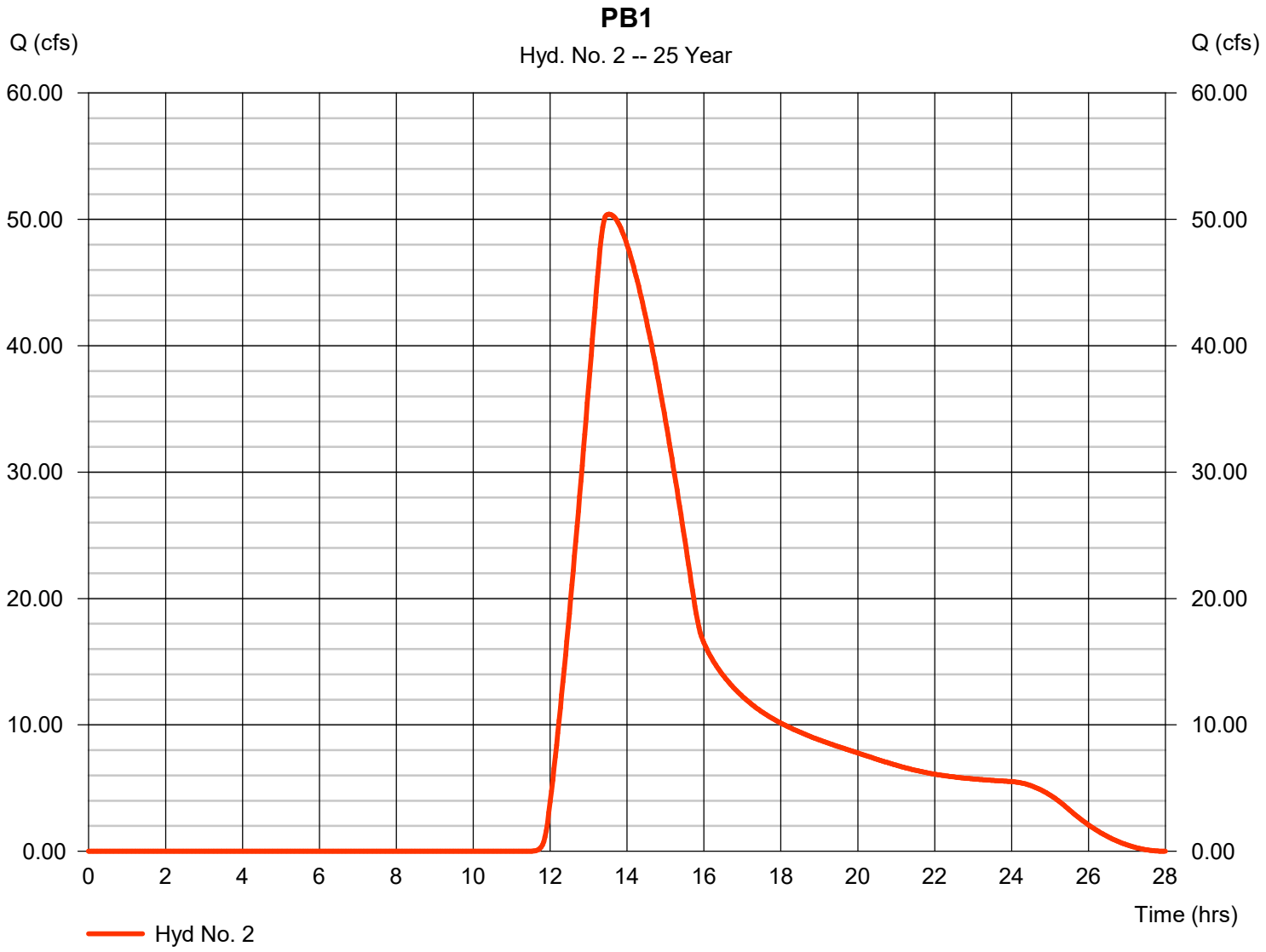
Hydrograph Report

Hyd. No. 2

PB1

Hydrograph type	=	SCS Runoff	Peak discharge	=	50.41 cfs
Storm frequency	=	25 yrs	Time to peak	=	13.53 hrs
Time interval	=	2 min	Hyd. volume	=	761,215 cuft
Drainage area	=	440.700 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	150.30 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(211.500 x 98) + (229.300 x 63)] / 440.700



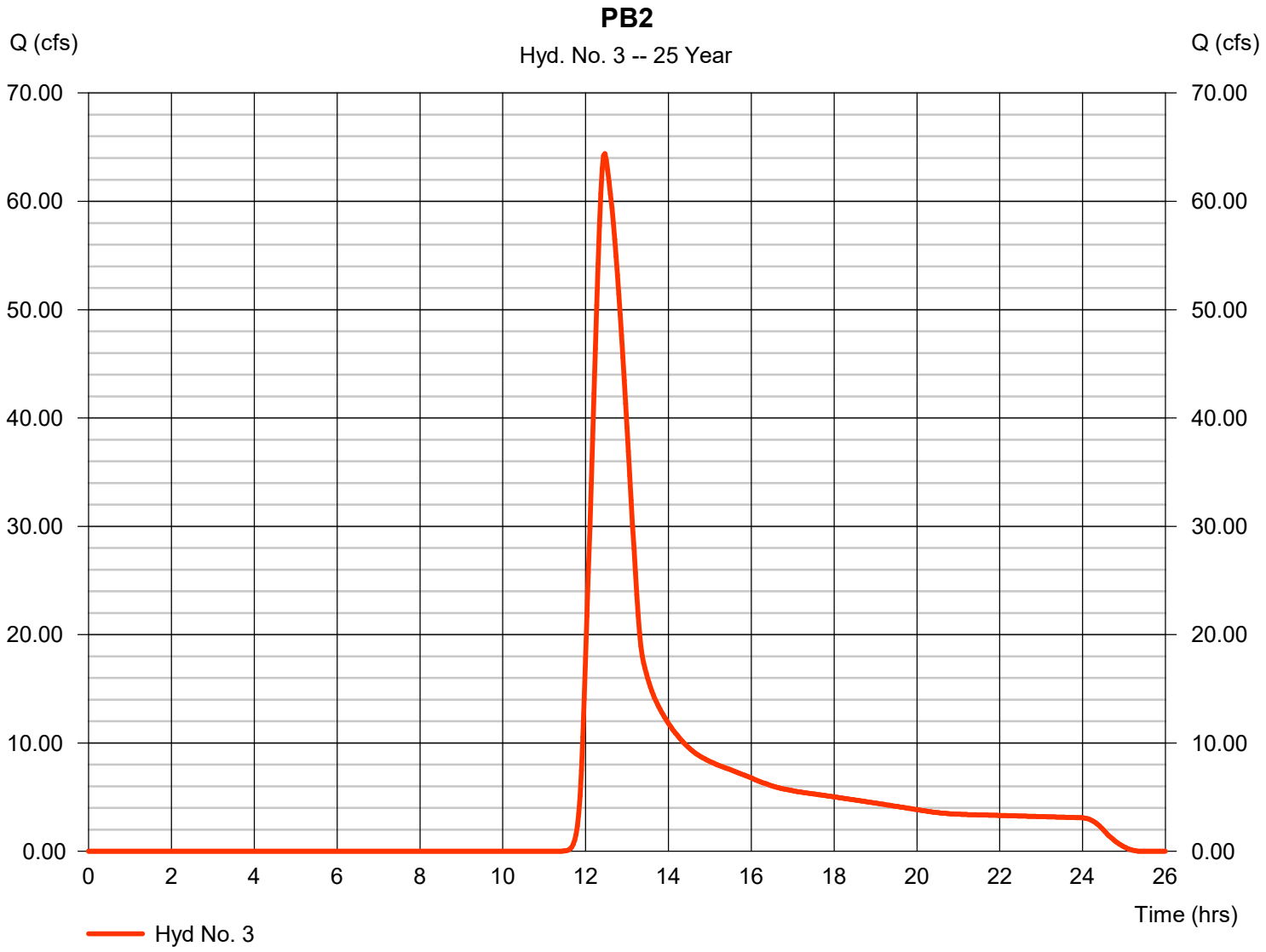
Hydrograph Report

Hyd. No. 3

PB2

Hydrograph type	= SCS Runoff	Peak discharge	= 64.40 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.47 hrs
Time interval	= 2 min	Hyd. volume	= 444,421 cuft
Drainage area	= 255.300 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 51.20 min
Total precip.	= 1.79 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(162.900 x 98) + (92.400 x 63)] / 255.300



Hydrograph Report

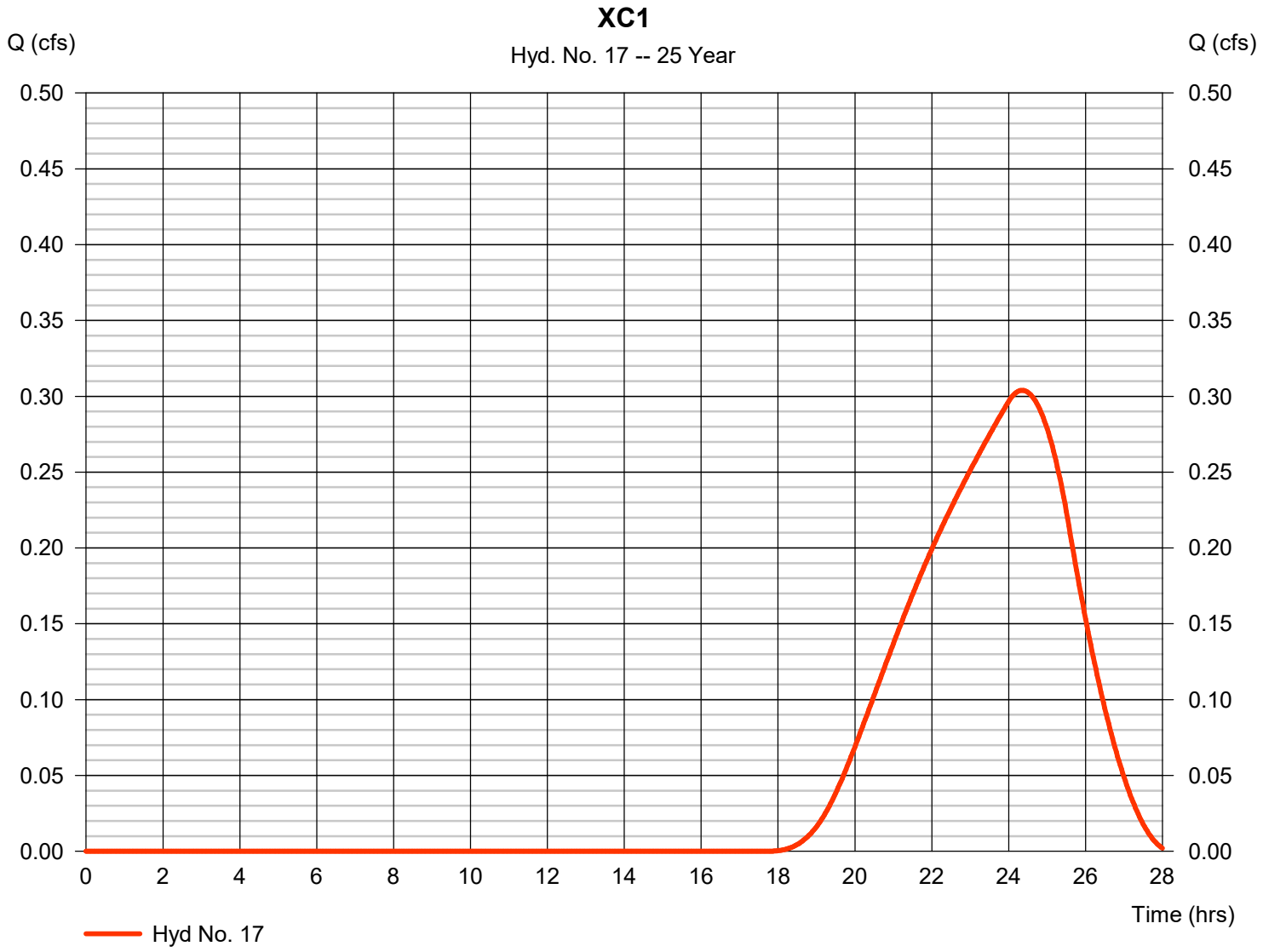
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Tuesday, 07 / 26 / 2022

Hyd. No. 17

XC1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.304 cfs
Storm frequency	= 25 yrs	Time to peak	= 24.37 hrs
Time interval	= 2 min	Hyd. volume	= 0.120 acft
Drainage area	= 509.000 ac	Curve number	= 55*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 162.10 min
Total precip.	= 1.79 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.600 x 81) + (455.800 x 55) + (42.600 x 81)] / 509.000



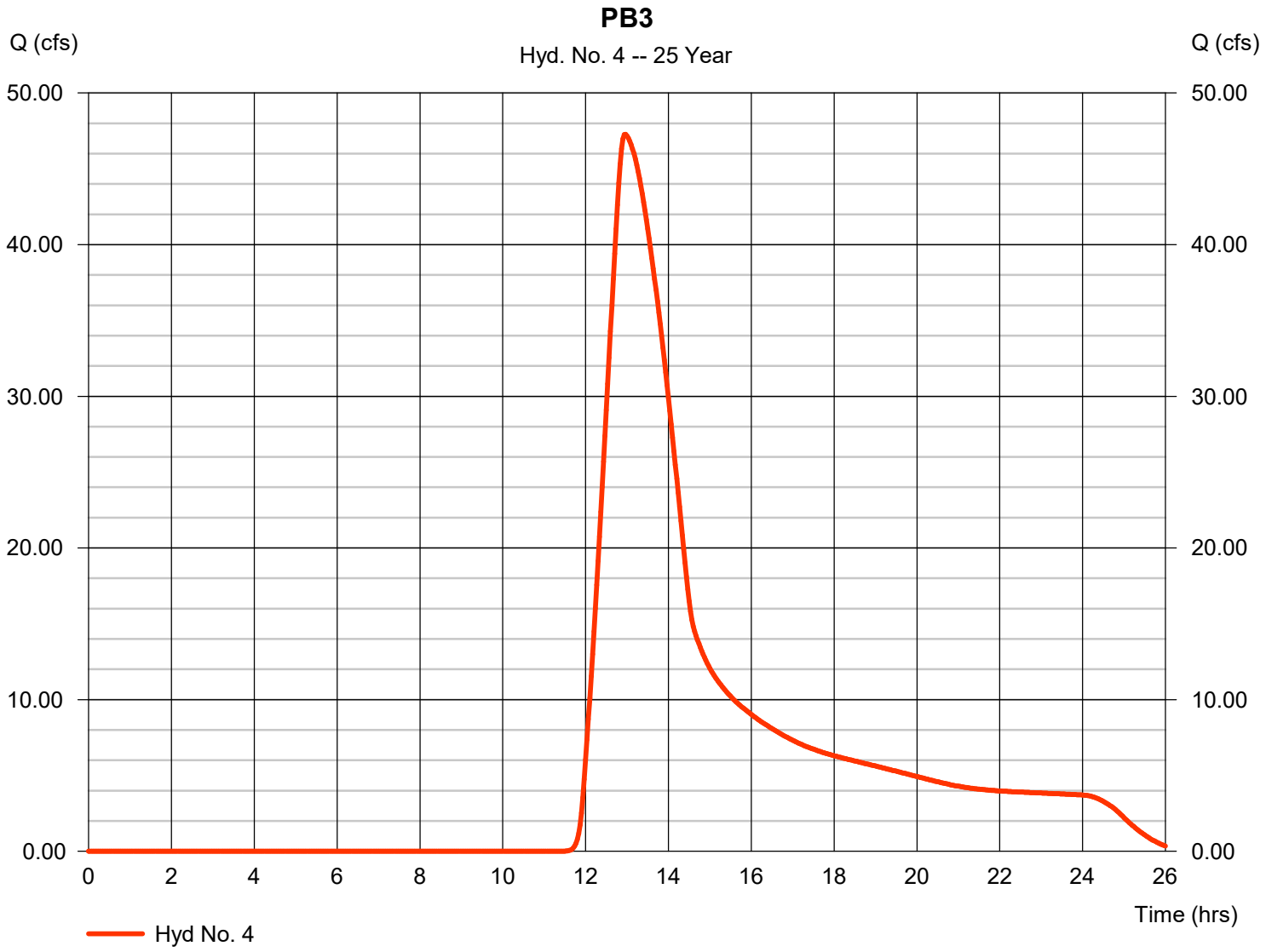
Hydrograph Report

Hyd. No. 4

PB3

Hydrograph type	=	SCS Runoff	Peak discharge	=	47.27 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.97 hrs
Time interval	=	2 min	Hyd. volume	=	523,368 cuft
Drainage area	=	303.000 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	99.90 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(136.200 x 98) + (166.800 x 63)] / 303.000



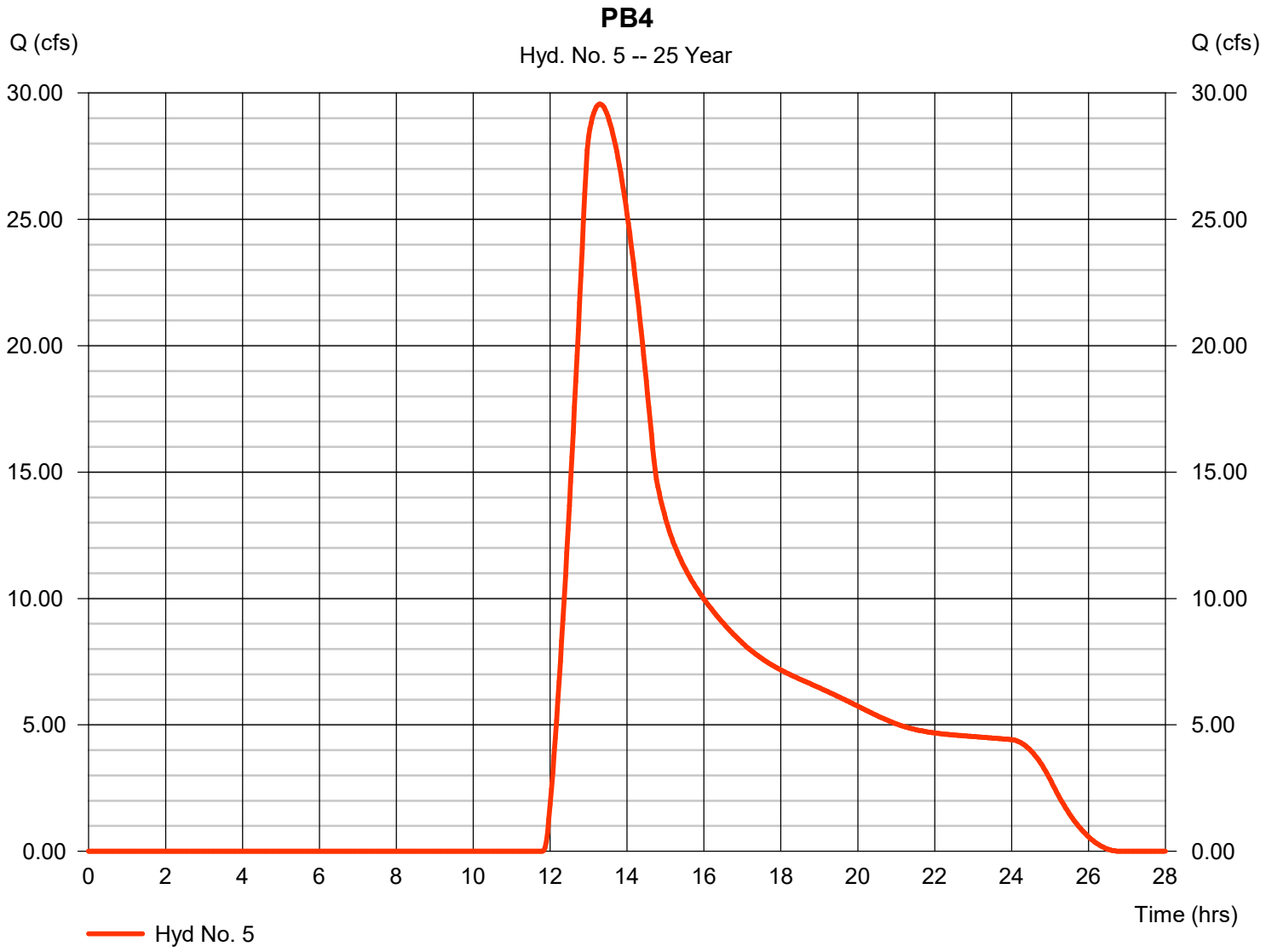
Hydrograph Report

Hyd. No. 5

PB4

Hydrograph type	=	SCS Runoff	Peak discharge	=	29.56 cfs
Storm frequency	=	25 yrs	Time to peak	=	13.30 hrs
Time interval	=	2 min	Hyd. volume	=	458,091 cuft
Drainage area	=	545.800 ac	Curve number	=	73*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	108.30 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(93.800 x 98) + (131.300 x 63) + (173.700 x 55) + (147.000 x 81)] / 545.800

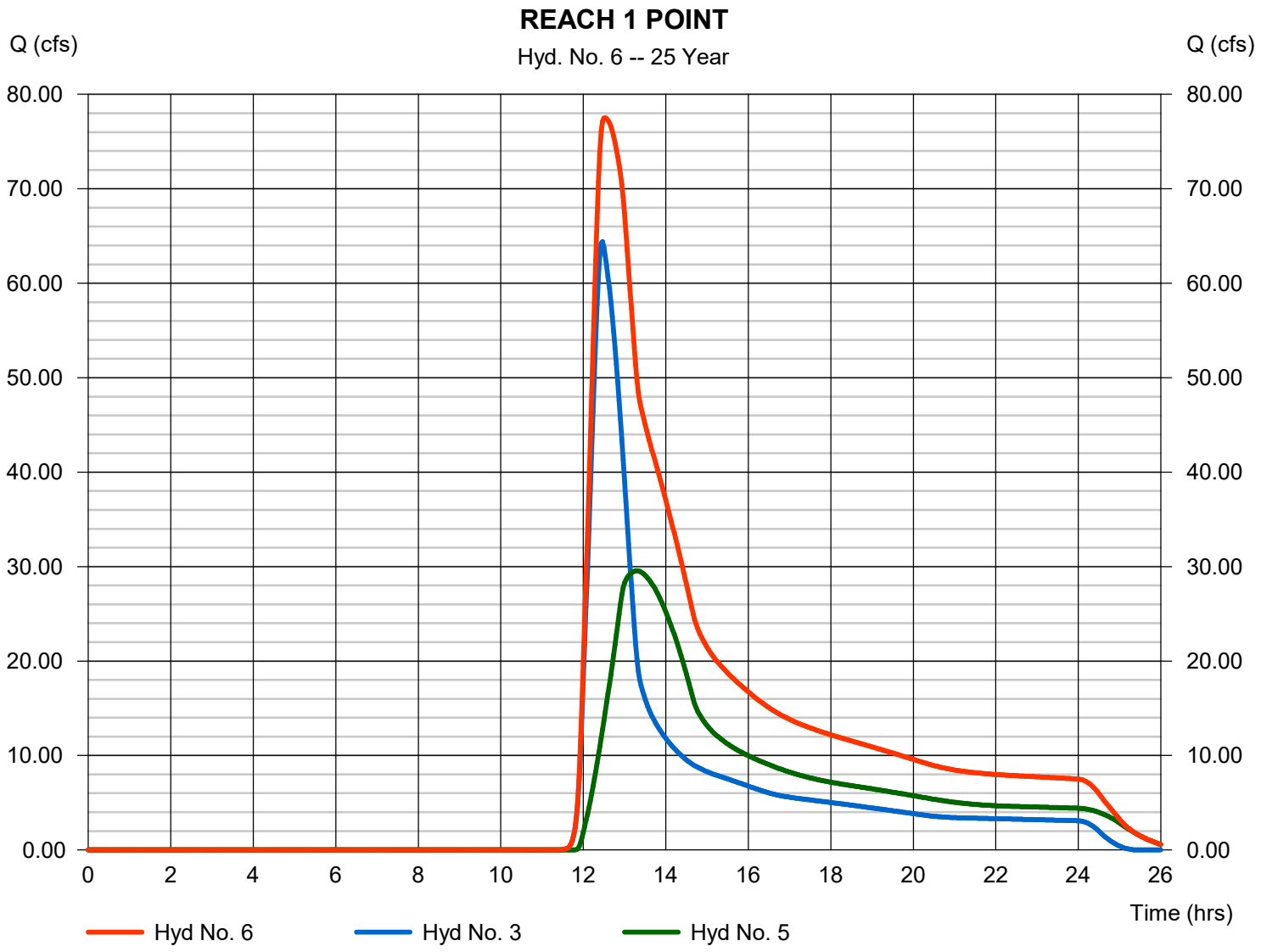


Hydrograph Report

Hyd. No. 6

REACH 1 POINT

Hydrograph type	=	Combine	Peak discharge	=	77.51 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.53 hrs
Time interval	=	2 min	Hyd. volume	=	902,512 cuft
Inflow hyds.	=	3, 5	Contrib. drain. area	=	801.100 ac



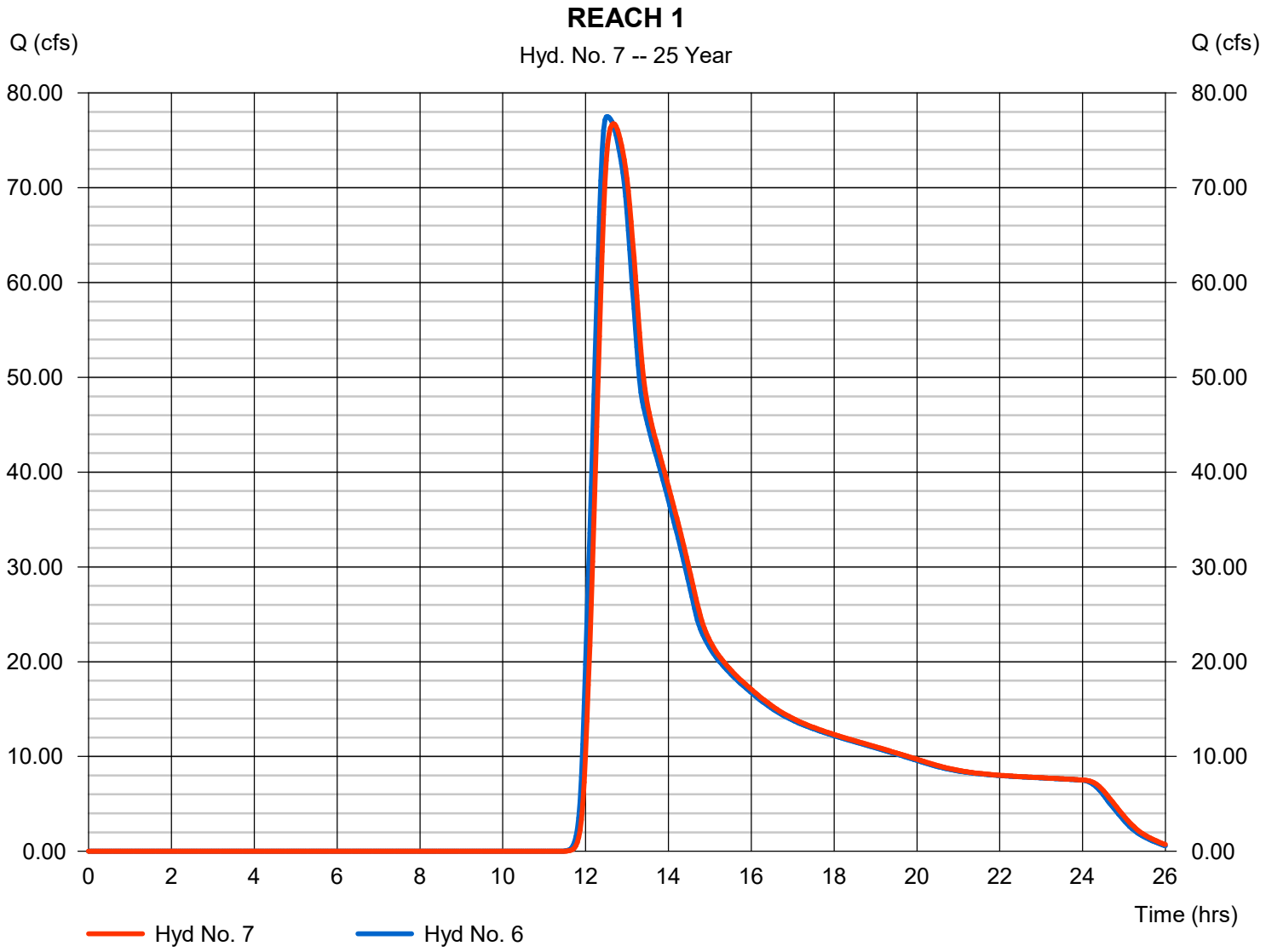
Hydrograph Report

Hyd. No. 7

REACH 1

Hydrograph type	=	Reach	Peak discharge	=	76.77 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.67 hrs
Time interval	=	2 min	Hyd. volume	=	902,508 cuft
Inflow hyd. No.	=	6 - REACH 1 POINT	Section type	=	Circular
Reach length	=	1318.0 ft	Channel slope	=	0.4 %
Manning's n	=	0.013	Bottom width	=	5.0 ft
Side slope	=	0.0:1	Max. depth	=	0.0 ft
Rating curve x	=	5.115	Rating curve m	=	1.250
Ave. velocity	=	3.95 ft/s	Routing coeff.	=	0.3669

Modified Att-Kin routing method used.



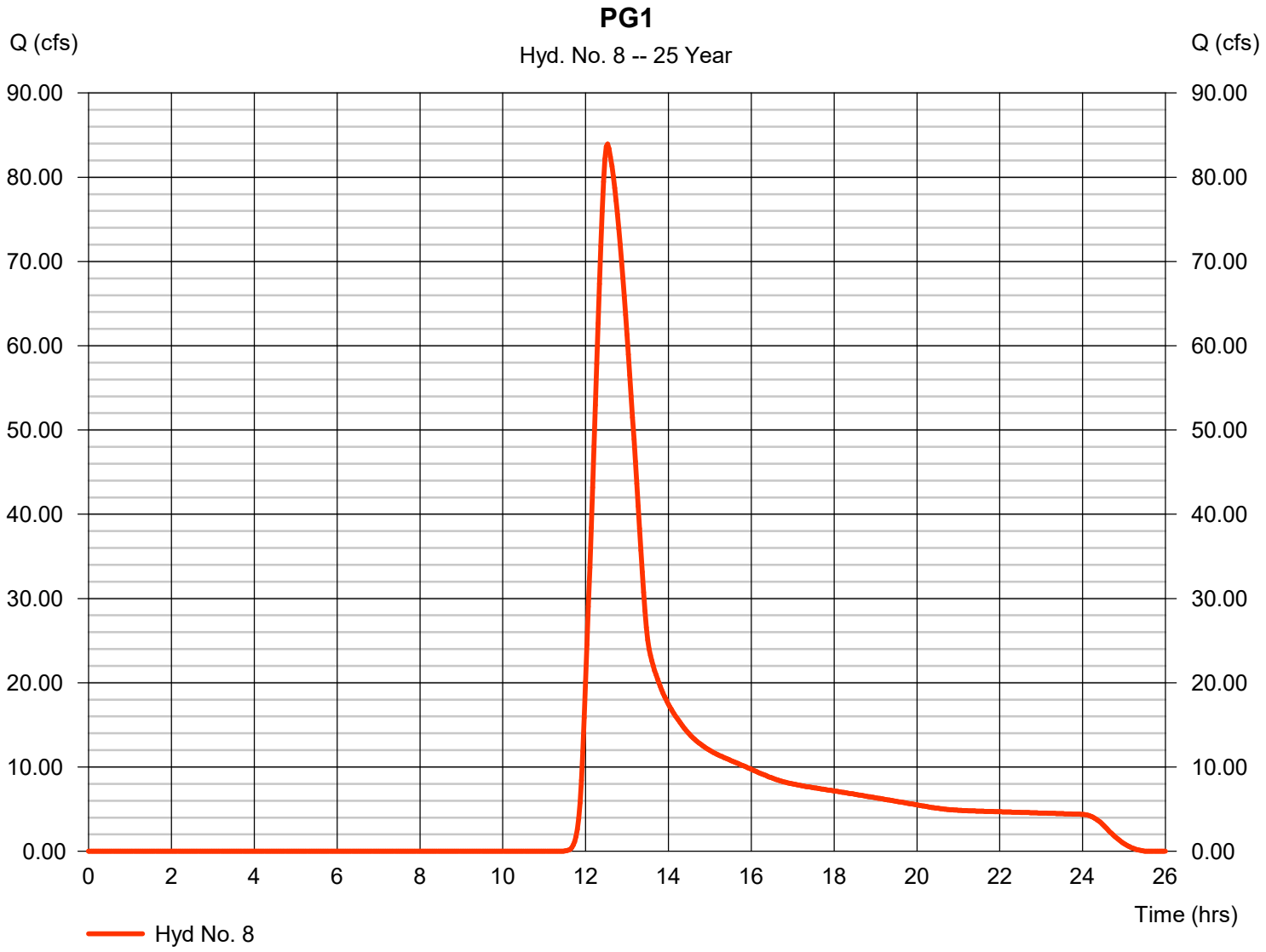
Hydrograph Report

Hyd. No. 8

PG1

Hydrograph type	=	SCS Runoff	Peak discharge	=	83.94 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.53 hrs
Time interval	=	2 min	Hyd. volume	=	628,560 cuft
Drainage area	=	363.900 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	59.50 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(132.600 x 98) + (231.300 x 63)] / 363.900



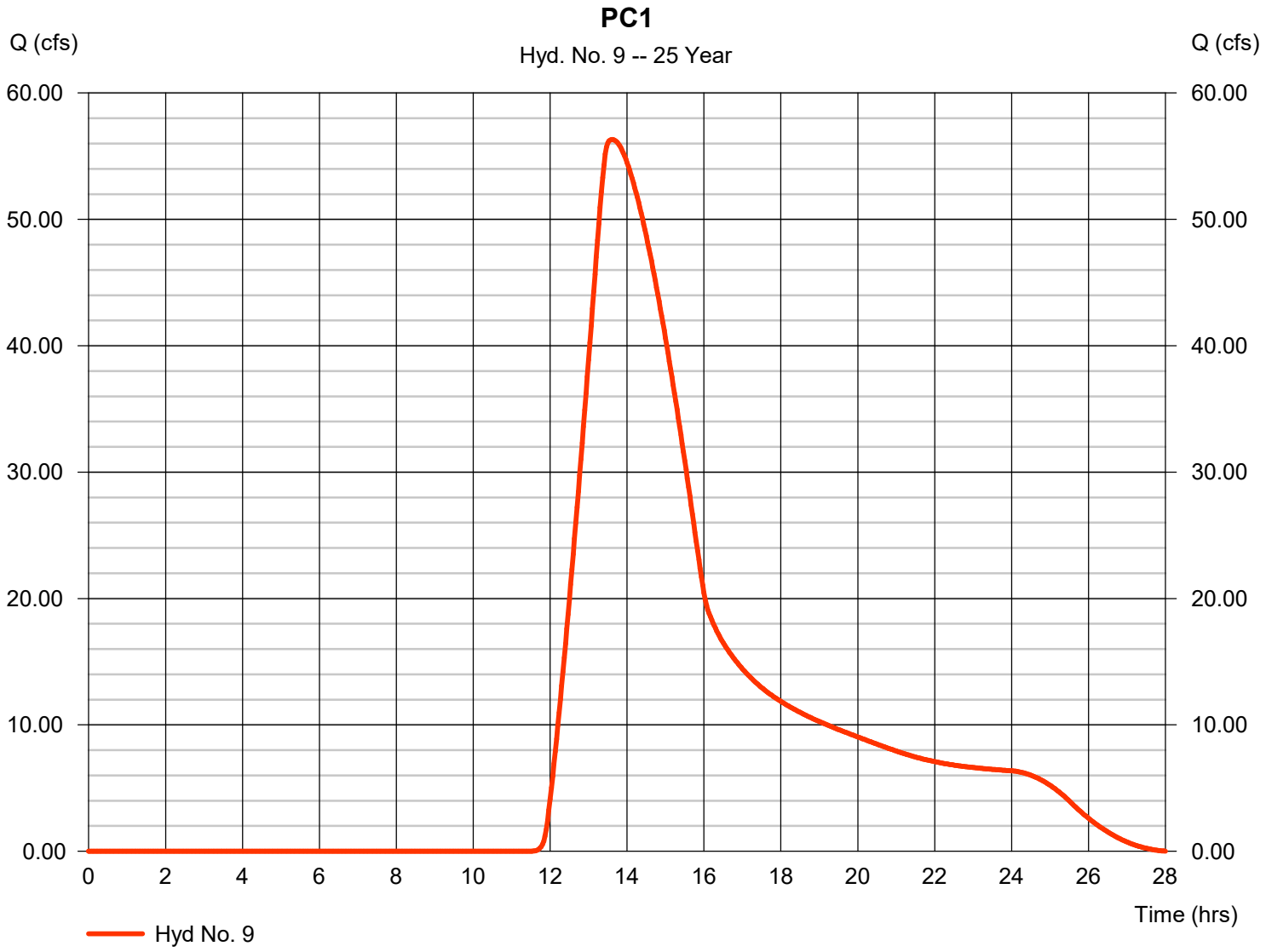
Hydrograph Report

Hyd. No. 9

PC1

Hydrograph type	=	SCS Runoff	Peak discharge	=	56.32 cfs
Storm frequency	=	25 yrs	Time to peak	=	13.60 hrs
Time interval	=	2 min	Hyd. volume	=	876,850 cuft
Drainage area	=	509.000 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	156.50 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(423.800 x 98) + (85.200 x 63)] / 509.000



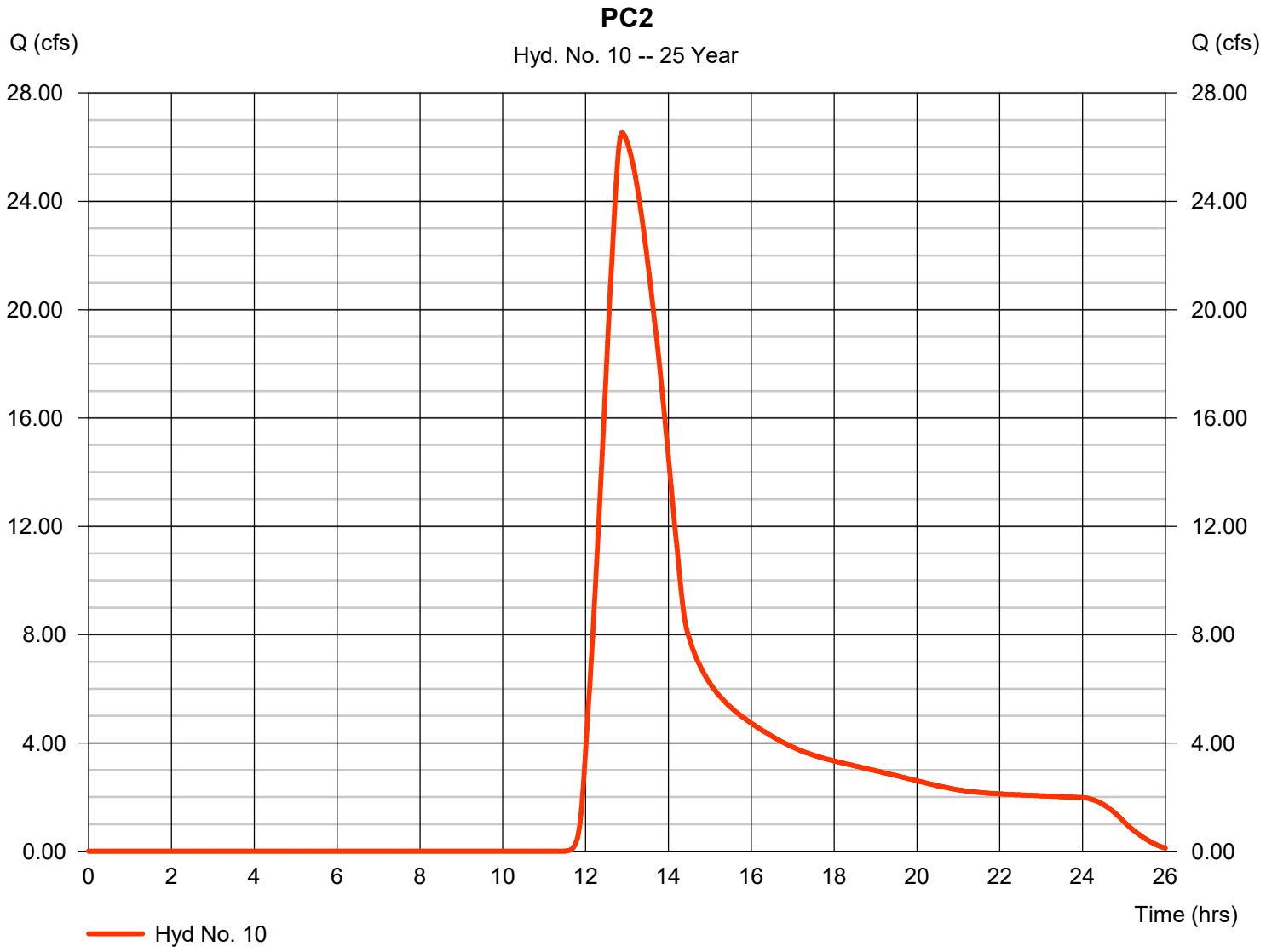
Hydrograph Report

Hyd. No. 10

PC2

Hydrograph type	=	SCS Runoff	Peak discharge	=	26.52 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.87 hrs
Time interval	=	2 min	Hyd. volume	=	279,682 cuft
Drainage area	=	161.200 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	92.10 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(152.700 x 98) + (8.500 x 63)] / 161.200



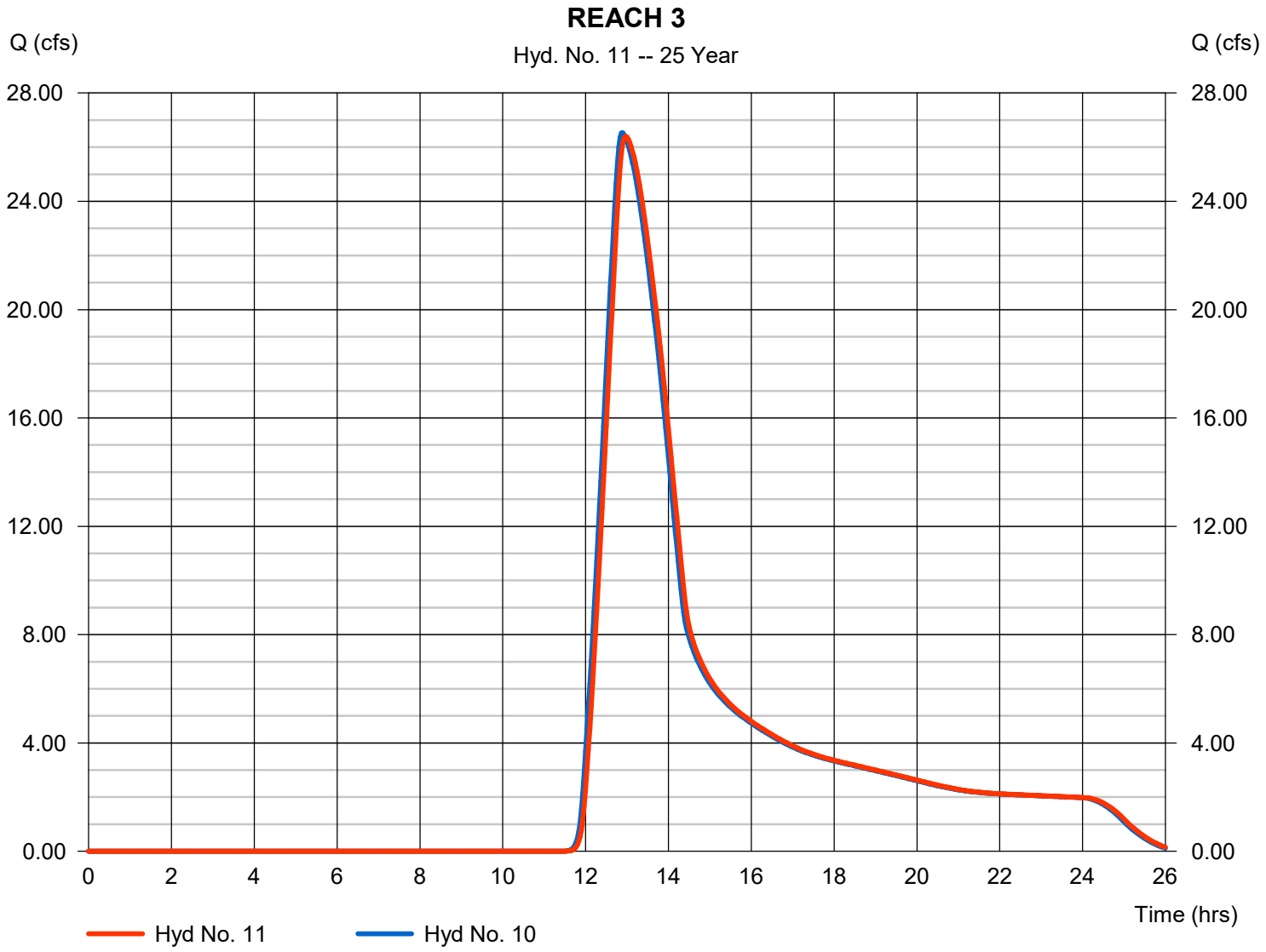
Hydrograph Report

Hyd. No. 11

REACH 3

Hydrograph type	=	Reach	Peak discharge	=	26.40 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.97 hrs
Time interval	=	2 min	Hyd. volume	=	279,680 cuft
Inflow hyd. No.	=	10 - PC2	Section type	=	Circular
Reach length	=	1197.0 ft	Channel slope	=	0.5 %
Manning's n	=	0.013	Bottom width	=	2.5 ft
Side slope	=	0.0:1	Max. depth	=	0.0 ft
Rating curve x	=	5.095	Rating curve m	=	1.250
Ave. velocity	=	5.40 ft/s	Routing coeff.	=	0.5059

Modified Att-Kin routing method used.

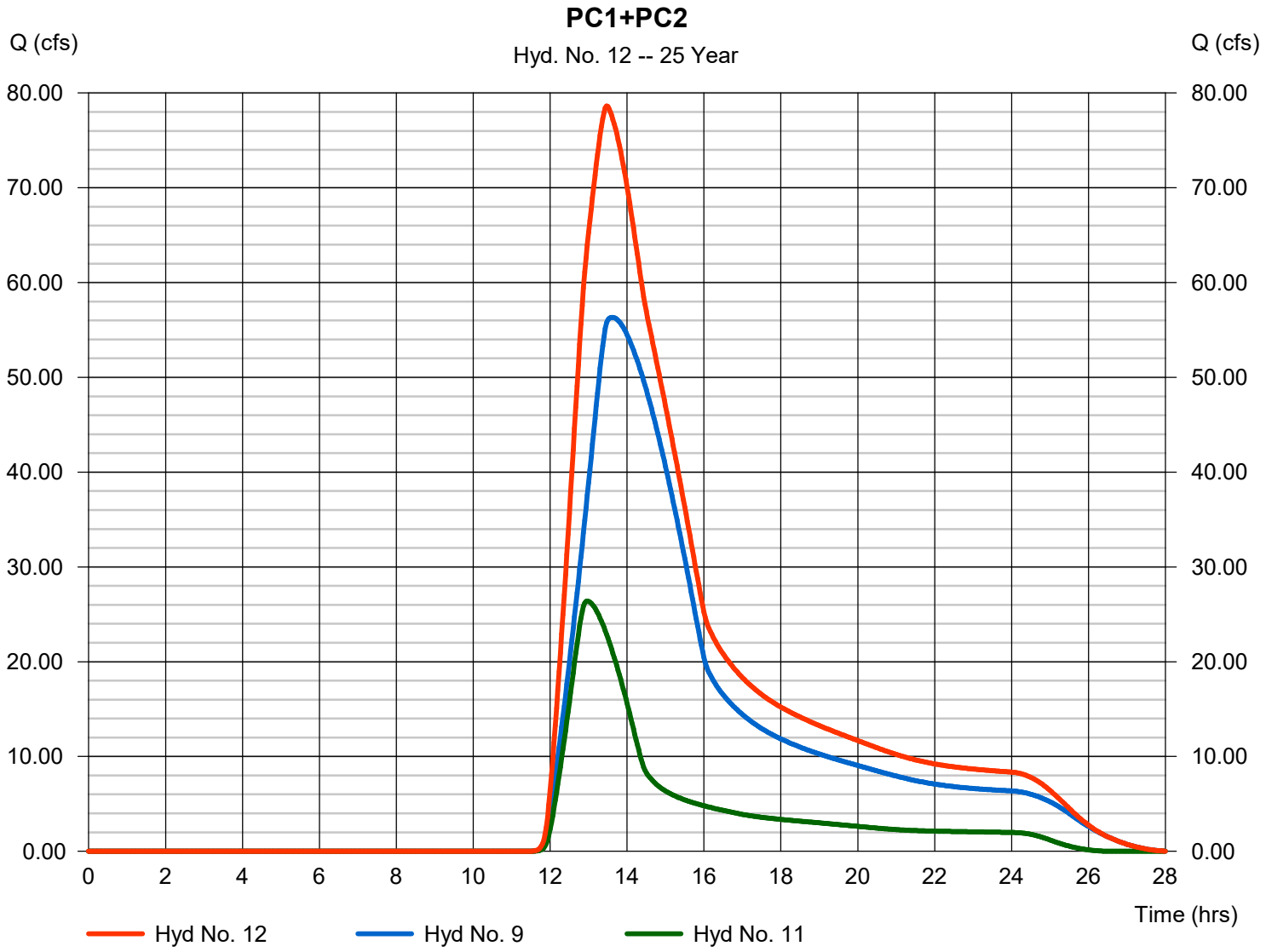


Hydrograph Report

Hyd. No. 12

PC1+PC2

Hydrograph type	= Combine	Peak discharge	= 78.64 cfs
Storm frequency	= 25 yrs	Time to peak	= 13.47 hrs
Time interval	= 2 min	Hyd. volume	= 1,156,531 cuft
Inflow hyds.	= 9, 11	Contrib. drain. area	= 509.000 ac



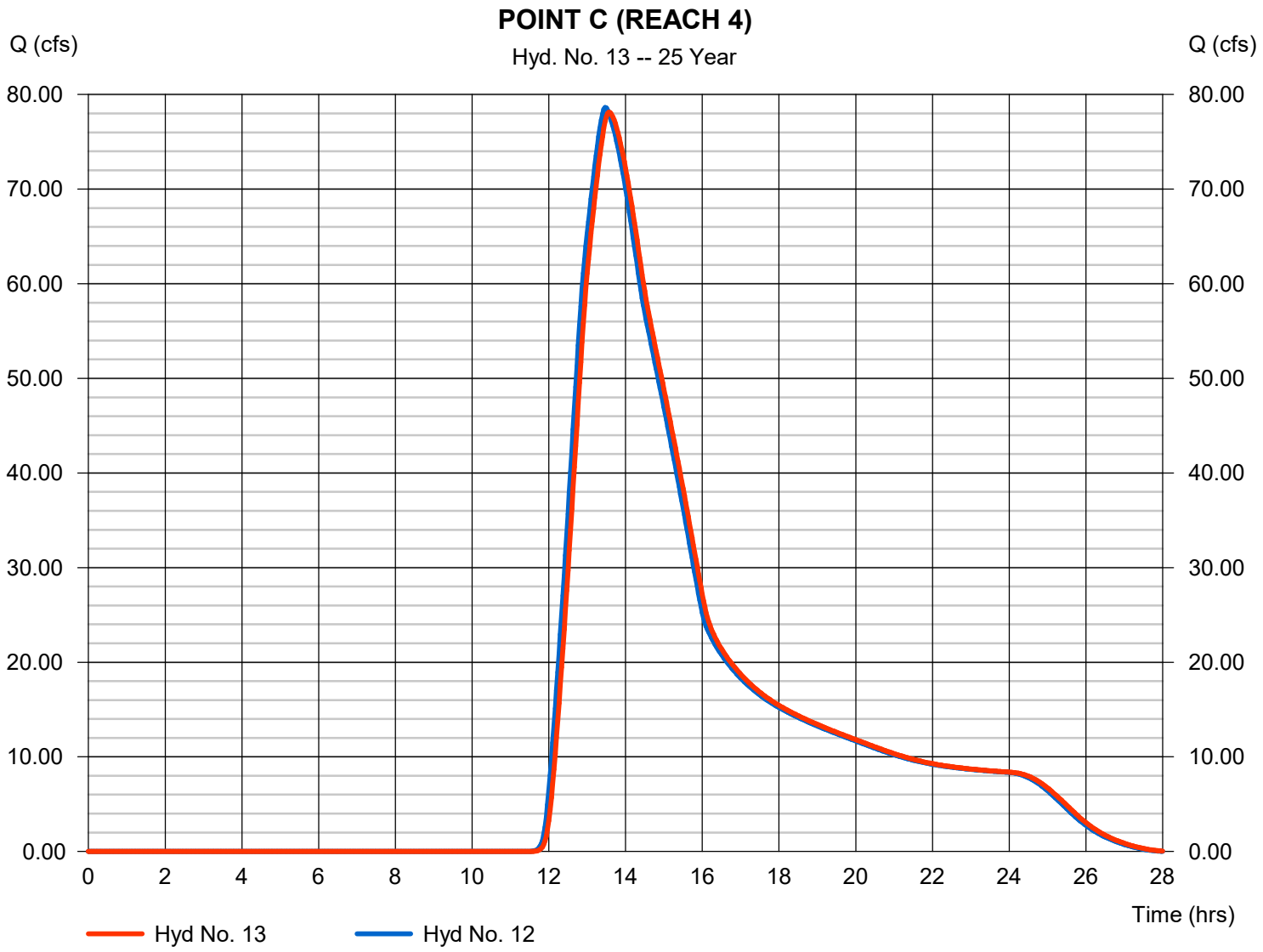
Hydrograph Report

Hyd. No. 13

POINT C (REACH 4)

Hydrograph type	=	Reach	Peak discharge	=	78.13 cfs
Storm frequency	=	25 yrs	Time to peak	=	13.57 hrs
Time interval	=	2 min	Hyd. volume	=	1,156,528 cuft
Inflow hyd. No.	=	12 - PC1+PC2	Section type	=	Trapezoidal
Reach length	=	1010.0 ft	Channel slope	=	0.5 %
Manning's n	=	0.035	Bottom width	=	9.0 ft
Side slope	=	3.0:1	Max. depth	=	3.5 ft
Rating curve x	=	0.695	Rating curve m	=	1.394
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.3597

Modified Att-Kin routing method used.



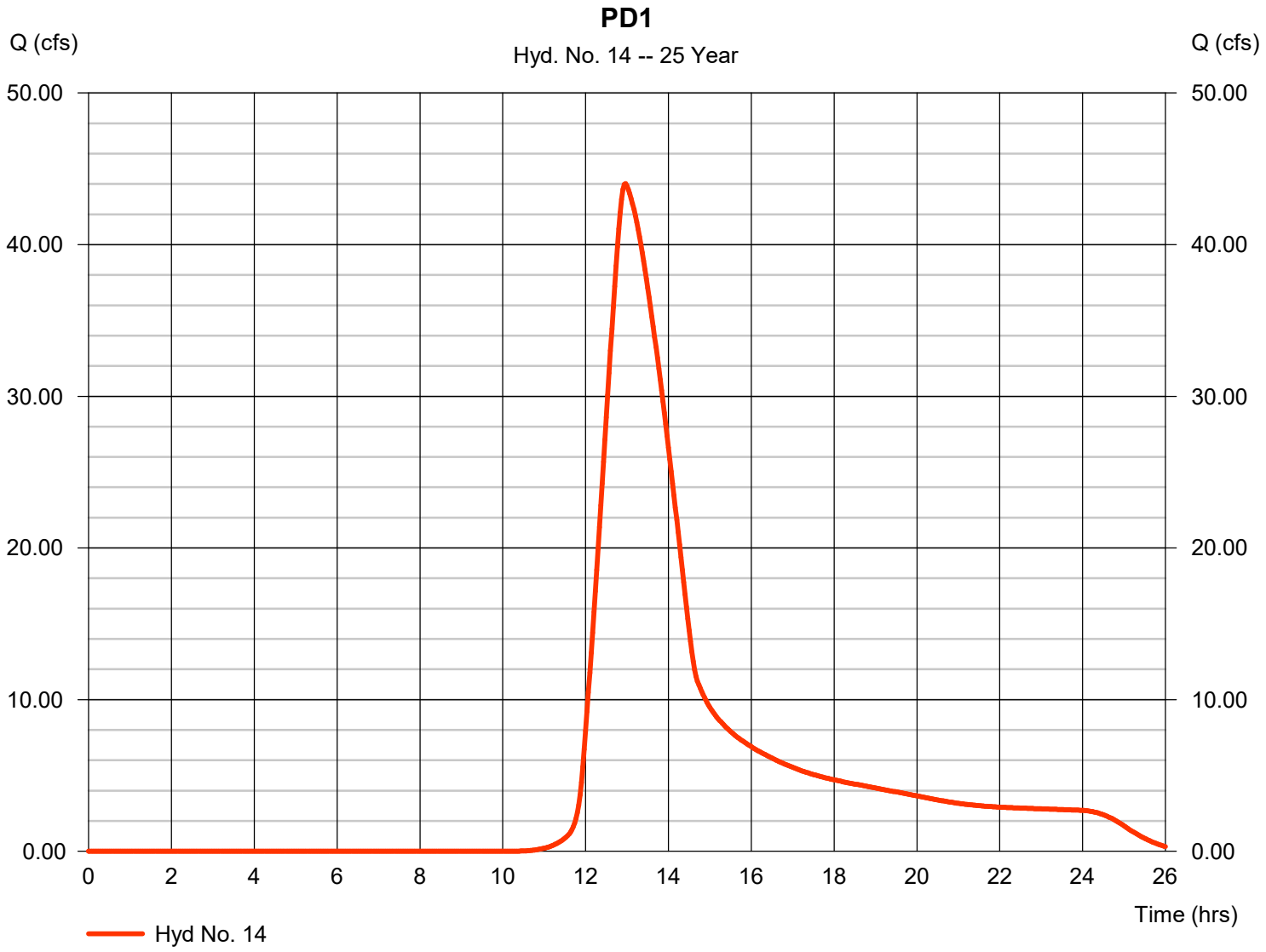
Hydrograph Report

Hyd. No. 14

PD1

Hydrograph type	=	SCS Runoff	Peak discharge	=	44.02 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.97 hrs
Time interval	=	2 min	Hyd. volume	=	450,662 cuft
Drainage area	=	178.300 ac	Curve number	=	86*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	104.50 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(92.300 x 81) + (80.000 x 91) + (5.800 x 93)] / 178.300



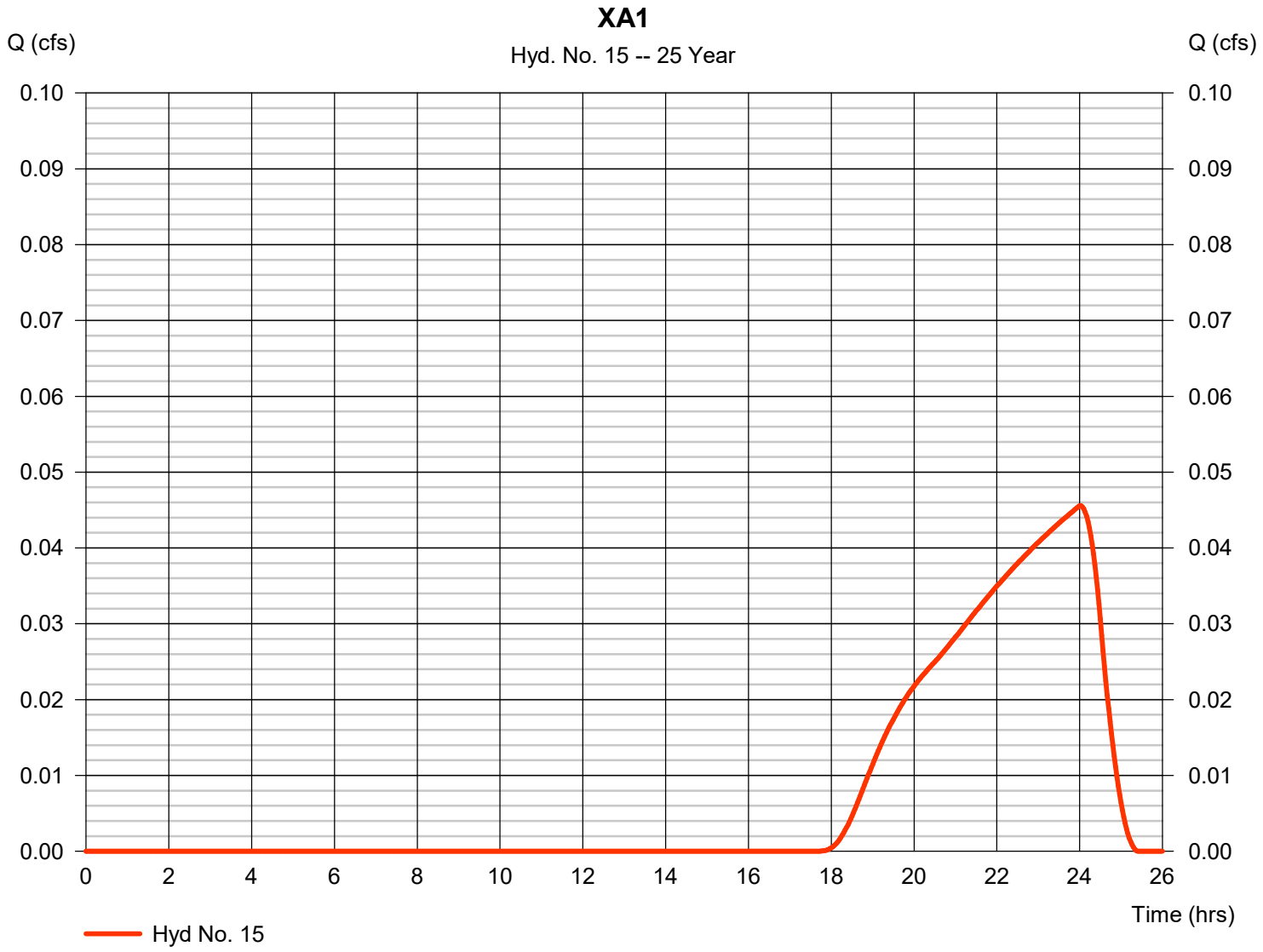
Hydrograph Report

Hyd. No. 15

XA1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.046 cfs
Storm frequency	= 25 yrs	Time to peak	= 24.03 hrs
Time interval	= 2 min	Hyd. volume	= 684 cuft
Drainage area	= 66.000 ac	Curve number	= 55*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 52.60 min
Total precip.	= 1.79 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(66.000 x 55)] / 66.000



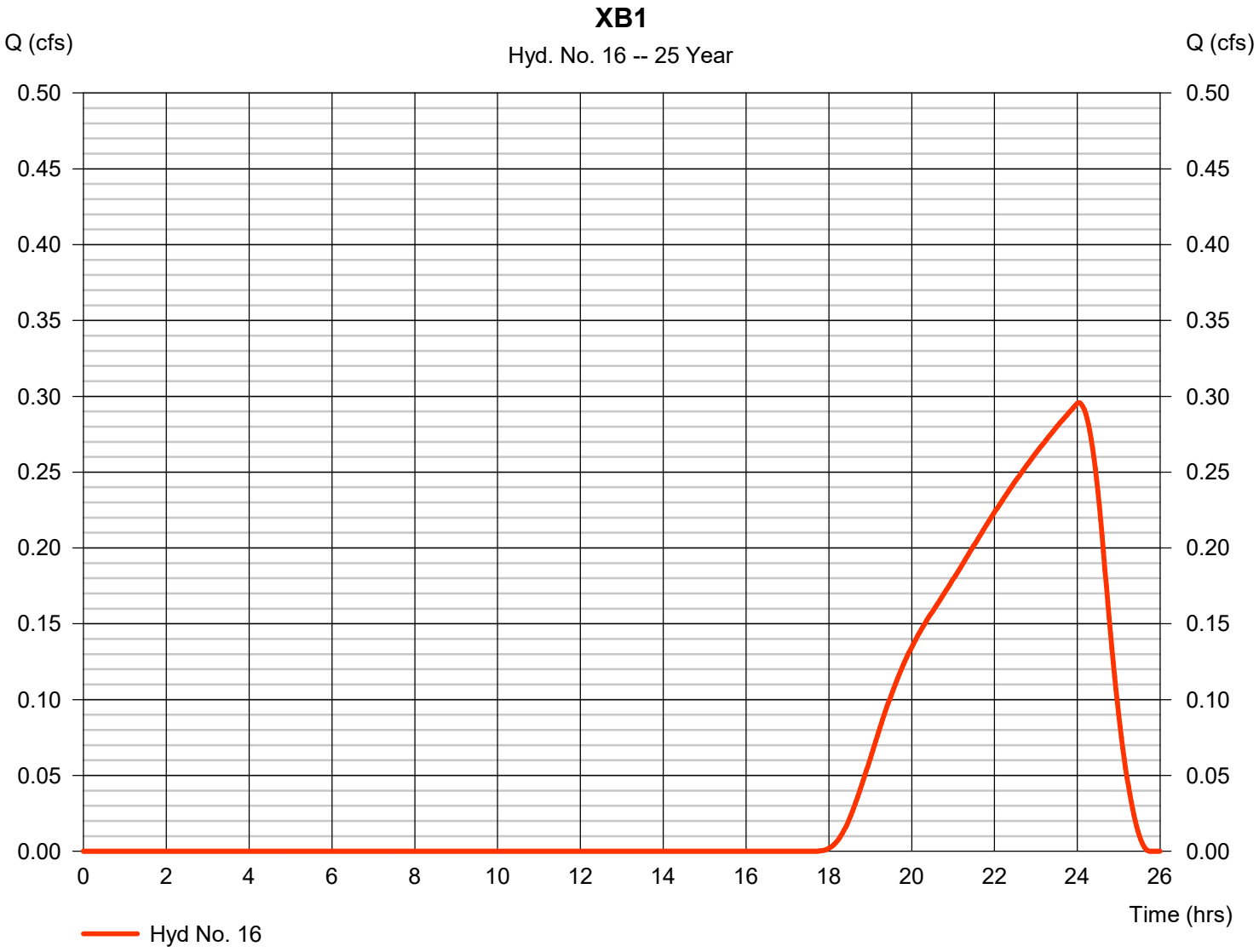
Hydrograph Report

Hyd. No. 16

XB1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.296 cfs
Storm frequency	= 25 yrs	Time to peak	= 24.03 hrs
Time interval	= 2 min	Hyd. volume	= 4,502 cuft
Drainage area	= 440.700 ac	Curve number	= 55*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 64.80 min
Total precip.	= 1.79 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(440.700 x 55)] / 440.700



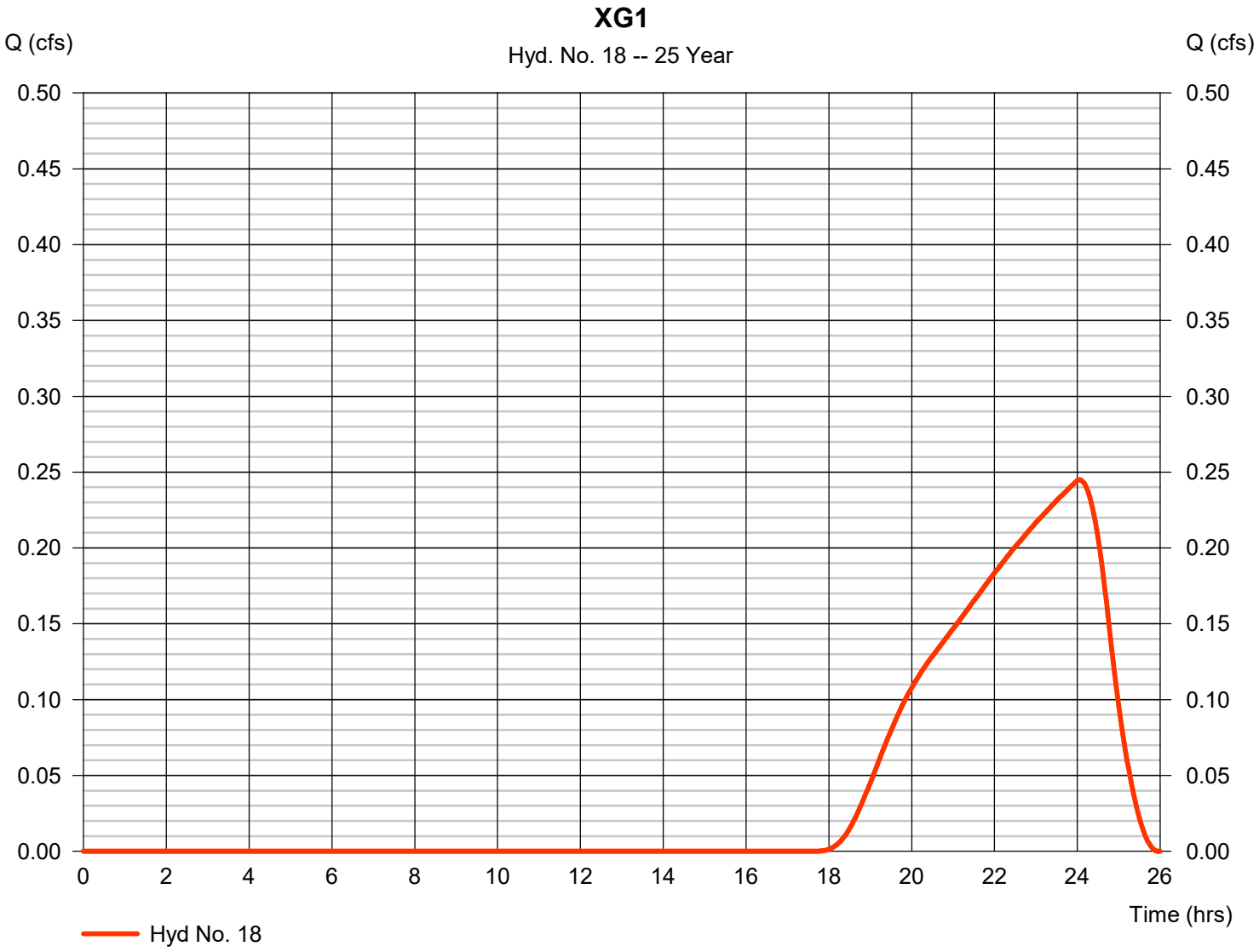
Hydrograph Report

Hyd. No. 18

XG1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.245 cfs
Storm frequency	=	25 yrs	Time to peak	=	24.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,762 cuft
Drainage area	=	363.900 ac	Curve number	=	55*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	71.10 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(4.600 x 81) + (1.100 x 81) + (358.200 x 55)] / 363.900



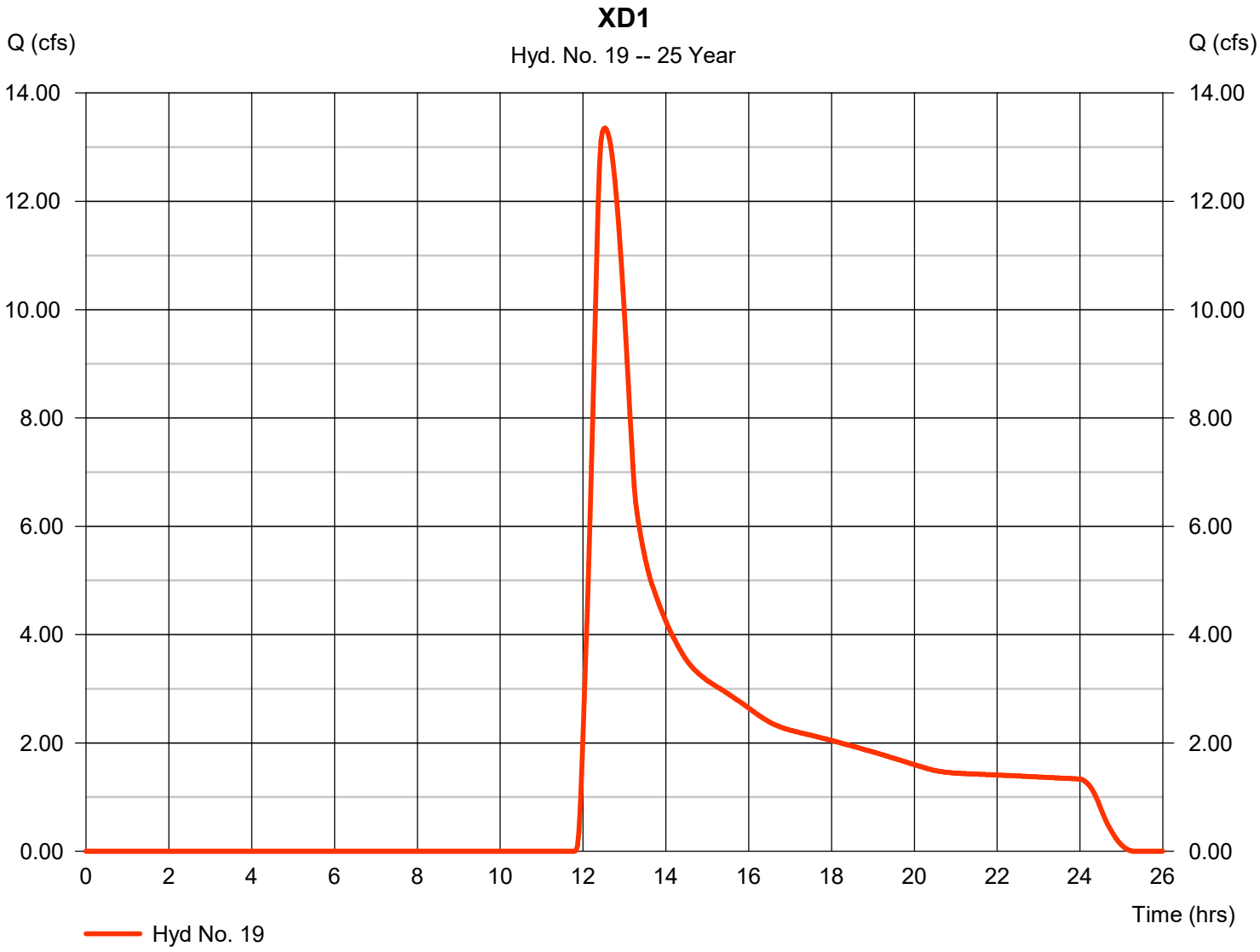
Hydrograph Report

Hyd. No. 19

XD1

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.35 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.53 hrs
Time interval	=	2 min	Hyd. volume	=	135,070 cuft
Drainage area	=	178.000 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	50.10 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(24.800 x 81) + (6.200 x 81) + (62.000 x 55) + (80.000 x 81) + (5.000 x 86)] / 178.000



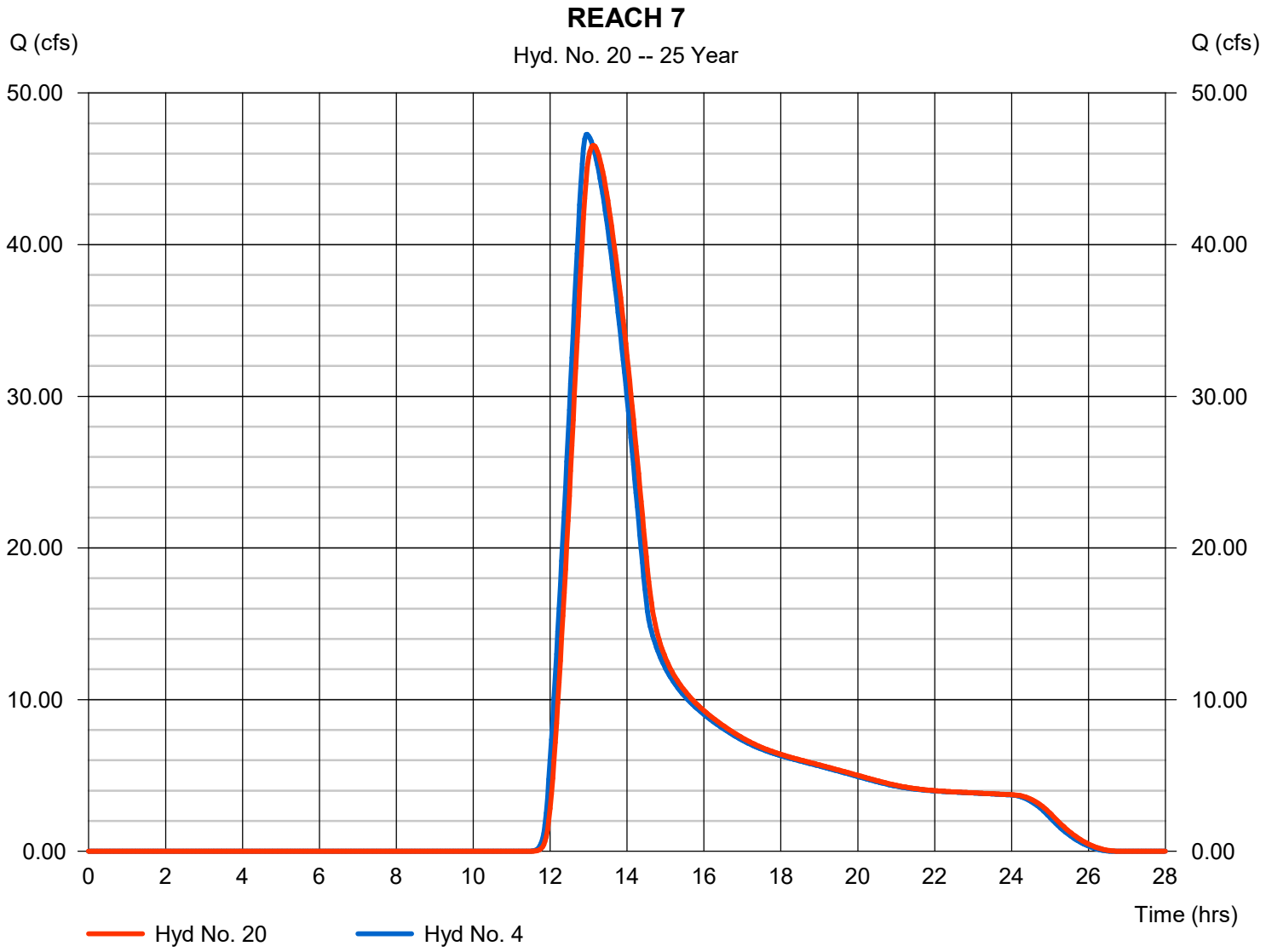
Hydrograph Report

Hyd. No. 20

REACH 7

Hydrograph type	= Reach	Peak discharge	= 46.55 cfs
Storm frequency	= 25 yrs	Time to peak	= 13.13 hrs
Time interval	= 2 min	Hyd. volume	= 523,365 cuft
Inflow hyd. No.	= 4 - PB3	Section type	= Circular
Reach length	= 2153.0 ft	Channel slope	= 0.4 %
Manning's n	= 0.013	Bottom width	= 3.5 ft
Side slope	= 0.0:1	Max. depth	= 0.0 ft
Rating curve x	= 4.820	Rating curve m	= 1.250
Ave. velocity	= 4.91 ft/s	Routing coeff.	= 0.2923

Modified Att-Kin routing method used.

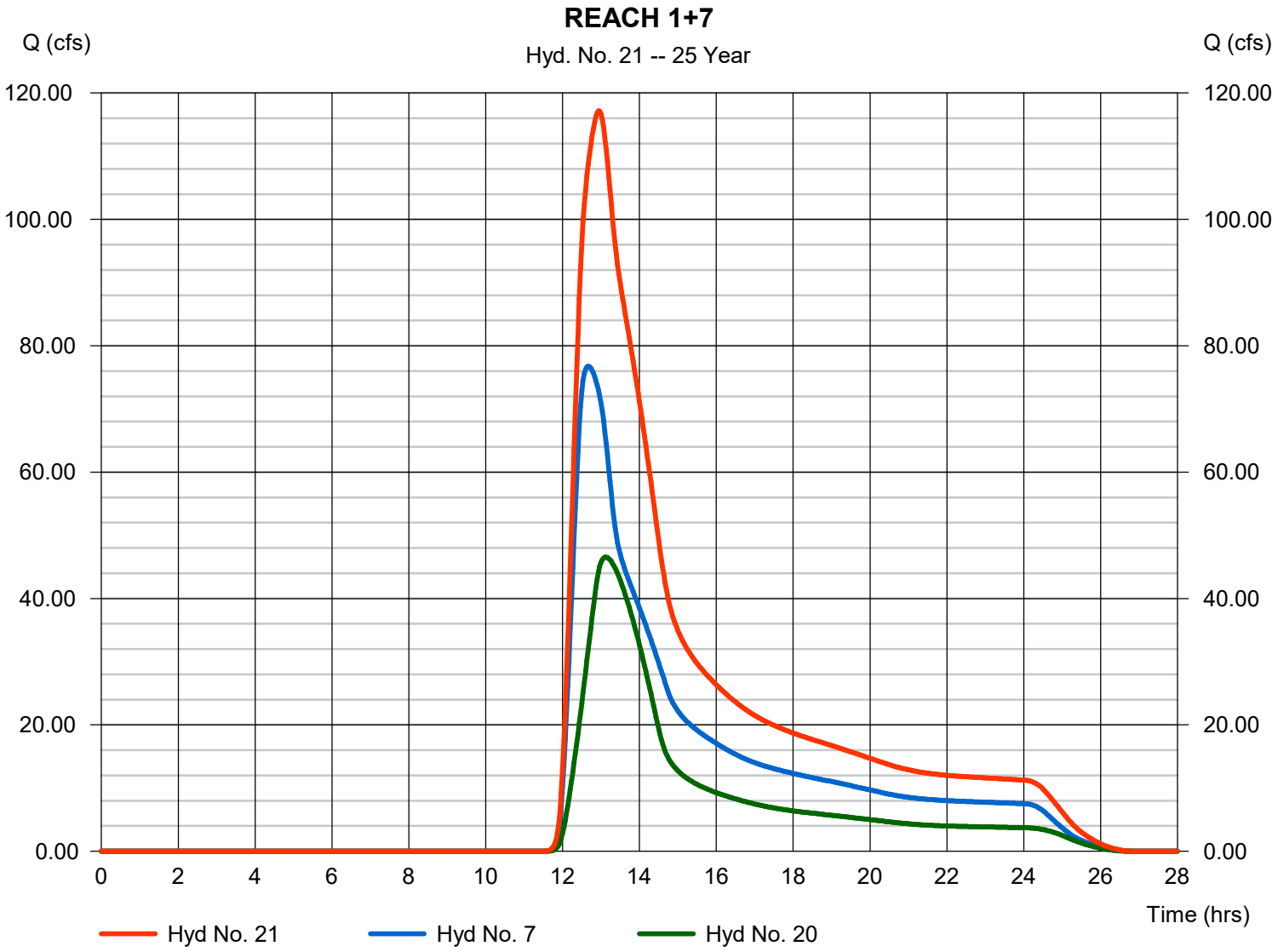


Hydrograph Report

Hyd. No. 21

REACH 1+7

Hydrograph type	=	Combine	Peak discharge	=	117.18 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.93 hrs
Time interval	=	2 min	Hyd. volume	=	1,425,874 cuft
Inflow hyds.	=	7, 20	Contrib. drain. area	=	0.000 ac



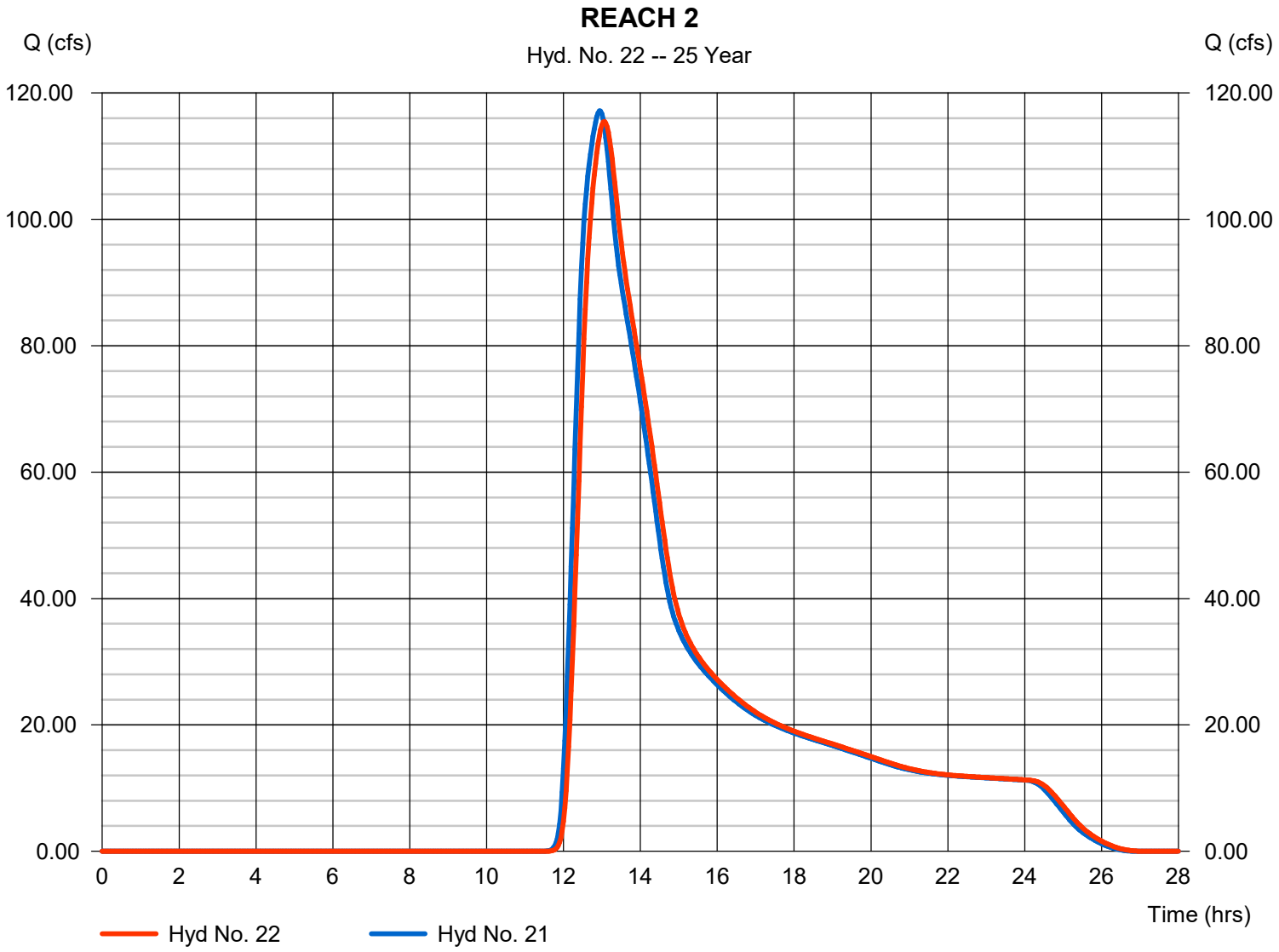
Hydrograph Report

Hyd. No. 22

REACH 2

Hydrograph type	=	Reach	Peak discharge	=	115.50 cfs
Storm frequency	=	25 yrs	Time to peak	=	13.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,425,870 cuft
Inflow hyd. No.	=	21 - REACH 1+7	Section type	=	Trapezoidal
Reach length	=	2187.0 ft	Channel slope	=	1.0 %
Manning's n	=	0.035	Bottom width	=	9.0 ft
Side slope	=	3.0:1	Max. depth	=	3.5 ft
Rating curve x	=	0.983	Rating curve m	=	1.394
Ave. velocity	=	3.80 ft/s	Routing coeff.	=	0.2538

Modified Att-Kin routing method used.

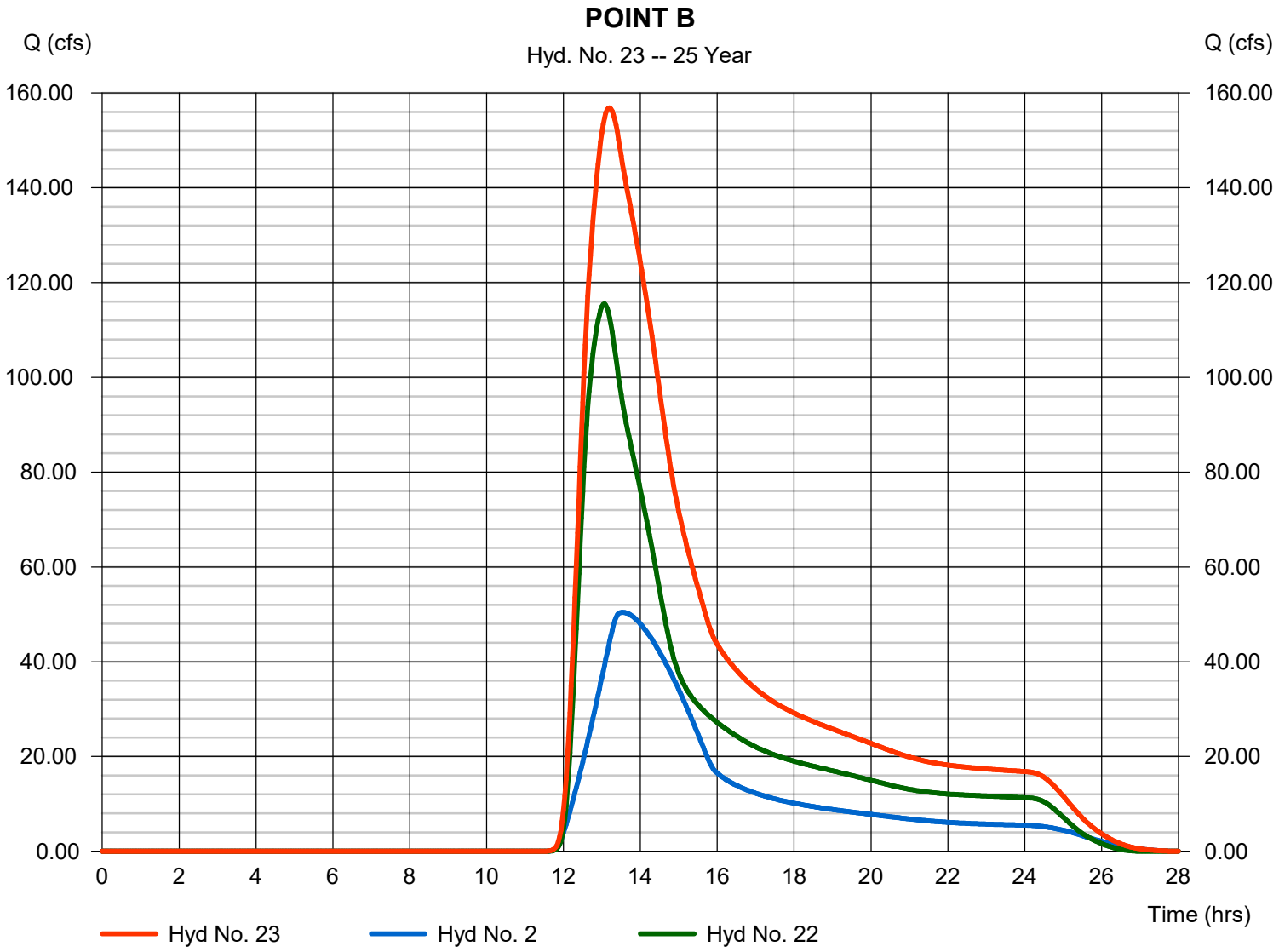


Hydrograph Report

Hyd. No. 23

POINT B

Hydrograph type	=	Combine	Peak discharge	=	156.86 cfs
Storm frequency	=	25 yrs	Time to peak	=	13.20 hrs
Time interval	=	2 min	Hyd. volume	=	2,187,085 cuft
Inflow hyds.	=	2, 22	Contrib. drain. area	=	440.700 ac



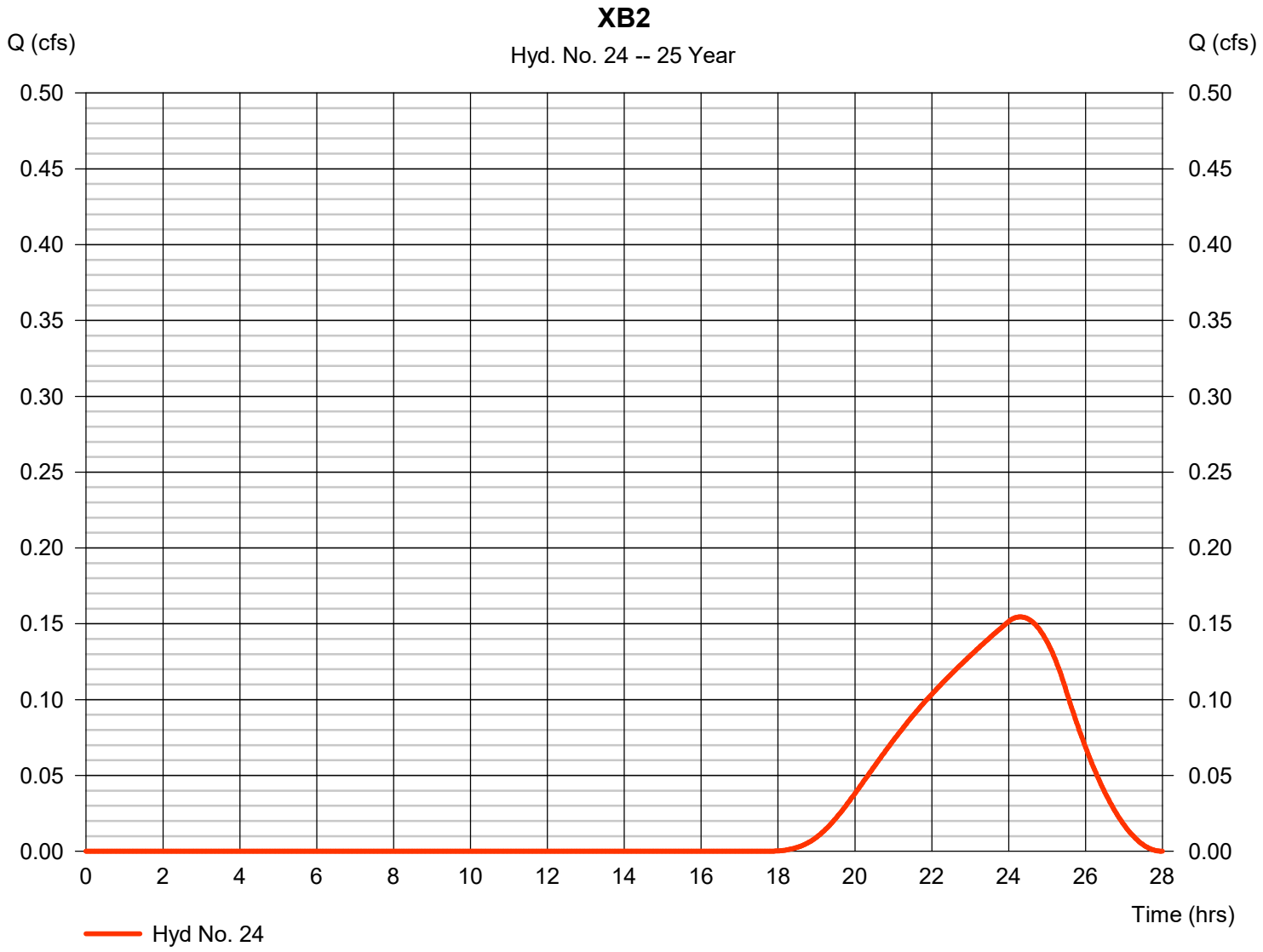
Hydrograph Report

Hyd. No. 24

XB2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.155 cfs
Storm frequency	=	25 yrs	Time to peak	=	24.30 hrs
Time interval	=	2 min	Hyd. volume	=	2,623 cuft
Drainage area	=	255.200 ac	Curve number	=	55*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	150.60 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(255.200 x 55)] / 255.200



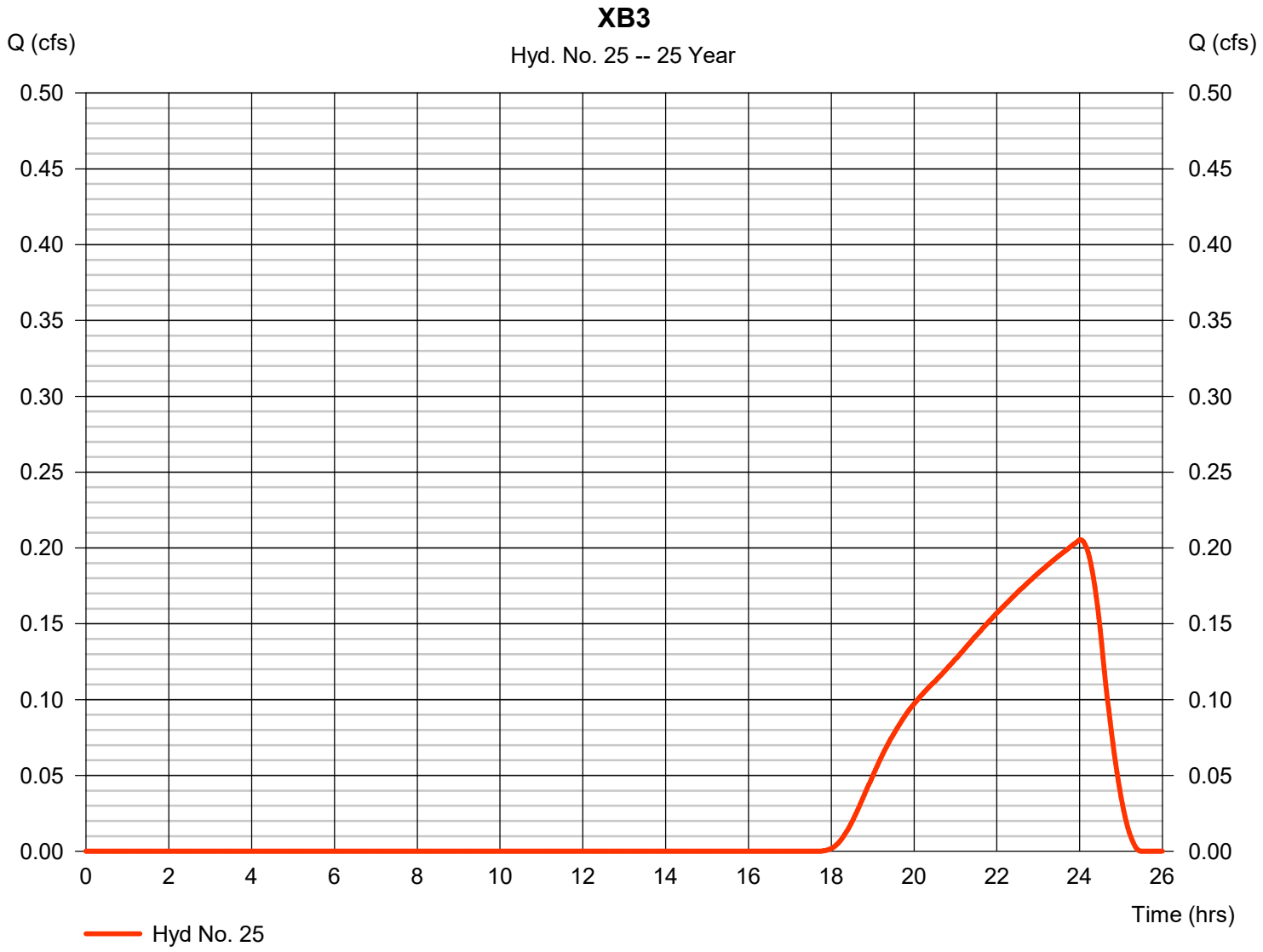
Hydrograph Report

Hyd. No. 25

XB3

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.205 cfs
Storm frequency	=	25 yrs	Time to peak	=	24.03 hrs
Time interval	=	2 min	Hyd. volume	=	3,091 cuft
Drainage area	=	302.900 ac	Curve number	=	55*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	56.10 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(302.900 x 55)] / 302.900



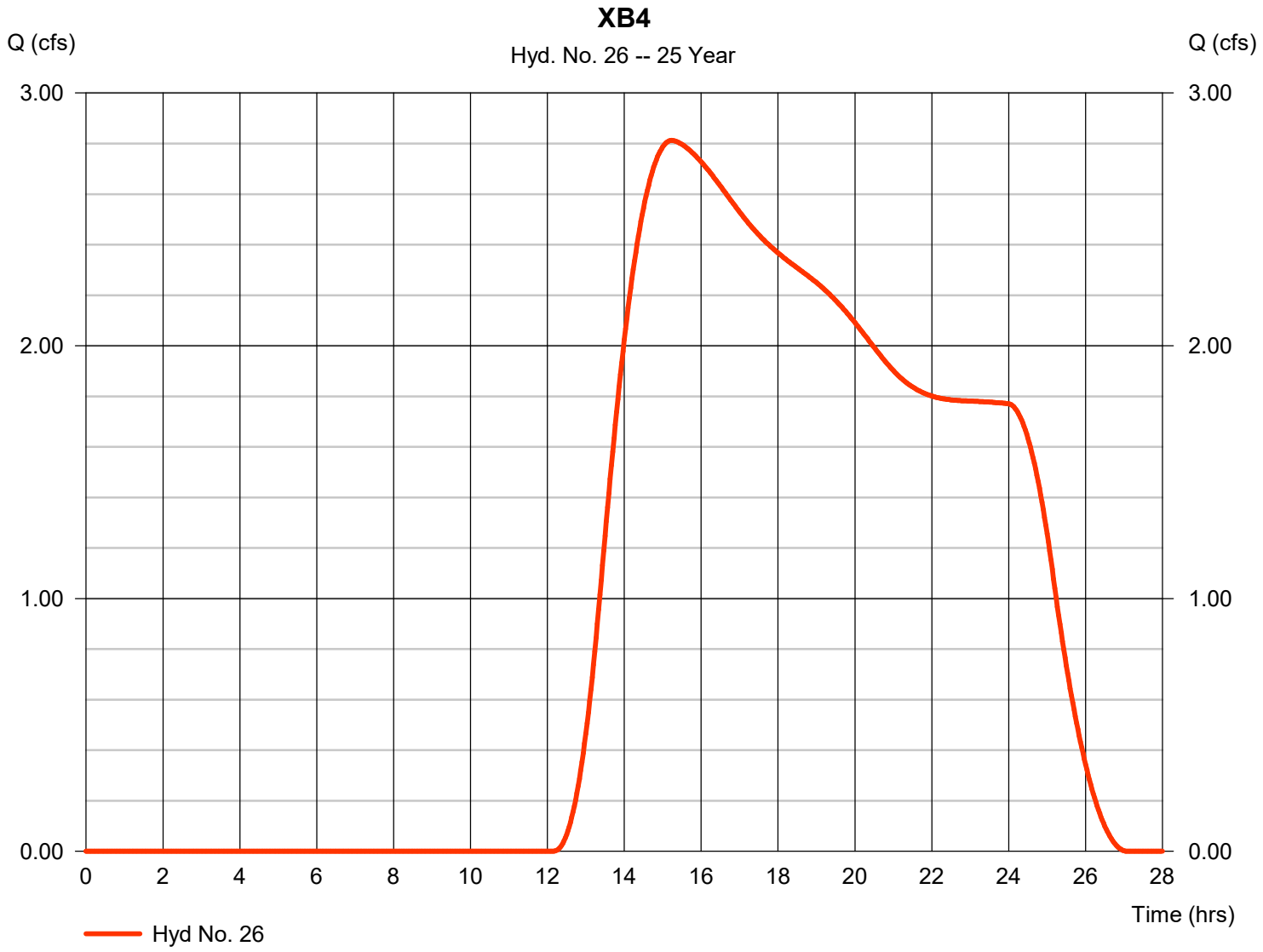
Hydrograph Report

Hyd. No. 26

XB4

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.813 cfs
Storm frequency	=	25 yrs	Time to peak	=	15.23 hrs
Time interval	=	2 min	Hyd. volume	=	93,896 cuft
Drainage area	=	545.900 ac	Curve number	=	62*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	117.20 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(224.200 x 55) + (173.700 x 55) + (147.000 x 81) + (0.800 x 81) + (0.200 x 81)] / 545.900

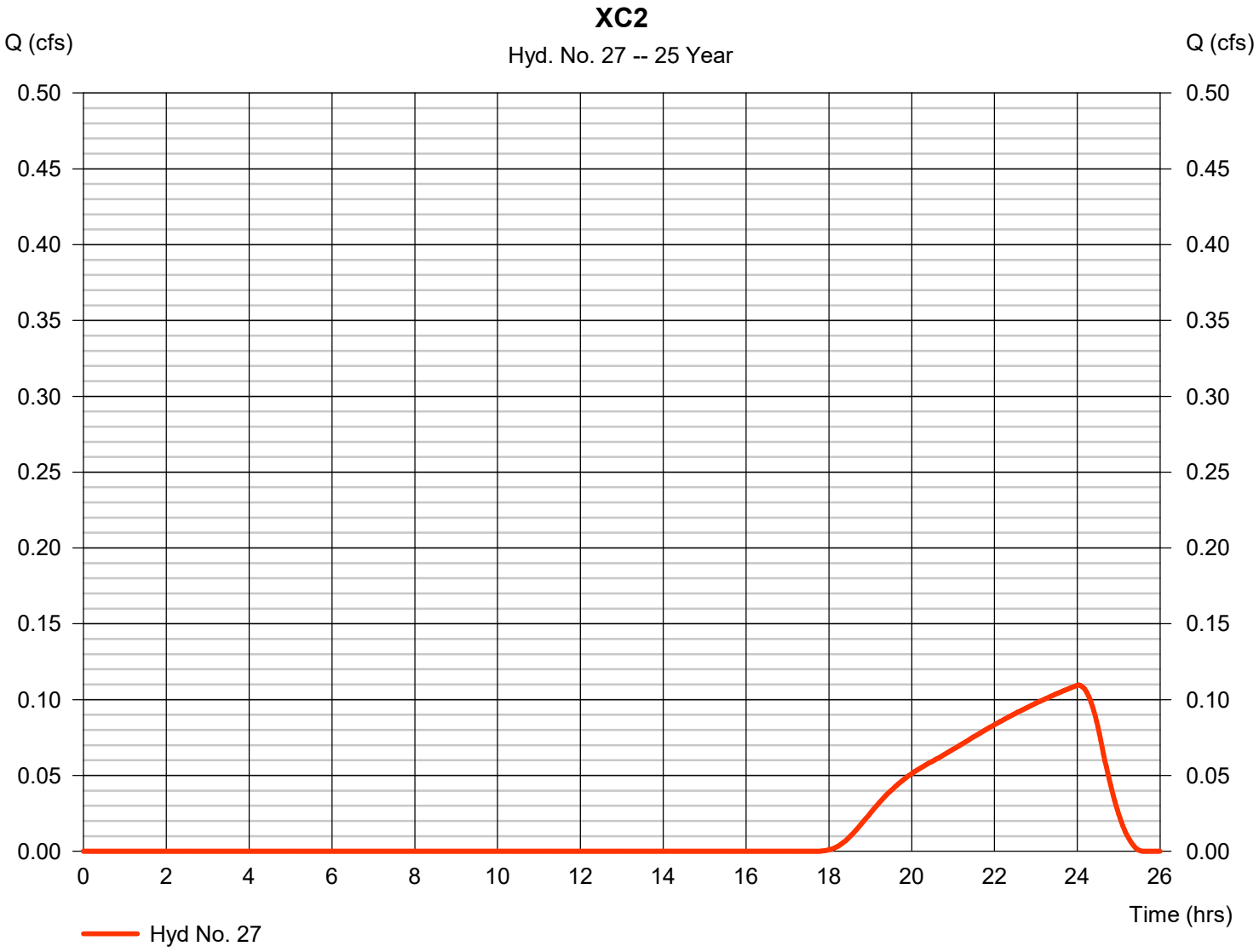


Hydrograph Report

Hyd. No. 27

XC2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.110 cfs
Storm frequency	=	25 yrs	Time to peak	=	24.03 hrs
Time interval	=	2 min	Hyd. volume	=	1,656 cuft
Drainage area	=	161.100 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	57.80 min
Total precip.	=	1.79 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



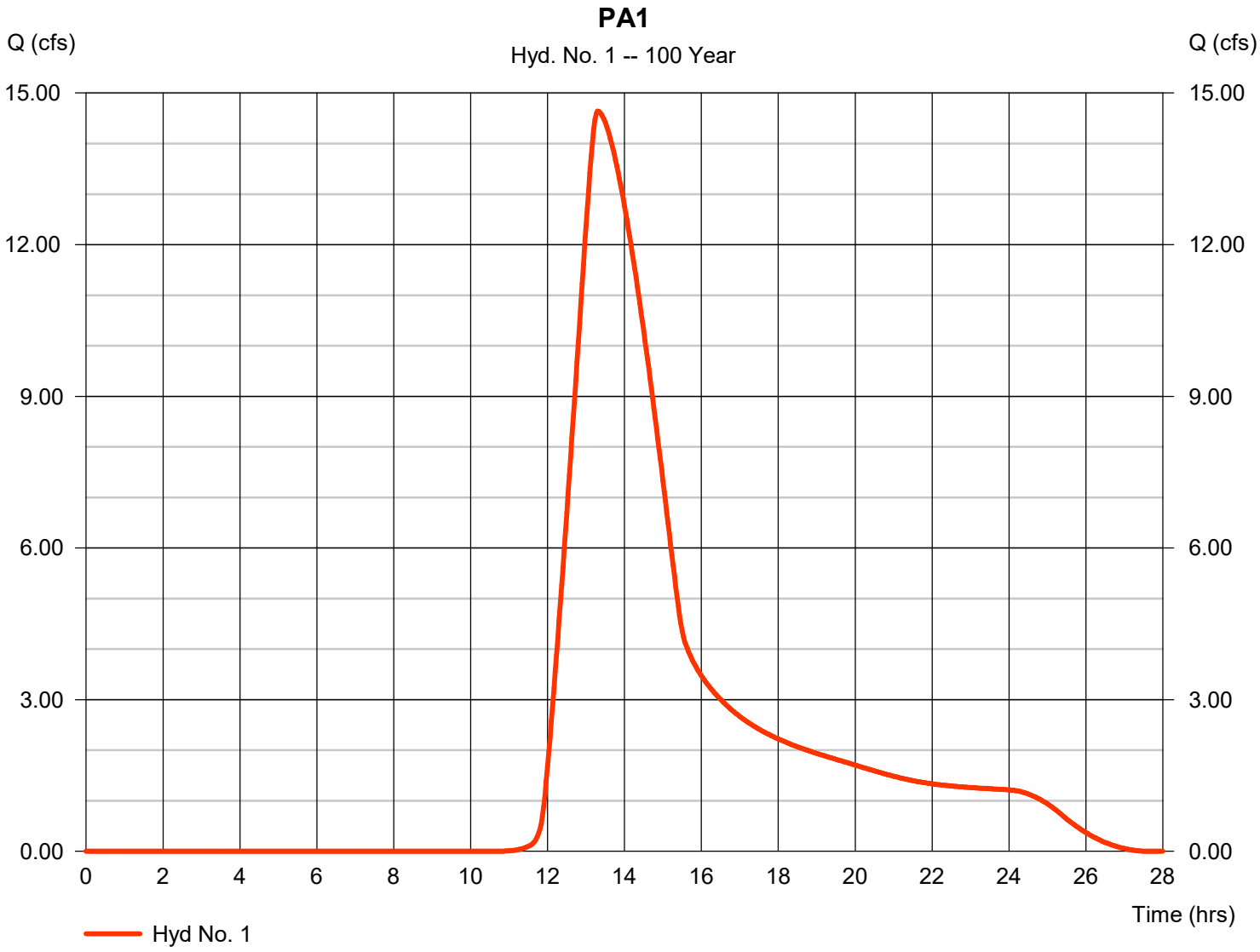
Hydrograph Report

Hyd. No. 1

PA1

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.64 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.30 hrs
Time interval	=	2 min	Hyd. volume	=	190,065 cuft
Drainage area	=	66.000 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	137.10 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(66.000 x 63)] / 66.000



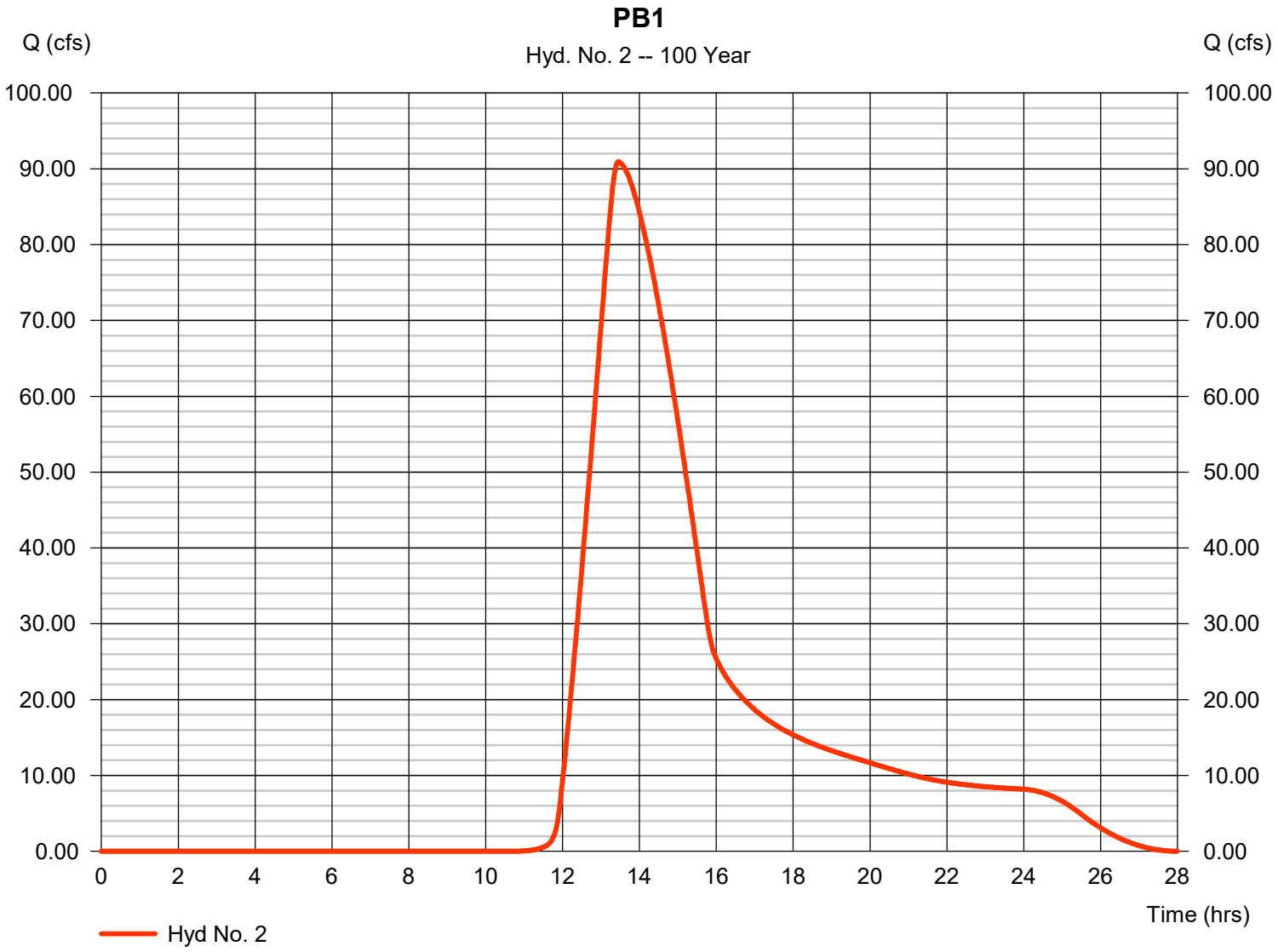
Hydrograph Report

Hyd. No. 2

PB1

Hydrograph type	=	SCS Runoff	Peak discharge	=	90.91 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.47 hrs
Time interval	=	2 min	Hyd. volume	=	1,272,999 cuft
Drainage area	=	440.700 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	150.30 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(211.500 x 98) + (229.300 x 63)] / 440.700



Hydrograph Report

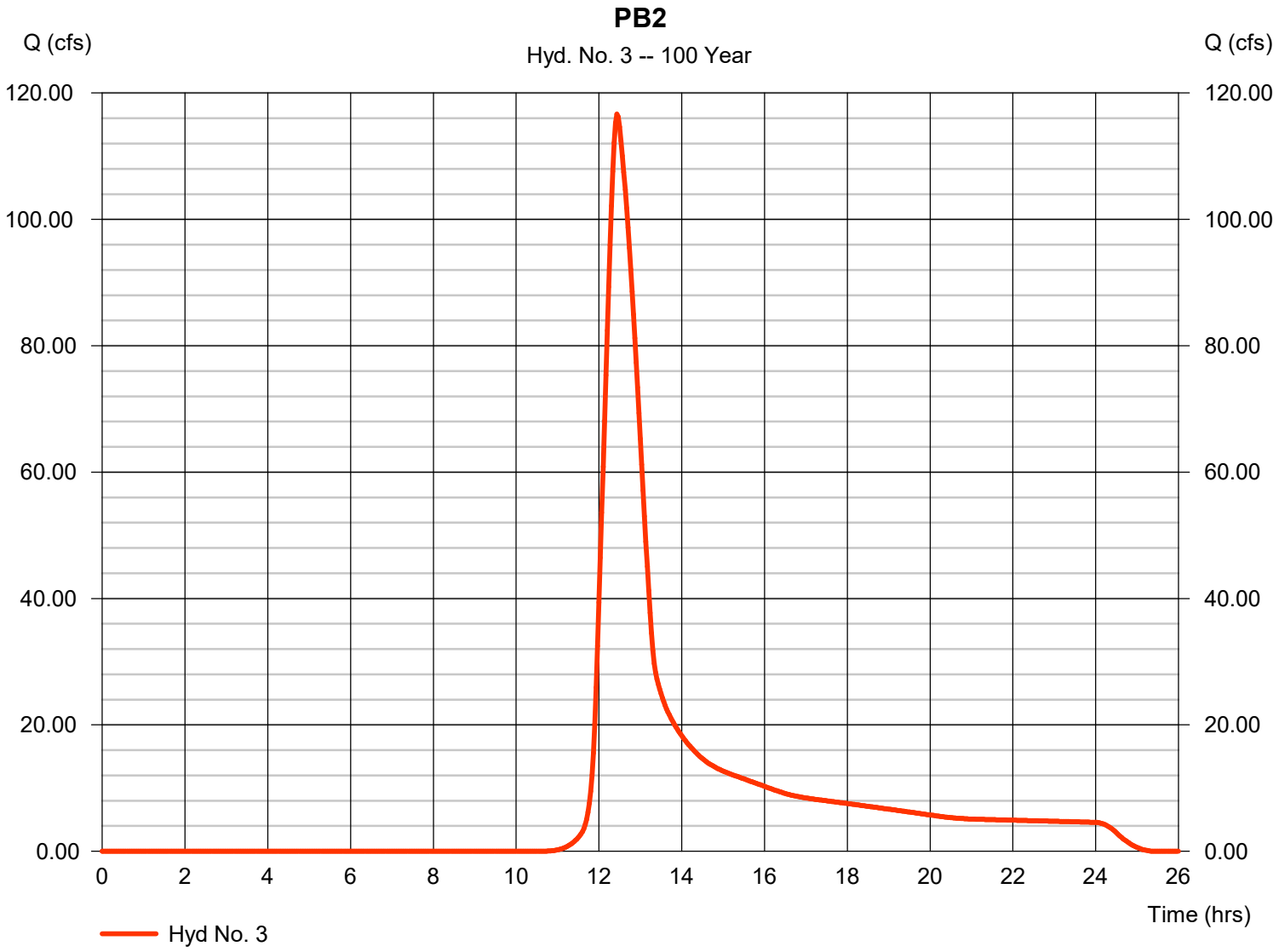
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Tuesday, 01 / 25 / 2022

Hyd. No. 3

PB2

Hydrograph type	=	SCS Runoff	Peak discharge	=	116.66 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.43 hrs
Time interval	=	2 min	Hyd. volume	=	743,217 cuft
Drainage area	=	255.300 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	51.20 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(162.900 x 98) + (92.400 x 63)] / 255.300



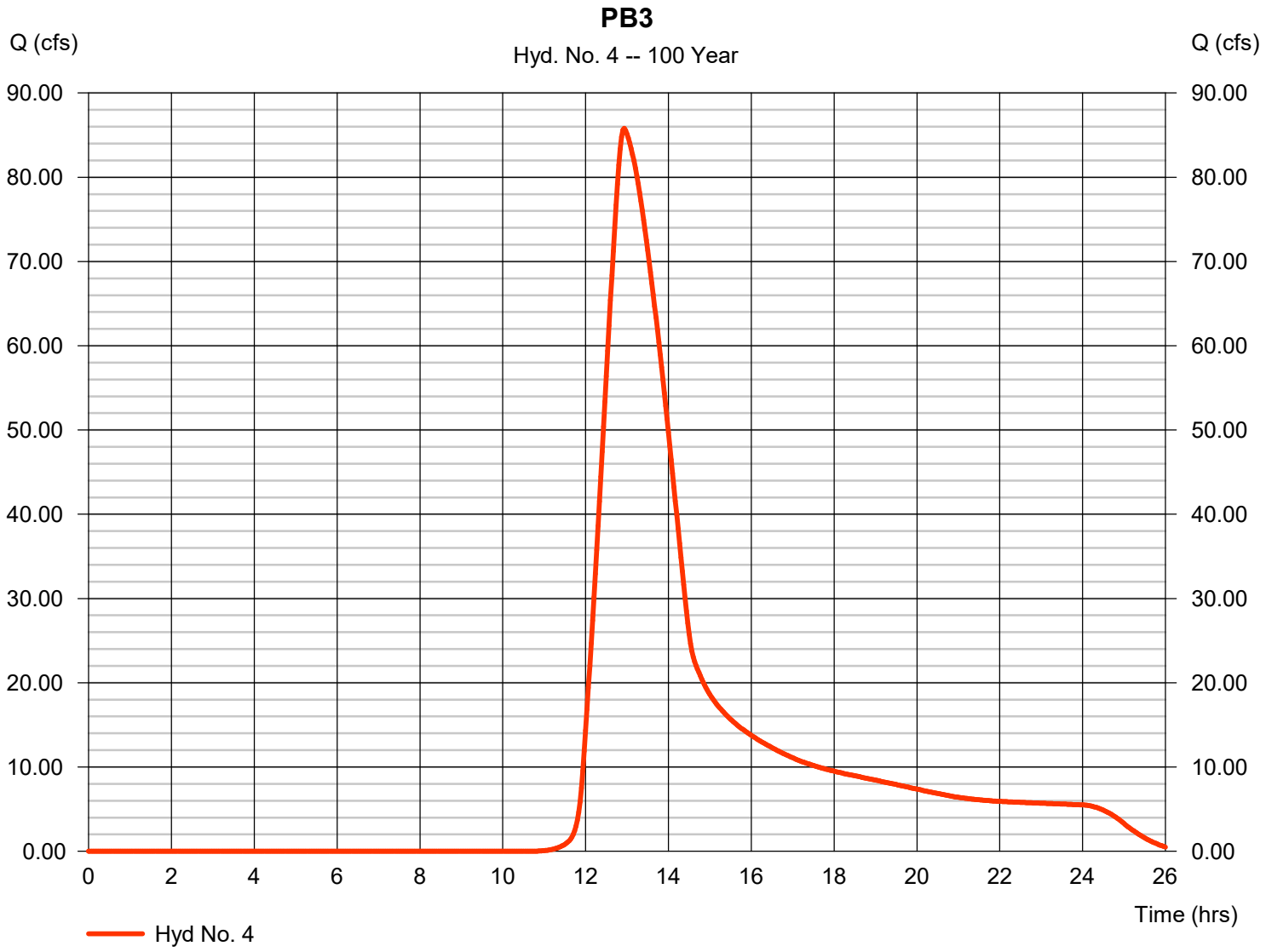
Hydrograph Report

Hyd. No. 4

PB3

Hydrograph type	=	SCS Runoff	Peak discharge	=	85.80 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.93 hrs
Time interval	=	2 min	Hyd. volume	=	875,241 cuft
Drainage area	=	303.000 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	99.90 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(136.200 x 98) + (166.800 x 63)] / 303.000



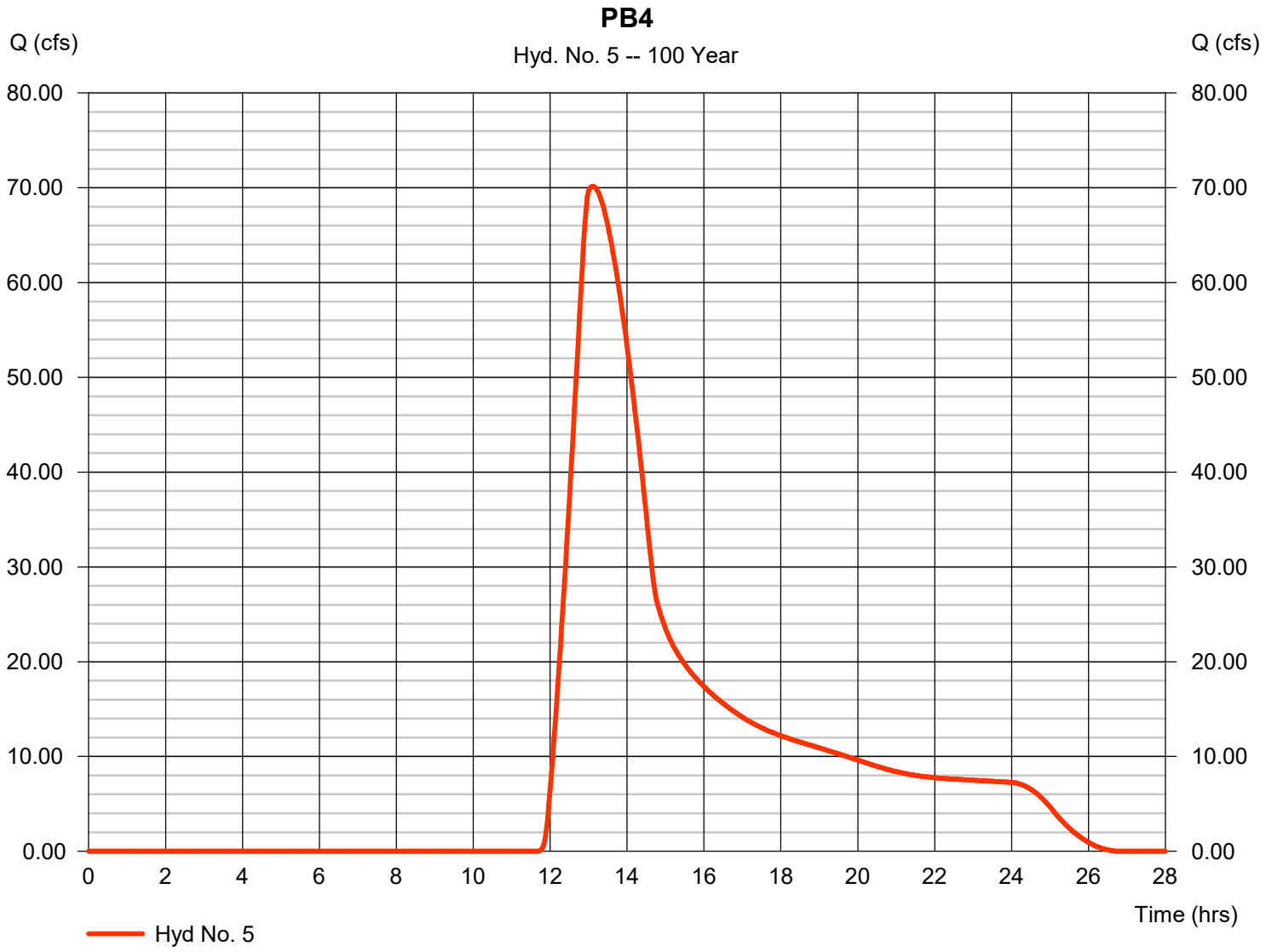
Hydrograph Report

Hyd. No. 5

PB4

Hydrograph type	=	SCS Runoff	Peak discharge	=	70.15 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.10 hrs
Time interval	=	2 min	Hyd. volume	=	903,601 cuft
Drainage area	=	545.800 ac	Curve number	=	73*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	108.30 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(93.800 x 98) + (131.300 x 63) + (173.700 x 55) + (147.000 x 81)] / 545.800

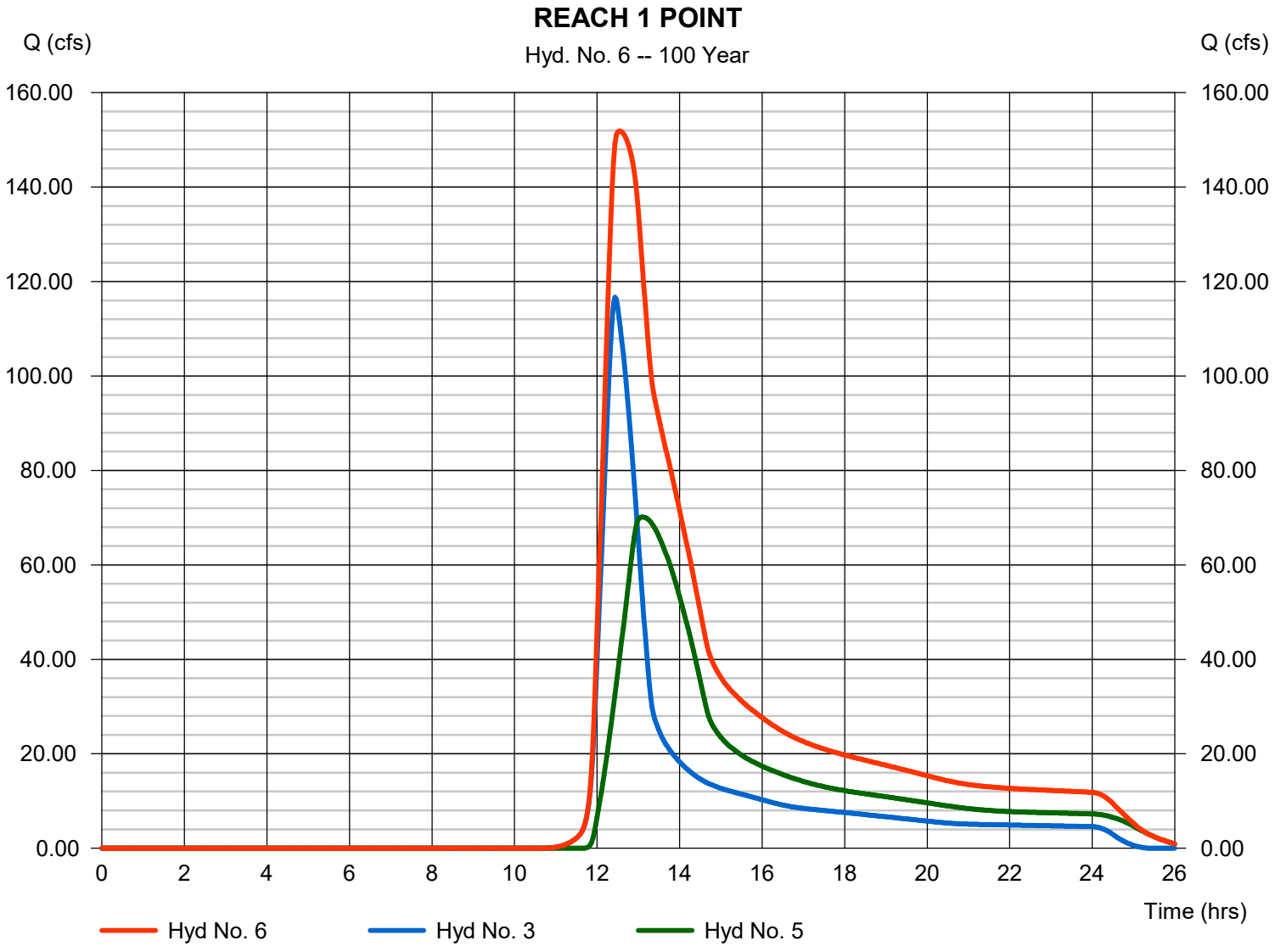


Hydrograph Report

Hyd. No. 6

REACH 1 POINT

Hydrograph type	= Combine	Peak discharge	= 151.86 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.53 hrs
Time interval	= 2 min	Hyd. volume	= 1,646,817 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 801.100 ac



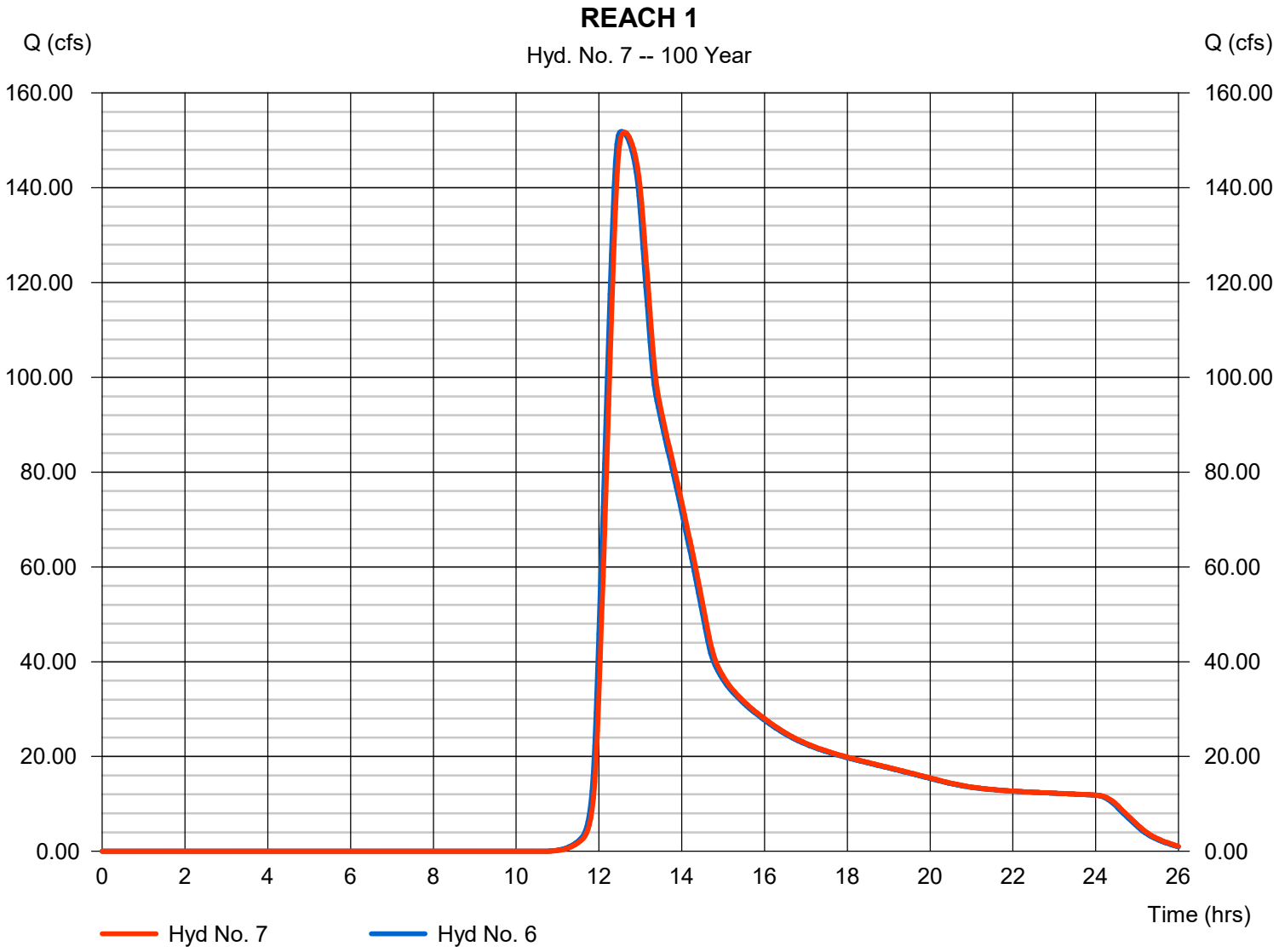
Hydrograph Report

Hyd. No. 7

REACH 1

Hydrograph type	=	Reach	Peak discharge	=	151.69 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.63 hrs
Time interval	=	2 min	Hyd. volume	=	1,646,817 cuft
Inflow hyd. No.	=	6 - REACH 1 POINT	Section type	=	Circular
Reach length	=	1318.0 ft	Channel slope	=	0.4 %
Manning's n	=	0.013	Bottom width	=	5.0 ft
Side slope	=	0.0:1	Max. depth	=	0.0 ft
Rating curve x	=	5.115	Rating curve m	=	1.250
Ave. velocity	=	7.73 ft/s	Routing coeff.	=	0.6112

Modified Att-Kin routing method used.



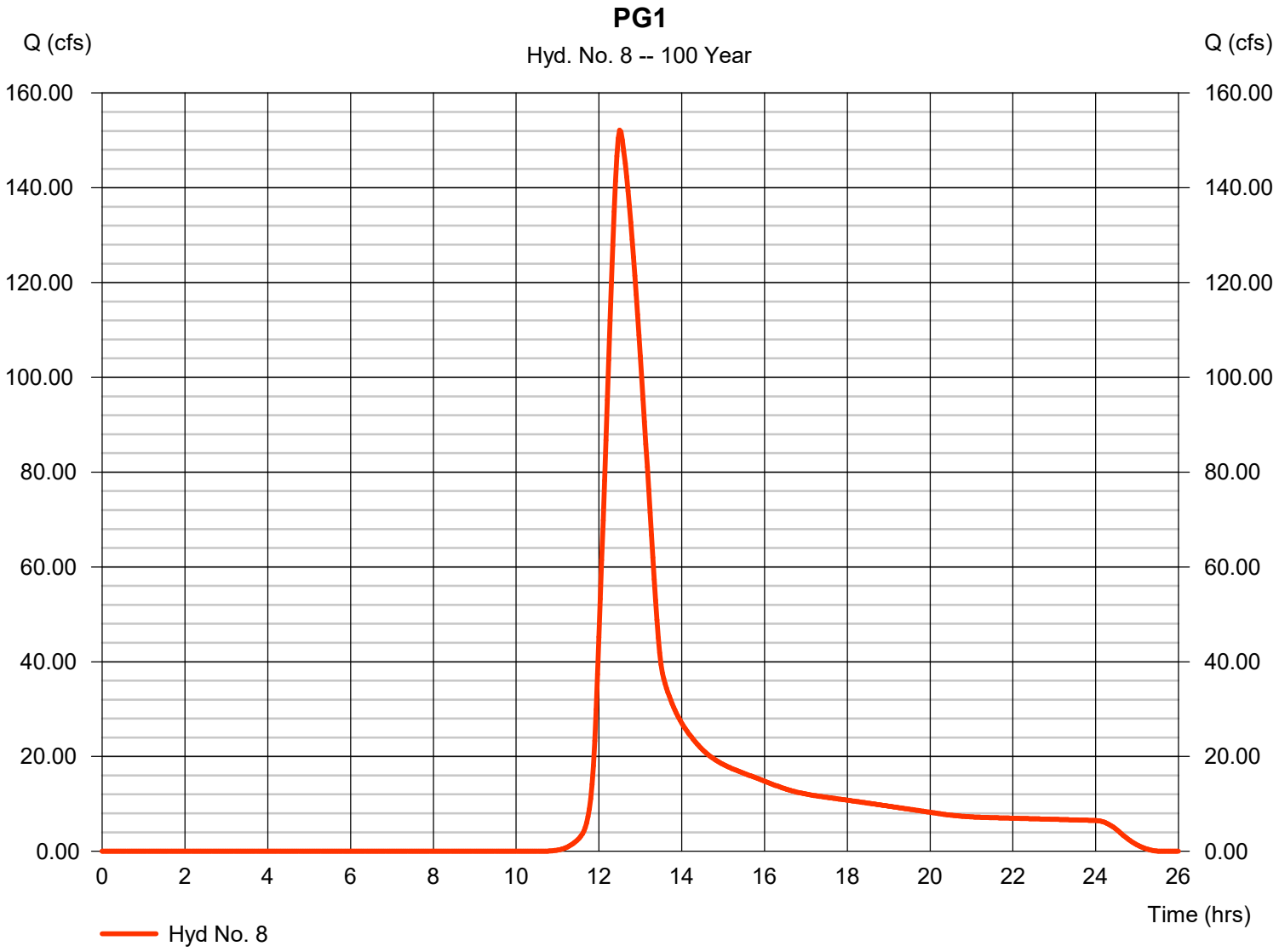
Hydrograph Report

Hyd. No. 8

PG1

Hydrograph type	=	SCS Runoff	Peak discharge	=	152.12 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.50 hrs
Time interval	=	2 min	Hyd. volume	=	1,051,156 cuft
Drainage area	=	363.900 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	59.50 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(132.600 x 98) + (231.300 x 63)] / 363.900



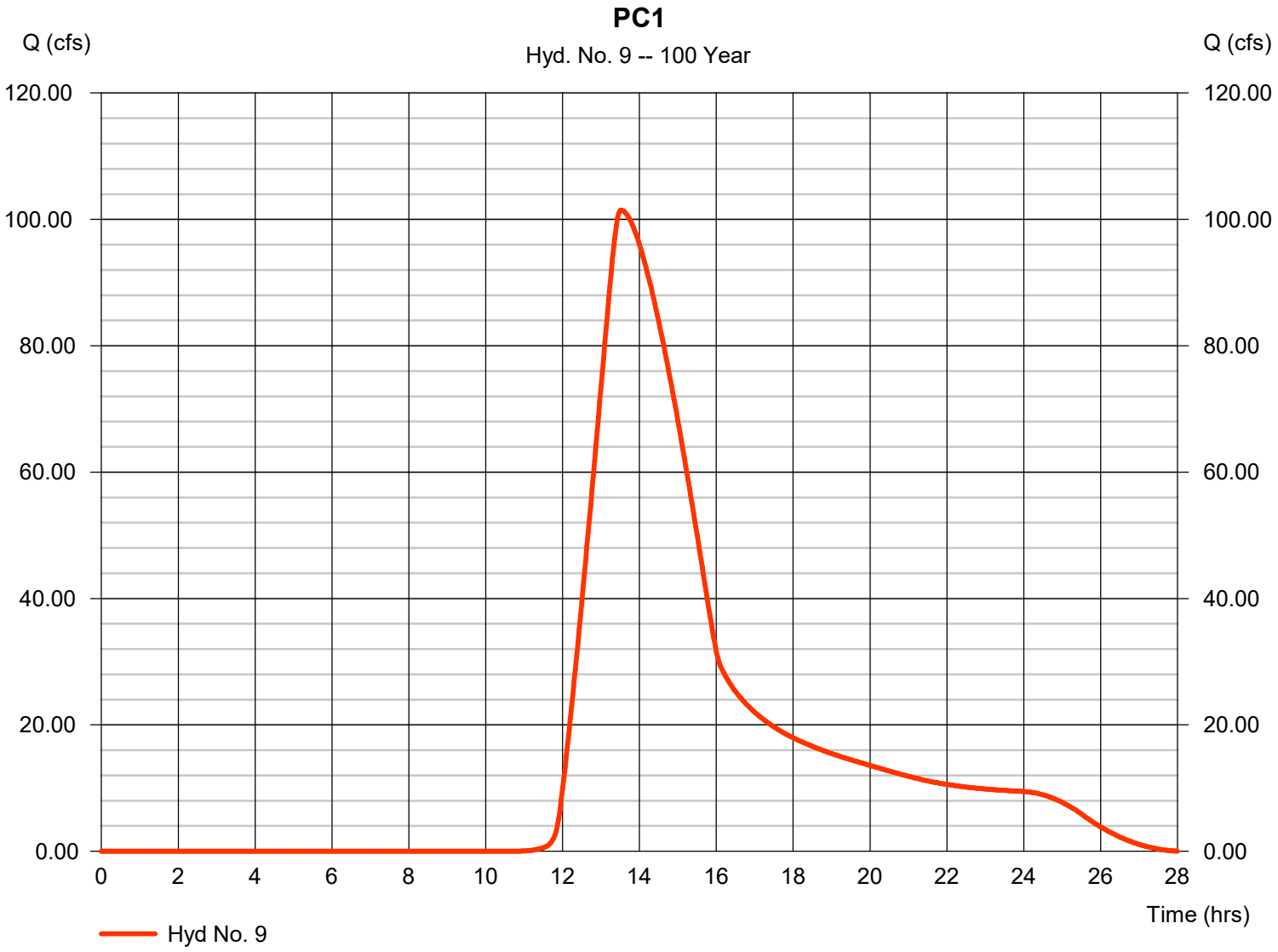
Hydrograph Report

Hyd. No. 9

PC1

Hydrograph type	=	SCS Runoff	Peak discharge	=	101.46 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.53 hrs
Time interval	=	2 min	Hyd. volume	=	1,466,379 cuft
Drainage area	=	509.000 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	156.50 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(423.800 x 98) + (85.200 x 63)] / 509.000



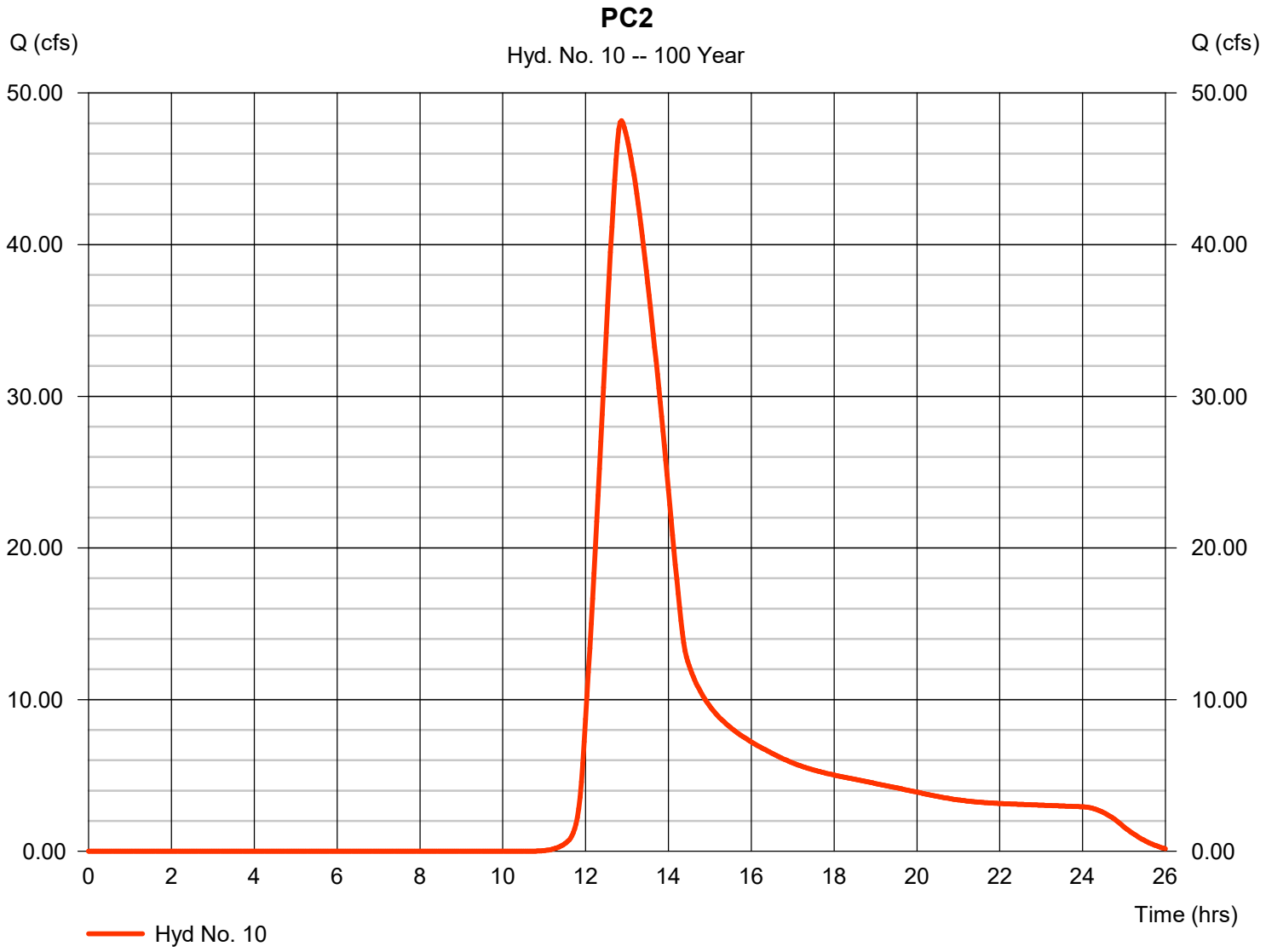
Hydrograph Report

Hyd. No. 10

PC2

Hydrograph type	=	SCS Runoff	Peak discharge	=	48.17 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.87 hrs
Time interval	=	2 min	Hyd. volume	=	467,718 cuft
Drainage area	=	161.200 ac	Curve number	=	81*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	92.10 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(152.700 x 98) + (8.500 x 63)] / 161.200



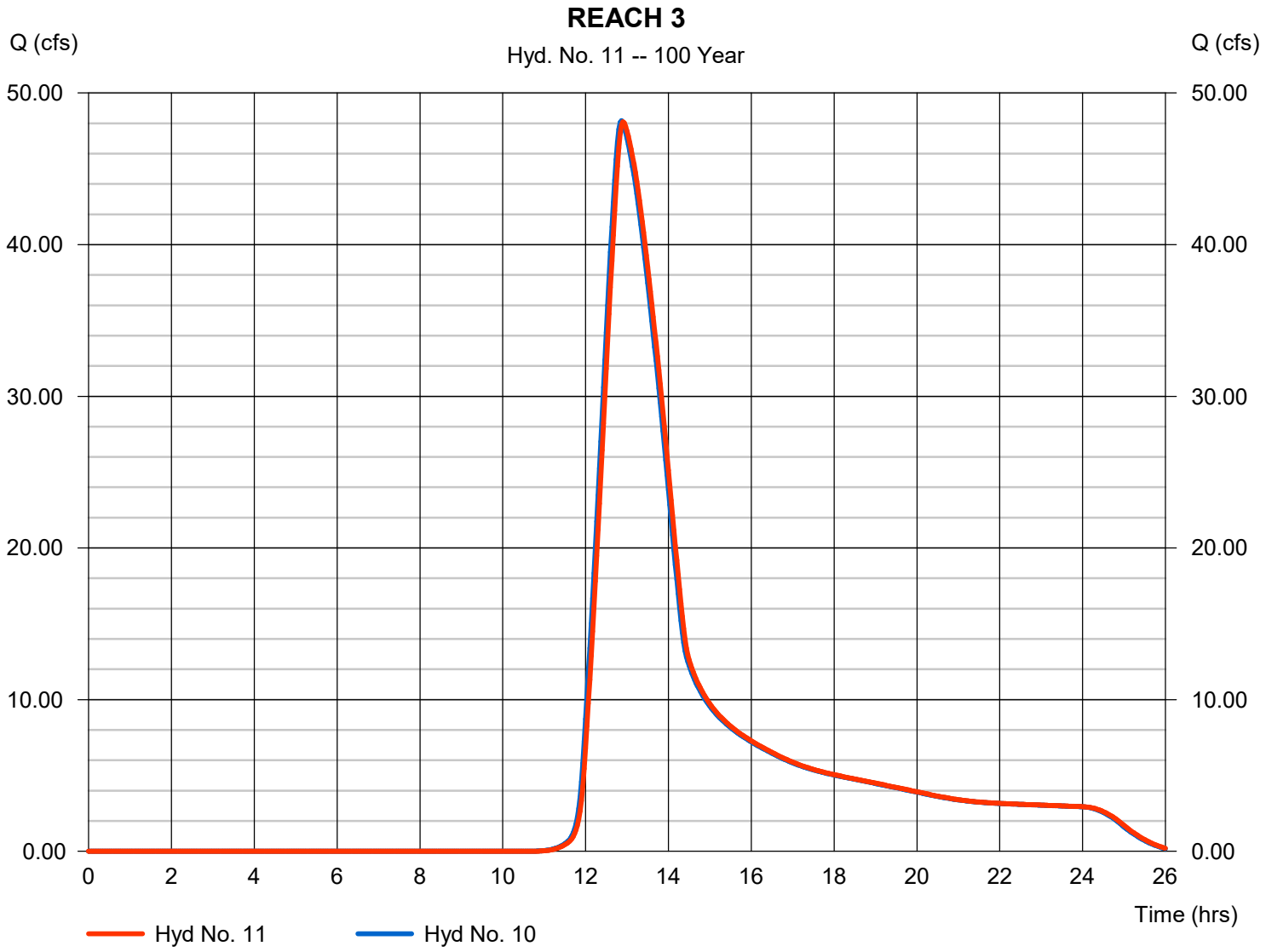
Hydrograph Report

Hyd. No. 11

REACH 3

Hydrograph type	=	Reach	Peak discharge	=	48.10 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.90 hrs
Time interval	=	2 min	Hyd. volume	=	467,717 cuft
Inflow hyd. No.	=	10 - PC2	Section type	=	Circular
Reach length	=	1197.0 ft	Channel slope	=	0.5 %
Manning's n	=	0.013	Bottom width	=	2.5 ft
Side slope	=	0.0:1	Max. depth	=	0.0 ft
Rating curve x	=	5.095	Rating curve m	=	1.250
Ave. velocity	=	9.81 ft/s	Routing coeff.	=	0.7615

Modified Att-Kin routing method used.

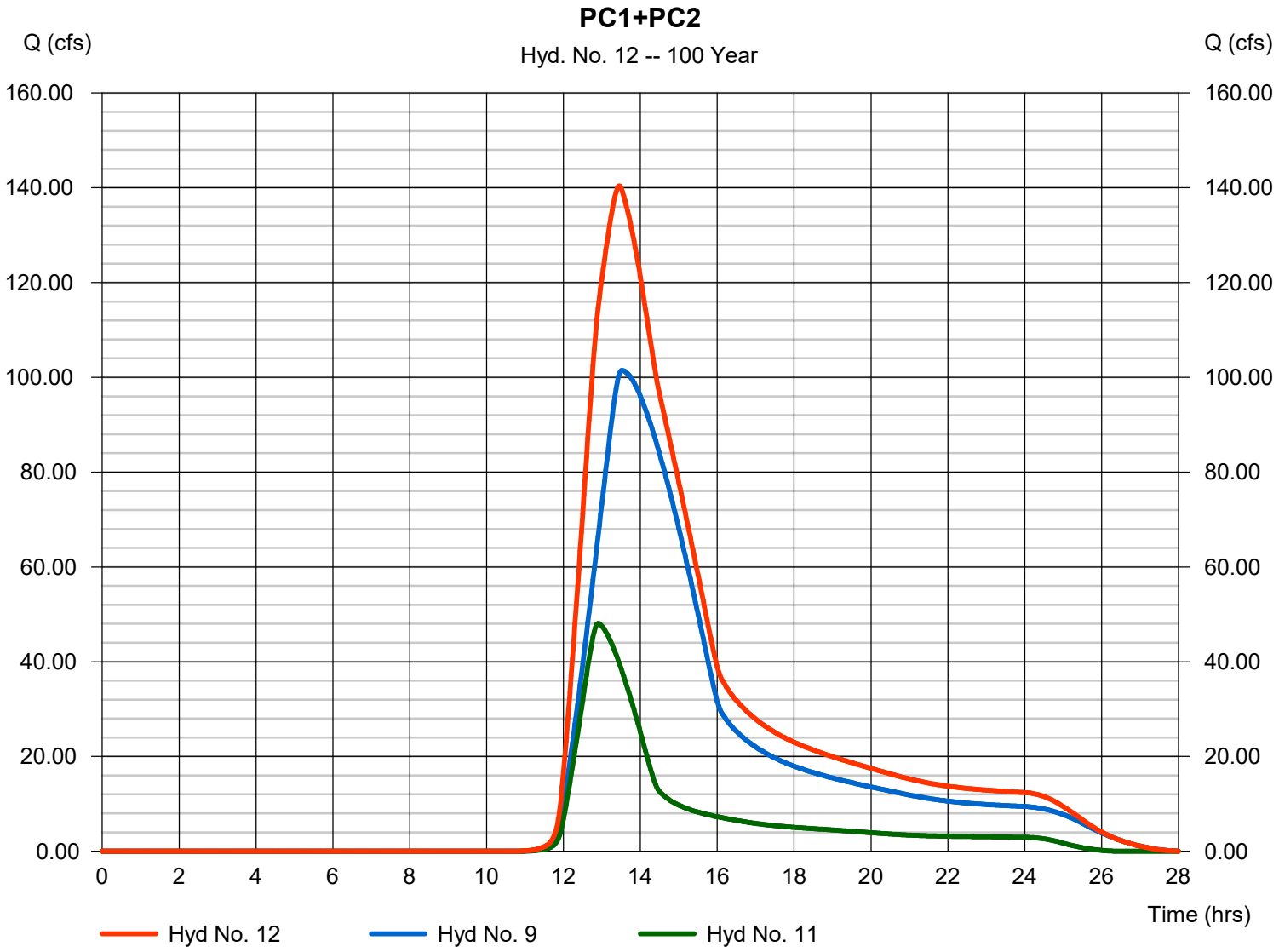


Hydrograph Report

Hyd. No. 12

PC1+PC2

Hydrograph type	=	Combine	Peak discharge	=	140.36 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.47 hrs
Time interval	=	2 min	Hyd. volume	=	1,934,096 cuft
Inflow hyds.	=	9, 11	Contrib. drain. area	=	509.000 ac



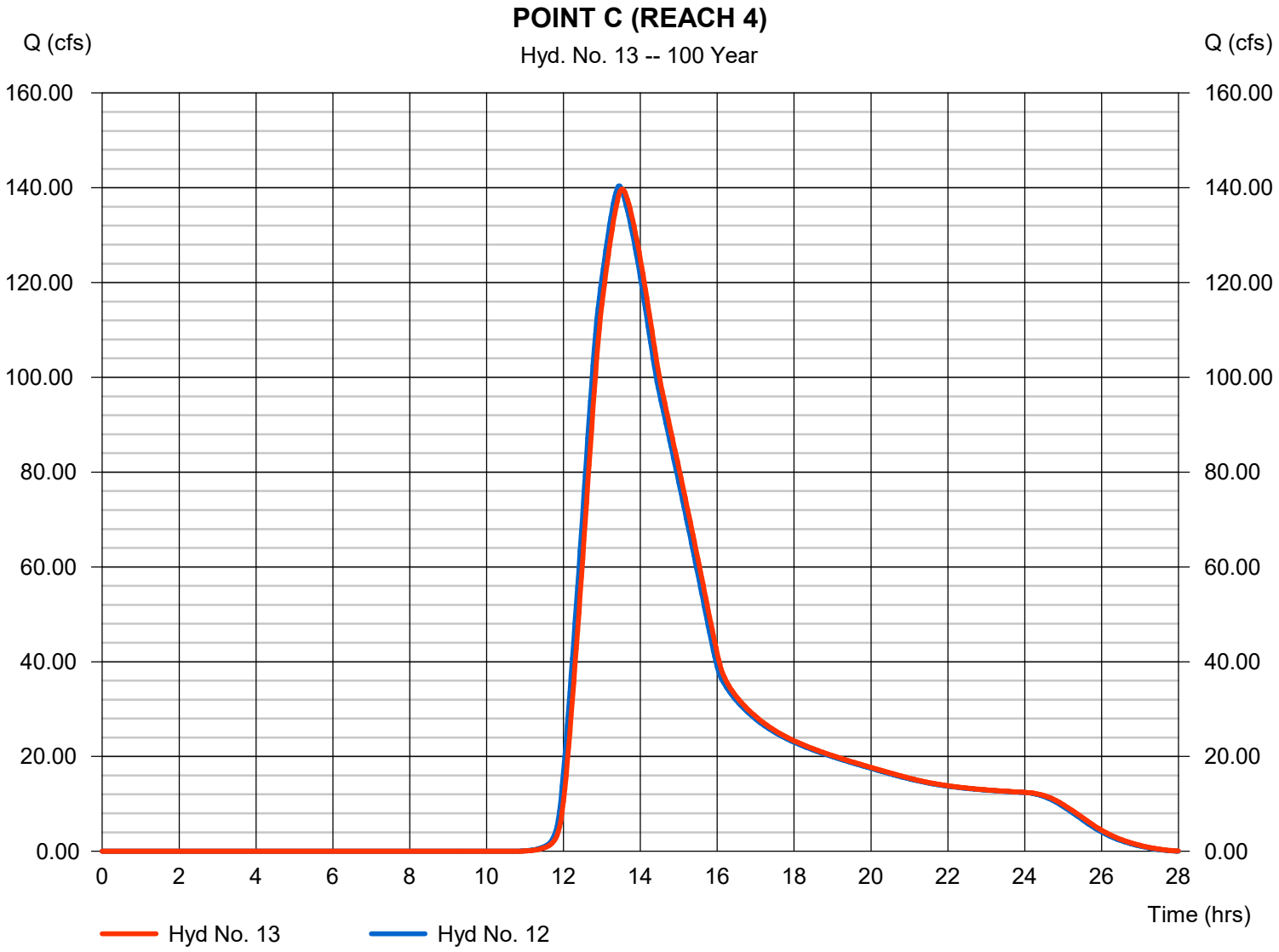
Hydrograph Report

Hyd. No. 13

POINT C (REACH 4)

Hydrograph type	=	Reach	Peak discharge	=	139.76 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.53 hrs
Time interval	=	2 min	Hyd. volume	=	1,934,095 cuft
Inflow hyd. No.	=	12 - PC1+PC2	Section type	=	Trapezoidal
Reach length	=	1010.0 ft	Channel slope	=	0.5 %
Manning's n	=	0.035	Bottom width	=	9.0 ft
Side slope	=	3.0:1	Max. depth	=	3.5 ft
Rating curve x	=	0.695	Rating curve m	=	1.394
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.4106

Modified Att-Kin routing method used.



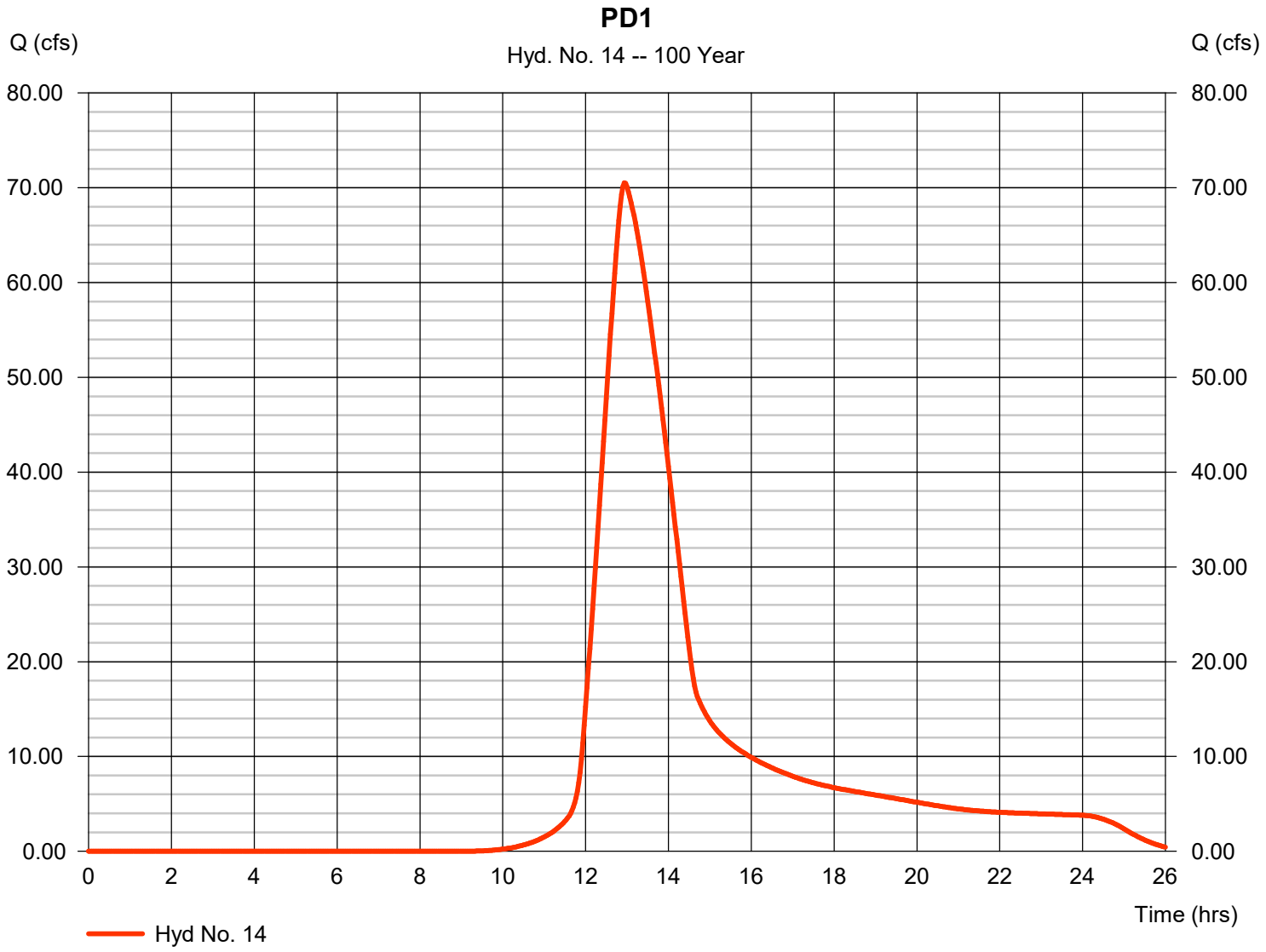
Hydrograph Report

Hyd. No. 14

PD1

Hydrograph type	=	SCS Runoff	Peak discharge	=	70.52 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.93 hrs
Time interval	=	2 min	Hyd. volume	=	698,068 cuft
Drainage area	=	178.300 ac	Curve number	=	86*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	104.50 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(92.300 x 81) + (80.000 x 91) + (5.800 x 93)] / 178.300



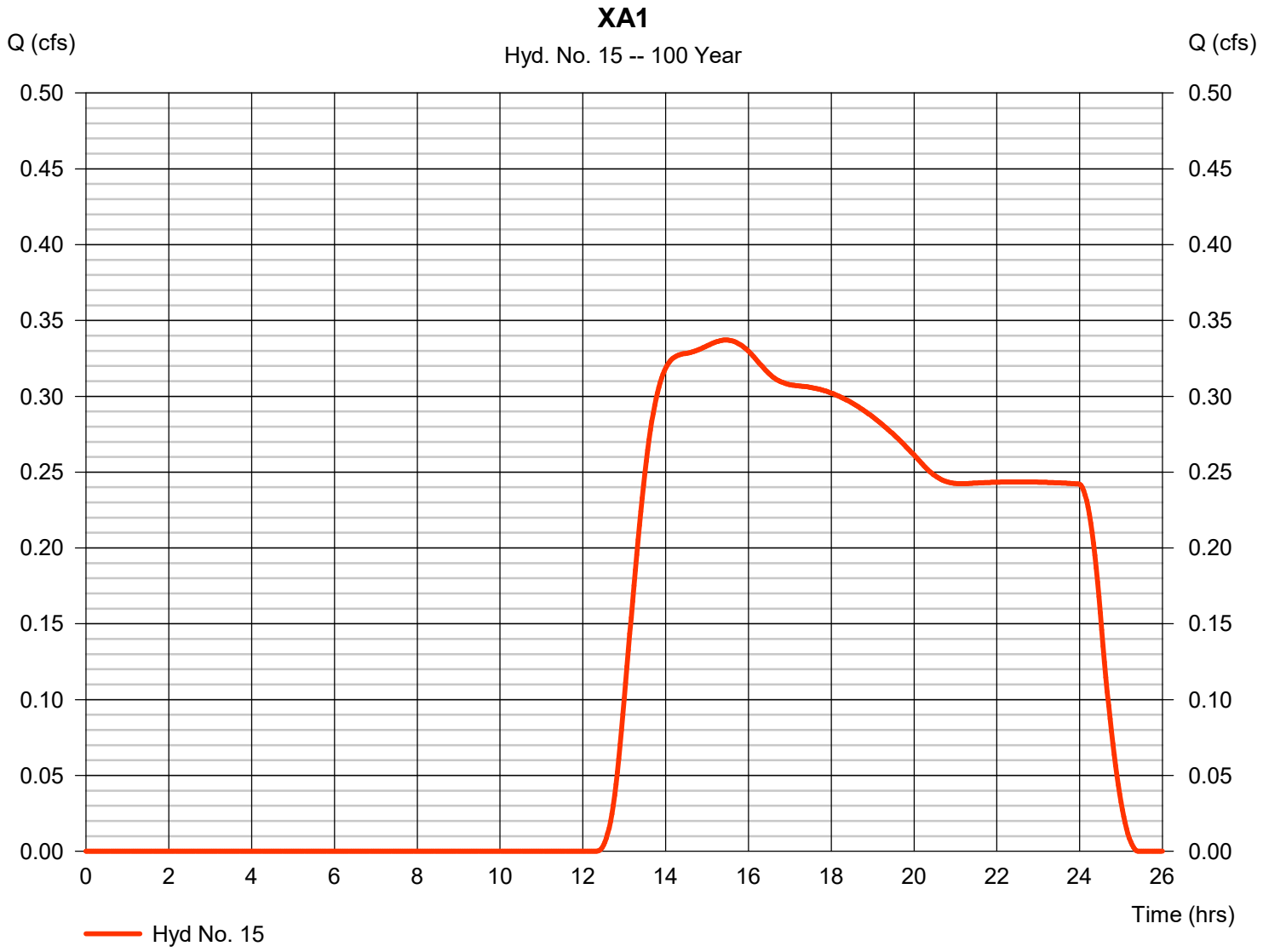
Hydrograph Report

Hyd. No. 15

XA1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.337 cfs
Storm frequency	=	100 yrs	Time to peak	=	15.47 hrs
Time interval	=	2 min	Hyd. volume	=	11,675 cuft
Drainage area	=	66.000 ac	Curve number	=	55*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	52.60 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(66.000 x 55)] / 66.000



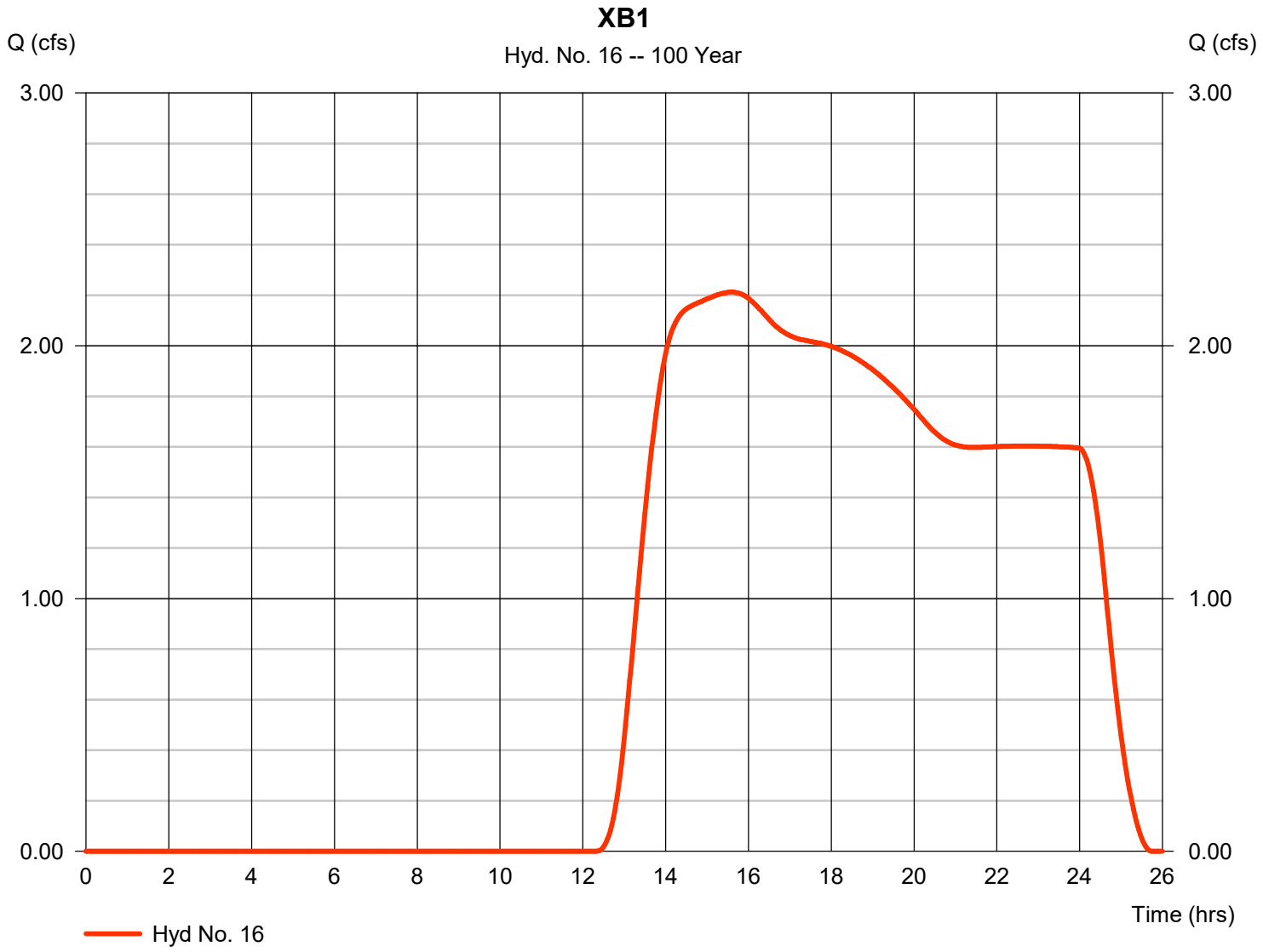
Hydrograph Report

Hyd. No. 16

XB1

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.212 cfs
Storm frequency	=	100 yrs	Time to peak	=	15.60 hrs
Time interval	=	2 min	Hyd. volume	=	76,870 cuft
Drainage area	=	440.700 ac	Curve number	=	55*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	64.80 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(440.700 x 55)] / 440.700



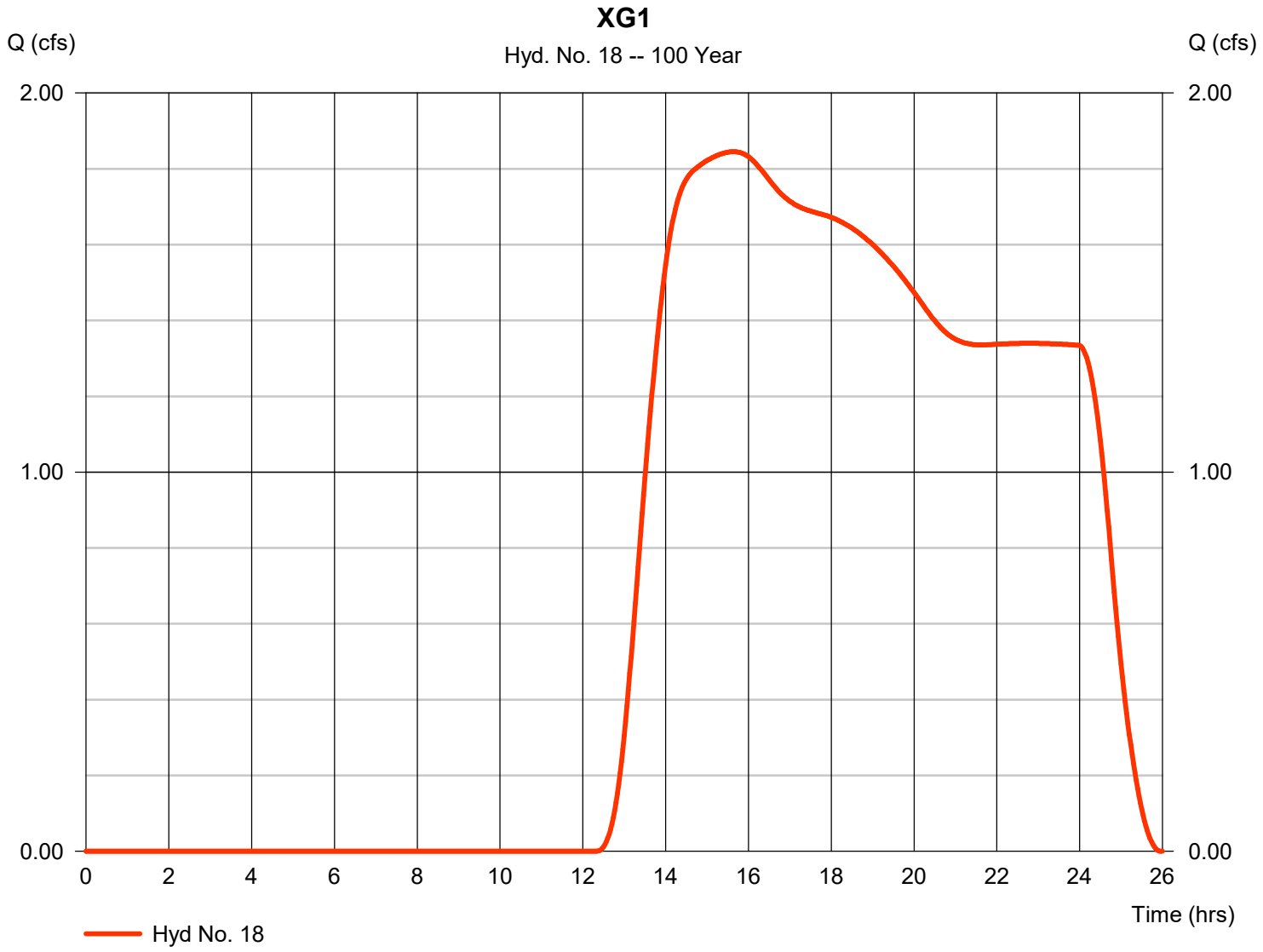
Hydrograph Report

Hyd. No. 18

XG1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.845 cfs
Storm frequency	=	100 yrs	Time to peak	=	15.63 hrs
Time interval	=	2 min	Hyd. volume	=	64,236 cuft
Drainage area	=	363.900 ac	Curve number	=	55*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	71.10 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(4.600 x 81) + (1.100 x 81) + (358.200 x 55)] / 363.900



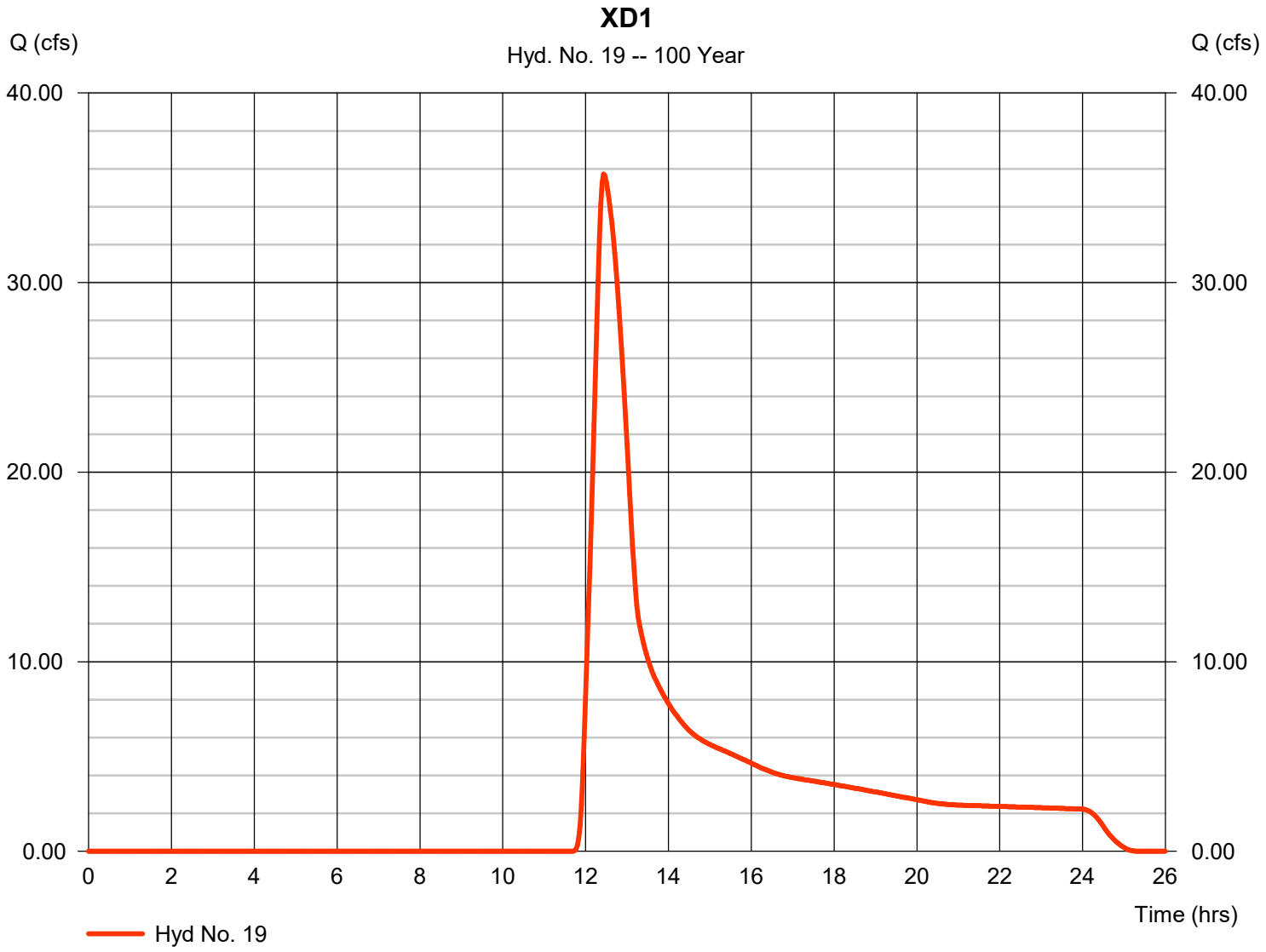
Hydrograph Report

Hyd. No. 19

XD1

Hydrograph type	=	SCS Runoff	Peak discharge	=	35.72 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.43 hrs
Time interval	=	2 min	Hyd. volume	=	273,562 cuft
Drainage area	=	178.000 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	50.10 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(24.800 x 81) + (6.200 x 81) + (62.000 x 55) + (80.000 x 81) + (5.000 x 86)] / 178.000



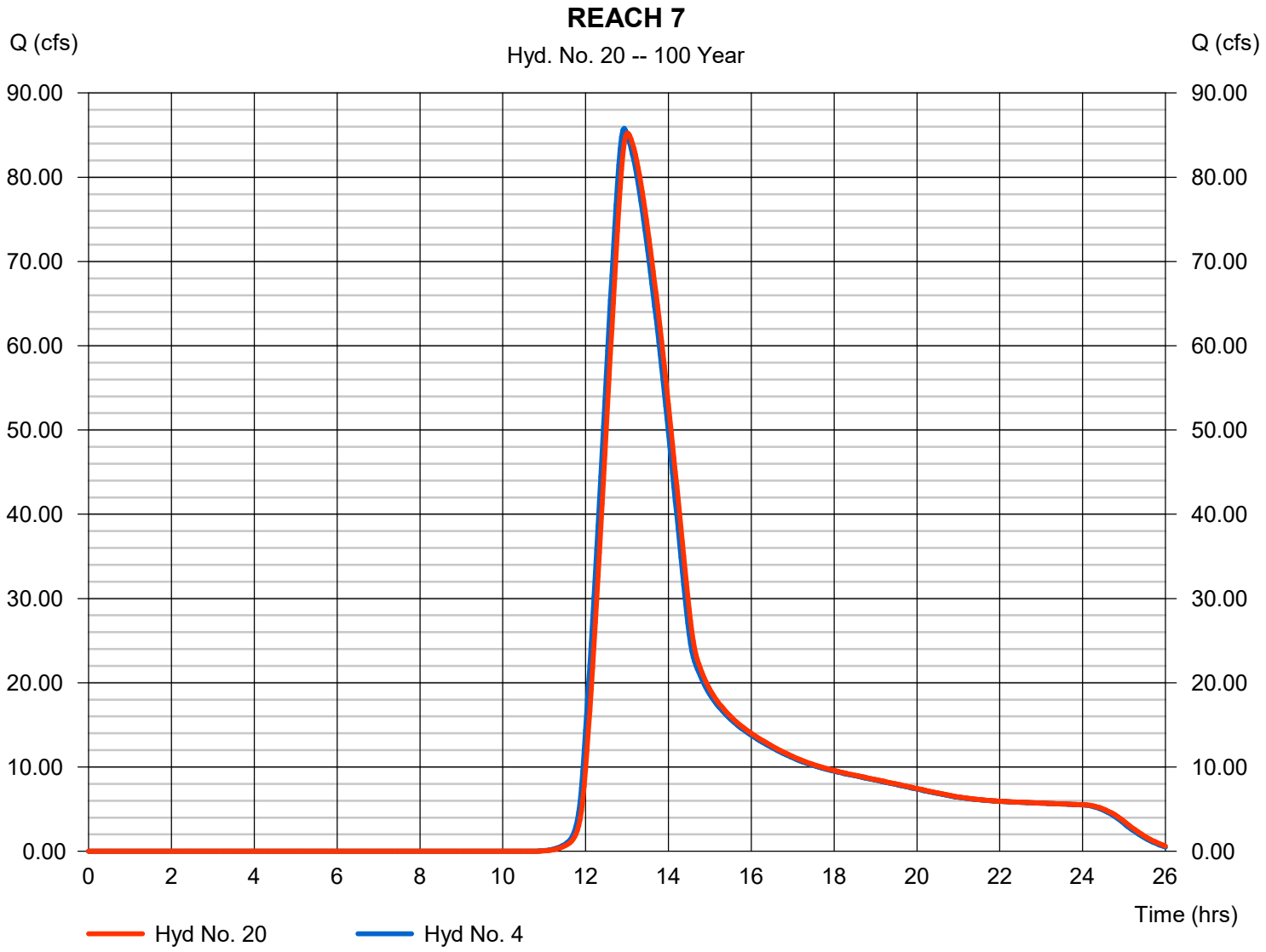
Hydrograph Report

Hyd. No. 20

REACH 7

Hydrograph type	= Reach	Peak discharge	= 85.22 cfs
Storm frequency	= 100 yrs	Time to peak	= 13.00 hrs
Time interval	= 2 min	Hyd. volume	= 875,239 cuft
Inflow hyd. No.	= 4 - PB3	Section type	= Circular
Reach length	= 2153.0 ft	Channel slope	= 0.4 %
Manning's n	= 0.013	Bottom width	= 3.5 ft
Side slope	= 0.0:1	Max. depth	= 0.0 ft
Rating curve x	= 4.820	Rating curve m	= 1.250
Ave. velocity	= 8.92 ft/s	Routing coeff.	= 0.4740

Modified Att-Kin routing method used.

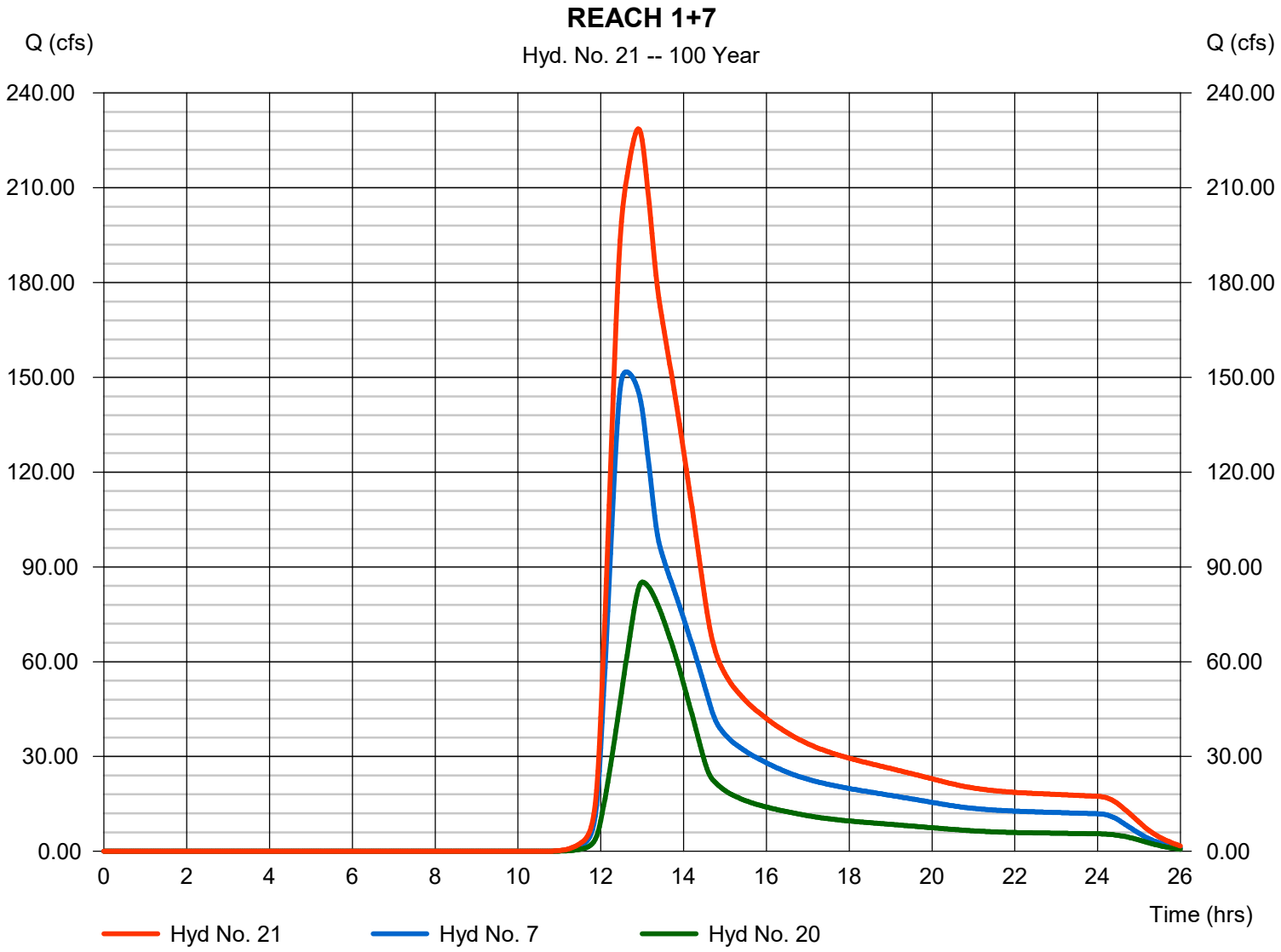


Hydrograph Report

Hyd. No. 21

REACH 1+7

Hydrograph type	= Combine	Peak discharge	= 228.63 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.90 hrs
Time interval	= 2 min	Hyd. volume	= 2,522,055 cuft
Inflow hyds.	= 7, 20	Contrib. drain. area	= 0.000 ac



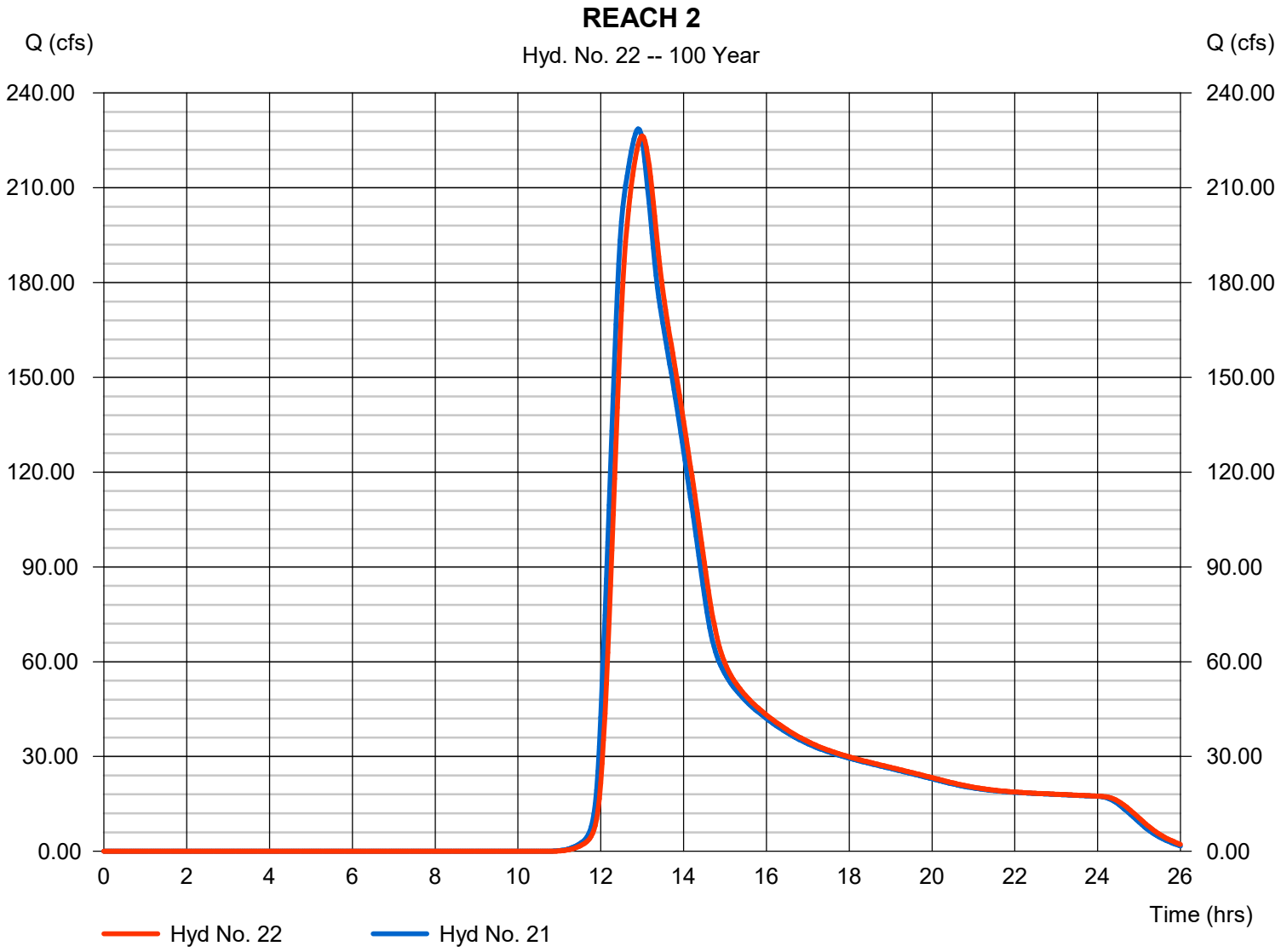
Hydrograph Report

Hyd. No. 22

REACH 2

Hydrograph type	=	Reach	Peak discharge	=	226.42 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.00 hrs
Time interval	=	2 min	Hyd. volume	=	2,522,053 cuft
Inflow hyd. No.	=	21 - REACH 1+7	Section type	=	Trapezoidal
Reach length	=	2187.0 ft	Channel slope	=	1.0 %
Manning's n	=	0.035	Bottom width	=	9.0 ft
Side slope	=	3.0:1	Max. depth	=	3.5 ft
Rating curve x	=	0.983	Rating curve m	=	1.394
Ave. velocity	=	4.59 ft/s	Routing coeff.	=	0.2987

Modified Att-Kin routing method used.

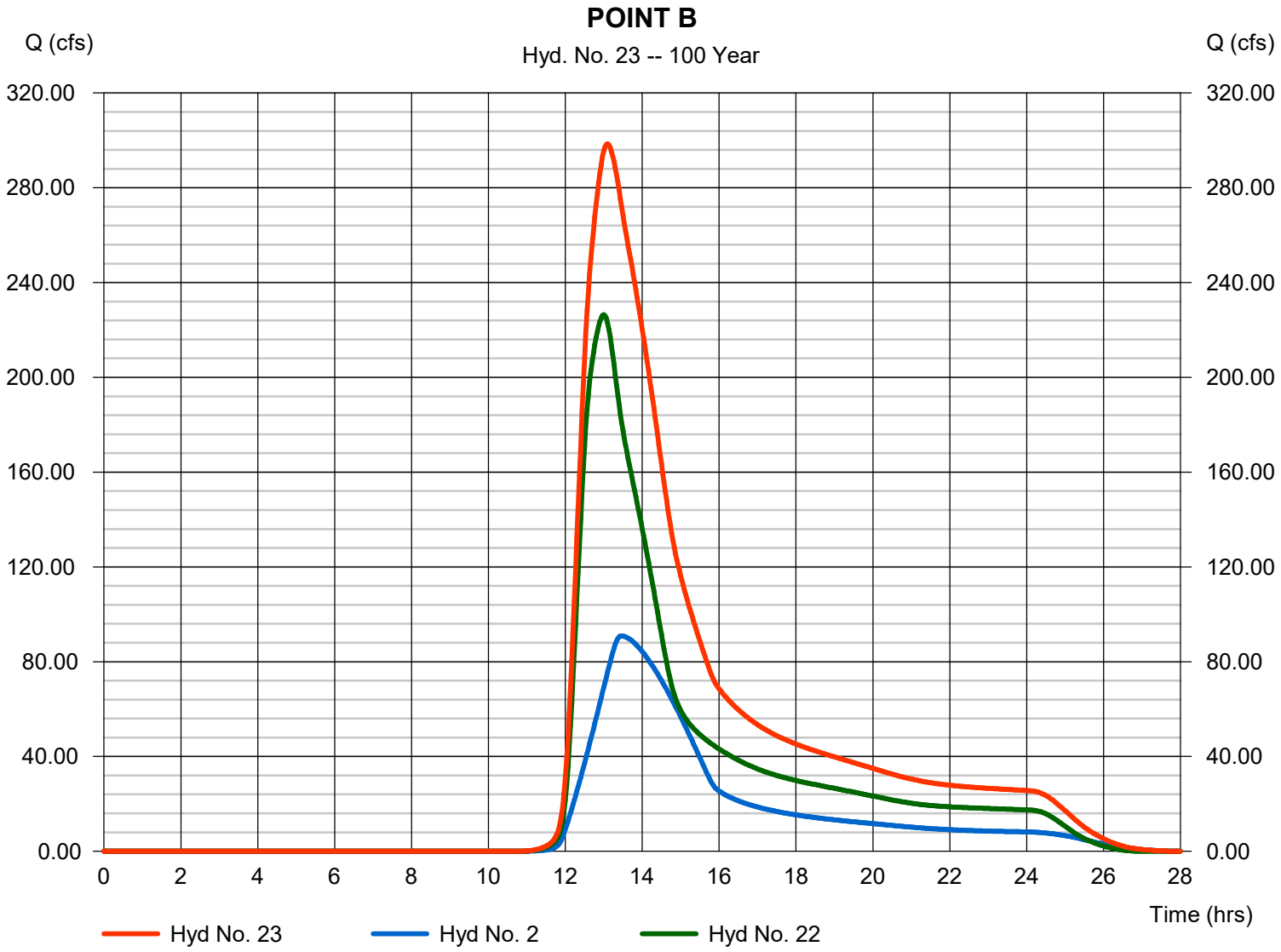


Hydrograph Report

Hyd. No. 23

POINT B

Hydrograph type	= Combine	Peak discharge	= 298.54 cfs
Storm frequency	= 100 yrs	Time to peak	= 13.10 hrs
Time interval	= 2 min	Hyd. volume	= 3,795,051 cuft
Inflow hyds.	= 2, 22	Contrib. drain. area	= 440.700 ac



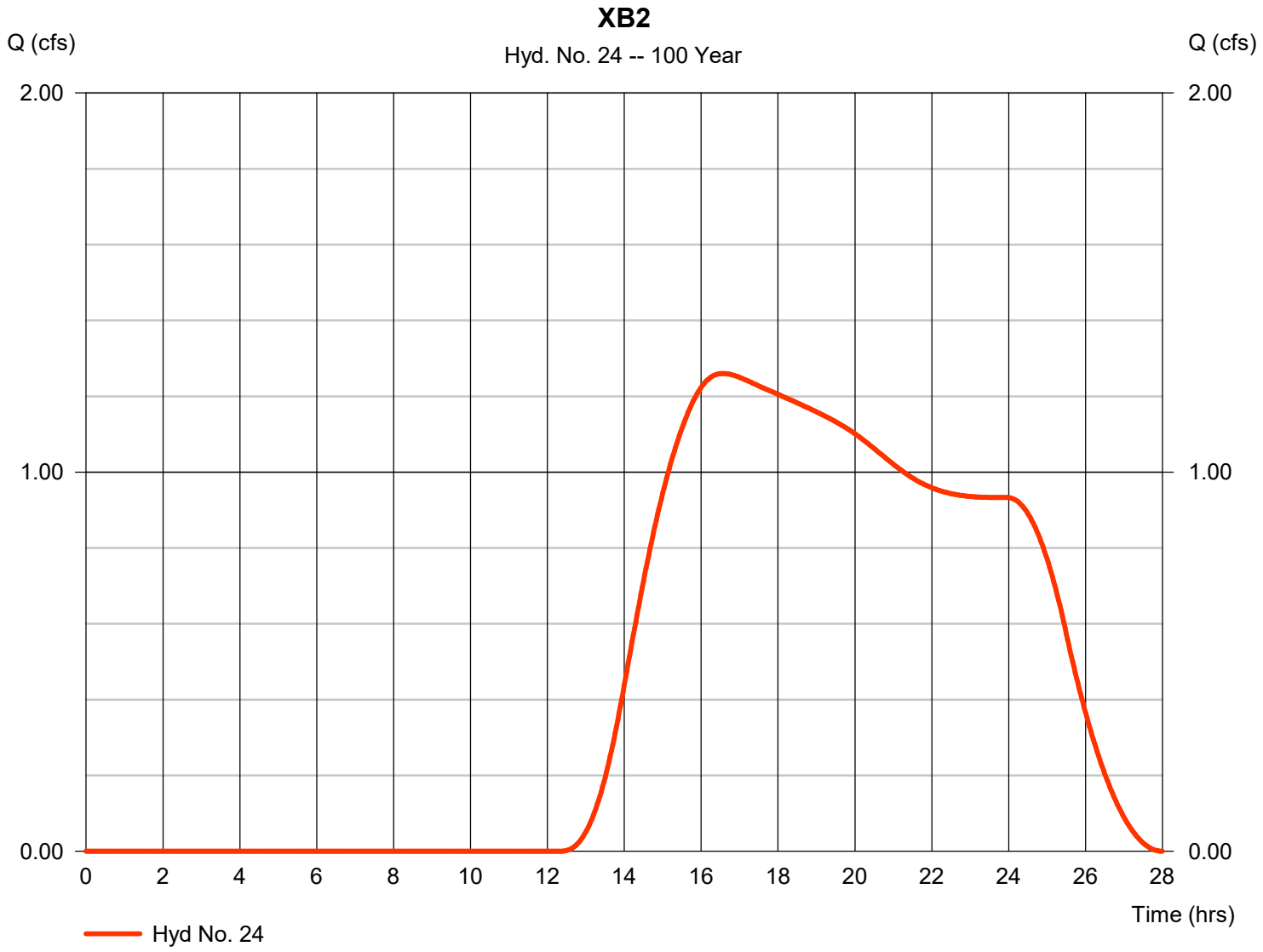
Hydrograph Report

Hyd. No. 24

XB2

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.260 cfs
Storm frequency	=	100 yrs	Time to peak	=	16.57 hrs
Time interval	=	2 min	Hyd. volume	=	44,794 cuft
Drainage area	=	255.200 ac	Curve number	=	55*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	150.60 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(255.200 x 55)] / 255.200



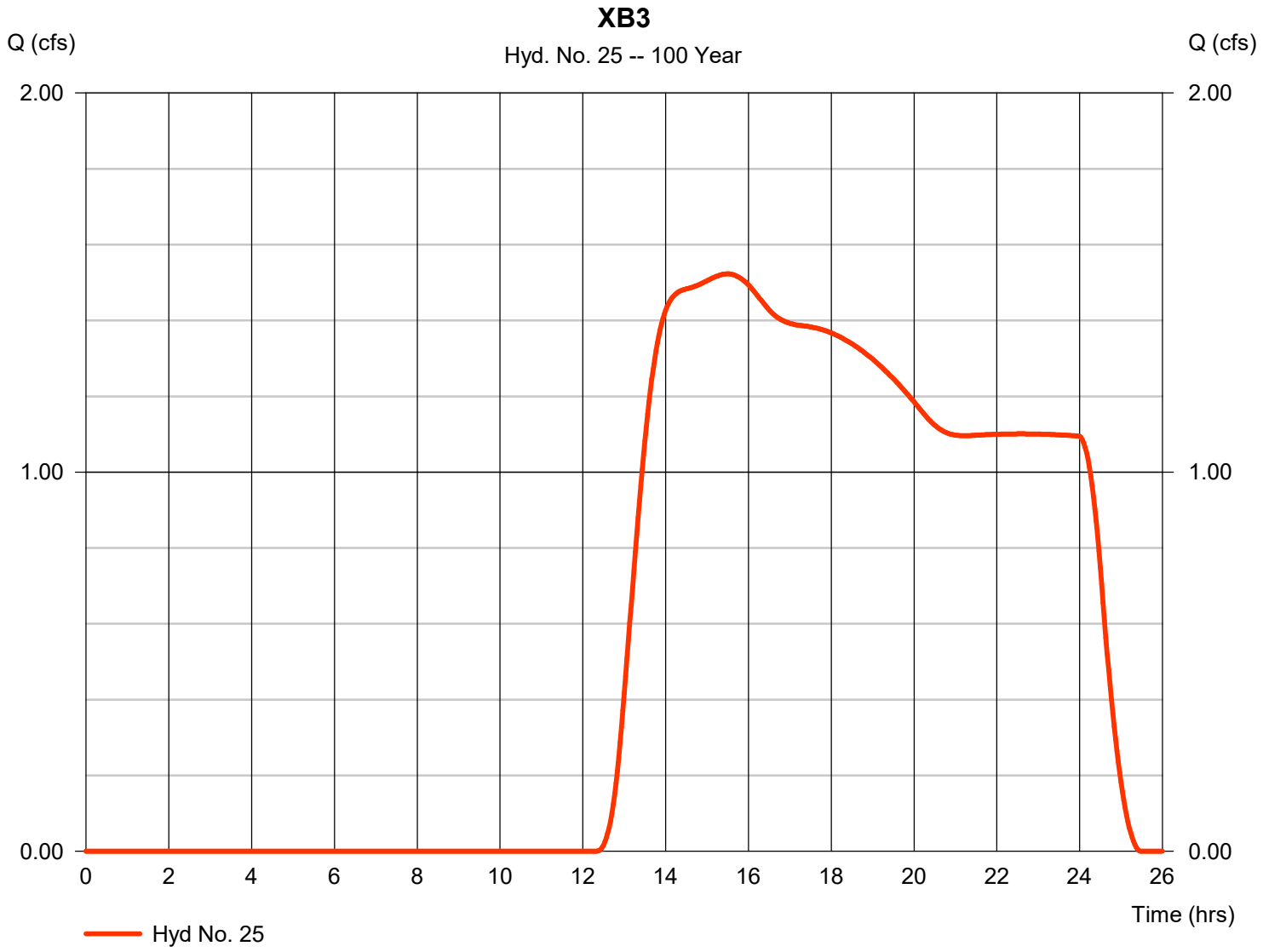
Hydrograph Report

Hyd. No. 25

XB3

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.523 cfs
Storm frequency	=	100 yrs	Time to peak	=	15.50 hrs
Time interval	=	2 min	Hyd. volume	=	52,775 cuft
Drainage area	=	302.900 ac	Curve number	=	55*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	56.10 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(302.900 x 55)] / 302.900



Hydrograph Report

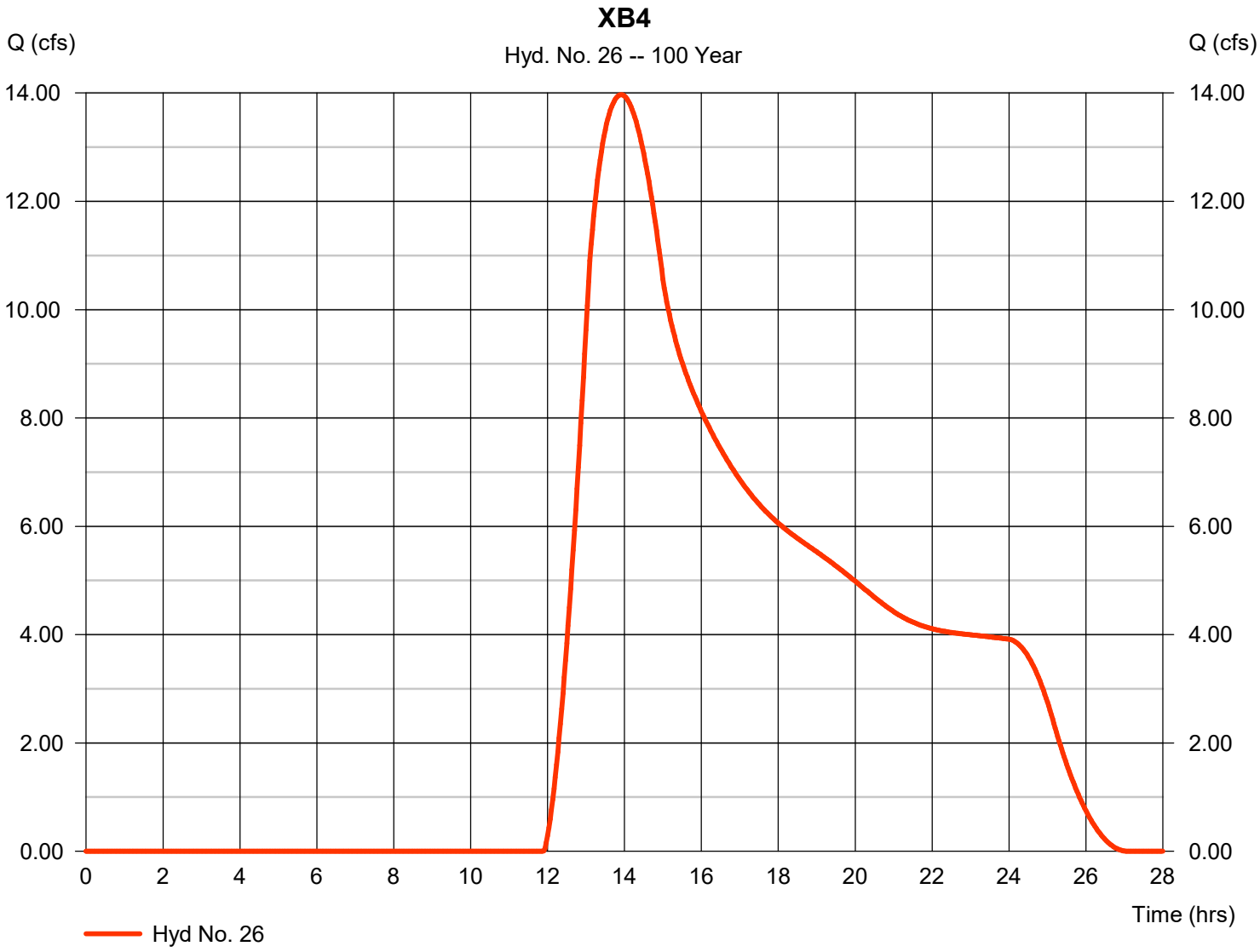
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Tuesday, 01 / 25 / 2022

Hyd. No. 26

XB4

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.97 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.90 hrs
Time interval	=	2 min	Hyd. volume	=	310,158 cuft
Drainage area	=	545.900 ac	Curve number	=	62*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	117.20 min
Total precip.	=	2.29 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(224.200 x 55) + (173.700 x 55) + (147.000 x 81) + (0.800 x 81) + (0.200 x 81)] / 545.900

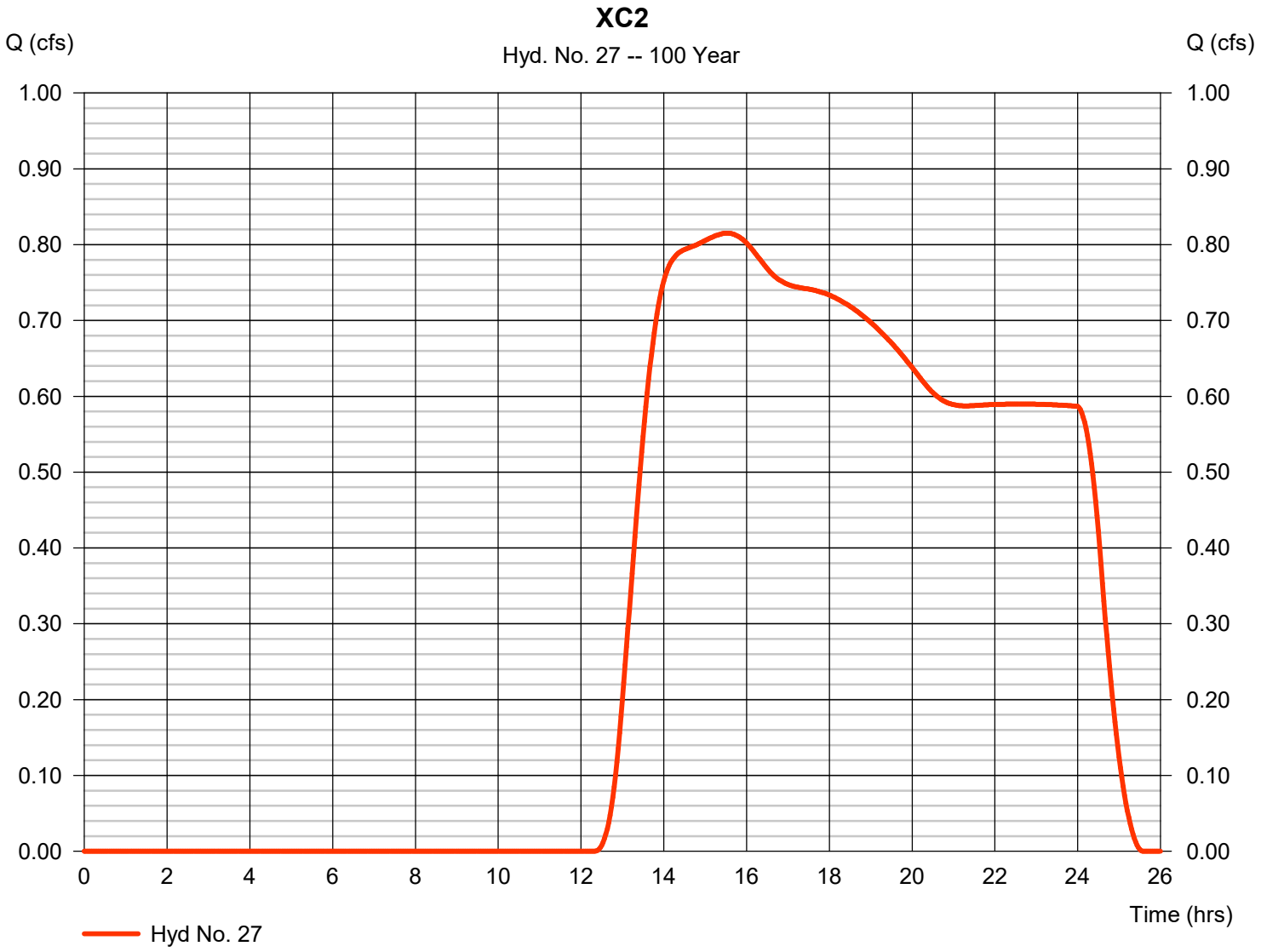


Hydrograph Report

Hyd. No. 27

XC2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.815 cfs
Storm frequency	= 100 yrs	Time to peak	= 15.53 hrs
Time interval	= 2 min	Hyd. volume	= 28,277 cuft
Drainage area	= 161.100 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 57.80 min
Total precip.	= 2.29 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

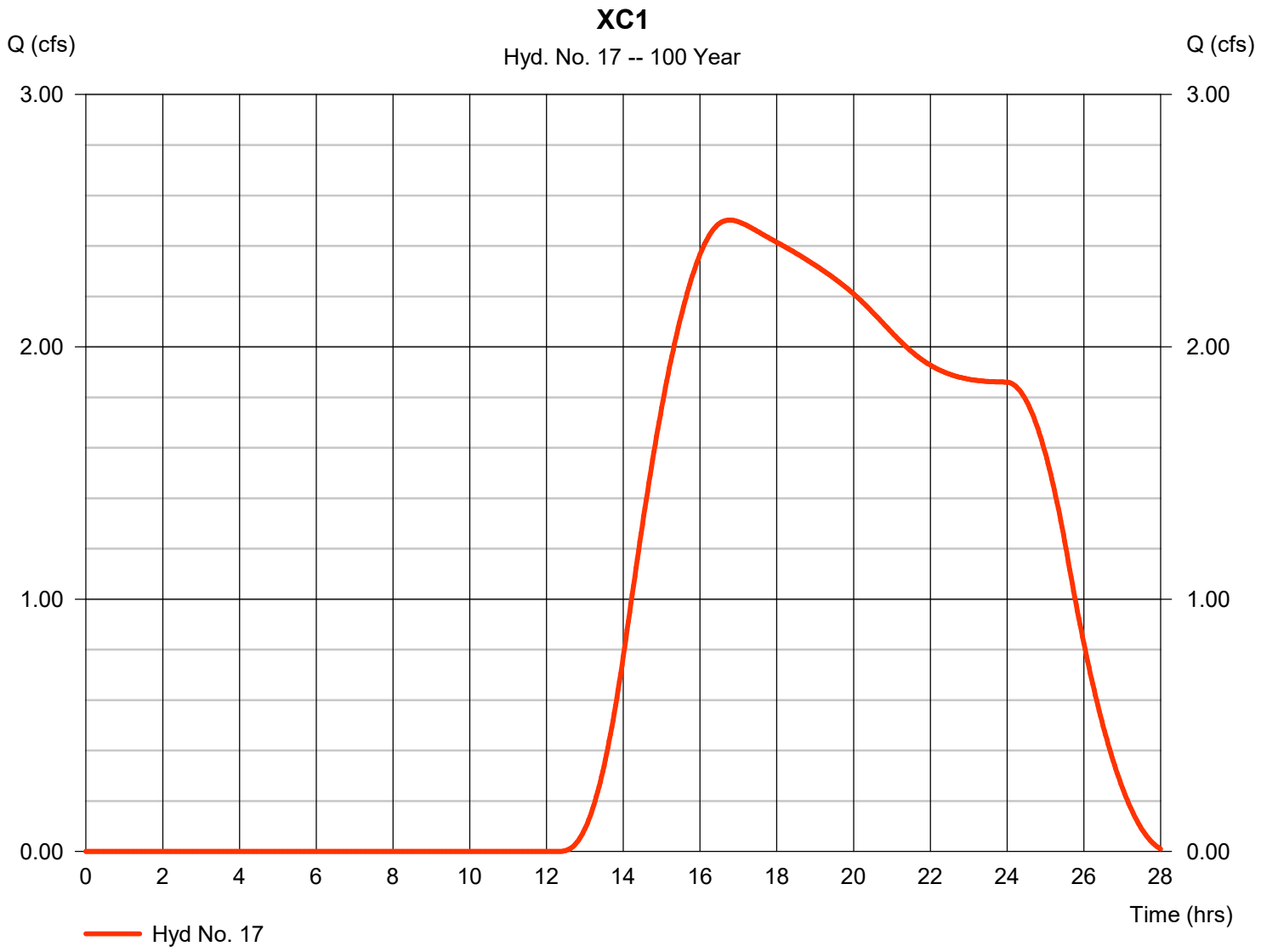
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Tuesday, 07 / 26 / 2022

Hyd. No. 17

XC1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.502 cfs
Storm frequency	= 100 yrs	Time to peak	= 16.77 hrs
Time interval	= 2 min	Hyd. volume	= 2.051 acft
Drainage area	= 509.000 ac	Curve number	= 55*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 162.10 min
Total precip.	= 2.29 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(10.600 x 81) + (455.800 x 55) + (42.600 x 81)] / 509.000



Final Memorandum

To: Ross Pfautz, Mark IV Capital, Inc.

From: Amy Lapin and Sean Fisher

Subject: Victory Master Planned Area
Fiscal Impact Analysis; EPS #222167

Date: August 11, 2023

The Economics of Land Use

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Denver
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Introduction

Mark IV Capital, Inc. (Mark IV Capital) retained Economic & Planning Systems, Inc. (EPS) to prepare a fiscal impact analysis (Analysis) of the proposed Victory Master Planned Area project (Project), a large-scale employment center proposed in northern Nevada. The Project is located in the City of Fernley (City), an incorporated city of approximately 24,000 residents in Lyon County (County) in the Reno-Sparks metropolitan area. The 2,173-acre Project is proposed to contain 28.6 million building square feet of new industrial and commercial land uses, with construction of infrastructure to support the Project expected to begin in 2023 and vertical construction starting in 2025 with full buildout anticipated by 2041.

This fiscal impact analysis (Analysis) examines the Project's estimated fiscal impact on the City's General Fund budget. Specifically, the Analysis estimates whether projected revenues from the Project will adequately cover the costs of delivering citywide services (e.g., general government, facilities, and street maintenance) to the Project. The Analysis is based on the assumption that the City will provide the same municipal services to the Project as the City currently provides to City residents and businesses.

The fiscal impacts of the proposed Project are summarized in the body of this memorandum. The data, assumptions, and detailed calculations underlying the Analysis are provided in **Appendices A** through **C**.

Project Overview

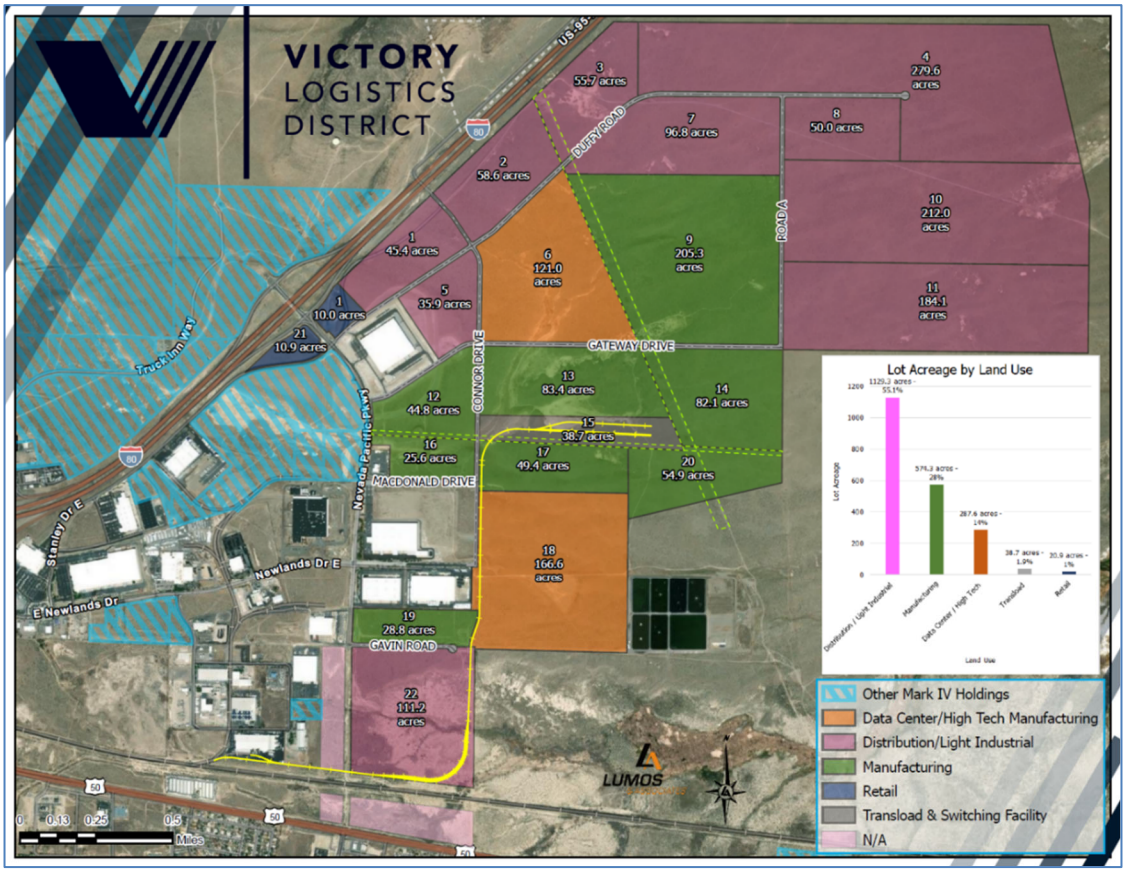
The Project is part of Mark IV Capital's larger, approximately 4,300-acre project known as the Victory Logistics District. It is located south of Interstate-80 (I-80), north of U.S. Highway 50 (Hwy 50), and east of Nevada Pacific Parkway in the City of Fernley, Nevada. The City is an incorporated city of approximately 24,000 residents and is located in Lyon County in the Greater Region approximately 30 miles east of the cities of Reno and Sparks, Nevada. See **Map 1** for the Project's context within the Greater Region.

Map 1. Proposed Project and Greater Regional Context

The Project is envisioned to be constructed as a world-class employment center designed to attract a premier tenant base of industrial, manufacturing, data center and other high technology, transload/switching service, and ancillary retail users. See **Map 2** for the Project's proposed land uses.

The proposed Project will offer synergies with existing, recently constructed, and approved industrial uses to the west and south of proposed Project land uses in Fernley, as well as the strong and growing industrial market of the Greater Region. The Project's location along I-80 and adjacent to U.S. Hwy 50 provides visibility along two major transcontinental transportation corridors, with easy accessibility via the I-80 Nevada Pacific Parkway interchange. In addition, the Project is served by a rail spur that connect to both the Union Pacific Railroad and BNSF Railways lines that serve major cities in the western United States.

Map 2. Proposed Victory Logistics District Land Uses



Project Land Uses

At full buildout, the 2,173-acre Project is planned to contain 28.6 million gross building square feet of industrial and commercial uses, accommodating approximately 16,600 ongoing jobs onsite. The first buildings constructed within the Project are anticipated to develop in 2025 with full buildout by 2041. Refer to **Table 1** for details regarding gross building space and employment for planned land uses at buildout. See **Tables A-2** and **A-3** in **Appendix A** for a summary of the Project land uses on an annual and cumulative basis, respectively. Annual and cumulative employment is shown in **Table A-4** in **Appendix A**.

Table 1. Summary of Project Land Uses and Employment at Buildout

Land Use	Gross Building Sq. Ft.	Direct Jobs Onsite
Distribution/Light Industrial	15,242,000	7,049
Manufacturing	7,962,000	4,910
Data Center/High Technology	4,484,000	4,148
Transload/Switching	674,000	12
Retail	273,000	492
Total	**28,636,000**	**16,611**

Source: Mark IV Capital, Inc; EPS.

Overview of Results

The Analysis estimates the fiscal revenues and expenditures generated by the Project on an annual basis from Fiscal Year (FY) 2022-23 through FY 2041-42. The results of the Analysis are presented at two periods of time, the initial years of development (through FY 2031-32) and Buildout (through FY 2041-42). The Analysis yields the following results as summarized in **Table 2**. **Tables 3** and **4** provide a detailed line-item listing of City General Fund revenues and expenditures resulting from the Project on an annual and cumulative basis.

- **The Project is estimated to yield an annual net fiscal surplus for the City's General Fund after the initial years of development and at buildout.** The Project is estimated to generate a net annual General Fund surplus ranging from approximately $5.9 million, after the initial years (FY 2031-32), to $16.3 million at buildout (FY 2041-42). By FY 2031-32, the Project is estimated to generate about $7.8 million in net new City General Fund revenues and will require $1.8 million in annual City General Fund service expenditures. At buildout, the Analysis estimates the Project will generate about $19.1 million in net, new recurring City General Fund revenues and will require about $2.7 million in annual City General Fund service costs annually.

- **The Project is estimated to result in a temporary annual net fiscal deficit in the first year of development followed by a substantial increase in annual net fiscal surpluses to the City's General Fund by the third year of development.** In the first year of the Project, this Analysis estimates an annual net fiscal deficit in the first year of vertical development (FY 2024-25), followed by a break-even net fiscal impact in the subsequent fiscal year and substantial net fiscal surpluses for all subsequent years evaluated. The primary drivers of this initial annual net fiscal deficit include an assumed one-year lag related to property tax revenues received by the City and annual streets and storm drains maintenance costs assumed to begin in that same year. It should be noted that this Analysis uses a conservative approach to estimating annual maintenance expenditures and actual maintenance expenditures in this initial year of development may be significantly less than these estimates. Refer to **Figure 1** for a graphical representation of estimated City General Fund revenues and expenditures and later sections of this memorandum for more details regarding property tax revenue and streets and storm drains maintenance costs.

- **The largest recurring source of revenue generated by the Project is Property Tax.** As shown in **Table 3**, the Project is estimated to generate annual property tax revenue of $5.5 million by FY 2031-32 and $13.9 million at buildout, accounting for about 73 percent of all recurring annual Project revenues at buildout.

- **The Project is anticipated to result in a cumulative net fiscal surplus of $136.1 million through FY 2041-42.** As shown in **Table 4**, at buildout, the Project is estimated to generate cumulative net General Fund revenues of $172.1 million. At buildout, the Project is estimated to require approximately $36.0 million in cumulative City General Fund service costs.

- **In addition to recurring annual revenues, the Project is estimated to generate $30.6 million in one-time permit and plan check fee revenues at buildout.** As shown in **Table 5**, by FY 2031-32, the Project is estimated to generate $12.1 million in one-time fee revenues, and $30.6 million in one-time fee revenues at buildout. These one-time fee revenues are anticipated to be mostly or entirely offset by direct expenditures related to reviewing and processing Project development permits and are excluded from net fiscal impact totals.

Table 2. City of Fernley General Fund Fiscal Impact Analysis Summary (Rounded) (2022$)

Item	Fiscal Impact (Rounded) Initial Years *FY 31-32*	Buildout *FY 41-42*
Fiscal Impacts to City of Fernley General Fund		
Annual Net Fiscal Impacts	*FY 2031-32*	*FY 2041-42*
Total Annual Revenues	$7,752,000	$19,077,000
Total Annual Expenditures	$1,832,000	$2,747,000
Net Annual Surplus/(Deficit)	**$5,920,000**	**$16,330,000**
Cumulative Net Fiscal Impacts	*FY 22-23 through FY 31-32*	*FY 22-23 through FY 41-42*
Total Cumulative Revenues	$42,559,000	$172,140,000
Total Cumulative Expenditures	$12,968,000	$35,995,000
Net Cumulative Surplus/(Deficit)	**$29,591,000**	**$136,145,000**

Source: EPS.

Note: Values are rounded to nearest $1,000.

Figure 1. Annual Estimated Net Fiscal Impacts (2022$)

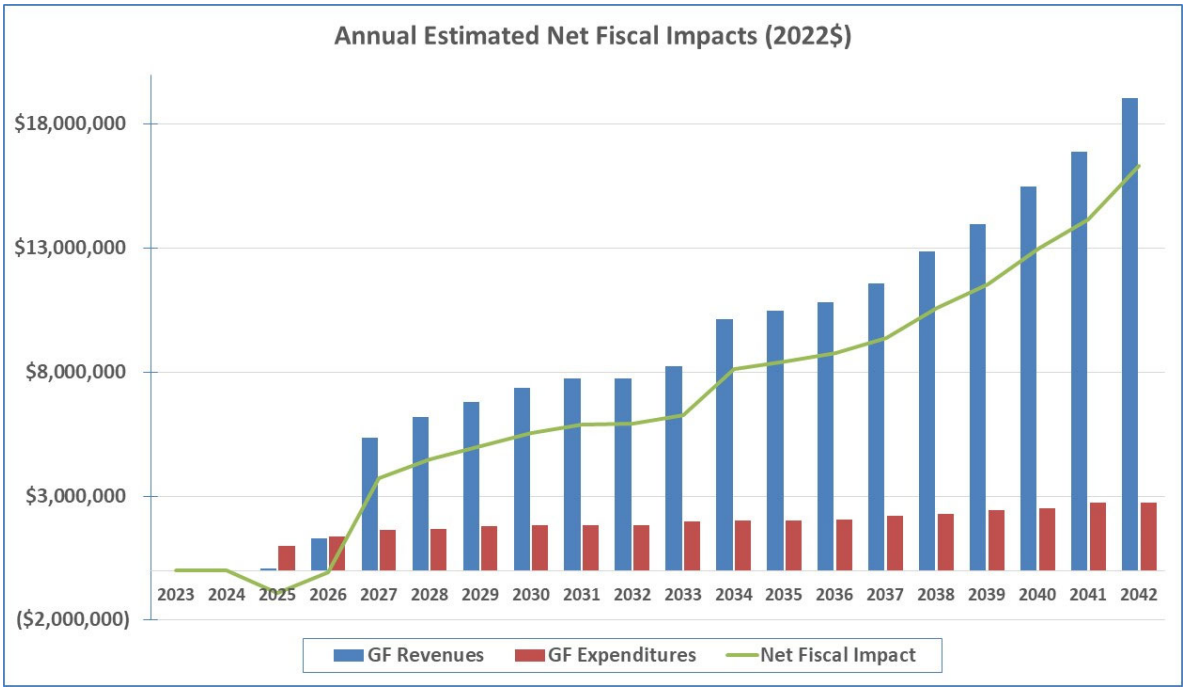


Table 3. Annual Estimated Project Revenues and Expenditures by Period (2022$)

Item	Annual Fiscal Impact by Period (Rounded) [1]		Buildout Percent of Total
	Initial Years *FY 2031-32*	Buildout *FY 2041-42*	
Annual General Fund Revenues			
Property Taxes	$5,477,000	$13,927,000	73.00%
Business License Fees	$1,257,000	$2,846,000	14.92%
Franchise Fees	$219,000	$496,000	2.60%
Consolidated Tax (CTX)	$34,000	$78,000	0.41%
Motor Vehicle Fuel Tax (Gas Tax)	$59,000	$133,000	0.70%
RTC Shared Revenue	$651,000	$1,474,000	7.73%
County Roads	$26,000	$58,000	0.30%
Penalties/Fines Municipal Court	$28,000	$64,000	0.34%
Interest Earnings	$1,000	$1,000	0.01%
Total Annual General Fund Revenues	**$7,752,000**	**$19,077,000**	**100.00%**
Annual General Fund Expenditures			
Mayor/Council	$16,000	$37,000	1.35%
Office of City Manager	$73,000	$166,000	6.04%
IT	$19,000	$43,000	1.57%
Animal Control	$11,000	$25,000	0.91%
Office of City Attorney	$71,000	$162,000	5.90%
Finance	$21,000	$48,000	1.75%
City Clerk	$38,000	$85,000	3.09%
Municipal Court	$60,000	$135,000	4.91%
Building & Safety	$78,000	$177,000	6.44%
Planning	$122,000	$277,000	10.08%
City Engineer	$96,000	$217,000	7.90%
Facilities	$64,000	$145,000	5.28%
Vector Control	$12,000	$27,000	0.98%
Cemetery	$0	$0	0.00%
Streets & Storm Drains	$1,078,000	$1,078,000	39.24%
Parks	$0	$0	0.00%
Fleet	$20,000	$45,000	1.64%
Subtotal Annual General Fund Expenditures	**$1,779,000**	**$2,667,000**	**97.09%**
Contingency [2]	$53,000	$80,000	2.91%
Total Annual General Fund Expenditures	**$1,832,000**	**$2,747,000**	**100.00%**
Annual Net Fiscal Impacts			
Total Annual Revenues	$7,752,000	$19,077,000	-
Total Annual Expenditures	$1,832,000	$2,747,000	-
Net Annual Surplus/(Deficit)	**$5,920,000**	**$16,330,000**	**-**

Source: Mark IV Capital; EPS.

[1] Annual revenues include recurring revenues only. In addition, the Project will generate building and permit fee revenues over the Project's buildout. Refer to Table 5 for a summary of one-time permit and plan check fee revenues.

[2] The City budget includes a 2.6 percent contingency on all non-contingency General Fund expenditures based on the maximum contingency level allowed by the State of Nevada of 3 percent. This analysis includes a 3 percent contingency on all costs (excluding the contingency cost), consistent with the State maximum.

Table 4. Cumulative Estimated Project Revenues and Expenditures by Period (2022$)

Item	Cumulative Fiscal Impact by Period (Rounded)		Buildout Percent of Total
	Initial Years *FY 22-23 through FY 31-32*	Buildout *FY 22-23 through FY 41-42*	
Cumulative General Fund Revenues			
Property Taxes	$28,800,000	$120,821,000	70.19%
Business License Fees	$7,604,000	$28,360,000	16.47%
Franchise Fees	$1,325,000	$4,941,000	2.87%
Consolidated Tax (CTX)	$207,000	$773,000	0.45%
Motor Vehicle Fuel Tax (Gas Tax)	$355,000	$1,325,000	0.77%
RTC Shared Revenue	$3,938,000	$14,688,000	8.53%
County Roads	$155,000	$577,000	0.34%
Penalties/Fines Municipal Court	$172,000	$642,000	0.37%
Interest Earnings	$3,000	$13,000	0.01%
Total Cumulative General Fund Revenues	**$42,559,000**	**$172,140,000**	**100.00%**
Cumulative General Fund Expenditures			
Mayor/Council	$98,000	$367,000	1.02%
Office of City Manager	$444,000	$1,654,000	4.60%
IT	$114,000	$426,000	1.18%
Animal Control	$67,000	$251,000	0.70%
Office of City Attorney	$432,000	$1,611,000	4.48%
Finance	$128,000	$476,000	1.32%
City Clerk	$227,000	$848,000	2.36%
Municipal Court	$360,000	$1,342,000	3.73%
Building & Safety	$474,000	$1,768,000	4.91%
Planning	$739,000	$2,757,000	7.66%
City Engineer	$581,000	$2,166,000	6.02%
Facilities	$387,000	$1,442,000	4.01%
Vector Control	$72,000	$267,000	0.74%
Cemetery	$0	$0	0.00%
Streets & Storm Drains	$8,348,000	$19,127,000	53.14%
Parks	$0	$0	0.00%
Fleet	$119,000	$445,000	1.24%
Subtotal Annual General Fund Expenditures	**$12,590,000**	**$34,947,000**	**97.09%**
Contingency [1]	$378,000	$1,048,000	2.91%
Total Annual General Fund Expenditures	**$12,968,000**	**$35,995,000**	**100.00%**
Cumulative Net Fiscal Impact			
Total Cumulative Revenues	$42,559,000	$172,140,000	-
Total Cumulative Expenditures	$12,968,000	$35,995,000	-
Net Fiscal Surplus/(Deficit)	**$29,591,000**	**$136,145,000**	**-**

Source: Mark IV Capital; EPS.

[1] The City budget includes a 2.6 percent contingency on all non-contingency General Fund expenditures based on the maximum contingency level allowed by the State of Nevada of 3 percent. This analysis includes a 3 percent contingency on all costs (excluding the contingency cost), consistent with the State maximum.

Table 5. One-Time Estimated Fee Revenues (2022$)

Item	Cumulative Fee Revenues (Rounded) Initial Years *FY 31-32*	Buildout *FY 41-42*
One-Time Fee Revenues [1]		
Building and Civil Permit Fees	$7,329,000	$18,555,000
Planning and Zoning Fees	$4,764,000	$12,061,000
Total Cumulative One-Time Fee Revenues	**$12,093,000**	**$30,616,000**

Source: EPS.

Note: Values are rounded to nearest $1,000.

[1] Reflects the cumulative total of one-time fee revenues (e.g., building and civil permit fees and plan check fees) collected by the City at building permit. These one-time fee revenues will be mostly or entirely offset by direct expenditures related to Project development. Refer to Table B-6 for details.

Methodology and Assumptions

This section details the underlying methodology and assumptions used to estimate the fiscal impact of the Project on the City. It describes assumptions concerning municipal service delivery, land development, and General Fund budgeting. In addition, it details the methodology used to forecast the Project's General Fund revenues and expenditures at buildout and on an annual basis.

Municipal Service Provision

This Analysis examines the Project's ability to generate adequate revenues to cover the City's costs of providing public services to the Project. The services analyzed in this Analysis comprise General Fund services (e.g., general government, streets and storm drains maintenance).

The Analysis excludes any services that may be funded privately and excludes any services that are provided through existing agreements with other public agencies. For example, the City does not currently provide public safety services to City residents and businesses. Based on an agreement between the City and County, the Lyon County Sheriff Department provides police protection services to the City. Likewise, based on agreements between the City and North Lyon Fire District, the fire district will continue providing fire protection and emergency services to the City. The City does not envision any changes to these agreements

because of development of the proposed Project.[1] Thus, the fiscal impacts of public safety services are not included in the Analysis.

In addition, this Analysis does not address activities budgeted in other City Funds (e.g., Special Revenue Funds, Proprietary Funds) nor does it include an evaluation of capital facilities or the funding of capital facilities needed to serve new development.

General Assumptions

The Analysis is based on the City's General Fund Budget for FY 2022–23, tax regulations and statutes current as of August 2023, and other general assumptions discussed herein. Each revenue item is estimated based on current State of Nevada (State) legislation and current City practices. Therefore, the Analysis reflects the current State-local fiscal relationship as it exists at the time the Analysis was completed. Future changes by either State legislation or City practices may affect the revenues and expenditures estimated in this Analysis. All costs and revenues are shown in constant 2022 dollars. General fiscal and demographic assumptions are detailed in **Table A-1** in **Appendix A**. Assumptions related to the proposed land uses, including estimated appraised values (real property and personal property values)per building square foot, employment densities, and vacancy rates, are shown in **Table A-2** in **Appendix A**.

EPS consulted the City's budget documents to develop forecasting methodologies for specific revenues and expenditures affected by new development in the proposed Project. In addition, EPS consulted with City staff to clarify budget data and review assumptions and Analysis results. This Analysis also used information from the following sources: Project Applicant (Mark IV Capital), County Assessor and Auditor-Controller, the U.S. Bureau of Labor Statistics (BLS), and subscription-based data sources (e.g., CoStar, IMPLAN).

The actual fiscal impacts of new development in the Project will vary from those presented in this Analysis if development plans or other assumptions (e.g., assessed valuations) vary from those presented in this Analysis.

General Fund Revenue- and Expenditure-Estimating Assumptions

This Analysis considers only General Fund revenues that will be generated by the Project. Departmental revenues and costs not affected by development are excluded from this Analysis. Calculations to estimate annual revenues are shown in **Table B-1** in **Appendix B**. Calculations to estimate annual expenditures are shown in **Table C-1** in **Appendix C**.

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[1] Email communication with City of Fernley, dated July 26, 2023.

Development Assumptions

Listed below are summaries of land use and other development-related assumptions used in the Analysis:

- **Land Use:** The Project is envisioned to accommodate a combination of nonresidential uses, including industrial, data center and other high technology, transload/switching service, and ancillary retail uses. Anticipated gross and occupied building square feet by land use are shown in **Table A-3** and **A-4** in **Appendix A** on an annual and cumulative basis, respectively. For all land use categories, except transload, a vacancy rate is assumed on all square footage ranging from 7.5 to 10 percent. Vacancy rates are a conservative assumption derived from an evaluation of CoStar market performance data by real estate sector, as of March 2023.

- **Employee Estimates:** Total employment estimates are based on an assumed employment density and occupied building square feet for each land use proposed in the Project. At full buildout, the Project is estimated to support about 16,600 employees. In estimating certain annual revenues and expenditures (service demands) related to the Project, EPS developed a "persons-served" population estimate to approximate the impacts of an employee in the Project relative to a Project resident. EPS uses a factor of 0.5 employees to derive the Project's persons-served population.[2] **Table A-5** in **Appendix A** shows the estimated employees and persons served generated by the Project. **Table A-2** in **Appendix A** shows the employment density assumptions used to estimate the Project employment.

- **Project Appraised Value:** The estimated appraised valuation of Project land uses is based on appraised value assumptions per gross building square foot obtained from the February 2023 International Code Council (ICC) Building Valuation data for all land uses except for the data center and transload use categories. Lyon County typically uses ICC Building Valuation data to estimate the appraised value of new construction. However, data center uses are not specifically included in the ICC Building Valuation. As such, the Analysis deviates from the standard County methodology and uses data collected from several sources, including Jones Lang LaSalle Incorporated (JLL), RSMeans data from Gordian, and the U.S. Chamber Technology Engagement Center (CTEC) to estimate a reasonable estimated appraised value.[3]

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[2] As the Project contains no residential uses, persons served is equal to one half of employees.

[3] Comparable data center value data include data obtained from RSMeans, current as of March, 2023, Sales and transactions data obtained from Costar Online, accessed February 21, 2023, the report titled "Data Centers: Jobs and Opportunities in Communities Nationwide" published by CTEC, published May 2017, and "Data centers: expensive to build, but worth every penny" published by JLL, accessed online February 17, 2023.

Transload appraised value is based on a conservative estimate of appraised values provided by Mark IV Capital, current as of April 2023, consistent with the previously completed Infrastructure Financing Challenges and Solutions, prepared by GCI Advisors, dated December 15, 2022. As a conservative assumption, this Analysis does not assume any value attributable to personal property for any uses except the data center use, which includes a personal property value per building square foot assumption based on publicly available assessment data pertaining to existing and planned data center uses throughout California and Nevada.[4] Our review of sources indicated a wide variance in potential real and personal property values for data center uses; this Analysis errs on the side of assigning a conservative total appraised value for this use. Actual appraised values may be considerably higher, thus generating a greater amount of property tax revenue for the City than estimated in this Analysis. This Analysis assumes there is a one-year lag between vertical construction and value added to the County tax roll to account for the process of assessment and tax collection. Total Annual and Cumulative Project Appraised values are shown in **Table A-6** in **Appendix A**. Appraised values per gross building square foot for each land use are shown in **Table A-2** in **Appendix A**.

- **Net Building Appreciation of Appraised Values:** Appraised values include both land and improvement (building and personal property) values. The allocation of appraised values of new development is based on an estimated allocation of 10 percent land value and 90 percent building and personal property value. This generalized allocation assumption is based on an evaluation of Lyon County assessor records for similar land uses although the allocation may vary for individual uses in the Project. This Analysis assumes that appraised values of improvements escalate by an annual rate of 1.93 percent to account for the annual growth of ICC Building Values, adjusted for inflation to continue to reflect current 2022$. In addition, for each year following the development of improvements, the current replacement value is decreased by 1.5 percent to reflect depreciation as defined by the Nevada Department of Taxation based on State law. Land values are not assumed to be subject to net appreciation factors in this Analysis. **Table A-7** in **Appendix A** shows the annual appraised value of land and improvements, and the cumulative appraised property values including annual net building appreciation. **Table A-1** in **Appendix A** shows the net building appreciation factors used in this Analysis.

[4] Data center personal property estimates based on value rolls provided by the County Assessors offices for the California counties of San Mateo, Sacramento, Yolo, Contra Costa, and Orange assessors offices and appraised/replacement value data provided online by Nevada's Storey County assessors office.

- **Project Assessed Value:** Based on State law, annual property values used to estimate property tax revenue are estimated to be 35 percent of its current taxable (replacement) value. Cumulative Project assessed values are shown in **Table A-8** in **Appendix A.**

Revenue-Estimating Methodology

EPS used either a marginal-revenue case-study approach or an average-revenue approach to estimate Project-related revenues.

The marginal-revenue case-study approach simulates actual revenue generation resulting from new development. The case-study approach for estimating property tax revenues, for instance, forecasts Project assessed values and applies the City's General Fund Mill Levy Rate to estimate annual property tax revenues generated by the Project. Case studies used in this Analysis are discussed in greater detail later in this section.

The average-revenue approach uses the City's FY 2022-23 final General Fund budgeted revenue amounts on a citywide per employee or persons served basis to forecast revenues derived from estimated employees of the Project.[5]

Revenue sources *not* expected to increase as a result of development are excluded from this Analysis. These sources of revenue are not affected by development because they are either one-time revenue sources not guaranteed to be available in the future or there is no direct relation between increased employment growth and increased revenue.

A listing of all included City revenue sources and the corresponding estimating procedure used to forecast future Project revenues is shown in **Table B-1** in **Appendix B**. A summary of estimated annual General Fund revenues generated by the Project after the initial years and buildout on an annual basis is provided in **Table B-2** and on a cumulative basis in **Table B-3**. Annual revenues generated by the Project for all years are shown in **Table B-4**.

Property Tax

Estimated annual property tax revenue resulting from development in the Project is presented in **Table B-5** in **Appendix B**. Annual property tax revenues are estimated by applying the City General Fund Mill Levy Rate per $100 of assessed value of 0.67 percent to the total assessed value of the Project, including land, real property, and personal property values.

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[5] A *per-persons-served* basis of estimating revenues is used to take into account that businesses (and their employees) have a fiscal impact on many City revenues but at a lower level than residential development's impact. As the Project does not include residential land uses, the persons served is equal to one half Project employees.

In addition, although not included in the net fiscal impact totals, this Analysis provides an estimate of revenues generated for the North Lyon Fire District, which has a Mill Levy Rate per $1000 of assessed value of 0.31 percent, as shown in **Table B-5**.

One-Time Fee Revenues

In addition to recurring annual revenues, the Analysis includes an estimate of one-time fee revenues generated by development of the Project, including building permit and plan check fees. Building permit fees are estimated by applying the building permit fee amounts included in the posted Building Permit Fee Schedule to the Project's appraised value at the time of development. Based on guidance provided by the Project Applicant, It is assumed that each new value entry for each land use represents development of a separate building, requiring an individual building permit. The building permit value year is estimated based on the assessed value per square foot assumptions shown in **Table A-2** in **Appendix A** and is assumed to be created in the year of development with no lag year. Based on the posted City's Building Permit Fee Schedule, Plan Check Fees are estimated as 65% of total building permit fees. Estimated building permit and plan check fees are shown in **Table B-6** in **Appendix B.**

Expenditure-Estimating Methodology

Expenditure estimates are based on the City's FY 2022-23 budget and supplemental information from City staff. This Analysis estimates General Fund expenditures attributable to the Project. With the exception of the Streets and Storm Drains category, General Fund department expenditures expected to be affected by the Project are forecasted using an average-cost approach. The average-cost approach uses the City's FY 2022-23 General Fund budgeted expenditures on a citywide per-persons-served or per capita basis to forecast expenditures required to serve new development. Streets and Storm Drains expenditures are estimated using a case study methodology.

A listing of all City General Fund expenditures and the corresponding estimating procedure used to forecast future Project expenditures is shown in **Table C-1** in **Appendix C**. A summary of estimated annual expenditures required to serve the Project at buildout is provided in **Table C-2**. A summary of estimated annual General Fund expenditures required to serve the Project after the initial years and at buildout on an annual basis is provided in **Table C-2** and on a cumulative basis in **Table C-3**. Annual expenditures required to serve the Project for all years are shown in **Table C-4.**

Average-Cost Expenditures

Expenditures that are affected by Project employees are projected using a *per-person-served* average cost multiplier. These expenditures include all departmental expenditures, except cemetery and park expenditures, which are estimated using a *per capita* average cost multiplier because these services

generally are demanded by residential development only. As the Project contains no residential uses, these per capita expenditure categories are not expected to grow with Project development.

For general government expenditures, a variable cost adjustment of 25 percent is included to account for fixed costs not expected to grow with Project development.[6]

Streets and Storm Drains Maintenance

As the Project is anticipated to result in a sizable increase in roadways to be publicly maintained, street and storm drainage expenditures required to serve the Project are estimated using a case study methodology.

Streets Maintenance Costs

Annual street maintenance costs are estimated by applying annual per-square-yard cost assumptions to the total number of square yards of publicly maintained roadways, as provided by the Project applicant. The annual per square yard cost assumptions were provided by Lumos and Associates and reflect the anticipated maintenance cost and schedule for street maintenance in the City, current as of February 2023 and include slurry/micro surface maintenance, pavement crack sealing, corrective maintenance, and pavement rehabilitation or reconstruction.

Storm Drains Maintenance Costs

Annual storm drains maintenance costs are estimated based on an assumed per acre-foot annual maintenance cost applied to the total acre-feet of detention basin within the Project. Annual storm drainage cost per acre foot was estimated based on the budgeted FY 2022-23 City storm drainage maintenance costs divided by the estimated total acre feet of existing drainage basins within the City. Based on data provided by Lumos and Associates, 64.5 acre-feet of detention basins are anticipated to be developed within the Project, with 16.9 acre-feet developed in 2024 and the remaining 47.6 developed in 2026.[7]

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6 Variable cost adjustment assumption on General Government expenditures was confirmed by City staff in a telephone conversation on July 6, 2023.

7 Email communication with Lumos and Associates, dated August 3, 2023.

Technical Appendices

The technical calculations used in this Analysis are shown in **Appendices A** through **C** (**Tables A-1** through **C-5**):

- **Appendix A** indicates the proposed land uses and general assumptions used in this Analysis.
- **Appendix B** identifies the projected revenues that will be generated by the Project for the City's General Fund.
- **Appendix C** details the estimated expenditures for the City to provide General Fund services to the Project.

APPENDICES:

Appendix A: General Assumptions

Appendix B: Revenue Estimating Tables

Appendix C: Expenditure Estimating Tables

APPENDIX A:

General Assumptions

Table A-1	General Assumptions	A-1
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Table A-8	Cumulative Assessed Value (2 pages)	A-13

Table A-1
Victory Master Planned Area
Fiscal Impact Analysis
General Assumptions

Item	Assumption	Source
General Assumptions		
Budget Analysis Assumptions [1]	FY 2022-23	City of Fernley FY 2022-23 Final Budget
Dollar Year of Fiscal Impacts	2022$	-
Fernley Demographic Characteristics (2022)		
Residential Population [2]	23,393	Esri 2022 Business Summary by NAICS
Employee Population [2]	4,816	Esri 2022 Business Summary by NAICS
Persons Served [3]	25,801	
Fernley Property Tax Factors		
Mill Levy Rate per $100 of Assessed Value		
Fernley General Fund	0.006735	City of Fernley FY 2022-23 Final Budget
North Lyon Fire District	0.003055	City of Fernley FY 2022-23 Final Budget
Assessed Value (% of Appraised Value)	35.0%	Nevada Department of Taxation
Annual Property Value Change		
Annual Building Depreciation Rate	1.5%	Nevada Department of Taxation
Annual ICC Appreciation Rate [4]	4.9%	International Code Council
Inflation Adjustment	3.0%	Bureau of Labor Statistics

pop

Source: City of Fernley Fiscal Year 2022-23 Final Budget; Esri; Nevada Department of Taxation; International Code Council; Bureau of Labor Statistics; EPS.

[1] Reflects City of Fernley FY 2022-23 Final Budget. Revenues and expenses are in 2022 dollars.
[2] City of Fernley residential and employee populations obtained from Esri's Business Summary report reflecting data as of January 2022.
[3] Persons Served is defined as total residents plus 50% of total employees. This figure is used to estimate specific revenues and expenditures that are assumed to be impacted by growth of both residential and employment populations combined. The percentage of 50% of employees assumes that an employee has half the impact on service demands as a resident (e.g., generally, a resident is home for 16 hours/day while an employee is at work for 8 hours/day).
[4] Annual ICC appreciation rate based on the average annual growth in national building construction costs estimates provided by the International Code Council for industrial uses from February 2013 through 2022.

Table A-2
Victory Master Planned Area
Fiscal Impact Analysis
Land Use Assumptions

Land Use	ICC Group [1]	Appraised Value (Rounded) Real Property [2]	Personal Property [3]	Total	Employment Density [4]	Vacancy Rate [5]
Project Land Uses		*Per Sq. Ft.*			*Sq. Ft./Employee*	
Distribution/Light Industrial	F-2	$125	$0	$125	2,000	7.5%
Manufacturing	F-2	$125	$0	$125	1,500	7.5%
Data Center/High Tech [6]	NA	$250	$150	$400	1,000	7.5%
Transload/Switching	NA	$1	$0	$1	56,000	0.0%
Retail	M	$165	$0	$165	500	10.0%

Source: Mark IV Capital; International Code Council; U.S. Energy Information Administration; U.S. Chamber of Commerce; CoStar; EPS.

[1] ICC Group refers to the Building Group most closely related to each included land use as defined in the 2019 International Building Code.
[2] Appraised value of real property is assumed to be consistent with the Building Valuation Data estimates provided by the International Code Council, current as of February 2023.
[3] As a conservative assumption, this analysis does not assume any value attributable to personal property for any uses except Data Center, which includes a conservative assumption of personal property based on publicly available assessment data pertaining to existing and planned data center uses throughout California and Nevada. The actual appraised value for this personal property may vary from estimates shown in this Analysis.
[4] Employment density assumptions based on a review of typical employment densities for proposed land uses. Sources used to inform these assumptions include:
Distribution/Light Industrial, Manufacturing, and Retail Uses: U.S. Energy Information Administration CBECS Survey Data.
Data Center/High Tech Uses: U.S. Chamber of Commerce.
[5] Vacancy rates are a conservative assumption derived from an evaluation of CoStar market performance data by real estate sector, as of March 2023. Actual vacancy rates may vary.
[6] Lyon County typically uses ICC Building Valuation data to estimate the appraised value of new construction. However, data center uses are not specifically included and EPS has not found appraised values for recently-constructed comparable data center uses. As such, this Analysis deviates from the standard County methodology and uses data collected from several sources, including JLL, RS Means, and CTEC, to estimate a reasonable estimated appraised value. The actual appraised value for this use may vary from estimates shown in this Analysis.

Table A-3
Victory Master Planned Area
Fiscal Impact Analysis
Annual Gross and Occupied Project Land Uses

Item	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Annual Gross Project Building Sq. Ft. [1]											
Distribution/Light Industrial	15,242,080	0	0	0	968,775	968,774	0	0	0	0	0
Manufacturing	7,962,159	0	0	0	1,317,951	990,337	990,337	990,337	990,337	0	0
Data Center/High Tech	4,484,064	0	0	0	2,902,836	0	0	0	0	0	0
Transload/Switching	674,309	0	0	674,309	0	0	0	0	0	0	0
Retail	273,121	0	0	142,441	0	0	0	130,680	0	0	0
Total Land Uses	**28,635,733**	**0**	**0**	**816,750**	**5,189,562**	**1,959,111**	**990,337**	**1,121,017**	**990,337**	**0**	**0**
Annual Occupied Project Building Sq. Ft. [2]											
Distribution/Light Industrial	14,098,924	0	0	0	896,117	896,116	0	0	0	0	0
Manufacturing	7,364,997	0	0	0	1,219,105	916,062	916,062	916,062	916,062	0	0
Data Center/High Tech	4,147,759	0	0	0	2,685,123	0	0	0	0	0	0
Transload/Switching	674,309	0	0	674,309	0	0	0	0	0	0	0
Retail	245,809	0	0	128,197	0	0	0	117,612	0	0	0
Total Land Uses	**26,531,798**	**0**	**0**	**802,506**	**4,800,345**	**1,812,178**	**916,062**	**1,033,674**	**916,062**	**0**	**0**

Source: Mark IV Capital; CoStar; EPS.

[1] Based on gross building square feet anticipated to be constructed, provided by Mark IV Capital based on data current as of December 2022.
[2] Based on the vacancy rate assumptions included in Table A-2.

Table A-3
Victory Master Planned Area
Fiscal Impact Analysis
Annual Gross and Occupied Project Land Uses

Item	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Year	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Annual Gross Project Building Sq. Ft. [1]										
Distribution/Light Industrial	0	609,404	609,404	609,405	0	1,575,021	3,150,042	1,575,020	5,176,235	0
Manufacturing	0	0	0	0	2,682,860	0	0	0	0	0
Data Center/High Tech	1,581,228	0	0	0	0	0	0	0	0	0
Transload/Switching	0	0	0	0	0	0	0	0	0	0
Retail	0	0	0	0	0	0	0	0	0	0
Total Land Uses	**1,581,228**	**609,404**	**609,404**	**609,405**	**2,682,860**	**1,575,021**	**3,150,042**	**1,575,020**	**5,176,235**	**0**
Annual Occupied Project Building Sq. Ft. [2]										
Distribution/Light Industrial	0	563,699	563,699	563,700	0	1,456,894	2,913,789	1,456,894	4,788,017	0
Manufacturing	0	0	0	0	2,481,646	0	0	0	0	0
Data Center/High Tech	1,462,636	0	0	0	0	0	0	0	0	0
Transload/Switching	0	0	0	0	0	0	0	0	0	0
Retail	0	0	0	0	0	0	0	0	0	0
Total Land Uses	**1,462,636**	**563,699**	**563,699**	**563,700**	**2,481,646**	**1,456,894**	**2,913,789**	**1,456,894**	**4,788,017**	**0**

Source: Mark IV Capital; CoStar; EPS.

[1] Based on gross building square feet anticipated to be constructed, provided by Mark IV Capital based on data current as of December 2022.
[2] Based on the vacancy rate assumptions included in Table A-2.

Table A-4
Victory Master Planned Area
Fiscal Impact Analysis
Cumulative Gross and Occupied Project Land Uses

Item	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Cumulative Gross Project Building Sq. Ft.											
Distribution/Light Industrial	15,242,080	0	0	0	968,775	1,937,549	1,937,549	1,937,549	1,937,549	1,937,549	1,937,549
Manufacturing	7,962,159	0	0	0	1,317,951	2,308,288	3,298,625	4,288,962	5,279,299	5,279,299	5,279,299
Data Center/High Tech	4,484,064	0	0	0	2,902,836	2,902,836	2,902,836	2,902,836	2,902,836	2,902,836	2,902,836
Transload/Switching	674,309	0	0	674,309	674,309	674,309	674,309	674,309	674,309	674,309	674,309
Retail	273,121	0	0	142,441	142,441	142,441	142,441	273,121	273,121	273,121	273,121
Total Land Uses	**28,635,733**	**0**	**0**	**816,750**	**6,006,312**	**7,965,423**	**8,955,760**	**10,076,777**	**11,067,114**	**11,067,114**	**11,067,114**
Cumulative Occupied Project Building Sq. Ft. [1]											
Distribution/Light Industrial	14,098,924	0	0	0	896,117	1,792,233	1,792,233	1,792,233	1,792,233	1,792,233	1,792,233
Manufacturing	7,364,997	0	0	0	1,219,105	2,135,166	3,051,228	3,967,290	4,883,352	4,883,352	4,883,352
Data Center/High Tech	4,147,759	0	0	0	2,685,123	2,685,123	2,685,123	2,685,123	2,685,123	2,685,123	2,685,123
Transload/Switching	674,309	0	0	674,309	674,309	674,309	674,309	674,309	674,309	674,309	674,309
Retail	245,809	0	0	128,197	128,197	128,197	128,197	245,809	245,809	245,809	245,809
Total Land Uses	**26,531,798**	**0**	**0**	**802,506**	**5,602,851**	**7,415,028**	**8,331,090**	**9,364,764**	**10,280,826**	**10,280,826**	**10,280,826**

Source: Mark IV Capital; CoStar; EPS.

[1] Based on the vacancy rate assumptions included in Table A-2.

Table A-4
Victory Master Planned Area
Fiscal Impact Analysis
Cumulative Gross and Occupied Project Land Uses

Item	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Year	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Cumulative Gross Project Building Sq. Ft.										
Distribution/Light Industrial	1,937,549	2,546,953	3,156,357	3,765,762	3,765,762	5,340,783	8,490,825	10,065,845	15,242,080	15,242,080
Manufacturing	5,279,299	5,279,299	5,279,299	5,279,299	7,962,159	7,962,159	7,962,159	7,962,159	7,962,159	7,962,159
Data Center/High Tech	4,484,064	4,484,064	4,484,064	4,484,064	4,484,064	4,484,064	4,484,064	4,484,064	4,484,064	4,484,064
Transload/Switching	674,309	674,309	674,309	674,309	674,309	674,309	674,309	674,309	674,309	674,309
Retail	273,121	273,121	273,121	273,121	273,121	273,121	273,121	273,121	273,121	273,121
Total Land Uses	**12,648,342**	**13,257,746**	**13,867,150**	**14,476,555**	**17,159,415**	**18,734,436**	**21,884,478**	**23,459,498**	**28,635,733**	**28,635,733**
Cumulative Occupied Project Building Sq. Ft. [1]										
Distribution/Light Industrial	1,792,233	2,355,932	2,919,630	3,483,330	3,483,330	4,940,224	7,854,013	9,310,907	14,098,924	14,098,924
Manufacturing	4,883,352	4,883,352	4,883,352	4,883,352	7,364,997	7,364,997	7,364,997	7,364,997	7,364,997	7,364,997
Data Center/High Tech	4,147,759	4,147,759	4,147,759	4,147,759	4,147,759	4,147,759	4,147,759	4,147,759	4,147,759	4,147,759
Transload/Switching	674,309	674,309	674,309	674,309	674,309	674,309	674,309	674,309	674,309	674,309
Retail	245,809	245,809	245,809	245,809	245,809	245,809	245,809	245,809	245,809	245,809
Total Land Uses	**11,743,462**	**12,307,160**	**12,870,859**	**13,434,559**	**15,916,204**	**17,373,098**	**20,286,887**	**21,743,781**	**26,531,798**	**26,531,798**

Source: Mark IV Capital; CoStar; EPS.

[1] Based on the vacancy rate assumptions included in Table A-2.

Table A-5
Victory Master Planned Area
Fiscal Impact Analysis
Annual and Cumulative Service Population

Item	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Annual Employment [1]											
Distribution/Light Industrial	7,049	0	0	0	448	448	0	0	0	0	0
Manufacturing	4,910	0	0	0	813	611	611	611	611	0	0
Data Center/High Tech	4,148	0	0	0	2,685	0	0	0	0	0	0
Transload/Switching	12	0	0	12	0	0	0	0	0	0	0
Retail	492	0	0	256	0	0	0	235	0	0	0
Total Employment	**16,611**	**0**	**0**	**268**	**3,946**	**1,059**	**611**	**846**	**611**	**0**	**0**
Annual Persons Served [2]	**8,305**	**0**	**0**	**134**	**1,973**	**529**	**305**	**423**	**305**	**0**	**0**
Cumulative Employment [1]											
Distribution/Light Industrial	7,049	0	0	0	448	896	896	896	896	896	896
Manufacturing	4,910	0	0	0	813	1,423	2,034	2,645	3,256	3,256	3,256
Data Center/High Tech	4,148	0	0	0	2,685	2,685	2,685	2,685	2,685	2,685	2,685
Transload/Switching	12	0	0	12	12	12	12	12	12	12	12
Retail	492	0	0	256	256	256	256	492	492	492	492
Total Employment	**16,611**	**0**	**0**	**268**	**4,214**	**5,273**	**5,884**	**6,730**	**7,340**	**7,340**	**7,340**
Cumulative Persons Served [2]	**8,305**	**0**	**0**	**134**	**2,107**	**2,637**	**2,942**	**3,365**	**3,670**	**3,670**	**3,670**

Source: Mark IV Capital; CoStar; EPS.

[1] Based on occupied land uses shown in Table A-3 and employment density assumptions shown in Table A-2.
[2] Persons Served defined as 50 percent of total Project employees. This figure represents an employee-to-resident equivalency and assumes that an employee's impact is about half of the impact of a resident.

Table A-5
Victory Master Planned Area
Fiscal Impact Analysis
Annual and Cumulative Service Population

Item	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Year	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Annual Employment [1]										
Distribution/Light Industrial	0	282	282	282	0	728	1,457	728	2,394	0
Manufacturing	0	0	0	0	1,654	0	0	0	0	0
Data Center/High Tech	1,463	0	0	0	0	0	0	0	0	0
Transload/Switching	0	0	0	0	0	0	0	0	0	0
Retail	0	0	0	0	0	0	0	0	0	0
Total Employment	**1,463**	**282**	**282**	**282**	**1,654**	**728**	**1,457**	**728**	**2,394**	**0**
Annual Persons Served [2]	**731**	**141**	**141**	**141**	**827**	**364**	**728**	**364**	**1,197**	**0**
Cumulative Employment [1]										
Distribution/Light Industrial	896	1,178	1,460	1,742	1,742	2,470	3,927	4,655	7,049	7,049
Manufacturing	3,256	3,256	3,256	3,256	4,910	4,910	4,910	4,910	4,910	4,910
Data Center/High Tech	4,148	4,148	4,148	4,148	4,148	4,148	4,148	4,148	4,148	4,148
Transload/Switching	12	12	12	12	12	12	12	12	12	12
Retail	492	492	492	492	492	492	492	492	492	492
Total Employment	**8,803**	**9,085**	**9,367**	**9,649**	**11,303**	**12,032**	**13,488**	**14,217**	**16,611**	**16,611**
Cumulative Persons Served [2]	**4,402**	**4,542**	**4,683**	**4,824**	**5,652**	**6,016**	**6,744**	**7,108**	**8,305**	**8,305**

Source: Mark IV Capital; CoStar; EPS.

[1] Based on occupied land uses shown in Table A-3 and employment density assumptions shown in Table A-2.
[2] Persons Served defined as 50 percent of total Project employees. This figure represents an employee-to-resident equivalency and assumes that an employee's impact is about half of the impact of a resident.

Table A-6
Victory Master Planned Area
Fiscal Impact Analysis
Annual and Cumulative Appraised Value (2022$)

Item	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Annual Appraised Value [1]											
Distribution/Light Industrial	$1,900,992,218	$0	$0	$0	$0	$120,825,618	$120,825,493	$0	$0	$0	$0
Manufacturing	$993,040,470	$0	$0	$0	$0	$164,374,849	$123,514,831	$123,514,831	$123,514,831	$123,514,831	$0
Data Center/High Tech	$1,793,625,600	$0	$0	$0	$0	$1,161,134,400	$0	$0	$0	$0	$0
Transload/Switching	$674,309	$0	$0	$0	$674,309	$0	$0	$0	$0	$0	$0
Retail	$45,018,534	$0	$0	$0	$23,478,550	$0	$0	$0	$21,539,984	$0	$0
Total Appraised Value	**$4,733,351,132**	**$0**	**$0**	**$0**	**$24,152,859**	**$1,446,334,867**	**$244,340,324**	**$123,514,831**	**$145,054,815**	**$123,514,831**	**$0**
Cumulative Appraised Value											
Distribution/Light Industria	$1,900,992,218	$0	$0	$0	$0	$120,825,618	$241,651,111	$241,651,111	$241,651,111	$241,651,111	$241,651,111
Manufacturing	$993,040,470	$0	$0	$0	$0	$164,374,849	$287,889,679	$411,404,510	$534,919,341	$658,434,171	$658,434,171
Data Center/High Tech	$1,793,625,600	$0	$0	$0	$0	$1,161,134,400	$1,161,134,400	$1,161,134,400	$1,161,134,400	$1,161,134,400	$1,161,134,400
Transload/Switching	$674,309	$0	$0	$0	$674,309	$674,309	$674,309	$674,309	$674,309	$674,309	$674,309
Retail	$45,018,534	$0	$0	$0	$23,478,550	$23,478,550	$23,478,550	$23,478,550	$45,018,534	$45,018,534	$45,018,534
Total Appraised Value	**$4,733,351,132**	**$0**	**$0**	**$0**	**$24,152,859**	**$1,470,487,726**	**$1,714,828,050**	**$1,838,342,880**	**$1,983,397,695**	**$2,106,912,526**	**$2,106,912,526**

Source: Mark IV Capital; CoStar; EPS.

Note: There is a one year lag between vertical construction and value added to the County tax roll, which accounts for assessment and tax collection.

[1] Based on gross building sq. ft. shown in Table A-3 and appraised values per square foot by land use shown in Table A-2.

Table A-6
Victory Master Planned Area
Fiscal Impact Analysis
Annual and Cumulative Appraised Value (2022$)

Item	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Year	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Annual Appraised Value [1]										
Distribution/Light Industrial	$0	$0	$76,004,867	$76,004,867	$76,004,992	$0	$196,436,619	$392,873,238	$196,436,494	$645,580,029
Manufacturing	$0	$0	$0	$0	$0	$334,606,299	$0	$0	$0	$0
Data Center/High Tech	$0	$632,491,200	$0	$0	$0	$0	$0	$0	$0	$0
Transload/Switching	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Retail	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Appraised Value	**$0**	**$632,491,200**	**$76,004,867**	**$76,004,867**	**$76,004,992**	**$334,606,299**	**$196,436,619**	**$392,873,238**	**$196,436,494**	**$645,580,029**
Cumulative Appraised Value										
Distribution/Light Industria	$241,651,111	$241,651,111	$317,655,978	$393,660,845	$469,665,837	$469,665,837	$666,102,456	$1,058,975,694	$1,255,412,188	$1,900,992,218
Manufacturing	$658,434,171	$658,434,171	$658,434,171	$658,434,171	$658,434,171	$993,040,470	$993,040,470	$993,040,470	$993,040,470	$993,040,470
Data Center/High Tech	$1,161,134,400	$1,793,625,600	$1,793,625,600	$1,793,625,600	$1,793,625,600	$1,793,625,600	$1,793,625,600	$1,793,625,600	$1,793,625,600	$1,793,625,600
Transload/Switching	$674,309	$674,309	$674,309	$674,309	$674,309	$674,309	$674,309	$674,309	$674,309	$674,309
Retail	$45,018,534	$45,018,534	$45,018,534	$45,018,534	$45,018,534	$45,018,534	$45,018,534	$45,018,534	$45,018,534	$45,018,534
Total Appraised Value	**$2,106,912,526**	**$2,739,403,726**	**$2,815,408,593**	**$2,891,413,460**	**$2,967,418,451**	**$3,302,024,751**	**$3,498,461,370**	**$3,891,334,608**	**$4,087,771,102**	**$4,733,351,132**

Source: Mark IV Capital; CoStar; EPS.

Note: There is a one year lag between vertical construction and value added to the County tax roll, which accounts for assessment and tax collection.

[1] Based on gross building sq. ft. shown in Table A-3 and appraised values per square foot by land use shown in Table A-2.

Table A-7
Victory Master Planned Area
Fiscal Impact Analysis
Annual and Cumulative Appraised Values Incl. Net Building Appreciation (2022$)

Item	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Annual Appraised Value - Land [1]	*10% of total*										
Distribution/Light Industrial	$190,099,222	$0	$0	$0	$0	$12,082,562	$12,082,549	$0	$0	$0	$0
Manufacturing	$99,304,047	$0	$0	$0	$0	$16,437,485	$12,351,483	$12,351,483	$12,351,483	$12,351,483	$0
Data Center/High Tech	$179,362,560	$0	$0	$0	$0	$116,113,440	$0	$0	$0	$0	$0
Transload/Switching	$67,431	$0	$0	$0	$67,431	$0	$0	$0	$0	$0	$0
Retail	$4,501,853	$0	$0	$0	$2,347,855	$0	$0	$0	$2,153,998	$0	$0
Total Appraised Value	**$473,335,113**	**$0**	**$0**	**$0**	**$2,415,286**	**$144,633,487**	**$24,434,032**	**$12,351,483**	**$14,505,482**	**$12,351,483**	**$0**
Annual Appraised Value - Improvements [1]	*90% of total*										
Distribution/Light Industrial	$1,710,892,996	$0	$0	$0	$0	$108,743,056	$108,742,944	$0	$0	$0	$0
Manufacturing	$893,736,423	$0	$0	$0	$0	$147,937,364	$111,163,348	$111,163,348	$111,163,348	$111,163,348	$0
Data Center/High Tech	$1,614,263,040	$0	$0	$0	$0	$1,045,020,960	$0	$0	$0	$0	$0
Transload/Switching	$606,878	$0	$0	$0	$606,878	$0	$0	$0	$0	$0	$0
Retail	$40,516,681	$0	$0	$0	$21,130,695	$0	$0	$0	$19,385,986	$0	$0
Total Appraised Value	**$4,260,016,018**	**$0**	**$0**	**$0**	**$21,737,573**	**$1,301,701,380**	**$219,906,292**	**$111,163,348**	**$130,549,334**	**$111,163,348**	**$0**
Total Appraised Value (Land + Improvements)	**$4,733,351,132**	**$0**	**$0**	**$0**	**$24,152,859**	**$1,446,334,867**	**$244,340,324**	**$123,514,831**	**$145,054,815**	**$123,514,831**	**$0**
Cumulative Appraised Value - Land											
Distribution/Light Industrial	$190,099,222	$0	$0	$0	$0	$12,082,562	$24,165,111	$24,165,111	$24,165,111	$24,165,111	$24,165,111
Manufacturing	$99,304,047	$0	$0	$0	$0	$16,437,485	$28,788,968	$41,140,451	$53,491,934	$65,843,417	$65,843,417
Data Center/High Tech	$179,362,560	$0	$0	$0	$0	$116,113,440	$116,113,440	$116,113,440	$116,113,440	$116,113,440	$116,113,440
Transload/Switching	$67,431	$0	$0	$0	$67,431	$67,431	$67,431	$67,431	$67,431	$67,431	$67,431
Retail	$4,501,853	$0	$0	$0	$2,347,855	$2,347,855	$2,347,855	$2,347,855	$4,501,853	$4,501,853	$4,501,853
Total Appraised Value	**$473,335,113**	**$0**	**$0**	**$0**	**$2,415,286**	**$147,048,773**	**$171,482,805**	**$183,834,288**	**$198,339,770**	**$210,691,253**	**$210,691,253**
Cumulative Appraised Value - Improvements Incl. Net Appreciation [2] [3]											
Distribution/Light Industrial	$2,345,831,100	$0	$0	$0	$0	$117,393,831	$237,562,944	$238,589,434	$239,620,359	$240,655,738	$241,695,591
Manufacturing	$1,110,137,166	$0	$0	$0	$0	$159,706,142	$282,721,520	$408,631,874	$537,495,377	$669,371,334	$672,263,631
Data Center/High Tech	$1,930,801,226	$0	$0	$0	$0	$1,128,154,925	$1,133,029,587	$1,137,925,312	$1,142,842,191	$1,147,780,316	$1,152,739,778
Transload/Switching	$688,643	$0	$0	$0	$642,738	$645,516	$648,305	$651,106	$653,920	$656,745	$659,583
Retail	$47,319,465	$0	$0	$0	$22,379,305	$22,476,004	$22,573,121	$22,670,657	$44,933,447	$45,127,601	$45,322,593
Total Appraised Value	**$5,434,777,601**	**$0**	**$0**	**$0**	**$23,022,043**	**$1,428,376,418**	**$1,676,535,477**	**$1,808,468,384**	**$1,965,545,293**	**$2,103,591,734**	**$2,112,681,176**
Cumulative Total Appraised Value - Land + Impr. Incl. Net Appreciation											
Distribution/Light Industrial	$2,535,930,322	$0	$0	$0	$0	$129,476,393	$261,728,056	$262,754,545	$263,785,470	$264,820,849	$265,860,702
Manufacturing	$1,209,441,213	$0	$0	$0	$0	$176,143,627	$311,510,488	$449,772,325	$590,987,311	$735,214,751	$738,107,048
Data Center/High Tech	$2,110,163,786	$0	$0	$0	$0	$1,244,268,365	$1,249,143,027	$1,254,038,752	$1,258,955,631	$1,263,893,756	$1,268,853,218
Transload/Switching	$756,074	$0	$0	$0	$710,169	$712,947	$715,736	$718,537	$721,350	$724,176	$727,014
Retail	$51,821,318	$0	$0	$0	$24,727,160	$24,823,859	$24,920,976	$25,018,512	$49,435,301	$49,629,454	$49,824,447
Total Appraised Value	**$5,908,112,714**	**$0**	**$0**	**$0**	**$25,437,329**	**$1,575,425,190**	**$1,848,018,282**	**$1,992,302,672**	**$2,163,885,063**	**$2,314,282,987**	**$2,323,372,429**

Source: Lyon County; Nevada Department of Taxation; International Code Council; EPS.

[1] The proportion of land to improvement value as a percentage of total appraised value is a generalized estimate based on an evaluation of Lyon County assessor records for similar land uses. Actual proportions may vary from these estimates.
[2] Appraised values for improvements have been escalated by 1.9% annually to account for annual growth of ICC Building Values, adjusted for inflation. For details on the annual escalation rate, refer to Table A-1.
[3] Beginning the year following development, appraised values of improvements are assumed to depreciate at a rate of 1.50% annually. Refer to Table A-1 for details.

Table A-7
Victory Master Planned Area
Fiscal Impact Analysis
Annual and Cumulative Appraised Values Incl. Net Building Appreciation (2022$)

Item	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Year	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Annual Appraised Value - Land [1]										
Distribution/Light Industrial	$0	$0	$7,600,487	$7,600,487	$7,600,499	$0	$19,643,662	$39,287,324	$19,643,649	$64,558,003
Manufacturing	$0	$0	$0	$0	$0	$33,460,630	$0	$0	$0	$0
Data Center/High Tech	$0	$63,249,120	$0	$0	$0	$0	$0	$0	$0	$0
Transload/Switching	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Retail	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Appraised Value	**$0**	**$63,249,120**	**$7,600,487**	**$7,600,487**	**$7,600,499**	**$33,460,630**	**$19,643,662**	**$39,287,324**	**$19,643,649**	**$64,558,003**
Annual Appraised Value - Improvements [1]										
Distribution/Light Industrial	$0	$0	$68,404,380	$68,404,380	$68,404,492	$0	$176,792,957	$353,585,914	$176,792,845	$581,022,026
Manufacturing	$0	$0	$0	$0	$0	$301,145,669	$0	$0	$0	$0
Data Center/High Tech	$0	$569,242,080	$0	$0	$0	$0	$0	$0	$0	$0
Transload/Switching	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Retail	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Appraised Value	**$0**	**$569,242,080**	**$68,404,380**	**$68,404,380**	**$68,404,492**	**$301,145,669**	**$176,792,957**	**$353,585,914**	**$176,792,845**	**$581,022,026**
Total Appraised Value (Land + Impr.)	**$0**	**$632,491,200**	**$76,004,867**	**$76,004,867**	**$76,004,992**	**$334,606,299**	**$196,436,619**	**$392,873,238**	**$196,436,494**	**$645,580,029**
Cumulative Appraised Value - Land										
Distribution/Light Industrial	$24,165,111	$24,165,111	$31,765,598	$39,366,085	$46,966,584	$46,966,584	$66,610,246	$105,897,569	$125,541,219	$190,099,222
Manufacturing	$65,843,417	$65,843,417	$65,843,417	$65,843,417	$65,843,417	$99,304,047	$99,304,047	$99,304,047	$99,304,047	$99,304,047
Data Center/High Tech	$116,113,440	$179,362,560	$179,362,560	$179,362,560	$179,362,560	$179,362,560	$179,362,560	$179,362,560	$179,362,560	$179,362,560
Transload/Switching	$67,431	$67,431	$67,431	$67,431	$67,431	$67,431	$67,431	$67,431	$67,431	$67,431
Retail	$4,501,853	$4,501,853	$4,501,853	$4,501,853	$4,501,853	$4,501,853	$4,501,853	$4,501,853	$4,501,853	$4,501,853
Total Appraised Value	**$210,691,253**	**$273,940,373**	**$281,540,859**	**$289,141,346**	**$296,741,845**	**$330,202,475**	**$349,846,137**	**$389,133,461**	**$408,777,110**	**$473,335,113**
Cumulative Appraised Value - Improvements Incl. Net Appreciation [2] [3]										
Distribution/Light Industrial	$242,739,937	$243,788,796	$330,904,921	$420,060,278	$511,295,953	$513,505,220	$755,850,443	$1,248,648,156	$1,503,538,275	$2,345,831,100
Manufacturing	$675,168,426	$678,085,771	$681,015,723	$683,958,334	$686,913,660	$1,091,155,419	$1,095,870,210	$1,100,605,372	$1,105,360,995	$1,110,137,166
Data Center/High Tech	$1,157,720,669	$1,865,337,874	$1,873,397,842	$1,881,492,635	$1,889,622,406	$1,897,787,305	$1,905,987,483	$1,914,223,094	$1,922,494,291	$1,930,801,226
Transload/Switching	$662,433	$665,295	$668,170	$671,057	$673,956	$676,869	$679,793	$682,731	$685,681	$688,643
Retail	$45,518,428	$45,715,110	$45,912,641	$46,111,026	$46,310,267	$46,510,370	$46,711,337	$46,913,173	$47,115,881	$47,319,465
Total Appraised Value	**$2,121,809,893**	**$2,833,592,846**	**$2,931,899,296**	**$3,032,293,330**	**$3,134,816,243**	**$3,549,635,182**	**$3,805,099,267**	**$4,311,072,526**	**$4,579,195,122**	**$5,434,777,601**
Cumulative Total Appraised Value - Land + Impr. Incl. Net Appreciation										
Distribution/Light Industrial	$266,905,048	$267,953,907	$362,670,519	$459,426,363	$558,262,537	$560,471,803	$822,460,689	$1,354,545,725	$1,629,079,494	$2,535,930,322
Manufacturing	$741,011,843	$743,929,189	$746,859,140	$749,801,751	$752,757,077	$1,190,459,466	$1,195,174,257	$1,199,909,419	$1,204,665,042	$1,209,441,213
Data Center/High Tech	$1,273,834,109	$2,044,700,434	$2,052,760,402	$2,060,855,195	$2,068,984,966	$2,077,149,865	$2,085,350,043	$2,093,585,654	$2,101,856,851	$2,110,163,786
Transload/Switching	$729,864	$732,726	$735,601	$738,488	$741,387	$744,299	$747,224	$750,162	$753,112	$756,074
Retail	$50,020,282	$50,216,963	$50,414,494	$50,612,879	$50,812,121	$51,012,224	$51,213,191	$51,415,027	$51,617,735	$51,821,318
Total Appraised Value	**$2,332,501,146**	**$3,107,533,219**	**$3,213,440,155**	**$3,321,434,676**	**$3,431,558,088**	**$3,879,837,657**	**$4,154,945,404**	**$4,700,205,987**	**$4,987,972,232**	**$5,908,112,714**

Source: Lyon County; Nevada Department of Taxation; EPS.

[1] The proportion of land to improvement value as a percentage of total appraised value is a generalized estimate based on an evaluation of Lyon County assessor records for similar land uses. Actual proportions may vary from these estimates.
[2] Appraised values for improvements have been escalated by 1.9% annually to account for annual growth of ICC Building Values, adjusted for inflation. For details on the annual escalation rate, refer to Table A-1.
[3] Beginning the year following development, appraised values of improvements are assumed to depreciate at a rate of 1.50% annually. Refer to Table A-1 for details.

Table A-8
Victory Master Planned Area
Fiscal Impact Analysis
Cumulative Assessed Value (2022$)

Item	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Cumulative Assessed Value [1]											
Distribution/Light Industria	$887,575,613	$0	$0	$0	$0	$45,316,738	$91,604,819	$91,964,091	$92,324,914	$92,687,297	$93,051,246
Manufacturing	$423,304,425	$0	$0	$0	$0	$61,650,269	$109,028,671	$157,420,314	$206,845,559	$257,325,163	$258,337,467
Data Center/High Tech	$738,557,325	$0	$0	$0	$0	$435,493,928	$437,200,059	$438,913,563	$440,634,471	$442,362,815	$444,098,626
Transload/Switching	$264,626	$0	$0	$0	$248,559	$249,531	$250,508	$251,488	$252,473	$253,462	$254,455
Retail	$18,137,461	$0	$0	$0	$8,654,506	$8,688,351	$8,722,341	$8,756,479	$17,302,355	$17,370,309	$17,438,556
Total Appraised Value	**$2,067,839,450**	**$0**	**$0**	**$0**	**$8,903,065**	**$551,398,817**	**$646,806,399**	**$697,305,935**	**$757,359,772**	**$809,999,045**	**$813,180,350**

Source: Nevada Department of Taxation; EPS.

[1] Annual assessed value used to estimate property tax revenue based on Nevada State law which requires all property be assessed at 35 percent of its taxable replacement value. This analysis assumes this value is equal to the total escalated appraised value shown in Table A-7.

Table A-8
Victory Master Planned Area
Fiscal Impact Analysis
Cumulative Assessed Value (2022$)

Item	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Year	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Cumulative Assessed Value [1]										
Distribution/Light Industria	$93,416,767	$93,783,868	$126,934,682	$160,799,227	$195,391,888	$196,165,131	$287,861,241	$474,091,004	$570,177,823	$887,575,613
Manufacturing	$259,354,145	$260,375,216	$261,400,699	$262,430,613	$263,464,977	$416,660,813	$418,310,990	$419,968,297	$421,632,765	$423,304,425
Data Center/High Tech	$445,841,938	$715,645,152	$718,466,141	$721,299,318	$724,144,738	$727,002,453	$729,872,515	$732,754,979	$735,649,898	$738,557,325
Transload/Switching	$255,452	$256,454	$257,460	$258,471	$259,486	$260,505	$261,528	$262,557	$263,589	$264,626
Retail	$17,507,099	$17,575,937	$17,645,073	$17,714,508	$17,784,242	$17,854,278	$17,924,617	$17,995,259	$18,066,207	$18,137,461
Total Appraised Value	**$816,375,401**	**$1,087,636,627**	**$1,124,704,054**	**$1,162,502,137**	**$1,201,045,331**	**$1,357,943,180**	**$1,454,230,891**	**$1,645,072,095**	**$1,745,790,281**	**$2,067,839,450**

Source: Nevada Department of Taxation; EPS.

[1] Annual assessed value used to estimate property tax revenue based on Nevada State law which requires all property be assessed at 35 percent of its taxable replacement value. This analysis assumes this value is equal to the total escalated appraised value shown in Table A-7.

APPENDIX B:

Revenue Estimating Tables

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Table B-6	Annual Building Permit and Plan Check Fee Revenue Case Study (2 pages)	B-8

Table B-1
Victory Master Planned Area
Fiscal Impact Analysis
Revenue Estimating Procedures (2022$)

Item	Estimating Procedure	Case Study Reference	FY 2022-23 Final Budget Revenues	Percent of Total	Service Population [1]	Revenue Multiplier
General Fund						
Property Taxes	Case Study	Table B-5	$3,933,950	28.2%	-	-
Property Taxes-Delinquent	NA [2]	-	$20,000	0.1%	-	-
Business License Fees	Employee Multiplier	-	$825,000	5.9%	4,816	$171.30
Franchise Fees	Persons Served Multiplier	-	$1,540,000	11.0%	25,801	$59.69
Liquor License Fees	NA [2]	-	$38,000	0.3%	-	-
Gaming License Fees	NA [2]	-	$120,000	0.9%	-	-
Licenses-Animal	NA [2]	-	$6,500	0.0%	-	-
Passport Fees	NA [2]	-	$10,500	0.1%	-	-
Building and Civil Permit Fees	Case Study [3]	Table B-6	$933,052	6.7%	-	-
Permit Processing Fee	NA [2]	-	$0	0.0%	-	-
Planning and Zoning Fees	Case Study [3]	Table B-6	$310,000	2.2%	-	-
Public Works/Civil Fees	NA [2]	-	$135,000	1.0%	-	-
PublicWorks/Civil Inspect Fees	NA [2]	-	$90,000	0.6%	-	-
Other Fees (eg. Copies etc)	NA [2]	-	$400	0.0%	-	-
Consolidated Tax (CTX)	Persons Served Multiplier	-	$240,870	1.7%	25,801	$9.34
Motor Veh Fuel Tax (Gas Tax)	Persons Served Multiplier	-	$413,119	3.0%	25,801	$16.01
RTC Shared Revenue	Persons Served Multiplier	-	$4,578,000	32.8%	25,801	$177.43
County Parks Agreement	NA [2]	-	$60,000	0.4%	-	-
County Roads	Persons Served Multiplier	-	$180,000	1.3%	25,801	$6.98
Administration Fees	NA [2]	-	$2,500	0.0%	-	-
Marijuana Sales Tax	NA [2]	-	$21,500	0.2%	-	-
Penalties/Fines Municipal Court	Persons Served Multiplier	-	$200,000	1.4%	25,801	$7.75
Community Service Fee	NA [2]	-	$1,000	0.0%	-	-
Muni Court Misc Fees	NA [2]	-	$600	0.0%	-	-
Interest Earnings	Persons Served Multiplier	-	$10,000	0.1%	-	-
Cemetery Burial/Cremation Fee	NA [2]	-	$4,000	0.0%	25,801	$0.16
Cemetery Plot Fees	NA [2]	-	$0	0.0%	-	-
Donation-City Sponsored Events	NA [2]	-	$1,500	0.0%	-	-
Miscellaneous Revenue	NA [2]	-	$45,000	0.3%	-	-
Credit Card Fee - Gen Svcs	NA [2]	-	$13,745	0.1%	-	-
Sale of Assets	NA [2]	-	$0	0.0%	-	-
Total General			**$13,734,236**	**98.5%**		
Parks Facilities Fund [4]						
Interest Earnings	NA	-	$250	0.0%	-	-
Park Rental Fees	NA	-	$7,500	0.1%	-	-
Facility Rental Fees	NA	-	$5,000	0.0%	-	-
Total Parks Facilities			**$12,750**	**0.1%**		
Res. Construction Tax Fund [4]						
Residential Construction Tax	NA	-	$200,000	1.4%	-	-
Interest Earnings	NA	-	$1,000	0.0%	-	-
Total RCT			**$201,000**	**1.4%**		
Total General Fund Revenues			**$13,947,986**	**100.0%**		

Source: City of Fernley FY 2022-2023 Final Budget; EPS.

[1] Refer to Table A-1 for details.
[2] Based on information provided in the City budget, It is not anticipated that the Project will generate revenues for this category.
[3] Reflects one-time fee revenues generated by Project development permitting. It is assumed that one-time fee revenues will be mostly or entirely offset by direct expenditures related to reviewing and processing permits for Project development. One-time fee revenues have been estimated for reference but are excluded from net fiscal impact totals.
[4] While labeled a fund, this revenue category does not meet the definition of a fund and is included in the City's General Fund. Based on the nonresidential land uses in the project, proposed development is not anticipated to generate revenues for this category.

Table B-2
Victory Master Planned Area
Fiscal Impact Analysis
Annual Estimated Project Revenues Summary (2022$)

Item	Annual Revenues at End of Period [1]	
	Initial Years	**Buildout**
	FY 2031-32	*FY 2041-42*
Annual General Fund Revenues		
Property Taxes	$5,476,770	$13,926,899
Business License Fees	$1,257,451	$2,845,510
Franchise Fees	$219,067	$495,732
Consolidated Tax (CTX)	$34,264	$77,537
Motor Vehicle Fuel Tax (Gas Tax)	$58,767	$132,985
RTC Shared Revenue	$651,228	$1,473,675
County Roads	$25,605	$57,943
Penalties/Fines Municipal Court	$28,450	$64,381
Interest Earnings	$569	$1,288
Total Annual General Fund Revenues	**$7,752,172**	**$19,075,948**
Total General Fund Annual Revenues	**$7,752,172**	**$19,075,948**

Source: Mark IV Capital; EPS.

[1] Annual revenues include recurring revenues only. In addition to the recurring revenues shown here, the Project will generate building and permit fee revenues over the Project's buildout. Refer to Table B-6 for an estimate of one-time permit and plan check fee revenues.

Table B-3
Victory Master Planned Area
Fiscal Impact Analysis
Cumulative Estimated Project Revenues Summary (2022$)

Item	Cumulative Revenues by Period Initial Years *FY 22-23 through FY 31-32*	 Buildout *FY 22-23 through FY 41-42*
Cumulative General Fund Revenues		
Property Taxes	$28,799,799	$120,821,043
Business License Fees	$7,604,337	$28,360,413
Franchise Fees	$1,324,793	$4,940,823
Consolidated Tax (CTX)	$207,210	$772,790
Motor Vehicle Fuel Tax (Gas Tax)	$355,388	$1,325,421
RTC Shared Revenue	$3,938,249	$14,687,718
County Roads	$154,846	$577,499
Penalties/Fines Municipal Court	$172,051	$641,665
Interest Earnings	$3,441	$12,833
Total Cumulative General Fund Revenues	**$42,560,113**	**$172,140,203**
Cumulative One-Time Fee Revenues		
Building and Civil Permit Fees	$7,328,674	$18,554,893
Planning and Zoning Fees	$4,763,638	$12,060,681
Subtotal Cumulative One-Time Fee Revenues	**$12,092,312**	**$30,615,574**

Source: Mark IV Capital; EPS.

Table B-4
Victory Master Planned Area
Fiscal Impact Analysis
Annual Estimated Project Revenues by Fiscal Year (2022$)

Item	Estimated Annual Revenues (2022$)										
	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Annual General Fund Revenues											
Property Taxes	$120,821,043	$0	$0	$0	$600	$3,713,671	$4,356,241	$4,696,355	$5,100,818	$5,455,344	$5,476,770
Business License Fees	$28,360,413	$0	$0	$45,984	$721,936	$903,306	$1,007,923	$1,152,834	$1,257,451	$1,257,451	$1,257,451
Franchise Fees	$4,940,823	$0	$0	$8,011	$125,772	$157,370	$175,596	$200,842	$219,067	$219,067	$219,067
Consolidated Tax (CTX)	$772,790	$0	$0	$1,253	$19,672	$24,614	$27,465	$31,413	$34,264	$34,264	$34,264
Motor Vehicle Fuel Tax (Gas Tax)	$1,325,421	$0	$0	$2,149	$33,740	$42,216	$47,105	$53,878	$58,767	$58,767	$58,767
RTC Shared Revenue	$14,687,718	$0	$0	$23,815	$373,887	$467,818	$521,998	$597,047	$651,228	$651,228	$651,228
County Roads	$577,499	$0	$0	$936	$14,701	$18,394	$20,524	$23,475	$25,605	$25,605	$25,605
Penalties/Fines Municipal Cour	$641,665	$0	$0	$1,040	$16,334	$20,438	$22,805	$26,083	$28,450	$28,450	$28,450
Interest Earnings	$12,833	$0	$0	$21	$327	$409	$456	$522	$569	$569	$569
Total Annual General Fund Revenues	**$172,140,203**	**$0**	**$0**	**$83,210**	**$1,306,967**	**$5,348,235**	**$6,180,113**	**$6,782,450**	**$7,376,220**	**$7,730,746**	**$7,752,172**

Source: Mark IV Capital; EPS.

Table B-4
Victory Master Planned Area
Fiscal Impact Analysis
Annual Estimated Project Revenues (2022$)

Item	Estimated Annual Revenues (2022$)									
	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Year	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Annual General Fund Revenues										
Property Taxes	$5,498,288	$7,325,233	$7,574,882	$7,829,452	$8,089,040	$9,145,747	$9,794,245	$11,079,561	$11,757,898	$13,926,899
Business License Fees	$1,508,007	$1,556,288	$1,604,570	$1,652,852	$1,936,263	$2,061,049	$2,310,621	$2,435,406	$2,845,510	$2,845,510
Franchise Fees	$262,718	$271,130	$279,541	$287,952	$337,327	$359,067	$402,546	$424,285	$495,732	$495,732
Consolidated Tax (CTX)	$41,091	$42,407	$43,723	$45,038	$52,761	$56,161	$62,962	$66,362	$77,537	$77,537
Motor Vehicle Fuel Tax (Gas Tax)	$70,477	$72,733	$74,989	$77,246	$90,491	$96,323	$107,987	$113,818	$132,985	$132,985
RTC Shared Revenue	$780,989	$805,994	$830,999	$856,004	$1,002,781	$1,067,407	$1,196,659	$1,261,285	$1,473,675	$1,473,675
County Roads	$30,707	$31,690	$32,674	$33,657	$39,428	$41,969	$47,051	$49,592	$57,943	$57,943
Penalties/Fines Municipal Cour	$34,119	$35,212	$36,304	$37,396	$43,809	$46,632	$52,279	$55,102	$64,381	$64,381
Interest Earnings	$682	$704	$726	$748	$876	$933	$1,046	$1,102	$1,288	$1,288
Total Annual General Fund Revenues	**$8,227,079**	**$10,141,391**	**$10,478,408**	**$10,820,346**	**$11,592,776**	**$12,875,287**	**$13,975,394**	**$15,486,514**	**$16,906,947**	**$19,075,948**

Source: Mark IV Capital; EPS.

Table B-5
Victory Master Planned Area
Fiscal Impact Analysis
Annual Estimated Project Property Tax Revenue by Fiscal Year Case Study (2022$)

Item	Assumptions / Source	Estimated Property Tax Revenues (2022$)									
		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Estimated Annual Property Tax Revenue											
Estimated Cumulative Assessed Value [1]	**Table A-8**	**$0**	**$0**	**$0**	**$8,903,065**	**$551,398,817**	**$646,806,399**	**$697,305,935**	**$757,359,772**	**$809,999,045**	**$813,180,350**
Mill Levy Rate per $100 of Assessed Value											
Fernley General Fund	**0.6735%**	**$0**	**$0**	**$0**	**$600**	**$3,713,671**	**$4,356,241**	**$4,696,355**	**$5,100,818**	**$5,455,344**	**$5,476,770**
North Lyon Fire District	0.3055%	$0	$0	$0	$272	$1,684,523	$1,975,994	$2,130,270	$2,313,734	$2,474,547	$2,484,266
Total Property Tax Levy	**0.9790%**	**$0**	**$0**	**$0**	**$872**	**$5,398,194**	**$6,332,235**	**$6,826,625**	**$7,414,552**	**$7,929,891**	**$7,961,036**

Source: Mark IV Capital; EPS.

[1] Estimated Annual Assessed Value includes the value of land, and net appreciated values of real and personal property.

Table B-5
Victory Master Planned Area
Fiscal Impact Analysis
Annual Estimated Project Property Tax Revenue by Fiscal Year Case Study (2022$)

Item	Estimated Property Tax Revenues (2022$)									
	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Year	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Estimated Annual Property Tax Revenue										
Estimated Cumulative Assessed Value [1]	**$816,375,401**	**$1,087,636,627**	**$1,124,704,054**	**$1,162,502,137**	**$1,201,045,331**	**$1,357,943,180**	**$1,454,230,891**	**$1,645,072,095**	**$1,745,790,281**	**$2,067,839,450**
Mill Levy Rate per $100 of Assessed Value										
Fernley General Fund	**$5,498,288**	**$7,325,233**	**$7,574,882**	**$7,829,452**	**$8,089,040**	**$9,145,747**	**$9,794,245**	**$11,079,561**	**$11,757,898**	**$13,926,899**
North Lyon Fire District	$2,494,027	$3,322,730	$3,435,971	$3,551,444	$3,669,193	$4,148,516	$4,442,675	$5,025,695	$5,333,389	$6,317,250
Total Property Tax Levy	**$7,992,315**	**$10,647,963**	**$11,010,853**	**$11,380,896**	**$11,758,234**	**$13,294,264**	**$14,236,920**	**$16,105,256**	**$17,091,287**	**$20,244,148**

Source: Mark IV Capital; EPS.

[1] Estimated Annual Assessed Value includes the value of land, and net appreciated values of real and personal property.

Table B-6
Victory Master Planned Area
Fiscal Impact Analysis
Annual Building Permit and Plan Check Fee Revenue Case Study (2022$

Item	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Annual Building Permit Value [1]											
Distribution/Light Industrial	$2,523,699,528	$0	$0	$0	$127,965,186	$130,437,456	$0	$0	$0	$0	$0
Manufacturing	$1,160,516,829	$0	$0	$0	$174,087,734	$133,340,737	$135,917,002	$138,543,043	$141,219,821	$0	$0
Data Center/High Tech	$1,995,631,154	$0	$0	$0	$1,229,745,660	$0	$0	$0	$0	$0	$0
Transload/Switching	$700,617	$0	$0	$700,617	$0	$0	$0	$0	$0	$0	$0
Retail	$48,555,351	$0	$0	$24,394,569	$0	$0	$0	$24,160,783	$0	$0	$0
Total Building Permit Value	**$5,729,103,479**	**$0**	**$0**	**$25,095,186**	**$1,531,798,580**	**$263,778,192**	**$135,917,002**	**$162,703,825**	**$141,219,821**	**$0**	**$0**
Building Permit Fees [2]											
Distribution/Light Industria	$8,174,220	$0	$0	$0	$415,847	$423,832	$0	$0	$0	$0	$0
Manufacturing	$3,763,583	$0	$0	$0	$564,822	$433,210	$441,531	$450,013	$458,659	$0	$0
Data Center/High Tech	$6,450,927	$0	$0	$0	$3,974,597	$0	$0	$0	$0	$0	$0
Transload/Switching	$4,292	$0	$0	$4,292	$0	$0	$0	$0	$0	$0	$0
Retail	$161,872	$0	$0	$81,313	$0	$0	$0	$80,558	$0	$0	$0
Total Building Permit Fees	**$18,554,893**	**$0**	**$0**	**$85,605**	**$4,955,266**	**$857,042**	**$441,531**	**$530,571**	**$458,659**	**$0**	**$0**
Plan Check Fees [3]											
Distribution/Light Industria	$5,313,243	$0	$0	$0	$270,300	$275,491	$0	$0	$0	$0	$0
Manufacturing	$2,446,329	$0	$0	$0	$367,135	$281,586	$286,995	$292,508	$298,128	$0	$0
Data Center/High Tech	$4,193,102	$0	$0	$0	$2,583,488	$0	$0	$0	$0	$0	$0
Transload/Switching	$2,790	$0	$0	$2,790	$0	$0	$0	$0	$0	$0	$0
Retail	$105,217	$0	$0	$52,854	$0	$0	$0	$52,363	$0	$0	$0
Total Plan Check Fees	**$12,060,681**	**$0**	**$0**	**$55,643**	**$3,220,923**	**$557,077**	**$286,995**	**$344,871**	**$298,128**	**$0**	**$0**
Total One-Time Fee Revenue	**$30,615,574**	**$0**	**$0**	**$141,248**	**$8,176,189**	**$1,414,118**	**$728,526**	**$875,443**	**$756,787**	**$0**	**$0**

Source: Mark IV Capital; EPS.

[1] Based on guidance provided by the Project Applicant, It is assumed that each new value entry for each land use represents development of a separate building. Building permit value year is estimated based on the assessed value per square foot assumptions shown on Table A-2 escalated by 1.93% annually to account for the average annual growth in ICC Building Valuation Data, adjusted for inflation and is assumed to be created in the year of development with no lag year.
[2] Based on the posted Building Permit Fee Schedule, Building permit fees are estimated based on the Building Valuation Data published by the International Code Council, titled "Square Foot Construction Costs."
[3] Based on the posted City's Building Permit Fee Schedule, Plan Check Fees are estimated as 65% of total building permit fees.

Table B-6
Victory Master Planned Area
Fiscal Impact Analysis
Annual Building Permit and Plan Check Fees (2022$)

Item	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Year	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Annual Building Permit Value [1]										
Distribution/Light Industrial	$0	$93,812,713	$95,625,260	$97,472,988	$0	$261,749,876	$533,614,247	$271,961,909	$911,059,893	$0
Manufacturing	$0	$0	$0	$0	$437,408,493	$0	$0	$0	$0	$0
Data Center/High Tech	$765,885,493	$0	$0	$0	$0	$0	$0	$0	$0	$0
Transload/Switching	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Retail	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Building Permit Value	**$765,885,493**	**$93,812,713**	**$95,625,260**	**$97,472,988**	**$437,408,493**	**$261,749,876**	**$533,614,247**	**$271,961,909**	**$911,059,893**	**$0**
Building Permit Fees [2]										
Distribution/Light Industria	$0	$305,534	$311,389	$317,357	$0	$847,971	$1,726,093	$880,956	$2,945,242	$0
Manufacturing	$0	$0	$0	$0	$1,415,348	$0	$0	$0	$0	$0
Data Center/High Tech	$2,476,329	$0	$0	$0	$0	$0	$0	$0	$0	$0
Transload/Switching	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Retail	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Building Permit Fees	**$2,476,329**	**$305,534**	**$311,389**	**$317,357**	**$1,415,348**	**$847,971**	**$1,726,093**	**$880,956**	**$2,945,242**	**$0**
Plan Check Fees [3]										
Distribution/Light Industria	$0	$198,597	$202,403	$206,282	$0	$551,181	$1,121,960	$572,621	$1,914,408	$0
Manufacturing	$0	$0	$0	$0	$919,976	$0	$0	$0	$0	$0
Data Center/High Tech	$1,609,614	$0	$0	$0	$0	$0	$0	$0	$0	$0
Transload/Switching	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Retail	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Plan Check Fees	**$1,609,614**	**$198,597**	**$202,403**	**$206,282**	**$919,976**	**$551,181**	**$1,121,960**	**$572,621**	**$1,914,408**	**$0**
Total One-Time Fee Revenue	**$4,085,943**	**$504,131**	**$513,791**	**$523,639**	**$2,335,325**	**$1,399,152**	**$2,848,053**	**$1,453,577**	**$4,859,650**	**$0**

Source: Mark IV Capital; EPS.

[1] Based on guidance provided by the Project Applicant, It is assumed that each new value entry for each land use represents development of a separate building. Building permit value year is estimated based on the assessed value per square foot assumptions shown on Table A-2 escalated by 1.93% annually to account for the average annual growth in ICC Building Valuation Data, adjusted for inflation and is assumed to be created in the year of development with no lag year.
[2] Based on the posted Building Permit Fee Schedule, Building permit fees are estimated based on the Building Valuation Data published by the International Code Council, titled "Square Foot Construction Costs".
[3] Based on the posted City's Building Permit Fee Schedule, Plan Check Fees are estimated as 65% of total building permit fees.

APPENDIX C:

Expenditure Estimating Tables

Table C-1 Expenditure Estimating Procedures C-1

Table C-2 Annual Estimated Project Expenditures Summary C-2

Table C-3 Cumulative Estimated Project Expenditures Summary C-3

Table C-4 Annual Estimated Project Expenditures by Fiscal Year (2 pages) C-4

Table C-5 Streets and Storm Drains Expenditures Case Study C-6

Table C-1
Victory Master Planned Area
Fiscal Impact Analysis
Expenditure Estimating Procedures (2022$)

Item	Estimating Procedure	Case Study Reference	FY 2022-23 Final Budget Expenditures	Percent of Total	Service Population	Expenditure Multiplier	Variable Cost Adjustment	Net Expenditure Multiplier
General Fund								
Mayor/Council	Persons Served Multiplier	-	$152,456	0.8%	25,801	$5.91	25.0%	$4.43
Office of City Manager	Persons Served Multiplier	-	$687,398	3.6%	25,801	$26.64	25.0%	$19.98
IT	Persons Served Multiplier	-	$176,919	0.9%	25,801	$6.86	25.0%	$5.14
Animal Control	Persons Served Multiplier	-	$104,242	0.5%	25,801	$4.04	25.0%	$3.03
Office of City Attorney	Persons Served Multiplier	-	$669,641	3.5%	25,801	$25.95	25.0%	$19.47
Finance	Persons Served Multiplier	-	$197,754	1.0%	25,801	$7.66	25.0%	$5.75
Contingency	Pct of Subtotal GF Exp.	-	$455,000	2.4%	-	-	-	-
Debt Service	NA	-	-	-	-	-	-	-
City Clerk	Persons Served Multiplier	-	$352,602	1.8%	25,801	$13.67	25.0%	$10.25
Municipal Court	Persons Served Multiplier	-	$557,882	2.9%	25,801	$21.62	25.0%	$16.22
Building & Safety	Persons Served Multiplier	-	$551,122	2.9%	25,801	$21.36	0.0%	$21.36
Planning	Persons Served Multiplier	-	$859,295	4.5%	25,801	$33.30	0.0%	$33.30
City Engineer	Persons Served Multiplier	-	$674,988	3.5%	25,801	$26.16	0.0%	$26.16
Facilities	Persons Served Multiplier	-	$449,480	2.3%	25,801	$17.42	0.0%	$17.42
Vector Control	Persons Served Multiplier	-	$83,354	0.4%	25,801	$3.23	0.0%	$3.23
Cemetery	Per Resident Multiplier	-	$132,000	0.7%	23,393	$5.64	0.0%	$5.64
Streets & Storm Drains	Case Study	Table C-5	$10,859,493	56.4%	-	-	-	-
Parks	Per Resident Multiplier	-	$1,162,175	6.0%	23,393	$49.68	0.0%	$49.68
Fleet	Persons Served Multiplier	-	$138,702	0.7%	25,801	$5.38	0.0%	$5.38
Total General Fund	-	-	**$18,264,503**	**94.8%**	-	-	-	-
Parks Facilities Fund [1]								
Total Parks Facilities	NA	-	-	-	-	-	-	-
Res. Construction Tax Fund [2]								
Total RCT	NA	-	$1,000,000	5.2%	-	-	-	-
Total General Fund	-	-	**$19,264,503**	**100.0%**	-	-	-	-
Revenues Less Expenditures								
Excess/(Deficit)		-	($5,316,517)	-	-	-	-	-
Funds reserved for streets, parks capital projects or major maintenance		-	$5,318,953	-	-	-	-	-
Revenues less expenditures plus committed fund balance		-	$2,436	-	-	-	-	-

Source: City of Fernley FY 2022-2023 Final Budget; EPS.

[1] The Parks Facilities Fund does not include any current expenditures. Thus, this analysis assumes the Project will not generate any expenditures in this category.
[2] The Fernley City Council adopted the residential construction tax (RCT), which is outlined in Fernley Municipal Code Section 26.02.01. The RCT applies solely to new residential dwelling units, apartment houses, and development of mobile home lots. Because the project does not include residential development, this analysis assumes no expenditures will be incurred.

Table C-2
Victory Master Planned Area
Fiscal Impact Analysis
Annual Estimated Project Expenditures Summary (2022$)

Item	Annual Expenditures at End of Period Initial Years 2032	 Buildout 2042
General Fund Annual Expenditures [1]		
Mayor/Council	$16,265	$36,807
Office of City Manager	$73,338	$165,957
IT	$18,875	$42,713
Animal Control	$11,121	$25,167
Office of City Attorney	$71,443	$161,670
Finance	$21,098	$47,743
City Clerk	$37,619	$85,128
Municipal Court	$59,520	$134,688
Building & Safety	$78,398	$177,408
Planning	$122,236	$276,610
City Engineer	$96,018	$217,281
Facilities	$63,939	$144,689
Vector Control	$11,857	$26,832
Cemetery	$0	$0
Streets & Storm Drains	$1,077,928	$1,077,928
Parks	$0	$0
Fleet	$19,731	$44,649
Subtotal General Fund Annual Expenditures	**$1,779,386**	**$2,665,271**
Contingency (3%) [2]	$53,382	$79,958
Total General Fund Annual Expenditures	**$1,832,768**	**$2,745,229**

Source: Mark IV Capital; EPS.

[1] Pubic safety services are provided the Lyon County Sheriff's Office and North Lyon Fire Protection District through agreements with the City. Based on feedback provided by the City, it is assumed that development of the Project will not result in a change to the funding structure for public safety services. Annual expenditures related to fire and police services are not included in the City General Fund Budget and have not been estimated in this Analysis.

[2] The City budget includes a 2.6 percent contingency on all non-contingency General Fund expenditures based on the maximum contingency level allowed by the State of Nevada of 3 percent. This analysis includes a 3 percent contingency on all costs (excluding the contingency cost), consistent with the State maximum.

Table C-3
Victory Master Planned Area
Fiscal Impact Analysis
Cumulative Estimated Project Expenditures Summary (2022$)

Item	Cumulative Expenditures by Period Initial Years 2023-2032	 Buildout 2023-2042
Cumulative General Fund Expenditures [1]		
Mayor/Council	$98,363	$366,846
Office of City Manager	$443,503	$1,654,048
IT	$114,147	$425,710
Animal Control	$67,256	$250,832
Office of City Attorney	$432,047	$1,611,320
Finance	$127,589	$475,845
City Clerk	$227,496	$848,447
Municipal Court	$359,941	$1,342,401
Building & Safety	$474,106	$1,768,179
Planning	$739,213	$2,756,899
City Engineer	$580,662	$2,165,582
Facilities	$386,668	$1,442,079
Vector Control	$71,706	$267,427
Cemetery	$0	$0
Streets & Storm Drains	$8,347,536	$19,126,812
Parks	$0	$0
Fleet	$119,319	$445,001
Total Cumulative General Fund Expenditures	**$12,589,551**	**$34,947,427**
Contingency (3%) [2]	$377,687	$1,048,423
Total Cumulative General Fund Expenditures	**$12,967,237**	**$35,995,849**

Source: Mark IV Capital; EPS.

[1] Pubic safety services are provided the Lyon County Sheriff's Office and North Lyon Fire Protection District through agreements with the City. Based on feedback provided by the City, it is assumed that development of the Project will not result in a change to the funding structure for public safety services. Annual expenditures related to fire and police services are not included in the City General Fund Budget and have not been estimated in this Analysis.

[2] The City budget includes a 2.6 percent contingency on all non-contingency General Fund expenditures based on the maximum contingency level allowed by the State of Nevada of 3 percent. This analysis includes a 3 percent contingency on all costs (excluding the contingency cost), consistent with the State maximum.

Table C-4
Victory Master Planned Area
Fiscal Impact Analysis
Annual Estimated Project Expenditures by Fiscal Year (2022$)

Item	Estimated Annual Expenditures (2022$)										
	Buildout	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
General Fund Expenditures [1]											
Mayor/Council	$36,807	$0	$0	$595	$9,338	$11,684	$13,038	$14,912	$16,265	$16,265	$16,265
Office of City Manager	$165,957	$0	$0	$2,682	$42,105	$52,683	$58,785	$67,236	$73,338	$73,338	$73,338
IT	$42,713	$0	$0	$690	$10,837	$13,559	$15,130	$17,305	$18,875	$18,875	$18,875
Animal Control	$25,167	$0	$0	$407	$6,385	$7,989	$8,915	$10,196	$11,121	$11,121	$11,121
Office of City Attorney	$161,670	$0	$0	$2,613	$41,017	$51,322	$57,266	$65,499	$71,443	$71,443	$71,443
Finance	$47,743	$0	$0	$772	$12,113	$15,156	$16,911	$19,343	$21,098	$21,098	$21,098
City Clerk	$85,128	$0	$0	$1,376	$21,598	$27,024	$30,154	$34,489	$37,619	$37,619	$37,619
Municipal Court	$134,688	$0	$0	$2,177	$34,172	$42,757	$47,709	$54,568	$59,520	$59,520	$59,520
Building & Safety	$177,408	$0	$0	$2,867	$45,010	$56,318	$62,841	$71,875	$78,398	$78,398	$78,398
Planning	$276,610	$0	$0	$4,470	$70,179	$87,810	$97,980	$112,066	$122,236	$122,236	$122,236
City Engineer	$217,281	$0	$0	$3,511	$55,127	$68,976	$76,964	$88,030	$96,018	$96,018	$96,018
Facilities	$144,689	$0	$0	$2,338	$36,709	$45,932	$51,251	$58,620	$63,939	$63,939	$63,939
Vector Control	$26,832	$0	$0	$434	$6,808	$8,518	$9,504	$10,871	$11,857	$11,857	$11,857
Cemetery	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Streets & Storm Drains	$1,077,928	$0	$0	$939,986	$939,986	$1,077,928	$1,077,928	$1,077,928	$1,077,928	$1,077,928	$1,077,928
Parks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fleet	$44,649	$0	$0	$722	$11,328	$14,174	$15,815	$18,089	$19,731	$19,731	$19,731
Subtotal General Fund Expenditures	**$2,665,271**	**$0**	**$0**	**$965,637**	**$1,342,711**	**$1,581,829**	**$1,640,189**	**$1,721,026**	**$1,779,386**	**$1,779,386**	**$1,779,386**
Contingency (3%) [2]	$79,958	$0	$0	$28,969	$40,281	$47,455	$49,206	$51,631	$53,382	$53,382	$53,382
Total General Fund Expenditures	**$2,745,229**	**$0**	**$0**	**$994,606**	**$1,382,992**	**$1,629,284**	**$1,689,394**	**$1,772,657**	**$1,832,768**	**$1,832,768**	**$1,832,768**

Source: Mark IV Capital; EPS.

[1] Pubic safety services are provided the Lyon County Sheriff's Office and North Lyon Fire Protection District through agreements with the City. Based on feedback provided by the City, it is assumed that development of the Project will not result in a change to the funding structure for public safety services. Annual expenditures related to fire and police services are not included in the City General Fund Budget and have not been estimated in this Analysis.

[2] The City budget includes a 2.6 percent contingency on all non-contingency General Fund expenditures based on the maximum contingency level allowed by the State of Nevada of 3 percent. This analysis includes a 3 percent contingency on all costs (excluding the contingency cost), consistent with the State maximum.

Table C-4
Victory Master Planned Area
Fiscal Impact Analysis
Annual Estimated Project Revenues (2022$)

Item	Estimated Annual Expenditures (2022$)									
	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Year	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
General Fund Expenditures [1]										
Mayor/Council	$19,506	$20,131	$20,755	$21,380	$25,046	$26,660	$29,888	$31,502	$36,807	$36,807
Office of City Manager	$87,951	$90,767	$93,582	$96,398	$112,928	$120,205	$134,761	$142,039	$165,957	$165,957
IT	$22,636	$23,361	$24,086	$24,811	$29,065	$30,938	$34,684	$36,557	$42,713	$42,713
Animal Control	$13,337	$13,764	$14,192	$14,619	$17,125	$18,229	$20,436	$21,540	$25,167	$25,167
Office of City Attorney	$85,679	$88,422	$91,165	$93,908	$110,010	$117,100	$131,280	$138,370	$161,670	$161,670
Finance	$25,302	$26,112	$26,922	$27,732	$32,488	$34,581	$38,769	$40,862	$47,743	$47,743
City Clerk	$45,114	$46,559	$48,003	$49,448	$57,926	$61,660	$69,126	$72,859	$85,128	$85,128
Municipal Court	$71,379	$73,665	$75,950	$78,235	$91,650	$97,557	$109,370	$115,277	$134,688	$134,688
Building & Safety	$94,019	$97,030	$100,040	$103,050	$120,720	$128,500	$144,060	$151,840	$177,408	$177,408
Planning	$146,592	$151,286	$155,979	$160,673	$188,223	$200,353	$224,614	$236,744	$276,610	$276,610
City Engineer	$115,150	$118,837	$122,524	$126,211	$147,852	$157,380	$176,437	$185,966	$217,281	$217,281
Facilities	$76,680	$79,135	$81,590	$84,045	$98,456	$104,801	$117,491	$123,836	$144,689	$144,689
Vector Control	$14,220	$14,675	$15,130	$15,586	$18,258	$19,435	$21,788	$22,965	$26,832	$26,832
Cemetery	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Streets & Storm Drains	$1,077,928	$1,077,928	$1,077,928	$1,077,928	$1,077,928	$1,077,928	$1,077,928	$1,077,928	$1,077,928	$1,077,928
Parks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fleet	$23,662	$24,420	$25,177	$25,935	$30,382	$32,340	$36,256	$38,214	$44,649	$44,649
Subtotal General Fund Expenditures	**$1,919,156**	**$1,946,090**	**$1,973,023**	**$1,999,957**	**$2,158,055**	**$2,227,666**	**$2,366,888**	**$2,436,498**	**$2,665,271**	**$2,665,271**
Contingency (3%) [2]	$57,575	$58,383	$59,191	$59,999	$64,742	$66,830	$71,007	$73,095	$79,958	$79,958
Total General Fund Expenditures	**$1,976,731**	**$2,004,473**	**$2,032,214**	**$2,059,956**	**$2,222,797**	**$2,294,496**	**$2,437,894**	**$2,509,593**	**$2,745,229**	**$2,745,229**

Source: Mark IV Capital; EPS.

[1] Pubic safety services are provided the Lyon County Sheriff's Office and North Lyon Fire Protection District through agreements with the City. Based on feedback provided by the City, it is assumed that development of the Project will not result in a change to the funding structure for public safety services. Annual expenditures related to fire and police services are not included in the City General Fund Budget and have not been estimated in this Analysis.

[2] The City budget includes a 2.6 percent contingency on all non-contingency General Fund expenditures based on the maximum contingency level allowed by the State of Nevada of 3 percent. This analysis includes a 3 percent contingency on all costs (excluding the contingency cost), consistent with the State maximum.

Table C-5
Victory Master Planned Area
Fiscal Impact Analysis
Streets and Storm Drains Expenditures Case Study (2022$)

Streets and Storm Drainage Expenditures

Item	Assumption/ Recurrence	Total Cost Estimate (per Recurrence Interval)	Annual Cost Estimate	Estimated Annual Expenditures (Rounded)
Annual Streets Maintenance Cost [1]				
Slurry/Micro Surface	15 Years	$13.80 per Sq. Yd.	$0.92 per Sq. Yd.	
Pavement Crack Sealing	15 Years	$2.70 per Sq. Yd.	$0.18 per Sq. Yd.	
Corrective Maintenance	21 Years	$22.00 per Sq. Yd.	$1.05 per Sq. Yd.	
Pavement Rehabilitation or Full Depth Reconstruction	33 Years	$76.50 per Sq. Yd.	$2.32 per Sq. Yd.	
Total Annual Street Maintenance Cost			**$4.47 per Sq. Yd.**	
Annual Project Streets Maintenance Cost	*Square Yards*			
Publicly Maintained Roads in Project [2]	199,474			
Total Annual Streets Maintenance Cost				**$891,000**
Annual Storm Drains Cost per Acre-Foot				
FY 2022-23 per Basin Storm Drains Maintenance Costs (Existing Basins) [3	$2,000			
Existing City Storm Basins Acre-Feet [4]	0.69			
Cost per Acre-Foot	**$2,899**			
Planned Basins in Project [4]				
Basin Acre-Feet Developed in 2024	16.90			
Basin Acre-Feet Developed in 2026	47.59			
Total Planned Basin Acre-Feet in Project	**64.49**			
Annual Project Storm Drains Maintenance Cost				
Annual Costs beginning FY 2024-25				$48,986
Annual Costs beginning FY 2026-27				$186,928
Total Annual Streets and Storm Drains Maintenance Costs				
Annual Costs beginning FY 2024-25				**$939,986**
Annual Costs beginning FY 2026-27				**$1,077,928**

Source: Mark IV Capital; Lumos and Associates; California Department of Transportation 2015 Concrete Pavement Guide; City of Fernley; EPS.

[1] Cost assumption provided by Lumos and Associates and reflects the anticipated maintenance cost and schedule for street maintenance in the City of Fernley, current as of February 2023.
[2] Total square yards of roadway in the project are based on information provided by Lumos and Associates, current as of July 2023.
[3] Cost assumptions were provided by the City, current as of August 2023.
[4] Quantity of existing and planned basin acre-feet and timing provided by Lumos and Associates, current as of August 2023.

CITY OF FERNLEY

Planning Commission
AGENDA REPORT

Meeting Date: December 13, 2023

REPORT TO:	Fernley Planning Commission
REPORT FROM:	**Shay League**

FINANCIAL IMPACT:		**CURRENTLY BUDGETED:**		**FUND/ACCOUNT:**
Yes:	No: X	Yes:	No: X	N/A

ACTION REQUESTED: Motion

AGENDA ITEM:

(For possible action) Consideration of a type I vacation request (T1V23002) and associated order of abandonment by Phelps Engineering Services on behalf of Richard Jackson to abandon the right-of-way known as "Hartsock Avenue", located at approximately 590 West Main Street (APN: 021-071-02).

AGENDA ITEM BRIEF:

Due to a previous mapping anomaly, a portion of the intended "Hartsock Avenue" is perceived as possibly being a public right-of-way. The developer is requesting we abandon this right-of-way, so they may develop this and the neighboring parcel.

RECOMMENDED MOTION:

Approval
"I move to recommend City Council adopt finding T1V(1) and approve the type 1 vacation request and order of abandonment associated with T1V23002."

BUSINESS IMPACT (per NRS Chapter 237):

A Business Impact Statement is not required because this is not a rule (term excludes vehicles by which legislative powers are exercised under NRS Chapters 271, 278, 278A, or 278B).

See attached report for background, analysis, alternatives.

ALTERNATIVES:

Denial
"After reviewing the written materials and public comment on this matter, I believe the public will be materially

injured by the proposed vacation because _____. Therefore, I move to recommend City Council deny the type 1 vacation request and the order of abandonment associated with T1V23002."

Note: Though no other motion language has been provided, all motions that conform with Fernley Planning Commission parliamentary procedure are appropriate.

BACKGROUND:

In September 1946, J.M. Hartsock filed an official plat to subdivide their land, which is now known as 590 and 600 West Main Street (APNs: 021-071-02 and 021-071-03), into approximately 61 parcels. In 1978, Betty and David Jackson filed a new record-of-survey indicating the recombination of all the parcels and streets, excepting lots 8, 9, and 10 of the "B" block and the length of Hartsock Avenue alongside parcel 10. This portion of Hartsock Avenue is approximately 6,223 square feet. By another mechanism, lots 8 and 9 were recombined with the parcel addressed as 600 West Main Street. This leaves parcel 10, which still contains that remnant of Hartsock Avnue. The trust of Ms. Jackson still owns both 590 and 600 West Main Street and wishes to develop them into a project with the working title "600 West Main Street".

The existence of Hartsock Avenue has encumbered the title of 5920 West Main Street. Though the right-of-way for Hartsock Avenue was never formally dedicated to or accepted by City of Fernley (which was then the Town of Fernley), the applicant needs us to specify that we are not interested in trying to establish a public right-of-way there.

FINDING:
T1V(1) The public will not be materially injured by the proposed vacation.
Staff has determined that the proposed benefit will not materially injure the public. There is no public road constructed on the right-of-way; further, staff does not believe we would have the legal authority to construct a public road on this right-of-way. The existence of this remnant of a very old map is preventing a project that will benefit the public from moving forward.

RELEVANT LAWS, STATUTES, AND REGULATIONS:

General
Nevada Revised Statutes (NRS), Chapter 278 - Planning and Zoning
Fernley Municipal Code (FMC), Title 32 - Development Code

Specific
NRS 278.479 - 278.480 - Vacation or Abandonment of Streets, Easements on Maps
FMC Section 32.03.080 (a) - Type I vacations

Note: The references provided are for convenience and not all-inclusive. City of Fernley Planning Department will continue to monitor links until the 12/13/2023 Planning Commission meeting, but cannot guarantee applicability and/or accuracy after that date.

FINANCIAL IMPLICATIONS:

N/A

ATTACHMENTS:

1. T1V23002 Order of Abandonment
2. Hartsock Subdivision Official Plat - 1946
3. Jackson Record of Survey - 1978

APN: 021-071-02, 021-071-03

Recording requested by:
When recorded, return to:
Phelps Engineering Services
10651 Professional Circle
Suite "A", Reno, NV 89521

Notice Per NRS 239B.030, this document does not contain personal information as defined in NRS 603A.040

ORDER OF ABANDONMENT
Undeeded portion of Hartsock Avenue Right-Of-Way per Parcel Map 53963M

WHEREAS:

A) A petition to vacate or abandon a public right-of-way was filed with the City Clerk of the City of Fernley by the owner of all the real property containing the road offer of dedication further described in **Exhibit "A"** & graphically depicted on **Exhibit "A1"**;

B) A duly noticed public hearing was held by the City Council for the City of Fernley on _____, 2023, for the purposes of considering the proposed vacation and abandonment, and it was duly moved, seconded & passed by the City Council of the City of Fernley that the public road offer of dedication described in **Exhibit "A",** & graphically depicted on **Exhibit "A1",** be vacated & abandoned;

C) Based on information received in the written staff report & at the public hearing, this Council finds that the abandonment will not result in a material injury to the public;

NOW, THEREFORE, IT IS HEREBY ORDERED by the City Council of the City of Fernley

1) That the public right away more particularly described in **Exhibit "A"**, & graphically depicted on **Exhibit "A1"**, hereto vacated & abandoned pursuant to the laws of the State of Nevada & title to said property shall revert & vest in the abutting property owner. Abutting properties owner being **Betty M. Jackson Trust**, owner of Lots 8, 9 & 10, Block "B", as shown on the Official Plat of HARTSOCK SUBDIVISION, filed in the Office of the County Recorder of Lyon County, State of Nevada, on September 16th, 1946, as Document No. 53963M, Official Records, also known as APN 021-071-02, and that certain 27.26 acre parcel depicted in the Record of Survey for DAVID D. AND BETTY M. JACKSON, filed in the Office of the County Recorder of Lyon County, State of Nevada, on February 8th, 1978, as Document No. 35908, Official Records, also known as APN 021-071-03.

RESERVING THEREFROM, over, under, across & through the abandoned area, a blanket public utilities & access easement for the benefit of all public utilities for the operation, maintenance, repair & reconstruction & upgrade of existing public utility facilities, & access thereto. Such easements are relocatable & resizable with future development & approval of the

impacted utility & the City Engineer.

2) This Order shall be recorded in the County Recorder's office, Lyon County, Nevada.

DATED: This day of _____day of_____, 2023.

City of Fernley, a municipal corporation

By: _____
Neal E. McIntyre., Mayor

STATE OF NEVADA }
}SS Acknowledgement in a representative capacity
}

This instrument was acknowledged before me on_____, 2023
By Neal E. McIntyre as Mayor of the City of Fernley.

_____
Notary Public

EXHIBIT "A"
VACATION OF UNDEEDED PORTION OF HARTSOCK AVENUE
Affected APNs: 021-071-02 & 021-071-03

A PART OF THE SOUTHWEST QUARTER (SW¼) OF SECTION 11, TOWNSHIP 20 NORTH, RANGE 24 EAST, MOUNT DIABLO MERIDIAN, SITUATE IN THE CITY OF FERNLEY, LYON COUNTY, NEVADA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS;

BEGINNING AT THE EASTERLY MOST SOUTHEAST CORNER OF THAT CERTAIN 27.26 ACRE PARCEL DEPICTED IN THE RECORD OF SURVEY FOR DAVID D. AND BETTY M. JACKSON, RECORDED IN DOCUMENT No. 35908, PUBLIC RECORDS OF LYON COUNTY, NEVADA; **THENCE** SOUTH 12°14'47" EAST ALONG THE WEST LINE OF PARCEL 1 (ADJUSTED), FOUND IN THE RECORD OF SURVEY / BOUNDARY LINE ADJUSTMENT FOR **"HOLLYWOOD INVESTMENT COMPANY, LLC, LAUREL LEE ELLISON, TODD ANDREW BANKOFIER, & JONNE ELIZABETH MATKOVICH"** SHOWN IN DOCUMENT No. 210358, PUBLIC RECORDS OF LYON COUNTY, NEVADA, TO A POINT ON A CURVE CONCAVE TO THE NORTH, HAVING A RADIUS OF 1450.00 FEET, AND A RADIAL BEARING OF NORTH 02°33'33" EAST; **THENCE** DEPARTING SAID WEST LINE, RUN WESTERLY, ALONG THE NORTH BOUNDARY OF U.S. HIGHWAY 40, AND THE ARC OF SAID CURVE, HAVING A CENTRAL ANGLE OF 03°16'04", AND AN ARC DISTANCE OF 82.70 FEET TO A POINT OF CUSP; **THENCE** DEPARTING SAID NORTH BOUNDARY, EASTERLY THRU NORTHERLY, ALONG THE EAST BOUNDARY OF LOT 10, BLOCK "B" OF **"HARTSOCK SUBDIVISION"** FILED AS DOCUMENT No. 53963M, PUBLIC RECORDS OF LYON COUNTY, NEVADA, AND ALONG THE ARC OF A CURVE CONCAVE TO THE NORTHWEST, HAVING A RADIUS OF 30.00 FEET, A CENTRAL ANGLE OF 108°04'24", AND AN ARC DISTANCE OF 56.59 FEET, TO A POINT OF TANGENCY; **THENCE** CONTINUE ALONG SAID EAST BOUNDARY, NORTH 12°14'47 EAST, A DISTANCE OF 105.93 FEET TO A POINT ON A CURVE CONCAVE TO THE NORTH, HAVING A RADIUS OF 1310.00 FEET AND A RADIAL BEARING OF NORTH 06°01'01" EAST; **THENCE** DEPARTING SAID EAST BOUNDARY, RUN EASTERLY, ALONG THE SOUTH BOUNDARY OF SAID 27.26 ACRE PARCEL, AND ALONG THE ARC OF SAID CURVE, HAVING A CENTRAL ANGLE OF 01°49'59", AND AN ARC DISTANCE OF 41.91 FEET TO THE **POINT OF BEGINNING**;

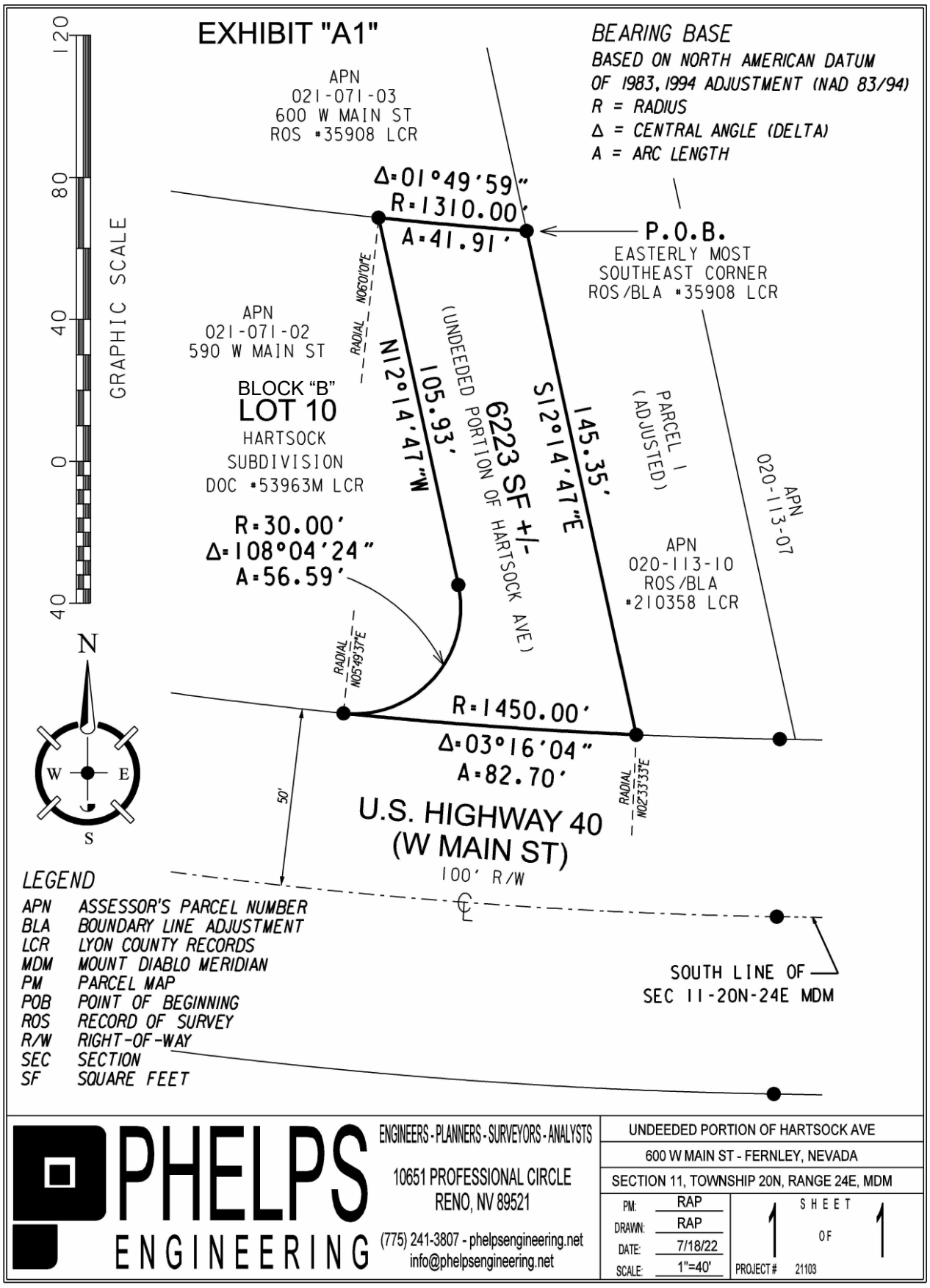
CONTAINING 6,223 SQUARE FEET, MORE OR LESS.

BASIS OF BEARINGS: THE NORTH AMERICAN DATUM OF 1983, 1994 ADJUSTMENT (NAD 83/94), NEVADA STATE PLANE WEST COORDINATE SYSTEM (2703). GRID BEARINGS FROM **THE UTAH REFERENCE NETWORK (TURN)** GLOBAL POSITIONING SYSTEM (GPS), COMBINED SCALE FACTOR OF 1.000258.

PHELPS ENGINEERING
DESIGN & DEVELOPMENT SERVICES

For the firm, by:
Richard A. Pedraza
PLS #21076
State of Nevada

10651 Professional Circle, Ste. "A"
Reno, NV 89521



PHELPS ENGINEERING

ENGINEERS - PLANNERS - SURVEYORS - ANALYSTS

10651 PROFESSIONAL CIRCLE
RENO, NV 89521

(775) 241-3807 - phelpsengineering.net
info@phelpsengineering.net

UNDEEDED PORTION OF HARTSOCK AVE
600 W MAIN ST - FERNLEY, NEVADA
SECTION 11, TOWNSHIP 20N, RANGE 24E, MDM

PM:	RAP
DRAWN:	RAP
DATE:	7/18/22
SCALE:	1"=40'

SHEET 1 OF 1

PROJECT # 21103

9/16/46 #53963
HARTSOCK SUBDIVISION
SW¼ OF SEC 11, T 20N, R 2HE

State of Nevada S.S.
County of Washoe

I, John E. Curran, being first duly sworn do hereby certify that this plat is a true and accurate map of the lands represented thereon, surveyed by me and laid out into blocks, lots, streets and public places at the instance of J.M. Hartsock, that the locations of said blocks, lots, streets and public places have been definitely established and perpetuated in accordance with the law and as shown hereon; that the blocks, lots, streets and public places shown hereon are situated wholly within the S.W. ¼ of section 11, T. 20N., R. 24E. M.D.B. & M. and that the survey was completed on the ~~14th~~ 9th day of September 1946.

John E. Curran
Reg. Prof. Engineer #258

Subscribed and sworn to before me this 9th day of Sept. 1946.
Elizabeth Davis
Notary Public in and for Washoe County, Nevada.
My Commission expires Sept. 25 1947

State of Nevada S.S.
County of Washoe

This is to certify that the undersigned, J.M. Hartsock is the owner of the tract of land represented on this map or plat and that the same is hereby executed in compliance with and subject to the provisions of "An Act of the Legislature of the State of Nevada authorizing owners of land to lay out and plat such lands into blocks, lots and streets and providing for the approval and filing of Maps or plats thereof, approved March 19th, 1905, as amended in 1921 and 1925."

In witness whereof, the said J.M. Hartsock has hereunto set his signature this 9 day of September 1946.

J.M. Hartsock

State of Nevada S.S.
County of Washoe

On this 9th day of Sept. 1946, Personally appeared before me, a Notary Public in and for Washoe, Nevada, J.M. Hartsock known to me to be the person described in and who executed the foregoing instrument, and upon oath did depose and say that he executed the same freely and voluntarily and for uses and purposes therein mentioned.

In witness whereof, I have hereunto set my hand and affixed my official seal at my office in the County of Washoe, State of Nevada the day and the year in this certificate first above written.

Notary Public in and for Washoe County, Nevada
My Commission expires April 27 1947

CURVE DATA

№	ANGLE	RADIUS	LENGTH	TANGENT
R 1	38°55'05"	1450.74	985.42	512.55
2	108°04'20"	30.00	56.58	41.34
3	68°16'30"	30.00	35.74	20.35
4	113°50'00"	30.00	59.60	46.05
5	58°47'50"	30.00	30.79	16.90
6	125°56'30"	30.00	65.95	58.80
7	91°12'40"	30.00	47.76	30.64
8	88°33'20"	30.00	46.36	29.27
9	91°34'30"	30.00	47.95	30.83
10	87°58'30"	30.00	46.07	28.96
11	92°17'30"	30.00	48.33	31.23
R 12	39°56'25"	1310.74	913.70	476.30
R 13	35°01'55"	1160.74	709.70	366.33
R 14	32°47'35"	1120.74	641.45	329.97
R 15	39°10'15"	970.74	662.00	289.08
R 16	24°58'25"	820.74	357.74	181.76
R 17	19°57'45"	780.74	272.08	137.39
18	121°47'55"	30.00	63.77	53.89
19	92°49'30"	30.00	48.61	31.51
R 20	38°08'15"	1310.74	872.46	453.03
21	86°37'50"	30.00	45.36	28.30
22	93°40'50"	30.00	49.05	31.99
R 23	30°33'35"	970.74	517.76	265.25
24	85°16'50"	30.00	44.65	27.63
25	95°21'00"	30.00	49.93	32.94
R 26	32°59'45"	1160.74	668.45	343.77
R 27	30°91'05"	1120.74	596.95	305.72
R 28	21°59'15"	820.74	313.53	158.71
R 29	16°20'55"	780.74	222.77	112.16
30	108°30'30"	30.00	56.82	41.67
31	67°44'40"	30.00	35.47	20.14
32	114°25'20"	30.00	59.91	46.57
33	57°59'10"	30.00	30.36	16.62
34	126°55'20"	30.00	66.45	60.07
R 35	37°17'15"	1450.74	944.13	489.64
36	121°22'45"	30.00	63.56	53.44

TOWN OF FERNLEY

#53963 9/16/46 #2

OFFICIAL PLAT

HARTSOCK SUBDIVISION

FERNLEY, NEVADA

C.V. Taylor ~ John E. Curran
Engineers
203 Title Insurance Bldg., Reno, Nev.

Sept. 1946 Scale 1 in. = 100 ft.

Approved by the County Commissioners of Lyon County, Nevada.
J.R. McCulloch
Chairman

Attest, Walter Whitacre
County Clerk and Clerk of the Board

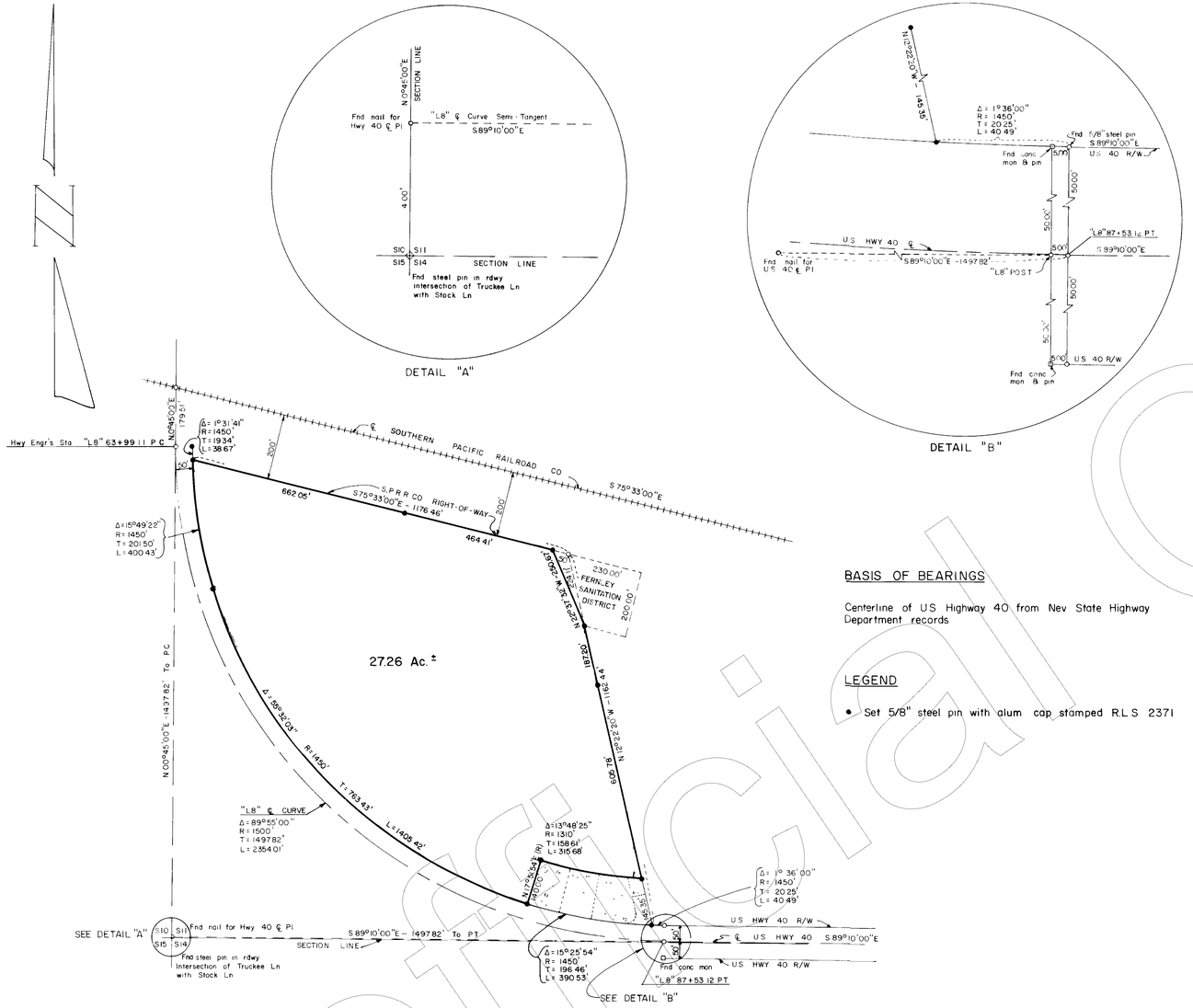
THIS DOCUMENT HAS BEEN MICROFILMED
53963

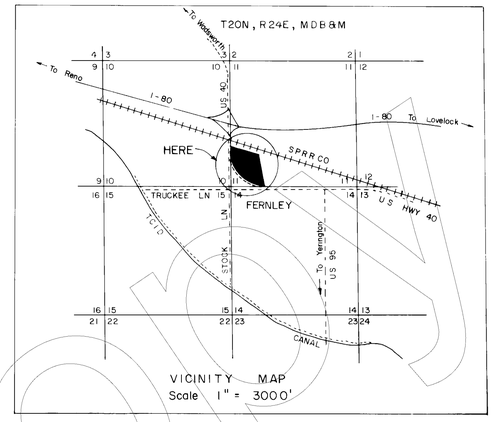
*See Order Vacating Portion of Plat in Miscellaneous B.K. R, pg. 233 recorded 1/13/48

Uncontrolled Copy

2/8/78 #35908
RECORD OF SURVEY
JACKSON, DAVID D., ET UX
PORT. OF SW., T20N, R24E

#650





VICINITY MAP
Scale 1" = 3000'

BASIS OF BEARINGS

Centerline of US Highway 40 from Nev State Highway Department records

LEGEND

- Set 5/8" steel pin with alum cap stamped R.L.S 2371

OWNER'S CERTIFICATE

The undersigned do hereby certify they are the owners of the tract of land shown hereon, and hereby consent to the preparation and recordation of this map

David D. Jackson — Betty M. Jackson

State of Nevada
County of Lyon — S S

On this 30 day of January, 1978, David D Jackson and Betty M Jackson did personally appear before me a Notary Public, who upon oath did depose and say that they executed the foregoing certificate freely and voluntarily for the purposes stated hereon.

Richard C Jackson
Notary Public

SURVEYOR'S CERTIFICATE

I, Fred L Petersen, a Registered Land Surveyor in the State of Nevada, certify that

1. This is a true and accurate representation of the land surveyed under my supervision at the instance of David D. Jackson.
2. The lands surveyed lie within Section 11, T 20N., R 24E, M D B & M and the survey was completed on October 22, 1977.
3. This plat complies with the applicable state statutes and any local ordinances
4. The monuments are of the character shown and occupy the positions indicated

10-26-77 — Date
Fred L Petersen
Registered Land Surveyor No 2371

RECORDER'S CERTIFICATE

File No 35908
Filed for record at the request of Fred L Petersen on this 8th day of February, 1978 at 19 minutes past 1 o'clock P M. in the Official Records of Lyon County, Nevada
FEE $5.00

County Recorder

2/8/78 #35908

RECORD OF SURVEY
OF
A PORTION OF THE S.W. 1/4, SECTION 11,
T.20N., R.24E., M.D.B.&M.,
IN LYON COUNTY, NEVADA
FOR
DAVID D. & BETTY M. JACKSON

FRED L PETERSEN, R.L.S 2371	October, 1977
ROUTE 1 BOX 138 B	Scale 1" = 200'
FERNLEY, NEVADA 89408	Sheet 1 of 1

#650

Unofficial Copy