



## RECOMMENDED MOTION:

"I move to recommend to the Board of Supervisors approval of TSM-17-184, a Tentative Subdivision Map known as Blackstone Ranch, Phase 2, consisting of 209 single family residential lots on property approved for Multifamily Duplex (MFD) and Single Family 6000 square feet (SF6) zoning, located south of East Robinson Street, west of Highway 395, and north of east Fifth Street APN 010-041-71, based on the findings and subject to the conditions of approval contained in the staff report."

## RECOMMENDED CONDITIONS OF APPROVAL

**The following are general conditions of approval:**

**The following are conditions of approval required per CCMC 18.02.105.5:**

1. All final maps shall be in substantial accord with the approved tentative map.
2. Prior to submittal of any final map, the Development Engineering Department shall approve all on-site and off-site improvements. The applicant shall provide construction plans to the Development Engineering Department for all required on-site and off-site improvements, prior to any submittals for approval of a final map. The plan must adhere to the recommendations contained in the project soils and geotechnical report.
3. Lots not planned for immediate development shall be left undisturbed and mass grading and clearing of natural vegetation shall not be allowed. Any and all grading shall comply with City standards. A grading permit from the Nevada Division of Environmental Protection shall be obtained prior to any grading. Noncompliance with this provision shall cause a cease and desist order to halt all grading work.
4. All lot areas and lot widths shall meet the zoning requirements approved as part of this tentative map with the submittal of any parcel map or preferably final map.
5. With the submittal of any final maps, the applicant shall provide evidence to the Planning and Community Development Department from the Health and Fire Departments indicating the agencies' concerns or requirements have been satisfied. Said correspondence shall be included in the submittal package for any parcel map or preferably final maps and shall include approval by the Fire Department of all hydrant locations.
6. The following note shall be placed on all final maps stating:  
  
"These parcels are subject to Carson City's Growth Management Ordinance and all property owners shall comply with provisions of said ordinance."
7. All other departments' conditions of approval, which are attached, shall be incorporated as conditions of this report.
8. Placement of all utilities, including AT&T Cablevision, shall be underground within the subdivision. Any existing overhead facilities shall be relocated prior to the submittal of a parcel map or preferably final maps.

9. The applicant must sign and return the Notice of Decision for conditions for approval within ten (10) days of receipt of notification after the Board of Supervisors meeting. If the Notice of Decision is not signed and returned within ten (10) days, then the item may be rescheduled for the next Planning Commission meeting for further consideration.
10. Hours of construction will be limited to 7:00 a.m. to 7:00 p.m., Monday through Friday, and 7:00 a.m. to 5:00 p.m. on Saturday and Sunday. If the hours of construction are not adhered to, the Carson City Building Department will issue a warning for the first violation, and upon a second violation, will have the ability to cause work at the site to cease immediately.
11. The applicant shall adhere to all City standards and requirements for water and sewer systems, grading and drainage, and street improvements.
12. The applicant shall obtain a dust control permit from the Nevada Division of Environmental Protection. The site grading must incorporate proper dust control and erosion control measures.
13. A detailed storm drainage analysis, water system analysis, and sewer system analysis shall be submitted to the Development Engineering Department prior to approval of a final map.
14. Prior to the recordation of the final map for any phase of the project, the improvements associated with the project must either be constructed and approved by Carson City, or the specific performance of said work secured, by providing the City with a proper surety in the amount of one hundred fifty percent (150%) of the engineer's estimate. In either case, upon acceptance of the improvements by the City, the developer shall provide the City with a proper surety in the amount of ten percent (10%) of the engineer's estimate to secure the developer's obligation to repair defects in workmanship and materials which appear in the work within one (1) year of acceptance by the City. Improvements associated with the Conditional Letter of Map Revision must be constructed and may not be secured for in lieu of construction.
15. A "will serve" letter from the water and wastewater utilities shall be provided to the Nevada Health Division prior to approval of a final map.
16. The District Attorney shall approve any CC&R's prior to recordation of the first final map.

**Specific Conditions to be included in the Design of the Improvement Plans, to be met prior to approval of construction permit:**

17. The improvement plans shall include all improvements identified in the approved Phasing Plan, which is part of the Lompa Ranch Specific Plan.
18. In order to allow for the full functionality of East Robinson Street, the applicant shall work with the School District to move the loading and unloading school bus function off of East Robinson Street. The identified solution shall be included in the improvement plans, unless the improvements have already been completed by a different phase of the Lompa Ranch development project.
19. The flood channels and associated access must be on separate parcels to be dedicated to the City. Maintenance of these lands will be funded through a maintenance district or

similar instrument, to be established prior to Final Map approval.

23. The dimensions of the flood channels will be per FEMA approval. These channels must be constructed prior to development of the subdivision. Bonding for these improvements will not be allowed.
24. The site improvement grading plans must include contours showing the base flood elevation plus two (2) feet, of adjacent channels to confirm that building pads are at least 2 feet above the channel base flood elevations.
25. Low impact design (LID) features must be included as part of this subdivision. LID features will be designed to the Truckee Meadows Low Impact Development Manual standards and must be privately owned and maintained by a Homeowner's Association or similar instrument. Note 6 on Page C1 is to be revised to reflect this condition.
26. Sidewalk, curb, and gutter must be installed in front of apns 010-041-34 and 010-041-35 and drainage for these parcels must be tied into the flood channel.
27. All street and sidewalk improvements on local streets, on the spine road, and on Robinson Street, will be installed as full street improvements, consistent with note 30 of the general notes.
28. All roundabout geometry must meet AASHTO geometric design standards.
29. The following street names may not be used: Appaloosa, Emily, and Sophia.
30. Looped streets must maintain the same name throughout the loop.
31. Aiden Ave and Aiden Ct must have the same suffix.
32. All streets will have a minimum 4 inch thick asphalt section.
33. Per the geotechnical report, areas with clay subgrade will have a minimum of 8 inches of base section. Either a map of these areas must be provided by a geotechnical engineer to determine which streets require this base thickness, or all streets must meet this minimum base thickness requirement.
34. The 12 inch water main in the spine road must connect all the way from Robinson Street to 5<sup>th</sup> Street per the Lompa Ranch North phasing plan.
35. Cast in place manholes are not permitted in this subdivision.
36. Sheet C1: General Notes 4, 6, 27, and 35 reference a landscape maintenance district. Consistent with the development agreement, these amenities are to be maintained by a home owner's association (HOA) or a landscape maintenance association. A landscape maintenance district will only be formed if the HOA (or similar entity) ceases to exist or remain functional. These notes and any other related notes on the drawings must be modified to be consistent with the development agreement.
37. Sheet C1: Regarding note 10, modify plans to recognize the irrigation system will only utilize a Reduced Pressure Principle Backflow Preventer. It will not utilize a Pressure Vacuum Breaker.



38. Sheet CS2: Modify the detail for the Spine Road's multi-use path to show a 10 foot wide landscape strip, a 10 foot wide concrete multi-use path, and a 3 foot wide DG path adjacent. The landscape strip should be adjacent to the roadway.
39. Sheet CX0: Along Robinson Street modify the detail for the multi-use path to show a 10 foot wide landscape strip, a 10 foot wide concrete multi-use path, and a 3 foot wide DG path adjacent. The landscape strip should be adjacent to the roadway.
40. Sheet CS0: Demonstrate that the area for the park will be ten acres, and will not include a drainage facility. The drainage channel is not to be on park property.
41. Sheet CS2: Curve the multi-use path along Robinson Street to connect to the pedestrian crossing on the Spine Road. Create connections from the multi-use path to the pedestrian crossing.
42. The multi-use path on the north side of Fifth Street is to connect to the Linear Park's multi-use path east of the freeway.
43. The project's improvement plans are subject to review and approval by the Parks Recreation and Open Space (PROS) department.
44. PROS Department is to sign off on the project improvements prior to final inspection by the Engineering Department.
45. The Conditional Letter of Map Revision (CLOMR) must be approved by FEMA prior to approval of any construction permits. All improvements associated with the CLOMR must be included in the improvement plans.
46. The CC&R's must clearly state that a Landscape Maintenance Association (LMA), a Home Owners Association (HOA) or similar entity is responsible for maintaining private storm drain infrastructure including any mains, basins, and LID infrastructure.
47. Landscaping plans for the construction permit must include site distance triangles showing that sight distance is not inhibited.
48. Landscaping plans for the construction permit must show distances to existing and proposed water, sewer and storm drain mains to ensure a minimum of 10 foot spacing from trees.
49. A geotechnical report will be required for the subdivision prior to approval of any construction permits.
50. Note that no water main shall have more than 15 services without looping.
51. Plans must show and note that all flood channels (Vicee Canyon, Ash Canyon, and Kings Canyon) must provide sufficient access for City maintenance equipment along the full length, with access points spaced out no more than every 660 feet, and must note that Robinson St, the Spine Road, E 5<sup>th</sup> St, and N Saliman Rd are not to be considered part of this access.
52. The developer must design the Kings Canyon flood channel such that the drainage

and/or any water rights associated with parcels 010-041-34 and 010-041-035 are not adversely affected.

**Conditions to be Addressed with the Final Map**

53. At the time of Final Map submittal, the applicant must demonstrate that the project complies with all identified conditions, as well as with the terms of the Development Agreement

54. The final mylar will be presented to the State Engineer for approval and signature.

**LEGAL REQUIREMENTS:** CCMC 17.05 (Tentative Maps); CCMC 17.07 (Findings); NRS 278.330;

**MASTER PLAN DESIGNATION:** Lompa Ranch North Specific Plan; Medium Density Residential (MDR)

**ZONING DISTRICT:** Approved as Multi-Family Duplex (MFD) and Single Family-6000 square feet (SF6) - effective when the ownership of the land changes

**KEY ISSUES:** Is the Tentative Map consistent with the Specific Plan? Does the proposal meet the Tentative Map requirements and other applicable requirements?

**SURROUNDING ZONING AND LAND USE INFORMATION**

NORTH: Public (P) and approved as General Commercial (GC) and Multifamily Duplex (MFD) / Carson City High School and vacant

SOUTH: Agriculture (A) / Agricultural Land

WEST: Single Family 6000 square feet (SF6) / Vacant

EAST: Approved as Multifamily Duplex (MFD) and existing Agricultural (A)/ Vacant

**ENVIRONMENTAL INFORMATION:**

FLOOD ZONE: Zone AE (100 year flood plain)

SLOPE/DRAINAGE: Generally flat

SEISMIC ZONE: Zone I (Severe)

**SITE DEVELOPMENT INFORMATION:**

SUBJECT SITE AREA: 58.5 Acres

ZONING: Approved as Multi-Family Duplex and SF6000 (minimum 6,000 square foot parcel size)

EXISTING LAND USE: Vacant Land

TOTAL RESIDENTIAL LOTS: 209 single family lots

PROPOSED LOT SIZES: Minimum Lot Size 6000 square feet

PROPOSED SETBACKS: Setback requirements for the SF6 and the MFD zoning district apply (the two districts have the same setback requirements.)

PARKING REQUIRED: Two spaces per dwelling unit

PROJECT PHASING: The proposed Tentative Map is the second phase of the Lompa Ranch Specific Plan.

## **SITE HISTORY:**

MPA-15-162: (March 17, 2016) Adoption of the Lompa Ranch North Specific Plan.

ZMA-15-163: (April 7, 2016) Adoption of a Zoning Map Amendment with an effective date of the date of a change of ownership.

CSM-17-027: (March 21, 2017) Review of a conceptual map for a 156 lot residential development on 33.1 acres.

## **BACKGROUND:**

Consistent with Chapter 8 of the Master Plan, Lompa Ranch is one of four areas of the City that is subject to a Specific Plan designation. The Specific Plan designation requires development proposals within the area to be reviewed in a comprehensive manner. The policies contained in the specific plan provide a framework for development in the area.

The Lompa Ranch North Specific Plan, which encompasses 251.33 acres, was adopted on March 17, 2016. From a land use perspective, the Specific Plan includes residential areas of various densities, as well as commercial areas, areas for park land, and a ten acre area for a school and/or a fire station. The Specific Plan also addresses design standards, Parks, Open Space and Trails, Sanitary Sewer, Water Service, Storm Water Management, Utility Services, Roadways and Traffic, Fire Protection, Police Protection, and Schools.

With respect to infrastructure and public services, the Specific Plan includes a phasing plan that addresses storm water and drainage, traffic and roadways, water, and sanitary sewer planning for the entire 251 acre area. Those improvements associated with Phases B1 and B2 of the Phasing Plan of the Specific Plan will be required as part of the improvements of this phase.

The Specific Plan also addresses parks, open space, and trail amenities, as well as fire mitigation. Per the Specific Plan, these improvements will be constructed by the developer and maintained via a homeowner's association, landscape maintenance association, or similar instrument. The ten acre park on the west side is to be constructed and dedicated to the City prior to the 750<sup>th</sup> residential unit west of Interstate 580. Conditions regarding milestones to be met prior to completion of construction, including submittal of a parks conceptual plan at the time of the 400 residential unit to the west of Interstate 580, are intended to ensure the required improvements do not result in a construction delay, but rather are being planned concurrent with other construction activities. Additionally, to ensure there is sufficient space for the 10 acre park exclusive of the drainage easement, staff has included a Condition of Approval requiring that as part of the improvement plans, the applicant demonstrate that the proposed tentative map accommodates that 10 acre park exclusive of the drainage easement.

In addition to the Specific Plan, the property is subject to a development agreement that was adopted through Ordinance 2017-25. The development agreement includes voluntary fees that must be paid at the time of building permit, as well as a framework for the parks improvements. The provisions of the development agreement will be applied to this project.

## **DISCUSSION:**

Blackstone Ranch Phase 2 is located south of Robinson Street, west of Highway 395, and north of East Fifth Street. Carson City High School is located to the north of the site. Otherwise, the site is surrounded by vacant land. The subject property is currently zoned Agricultural (A), but is approved to be zoned Single Family 6000 square feet (SF6) and Multi-family Duplex (MFD.)

The effective date of the approved zoning is the date the land ownership changes. Single family residential development is allowed by right in the SF6 and the MFD zoning district.

The applicant proposes 209 residential lots, intended to contain detached single family residential homes. The lots will be a minimum of 6000 square feet. Vehicular access is proposed via East Robinson Street, East Fifth Street, and via internal access between Phase 1 and Phase 2.

As noted, the subject property is located in the 100 year floodplain. Per the Specific Plan, a Letter of Map Revision must be approved by Carson City and submitted to the Federal Emergency Management Agency (FEMA) prior to submittal of the first construction permit. This has occurred. Additionally, prior to any construction permit being issued, the development must have a Conditional Letter of Map Revision (CLOMR) approved by Carson City and FEMA. Per the proposed conditions of approval, the flood conveyance channels identified in the CLOMR must be included with the improvement plans for the subject tentative map, and executed with the same. Bonding of improvements associated with the CLOMR will not be allowed.

**PUBLIC COMMENTS:** Public notices were mailed to 30 property owners within 950 feet of the subject site pursuant to the provisions of NRS and CCMC for the Tentative Subdivision Map application. As of the completion of this staff report, no public comment has been received. Any written comments that are received after this report is completed will be submitted prior to or at the Planning Commission meeting on November 29, 2017 depending upon their submittal date to the Planning Division.

**OTHER CITY DEPARTMENT OR OUTSIDE AGENCY COMMENTS:** The following comments were received from City departments. Recommendations have been incorporated into the recommended conditions of approval, where applicable.

**Engineering Division:**

The Engineering Division has reviewed the application within areas relative to adopted standards and practices and to the provisions of CCMC 17.07.005. The Engineering Division offers the following condition of approval:

1. The flood channels and associated access must be on separate parcels to be dedicated to the City. Maintenance of these lands will be funded through a maintenance district or similar instrument, to be established prior to Final Map approval.
2. The dimensions of the flood channels will be per FEMA approval. These channels must be constructed prior to development of the subdivision.
3. The site improvement grading plans must include contours showing the base flood elevation plus two (2) feet, of adjacent channels to confirm that building pads are at least 2 feet above the channel base flood elevations.
4. Low impact design (LID) features must be included as part of this subdivision. LID features will be designed to the Truckee Meadows Low Impact Development Manual standards and must be privately owned and maintained by an LMD or similar consistent with note 6 of the general notes.
5. The "Fifth Street Trail" must connect to the existing I-580 underpass trail. The connection over the floodway must have a clear span with adequate freeboard.
6. Sidewalk, curb, and gutter must be installed in front of apns 010-041-34 and 010-041-35 and drainage for these parcels must be tied into the flood channel.
7. All street and sidewalk improvements on local streets, on the spine road, and on Robinson Street, will be installed as full street improvements, consistent with note 30 of the general notes.

8. All roundabout geometry must meet AASHTO geometric design standards.
9. The following street names may not be used: Appaloosa, Emily, and Sophia.
10. Looped streets must maintain the same name throughout the loop.
11. Aiden Ave and Aiden Ct must have the same suffix.
12. All streets will have a minimum 4 inch thick asphalt section.
13. Per the geotechnical report areas with clay subgrade will have a minimum of 8 inches of base section. Either a map of these areas must be provided by a geotechnical engineer to determine which streets require this base thickness, or all streets must meet this minimum base thickness requirement.
14. The 12 inch water main in the spine road must connect all the way from Robinson Street to 5<sup>th</sup> Street per the Lompa Ranch North phasing plan.
15. Cast in place manholes are not permitted in this subdivision.

#### **Parks, Recreation and Open Space (PROS)**

1. Page C1: Regarding notes 4, 6, 27, and 35 reference a landscape maintenance district. Consistent with the development agreement, these amenities are to be maintained by a home owner's association (HOA) or a landscape maintenance association. A landscape maintenance district will only be formed if the HOA (or similar entity) ceases to exist or remain functional. These notes and any other related notes on the drawings must be modified to be consistent with the development agreement.
2. Page C1: Regarding note 10, modify to recognize that the irrigation system will utilize a backflow preventer only. It will not utilize a vacuum breaker system.
3. Page CS2 and CX0: Modify the detail for the multi-use trail to show a 10 foot wide landscape strip, a 10 foot wide concrete multi-use path, and a 3 foot wide DG path adjacent. The landscape strip should be adjacent to the roadway.
4. Page CS0: Demonstrate that the area of the park will be ten acres and will not include a drainage facility. The drainage way is not to be on park land.
5. Page CS2: Curve the multi-use path on Robinson Street to connect to the pedestrian crossing on the spine road. Create connections to the pedestrian crossings.
6. The multi-use path on the north side of Fifth Street is to connect to the linear park east of the freeway.
7. The improvement plans are subject to review and approval by the PROS department.
8. PROS department is to sign off on the improvements prior to final inspection by the Engineering Department.

#### **Fire Department**

1. Project must comply with the 2012 IFC and Northern NV Fire Code Amendments as adopted by Carson City.

**Building Division:** No comments.

**Environmental Control:** Required compliance with CCMC Title 12.06 and Appendix 18 Division 15.5, and all applicable codes found in Chapters 7 and 10 of the 2012 Uniform Plumbing Code.

**Health Department:** No comments.

**TENTATIVE MAP FINDINGS:** Staff recommends approval of the Tentative Subdivision Map based on the findings below and in the information contained in the attached reports and documents, pursuant to CCMC 17.05 (Tentative Maps); 17.07 (Findings) and NRS 278.349, subject to the recommended conditions of approval, and further substantiated by the applicant's written justification. In making findings for approval, the Planning Commission and Board of Supervisors must consider:

1. ***Environmental and health laws and regulations concerning water and air pollution, the disposal of solid waste, facilities to supply water, community or public sewage disposal and, where applicable, individual systems for sewage disposal.***

The development is required to comply with all applicable environmental and health laws concerning water and air pollution and disposal of solid waste.

2. ***The availability of water which meets applicable health standards and is sufficient in quantity for the reasonably foreseeable needs of the subdivision.***

Water supplied to the development will meet applicable health standards. Carson City's water supply will not be exceeded by final approval of this development.

3. ***The availability and accessibility of utilities.***

All utilities are available in the area to serve this development.

4. ***The availability and accessibility of public services such as schools, police protection, transportation, recreation and parks.***

The project is located within an existing neighborhood that is served by existing schools, sheriff protection, transportation facilities and parks. The proposed subdivision will not overburden police protection. As part of the area Specific Plan, parks and recreation facilities are required to be constructed and dedicated to the City so as to meet increased demands. The subject tentative map is subject to a development agreement addressing the timing of construction and maintenance of parks, open space, and trails in Lompa Ranch.

The Lompa Ranch Specific Plan includes a ten acre land reservation for a school to meet future enrollment needs. The development agreement addresses financing and timing of the school. School district staff has advised that a new school, likely an elementary school, will be necessary due to on-going residential growth.

5. ***Access to public lands. Any proposed subdivision that is adjacent to public lands shall incorporate public access to those lands or provide an acceptable alternative.***

The proposed subdivision is located within a developed area of Carson City that is not adjacent to public lands. Access is not required in this case.

6. ***Conformity with the zoning ordinance and land use element of the City's Master Plan.***

The proposed subdivision is consistent with the Master Plan and the Lompa Ranch Specific Plan for permitted primary uses in the Medium Density Residential (MDR) land use designation. Primary uses in this land use area include single family homes.

**7. *General conformity with the City's Master plan for streets and highways.***

Subject to compliance with the proposed conditions of approval, the proposed subdivision conforms to the City's master plan for streets.

**8. *The effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision.***

The proposed tentative map will take access from East Robinson Street, across the street from the high school. Currently, and for over fifteen years, school buses have stacked along Robinson Street for morning drop off and afternoon pick up. While stacked, the buses are required to have flashing lights on, thus limiting travel along this portion of roadway. Expansion or shifting of the roadway away from the stacking would be difficult due to the location of a ditch along the south side of the road. The school campus has space to accommodate on-site bus parking, but no funds to make the associated improvements.

In order to allow for the functionality of East Robinson Street, staff recommends that the applicant work with the school district to create an off-street loading and drop off area on the existing campus. These improvements should be included in the improvements associated with subject tentative map, and completed prior to the recordation of the Final Map, unless such improvements have been completed as part of a different phase of development.

All roadway improvements identified in the Phasing Plan of the Specific Plan for Phases B1 and B2 will be completed as part of this subdivision, and improvements included in the improvement plans. The traffic analysis concludes that the project traffic will not cause any significant impacts requiring mitigation.

**9. *The physical characteristics of the land such as flood plains, earthquake faults, slope and soil.***

The physical characteristics of the site currently do preclude the development as proposed. Per the specific plan, prior to the first construction permit, the development must have a CLOMR approved by Carson City and FEMA. The improvements associated with the approved CLOMR, per the proposed conditions of approval, must be constructed with the improvement plans associated with the subject project.

**10. *The recommendations and comments of those entities reviewing the subdivision request pursuant to NRS 278.330 thru 278.348, inclusive.***

The proposed tentative map has been routed to the Nevada Department of Environmental Protection and the Nevada Division of Water Resources. The Division of Water Resources has requested that a Will Serve letter from Carson City Public Works and a final mylar map of the proposed project be presented to the State Engineer for approval and signed through his office prior to development. This request has been incorporated into the proposed conditions of approval.

**11. *The availability and accessibility of fire protection including, but not limited to, the availability and accessibility of water and services for the prevention and containment of fires including fires in wild lands.***

As noted in the Specific Plan, the development of Lompa Ranch will impact the Fire Department's level of service. In response to this concern, the project development agreement addresses fees and improvements relative to fire safety. The terms of the development agreement apply to this project.

**12. *Recreation and trail easements.***

The Lompa Ranch Specific Plan specifically addresses Parks, Open Space, and Trails. The trail system is required to conform with the standards and policies of the Unified Pathways Master Plan. The Parks and Recreation staff has reviewed the tentative map for compliance with the requirements of the Specific Plan and finds, subject to the incorporation of the conditions of approval, the proposed tentative map will be in compliance.

The Specific Plan includes a requirement for the completion and dedication of a ten acre park at the time of the 750 dwelling unit on the west side of Interstate 580. The Specific Plan also obligates a homeowners association or a landscape maintenance association be formed for purposes of maintaining landscaped areas, open space, trails, and parks and recreation facilities. Of note, as part of the improvement plans, the applicant must demonstrate that the area for the park will be ten acres, and will not include a drainage facility.

**Attachments**

Lompa Ranch North Specific Plan Area, Adopted March 17, 2016  
City and State Comments  
Tentative Map Application (TSM-17-184)



# *Lompa Ranch North Specific Plan*

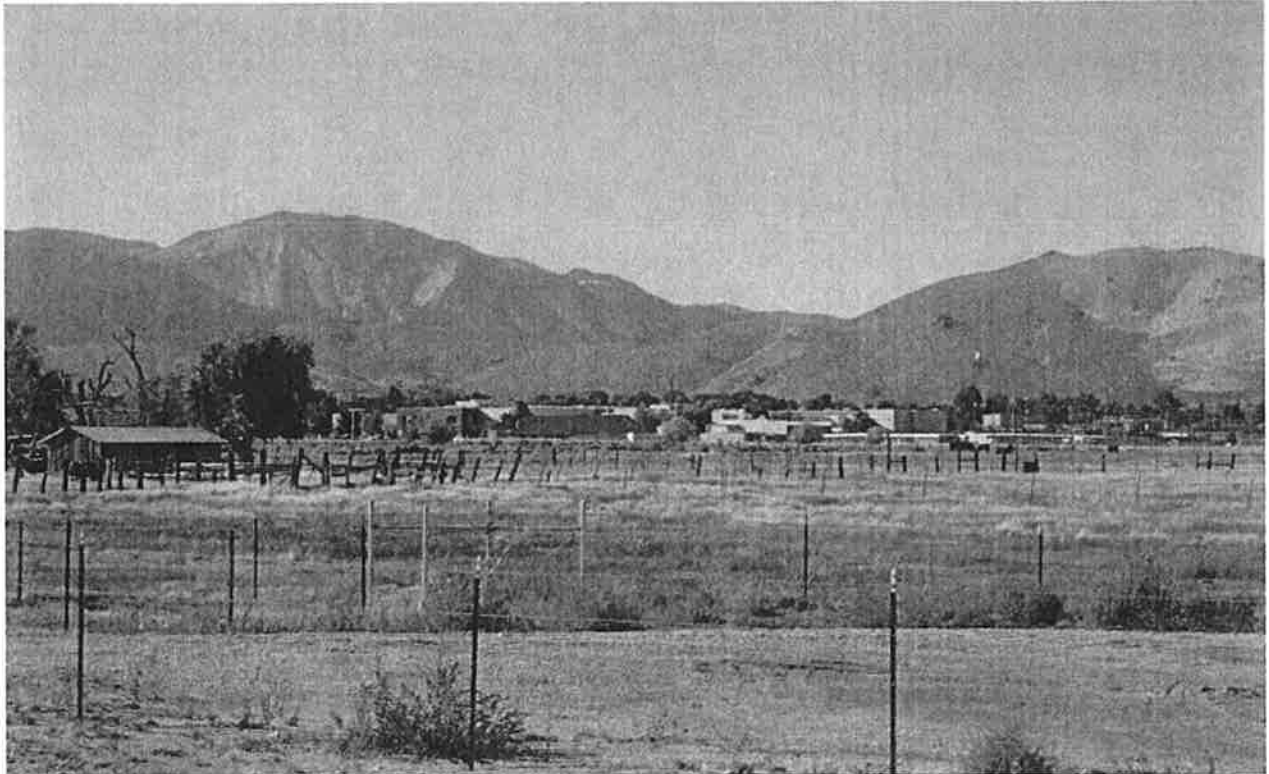


Photo Credit: aroundcarson.com

**ADOPTED  
MARCH 17, 2016**

**CARSON CITY BOARD OF SUPERVISORS**

# *Lompa Ranch North Specific Plan*

---

## TABLE OF CONTENTS

<b>CHAPTER 1 – INTRODUCTION .....</b>	<b>1-1</b>
1.1 Location .....	1-1
1.2 Purpose .....	1-2
1.3 Vision .....	1-2
1.3.1 Land Use Pattern.....	1-2
1.3.2 Sense of Place and Community.....	1-3
1.3.3 Diverse Housing Mix .....	1-3
1.3.4 Implementation .....	1-3
1.4 Allowed Uses .....	1-4
1.4.1 General Standards .....	1-5
 <b>CHAPTER 2 – DESIGN STANDARDS AND GUIDELINES .....</b>	 <b>2-1</b>
2.1 Commercial Uses .....	2-1
2.1.1 Commercial Site Planning Standards .....	2-1
2.1.2 Commercial Grading and Drainage .....	2-2
2.1.3 Commercial Parking Lots.....	2-3
2.1.4 Commercial Landscaping .....	2-4
2.1.5 Commercial Lighting .....	2-4
2.1.6 Commercial Signs.....	2-5
2.1.7 Commercial Fencing.....	2-6
2.1.8 Commercial Trash and Utility Areas.....	2-6
2.2 Single Family Residential Areas .....	2-7
2.2.1 Neighborhood Diversity .....	2-7
2.2.2 Single Family Neighborhood Design .....	2-8
2.2.3 Single Family Grading.....	2-9
2.2.4 Single Family Landscaping.....	2-9
2.2.5 Single Family Lighting.....	2-10
2.2.6 Single Family Walls and Fencing .....	2-10
2.3 Multi-Family Residential Site Planning .....	2-11
2.3.1 Multi-Family Building Orientation .....	2-11
2.3.2 Multi-Family Grading and Drainage.....	2-12
2.3.3 Multi-Family Parking.....	2-13
2.3.4 Multi-Family Landscaping .....	2-13
2.3.5 Multi-Family Lighting .....	2-14
2.3.6 Multi-Family Walls and Fencing.....	2-14
2.3.7 Multi-Family Service and Utility Areas .....	2-15
2.4 Architecture Standards and Guidelines .....	2-15

# *Lompa Ranch North Specific Plan*

---

2.4.1	Architectural Theme .....	2-15
2.4.2	Residential Architectural Elements .....	2-16
2.4.3	Commercial Architecture .....	2-16
2.4.4	Commercial and School Building Mass and Form.....	2-17
2.4.5	Commercial Roof Form .....	2-18
2.4.6	Commercial Materials and Colors.....	2-18
2.4.7	Single Family Residential Architecture.....	2-19
2.4.8	Single Family Building Mass and Form.....	2-19
2.4.9	Single Family Roof Form .....	2-20
2.4.10	Single Family Materials and Colors .....	2-20
2.4.11	Single Family Garages .....	2-20
2.4.12	Multi-Family Architecture .....	2-21
2.4.13	Multi-Family Building Mass and Form .....	2-21
2.4.14	Multi-Family Roof Form .....	2-22
2.4.15	Multi-Family Materials and Colors.....	2-22
 <b>CHAPTER 3 – PUBLIC SERVICES AND INFRASTRUCTURE .....</b>		<b>3-1</b>
3.1	Parks, Open Space, and Trails.....	3-1
3.1.1	General Standards .....	3-1
3.1.2	Trails and Pathways .....	3-1
3.1.3	West Side Facilities .....	3-2
3.1.4	East Side Facilities .....	3-3
3.1.5	Open Space .....	3-3
3.1.6	Parks – General Standards .....	3-4
3.2	Sanitary Sewer .....	3-5
3.3	Water Service .....	3-5
3.4	Storm Water Management.....	3-6
3.5	Utility Services .....	3-8
3.6	Roadways .....	3-8
3.6.1	Saliman Road .....	3-9
3.6.2	Robinson Street.....	3-9
3.6.3	Fifth Street .....	3-9
3.6.4	Airport Road.....	3-9
3.5.6	North/South Collector (Spine Road) .....	3-10
3.6.6	U.S.50/E. William Street.....	3-10
3.7	Traffic Impacts .....	3-10
3.8	Fire Protection .....	3-11
3.9	Police Protection.....	3-12
3.10	Schools .....	3-12

# *Lompa Ranch North Specific Plan*

## 1. Introduction

### 1.1 Location

The Lompa Ranch North Specific Plan Area encompasses 251.31± acres. The majority of land (203.27±) acres is located on the west side of Interstate 580, north of East Fifth Street, east of Saliman Road, and south of US Highway 50 (East William Street). The remaining 48.04± acres is located on the east side of Interstate 580 along the western side of Airport Road. Figure 1 (below) depicts the Lompa Ranch North in context with the surrounding area.



Figure 1 – Lompa Ranch North Specific Plan Area

## *Lompa Ranch North Specific Plan*

---

### **1.2 Purpose**

The purpose of this Development Handbook is to provide for the orderly development of the Lompa Ranch North Specific Plan Area (SPA) as envisioned, while assuring that the stated desired level of quality is achieved. Since implementation of public and private improvements will occur in multiple phases, over many years, the standards and guidelines contained herein establish a common framework to guide individual improvement plans. The development of the property is controlled and restricted by these development requirements as well as by all applicable government codes and regulations. This Development Handbook is not intended to limit creativity or prevent variation necessary to respond to unique site conditions, but rather to generate consistency and quality throughout the SPA.

This SPA is for the Lompa Ranch North properties specifically identified with this document. Future development of the remaining Lompa Ranch properties as identified in the 2006 Carson City Master Plan shall be required to receive approval of a new SPA for those areas prior to development.

### **1.3 Vision**

The Lompa Ranch North SPA is intended to provide for a sustainable community that includes a range of land uses that complement not only each other but those that currently exist outside of the SPA boundaries. The vision is to provide for a viable community that promotes a variety of housing types supported by well-balanced commercial, recreational, and educational opportunities.

Complementing the commercial uses and neighborhoods within Lompa Ranch North will be a linear open space preserve along Interstate 580 as well as a network of trails and sidewalks throughout the community, providing non-vehicular connectivity to the various internal and regional components of the area. Throughout Lompa Ranch North, consistent design themes, entries, and landscape treatments will establish a sense of place/community and recall the property's ranching roots.

#### **1.3.1 Land Use Pattern**

The land use mix within Lompa Ranch North provides for varying levels of compatible densities and intensities that will result in a synergy that attracts both residents and businesses. This supports walkability within the community to commercial, recreational, employment, and public activities. It also minimizes the consumption of land associated with traditional suburban development by encouraging and creating a more compact development pattern that is efficient for infrastructure, public services and maintenance.

## *Lompa Ranch North Specific Plan*

---

### **1.3.2 Sense of Place and Community**

Creating a sense of place is one of the key components in creating a vibrant and balanced community. A sense of place is fostered within Lompa Ranch North by creating human-scale environments in which the individual can feel both comfortable and safe. This includes provisions for open space and walking paths, neighborhood parks, common design themes, and uses that complement each other. Furthermore, the Lompa Ranch North SPA promotes and provides for connectivity between various neighborhoods and uses that are integrated through the standards included within this handbook.



### **1.3.3 Diverse Housing Mix**



The Lompa Ranch North SPA provides for neighborhood diversity by allowing for a mix of residential densities and product types to support a wide range of resident interests and needs. The densities included in the SPA will also

support and complement planned commercial uses within the Lompa Ranch North plan area. Furthermore, this diversity in densities and housing types serves to break up the monotony of traditional residential development by reinforcing the dynamics of character and identity within each of the neighborhoods.



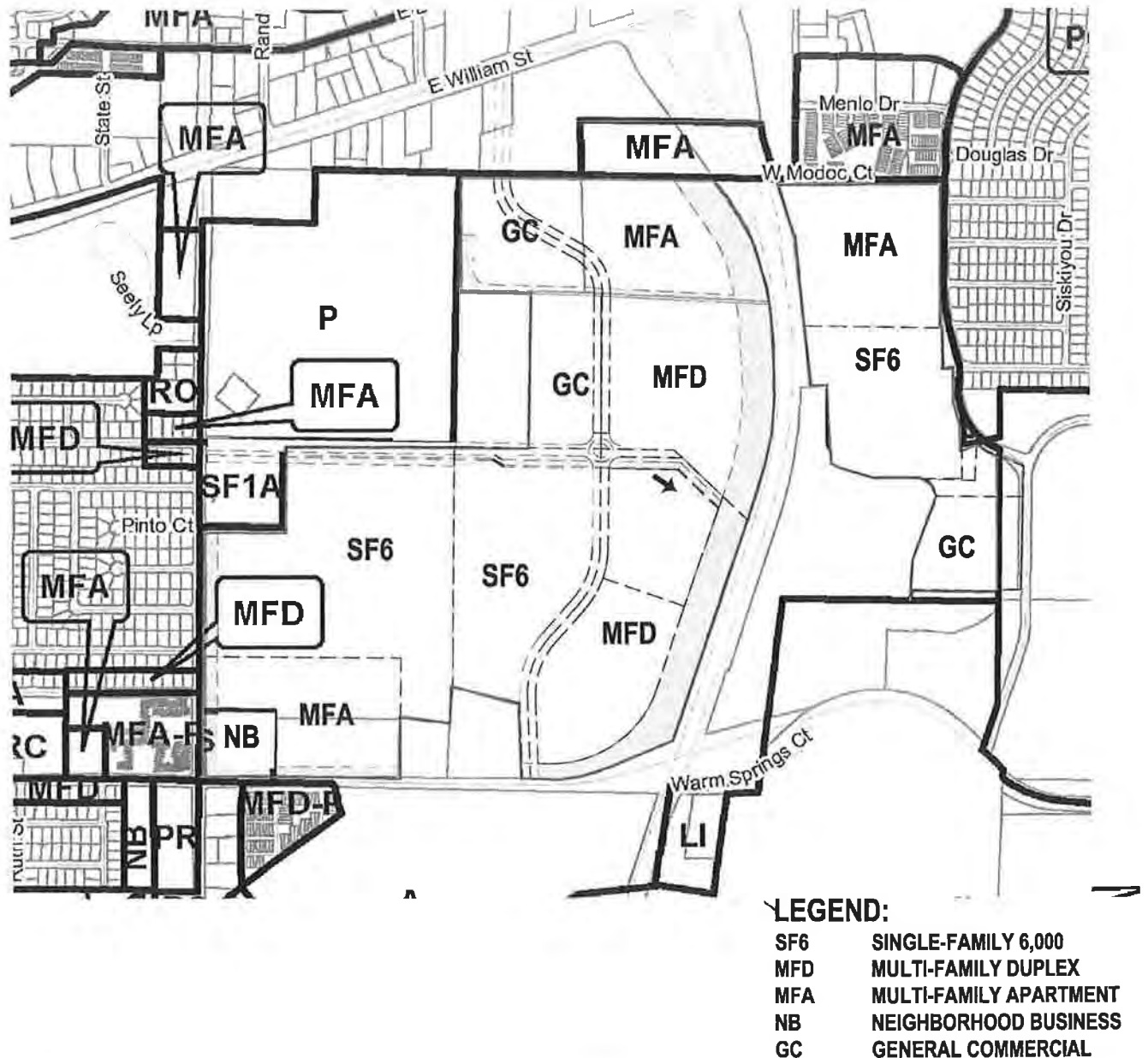
### **1.3.4 Implementation**

This handbook will be used by the Carson City Community Development Department as a guide for reviewing individual projects within the boundaries of the Lompa Ranch North SPA.

## *Lompa Ranch North Specific Plan*

### 1.4 Allowed Uses

Allowed uses within the Lompa Ranch North SPA shall be determined based on the underlying zoning categories, as included in the Carson City Municipal Code Title 18. The zoning districts included within Lompa Ranch North are depicted below:





# Lompa Ranch North Specific Plan

Master Plan land use designations for the Lompa Ranch North SPA are included below:



## 1.4.1 General Standards

- The Lompa Ranch North SPA is envisioned to include a mix of residential uses ranging from 4 units per acre up to 36 units per acre.
- Land use is determined based on zoning. Zoning adopted with this Specific Plan shall be reviewed and approved by the Carson City Planning Commission and Board of Supervisors and deemed to be appropriate for the site(s).



## *Lompa Ranch North Specific Plan*

---

- c) Commercial uses at a varying range of intensities are encouraged within the SPA to serve both new residents of Lompa Ranch North as well as those within the surrounding area. Commercial uses shall be located as to properly relate to adjoining uses.
- d) Uses within Lompa Ranch North shall conform to the underlying zoning district(s) assigned to the individual parcels as outlined in Title 18 of the Carson City Municipal Code
- e) Supplemental review required for specific uses within zoning categories such as Special Use Permits shall remain in effect per the Carson City Municipal Code (refer to allowed uses within individual zoning categories).
- f) This Specific Plan shall not grant any special privileges or waivers in terms of public review or entitlements otherwise required under the Carson City Municipal code in terms of allowed uses or supplemental review.

## *Lompa Ranch North Specific Plan*

---

## **2 Standards and Guidelines**

The site planning standards and guidelines address general provisions of site development which include building orientation, grading and drainage, parking areas, landscape, lighting, signs, walls and fences, and service areas. Site planning controls the proper placement of buildings and internal roads that service and access the various land uses in the community. It addresses the linkages and land use relationships at a human-scale, in order to create a stimulating and visually pleasant community. The goal is to promote pedestrian activity and safety, create visual compatibility with surrounding neighborhoods and minimize negative impacts on the natural environment. These standards are intended to be used in addition to the standards outlined in the Carson City Municipal Code, Title 18 Appendix - Development Standards. In cases where a conflict exists, the stricter of the standards shall apply. Where these standards are silent, the Carson City Development Standards shall apply.

### **2.1 Commercial Uses**

#### **2.1.1 Commercial Site Planning Standards**

- a) Building placement and orientation shall be designed to create visual interest along public streets. Multiple buildings in a single project shall demonstrate a positive functional relationship to one another.
- b) To the extent possible, buildings located within a single project shall be clustered. Plazas and pedestrian areas shall also be an important element in the design of clustered buildings. When clustering is impractical, a visual link should be established between buildings through the use of architectural features, landscaping, etc.
- c) For general commercial uses, a minimum of 15 percent of the building area should be located at or near the front setback line. This minimizes large, continuous areas of parking and encourages active streetscapes.
- d) Buildings shall be oriented so that public access or windows face adjoining streets.
- e) Plazas or common areas within a project shall be located near building entrances or areas of high pedestrian traffic to ensure their use.
- f) To the extent possible, areas between buildings shall be utilized for plazas, outdoor seating, or landscape

## *Lompa Ranch North Specific Plan*

---

features in order to eliminate “dead zones” of underutilized space.

g) Bicycle racks shall be provided within all commercial centers.

### **2.1.2 Commercial Grading and Drainage**

a) Design of commercial uses shall be sensitive to the natural terrain, and structures should be located to minimize necessary grading and preserve natural site features such as drainageways, wetlands, etc. Grading of commercial sites should blend with the natural topography of the site.

b) Grading within commercial areas shall be designed to complement the architectural and landscape design character of the center and surrounding area. Grading techniques can be used to screen parking and service areas, reduce the perception of height and mass on larger buildings, and provide reasonable transitions between uses.

c) Graded slopes should properly transition to existing natural terrain at project borders.

d) Man-made slopes shall not exceed an average of 3:1 slope and turf areas shall not exceed an average 4:1 slope.

e) Areas disturbed by grading activities shall be revegetated prior to the issuance of a certificate of occupancy. If climatic conditions or other circumstances prevent planting at the time of occupancy, a bond shall be provided for landscaping during the subsequent growing season. Drought tolerant plant species shall be utilized to help minimize erosion.

f) New commercial developments must include a final hydrology report to be reviewed and approved by the Carson City Engineering Department prior to the issuance of a building permit.

g) An erosion control plan shall be included with each grading permit.

Appendix 1 contains the Conceptual Drainage Study and Stormwater Management Report for Lompa Ranch North.

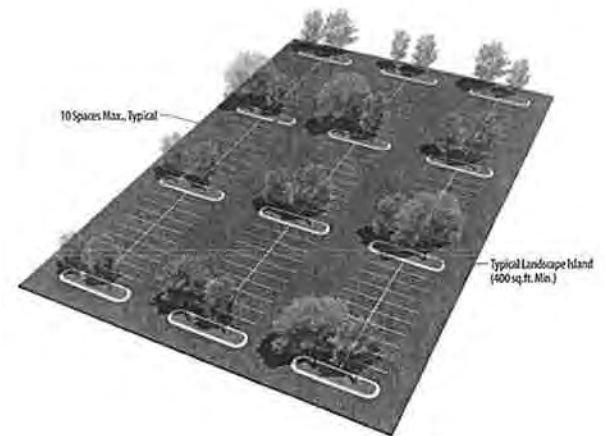
## *Lomp Ranch North Specific Plan*

### **2.1.3 Commercial Parking Lots**

a) A minimum of 10 feet of landscaping shall be provided between parking lots and the public streets.

b) A minimum 400 square foot interior planter shall be provided at the end of parking aisles (refer to example to the right). Planters shall include a minimum of one deciduous tree (min. two inch caliper) – see example to the right.

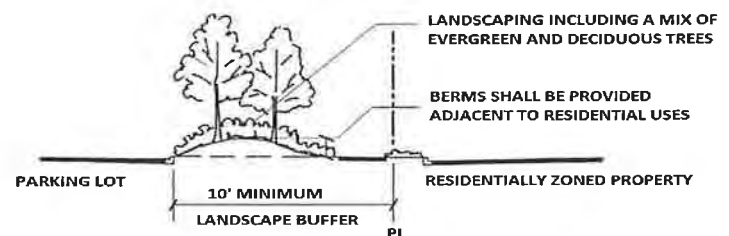
c) Landscape islands (minimum of 400 square feet) shall be provided for every 10 spaces in large parking fields and shall include a minimum of one deciduous tree (two inch caliper minimum). See example to right.



d) Pedestrian connections between parking lots and buildings shall be provided along with connections to sidewalks along adjoining public streets.

e) Parking should be located to the side and rear of a project site where feasible. However, no more than 10 percent of the required parking shall be in the rear service area (typically not used for general public access) of a project site.

f) Parking areas shall be screened from adjoining residential areas through the use of landscaping and berming. This buffer shall be a minimum of 10 feet in width (see example to right).



g) Commercial centers that include tenants that utilize shopping carts shall provide a "cart corral" within 150 feet of 85 percent of their parking stalls.

h) For commercial centers exceeding 5 acres, a maintenance plan shall be required for parking lots that includes regular sweeping and a snow removal/storage plan for winter weather events.

i) For commercial centers adjoining residential areas, parking lot sweeping shall be limited to the hours

## *Lompa Ranch North Specific Plan*

---

between 8:00 am and 9:00 pm.

j) Parking lot design, including space dimensions, aisle widths, etc. shall comply with the provisions of the Carson City Municipal Code.

k) Outdoor sales or special events may not reduce parking past minimum requirements mandated in the Carson City Municipal Code.

### **2.1.4 Commercial Landscaping**

a) Landscaping, including plant materials and themes shall be consistent throughout the Lompa Ranch North SPA.

b) Landscaping standards contained in the Carson City Development Standards shall apply within Lompa Ranch North.

c) Within commercial centers, areas not utilized for parking, buildings, plazas, or access/circulation shall be landscaped to the back of curb. Unbuilt pad areas shall be excluded from this standard.

d) Drought tolerant plantings shall be used in conjunction with low water demand principles and techniques.

e) All landscaped areas shall be irrigated with permanent automatic irrigation systems. All irrigation systems shall be placed underground.

f) Landscape maintenance within commercial areas shall be the responsibility of individual property owners or completed through a private maintenance association.

g) Landscaping along adjoining rights-of-way shall be a minimum width of 15 feet and provide a mix of trees, shrubs, and living groundcover. Trees shall be provided at a rate of 1 tree per 25 lineal feet of street frontage with a minimum of six shrubs per tree

### **2.1.5 Commercial Lighting**

a) Adequate lighting shall be provided to ensure a safe pedestrian environment.

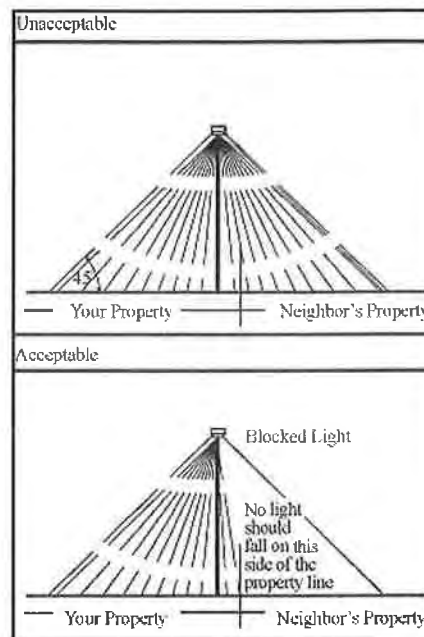
## *Lompa Ranch North Specific Plan*

b) Parking lot lighting within 75 feet of residential areas shall be limited to 12 feet in height and shall incorporate shielded fixtures. Additional height limitations for parking lot lighting within certain distances of residential areas are identified in the Carson City Development Standards.

c) Parking lot lighting shall use shielded/directed fixtures to ensure that spill-over and glare do not occur on adjoining properties. See example to right.

d) The use of bollard lighting is encouraged in pedestrian areas.

e) Exterior lighting shall be used for purposes of illumination and safety only, and shall not be designed for, or used as, an advertising display.



### **2.1.6 Commercial Signs**

Signs and their integration into the project is a critical element in the design of Lompa Ranch North. Careful use of forms, styles, materials, and colors will establish continuity throughout the community. Signs are intended to be utilized only where necessary, and in an understated manner, emphasizing an image of permanence and quality.

a) Signs shall be included on facades or entry canopies of buildings and illuminated or backlit with indirect lighting. All tenant identification signs shall be consistently located and integrated into the architectural design of the building entry. Storefront signs shall be proportional with the building architecture (see example to right).

b) Flashing or animated signs are prohibited.

c) Building signs that project more than 4 inches beyond the wall façade are prohibited, unless incorporated as an architectural element.



## *Lompa Ranch North Specific Plan*

d) Hanging signs may be included under eaves above walkways and shall maintain a minimum of 8 feet of clearance. These signs shall be architecturally compatible with the building they serve (see example to right).



### **2.1.7 Commercial Fencing**

a) Walls and fences shall be utilized to provide a buffer between incompatible uses. It is important, however, that walls are appropriately integrated into each project

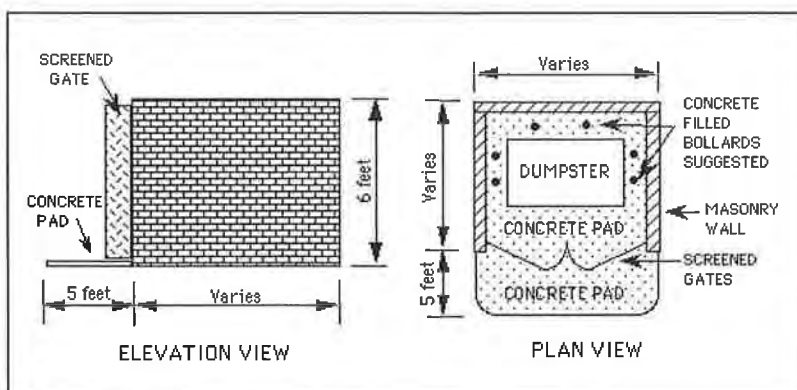
b) Solid fencing (6 foot minimum) shall be installed between commercial uses within Lompa Ranch North and adjoining residential uses. This can include wood or vinyl fencing, concrete block walls, pre-cast wall systems, or similar.

c) Chain link fencing shall be prohibited within commercial centers.

### **2.1.8 Commercial Trash and Utility Areas**

a) Service and maintenance areas shall be screened from adjacent public right-of-ways, pedestrian plazas or adjacent residential uses with landscaped berms, walls or plantings. Storage areas shall be enclosed by a 100% site obscuring fence or wall, permanently installed and maintained at a minimum height of six feet.

b) All trash and garbage bins shall be stored in an enclosure that includes solid screening, to the approval of the Carson City Community Development Department.



c) Trash enclosures shall incorporate building materials, colors, etc. that are complementary to the overall project architecture. Gates shall be constructed of durable building materials that screens at a minimum 80% of the view into the trash enclosure. Wood or chain link gates are not allowed (see example to left).

## *Lompa Ranch North Specific Plan*

---

d) Trash enclosures must include provisions for concrete pads or appropriately designed asphalt sections in front of the enclosure. The area in front of the trash enclosure shall be a minimum of six (6) feet to reduce pavement damage from disposal trucks.

### **2.2 Single Family Residential Areas**

#### **2.2.1 Neighborhood Diversity**

Single family areas within the Lompa Ranch North SPA will include varied densities and housing types in order to create separate and distinct neighborhoods within the project. This can be accomplished through the use of varied housing types, distinct architectural styles and elements, etc.

- a) Densities within single family areas will range from 3 to 8 dwelling units per acre.
- b) Neighborhood density shall properly relate to adjoining developed areas and provide for transition between neighborhood types. Proper transitions can include feathering of density/lot size, landscape buffers, or walls/fences that serve to identify community boundaries.
- c) Individual single family projects within the SPA boundary may create their own sense of identity through the use of entry features that include distinctive signage, entry treatments, landscape improvements, water features, etc.
- d) Varied densities are encouraged throughout the SPA boundary to encourage varied product types including single family detached homes, patio homes, duplexes, townhouses, etc. Additionally, new urbanism design principles such as house-forward designs with residential alleyways are permitted within the single family areas.
- e) It is the intent of the SPA to provide a number of distinctly different neighborhood types rather than a single "large neighborhood" with a single product type.
- f) Variation in architectural styles is encouraged throughout the SPA in order to provide distinct neighborhood identity to new subdivisions within the Lompa Ranch North.



## *Lompa Ranch North Specific Plan*

---

### **2.2.2 Single Family Neighborhood Design**

Neighborhoods within Lompa Ranch North will promote quality development that is complementary to the existing built environment, while establishing its own sense of identity through uniform and innovative design. A variety of single family detached, as well as single family attached products are anticipated within the SPA boundary.

a) To the extent possible, “forward” architecture shall be used in the design of homes. This is accomplished by placing entries, windows, front porches, and living areas towards the street on most plan variations.

b) With the exception of zero lot line lots, plans should be reversed and plotted so that garages and entries are adjacent to each other. This creates an undulating sense of setback. Occasionally this pattern should be broken so that it will not become overly repetitious or reflected by the massing across the street.

c) The garage shall not be the dominant feature of the building facade facing the street and should be offset through architectural detailing for garage forward elevations.



d) So as not to contribute to a repetitious and monotonous appearance along the street, the use of varying building setbacks from the street right-of-way is encouraged.

e) Neighborhoods shall provide connections into the community trail system.

g) In order to avoid a “walled-in” feel, homes backing to parks, open space, or drainage corridors shall include open rear fencing. This includes the use of split rail or iron fencing. See example to right.

h) Setbacks for single family residential areas shall comply with the underlying zoning district for which the subdivision is located. In order to provide for visual interest within the streetscape, front setbacks may be reduced up to 5 feet in order to achieve a non-monotonous/repetitive streetscape pattern.

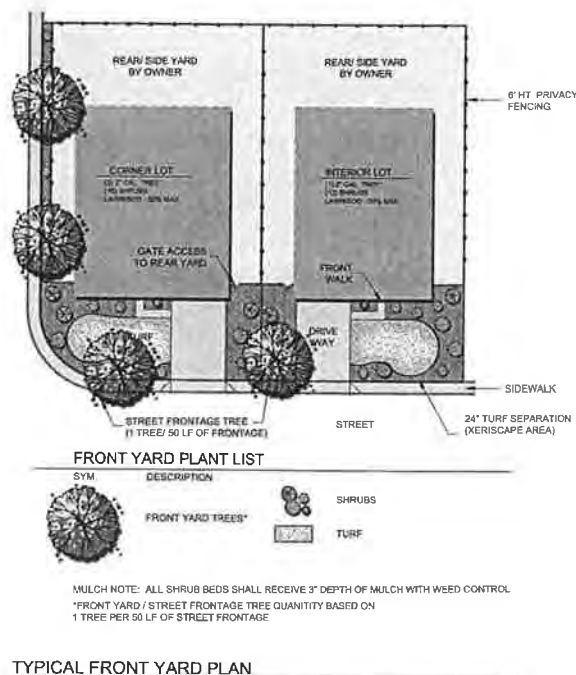
## Lompa Ranch North Specific Plan

### 2.2.3 Single Family Grading

- a) The design of residential neighborhoods shall be sensitive to the natural terrain, and structures shall be located in such a manner so as to minimize necessary grading and preserve natural site features and drainage ways. Any grading of the site terrain shall blend with the natural topography of the site.
- c) Graded slopes shall be rounded resulting in smooth, harmonious transitions between the man-made terrain and the natural terrain.
- d) All graded slopes shall be revegetated prior to building occupancy. If climatic conditions or other circumstances prevent planting at the time of occupancy a bond shall be provided for landscaping during the subsequent growing season or other arrangements made for revegetation, subject to the approval of the administrator. Drought tolerant plant species shall be utilized to help minimize erosion.

### 2.2.4 Single Family Landscaping

- a) Front and street side yard landscaping shall be installed by the builder prior to the occupancy of the individual home. See example to right.
- b) Front yard landscape packages shall provide for a minimum of 1 tree per 50 lineal feet of street frontage as well as a minimum of 12 shrubs. Trees shall be a minimum of 1 inch caliper for deciduous and 6 feet in height for evergreens. Shrubs shall be a minimum of 2 gallon.
- c) Xeriscape options for front yards shall be permitted. Xeriscape packages must include the required trees and shrubs outlined under the previous standard.



- c) Front yard landscaping is required for all homes and will be reviewed and approved with the tentative map establishing installation timing.
- d) Front yard landscape packages shall include an automatic irrigation systems.

## *Lompa Ranch North Specific Plan*

---

### **2.2.5 Single Family Lighting**

- a) Lighting shall be designed to differentiate land use areas, emphasize community amenities, provide continuity along street corridors and ensure the safety of residents and users.
- b) Exterior lighting shall be shielded from projection offsite and designed to be compatible with the architectural and landscape design of the home.

### **2.2.6 Single Family Walls and Fencing**

- a) Walls may be used where necessary to provide privacy and security for residential neighborhoods when adjacent to arterial or collector roadways, or when adjoining non-residential uses.
- b) Walls within the community shall not become the dominant visual element and walls where needed shall blend into the overall landscape.
- c) Walls within Lompa Ranch North shall not exceed 6 feet in height. Acceptable materials include stone, stone veneer, split face/precision block, slump stone, and stuccoed CMU.
- d) Open fencing shall be used where the rear of individual lots are adjacent to open space. See examples below.
- e) Open fences at rear yards may include landscaping with trees and shrubs to screen views of private yards from adjacent properties, common areas, and/or roadways.
- f) Acceptable open fencing materials include wood or vinyl split-rail or wrought iron. See examples below.



## *Lompa Ranch North Specific Plan*

---

g) Single family residential lots may include solid privacy fences. Acceptable materials include wood and vinyl. Privacy fencing shall not exceed 6 feet in height.

h) Chain link fencing is prohibited within residential areas.

### **2.3 Multi-Family Residential Site Planning**

#### **2.3.1 Multi-Family Building Orientation**

a) Multi-family structures should be grouped in clusters of buildings rather than one large continuous structure in order to minimize the scale of the project.



b) Open space areas and courtyards shall be created within multi-family developments in order to break up building mass and provide recreational opportunities. See example to left. Open space/recreational areas shall be provided per the requirements of the Carson City Municipal Code.

c) To provide privacy between living spaces, there should be distance separations, buffering or changes in the angles of units. See examples below.



## *Lompa Ranch North Specific Plan*

---

d) All multi-family/attached single family developments shall incorporate pedestrian connections to adjoining residential, recreational and commercial uses as well as to the community trail system (where practical).

e) Multi-family/attached single family projects in excess of 35 units shall provide a secure children's play area. Additionally, such projects shall incorporate a minimum of 5 recreational facilities. These can be any 5 of the following:

- Swimming pool
- Tennis courts
- Horseshoe Pits
- Spa
- Fitness Center/Gym
- Game room
- Community room
- Picnic areas to include tables with barbecues
- Volleyball court
- Basketball court



f) Recreation facilities shall be conveniently and centrally located for the majority of the units (see examples to right).

g) Private open space, such as decks or patios, shall be contiguous to the units with a minimum width of six (6) feet.

h) Setbacks shall conform to the underlying base zoning. Deviations to setbacks within 10% of requirements may be granted by the Carson City Community Development Director or his/her designee.

### **2.3.2 Multi-Family Grading and Drainage**

a) The design of multi-family housing or attached single family housing shall be sensitive to the natural terrain, and structures shall be located in such a manner so as to minimize necessary grading and preserve natural site features and drainage ways. Any grading of the site terrain shall blend with the natural topography of the site.

## *Lompa Ranch North Specific Plan*

---

- b) Site grading shall be designed to complement the architectural and landscape design character of the community, screening parking and service areas, reducing the perception of height and mass on larger buildings, and providing reasonable transitions between on-site uses.
- c) Graded slopes shall be rounded resulting in smooth, harmonious transitions between the man-made terrain and the natural terrain.
- d) All graded slopes shall be revegetated prior to building occupancy. If climatic conditions or other circumstances prevent planting at the time of occupancy a bond shall be provided for landscaping during the subsequent growing season or other arrangements made for revegetation, subject to the approval of the administrator. Drought tolerant plant species shall be utilized to help minimize erosion.

Appendix 1 contains the Conceptual Drainage Study and Stormwater Management Report for Lompa Ranch North.

### **2.3.3 Multi-Family Parking**

- a) Parking areas shall not be located in excess of 400 feet from individual units within multi-family projects.
- b) Pedestrian links between units (i.e. sidewalks) shall be provided between all units and parking areas.
- c) Garages and covered parking shall be designed as an integral part of the architecture of the development and shall include the same colors, materials, etc. as the primary building(s). Carports should not have roof pitch of less than 3:12.

### **2.3.4 Multi-Family Landscaping**

- a) Minimum landscape requirements shall be established by the Carson City Development Standards based on underlying zoning of the project site.
- b) Drought tolerant and low water demand plantings shall be used to the extent possible. Xeriscaping may be substituted for turf areas and must contain trees and shrubs per the standards of the Carson City Development Standards.
- c) Automatic irrigation systems shall be installed with all multi-family projects. All irrigation systems shall be placed underground.

## *Lompa Ranch North Specific Plan*

---

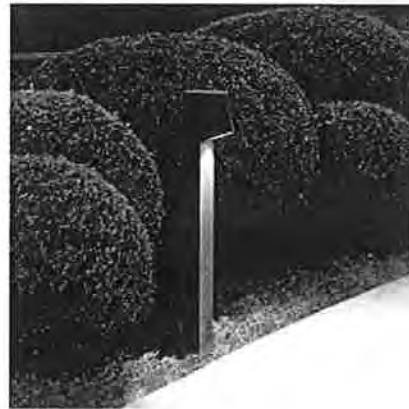
d) Large parking lots (in excess of 25 spaces) within multi-family shall provide a minimum 400 square foot landscape island containing at least one tree (two inch caliper) for every 10 spaces of required parking.

e) Landscaping along adjoining rights-of-way shall be a minimum width of 15 feet and provide a mix of trees, shrubs, and living groundcover. Trees shall be provided at a rate of 1 tree per 25 lineal feet of street frontage with a minimum of six shrubs per tree.

### **2.3.5 Multi-Family Lighting**

a) The height of lighting within multi-family projects shall be in scale with the setting and complement the architecture. Light fixtures over 10 feet shall include a cut-off shield to prevent the light source from being directly visible from off-site areas.

b) Light sources shall be kept as low to the ground as possible while ensuring safe and functional levels of illumination. For example, the use of bollard lighting rather than pole lighting is required in pedestrian areas. See examples below.



c) Illumination of landscape features or building facades for aesthetic purposes shall ensure that light does not project beyond the project boundary.

### **2.3.6 Multi-Family Walls and Fencing**

a) Multi-family projects that adjoin common areas, open space, or drainageways shall include open fencing adjacent to such features. Acceptable materials include wood or vinyl split rail or wrought iron and shall not exceed 6 feet in height.

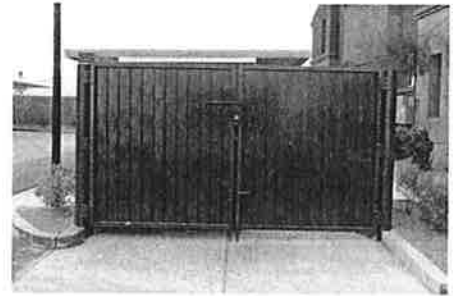
## *Lompa Ranch North Specific Plan*

---

- b) In areas where open fencing is employed, landscaping shall be used to screen views of private yards from adjacent properties and public streets.
- c) Design of all walls and fences shall be consistent in terms of material, color and detail within each multi-family and attached single family residential project. Chain link fencing is prohibited.
- d) In areas where multi-family development adjoins either single family residential or commercial use, a minimum 6-foot wall shall be provided for separation. Acceptable materials include stone, stone veneer, split face/precision block, slump stone, and stuccoed CMU.

### **2.3.7 Multi-Family Service and Utility Areas**

a) Enclosures shall be provided in order to screen all trash dumpsters and shall architecturally complement the primary building(s). Enclosures shall include solid gates and screen a minimum of 80% of the interior area. See example to right.



b) Trash enclosures shall include durable materials that complement the primary architecture and shall be screened with landscape on three sides and shall comply with the Carson City Development Standards. Chain link fencing is prohibited. See example to right.

c) The use of individual trash cans for multi-family projects in excess of 15 units shall be prohibited.

## **2.4 ARCHITECTURE STANDARDS AND GUIDELINES**

### **2.4.1 Architectural Theme**

It is the intent of the Lompa Ranch North SPA to promote a high quality development that incorporates an architectural style that reflect the historical ranching aspect of the area. Therefore, a ranch and craftsman architectural theme is adopted with the Lompa Ranch North SPA.

Variations on the ranch/craftsman style are encouraged in order to promote creative design, innovative features, and high quality elevations. Variations may include the introduction of a southwestern elements such as barrel tile roofs or Victorian elements such as wrap-around porches. These deviations will be



## *Lompa Ranch North Specific Plan*

---

complementary to the overall theme and can add visual interest within the community.

### **2.4.2 Residential Architectural Elements**

a) New structures within Lompa Ranch North shall, at a minimum, incorporate a minimum of two of the following elements:

- Gable roofs with deep overhangs.
- Exposed rafters, brackets, columns, etc.
- Decorative doors and windows
- A mixture of 2 (at a minimum) exterior elements including stucco, wood siding or shingles, brick, or stone
- Exterior porches or courtyards

b) Acceptable roofing materials include concrete or clay tile, slate, or architectural grade (30+ year) composition asphalt shingles. Metal roofing may be used as an architectural element in conjunction with the previously listed materials.

c) Flat roofs are prohibited in residential areas.

d) Metal buildings, other than accessory sheds not to exceed 250 square feet, are prohibited.

e) Modular homes are not permitted within the Lompa Ranch North SPA.

f) Building articulation shall include a minimum of 4 separate roof planes incorporated on front/primary elevations. Front/primary elevations shall contain a minimum of 2 wall planes offset by a minimum of 3 feet.

g) Building colors shall utilize an earth tone pallet such as browns, tans, whites, greens, deep reds and oranges, pale yellows, etc. The use of bright or vibrant colors is prohibited with the exception of highlighting architectural elements.

### **2.4.3 Commercial Architecture**

Commercial areas within the Lompa Ranch North SPA are envisioned to complement residential uses in function and form. Smaller retail uses will incorporate the ranch theme while larger commercial centers can take a more traditional center approach with the inclusion of the ranch theme elements such as rock, stone, brick, etc.

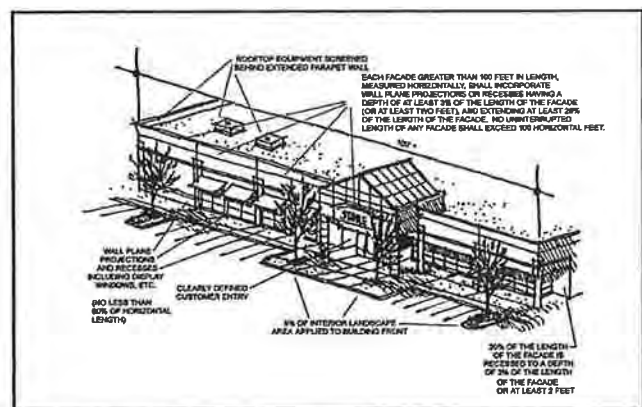
## *Lomp Ranch North Specific Plan*

### **2.4.4 Commercial and School Building Mass and Form**

- a) Individual buildings, forms, and components within commercial centers shall be designed as a whole to ensure unity to the overall design of the center.
- b) Facades shall include articulation to ensure that the large scale of commercial buildings is softened and appropriate for the area at a human scale. Articulation shall be provided on all sides of any commercial building that is adjacent to a public right-of-way or main commercial parking area.
- c) Visual interest shall be created in building facades through the incorporation of wall plane projections or recesses that are a minimum of two (2) feet in depth.
- d) Wall plane projection or recess may be substituted with a combination of vertical or horizontal elements such as trellises, awnings, shed roofs, or columns. Any such element must have a minimum of 2 feet change in vertical or horizontal projection or recess. The proposed alternative design solution shall meet the intent of this standard.
- e) In commercial areas adjoining residential uses, building heights shall relate to the adjacent development to enhance view corridors and ensure compatibility.
- f) Multi-tenant commercial spaces shall use color change, texture change, material change, or relief change to avoid large expanses of blank walls and box-like structures (see example to the left).



- g) Buildings in excess of 10,000 square feet should vary building and roof forms to give the appearance of smaller forms. See example to right.



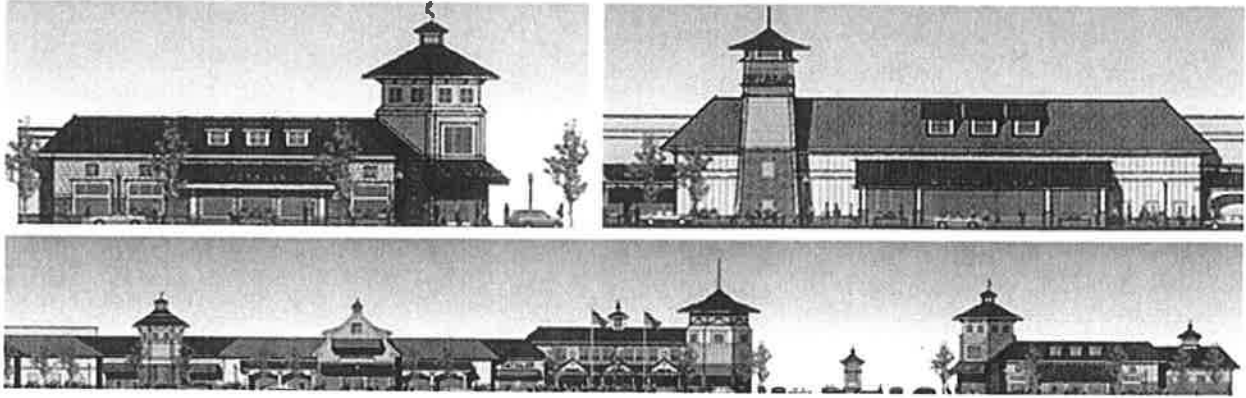
- h) Commercial centers that include multiple buildings shall incorporate a consistent architectural theme. Pad site buildings with conflicting architectural style are prohibited.

### **2.4.5 Commercial Roof Form**

## *Lompa Ranch North Specific Plan*

---

a) Rooflines shall include variations to add visual interest and reduce the scale of large buildings. Refer to example below.



b) Roof profile elements visible at ground level shall incorporate horizontal and vertical offsets as depicted in the example above.

c) All rooftop equipment shall be screened from public view at street level and the parking lot.

d) All roof mounted mechanical equipment must be screened from public view at the street level and the parking lot.

### **2.4.6 Commercial Materials and Colors**

a) The colors and materials of new buildings shall be compatible with those of adjoining buildings/uses.

b) Exterior building materials shall be of high quality. These may include, but are not limited to:

- brick
- stained, painted, or weathered wood/cementitious products such as heavy timbers or stock lumber
- stone veneer/cultured stone
- integral color split face block or rough cut wood
- metal such as corrugated, battened or standing panelized systems; performed painted or stained metal shapes
- fabric or metal awnings
- dimensioned asphalt or simulated wood shingles
- tilt-up concrete with wood texture, or other similar treatment

c) Accent colors (including vibrant colors) may be used to emphasize special façade elements in order to attract attention at focal points.

## *Lompa Ranch North Specific Plan*

---

- d) Facades shall include the use of earth tone palette colors in broad expanses. The use of high intensity colors, very dark colors or fluorescent colors are discouraged unless they are used to accentuate architectural forms or features.
- e) Building trim and accent may feature a brighter, more intense palette of colors used to direct focus toward important building elements.
- f) The following exterior building materials are not allowed as predominant features on building facades:
  - integral color smooth-faced or painted concrete masonry
  - tilt-up concrete panels without textures or finishes
  - pre-fabricated steel panels
  - unprotected wood
  - dimensional asphalt shingles (architectural grade asphalt shingles may be used on roofs)

### **2.4.7 Single Family Residential Architecture**

Architectural standards for residential areas promote an upscale development concept that reflects a western and ranching heritage while providing for modern amenities and features. Although neighborhoods may include distinctive architectural designs, common elements serve to create a cohesive community that creates a sense of place.

### **2.4.8 Single Family Building Mass and Form**

- a) Home facades shall incorporate the architectural style and materials outlined in section 2.4.1.
- b) A minimum of 3 distinctive floor plans shall be used within each subdivision. Subdivisions with less than 20 lots are exempt from this requirement. Phasing of 20 units or less does not circumvent this standard.
- c) Architectural details and stylings used on the front of the home shall be carried over to all elevations.
- d) A minimum of 3 distinctive front elevations shall be included for each model within subdivisions. Matching elevations shall not be allowed to repeat next to each other.
- e) Varied setbacks, floorplans, and elevation packages shall be used within subdivisions to create a visually interesting streetscape.

### **2.4.9 Single Family Roof Form**

- a) Roof planes are required to vary through the use of architectural features such as dormers, gables, hipped roofs and variations in pitch appropriate to the homes chosen architectural style.

## *Lompa Ranch North Specific Plan*

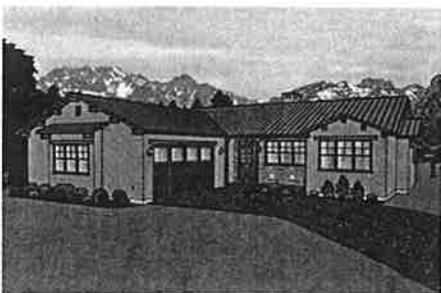
---

### **2.4.10 Single Family Materials and Colors**

- a) As mandated within other provisions of this handbook, single family homes shall incorporate an[d] earth tone color palette. The use of bright and vibrant colors is prohibited with the exception of enhancing key architectural elements and features.
- b) Conflicting architectural styles within a single subdivision shall be prohibited.
- c) Building materials and elements shall be consistent with those outlined under previous standards.

### **2.4.11 Single Family Garages**

- a) Garages shall include a minimum of 5 feet offset from inhabitable areas. Front elevations should provide focus on living areas and not garages.
- b) Home plans shall incorporate one of the garage designs listed below and each subdivision shall incorporate at least two of these techniques to reduce the emphasis of the garage on the street (see examples to left).
  - Recessing garage back a minimum of five (5) feet in relationship to the front of the house.



- Incorporation of a side-load garage that eliminates the continuous view of garage doors from the street.

## *Lompa Ranch North Specific Plan*

---

c) Garage forward plans shall be permitted when offsets (5 feet minimum) exist for the garage in order to provide visual distinction between the garage and residence. See examples below.



### **2.4.12 Multi-Family Architecture**

Multi-family standards are intended to result in a visually pleasing product that does not reflect a “big box” appearance and incorporates elements to break up building masses, provide articulation at a human scale, and complement single family uses within the Lompa Ranch North SPA.

### **2.4.13 Multi-Family Building Mass and Form**

a) Facades of multi-family buildings shall be articulated using at least one of the architectural elements previously listed in the Architectural Theme standards.



b) Buildings shall incorporate facade articulation with no long expanses of flat wall planes, vertically or horizontally, exceeding 50 feet (see example to left).

c) Architectural elements (i.e., exterior materials, fenestration, window trims, cornices, arches, etc) shall be utilized on all sides of the building.

d) Architectural elements such as towers, piers and varied rooflines may be used to break up the horizontal massing and provide visual interest.

## *Lompa Ranch North Specific Plan*

---

- e) Single family attached products such as townhomes that include garages and/or carport are more than 50 percent of the total width of the unit shall incorporate architectural features such as shutters, garage door window trim and minimum offsets of 2 feet, to reduce the visual impact of garages and carports on the front façade.
- f) Garages and carports not attached to the main residential building shall match the main structure in building design, materials, roof pitch and architectural character.

### **2.4.14 Multi-Family Roof Form**

- a) Roofs planes shall include variation which can be accomplished with the inclusion of elements such as dormers, gables, hipped roofs and variations in pitch. (See example to right).
- b) Roof materials shall include concrete tile, clay tile, slate, or architectural grade (30+ year) composition shingles. Metal roofing is prohibited as a primary material but may be used as an accent feature when combined with the allowed materials.



### **2.4.15 Multi-Family Materials and Colors**

- a) As mandated within other provisions of this handbook, multi-family uses shall incorporate an earth tone color palette. The use of bright and vibrant colors is prohibited with the exception of enhancing key architectural elements and features.
- b) Varied elevations may be used within a single project. However, conflicting architectural styles within a single multi-family development shall be prohibited.
- c) Building materials and elements shall be consistent with those outlined under previous standards.

## *Lompa Ranch North Specific Plan*

---

### **3 Public Services and Infrastructure**

#### **3.1 Parks, Open Space, and Trails**

The Lompa Ranch North SPA envisions a community that is linked together through a system of trails, open space, and parks. The intent of these standards is to implement the provisions of the *Unified Pathways Master Plan*; *Parks and Recreation Master Plan*; and *Open Space Master Plan* adopted by Carson City.

##### **3.1.1 General Standards**

- a) A Landscape Maintenance District (LMD) shall be formed by the Master Developer to provide for the maintenance and upkeep of open space and common area landscaping, trails, and park/recreation facilities and amenities. The LMD shall be in place prior to the issuance of the first certificate of occupancy.
- b) A private homeowner's association (HOA) shall provide for the maintenance of all private landscape features and non-public recreation facilities (i.e. private parks within gated communities, etc.).
- c) Design of open space areas shall follow the standards and policies of the Carson City Open Space Plan, adopted by Carson City in June 2000.
- d) Pathways and trails, other than those described in Section 3.1.2 (following) shall conform to the standards and policies of the Unified Pathways Master Plan adopted by Carson City on April 6, 2004~~1~~6 (as revised March 15, 2007).
- e) Any new park facilities within the Lompa Ranch North SPA shall conform to the *Parks and Recreation Master Plan* as adopted by Carson City on April 6, 2006.
- f) Sidewalk connections to the Lompa Ranch North SPA trail/pathway system shall be provided in order to provide convenient and logical access to the trail system, parks/recreation areas, and open space.

##### **3.1.2 Trails and Pathways**

- a) Trails, pathways, and sidewalks not specifically called out within this section shall conform to the standards outlined in Section 6 of the Carson City Unified Pathways Master Plan (Pathway Types).



## *Lompa Ranch North Specific Plan*

---

b) As individual subdivisions and/or projects are submitted for review, the applicant/developer shall be required to demonstrate that trail connectivity between parks, trails, open space, and the high school is being provided. This shall be to the satisfaction of the Community Development and Parks, Recreation and Open Space Departments.

c) The trails and pathway system shall be constructed of concrete with a portion of it constructed using stabilized decomposed granite.

### **3.1.3 West Side Facilities**

The following standards apply to properties within Lompa Ranch North that lie west of Interstate 580:

a) Prior to the issuance of the certificate of occupancy for the 750<sup>th</sup> residential unit west of Interstate 580, the Master Developer shall construct and dedicate to the City a minimum 10-acre neighborhood park site on the west side of the freeway as shown on the adopted land use map. This shall be coordinated through and agreed upon by the Carson City Parks, Recreation and Open Space Department.

b) For the park area west of the freeway, a meandering path (consistent with Unified Pathways Master Plan Standards) shall be constructed along a north/south route, connection 5<sup>th</sup> Street to the northern boundary of the SPA area. This pathway may follow a proposed drainage channel(s) where feasible and shall meet the guidelines for an “off-street/multi-use trail.” A multi-use path shall connect to the SPA’s park/recreation facilities in this project.

c) A fitness course may be substituted for park benches along the north/south trail. See examples below:



## *Lompa Ranch North Specific Plan*

---

- d) An east-west off-street multi-use path shall be constructed on the freeway's west side of the Lompa Ranch North SPA along 5<sup>th</sup> Street and connected to the east side development. Timing of this trail along with final alignment shall be in conjunction with new development and coordinated through the Parks, Recreation, and Open Space Department.
- e) An east-west multi-use path shall connect with the north/south trail, as depicted in the Unified Pathways Master Plan and described in c) and d) above.
- f) For park area west of the freeway, trails, pathways, and sidewalks shall provide off-street connectivity from 5<sup>th</sup> Street to Carson High School and Robinson Street.

### **3.1.4 East Side Facilities**

The following standards apply to properties within Lompa Ranch North that lie east of Interstate 580:

- a) The Master Developer shall work with the Carson City Parks, Recreation and Open Space Department and provide for a 3-acre minimum neighborhood park site on the east side of Interstate 580 as depicted on the land use plan. The park site shall be constructed and dedicated to the City prior to the issuance of the certificate of occupancy for the 250<sup>th</sup> residential unit located on the east side of I-580. This shall be coordinated through and agreed upon by the Carson City Parks, Recreation and Open Space Department.
- b) For park area east of the freeway, the north/south trail being constructed by the City shall, at a minimum, include landscaping and pedestrian amenities. Trees (either evergreen or deciduous) shall be planted at a rate of 1 tree per 50 lineal feet with a minimum of 4 shrubs per tree. Park benches shall be located along the trails at a rate of 1 bench per 500 lineal feet of trail along with mileage parkers at one-mile intervals.
- c) The City property (approximately .13 acres) adjacent to the 3-acre minimum neighborhood park site shall be included in the park's design and constructed with the other park amenities.

### **3.1.5 Open Space**

- a) All identified wetland areas within the Lompa Ranch North SPA shall be preserved as dedicated open space.
- b) Drainage channels shall be incorporated into open space areas and include trails/paths as described in section 3.1.2.
- c) Open space areas shall be maintained through a LMD and/or by a private homeowners association(s).
- d) Landscape medians, parkways, corridors, etc. included within common or open space areas shall be maintained by a private homeowners association(s) and/or through the LMD.

## *Lompa Ranch North Specific Plan*

---

e) Open space areas that remain private shall not include public access (if privately owned) and shall be maintained by a private homeowners association and not through an LMD.

### **3.1.6 Parks – General Standards**

a) Parks within the Lompa Ranch North SPA shall be maintained through implementation of a Landscape Maintenance District. Any private parks (without general public access) shall be maintained by a private homeowners association(s).

b) Opportunities for joint use of park and open space facilities (i.e. stormwater detention basins) shall be a priority within the Lompa Ranch North SPA. This includes the incorporation of one or more dog park facilities.

c) All park facilities and open space areas shall have access to the overall trails/pathways system and sidewalk network within the SPA area.

d) Smaller public parks are discouraged within the SPA in favor of larger community parks. Private small parks or pocket parks may be permitted within individual subdivisions but shall be maintained by a private HOA, not the LMD.

e) Park facilities within Lompa Ranch North will be coordinated with the Carson City Parks, Recreation, and Open Space Department for review and approval as individual projects within the Lompa Ranch North SPA are brought forward.

f) Park design shall be consistent with Carson City Parks, Recreation, and Open Space Department guidelines and design standards, including water conservation design elements.

g) Playgrounds within public parks shall be designed to be universally accessible per design standards adopted by the Carson City Parks, Recreation and Open Space Department.

h) As part of the overall Lompa Ranch North park plan , provisions for a neighborhood “Splash Pad” and/or water play feature shall be included to the approval of the Carson City Parks, Recreation and Open Space Department.

i) New parks shall be designed to allow for automobile access, including City maintenance vehicles and emergency services.

j) The Master Developer, at its cost, will dedicate land and improvements for two neighborhood parks, detention basin parks and trails/pathways within the Project; as a result, the residential construction tax described in Carson City Municipal Code 15.06 – Residential Construction Tax et. seq. will not be collected by Carson City at the time building permits are issued for residential dwellings in the Project.

## *Lompa Ranch North Specific Plan*

---

### **3.2 Sanitary Sewer**

- a) All new development within the Lompa Ranch North SPA shall be required to connect to municipal sanitary sewer service.
- b) Prior to submittal for the first construction permit, a complete description of all phasing must be submitted. This phasing description must indicate the geographical boundaries of each phase, a description of the proposed development for each phase, and the estimated sewer demand imposed by each phase. A final sewer report demonstrating capacity to serve the development shall be submitted with each individual project within the SPA boundary. Any existing sewer capacity provided to the development shall be on a “first come, first served” basis. There may be additional future infrastructure or costs associated with serving the development depending on build out time frames.
- c) The site has no known constraints which would impact the ability to be served by a gravity fed extension of the public sewer. Existing sewer manholes in the SPA have vents. Any sewer vents located within or near the boundary of a phase must be evaluated as part of the sewer analysis for that phase to prevent odor issues.
- d) An overall water and sewer technical report for each phase shall be submitted to and approved by Carson City prior to submittal for the first construction permit of each phase, to ensure that each project phase is properly sized and designed. The Lompa Ranch North Water and Sewer Demand Report is included as Appendix 5 of this document. Water and sewer technical reports shall include analysis of downstream/offsite capacities. Technical reports shall cite sources of any rate of demand used.

### **3.3 Water Service**

- a) All new development within the Lompa Ranch North SPA shall be required to connect to municipal water service.
- b) Prior to submittal for the first construction permit, a complete description of all phasing must be submitted. This phasing description must indicate the geographical boundaries of each phase, a description of the proposed development for each phase, and the estimated water demand imposed by each phase. All new development shall be required to pay applicable water connection fees and demonstrate that adequate water supply is available to serve the project and dedicated for use. Any existing water capacity provided to the development shall be on a “first come, first served” basis. There may be additional future infrastructure or costs associated with serving the development depending on building out time frames.

## *Lompa Ranch North Specific Plan*

---

c) Separate irrigation meters will be employed in accordance with the guidelines present at the time of connection.

d) An overall water and sewer technical report for each phase shall be submitted to and approved by Carson City prior to submittal for the first construction permit for each phase, to ensure that each project phase is properly sized and designed. The Lompa Ranch North Water and Sewer Demands Study is included as Appendix 4 of this document. Water and sewer technical reports shall include analysis of downstream/offsite capacities. Technical reports shall cite sources of any rate of demand used.

### **3.4 Storm Water Management**

The Lompa Ranch area benefits from extensive review and policy implementation that has been performed by Carson City as part of their long-range planning and infrastructure management processes. It is a goal of this Specific Plan to adhere to and complement this planning work. Policy *LR-SPA 3.1 Floodplain and Drainage*, from the Carson City Master Plan is therefore included in this document as a means of establishing long-range storm water management planning for Lompa Ranch North. This policy states:

- *The existing floodplain shall be identified based on FEMA mapping with post-freeway drainage improvements for development of the final SPA. In order to develop the property, drainage improvements will be required to mitigate the 100-year floodplain on the property. This may also require amending the FEMA mapping through a letter map amendment process. Once the new floodplain is determined, designated land use intensities shall be developed outside this floodplain area.*
- *An overall storm water management plan shall be developed with the final SPA to ensure adequate drainage facilities to serve the entire SPA area.*
- *A detailed wetlands delineation shall be provided with the final SPA identifying any areas that meet the Federal 404 definition of wetlands. Following wetland identification, designated land use intensities shall be developed outside the wetlands.*

Per the above policy, a wetlands delineation is currently planned for Spring 2016. The completion deadline for this task is June 30, 2016. No development shall occur within the Lompa Ranch North SPA until the wetlands delineation has been completed.

Additional resources for guiding storm water management (and other utilities) are the Conceptual Drainage Study and Stormwater Management Report for Lompa Ranch North (included in Appendix 1). In particular, this report states the following:

## *Lompa Ranch North Specific Plan*

---

*Based on the floodplain analysis, it is recommended that a LOMR be pursued based on the existing topography. The LOMR would remove much of the Lompa Ranch from the burden of delineated floodway both upstream and downstream of the Highway 395. It would establish discharges which could be used for the design of proposed drainage improvements including the design of channels along 5th Street, Saliman Drive, Robinson Road and north of Carson High School. In addition the model could be used for future site development planning and design and would be considered as the effective model for future modeling efforts, specifically those that would be part of a CLOMR for new development.*

The existing *Master Plan Policy LR-SPA 3.1* and the *Conceptual Drainage Study and Stormwater Management Report* therefore form part of the standards for the Lompa Ranch North SPA.

The LOMR must be approved by Carson City and submitted to the Federal Emergency Management Agency (FEMA) prior to submittal for the first construction permit. Prior to any construction permit being issued, the development must have a conditional letter of map revision (CLOMR) approved by Carson City and FEMA. If the property is divided and sold to different owners, each separate development in the floodplain must have a CLOMR approved by FEMA prior to any construction permit being issued. The developer of any parcel in the flood plain, prior to any construction permit being issued, must provide funds to the City to process a Letter of Map Revision (LOMR) after the improvements are complete.

Additional standards include:

- a) The primary channels provided along Robinson Street, Saliman Road, Interstate 580, and 5<sup>th</sup> Street shall be designed to contain the existing off-site watershed discharges as well as the existing discharges from the SPA area.
- b) Onsite retention and detention facilities are required within the development of multi-family and commercial parcels.
- c) Existing drainage patterns shall be maintained.
- d) A comprehensive drainage impact analysis for the overall Lompa Ranch North SPA shall be reviewed and approved with the first tentative map and/or permit request. The analysis shall provide estimates of project impacts at buildout along with required upgrades, improvements, etc. as well as with triggers for when these improvements are required.
- e) Updates to the master drainage analysis shall be provided for any project proposing multi-family or commercial uses.
- f) Prior to submittal for the first construction permit, a complete description of all phasing must be submitted. This phasing description must indicate the geographical boundaries of each phase, a description of the proposed development for each phase, and the estimated stormwater runoff imposed by each phase.

## *Lompa Ranch North Specific Plan*

---

g) The development shall implement Low Impact Development (LID) Standards to include the *Truckee Meadows Low Impact Development Standards Handbook*, current edition, or current LID standards adopted by Carson City.

Appendix 1 contains the Conceptual Drainage Study and Stormwater Management Report for Lompa Ranch North.

### **3.5 Utility Services**

a) All utility services within the Lompa Ranch North SPA shall be undergrounded. Overhead power lines shall be prohibited.

b) Plans for electrical, natural gas, telephone, and cable service shall be reviewed and approved by the applicable purveyor (i.e. NV Energy, Southwest Gas, AT&T, etc) prior to the issuance of a building permit.

### **3.6 Roadways**

A traffic impact study has been completed for Lompa Ranch North (included in Appendix 2). This study includes recommended roadway improvements that mitigate the projected impacts. These roadway improvements are included below under their relevant heading.

a) All roadways within the Lompa Ranch North SPA shall comply with the standards and requirements included within the Carson City Municipal Code. This includes the provision of sidewalks where appropriate. All sidewalks in the Lompa Ranch North SPA shall be designed to provide connectivity to multi-use paths, parks, and open space.

b) Prior to submittal for the first construction permit, a complete description of all phasing must be submitted. This phasing description must indicate the geographical boundaries of each phase, a description of the proposed development for each phase, and the estimated traffic impact imposed by each phase.

c) An easement agreement or right of way must be in place prior to approval of any construction permits which are part of a phase which requires roadway improvements which will need additional right-of-way to be completed.

d) Each phase will require a traffic impact study to be completed and submitted for that phase prior to approval of any construction permits in that phase. The traffic study for Phase 1 will require coordination with the School District to mitigate impacts along Robinson Street.

## *Lonpa Ranch North Specific Plan*

---

### **3.6.1 Saliman Road**

a) Consistent with the conclusions/recommendations outlined in the traffic impact analysis (Appendix 2), add northbound dual lefts at E. William/Saliman intersection, and add northbound right turn lane at 5<sup>th</sup> Street. Include drainage improvements. Channel section to include open space for multi-use path.

### **3.6.2 Robinson Street**

a) Robinson Street shall be improved to collector standards established by the Carson City Municipal Code. Robinson Street should be extended to intersect with a new north-south “spine road” within the project area and as shown in Exhibit 2. Robinson Street can be constructed with one through lane in each direction. Include drainage improvements. Channel section to include open space for multi-use path.

b) Consistent with the conclusions/recommendations outlined in the traffic impact analysis (Appendix 2), add westbound right turn lane at Saliman Road, and widen Robinson Street to accept dual left turn lanes from Saliman Road.

### **3.6.3 Fifth Street**

a) Fifth Street shall include new drainage improvements to address site development conditions to the satisfaction of the Carson City Engineering and Public Works Departments.

b) Consistent with the conclusions/recommendations outlined in the traffic impact analysis (Appendix 2), add an intersection where the new Spine Road will meet 5<sup>th</sup> Street with an eastbound left turn lane, westbound right turn lane, southbound exclusive left and right turn lanes, and signalization (signalization only if warranted). Widen 5<sup>th</sup> Street at this intersection to accommodate turn lanes. Also, add a westbound right turn lane at Airport Road. Add a westbound right turn lane at Saliman Road, which may already be warranted without the project.

### **3.6.4 Airport Road**

a) Right-turn lanes will be added along Airport Road based on the recommendations included in the reviewed and approved traffic impact analysis. The Carson City Engineering Department shall determine compliance with this standard.



## *Lompa Ranch North Specific Plan*

---

b) US 50/Airport – Consistent with the conclusions/recommendations outlined in the traffic impact analysis (Appendix 2), Provide northbound dual left turn lanes.

### **3.6.5 North/South Collector (Spine Road)**

a) A collector roadway (Spine Road) shall be constructed from 5<sup>th</sup> Street extending north to US Highway 50. This road shall be designed as a limited access collector (per City standard) and include additional space for a multi-use path and landscaping, separated from vehicular traffic. The Spine Road can be constructed with one through lane in each direction. For Phase 1, the spine road may need to extend north of the Robinson Street extension.

b) US 50/Gold Dust Casino – Consistent with the conclusions/recommendations outlined in the traffic impact analysis (Appendix 2), add a northbound right turn lane and widen the south leg to accept a new left turn lane from westbound E. William Street. The south leg will continue to connect with the proposed north-south spine road.

c) Consistent with the conclusions/recommendations outlined in the traffic impact analysis (Appendix 2), a new three- to four-leg intersection at Robinson Street/Spine Road should be constructed to provide a north leg at this intersection. This north leg is proposed to continue to its connection with the south leg of the William Street/Casino intersection. This will require widening the existing south leg of this intersection to a standard two to three lane cross section.

d) The preferred northern intersection of the spine road is at the existing signalized intersection on William Street serving access to the Gold Dust Casino. The south leg of this intersection should be widened to accommodate a potential additional westbound to southbound left turn lane at this intersection. The spine road is anticipated to carry approximately 12,000 vehicles per day at Build Out. This volume approaches the threshold for a four-lane roadway. Further analysis and continuing discussions with the property owners south of William Road will be required.

### **3.6.6 U.S. 50/E. William Street**

a) Consistent with the conclusions/recommendations outlined in the traffic impact analysis (Appendix 2), add westbound dual left turn lanes at the new Spine Road.

## **3.7 Traffic Impacts**

a) A generic traffic impact analysis for the overall Lompa Ranch North SPA has been reviewed and accepted with this Specific Plan. This analysis provides estimates of the project impacts at buildout along with required upgrades, improvements, etc. Additional traffic impact studies will be required for each phase of development prior to approval of any construction permits which are part of that phase.

## *Lompa Ranch North Specific Plan*

---

b) Updates to the master traffic impact analysis shall be provided for any project generating more than 80 peak hour trips to determine if roadway upgrades/improvements are triggered. Such updates shall also address long-term cumulative impacts from the site as a whole so that appropriate refinements may be made to any mitigation measures.

Appendix 2 contains the Traffic Impact Study for Lompa Ranch North.

### **3.8 Fire Protection**

The Carson City Fire Department currently services the Lompa Ranch North area from Fire Station # 1 located on Stewart Street. As development occurs within the Specific Plan boundary and surrounding area(s), an additional facility and/or equipment may be needed in order to ensure adequate levels of service for new development. As such, the following standards are included within this SPA:

a) As individual projects and subdivisions are submitted, the Carson City Fire Department shall review development plans in context with existing service limitations to ensure adequate levels of service are maintained.

b) The Carson City Fire Department has the ability to condition projects to ensure adequate levels of service are maintained for Lompa Ranch North. Such conditions include requiring fire sprinklers for new homes if response times are below accepted levels, inclusion of fire resistant building materials, requiring upgrades to existing equipment or purchase of new equipment, etc.

c) In order to assist in funding new fire facilities within the area (i.e. fire station), individual builders within Lompa Ranch North shall work with the Carson City Fire Department to participate in a program implemented by Carson City which provides funds (to be paid at time of building permit) that are dedicated to fire improvements. In the absence of a current City-wide impact fee program, fees shall be as follows for Lompa Ranch North: a minimum of \$1,000.00 per dwelling unit in single family or multi-family residential development. Also, a minimum fee of \$1,000.00 per 1,000 square feet of business, industrial, commercial or lodging facilities. The Board of Supervisors reserves the right to use this fee to offset the cost to the City of other facilities that is incurred as a result of the impacts of the proposed development.

d) In lieu of and as an alternative to the fire fee, it may be possible for individual builders within Lompa Ranch North to work with the Carson City Fire Department to determine if other mitigation measures may be available. Such measures could include, but are not limited to, providing improvements such as paving, utility extensions, etc. along with construction of new facilities, etc. These improvements shall be credited back to

## *Lompa Ranch North Specific Plan*

---

any applicable fire fee. This shall be reviewed on a case by case basis dependent on current Fire Department needs and demands.

e) New development within Lompa Ranch North shall participate in any applicable impact fee program that is enacted by Carson City. This SPA shall not exempt development from any impact fee program adopted post-approval of this SPA.

### **3.9 Police Protection**

The Carson City Sheriff's Department currently operates patrols in the area. The following standards related to police protection are provided for the Lompa Ranch North SPA:

- a) All new projects submitted for review by Carson City shall be routed through the Sheriff's Department for review and comment.
- b) The Sheriff's Department shall reserve to the right to condition projects in order to implement and or incorporate crime prevention measures, etc.
- c) New commercial projects within Lompa Ranch North shall be required to submit a lighting and security plan to the Sheriff's Department for review and approval.

### **3.10 Schools**

The following standards have been developed in conjunction with the Carson City School District:

- a) A new elementary school site (minimum of 10 acres) shall be reserved within Lompa Ranch North to meet future enrollments needs.
- b) The elementary school site shall be made available prior to the issuance of the 700<sup>th</sup> residential certificate of occupancy.
- c) Generally, the 10-acre elementary school site should be located on the west side of Interstate 580, central to the project site near the current terminus of Robinson Street.
- c) All residential development within the Lompa Ranch North SPA shall be required to provide estimated student enrollment projections to the Carson City School District for review.

## *Lompa Ranch North Specific Plan*

---

d) The Master Developer of the Lompa Ranch North SPA shall work with the School District to participate in the current (2016) School Facilities Master Plan Update process to ensure that needs identified within the SPA boundary are addressed.

**Engineering Division  
Planning Commission Report  
File Number TSM-17-184**

**TO:** Hope Sullivan - Planning Department  
**FROM:** Stephen Pottéy – Development Engineering Department  
**DATE:** November 13, 2017      **MEETING DATE:** November 29, 2017

**SUBJECT TITLE:**

Action to consider an application for Tentative Subdivision Map for 209 Sing Family Units for Blackstone Ranch Phase 2, apn 010-041-71.

**RECOMMENDATION:**

The Engineering Division has no preference or objection to the tentative map request.

**CONDITIONS OF APPROVAL:**

The Engineering Division has reviewed the application within our areas of purview relative to adopted standards and practices and to the provisions of CCMC 17.07.005. The Engineering Division offers the following condition of approval:

- The flood channels and associated access must be on separate parcels to be dedicated to the City. Maintenance of these lands will be funded through a maintenance district or similar instrument, to be established prior to Final Map approval.
- The dimensions of the flood channels will be per FEMA approval. These channels must be constructed prior to development of the subdivision.
- The site improvement grading plans must include contours showing the base flood elevation plus two (2) feet, of adjacent channels to confirm that building pads are at least 2 feet above the channel base flood elevations.
- Low impact design (LID) features must be included as part of this subdivision. LID features will be designed to the Truckee Meadows Low Impact Development Manual standards and must be privately owned and maintained by an LMD or similar consistent with note 6 of the general notes.
- The "Fifth Street Trail" must connect to the existing I-580 underpass trail. The connection over the floodway must have a clear span with adequate freeboard.
- Sidewalk, curb, and gutter must be installed in front of apns 010-041-34 and 010-041-35 and drainage for these parcels must be tied into the flood channel.
- All street and sidewalk improvements on local streets, on the spine road, and on Robinson Street, will be installed as full street improvements, consistent with note 30 of the general notes.
- All roundabout geometry must meet AASHTO geometric design standards.
- The following street names may not be used: Appaloosa, Emily, and Sophia.
- Looped streets must maintain the same name throughout the loop.

- Aiden Ave and Aiden Ct must have the same suffix.
- All streets will have a minimum 4 inch thick asphalt section.
- Per the geotechnical report areas with clay subgrade will have a minimum of 8 inches of base section. Either a map of these areas must be provided by a geotechnical engineer to determine which streets require this base thickness, or all streets must meet this minimum base thickness requirement.
- The 12 inch water main in the spine road must connect all the way from Robinson Street to 5<sup>th</sup> Street per the Lompa Ranch North phasing plan.
- Cast in place manholes are not permitted in this subdivision.

## FINDINGS:

The following Tentative Map Findings by the Engineering Division are based on approval of the above conditions of approval:

1. *Environmental and health laws and regulations concerning water and air pollution, the disposal of solid waste, facilities to supply water, community or public sewage disposal and, where applicable, individual systems for sewage disposal.*  
The existing infrastructure has been found sufficient to supply the water and sanitary sewer needs of the subdivision, and the City has the capacity to meet the water and sewer demand.
2. *The availability of water which meets applicable health standards and is sufficient in quantity for the reasonably foreseeable needs of the subdivision.*  
The City has sufficient capacity to meet the water demand of the subdivision.
3. *The availability and accessibility of utilities.*  
Water and sanitary sewer utilities are available and accessible.
4. *The availability and accessibility of public services such as schools, police protection, transportation, recreation and parks.*  
The road network necessary for the subdivision is available and accessible and will be improved as part of this project.
5. *Access to public lands. Any proposed subdivision that is adjacent to public lands shall incorporate public access to those lands or provide an acceptable alternative.*  
Development engineering has no comment on this finding.
6. *Conformity with the zoning ordinance and land use element of the city's master plan.*  
Development engineering has no comment on this finding.
7. *General conformity with the city's master plan for streets and highways.*  
The development is in conformance with the city's master plan for streets and highways.
8. *The effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision.*

The existing infrastructure is sufficient to meet the additional demand imposed by the subdivision with the improvements proposed.

9. *The physical characteristics of the land such as flood plains, earthquake faults, slope and soil.*

The site is currently in the FEMA flood map revision process. This process will allow for new flood channels to be installed prior to development of this subdivision which will eliminate the flood plain in the areas to be developed.

10. *The recommendations and comments of those entities reviewing the subdivision request pursuant to NRS 278.330 thru 278.348, inclusive.*

Development engineering has no comment on this finding.

11. *The availability and accessibility of fire protection including, but not limited to, the availability and accessibility of water and services for the prevention and containment of fires including fires in wild lands.*

The subdivision has sufficient secondary access, and sufficient fire water flows.

12. *Recreation and trail easements.*

Development engineering has no comment on this finding.

These comments are based on the tentative map plans and reports submitted. All applicable code requirements will apply whether mentioned in this letter or not.

## Hope Sullivan

---

**From:** Dave Ruben  
**Sent:** Thursday, November 09, 2017 4:41 PM  
**To:** Lena Reseck; Kathe Green; Hope Sullivan  
**Subject:** TSM 17-184 Lompa Ranch Phase 2

Comments for TSM 17-184:

1. Project must comply with the 2012 IFC and Northern NV Fire Code Amendments as adopted by Carson City.

***Dave Ruben***

Fire Marshal  
Carson City Fire Department  
777 S. Stewart Street  
Carson City, NV 89701

Direct 775-283-7153  
Main 775-887-2210  
FAX 775-887-2209



PROS Department Comments  
Tentative Subdivision Map - Blackstone Ranch, Phase 2  
TSM-17-184  
November 15, 2017

1. Sheet C1: General Notes 4, 6, 27, and 35 reference a landscape maintenance district. Consistent with the development agreement, these amenities are to be maintained by a home owner's association (HOA) or a landscape maintenance association. A landscape maintenance district will only be formed if the HOA (or similar entity) ceases to exist or remain functional. These notes, and any other related notes on the drawings must be modified to be consistent with the development agreement.
2. Sheet C1: Regarding note 10, modify plans to recognize the irrigation system will only utilize a Reduced Pressure Principle Backflow Preventer. It will not utilize a Pressure Vacuum Breaker.
3. Sheet CS2: Modify the detail for the Spine Road's multi-use path to show a 10 foot wide landscape strip, a 10 foot wide concrete multi-use path, and a 3 foot wide DG path adjacent. The landscape strip should be adjacent to the roadway.
4. Sheet CX0: Along Robinson Street modify the detail for the multi-use path to show a 10 foot wide landscape strip, a 10 foot wide concrete multi-use path, and a 3 foot wide DG path adjacent. The landscape strip should be adjacent the roadway. -
5. Sheet CS0: Demonstrate that the area for the park will be ten acres and will not include a drainage facility. The drainage channel is not to be on park property.
6. Sheet CS2: Curve the multi-use path along Robinson Street to connect to the pedestrian crossing on the Spine Road. Create connections from the multi-use path to the pedestrian crossing.
7. The multi-use path on the north side of Fifth Street is to connect to the Linear Park's multi-use path east of the freeway.
8. The project's improvement plans are subject to review and approval by the PROS department.
9. PROS Department is to sign off on the project improvements prior to final inspection by the Engineering Department.

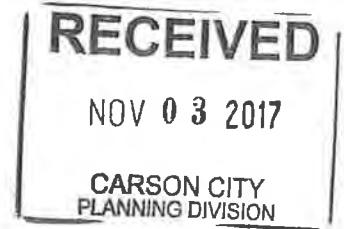


NEVADA DIVISION OF  
**ENVIRONMENTAL  
PROTECTION**

**STATE OF NEVADA**  
Department of Conservation & Natural Resources  
Brian Sandoval, Governor  
Bradley Crowell, Director  
Greg Lovato, Administrator

November 01, 2017

Lee Plemel  
Planning Division  
108 E. Proctor St.  
Carson City, NV 89701



Re: Tentative Map - Blackstone Ranch Phase II  
209 lots in Carson City

Dear Mr. PLEMEL:

The Nevada Division of Environmental Protection (NDEP) has reviewed the above referenced subdivision and recommends denial of said subdivision with respect to water pollution and sewage disposal.

Further review of the Tentative Map requires submittal of the following:

- To further process this submittal the NDEP requires an intent to serve or will serve letter from the municipal sewer service provider.

If you have any questions regarding this letter please contact me at (775) 687-9546, or [rfahey@ndep.nv.gov](mailto:rfahey@ndep.nv.gov).

Sincerely,

Ryan Fahey, Staff Engineer  
Technical Services Branch  
Bureau of Water Pollution Control

cc:

Darren Schulz, Carson City Public Works Director, 3505 Butti Way, Carson City, NV 89701  
Engineer: The Red, LTD 7272 S. El Capitan Way, Las Vegas NV 89148  
Developer: Blackstone NV LLC, 439 Plumb Lane, Reno. NV 89509

Control No. 11496

RECEIVED

OCT 30 2017

CARSON CITY  
PLANNING DIVISION

Carson City Planning Division  
108 E. Proctor Street • Carson City NV 89701  
Phone: (775) 887-2180 • E-mail: [planning@carson.org](mailto:planning@carson.org)

FILE # TSM - 17 - **TSM - 17 - 184**

APPLICANT PHONE #  
Blackstone Development Group 520-400-4845

MAILING ADDRESS, CITY, STATE, ZIP  
439 W. Plumb Ln. Reno, NV 89509

EMAIL  
[jgm@blackstonedevelopmentgroup.com](mailto:jgm@blackstonedevelopmentgroup.com)

PROPERTY OWNER PHONE #  
Arraiz Family Trust 775-884-1896

MAILING ADDRESS, CITY, STATE, ZIP  
3261 Conte Dr. Carson City, NV 89701

EMAIL  
[jfuhart@ccim.net](mailto:jfuhart@ccim.net)

APPLICANT AGENT/REPRESENTATIVE PHONE #  
Rubicon Design Group, LLC 775-425-4800

MAILING ADDRESS, CITY, STATE, ZIP  
1610 Montclair Ave. Suite B Reno, NV 89509

EMAIL  
[mrailey@rubicondesigngroup.com](mailto:mrailey@rubicondesigngroup.com)

Project's Assessor Parcel Number(s)  
010-041-71

Project's Street Address  
N. of E. 5th St., E. of Saliman Rd., W. of I-580

Nearest Major Cross Street(s)  
Saliman Rd./Robinson St. or 5th St./Saliman Rd.

Project's Master Plan Designation  
Medium Density Residential

Project's Current Zoning  
SF6 and MDR

Project Name  
Blackstone Ranch Phase 2

Total Project Area	Number of Lots	Smallest Parcel Size
58.5 acres	209	6,000 sq. ft.

Please provide a brief description of your proposed project below. Provide additional pages to describe your request in more detail.

This request is to allow for a total of 209 single family units (phase 2) of Blackstone Ranch which is located within the Lompa Ranch North Specific Plan (SPA). Please refer to attached report for a highly detailed project description.

**NOTE:** If your project is located within the Historic District or airport area, it may need to be scheduled before the Historic Resources Commission or the Airport Authority in addition to being scheduled for review by the Planning Commission. Planning staff can help you make this determination.

ACKNOWLEDGMENT OF APPLICANT: (a) I certify that the foregoing statements are true and correct to the best of my knowledge and belief; (b) I agree to fulfill all conditions established by the Board of Supervisors.

Applicant's Signature

FOR OFFICE USE ONLY:

CCMC 17.06 and 17.07

## TENTATIVE SUBDIVISION MAP

FEE\*: \$3,500.00 + noticing fee

\*Due after application is deemed complete by staff

☐ SUBMITTAL PACKET – 4 Complete Packets (1 Unbound Original and 3 Copies) Including:

- ☐ Application Form including Applicant's Acknowledgment
- ☐ Property Owner Affidavit
- ☐ Copy of Conceptual Subdivision Map Letter
- ☐ Detailed Written Project Description
- ☐ Proposed Street Names
- ☐ Master Plan Policy Checklist
- ☐ Wet Stamped Tentative Map (24" x 36")
- ☐ Reduced Tentative Map (11" x 17")
- ☐ Conceptual Drainage Study
- ☐ Geotechnical Report
- ☐ Traffic Study (if applicable)
- ☐ Documentation of Taxes Paid to Date

☐ CD or USB DRIVE with complete application in PDF

☐ STATE AGENCY SUBMITTAL Including:

- ☐ 2 Wet-stamped copies of Tentative Map (24" x 36")
- ☐ Check made out to NDEP for \$400.00 + \$3/lot
- ☐ Check made out to Division of Water Resources for \$180.00 + \$1/lot

Application Reviewed and Received By:

Submittal Deadline: See attached Planning Commission application submittal schedule.

Note: Submittals must be of sufficient clarity and detail for all departments to adequately review the request. Additional information may be required.

10/18/17

Date

### TENTATIVE SUBDIVISION MAP SUBMITTAL CHECKLIST

To avoid unnecessary time delays in processing your Tentative Subdivision Map, it is important that it be as complete as possible when submitted. A checklist is provided below to assist you and your engineer. If you have questions regarding your application, please contact the Planning Division at (775) 887-2180 or [planning@carson.org](mailto:planning@carson.org).

The tentative submittal packet must include all of the following information. Packets which do not contain this information or information requested at the Conceptual Subdivision Map stage may not be scheduled on the next available Planning Commission agenda. It is up to the applicant to ensure that all required information is submitted in order for staff and the Planning Commission to make a proper recommendation.

- ☒ Completed Application Form including Applicant's Acknowledgment
- ☒ Property Owner's Affidavit
- ☒ Copy of Conceptual Map Letter from Carson City. Completing the Conceptual Subdivision Map process is required prior to submitting for a Tentative Subdivision Map. If you have not completed this step, your Tentative Subdivision Map application will not be accepted. Please contact the Planning Division for additional information.
- ☒ Detailed Written Project Description including the following:
  - ☒ General project details (number of lots, lot sizes, setbacks, proposed uses, etc.)
  - ☒ Information indicating the benefits of the development to Carson City, any impacts which may arise from the development and the mitigation programs, how the proposed development will enhance or benefit the surrounding areas and how dust will be controlled.
  - ☒ Address how your project complies with the findings outlined in Carson City Municipal Code, Section 17.07 and NRS 278.349(3), listing each finding and providing a separate response for each.
  - ☒ Information addressing the Master Plan Policy Checklist for a Tentative Subdivision Map of the five items that appear in the Carson City Master Plan. Each theme looks at how a proposed development can help achieve the goals of the Carson City Master Plan. Address each theme in the checklist and provide written support of the policy statement in your own words. For additional guidance, please refer to the Carson City Master Plan document on our website at [www.carson.org/planning](http://www.carson.org/planning) or you may contact the Planning Division to review the document in our office or request a copy.
  - ☒ A master plan for potential development of the property under the ownership or control of the developer in the area of the proposed development, if applicable.
  - ☒ In the case of plans which call for development over a period of years, a schedule showing proposed time within which applications for final approval of all sections of the development are intended to be filed.
  - ☒ An indication of the type of water system to be used, its water sources and engineering data flows.
  - ☒ Solid waste provision.
  - ☒ An indication of method of sewage disposal to be used and the area of disposal.
  - ☒ The form of organization proposed to own and maintain any common open space, if applicable.
- ☒ Completed Master Plan Policy Checklist (attached).
- ☒ Tentative Subdivision Map drawn to scale on 24" x 36" sheet(s) including:
  - ☒ Subdivision name.
  - ☒ North arrow, scale and all sheets numbered.
  - ☒ Name and address of developer and engineer and date of map.
  - ☒ Ownership interest in land.
  - ☒ Legal description of land described by 40 acre subdivision, section, township and range.
  - ☒ Vicinity map.
  - ☐ Existing Master Plan and zoning of site.
  - ☒ Adjacent subdivision(s), land uses, zoning and ownership abutting the project.
  - ☒ Location of existing buildings and improvements, if any.
  - ☒ Areas not a part of the subdivision to be designated as "Not a Part".
  - ☒ Table showing the total project area, number of lots, calculation of residential densities and percentage designated for each proposed use. The density shall be described in terms of units per acre (gross and net building areas).
  - ☒ Topography at 2.5-foot contour intervals for slopes of less than 10 percent and 5-foot contour intervals for slopes of greater than 10 percent. The location of natural features including trees may be required.
  - ☒ Proposed lot layout, lot sizes and setbacks. Blocks and parcels are to be numbered consecutively and the dimensions of all parcels are to be shown.
  - ☒ Typical lot detail.
  - ☒ Height, size, location and use of all structures, fences and walls shown.

- ☑ Location and size of proposed parks, common areas and/or open space and amount of recreational improvements.
- ☑ Conceptual landscape plan, if applicable.
- ☑ Proposed circulation system showing all public and private streets (including proposed street names), sidewalks, and bikeways, the width of all streets, typical street cross sections, location of adjoining streets (with street names), sidewalks and bikeways.
- ☑ Proposed parking.
- ☑ Proposed boat and/or RV parking, if applicable.
- ☑ Layout of proposed water, sewer and storm drainage facilities.
- ☑ Location of all natural drainages shown.
- ☑ Show 100-year floodplain, as determined by FEMA Flood Insurance Maps or recognized methods, for those areas subject to flooding.
- ☑ Show earthquake fault lines through the proposed development with building setbacks from fault line as recommended by a geotechnical study.
- ☑ Grading plan for the site (including streets) meeting Carson City Development Standards and requirements showing all cuts, fills and retaining walls.
- ☑ Erosion control plan including stream protection, road drainage, erosion prevention and prevention of untreated discharge to streams, if applicable.
- ☑ All existing and proposed easements.
- ☑ Conceptual Drainage Study per Carson City Development Standards Sections 14.6 and 14.8. Contact Development Engineering at (775) 887-2300 for additional information.
- ☑ Geotechnical Report including soil types, seasonal high water table and percolation rates.
- ☑ Traffic Study per Carson City Development Standards Section 12.13.1 (if applicable).
- ☑ Documentation of property taxes paid to date on all parcels associated with the proposed project.

#### **STATE AGENCY SUBMITTALS**

To assure the necessary reviews are completed, the Planning Division will submit the Tentative Subdivision Map on your behalf to the Nevada Division of Environmental Protection and the Nevada Division of Water Resources.

To complete these submittals, we will require two wet-stamped copies of the Tentative Subdivision Map and payment of the State fees at the time of the City application submittal. This can be handled by submitting two checks to the Planning Division office: one payable to NDEP for \$400 per map plus \$3.00 per lot; the second payable to STATE WATER RESOURCES in the amount of \$180 per map plus \$1.00 per lot. The checks will be routed to the State offices with their copy of the Tentative Subdivision Map.

**NOTE:** Fees are subject to change. While Carson City makes every effort to keep this application up to date, it is the applicant's responsibility to ensure State agency checks submitted are for the current fee amounts.



Carson City Planning Division  
108 E. Proctor Street  
Carson City, Nevada 89701  
(775) 887-2180 – Hearing Impaired: 711  
planning@carson.org  
www.carson.org/planning

Date: June 8, 2017

Mike Railey  
Rubicon Design Group, LLC  
100 California Ave, Ste 202  
Reno, NV 89509

**SITE INFORMATION:**

Location:	South of East Robinson Street, North of Fifth Street
APN:	010-041-71
Master Plan Designation:	Medium Density Residential (MDR)
Approved Zoning:	Single Family 6000 (SF6)
Parcel size:	35.1 acres
Subject:	CSM-17-027

**PROJECT DESCRIPTION:** A subdivision of land for the creation of 156 lots, a street network, and open space.

The following is a summary of the comments prepared by City staff regarding the proposed project. The Conceptual Map Review meeting was held on March 21, 2017.

**PLANNING DIVISION** – Contact Hope Sullivan, 775-283-7922

1. Consistent with the Specific Plan, prior to the submittal of the Improvement Plans for the Tentative Map, a complete phasing plan that addresses the timing and design of the drainage improvements, traffic improvements, and utility improvements is required (see comments by Project Manager Stephen Pottey). This plan will be subject to a technical review. Upon approval of the plan, the information in the plan will be memorialized in a development agreement. It is also recommended that this development agreement also memorialize the information provided in the Specific Plan regarding Parks and Trails, as well as the Fire.
2. Page 4 of the application references open space requirements. What is the code reference being utilized to determine this requirement?
3. Note 20 on Sheet C1 and notes on CS0 reference a landscape maintenance district. There have been conversations with parks to have maintenance handled by a Homeowners Association. So, these notes may change based on the outcome of the conversation.

FIRE DEPARTMENT – Contact Dave Ruben, Fire Marshall, 283-7153

1. Add hydrants at : Lompa Ranch Blvd and 5<sup>th</sup> Street, Lompa Ranch Blvd and Robinson Street.
2. Provide detail on new connection of B@ in this phase.
3. Eliminate duplicate street names.

PARKS AND RECREATION- Contact Vern Krahn, Senior Park Planner, 283-7343

1. All conditions approved by the Board of Supervisors on March 16, 2017 for the Blackstone Ranch, Phase 1's Tentative Subdivision Map (TSM-17-005) will apply to the Phase 2. Please note operations and maintenance responsibilities, Item #59 C & D in the Signed Notice of Decision.
2. Phase 2 will be required to adhere to the Lompa Ranch North Specific Plan's phasing plan as approved by the Board of Supervisors.
3. The applicant needs to follow the Master Plan land use map for the location of the 10 acre neighborhood park regarding the layout for the Phase 2 subdivision. The park is shown in the Lompa Ranch North Specific Plan on page 1-5 (Exhibit A) and the map locates the entire park south of both the Robinson Street round about circle and the Ash Canyon Creek east-west drainage channel.
4. Per the Lompa Ranch North Specific Plan, the residential lots located east of the Spine Road are in an area where the neighborhood park is planned to be constructed (Exhibits A and B). The lots need to be moved further south to accommodate the required acreage for the park.
5. The Ash Canyon Creek drainage channel and any storm water detention facility required for the development shall not be included in the neighborhood park's acreage. They are separate facilities and need to be designed and treated as such. Per the Specific Plan approved by the Board of Supervisors, the park will not be cut in half by a storm water drainage facility. Since the drainage channel is adjacent to the north side of the park there is a design opportunity to enhance the channel and to provide an amenity for the park and residents in the development (Exhibit C). The design for both facilities needs to be coordinated with Public Works and the Parks, Recreation & Open Space Department.
6. The applicant will complete construction of the multi-use path, landscape medians, and all associated landscaping/irrigation systems in conjunction with Phase 2's full street improvements.

7. All landscaping and irrigation located along Robinson Street and the Spine Road will be designed and installed to International Society of Arboriculture (ISA) and Carson City standards to the satisfaction of the Parks, Recreation & Open Space Department. Tree selection for these areas will take into consideration mature tree height, spread, branching pattern, and root aggressiveness as to not conflict with or damage the bicycle lanes and/or the multi-use path. No nut or fruit bearing trees shall be allowed in the design. Shrub selection shall take into consideration the automobile's visual triangle at intersections and safety at pedestrian crossings.
8. All deciduous and evergreen tree sizes will conform to CCMC Development Standards in Title 18.3.5 Landscape Design Standards. These standards require all deciduous trees to be a 2" caliper (minimum) and all evergreen trees to be 6' tall (minimum).
9. The applicant will be required to clearly identify the three foot wide decomposed granite path along the multi-use paths within the development. Final design standards for the path shall be completed to the satisfaction of the Parks, Recreation & Open Space Department.
10. The conceptual subdivision map for Phase 2 is showing proposed improvements on three sides of the 10 acre neighborhood park. A conceptual park development plan is necessary to provide comments on these proposed improvements. The plan will address the following design coordination issues:
  - a. The Spine Road's frontage improvements to provide access to the park's future parking lot.
  - b. Ash Canyon Creek east-west drainage channel maintenance road and access to the park.
  - c. Multi-use path connectivity from the 10 acre neighborhood park (or the Spine Road's multi-use path) underneath I580 to the 3 acre neighborhood park on the east side of the development.
  - d. Location for the irrigation system's controller and water service point of connection for the park and the proposed landscaping along Robinson Street and Spine Road, including any future utility stub outs for the park.

**ENGINEERING AND UTILITIES** – Contact Stephen Pottey, Project Manager

1. There must be a culvert where the Spine Road meets 5<sup>th</sup> St to allow drainage from the existing channel to enter the new channel. This culvert must enter the new channel at a high enough elevation to prevent backwater in typical conditions and must be sized to handle the flows from a 100 year event.
2. The Lompa Ranch Specific Plan Area calls for future development to the south of 5<sup>th</sup> Street to be Mixed Use Residential and Medium Density Residential. Show that there is sufficient right-of-way dedicated by the project to have a roundabout centered on this intersection in the future. Assume that dedicated right turn lanes will be required in all three directions.
3. A sampling tap is requested to be included in a common area of the project near one of the entrances. Our standard for sampling taps is the Kupferle Eclipse #88 or approved equal.
4. The Technical Drainage study must show how detention. If detention is not used, it must be justified and the capacity of the downstream infrastructure analyzed.



5. Show any storm drain system necessary to meet dry lane requirements.
6. Provide for pedestrian and maintenance vehicle crossing along the Kings Canyon Channel at the Spine Road.
7. Access ways will be required on both sides of the Kings Canyon Channel due to the width and NDEP regulations. These access ways must be at least 15 feet wide, with extra width at locations where sharp turns are necessary.
8. Show the Kings Canyon and Robinson Channels as existing in the tentative map. Offsite areas that are visible in the maps should still show the channel.
9. The Robinson St section should show the access easement on the south side of the channel.
10. Provide a section detail for the Kings Canyon Channel.
11. Access to lots will not be permitted from sides or back of lots.
12. Grading plans must indicate lowest floor elevations based on the overall phasing drainage report.
13. Care must be taken at the Appaloosa/Harper and Scarlett/Harper intersections to ensure that there are no sight distance issues.
14. The following street names cannot be used: Avery, Harper, Molly, Lompa Ranch, and Scarlett.
15. Only one of the following street names may be used, not both: Zoey and Zoey.
16. Please ensure all street suffixes are correct per Carson City Development Standards
17. A updated traffic plan must be submitted consistent with the conditions related to phasing at the March 16, 2017, Board of Supervisors meeting to analyze existing conditions and determine the necessary improvements
18. Plans submitted with this phase shall show a roundabout at the intersection of Robinson and the spine road, as a roundabout is required at this intersection
19. The area on the east side of the spine road needs to only have one access road onto the spine road. Based on the proposed design and anticipated future development, staff has a safety concern with the number of access points proposed on the spine road. The Phase 2 area on the east side of the spine road should consider future development to the south and north to reduce the number of access points on the collector roadway. Due to the curvature of the road and potential quick succession of access point along the spine road, access roads should be limited and planned to align with access points located on the west side of the spine road.
20. Medians in the Spine Road must be maintained by the LMD.
21. Trees must be at least 10 feet from water and sewer mains and must not obstruct turning sight distance.
22. Robinson Street and the Spine Road shall be improved to Collector Roadway standards with bike lanes.
23. Robinson Street and the Spine Road shall be constructed as full street improvements.

24. Both the Robinson Street and the Spine Road corridors shall include multi-use paths.
25. Local roads will have a minimum ACC pavement thickness of 4"
26. Prior to Tentative Map submittal a comprehensive storm drainage phasing plan for the Lompa Ranch SPA area must be submitted by the applicant and approved by the City.
27. Prior to Tentative Map submittal a comprehensive transportation phasing plan for the Lompa Ranch SPA area must be submitted by the applicant and approved by the City.
28. Prior to Tentative Map submittal a comprehensive sanitary sewer phasing plan and main analysis for the Lompa Ranch SPA area must be submitted by the applicant and approved by the City.
29. Prior to Tentative Map submittal a comprehensive water main phasing plan and main analysis for the Lompa Ranch SPA area must be submitted by the applicant and approved by the City.
30. A Technical Drainage Study will be required with the Tentative Map, meeting the requirements of section 14 of the Carson City Development Standards. This drainage study must correlate to the Phasing Drainage Study. The drainage study must also clearly show compliance with the 1 to 1 volume mitigation requirement of the flood protection ordinance, the method of perpetuating irrigation rights to the south, and use of LID.
31. Extra care should be taken with respect to liquefaction due to high groundwater in the area.
32. Any engineering work done on this project must be wet stamped and signed by an engineer licensed in Nevada. This will include site, grading, utility and erosion control plans as well as standard details.
33. All construction work must be to Carson City Development Standards (CCDS) and meet the requirements of the Carson City Standard Details.
34. Fresh water must be used for Dust control. Contact Rit Palmer at Public Works at 283-7382 for more information.
35. A wet stamped main analysis must be submitted in accordance with CCDS 15.3.1(a) to show that adequate pressure will be delivered to the meter and fire flows meet the minimum requirements of the Carson City Fire Department.
36. A wet stamped sewer analysis must be submitted that includes addressing the effect of flows on the existing City system. See section 15.3.2 of CCDS.
37. A private testing agreement will be necessary for the compaction and material testing in the street right of way. The form can be obtained through Carson City Permit Engineering.
38. The irrigation service will need a reduced pressure backflow preventer if a vacuum breaker system cannot be designed to operate properly.
39. An erosion control plan meeting section 13 of CCDS will be required in the plan set.
40. New electrical service must be underground.
41. Any work performed in the street right of way will require a traffic control plan and a time line type schedule to be submitted before the work can begin. A minimum of one week notice must be given before any work can begin in the street right of way.

- 42. A Construction Stormwater Permit from the Nevada Division of Environmental Protection (NDEP) will be required for the construction of projects 1 acre or greater.
- 43. A Dust Control Permit from NDEP will be required for any project 5 acres or greater.
- 44. A sewer and water connection fee form must be included in the first submittal for irrigation water use.

Please be advised if the proposed Subdivision is anticipating having model homes and or temporary sales office on site, a Special Use Permit will be required.

Thank you for the opportunity to comment on your project. Please be advised that the comments presented in this letter may not include all the requirements or conditions which may be placed on the project at the time of final review by the Planning Commission and Board of Supervisors.

You may also note comments provided by various city staff at the conceptual review meeting that may not have been included in any written comments. If you have any questions, please feel free to contact this office at 775-283-7922.

Sincerely,



Hope Sullivan  
Planning Manager

cc: CSM-17-027  
Conceptual Review Committee



# CARSON CITY

Capital of Nevada

[Treasurer Home](#)[Assessor Data Inquiry](#)[Back to Last Page](#)

## Secured Tax Inquiry Detail for Parcel # 010-041-71

Property Location: 2200 E FIFTH ST  
Billed to: ARRAIZ FAMILY 1993 TR 10/18/93  
% JUAN P & DOROTHY L ARRAIZ, TT  
3281 CONTE DR  
CARSON CITY, NV 89701-0000

Tax Year: 2017-18  
Roll #: 000690  
District: 2.4  
Tax Service:  
Land Use Code: 600

[Code Table](#)

### Outstanding Taxes:

Prior Year	Tax	Penalty/Interest	Total	Amount Paid	Total Due
------------	-----	------------------	-------	-------------	-----------

No Prior Year Taxes

### Current Year

08/21/17	32.60		32.60	32.60	.00	
10/02/17	30.00	1.20	31.20	.00	31.20	<a href="#">--Pay</a>
01/01/18	30.00		30.00	.00	61.20	<a href="#">--Pay</a>
03/05/18	30.00		30.00	.00	91.20	<a href="#">--Pay</a>
<b>Totals:</b>	<b>122.60</b>	<b>1.20</b>	<b>123.80</b>	<b>32.60</b>		

[Payment Cart](#)[History](#)

### Additional Information

	2017-18	2016-17	2015-16	2014-15	2013-14
Tax Rate	3.5700	3.5200	3.5200	3.5400	3.5600
Tax Cap Percent	2.6	.2	3.2	3.0	4.2
Abatement Amount	36.47	30.87	18.61	7.51	



# **BLACKSTONE RANCH - PHASE 2**

## **Tentative Subdivision Map Application**



Photo Credit: aroundcarson.com

Prepared by:



**October 19, 2017**

# **BLACKSTONE RANCH – PHASE 2**

## **TENTATIVE SUBDIVISION MAP APPLICATION**

**Prepared for:**

Blackstone Development Group, Inc.

439 W. Plumb Lane

Reno, Nevada 89509

**Prepared by:**

Rubicon Design Group, LLC

100 California Avenue, Suite 202

Reno, Nevada 89509

(775) 425-4800

**October 19, 2017**





## BLACKSTONE RANCH – PHASE 2

---

### Table of Contents

Introduction .....	1
Project Location .....	1
Existing Conditions.....	2
Project Description .....	5
Master Plan Policy Checklist.....	8
Tentative Map Findings .....	14
Nevada Revised Statutes .....	16

#### List of Figures:

Figure 1 – Vicinity Map .....	1
Figure 2 –Existing Conditions.....	2
Figure 3 – Master Plan Land Use .....	3
Figure 4 – Zoning Map .....	4
Figure 5 – Preliminary Site Plan .....	7

#### Attachments:

Carson City Application Form and Checklist  
Conceptual Review Letter  
Preliminary Engineering Plans and Reports  
Preliminary Landscape Plans  
Traffic Impact Analysis  
Preliminary Geotechnical Report



## BLACKSTONE RANCH - PHASE 2

### Introduction

This application includes the following request:

- A **Tentative Subdivision Map Application** to allow for a 209-unit single family residential subdivision within the Lompa Ranch North Specific Plan.

### Project Location

Blackstone Ranch Phase 2 is located within the Lompa Ranch North Specific Plan area which encompasses 203± acres located on the west side of Interstate 580, north of East Fifth Street, east of Saliman Road, and south of US Highway 50 (East William Street). The remaining 48.04± acres are located on the east side of Interstate 580 along the western side of Airport Road. Specifically, Phase 2 is located east of Saliman Road, southeast of the existing terminus of Robinson Street on the west side of Lompa Ranch. Phase 2 will include 58.5± acres and is located within a portion of an existing 106.71± acre parcel (APN# 010-041-71). Figure 1 (below) depicts the project location.



Figure 1 – Vicinity Map





## BLACKSTONE RANCH – PHASE 2

---

### Existing Conditions

Currently, the project site is vacant and consists primarily of pasture land. Figure 2 (below) depicts the existing onsite conditions.

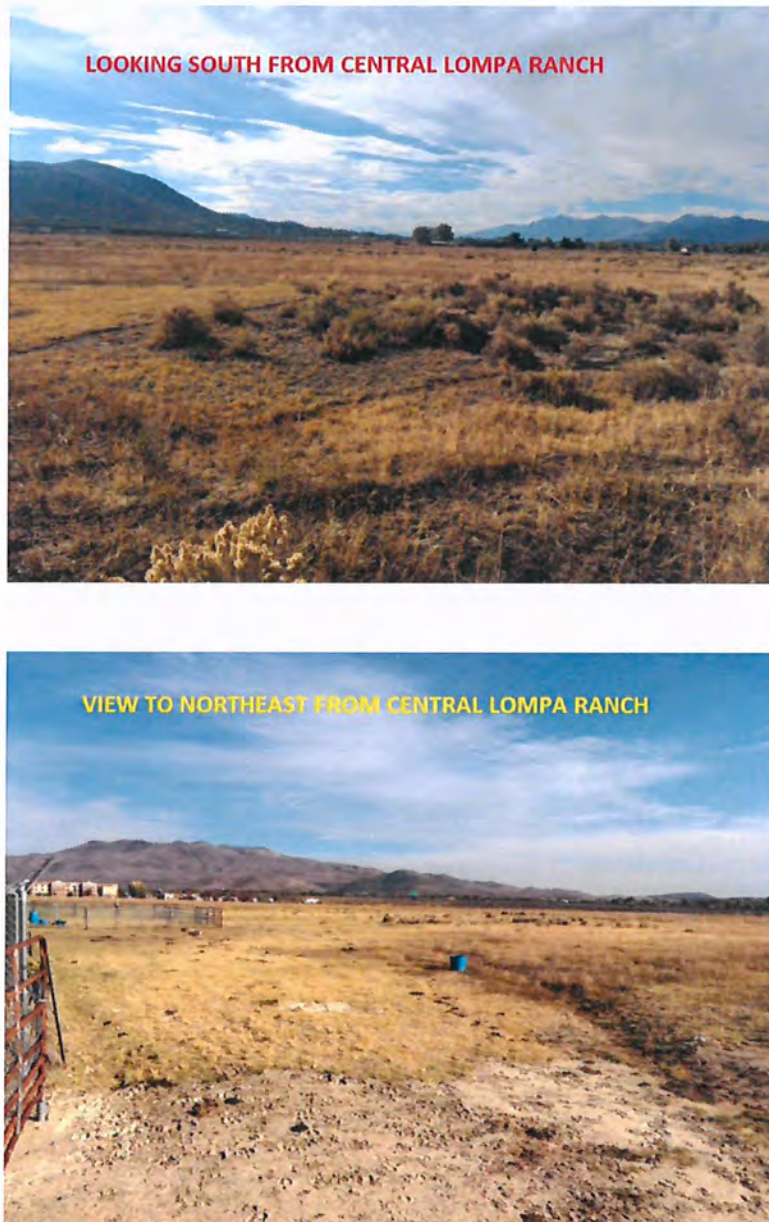
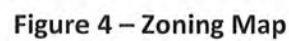


Figure 2 – Existing Conditions









## **BLACKSTONE RANCH – PHASE 2**

---

Surrounding land use includes Blackstone Ranch Phase 2 (to include single family homes) to the west, vacant land and the Carson High School solar array to the north, a single-family residence and vacant land to the south, and Interstate 580 to the east. Access to the Phase 2 property will be from an extension of Robinson Street to the east and via a new north/south spine road that will connect Robinson Street to 5<sup>th</sup> Street to the south.

### **Project Description**

This Tentative Subdivision Map application is for the second phase of the overall Lompa Ranch project. The plan incorporates comments received from Carson City during the Conceptual Map phase of the project review and includes a change to the overall project boundary in order to preserve the community park location as provided in the Lompa Ranch North Specific Plan. As such, the Phase 2 boundary was extended south to Fifth Street, incorporating the MFD zoning.

Blackstone Ranch Phase 2 is proposed for 209 single family units. Primary access to the development will be via an extension of Robinson Street at the north and from a new north/south spine road that will connect Robinson Street with East Fifth Street.; one located along Saliman Road and one located along Robinson Street. Neighborhood access points include a “split” entry which will allow for an entry monument that identifies the community, as called out in the Lompa Ranch North Specific Plan.

Consistent with the existing SF-6 and MFD zoning, lot sizes will range from 6,000± square feet to 11,335± square feet, with an overall average lot size of 6,621± square feet. At this time, final home plans (including elevations and floor plans) have not been completed. However, building envelopes are shown on the Tentative Map. Elevations must comply with the standards included within the Specific Plan. This includes the use of varied materials and a minimum of three different elevation options for each model. Additionally, “staggered” setbacks are required to ensure that a monotonous streetscape does not occur.

The Carson City Municipal Code requires that a minimum of 150 square feet of open space area be provided for each individual unit. Based on 209 units, a total of 31,350 square feet of open space is required. As proposed, a total of 377,230± square feet of open space is provided. A homeowners’ association along with covenants, conditions and restrictions (CC&R’s) will be created for the project and will be responsible for the maintenance of all open space/common areas.





## BLACKSTONE RANCH – PHASE 2

The following table provides an overall summary of Blackstone Ranch - Phase 2:

Development Standard	Proposed with Blackstone Ranch – Phase 2
Total Project Area	58.5± acres <sup>1</sup>
Total Units	209
Total Lot Area	31.8± acres
Right-of-Way Area	18± acres
Common Area/Open Space	8.7± acres
Project Density	3.57 dwelling units per acre
Minimum Lot Size	6,000± square feet
Maximum Lot Size	11,335± square feet
Average Lot Size	6,621± square feet

<sup>1</sup> – Current parcel acreage = 106.71± acres

Consistent with the Lompa Ranch Specific Plan standards, a pedestrian trail will be constructed along the Robinson Street frontage, adjacent to the proposed open channel as well as along the new north/south spine road. The trail(s) will be paved and constructed to the Unified Pathways Master Plan standards.

In terms of impacts, Blackstone Ranch Phase 2 is compatible with the surrounding area and will not unduly burden existing public services and infrastructure. A comprehensive traffic impact analysis completed by Traffic Works is attached. Based on typical Institute of Transportation Engineers (ITE) estimates, Blackstone Ranch Phase 2 will generate approximately 2,069 average daily trips (ADT) with 157 am peak hour trips and 209 pm peak hour trips. The traffic impact analysis describes all necessary mitigation measures and/or improvements that will be made to ensure appropriate levels of service are maintained.

Blackstone Development Group, Inc., the Master Developer, is currently working with Carson City and the Federal Emergency Management Agency (FEMA) on a Letter of Map Revision (LOMR) which has removed the majority of the 251 acres from the floodway and a Conditional Letter of Map Revision (CLOMR) to remove the property from the floodplain. A master drainage analysis is attached and includes a network of storm water channels and improvements that will remove the subject property from the FEMA flood plain. Based on pre-application meetings with Carson City staff, it was determined that tentative maps can move forward and will simply include a condition that requires the developer to demonstrate that the property has been removed from the hazard zone(s). The CLOMR/LOMR process will accomplish this. Also, a preliminary drainage report was completed with the Lompa Ranch North Specific Plan. A more refined report that specifically addresses Blackstone Ranch Phase 2 is included as an attachment to this report.

With only 209 units, overall project impacts will be minimal. The project, as proposed, is consistent with the adopted zoning and Specific Plan standards. The project will be required to pay all applicable impact and City fees, including the adopted fire impact fee included within the Lompa Ranch North Specific Plan. Park tax will not be required as the Lompa Ranch Master Developer will be required to construct a 10-acre community park with construction of the 750<sup>th</sup> unit.





## BLACKSTONE RANCH - PHASE 2

As an infill development, emergency services are already occurring within the area. The project is not anticipated to unduly impact existing levels of service and is in fact providing fire mitigation funds that can help support the construction of an additional fire station in the future.

Figure 5 (below) depicts the layout proposed for Phase 2.

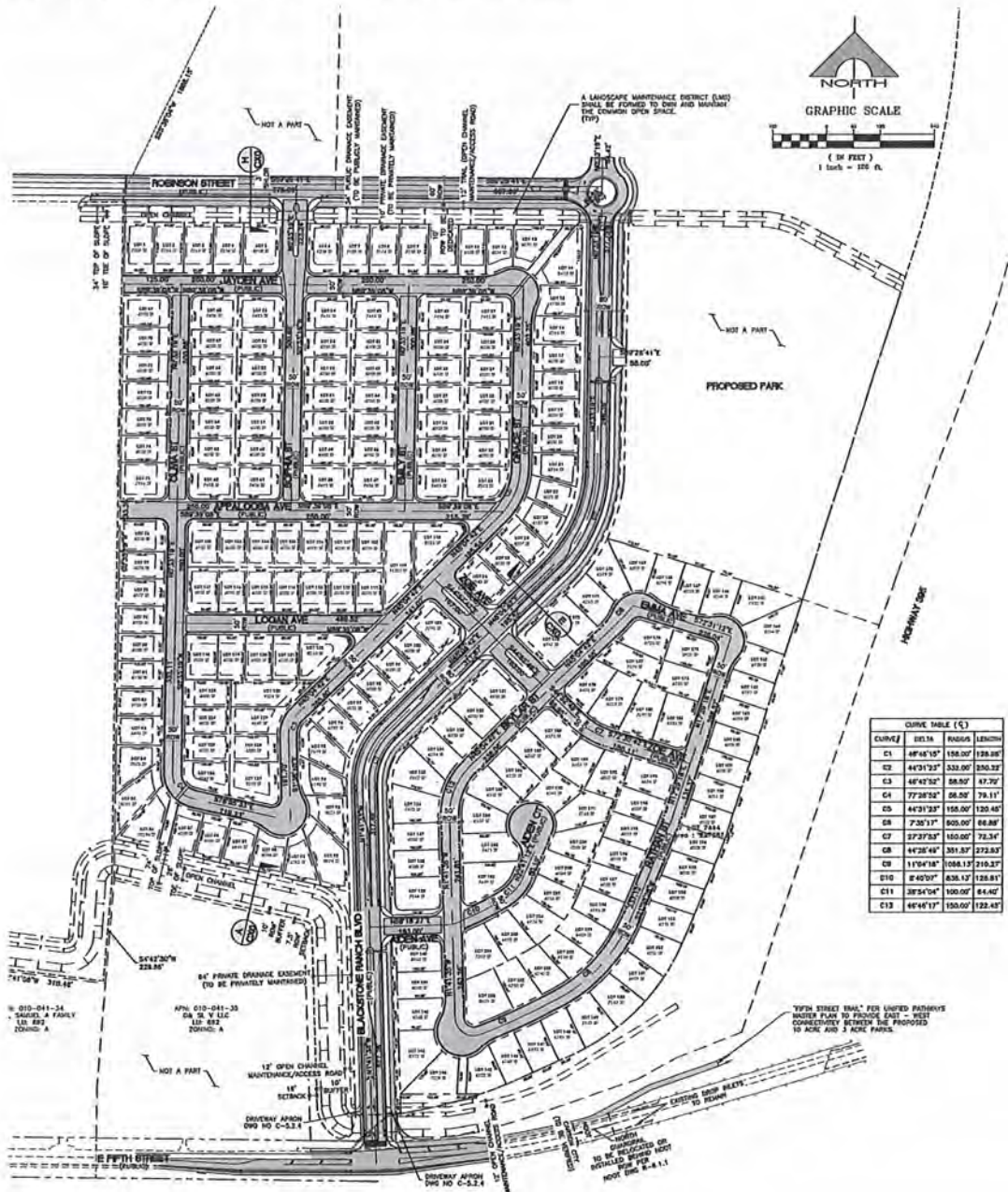


Figure 5 – Preliminary Site Plan



## BLACKSTONE RANCH – PHASE 2

---

### Master Plan Policy Checklist

Consistent with Carson City Tentative Subdivision Map application requirements, this section is taken directly from Carson City documents and forms part of the **Tentative Map** application process. Responses to the checklist questions are included in this section and are printed in **bold** type.

#### PURPOSE

The purpose of a development checklist is to provide a list of questions that address whether a development proposal is in conformance with the goals and objectives of the 2006 Carson City Master Plan that are related to Master Plan Map Amendments and Zoning Map Amendments. This checklist is designed for developers, staff, and decision-makers and is intended to be used as a guide only.

Development Name:

Reviewed By:

Date of Review:

#### DEVELOPMENT CHECKLIST

The following five themes are those themes that appear in the Carson City Master Plan and which reflect the community's vision at a broad policy level. Each theme looks at how a proposed Master Plan or Zoning Map Amendment can help achieve the goals of the Carson City Master Plan. A check mark indicates that the proposed amendment meets the applicable Master Plan policy. The Policy Number is indicated at the end of each policy statement summary. Refer to the Comprehensive Master Plan for complete policy language.

#### CHAPTER 3: A BALANCED LAND USE PATTERN

The Carson City Master Plan seeks to establish a balance of land uses within the community by providing employment opportunities, a diverse choice of housing, recreational opportunities, and retail services.

Is or does the proposed amendment:

- ✓ Consistent with the Master Plan Land Use Map in location and density?

**As proposed, Blackstone Ranch Phase 2 is in direct compliance with the existing Medium Density Residential Master Plan designation and SF6/MFD zoning. Additionally, the project is in full compliance with the standards and requirements included within the Lompa Ranch North Specific Plan.**

- ✓ Meet the provisions of the Growth Management Ordinance (1.1d, Municipal Code 18.12)?

**This project meets the provisions of the Growth Management Ordinance by locating housing in an area that is adjacent to existing roadways and services. The project is an infill development and serves to better maximize the use of Carson City's infrastructure. Infill residential is encouraged within the Master Plan. The project has convenient access to all community services and is appealing to a wide range of potential residents.**





## **BLACKSTONE RANCH – PHASE 2**

---

- ✓ Encourage the use of sustainable building materials and construction techniques to promote water and energy conservation (1.1e and f)?

**New development must comply with the standards included within the Lompa Ranch North Specific Plan which include energy efficient building materials as well as locating building envelopes with solar orientation in mind (to the extent possible).**

Located in a priority infill development area (1.2a)?

**The project site is not in a priority infill area but it is an infill project.**

- ✓ Provide pathway connections and easements consistent with the adopted Unified Pathways Master Plan and maintain access to adjacent public lands (1.4a)?

**The overall Lompa Ranch project will provide a comprehensive trail network. As such, Phase 2 will include the links to the ultimate network in accordance with the Specific Plan standards.**

- ✓ Encourage cluster development techniques, particularly at the urban interface with surrounding public lands, as appropriate, and protect distinctive site features (1.4b and c, 3.2a)?

**The project clusters development and retains significant open space. This open space then serves as an access point to trails and undeveloped areas and exceeds the required minimum by over 8 acres.**

At adjacent county boundaries, coordinated with adjacent existing or planned development with regards to compatibility, access, and amenities (1.5a)?

**The site is not located along a county boundary.**

- ✓ Located to be adequately served by City services including fire and sheriff services, and coordinated with the School District to ensure the adequate provision of schools (1.5d)?

**As an infill parcel, the site is bordered by existing development and is within existing service boundaries. City and area services are already occurring within the area and can be provided to this site as well. Also, the project is subject to fire impact fees as adopted in the Lompa Ranch Specific Plan.**

In identified Mixed-Use areas, promote mixed-use development patterns as appropriate for the surrounding context consistent with the land use descriptions of the applicable Mixed-Use designation, and meet the intent of the Mixed-Use Evaluation Criteria (2.1b, 2.2b, 2.3b, Land Use Districts, Appendix C)?

**The site is not within an identified mixed-use area. However, the overall Lompa Ranch project will be a highly integrated mixed-use development. This is simply a single phase in a much larger overall development.**





## **BLACKSTONE RANCH – PHASE 2**

---

- ✓ Provide a variety of housing models and densities within the urbanized area appropriate to the development size, location and surrounding neighborhood context (2.2a, 9.1a)?

**The project will provide new housing options in east Carson City and serves to fill a defined demand for new homes in the area. New homes will incorporate design standards from the Lompa Ranch North Specific Plan and overall density/lot size is consistent with existing single family uses to the west.**

Protect environmentally sensitive areas through proper setbacks, dedication, or other mechanisms (3.1b)?

**There are no environmentally sensitive areas on the site. A threatened and endangered species evaluation memo is included as an attachment to this report.**

If at the urban interface, provide multiple access points, maintain defensible space (for fires) and are constructed of fire resistant materials (3.3b)?

**The site is not within an urban/wildlife interface area.**

Site outside the primary floodplain and away from geologic hazard areas or follow the required setbacks or other mitigation measures (3.3d, e)?

**As noted previously, a CLOMR/LOMR process is currently underway which will remove the subject site from the FEMA flood hazard area(s). A condition will be placed on the tentative map that requires completion of this process prior to construction.**

- ✓ Provide for levels of services (i.e. water, sewer, road improvements, sidewalks, etc) consistent with the Land Use designation and adequate for the proposed development (Land Use table descriptions)?

**The project proposes to provide levels of service consistent with what is seen in the area now. As an infill site, it is possible to coordinate the project design with development that adjoins the site. Roads, sidewalks, and utilities will therefore be commensurate with what the neighborhood enjoys now. Trail connections and open space will be improved.**

If located within an identified Specific Plan Area (SPA), meet the applicable policies of that SPA (Land Use Map, Chapter 8)?

**The project, as proposed, is in full compliance with the Lompa Ranch North Specific Plan.**



## BLACKSTONE RANCH – PHASE 2

---

### CHAPTER 4: EQUITABLE DISTRIBUTION OF RECREATIONAL OPPORTUNITIES

The Carson City Master Plan seeks to continue providing a diverse range of park and recreational opportunities to include facilities and programming for all ages and varying interests to serve both existing and future neighborhoods.

Is or does the proposed amendment:

- ✓ Provide park facilities commensurate with the demand created and consistent with the City's adopted standards (4.1b)?

**The project will provide substantial open space area that will benefit the neighborhood. The project is therefore proposing amenities well above what is required by Code and by normal planning practice. Also, as the Lompa Ranch master plan develops, a new community park and trail network will be provided per the Lompa Ranch North Specific Plan.**

- ✓ Consistent with the Open Space Master Plan and Carson River Master Plan (4.3a)?

**This project advances the goals of the Open Space Master Plan through its use of an infill site and through the provision of park/open space area. The project does not extend development into wildland areas.**

### CHAPTER 5: ECONOMIC VITALITY

The Carson City Master Plan seeks to maintain its strong diversified economic base by promoting principles which focus on retaining and enhancing the strong employment base, include a broader range of retail services in targeted areas, and include the roles of technology, tourism, recreational amenities, and other economic strengths vital to a successful community.

Is or does the proposed amendment:

- ✓ Incorporating public facilities and amenities that will improve residents' quality of life (5.5e)?

**As detailed above, the project will provide public amenities in the form of park space and enhanced trails.**

Promote revitalization of the Downtown core (5.6a)?

**Not applicable.**

Incorporate additional housing in and around the Downtown, including lofts, condominiums, duplexes, live-work units (5.6c)?

**Not applicable.**





## BLACKSTONE RANCH – PHASE 2

---

### CHAPTER 6: LIVABLE NEIGHBORHOODS AND ACTIVITY CENTERS

The Carson City Master Plan seeks to promote safe, attractive and diverse neighborhoods, compact mixed-use activity centers, and a vibrant, pedestrian-friendly Downtown.

Is or does the proposed amendment:

- ✓ Provide variety and visual interest through the incorporation of varied lot sizes, building styles and colors, garage orientation and other features (6.1b)?

**As required per the Specific Plan, new homes will be required to provide a mix of building materials in order to provide for more diverse architecture. This, coupled with staggered setbacks will ensure a visually appealing streetscape. Also, all floor plans will be required to have a minimum of 3 distinct elevations. This ensures that the neighborhood has visual interest and that all of the homes will not look alike.**

- ✓ Provide variety and visual interest through the incorporation of well-articulated building facades, clearly identified entrances and pedestrian connections, landscaping and other features consistent with the Development Standards (6.1c)?

**The Lompa Ranch North Specific Plan standards far exceed the requirements of the Carson City Municipal Code. This ensures that there will be enhanced landscaping, distinctive entry monuments, upscale architecture, etc.**

- ✓ Provide appropriate height, density and setback transitions and connectivity to surrounding development to ensure compatibility with surrounding development for infill projects or adjacent to existing rural neighborhoods (6.2a, 9.3b 9.4a)?

**The project will be complementary to surrounding development in terms of height, setbacks, and use and will therefore be directly compatible.**

If located in an identified Mixed-Use Activity Center area, contain the appropriate mix, size and density of land uses consistent with the Mixed-Use district policies (7.1a, b)?

**The project is not in a mixed-use activity center.**

If located Downtown:

- o Integrate an appropriate mix and density of uses (8.1a, e)?

**Not applicable.**



## BLACKSTONE RANCH – PHASE 2

---

o Include buildings at the appropriate scale for the applicable Downtown Character Area (8.1b)?

**The project is not located downtown.**

o Incorporate appropriate public spaces, plazas and other amenities (8.1d)?

**The project is not located downtown however it does include public spaces.**

### CHAPTER 7: A CONNECTED CITY

The Carson City Master Plan seeks promote a sense of community by linking its many neighborhoods, employment areas, activity centers, parks, recreational amenities and schools with an extensive system of interconnected roadways, multi-use pathways, bicycle facilities, and sidewalks.

Is or does the proposed amendment:

✓ Promote transit-supportive development patterns (e.g. mixed-use, pedestrian-oriented, higher density) along major travel corridors to facilitate future transit (11.2b)?

**The project is located along existing streets and is within walking distance of schools and commercial uses. Also, the site is within walking distance of existing transit stops.**

✓ Maintain and enhance roadway connections and networks consistent with the Transportation Master Plan (11.2c)?

**The project is accessed by the existing roadway network. It will also fill some existing gaps in the roadway network by providing additional improvements as depicted on the attached plans.**

✓ Provide appropriate pathways through the development and to surrounding lands, including parks and public lands, consistent with the Unified Pathways Master Plan and the proposed use and density (12.1a, c)?

**The project will provide for a pedestrian path as called out in the Specific Plan, consistent with the Unified Pathways Master Plan.**





## **BLACKSTONE RANCH - PHASE 2**

---

### **Tentative Map Findings**

Section 17.07.005 of the Carson City Municipal Code establishes findings that the Planning Commission and/or Board of Supervisors must make in approving a tentative subdivision map. These findings are listed below and are addressed in **bold face** type.

In considering parcel maps, planned unit developments and tentative subdivision maps the director shall consider the following:

1. Environmental and health laws and regulations concerning water and air pollution, the disposal of solid waste, facilities to supply water, community or public sewage disposal and, where applicable, individual systems for sewage disposal.

**Blackstone Ranch Phase 2 serves as an infill project within an established area of the City. Therefore, all necessary infrastructure and municipal services necessary to serve the project are in place or can easily be extended (at the expense of the developer). The project will be served by municipal water and sewer, solid waste disposal, NV Energy, Southwest Gas, cable television, etc. in accordance with Carson City and State of Nevada standards.**

2. The availability of water which meets applicable health standards and is sufficient in quantity for the reasonably foreseeable needs of the subdivision.

**Blackstone Ranch will be served by the existing municipal water system and it will be demonstrated by the project applicant that sufficient water rights have been dedicated/acquired to serve the project.**

3. The availability and accessibility of utilities.

**As an infill development, all necessary utilities are in place or can be easily extended to serve the project.**

4. The availability and accessibility of public services such as schools, police protection, transportation, recreation and parks.

**The project is located within the developed core of the City and is therefore located in an area where all City services and infrastructure exist. Additionally, as part of the overall Lompa Ranch SPA, new schools, parks, and community amenities are planned and mandated through the SPA.**

5. Access to public lands. Any proposed subdivision that is adjacent to public lands shall incorporate public access to those lands or provide an acceptable alternative.

**Not applicable. However, the project does provide pedestrian trail links per the requirements of the Lompa Ranch SPA.**



## **BLACKSTONE RANCH – PHASE 2**

---

6. Conformity with the zoning ordinance and land use element of the city's master plan.

**The project is in direct compliance with the existing Master Plan designation. Furthermore, the project complies with the SF-6 and MFD zoning in terms of overall density and character.**

7. General conformity with the city's master plan for streets and highways.

**With only 209 units, the project will be adequately served by the existing roadway network and will result in negligible impacts. A comprehensive traffic impact analysis is attached and provides specific details and mitigation measures.**

8. The effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision.

**As outlined in the attached traffic impact analysis, all impacts associated with Blackstone Ranch Phase 2 can easily be mitigated and no significant impacts are anticipated.**

9. The physical characteristics of the land such as flood plains, earthquake faults, slope and soil.

**The project is well suited for the type of development proposed, especially given the planned drainage improvements (as noted in the attached drainage report). The project site contains no faults or unusual soils. Attached to this report are detailed engineering plans, reports, and analyses that provide further details. The site is in an infill area and is part of the developed core of Carson City.**

10. The recommendations and comments of those entities reviewing the subdivision request pursuant to NRS 278.330 thru 278.348, inclusive.

**This application package will be sent to reviewing agencies per the requirements of the Carson City Municipal Code and Nevada Revised Statutes. Once comments are received, they can be incorporated into the final design of the project or included as conditions of approval of this tentative subdivision map request.**

11. The availability and accessibility of fire protection including, but not limited to, the availability and accessibility of water and services for the prevention and containment of fires including fires in wild lands.

**Fire suppression will be provided for Blackstone Ranch Phase 2. This is accomplished by providing fire hydrants per Carson City standards and to the approval of the Carson City Fire and Engineering Departments. It is also important to note that new homes within the Lompa Ranch SPA are required to contribute \$1,000.00 per unit as a fire mitigation fee.**





## **BLACKSTONE RANCH - PHASE 2**

---

### 12. Recreation and trail easements.

**Trail connections will be constructed within Blackstone Ranch Phase 2 per the requirements of the Lompa Ranch SPA. All necessary public use easements, etc. will be dedicated with final map.**

### **Nevada Revised Statutes**

Per item 34 of the tentative subdivision map application, the provisions NRS 278.349(3) are addressed in this section. Like the tentative map findings, NRS considerations are addressed in **bold face** type. Some NRS considerations are repetitive to Carson City adopted findings but are included to ensure complete compliance.

The governing body, or planning commission if it is authorized to take final action on a tentative map, shall consider:

(a) Environmental and health laws and regulations concerning water and air pollution, the disposal of solid waste, facilities to supply water, community or public sewage disposal and, where applicable, individual systems for sewage disposal;

**Blackstone Ranch Phase 2 will connect to City services. Waste disposal will therefore be managed in the same manner as other residential developments in the City. By utilizing the existing zoning and overall density, impacts from the project will be consistent with the City's goals and expectations.**

(b) The availability of water which meets applicable health standards and is sufficient in quantity for the reasonably foreseeable needs of the subdivision;

**The area is served by municipal utilities, including water. Additionally, fire hydrants will be provided per City standards. Water rights will be secured to serve the project, to the satisfaction of Carson City Engineering Department.**

(c) The availability and accessibility of utilities;

**The site is bordered by municipal utilities. They are therefore both available and accessible.**



## **BLACKSTONE RANCH – PHASE 2**

---

(d) The availability and accessibility of public services such as schools, police protection, transportation, recreation and parks;

The site is served by existing roads and is within walking distance of Mills Park and Carson High. Public services already extend to development that adjoins the site. In effect, the site is fully served by City services. It is also important to note that new public facilities, including a 10-acre community park will be included within the Lompa Ranch SPA as it continues to build-out.

(e) Conformity with the zoning ordinances and master plan, except that if any existing zoning ordinance is inconsistent with the master plan, the zoning ordinance takes precedence;

The current SF-6 and MFD zoning is consistent with the current Master Plan designation. This zoning is to remain in place with this project. The overall density of the site and the proposed structures are consistent with the zoning regulations.

(f) General conformity with the governing body's master plan of streets and highways;

The project conforms to the Master Plan for streets in that it locates development along an existing street. No changes to streets or highways are required.

(g) The effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision;

As noted above, no new streets or highways are required. A comprehensive traffic impact analysis is attached to this report.

(h) Physical characteristics of the land such as floodplain, slope and soil;

Engineering improvements, including new drainage improvements, will be implemented to ensure that all new units are not located within areas prone to flooding. There are no slope or soil constraints that would preclude development at the densities being proposed.





## **BLACKSTONE RANCH – PHASE 2**

---

(i) The recommendations and comments of those entities and persons reviewing the tentative map pursuant to NRS 278.330 to 278.3485, inclusive;

**Comments received on this application will be reviewed and discussed as needed. Any required amendments to the project will be incorporated or resolved to the satisfaction of Carson City staff.**

(j) The availability and accessibility of fire protection, including, but not limited to, the availability and accessibility of water and services for the prevention and containment of fires, including fires in wild lands; and

**The project site is not located within a wildland fire zone. Fire hydrants will be provided per City standards and the project will ultimately contribute \$209,000 in fire mitigation fees.**

(k) The submission by the subdivider of an affidavit stating that the subdivider will make provision for payment of the tax imposed by chapter 375 of NRS and for compliance with the disclosure and recording requirements of subsection 5 of NRS 598.0923, if applicable, by the subdivider or any successor in interest.

**A tax certificate for the parcel included within this application is included as an attachment to this report.**





TSM - 17 - 184

R | REAL ESTATE • E | ENGINEERING • D | DEVELOPMENT

**CONCEPTUAL DRAINAGE STUDY FOR BLACKSTONE RANCH – PHASE 2**  
**58.5 ACRE TENTATIVE MAP**  
(A PORTION OF PARCEL NO. 10-041-71)

CARSON CITY, NEVADA

Prepared for:  
**BLACKSTONE DEVELOPMENT GROUP**

439 Plumb Lane  
Reno, Nevada 89509  
775.352.4200 p  
888.618.0620 f  
jgm@blackstonedevelopmentgroup.com

Prepared by:  
**The Red Ltd**

7272 S. El Capitan Way, #2  
Las Vegas, Nevada 89148  
702.325.2114 o  
702.946.0865 f  
www.TheRedLtd.com



October 17, 2017



R | REAL ESTATE • E | ENGINEERING • D | DEVELOPMENT

October 17, 2017

Mr. Stephen Pottéy, PE  
Carson City Development Services  
108 E. Proctor Street  
Carson City, NV 89701

**RE: CONCEPTUAL DRAINAGE STUDY FOR BLACKSTONE RANCH – PHASE 2, 58.5  
ACRE TENTATIVE MAP (“TM”)**

Dear Mr. Pottey:

The Red Ltd is pleased to provide a Conceptual Drainage Study for Blackstone Ranch – Phase 2, 58.5 acre TM (a portion of parcel no. 10-041-71). The 209 lot residential subdivision is generally located west of North Saliman Road, north of 5th Street and south of Robinson Street. The proposed project is generally located in the Lompa Ranch Specific Plan Area (SPA). The proposed zoning, Single Family 6000 (“SF6”) allows for 3 – 8 dwelling units/acre. The proposed residential subdivision has a density of 3.57 units/acre with a minimum lot size of 6,000 sf, average lot size of 6,659 +/- sf and 8.70 acres of open space

The purpose of this report is to present a conceptual drainage analysis (“Conceptual Drainage Study”) to accompany the TM application. The findings herein are pursuant to analyses of existing and proposed drainage conditions to provide for recommendations for drainage facilities and/or easements to accommodate conveyance and storage functions. This study has been prepared in accordance with the Clark County Municipal Code, Section 14.8.

If you have any questions or require additional information, please do not hesitate to call me at (702) 277-4786.

Sincerely,  
THE RED LTD

A handwritten signature in blue ink, appearing to read 'E. León', is written over the company name.

Edgar León, P.E.  
Project Manager

## TABLE OF CONTENTS

1	INTRODUCTION .....	3
1.1	Description of Project .....	3
1.2	Existing Site Conditions.....	3
1.3	Conceptual Drainage Study References and Master Drainage Analyses Primary Resource .....	3
2	EXISTING AND PROPOSED HYDROPOGY .....	4
2.1	Existing and Proposed Drainage Basin Boundaries.....	5
2.2	Discuss Existing Drainage Problems .....	5
2.3	Floodplain.....	6
2.4	Existing Irrigation.....	6
2.5	Tributary Exhibit .....	6
3	PROPOSED DRAINAGE FACILITIES (ON-SITE AND OFF-SITE) .....	6
3.1	Routing of Flows in and/or Around Site, Downstream and Location of Drainage Facilities .....	6
3.2	Mitigation Measures .....	7
3.3	Floodplain Modifications.....	8
4	CONCLUSIONS.....	8

---

## APPENDICES

- 1      **APPENDIX 1: MAPS**  
*Map and Vicinity Map – Blackstone Ranch, Phase 2 (58.5 Acres)*  
*Location Map and Vicinity Map – Lompa Ranch North (231 +/- Acres)*
- 2      **APPENDIX 2: SITE PLANS**  
*Blackstone Ranch, Phase 2 – Proposed Site Plan (209 Lot TM)*
- 3      **APPENDIX 3: GRADING AND DRAINAGE PLANS**  
*Grading and Drainage Plan*
- 4      **APPENDIX 4: DRAINAGE BASINS AND DESIGN FLOWS**  
*Existing On-Site Drainage Basin Boundaries*  
*Proposed On-Site Drainage Basin Boundaries*
- 5      **APPENDIX 5: FIRM MAPS**  
*Effective FRIM Panel 3200010111G*
- 6      **APPENDIX 6: 189 LOT TM – DRAINAGE FACILITIES (OPEN CHANNELS)**  
*Proposed Open Channels (Kimley Horn)*

## 1 INTRODUCTION

### 1.1 Description of Project

Blackstone Ranch – Phase 2 is 209 lot Tentative Map (“TM”) encompassing approximately 58.5+/- acres located in Carson City, Nevada. The property is generally located west of North Saliman Road, north of 5<sup>th</sup> Street and south of Robinson Street, more specifically described as a portion of Assessor’s Parcel No. 10-041-71. Reference **Appendix 1**, “*Location and Vicinity Map – Blackstone Ranch, Phase 2 (58.5 Acres)*”. The proposed land use of the property is Medium Density Residential. The approved land use designation is Medium Density Residential (LDR) pursuant to the Lompa Ranch North Specific Plan Area (SPA) adopted in March of 2016. The proposed zoning, Single Family 6000 (“SF6”) allows for 3 – 8 dwelling units/acre. The proposed residential subdivision has a density of 3.57 units/acre with a minimum lot size of 6,000 sf, average lot size of 6,658 +/- sf and 8.70 acres of open space. Reference **Appendix 2**, “*Blackstone Ranch, Phase 2 - Proposed Site Plan (189 Lot TM)*”.

The purpose of this report is to present a conceptual drainage analysis (“Conceptual Drainage Study”) to accompany the TM application. The findings herein are pursuant to analyses of existing and proposed drainage conditions to provide for recommendations for drainage facilities and/or easements to accommodate conveyance and storage functions. Measure to mitigate adverse storm water conditions shall be addressed and shown on the “*Grading and Drainage Plan*” provided as **Appendix 3**. This study was conducted in accordance with the criteria set forth by the *Carson City Municipal Code* (“CCMC”).

### 1.2 Existing Site Conditions

The project site is currently zoned agricultural and is comprised of undeveloped open space including area that is delineated in the floodplain. The subject property is relatively flat, generally draining from east to west with a slight average slope of 0.4% - 0.6%. Two regulatory watercourses, Ash Canyon Creek and Kings Canyon Creek that are adjacent to the site.

### 1.3 Conceptual Drainage Study References and Master Drainage Analyses Primary Resource

The primary resource for the Conceptual Drainage Study is the comprehensive drainage analyses for Lompa Ranch North SPA prepared by Kimley Horn, dated June 2017 (“Master Drainage Study”). Lompa Ranch North is approximately 251.31 +/- acres. The 58.5 acre subject property is situated on the southwest portion of the proposed master planned development. The western portion of Lompa Ranch North encompasses as 203.27



+/- acres is located on the west side of Interstate 580. The western portion of the property is located east of North Saliman Road, north of East 5<sup>th</sup> Street and south of US Highway 50 (East William Street). The remaining 48.04+/- acres is located on the east side of Interstate 580, west of Airport Road and south of West/East of Merdoc Court. Reference **Appendix 1**, “*Location and Vicinity Map – Lompa Ranch North (251.31 +/- Acres)*”.

The Concept Drainage Study herein and the associated TM plans/application have been prepared to utilize the established on-site and off-site existing and proposed storm water 100-year peak flows, reference delineated drainage basins and incorporate the proposed drainage conveyance facilities applicable to the subject property. The intent is to reference the comprehensive drainage guideline established for the master planned community to mitigate adverse downstream conditions that may result from proposed development if measures in the master drainage study are not properly planned and implemented.

Other referenced material are itemized as follows:

1. *Lompa Ranch North Special Plan*, Rubicon Design Group, March 17, 2016.
2. *Drainage Master Plan v3 – Lompa Ranch East & West Developments*, Kimley Horn, June 1, 2017.
3. *Carson City Municipal Code*, Carson City, online content updated June 29, 2016.
4. *Letter of Map Revision for the Kings Canyon Creek North Saliman Road to Fairview Drive (Carson City, Nevada) Technical Data Book*”, JR Fuller/Hydrology & Geomorphology, Inc., approved January 20, 2017 and effective June 5, 2017.
5. *Hydraulic Analysis for Carson City Restudy, Flood Insurance Study*, HDR, June 2010.

## 2 EXISTING AND PROPOSED HYDROLOGY

### 2.1 Existing and Proposed Drainage Basins and Design Flows

Existing Off-Site Drainage Basins Boundaries and Design Flows. An updated Flood Insurance Study was prepared by HDR for FEMA in June 2010 included hydraulic modeling for the regulatory watercourses adjacent to the project. Reference **Appendix 4** for an exhibit from HDR’s study that delineates off-site sub-basins associated with Kings Canyon Creek, Ash Canyon Creek as well as Vice Canyon Creek north of the subject site. The table below summarizes the peak discharges of the aforementioned regulatory watercourses from the report:



**TABLE 1: HYDRAULIC MODELING DISCHARGES FOR REGULATORY WATERCOURSES  
ADJACENT TO THE PROJECT SITE**

WATERCOURSE	PEAK DISCHARGES (CFS)			
	10-YR	50-YR	100-YR	500-YR
Kings Canyon Creek	284	851	1140	1977
Ash Canyon Creek	95	364	556	1208
Vicee Canyon Creek	193	214	219	235

Existing On-Site Drainage Basin Boundaries. The existing onsite basins have been excerpted from the Master Drainage Study and identified as EXOS-6 and EXOS-7. Refer to **Appendix 4**, “*Existing Conditions – Split by Future Land Use*” for delineated basins and flow characteristics. Although relatively flat, EXOS-6 has a natural drainage pattern that generally drains 0.4% - 0.6% to the northeast and EXOS-7 generally drains 0.4% - 0.6% to the southeast, separating the two on-site drainage basins. The 100-year peak flows is 24.53 cfs for EXOS-6 and 28.20 cfs for EXOS-7.

Proposed On-Site Drainage Basin Boundaries. The proposed onsite basins have been established in the Master Drainage Study as PR-10, PR-11, PR-13, PR-14 and PR-15. Refer to **Appendix 4**, “*Proposed Conditions*” for delineated basins and flow characteristics. The 100-year peak flows for is 41.73 cfs for PR-10, 20.0 cfs for PR-11, 35.91 cfs for PR-13, 19.30 for PR-14 and 36.30 cfs for PR-15.

## 2.2 Existing Drainage Problems

The property is currently undeveloped. Therefore, there are no known existing drainage problems.

## 2.3 Floodplain

Reference Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM), **Appendix 5**, “*FRIM Panel 3200010111G*”, revised to reflect the Letter of Map Revision (“LOMR”) approved by FEMA on January 20, 2017 and effective June 6, 2017, denotes the existing floodplain and floodway with respect to the subject property. The floodplain on King’s Canyon Channel (KCC) is generally located within a Zone AE. Zone AE is described as areas of 1% annual chance of flooding, for which Base Flood Elevation (BFE) have been provided. Small portions of the project site are revised to become Zone

X, 500-year annual chance of flooding. The floodway has been reduced but still located through the northern portion the site, which is Ash Canyon Channel (ACC) and mapped on the easternmost portion of the site. A subsequent Conditional Letter of Map Revision (CLOMR) with design recommendations for trapezoidal channels as presented in the Master Drainage Study, will accommodate 100-year peak flows in proposed drainage facilities aligned and south of Robinson Street and north of 5<sup>th</sup> Street. The TM subdivision layout incorporates the channel design parameters that will be subject to CLOMR approval, concentrating storm water flows conveyed through the site, hence allowing development within the floodplain.

#### **2.4 Existing Irrigation**

The property is not currently being used for agricultural purposes. There is no artificial or controlled irrigation of the property.

#### **2.5 Tributary Exhibit**

Reference Appendix 4, "*Carson City Restudy – Sub-Basins (HDR)*".

### **3 PROPOSED DRAINAGE FACILITIES (ON-SITE AND OFF-SITE)**

#### **3.1 Routing of On-Site Flows and Location of Drainage Facilities**

On-site flows generated by the proposed development will be routed within the local street network of the residential subdivision via "L"-curb and gutter and cross/valley gutters as shown in **Appendix 2, "Grading and Drainage Plan"**. The grading of the local street network and subdivision has been configured subject to the on-site basins as delineated in the Master Drainage Study and shown in the Grading and Drainage Plan. The proposed on-site drainage basin west of Lompa Ranch Blvd, PR-10 follows the natural grading pattern, discharging to the 34 feet wide trapezoidal channel aligned and located south of Robinson Street. The proposed on-site drainage basin to the south of PR-10, PR-13 also generally follows the natural grading pattern, discharging to the 62 feet wide trapezoidal channel located south of a cul-de-sac and north of 5th Street via a 20 feet wide proposed drainage easement. The proposed on-site drainage basin east of Spline Road, PR-11, PR-13 and PR-15 follows the natural drainage pattern, converging with flows traversing south via an existing drainage easement situated west of Interstate 580 and discharging into the proposed KCC.

### 3.2 Routing of Off-Site Flows and Location of Drainage Facilities

Proposed trapezoidal channel drainage facility improvements on Robinson Street or Ash Canyon Channel (ACC), Saliman Road and 5th Street or KCC have been designed to accommodate and convey the 100-year 24-hour peak flow with 1 foot of free board. Reference **Appendix 6**, “*Proposed Open Channels*” prepared by Kimley-Horn for the location of the channels abutting the subject property with respect to the 209 lot subdivision and proposed channel configuration based on the following design parameters established in the Master Drainage Study:

“The ACC channel will flow from the intersection of Robinson Road and Saliman east to the swale adjacent to US-395/I-580. The conceptual cross section for ACC is either an earthen, open, 5-foot deep trapezoidal channel, with 3:1 side slopes. One road crossing with the north-south spine road is expected. The preliminary design for this road crossing is a bottomless arch culvert. The flow will not be trapped behind the road crossing but will be allowed to flow under the road in the box culvert.

The KCC channel will travel adjacent to East 5th Street, follow the property boundary of the Lompa homestead, and continue to join Tributaries H & I before flowing under the bridge at US-395/I-580. This proposed channel will be 6-feet deep, with 3:1 side slopes, and include a bench at 3-feet for a twelve-foot wide maintenance road.

Additionally, the Saliman Road Channel will be constructed, though it is not a FEMA mapped watercourse. It will have a top width of 25-feet, V-shape channel, with a depth of 0.5-feet at the north end, and increasing to a depth of 2-feet at the southern end of the residential development. The 25-foot wide channel will continue to the south through the multi-family and commercial families and empty into the KCC at 5th Street. The parking lot of the commercial property at the intersection of 5th Street and Saliman will be used for overflow conveyance. It is proposed that a 50-foot wide swale be included in the parking lot, with a slope of 4% towards the Saliman Road Channel.”

### 3.3 Mitigation Measures

Low Impact Development (“LID”) practices and Best Management Practices (“BMP”) shall be implemented to identify storm water mitigation measures intended to control erosion and storm water pollution as close to the source as possible. Potential sources of pollution shall be infiltrated, evapotranspired, captured and used, and/or treated through LID measures to mitigate adverse impact to downstream and adjacent properties.

### 3.4 Floodplain Modifications

The proposed channels and grading of the subject property has been designed to adhere to the 1 to 1 compensation of the displacement of the volume due to proposed construction in the floodplain. Reference **Appendix 7**, “*1 to 1 Displacement of Volume in the Floodplain*” prepared by Kimley Horn to address the required consideration of cut/fill design parameters with respect to the floodplain construction. The channel design presented in the Master Drainage Study and finding summarized in **Appendix 7** denotes proposed water surface elevation (WSE) in the trapezoidal channels. The finished floor elevations (FFE) have been established at a minimum of 2 feet above the respective watershed designated BFE.

## 4 CONCLUSION

The proposed design of the 209 lot subdivision has been configured utilizing the parameters and on-/ off-site basins established in the Master Drainage Study as well designed in accordance with CCMC and FEMA standards. Adherence to the Master Drainage Study shall consideration for planning utilizing proposed drainage facilities that will convey and accommodate 100-year peak flows, hence mitigating adverse storm water conditions and impact on downstream properties.

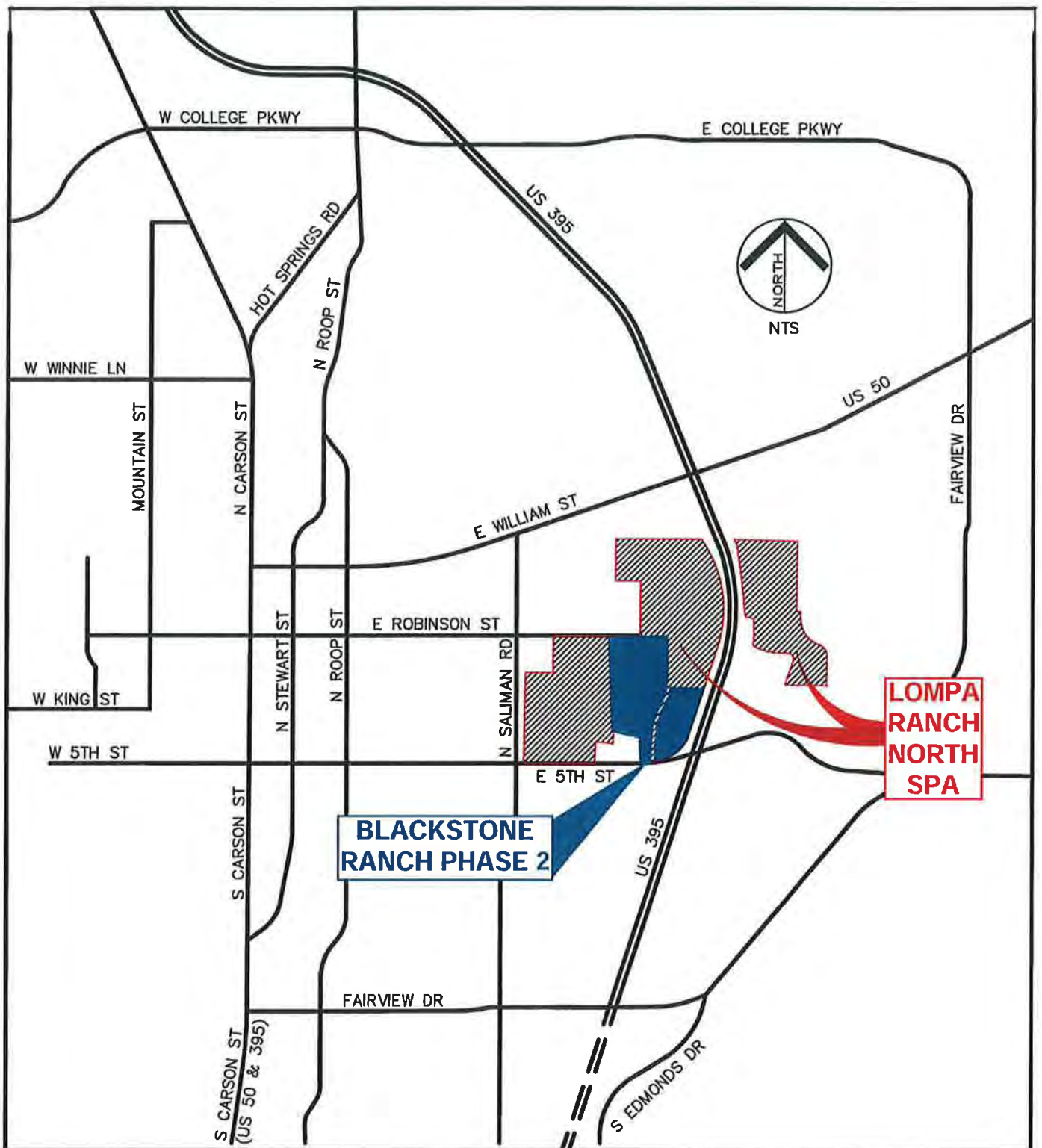
## Appendix 1

---

### LOCATION AND VICINITY MAPS

- LOCATION AND VICINITY MAP – BLACKSTONE RANCH, PHASE 2  
(58.5 Acres)
- LOCATION AND VICINITY MAP – LOMPA RANCH NORTH (251.31 +/-  
ACRES)





## LOMPA RANCH NORTH SPA Figure 1 | Vicinity Map

R | REAL ESTATE • E | ENGINEERING • D | DEVELOPMENT



## Appendix 2

---

### BLACKSTONE RANCH, PHASE 2 – PROPOSED SITE PLAN (209 LOT TM)

Prepared by: The Red Ltd







## Appendix 3

---

# GRADING AND DRAINAGE PLAN

Prepared by: The Red Ltd

**THE RED LTD**  
 2771 S. 2nd Street  
 Suite 2  
 Las Vegas, NV 89104  
 (702) 834-9000  
 www.theredltd.com

1:1 REAL ESTATE  
 1:1 CONTRACTING  
 1:1 LANDSCAPE

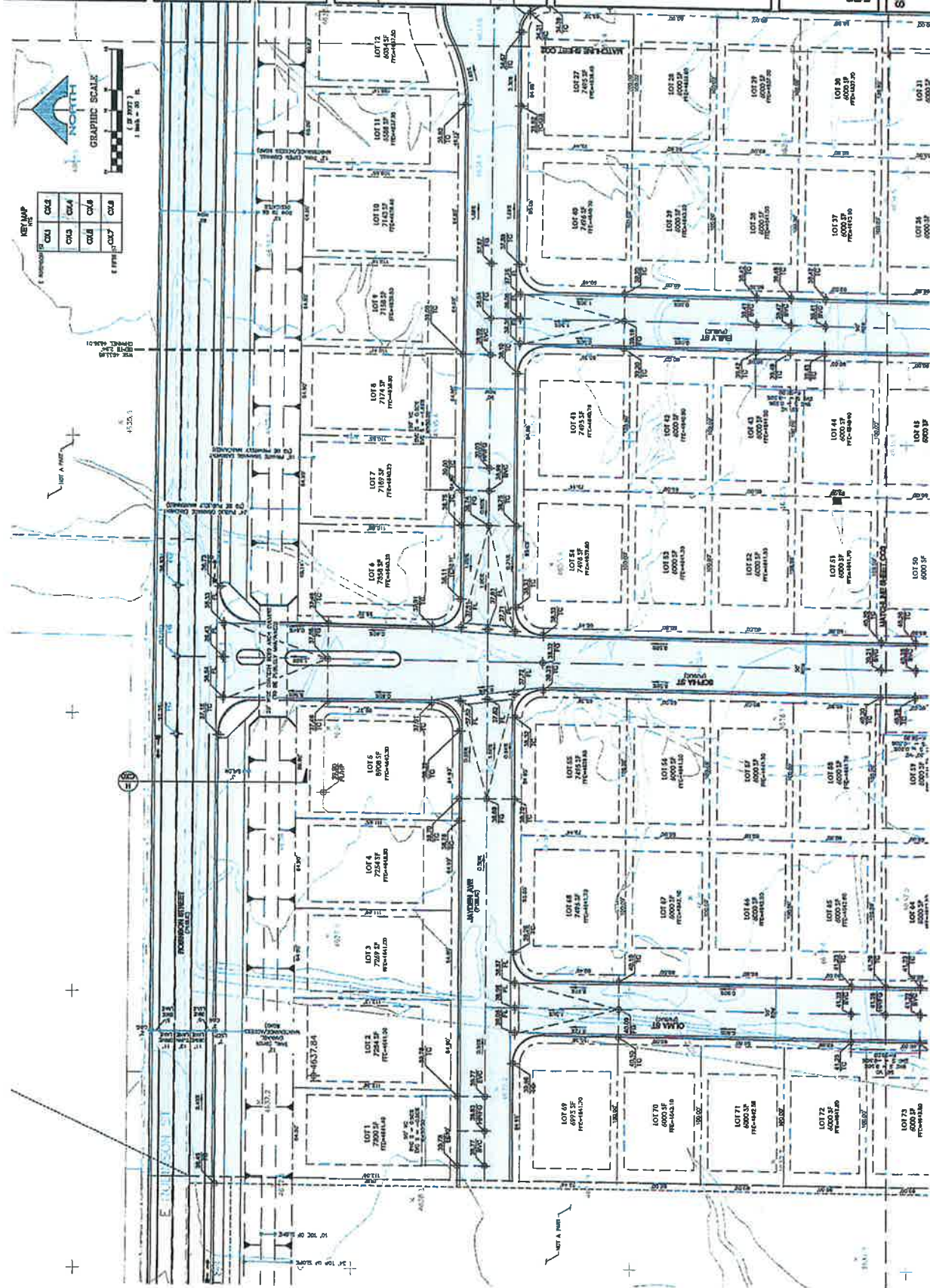


**CLUB**  
 BLACKSTONE DEVELOPMENT  
 GROUP  
 1000 S. 2nd Street  
 Suite 200  
 Las Vegas, NV 89104  
 CONTACT: JORDAN WATERS  
 PHONE: (702) 302-4203

DATE	NO.	DESCRIPTION
10/1/2014	1	APPROVED

**GRADING PLAN (1 OF 8)**  
 BLACKSTONE RANCH - PHASE 2

NO.	DESCRIPTION
1	EXISTING
2	PROPOSED
3	ADJUSTED
4	FINAL





**THE RED LTD**  
 7273 S. Canyon Way  
 Suite 2  
 Las Vegas, NV 89148  
 (702) 522-7200  
 www.thered.com

1: DEAN BERT  
 2: J. BERT  
 3: J. BERT  
 4: J. BERT  
 5: J. BERT



**BLACKSTONE DEVELOPMENT GROUP**  
 400 PLUM BLVD  
 SUITE 200  
 LAS VEGAS, NV 89101  
 (702) 333-4300

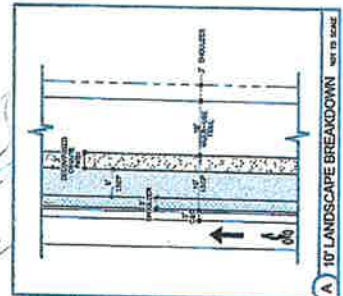
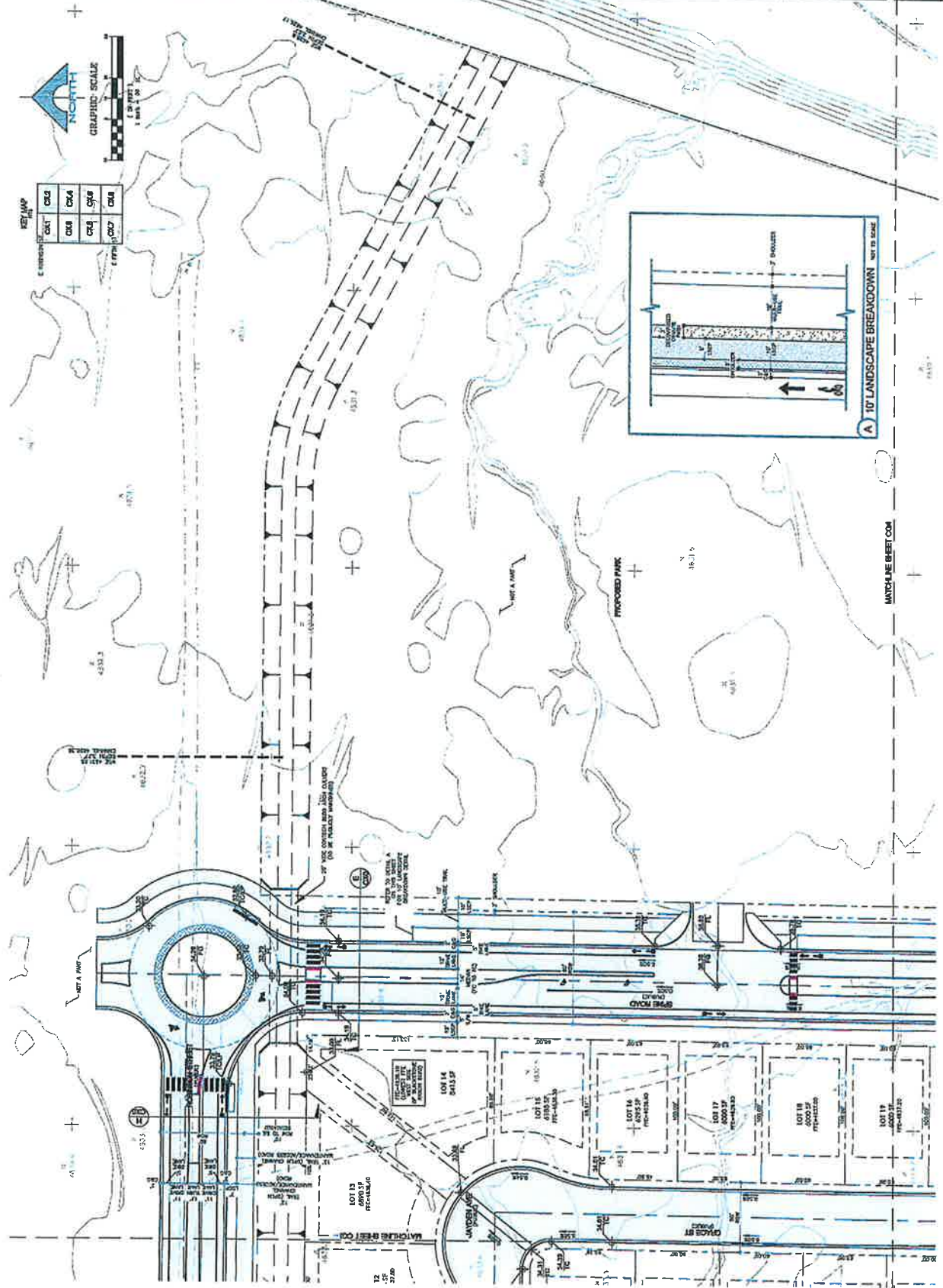
DATE	NO.	REVISION	APPROVED

**BLACKSTONE RANCH - PHASE 2**

**GRADING PLAN (2 OF 8)**

NO.	DATE	REVISION	BY	CHKD.
1	10/15/20	ISSUED FOR PERMIT	DEAN BERT	J. BERT
2	11/10/20	REVISED	DEAN BERT	J. BERT
3	12/15/20	REVISED	DEAN BERT	J. BERT
4	01/15/21	REVISED	DEAN BERT	J. BERT
5	02/15/21	REVISED	DEAN BERT	J. BERT

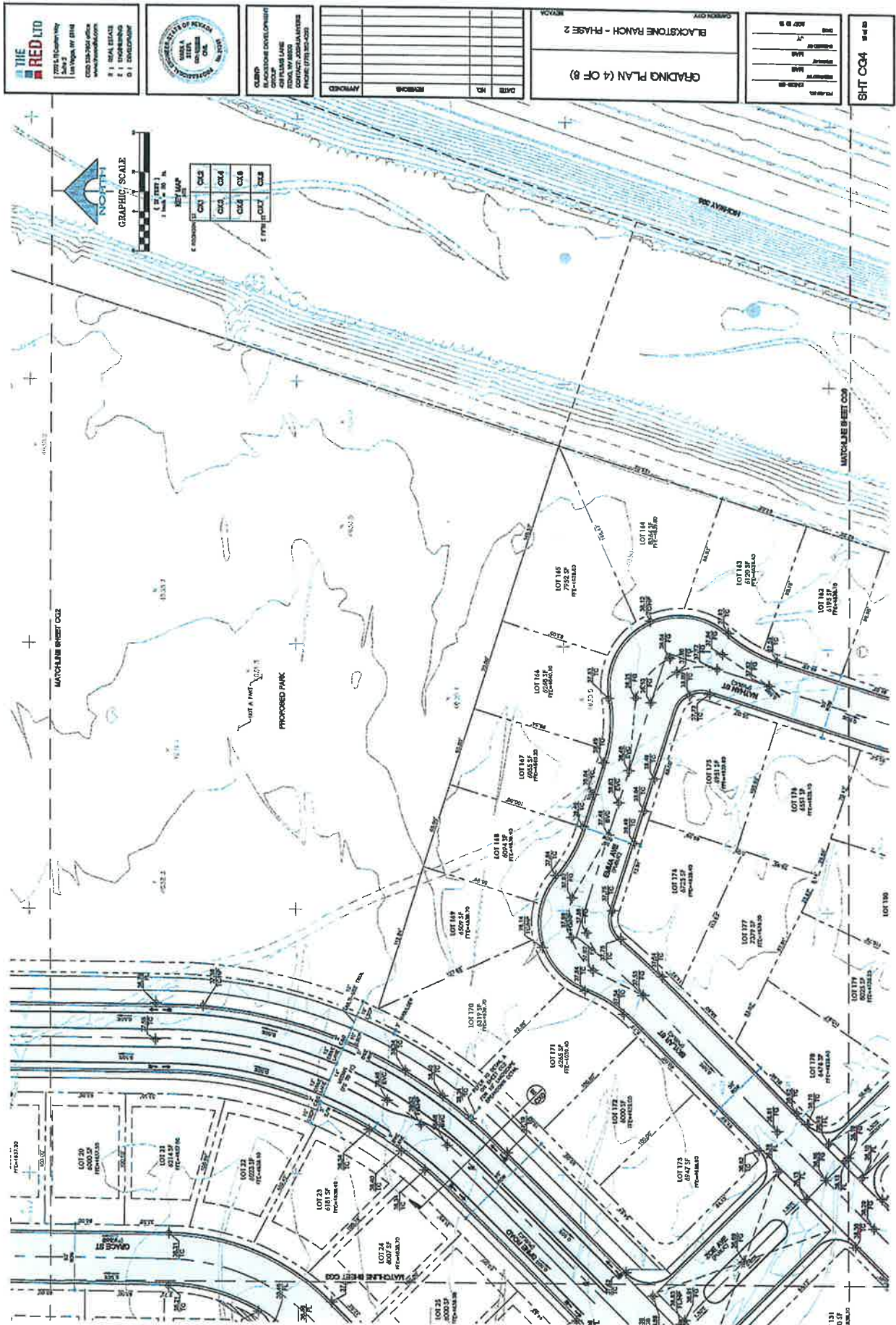
**SHT C02**



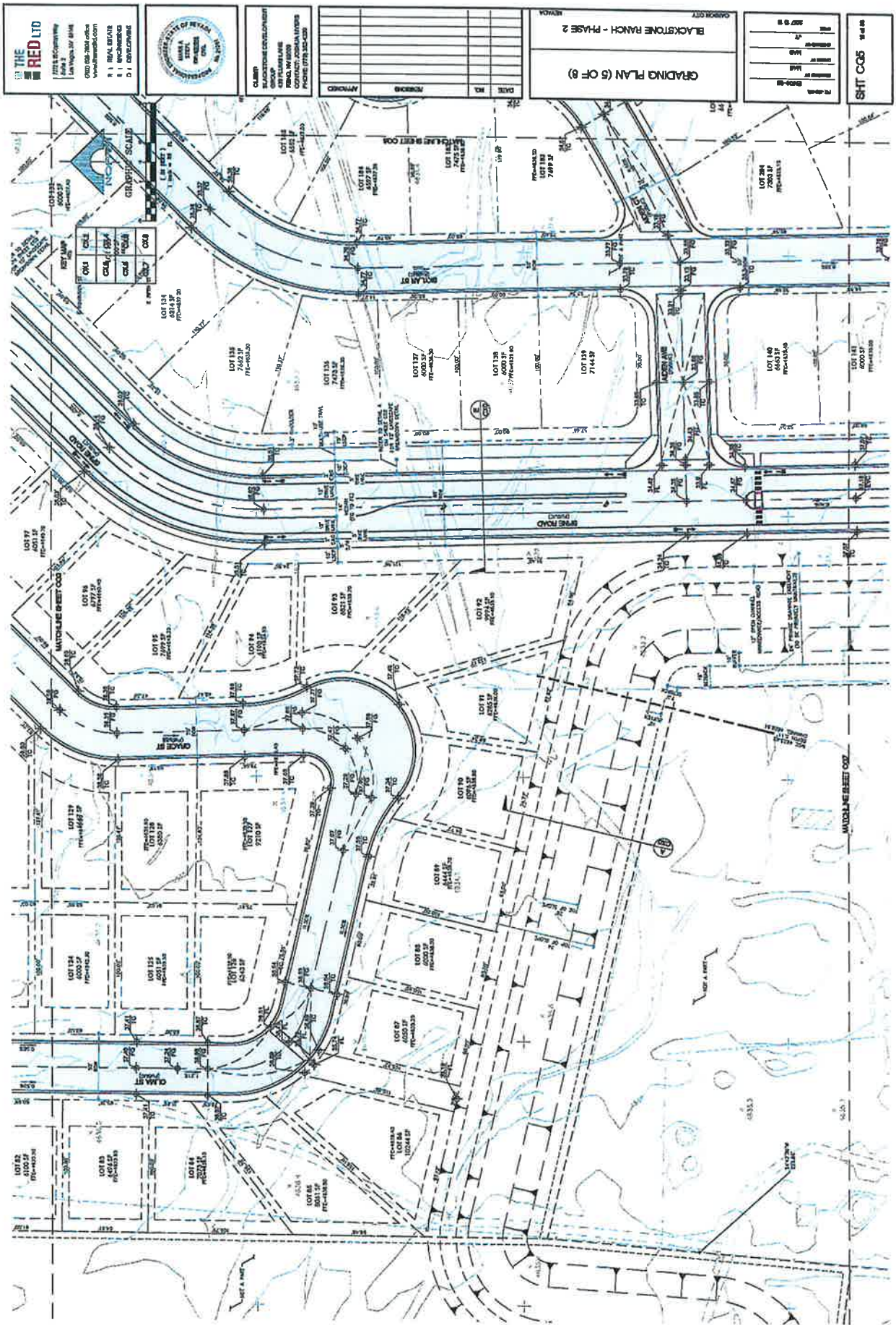


















U. S. AIR	10-10-68
LA	10-10-68
SWI	10-10-68
SWI	10-10-68
10-10-68	10-10-68

GRADING PLAN (7 OF 8)

GRADING PLAN (7 OF 8)

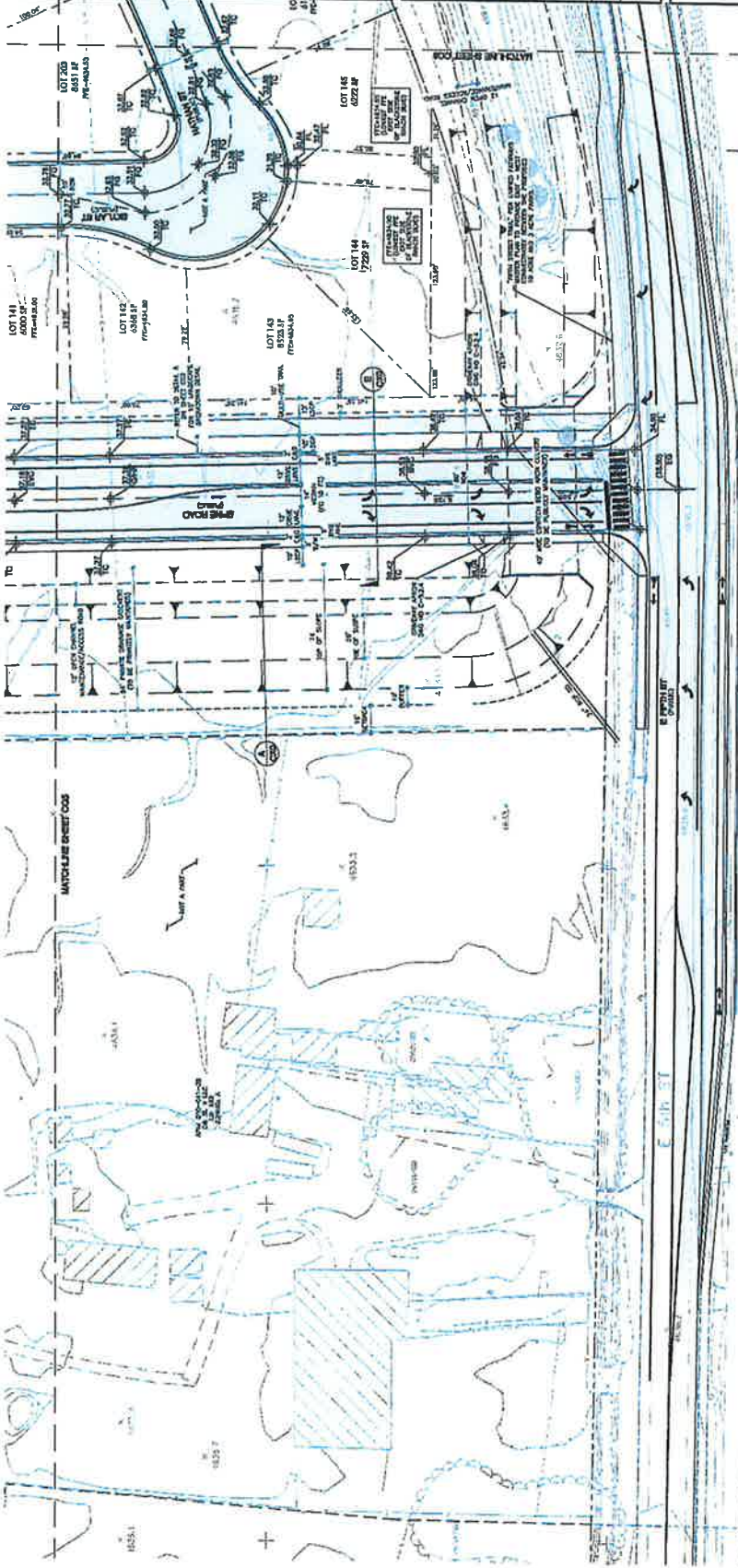
DATE	NAME	AGE	SEX

**CLIENT:**  
BLACKSTONE DEVELOPMENT  
GROUP  
150 PLAZA LANE  
RUMBO, TN 38066  
CONTACT: JOSEPH W. WINTERS



**THE RED LTD**  
7773 N. El Capitan Way  
Suite 3  
Las Vegas, NV 89148  
CROD 324-7614 office  
[www.theredltd.com](http://www.theredltd.com)

R | REAL ESTATE  
E | ENGINEERING  
D | DEVELOPMENT



OX1	OX2
OX3	OX4
OX5	OX6
OX7	OX8





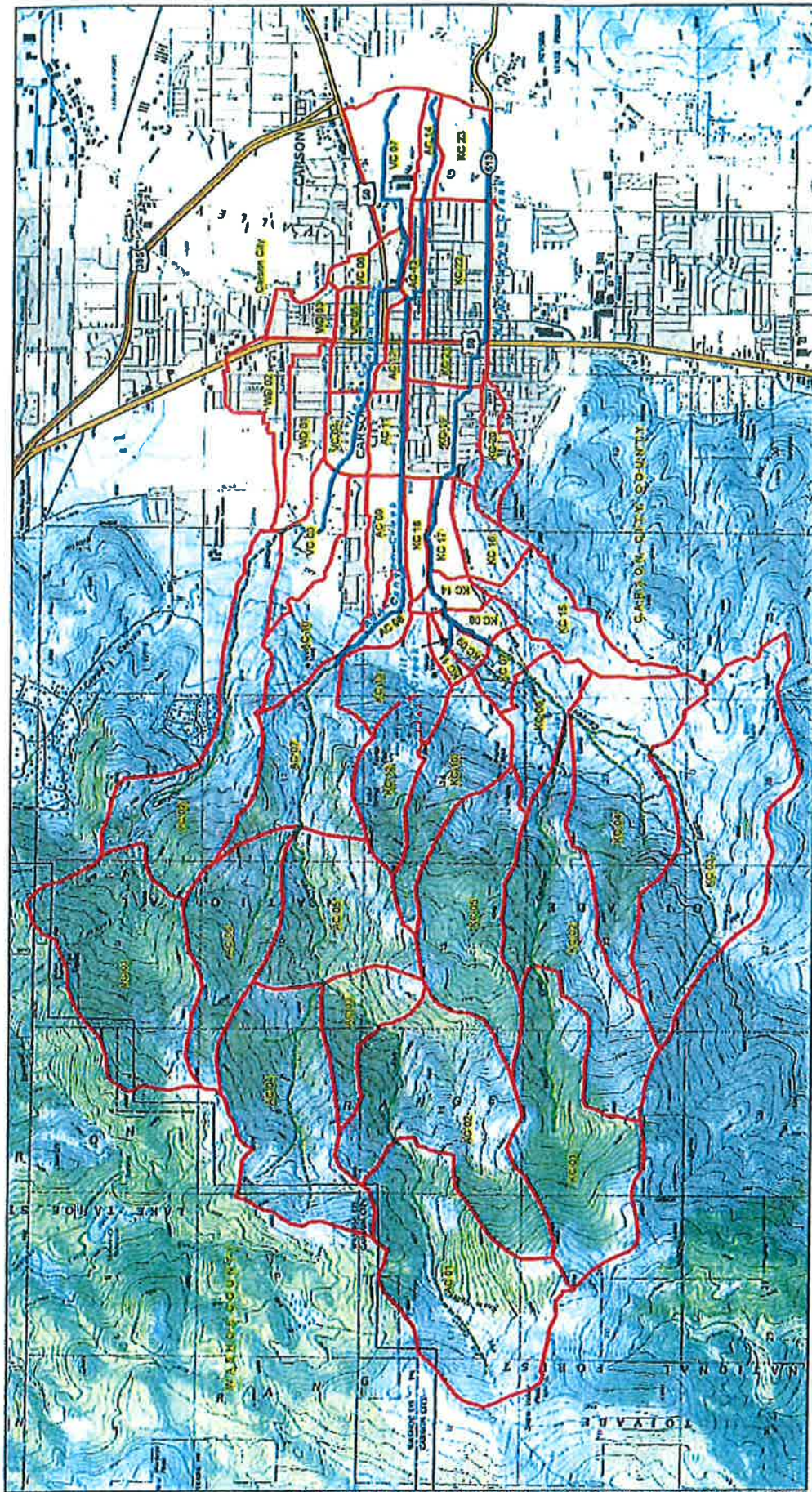
## Appendix 4

---

# EXISTING AND PROPOSED DRAINAGE BASIN BOUNDARIES AND DESIGN FLOWS

Prepared by: Kimley-Horn (On-Site) and HDR (Off-Site)





**Carson City Restudy - Sub-basins**  
**Figure 2**



- Legend**
- Sub-basins
  - Stream Reaches Study Area
  - Stream Reaches (Non Study)
  - Major Roads
  - Urbanized Area
  - Counties \*
  - Carson City County and City boundaries only

\* Carson City County and City boundaries only

**FEMA**  
**ONE COMPANY | Many Solutions**

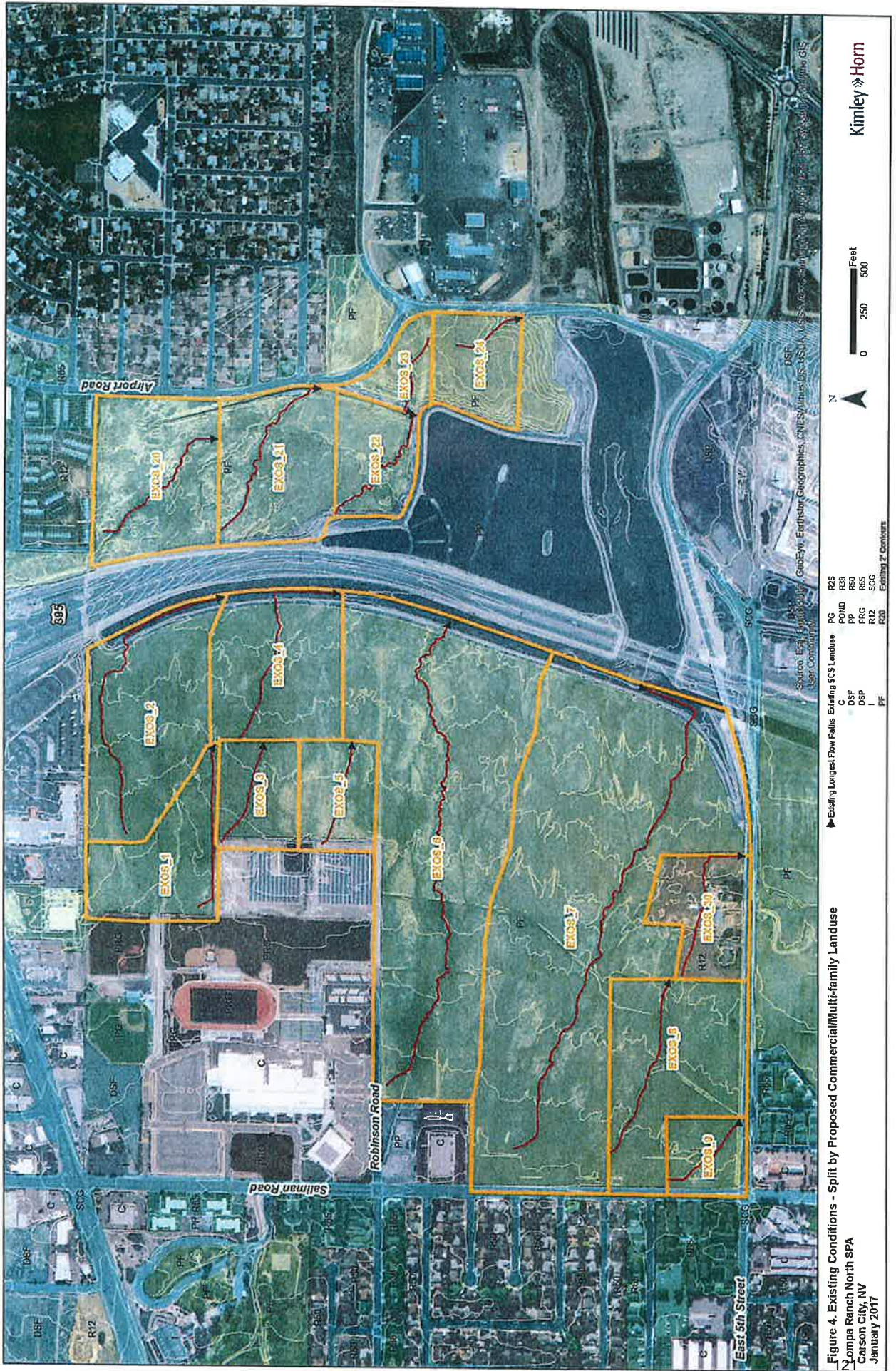
Mapa Source: NCE, Type US, 2009  
 Horizontal Datum: NAD 1983  
 Vertical Datum: NAVD 1988  
 Projection: UTM  
 Zone: 12N  
 Units: Feet  
 Date: 11/11/11



Table 2. Peak Flows (100-year storm) in cfs

Existing Natural		Existing - For Vol Calcs		Proposed	
EX-1	16.75	EXOS-1	7.03	PR-1	36.81
EX-2	36.57	EXOS-2	7.97	PR-2	49.17
EX-3	38.67	EXOS-3	4.47	PR-3	22.31
EX-20	10.57	EXOS-4	8.86	PR-4	40.80
EX-21	6.27	EXOS-5	3.94	PR-5	21.65
EX-22	2.07	EXOS-6	24.53	PR-6	4.24
EX-23	1.34	EXOS-7	28.2	PR-7	32.58
EX-30	8.83	EXOS-8	9.01	PR-8	45.38
		EXOS-9	4.49	PR-9	14.81
		EXOS-20	6.18	PR-10	41.73
		EXOS-21	6.33	PR-11	20.06
		EXOS-22	4.56	PR-12	78.91
		EXOS-23	1.29	PR-13	35.91
		EXOS-24	2.11	PR-14	19.30
		EXOS-30	8.83	PR-15	36.30
				PR-20	40.73
				PR-21	36.09
				PR-22	18.33
				PR-23	1.38
				PR-24	19.45
				PR-30	8.83









**Figure 5. Proposed Conditions**  
 Lompa Ranch North SPA  
 Carson City, NV  
 January 2017

**Kimley»Horn**

**Drainage Direction**  
 Drainage Direction  
**Proposed Subbasins**  
 Proposed Subbasins

**Proposed SCS Landuse**  
 POND  
 R65  
 R60  
 R50  
 R40  
 R30  
 R20  
 R12  
 R6  
 R5  
 R4  
 R3  
 R2  
 R1  
 R0  
 C  
 PF  
 PG

**Scale**  
 0 250 500 Feet

**North Arrow**  
 N



**Exhibit 1 - Weighted Parameters by Subbasin**
**Kimley»Horn**
**Existing Conditions - Natural Drainage**

Name	Area (Acres)	Ksat (in/hr)	PSIF (in)	Dtheta	Imp (%)	DStore Perv	basin N Perv
EX_1	35.4	0.18	8.2	0.19	3.4	0.15	0.30
EX_2	77.4	0.18	5.9	0.21	3.1	0.15	0.30
EX_20	25.3	0.23	4.2	0.24	1.0	0.15	0.30
EX_21	11.1	0.11	8.5	0.18	0.0	0.15	0.29
EX_22	6.5	0.35	4.0	0.25	0.0	0.15	0.30
EX_23	4.6	0.39	4.2	0.25	0.2	0.15	0.30
EX_3	92.3	0.25	3.7	0.25	3.1	0.15	0.30
EX_30	8.4	0.25	3.5	0.25	18.5	0.15	0.24

**Existing Conditions - Divided by Proposed Landuse**

Name	Area (Acres)	Ksat (in/hr)	PSIF (in)	Dtheta	Imp (%)	DStore Perv	basin N Perv
EXOS_1	11.2	0.12	9.3	0.17	6.4	0.15	0.30
EXOS_2	19.2	0.25	7.0	0.21	2.4	0.15	0.30
EXOS_20	15.6	0.25	3.5	0.25	0.4	0.15	0.30
EXOS_21	13.7	0.18	6.0	0.21	1.4	0.15	0.30
EXOS_22	7.2	0.09	8.9	0.18	0.0	0.15	0.29
EXOS_23	3.9	0.34	4.0	0.25	0.0	0.15	0.29
EXOS_24	7.2	0.38	4.2	0.25	0.1	0.15	0.30
EXOS_3	6.8	0.07	9.7	0.16	8.1	0.15	0.30
EXOS_30	8.4	0.25	3.5	0.25	18.5	0.15	0.24
EXOS_4	15.2	0.10	8.6	0.18	0.0	0.15	0.30
EXOS_5	6.6	0.25	3.5	0.25	8.0	0.15	0.30
EXOS_6	53.6	0.19	5.4	0.22	2.4	0.15	0.30
EXOS_7	68.9	0.24	3.7	0.25	1.5	0.15	0.30
EXOS_8	18.5	0.25	3.5	0.25	5.2	0.15	0.30
EXOS_9	4.9	0.25	3.5	0.25	16.4	0.15	0.30

**Proposed Conditions**

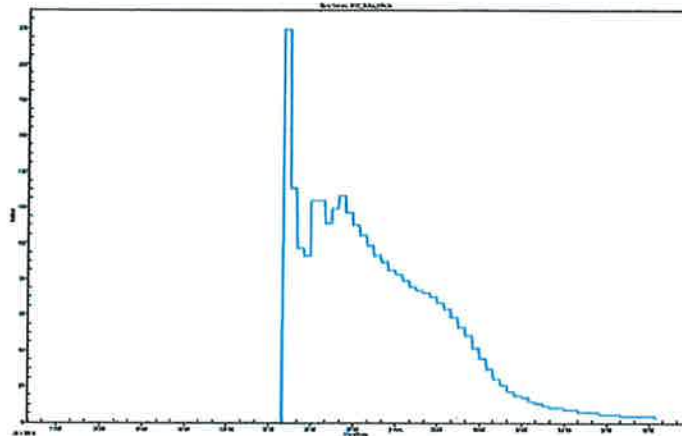
Name	Area (Acres)	Ksat (in/hr)	PSIF (in)	Dtheta	Imp (%)	DStore Perv	basin N Perv
PR_1	11.2	0.12	9.3	0.17	84.9	0.15	0.24
PR_10	16.9	0.24	3.7	0.25	58.8	0.15	0.25
PR_11	9.1	0.25	3.5	0.25	51.4	0.15	0.25
PR_12	31.9	0.23	4.2	0.24	58.8	0.15	0.24
PR_13	14.5	0.25	3.6	0.25	59.1	0.15	0.24
PR_14	8.6	0.25	3.5	0.25	52.4	0.15	0.25
PR_15	16.8	0.25	3.5	0.25	49.8	0.15	0.25
PR_2	19.2	0.25	7.0	0.21	61.7	0.15	0.24
PR_20	15.6	0.25	3.5	0.25	63.2	0.15	0.24
PR_21	13.7	0.18	6.0	0.21	62.9	0.15	0.24
PR_22	7.2	0.09	8.9	0.18	55.5	0.15	0.25
PR_23	3.9	0.34	4.0	0.25	3.0	0.15	0.30
PR_24	7.2	0.38	4.2	0.25	69.4	0.15	0.25
PR_3	6.8	0.07	9.7	0.16	84.7	0.15	0.24
PR_30	8.4	0.25	3.5	0.25	18.5	0.15	0.24
PR_4	15.2	0.10	8.6	0.18	60.9	0.15	0.24
PR_5	6.6	0.25	3.5	0.25	86.1	0.15	0.24
PR_6	10.3	0.25	3.5	0.25	5.6	0.19	0.38
PR_7	14.3	0.05	9.9	0.15	52.3	0.17	0.30
PR_8	18.5	0.25	3.5	0.25	58.5	0.15	0.25
PR_9	4.9	0.25	3.5	0.25	76.2	0.15	0.25

Exhibit 2 - Offsite Flow Hydrographs, 100-year Event

Kimley»Horn

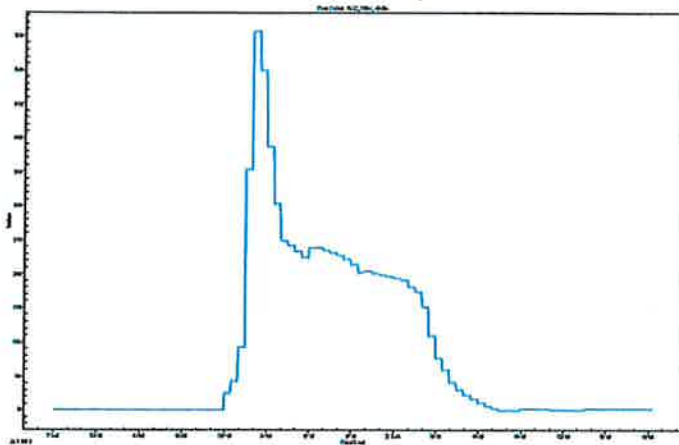
VCC 100-year Offsite Flow Hydrograph

Peak Flow = 219.45 cfs



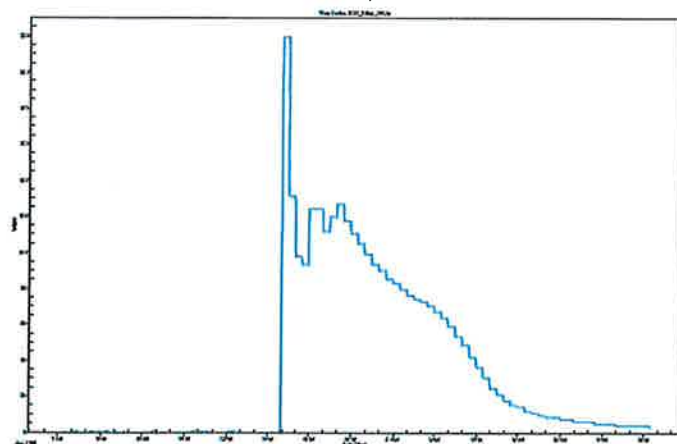
ACC 100-year Offsite Flow Hydrograph

Peak Flow = 556.36 cfs



KCC 100-year Offsite Flow Hydrograph

Peak Flow = 1139.54 cfs



# Exhibit 3. NOAA Atlas 14 Point Precipitation Frequency Estimates Lompa Ranch North SPA



NOAA Atlas 14, Volume 1, Version 5  
Location name: Carson City, Nevada, USA\*  
Latitude: 39.1644°, Longitude: -119.7462°  
Elevation: 4637.08 ft\*\*  
\* source: ESRI Maps  
\*\* source: USGS



## POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Helm, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishant Roy, Carl Trypanuk, Dale Unruh, Fengtin 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) <sup>1</sup>										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.095 (0.082-0.113)	0.119 (0.103-0.141)	0.159 (0.136-0.188)	0.197 (0.168-0.233)	0.260 (0.214-0.308)	0.317 (0.253-0.379)	0.386 (0.298-0.466)	0.468 (0.347-0.574)	0.598 (0.418-0.749)	0.716 (0.476-0.913)
10-min	0.145 (0.125-0.171)	0.181 (0.156-0.214)	0.242 (0.207-0.287)	0.300 (0.255-0.355)	0.395 (0.326-0.469)	0.483 (0.386-0.577)	0.588 (0.454-0.709)	0.712 (0.528-0.874)	0.910 (0.636-1.14)	1.09 (0.725-1.39)
15-min	0.180 (0.155-0.212)	0.224 (0.194-0.266)	0.299 (0.257-0.355)	0.371 (0.316-0.441)	0.490 (0.404-0.582)	0.598 (0.478-0.715)	0.728 (0.562-0.878)	0.883 (0.654-1.08)	1.13 (0.789-1.41)	1.35 (0.899-1.72)
30-min	0.242 (0.208-0.286)	0.301 (0.261-0.358)	0.403 (0.346-0.478)	0.500 (0.426-0.593)	0.660 (0.544-0.784)	0.806 (0.644-0.963)	0.981 (0.757-1.18)	1.19 (0.881-1.46)	1.52 (1.06-1.90)	1.82 (1.21-2.32)
60-min	0.300 (0.258-0.354)	0.373 (0.323-0.443)	0.499 (0.428-0.592)	0.619 (0.527-0.734)	0.817 (0.673-0.970)	0.997 (0.797-1.19)	1.21 (0.937-1.46)	1.47 (1.09-1.81)	1.88 (1.32-2.36)	2.26 (1.50-2.87)
2-hr	0.406 (0.361-0.466)	0.504 (0.448-0.577)	0.643 (0.568-0.735)	0.766 (0.669-0.876)	0.952 (0.809-1.09)	1.12 (0.929-1.30)	1.31 (1.06-1.53)	1.53 (1.20-1.83)	1.92 (1.44-2.38)	2.29 (1.65-2.90)
3-hr	0.485 (0.434-0.546)	0.605 (0.545-0.684)	0.760 (0.678-0.858)	0.887 (0.784-0.998)	1.07 (0.928-1.21)	1.22 (1.04-1.40)	1.39 (1.17-1.61)	1.62 (1.32-1.89)	1.97 (1.57-2.41)	2.32 (1.79-2.93)
6-hr	0.671 (0.603-0.751)	0.839 (0.753-0.941)	1.04 (0.932-1.17)	1.21 (1.07-1.35)	1.42 (1.25-1.60)	1.60 (1.38-1.81)	1.77 (1.50-2.02)	1.97 (1.64-2.28)	2.27 (1.84-2.67)	2.53 (2.00-3.03)
12-hr	0.885 (0.789-0.994)	1.11 (0.992-1.25)	1.40 (1.24-1.58)	1.63 (1.44-1.83)	1.93 (1.69-2.19)	2.16 (1.87-2.47)	2.40 (2.04-2.77)	2.65 (2.21-3.09)	2.98 (2.42-3.54)	3.24 (2.57-3.91)
24-hr	1.16 (1.05-1.28)	1.48 (1.32-1.60)	1.83 (1.67-2.02)	2.14 (1.94-2.36)	2.57 (2.32-2.83)	2.91 (2.60-3.20)	3.26 (2.90-3.61)	3.62 (3.19-4.03)	4.12 (3.58-4.61)	4.52 (3.87-5.10)
2-day	1.39 (1.25-1.55)	1.74 (1.56-1.95)	2.21 (1.99-2.48)	2.60 (2.32-2.91)	3.13 (2.78-3.52)	3.56 (3.14-4.01)	4.00 (3.50-4.53)	4.47 (3.87-5.10)	5.11 (4.36-5.89)	5.63 (4.73-6.55)
3-day	1.52 (1.36-1.71)	1.92 (1.71-2.15)	2.45 (2.19-2.76)	2.89 (2.57-3.25)	3.50 (3.09-3.95)	3.99 (3.50-4.52)	4.51 (3.92-5.13)	5.05 (4.35-5.78)	5.82 (4.92-6.71)	6.43 (5.35-7.49)
4-day	1.66 (1.48-1.87)	2.09 (1.87-2.36)	2.69 (2.39-3.04)	3.18 (2.82-3.59)	3.87 (3.41-4.39)	4.42 (3.86-5.03)	5.01 (4.34-5.72)	5.64 (4.82-6.46)	6.52 (5.47-7.54)	7.23 (5.98-8.44)
7-day	1.93 (1.72-2.17)	2.44 (2.17-2.75)	3.15 (2.80-3.55)	3.71 (3.30-4.19)	4.51 (3.99-5.11)	5.15 (4.51-5.84)	5.81 (5.05-6.62)	6.51 (5.61-7.45)	7.49 (6.35-8.65)	8.26 (6.90-9.63)
10-day	2.11 (1.88-2.38)	2.69 (2.39-3.03)	3.48 (3.09-3.92)	4.10 (3.64-4.62)	4.95 (4.36-5.58)	5.62 (4.91-6.35)	6.30 (5.47-7.14)	7.01 (6.03-7.97)	7.98 (6.78-9.17)	8.73 (7.33-10.1)
20-day	2.58 (2.31-2.89)	3.28 (2.94-3.67)	4.23 (3.79-4.72)	4.95 (4.42-5.52)	5.91 (5.25-6.60)	6.64 (5.86-7.42)	7.38 (6.48-8.29)	8.12 (7.08-9.16)	9.10 (7.84-10.4)	9.84 (8.39-11.3)
30-day	2.91 (2.52-3.24)	3.70 (3.33-4.12)	4.76 (4.28-5.29)	5.55 (4.98-6.17)	6.61 (5.90-7.35)	7.42 (6.57-8.26)	8.23 (7.24-9.20)	9.03 (7.88-10.2)	10.1 (8.72-11.5)	10.9 (9.33-12.5)
45-day	3.42 (3.09-3.79)	4.35 (3.92-4.81)	5.59 (5.04-6.17)	6.50 (5.85-7.17)	7.67 (6.87-8.48)	8.53 (7.61-9.45)	9.36 (8.33-10.4)	10.2 (9.00-11.3)	11.2 (9.80-12.5)	11.9 (10.4-13.4)
60-day	3.93 (3.54-4.36)	5.00 (4.50-5.55)	6.42 (5.78-7.09)	7.42 (6.57-8.20)	8.67 (7.77-9.59)	9.57 (8.55-10.6)	10.4 (9.28-11.6)	11.2 (9.95-12.5)	12.1 (10.7-13.6)	12.8 (11.3-14.4)

<sup>1</sup> 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.

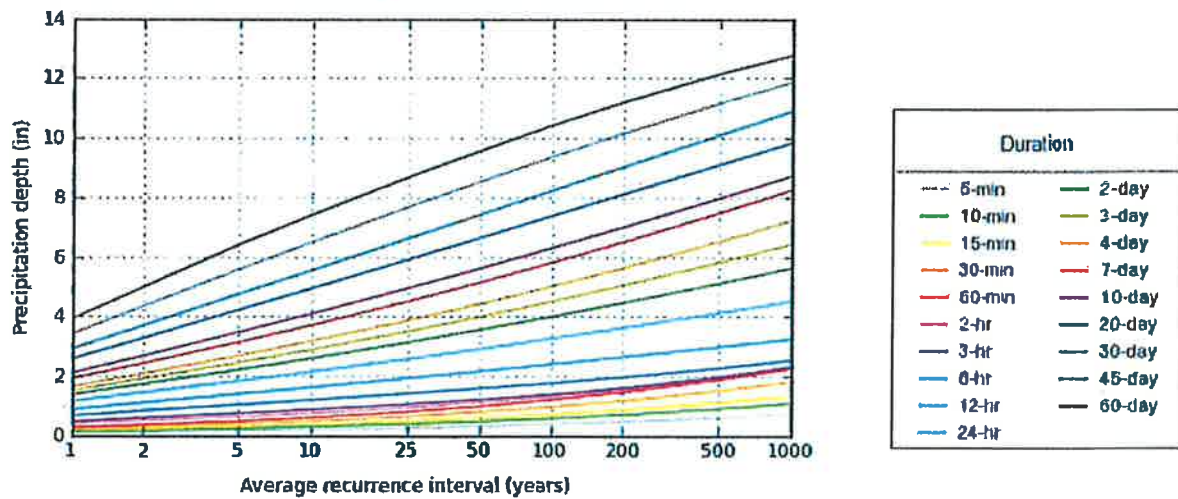
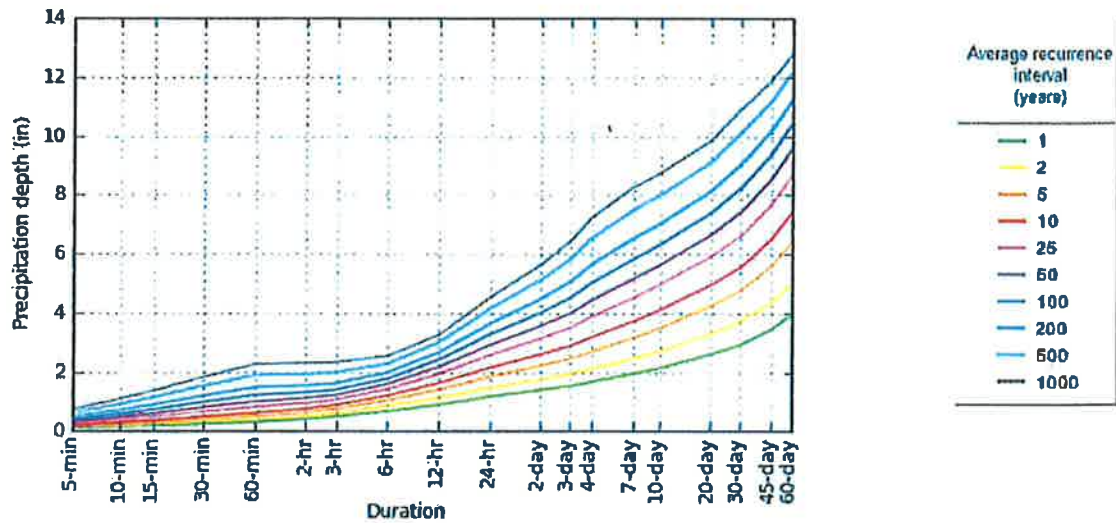
Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)



## PF graphical

PDS-based depth-duration-frequency (DDF) curves  
Latitude: 39.1644°, Longitude: -119.7462°



## Maps & aeriels

### Small scale terrain



## Large scale terrain



### Large scale map



Large scale aerial



[Back to Top](#)

---

[US Department of Commerce](#)  
[National Oceanic and Atmospheric Administration](#)  
[National Weather Service](#)  
[National Water Center](#)  
1325 East West Highway  
Silver Spring, MD 20910  
Questions?: [HDSC.Questions@noaa.gov](mailto:HDSC.Questions@noaa.gov)

[Disclaimer](#)



**Soil Map—Carson City Area, Nevada  
(SoilsBoundary)**



Web Soil Survey  
National Cooperative Soil Survey

1/10/2017  
Page 1 of 3

## MAP LEGEND

## MAP INFORMATION

**Area of Interest (AOI)**














- Blue outline box: Area of Interest (AOI)

**Soils**

- Red outline box: Soil Map Unit Polygons
- Orange outline box: Soil Map Unit Lines
- Orange outline box: Soil Map Unit Points

**Special Point Features**

- Blue circle with 'X': Blowout
- Blue square with 'X': Borrow Pit
- Blue circle with 'X': Clay Spot
- Blue circle with 'X': Closed Depression
- Blue circle with 'X': Gravel Pit
- Blue circle with 'X': Gravelly Spot
- Blue circle with 'X': Landfill
- Blue circle with 'X': Lava Flow
- Blue circle with 'X': Marsh or swamp
- Blue circle with 'X': Mine or Quarry
- Blue circle with 'X': Miscellaneous Water
- Blue circle with 'X': Perennial Water
- Blue circle with 'X': Rock Outcrop
- Blue circle with 'X': Saline Spot
- Blue circle with 'X': Sandy Spot
- Blue circle with 'X': Severely Eroded Spot
- Blue circle with 'X': Sinkhole
- Blue circle with 'X': Slide or Slip
- Blue circle with 'X': Sodic Spot

	Spoil Area
	Stony Spot
	Very Stony Spot
	Wet Spot
	Other
	Special Line Features
<b>Water Features</b>	
	Streams and Canals
<b>Transportation</b>	
	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads
<b>Background</b>	
	Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

**Warning:** Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

**Please rely on the bar scale on each map sheet for map measurements.**

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:

**Coordinate System:** Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Carson City Area, Nevada  
Survey Area Data: Version 10, Sep 9, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 26, 2013—Jul 28, 2013

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



## Map Unit Legend

Carson City Area, Nevada (NV629)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Bishop loam, saline	93.9	22.8%
22	Greenbrae fine sandy loam, 0 to 2 percent slopes	23.9	5.8%
36	Jubilee coarse sandy loam, 0 to 2 percent slopes	15.7	3.8%
38	Kimmerling silty clay loam	56.8	13.8%
50	Orizaba loam, saline-alkali	138.7	33.7%
71	Urban land	11.8	2.9%
73	Vamp fine sandy loam, drained	1.5	0.4%
74	Vamp fine sandy loam, slightly saline-alkali	0.0	0.0%
77	Voltaire silty clay loam, saline	68.7	16.7%
<b>Totals for Area of Interest</b>		<b>411.1</b>	<b>100.0%</b>

Exhibit 5 - Weighted Parameters by Subbasin

Kimley»Horn

Existing Natural	
EX-1	14.24
EX-2	29.11
EX-3	27.52
EX-20	9.69
EX-21	5.72
EX-22	2.52
EX-23	1.69
EX-30	8.18
AOI 1	525.51
AOI 2	1283.16
AOI 3	1668.06

Existing - For Vol Calcs	
EXOS-1	5.38
EXOS-2	6.65
EXOS-3	3.87
EXOS-4	8.16
EXOS-5	3.66
EXOS-6	19.33
EXOS-7	18.71
EXOS-8	7.3
EXOS-9	3.8
EXOS-20	5.66
EXOS-21	4.22
EXOS-22	4.04
EXOS-23	1.61
EXOS-24	2.6
EXOS-30	8.18

Proposed	
PR-1	36.82
PR-2	49.16
PR-3	22.31
PR-4	40.82
PR-5	21.65
PR-6	4.23
PR-7	32.55
PR-8	45.38
PR-9	14.81
PR-10	41.73
PR-11	20.06
PR-12	78.90
PR-13	35.92
PR-14	19.30
PR-15	36.30
PR-20	40.74
PR-21	36.08
PR-22	18.33
PR-23	1.38
PR-24	19.45
PR-30	8.83
AOI 1	502.67
AOI 2	1144.64
AOI 3	1645.97



## Appendix 5

---

### FEMA FLOODPLAIN MAP

Prepared by: JR Fuller







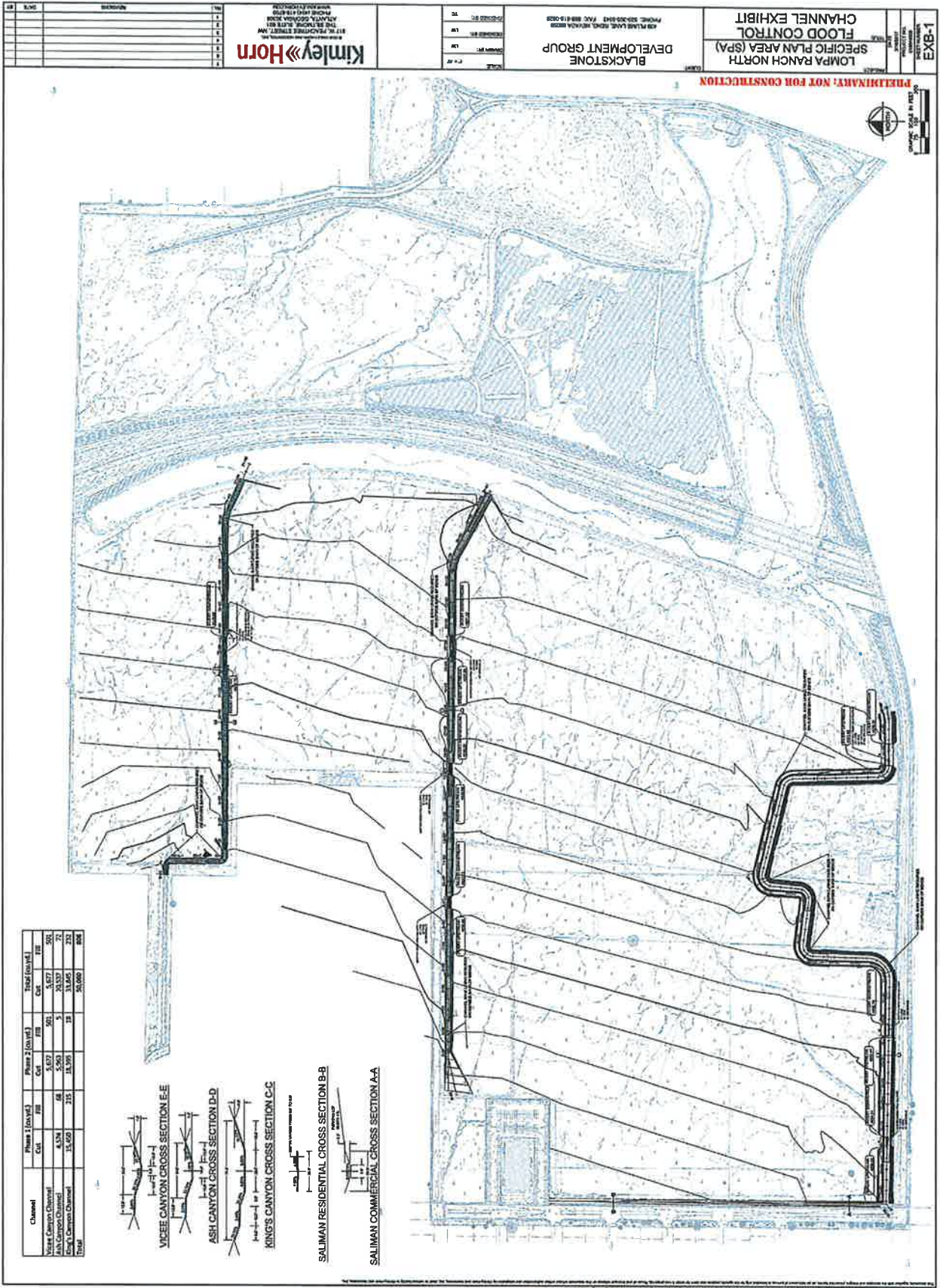


## Appendix 6

---

### 156 LOT TM - DRAINAGE FACILITIES (OPEN CHANNELS)

Prepared by: Kimley Horn



**BLACKSTONE RANCH – PHASE II, 56.1 ACRE TENTATIVE MAP  
WATER FEASIBILITY STUDY  
(A PORTION OF PARCEL NO. 10-041-71)**

CARSON CITY, NEVADA

Prepared for:  
**BLACKSTONE DEVELOPMENT GROUP**

439 Plumb Lane  
Reno, Nevada 89509  
775.352.4200 p  
888.618.0620 f  
jgm@blackstonedevelopmentgroup.com

Prepared by:

**The RED Ltd**

R – Real Estate Advisors | E – Engineering | D – Development

7272 S. El Capitan Way, #2  
Las Vegas, Nevada 89148  
702.325.2114 o  
702.946.0865 f  
www.TheREDLtd.com

October 15, 2017





R | REAL ESTATE • E | ENGINEERING • D | DEVELOPMENT

October 15, 2017

Mr. Stephen Pott  y, PE  
Carson City Development Services  
108 E. Proctor Street  
Carson City, NV 89701

**RE: WATER FEASIBILITY STUDY FOR BLACKSTONE RANCH  
PHASE II, 56.1 ACRE TENTATIVE MAP ("TM")**

Dear Mr. Pott  y:

The RED Ltd. is pleased to provide a Water Feasibility Study for the Blackstone Ranch – Phase II, 56.1-acre TM (a portion of 10-041-71). The development proposes to connect to water facilities on the peripheral of the project.

The data presented herein was compiled from as-builts, existing capacity information, hydraulic grade lines ("HGLs"), and utility atlas' provided by Carson City Public Works. The data presented was also compiled from survey data provided by Blackstone Development Group. Pursuant to the analysis of the water mains in the vicinity of the subject property, the existing facilities with the proposed build-out as outlined in this study shall adequately service the proposed development.

If you have any questions or require additional information, please do not hesitate to call me at (702) 277-4786. Thank you.

Sincerely,  
THE RED LTD  
R – Real Estate Advisors | E – Engineering | D – Development

A handwritten signature in black ink, appearing to read 'E. Le  n', is written over the typed name.

Edgar Le  n, P.E.  
Project Manager



## TABLE OF CONTENTS

1	GENERAL INFORMATION OF SITE.....	5
1.1	Introduction .....	5
1.2	Project Site.....	5
2	WATER DEMANDS .....	5
2.1	Domestic Demand Calculations.....	5
2.2	Max Day + Fire Protection Demand Calculations .....	6
3	PROJECT WATER ANALYSIS .....	7
3.1	Jurisdiction .....	7
3.2	Existing Public Water Facilities .....	7
3.3	Carson City Utilities Department Pressure Zone Designations .....	7
3.4	Carson City Utilities Department Hydraulic Grade Lines (HGL's).....	8
4	ANALYSIS .....	8
4.1	Water System.....	8
5	CONCLUSION .....	8

- 1      **APPENDIX 1**  
         **Blackstone Ranch Phase II - Maps**  
         *Figure 1: Vicinity Map*  
         *Figure 2: Location Map*  
         *Figure 3: Assessor's Parcel Map*  
         *Figure 4: Lompa Ranch West Phasing Plan*  
         *Figure 5: Lompa Ranch East Phasing Plan*  
         *Figure 6: Development and Infrastructure Phasing Plan*  
         *Figure 7: Blackstone Ranch - Phase II - Overall Utility Plan*
  
- 2      **APPENDIX 2**  
         **Water References**  
         *Table 1 – Average Water Consumption for Various Types of Developments*  
         *Table B105.1 – Required Fire Flow and Flow Duration for Buildings*  
         *Table A – Domestic Water Meter Chart*  
         *Existing Water Information from the Carson City Public Works*
  
- 3      **APPENDIX 3**  
         **Hydraulic Analysis**  
         *Hydraulic Analysis Calculations*
  - *Maximum Day Scenario*
  - *Peak Hour Scenario*
  - *Maximum Day Plus Fire Scenario*
  - *Node Map*
  
- 4      **APPENDIX 4**  
         **Master Concept Sanitary Sewer and Water System Layout**

*This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by The Red Ltd shall be without liability to The Red Ltd.*

## **1 GENERAL INFORMATION OF SITE**

### **1.1 Introduction**

The RED Ltd. was retained by Blackstone Development Group to perform a Water Feasibility Study for the Lompa Ranch North Specific Plan Area (SPA). The site is currently undeveloped with existing public utility infrastructure both within and on the peripheral of the subject property.

The purpose of this Water Feasibility Study is to investigate the options for delivering domestic and fire protection water services. This study was conducted in accordance with the criteria set forth by the Carson City Municipal Code (“CCMC”).

### **1.2 Project Site**

The Blackstone Ranch – Phase II property is generally located west of North Saliman Road, north of 5th Street, south of Robinson Street, and west of the Carson City Freeway (US-395). More specifically, the project is described as a portion of Assessor’s Parcel No. 10-041-70. The proposed land use of the property is Medium Density Residential. The approved land use designation is Medium Density Residential (LDR) pursuant to the Lompa Ranch North Specific Plan Area (SPA) adopted in March of 2016. The proposed zoning, Single Family 6,000 square feet (“SF6”) allows for 3 – 8 dwelling units/acre. The proposed residential subdivision has a density of 4.5 units/acre with a minimum lot size of 6,000 sf, average lot size of 6,424 +/- sf and 10 acres of open space.

Reference **Figure 1** for the project vicinity map, **Figure 2** for the location map, **Figure 3** for an assessor’s parcel map, **Figure 5** for Blackstone Ranch, Phase II - Site Plan and **Figure 6** for the Blackstone Ranch, Phase II – Utility Plan. These figures are provided within **Appendix 1**.

## **2 WATER DEMANDS**

### **2.1 Domestic Demand Calculations**

Domestic water demands for this analysis are determined from the proposed use and acreage of the proposed development. Table 1 – Average Water Consumption for Various Types of Developments was utilized to determine the domestic water demands associated with the Blackstone Ranch – Phase II project based on the proposed use. These rates are reasonable and have been accepted statewide by numerous jurisdictions. Based on the existing zoning of this project, Single Family Residential was utilized for the calculation basis. The demand factors are applied to the gross development acreage per the table.

Per Table 1, the Average Daily domestic water demand is determined as 2.30 Gallons per Minute (GPM) per Acre.

- $\pm 56.1 \text{ Acres} \times 2.30 \text{ GPM/Acre} \approx 129 \text{ GPM}$

Per Table 1, the Max Daily domestic water demand is determined as 5.20 Gallons per Minute (GPM) per Acre.

- $\pm 56.1 \text{ Acres} \times 5.20 \text{ GPM/Acre} \approx 292 \text{ GPM}$

Per Table 1, the Peak Hour domestic water demand is determined as 8.0 Gallons per Minute (GPM) per Acre.

- $\pm 56.1 \text{ Acres} \times 8.00 \text{ GPM/Acre} \approx 449 \text{ GPM}$

Water service from a municipal system is pressurized. As a result, the water use from a development decreases the pressure in the overall system, and the following minimum pressures must typically be maintained while the applicable demands are applied:

- Average Day: 129 GPM at 45 PSI
- Max Day: 292 GPM at 40 PSI
- Peak Hour: 449 GPM at 30 PSI

In addition to the water demands above and to be conservative, this analysis takes into account the adjacent Lompa Ranch North Phase A1 project. The Water Feasibility Study for Lompa Ranch North Phase A1 was utilized to obtain the following referenced demands.

- Average Day: 102 GPM at 45 PSI
- Max Day: 229 GPM at 40 PSI
- Peak Hour: 352 GPM at 30 PSI

Reference **Appendix 2** for Table 1 – Average Water Consumption for Various Types of Developments.

## 2.2 Max Day + Fire Protection Demand Calculations

Fire protection water demands are determined from the size and construction type of the largest building onsite. The International Building Code (IBC) Table B105.1 - Minimum Required Fire Flow and Flow Duration for Buildings was utilized to determine the fire protection demands for the proposed development (see **Appendix 2**).



A reduction in required fire-flow of 50 percent, as approved, is typically allowed when the building is equipped with an *approved automatic sprinkler system*. No sprinkler systems are anticipated to be implemented in any of the single family residential homes. The largest Type V-B building is anticipated to have a building footprint of no more than 4,800 square feet.

Per Table B105.1, the largest Type V-B building's fire flow is 1,750 GPM.

- Fire Flow = 1,750 GPM

See **Appendix 2** for the International Building Code (IBC) Table B105.1 - Minimum Required Fire Flow and Flow Duration for Buildings.

A developments total water demand is determined from the sum of the maximum daily demand plus the fire protection demand.

- $292 \text{ GPM} + 1,750 \text{ GPM} = 2,042 \text{ GPM}$

Water service from a municipal system is pressurized. As a result, the water use from a development decreases the pressure in the overall system, and the following minimum pressure must be maintained in the onsite water distribution system while the Max Day + Fire Protection demands are applied:

- Max Day + Fire Protection = 2,042 GPM at 20 PSI

### **3 PROJECT WATER ANALYSIS**

#### **3.1 Jurisdiction**

The proposed project site is located within Carson City and falls under the service jurisdiction of the Carson City Utilities Department ("CCUD") for public water. Therefore, this study is premised on the public water service being obtained from the CCUD.

### 3.2 Exiting Public Water Facilities

Pursuant to recent correspondence with the CCUD, two potential points-of-connections (“POCs”) to the public water distribution system were identified for Phase II. POCs are to a 24” diameter water line on Robinson Street and a 16” main on 5<sup>th</sup> Street. As-built drawings of the water lines were provided by Carson City Public Works (“CCPW”).

24” Main on Robinson Street: As denoted in Carson City’s Public Works Utility Run Books and as-built information, the existing public water within the vicinity of the project site includes a 24” main on Robinson Street. A point-of-connection to the existing 24” main is proposed to help supply Phase II. This connection is anticipated to consist of a proposed 12” water main.

16” Main on 5<sup>th</sup> Street: A 16” main exists along 5<sup>th</sup> Street, between Saliman Road and US-395, just east of Saliman Road. Carson City Public Works does not currently have as-built drawings for this facility. Therefore, depth of cover and location information shall be verified prior to construction via subsurface utility engineering services.

In addition to the above-mentioned, additional points-of-connection are anticipated and modeled via the proposed cross access streets from the Blackstone Ranch – Phase I property. These water line points-of-connection are anticipated to be in place prior to the commencement of construction for the Blackstone Ranch – Phase II project.

Reference **Appendix 2** for existing water information provided by CCPW.

### 3.3 Carson City Utilities Department Pressure Zone Designation

For this preliminary analysis, it is our understanding that the project site is located within the 4880 Pressure Zone designation. Any new findings shall require a supplement/update to be furnished to Carson City.

### 3.4 Carson City Utilities Department Hydraulic Grade Lines (HGL's)

The Red Ltd is in receipt of hydraulic grade lines ("HGLs") from Carson City for both 1,750 GMP Fire Flow and 1,750 GPM Fire Flow for various locations throughout the site. These HGLs were received in the form of Excel Line Charts for 24-hour period. As previously mentioned in Section 2.2 of this study, this analysis utilizes the 1,750 GMP Fire Flow. The Peak Hour was assumed to be the worst-case scenario of each 24-hour period. The HGL for the Max Day was reasonably assumed to be about 10 GPM more than the HGL for the Peak Hour. The HGL for the Max Day + 1,750 Fire Flow was reasonably assumed to be about 6 GPM less than the HGL for the Peak Hour. It is anticipated that this study will closely reflect existing conditions with the assumed pressure zone and HGLs. Therefore, any new information that deviates from this report will be addressed with a supplement/update.

For this preliminary analysis, the following HGL estimates have been utilized.

#### Reservoir 1 & 2 – Robinson Street & Saliman Road

- Maximum Day 4,874 feet
- Peak Hour 4,857 feet
- Max Day + 1,750 gpm Fire Flow 4,843 feet

#### Reservoir 3 – Robinson Street & Spine Road

- Maximum Day 4,854 feet
- Peak Hour 4,844 feet
- Max Day + 1,750 gpm Fire Flow 4,838 feet

#### Reservoir 5 – 5<sup>th</sup> Street & Spine Road

- Maximum Day 4,842 feet
- Peak Hour 4,832 feet
- Max Day + 1,750 gpm Fire Flow 4,826 feet

## 4 ANALYSIS

### 4.1 Water System

The water system for Blackstone Ranch – Phase II was analyzed using the WaterCAD V8i software. The results of the analyses are shown in Table 1. The fire hydrant demand nodes H-36 and H-41 (at 875 GPM each) covers the worst-case scenario for Maximum Day + Fire Flow.

TABLE 1: RESIDUAL WATER PRESSURES

PRESSURES			
Node ID	Maximum Day Residual (psi)	Peak Hour Residual (psi)	Maximum Day + Fire Residual (psi)
J-60	95	89	-
J-80	98	92	-
J-85	96	90	-
J-122	95	90	-
H-36	-	-	82
H-41	-	-	82

Reference **Appendix 3** for Water Network Analyses Output (WaterCAD V8i).

## **5 CONCLUSION**

Utilizing the Pressure Zone and HGL's as stated herein, the existing and proposed public water infrastructure and points-of-connection for the Blackstone Ranch – Phase II are anticipated to adequately service the water network to meet the required domestic and fire flow water demands. This analysis also indicates that pressure reducing valves may be required at varying locations. However, more information and further analysis by each incoming development is recommended to confirm a sound design.

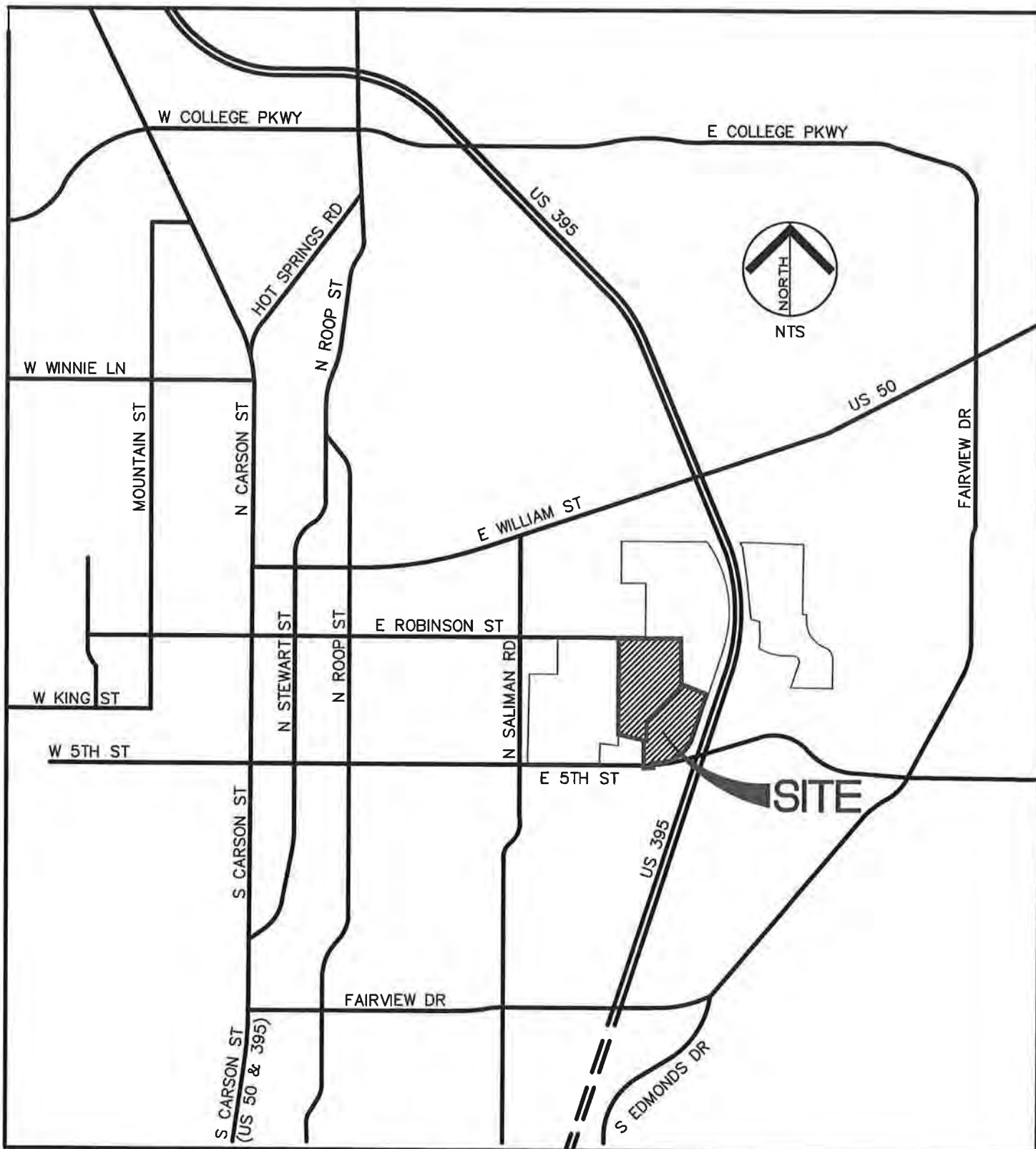


## Appendix 1

---

### LOMPA RANCH NORTH SPECIFIC PLAN AREA

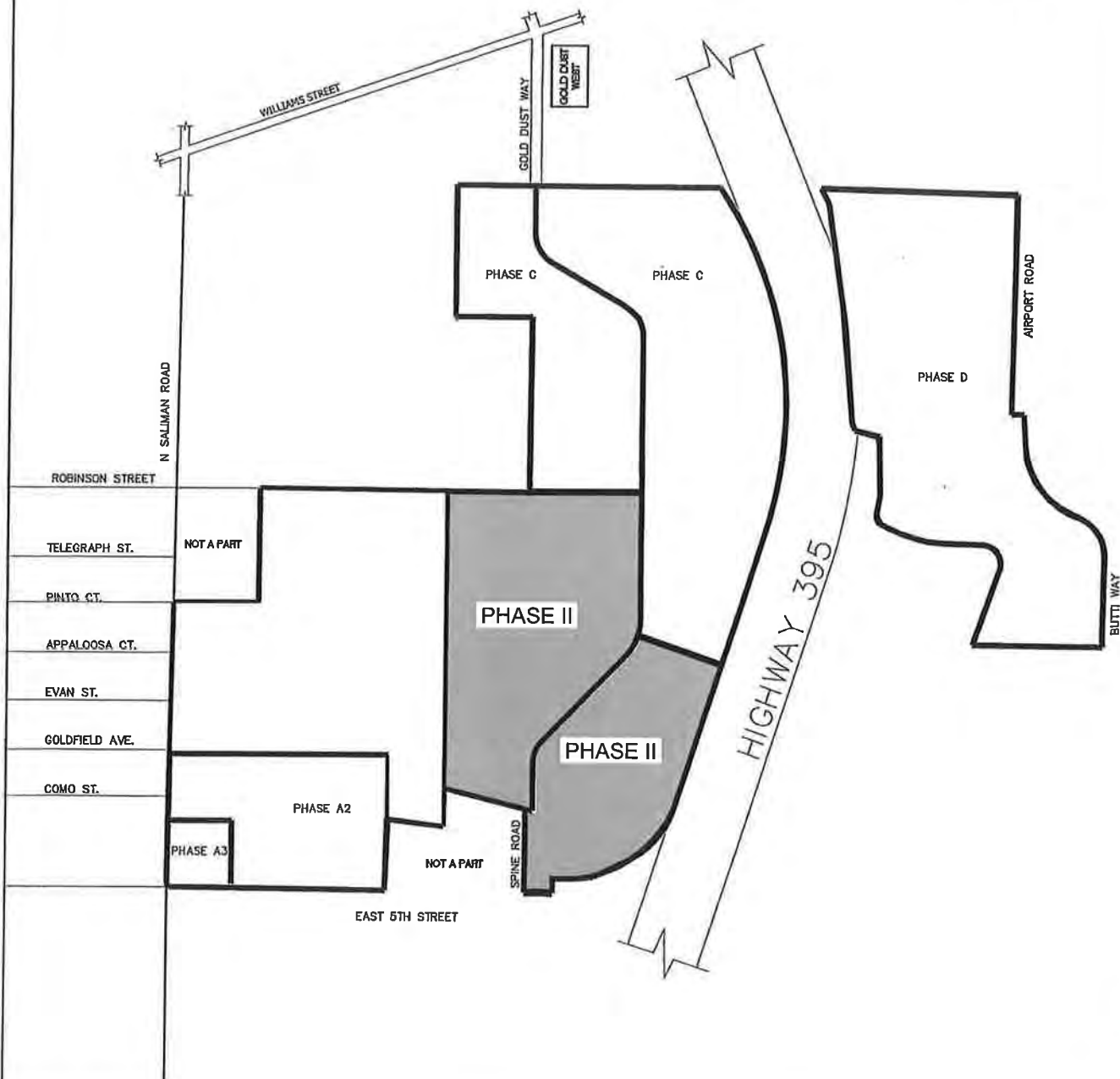
- FIGURE 1: VICINITY MAP
- FIGURE 2: LOCATION MAP
- FIGURE 3: ASSESSORS PARCEL MAP
- FIGURE 4: LOMPA RANCH WEST PHASING PLAN
- FIGURE 5: LOMPA RANCH EAST PHASING PLAN
- FIGURE 6: DEVELOPMENT AND INFRASTRUCTURE PHASING PLAN
- FIGURE 7: BLACKSTONE RANCH – PHASE II - OVERALL UTILITY PLAN



## BLACKSTONE RANCH - PHASE II

### Figure 1 | Vicinity Map

R | REAL ESTATE • E | ENGINEERING • D | DEVELOPMENT



## BLACKSTONE RANCH - PHASE II

### Figure 2 | Location Map

R | REAL ESTATE • E | ENGINEERING • D | DEVELOPMENT



## Assessor Parcels Report: 01004170



### Parcel Information:

Assessed Owner:	KEATING, TOM & MARTHA FAM TRUST % T B & M L KEATING, TRUSTEE CARSON CITY, NV 89703-0000		
Physical Address:	E 5TH ST		
Zoning:	A	Improved Value:	\$0.00
Land Use Code:	600	Land Value:	\$0.00
Total Acres:	62.05	Total Assessed Value:	\$3,735.00

&&ParcelImage1&&

&&ParcelImage2&&

### Figure 3 - Assessors Parcel Map

The data contained herein has been compiled on a geographic information system (GIS) for the use of Carson City. The data does not represent survey delineation and should not be construed as a replacement for the authoritative source, plat maps, deeds, resurveys, etc. No liability is assumed by Carson City or Douglas County as to the sufficiency or accuracy of the data.

Report Generated: 1/10/2017 14:41:10 PM

## CARSON CITY, NEVADA





## 48 ACRES | APN 010-041-73 &amp; 010-036-04

CARLSON CITY, NEVADA



1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

**BLACKSTONE**  
**DEVELOPMENT GROUP**





## Appendix 2

---

### WATER REFERENCES

- TABLE 1 – AVERAGE WATER CONSUMPTION FOR VARIOUS TYPES OF DEVELOPMENTS
  - TABLE B105.1 – REQUIRED FIRE FLOW AND FLOW DURATION FOR BUILDINGS
    - TABLE A – DOMESTIC WATER METER CHART
- EXISTING WATER INFORMATION FROM CARSON CITY PUBLIC WORKS

TABLE 1

## WATER CONSUMPTION RATES FOR VARIOUS TYPES OF DEVELOPMENT

CUSTOMER CLASS/DESCRIPTION	DEMAND FLOW RATES					
	AVERAGE DAY		MAXIMUM DAY		PEAK HOUR	
	GPM per Unit	GPM per Acre	GPM per Unit	GPM per Acre	GPM per Unit	GPM per Acre
Single Family Residential	0.52	2.30	1.18	5.20	1.81	8.00
Multi-Family (12 Units or Less per Acre)	0.52	2.30	1.18	5.20	1.81	8.00
Residential, Duplex and Triplex	0.52	2.30	1.18	5.20	1.81	8.00
Apartments, Condominiums and Townhouses	0.21	5.70	0.53	14.00	0.63	16.80
Mobile Home Parks	N/A	2.40	N/A	3.70	N/A	5.70
Hotels	0.29	N/A	0.36	N/A	0.45	N/A
Golf Courses, Parks and Open Spaces	N/A	4.40	N/A	8.40	N/A	8.40
Industrial Park (Light Industry)	N/A	1.10	N/A	1.50	N/A	2.30
Commercial	N/A	2.10	N/A	3.00	N/A	4.60
Schools	N/A	1.70	N/A	3.50	N/A	5.40



**TABLE B105.1**  
**MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS**

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute) <sup>b</sup>	FLOW DURATION (hours)
Type IA and IB <sup>a</sup>	Type IIA and IIIA <sup>a</sup>	Type IV and V-A <sup>a</sup>	Type IIB and IIIB <sup>a</sup>	Type V-B <sup>a</sup>		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
-	-	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
-	-	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
-	-	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
-	-	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
-	-	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
-	-	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
-	-	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
-	-	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m<sup>2</sup>, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

- a. Types of construction are based on the International Building Code.
- b. Measured at 20 psi residual pressure.

**Exception:** A reduction in required fire-flow of 50 percent, as approved, is allowed when the building is equipped with an *approved automatic sprinkler system*.

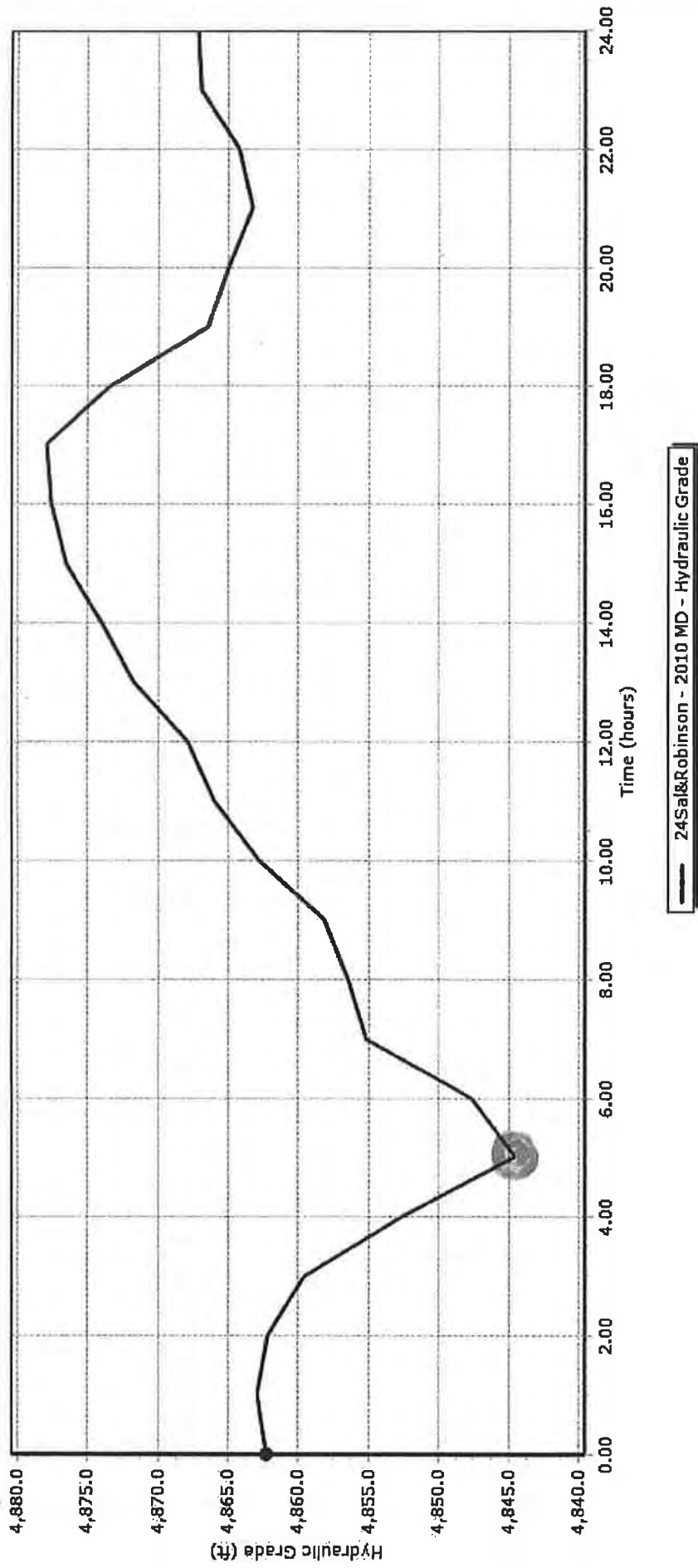
**TABLE A**  
**DOMESTIC WATER METER CHART**  
**Characteristics**

TYPE	DISPLACEMENT (1)			COMPOUND (2)			TURBINE (3)		
SIZE	GPM		PSI*	GPM		PSI*	GPM		PSI*
	MAX	CONT	@ MAX GPM	MAX	CONT	@ MAX GPM	MAX	CONT	@ MAX GPM
5/8 X 3/4"	20	10	15						
3/4"	30	15	15				30 (4)		
1"	50	25	15				50 (4)		
1-1/2"	100	50	15				100 (4)		
2"	160	80	15				160 (4)		
3"				320	160	20	350	240	7
4"				500	250	20	630	420	7
6"				1000	500	20	1400	920	7
8"				1600	800	20	2400	1600	7
10"				2300	1150	20	3800	2500	7

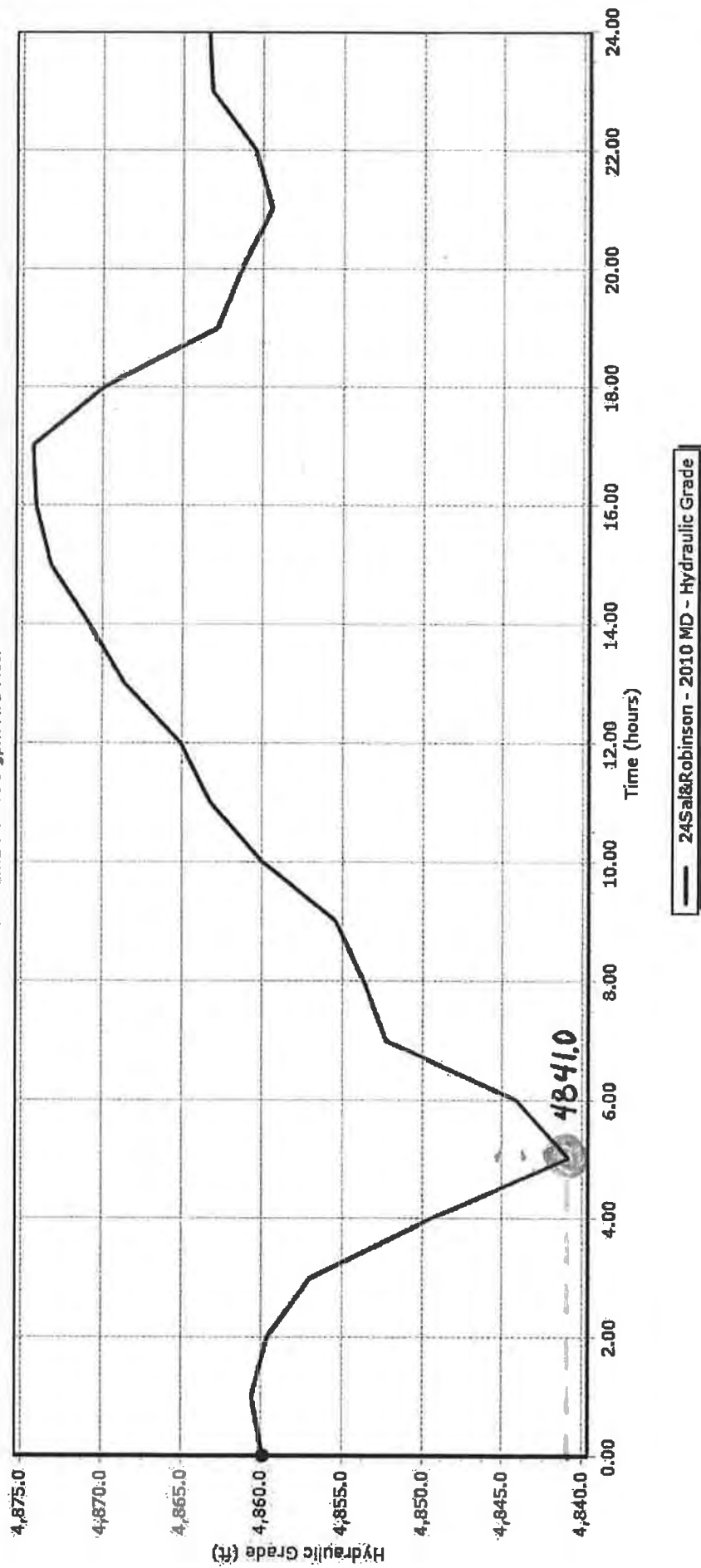
\* Maximum pressure loss at safe maximum operating capacity.

- (1) AWWA C700 Cold-Water Meters – Displacement Type, Bronze Main Case, Table 1.
- (2) AWWA C702 Cold Water Meters – Compound Type, Table 1.
- (3) AWWA C701 Cold-Water Meters – Turbine Type For Customer Service, Table 1. Class II In-line (High Velocity Types – Pressure Losses do not include strainer).
- (4) Max flow for residential fire service - continuous flow and psi loss characteristics are similar to displacement meters.

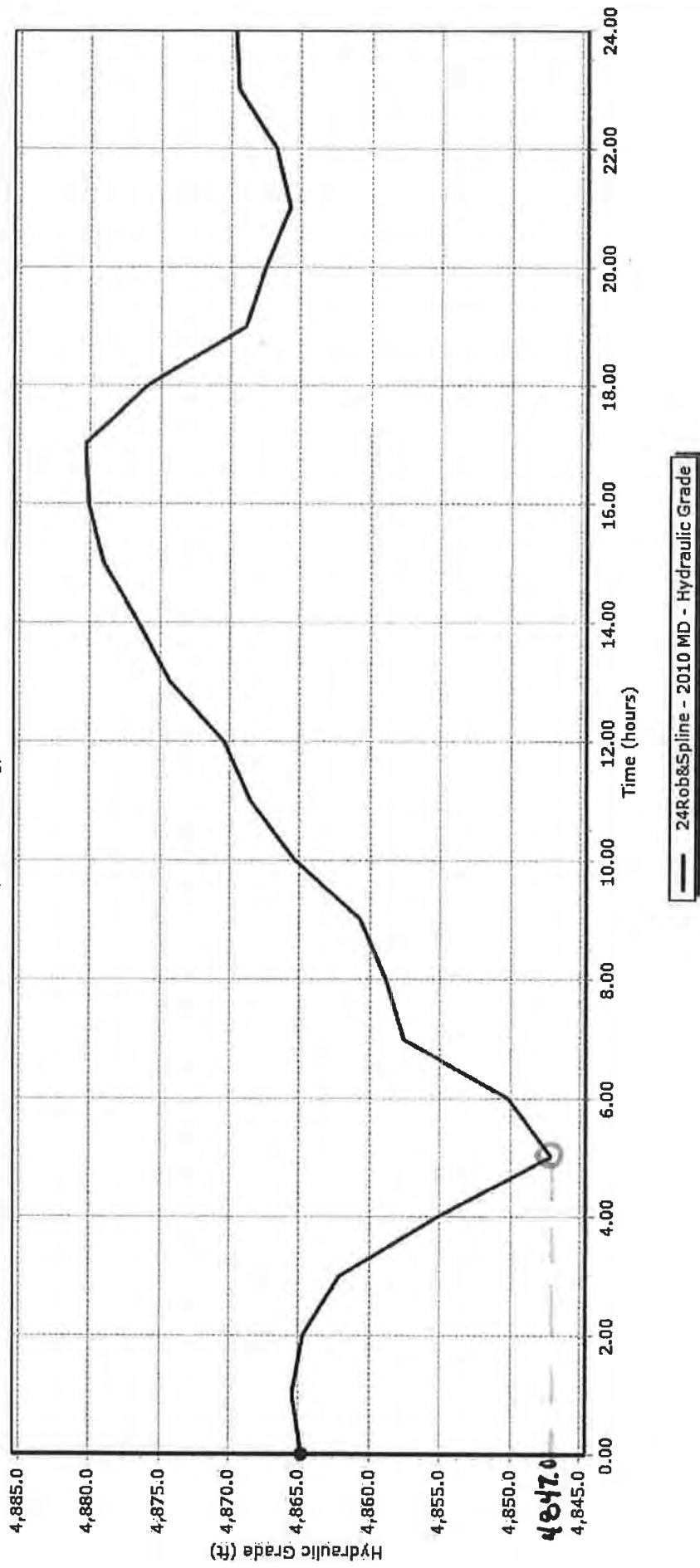
248Saliman + 1500 gpm Fire Flow



248Saliman + 1750 gpm Fire Flow

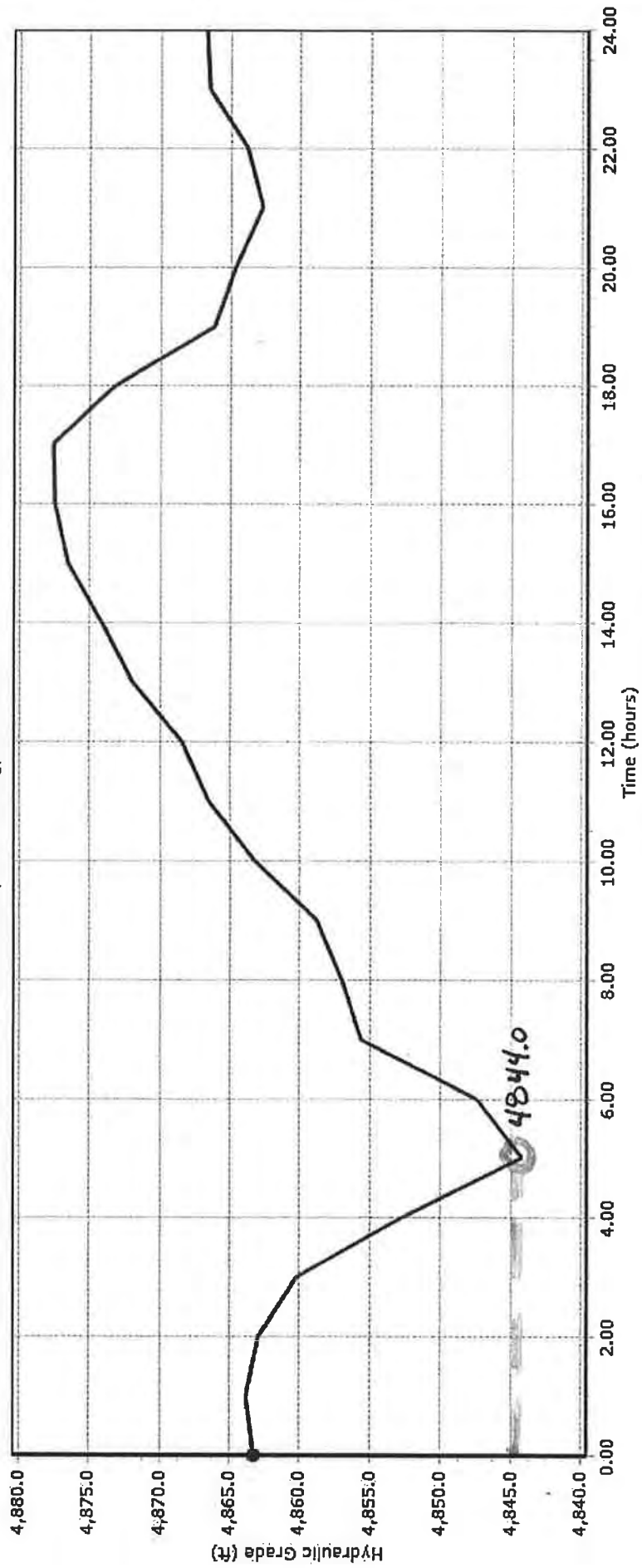


24&Spline + 1500 gpm Fire Flow



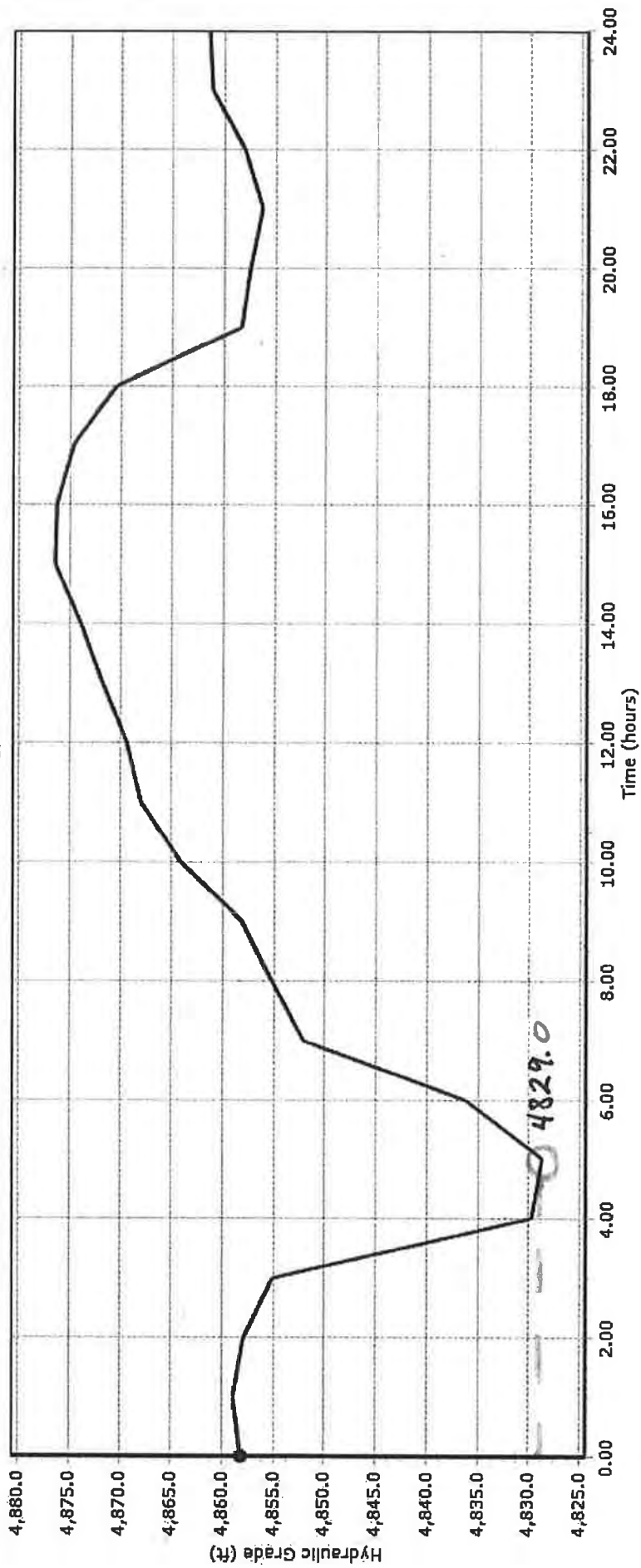


24&Spline + 1750 gpm Fire Flow



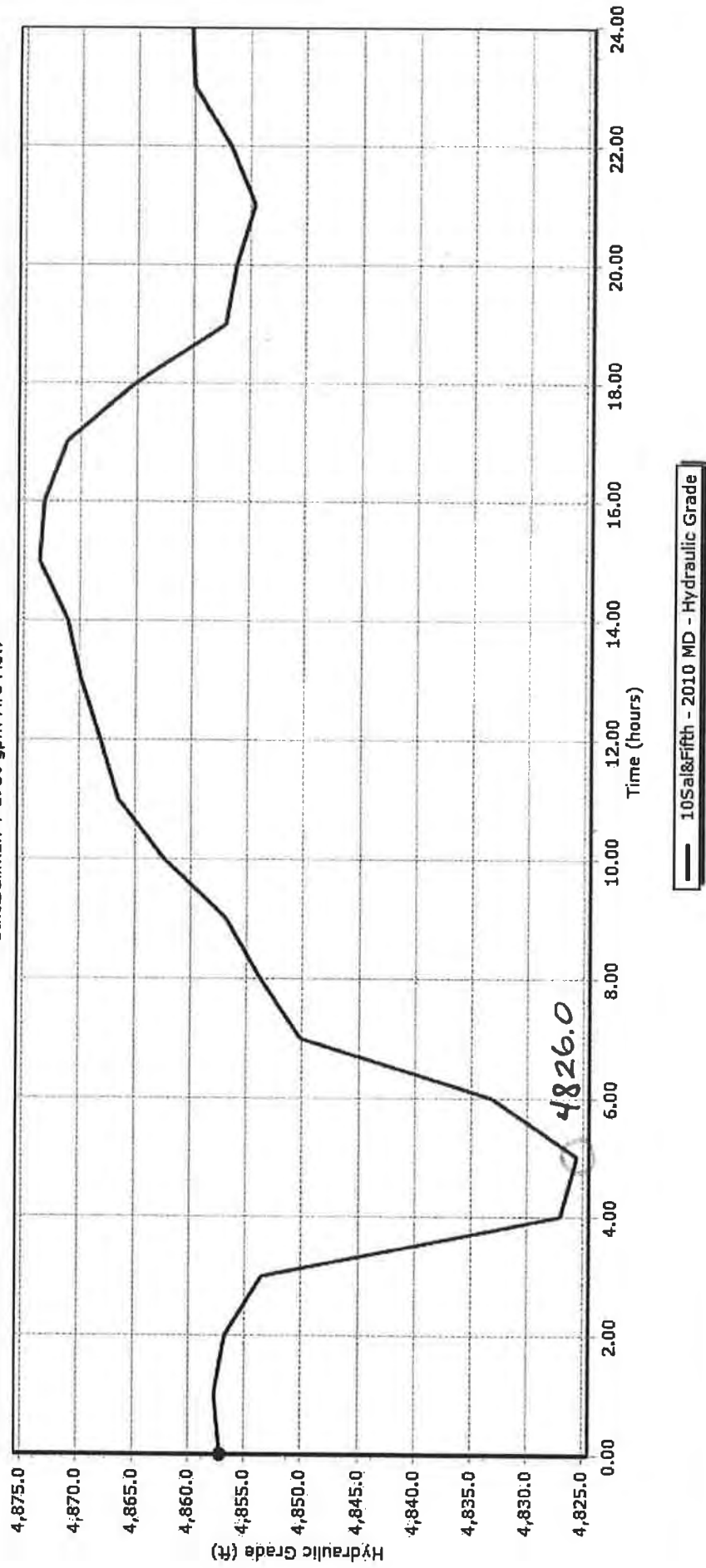
24Rob&Spline - 2010 MD - Hydraulic Grade

Fifth&Saliman + 1500 gpm Fire Flow

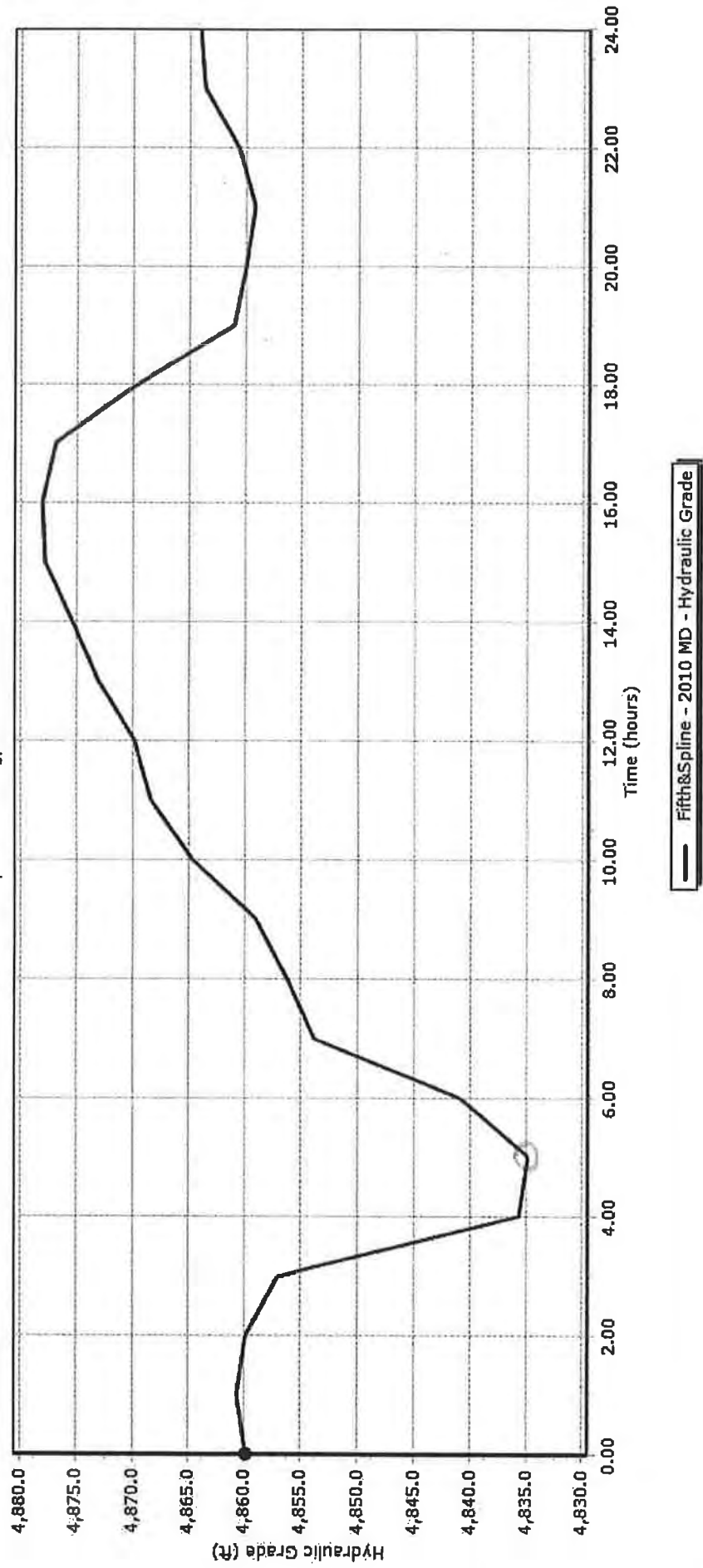


— 10Sal&Fifth - 2010 MD - Hydraulic Grade

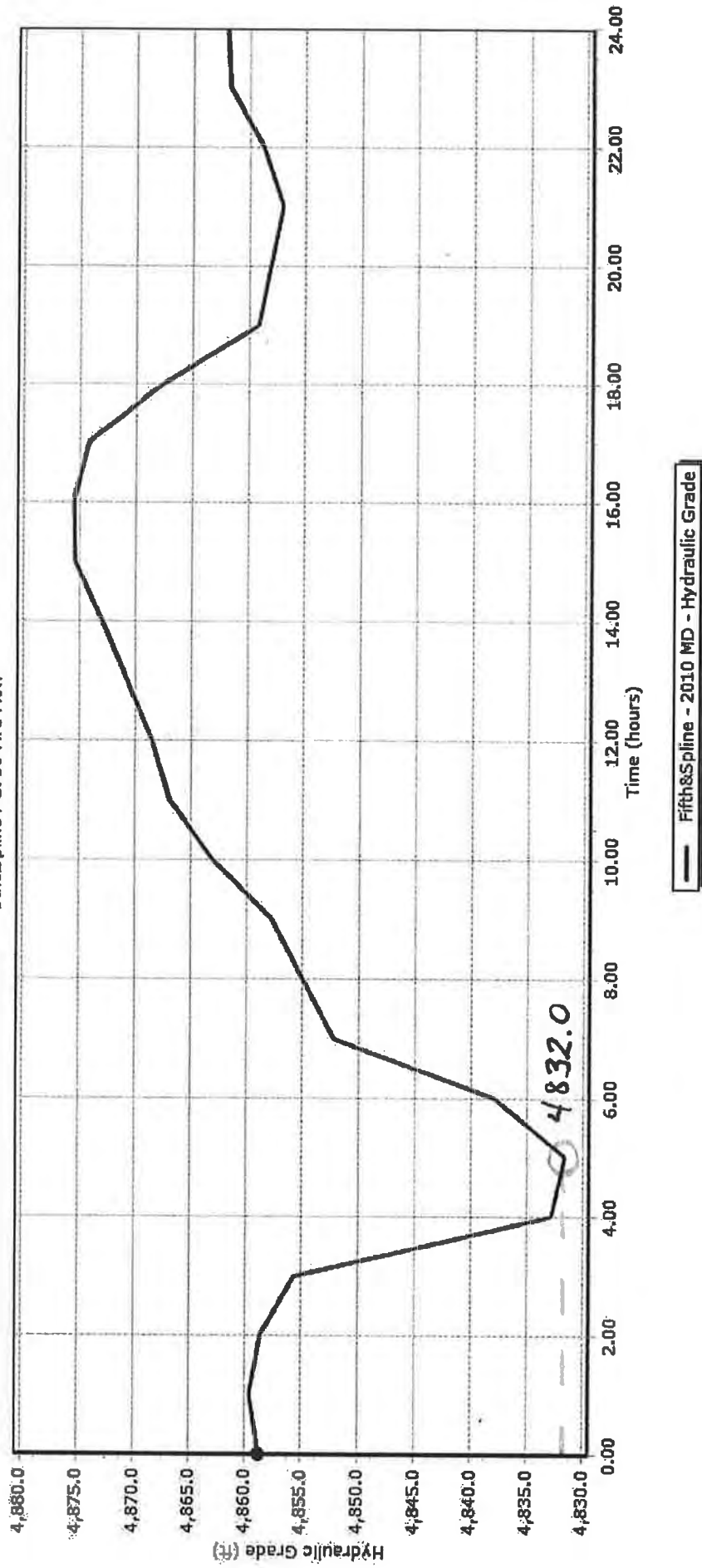
5th&Saliman + 1750 gpm Fire Flow



Fifth&Spline + 1500 gpm Fire Flow

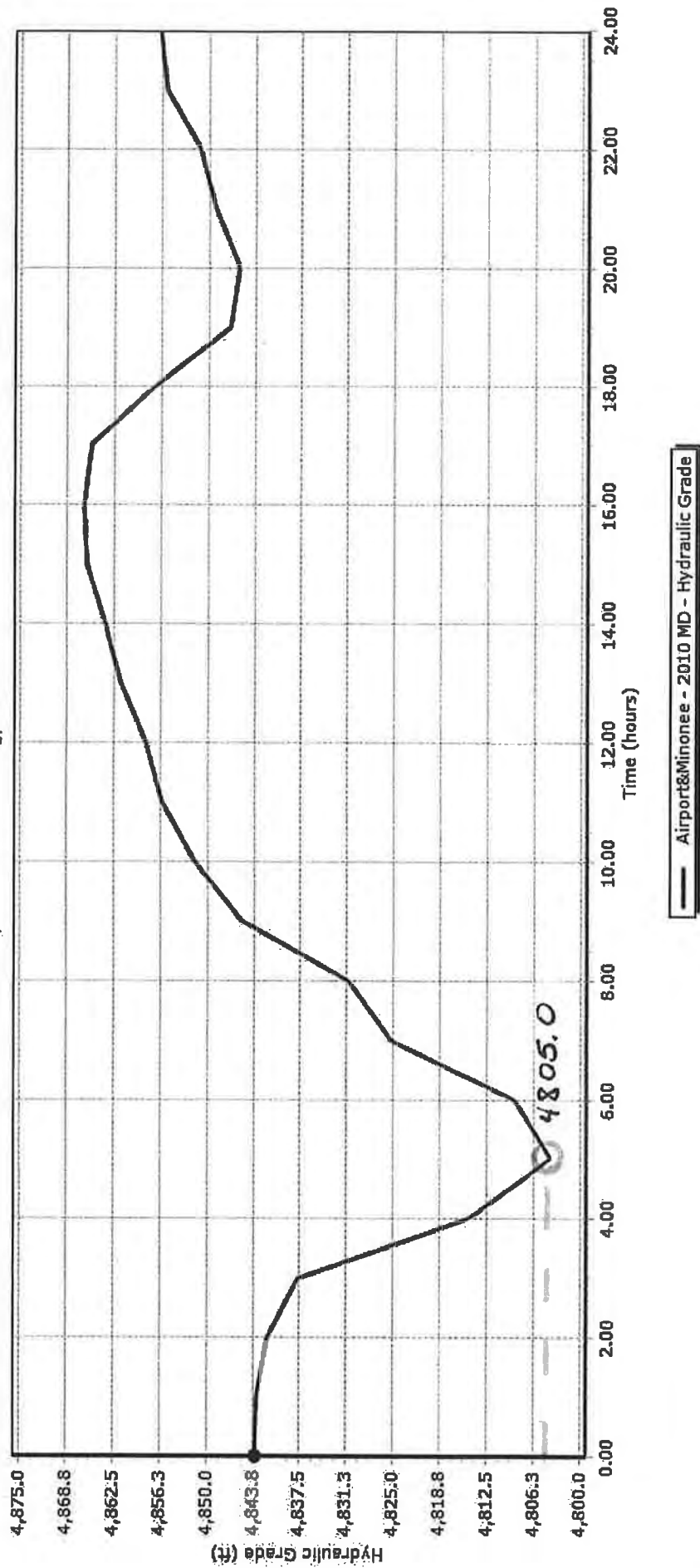


5th&Spline+ 1750 Fire Flow

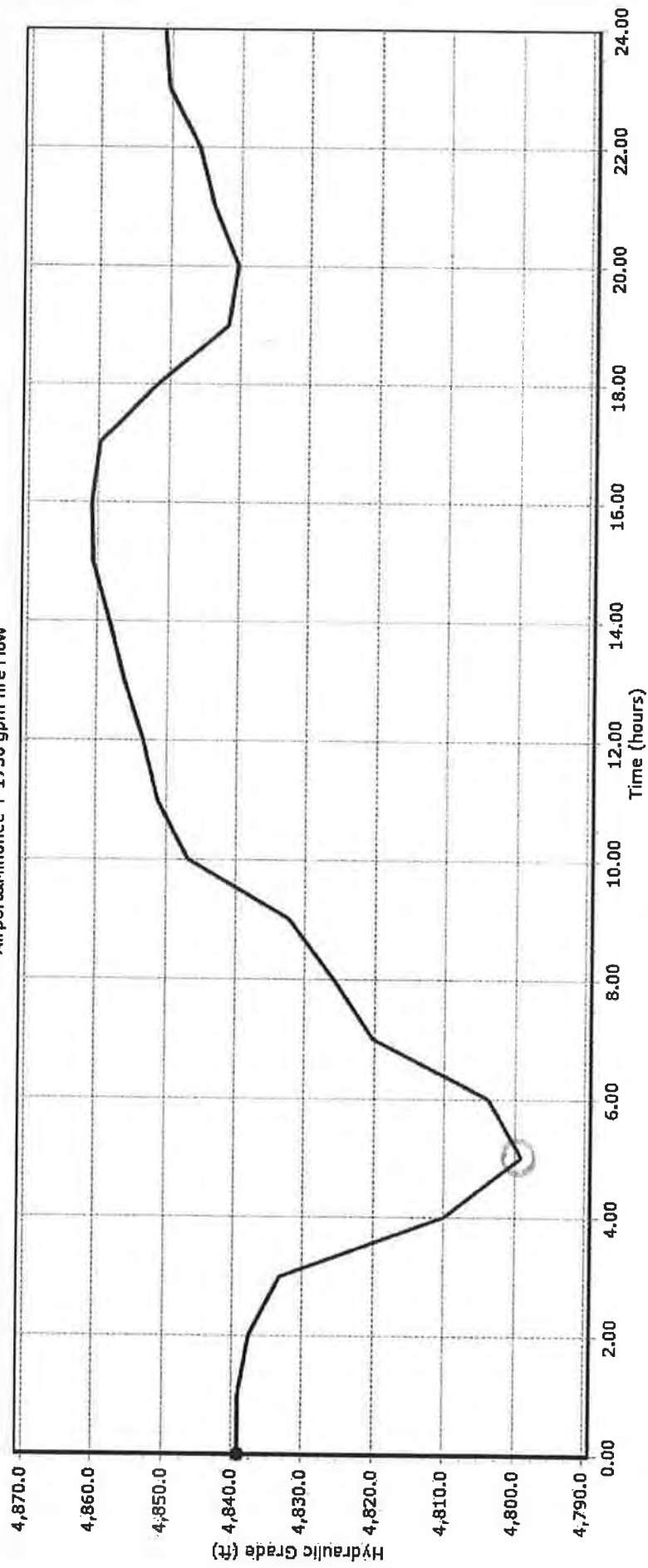


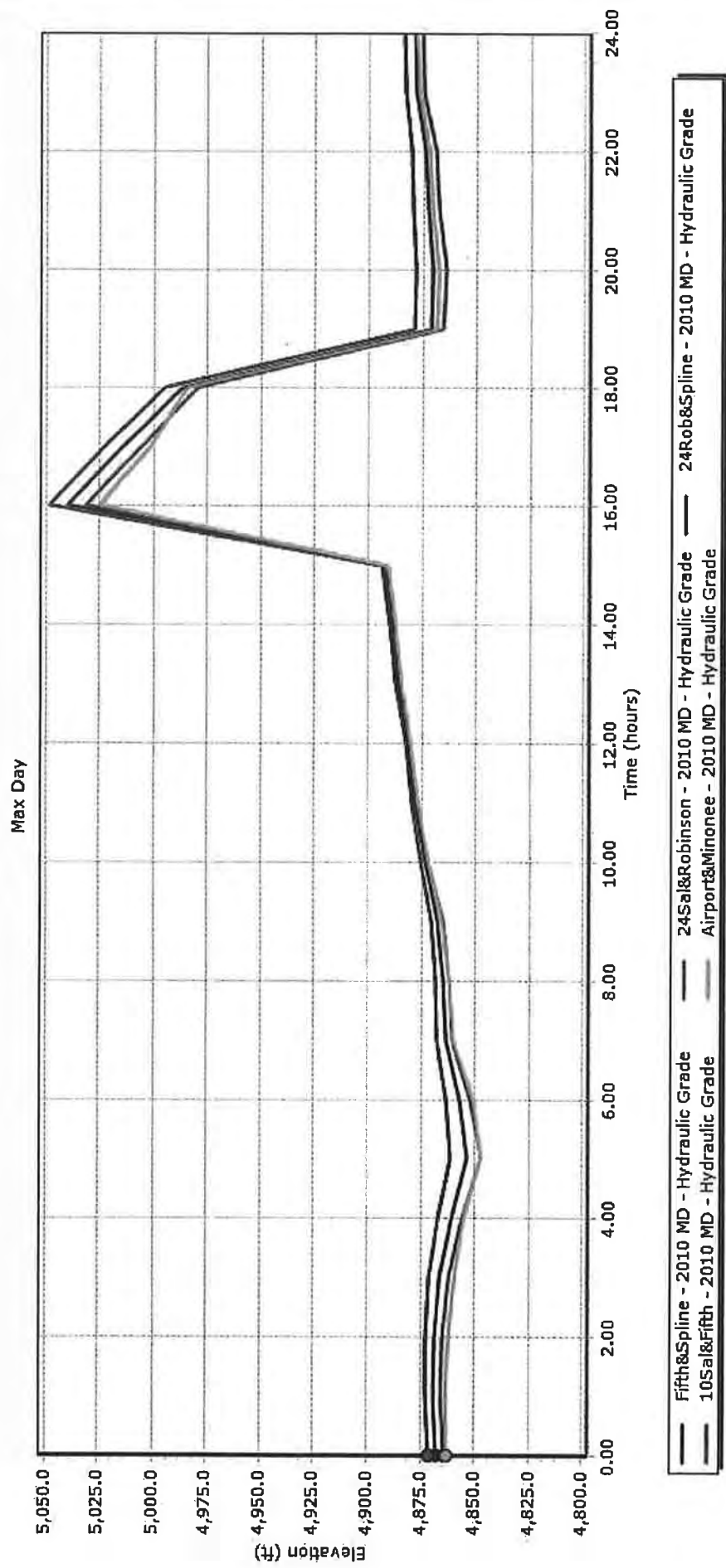


Airport&Minonee + 1500 gpm fire flow



Airport&Minonee + 1750 gpm fire Flow





## Appendix 3

---

### HYDRAULIC ANALYSIS

- HYDRAULIC ANALYSIS CALCULATIONS
  - MAXIMUM DAY SCENARIO
  - PEAK HOUR SCENARIO
  - MAXIMUM DAY PLUS FIRE SCENARIO
    - NODE MAP

Scenario: Max Day  
 Current Time Step: 0.000 h  
 FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Head Loss
32	P-1	1,582	R-1	J-1	24.0	PVC	130.0	False	0.000	9,000	6.38	0.005	
40	P-4	787	R-2	J-4	10.0	PVC	120.0	False	0.000	1,538	6.28	0.016	
42	P-5	244	J-4	J-5	8.0	PVC	120.0	False	0.000	237	1.51	0.001	
47	P-8	92	J-7	J-2	8.0	PVC	120.0	False	0.000	57	0.37	0.000	
50	P-10	91	J-5	J-8	8.0	PVC	120.0	False	0.000	40	0.26	0.000	
52	P-11	85	J-8	J-9	8.0	PVC	120.0	False	0.000	40	0.26	0.000	
58	P-15	166	J-5	J-11	8.0	PVC	120.0	False	0.000	197	1.26	0.001	
59	P-16	247	J-11	J-6	8.0	PVC	120.0	False	0.000	117	0.75	0.000	
74	P-26	249	J-13	J-16	8.0	PVC	120.0	False	0.000	275	1.76	0.002	
85	P-34	256	J-17	J-19	8.0	PVC	120.0	False	0.000	90	0.57	0.000	
91	P-35	49	J-9	J-20	8.0	PVC	120.0	False	0.000	40	0.26	0.000	
92	P-36	252	J-20	J-15	8.0	PVC	120.0	False	0.000	40	0.26	0.000	
93	P-37	25	H-1	J-20	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
95	P-38	131	J-15	J-21	8.0	PVC	120.0	False	0.000	72	0.46	0.000	
96	P-39	102	J-21	J-19	8.0	PVC	120.0	False	0.000	72	0.46	0.000	
97	P-40	24	H-3	J-21	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
99	P-41	159	J-11	J-22	8.0	PVC	120.0	False	0.000	80	0.51	0.000	
101	P-43	31	H-2	J-22	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
103	P-44	366	J-22	J-23	8.0	PVC	120.0	False	0.000	80	0.51	0.000	
105	P-46	28	H-4	J-23	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
108	P-47	161	J-6	J-24	8.0	PVC	120.0	False	0.000	60	0.38	0.000	
110	P-49	24	H-5	J-24	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
113	P-50	361	J-24	J-25	8.0	PVC	120.0	False	0.000	60	0.38	0.000	
115	P-52	26	H-6	J-25	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
121	P-55	469	J-25	J-26	8.0	PVC	120.0	False	0.000	80	0.51	0.000	
122	P-56	237	J-26	J-12	8.0	PVC	120.0	False	0.000	80	0.51	0.000	
123	P-57	17	H-8	J-26	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
126	P-58	439	J-25	J-27	8.0	PVC	120.0	False	0.000	60	0.38	0.000	
127	P-59	272	J-27	J-7	8.0	PVC	120.0	False	0.000	60	0.38	0.000	
128	P-60	15	H-9	J-27	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
131	P-61	94	J-2	J-28	8.0	PVC	120.0	False	0.000	57	0.37	0.000	
132	P-62	98	J-28	J-3	8.0	PVC	120.0	False	0.000	57	0.37	0.000	
133	P-63	32	H-10	J-28	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
136	P-64	185	J-12	J-29	8.0	PVC	120.0	False	0.000	-3	0.02	0.000	
137	P-65	65	J-29	J-7	8.0	PVC	120.0	False	0.000	-3	0.02	0.000	
138	P-66	28	H-11	J-29	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
141	P-67	319	J-19	J-30	8.0	PVC	120.0	False	0.000	162	1.03	0.001	
142	P-68	235	J-30	J-10	8.0	PVC	120.0	False	0.000	162	1.03	0.001	
143	P-69	17	H-12	J-30	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
146	P-70	117	J-10	J-31	8.0	PVC	120.0	False	0.000	-82	0.52	0.000	
147	P-71	131	J-31	J-12	8.0	PVC	120.0	False	0.000	-82	0.52	0.000	
148	P-72	22	H-13	J-31	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
151	P-73	332	J-14	J-32	8.0	PVC	120.0	False	0.000	32	0.20	0.000	
152	P-74	160	J-32	J-15	8.0	PVC	120.0	False	0.000	32	0.20	0.000	
153	P-75	31	H-14	J-32	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
156	P-76	201	J-18	J-33	8.0	PVC	120.0	False	0.000	89	0.57	0.000	
157	P-77	33	J-33	J-14	8.0	PVC	120.0	False	0.000	89	0.57	0.000	
158	P-78	14	H-15	J-33	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
161	P-79	40	J-17	J-34	8.0	PVC	120.0	False	0.000	-81	0.52	0.000	
162	P-80	201	J-34	J-18	8.0	PVC	120.0	False	0.000	-81	0.52	0.000	
163	P-81	28	H-16	J-34	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
167	P-83	42	J-35	J-18	8.0	PVC	120.0	False	0.000	170	1.08	0.001	
168	P-84	33	H-17	J-35	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
171	P-85	233	J-16	J-36	8.0	PVC	120.0	False	0.000	9	0.06	0.000	
172	P-86	320	J-36	J-17	8.0	PVC	120.0	False	0.000	9	0.06	0.000	
173	P-87	20	H-18	J-36	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
176	P-88	63	J-16	J-37	8.0	PVC	120.0	False	0.000	266	1.70	0.002	
177	P-89	192	J-37	J-10	8.0	PVC	120.0	False	0.000	266	1.70	0.002	
178	P-90	34	H-19	J-37	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
181	P-91	236	J-13	J-38	8.0	PVC	120.0	False	0.000	170	1.08	0.001	
182	P-92	275	J-38	J-35	8.0	PVC	120.0	False	0.000	170	1.08	0.001	
183	P-93	18	H-20	J-38	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
186	P-94	170	J-1	J-39	8.0	PVC	120.0	False	0.000	979	6.25	0.020	
187	P-95	43	J-39	J-13	8.0	PVC	120.0	False	0.000	979	6.25	0.020	
188	P-96	39	H-21	J-39	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
202	P-98	1,009	J-40	J-41	24.0	PVC	130.0	False	0.000	6,537	4.64	0.003	
213	P-103	359	R-3	J-46	24.0	PVC	130.0	False	0.000	-6,537	4.64	0.003	
214	P-104	22	J-46	J-42	24.0	PVC	130.0	False	0.000	-6,537	4.64	0.003	
215	P-105	82	J-45	J-46	8.0	PVC	120.0	False	0.000	0	0.00	0.000	
217	P-106	18	J-41	J-47	24.0	PVC	130.0	False	0.000	6,537	4.64	0.003	
218	P-107	591	J-47	J-42	24.0	PVC	130.0	False	0.000	6,537	4.64	0.003	
237	P-117	2,179	J-54	J-55	16.0	PVC	130.0	False	0.000	1,301	2.08	0.001	
239	P-118	237	R-5	J-55	16.0	PVC	130.0	False	0.000	-3,395	5.42	0.006	
241	P-119	1,171	J-1	J-56	24.0	PVC	130.0	False	0.000	8,020	5.69	0.004	
242	P-120	565	J-56	J-40	24.0	PVC	130.0	False	0.000	6,537	4.64	0.003	
246	P-122	336	J-57	J-58	12.0	PVC	120.0	False	0.000	1,483	4.21	0.006	
248	P-123	107	J-58	J-59	8.0	PVC	120.0	False	0.000	-797	5.09	0.014	
250	P-124	184	J-58	J-60	8.0	PVC	120.0	False	0.000	715	4.66	0.011	
252	P-125	346	J-58	J-61	12.0	PVC	120.0	False	0.000	1,566	4.44	0.007	
256	P-128	353	J-62	J-54	10.0	PVC	120.0	False	0.000	1,301	5.31	0.012	
258	P-129	110	J-62	J-63	8.0	PVC	120.0	False	0.000	0	0.00	0.000	
263	P-131	723	J-4	J-64	10.0	PVC	120.0	False	0.000	1,301	5.31	0.012	
264	P-132	291	J-64	J-62	10.0	PVC	120.0	False	0.000	1,301	5.31	0.012	
265	P-133	113	J-64	J-65	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
267	P-134	35	J-56	J-67	12.0	PVC	120.0	False	0.000	1,483	4.21	0.006	
270	P-136	11	J-87	J-68	12.0	PVC	120.0	False	0.000	0	0.00	0.000	
302	P-153	78	J-82	J-59	8.0	PVC	120.0	False	0.000	797	5.09	0.014	
304	P-154	73	J-81	J-83	8.0	PVC	120.0	False	0.000	126	0.80	0.000	
305	P-155	211	J-83	J-82	8.0	PVC	120.0	False	0.000	448	2.86	0.005	
308	P-157	254	J-10	J-84	8.0	PVC	120.0	False	0.000	453	2.89	0.005	
318	P-163	252	J-13	J-88	8.0	PVC	120.0	False	0.000	535	3.41	0.007	
322	P-166	251	J-84	J-89	8.0	PVC	120.0	False	0.000	444	2.83	0.005	
326	P-169	136	J-80	J-82	8.0	PVC	120.0	False	0.000	349	2.23	0.003	
343	P-181	136	J-88	J-95	8.0	PVC	120.0	False	0.000	340	2.17	0.003	
344	P-182	117	J-95	J-91	8.0	PVC	120.0	False	0.000	340	2.17	0.003	
346	P-183	20	J-95	H-22	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
348	P-184	134	J-91	J-96	8.0	PVC	120.0	False	0.000	275	1.75	0.002	
349	P-185	112	J-96	J-93	8.0	PVC	120.0	False	0.000	275	1.75	0.002	
351	P-186	23	J-96	H-23	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
353	P-187	138	J-93	J-97	8.0	PVC	120.0	False	0.000	221	1.41	0.001	
354	P-188	118	J-97	J-80	8.0	PVC	120.0	False	0.000	221	1.41	0.001	



358	P-190	21	J-97	H-24	6.0	PVC	120.0	False	0.000	0	0.00	0.000
363	P-192	235	J-84	J-100	8.0	PVC	120.0	False	0.000	-195	1.24	0.001
364	P-193	271	J-100	J-88	8.0	PVC	120.0	False	0.000	-195	1.24	0.001
366	P-194	14	J-100	H-26	6.0	PVC	120.0	False	0.000	0	0.00	0.000
368	P-195	276	J-91	J-101	8.0	PVC	120.0	False	0.000	65	0.41	0.000
369	P-196	230	J-101	J-92	8.0	PVC	120.0	False	0.000	65	0.41	0.000
371	P-197	14	J-101	H-27	6.0	PVC	120.0	False	0.000	0	0.00	0.000
373	P-198	279	J-93	J-102	8.0	PVC	120.0	False	0.000	54	0.35	0.000
374	P-199	231	J-102	J-94	8.0	PVC	120.0	False	0.000	54	0.35	0.000
376	P-200	16	J-102	H-28	6.0	PVC	120.0	False	0.000	0	0.00	0.000
378	P-201	277	J-80	J-103	8.0	PVC	120.0	False	0.000	126	0.80	0.000
379	P-202	178	J-103	J-81	8.0	PVC	120.0	False	0.000	126	0.80	0.000
381	P-203	18	J-103	H-29	6.0	PVC	120.0	False	0.000	0	0.00	0.000
383	P-204	134	J-84	J-104	8.0	PVC	120.0	False	0.000	203	1.30	0.001
384	P-205	113	J-104	J-92	8.0	PVC	120.0	False	0.000	203	1.30	0.001
386	P-206	35	J-104	H-30	6.0	PVC	120.0	False	0.000	0	0.00	0.000
388	P-207	137	J-92	J-105	8.0	PVC	120.0	False	0.000	268	1.71	0.002
389	P-208	111	J-105	J-94	8.0	PVC	120.0	False	0.000	268	1.71	0.002
393	P-210	36	J-105	H-31	6.0	PVC	120.0	False	0.000	0	0.00	0.000
395	P-211	138	J-94	J-107	8.0	PVC	120.0	False	0.000	322	2.06	0.003
396	P-212	63	J-107	J-83	8.0	PVC	120.0	False	0.000	322	2.06	0.003
398	P-213	34	J-107	H-32	6.0	PVC	120.0	False	0.000	0	0.00	0.000
400	P-214	223	J-89	J-108	8.0	PVC	120.0	False	0.000	239	1.53	0.001
401	P-215	229	J-108	J-90	8.0	PVC	120.0	False	0.000	239	1.53	0.001
403	P-216	22	J-108	H-33	6.0	PVC	120.0	False	0.000	0	0.00	0.000
405	P-217	115	J-89	J-109	8.0	PVC	120.0	False	0.000	205	1.31	0.001
406	P-218	239	J-109	J-85	8.0	PVC	120.0	False	0.000	205	1.31	0.001
408	P-219	34	J-109	H-34	6.0	PVC	120.0	False	0.000	0	0.00	0.000
410	P-220	232	J-86	J-110	8.0	PVC	120.0	False	0.000	110	0.70	0.000
411	P-221	270	J-110	J-90	8.0	PVC	120.0	False	0.000	110	0.70	0.000
413	P-222	22	J-110	H-35	6.0	PVC	120.0	False	0.000	0	0.00	0.000
415	P-223	137	J-85	J-111	8.0	PVC	120.0	False	0.000	110	0.70	0.000
416	P-224	145	J-111	J-86	8.0	PVC	120.0	False	0.000	110	0.70	0.000
418	P-225	25	J-111	H-36	6.0	PVC	120.0	False	0.000	0	0.00	0.000
420	P-226	323	J-67	J-112	12.0	PVC	120.0	False	0.000	1,483	4.21	0.006
431	P-232	111	J-116	J-117	8.0	PVC	120.0	False	0.000	159	1.02	0.001
433	P-233	244	J-112	J-118	12.0	PVC	120.0	False	0.000	1,483	4.21	0.006
434	P-234	138	J-118	J-57	12.0	PVC	120.0	False	0.000	1,483	4.21	0.006
436	P-236	92	J-113	J-117	8.0	PVC	120.0	False	0.000	-159	1.02	0.001
438	P-237	42	J-113	J-119	8.0	PVC	120.0	False	0.000	75	0.48	0.000
439	P-238	207	J-119	J-114	8.0	PVC	120.0	False	0.000	75	0.48	0.000
441	P-239	46	J-119	H-37	6.0	PVC	120.0	False	0.000	0	0.00	0.000
443	P-240	83	J-114	J-120	8.0	PVC	120.0	False	0.000	75	0.48	0.000
444	P-241	190	J-120	J-115	8.0	PVC	120.0	False	0.000	75	0.48	0.000
446	P-242	14	J-120	H-38	6.0	PVC	120.0	False	0.000	0	0.00	0.000
448	P-243	223	J-115	J-121	8.0	PVC	120.0	False	0.000	-158	1.01	0.001
449	P-244	115	J-121	J-116	8.0	PVC	120.0	False	0.000	-158	1.01	0.001
451	P-245	29	J-121	H-39	6.0	PVC	120.0	False	0.000	0	0.00	0.000
463	P-252	121	J-122	J-125	8.0	PVC	120.0	False	0.000	183	1.16	0.001
464	P-253	264	J-125	J-124	8.0	PVC	120.0	False	0.000	183	1.16	0.001
467	P-255	74	J-126	J-123	8.0	PVC	120.0	False	0.000	-346	2.21	0.003
468	P-256	31	J-60	J-116	6.0	PVC	130.0	False	0.000	318	3.60	0.009
470	P-257	30	J-124	J-127	8.0	PVC	120.0	False	0.000	183	1.16	0.001
474	P-259	65	J-127	H-41	6.0	PVC	120.0	False	0.000	0	0.00	0.000
476	P-260	25	J-125	H-42	6.0	PVC	120.0	False	0.000	0	0.00	0.000
478	P-261	146	J-115	J-128	8.0	PVC	120.0	False	0.000	234	1.49	0.001
479	P-262	284	J-128	J-122	8.0	PVC	120.0	False	0.000	234	1.49	0.001
481	P-263	34	J-128	H-43	6.0	PVC	120.0	False	0.000	0	0.00	0.000
483	P-264	129	J-123	J-129	8.0	PVC	120.0	False	0.000	-346	2.21	0.003
484	P-265	99	J-129	J-60	8.0	PVC	120.0	False	0.000	-346	2.21	0.003
486	P-266	35	J-128	H-44	6.0	PVC	100.0	False	0.000	0	0.00	0.000
490	P-268	165	J-131	J-126	8.0	PVC	120.0	False	0.000	-346	2.21	0.003
492	P-269	36	J-131	H-45	6.0	PVC	120.0	False	0.000	0	0.00	0.000
494	P-270	227	J-127	J-132	8.0	PVC	120.0	False	0.000	183	1.16	0.001
495	P-271	111	J-132	J-131	8.0	PVC	120.0	False	0.000	-346	2.21	0.003
497	P-272	153	J-132	J-133	8.0	PVC	120.0	False	0.000	0	0.00	0.000
499	P-273	110	J-133	J-134	8.0	PVC	120.0	False	0.000	0	0.00	0.000
501	P-274	19	J-134	H-46	6.0	PVC	120.0	False	0.000	0	0.00	0.000
503	P-275	402	J-61	J-135	12.0	PVC	120.0	False	0.000	1,566	4.44	0.007
504	P-276	534	J-135	J-55	12.0	PVC	120.0	False	0.000	2,094	5.94	0.012
505	P-277	189	J-135	J-132	8.0	PVC	120.0	False	0.000	-529	3.37	0.007

G:\TheRED\ID\EN-128-320 St Rose &amp; Amigo\Design\WNA\2017-06-14 WNA\Analysis\2017-06-28 WNA-BLACKSTONE RANCH - PHASE II.wtg

**Scenario: Max Day**  
**Current Time Step: 0.000 h**  
**FlexTable: Junction Table**

ID	Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
31	J-1	4,642.00	<None>	<Collection: 0 items>	0	4,865.98	97
34	J-2	4,633.00	<None>	<Collection: 0 items>	0	4,860.75	99
36	J-3	4,633.50	<None>	<Collection: 1 item>	57	4,860.73	98
39	J-4	4,639.50	<None>	<Collection: 0 items>	0	4,861.53	96
41	J-5	4,640.00	<None>	<Collection: 0 items>	0	4,861.17	96
43	J-6	4,640.00	<None>	<Collection: 1 item>	57	4,860.90	96
45	J-7	4,633.00	<None>	<Collection: 0 items>	0	4,860.76	99
49	J-8	4,640.00	<None>	<Collection: 0 items>	0	4,861.17	96
51	J-9	4,640.00	<None>	<Collection: 0 items>	0	4,861.16	96
53	J-10	4,636.10	<None>	<Collection: 1 item>	57	4,860.71	97
57	J-11	4,640.00	<None>	<Collection: 0 items>	0	4,861.00	96
60	J-12	4,634.55	<None>	<Collection: 0 items>	0	4,860.76	98
64	J-13	4,640.25	<None>	<Collection: 0 items>	0	4,861.66	96
67	J-14	4,639.00	<None>	<Collection: 1 item>	57	4,861.16	96
69	J-15	4,640.00	<None>	<Collection: 1 item>	0	4,861.15	96
73	J-16	4,638.20	<None>	<Collection: 1 item>	0	4,861.17	96
76	J-17	4,639.50	<None>	<Collection: 0 items>	0	4,861.17	96
78	J-18	4,639.37	<None>	<Collection: 0 items>	0	4,861.22	96
82	J-19	4,638.84	<None>	<Collection: 0 items>	0	4,861.11	96
90	J-20	4,640.00	<None>	<Collection: 0 items>	0	4,861.16	96
94	J-21	4,639.35	<None>	<Collection: 0 items>	0	4,861.12	96
98	J-22	4,639.30	<None>	<Collection: 0 items>	0	4,860.97	96
102	J-23	4,637.68	<None>	<Collection: 0 items>	0	4,860.90	97
107	J-24	4,639.08	<None>	<Collection: 0 items>	0	4,860.88	96
112	J-25	4,637.04	<None>	<Collection: 0 items>	0	4,860.84	97
120	J-26	4,635.60	<None>	<Collection: 0 items>	0	4,860.80	97
125	J-27	4,634.55	<None>	<Collection: 0 items>	0	4,860.79	98
130	J-28	4,633.25	<None>	<Collection: 0 items>	0	4,860.74	98
135	J-29	4,633.39	<None>	<Collection: 1 item>	0	4,860.76	98
140	J-30	4,637.26	<None>	<Collection: 0 items>	0	4,860.88	97
145	J-31	4,635.37	<None>	<Collection: 0 items>	0	4,860.73	98
150	J-32	4,639.68	<None>	<Collection: 0 items>	0	4,861.15	96
155	J-33	4,639.05	<None>	<Collection: 0 items>	0	4,861.17	96
160	J-34	4,639.48	<None>	<Collection: 0 items>	0	4,861.18	96
165	J-35	4,639.44	<None>	<Collection: 0 items>	0	4,861.25	96
170	J-36	4,638.75	<None>	<Collection: 0 items>	0	4,861.17	96
175	J-37	4,637.66	<None>	<Collection: 0 items>	0	4,861.06	97
180	J-38	4,639.88	<None>	<Collection: 0 items>	0	4,861.47	96
185	J-39	4,640.60	<None>	<Collection: 0 items>	0	4,862.52	96
199	J-40	4,626.00	<None>	<Collection: 0 items>	0	4,859.61	101
201	J-41	4,622.00	<None>	<Collection: 0 items>	0	4,856.78	102
203	J-42	4,628.00	<None>	<Collection: 1 item>	0	4,855.07	98
211	J-45	4,628.28	<None>	<Collection: 0 items>	0	4,855.01	98
212	J-46	4,628.28	<None>	<Collection: 0 items>	0	4,855.01	98
216	J-47	4,622.18	<None>	<Collection: 0 items>	0	4,856.73	101
234	J-54	4,639.00	<None>	<Collection: 0 items>	0	4,845.64	89
236	J-55	4,632.00	<None>	<Collection: 0 items>	0	4,843.42	91
240	J-56	4,631.21	<None>	<Collection: 0 items>	0	4,861.19	100
243	J-57	4,628.00	<None>	<Collection: 0 items>	0	4,856.68	99
245	J-58	4,634.50	<None>	<Collection: 0 items>	0	4,854.63	95
247	J-59	4,634.50	<None>	<Collection: 0 items>	0	4,856.11	96
249	J-60	4,633.50	<None>	<Collection: 1 item>	51	4,852.53	95
251	J-61	4,632.00	<None>	<Collection: 0 items>	0	4,852.30	95
254	J-62	4,639.13	<None>	<Collection: 0 items>	0	4,849.75	91
257	J-63	4,639.13	<None>	<Collection: 1 item>	0	4,849.75	91
260	J-65	4,639.13	<None>	<Collection: 1 item>	0	4,853.13	93
262	J-64	4,639.24	<None>	<Collection: 0 items>	0	4,853.13	93
266	J-67	4,631.06	<None>	<Collection: 0 items>	0	4,860.98	99

269	J-68	4,631.06	<None>	<Collection: 0 items>	0	4,860.98	99
296	J-80	4,631.00	<None>	<Collection: 1 item>	95	4,858.45	98
298	J-81	4,630.00	<None>	<Collection: 0 items>	0	4,858.24	99
300	J-82	4,630.00	<None>	<Collection: 0 items>	0	4,857.20	98
303	J-83	4,630.00	<None>	<Collection: 0 items>	0	4,858.21	99
307	J-84	4,634.47	<None>	<Collection: 0 items>	0	4,859.47	97
310	J-85	4,635.00	<None>	<Collection: 1 item>	95	4,857.89	96
312	J-86	4,635.00	<None>	<Collection: 0 items>	0	4,857.79	96
317	J-88	4,637.94	<None>	<Collection: 0 items>	0	4,859.99	96
321	J-89	4,634.71	<None>	<Collection: 0 items>	0	4,858.29	97
324	J-90	4,631.22	<None>	<Collection: 0 items>	0	4,857.61	98
328	J-91	4,635.61	<None>	<Collection: 0 items>	0	4,859.26	97
331	J-92	4,632.88	<None>	<Collection: 0 items>	0	4,859.19	98
335	J-93	4,633.35	<None>	<Collection: 0 items>	0	4,858.78	98
338	J-94	4,631.29	<None>	<Collection: 0 items>	0	4,858.73	98
342	J-95	4,636.69	<None>	<Collection: 0 items>	0	4,859.59	96
347	J-96	4,634.38	<None>	<Collection: 0 items>	0	4,859.00	97
352	J-97	4,632.08	<None>	<Collection: 0 items>	0	4,858.60	98
362	J-100	4,636.08	<None>	<Collection: 0 items>	0	4,859.71	97
367	J-101	4,634.12	<None>	<Collection: 0 items>	0	4,859.22	97
372	J-102	4,632.22	<None>	<Collection: 0 items>	0	4,858.75	98
377	J-103	4,630.39	<None>	<Collection: 0 items>	0	4,858.32	99
382	J-104	4,633.61	<None>	<Collection: 0 items>	0	4,859.32	98
387	J-105	4,632.00	<None>	<Collection: 0 items>	0	4,858.94	98
394	J-107	4,630.40	<None>	<Collection: 0 items>	0	4,858.37	99
399	J-108	4,632.99	<None>	<Collection: 0 items>	0	4,857.95	97
404	J-109	4,634.83	<None>	<Collection: 0 items>	0	4,858.16	97
409	J-110	4,633.08	<None>	<Collection: 0 items>	0	4,857.70	97
414	J-111	4,635.00	<None>	<Collection: 0 items>	0	4,857.84	96
419	J-112	4,629.66	<None>	<Collection: 0 items>	0	4,859.01	99
422	J-113	4,635.00	<None>	<Collection: 1 item>	84	4,852.11	94
424	J-114	4,635.50	<None>	<Collection: 0 items>	0	4,852.07	94
426	J-115	4,633.50	<None>	<Collection: 0 items>	0	4,852.02	95
428	J-116	4,633.50	<None>	<Collection: 0 items>	0	4,852.25	95
430	J-117	4,635.00	<None>	<Collection: 0 items>	0	4,852.17	94
432	J-118	4,628.61	<None>	<Collection: 0 items>	0	4,857.52	99
437	J-119	4,635.50	<None>	<Collection: 0 items>	0	4,852.10	94
442	J-120	4,635.00	<None>	<Collection: 0 items>	0	4,852.05	94
447	J-121	4,635.00	<None>	<Collection: 0 items>	0	4,852.17	94
452	J-122	4,630.75	<None>	<Collection: 1 item>	51	4,851.40	95
454	J-123	4,632.00	<None>	<Collection: 0 items>	0	4,851.86	95
459	J-124	4,630.10	<None>	<Collection: 0 items>	0	4,851.05	96
462	J-125	4,630.75	<None>	<Collection: 0 items>	0	4,851.29	95
465	J-126	4,632.00	<None>	<Collection: 0 items>	0	4,851.64	95
469	J-127	4,630.30	<None>	<Collection: 0 items>	0	4,851.02	95
477	J-128	4,632.56	<None>	<Collection: 0 items>	0	4,851.81	95
482	J-129	4,632.85	<None>	<Collection: 0 items>	0	4,852.24	95
488	J-131	4,631.44	<None>	<Collection: 0 items>	0	4,851.15	95
493	J-132	4,631.07	<None>	<Collection: 0 items>	0	4,850.82	95
496	J-133	4,632.10	<None>	<Collection: 0 items>	0	4,850.82	95
498	J-134	4,632.60	<None>	<Collection: 0 items>	0	4,850.82	94
502	J-135	4,631.60	<None>	<Collection: 0 items>	0	4,849.59	94

G:\TheRED\td\EN-128-320 St Rose & Amigo\Design\WNA\2017-06-14 WNA\Analysis\2017-06-28 WNA-BLACKSTONE RANCH - PHASE II.wtg

**Scenario: Max Day**  
**Current Time Step: 0.000 h**  
**FlexTable: Reservoir Table**

---

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
30	R-1	4,874.00	4880	9,000	4,874.00
38	R-2	4,874.00	4880	1,538	4,874.00
209	R-3	4,854.00	4880	-6,537	4,854.00
238	R-5	4,842.00	4880	-3,395	4,842.00

G:\TheREDIt\EN-128-320 St Rose & Amigo\Design\WNA\2017-06-14 WNA\Analysis\2017-06-28 WNA-BLACKSTONE RANCH - PHASE II.wtg

Scenario: Peak Hour  
Current Time Step: 0.000 h  
FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Head Loss
32	P-1	1,582	R-1	J-1	24.0	PVC	130.0	False	0.000	7,458	5.29	0.004	
40	P-4	787	R-2	J-4	10.0	PVC	120.0	False	0.000	1,396	5.70	0.013	
42	P-5	244	J-4	J-5	8.0	PVC	120.0	False	0.000	285	1.82	0.002	
47	P-8	92	J-7	J-2	8.0	PVC	120.0	False	0.000	89	0.57	0.000	
50	P-10	91	J-5	J-8	8.0	PVC	120.0	False	0.000	53	0.34	0.000	
52	P-11	85	J-8	J-9	8.0	PVC	120.0	False	0.000	53	0.34	0.000	
56	P-15	166	J-5	J-11	8.0	PVC	120.0	False	0.000	231	1.48	0.001	
59	P-16	247	J-11	J-6	8.0	PVC	120.0	False	0.000	146	0.93	0.001	
74	P-26	249	J-13	J-16	8.0	PVC	120.0	False	0.000	302	1.93	0.002	
85	P-34	256	J-17	J-19	8.0	PVC	120.0	False	0.000	99	0.63	0.000	
91	P-35	49	J-9	J-20	8.0	PVC	120.0	False	0.000	53	0.34	0.000	
92	P-36	252	J-20	J-15	8.0	PVC	120.0	False	0.000	72	0.46	0.000	
93	P-37	25	H-1	J-20	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
95	P-38	131	J-15	J-21	8.0	PVC	120.0	False	0.000	72	0.46	0.000	
96	P-39	102	J-21	J-19	8.0	PVC	120.0	False	0.000	72	0.46	0.000	
97	P-40	24	H-3	J-21	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
99	P-41	159	J-11	J-22	8.0	PVC	120.0	False	0.000	85	0.54	0.000	
101	P-43	31	H-2	J-22	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
103	P-44	368	J-22	J-23	8.0	PVC	120.0	False	0.000	85	0.54	0.000	
105	P-46	28	H-4	J-23	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
108	P-47	161	J-6	J-24	6.0	PVC	120.0	False	0.000	57	0.37	0.000	
110	P-49	24	H-5	J-24	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
113	P-50	361	J-24	J-25	6.0	PVC	120.0	False	0.000	57	0.37	0.000	
115	P-52	26	H-6	J-25	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
121	P-55	469	J-23	J-26	8.0	PVC	120.0	False	0.000	85	0.54	0.000	
122	P-56	237	J-26	J-12	8.0	PVC	120.0	False	0.000	85	0.54	0.000	
123	P-57	17	H-8	J-26	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
126	P-58	439	J-25	J-27	8.0	PVC	120.0	False	0.000	57	0.37	0.000	
127	P-59	272	J-27	J-7	8.0	PVC	120.0	False	0.000	57	0.37	0.000	
128	P-60	15	H-9	J-27	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
131	P-61	94	J-2	J-28	8.0	PVC	120.0	False	0.000	89	0.57	0.000	
132	P-62	98	J-28	J-3	8.0	PVC	120.0	False	0.000	89	0.57	0.000	
133	P-63	32	H-10	J-28	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
136	P-64	185	J-12	J-29	8.0	PVC	120.0	False	0.000	32	0.20	0.000	
137	P-65	65	J-29	J-7	8.0	PVC	120.0	False	0.000	32	0.20	0.000	
138	P-66	28	H-11	J-29	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
141	P-67	319	J-19	J-30	8.0	PVC	120.0	False	0.000	171	1.09	0.001	
142	P-68	235	J-30	J-10	8.0	PVC	120.0	False	0.000	171	1.09	0.001	
143	P-69	17	H-12	J-30	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
146	P-70	117	J-10	J-31	8.0	PVC	120.0	False	0.000	-53	0.34	0.000	
147	P-71	131	J-31	J-12	8.0	PVC	120.0	False	0.000	-53	0.34	0.000	
148	P-72	22	H-13	J-31	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
151	P-73	332	J-14	J-32	8.0	PVC	120.0	False	0.000	18	0.12	0.000	
152	P-74	160	J-32	J-15	8.0	PVC	120.0	False	0.000	18	0.12	0.000	
153	P-75	31	H-14	J-32	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
156	P-76	201	J-18	J-33	8.0	PVC	120.0	False	0.000	107	0.69	0.000	
157	P-77	33	J-33	J-14	8.0	PVC	120.0	False	0.000	107	0.69	0.000	
158	P-78	14	H-15	J-33	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
161	P-79	40	J-17	J-34	8.0	PVC	120.0	False	0.000	-81	0.52	0.000	
162	P-80	201	J-34	J-18	8.0	PVC	120.0	False	0.000	-81	0.52	0.000	
163	P-81	28	H-16	J-34	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
167	P-83	42	J-35	J-18	8.0	PVC	120.0	False	0.000	189	1.20	0.001	
168	P-84	33	H-17	J-35	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
171	P-85	233	J-16	J-36	8.0	PVC	120.0	False	0.000	18	0.11	0.000	
172	P-86	320	J-36	J-17	8.0	PVC	120.0	False	0.000	18	0.11	0.000	
173	P-87	20	H-18	J-36	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
176	P-88	63	J-16	J-37	8.0	PVC	120.0	False	0.000	284	1.82	0.002	
177	P-89	192	J-37	J-10	8.0	PVC	120.0	False	0.000	284	1.82	0.002	
178	P-90	34	H-19	J-37	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
181	P-91	236	J-13	J-38	8.0	PVC	120.0	False	0.000	189	1.20	0.001	
182	P-92	275	J-38	J-35	8.0	PVC	120.0	False	0.000	189	1.20	0.001	
183	P-93	18	H-20	J-38	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
186	P-94	170	J-1	J-39	8.0	PVC	120.0	False	0.000	1,022	6.53	0.022	
187	P-95	43	J-39	J-13	8.0	PVC	120.0	False	0.000	1,022	6.53	0.022	
188	P-96	39	H-21	J-39	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
202	P-98	1,009	J-40	J-41	24.0	PVC	130.0	False	0.000	4,841	3.43	0.002	
213	P-103	359	R-3	J-46	24.0	PVC	130.0	False	0.000	-4,841	3.43	0.002	
214	P-104	22	J-46	J-42	24.0	PVC	130.0	False	0.000	-4,841	3.43	0.002	
215	P-105	62	J-45	J-46	8.0	PVC	120.0	False	0.000	0	0.00	0.000	
217	P-106	18	J-41	J-47	24.0	PVC	130.0	False	0.000	4,841	3.43	0.002	
218	P-107	591	J-47	J-42	24.0	PVC	130.0	False	0.000	4,841	3.43	0.002	
237	P-117	2,179	J-54	J-55	16.0	PVC	130.0	False	0.000	1,111	1.77	0.001	
239	P-118	237	R-5	J-55	16.0	PVC	130.0	False	0.000	-2,891	4.61	0.004	
241	P-119	1,171	J-1	J-56	24.0	PVC	130.0	False	0.000	4,925	3.49	0.002	
242	P-120	565	J-56	J-40	24.0	PVC	130.0	False	0.000	1,510	4.28	0.006	
246	P-122	336	J-57	J-58	12.0	PVC	120.0	False	0.000	-427	2.73	0.004	
248	P-123	107	J-58	J-59	8.0	PVC	120.0	False	0.000	604	3.86	0.008	
250	P-124	184	J-58	J-60	12.0	PVC	120.0	False	0.000	1,333	3.78	0.005	
252	P-125	346	J-58	J-61	10.0	PVC	120.0	False	0.000	1,111	4.54	0.009	
256	P-128	353	J-62	J-54	8.0	PVC	120.0	False	0.000	0	0.00	0.000	
258	P-129	110	J-62	J-63	8.0	PVC	120.0	False	0.000	1,111	4.54	0.009	
263	P-131	723	J-4	J-64	10.0	PVC	120.0	False	0.000	1,111	4.54	0.009	
264	P-132	291	J-64	J-62	10.0	PVC	120.0	False	0.000	0	0.00	0.000	
265	P-133	113	J-64	J-65	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
267	P-134	35	J-56	J-67	12.0	PVC	120.0	False	0.000	1,510	4.28	0.006	
270	P-136	11	J-67	J-68	12.0	PVC	120.0	False	0.000	0	0.00	0.000	
302	P-153	78	J-82	J-59	8.0	PVC	120.0	False	0.000	659	4.21	0.010	
304	P-154	73	J-81	J-83	8.0	PVC	120.0	False	0.000	85	0.54	0.000	
305	P-155	211	J-83	J-82	8.0	PVC	120.0	False	0.000	382	2.44	0.004	
308	P-157	254	J-10	J-84	8.0	PVC	120.0	False	0.000	419	2.68	0.004	
318	P-163	252	J-13	J-88	8.0	PVC	120.0	False	0.000	532	3.39	0.007	
322	P-166	251	J-84	J-89	8.0	PVC	120.0	False	0.000	423	2.70	0.004	
326	P-169	136	J-90	J-82	8.0	PVC	120.0	False	0.000	277	1.77	0.002	
343	P-181	136	J-88	J-95	8.0	PVC	120.0	False	0.000	335	2.14	0.003	
344	P-182	117	J-95	J-91	8.0	PVC	120.0	False	0.000	335	2.14	0.003	
346	P-183	20	H-22	J-95	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
348	P-184	134	J-91	J-96	8.0	PVC	120.0	False	0.000	271	1.73	0.002	
349	P-185	112	J-96	J-93	8.0	PVC	120.0	False	0.000	271	1.73	0.002	
351	P-186	23	J-96	H-23	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
353	P-187	138	J-93	J-97	8.0	PVC	120.0	False	0.000	231	1.48	0.001	
354	P-188	118	J-97	J-80	8.0	PVC	120.0	False	0.000	231	1.48	0.001	



358	P-190	21	J-97	H-24	6.0	PVC	120.0	False	0.000	0	0.00	0.000
363	P-192	235	J-84	J-100	8.0	PVC	120.0	False	0.000	-196	1.25	0.001
364	P-193	271	J-100	J-88	8.0	PVC	120.0	False	0.000	-196	1.25	0.001
366	P-194	14	J-100	H-26	6.0	PVC	120.0	False	0.000	0	0.00	0.000
368	P-195	276	J-91	J-101	8.0	PVC	120.0	False	0.000	64	0.41	0.000
369	P-196	230	J-101	J-92	8.0	PVC	120.0	False	0.000	64	0.41	0.000
371	P-197	14	J-101	H-27	6.0	PVC	120.0	False	0.000	0	0.00	0.000
373	P-198	279	J-93	J-102	8.0	PVC	120.0	False	0.000	40	0.25	0.000
374	P-199	231	J-102	J-94	8.0	PVC	120.0	False	0.000	40	0.25	0.000
376	P-200	16	J-102	H-28	6.0	PVC	120.0	False	0.000	0	0.00	0.000
378	P-201	277	J-80	J-103	8.0	PVC	120.0	False	0.000	85	0.54	0.000
379	P-202	178	J-103	J-81	8.0	PVC	120.0	False	0.000	85	0.54	0.000
381	P-203	18	J-103	H-29	6.0	PVC	120.0	False	0.000	0	0.00	0.000
383	P-204	134	J-84	J-104	8.0	PVC	120.0	False	0.000	193	1.23	0.001
384	P-205	113	J-104	J-92	8.0	PVC	120.0	False	0.000	193	1.23	0.001
386	P-206	35	J-104	H-30	6.0	PVC	120.0	False	0.000	0	0.00	0.000
388	P-207	137	J-92	J-105	8.0	PVC	120.0	False	0.000	257	1.64	0.002
389	P-208	111	J-105	J-94	8.0	PVC	120.0	False	0.000	257	1.64	0.002
393	P-210	36	J-105	H-31	6.0	PVC	120.0	False	0.000	0	0.00	0.000
395	P-211	138	J-94	J-107	8.0	PVC	120.0	False	0.000	297	1.90	0.002
396	P-212	63	J-107	J-83	8.0	PVC	120.0	False	0.000	297	1.90	0.002
398	P-213	34	J-107	H-32	6.0	PVC	120.0	False	0.000	0	0.00	0.000
400	P-214	223	J-89	J-108	8.0	PVC	120.0	False	0.000	210	1.34	0.001
401	P-215	229	J-108	J-90	8.0	PVC	120.0	False	0.000	210	1.34	0.001
403	P-216	22	J-108	H-33	6.0	PVC	120.0	False	0.000	0	0.00	0.000
405	P-217	115	J-89	J-109	8.0	PVC	120.0	False	0.000	212	1.36	0.001
406	P-218	239	J-109	J-85	8.0	PVC	120.0	False	0.000	212	1.36	0.001
408	P-219	34	J-109	H-34	6.0	PVC	120.0	False	0.000	0	0.00	0.000
410	P-220	232	J-86	J-110	8.0	PVC	120.0	False	0.000	66	0.42	0.000
411	P-221	270	J-110	J-90	8.0	PVC	120.0	False	0.000	66	0.42	0.000
413	P-222	22	J-110	H-35	6.0	PVC	120.0	False	0.000	0	0.00	0.000
415	P-223	137	J-85	J-111	8.0	PVC	120.0	False	0.000	66	0.42	0.000
416	P-224	145	J-111	J-86	8.0	PVC	120.0	False	0.000	66	0.42	0.000
418	P-225	25	J-111	H-36	6.0	PVC	120.0	False	0.000	0	0.00	0.000
420	P-226	323	J-67	J-112	12.0	PVC	120.0	False	0.000	1,510	4.28	0.006
431	P-232	111	J-116	J-117	8.0	PVC	120.0	False	0.000	90	0.58	0.000
433	P-233	244	J-112	J-118	12.0	PVC	120.0	False	0.000	1,510	4.28	0.006
434	P-234	138	J-118	J-57	12.0	PVC	120.0	False	0.000	1,510	4.28	0.006
436	P-236	92	J-113	J-117	8.0	PVC	120.0	False	0.000	-90	0.58	0.000
438	P-237	42	J-113	J-119	8.0	PVC	120.0	False	0.000	80	0.58	0.000
439	P-238	207	J-119	J-114	8.0	PVC	120.0	False	0.000	80	0.58	0.000
441	P-239	46	J-119	H-37	6.0	PVC	120.0	False	0.000	0	0.00	0.000
443	P-240	83	J-114	J-120	8.0	PVC	120.0	False	0.000	90	0.58	0.000
444	P-241	190	J-120	J-115	8.0	PVC	120.0	False	0.000	90	0.58	0.000
446	P-242	14	J-120	H-38	6.0	PVC	120.0	False	0.000	0	0.00	0.000
448	P-243	223	J-115	J-121	8.0	PVC	120.0	False	0.000	-136	0.87	0.001
449	P-244	115	J-121	J-116	8.0	PVC	120.0	False	0.000	-136	0.87	0.001
451	P-245	29	J-121	H-39	6.0	PVC	120.0	False	0.000	0	0.00	0.000
463	P-252	121	J-122	J-125	8.0	PVC	120.0	False	0.000	148	0.95	0.001
464	P-253	264	J-125	J-124	8.0	PVC	120.0	False	0.000	148	0.95	0.001
467	P-255	74	J-126	J-123	8.0	PVC	120.0	False	0.000	-299	1.91	0.002
468	P-256	31	J-60	J-116	6.0	PVC	130.0	False	0.000	227	2.57	0.005
470	P-257	30	J-124	J-127	8.0	PVC	120.0	False	0.000	148	0.95	0.001
474	P-259	65	J-127	H-41	6.0	PVC	120.0	False	0.000	0	0.00	0.000
476	P-260	25	J-125	H-42	6.0	PVC	120.0	False	0.000	0	0.00	0.000
478	P-261	146	J-115	J-128	8.0	PVC	120.0	False	0.000	227	1.45	0.001
479	P-262	264	J-128	J-122	8.0	PVC	120.0	False	0.000	227	1.45	0.001
481	P-263	34	J-128	H-43	6.0	PVC	120.0	False	0.000	0	0.00	0.000
483	P-264	129	J-123	J-129	8.0	PVC	120.0	False	0.000	-299	1.91	0.002
484	P-265	99	J-129	J-60	8.0	PVC	120.0	False	0.000	-299	1.91	0.002
486	P-266	35	J-129	H-44	6.0	PVC	100.0	False	0.000	0	0.00	0.000
490	P-268	165	J-131	J-126	8.0	PVC	120.0	False	0.000	-299	1.91	0.002
492	P-269	36	J-131	H-45	6.0	PVC	120.0	False	0.000	0	0.00	0.000
494	P-270	227	J-127	J-132	8.0	PVC	120.0	False	0.000	148	0.95	0.001
495	P-271	111	J-132	J-131	8.0	PVC	120.0	False	0.000	-299	1.91	0.002
497	P-272	153	J-132	J-133	8.0	PVC	120.0	False	0.000	0	0.00	0.000
499	P-273	110	J-133	J-134	8.0	PVC	120.0	False	0.000	0	0.00	0.000
501	P-274	19	J-134	H-46	6.0	PVC	120.0	False	0.000	0	0.00	0.000
503	P-275	402	J-61	J-135	12.0	PVC	120.0	False	0.000	1,333	3.78	0.005
504	P-276	534	J-135	J-55	12.0	PVC	120.0	False	0.000	1,780	5.05	0.009
505	P-277	189	J-135	J-132	8.0	PVC	120.0	False	0.000	-447	2.85	0.005

G:\TheREDIt\EN-128-320 St Rose &amp; Amigo\Design\WNA\2017-06-14 WNA\Analysis\2017-06-28 WNA-BLACKSTONE RANCH - PHASE II.wtg

**Scenario: Peak Hour**  
**Current Time Step: 0.000 h**  
**FlexTable: Junction Table**

ID	Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
31	J-1	4,642.00	<None>	<Collection: 0 items>	0	4,851.34	91
34	J-2	4,633.00	<None>	<Collection: 0 items>	0	4,845.54	92
36	J-3	4,633.50	<None>	<Collection: 1 item>	89	4,845.50	92
39	J-4	4,639.50	<None>	<Collection: 0 items>	0	4,846.58	90
41	J-5	4,640.00	<None>	<Collection: 0 items>	0	4,846.08	89
43	J-6	4,640.00	<None>	<Collection: 1 item>	89	4,845.69	89
45	J-7	4,633.00	<None>	<Collection: 0 items>	0	4,845.56	92
49	J-8	4,640.00	<None>	<Collection: 0 items>	0	4,846.07	89
51	J-9	4,640.00	<None>	<Collection: 0 items>	0	4,846.06	89
53	J-10	4,636.10	<None>	<Collection: 1 item>	89	4,845.55	91
57	J-11	4,640.00	<None>	<Collection: 0 items>	0	4,845.84	89
60	J-12	4,634.55	<None>	<Collection: 0 items>	0	4,845.57	91
64	J-13	4,640.25	<None>	<Collection: 0 items>	0	4,846.65	89
67	J-14	4,639.00	<None>	<Collection: 1 item>	89	4,846.04	90
69	J-15	4,640.00	<None>	<Collection: 1 item>	0	4,846.03	89
73	J-16	4,638.20	<None>	<Collection: 1 item>	0	4,846.08	90
76	J-17	4,639.50	<None>	<Collection: 0 items>	0	4,846.07	89
78	J-18	4,639.37	<None>	<Collection: 0 items>	0	4,846.12	89
82	J-19	4,638.84	<None>	<Collection: 0 items>	0	4,845.99	90
90	J-20	4,640.00	<None>	<Collection: 0 items>	0	4,846.06	89
94	J-21	4,639.35	<None>	<Collection: 0 items>	0	4,846.01	89
98	J-22	4,639.30	<None>	<Collection: 0 items>	0	4,845.81	89
102	J-23	4,637.68	<None>	<Collection: 0 items>	0	4,845.73	90
107	J-24	4,639.08	<None>	<Collection: 0 items>	0	4,845.68	89
112	J-25	4,637.04	<None>	<Collection: 0 items>	0	4,845.64	90
120	J-26	4,635.60	<None>	<Collection: 0 items>	0	4,845.62	91
125	J-27	4,634.55	<None>	<Collection: 0 items>	0	4,845.59	91
130	J-28	4,633.25	<None>	<Collection: 0 items>	0	4,845.52	92
135	J-29	4,633.39	<None>	<Collection: 0 items>	0	4,845.57	92
140	J-30	4,637.26	<None>	<Collection: 0 items>	0	4,845.74	90
145	J-31	4,635.37	<None>	<Collection: 0 items>	0	4,845.56	91
150	J-32	4,639.68	<None>	<Collection: 0 items>	0	4,846.03	89
155	J-33	4,639.05	<None>	<Collection: 0 items>	0	4,846.05	90
160	J-34	4,639.48	<None>	<Collection: 0 items>	0	4,846.08	89
165	J-35	4,639.44	<None>	<Collection: 0 items>	0	4,846.16	89
170	J-36	4,638.75	<None>	<Collection: 0 items>	0	4,846.07	90
175	J-37	4,637.66	<None>	<Collection: 0 items>	0	4,845.95	90
180	J-38	4,639.88	<None>	<Collection: 0 items>	0	4,846.42	89
185	J-39	4,640.60	<None>	<Collection: 0 items>	0	4,847.59	90
199	J-40	4,626.00	<None>	<Collection: 1 item>	84	4,847.21	96
201	J-41	4,622.00	<None>	<Collection: 0 items>	0	4,845.59	97
203	J-42	4,628.00	<None>	<Collection: 1 item>	0	4,844.61	94
211	J-45	4,628.28	<None>	<Collection: 0 items>	0	4,844.58	94
212	J-46	4,628.28	<None>	<Collection: 0 items>	0	4,844.58	94
216	J-47	4,622.18	<None>	<Collection: 0 items>	0	4,845.56	97
234	J-54	4,639.00	<None>	<Collection: 0 items>	0	4,834.71	85
236	J-55	4,632.00	<None>	<Collection: 0 items>	0	4,833.06	87
240	J-56	4,631.21	<None>	<Collection: 0 items>	0	4,848.15	94
243	J-57	4,628.00	<None>	<Collection: 0 items>	0	4,843.49	93
245	J-58	4,634.50	<None>	<Collection: 0 items>	0	4,841.37	90
247	J-59	4,634.50	<None>	<Collection: 1 item>	232	4,841.83	90
249	J-60	4,633.50	<None>	<Collection: 1 item>	79	4,839.83	89
251	J-61	4,632.00	<None>	<Collection: 0 items>	0	4,839.63	90
254	J-62	4,639.13	<None>	<Collection: 0 items>	0	4,837.78	86
257	J-63	4,639.13	<None>	<Collection: 1 item>	0	4,837.78	86
260	J-65	4,639.13	<None>	<Collection: 1 item>	0	4,840.30	87
262	J-64	4,639.24	<None>	<Collection: 0 items>	0	4,840.30	87
266	J-67	4,631.06	<None>	<Collection: 0 items>	0	4,847.93	94

269	J-68	4,631.06	<None>	<Collection: 0 items>	0	4,847.93	94
296	J-80	4,631.00	<None>	<Collection: 1 item>	146	4,843.47	92
298	J-81	4,630.00	<None>	<Collection: 0 items>	0	4,843.36	92
300	J-82	4,630.00	<None>	<Collection: 0 items>	0	4,842.59	92
303	J-83	4,630.00	<None>	<Collection: 0 items>	0	4,843.35	92
307	J-84	4,634.47	<None>	<Collection: 0 items>	0	4,844.47	91
310	J-85	4,635.00	<None>	<Collection: 1 item>	146	4,842.97	90
312	J-86	4,635.00	<None>	<Collection: 0 items>	0	4,842.93	90
317	J-88	4,637.94	<None>	<Collection: 0 items>	0	4,845.00	90
321	J-89	4,634.71	<None>	<Collection: 0 items>	0	4,843.40	90
324	J-90	4,631.22	<None>	<Collection: 0 items>	0	4,842.86	92
328	J-91	4,635.61	<None>	<Collection: 0 items>	0	4,844.29	90
331	J-92	4,632.88	<None>	<Collection: 0 items>	0	4,844.22	91
335	J-93	4,633.35	<None>	<Collection: 0 items>	0	4,843.83	91
338	J-94	4,631.29	<None>	<Collection: 0 items>	0	4,843.80	92
342	J-95	4,636.69	<None>	<Collection: 0 items>	0	4,844.62	90
347	J-96	4,634.38	<None>	<Collection: 0 items>	0	4,844.04	91
352	J-97	4,632.08	<None>	<Collection: 0 items>	0	4,843.63	92
362	J-100	4,636.08	<None>	<Collection: 0 items>	0	4,844.72	90
367	J-101	4,634.12	<None>	<Collection: 0 items>	0	4,844.25	91
372	J-102	4,632.22	<None>	<Collection: 0 items>	0	4,843.81	92
377	J-103	4,630.39	<None>	<Collection: 0 items>	0	4,843.40	92
382	J-104	4,633.61	<None>	<Collection: 0 items>	0	4,844.34	91
387	J-105	4,632.00	<None>	<Collection: 0 items>	0	4,843.99	92
394	J-107	4,630.40	<None>	<Collection: 0 items>	0	4,843.49	92
399	J-108	4,632.99	<None>	<Collection: 0 items>	0	4,843.13	91
404	J-109	4,634.83	<None>	<Collection: 0 items>	0	4,843.26	90
409	J-110	4,633.08	<None>	<Collection: 0 items>	0	4,842.90	91
414	J-111	4,635.00	<None>	<Collection: 0 items>	0	4,842.95	90
419	J-112	4,629.66	<None>	<Collection: 0 items>	0	4,845.89	94
422	J-113	4,635.00	<None>	<Collection: 0 items>	0	4,839.63	89
424	J-114	4,635.50	<None>	<Collection: 0 items>	0	4,839.57	88
426	J-115	4,633.50	<None>	<Collection: 0 items>	0	4,839.50	89
428	J-116	4,633.50	<None>	<Collection: 0 items>	0	4,839.68	89
430	J-117	4,635.00	<None>	<Collection: 0 items>	0	4,839.65	89
432	J-118	4,628.61	<None>	<Collection: 0 items>	0	4,844.36	93
437	J-119	4,635.50	<None>	<Collection: 0 items>	0	4,839.62	88
442	J-120	4,635.00	<None>	<Collection: 0 items>	0	4,839.55	88
447	J-121	4,635.00	<None>	<Collection: 0 items>	0	4,839.62	89
452	J-122	4,630.75	<None>	<Collection: 1 item>	79	4,838.92	90
454	J-123	4,632.00	<None>	<Collection: 0 items>	0	4,839.31	90
459	J-124	4,630.10	<None>	<Collection: 0 items>	0	4,838.68	90
462	J-125	4,630.75	<None>	<Collection: 0 items>	0	4,838.84	90
465	J-126	4,632.00	<None>	<Collection: 0 items>	0	4,839.15	90
469	J-127	4,630.30	<None>	<Collection: 0 items>	0	4,838.66	90
477	J-128	4,632.56	<None>	<Collection: 0 items>	0	4,839.30	89
482	J-129	4,632.85	<None>	<Collection: 0 items>	0	4,839.61	89
488	J-131	4,631.44	<None>	<Collection: 0 items>	0	4,838.77	90
493	J-132	4,631.07	<None>	<Collection: 0 items>	0	4,838.52	90
496	J-133	4,632.10	<None>	<Collection: 0 items>	0	4,838.52	89
498	J-134	4,632.60	<None>	<Collection: 0 items>	0	4,838.52	89
502	J-135	4,631.60	<None>	<Collection: 0 items>	0	4,837.62	89

G:\TheRED\td\EN-128-320 St Rose & Amigo\Design\WNA\2017-06-14 WNA\Analysis\2017-06-28 WNA-BLACKSTONE RANCH - PHASE II.wtg

**Scenario: Peak Hour**  
**Current Time Step: 0.000 h**  
**FlexTable: Reservoir Table**

---

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
30	R-1	4,857.00	4880	7,458	4,857.00
38	R-2	4,857.00	4880	1,396	4,857.00
209	R-3	4,844.00	4880	-4,841	4,844.00
238	R-5	4,832.00	4880	-2,891	4,832.00

G:\TheREDIt\EN-128-320 St Rose & Amigo\Design\WNA\2017-06-14 WNA\Analysis\2017-06-28 WNA-BLACKSTONE RANCH - PHASE II.wtg

Scenario: Max Day + Fire  
 Current Time Step: 0.000 h  
 FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Has Check Valve?	Minor Loss Coefficient (Local)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Head Loss
32	P-1	1,582	R-1	J-1	24.0	PVC	130.0	False	0.000	5,062	3.59	0.002	
40	P-4	787	R-2	J-4	10.0	PVC	120.0	False	0.000	1,284	5.24	0.011	
42	P-5	244	J-4	J-5	8.0	PVC	120.0	False	0.000	466	2.98	0.005	
47	P-8	92	J-7	J-2	8.0	PVC	120.0	False	0.000	932	5.95	0.019	
50	P-10	91	J-5	J-8	8.0	PVC	120.0	False	0.000	-46	0.29	0.000	
52	P-11	85	J-8	J-9	8.0	PVC	120.0	False	0.000	-46	0.29	0.000	
58	P-15	166	J-5	J-11	8.0	PVC	120.0	False	0.000	512	3.27	0.006	
59	P-16	247	J-11	J-6	8.0	PVC	120.0	False	0.000	344	2.20	0.003	
74	P-26	249	J-13	J-16	8.0	PVC	120.0	False	0.000	424	2.71	0.004	
85	P-34	256	J-17	J-19	8.0	PVC	120.0	False	0.000	165	1.05	0.001	
91	P-35	49	J-9	J-20	8.0	PVC	120.0	False	0.000	-46	0.29	0.000	
92	P-36	252	J-20	J-15	8.0	PVC	120.0	False	0.000	-46	0.29	0.000	
93	P-37	25	H-1	J-20	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
95	P-38	131	J-15	J-21	8.0	PVC	120.0	False	0.000	47	0.30	0.000	
96	P-39	102	J-21	J-19	8.0	PVC	120.0	False	0.000	47	0.30	0.000	
97	P-40	24	H-3	J-21	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
99	P-41	159	J-11	J-22	8.0	PVC	120.0	False	0.000	168	1.07	0.001	
101	P-43	31	H-2	J-22	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
103	P-44	366	J-22	J-23	8.0	PVC	120.0	False	0.000	168	1.07	0.001	
105	P-46	28	H-4	J-23	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
108	P-47	161	J-6	J-24	8.0	PVC	120.0	False	0.000	287	1.83	0.002	
110	P-49	24	H-5	J-24	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
113	P-50	361	J-24	J-25	8.0	PVC	120.0	False	0.000	287	1.83	0.002	
115	P-52	26	H-6	J-25	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
121	P-55	469	J-23	J-26	8.0	PVC	120.0	False	0.000	168	1.07	0.001	
122	P-56	237	J-26	J-12	8.0	PVC	120.0	False	0.000	168	1.07	0.001	
123	P-57	17	H-8	J-26	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
126	P-58	439	J-25	J-27	8.0	PVC	120.0	False	0.000	287	1.83	0.002	
127	P-59	272	J-27	J-7	8.0	PVC	120.0	False	0.000	287	1.83	0.002	
128	P-60	15	H-9	J-27	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
131	P-61	94	J-2	J-28	8.0	PVC	120.0	False	0.000	932	5.95	0.019	
132	P-62	98	J-28	J-3	8.0	PVC	120.0	False	0.000	57	0.37	0.000	
133	P-63	32	H-10	J-28	6.0	PVC	120.0	False	0.000	-875	9.93	0.067	
136	P-64	185	J-12	J-29	8.0	PVC	120.0	False	0.000	645	4.12	0.009	
137	P-65	65	J-29	J-7	8.0	PVC	120.0	False	0.000	645	4.12	0.009	
138	P-66	28	H-11	J-29	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
141	P-67	319	J-19	J-30	8.0	PVC	120.0	False	0.000	211	1.35	0.001	
142	P-68	235	J-30	J-10	8.0	PVC	120.0	False	0.000	211	1.35	0.001	
143	P-69	17	H-12	J-30	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
146	P-70	117	J-10	J-31	8.0	PVC	120.0	False	0.000	477	3.05	0.005	
147	P-71	131	J-31	J-12	8.0	PVC	120.0	False	0.000	477	3.05	0.005	
148	P-72	22	H-13	J-31	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
151	P-73	332	J-14	J-32	8.0	PVC	120.0	False	0.000	92	0.59	0.000	
152	P-74	160	J-32	J-15	8.0	PVC	120.0	False	0.000	92	0.59	0.000	
153	P-75	31	H-14	J-32	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
156	P-76	201	J-18	J-33	8.0	PVC	120.0	False	0.000	150	0.96	0.001	
157	P-77	33	J-33	J-14	8.0	PVC	120.0	False	0.000	150	0.96	0.001	
158	P-78	14	H-15	J-33	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
161	P-79	40	J-17	J-34	8.0	PVC	120.0	False	0.000	-118	0.76	0.000	
162	P-80	201	J-34	J-18	8.0	PVC	120.0	False	0.000	-118	0.76	0.000	
163	P-81	28	H-16	J-34	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
167	P-83	42	J-35	J-18	8.0	PVC	120.0	False	0.000	268	1.71	0.002	
168	P-84	33	H-17	J-35	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
171	P-85	233	J-16	J-36	8.0	PVC	120.0	False	0.000	47	0.30	0.000	
172	P-86	320	J-36	J-17	8.0	PVC	120.0	False	0.000	47	0.30	0.000	
173	P-87	20	H-18	J-36	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
176	P-88	63	J-16	J-37	8.0	PVC	120.0	False	0.000	378	2.41	0.004	
177	P-89	192	J-37	J-10	8.0	PVC	120.0	False	0.000	378	2.41	0.003	
178	P-90	34	H-19	J-37	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
181	P-91	236	J-13	J-38	8.0	PVC	120.0	False	0.000	268	1.71	0.002	
182	P-92	275	J-38	J-35	8.0	PVC	120.0	False	0.000	268	1.71	0.002	
183	P-93	18	H-20	J-38	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
186	P-94	170	J-1	J-39	8.0	PVC	120.0	False	0.000	1,178	7.52	0.029	
187	P-95	43	J-39	J-13	8.0	PVC	120.0	False	0.000	1,178	7.52	0.029	
188	P-96	39	H-21	J-39	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
202	P-98	1,009	J-40	J-41	24.0	PVC	130.0	False	0.000	2,238	1.59	0.000	
213	P-103	359	R-3	J-46	24.0	PVC	130.0	False	0.000	-2,238	1.59	0.000	
214	P-104	22	J-46	J-42	24.0	PVC	130.0	False	0.000	-2,238	1.59	0.000	
215	P-105	62	J-45	J-46	8.0	PVC	120.0	False	0.000	0	0.00	0.000	
217	P-106	18	J-41	J-47	24.0	PVC	130.0	False	0.000	2,238	1.59	0.000	
218	P-107	591	J-47	J-42	24.0	PVC	130.0	False	0.000	2,238	1.59	0.000	
237	P-117	2,179	J-54	J-55	16.0	PVC	130.0	False	0.000	817	1.30	0.000	
239	P-118	237	R-5	J-55	16.0	PVC	130.0	False	0.000	-1,753	2.80	0.002	
241	P-119	1,171	J-1	J-56	24.0	PVC	130.0	False	0.000	3,884	2.75	0.001	
242	P-120	565	J-56	J-40	24.0	PVC	130.0	False	0.000	2,238	1.59	0.000	
246	P-122	336	J-57	J-58	12.0	PVC	120.0	False	0.000	1,646	4.67	0.007	
248	P-123	107	J-58	J-59	8.0	PVC	120.0	False	0.000	-350	2.23	0.003	
250	P-124	184	J-58	J-60	8.0	PVC	120.0	False	0.000	787	4.89	0.013	
252	P-125	346	J-58	J-61	12.0	PVC	120.0	False	0.000	1,230	3.49	0.004	
256	P-128	353	J-62	J-54	10.0	PVC	120.0	False	0.000	817	3.34	0.005	
258	P-129	110	J-62	J-63	8.0	PVC	120.0	False	0.000	0	0.00	0.000	
263	P-131	723	J-4	J-64	10.0	PVC	120.0	False	0.000	817	3.34	0.005	
264	P-132	291	J-62	J-64	10.0	PVC	120.0	False	0.000	817	3.34	0.005	
265	P-133	113	J-64	J-65	8.0	PVC	120.0	False	0.000	0	0.00	0.000	
267	P-134	35	J-56	J-67	12.0	PVC	120.0	False	0.000	1,646	4.67	0.007	
270	P-136	11	J-67	J-68	12.0	PVC	120.0	False	0.000	0	0.00	0.000	
302	P-153	78	J-82	J-59	8.0	PVC	120.0	False	0.000	350	2.23	0.003	
304	P-154	73	J-81	J-83	8.0	PVC	120.0	False	0.000	48	0.31	0.000	
305	P-155	211	J-83	J-82	8.0	PVC	120.0	False	0.000	218	1.39	0.001	
308	P-157	254	J-10	J-84	8.0	PVC	120.0	False	0.000	55	0.35	0.000	
318	P-163	252	J-13	J-88	8.0	PVC	120.0	False	0.000	485	3.10	0.006	
322	P-166	251	J-84	J-89	8.0	PVC	120.0	False	0.000	226	1.45	0.001	
326	P-169	136	J-90	J-82	8.0	PVC	120.0	False	0.000	131	0.84	0.000	
343	P-181	136	J-88	J-95	8.0	PVC	120.0	False	0.000	274	1.75	0.002	
344	P-182	117	J-95	J-91	8.0	PVC	120.0	False	0.000	274	1.75	0.002	
346	P-183	20	J-95	H-22	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
348	P-184	134	J-91	J-96	8.0	PVC	120.0	False	0.000	182	1.16	0.001	
349	P-185	112	J-96	J-93	8.0	PVC	120.0	False	0.000	182	1.16	0.001	
351	P-186	23	J-96	H-23	6.0	PVC	120.0	False	0.000	0	0.00	0.000	
353	P-187	138	J-93	J-97	8.0	PVC	120.0	False	0.000	143	0.91	0.001	
354	P-188	118	J-97	J-80	8.0	PVC	120.0	False	0.000	143	0.91	0.001	



358	P-190	21	J-97	H-24	6.0	PVC	120.0	False	0.000	0	0.00	0.000
363	P-192	235	J-84	J-100	8.0	PVC	120.0	False	0.000	-211	1.35	0.001
364	P-193	271	J-100	J-88	8.0	PVC	120.0	False	0.000	-211	1.35	0.001
366	P-194	14	J-100	H-26	6.0	PVC	120.0	False	0.000	0	0.00	0.000
368	P-195	276	J-91	J-101	8.0	PVC	120.0	False	0.000	92	0.58	0.000
369	P-196	230	J-101	J-92	8.0	PVC	120.0	False	0.000	92	0.58	0.000
371	P-197	14	J-101	H-27	6.0	PVC	120.0	False	0.000	0	0.00	0.000
373	P-198	279	J-93	J-102	8.0	PVC	120.0	False	0.000	39	0.25	0.000
374	P-199	231	J-102	J-94	8.0	PVC	120.0	False	0.000	39	0.25	0.000
376	P-200	16	J-102	H-28	6.0	PVC	120.0	False	0.000	0	0.00	0.000
378	P-201	277	J-80	J-103	8.0	PVC	120.0	False	0.000	0	0.00	0.000
379	P-202	178	J-103	J-81	8.0	PVC	120.0	False	0.000	48	0.31	0.000
381	P-203	18	J-103	H-29	6.0	PVC	120.0	False	0.000	48	0.31	0.000
383	P-204	134	J-84	J-104	8.0	PVC	120.0	False	0.000	0	0.00	0.000
384	P-205	113	J-104	J-92	8.0	PVC	120.0	False	0.000	40	0.25	0.000
386	P-206	35	J-104	H-30	6.0	PVC	120.0	False	0.000	40	0.25	0.000
388	P-207	137	J-92	J-105	8.0	PVC	120.0	False	0.000	0	0.00	0.000
389	P-208	111	J-105	J-94	8.0	PVC	120.0	False	0.000	131	0.84	0.000
393	P-210	36	J-105	H-31	6.0	PVC	120.0	False	0.000	0	0.00	0.000
395	P-211	138	J-94	J-107	8.0	PVC	120.0	False	0.000	171	1.09	0.001
396	P-212	63	J-107	J-83	8.0	PVC	120.0	False	0.000	171	1.09	0.001
398	P-213	34	J-107	H-32	6.0	PVC	120.0	False	0.000	0	0.00	0.000
400	P-214	223	J-89	J-108	8.0	PVC	120.0	False	0.000	109	0.69	0.000
401	P-215	229	J-108	J-90	8.0	PVC	120.0	False	0.000	109	0.69	0.000
403	P-216	22	J-108	H-33	6.0	PVC	120.0	False	0.000	0	0.00	0.000
405	P-217	115	J-89	J-109	8.0	PVC	120.0	False	0.000	118	0.75	0.000
406	P-218	239	J-109	J-85	8.0	PVC	120.0	False	0.000	118	0.75	0.000
408	P-219	34	J-109	H-34	6.0	PVC	120.0	False	0.000	0	0.00	0.000
410	P-220	232	J-86	J-110	8.0	PVC	120.0	False	0.000	23	0.14	0.000
411	P-221	270	J-110	J-90	8.0	PVC	120.0	False	0.000	23	0.14	0.000
413	P-222	22	J-110	H-35	6.0	PVC	120.0	False	0.000	0	0.00	0.000
415	P-223	137	J-85	J-111	8.0	PVC	120.0	False	0.000	23	0.14	0.000
416	P-224	145	J-111	J-86	8.0	PVC	120.0	False	0.000	23	0.14	0.000
418	P-225	25	J-111	H-36	6.0	PVC	120.0	False	0.000	0	0.00	0.000
420	P-226	323	J-67	J-112	12.0	PVC	120.0	False	0.000	1,646	4.67	0.007
431	P-232	111	J-116	J-117	8.0	PVC	120.0	False	0.000	203	1.29	0.001
433	P-233	244	J-112	J-118	12.0	PVC	120.0	False	0.000	1,646	4.67	0.007
434	P-234	138	J-116	J-57	12.0	PVC	120.0	False	0.000	1,646	4.67	0.007
436	P-236	92	J-113	J-117	8.0	PVC	120.0	False	0.000	-203	1.29	0.001
438	P-237	42	J-113	J-119	8.0	PVC	120.0	False	0.000	119	0.76	0.000
439	P-238	207	J-119	J-114	8.0	PVC	120.0	False	0.000	119	0.76	0.000
441	P-239	46	J-119	H-37	6.0	PVC	120.0	False	0.000	0	0.00	0.000
443	P-240	83	J-114	J-120	8.0	PVC	120.0	False	0.000	119	0.76	0.000
444	P-241	190	J-120	J-115	8.0	PVC	120.0	False	0.000	119	0.76	0.000
446	P-242	14	J-120	H-38	6.0	PVC	120.0	False	0.000	0	0.00	0.000
448	P-243	223	J-115	J-121	8.0	PVC	120.0	False	0.000	-221	1.41	0.001
449	P-244	115	J-121	J-116	8.0	PVC	120.0	False	0.000	-221	1.41	0.001
451	P-245	29	J-121	H-39	6.0	PVC	120.0	False	0.000	0	0.00	0.000
463	P-252	121	J-122	J-125	8.0	PVC	120.0	False	0.000	289	1.84	0.002
464	P-253	264	J-125	J-124	8.0	PVC	120.0	False	0.000	289	1.84	0.002
467	P-255	74	J-126	J-123	8.0	PVC	120.0	False	0.000	-292	1.86	0.002
468	P-256	31	J-60	J-116	6.0	PVC	130.0	False	0.000	424	4.81	0.015
470	P-257	30	J-124	J-127	8.0	PVC	120.0	False	0.000	289	1.84	0.002
474	P-259	65	J-127	H-41	6.0	PVC	120.0	False	0.000	875	9.93	0.067
476	P-260	25	J-125	H-42	6.0	PVC	120.0	False	0.000	0	0.00	0.000
478	P-261	146	J-115	J-128	8.0	PVC	120.0	False	0.000	340	2.17	0.003
479	P-262	284	J-128	J-122	8.0	PVC	120.0	False	0.000	340	2.17	0.003
481	P-263	34	J-128	H-43	6.0	PVC	120.0	False	0.000	0	0.00	0.000
483	P-264	129	J-123	J-129	8.0	PVC	120.0	False	0.000	-292	1.86	0.002
484	P-265	99	J-129	J-60	8.0	PVC	120.0	False	0.000	-292	1.86	0.002
486	P-266	35	J-129	H-44	6.0	PVC	100.0	False	0.000	0	0.00	0.000
490	P-268	165	J-131	J-126	8.0	PVC	120.0	False	0.000	-292	1.86	0.002
492	P-269	35	J-131	H-45	6.0	PVC	120.0	False	0.000	0	0.00	0.000
494	P-270	227	J-127	J-132	8.0	PVC	120.0	False	0.000	-586	3.74	0.008
495	P-271	111	J-132	J-131	8.0	PVC	120.0	False	0.000	-292	1.86	0.002
497	P-272	153	J-132	J-133	8.0	PVC	120.0	False	0.000	0	0.00	0.000
499	P-273	110	J-133	J-134	8.0	PVC	120.0	False	0.000	0	0.00	0.000
501	P-274	19	J-134	H-46	6.0	PVC	120.0	False	0.000	0	0.00	0.000
503	P-275	402	J-61	J-135	12.0	PVC	120.0	False	0.000	1,230	3.49	0.004
504	P-276	534	J-135	J-55	12.0	PVC	120.0	False	0.000	935	2.65	0.003
505	P-277	189	J-135	J-132	8.0	PVC	120.0	False	0.000	294	1.88	0.002

G:\TheRED\IEN-128-320 St Rose &amp; Amigo\Design\WNA\2017-06-14 WNA\Analysis\2017-06-28 WNA-BLACKSTONE RANCH - PHASE II.wtg

**Scenario: Max Day + Fire**  
**Current Time Step: 0.000 h**  
**FlexTable: Junction Table**

ID	Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
31	J-1	4,642.00	<None>	<Collection: 0 items>	0	4,840.24	86
34	J-2	4,633.00	<None>	<Collection: 0 items>	0	4,826.77	84
36	J-3	4,633.50	<None>	<Collection: 1 item>	57	4,825.02	83
39	J-4	4,639.50	<None>	<Collection: 0 items>	0	4,834.08	84
41	J-5	4,640.00	<None>	<Collection: 0 items>	0	4,832.82	83
43	J-6	4,640.00	<None>	<Collection: 1 item>	57	4,831.07	83
45	J-7	4,633.00	<None>	<Collection: 0 items>	0	4,828.49	85
49	J-8	4,640.00	<None>	<Collection: 0 items>	0	4,832.82	83
51	J-9	4,640.00	<None>	<Collection: 0 items>	0	4,832.83	83
53	J-10	4,636.10	<None>	<Collection: 1 item>	57	4,832.17	85
57	J-11	4,640.00	<None>	<Collection: 0 items>	0	4,831.80	83
60	J-12	4,634.55	<None>	<Collection: 0 items>	0	4,830.84	85
64	J-13	4,640.25	<None>	<Collection: 0 items>	0	4,834.15	84
67	J-14	4,639.00	<None>	<Collection: 1 item>	57	4,832.98	84
69	J-15	4,640.00	<None>	<Collection: 1 item>	0	4,832.85	83
73	J-16	4,638.20	<None>	<Collection: 1 item>	0	4,833.07	84
76	J-17	4,639.50	<None>	<Collection: 0 items>	0	4,833.03	84
78	J-18	4,639.37	<None>	<Collection: 0 items>	0	4,833.13	84
82	J-19	4,638.84	<None>	<Collection: 0 items>	0	4,832.83	84
90	J-20	4,640.00	<None>	<Collection: 0 items>	0	4,832.83	83
94	J-21	4,639.35	<None>	<Collection: 0 items>	0	4,832.84	84
98	J-22	4,639.30	<None>	<Collection: 0 items>	0	4,831.67	83
102	J-23	4,637.68	<None>	<Collection: 0 items>	0	4,831.39	84
107	J-24	4,639.08	<None>	<Collection: 0 items>	0	4,830.73	83
112	J-25	4,637.04	<None>	<Collection: 0 items>	0	4,829.98	83
120	J-26	4,635.60	<None>	<Collection: 0 items>	0	4,831.02	85
125	J-27	4,634.55	<None>	<Collection: 0 items>	0	4,829.06	84
130	J-28	4,633.25	<None>	<Collection: 0 items>	0	4,825.03	83
135	J-29	4,633.39	<None>	<Collection: 1 item>	0	4,829.10	85
140	J-30	4,637.26	<None>	<Collection: 0 items>	0	4,832.45	84
145	J-31	4,635.37	<None>	<Collection: 0 items>	0	4,831.54	85
150	J-32	4,639.68	<None>	<Collection: 0 items>	0	4,832.89	84
155	J-33	4,639.05	<None>	<Collection: 0 items>	0	4,833.00	84
160	J-34	4,639.48	<None>	<Collection: 0 items>	0	4,833.04	84
165	J-35	4,639.44	<None>	<Collection: 0 items>	0	4,833.20	84
170	J-36	4,638.75	<None>	<Collection: 0 items>	0	4,833.05	84
175	J-37	4,637.66	<None>	<Collection: 0 items>	0	4,832.85	84
180	J-38	4,639.88	<None>	<Collection: 0 items>	0	4,833.71	84
185	J-39	4,640.60	<None>	<Collection: 0 items>	0	4,835.37	84
199	J-40	4,626.00	<None>	<Collection: 0 items>	0	4,838.77	92
201	J-41	4,622.00	<None>	<Collection: 0 items>	0	4,838.38	94
203	J-42	4,628.00	<None>	<Collection: 1 item>	0	4,838.15	91
211	J-45	4,628.28	<None>	<Collection: 0 items>	0	4,838.14	91
212	J-46	4,628.28	<None>	<Collection: 0 items>	0	4,838.14	91
216	J-47	4,622.18	<None>	<Collection: 0 items>	0	4,838.37	94
234	J-54	4,639.00	<None>	<Collection: 0 items>	0	4,827.35	81
236	J-55	4,632.00	<None>	<Collection: 0 items>	0	4,826.42	84
240	J-56	4,631.21	<None>	<Collection: 0 items>	0	4,838.99	90
243	J-57	4,628.00	<None>	<Collection: 0 items>	0	4,833.52	89
245	J-58	4,634.50	<None>	<Collection: 0 items>	0	4,831.03	85
247	J-59	4,634.50	<None>	<Collection: 0 items>	0	4,831.35	85
249	J-60	4,633.50	<None>	<Collection: 1 item>	51	4,828.64	84
251	J-61	4,632.00	<None>	<Collection: 0 items>	0	4,829.54	85
254	J-62	4,639.13	<None>	<Collection: 0 items>	0	4,829.09	82
257	J-63	4,639.13	<None>	<Collection: 1 item>	0	4,829.09	82
260	J-65	4,639.13	<None>	<Collection: 1 item>	0	4,830.52	83
262	J-64	4,639.24	<None>	<Collection: 0 items>	0	4,830.52	83
266	J-67	4,631.06	<None>	<Collection: 0 items>	0	4,838.73	90

269	J-68	4,631.06	<None>	<Collection: 0 items>	0	4,838.73	90
296	J-80	4,631.00	<None>	<Collection: 1 item>	95	4,831.89	87
298	J-81	4,630.00	<None>	<Collection: 0 items>	0	4,831.86	87
300	J-82	4,630.00	<None>	<Collection: 0 items>	0	4,831.59	87
303	J-83	4,630.00	<None>	<Collection: 0 items>	0	4,831.85	87
307	J-84	4,634.47	<None>	<Collection: 0 items>	0	4,832.15	86
310	J-85	4,635.00	<None>	<Collection: 1 item>	95	4,831.67	85
312	J-86	4,635.00	<None>	<Collection: 0 items>	0	4,831.66	85
317	J-88	4,637.94	<None>	<Collection: 0 items>	0	4,832.75	84
321	J-89	4,634.71	<None>	<Collection: 0 items>	0	4,831.81	85
324	J-90	4,631.22	<None>	<Collection: 0 items>	0	4,831.65	87
328	J-91	4,635.61	<None>	<Collection: 0 items>	0	4,832.26	85
331	J-92	4,632.88	<None>	<Collection: 0 items>	0	4,832.14	86
335	J-93	4,633.35	<None>	<Collection: 0 items>	0	4,832.04	86
338	J-94	4,631.29	<None>	<Collection: 0 items>	0	4,832.01	87
342	J-95	4,636.69	<None>	<Collection: 0 items>	0	4,832.49	85
347	J-96	4,634.38	<None>	<Collection: 0 items>	0	4,832.14	86
352	J-97	4,632.08	<None>	<Collection: 0 items>	0	4,831.96	86
362	J-100	4,636.08	<None>	<Collection: 0 items>	0	4,832.43	85
367	J-101	4,634.12	<None>	<Collection: 0 items>	0	4,832.19	86
372	J-102	4,632.22	<None>	<Collection: 0 items>	0	4,832.03	86
377	J-103	4,630.39	<None>	<Collection: 0 items>	0	4,831.87	87
382	J-104	4,633.61	<None>	<Collection: 0 items>	0	4,832.14	86
387	J-105	4,632.00	<None>	<Collection: 0 items>	0	4,832.07	87
394	J-107	4,630.40	<None>	<Collection: 0 items>	0	4,831.90	87
399	J-108	4,632.99	<None>	<Collection: 0 items>	0	4,831.73	86
404	J-109	4,634.83	<None>	<Collection: 0 items>	0	4,831.76	85
409	J-110	4,633.08	<None>	<Collection: 0 items>	0	4,831.66	86
414	J-111	4,635.00	<None>	<Collection: 0 items>	0	4,831.66	85
419	J-112	4,629.66	<None>	<Collection: 0 items>	0	4,836.34	89
422	J-113	4,635.00	<None>	<Collection: 1 item>	84	4,827.94	83
424	J-114	4,635.50	<None>	<Collection: 0 items>	0	4,827.83	83
426	J-115	4,633.50	<None>	<Collection: 0 items>	0	4,827.72	84
428	J-116	4,633.50	<None>	<Collection: 0 items>	0	4,828.16	84
430	J-117	4,635.00	<None>	<Collection: 0 items>	0	4,828.04	84
432	J-118	4,628.61	<None>	<Collection: 0 items>	0	4,834.53	89
437	J-119	4,635.50	<None>	<Collection: 0 items>	0	4,827.92	83
442	J-120	4,635.00	<None>	<Collection: 0 items>	0	4,827.80	83
447	J-121	4,635.00	<None>	<Collection: 0 items>	0	4,828.01	84
452	J-122	4,630.75	<None>	<Collection: 1 item>	51	4,826.49	85
454	J-123	4,632.00	<None>	<Collection: 0 items>	0	4,828.14	85
459	J-124	4,630.10	<None>	<Collection: 0 items>	0	4,825.67	85
462	J-125	4,630.75	<None>	<Collection: 0 items>	0	4,826.23	85
465	J-126	4,632.00	<None>	<Collection: 0 items>	0	4,827.98	85
469	J-127	4,630.30	<None>	<Collection: 0 items>	0	4,825.60	84
477	J-128	4,632.56	<None>	<Collection: 0 items>	0	4,827.30	84
482	J-129	4,632.85	<None>	<Collection: 0 items>	0	4,828.42	85
488	J-131	4,631.44	<None>	<Collection: 0 items>	0	4,827.63	85
493	J-132	4,631.07	<None>	<Collection: 0 items>	0	4,827.39	85
496	J-133	4,632.10	<None>	<Collection: 0 items>	0	4,827.39	84
498	J-134	4,632.60	<None>	<Collection: 0 items>	0	4,827.39	84
502	J-135	4,631.60	<None>	<Collection: 0 items>	0	4,827.80	85

G:\TheREDIt\EN-128-320 St Rose & Amigo\Design\WNA\2017-06-14 WNA\Analysis\2017-06-28 WNA-BLACKSTONE RANCH - PHASE II.wtg

Scenario: Max Day + Fire  
 Current Time Step: 0.000 h  
 FlexTable: Hydrant Table

ID	Label	Hydrant Status	Include Lateral Loss?	Emitter Coefficient (gpm/psi <sup>0.5</sup> )	Lateral Length (ft)	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
86	H-1	Closed	False	0.000	20	4,640.00	<None>	<Collection: 0 items>	0	4,834.58	84
87	H-2	Closed	False	0.000	20	4,639.30	<None>	<Collection: 0 items>	0	4,834.34	84
88	H-3	Closed	False	0.000	20	4,639.35	<None>	<Collection: 0 items>	0	4,834.49	84
89	H-4	Closed	False	0.000	20	4,637.68	<None>	<Collection: 0 items>	0	4,834.23	85
106	H-5	Closed	False	0.000	20	4,639.08	<None>	<Collection: 0 items>	0	4,834.23	84
111	H-6	Closed	False	0.000	20	4,637.04	<None>	<Collection: 0 items>	0	4,834.16	85
119	H-8	Closed	False	0.000	20	4,635.60	<None>	<Collection: 0 items>	0	4,834.10	86
124	H-9	Closed	False	0.000	20	4,634.55	<None>	<Collection: 0 items>	0	4,834.08	86
129	H-10	Closed	False	0.000	20	4,633.25	<None>	<Collection: 1 item>	0	4,834.02	87
134	H-11	Closed	False	0.000	20	4,633.39	<None>	<Collection: 0 items>	0	4,834.03	87
139	H-12	Closed	False	0.000	20	4,637.26	<None>	<Collection: 0 items>	0	4,834.16	85
144	H-13	Closed	False	0.000	20	4,635.37	<None>	<Collection: 0 items>	0	4,833.98	86
149	H-14	Closed	False	0.000	20	4,639.68	<None>	<Collection: 0 items>	0	4,834.54	84
154	H-15	Closed	False	0.000	20	4,639.05	<None>	<Collection: 0 items>	0	4,834.55	85
159	H-16	Closed	False	0.000	20	4,639.48	<None>	<Collection: 0 items>	0	4,834.53	84
164	H-17	Closed	False	0.000	20	4,639.44	<None>	<Collection: 0 items>	0	4,834.63	84
169	H-18	Closed	False	0.000	20	4,638.75	<None>	<Collection: 0 items>	0	4,834.52	85
174	H-19	Closed	False	0.000	20	4,637.66	<None>	<Collection: 0 items>	0	4,834.38	85
179	H-20	Closed	False	0.000	20	4,639.88	<None>	<Collection: 0 items>	0	4,834.86	84
184	H-21	Closed	False	0.000	20	4,640.60	<None>	<Collection: 0 items>	0	4,836.11	85
345	H-22	Closed	False	0.000	20	4,636.69	<None>	<Collection: 0 items>	0	4,832.48	85
350	H-23	Closed	False	0.000	20	4,634.38	<None>	<Collection: 0 items>	0	4,831.83	86
357	H-24	Closed	False	0.000	20	4,632.08	<None>	<Collection: 0 items>	0	4,831.44	86
365	H-26	Closed	False	0.000	20	4,636.08	<None>	<Collection: 0 items>	0	4,832.51	85
370	H-27	Closed	False	0.000	20	4,634.12	<None>	<Collection: 0 items>	0	4,832.03	86
375	H-28	Closed	False	0.000	20	4,632.22	<None>	<Collection: 0 items>	0	4,831.58	86
380	H-29	Closed	False	0.000	20	4,630.39	<None>	<Collection: 0 items>	0	4,831.18	87
385	H-30	Closed	False	0.000	20	4,633.61	<None>	<Collection: 0 items>	0	4,832.05	86
392	H-31	Closed	False	0.000	20	4,632.00	<None>	<Collection: 0 items>	0	4,831.74	86
397	H-32	Closed	False	0.000	20	4,630.40	<None>	<Collection: 0 items>	0	4,831.22	87
402	H-33	Closed	False	0.000	20	4,632.99	<None>	<Collection: 0 items>	0	4,829.80	85
407	H-34	Closed	False	0.000	20	4,634.83	<None>	<Collection: 0 items>	0	4,829.09	84
412	H-35	Closed	False	0.000	20	4,633.08	<None>	<Collection: 0 items>	0	4,828.53	85
417	H-36	Open	False	0.000	20	4,635.00	<None>	<Collection: 1 item>	875	4,825.15	82
440	H-37	Closed	False	0.000	20	4,635.50	<None>	<Collection: 0 items>	0	4,827.21	83
445	H-38	Closed	False	0.000	20	4,635.00	<None>	<Collection: 0 items>	0	4,827.09	83
450	H-39	Closed	False	0.000	20	4,635.00	<None>	<Collection: 0 items>	0	4,827.30	83
473	H-41	Open	False	0.000	20	4,630.30	<None>	<Collection: 1 item>	875	4,820.68	82
475	H-42	Closed	False	0.000	20	4,630.75	<None>	<Collection: 0 items>	0	4,825.61	84
480	H-43	Closed	False	0.000	20	4,632.56	<None>	<Collection: 0 items>	0	4,826.62	84
485	H-44	Closed	False	0.000	20	4,632.85	<None>	<Collection: 0 items>	0	4,827.72	84
491	H-45	Closed	False	0.000	20	4,631.44	<None>	<Collection: 0 items>	0	4,827.06	85
500	H-46	Closed	False	0.000	20	4,632.60	<None>	<Collection: 0 items>	0	4,826.86	84

G:\TheRED\td\EN-128-320 St Rose & Amigo\Design\WNA\2017-06-14 WNA\Analysis\2017-06-28 WNA-BLACKSTONE RANCH - PHASE II.wtg

**Scenario: Max Day + Fire**  
**Current Time Step: 0.000 h**  
**FlexTable: Reservoir Table**

---

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
30	R-1	4,843.00	4880	5,062	4,843.00
38	R-2	4,843.00	4880	1,284	4,843.00
209	R-3	4,838.00	4880	-2,238	4,838.00
238	R-5	4,826.00	4880	-1,753	4,826.00

G:\TheREDIt\EN-128-320 St Rose & Amigo\Design\WNA\2017-06-14 WNA\Analysis\2017-06-28 WNA-BLACKSTONE RANCH - PHASE II.wtg



**THE RED LTD**  
 1000 10th Avenue SW  
 Suite 200  
 Calgary, AB T2C 1A8  
 (403) 243-7334 office  
 www.thered.ca  
 B | REAL ESTATE  
 C | ENGINEERING  
 D | DEVELOPMENT

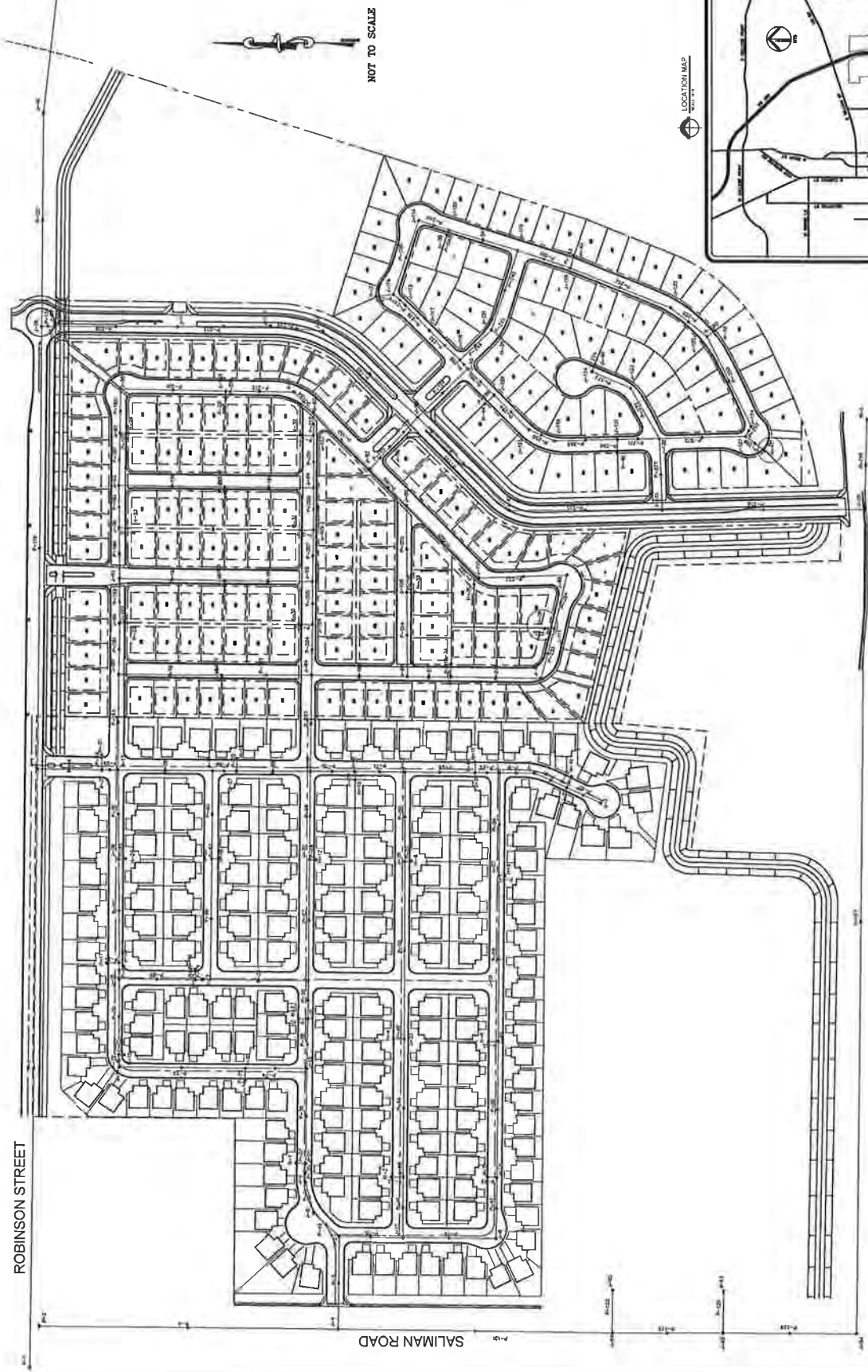
**BLACKSTONE DEVELOPMENT GROUP**  
 1000 10th Avenue SW  
 Suite 200  
 Calgary, AB T2C 1A8  
 CONTACT: JESSICA MYERS  
 PHONE: (403) 332-4200

**PROJECT**  
 BLACKSTONE DEVELOPMENT GROUP  
 1000 10th Avenue SW  
 Suite 200  
 Calgary, AB T2C 1A8  
 CONTACT: JESSICA MYERS  
 PHONE: (403) 332-4200

DATE	NO.	REVISION	APPROVED

**BLACKSTONE RANCH - PHASE II**  
 CHARTER CITY  
 1000 10th Avenue SW  
 Suite 200  
 Calgary, AB T2C 1A8  
 (403) 332-4200

**8/11**  
 1000 10th Avenue SW  
 Suite 200  
 Calgary, AB T2C 1A8  
 (403) 332-4200



LOCATION MAP



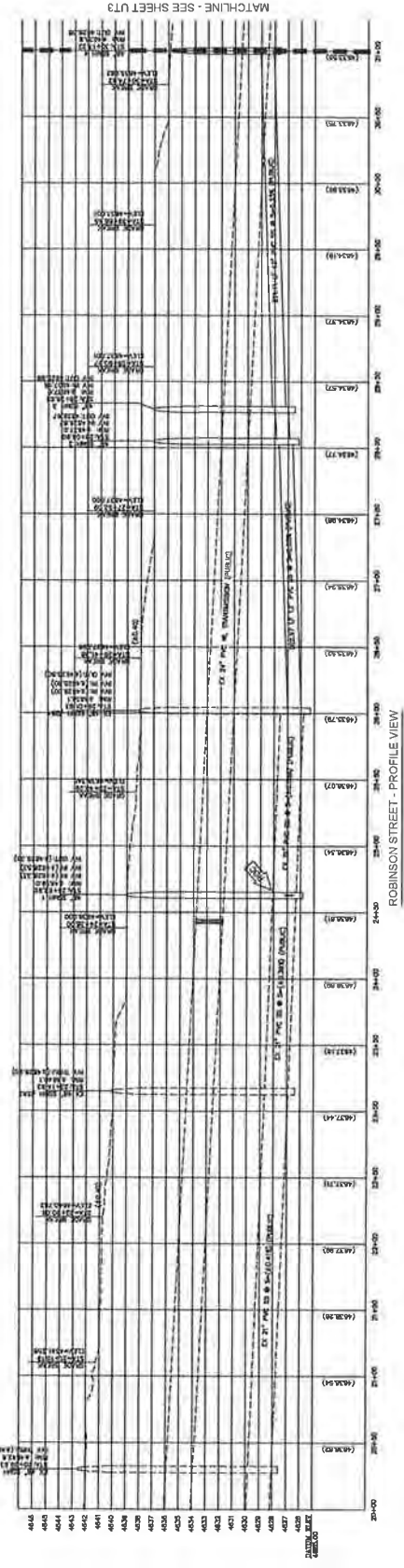
MASTER MAP/PHASE II AREA WITH LOTS  
 P-35 AND P-41 WERE USED IN THE ANALYSIS

## Appendix 4

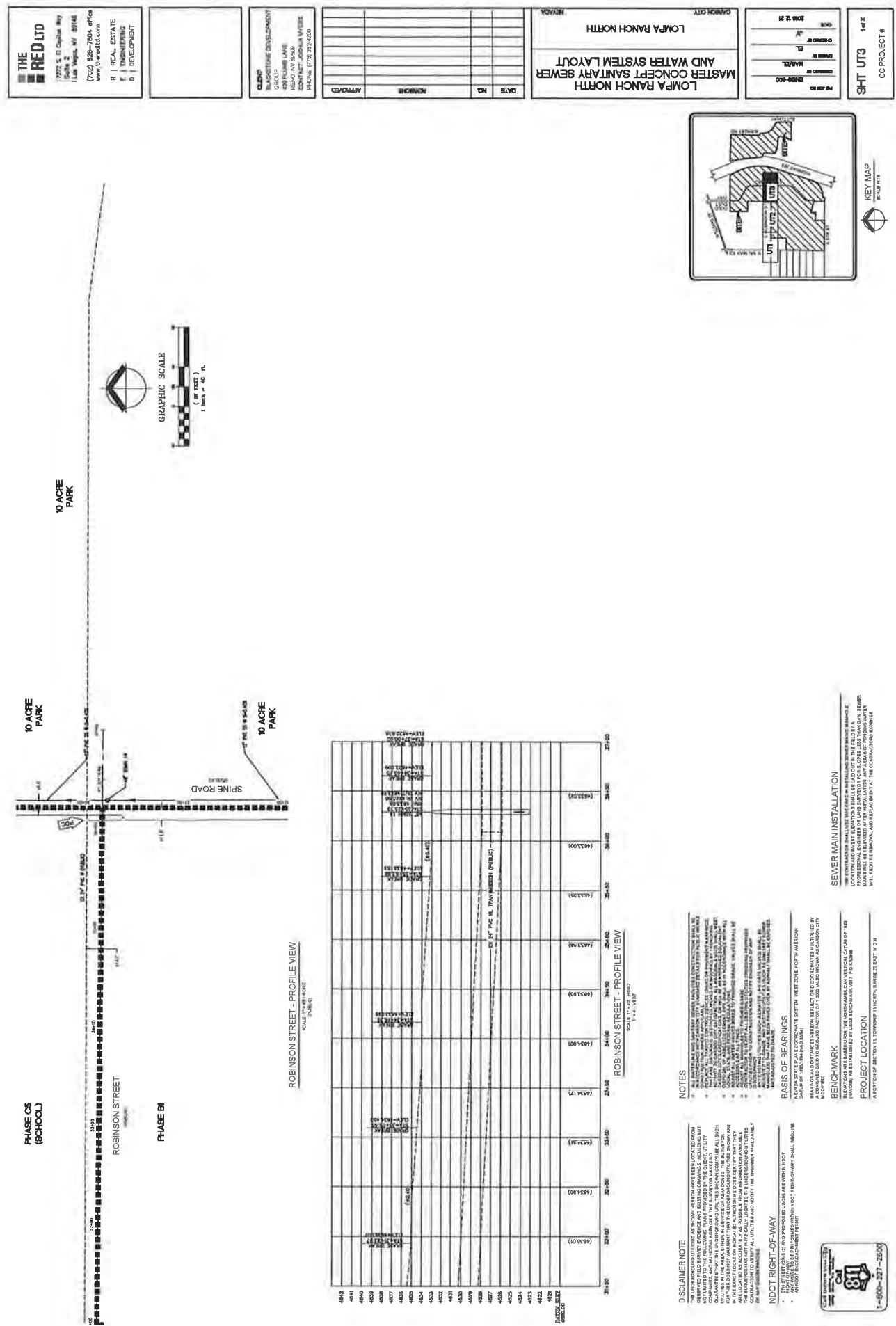
---

# MASTER CONCEPT SANITARY SEWER AND WATER SYSTEM LAYOUT

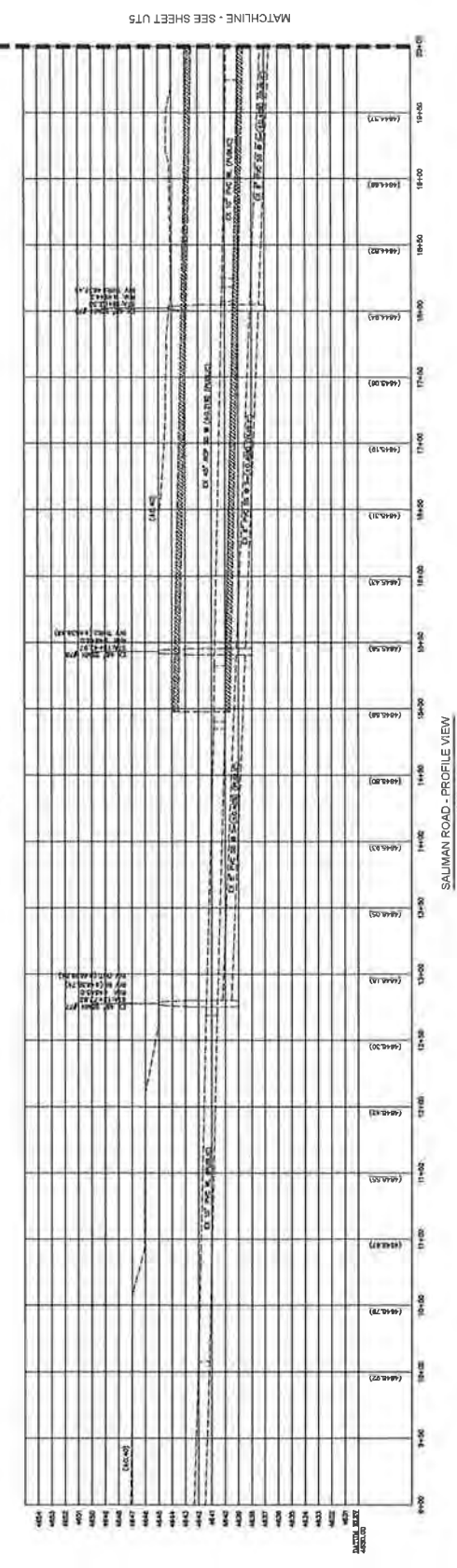




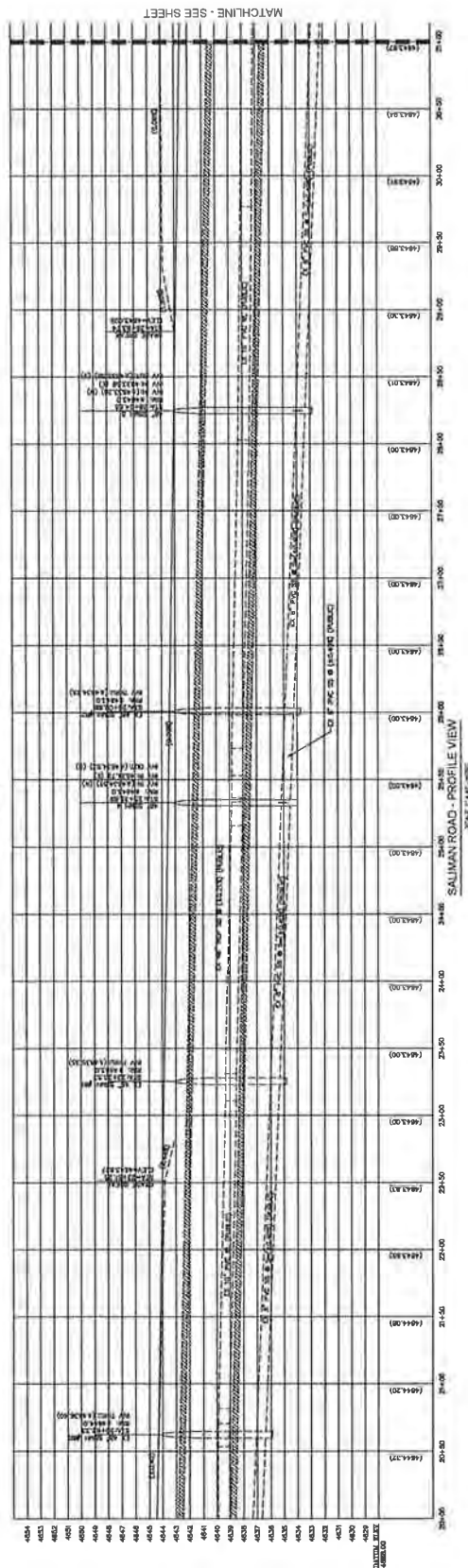
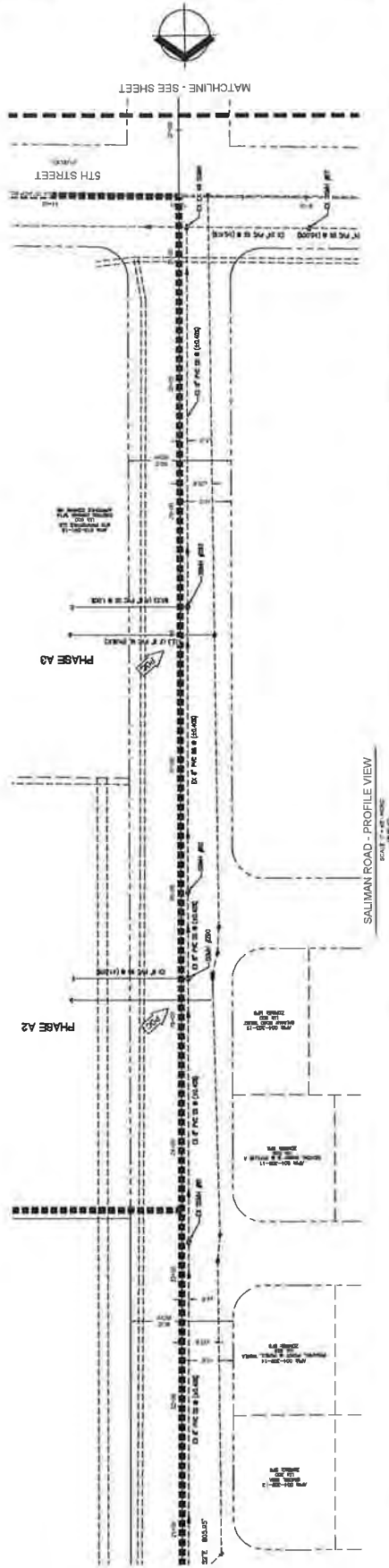
Call before you dig  
avoid fines & delays  
1-800-227-2600







Call anytime with 124  
any time, anywhere  
Call 1-800-227-2600



**Abstract**

[illegible]

## DISCUSSION

NDOT RIGHT-OF-WAY

[illegible]

**BASIS OF BEARINGS**  
NEVADA STATE PLANE COORDINATE SYSTEM WEST ZONE, NORTH AMERICAN DATUM OF 1983/1984 (NAD 83/84)

BEARINGS AND DISTANCE

## BENCHMARK

ELEVATIONS ARE BASED UPON THE N.

### PROJECT LOCATION

© 2000 Blackwell Science Ltd *Journal of Internal Medicine* 247: 399–406

### SEWER MAIN INSTALLATION

**Call Machine Your Way**  
**800-678-9222**



**THE RED LTD**

1221 S. D. Capital Way  
Suite 2  
Las Vegas, NV 89148  
(702) 529-7804 office  
www.theredltd.com

R | REAL ESTATE  
E | ENGINEERING  
D | DEVELOPMENT

**CLASH**

BLACKSTONE DEVELOPMENT  
GROUP  
830 LURE LANE  
SUITE 100  
CONTACT: JOSHUA WILKES  
PHONE: (775) 352-4000

DATE

NO.

REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**

DATE

NO.

REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**

DATE

NO.

REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**

DATE

NO.

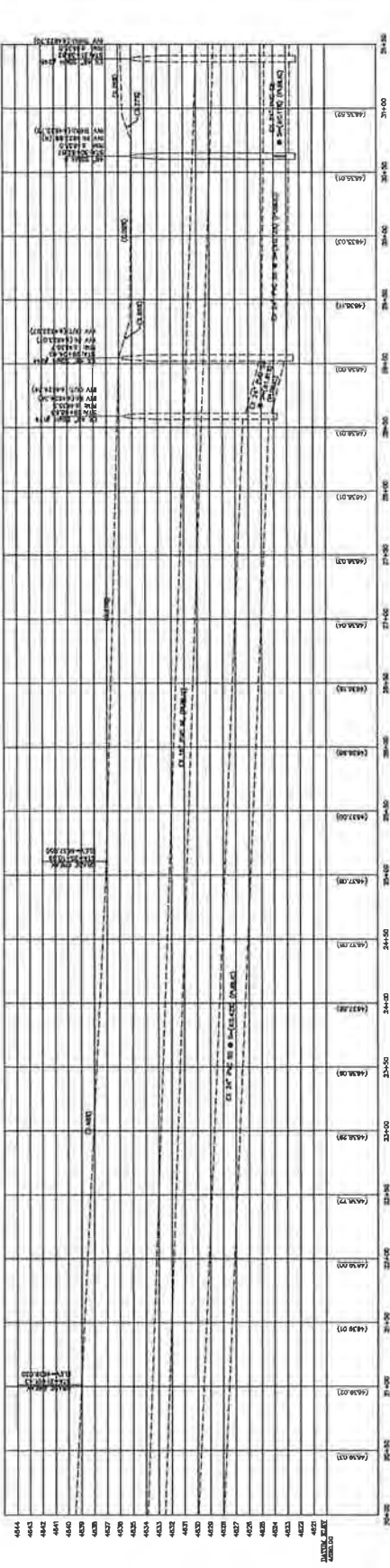
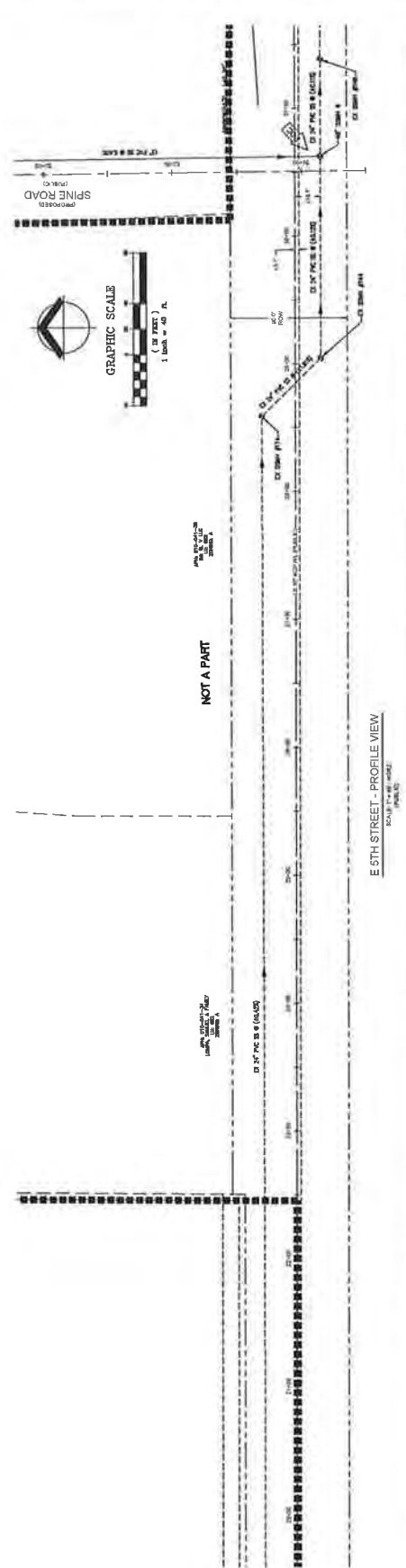
REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**



DATE

NO.

REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**

DATE

NO.

REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**

DATE

NO.

REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**

DATE

NO.

REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**

DATE

NO.

REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**

DATE

NO.

REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**

DATE

NO.

REVISION

APPROVED

**LOMPA RANCH NORTH**

**MASTER CONCEPT SANITARY SEWER**

**AND WATER SYSTEM LAYOUT**

THE RED LTD

1722 S. D. Capital Way  
Suite 2  
Lanham, MD 20655  
(702) 529-7804  
www.theredltd.com

REAL ESTATE  
ENGINEERING  
DEVELOPMENT

BLACKSTONE DEVELOPMENT

1722 S. D. Capital Way  
Suite 2  
Lanham, MD 20655  
(702) 529-7804  
www.theredltd.com

CONTACT: JOSHUA MYERS  
PHONE: 773.231.4330

DATE

NO.

APPROVED

DATE

NO.

APPROVED

DATE

NO.

APPROVED

DATE

NO.

APPROVED

DATE

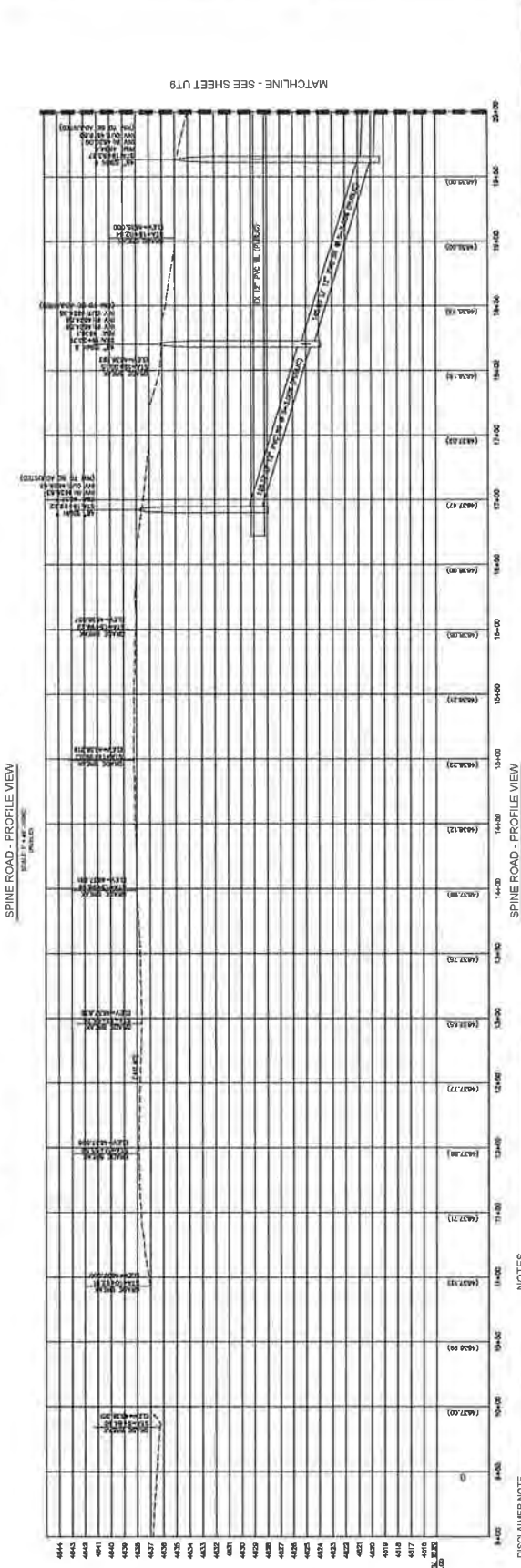
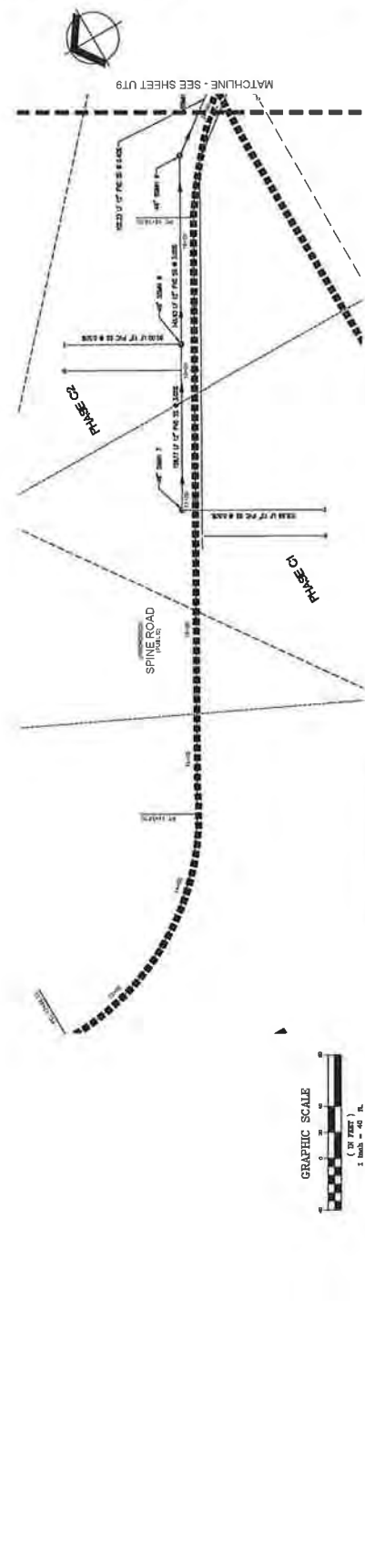
NO.

APPROVED

DATE

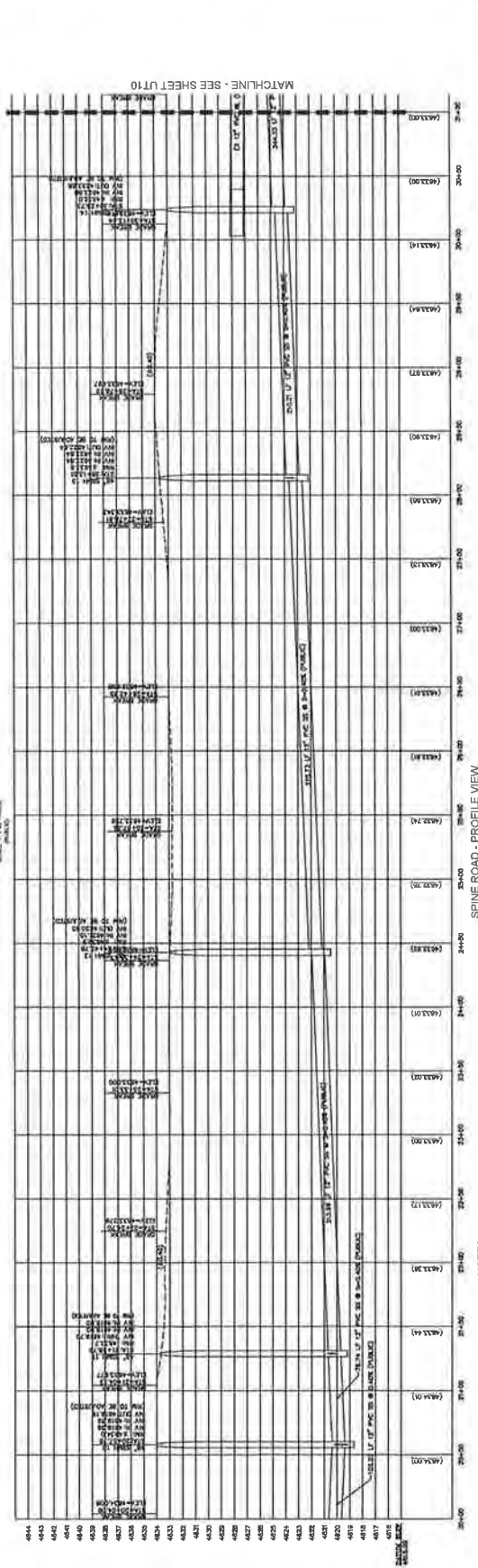
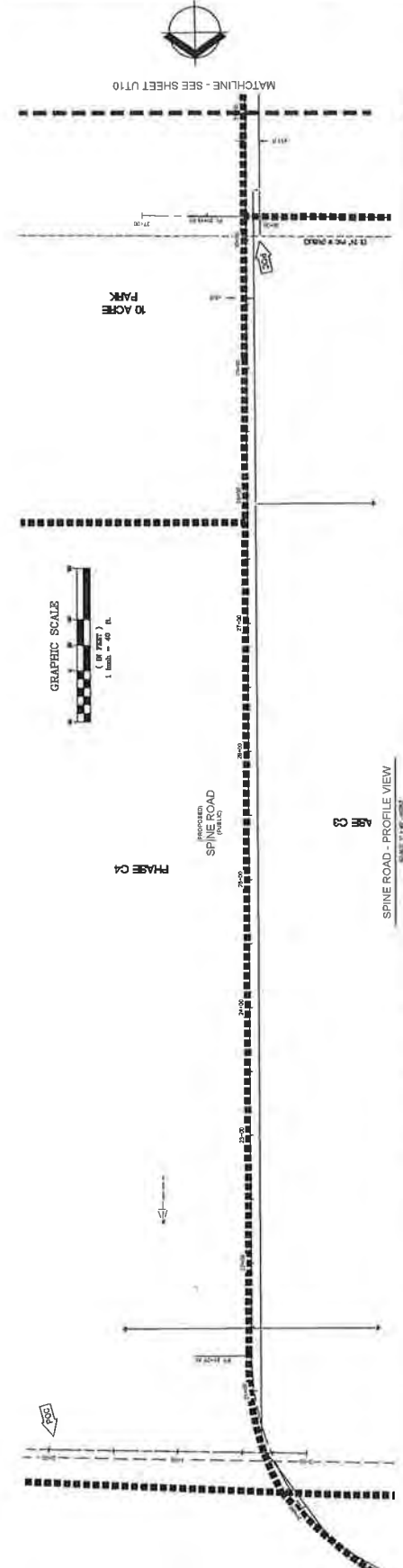
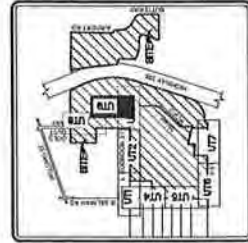
NO.

APPROVED



1-500-227-3600  
 1-500-227-3600  
 1-500-227-3600



[illegible]

[illegible]





R | REAL ESTATE • E | ENGINEERING • D | DEVELOPMENT

## BLACKSTONE RANCH PHASE 2 SANITARY SEWER FEASIBILITY STUDY

CARSON CITY, NEVADA

**Prepared for:**  
**BLACKSTONE DEVELOPMENT GROUP**

439 Plumb Lane  
Reno, Nevada 89509  
775.352.4200 p  
888.618.0620 f  
jgm@blackstonedevelopmentgroup.com

**Prepared by:**  
**The Red Ltd**

7272 S, El Capitan Way, #2  
Las Vegas, Nevada 89148  
702.325.2114 o  
702.946.0865 f  
www.TheRedLtd.com

**October 15, 2017**





R | REAL ESTATE • E | ENGINEERING • D | DEVELOPMENT

October 15, 2017  
Job No. EN-139-110

Mr. Stephen Pottéy, PE  
Carson City Development Services  
108 E. Proctor Street  
Carson City, NV 89701

**Subject: BLACKSTONE RANCH PHASE 2  
SEWER FEASIBILITY STUDY**

Dear Mr. Stephen Pottey:

The RED LTD is pleased to provide this Sanitary Sewer Feasibility Study for the Blackstone Ranch Phase 2 project. This development proposes to connect to existing utility facilities surrounding the vicinity.

Although Carson City Public Works has notified The RED LTD of the existing capacity for only a few existing sanitary sewer mains around the project site, we anticipate that the surrounding system will adequately service the proposed development.

If you have any questions or require additional information, please do not hesitate to call me at my office.

Sincerely,

Edgar León, PE  
Project Manager  
The RED LTD



## TABLE OF CONTENTS

1	GENERAL INFORMATION OF SITE .....	5
1.1	Final Proposed Sewer Alignment.....	5
1.2	Introduction.....	5
1.3	Project Site .....	5
2	SEWER GENERATION .....	6
2.1	Lot Coverage.....	6
2.2	Calculations.....	6
3	PROJECT SEWER ANALYSIS .....	8
3.1	Jurisdiction.....	8
3.2	Exiting Public Sewer Facilities .....	8
3.3	Project Outfall .....	9
4	FINAL PROPOSED PUBLIC SEWER ALIGNMNET.....	9
4.1	Final Proposed Sewer Alignment.....	9
5	ON SITE SEWER.....	10
5.1	Onsite Proposed Sewer Main Alignment.....	10
6	CONCLUSION.....	10

## TABLE OF CONTENTS (CON'T)

## APPENDICES

- 1 APPENDIX 1
  - 1.1 Vicinity Map
  - 1.2 Location Map
  - 1.3 Existing Site Topography
- 2 APPENDIX 2
  - 2.1 **Sewer Calculations**
    - 2.1.1 BLACKSTONE RANCH PHASE 2 - Sanitary Sewer Demand Analysis
    - 2.1.2 Carson City's Municipal Code Title 12.06.270
    - 2.1.3 Carson City's Municipal Code Title 12.06.280
    - 2.1.4 Hydraulic Analysis Calculations
- 3 APPENDIX 3
  - 3.1 **Sewer Alignments**
    - 3.1.1 Carson City Public Works Utility Run Book
    - 3.1.2 As-Built Drawings

**This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by The RED Ltd shall be without liability to The RED Ltd.**

## 1 GENERAL INFORMATION OF SITE

### 1.1 Final Proposed Sewer Alignment

This Preliminary Sewer Feasibility Study - Proposed Sewer Alignment report reflects the proposed right of way alignment for access, roadway, and utility purposes that was amenable to the Carson City Public Works Department from a right of way corridor perspective. The final proposed sewer alignment incorporates the research, coordination, and meetings from the previous feasibility studies with the analysis of the final proposed sewer alignment.

### 1.2 Introduction

The RED LTD was retained by Blackstone Development Group to perform a Sewer Feasibility Study for the Blackstone Ranch Phase 2 project which is within the area bound by Robinson Street, Saliman Road, 5<sup>th</sup> Street, and proposed Spine Road. This project is located south of Highway 395 (US-395) and Williams Street (US-50). The project site is approximately 58.5 +/- acres. The site is proposed to be zoned Medium to High Density Residential.

The site is currently undeveloped with existing public utility infrastructure around the vicinity of the project. The purpose of this Sewer Feasibility Study is to investigate the options for sewer service to the proposed site.

### 1.3 Project Site

#### Location:

The property is generally located west of North Saliman Road, north of 5<sup>th</sup> Street and south of Robinson Street, more specifically described as a portion of Assessor's Parcel No. 10-041-70.

See **Figure 1** for the project vicinity map and **Figure 2** for the location map. These figures are provided within Appendix 1.

## 2 SEWER GENERATION

### 2.1 Lot Coverage

For a conservative analysis, the sewer generation for the project site is based on the anticipated acreage for each phase of the project. This acreage does not regard the area for improvements such as proposed roadways.

**Table 1**  
**Project Acreage**

<b>Blackstone Ranch Phase 2</b>		
Phase	Acreage	Land Use Designation
2 (B1 & B2)	58.5	Medium Density Residential

### 2.2 Calculations

Sewer generations for developments are determined from Carson City's Municipal Code Title 12 (Water, Sewage, and Drainage). Based on Title 12.06.270, in determining the required capacities of sanitary sewers, additional maximum sewage flow from residential subdivisions, etc.; shall be considered. Based on Title 12.06.280.A., new sewer systems shall be designed on the basis of the most recent zoning and master plan, using the following minimum daily per capita contributions.

**Table 2**  
**Per Capita Design Factors**

<b>12.06.280.A. - Sanitary Sewer</b>	
Description	Per Capita Design Factors
Average daily flow rate	150 gpcd*
Minimum flow rate	90 gpcd*
Peak design flow rate for lateral sewers and interceptors serving a tributary population of less than 5,000	300 gpcd*
Peak design flow rate for interceptors serving a tributary population of 5,000 or more	250 gpcd*
Infiltration from areas of high water table	200 gal/acre/day

\* Gallons per capita per day

Based on Title 12.06.280.B., new sewer systems shall also be designed on the basis of minimum equivalent population densities.

**Table 3**  
**Population Densities**

<b>12.06.280.B. – Sanitary Sewer</b>		
<b>Description</b>	<b>Typical Zoning Land Use Classification</b>	<b>Equivalent Population Per Acre</b>
Low density residential	SF 12,000/ SF 25,000	14
Medium density residential	SF6,000/ MFD	29
High density residential	MFA	60
Commercial	LC/GC	12
Public (School-Park-Government)	P	12
Industrial district	GI/LI	12

Based on the above-mentioned, the estimated sewage flow for Blackstone Ranch Phase 2 is summarized and included within Appendix 2. Referenced Title 12.06.270 and Title 12.06.280 are also included in Appendix 2.



### 3 PROJECT SEWER ANALYSIS

#### 3.1 Jurisdiction

The proposed project is under the jurisdiction of Carson City Public Works. The Mandatory Sewer Connection Program was created and defined by Resolution No. 1995-R-31. The resolution requires that all properties in the designated areas must sewer using the Carson City sewer system, as it becomes available.

#### 3.2 Exiting Public Sewer Facilities

Refer to the “Concept Sewer and Water System Phasing Plan - Lompa Ranch North SPA” within Appendix 1 in reference to the following information.

18” Main on Robinson Street: Per the Carson City Public Works Utility Run Books, the existing public sewer in the vicinity of the project site includes an 18” main on Robinson Street, just east of Saliman Road. Carson City Public Works recently stated that this main is currently at 45% capacity. Although the High School Sewer Project asbuilts depict a 21” main, an 18” main was assumed to be the case to be conservative.

48” Main, South of Proposed Phase D2: The existing 18” main mentioned above connects to a 33” main at proposed Phase C2. This 33” main conveys wastewater southeast across proposed Phase C4 and thereafter becomes a 48” main before crossing US-395. This 48” main runs just south of Phase D2 and conveys wastewater flows to the east toward the intersection of Butti Way and Airport Road. This main is currently at 25% capacity.

8” Main on Saliman Road: An 8” main exists along Saliman Road, between Robinson Street and 5th Street. Carson City Public Works does not currently have asbuilt drawings for this sanitary sewer and the current capacity is unknown.

24” Main on 5<sup>th</sup> Street: A 24” main exists along 5<sup>th</sup> Street, between Saliman Road and US-395. Just east of Saliman Road, Carson City Public Works does not currently have asbuilt drawings for this main. The current capacity is unknown.

18” Main on Existing Easement: An 18” main exists along a utility easement that runs north-south, just west of Airport Road. This main connects to the 48” main just south of Phase D2. The current capacity is unknown.

See **Appendix 3** for existing sewer information received from Carson City Public Works.

### 3.3 Project Outfall

Based on existing topography, the lowest point of Blackstone Ranch Phase 2 appears to be located northeast of the project, near the easterly end of Robinson Street. However, the existing 18" public sewer on Robinson Street and the 8" main on Saliman Road (mentioned in Section 3.2) allow for preliminary points-of-connection and adequate slopes in the future onsite gravity sewer lines servicing the individual parcels within Blackstone Ranch Phase 2.

See **Appendix 1** for the exiting site topography.

## 4 FINAL PROPOSED PUBLIC SEWER ALIGNMENT

### 4.1 Existing and Proposed Sewer Alignment

The current streets and easements surrounding this project allows for connectivity to the existing public sewer facilities. Phase A1 of the Lompa Ranch North SPA is anticipated to be constructed prior to Blackstone Ranch Phase 2. Therefore, Phase A1 of the Lompa Ranch North SPA is referenced and noted in this report.

Phase A1: It is proposed that the Point-of-Connection (POC) for Blackstone Ranch Phase 2 will be at the 18" main on Robinson Street. Per the analysis in Section 2 of this report, it is anticipated that the Peak Design Flow Rate for Phase A1 will be approximately 322,625 gpd ( $\pm 0.50$  cfs). To reiterate, the existing 18" main was described to be at 45% capacity by Carson City Public Works. The results of the hydraulic analysis for the existing 18" main with an additional proposed 0.50 cfs for Phase A1 are as follows. The results of the hydraulic analysis indicate that the 18" main on Robinson Street should adequately service Phase A1.

- Depth of Flow: 0.68"
- Velocity: 36.05 ft/sec
- Percent Full: 45.5%

Proposed Blackstone Ranch Phase 2 consists of Phase B1 and B2 of the Lompa Ranch North SPA.

Phase B1 (North-Half): Due to likely future depth of cover constraints for the SS main, the north-half of proposed Phase B1 will be obligated to continue the existing main on Robinson Street further east along its frontage with a 12" main. It is assumed and proposed that the POC for the north-half of Phase B1 will be at this 12" SS main extension. It is anticipated that the Peak Design Flow Rate for the north-half of Phase B1 will be approximately 105,125 gpd ( $\pm 0.16$  cfs). This is half of the total Peak Design Flow Rate for Phase B1. Hydraulic analysis for the proposed 12" main extension is as follows:

- Depth of Flow: 0.22'
- Velocity: 1.28 ft/sec
- Percent Full: 21.7%

*Therefore, the 12" sanitary sewer main on Robinson Street can adequately service the north-half of Phase B1.*

Phase B1 (South-Half) & Phase B2: Due to likely future constraints regarding depth of cover for the sanitary sewer main, the northernmost portion of proposed Phase B2 may be forced to extend a 12" main from the north. This concept is depicted on the Master Sewer & Water Plans. Due to the uncertainties of future grading, this report assumes that the south-half of Phase B1 and Phase B2 will be able to connect to a proposed 12" main along future Spine Road. This proposed 12" main is proposed to slope downward toward the south where a Point-of-Connection will be established with the existing 24" sanitary sewer main on East 5<sup>th</sup> Street. It is anticipated that the Peak Design Flow Rate for the south-half of Phase B1 and Phase B2 will be approximately 301,600 gpd ( $\pm 0.47$  cfs). Hydraulic analysis for the proposed 12" main extension along Spine Road is as follows:

- Depth of Flow: 0.38'
- Velocity: 1.73 ft/sec
- Percent Full: 37.7%

*Therefore, the 12" main on Spine Road can adequately service the south-half of Phase B1 as well as Phase B2.*

## **5 ON SITE SEWER**

### **5.1 Onsite Proposed Sewer Main Alignments**

The proposed Points-of-Connection shown on the Master Conceptual Sanitary Sewer and Water System Layout Plans (presented with this report) is for preliminary planning and discussion purposes only. The onsite sewer size is conceptually sized at 8". Due to the preliminary stage of the project, the onsite sewer main alignment's size may vary as the design of the onsite sewer facilities for Blackstone Ranch Phase 2 move forward. The actual onsite sewer main alignment may vary depending on further detailed coordination with the other onsite utilities and roadways. The preliminary sewer improvements proposed are at adequate depths to provide gravity sewer service for the project.

## **6 CONCLUSION**

Based on the information provided to The RED LTD, the proposed sanitary sewer improvements for Blackstone Ranch Phase 2 represents the preferred manner to proceed due to geographical constraints and the future roadway connectivity. The existing sanitary sewer system has the capacity to adequately service the proposed development based on the available information that was analyzed.

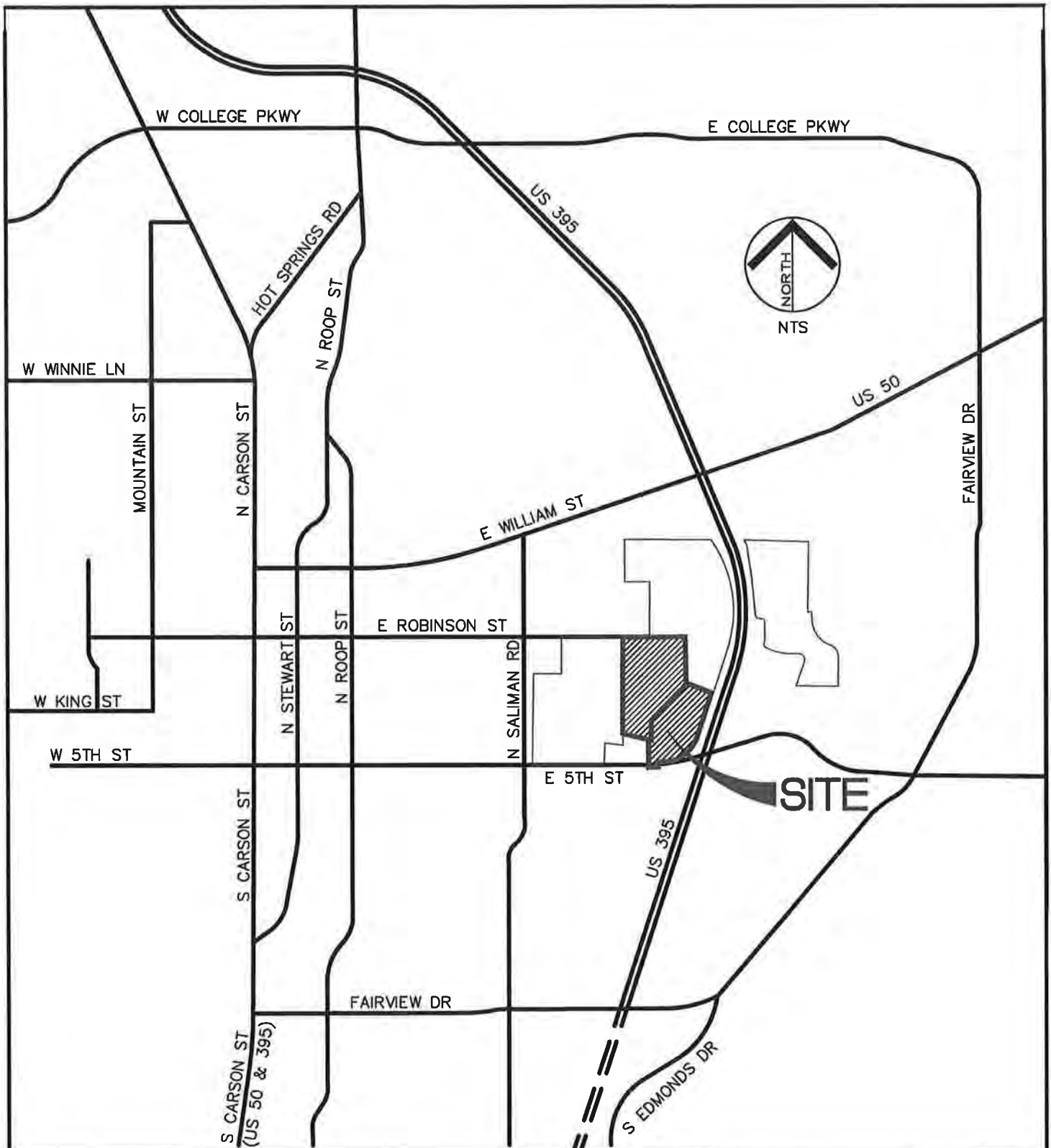
## Appendix 1

---

### BLACKSTONE RANCH PHASE 2

- Vicinity Map
- Location Map
- Existing Site Topography
- Lompa Ranch West Phasing Plan
- Lompa Ranch East Phasing Plan
- SPA Development and Infrastructure Phasing Plan
- SPA Overall Utility Plan

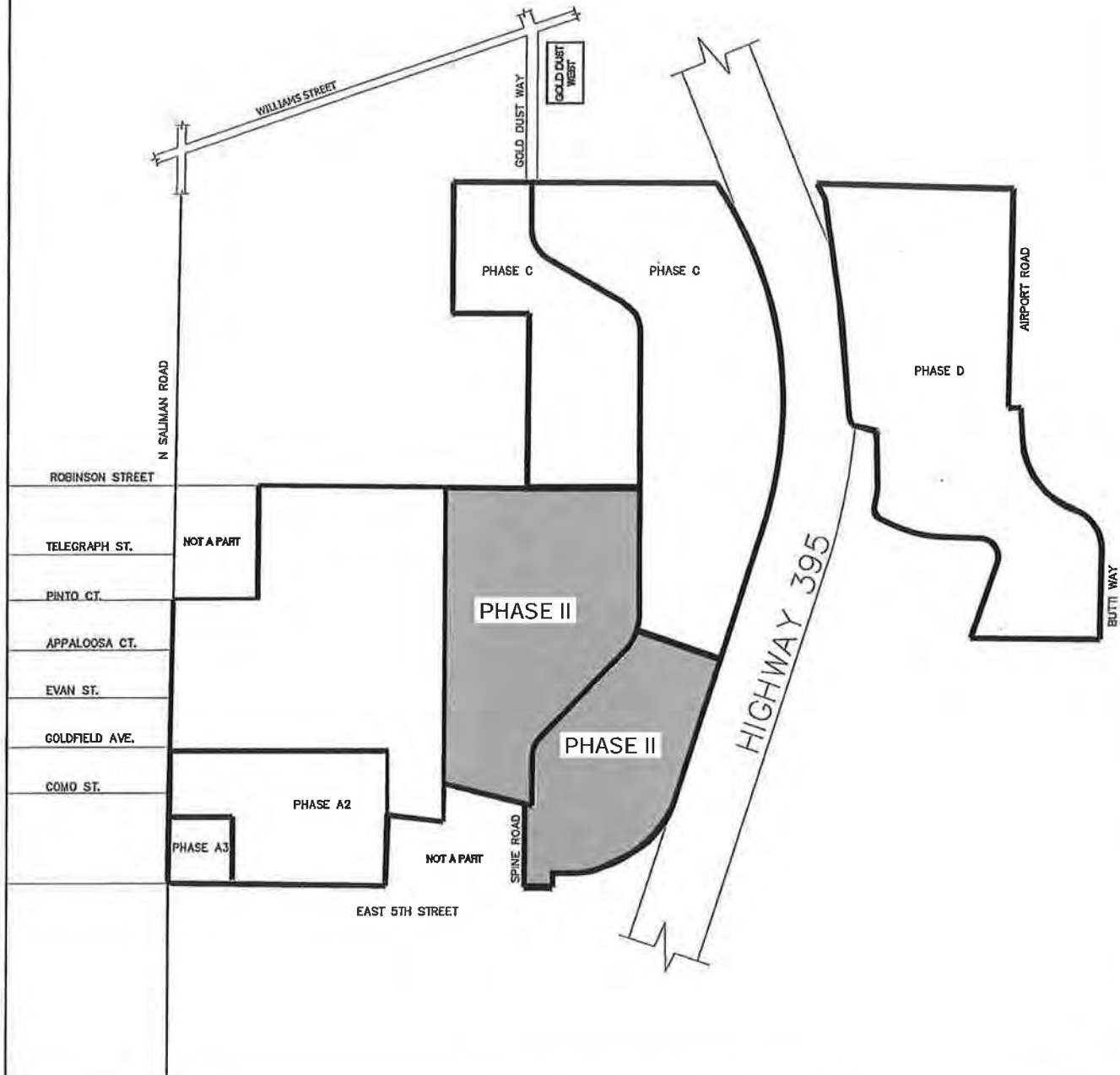




## BLACKSTONE RANCH PHASE II

### Figure 1 | Vicinity Map

R | REAL ESTATE • E | ENGINEERING • D | DEVELOPMENT



## BLACKSTONE RANCH PHASE II

### Figure 2 | Location Map

R | REAL ESTATE • E | ENGINEERING • D | DEVELOPMENT



## CARSON CITY, NEVADA



## CARRISON CITY, NEVADA









## Appendix 2

---

### SEWER CALCULATIONS

- Blackstone Ranch Phase 2 – Sanitary Sewer Demand Analysis
- Carson City's Municipal Code Title 12.06.270
- Carson City's Municipal Code Title 12.06.280
- Hydraulic Analysis Calculations

## SANITARY SEWER DEMAND ANALYSIS

Lompa Ranch Phase 1 (Considered as Existing Phase A1 and Phase A2)												
Phase	Acreage	Land Use Designation	Existing Zoning	Proposed Zoning	Allowed Dwelling Units (Per Acre)	Proposed Dwelling Units (Per Acre)	Equivalent Population per Acre (12,06,270.B)	Population Estimate	Average Daily Flow Rate (150 gpcd)	Minimum Daily Flow Rate (90 gpcd)	Peak Design Flow Rate (250 gpcd)	Infiltration (200 gal/acre/day)
A1	44.5	Medium Density Residential	SF6	SF6	3 - 8	4.2	29	1,291	193,575	116,145	322,625	8,900
A2	17.5	High Density Residential	MFA	MFA	Up to 32	20.0	60	1,050	157,500	94,500	262,500	3,500
A3	4	Commercial	NB	NB			12	48	7,200	4,320	12,000	800
Totals	66							2,389	358,275	214,965	597,125	13,200
Blackstone Ranch Phase 2												
Phase	Acreage	Land Use Designation	Existing Zoning	Proposed Zoning	Allowed Dwelling Units (Per Acre)	Proposed Dwelling Units (Per Acre)	Equivalent Population per Acre (12,06,270.B)	Population Estimate	Average Daily Flow Rate (150 gpcd)	Minimum Daily Flow Rate (90 gpcd)	Peak Design Flow Rate (250 gpcd)	Infiltration (200 gal/acre/day)
B1	29	Medium Density Residential	SF6	SF6	3 - 8	4.5	29	841	126,150	75,690	210,250	5,800
B2	27.1	Medium Density Residential	MFD	MFD	Up to 2	3.0	29	786	117,885	70,731	196,475	5,420
Total EAST	56.1							1,627	244,035	146,421	406,725	798,808

### NOTES:

The total acreage shown above varies from the Lompa Ranch Specific Plan Area (dated January 14, 2016) due to regard for proposed right-of-way areas such as roadways. Note: Gallons per Capita, per Day (gpcd)

A 15" Sanitary Sewer main at full flow has the capacity to accommodate approximately 2,952,000 gallons per day (gpd). A 15" Sanitary Sewer main also has the capacity to accommodate approximately 2,691,360 gallons per day (gpd) at 75% capacity.

A 12" Sanitary Sewer main at full flow has the capacity to accommodate approximately 1,628,035 gallons per day (gpd). A 12" Sanitary Sewer main also has the capacity to accommodate approximately 1,484,640 gallons per day (gpd) at 75% capacity.

Due to the availability of exiting Sanitary Sewer mains within the vicinity of the Lompa Ranch Specific Plan Area project, it is anticipated that 12" Sanitary Sewer mains will adequately service the site at full build-out. Each project phase shall analyze, validate capacity, and upgrade any Sanitary Sewer improvement as needed.



**12.06.270 - Sanitary sewer design standards and specifications—Factors.**

In determining the required capacities of sanitary sewers, the following factors shall be considered:

- A. Maximum hourly sewage flow;
- B. Additional maximum sewage or waste flow from industrial plants, institutions, residential subdivisions, etc.;
- C. Groundwater infiltration;
- D. Topography of area to be sewerred;
- E. Location of waste treatment plant;
- F. Depth of excavation;
- G. Pumping requirements.

(Ord. 1977-12 (part), 1977).

**12.06.280 - Sanitary sewer design standards and specifications—Basis.**

- A. Per Capita Flow. New sewer systems shall be designed on the basis of the most recent zoning and master plan, using the following minimum daily per capita contributions:

	<b>Per Capita Design Factors</b>
Average daily flow rate	150 gpcd*
Minimum flow rate	90 gpcd*
Peak design flow rate for lateral sewers and interceptors serving a tributary population of less than 5,000	300 gpcd*
Peak design flow rate for interceptors serving a tributary population of 5,000 or more	250 gpcd*
Infiltration from areas of high water table	200 gal/acre/day.

\* Gallons per capita per day



- B. Population Densities. The following are minimum equivalent population densities for use in computing typical sewage contributions:

	<b>Typical Zoning Land Use Classification</b>	<b>Equivalent Population Per Acre</b>
Low density residential	SF12,000/ SF25,000	14
Medium density residential	SF6,000/ MFD	29
High density residential	MFA	60
Commercial	LC/GC	12
Public (School-Park-Government)	P	12
Industrial district	GI/LI	12

A report on estimated sewage flow shall be submitted for each proposed project. When deviations from the foregoing per capita flows and occupancy rates are demonstrated, a description of the design shall be included in the report, and the department may allow such deviations. Flow generation and peaking factors may be per recommended standards for wastewater facilities (ten states standards).

(Ord. 1995-36 § 4, 1995: Ord. 1977-12 (part), 1977).

## Robinson St - Ex 18" SS @ 45% Capacity (Phase A1)

### Project Description

Friction Method	Manning Formula
Solve For	Discharge

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.68	ft
Diameter	1.50	ft

### Results

Discharge	2.80	ft³/s
Flow Area	0.78	ft²
Wetted Perimeter	2.22	ft
Hydraulic Radius	0.35	ft
Top Width	1.49	ft
Critical Depth	0.64	ft
Percent Full	45.3	%
Critical Slope	0.00509	ft/ft
Velocity	3.60	ft/s
Velocity Head	0.20	ft
Specific Energy	0.88	ft
Froude Number	0.88	
Maximum Discharge	7.15	ft³/s
Discharge Full	6.64	ft³/s
Slope Full	0.00071	ft/ft
Flow Type	SubCritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	45.33	%
Downstream Velocity	Infinity	ft/s

---

**Robinson St - Ex 18" SS @ 45% Capacity (Phase A1)**

---

**GVF Output Data**

Upstream Velocity	Infinity	ft/s
Normal Depth	0.68	ft
Critical Depth	0.64	ft
Channel Slope	0.00400	ft/ft
Critical Slope	0.00509	ft/ft

## Robinson St - Ex 18" SS @ 45% Capacity (Phase A1)

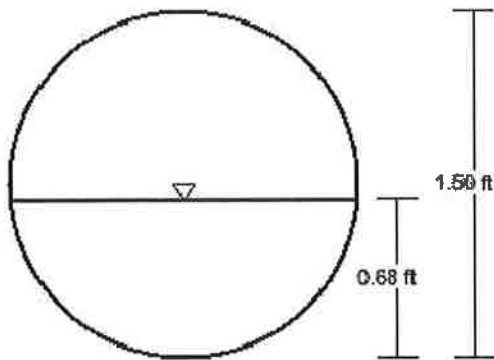
### Project Description

Friction Method                      Manning Formula  
Solve For                              Discharge

### Input Data

Roughness Coefficient	0.013
Channel Slope	0.00400    ft/ft
Normal Depth	0.68    ft
Diameter	1.50    ft
Discharge	2.80    ft <sup>3</sup> /s

### Cross Section Image



V: 1  
H: 1

## Robinson St - Ex 18" SS + 0.50 CFS (Phase A1)

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Diameter	1.50	ft
Discharge	3.30	ft³/s

### Results

Normal Depth	0.75	ft
Flow Area	0.88	ft²
Wetted Perimeter	2.35	ft
Hydraulic Radius	0.37	ft
Top Width	1.50	ft
Critical Depth	0.69	ft
Percent Full	49.8	%
Critical Slope	0.00520	ft/ft
Velocity	3.75	ft/s
Velocity Head	0.22	ft
Specific Energy	0.97	ft
Froude Number	0.86	
Maximum Discharge	7.15	ft³/s
Discharge Full	6.64	ft³/s
Slope Full	0.00099	ft/ft
Flow Type	SubCritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	49.79	%
Downstream Velocity	Infinity	ft/s



---

**Robinson St - Ex 18" SS + 0.50 CFS (Phase A1)**

---

**GVF Output Data**

Upstream Velocity	Infinity	ft/s
Normal Depth	0.75	ft
Critical Depth	0.69	ft
Channel Slope	0.00400	ft/ft
Critical Slope	0.00520	ft/ft

## Robinson St - Ex 18" SS + 0.50 CFS (Phase A1)

### Project Description

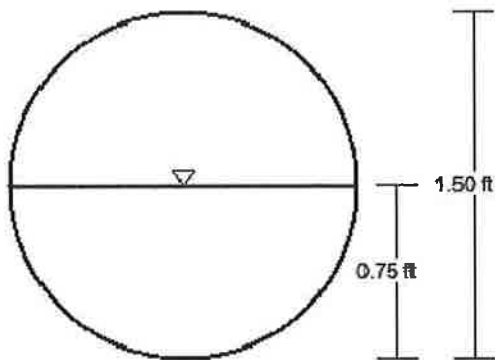
Friction Method                      Manning Formula

Solve For                              Normal Depth

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.75	ft
Diameter	1.50	ft
Discharge	3.30	ft <sup>3</sup> /s

### Cross Section Image



V: 1  
H: 1

## Lompa Ranch Blvd Prop 12" SS + 0.47 CFS (B2 & South-Half Phase B1)

### Project Description

Friction Method                      Manning Formula

Solve For                              Normal Depth

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00190	ft/ft
Diameter	1.00	ft
Discharge	0.47	ft³/s

### Results

Normal Depth	0.38	ft
Flow Area	0.27	ft²
Wetted Perimeter	1.32	ft
Hydraulic Radius	0.21	ft
Top Width	0.97	ft
Critical Depth	0.28	ft
Percent Full	37.7	%
Critical Slope	0.00563	ft/ft
Velocity	1.73	ft/s
Velocity Head	0.05	ft
Specific Energy	0.42	ft
Froude Number	0.58	
Maximum Discharge	1.67	ft³/s
Discharge Full	1.55	ft³/s
Slope Full	0.00017	ft/ft
Flow Type	SubCritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	37.73	%
Downstream Velocity	Infinity	ft/s

---

**Lompa Ranch Blvd Prop 12" SS + 0.47 CFS (B2 & South-Half Phase B1)**

---

**GVF Output Data**

Upstream Velocity	Infinity	ft/s
Normal Depth	0.38	ft
Critical Depth	0.28	ft
Channel Slope	0.00190	ft/ft
Critical Slope	0.00563	ft/ft

## Lompa Ranch Blvd Prop 12" SS + 0.47 CFS (B2 & South-Half Phase B1)

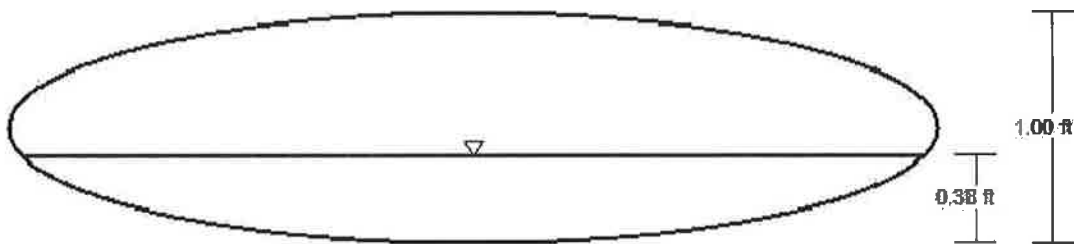
### Project Description

Friction Method                      Manning Formula  
Solve For                                Normal Depth

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00190	ft/ft
Normal Depth	0.38	ft
Diameter	1.00	ft
Discharge	0.47	ft <sup>3</sup> /s

### Cross Section Image



V: 1  
H: 4

## Robinson St - Prop 12" SS + 0.16 CFS (North-Half of Phase B1)

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00190	ft/ft
Diameter	1.00	ft
Discharge	0.16	ft³/s

### Results

Normal Depth	0.22	ft
Flow Area	0.13	ft²
Wetted Perimeter	0.97	ft
Hydraulic Radius	0.13	ft
Top Width	0.82	ft
Critical Depth	0.16	ft
Percent Full	21.7	%
Critical Slope	0.00597	ft/ft
Velocity	1.28	ft/s
Velocity Head	0.03	ft
Specific Energy	0.24	ft
Froude Number	0.58	
Maximum Discharge	1.67	ft³/s
Discharge Full	1.55	ft³/s
Slope Full	0.00002	ft/ft
Flow Type	SubCritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	21.67	%
Downstream Velocity	Infinity	ft/s



---

**Robinson St - Prop 12" SS + 0.16 CFS (North-Half of Phase B1)**

---

**GVF Output Data**

Upstream Velocity	Infinity	ft/s
Normal Depth	0.22	ft
Critical Depth	0.16	ft
Channel Slope	0.00190	ft/ft
Critical Slope	0.00597	ft/ft

## Robinson St - Prop 12" SS + 0.16 CFS (North-Half of Phase B1)

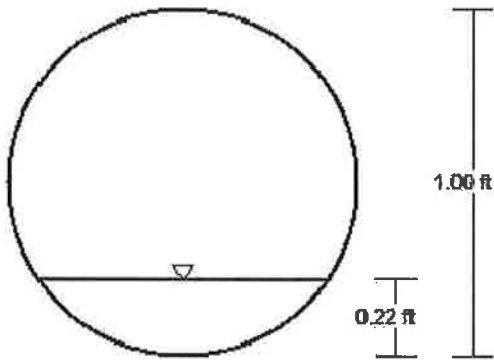
### Project Description

Friction Method                      Manning Formula  
Solve For                              Normal Depth

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00190	ft/ft
Normal Depth	0.22	ft
Diameter	1.00	ft
Discharge	0.16	ft <sup>3</sup> /s

### Cross Section Image



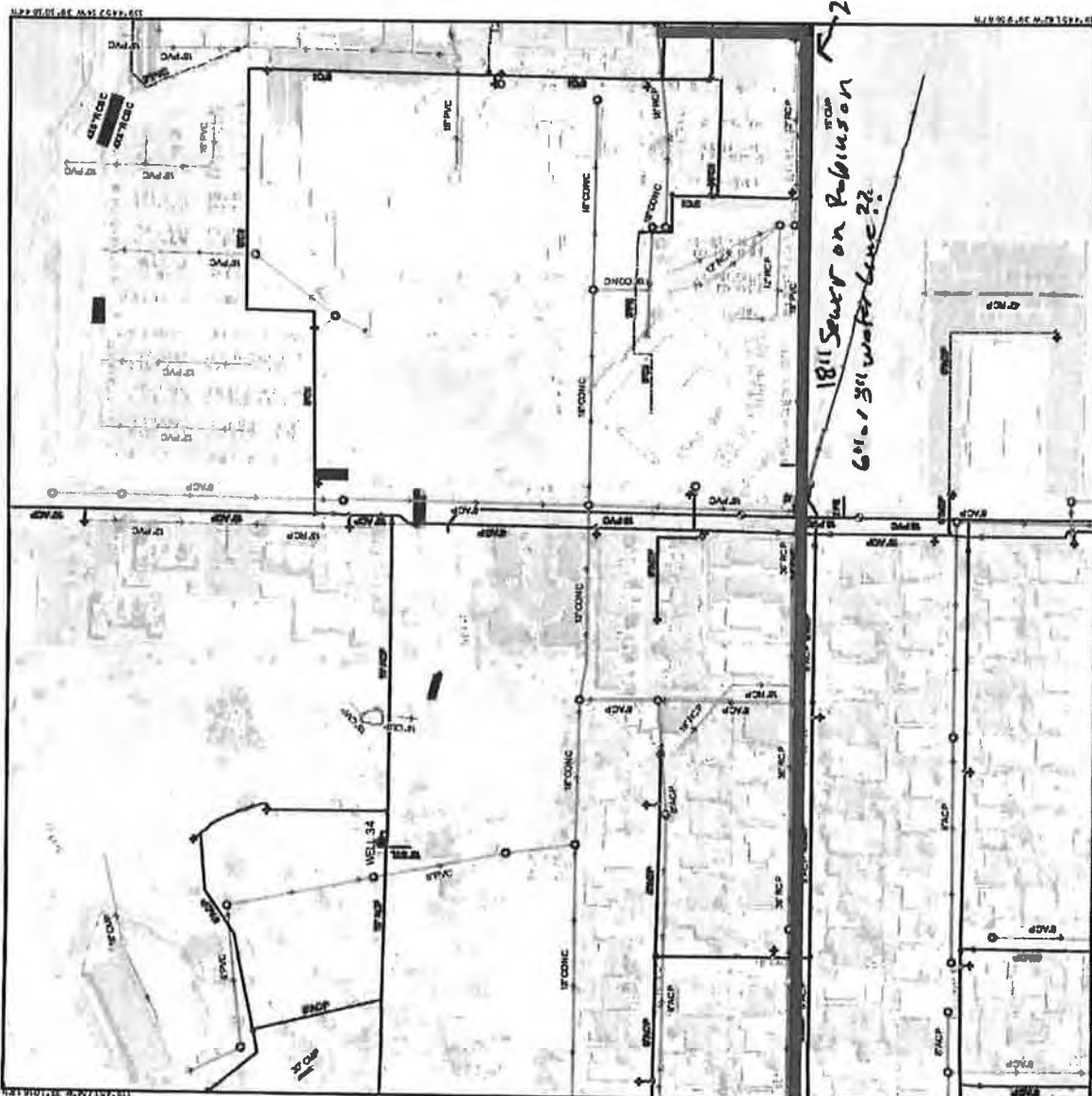
V: 1  
H: 1

## Appendix 3

---

### REFERENCE DRAWINGS

- Carson City Public Works Utility Run Book
- Asbuilt Drawings



# Carson City Public Works Utility Run Book



- Legend**

  - Detail Boundary
  - Proposed Freeway
  - Carson City Boundary
- Water Features**

  - Fire Hydrant
  - Fire Service
  - Pressure Reducing Valve
  - Flush Out
  - Intake
  - Reducer
  - Single Check Valve
  - Treatment Plant
  - Fire Hydrant Valve
  - Water Zone Valve
  - Closed Valve
  - Gate Valve
  - Butterfly Valve
  - Booster
  - Back Flow Device
  - Air Release Valve
  - Well
  - Water Tank
  - Water Pipe
  - Ownership
  - Rubic
  - Private
  - State
- Sewer Features**

  - Cleanout
  - Lift Station
  - Drop Manhole
  - Sewer Manhole
  - Sewer Valve
  - Forced Main
  - Gravity Main
  - Gravity Main (Private)
- Storm Drain Features**

  - Out Fall
  - Out Fall End
  - V-Ditch
  - Channel Crest
  - Manhole
  - Catch Basin
  - Sump Pipe
  - Weather Station
  - RC Boxed Culvert (State)
  - Hydrology Channel
  - Basin
- Reclaimed Features**

  - Velvet Outlet
  - Vent
  - Valve
  - Reducer
  - Inlet
  - Manhole
  - Drain
  - Drop Inlet
  - Blow off Assembly
  - Cutoff Wall
  - Cardleg Joint
  - C/Air Release Valve
  - Butterfly Valve
  - Air Release Valve
  - Air Vacuum Valve Assembly
  - Elect Pull Box
  - Rig Launching Station
  - Cathodic Test Station
  - Flange
  - Cathodic Wire
  - Telemetry
  - Reclaim Pipe
  - Reclaim Pipe Encased

12/11/2013  
Adjacent Pages

CL15	CL15	CL15
CL16	CL16	CL16
CL17	CL17	CL17

24" Water Transmission  
18" Sewer on Robinson  
6" - 18" water line

Douglas County  
GIS Department  
P.O. Box 218  
1615 8th Street  
Minden, NV 89423  
(775) 782-9894

Photos Flown: 2010

1 buch = 200 khal

1 buch = 200 Mal

## Reclaimed Features

- Valved Outlet  
Vent  
Valve

Methods

- Drain  
Drop Inlet  
Blow off Assembly

### Cutoff Wall

- Cardiac Joint

**C Air Release Valve**

- Buttery Valve  
 Air Release Valve  
 Air Vacuum Valve Assem  
 Elect Pull Box

### Ag Launching Station

- Cathodic Test Station  
Flange  
— Cathodic Wire

## Telemetry

- Reclaim Pipe
- Reclaim Pipe Encased

- 013

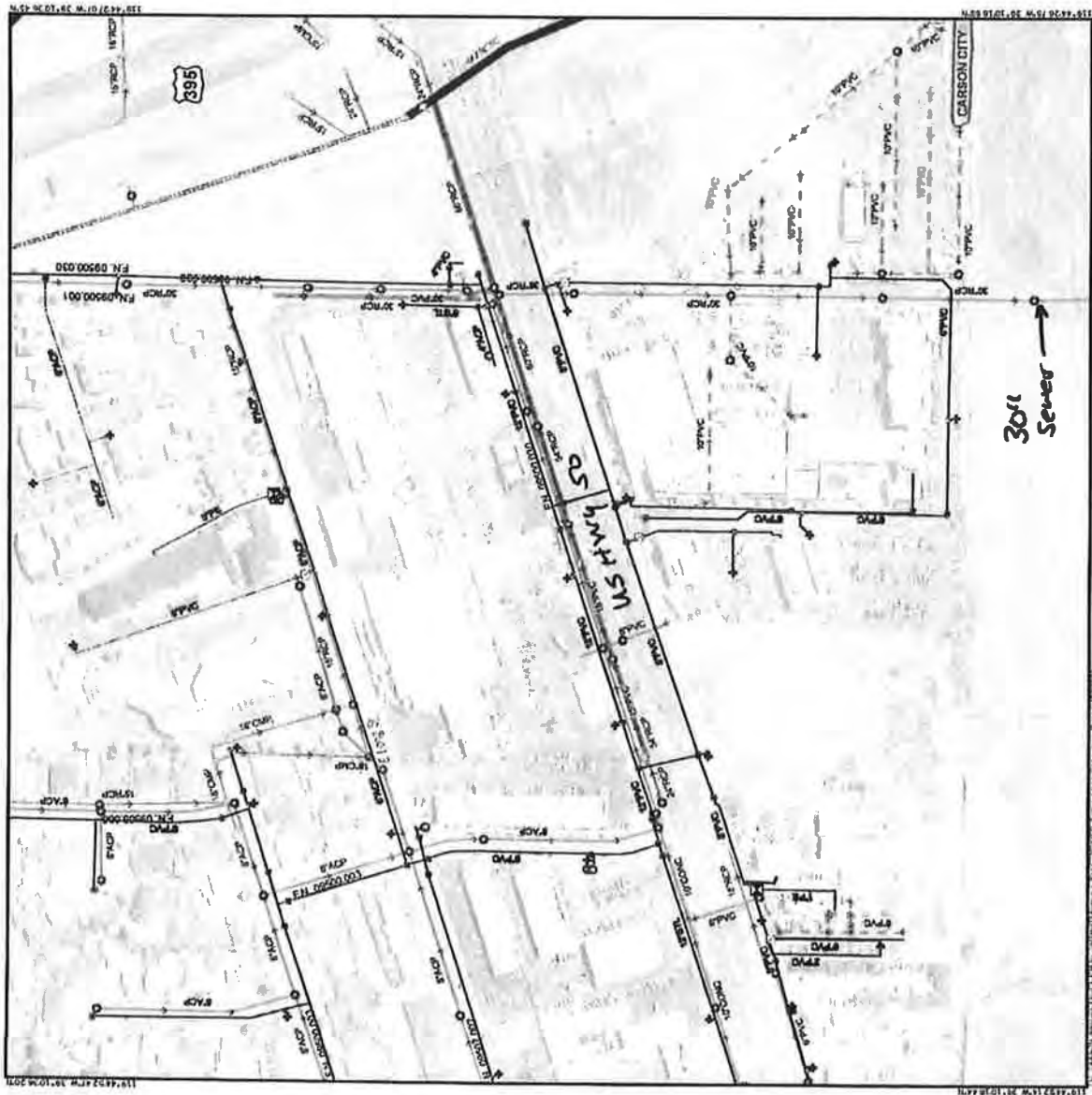
Q16	Q16	Q16	Q16
Q17	Q17	Q17	Q17
Q18	Q18	Q18	Q18

[illegible]

Page: CL17

Douglas County  
GIS Department  
P.O. Box 218  
1615 8th Street  
Minden, NV 89423  
(775) 782-9894

Photos Flown: 2010



# Carson City Public Works Utility Run Book



- Legend**

  - Detail Boundary
  - Proposed Freeway
  - Carson City Boundary
- Water Features**

  - Fire Hydrant
  - Fire Service
  - Pressure Reducing Valve
  - Flush Out
  - Intake
  - Reducer
  - Single Check Valve
  - Treatment Plant
  - Fire Hydrant Valve
  - Water Zone Valve
  - Closed Valve
  - Gate Valve
  - Butterfly Valve
  - Booster
  - Back Flow Device
  - Air Release Valve
  - Well
  - Water Tank
  - Water Pipe
  - Ownership
  - Public
  - Private
  - State
- Sewer Features**

  - Cleanout
  - Lift Station
  - Drop Manhole
  - Sewer Manhole
  - Sewer Valve
  - Forced Main
  - Gravity Main
  - Gravity Main (Private)
- Storm Drain Features**

  - Out Fall
  - Out Fall End
  - V-Ditch
  - Channel Crest
  - Manhole
  - Catch Basin
  - Storm Pipe
  - Weather Station
  - RC Boxed Culvert (State)
  - Hydrology Channel
  - Basin
- Reclaimed Features**

  - Valved Outlet
  - Vent
  - Valve
  - Reducer
  - Inlet
  - Manhole
  - Drain
  - Drop Inlet
  - Blow off Assembly
  - Cutoff Wall
  - Cardigan Joint
  - C/Air Release Valve
  - Butterfly Valve
  - Air Release Valve
  - Air Vacuum Valve Assembly
  - Elect Pull Box
  - Pig Launching Station
  - Cathodic Test Station
  - Flange
  - Cathodic Wire
  - Telemetry
  - Reclaim Pipe
  - Reclaim Pipe Encased

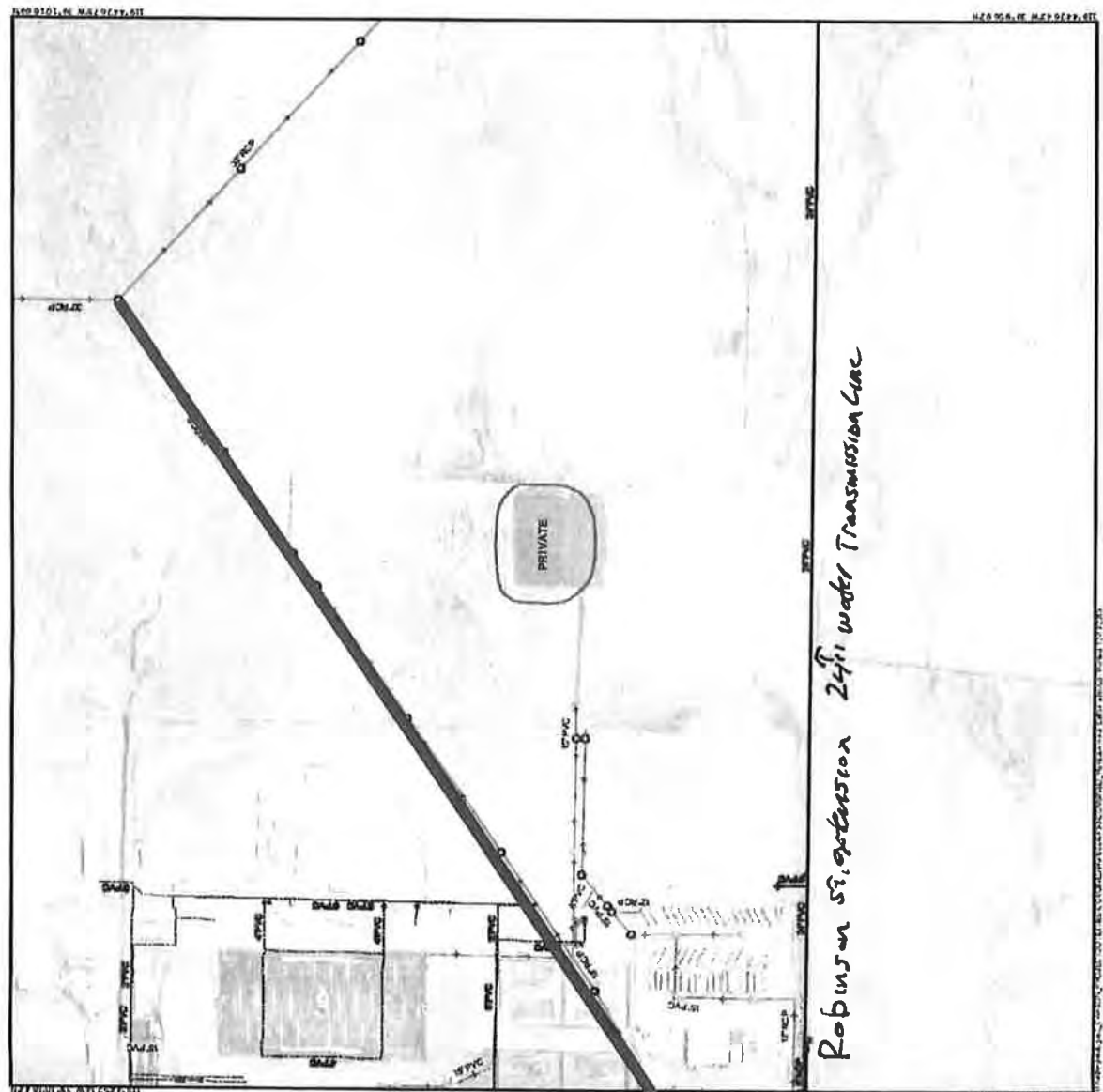
10/8/2012  
Adjacent Pages



Douglas County  
GIS Department  
P.O. Box 238  
1615 8th Street  
Minden, NV 89423  
(775) 782-9894

Photos Flown: 2010





# Carson City Public Works Utility Run Book



- Legend**

  - Detail Boundary
  - Proposed Freeway
  - Carson City Boundary
- Water Features**

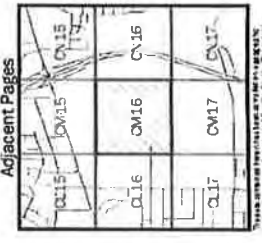
  - Fire Hydrant
  - Fire Service
  - Pressure Reducing Valve
  - Flush Out
  - Inlet
  - Reducer
  - Single Check Valve
  - Treatment Plant
  - Fire Hydrant Valve
  - Water Zone Valve
  - Closed Valve
  - Gate Valve
  - Butterfly Valve
  - Booster
  - Back Flow Device
  - Air Release Valve
  - Well
  - Water Tank
  - Water Pipe
  - Ownership
  - Public
  - Private
  - State
- Sewer Features**

  - Cleanout
  - Lift Station
  - Drop Manhole
  - Sewer Manhole
  - Sewer Valve
  - Forced Main
  - Gravity Main
  - Gravity Main (Private)
- Storm Drain Features**

  - Out Fall
  - Out Fall End
  - V-Box
  - Channel Crest
  - Manhole
  - Catch Basin
  - Storm Pipe
  - Weather Station
  - RC Boxed Culvert (State)
  - Hydrology Channel
  - Basin
- Reclaimed Features**

  - Valved Outlet
  - Vent
  - Valve
  - Reducer
  - Inlet
  - Manhole
  - Drain
  - Drop Inlet
  - Box off Assembly
  - Cutoff Wall
  - Cardigan Joint
  - C-Air Release Valve
  - Butterfly Valve
  - Air Release Valve
  - Air Vacuum Valve Assembly
  - Elect Pull Box
  - Pig Launching Station
  - Cathodic Test Station
  - Flange
  - Cathodic Wire
  - Telemetry
  - Reclaim Pipe
  - Radial Pipe Encased

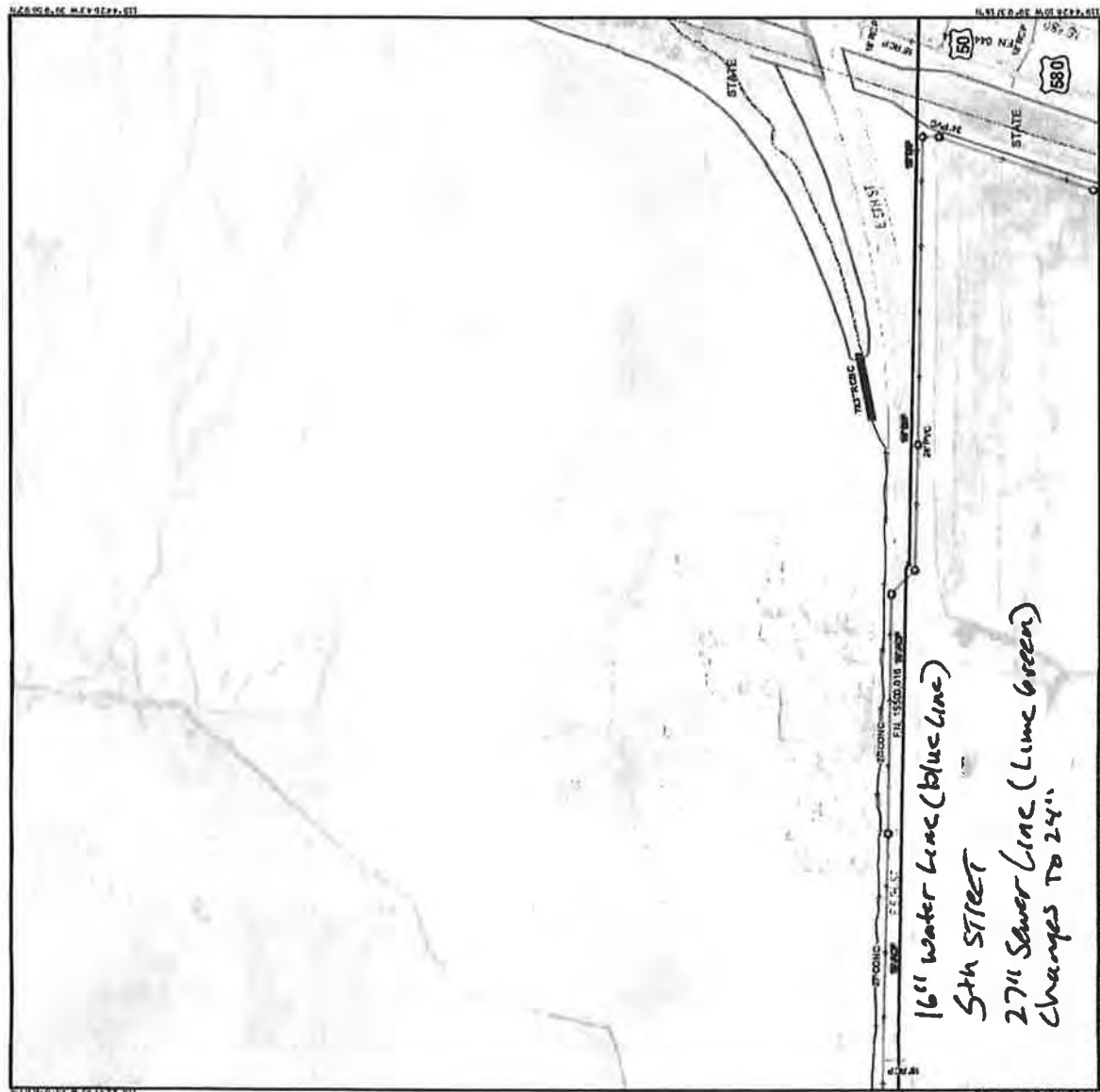
12/11/2013



Page: CM16

Douglas County  
GIS Department  
P.O. Box 218  
3515 8th Street  
Minden, NV 89423  
(775) 782-9884

Photos Flown: 2010



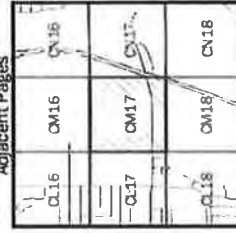
# Carson City Public Works Utility Run Book



- | Legend |                      |
|--------|----------------------|
|        | Detail Boundary      |
|        | Proposed Freeway     |
|        | Carson City Boundary |
- 
- | Water Features |                         |
|----------------|-------------------------|
|                | Fire Hydrant            |
|                | Fire Service            |
|                | Pressure Reducing Valve |
|                | Flush Out               |
|                | Inlet                   |
|                | Reducer                 |
|                | Single Check Valve      |
|                | Treatment Plant         |
|                | Fire Hydrant Valve      |
|                | Water Zone Valve        |
|                | Closed Valve            |
|                | Gate Valve              |
|                | Butterfly Valve         |
|                | Booster                 |
|                | Back Flow Device        |
|                | Air Release Valve       |
|                | Well                    |
|                | Water Tank              |
|                | Water Pipe              |
|                | Ownership               |
|                | Public                  |
|                | Private                 |
|                | State                   |
- 
- | Sewer Features |                        |
|----------------|------------------------|
|                | Cleanout               |
|                | Lift Station           |
|                | Drop Manhole           |
|                | Sewer Manhole          |
|                | Sewer Valve            |
|                | Forced Main            |
|                | Gravity Main (Private) |
- 
- | Storm Drain Features |                          |
|----------------------|--------------------------|
|                      | Out Fall                 |
|                      | Out Fall End             |
|                      | V-Orific                 |
|                      | Channel Crest            |
|                      | Manhole                  |
|                      | Catch Basin              |
|                      | Storm Pipe               |
|                      | Weather Station          |
|                      | RC Boxed Culvert (State) |
|                      | Hydrology Channel        |
|                      | Basin                    |
- 
- | Reclaimed Features |                           |
|--------------------|---------------------------|
|                    | Valved Outlet             |
|                    | Vent                      |
|                    | Valve                     |
|                    | Reducer                   |
|                    | Inlet                     |
|                    | Manhole                   |
|                    | Drain                     |
|                    | Drop Inlet                |
|                    | Blow off Assembly         |
|                    | Culvert Wall              |
|                    | Cardiege Joint            |
|                    | CAV Release Valve         |
|                    | Butterfly Valve           |
|                    | Air Release Valve         |
|                    | Air Vacuum Valve Assembly |
|                    | Back Pull Box             |
|                    | Pig Launching Station     |
|                    | Cathodic Test Station     |
|                    | Flange                    |
|                    | Cathodic Wire             |
|                    | Telemetry                 |
|                    | Reclaim Pipe              |
|                    | Reclaim Pipe Encased      |

12/11/2013

Adjacent Pages



These adjacent pages are not to be used for any other purpose than the one intended. The user is responsible for ensuring that the correct page is used for the intended purpose. The user is also responsible for ensuring that the correct page is used for the intended purpose.

Page: CM17

Douglas County  
GIS Department  
P.O. Box 2218  
1615 5th Street  
Minden, NV 89423  
(775) 782-9894

Photos Flown: 2010



# Carson City Public Works Utility Run Book



- Legend**

  - Detail Boundary
  - Proposed Freeway
  - Carson City Boundary
- Water Features**

  - Fire Hydrant
  - Fire Service
  - Pressure Reducing Valve
  - Flush Out
  - Intake
  - Reducer
  - Single Check Valve
  - Treatment Plant
  - Fire Hydrant Valve
  - Water Zone Valve
  - Closed Valve
  - Gate Valve
  - Butterfly Valve
  - Booster
  - Back Flow Device
  - Air Release Valve
  - Well
  - Water Tank
  - Water Pipe
- Sewer Features**

  - Cleanout
  - Lift Station
  - Drop Manhole
  - Sewer Manhole
  - Sewer Valve
  - Forced Main
  - Gravity Main
  - Gravity Main (Private)
- Storm Drain Features**

  - Out Fall
  - Out Fall End
  - V-Ditch
  - Channel Crest
  - Manhole
  - Catch Basin
  - Storm Pipe
  - Weather Station
  - RC Boxed Culvert (State)
  - Hydrology Channel
  - Basin
- Reclaimed Features**

  - Valved Outlet
  - Vent
  - Valve
  - Reducer
  - Inlet
  - Manhole
  - Drain
  - Drop Inlet
  - Blow off Assembly
  - Cutoff Wall
  - Cardiege Joint
  - C Air Release Valve
  - Butterfly Valve
  - Air Release Valve
  - Air Vacuum Valve Assembly
  - Elect Pull Box
  - Pig Launching Station
  - Cathodic Test Station
  - Flange
  - Cathodic Wire
  - Telemetry
  - Reclaim Pipe
  - Reclaim Pipe Encased

9/17/2014

Adjacent Pages



The data contained herein has been compiled from a digital map information system for the use of Douglas County. The data does not represent any warranty or endorsement by Douglas County. The data is provided as is, without any guarantee of accuracy or reliability. Douglas County is not responsible for any errors or omissions in the data.

Douglas County  
GIS Department  
P.O. Box 218  
1615 8th Street  
Minidoka, ID 83423  
(775) 762-9694

Photos Flown: 2013

# HIGH SCHOOL SEWER PROJECT

## BOARD OF SUPERVISORS

Marvin Teixeira \_\_\_\_\_ Mayor  
 Kay Bennett \_\_\_\_\_ Supervisor  
 Tom Feltic \_\_\_\_\_ Supervisor  
 Greg Smith \_\_\_\_\_ Supervisor  
 Tom Tatro \_\_\_\_\_ Supervisor  
 Kiyoshi Nishikawa \_\_\_\_\_ City Clerk



VICINITY MAP



## APPROVALS

CARSON CITY



PROJECT LOCATION MAP

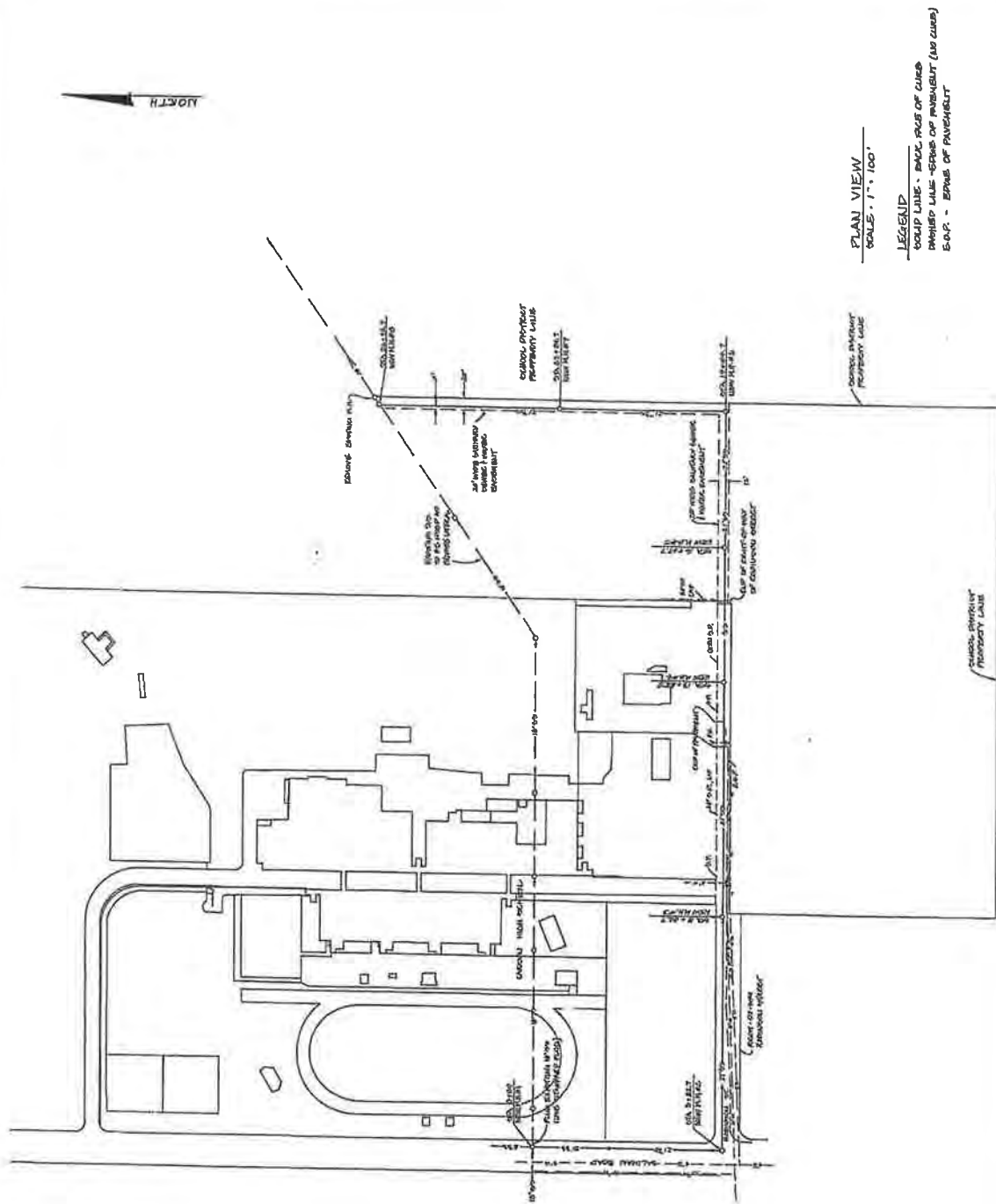
## SHEET INDEX

COVER SHEET	SHEET NO.
PLAN VIEW	1
PLAN & PROFILE	2
DETAILS	3, 4
	5

5/24/12  
Date

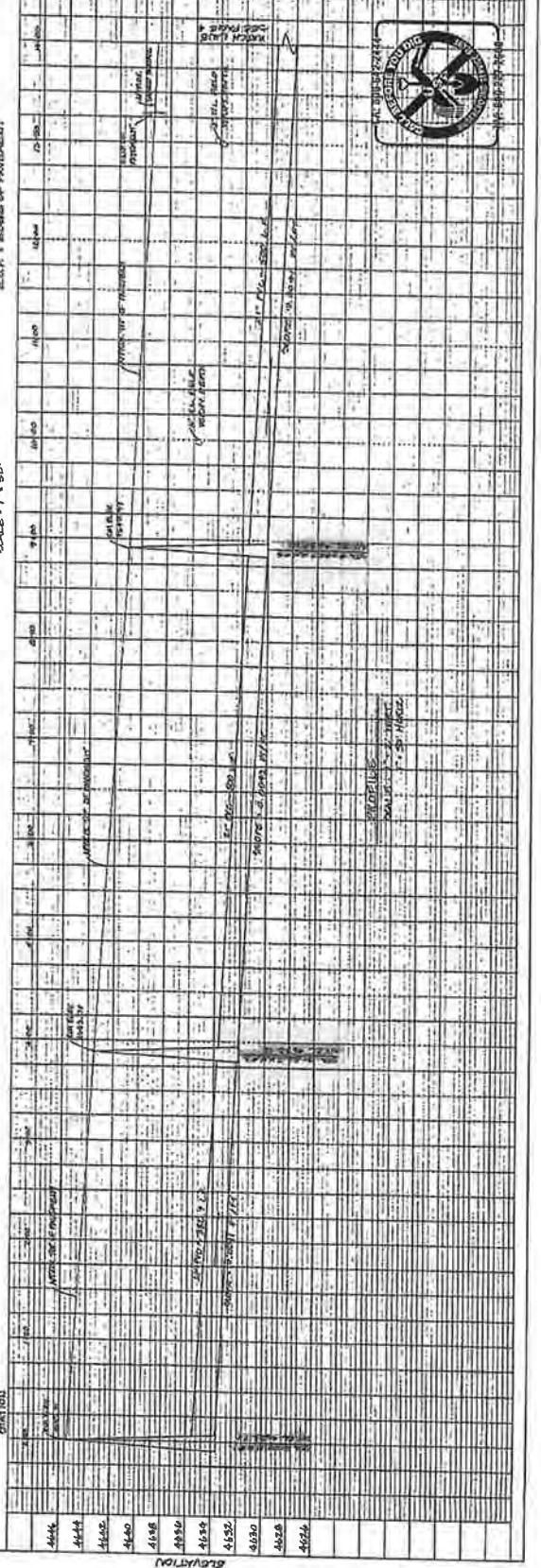
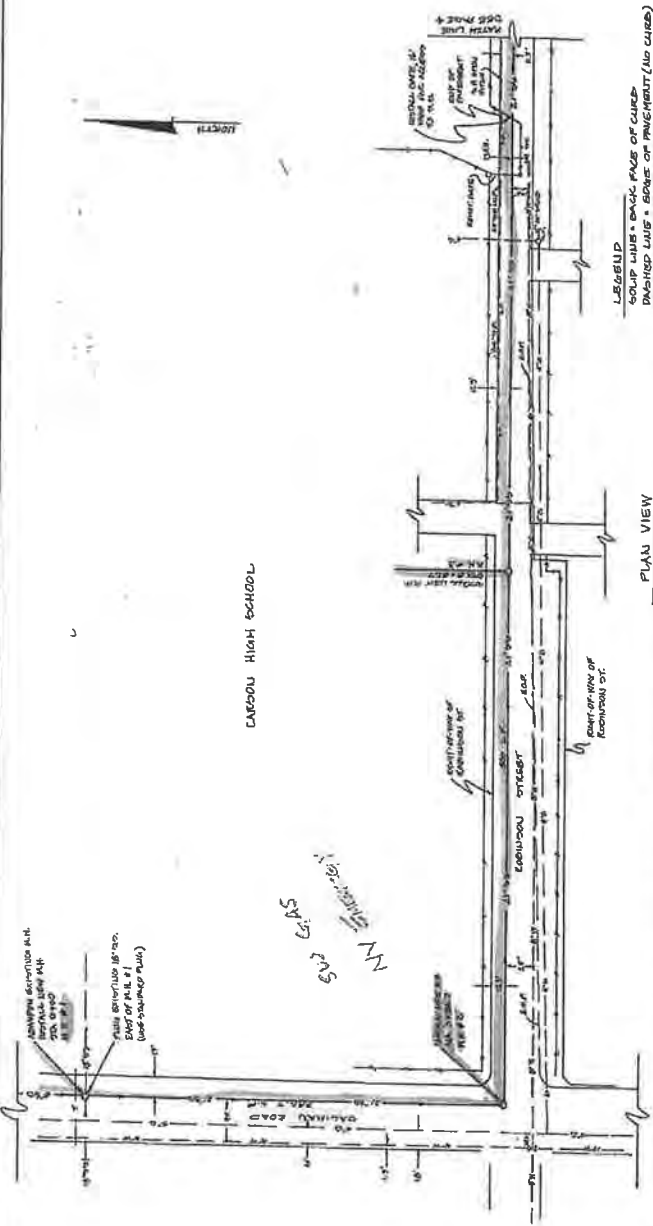
Dorothy A. Timlan-Palmer, Utility Manager

DESIGNED BY: <u>8-21</u> DRAWING NO.: <u>8-21</u> DATE: <u>5/24/12</u>		HIGH SCHOOL SEWER PROJECT A-5-Building		CARSON CITY, NEVADA UTILITY DIVISION PH: 887-2340	
SHEET NO. <u>1</u> OF <u>5</u>		DRAWING NO. <u>16500.028</u> PROJECT NO. <u>16500.028</u>		DRAWING NO. <u>16500.028</u> PROJECT NO. <u>16500.028</u>	



HIGH SCHOOL SEWER PROJECT  
 AS-BUILT

DATE	12/22/17
DESIGNED BY	J.A.T.
CHECKED BY	J.A.T.
SCALE	AS SHOWN
PROJECT	HIGH SCHOOL SEWER PROJECT
SHEET	3 OF 5



1. All sewer service lines shall be installed at all times. No service shall be stopped or interrupted for more than 15 minutes at any time.
2. The contractor shall make every effort to have all necessary interruptions of service to any customer.
3. The Carson City Sewer Utility Division shall be notified 24 hours in advance of any planned interruption of service. Any sewer service interruption shall be posted in the Carson City Sewer Utility Division's office.
4. All manhole lids and covers that are removed shall become the property of the Carson City Sewer Utility Division.
5. All locations and depths of lines shown on this plan are approximate and should be verified by field work.
6. Line locations shall be the responsibility of the contractor.
7. The contractor shall be responsible for maintaining all existing utility lines and services.
8. Contractor shall be responsible for verification of location of existing lines and services. The contractor shall maintain a record of all existing lines and services.
9. Field adjust all manhole elevations and correct to match street elevations.
10. Use 200-gallon PVC sewer pipe for all new lines and laterals 1200-35, 16 1/2" outside diameter specified.
11. Use only potable water for test water. Trucks must be used to transport water to the site. A hydrant with a meter will be provided daily at the test connection location.
12. Any survey values must be raised to match pavement elevation.
13. When necessary to disturb any existing sewer system, the contractor shall be contacted immediately and work halted until the system has been properly repaired.
14. No trenching or excavation shall be done for laterals, while sections are being installed.
15. Type 3 clean rock may be used in pipe runs when depth is greater than 5 ft.



[illegible][illegible]



# CARSON CITY FREEWAY PHASE 2A

## UTILITY RELOCATIONS

### E. FIFTH ST. WEST OF FREEWAY

### CARSON CITY, NEVADA - SEC 16, T15N, R20E

### PROJECT 00-6010

**BOARD OF SUPERVISORS**

Mayor  
 Mary Teixeira  
 Supervisor  
 Robin Williamson  
 Supervisor  
 Shelly Aldean  
 Supervisor  
 Pete Livemore  
 Supervisor  
 Richard Staub  
 City Clerk  
 Alan Glover

**DESIGNED FOR:**

CARSON CITY PUBLIC WORKS  
 OPERATIONS DIVISION  
 3505 BUTTE WAY  
 CARSON CITY, NV 89701  
 BB7-2355

#### GENERAL NOTES:

- ALL WORK SHALL CONFORM TO THE STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION AS ADOPTED BY CARSON CITY, AND APPLICABLE MOST CURRENT EDITIONS OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION IN NEVADA.
- ALL TRAVEL CONTROL AND TRAFFIC CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR TRAFFIC CONTROL MEASURES IN NEVADA.
- THE CONTRACTOR SHALL OBTAIN NECESSARY PERMITS FROM THE CITY OF CARSON CITY AND THE NEVADA DEPARTMENT OF TRANSPORTATION AND CONSTRUCTION.
- THE LOCATION OF EXISTING UTILITIES SHOWN ON THESE DRAWINGS IS BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES THAT MAY BE AFFECTED BY THE CONSTRUCTION.

#### SHEET INDEX

- 1W TITLE SHEET  
 2W INDEX MAP, ABBREVIATIONS, LEGEND AND CONTROL POINTS  
 3W - 4W E. FIFTH ST. WEST OF FREEWAY - SANITARY SEWER  
 5W - 6W E. FIFTH ST. WEST OF FREEWAY - WATER  
 7W - 10W TYPICAL CONSTRUCTION DETAILS

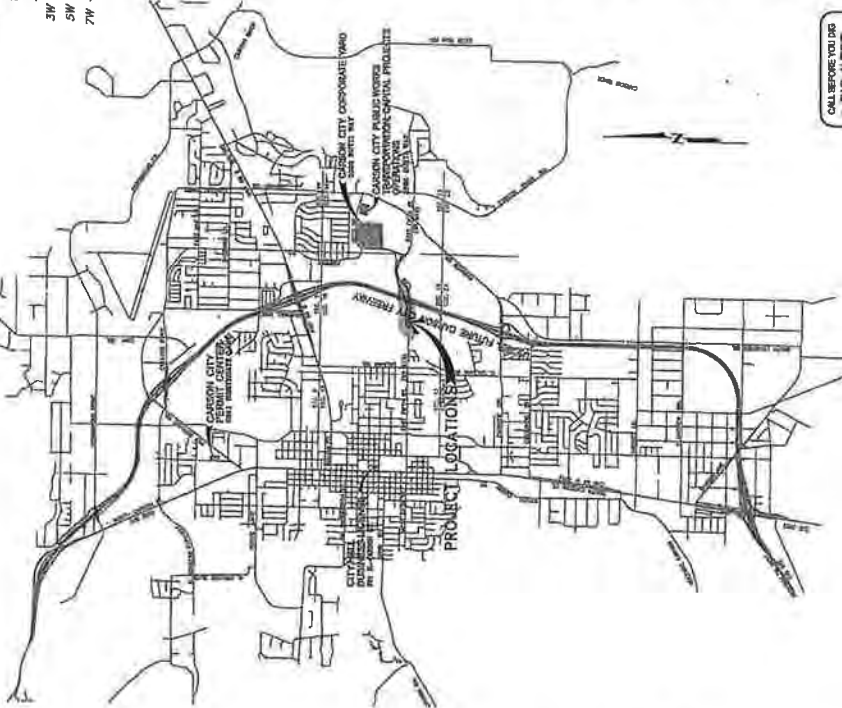
#### RECORD DRAWING NOTE: (AB)

PROJECT CONSULTED BY: MARY WILLIAMSON, SUPERVISOR  
 RECORD DRAWINGS PREPARED BY: THE CARSON CITY PUBLIC WORKS DEPARTMENT  
 AND THE CARSON CITY PUBLIC WORKS DEPARTMENT  
 DATED: JUNE 5, 2008

#### REVIEWED FOR CITY REQUIREMENTS:

*Jeff Aldean, P.E.* (BY) COMPLETED: 6/15/07 DATE  
 CITY ENGINEER, P.E. - CITY ENGINEER  
*Jeff Aldean, P.E.* (BY) COMPLETED: 6/15/07 DATE  
 DEVELOPMENT ENGINEER  
*Ken Arnold* (BY) COMPLETED: 6/14/07 DATE  
 NEW APPROVAL, PUBLIC WORKS OPERATIONS MANAGER

APPLICATION NO. 07-333  
 NDOT APPLICATION NO. 92334  
 NDEP BSDW NO. CC-2766-07RPA



VICINITY MAP  
 N.T.S.

**CARSON CITY FREEWAY PHASE 2A**  
 UTILITY RELOCATIONS  
 PROJECT NO. 00-6010  
 TITLE SHEET

**CARSON CITY PUBLIC WORKS DEPARTMENT**  
 3505 BUTTE WAY  
 CARSON CITY, NEVADA 89701  
 PHONE: 702-887-2355  
 FAX: 702-887-2355  
 WWW.CC-PWD.COM

**THE CARSON CITY GROUP, INC.**  
 1400 VANDERBILT  
 SUITE 100  
 CARSON CITY, NEVADA 89701  
 PHONE: 702-887-2355  
 FAX: 702-887-2355  
 WWW.CC-GROUP.COM



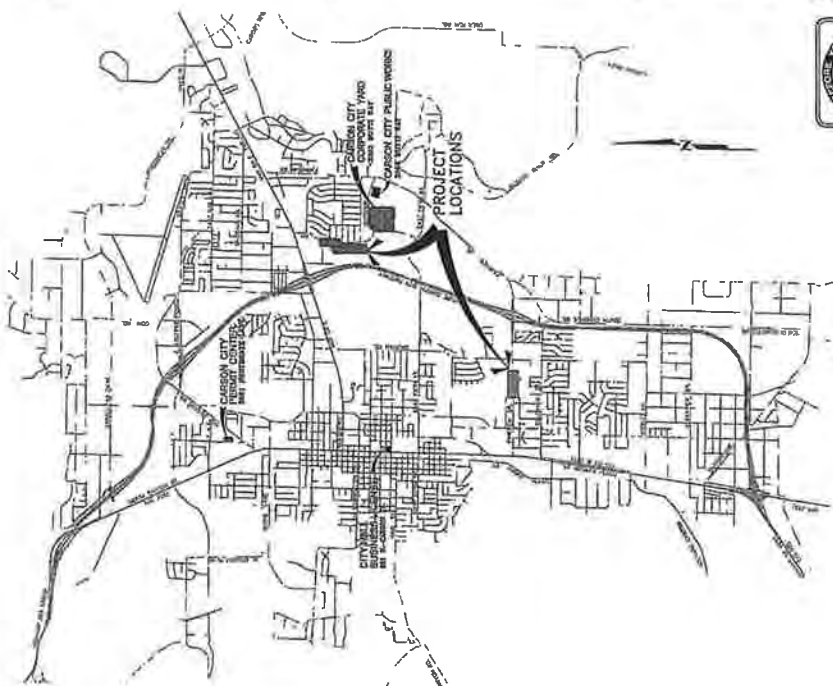




**CARSON CITY, NEVADA - SEC 16, T15N, R20E**  
**PROJECT 06-6006**

Mayor	Marv Teixeira
Supervisor	Robin Williamson
Supervisor	Shelly Aldean
Supervisor	Pete Livermore
Supervisor	Richard Staub
City Clerk	Alan Glover

CARSON CITY PUBLIC WORKS DEPARTMENT  
OPERATIONS DIVISION  
3505 BUTTE WAY  
CARSON CITY, NV 89701  
887-2355

[illegible]

**VICINITY MAP**

1	TITLE SHEET
2	SHEET INDEX MAP & LEGEND
3	AIRPORT ROAD — PLAN & PROFILE
4	AIRPORT ROAD — PLAN & PROFILE
5	AIRPORT ROAD — PLAN & PROFILE
6	FAIRVIEW DRIVE — PLAN & PROFILE
7	FAIRVIEW DRIVE — PLAN & PROFILE
8	TYPICAL CONSTRUCTION DETAILS

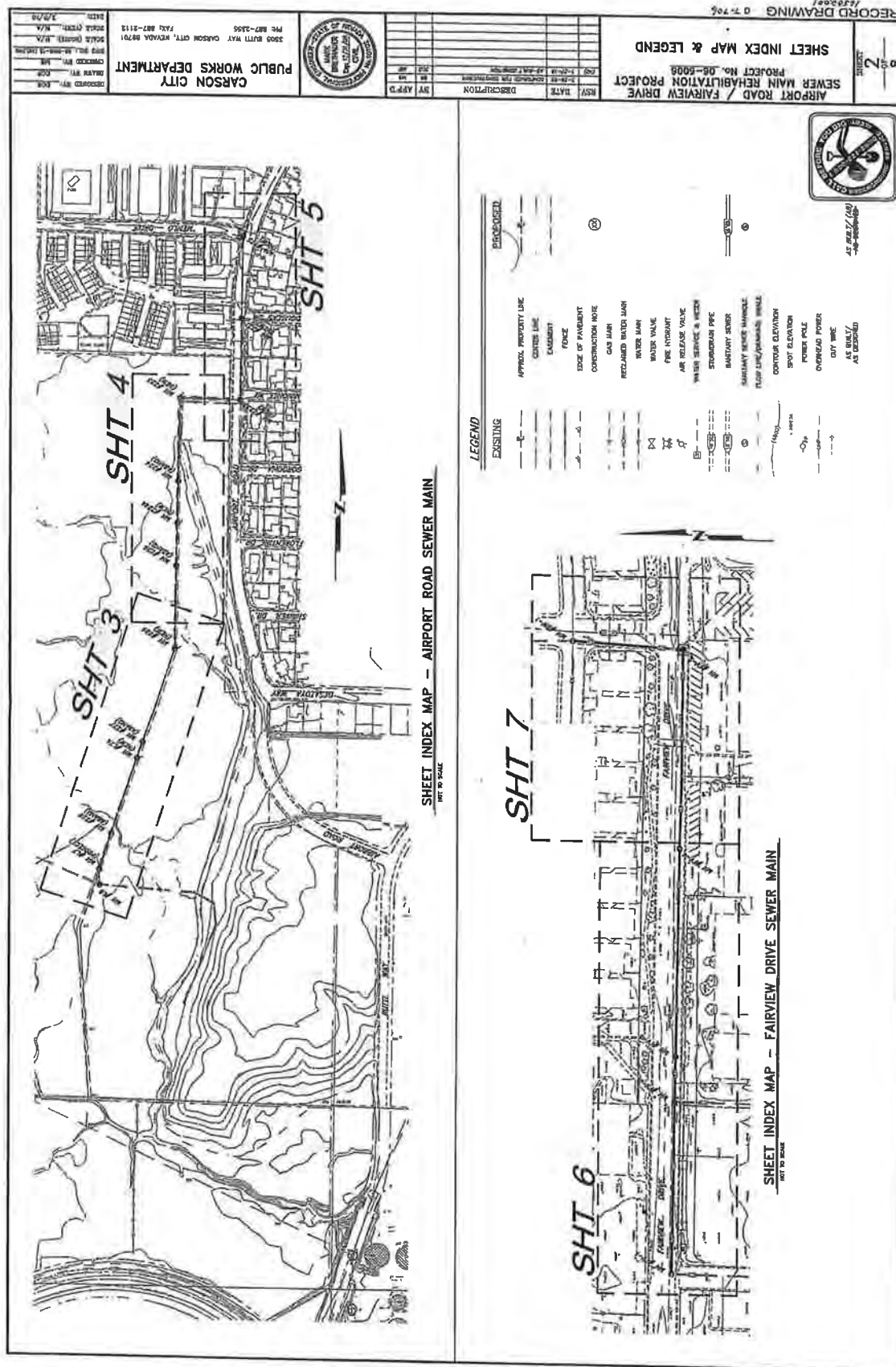
AC	ARMATURE CONCRETE	POINT	FLIGHT (FPS)	CONCRETE	STANDARD INTERPRETATION FOR
BI	BRIDGE	0	0	REINFORCED CONCRETE	CONSTRUCTION
CI	CONCRETE	1	1	ASPHALT	SYSTEM
DI	DRIVE PILE/PILE CAP	2	2	ASPH. BUILT	TELEPHONE
EM	EMERALD	3	3	ASPH. ROAD	TRAIL
GA	GALVANIZED	4	4	STORM DRAIN	UNDERGROUND
HA	HANDRAIL	5	5	STORM DRAIN MANHOLE	UTILITY
LA	LAMP	6	6	STORM DRAIN MANHOLE	WATER
EA	EARTH	7	7	SQUARE PILE	WATER
EL	ELECTRIC	8	8	SQUARE PILE	WATER
FT	FEET	9	9	SQUARE PILE	WATER
FL	FEET	10	10	SQUARE PILE	WATER
HA	HANDRAIL	11	11	SQUARE PILE	WATER
HA	HANDRAIL	12	12	SQUARE PILE	WATER
HA	HANDRAIL	13	13	SQUARE PILE	WATER
HA	HANDRAIL	14	14	SQUARE PILE	WATER
HA	HANDRAIL	15	15	SQUARE PILE	WATER
HA	HANDRAIL	16	16	SQUARE PILE	WATER
HA	HANDRAIL	17	17	SQUARE PILE	WATER
HA	HANDRAIL	18	18	SQUARE PILE	WATER
HA	HANDRAIL	19	19	SQUARE PILE	WATER
HA	HANDRAIL	20	20	SQUARE PILE	WATER
HA	HANDRAIL	21	21	SQUARE PILE	WATER
HA	HANDRAIL	22	22	SQUARE PILE	WATER
HA	HANDRAIL	23	23	SQUARE PILE	WATER
HA	HANDRAIL	24	24	SQUARE PILE	WATER
HA	HANDRAIL	25	25	SQUARE PILE	WATER
HA	HANDRAIL	26	26	SQUARE PILE	WATER
HA	HANDRAIL	27	27	SQUARE PILE	WATER
HA	HANDRAIL	28	28	SQUARE PILE	WATER
HA	HANDRAIL	29	29	SQUARE PILE	WATER
HA	HANDRAIL	30	30	SQUARE PILE	WATER
HA	HANDRAIL	31	31	SQUARE PILE	WATER
HA	HANDRAIL	32	32	SQUARE PILE	WATER
HA	HANDRAIL	33	33	SQUARE PILE	WATER
HA	HANDRAIL	34	34	SQUARE PILE	WATER
HA	HANDRAIL	35	35	SQUARE PILE	WATER
HA	HANDRAIL	36	36	SQUARE PILE	WATER
HA	HANDRAIL	37	37	SQUARE PILE	WATER
HA	HANDRAIL	38	38	SQUARE PILE	WATER
HA	HANDRAIL	39	39	SQUARE PILE	WATER
HA	HANDRAIL	40	40	SQUARE PILE	WATER
HA	HANDRAIL	41	41	SQUARE PILE	WATER
HA	HANDRAIL	42	42	SQUARE PILE	WATER
HA	HANDRAIL	43	43	SQUARE PILE	WATER
HA	HANDRAIL	44	44	SQUARE PILE	WATER
HA	HANDRAIL	45	45	SQUARE PILE	WATER
HA	HANDRAIL	46	46	SQUARE PILE	WATER
HA	HANDRAIL	47	47	SQUARE PILE	WATER
HA	HANDRAIL	48	48	SQUARE PILE	WATER
HA	HANDRAIL	49	49	SQUARE PILE	WATER
HA	HANDRAIL	50	50	SQUARE PILE	WATER
HA	HANDRAIL	51	51	SQUARE PILE	WATER
HA	HANDRAIL	52	52	SQUARE PILE	WATER
HA	HANDRAIL	53	53	SQUARE PILE	WATER
HA	HANDRAIL	54	54	SQUARE PILE	WATER
HA	HANDRAIL	55	55	SQUARE PILE	WATER
HA	HANDRAIL	56	56	SQUARE PILE	WATER
HA	HANDRAIL	57	57	SQUARE PILE	WATER
HA	HANDRAIL	58	58	SQUARE PILE	WATER
HA	HANDRAIL	59	59	SQUARE PILE	WATER
HA	HANDRAIL	60	60	SQUARE PILE	WATER
HA	HANDRAIL	61	61	SQUARE PILE	WATER
HA	HANDRAIL	62	62	SQUARE PILE	WATER
HA	HANDRAIL	63	63	SQUARE PILE	WATER
HA	HANDRAIL	64	64	SQUARE PILE	WATER
HA	HANDRAIL	65	65	SQUARE PILE	WATER
HA	HANDRAIL	66	66	SQUARE PILE	WATER
HA	HANDRAIL	67	67	SQUARE PILE	WATER
HA	HANDRAIL	68	68	SQUARE PILE	WATER
HA	HANDRAIL	69	69	SQUARE PILE	WATER
HA	HANDRAIL	70	70	SQUARE PILE	WATER
HA	HANDRAIL	71	71	SQUARE PILE	WATER
HA	HANDRAIL	72	72	SQUARE PILE	WATER
HA	HANDRAIL	73	73	SQUARE PILE	WATER
HA	HANDRAIL	74	74	SQUARE PILE	WATER
HA	HANDRAIL	75	75	SQUARE PILE	WATER
HA	HANDRAIL	76	76	SQUARE PILE	WATER
HA	HANDRAIL	77	77	SQUARE PILE	WATER
HA	HANDRAIL	78	78	SQUARE PILE	WATER
HA	HANDRAIL	79	79	SQUARE PILE	WATER
HA	HANDRAIL	80	80	SQUARE PILE	WATER
HA	HANDRAIL	81	81	SQUARE PILE	WATER
HA	HANDRAIL	82			

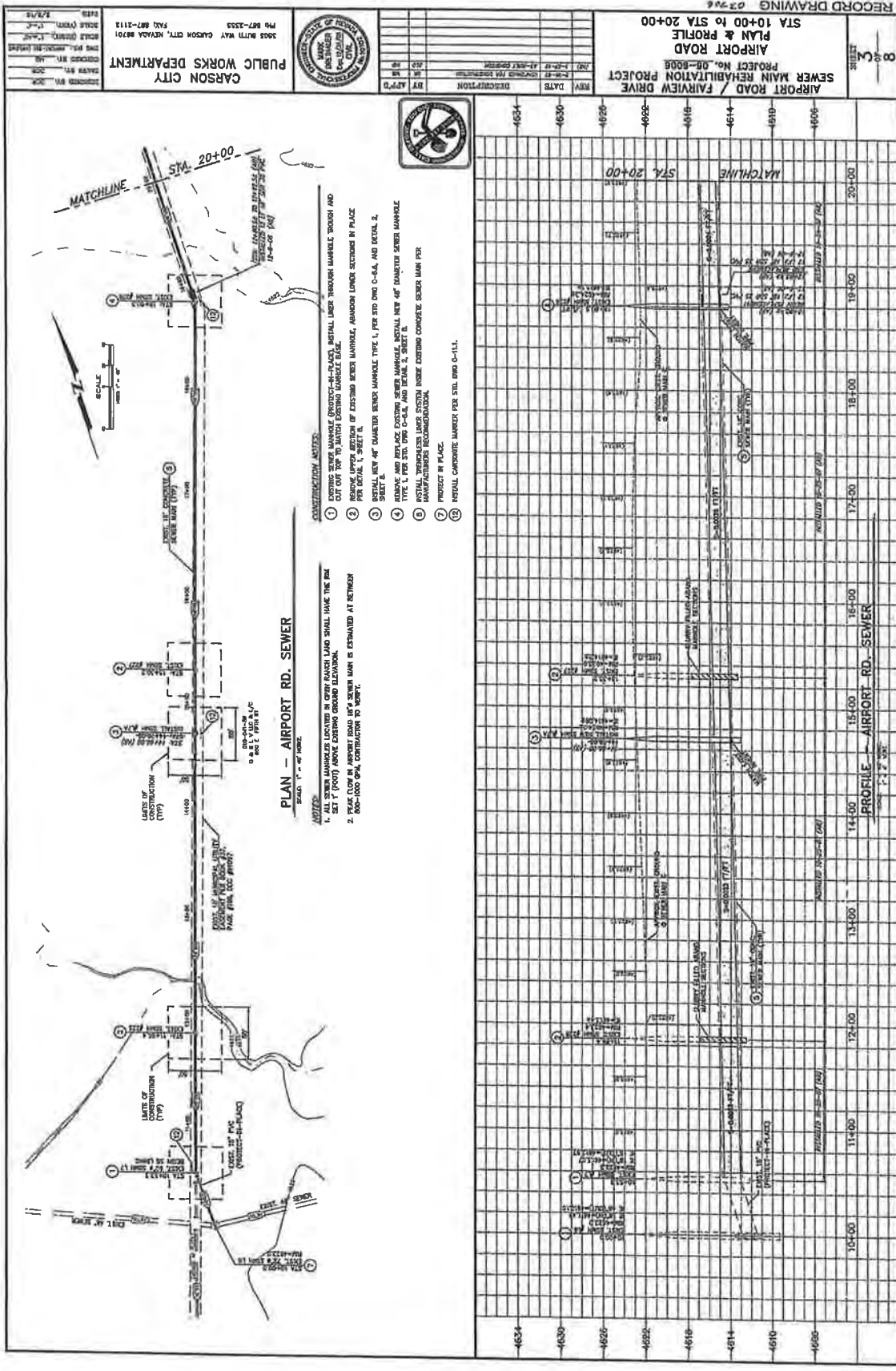
<i>Jeff Sharp</i>	(NY COMPUTER)	DATE	<i>7/25/07</i>
JAY GANS, P.E.	DEPUTY CITY ENGINEER		
<i>Tom Grundy</i>	(NY COMPUTER)	DATE	<i>7/26/07</i>
DEVELOPMENT ENGINEERING			
<i>Ken Arnold</i>	(NY COMPUTER)	DATE	<i>7/26/07</i>
KEN ARNOLD, PUBLIC WORKS OPERATIONS MANAGER			

PROJECT FINANCED BY NATIONAL RECONSTRUCTION AND DEVELOPMENT CORPORATION UNDER CITY CONTRACT NO. 2387-141 (1961).  
 ORIGINAL DRAWINGS PREPARED BY CHRYSLER CITY PLANNING BOARD FOR 1961. ALL VOLUMES INFORMATION PROVIDED BY CHRYSLER CITY, CHRYSLER CITY HOLDINGS 1962.  
 AND THEIR CONSTRUCTION DIVISION 214 (1961).  
 AND 214 (1961).

PERMIT NO. 07-0706







16502.001  
 DRAWING NUMBER

DRAWING NUMBER

DRAWING NUMBER

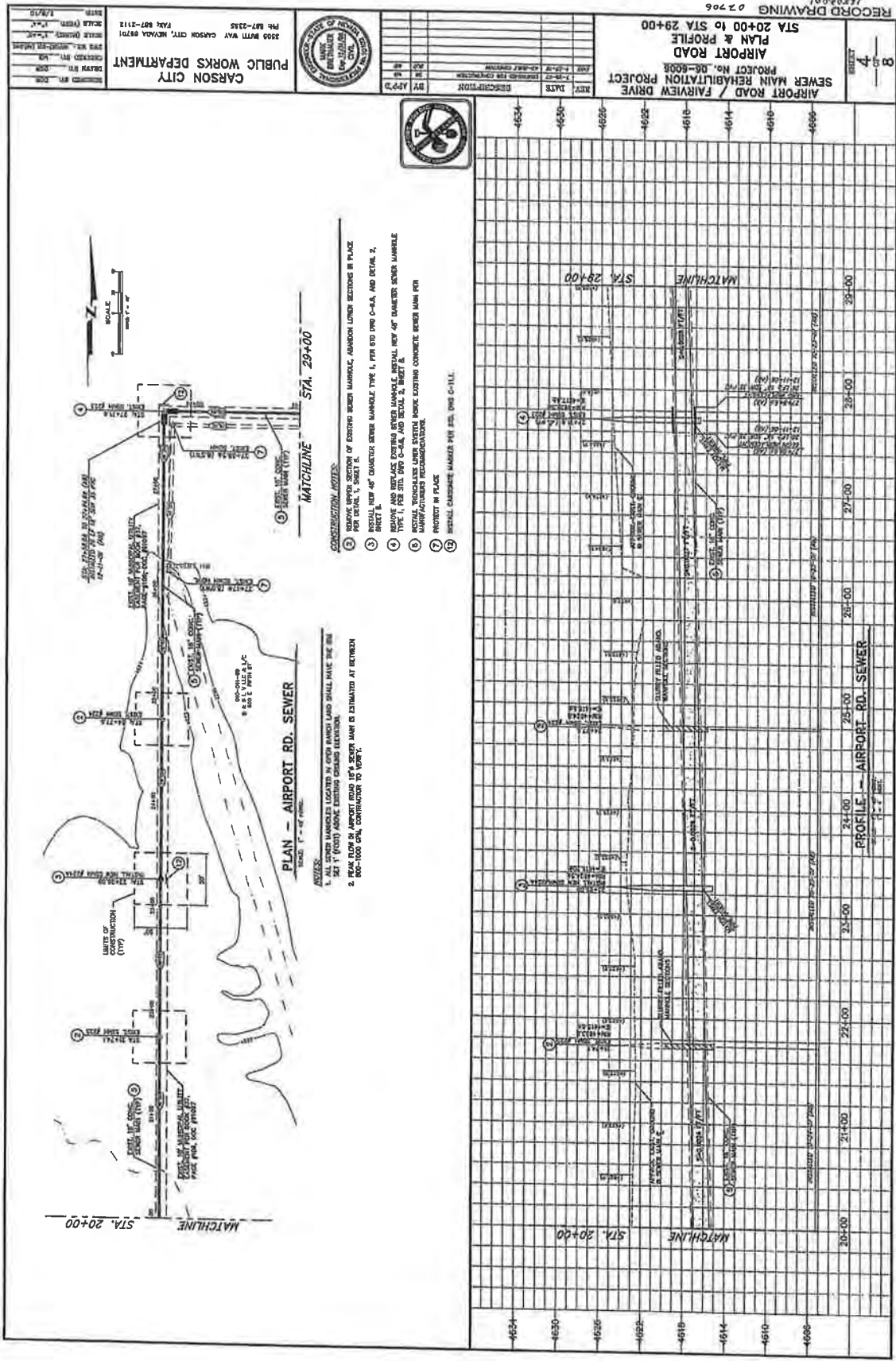
DRAWING NUMBER

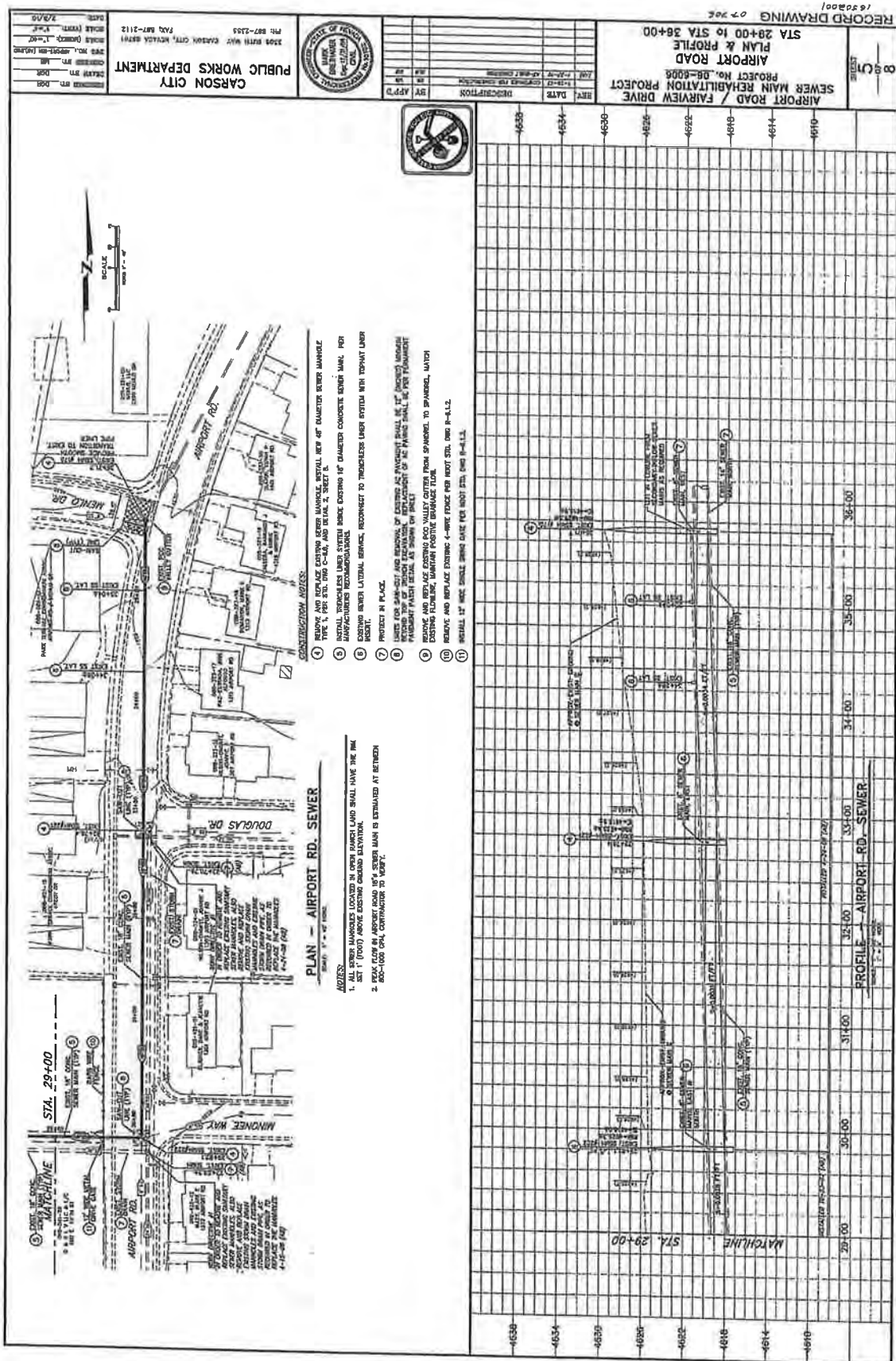
DRAWING NUMBER  
16502.001

DRAWING NUMBER

DRAWING NUMBER

DRAWING NUMBER



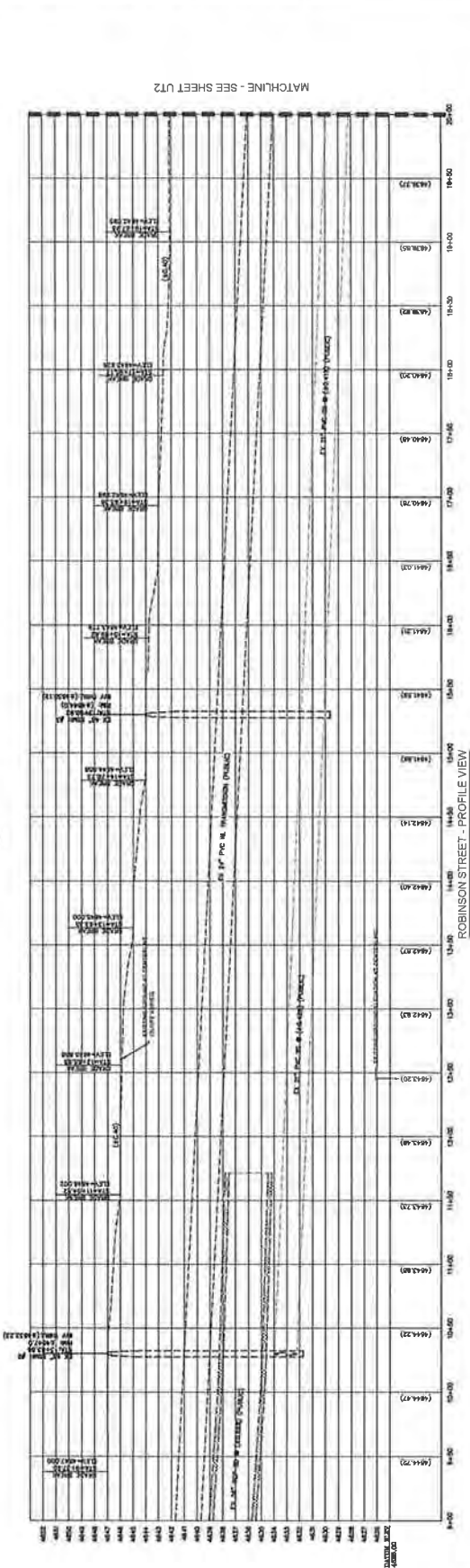


## Appendix 4

---

# MASTER CONCEPTUAL SANITARY SEWER AND WATER SYSTEM LAYOUT









PROJECT LOCATION

258



THE RED LTD

1001 S. 10th Ave.  
Suite 200  
Las Vegas, NV 89102  
www.theredltd.com

A. REAL ESTATE  
B. ENGINEERING  
C. DEVELOPMENT

BLACKSTONE DEVELOPMENT GROUP

420 PLUM LANE  
SUITE 100  
LAS VEGAS, NV 89102  
CONTACT: JESSICA MYERS  
PHONE: (702) 392-4000

APPROVED

DATE: \_\_\_\_\_

NO. \_\_\_\_\_

REVISIONS

LOMP RANCH NORTH

MASTER CONCEPT SANITARY SEWER AND WATER SYSTEM LAYOUT

APPROVED

DATE: \_\_\_\_\_

NO. \_\_\_\_\_

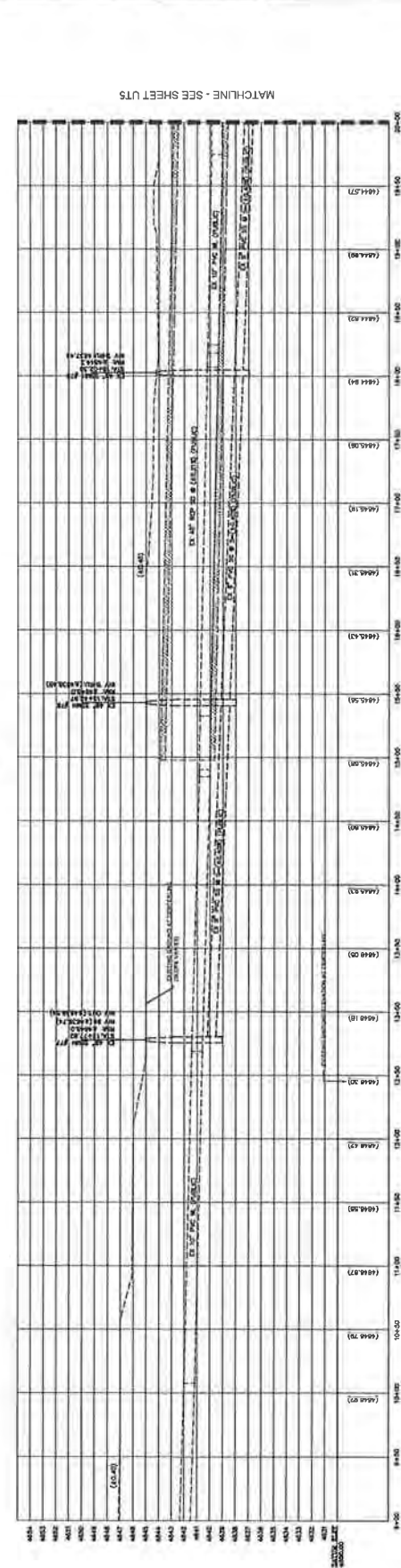
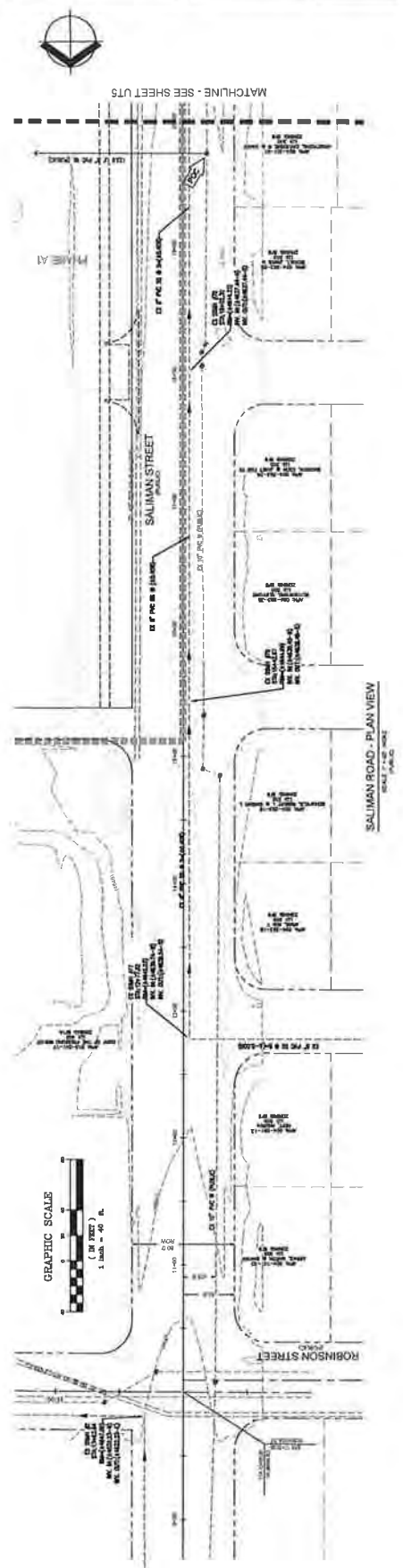
REVISIONS

1" = 40'

1" = 40'

1" = 40'

1" = 40'



KEY MAP

SCALE: 1" = 40'

SEWER MAIN INSTALLATION

THE CONTRACTOR SHALL USE THE CASE IN INSTALLING SEWER MAINS. AVOID LOCATION AND INVERT ELEVATIONS SHALL BE LAD OUT IN THE FIELD BY A MANNER BEING DETERMINED AFTER INSPECTION AND AVOID OF PROTECTING POWER WILL BE THE SEWER MAINS AND BE PLACED IN THE CONSTRUCTION ZONE.

NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

BASIS OF BEARINGS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

PROJECT LOCATION

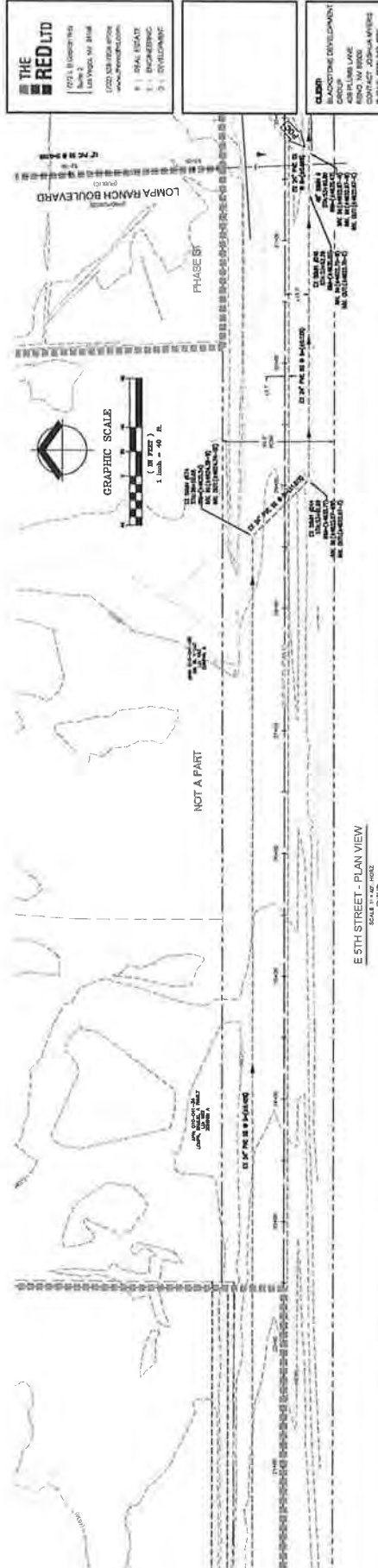
THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

SHT UT5 648  
CC PROJECT #







[illegible][illegible][illegible][illegible]



**THE RED LTD**

10020 G. Canyon Hwy  
Suite 1  
Las Vegas, NV 89140

(702) 528-7804 office  
[www.theredltd.com](http://www.theredltd.com)

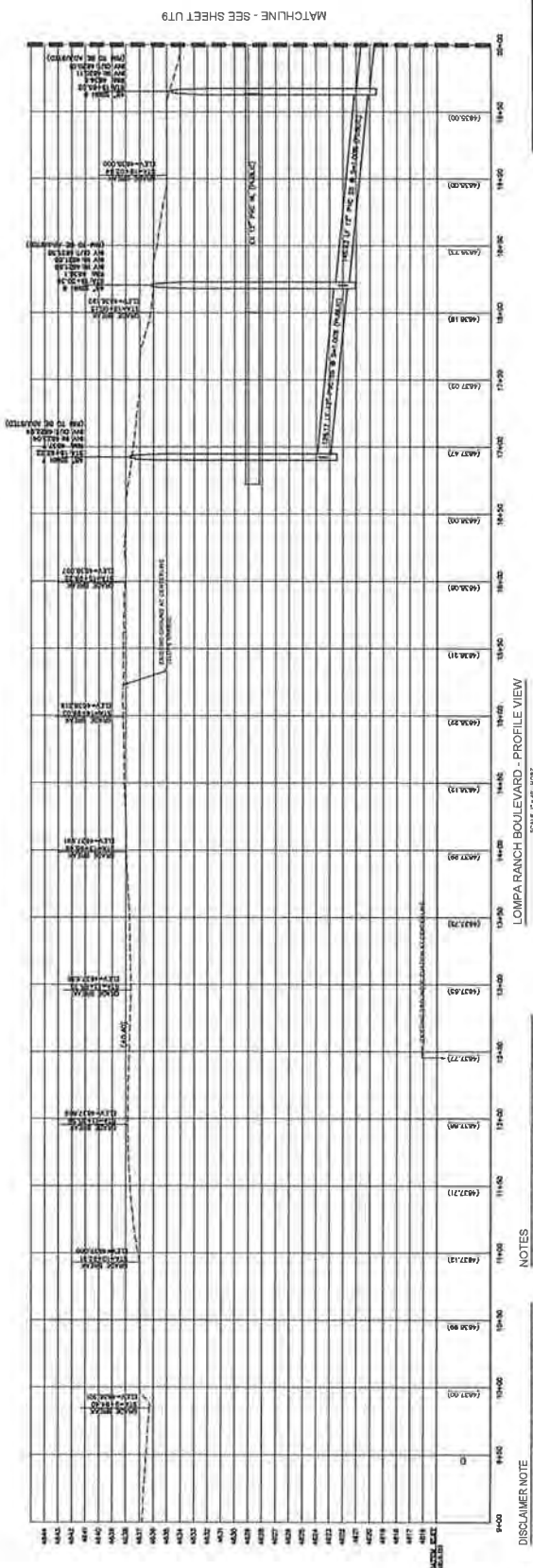
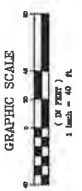
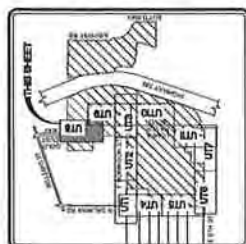
R | REAL ESTATE  
E | ENGINEERING  
D | DEVELOPMENT

**CLUB**  
BLACKSTONE DEVELOPMENT<sup>TM</sup>  
GROUP  
430 PLUMB LANE  
RENO NV 89509  
CONTACT JOSHUA MYERS  
PHONE (775) 392-4200

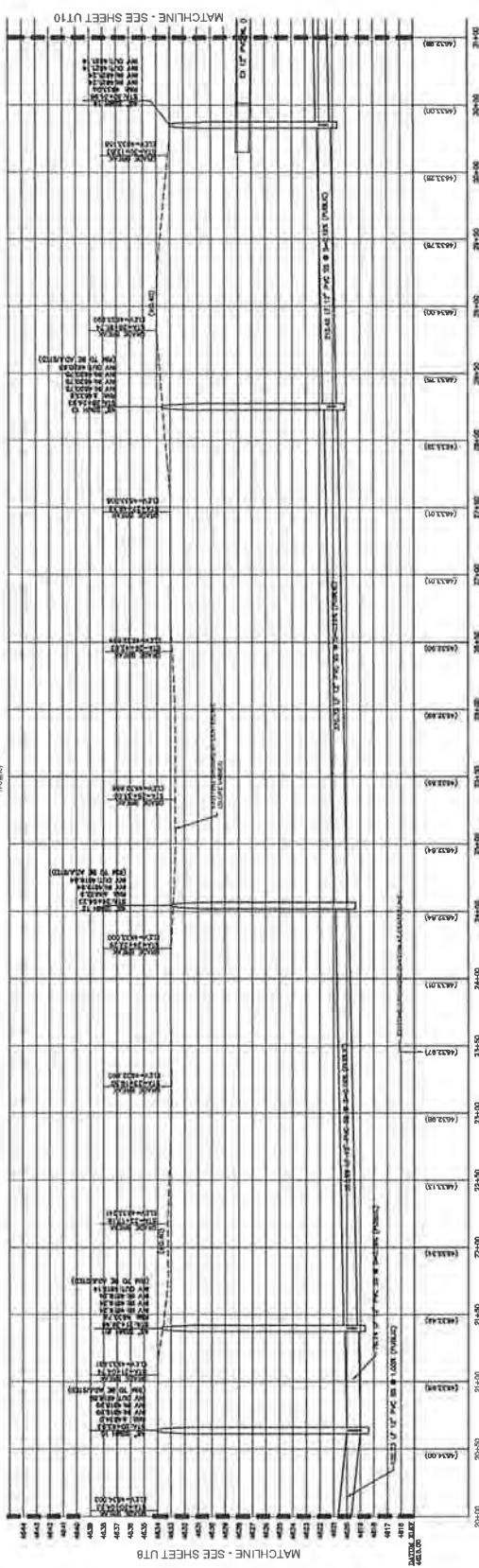
[illegible]

LOMPA RANCH NORTH MASTER CONCEPT SANITARY SEWER AND WATER SYSTEM LAYOUT	LOMPA RANCH NORTH CANON CITY
---	---------------------------------

The image shows two forms from a file folder. The top form is a "HUMAN AOS" (Human Activity Observation Sheet) with fields for Name, Age, Sex, Height, Weight, and Date. The bottom form is a "SHT UT8" (Shot Utensil) form with fields for CC PROJECT # and SHT UT8.

[illegible][illegible]

SHT UT9      948  
CC PROJECT #



LOCATION AND INVERT ELEVATIONS SHALL BE LAID OUT IN THE FIELD BY A PROFESSIONAL ENGINEER OR LAND SURVEYOR FOR SLOPE LESS THAN 4%. STEEPER SLOPES SHALL BE FIELD-PIECED AFTER INSTALLATION AND ADJUSTED BY STAKING MATERIAL, RESURFACING, AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

PROJECT LOCATION

PROJECT LOCATION

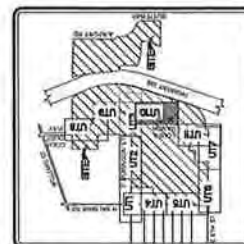
LOCATION AND INVERT ELEVATIONS SHALL BE LAID OUT IN THE FIELD BY A PROFESSIONAL ENGINEER OR LAND SURVEYOR FOR SLOPE LESS THAN 4%. STEEPER SLOPES SHALL BE FIELD-PIECED AFTER INSTALLATION AND ADJUSTED BY STAKING MATERIAL. ALL RESURFACING AND REPAIRS AT THE CONTRACTOR'S EXPENSE.

**THE  
RED LTD**

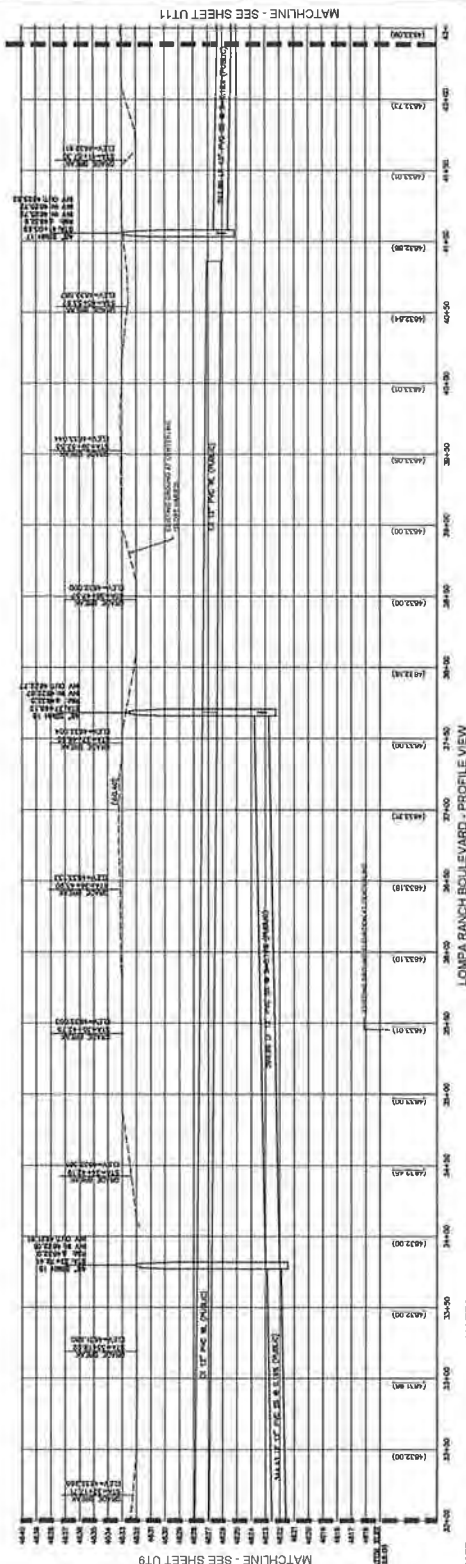
1231 D. Carnegie Ave.  
Suite 2  
Las Vegas, NV 89148

(702) 438-1234 office  
www.theredltd.com

R | REAL ESTATE  
C | ENGINEERING  
D | DEVELOPMENT



KEY MAP  
SCALE NTS



## NOTES

- [illegible]

## ASIS OF BEARINGS

### ANALYSIS OF BEARINGS

## BENCHMARK

ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1889 (MVDN) AS ESTABLISHED BY U.S.S. BENCHMARK V257, PID K10308

## PROJECT LOCATION

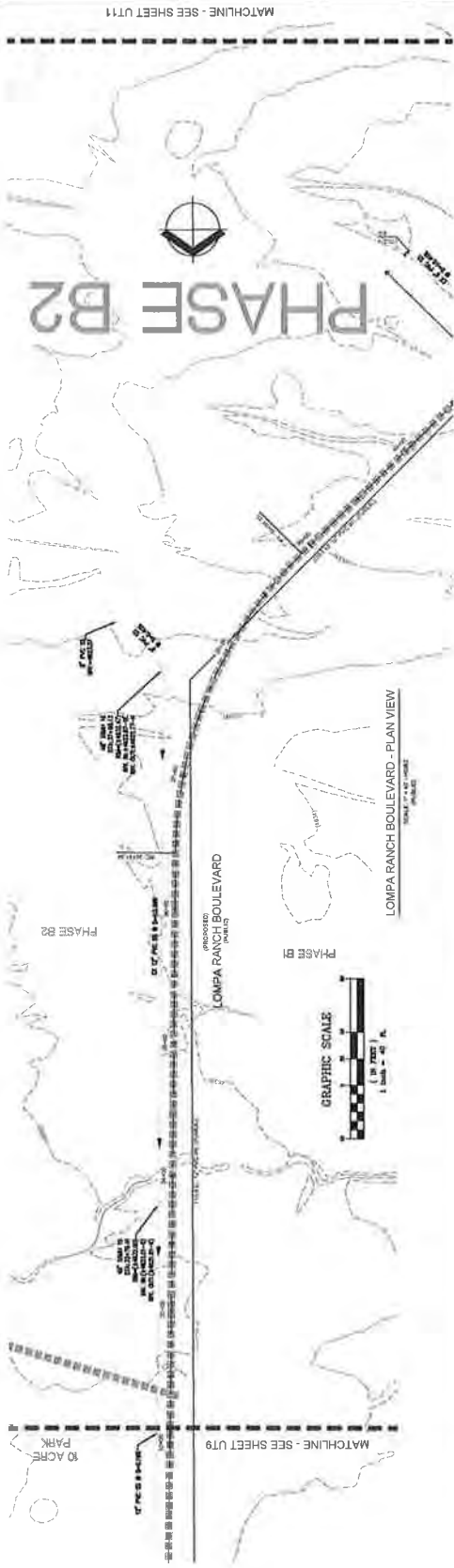
APPLIED POLYMER SYMPOSIA NO. 10, 1968

DISCLAIMER NOTE

- DISCLAIMER NOTE**
- THE UNDERGROUND UTILITIES AS SHOWN HEREIN HAVE BEEN LOCATED FROM SURVEY FIELD SURVEY EVIDENCE AND EXISTING DRAWINGS, INCLUDING BUT NOT LIMITED TO, CITY RECORDS, RECORDS OF THE UTILITY COMPANY, AND RECORDS OF THE SURVEYOR. THE SURVEYOR MAKES NO WARRANTIES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA. THERE IS NO SERVICE OF ABANDONED THE SURVEYOR. THE SURVEYOR MAKES NO WARRANTIES THAT THE INFORMATION AVAILABLE TO THE SURVEYOR IS COMPLETE OR ACCURATE. THE FIELD CERTIFY THAT THEY HAVE BEEN FIELD LOCATED TO THE BEST OF THEIR KNOWLEDGE AND BELIEF. THE SURVEYOR HAS NOT MATERIALLY LOCATED THE UNDERGROUND UTILITIES AS SHOWN HEREIN. THE SURVEYOR HAS NOT MATERIALLY LOCATED THE UNDERGROUND UTILITIES AS SHOWN HEREIN. THE SURVEYOR HAS NOT MATERIALLY LOCATED THE UNDERGROUND UTILITIES AS SHOWN HEREIN.
- NOT RIGHT-OF-WAY**
- THE STREET RIGHT-OF-WAY AND EASEMENTS SHOWN ARE NOT TO BE CONSIDERED A PART OF THIS SURVEY.
- DATE: 10/1/2011
- BY: [Signature]
- FOR: [Signature]

DOT RIGHT-OF-WAY

- THE STATE OF TEXAS, COUNTY OF DALLAS, ss. I, the undersigned, a Notary Public in and for said State, do hereby certify that the foregoing is a true and correct copy of the original of the same as the same appears from the records of said County.



MATCHLINE - SEE SHEET UT11

MATCHLINE - SEE SHEET UT11

COMPA RANCH BOULEVARD - PLAN VIEW

28+00 28+50 29+00 29+50  
OMPA RANCH BOULEVARD - PROFILE VIEW

## SEWER MAIN INSTALLATION

The contractor shall use only those pre-installed steel joists manufactured by the American Iron and Steel Institute that are listed in the AISI E1-1 specification. Contractors of steel joist bridges must follow the AISI E1-1 specification. Contractors of steel joist bridges must follow the AISI E1-1 specification. Contractors of steel joist bridges must follow the AISI E1-1 specification.

**THE RED TO**  
 2701 S. Duran Way  
 Suite 2  
 Las Vegas, NV 89148  
 (702) 735-1111  
 www.redto.com

R : REAL ESTATE  
 C : ENGINEERING  
 D : DEVELOPMENT

**CLUMP**  
 BLACKSTONE DEVELOPMENT  
 GROUP  
 400 PINE LAKE  
 SUITE 100  
 LAS VEGAS, NV 89148  
 CONTACT: ADRIANA WATERS  
 PHONE: (702) 399-4500

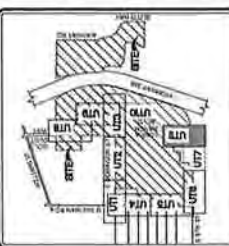
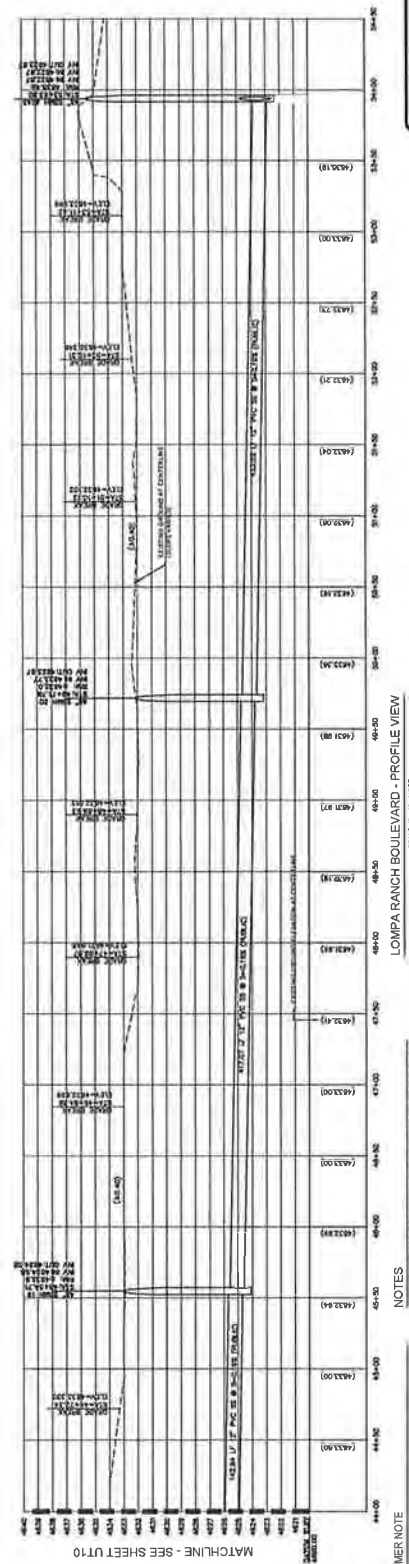
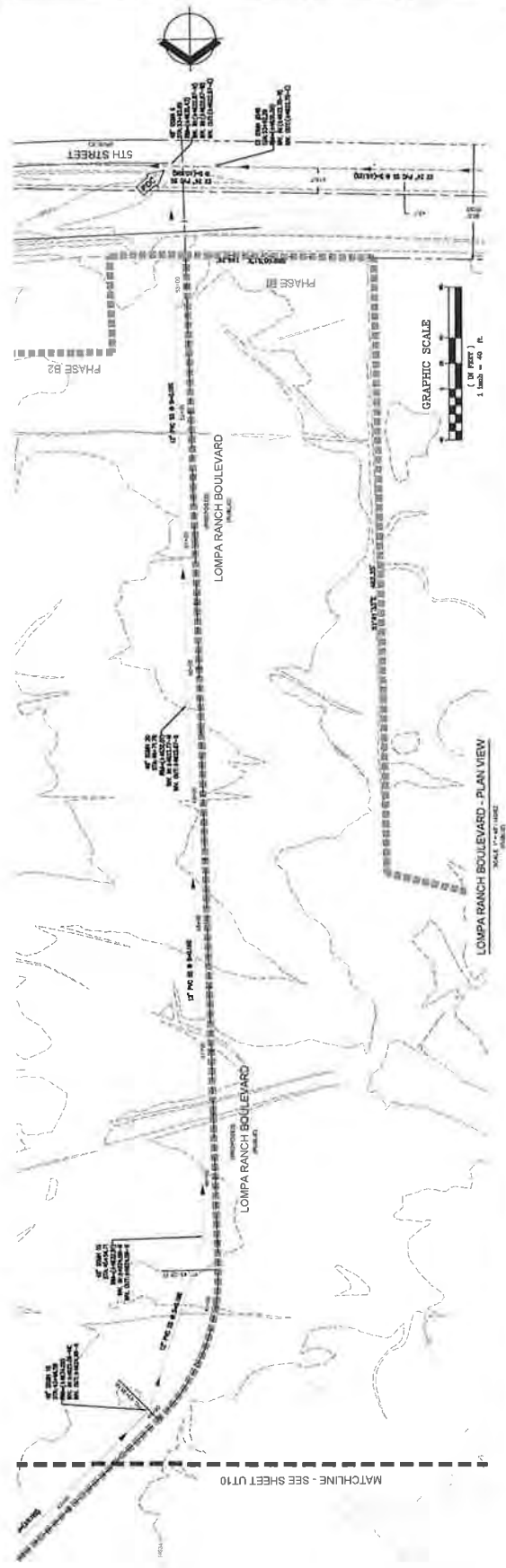
DATE	NO.	REVISION	APPROVED

**LOMPA RANCH NORTH**  
**MASTER CONCEPT SANITARY SEWER**  
**AND WATER SYSTEM LAYOUT**

CANNON CITY, NEW MEXICO

**8-FT UTM**  
 CO PROJECT #

NO. 101  
 DATE: 10/1/10  
 DRAWN BY: [Signature]  
 CHECKED BY: [Signature]  
 APPROVED BY: [Signature]



KEY MAP  
 SCALE: 1" = 40'

**NOTES**

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

**NOT RIGHT-OF-WAY**

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

**SEWER MAIN INSTALLATION**

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

**BENCHMARK**

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

**PROJECT LOCATION**

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

# TRAFFIC IMPACT STUDY

## FOR

# Lompa Ranch West

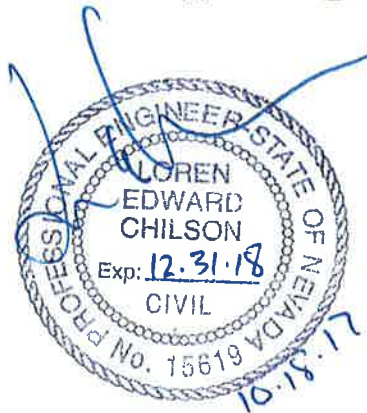
## Phase 2

October 18, 2017

PREPARED FOR:

**Blackstone Development Group, Inc.**

PREPARED BY:



---

TRAFFIC WORKS, LLC  
5482 Longley Ln, Suite B, Reno, NV 89511  
775.322.4300  
[www.Traffic-Works.com](http://www.Traffic-Works.com)

## **YOUR QUESTIONS ANSWERED QUICKLY**

### **Why did you perform this study?**

This Traffic Impact Study evaluates the potential traffic impacts associated with construction of Phase 2 of Lompa Ranch West. This study of potential traffic impacts was undertaken to confirm consistency with the master Traffic Impact Study and to assist in determining what traffic controls or mitigations may be needed with this phase to reduce potential impacts, if any.

### **What does the project consist of?**

The proposed Phase 2 project consists of up to 209 single-family housing units.

### **How much traffic will the project generate?**

The proposed project is anticipated to generate approximately 2,069 daily trips, 157 AM peak hour trips, and 209 PM peak hour trips.

### **Are there any traffic impacts?**

All the study intersections and the Saliman Road segment between William Street and Robinson Street are anticipated to operate at acceptable level of service conditions now and in 2025, with the addition of the Phase 2 project traffic (Phase 1 traffic is included in the background traffic volumes). There are no project impacts that require mitigation.

### **Are any improvements proposed?**

The existing intersections are expected to accommodate the proposed Phase 2 development without any significant issues.

The 5<sup>th</sup> Street/Spine Road intersection should enable all movements with side-street STOP control. This intersection should have exclusive outbound left and right-turn lanes from Spine Road and exclusive inbound left and right-turn lanes on 5th Street. A single inbound lane is sufficient. This project phase will dedicate adequate right-of-way for traffic signal poles and a roundabout at the 5th Street/Spine Rd intersection (north side of 5th Street only) with the Spine Road connection to 5th Street.

The project will also improve the north side of East 5<sup>th</sup> Street from the western boundary of APN 010-041-34 to the existing sidewalk on the west side of Interstate 580 per the Lompa Ranch Phasing Plan.



## **LIST OF FIGURES**

1. Study Area
2. Site Plan
3. Background Traffic Volumes
4. Trip Assignment
5. Conceptual 5<sup>th</sup> Street Cross-Section
6. Background Plus Project Traffic Volumes
7. 2025 Background Plus Project Traffic Volumes

## **LIST OF APPENDICES**

- A. Background Conditions LOS Calculations
- B. Background Plus Project LOS Calculations
- C. 2025 Background Plus Project LOS Calculations

## INTRODUCTION

This report presents the findings of a Traffic Impact Study completed to assess the potential traffic impacts on local intersections associated with construction of Phase 2 of the Lompa Ranch West development. 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, if any are found.

The project site is currently undeveloped. Lompa Ranch West Phase 2 consists of 209 single-family housing units.

### *Study Area and Evaluated Scenarios*

The Phase 2 project is generally located north of East 5<sup>th</sup> Street, west of Interstate 580, and south of Robinson Street in Carson City, NV. The project location and the study intersections are shown in **Figure 1**. The site plan is provided in **Figure 2**. The following study intersections were analyzed:

- William Street/Saliman Road
- Saliman Road/Robinson Street
- Saliman Road/5<sup>th</sup> Street
- 5<sup>th</sup> Street/Spine Road

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

- Background Conditions (Existing With Lompa Ranch West Phase 1)
- Background Plus Project Conditions (Existing With Lompa Ranch West Phase 1 and Phase 2)
- 2025 Background Plus Project Conditions (2025 With Lompa Ranch West Phase 1 and Phase 2)

### *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. The LOS for a Two-Way STOP Control (TWSC) intersection is defined by the worst minor approach delay.

The complete methodology is established in the Highway Capacity Manual (HCM), 2010, published by the Transportation Research Board. **Table 1** presents the delay thresholds for each level of service grade at un-signalized and signalized intersections.

Level of service calculations were performed for the study intersections using the Vistro 5.0 software package with analysis and results reported in accordance with the 2010 HCM methodology.

**Table 1: Level of Service Definition for Intersections**

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

**Source:** Highway Capacity Manual (2010), Chapters 16 and 17

#### Level of Service Policy

The Carson City Code of Ordinances Section 12.13 establishes Level of Service (LOS) “D” as the citywide level of service standard.

In addition to the general LOS “D” standard stated above, the following specific (more conservative) LOS standards were also followed:

- LOS Standard 1: Segment of Saliman Road between Robinson St. and William St. – LOS “C” or better during the peak hours in 2025 rather than City standard LOS “D” using daily volumes.
- LOS Standard 2: Northbound approach to William Street – LOS “D” or better on the individual approach in addition to LOS “D” or better for the overall intersection during school hours.
- LOS Standard 3: Westbound left-turn movement to Saliman Road – LOS “D” or better during school hours.

## EXISTING TRANSPORTATION FACILITIES

### *Roadway Facilities*

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

*E. William Street* is a five-lane roadway, with two travel lanes in each direction and a center-turn-lane, that runs generally in the east-west direction. The posted speed limit is 40 miles per hour (mph) in the project area.

*Saliman Road* is a five-lane roadway with two travel lanes in each direction and a center-turn-lane that runs generally in the north-south direction. The posted speed limit is 25 miles per hour (mph) in the project area. There is an existing school zone north of Robinson Street to the north edge of the Carson High School property (nearly to William Street).

*Robinson Street* is a two-lane east-west roadway that will serve as a primary access to Phase 1 and Phase 2 of Lompa Ranch West. The existing posted speed limit is 15 miles per hour (mph) due to the current half-street configuration and school activity.

*5<sup>th</sup> Street* is currently a two-lane roadway east of Saliman Road and a three-lane roadway west of Saliman Road. The posted speed limit is 40 miles per hour (mph).

### *Alternate Travel Modes*

Sidewalks are present on both the east and west sides of Saliman Road, the north side of Robinson Street, and the south side of 5<sup>th</sup> Street near the project site. Marked bike lanes exist on Saliman Road and East 5<sup>th</sup> Street west of Saliman Road. Striped shoulders exist on East 5<sup>th</sup> Street east of Saliman Road to Butti Way.

## BACKGROUND CONDITIONS

### *Traffic Volumes*

Existing traffic volumes were determined by collecting turning movement counts during the AM and PM peak periods at the study intersections on an average mid-week day, with school in regular session. The volumes used in this analysis are the same as those used for Phase 1 traffic study. Background condition traffic volumes were obtained by adding the Phase 1 traffic to existing traffic volumes. The background condition peak hour intersection traffic volumes and lane configurations are shown on **Figure 3**, attached.

Please note that the background condition traffic volumes in this report are slightly different from the "Existing Plus Project" conditions traffic volumes shown in the "*Traffic Impact Study For*

*Lompa Ranch West Phase 1"* report dated December 23, 2016. This is due to the fact that the trip assignment for Phase 1 of the project will change slightly due to the new 5<sup>th</sup> Street/Spine Road connection that did not exist with only Phase 1 of the project. However, the trip distribution percentages for Phase 1 traffic remain the same as were used in Phase 1 study.

### ***Level of Service***

Level of service calculations were performed using the background conditions traffic volumes, existing lane configurations, and existing traffic controls. The results are presented in **Table 2** and the calculation sheets are provided in **Appendix A**, attached.

As shown in **Table 2**, all the study intersections currently operate at acceptable level of service conditions during both the AM and PM peak hours.

**Table 2: Background Conditions Intersection Level of Service Summary**

Intersection	Intersection Control	AM Peak		PM Peak	
		LOS	Delay	LOS	Delay
William St/Saliman Rd (Overall)	Signal	C	34.3	D	36.2
Northbound		D	51.3	D	49.0
Southbound		D	54.4	D	52.3
Eastbound		C	21.1	C	31.7
Westbound		C	27.0	C	31.4
Saliman Rd/Robinson St (Overall)	All-Way STOP	B	12.9	B	13.5
Northbound		B	14.2	B	13.7
Southbound		B	12.3	B	14.4
Eastbound		B	11.6	B	12.0
Westbound		B	11.5	B	10.5
Saliman Rd/5th St (Overall)	Signal	C	24.2	C	27.1
Northbound		B	19.5	B	14.3
Southbound		B	18.7	B	13.8
Eastbound		C	25.2	D	39.9
Westbound		C	30.0	D	39.0

## **PROJECT GENERATED TRAFFIC**

### ***Project Description***

Lompa Ranch West Phase 2 consists of 209 single-family housing units. The project location is shown in **Figure 1** and the site plan is provided in **Figure 2**.

### ***Trip Generation***

Trip generation rates for the proposed project were obtained from the *Trip Generation Manual, 9th Edition*, published by the Institute of Transportation Engineers.

**Table 3** provides the Daily, AM Peak Hour, and PM Peak Hour trip generation calculations for the proposed project based on the ITE Trip Generation Manual. As shown in **Table 3**, the proposed project is anticipated to generate approximately 2,069 daily trips, 157 AM peak hour trips, and 209 PM peak hour trips.

**Table 3: Daily Trip Generation Estimates**

Phase 2 Land Use	Size (Units)	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Single Family Housing	209	2,069	157	39	118	209	132	77
<b>TOTAL</b>		2,069	157	39	118	209	132	77

### ***Trip Distribution and Assignment***

Traffic generated by the project was distributed to the road network based on the location of the project, major activity centers, and local roadway connections. The following trip distribution percentages were used for distributing the project traffic:

- 15% to William Street east of US 395
- 15% to I-580 North
- 15% to I-580 South
- 15% to William Street west of Saliman Road
- 5% west on Robinson Drive west of Saliman Road
- 10% west on 5th Street
- 15% to Saliman Road south of 5th Street
- 10% to 5th Street east of Saliman Road

Project generated trips were assigned to the adjacent roadway system based on the distribution outlined above. The project trip assignment is shown on **Figure 4**, attached.

### ***Project Access***

Phase 2 project traffic will access the adjacent roadway system using the following access points:

- Saliman Road/Robinson Street
- 5<sup>th</sup> Street/Spine Road



- Saliman Road/Appaloosa Court (Secondary Access)

The 5<sup>th</sup> Street/Spine Road intersection is proposed as a full access intersection allowing for all the possible movements with side-street STOP control. This intersection should have exclusive outbound left and right-turn lanes from Spine Road and exclusive inbound left and right-turn lanes on 5th Street. A single inbound lane is sufficient. This project will dedicate adequate right-of-way for a roundabout or traffic signal at the 5th Street/Spine Rd intersection (north side of 5th Street only) with the connection to 5th Street. An initial review indicates adequate sight lines can be provided at the proposed 5th Street/Spine Road intersection. The final design must demonstrate appropriate sight distances.

The north side of 5<sup>th</sup> Street will be improved, along project frontage, to the cross-section shown in **Figure 5**, in accordance with the Lompa Ranch Phasing Plan.

The Robinson Street/Spine Road intersection is proposed as a three-legged roundabout intersection as shown in the site plan (**Figure 2**).

Robinson Street will be fully improved from Phase 1 to the Spine Road, matching the roadway cross-section constructed in Phase 1.

The project access design and roadway design should meet the American Association of State Highway and Transportation (AASHTO) sight distance requirements and/or City design standards, which appears possible. All the signing and striping at the proposed access intersection should be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) guidelines.

## **BACKGROUND PLUS PROJECT CONDITIONS**

### ***Traffic Volumes***

Background Plus Project traffic volumes were developed by adding the Phase 2 project generated trips (**Figure 4**) to the background traffic volumes (**Figure 3**) and are shown on **Figure 6**, attached. The Background Plus Project condition Peak Hour Factors (PHF) and travel patterns were assumed to remain the same as background conditions.

### ***Level of Service***

Level of service calculations were performed using the Background Plus Project conditions traffic volumes. **Table 4** presents the level of service analysis summary for Background Plus Project scenario. Detailed calculation sheets are provided in **Appendix B**, attached.

**Table 4: Background Plus Project Intersection Level of Service Summary**

Intersection	Intersection Control	AM Peak		PM Peak	
		LOS	Delay	LOS	Delay
William St/Saliman Rd (Overall)	Signal	C	32.2	D	35.5
Northbound		D	36.6	D	39.4
Southbound		D	45.9	D	45.9
Eastbound		C	25.3	D	37.5
Westbound		C	29.4	C	29.7
Saliman Rd/Robinson St (Overall)	All-Way STOP	B	13.8	B	14.3
Northbound		C	15.3	B	14.8
Southbound		B	12.9	C	15.2
Eastbound		B	11.9	B	12.5
Westbound		B	12.9	B	11.5
Saliman Rd/5th St (Overall)	Signal	C	24.3	C	27.2
Northbound		C	20.1	B	14.8
Southbound		B	19.3	B	14.4
Eastbound		C	25.0	D	39.4
Westbound		C	29.8	D	38.5
5th St/Spine Rd	Side Street STOP				
Southbound Left		C	20.4	C	17.2
Southbound Right		B	13.2	A	9.9
Eastbound Left		A	9.0	A	8.0

As shown in **Table 4**, under the Background Plus Project conditions, all the study intersections are anticipated to operate at acceptable level of service conditions during both the AM and PM peak hours.

The William Street/Saliman Road intersection signal timings were optimized in order to provide better traffic operations during the school peak hours. Hence the Background Plus Project conditions LOS at this intersection is better than the background conditions during both the AM and PM peak hours. With Phase 2 traffic, both the northbound approach and the westbound left-turn movements operate at LOS “D” or better during the school hours.

The Phase 2 project traffic is anticipated to cause an increase in average delay of less than 1 second per vehicle at all study intersections during both the AM and PM peak hours.

**Peak Hour Roadway Segment Level of Service**

For a complete explanation of peak hour roadway segment LOS methodology, please refer to the *Traffic Impact Study for Lompa Ranch West Build-Out* report dated March 9, 2017. The LOS criteria for roadway segment analysis is shown in Table 5.

**Table 5: LOS Criteria for Roadway Segments**

Facility Type	Peak Hour LOS Capacity Threshold				
	A	B	C	D	E
Minor 2-lane Hwy	90	200	680	1,410	≤1,740
Major 2-lane Hwy/Exp	120	290	790	1,600	≤2,050
4-lane, Multi-lane Hwy/Exp	1,070	1,760	2,530	3,280	≤3,650
6-lane Expressway	1,610	2,640	3,800	4,920	≤5,480
2-lane Minor Arterial	--	--	650	1,180	≤1,250
2-lane Major Arterial	--	--	970	1,760	≤1,870
4-lane Major Arterial, Undivided	--	--	1,750	2,740	≤2,890
4-lane Major Arterial, Divided	--	--	1,920	3,540	≤3,740
6-lane Arterial, Divided	--	--	2,710	5,320	≤5,600
3-lane Arterial, One-way Rd	--	--	310	2,060	≤2,170
2-lane Freeway	1,110	2,010	2,880	3,570	≤4,010
2-lane Freeway + Aux Lane	1,410	2,550	3,640	4,490	≤5,035
3-lane Freeway	1,700	3,080	4,400	5,410	≤6,060
3-lane Freeway + Aux Lane	2,010	3,640	5,180	6,350	≤7,100
4-lane Freeway	2,320	4,200	5,950	7,280	≤8,140
6-lane Freeway	3,330	6,030	8,640	10,710	≤12,030
Minor 2-lane Collector	--	--	370	790	≤1,020
Major 2-lane Collector	--	--	550	1,180	≤1,520

Table 6 summarizes the Background Plus Project conditions peak hour bidirectional roadway volumes and roadway segment LOS for the Saliman Road segment between William Street and Robinson Street.

**Table 6: Background Plus Project Roadway Segment Level of Service Summary**

Roadway	Location	Peak Hour	Existing Volume	Phase 1 Traffic	Phase 2 Traffic	Total
Saliman Rd	Between William St & Robinson St	AM Peak	1,050	84	96	1,230
		PM Peak	870	112	128	1,110

As shown in **Table 6**, the Saliman Road segment between William Street and Robinson Street is anticipated to carry a bidirectional volume of less than 1,750 vehicles per hour during both the AM and PM peak hours. Applying the thresholds shown in **Table 5**, the Saliman Road segment between Robinson Street and William Street will operate at LOS “C” or better during the Background Plus Project conditions.

#### ***Saliman Road/Robinson Street Intersection***

As shown in **Figure 6**, the Background Plus Project conditions AM peak hour bi-directional traffic volumes on Robinson Street east of Saliman Road are less than 600 vehicles per hour. A preliminary signal warrant analysis showed that the Background Plus Project conditions peak hour volumes do not meet signal warrants. A traffic signal is not warranted or triggered with the Phase 2 project.

## **2025 BACKGROUND PLUS PROJECT CONDITIONS**

### ***Traffic Volumes***

2025 traffic volumes were developed in this study to provide a baseline for assessing future potential impacts of the project. Reasonably reliable traffic volume projections are available for the 2025 timeframe from the regional travel demand model. Traffic growth rates were determined using the latest iteration of the Carson Area Metropolitan Planning Organization travel demand model outputs. The obtained growth rates were then applied to the existing AM and PM peak hour traffic volumes to forecast future intersection peak hour traffic volumes. The growth rates and factors are shown in **Table 7** and the 2025 Background Plus Project peak hour turning movement volumes (including Phase 1 and Phase 2 traffic) are shown in **Figure 7**, attached.

**Table 7: 2025 Growth Rates**

Location -->	William St	Saliman Rd	5th St
	west of Casino	south of William	east of Saliman
2015 CAMPO Volume	25,100	7,200	6,700
2025 CAMPO Volume	27,900	10,200	10,400
Model Difference 2025-2015	2,800	3,000	3,700
10 Years % Change	11%	42%	55%
9 years growth factor (2016 to 2025)	1.1	1.4	1.5

### Level of Service

**Table 8** presents the level of service analysis summary for the 2025 Background Plus Project conditions assuming existing intersection configurations and optimized signal timings. Detailed calculation sheets are provided in **Appendix C**, attached.

**Table 8: 2025 Background Plus Project Intersection Level of Service Summary**

Intersection	Intersection Control	AM Peak		PM Peak	
		LOS	Delay	LOS	Delay
William St/Saliman Rd (Overall)	Signal	D	36.0	D	49.8
Northbound		D	37.5	D	50.1
Southbound		D	49.9	D	48.1
Eastbound		C	30.6	E	59.1
Westbound		D	36.0	D	40.6
Saliman Rd/Robinson St (Overall)	All-Way STOP	B	14.3	C	20.5
Northbound		B	14.8	D	26.4
Southbound		C	15.2	C	18.5
Eastbound		B	12.5	B	14.2
Westbound		B	11.5	C	15.2
Saliman Rd/5th St (Overall)	Signal	C	31.3	C	28.7
Northbound		D	35.0	C	25.1
Southbound		C	30.8	C	24.2
Eastbound		C	21.7	C	32.5
Westbound		C	33.8	C	31.5
5th St/Spine Rd	Side Street STOP				
Southbound Left		D	34.8	D	27.5
Southbound Right		C	17.0	B	10.9
Eastbound Left		B	10.2	A	8.4

As shown in **Table 8**, under the 2025 Background Plus Project conditions, all the study intersections are anticipated to operate at acceptable level of service conditions during both the AM and PM peak hours. Both the northbound approach and the westbound left-turn movement at the William Street/Saliman Road intersection operate at LOS "D" or better during the school hours.

#### ***Peak Hour Roadway Segment Level of Service***

**Table 9** summarizes the 2025 Background Plus Project conditions peak hour bidirectional roadway volumes and roadway segment LOS for Saliman Road segment between William Street and Robinson Street.

**Table 9: 2025 Background Plus Project Roadway Segment Level of Service Summary**

Roadway	Location	Peak Hour	2025 Volume	Phase 1 Traffic	Phase 2 Traffic	Total
Saliman Rd	Between William St & Robinson St	AM Peak	1,418	84	96	1,598
		PM Peak	1,175	112	128	1,415

As shown in **Table 9**, the Saliman Road segment between William Street and Robinson Street is anticipated to carry a bidirectional volume of less than 1,750 vehicles per hour during the 2025 Background Plus Project conditions AM and PM peak hours. Applying the thresholds shown in **Table 5**, the Saliman Road segment between Robinson Street and William Street is anticipated to operate at LOS "C" or better during the 2025 Background Plus Project conditions.

#### ***Saliman Road/Robinson Street Intersection***

As shown in **Figure 7**, the Background Plus Project conditions AM peak hour bi-directional traffic volumes on Robinson Street east of Saliman Road are less than 600 vehicles per hour. A traffic signal is not recommended with the Phase 2 project.

### **PROPOSED IMPROVEMENTS**

The Level of Service analysis shows that the project traffic does not cause any significant impacts requiring mitigation. Under the 2025 Background Plus Project conditions, all the study intersections operate at acceptable LOS conditions with minimal average delay increases.

While the Phase 1 project improves Robinson Street, Phase 2 of the Lompa Ranch West project improves the north side of East 5<sup>th</sup> Street along the project frontage.



## CONCLUSIONS & RECOMMENDATIONS

The following is a list of our key findings and recommendations:

**Project Trips:** The Lompa Ranch West Phase 2 is anticipated to generate approximately 2,069 daily trips, 157 AM peak hour trips, and 209 PM peak hour trips.

**Background Level of Service:** All the study intersections are anticipated to operate at acceptable level of service conditions during the background conditions (Existing + Phase 1).

**Background Plus Project Intersection Level of Service:** All the study intersections are anticipated to operate at acceptable level of service conditions under the Background Plus Project scenario. With the addition of project traffic, the average delays are anticipated to increase by not more than 1 second per vehicle during the peak hours. The impacts of project traffic are considered not significant.

**2025 Background Plus Project Intersection Level of Service:** All the study intersections are anticipated to operate at acceptable level of service conditions under the 2025 Background Plus Project scenario.

**Saliman Road Segment LOS:** Saliman Road between William Street and Robinson Street is anticipated to operate at LOS "C" or better under both the Background Plus Project and 2025 Background Plus Project conditions, during the peak hours.

**LOS Thresholds Summary:** The following table summarizes all the LOS thresholds and findings for both the Background Plus Project and 2025 Background Plus Project conditions.

All intersections at or better than LOS "D"	YES
Saliman Road between Robinson St. and William St LOS "C" or better during the peak hours	YES
Northbound approach to William Street LOS "D" or better during school hours	YES
Westbound left-turn movement to Saliman Road LOS "D" or better during the school hours.	YES

Since all the thresholds are satisfied, no mitigation measures are necessary with this phase.

**5th Street/Spine Road Access:** This intersection is proposed as a full access intersection allowing for all the possible movements with side-street STOP control. This intersection should have exclusive outbound left and right-turn lanes from Spine Road and exclusive inbound left and right-turn lanes on 5th Street. A single inbound lane is sufficient. This project will dedicate

adequate right-of-way for a roundabout or traffic signal at the 5th Street/Spine Rd intersection (north side of 5th Street only) with the Spine Rd connection to 5th Street.

***Saliman Road/Robinson Street Intersection:***

- This intersection is anticipated to operate at acceptable LOS conditions during both Background Plus Project and 2025 Background Plus Project conditions.
- The AM peak hour bi-directional traffic volume on Robinson Street east of Saliman Road will be less than 600 vehicles per hour with Existing traffic + Lompa Ranch Phases 1 & 2.
- Existing + Lompa Ranch Phases 1 & 2 traffic volumes at this intersection do not meet signal warrants with Phase 2.

***Proposed Improvements:*** The project will improve the north side of East 5th Street from the western boundary of APN 010-041-34 to the existing sidewalk on the west side of Interstate 580 per the Lompa Ranch Phasing Plan.

***Mitigations:*** No mitigation measures are needed with Phase 2 as all the study intersections operate at acceptable LOS conditions with the addition of the project traffic.

The City should revisit signal timings and optimization at the William Street/Saliman Road and Saliman Road/East 5<sup>th</sup> Street intersections at the completion of Phase 2.



## Study Intersections

- 1 William St/Saliman Rd
- 2 Saliman Rd/Robinson St
- 3 Saliman Rd/5th St
- 4 5th St/Spine Rd



**THE RED LTD**  
 7271 S. Canyon Way  
 Suite 2  
 Las Vegas, NV 89148  
 (702) 395-7433  
 www.redltd.com

SEAL, DESIGN, ENGINEERING, DEVELOPMENT

PROFESSIONAL SEAL  
 STATE OF NEVADA  
 CIVIL  
 No. 7258

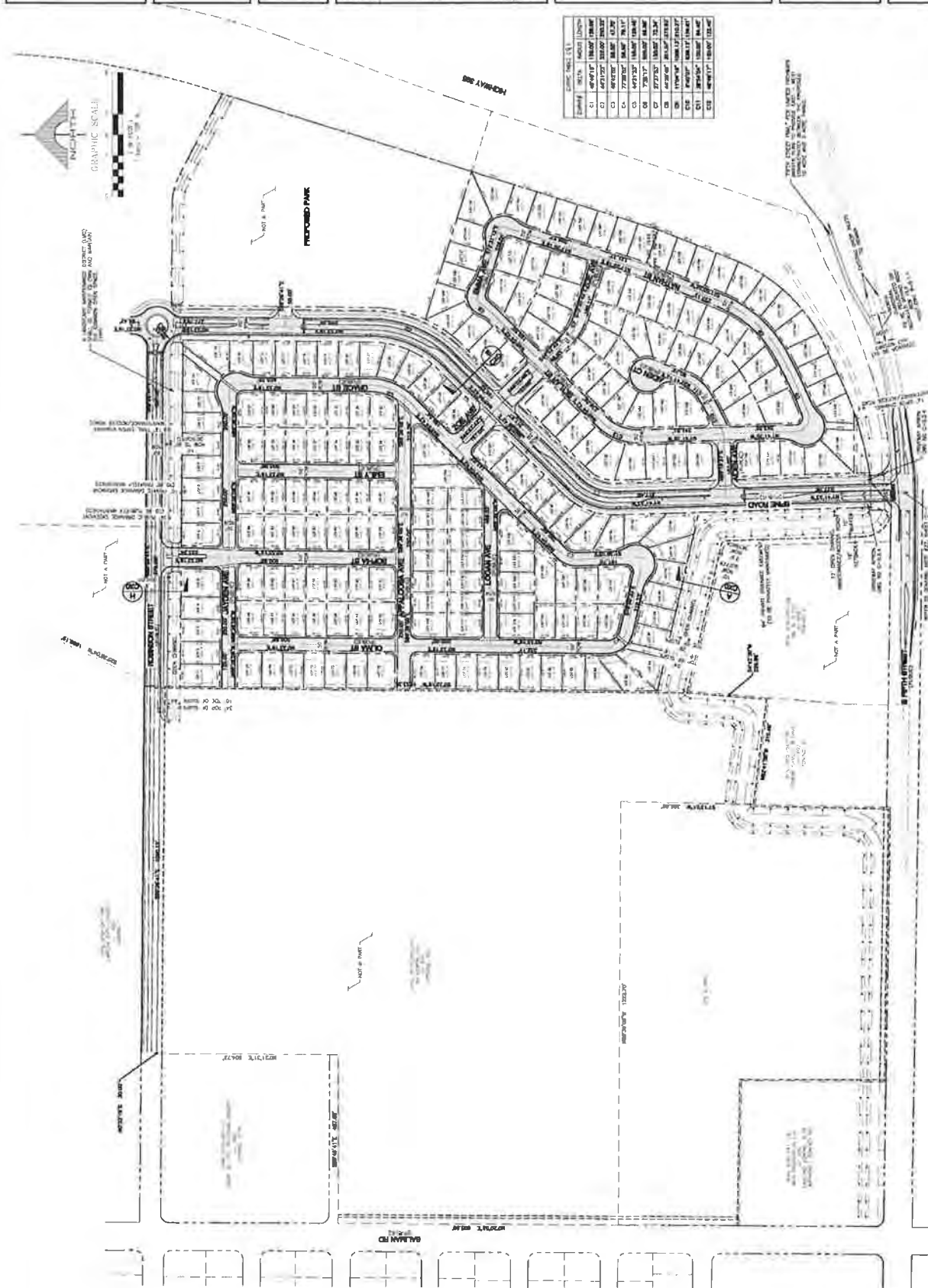
**CLARK**  
 BLACKSTONE RANCH DEVELOPMENT  
 10000 S. RANCHO BLVD.  
 SUITE 100  
 LAS VEGAS, NV 89138  
 (702) 735-1200

DATE: \_\_\_\_\_  
 REVISION: \_\_\_\_\_  
 APPROVED: \_\_\_\_\_

**OVERALL SITE PLAN**  
 BLACKSTONE RANCH - PHASE 2  
 SHEET 001

SCALE: 1" = 100' 0"

LEGEND:  
 - LOT LINES  
 - EASEMENTS  
 - EXISTING ROADS  
 - PROPOSED ROADS  
 - UTILITIES



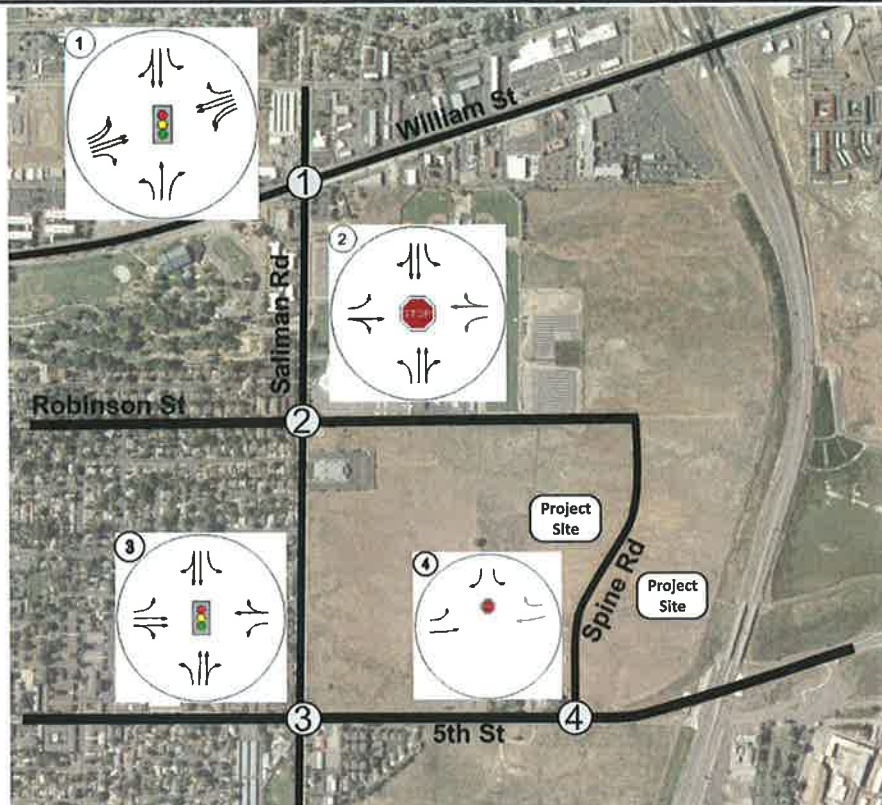
**TRAFFIC WORKS**

**Figure 2**

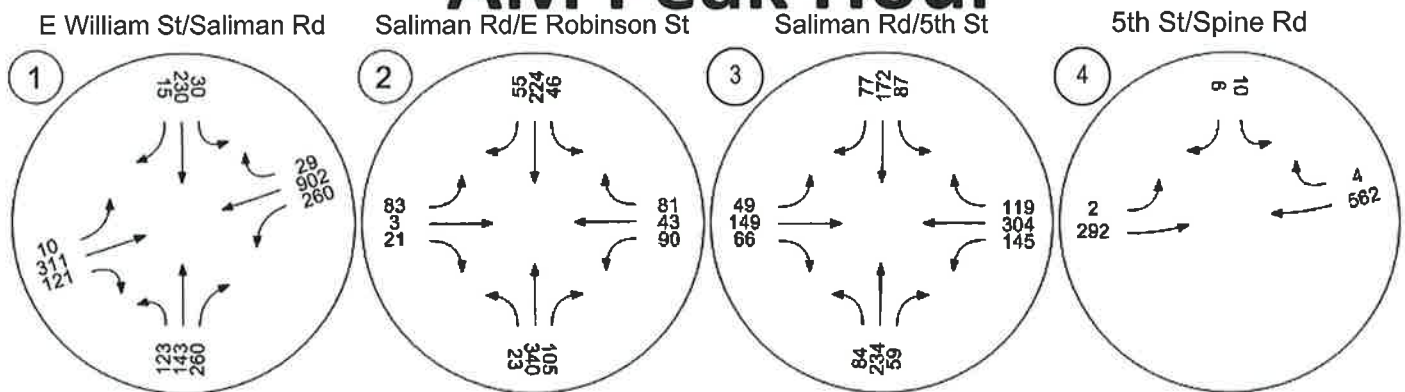
**Lompa Ranch West Phase 2**

**TRAFFIC IMPACT STUDY**

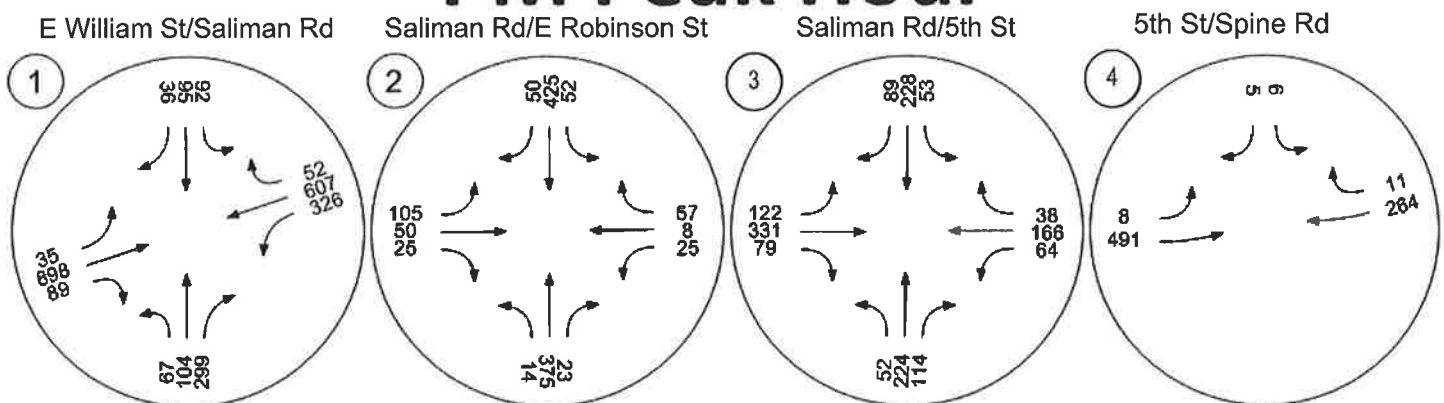
**Site Plan**

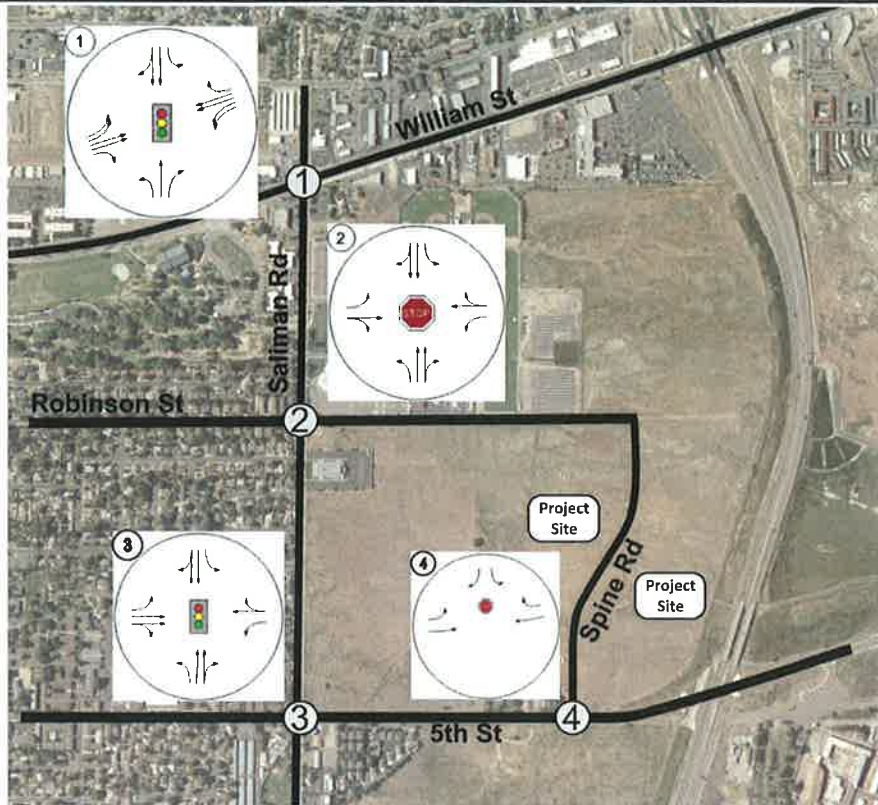


## AM Peak Hour

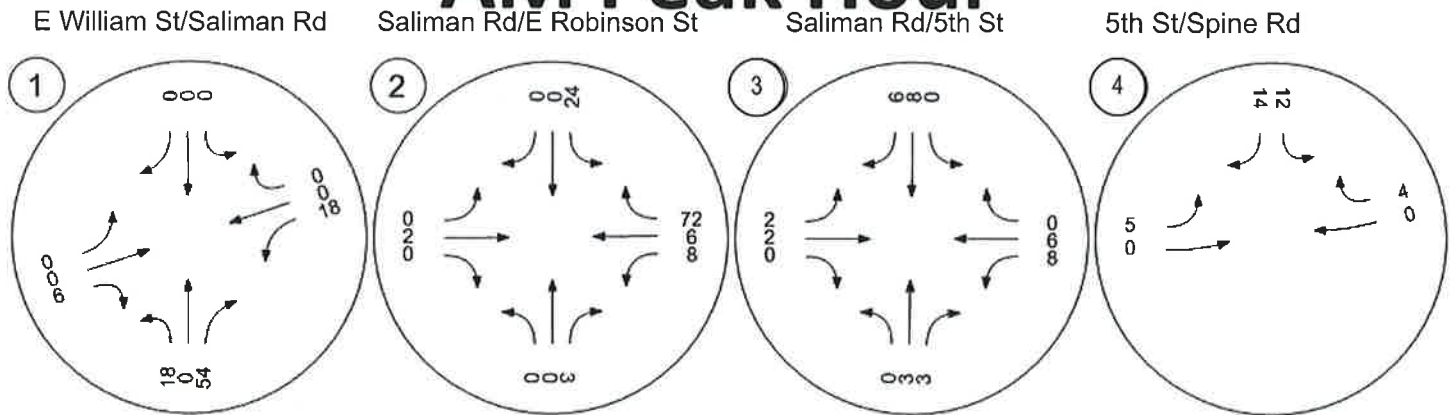


## PM Peak Hour

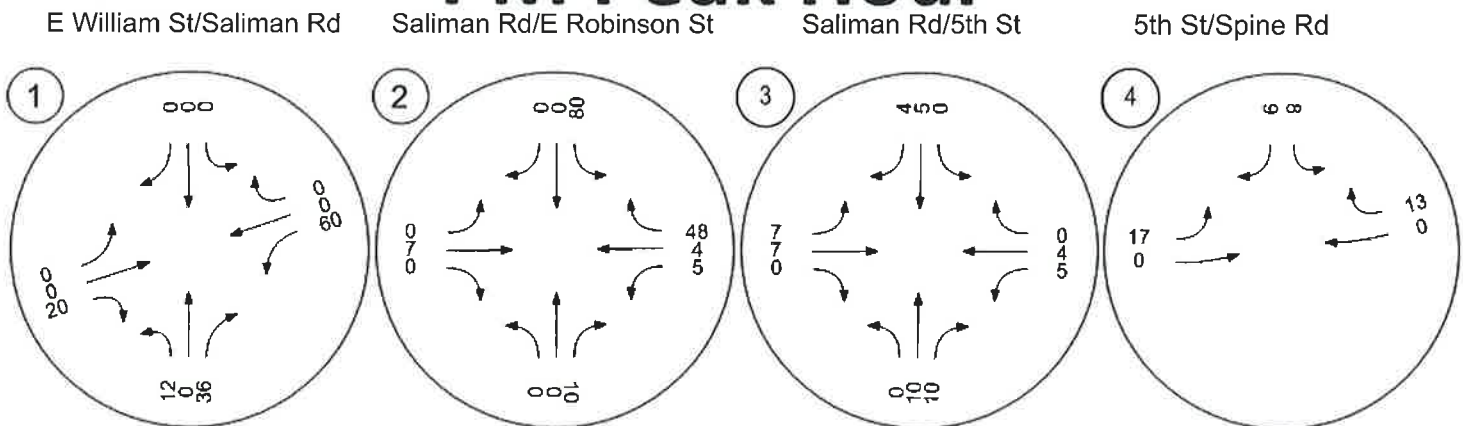




## AM Peak Hour



## PM Peak Hour

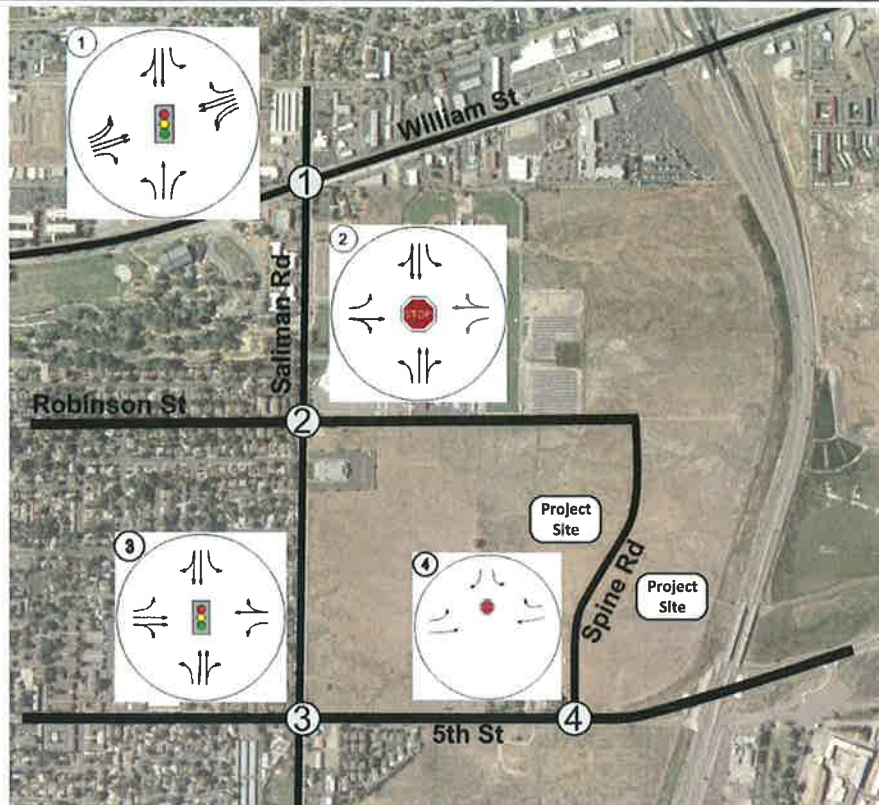




# 5th Street

Right-of-way Width = 60 feet (minimum)





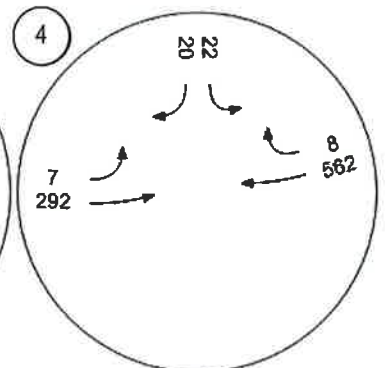
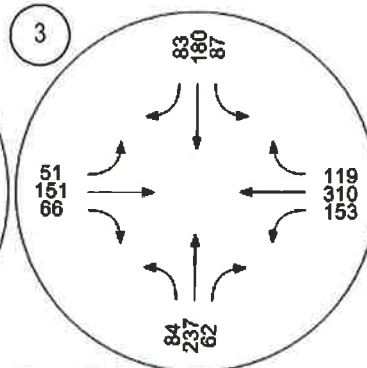
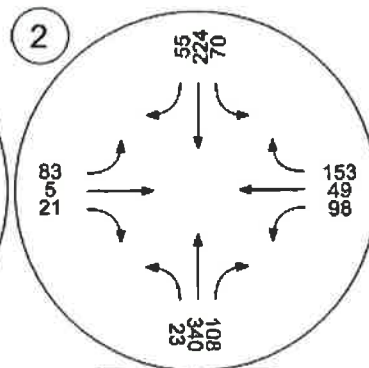
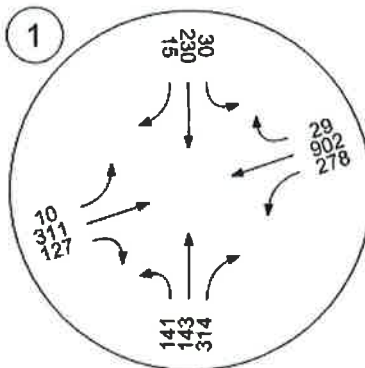
## AM Peak Hour

E William St/Saliman Rd

Saliman Rd/E Robinson St

Saliman Rd/5th St

5th St/Spine Rd



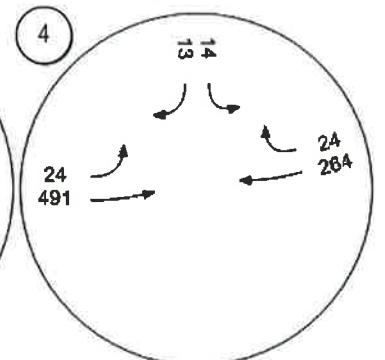
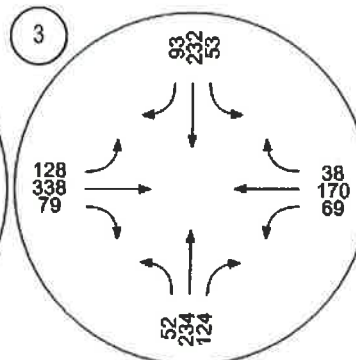
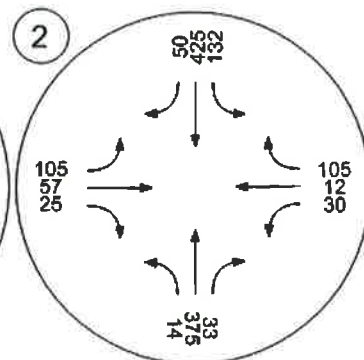
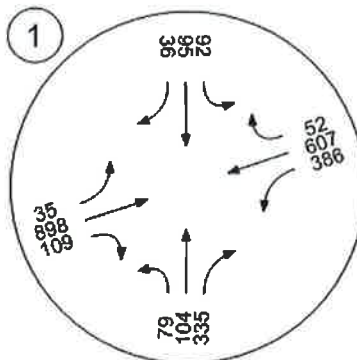
## PM Peak Hour

E William St/Saliman Rd

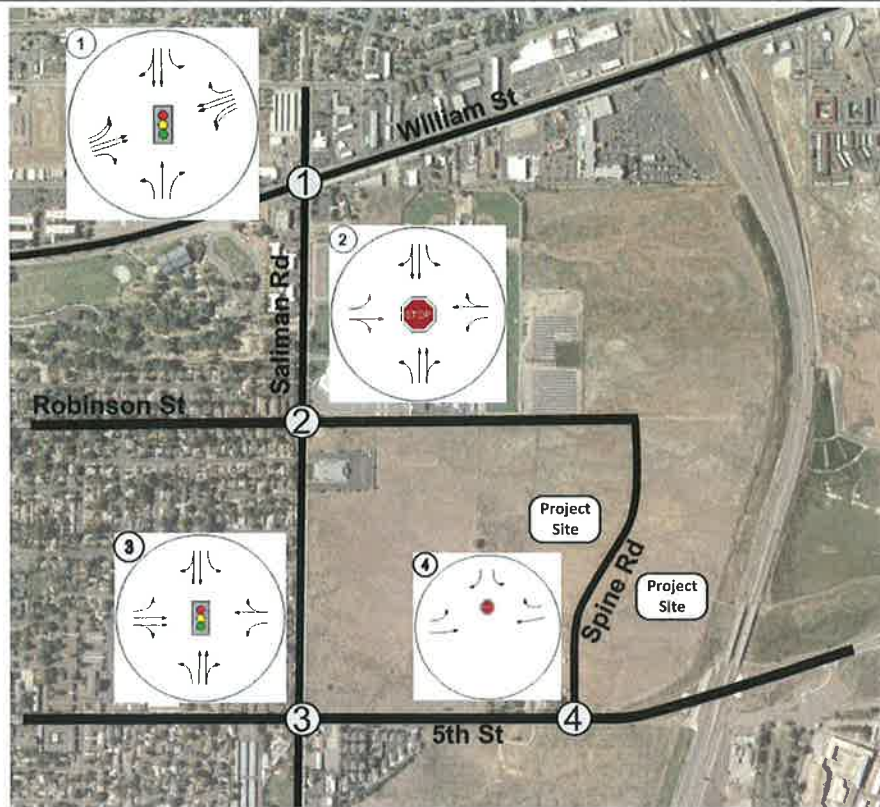
Saliman Rd/E Robinson St

Saliman Rd/5th St

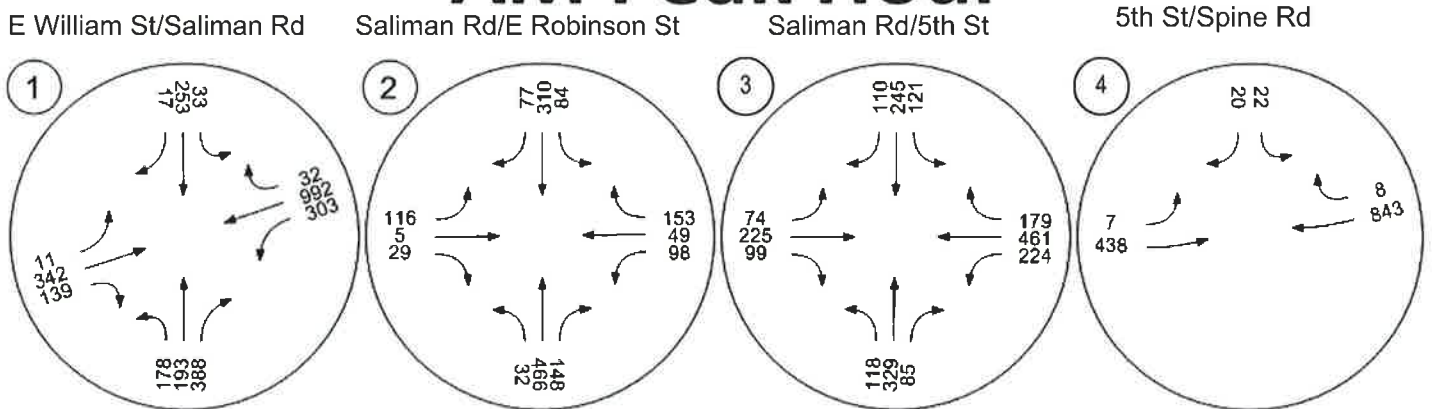
5th St/Spine Rd



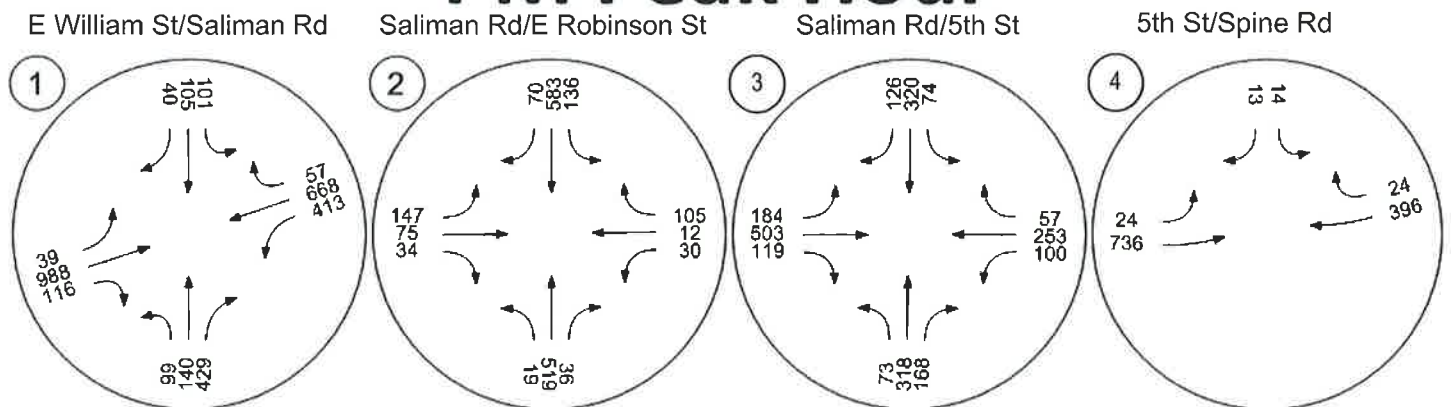




## AM Peak Hour



## PM Peak Hour



## **Appendix A**


### **Background Conditions LOS Calculations**

**Intersection Level Of Service Report**  
**Intersection 1: E William St/Saliman Rd**

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 34.3  
Level Of Service: C  
Volume to Capacity (v/c): 0.551

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			E William St			William St		
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 Pocket	1	0	0	1	0	0	2	0	1	2	0	1
Pocket Length [ft]	150.00	100.00	100.00	160.00	100.00	100.00	215.00	100.00	125.00	175.00	100.00	75.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			E William St			William St		
Base Volume Input [veh/h]	107	143	212	30	230	15	10	311	116	245	902	29
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	48	0	0	0	0	0	5	15	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	143	260	30	230	15	10	311	121	260	902	29
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
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]	36	42	76	9	68	4	3	91	36	76	265	9
Total Analysis Volume [veh/h]	145	168	306	35	271	18	12	366	142	306	1061	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

### Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	130
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

### Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.8	4.0	0.0	0.0	4.0	0.0	4.0	2.0	0.0	4.0	2.0	0.0
Split [s]	11	55	0	0	44	0	13	34	0	41	62	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	29	0	0	29	0	0	21	0	0	22	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.8	5.0	0.0	0.0	5.0	0.0	6.0	4.0	0.0	6.0	4.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

### Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	8.00	6.00	6.00	8.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	5.00	5.00	5.00	5.00	5.00	6.00	4.00	4.00	6.00	4.00	4.00
g_i, Effective Green Time [s]	31	31	31	20	20	20	2	63	63	15	76	76
g / C, Green / Cycle	0.24	0.24	0.24	0.15	0.15	0.15	0.01	0.48	0.48	0.12	0.59	0.59
(v / s)_i Volume / Saturation Flow Rate	0.12	0.10	0.21	0.03	0.09	0.09	0.00	0.11	0.10	0.10	0.33	0.02
s, saturation flow rate [veh/h]	1160	1676	1425	1091	1676	1640	3101	3192	1425	3101	3192	1425
c, Capacity [veh/h]	275	396	337	111	253	248	45	1542	688	369	1876	838
d1, Uniform Delay [s]	43.02	42.14	48.29	60.46	51.32	51.37	63.42	19.63	19.30	55.99	16.56	11.32
k, delay calibration	0.11	0.11	0.13	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.57	0.72	10.84	1.59	2.05	2.14	3.17	0.36	0.68	4.80	1.24	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

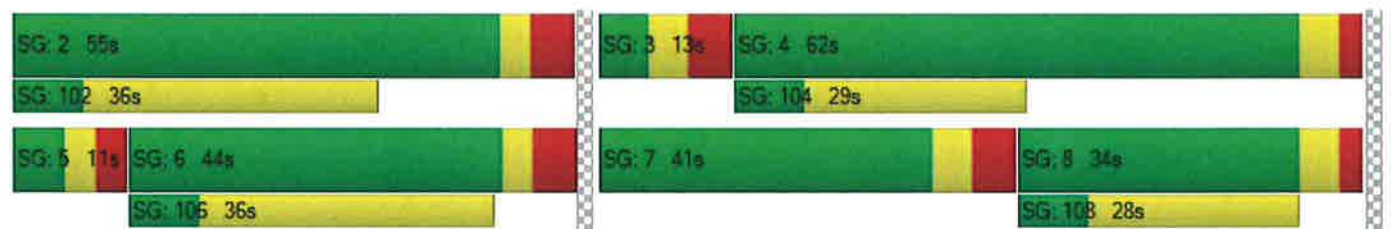
X, volume / capacity	0.53	0.42	0.91	0.31	0.57	0.58	0.27	0.24	0.21	0.83	0.57	0.04
d, Delay for Lane Group [s/veh]	44.59	42.86	59.13	62.05	53.36	53.50	66.59	19.99	19.98	60.79	17.80	11.41
Lane Group LOS	D	D	E	E	D	D	E	B	B	E	B	B
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	4.06	4.69	10.64	1.18	4.56	4.52	0.22	3.34	2.62	5.16	9.85	0.44
50th-Percentile Queue Length [ft]	101.46	117.26	265.95	29.59	114.10	112.94	5.42	83.50	65.47	128.98	246.34	10.97
95th-Percentile Queue Length [veh]	7.31	8.24	15.99	2.13	8.07	8.00	0.39	6.01	4.71	8.88	15.00	0.79
95th-Percentile Queue Length [ft]	182.63	206.05	399.67	53.26	201.69	200.08	9.76	150.31	117.85	222.10	375.04	19.75

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	44.59	42.86	59.13	62.05	53.43	53.50	66.59	19.99	19.98	60.79	17.80	11.41
Movement LOS	D	D	E	E	D	D	E	B	B	E	B	B
d_A, Approach Delay [s/veh]	51.31			54.37			21.06			27.03		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	34.29											
Intersection LOS	C											
Intersection V/C	0.551											

**Sequence**

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Saliman Rd/E Robinson St**

Control Type: All-way stop  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 12.9  
Level Of Service: B  
Volume to Capacity (v/c): 0.463

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			Robinson St			Robinson St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T			T T		
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 Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	130.00	100.00	100.00	160.00	100.00	100.00	60.00	100.00	100.00	90.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			Robinson St			Robinson St		
Base Volume Input [veh/h]	22	314	100	34	216	55	83	1	20	77	39	43
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	26	5	12	8	0	0	2	1	13	4	38
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]	23	340	105	46	224	55	83	3	21	90	43	81
Peak Hour Factor	0.8500	0.8500	1.0000	1.0000	0.8500	0.8500	0.8500	1.0000	0.8500	1.0000	1.0000	1.0000
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]	7	100	26	12	66	16	24	1	6	23	11	20
Total Analysis Volume [veh/h]	27	400	105	46	264	65	98	3	25	90	43	81
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings****Lanes**

Capacity per Entry Lane [veh/h]	507	545	570	487	522	543	477	554	480	546
Degree of Utilization, x	0.05	0.46	0.44	0.09	0.32	0.30	0.21	0.05	0.19	0.23

**Movement, Approach, & Intersection Results**





95th-Percentile Queue Length [veh]	0.17	2.43	2.26	0.31	1.34	1.27	0.76	0.16	0.68	0.87
95th-Percentile Queue Length [ft]	4.21	60.72	56.45	7.79	33.54	31.73	19.08	3.98	17.07	21.68
Approach Delay [s/veh]	14.20			12.27			11.60		11.52	
Approach LOS	B			B			B		B	
Intersection Delay [s/veh]	12.90									
Intersection LOS	B									

**Intersection Level Of Service Report**  
**Intersection 4: Saliman Rd/5th St**

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 24.2  
Level Of Service: C  
Volume to Capacity (v/c): 0.451

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			5th St			5th St		
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 Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	130.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			5th St			5th St		
Base Volume Input [veh/h]	84	230	57	86	162	68	46	148	66	141	302	119
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	2	1	10	9	3	1	0	4	2	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	234	59	87	172	77	49	149	66	145	304	119
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
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]	24	68	17	25	50	22	14	43	19	42	88	35
Total Analysis Volume [veh/h]	98	272	69	101	200	90	57	173	77	169	353	138
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.2	0.0	0.0	3.2	0.0
All red [s]	2.3	2.3	0.0	2.4	2.3	0.0	0.0	2.2	0.0	0.0	2.3	0.0
Split [s]	11	30	0	13	32	0	0	57	0	0	57	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	13	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	3.3	3.3	0.0	3.4	3.3	0.0	0.0	3.4	0.0	0.0	3.5	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.30	5.30	5.30	5.30	5.30	5.30	5.40	5.40	5.40	5.50	5.50
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00
I2, Clearance Lost Time [s]	0.00	3.30	3.30	0.00	3.30	3.30	0.00	3.40	3.40	3.50	3.50
g_i, Effective Green Time [s]	50	40	40	50	40	40	39	39	39	39	39
g / C, Green / Cycle	0.50	0.40	0.40	0.50	0.40	0.40	0.39	0.39	0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.09	0.10	0.11	0.10	0.09	0.09	0.07	0.08	0.08	0.17	0.31
s, saturation flow rate [veh/h]	1077	1676	1562	1043	1676	1506	854	1676	1508	1013	1597
c, Capacity [veh/h]	590	670	624	566	674	605	132	653	587	388	620
d1, Uniform Delay [s]	13.31	20.13	20.18	13.41	19.64	19.71	44.21	20.20	20.29	28.41	27.02
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.61	0.95	1.04	0.15	0.76	0.89	2.21	0.15	0.17	0.77	3.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.26	0.27	0.18	0.22	0.23	0.43	0.20	0.21	0.44	0.79
d, Delay for Lane Group [s/veh]	13.91	21.08	21.22	13.55	20.40	20.60	46.42	20.35	20.46	29.18	30.31
Lane Group LOS	B	C	C	B	C	C	D	C	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	1.24	2.87	2.75	1.20	2.41	2.27	0.91	1.99	1.89	3.37	10.56
50th-Percentile Queue Length [ft]	30.97	71.77	68.78	30.00	60.22	56.74	22.82	49.66	47.14	84.31	264.01
95th-Percentile Queue Length [veh]	2.23	5.17	4.95	2.16	4.34	4.09	1.64	3.58	3.39	6.07	15.89
95th-Percentile Queue Length [ft]	55.75	129.19	123.80	54.00	108.39	102.13	41.07	89.38	84.85	151.75	397.25

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	13.91	21.13	21.22	13.55	20.45	20.60	46.42	20.38	20.46	29.18	30.31	30.31
Movement LOS	B	C	C	B	C	C	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	19.53			18.71			25.23			30.02		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	24.18											
Intersection LOS	C											
Intersection V/C	0.451											

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






**Intersection Level Of Service Report**  
**Intersection 6: 5th St/Spine Rd**

Control Type: Two-way stop  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 19.2  
Level Of Service: C  
Volume to Capacity (v/c): 0.045

**Intersection Setup**

Name	Spine Rd		5th St		5th St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	1
Pocket Length [ft]	200.00	100.00	150.00	100.00	100.00	150.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Spine Rd		5th St		5th St	
Base Volume Input [veh/h]	0	0	0	291	562	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	6	2	1	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	6	2	292	562	4
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	2	1	86	165	1
Total Analysis Volume [veh/h]	12	7	2	344	661	5
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

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

**Movement, Approach, & Intersection Results**





V/C, Movement V/C Ratio	0.05	0.02	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	19.19	12.90	8.91	0.00	0.00	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.05	0.01	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	3.53	1.15	0.16	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	16.88		0.05		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.33					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 1: E William St/Saliman Rd**

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 36.2  
Level Of Service: D  
Volume to Capacity (v/c): 0.642

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			E William St			William St		
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 Pocket	1	0	0	1	0	0	2	0	1	2	0	1
Pocket Length [ft]	150.00	100.00	100.00	160.00	100.00	100.00	215.00	100.00	125.00	175.00	100.00	75.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			E William St			William St		
Base Volume Input [veh/h]	57	104	269	92	95	36	35	898	71	272	607	52
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	0	30	0	0	0	0	0	18	54	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	67	104	299	92	95	36	35	898	89	326	607	52
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
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]	18	28	80	25	26	10	9	241	24	88	163	14
Total Analysis Volume [veh/h]	72	112	322	99	102	39	38	966	96	351	653	56
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



### Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	130
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

### Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.8	4.0	0.0	0.0	4.0	0.0	4.0	2.0	0.0	4.0	2.0	0.0
Split [s]	11	54	0	0	43	0	22	34	0	42	54	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	29	0	0	29	0	0	21	0	0	22	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.8	5.0	0.0	0.0	5.0	0.0	6.0	4.0	0.0	6.0	4.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

### Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	8.00	6.00	6.00	8.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	5.00	5.00	5.00	5.00	5.00	6.00	4.00	4.00	6.00	4.00	4.00
g_i, Effective Green Time [s]	34	34	34	23	23	23	4	58	58	17	72	72
g / C, Green / Cycle	0.26	0.26	0.26	0.17	0.17	0.17	0.03	0.45	0.45	0.13	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.06	0.07	0.23	0.09	0.04	0.05	0.01	0.30	0.07	0.11	0.20	0.04
s, saturation flow rate [veh/h]	1247	1676	1425	1148	1676	1524	3101	3192	1425	3101	3192	1425
c, Capacity [veh/h]	356	434	369	174	292	265	90	1422	635	415	1757	784
d1, Uniform Delay [s]	37.51	38.26	46.12	57.21	46.35	46.46	62.04	28.66	21.43	54.99	16.52	13.68
k, delay calibration	0.11	0.11	0.16	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	0.31	9.16	2.91	0.44	0.51	3.09	2.63	0.50	4.77	0.60	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.20	0.26	0.87	0.57	0.25	0.26	0.42	0.68	0.15	0.84	0.37	0.07
d, Delay for Lane Group [s/veh]	37.78	38.57	55.28	60.12	46.78	46.98	65.14	31.29	21.94	59.76	17.13	13.86
Lane Group LOS	D	D	E	E	D	D	E	C	C	E	B	B
Critical Lane Group	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	1.83	2.90	10.87	3.34	2.06	1.99	0.66	12.39	1.85	5.90	5.63	0.82
50th-Percentile Queue Length [ft]	45.69	72.57	271.76	83.39	51.54	49.63	16.45	309.81	46.34	147.38	140.69	20.42
95th-Percentile Queue Length [veh]	3.29	5.23	16.28	6.00	3.71	3.57	1.18	18.17	3.34	9.88	9.52	1.47
95th-Percentile Queue Length [ft]	82.24	130.63	406.93	150.11	92.77	89.33	29.61	454.15	83.41	246.92	237.96	36.75

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	37.78	38.57	55.28	60.12	46.84	46.98	65.14	31.29	21.94	59.76	17.13	13.86
Movement LOS	D	D	E	E	D	D	E	C	C	E	B	B
d_A, Approach Delay [s/veh]	49.09			52.34			31.65			31.07		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	36.18											
Intersection LOS	D											
Intersection V/C	0.642											

**Sequence**

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






**Intersection Level Of Service Report**  
**Intersection 2: Saliman Rd/E Robinson St**

Control Type: All-way stop  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 13.5  
Level Of Service: B  
Volume to Capacity (v/c): 0.469

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			Robinson St			Robinson St		
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 Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	130.00	100.00	100.00	160.00	100.00	100.00	60.00	100.00	100.00	90.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			Robinson St			Robinson St		
Base Volume Input [veh/h]	13	359	7	9	396	50	105	45	23	16	6	33
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	16	16	43	29	0	0	5	2	9	2	24
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]	14	375	23	52	425	50	105	50	25	25	8	57
Peak Hour Factor	0.9300	0.9300	1.0000	1.0000	0.9300	0.9300	0.9300	1.0000	0.9300	1.0000	1.0000	1.0000
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]	4	101	6	13	114	13	28	13	7	6	2	14
Total Analysis Volume [veh/h]	15	403	23	52	457	54	113	50	27	25	8	57
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings****Lanes**

Capacity per Entry Lane [veh/h]	496	533	539	507	545	558	470	518	461	533
Degree of Utilization, x	0.03	0.40	0.40	0.10	0.47	0.46	0.24	0.15	0.05	0.12

**Movement, Approach, & Intersection Results**





95th-Percentile Queue Length [veh]	0.09	1.91	1.88	0.34	2.48	2.39	0.93	0.52	0.17	0.41
95th-Percentile Queue Length [ft]	2.33	47.69	46.89	8.52	61.94	59.67	23.28	12.98	4.28	10.34
Approach Delay [s/veh]	13.66			14.37			12.00		10.54	
Approach LOS	B			B			B		B	
Intersection Delay [s/veh]	13.51									
Intersection LOS	B									

**Intersection Level Of Service Report**  
**Intersection 4: Saliman Rd/5th St**

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 27.1  
Level Of Service: C  
Volume to Capacity (v/c): 0.275

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			5th St			5th St		
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 Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	130.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			5th St			5th St		
Base Volume Input [veh/h]	52	211	109	52	220	83	112	329	79	61	165	37
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	5	1	8	6	10	2	0	3	1	1
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	224	114	53	228	89	122	331	79	64	166	38
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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]	14	62	31	15	63	24	34	91	22	18	46	10
Total Analysis Volume [veh/h]	57	246	125	58	251	98	134	364	87	70	182	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



### Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

### Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.2	0.0	0.0	3.2	0.0
All red [s]	2.3	2.3	0.0	2.4	2.3	0.0	0.0	2.2	0.0	0.0	2.3	0.0
Split [s]	18	47	0	18	47	0	0	55	0	0	55	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	13	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	3.3	3.3	0.0	3.4	3.3	0.0	0.0	3.4	0.0	0.0	3.5	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

### Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.30	5.30	5.30	5.30	5.30	5.30	5.40	5.40	5.40	5.50	5.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	3.30	3.30	0.00	3.30	3.30	0.00	3.40	3.40	3.50	3.50
g_i, Effective Green Time [s]	75	65	65	75	65	65	35	35	35	35	35
g / C, Green / Cycle	0.62	0.54	0.54	0.62	0.54	0.54	0.29	0.29	0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.06	0.12	0.12	0.06	0.11	0.11	0.13	0.14	0.14	0.08	0.14
s, saturation flow rate [veh/h]	993	1676	1492	977	1676	1521	1071	1676	1567	842	1623
c, Capacity [veh/h]	656	908	808	642	909	825	202	484	452	187	467
d1, Uniform Delay [s]	9.06	14.26	14.32	9.10	14.07	14.13	49.39	35.23	35.29	47.17	35.30
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.26	0.53	0.63	0.06	0.49	0.56	3.69	0.74	0.80	1.24	0.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

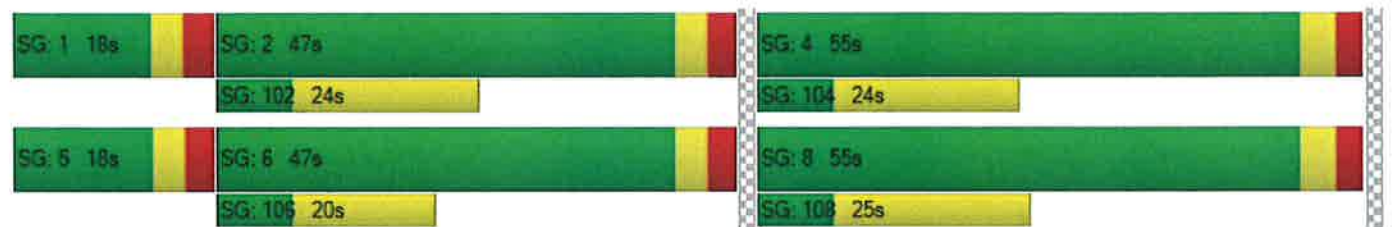
X, volume / capacity	0.09	0.21	0.22	0.09	0.20	0.20	0.66	0.48	0.48	0.37	0.48
d, Delay for Lane Group [s/veh]	9.33	14.79	14.95	9.16	14.56	14.69	53.08	35.96	36.09	48.41	36.06
Lane Group LOS	A	B	B	A	B	B	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.62	2.84	2.64	0.59	2.62	2.47	3.25	5.71	5.41	2.01	5.52
50th-Percentile Queue Length [ft]	15.53	70.97	66.12	14.87	65.47	61.86	81.36	142.68	135.15	50.14	138.00
95th-Percentile Queue Length [veh]	1.12	5.11	4.76	1.07	4.71	4.45	5.86	9.63	9.22	3.61	9.37
95th-Percentile Queue Length [ft]	27.96	127.75	119.01	26.77	117.85	111.36	146.45	240.63	230.48	90.24	234.33

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	9.33	14.83	14.95	9.16	14.60	14.69	53.08	36.01	36.09	48.41	36.06	36.06
Movement LOS	A	B	B	A	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	14.13			13.84			39.93			39.00		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	27.13											
Intersection LOS	C											
Intersection V/C	0.275											

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: 5th St/Spine Rd**

Control Type: Two-way stop  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 16.2  
Level Of Service: C  
Volume to Capacity (v/c): 0.021

**Intersection Setup**

Name	Spine Rd		5th St		5th St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration	↰↱		↰↑		↑↱	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	1
Pocket Length [ft]	200.00	100.00	150.00	100.00	100.00	150.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Spine Rd		5th St		5th St	
Base Volume Input [veh/h]	0	0	0	490	263	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	5	8	1	1	11
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	5	8	491	264	11
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	2	135	73	3
Total Analysis Volume [veh/h]	7	5	9	540	290	12
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

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

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.02	0.01	0.01	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	16.17	9.84	7.88	0.00	0.00	0.00
Movement LOS	C	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.07	0.02	0.02	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	1.63	0.50	0.54	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	13.53		0.13		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.27					
Intersection LOS	C					

## **Appendix C**





### **2025 Background Plus Project LOS Calculations**

**Intersection Level Of Service Report**  
**Intersection 1: E William St/Saliman Rd**

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 36.0  
Level Of Service: D  
Volume to Capacity (v/c): 0.690

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			E William St			William St		
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 Pocket	1	0	0	1	0	0	2	0	1	2	0	1
Pocket Length [ft]	150.00	100.00	100.00	160.00	100.00	100.00	215.00	100.00	125.00	175.00	100.00	75.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			E William St			William St		
Base Volume Input [veh/h]	107	143	212	30	230	15	10	311	116	245	902	29
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	34	0	102	0	0	0	0	0	11	33	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	178	193	388	33	253	17	11	342	139	303	992	32
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
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]	52	57	114	10	74	5	3	101	41	89	292	9
Total Analysis Volume [veh/h]	209	227	456	39	298	20	13	402	164	356	1167	38
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



### Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

### Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.8	4.0	0.0	0.0	4.0	0.0	4.0	2.0	0.0	4.0	2.0	0.0
Split [s]	16	60	0	0	44	0	13	34	0	16	37	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	29	0	0	29	0	0	21	0	0	22	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.8	5.0	0.0	0.0	5.0	0.0	6.0	4.0	0.0	6.0	4.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

### Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	8.00	6.00	6.00	8.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	5.00	5.00	5.00	5.00	5.00	6.00	4.00	4.00	6.00	4.00	4.00
g_i, Effective Green Time [s]	38	38	38	22	22	22	2	36	36	15	49	49
g / C, Green / Cycle	0.35	0.35	0.35	0.20	0.20	0.20	0.02	0.33	0.33	0.14	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.18	0.14	0.32	0.04	0.10	0.10	0.00	0.13	0.12	0.11	0.37	0.03
s, saturation flow rate [veh/h]	1189	1676	1425	1034	1676	1640	3101	3192	1425	3101	3192	1425
c, Capacity [veh/h]	428	582	495	151	338	330	50	1038	464	424	1423	635
d1, Uniform Delay [s]	27.48	27.13	34.49	48.14	38.83	38.86	53.55	28.68	28.33	46.37	26.65	17.37
k, delay calibration	0.11	0.11	0.19	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.87	0.43	12.17	0.89	1.03	1.07	2.76	1.09	2.11	4.53	5.39	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

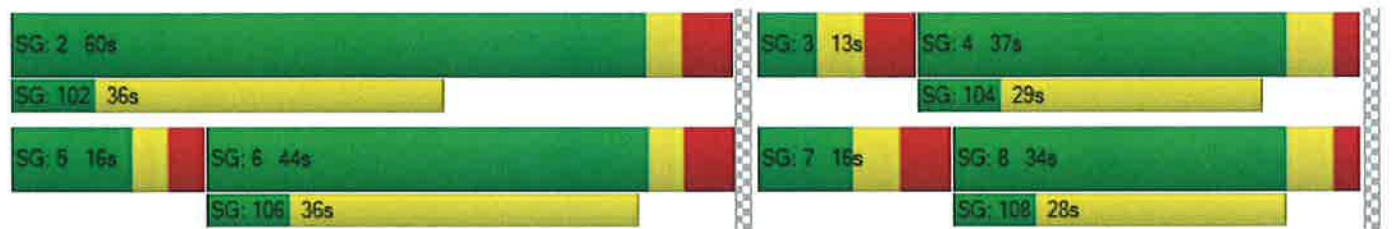
X, volume / capacity	0.49	0.39	0.92	0.26	0.47	0.48	0.26	0.39	0.35	0.84	0.82	0.06
d, Delay for Lane Group [s/veh]	28.35	27.55	46.67	49.04	39.86	39.94	56.31	29.78	30.44	50.90	32.04	17.55
Lane Group LOS	C	C	D	D	D	D	E	C	C	D	C	B
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	4.21	4.55	13.13	1.06	3.91	3.86	0.20	4.24	3.56	5.00	13.97	0.58
50th-Percentile Queue Length [ft]	105.27	113.85	328.23	26.44	97.70	96.57	4.92	105.90	88.97	124.88	349.29	14.49
95th-Percentile Queue Length [veh]	7.58	8.05	19.07	1.90	7.03	6.95	0.35	7.61	6.41	8.66	20.10	1.04
95th-Percentile Queue Length [ft]	189.40	201.34	476.79	47.59	175.86	173.83	8.85	190.28	160.15	216.51	502.54	26.08

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	28.35	27.55	46.67	49.04	39.90	39.94	56.31	29.78	30.44	50.90	32.04	17.55
Movement LOS	C	C	D	D	D	D	E	C	C	D	C	B
d_A, Approach Delay [s/veh]	37.51			40.90			30.56			35.99		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	35.98											
Intersection LOS	D											
Intersection V/C	0.690											

**Sequence**

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Saliman Rd/E Robinson St**

Control Type: All-way stop  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 20.5  
Level Of Service: C  
Volume to Capacity (v/c): 0.735

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			Robinson St			Robinson St		
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 Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	130.00	100.00	100.00	160.00	100.00	100.00	60.00	100.00	100.00	90.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			Robinson St			Robinson St		
Base Volume Input [veh/h]	22	314	100	34	216	55	83	1	20	77	39	43
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	26	8	36	8	0	0	4	1	21	10	110
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]	32	466	148	84	310	77	116	5	29	98	49	153
Peak Hour Factor	0.8500	0.8500	1.0000	1.0000	0.8500	0.8500	0.8500	1.0000	0.8500	1.0000	1.0000	1.0000
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]	9	137	37	21	91	23	34	1	9	25	12	38
Total Analysis Volume [veh/h]	38	548	148	84	365	91	136	5	34	98	49	153
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings****Lanes**

Capacity per Entry Lane [veh/h]	445	474	493	422	448	464	423	479	421	474
Degree of Utilization, x	0.09	0.74	0.71	0.20	0.51	0.49	0.32	0.08	0.23	0.43

**Movement, Approach, & Intersection Results**

95th-Percentile Queue Length [veh]	0.28	6.02	5.54	0.73	2.83	2.67	1.37	0.26	0.89	2.10
95th-Percentile Queue Length [ft]	6.97	150.53	138.50	18.35	70.67	66.63	34.22	6.62	22.24	52.47
Approach Delay [s/veh]	26.40			17.52			14.23		15.17	
Approach LOS	D			C			B		C	
Intersection Delay [s/veh]	20.51									
Intersection LOS	C									







**Intersection Level Of Service Report**  
**Intersection 4: Saliman Rd/5th St**

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 31.3  
Level Of Service: C  
Volume to Capacity (v/c): 0.679

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			5th St			5th St		
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 Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	130.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			5th St			5th St		
Base Volume Input [veh/h]	84	230	57	86	162	68	46	148	66	141	302	119
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.40	1.40	1.40	1.40	1.40	1.40	1.50	1.50	1.50	1.50	1.50	1.50
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	5	1	18	15	5	3	0	12	8	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	118	329	85	121	245	110	74	225	99	224	481	179
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
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]	34	96	25	35	71	32	22	65	29	65	134	52
Total Analysis Volume [veh/h]	137	383	99	141	285	128	86	262	115	260	536	208
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.2	0.0	0.0	3.2	0.0
All red [s]	2.3	2.3	0.0	2.4	2.3	0.0	0.0	2.2	0.0	0.0	2.3	0.0
Split [s]	11	30	0	13	32	0	0	57	0	0	57	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	13	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	3.3	3.3	0.0	3.4	3.3	0.0	0.0	3.4	0.0	0.0	3.5	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.30	5.30	5.30	5.30	5.30	5.30	5.40	5.40	5.40	5.50	5.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	3.30	3.30	0.00	3.30	3.30	0.00	3.40	3.40	3.50	3.50
g_i, Effective Green Time [s]	39	26	26	39	28	28	51	51	51	51	51
g / C, Green / Cycle	0.39	0.26	0.26	0.39	0.28	0.28	0.51	0.51	0.51	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.13	0.15	0.15	0.14	0.13	0.13	0.13	0.12	0.12	0.29	0.47
s, saturation flow rate [veh/h]	1041	1676	1560	1040	1676	1504	681	1676	1508	901	1598
c, Capacity [veh/h]	412	430	400	399	463	416	116	849	764	454	808
d1, Uniform Delay [s]	21.28	32.47	32.52	21.68	30.05	30.14	46.33	13.78	13.83	23.32	22.87
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.13	0.38
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.16	5.58	6.12	0.53	3.34	3.85	9.08	0.14	0.16	1.34	14.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.33	0.58	0.58	0.35	0.47	0.47	0.74	0.23	0.24	0.57	0.92
d, Delay for Lane Group [s/veh]	23.44	38.05	38.63	22.21	33.39	33.99	55.40	13.92	13.99	24.66	36.98
Lane Group LOS	C	D	D	C	C	C	E	B	B	C	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.37	5.86	5.56	2.25	4.69	4.36	1.27	2.43	2.26	4.96	18.26
50th-Percentile Queue Length [ft]	59.26	146.40	139.00	56.26	117.35	108.90	31.85	60.75	56.49	123.97	456.51
95th-Percentile Queue Length [veh]	4.27	9.82	9.43	4.05	8.25	7.78	2.29	4.37	4.07	8.61	25.27
95th-Percentile Queue Length [ft]	106.68	245.62	235.68	101.27	206.18	194.48	57.33	109.35	101.67	215.27	631.71

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	23.44	38.25	38.63	22.21	33.54	33.99	55.40	13.93	13.99	24.66	36.98	36.98
Movement LOS	C	D	D	C	C	C	E	B	B	C	D	D
d_A, Approach Delay [s/veh]	35.04			30.76			21.65			33.79		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	31.32											
Intersection LOS	C											
Intersection V/C	0.679											

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: 5th St/Spine Rd**

Control Type: Two-way stop  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 34.8  
Level Of Service: D  
Volume to Capacity (v/c): 0.166

**Intersection Setup**

Name	Spine Rd		5th St		5th St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration	↵↵		↵↵		↵↵	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	1
Pocket Length [ft]	200.00	100.00	150.00	100.00	100.00	150.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Spine Rd		5th St		5th St	
Base Volume Input [veh/h]	0	0	0	291	562	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	0.00	0.00	1.50	1.50	1.50	1.50
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	20	7	1	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	20	7	438	843	8
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	6	2	122	234	2
Total Analysis Volume [veh/h]	24	22	8	487	937	9
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

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

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.17	0.07	0.01	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	34.78	17.04	10.02	0.00	0.00	0.00
Movement LOS	D	C	B	A	A	A
95th-Percentile Queue Length [veh]	0.57	0.22	0.03	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	14.37	5.49	0.84	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	26.30		0.16		0.00	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	0.87					
Intersection LOS	D					







**Intersection Level Of Service Report**  
**Intersection 1: E William St/Saliman Rd**

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 49.8  
Level Of Service: D  
Volume to Capacity (v/c): 0.799

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			E William St			William St		
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 Pocket	1	0	0	1	0	0	2	0	1	2	0	1
Pocket Length [ft]	150.00	100.00	100.00	160.00	100.00	100.00	215.00	100.00	125.00	175.00	100.00	75.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			E William St			William St		
Base Volume Input [veh/h]	57	104	269	92	95	36	35	898	71	272	607	52
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	22	0	66	0	0	0	0	0	38	114	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	99	140	429	101	105	40	39	988	116	413	668	57
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
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]	27	38	115	27	28	11	10	266	31	111	180	15
Total Analysis Volume [veh/h]	106	151	461	109	113	43	42	1062	125	444	718	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.8	4.0	0.0	0.0	4.0	0.0	4.0	2.0	0.0	4.0	2.0	0.0
Split [s]	11	102	0	0	91	0	13	35	0	13	35	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	29	0	0	29	0	0	21	0	0	22	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.8	5.0	0.0	0.0	5.0	0.0	6.0	4.0	0.0	6.0	4.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	8.00	6.00	6.00	8.00	6.00	6.00
I1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I2, Clearance Lost Time [s]	0.00	5.00	5.00	5.00	5.00	5.00	6.00	4.00	4.00	6.00	4.00	4.00
g_i, Effective Green Time [s]	51	51	51	40	40	40	4	53	53	24	74	74
g / C, Green / Cycle	0.34	0.34	0.34	0.27	0.27	0.27	0.03	0.36	0.36	0.16	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.09	0.09	0.32	0.10	0.05	0.05	0.01	0.33	0.09	0.14	0.22	0.04
s, saturation flow rate [veh/h]	1191	1676	1425	1108	1676	1525	3101	3192	1425	3101	3192	1425
c, Capacity [veh/h]	431	573	487	255	449	408	87	1138	508	502	1565	699
d1, Uniform Delay [s]	34.97	35.73	48.07	54.98	42.24	42.35	71.79	46.52	34.03	61.49	25.14	20.36
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.29	0.24	10.07	1.13	0.19	0.22	4.04	14.78	1.15	5.39	0.97	0.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

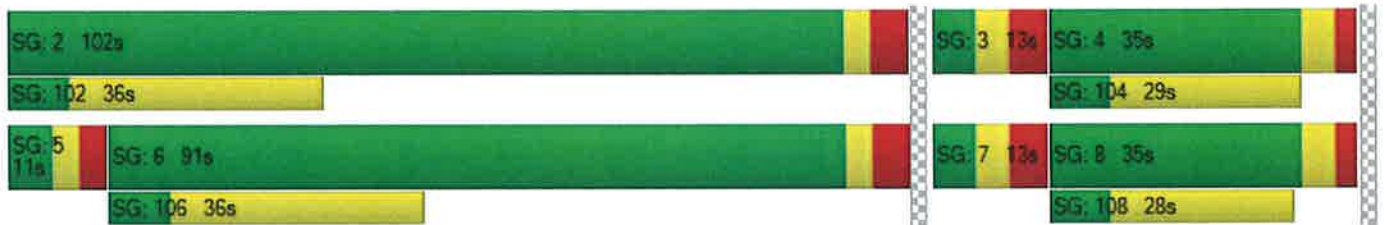
X, volume / capacity	0.25	0.26	0.95	0.43	0.18	0.19	0.48	0.93	0.25	0.88	0.46	0.09
d, Delay for Lane Group [s/veh]	35.26	35.98	58.14	56.11	42.43	42.57	75.83	61.30	35.18	66.88	26.11	20.60
Lane Group LOS	D	D	E	E	D	D	E	E	D	E	C	C
Critical Lane Group	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	2.82	4.11	18.09	3.82	2.34	2.24	0.85	21.38	3.44	8.68	8.71	1.22
50th-Percentile Queue Length [ft]	70.56	102.82	452.28	95.62	58.43	56.01	21.25	534.42	86.03	216.88	217.67	30.42
95th-Percentile Queue Length [veh]	5.08	7.40	25.07	6.88	4.21	4.03	1.53	28.96	6.19	13.51	13.55	2.19
95th-Percentile Queue Length [ft]	127.02	185.07	626.67	172.12	105.17	100.82	38.25	723.98	154.85	337.64	338.65	54.75

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	35.26	35.98	58.14	56.11	42.47	42.57	75.83	61.30	35.18	66.88	26.11	20.60
Movement LOS	D	D	E	E	D	D	E	E	D	E	C	C
d_A, Approach Delay [s/veh]	50.10			48.10			59.14			40.64		
Approach LOS	D			D			E			D		
d_I, Intersection Delay [s/veh]	49.81											
Intersection LOS	D											
Intersection V/C	0.799											

**Sequence**

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Saliman Rd/E Robinson St**

Control Type: All-way stop  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 24.3  
Level Of Service: C  
Volume to Capacity (v/c): 0.764

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			Robinson St			Robinson St		
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 Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	130.00	100.00	100.00	160.00	100.00	100.00	60.00	100.00	100.00	90.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			Robinson St			Robinson St		
Base Volume Input [veh/h]	13	359	7	9	396	50	105	45	23	16	6	33
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	16	26	123	29	0	0	12	2	14	6	72
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]	19	519	36	136	583	70	147	75	34	30	12	105
Peak Hour Factor	0.9300	0.9300	1.0000	1.0000	0.9300	0.9300	0.9300	1.0000	0.9300	1.0000	1.0000	1.0000
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]	5	140	9	34	157	19	40	19	9	8	3	26
Total Analysis Volume [veh/h]	20	558	36	136	627	75	158	75	37	30	12	105
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings****Lanes**

Capacity per Entry Lane [veh/h]	419	444	449	432	459	468	394	426	393	442
Degree of Utilization, x	0.05	0.67	0.66	0.31	0.76	0.75	0.40	0.26	0.08	0.26

**Movement, Approach, & Intersection Results**

95th-Percentile Queue Length [veh]	0.15	4.80	4.71	1.33	6.55	6.29	1.89	1.04	0.25	1.05
95th-Percentile Queue Length [ft]	3.75	120.08	117.64	33.28	163.82	157.19	47.19	26.06	6.16	26.28
Approach Delay [s/veh]	24,94			28,26			16.29		13.50	
Approach LOS	C			D			C		B	
Intersection Delay [s/veh]	24.28									
Intersection LOS	C									







**Intersection Level Of Service Report**  
**Intersection 4: Saliman Rd/5th St**

Control Type: Signalized  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 28.7  
Level Of Service: C  
Volume to Capacity (v/c): 0.412

**Intersection Setup**

Name	Saliman Rd			Saliman Rd			5th St			5th St		
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 Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	160.00	100.00	100.00	170.00	100.00	100.00	130.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Saliman Rd			Saliman Rd			5th St			5th St		
Base Volume Input [veh/h]	52	211	109	52	220	83	112	329	79	61	165	37
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.40	1.40	1.40	1.40	1.40	1.40	1.50	1.50	1.50	1.50	1.50	1.50
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	23	15	1	12	10	16	9	0	8	5	1
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	318	168	74	320	126	184	503	119	100	253	57
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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]	20	87	46	20	88	35	51	138	33	27	70	16
Total Analysis Volume [veh/h]	80	349	185	81	352	138	202	553	131	110	278	63
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.2	0.0	0.0	3.2	0.0
All red [s]	2.3	2.3	0.0	2.4	2.3	0.0	0.0	2.2	0.0	0.0	2.3	0.0
Split [s]	18	47	0	18	47	0	0	55	0	0	55	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	13	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	3.3	3.3	0.0	3.4	3.3	0.0	0.0	3.4	0.0	0.0	3.5	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.30	5.30	5.30	5.30	5.30	5.30	5.40	5.40	5.40	5.50	5.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	3.30	3.30	0.00	3.30	3.30	0.00	3.40	3.40	3.50	3.50
g_i, Effective Green Time [s]	60	50	50	60	50	50	49	49	49	49	49
g / C, Green / Cycle	0.50	0.42	0.42	0.50	0.42	0.42	0.41	0.41	0.41	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.09	0.17	0.17	0.09	0.15	0.15	0.21	0.21	0.21	0.16	0.21
s, saturation flow rate [veh/h]	918	1676	1485	892	1676	1519	960	1676	1567	679	1624
c, Capacity [veh/h]	463	700	620	443	702	636	261	683	638	216	660
d1, Uniform Delay [s]	16.31	24.45	24.52	16.52	23.90	23.97	45.26	26.70	26.71	42.46	26.75
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.81	1.71	1.98	0.20	1.45	1.65	4.90	0.61	0.65	1.85	0.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

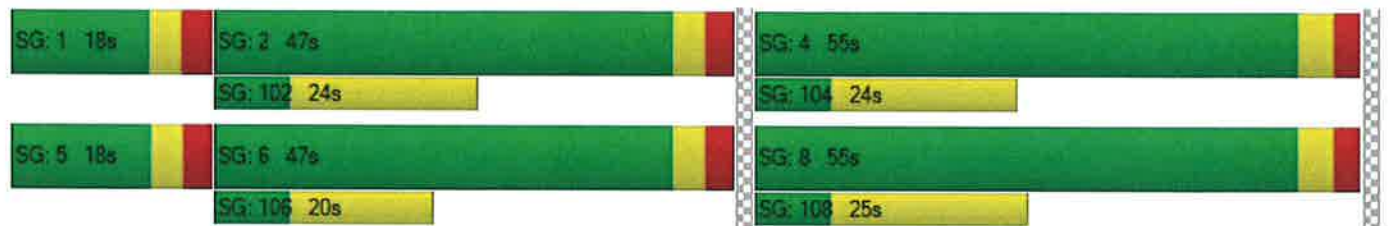
X, volume / capacity	0.17	0.40	0.41	0.18	0.36	0.37	0.78	0.52	0.52	0.51	0.52
d, Delay for Lane Group [s/veh]	17.12	26.16	26.51	16.72	25.35	25.61	50.16	27.31	27.36	44.32	27.38
Lane Group LOS	B	C	C	B	C	C	D	C	C	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh]	1.26	5.92	5.38	1.19	5.25	4.87	4.25	7.67	7.18	3.10	7.40
50th-Percentile Queue Length [ft]	31.40	147.97	134.58	29.78	131.19	121.87	106.34	191.66	179.44	77.52	185.11
95th-Percentile Queue Length [veh]	2.26	9.91	9.19	2.14	9.00	8.50	7.64	12.21	11.57	5.58	11.87
95th-Percentile Queue Length [ft]	56.53	247.72	229.70	53.61	225.11	212.40	190.90	305.19	289.29	139.53	296.67

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	17.12	26.23	26.51	16.72	25.42	25.61	50.16	27.33	27.36	44.32	27.38	27.38
Movement LOS	B	C	C	B	C	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	25.12			24.23			32.54			31.51		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	28.67											
Intersection LOS	C											
Intersection V/C	0.412											

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






**Intersection Level Of Service Report**  
**Intersection 6: 5th St/Spine Rd**

Control Type: Two-way stop  
Analysis Method: HCM 2010  
Analysis Period: 15 minutes

Delay (sec / veh): 27.5  
Level Of Service: D  
Volume to Capacity (v/c): 0.086

**Intersection Setup**

Name	Spine Rd		5th St		5th St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	1
Pocket Length [ft]	200.00	100.00	150.00	100.00	100.00	150.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Spine Rd		5th St		5th St	
Base Volume Input [veh/h]	0	0	0	490	263	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.50	1.50	1.50	1.50	1.50	1.50
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	14	13	24	1	1	24
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	13	24	736	396	24
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	4	7	202	109	7
Total Analysis Volume [veh/h]	15	14	26	809	435	26
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

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

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.09	0.02	0.02	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	27.54	10.93	8.35	0.00	0.00	0.00
Movement LOS	D	B	A	A	A	A
95th-Percentile Queue Length [veh]	0.28	0.07	0.07	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	6.95	1.73	1.81	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	19.52		0.26		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.59					
Intersection LOS	D					



CARSON CITY, NEVADA

AC	ACRYLIC CHARGE	IM	IMMUTATION
AD	ADDITIONAL	IN	INSTRUMENT
AE	ARMED CARRY RETURN	INT	INTERMEDIATE
AF	AFRICAN	INTC	INTERCOM
AG	BACK OF SPINAL	INTD	INTERDUAL
AI	AGONY	INTL	INTERNATIONAL
AL	ALUMINUM	INTS	INTERSECTION
AM	ALUMINUM	INTT	INTERTEXT
AN	ANALOG	INTV	INTERVIEW
AO	COMBATED MEAT MEAT	INTX	INTERX
AP	COMBATED MEAT MEAT	INTY	INTERVIEW
AR	COMBATED MEAT MEAT	INTZ	INTERVIEW
AS	COMBATED MEAT MEAT	INTA	INTERVIEW
AT	COMBATED MEAT MEAT	INTB	INTERVIEW
AV	COMBATED MEAT MEAT	INTC	INTERVIEW
AW	COMBATED MEAT MEAT	INTD	INTERVIEW
AX	COMBATED MEAT MEAT	INTE	INTERVIEW
AY	COMBATED MEAT MEAT	INTF	INTERVIEW
AZ	COMBATED MEAT MEAT	INTG	INTERVIEW
BA	COMBATED MEAT MEAT	INTH	INTERVIEW
BB	COMBATED MEAT MEAT	INTI	INTERVIEW
BC	COMBATED MEAT MEAT	INTJ	INTERVIEW
BD	COMBATED MEAT MEAT	INTK	INTERVIEW
BE	COMBATED MEAT MEAT	INTL	INTERVIEW
BF	COMBATED MEAT MEAT	INTM	INTERVIEW
BG	COMBATED MEAT MEAT	INTN	INTERVIEW
BH	COMBATED MEAT MEAT	INTO	INTERVIEW
BI	COMBATED MEAT MEAT	INTP	INTERVIEW
BJ	COMBATED MEAT MEAT	INTQ	INTERVIEW
BK	COMBATED MEAT MEAT	INTR	INTERVIEW
BL	COMBATED MEAT MEAT	INTS	INTERVIEW
BM	COMBATED MEAT MEAT	INTT	INTERVIEW
BN	COMBATED MEAT MEAT	INTU	INTERVIEW
BO	COMBATED MEAT MEAT	INTV	INTERVIEW
BP	COMBATED MEAT MEAT	INTW	INTERVIEW
BQ	COMBATED MEAT MEAT	INTX	INTERVIEW
BR	COMBATED MEAT MEAT	INTY	INTERVIEW
BS	COMBATED MEAT MEAT	INTZ	INTERVIEW
BT	COMBATED MEAT MEAT	INTA	INTERVIEW
BU	COMBATED MEAT MEAT	INTB	INTERVIEW
BV	COMBATED MEAT MEAT	INTC	INTERVIEW
BW	COMBATED MEAT MEAT	INTD	INTERVIEW
BX	COMBATED MEAT MEAT	INTE	INTERVIEW
BY	COMBATED MEAT MEAT	INTF	INTERVIEW
BZ	COMBATED MEAT MEAT	INTG	INTERVIEW
CA	COMBATED MEAT MEAT	INTH	INTERVIEW
CB	COMBATED MEAT MEAT	INTI	INTERVIEW
CC	COMBATED MEAT MEAT	INTJ	INTERVIEW
CD	COMBATED MEAT MEAT	INTK	INTERVIEW
CE	COMBATED MEAT MEAT	INTL	INTERVIEW
CF	COMBATED MEAT MEAT	INTM	INTERVIEW
CG	COMBATED MEAT MEAT	INTN	INTERVIEW
CH	COMBATED MEAT MEAT	INTO	INTERVIEW
CI	COMBATED MEAT MEAT	INTP	INTERVIEW
CJ	COMBATED MEAT MEAT	INTQ	INTERVIEW
CK	COMBATED MEAT MEAT	INTR	INTERVIEW
CL	COMBATED MEAT MEAT	INTS	INTERVIEW
CM	COMBATED MEAT MEAT	INTT	INTERVIEW
CN	COMBATED MEAT MEAT	INTU	INTERVIEW
CO	COMBATED MEAT MEAT	INTV	INTERVIEW
CP	COMBATED MEAT MEAT	INTW	INTERVIEW
CQ	COMBATED MEAT MEAT	INTX	INTERVIEW
CR	COMBATED MEAT MEAT	INTY	INTERVIEW
CS	COMBATED MEAT MEAT	INTZ	INTERVIEW
CT	COMBATED MEAT MEAT	INTA	INTERVIEW
CU	COMBATED MEAT MEAT	INTB	INTERVIEW
CV	COMBATED MEAT MEAT	INTC	INTERVIEW
CW	COMBATED MEAT MEAT	INTD	INTERVIEW
CX	COMBATED MEAT MEAT	INTE	INTERVIEW
CY	COMBATED MEAT MEAT	INTF	INTERVIEW
CZ	COMBATED MEAT MEAT	INTG	INTERVIEW
DA	COMBATED MEAT MEAT	INTH	INTERVIEW
DB	COMBATED MEAT MEAT	INTI	INTERVIEW
DC	COMBATED MEAT MEAT	INTJ	INTERVIEW
DD	COMBATED MEAT MEAT	INTK	INTERVIEW
DE	COMBATED MEAT MEAT	INTL	INTERVIEW
DF	COMBATED MEAT MEAT	INTM	INTERVIEW
DG	COMBATED MEAT MEAT	INTN	INTERVIEW
DH	COMBATED MEAT MEAT	INTO	INTERVIEW
DI	COMBATED MEAT MEAT	INTP	INTERVIEW
DJ	COMBATED MEAT MEAT	INTQ	INTERVIEW
DK	COMBATED MEAT MEAT	INTR	INTERVIEW
DL	COMBATED MEAT MEAT	INTS	INTERVIEW
DM	COMBATED MEAT MEAT	INTT	INTERVIEW
DN	COMBATED MEAT MEAT	INTU	INTERVIEW
DO	COMBATED MEAT MEAT	INTV	INTERVIEW
DP	COMBATED MEAT MEAT	INTW	INTERVIEW
DQ	COMBATED MEAT MEAT	INTX	INTERVIEW
DR	COMBATED MEAT MEAT	INTY	INTERVIEW
DS	COMBATED MEAT MEAT	INTZ	INTERVIEW
DT	COMBATED MEAT MEAT	INTA	INTERVIEW
DU	COMBATED MEAT MEAT	INTB	INTERVIEW
DV	COMBATED MEAT MEAT	INTC	INTERVIEW
DW	COMBATED MEAT MEAT	INTD	INTERVIEW
DX	COMBATED MEAT MEAT	INTE	INTERVIEW
DY	COMBATED MEAT MEAT	INTF	

FACE	PART	UNIT NAME
1	1	CONCRETE
2	2	CONCRETE
3	3	CONCRETE
4	4	CONCRETE
5	5	CONCRETE
6	6	CONCRETE
7	7	CONCRETE
8	8	CONCRETE
9	9	CONCRETE
10	10	CONCRETE
11	11	CONCRETE
12	12	CONCRETE
13	13	CONCRETE
14	14	CONCRETE
15	15	CONCRETE
16	16	CONCRETE
17	17	CONCRETE
18	18	CONCRETE
19	19	CONCRETE
20	20	CONCRETE
21	21	CONCRETE
22	22	CONCRETE
23	23	CONCRETE
24	24	CONCRETE
25	25	CONCRETE
26	26	CONCRETE
27	27	CONCRETE
28	28	CONCRETE
29	29	CONCRETE
30	30	CONCRETE
31	31	CONCRETE
32	32	CONCRETE
33	33	CONCRETE
34	34	CONCRETE
35	35	CONCRETE
36	36	CONCRETE
37	37	CONCRETE
38	38	CONCRETE
39	39	CONCRETE
40	40	CONCRETE
41	41	CONCRETE
42	42	CONCRETE
43	43	CONCRETE
44	44	CONCRETE
45	45	CONCRETE
46	46	CONCRETE
47	47	CONCRETE
48	48	CONCRETE
49	49	CONCRETE
50	50	CONCRETE
51	51	CONCRETE
52	52	CONCRETE
53	53	CONCRETE
54	54	CONCRETE
55	55	CONCRETE
56	56	CONCRETE
57	57	CONCRETE
58	58	CONCRETE
59	59	CONCRETE
60	60	CONCRETE
61	61	CONCRETE
62	62	CONCRETE
63	63	CONCRETE
64	64	CONCRETE
65	65	CONCRETE
66	66	CONCRETE
67	67	CONCRETE
68	68	CONCRETE
69	69	CONCRETE
70	70	CONCRETE
71	71	CONCRETE
72	72	CONCRETE
73	73	CONCRETE
74	74	CONCRETE
75	75	CONCRETE
76	76	CONCRETE
77	77	CONCRETE
78	78	CONCRETE
79	79	CONCRETE
80	80	CONCRETE
81	81	CONCRETE
82	82	CONCRETE
83	83	CONCRETE
84	84	CONCRETE
85	85	CONCRETE
86	86	CONCRETE
87	87	CONCRETE
88	88	CONCRETE
89	89	CONCRETE
90	90	CONCRETE
91	91	CONCRETE
92	92	CONCRETE
93	93	CONCRETE
94	94	CONCRETE
95	95	CONCRETE
96	96	CONCRETE
97	97	CONCRETE
98	98	CONCRETE
99	99	CONCRETE
100	100	CONCRETE



### BASIS OF BEARINGS

NEVADA STATE PLANE COORDINATE SYSTEM. WEST ZONE. NORTH AMERICAN DATUM OF 1983/1994 (NAD 83/94). BEARINGS AND DISTANCES HEREON REFLECT GRID COORDINATES MULTIPLIED BY A COMBINED GRID TO GROUND FACTOR OF 1.0002 (ALSO KNOWN AS CARSON CITY MODIFIED)

## Basis of Elevation

ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1985 (NAVD85) AS ESTABLISHED BY U.S. BENCHMARK V357, PID KROG88

## PROJECT LOCATION

A PORTION OF SECTION 18, TOWNSHIP 15 NORTH, RANGE 20 EAST, M.D.M.

<b>OWNER</b> STATE OF ARIZONA AND COUNTY OF COCHISE, ATTENTION OF THE ASSISTANT COUNTY ENGINEER, 2410 WEST OGDEN AVENUE, TULSA, OK 74103	
<b>DEVELOPER</b> BLACKSTONE DEVELOPMENT GROUP 4300 PALM LANE SUITE 100 CHANDLER, ARIZONA 85226 PHONE: (480) 795-2514 FAX: N/A	
<b>LANDSCAPE ARCHITECT</b> JOHN JONES LANDSCAPE ARCHITECT 1000 N. CENTRAL AVENUE, SUITE 202 TULSA, OKLA. 74103-1411 PHONE: (918) 485-0334 FAX: (918) 485-0325 E-MAIL: JONES@JLARCH.COM	
<b>CIVIL ENGINEER</b> THE BIRD LTD. 1000 N. CENTRAL AVENUE, SUITE 202 TULSA, OKLA. 74103-1411 PHONE: (918) 485-0334 FAX: (918) 485-0325 E-MAIL: BIRD@BIRDLTD.COM	
<b>ENGINEER'S STATEMENT</b> I, JAMES W. WYATT, A PROFESSIONAL CIVIL ENGINEER, HAVE BEEN HIRE BY THE STATE OF ARIZONA AND COUNTY OF COCHISE TO PREPARE THE ATTACHED PLANS FOR THE PROJECT DESCRIBED HEREIN. I HAVE REVIEWED THE PLANS AND FIND THEM TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ARIZONA ENGINEERING BOARD AND THE ARIZONA CIVIL ENGINEERING BOARD. I HAVE ALSO REVIEWED THE PLANS AND FIND THEM TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ARIZONA CIVIL ENGINEERING BOARD AND THE ARIZONA CIVIL ENGINEERING BOARD. I HAVE ALSO REVIEWED THE PLANS AND FIND THEM TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ARIZONA CIVIL ENGINEERING BOARD AND THE ARIZONA CIVIL ENGINEERING BOARD.	
<b>PROJECT DATA</b> PROJECT NAME: STATE OF ARIZONA AND COUNTY OF COCHISE PROJECT LOCATION: STATE OF ARIZONA AND COUNTY OF COCHISE PROJECT DESCRIPTION: STATE OF ARIZONA AND COUNTY OF COCHISE PROJECT OWNER: STATE OF ARIZONA AND COUNTY OF COCHISE PROJECT ENGINEER: JAMES W. WYATT PROJECT DATE: 10/1/2010	
<b>PROJECT DATA</b> PROJECT NAME: STATE OF ARIZONA AND COUNTY OF COCHISE PROJECT LOCATION: STATE OF ARIZONA AND COUNTY OF COCHISE PROJECT DESCRIPTION: STATE OF ARIZONA AND COUNTY OF COCHISE PROJECT OWNER: STATE OF ARIZONA AND COUNTY OF COCHISE PROJECT ENGINEER: JAMES W. WYATT PROJECT DATE: 10/1/2010	

PROJECT DATA

RESIDENT MARKET CHARACTERISTICS LAND USE DESIGNATION CURRENT ZONE REDEVELOPED/REDEVELOPABLE ZONE	A RESIDENTIAL (R-1) ZONE MEDIUM DENSITY RESIDENTIAL, A RESIDENTIAL (P) THE ZONING CODES FOR THIS ZONE SUBJECT TO REVISIONS MAY BE FOUND
LOT AREA TOTAL LOT AND SUB ALTERNATE BENCHMARK PROPOSED BENCHMARK	396 TOTAL (396.00 SQ. FT.) 2-0 R/14/12 1-0 R/14/12
DEMONSTRATION OF IMPROVED ACCESS AND EGRESS	PROPOSED SITE CROSS AREA : 385 ACRES TOTAL LOT AREA : 318 ACRES PROPOSED HIGH-LEVEL WAY : 110 ACRES PROPOSED LOW-LEVEL WAY : 108 ACRES OTHER IMPROVED ACCESS : 10 ACRES
LOCAL ZONE DEVELOPMENT FROM FLOOD HAZARD ZONE EXISTING AND PROPOSED	EVIDENCE OF LOCAL DEVELOPMENT AND PROPOSED FLOOD ZONE EXISTING AND PROPOSED

**THE  
RED LTD**  
17th & N Capitol Hwy  
Suite 2  
Los Angeles, CA 90048  
(323) 528-7804 office  
[www.theredltd.com](http://www.theredltd.com)  
R | REAL ESTATE  
E | ENGINEERING  
D | DEVELOPMENT



**client**  
BLACKSTONE DEVELOPMENT  
GROUP  
439 PLUMB LANE  
MELROSE, NY 10553  
CONTACT: CAROL MAYER  
PHONE: (716) 352-4200

[illegible]

TITLE SHEET



[illegible]

- [illegible]

- [illegible]

- [illegible]

- [illegible]

BLACKSTONE RANCH - PHASE 2

**YOUNG**

**CLIENT**  
BLACKSTONE DEVELOPMENT  
GROUP  
428 PLUMME LANE  
RENO, NV 89503  
CONTACT: JACQUELYNNE  
SCOTT (775) 303-4100



**THE RED LTD**  
 1075, 11th Floor, 1075  
 Suite 2  
 Las Vegas NV 89 40  
 www.theredltd.com  
 R | REAL ESTATE  
 E | ENGINEERING  
 D | DEVELOPMENT

1989  
SHT 01

1013

[illegible]

**THE RED LTD**  
 10000 Corporate  
 Suite 100  
 10000 Corporate  
 Suite 100  
 10000 Corporate  
 Suite 100

**BLACKSTONE RANCH - PHASE 2**

**OVERALL SITE PLAN**

**BLACKSTONE RANCH - PHASE 2**

**REVISIONS**

**DATE**

**NO.**

**APPROVED**

**CLIENT**  
 BLACKSTONE RANCH  
 10000 Corporate  
 Suite 100  
 10000 Corporate  
 Suite 100

**DESIGNER**  
 THE RED LTD  
 10000 Corporate  
 Suite 100  
 10000 Corporate  
 Suite 100

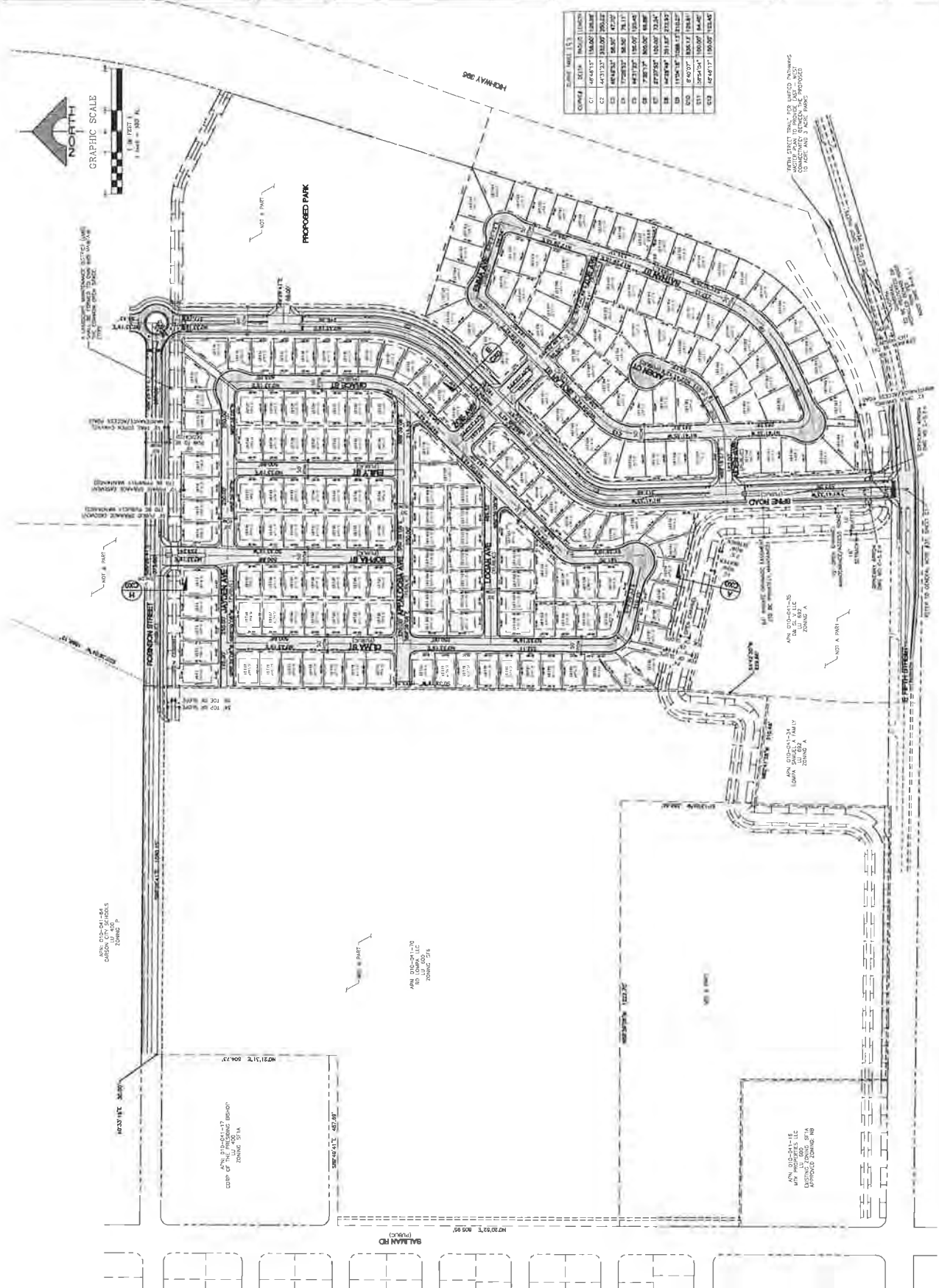
**DATE**

**NO.**

**APPROVED**

**DATE**

**NO.**



NOTE:  
REFER TO SHEET CS2 FOR  $q_c$  CURVE TABLE



<p>SITE PLAN (1 OF 8)</p>	<p>BLACKSTONE RANCH - PHASE 2</p>
<p>CANNON CITY</p>	<p>NEVADA</p>

1



**THE RED LTD**  
 10000 100th Ave NW  
 Suite 200  
 Edmonds, WA 98149  
 www.thered.com  
 P: 206.261.2343  
 F: 206.261.2344  
 D: 206.261.2345



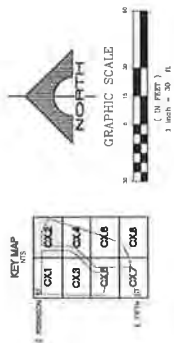
**CLIENT**  
 BLACKSTONE DEVELOPMENT  
 GROUP  
 10000 100th Ave NW  
 Suite 200  
 Edmonds, WA 98149  
 CONTACT: JACQUELINE  
 PHONE: (206) 261-2343

DATE	NO.	REVISION	APPROVED

**BLACKSTONE RANCH - PHASE 2**  
**SITE PLAN (2 OF 8)**  
 LAYDOWN CITY

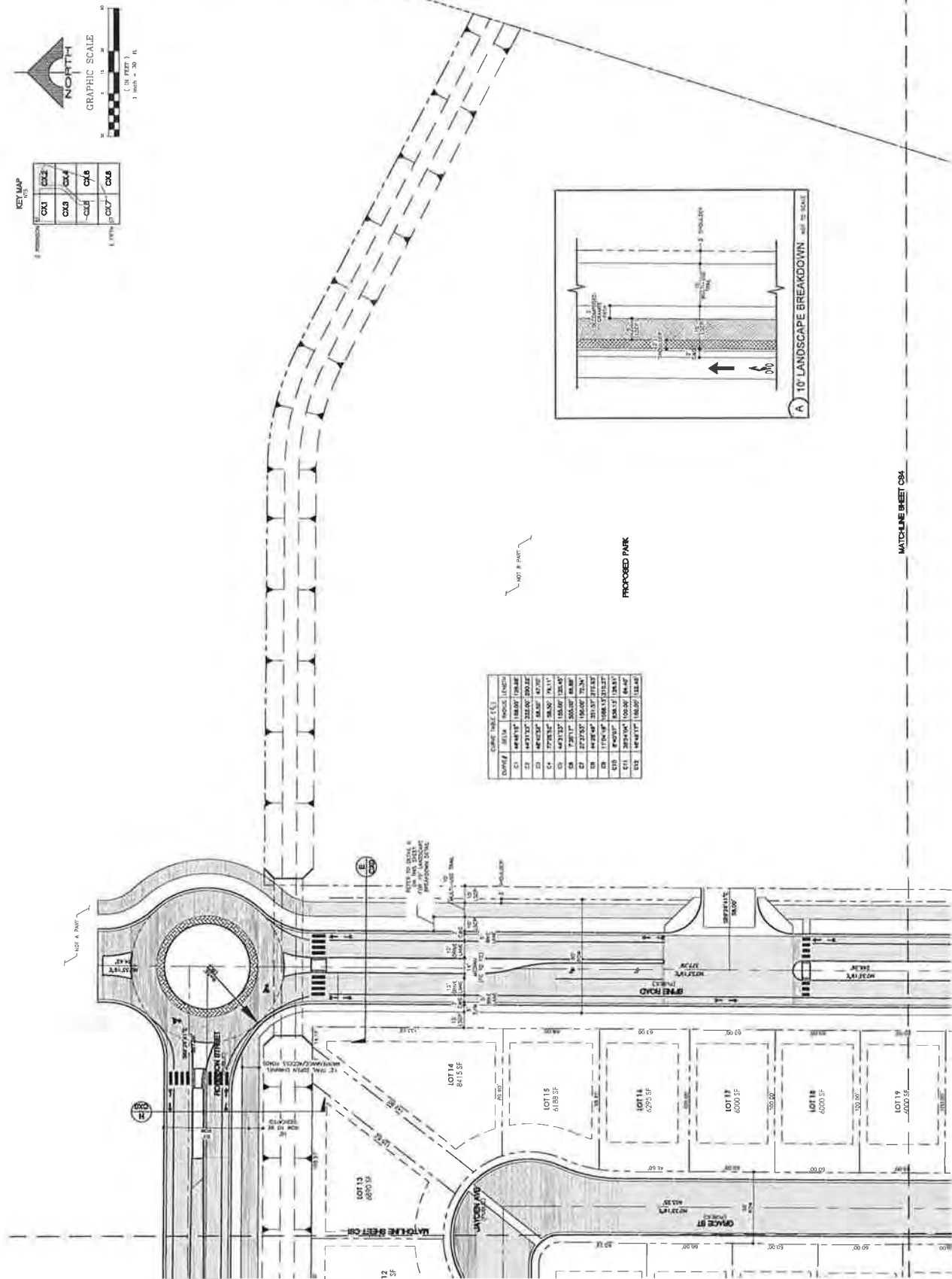
NO.	DATE	REVISION
1	01/15/11	ISSUED FOR PERMIT
2	01/15/11	ISSUED FOR PERMIT
3	01/15/11	ISSUED FOR PERMIT
4	01/15/11	ISSUED FOR PERMIT
5	01/15/11	ISSUED FOR PERMIT

**SHT C82**  
 1 of 8



**KEY MAP**

C81	C82	C83	C84	C85	C86	C87	C88



**DATE TABLE (S)**

DATE	AREA	MODULE	LENGTH
01	48'00" x 120'00"	120'00"	120'00"
02	48'00" x 120'00"	120'00"	120'00"
03	48'00" x 120'00"	120'00"	120'00"
04	48'00" x 120'00"	120'00"	120'00"
05	48'00" x 120'00"	120'00"	120'00"
06	48'00" x 120'00"	120'00"	120'00"
07	48'00" x 120'00"	120'00"	120'00"
08	48'00" x 120'00"	120'00"	120'00"
09	48'00" x 120'00"	120'00"	120'00"
10	48'00" x 120'00"	120'00"	120'00"
11	48'00" x 120'00"	120'00"	120'00"
12	48'00" x 120'00"	120'00"	120'00"
13	48'00" x 120'00"	120'00"	120'00"
14	48'00" x 120'00"	120'00"	120'00"
15	48'00" x 120'00"	120'00"	120'00"
16	48'00" x 120'00"	120'00"	120'00"
17	48'00" x 120'00"	120'00"	120'00"
18	48'00" x 120'00"	120'00"	120'00"
19	48'00" x 120'00"	120'00"	120'00"
20	48'00" x 120'00"	120'00"	120'00"
21	48'00" x 120'00"	120'00"	120'00"
22	48'00" x 120'00"	120'00"	120'00"
23	48'00" x 120'00"	120'00"	120'00"
24	48'00" x 120'00"	120'00"	120'00"
25	48'00" x 120'00"	120'00"	120'00"
26	48'00" x 120'00"	120'00"	120'00"
27	48'00" x 120'00"	120'00"	120'00"
28	48'00" x 120'00"	120'00"	120'00"
29	48'00" x 120'00"	120'00"	120'00"
30	48'00" x 120'00"	120'00"	120'00"
31	48'00" x 120'00"	120'00"	120'00"
32	48'00" x 120'00"	120'00"	120'00"
33	48'00" x 120'00"	120'00"	120'00"
34	48'00" x 120'00"	120'00"	120'00"
35	48'00" x 120'00"	120'00"	120'00"
36	48'00" x 120'00"	120'00"	120'00"
37	48'00" x 120'00"	120'00"	120'00"
38	48'00" x 120'00"	120'00"	120'00"
39	48'00" x 120'00"	120'00"	120'00"
40	48'00" x 120'00"	120'00"	120'00"
41	48'00" x 120'00"	120'00"	120'00"
42	48'00" x 120'00"	120'00"	120'00"
43	48'00" x 120'00"	120'00"	120'00"
44	48'00" x 120'00"	120'00"	120'00"
45	48'00" x 120'00"	120'00"	120'00"
46	48'00" x 120'00"	120'00"	120'00"
47	48'00" x 120'00"	120'00"	120'00"
48	48'00" x 120'00"	120'00"	120'00"
49	48'00" x 120'00"	120'00"	120'00"
50	48'00" x 120'00"	120'00"	120'00"
51	48'00" x 120'00"	120'00"	120'00"
52	48'00" x 120'00"	120'00"	120'00"
53	48'00" x 120'00"	120'00"	120'00"
54	48'00" x 120'00"	120'00"	120'00"
55	48'00" x 120'00"	120'00"	120'00"
56	48'00" x 120'00"	120'00"	120'00"
57	48'00" x 120'00"	120'00"	120'00"
58	48'00" x 120'00"	120'00"	120'00"
59	48'00" x 120'00"	120'00"	120'00"
60	48'00" x 120'00"	120'00"	120'00"
61	48'00" x 120'00"	120'00"	120'00"
62	48'00" x 120'00"	120'00"	120'00"
63	48'00" x 120'00"	120'00"	120'00"
64	48'00" x 120'00"	120'00"	120'00"
65	48'00" x 120'00"	120'00"	120'00"
66	48'00" x 120'00"	120'00"	120'00"
67	48'00" x 120'00"	120'00"	120'00"
68	48'00" x 120'00"	120'00"	120'00"
69	48'00" x 120'00"	120'00"	120'00"
70	48'00" x 120'00"	120'00"	120'00"
71	48'00" x 120'00"	120'00"	120'00"
72	48'00" x 120'00"	120'00"	120'00"
73	48'00" x 120'00"	120'00"	120'00"
74	48'00" x 120'00"	120'00"	120'00"
75	48'00" x 120'00"	120'00"	120'00"
76	48'00" x 120'00"	120'00"	120'00"
77	48'00" x 120'00"	120'00"	120'00"
78	48'00" x 120'00"	120'00"	120'00"
79	48'00" x 120'00"	120'00"	120'00"
80	48'00" x 120'00"	120'00"	120'00"
81	48'00" x 120'00"	120'00"	120'00"
82	48'00" x 120'00"	120'00"	120'00"
83	48'00" x 120'00"	120'00"	120'00"
84	48'00" x 120'00"	120'00"	120'00"
85	48'00" x 120'00"	120'00"	120'00"
86	48'00" x 120'00"	120'00"	120'00"
87	48'00" x 120'00"	120'00"	120'00"
88	48'00" x 120'00"	120'00"	120'00"
89	48'00" x 120'00"	120'00"	120'00"
90	48'00" x 120'00"	120'00"	120'00"
91	48'00" x 120'00"	120'00"	120'00"
92	48'00" x 120'00"	120'00"	120'00"
93	48'00" x 120'00"	120'00"	120'00"
94	48'00" x 120'00"	120'00"	120'00"
95	48'00" x 120'00"	120'00"	120'00"
96	48'00" x 120'00"	120'00"	120'00"
97	48'00" x 120'00"	120'00"	120'00"
98	48'00" x 120'00"	120'00"	120'00"
99	48'00" x 120'00"	120'00"	120'00"
100	48'00" x 120'00"	120'00"	120'00"











05 01 2002	15/03
15/03	15/03/2002
15/03	15/03/2002
15/03	15/03/2002
15/03/2002	15/03/2002

BLACKSTONE RANCH - PHASE 2

## SITE PLAN (7 OF 8)

[illegible]

**CLIENT**  
BLACKSTONE DEVELOPMENT  
GROUP  
400 PLUMB LINE  
WEND, MA 01903  
CONTACT JOSHUA MYERS  
800-ONE (771) 312-4322

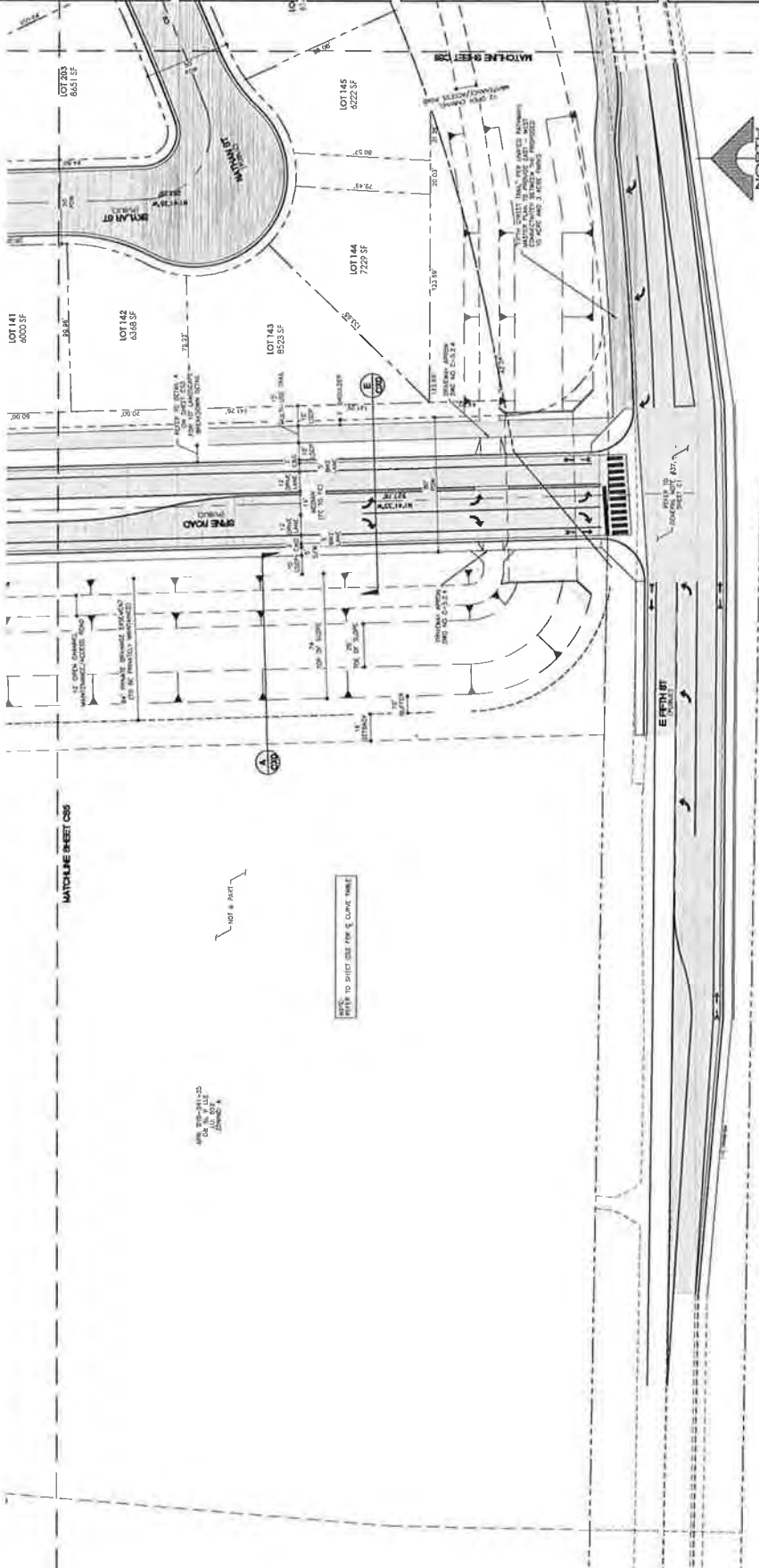


**THE RED LTD**

700 W. 9th Canadian Hwy  
Suite 2  
Las Vegas, NV 89166

(702) 526 7604 office  
toll-free 1-800-333-3333

REAL ESTATE  
ENGINEERING  
DEVELOPMENT



GRAPHIC SCALE  
( IN FEET )

CU3	CU4	CU5	CU6
CU3	CU3	CU5	CU7



**THE RED LTD**  
 10000 100th Ave NW  
 Suite 100  
 Edmonton, Alberta T5A 1C6  
 Canada  
 Tel: (780) 441-1111  
 Fax: (780) 441-1112  
 Email: info@thered.ca  
 Website: www.thered.ca

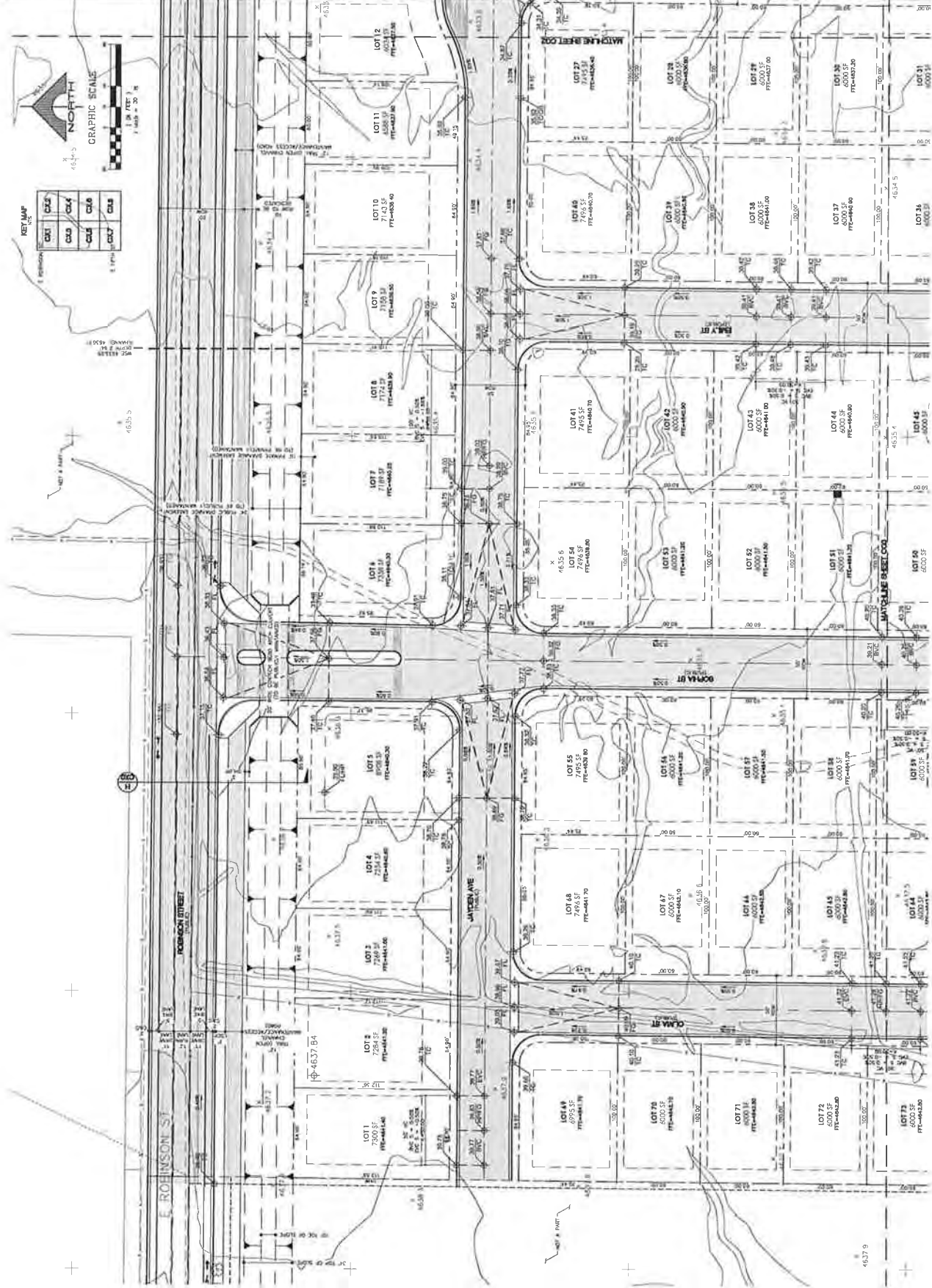


**CLIENT:** THE RED LTD  
**PROJECT:** GRADING PLAN (1 OF 8)  
**DATE:** 2018-01-01  
**SCALE:** 1" = 40.0'

DATE	NO.	DESCRIPTION
2018-01-01	1	ISSUED FOR PERMIT

**BLACKSTONE RANCH - PHASE 2**  
**GRADING PLAN (1 OF 8)**

DATE	NO.	DESCRIPTION
2018-01-01	1	ISSUED FOR PERMIT





**THE RED LTD**  
 1775 S. Capistrano  
 Suite 100, San Jose, CA 95128  
 (408) 261-8848  
 www.thered.com

DESIGNED BY: RED LTD  
 CHECKED BY: J. L. LACROIX  
 DATE: 05/11/2010

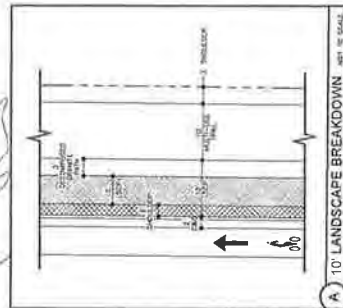
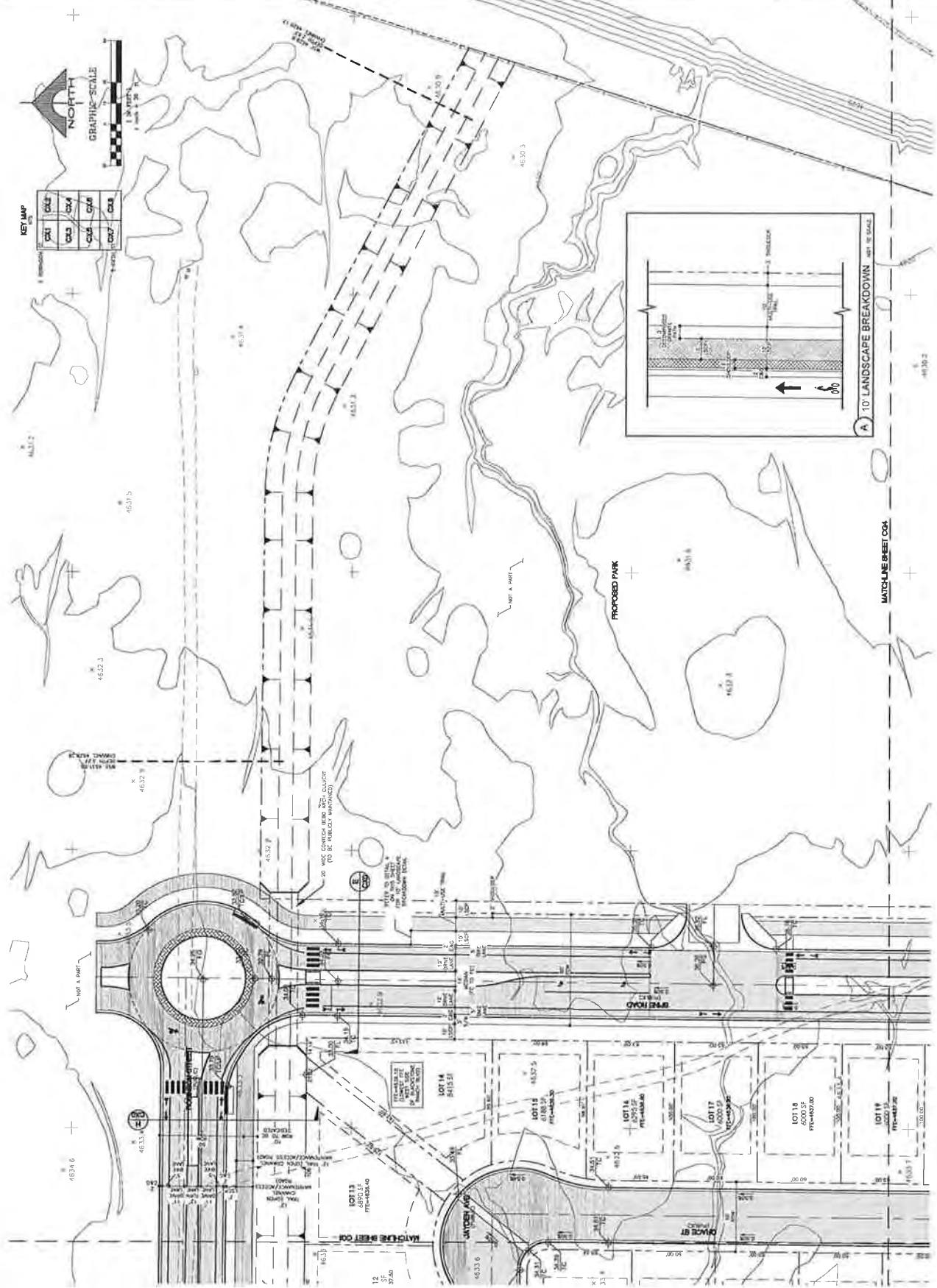


**CLIENT:**  
 ONE EMBLEM  
 200 E. PLUMB LANE  
 SUITE 100  
 LAS VEGAS, NEVADA 89101  
 PHONE: (702) 352-4200

DATE	NO.	REVISIONS	APPROVED

**BLACKSTONE RANCH - PHASE 2**  
**GRADING PLAN (2 OF 8)**

PROJECT NO.	2008-01
DRAWN BY	MAJ
CHECKED BY	MAJ
DATE	05/11/2010
SHEET NO.	2 OF 8



**SHT C02**



**THE RED LTD**  
 100 S. 10th Street  
 Suite 200  
 Minneapolis, MN 55402  
 (612) 339-1000  
 www.thered.com  
 E: REAL ESTATE  
 E: ENGINEERING  
 D: DEVELOPMENT

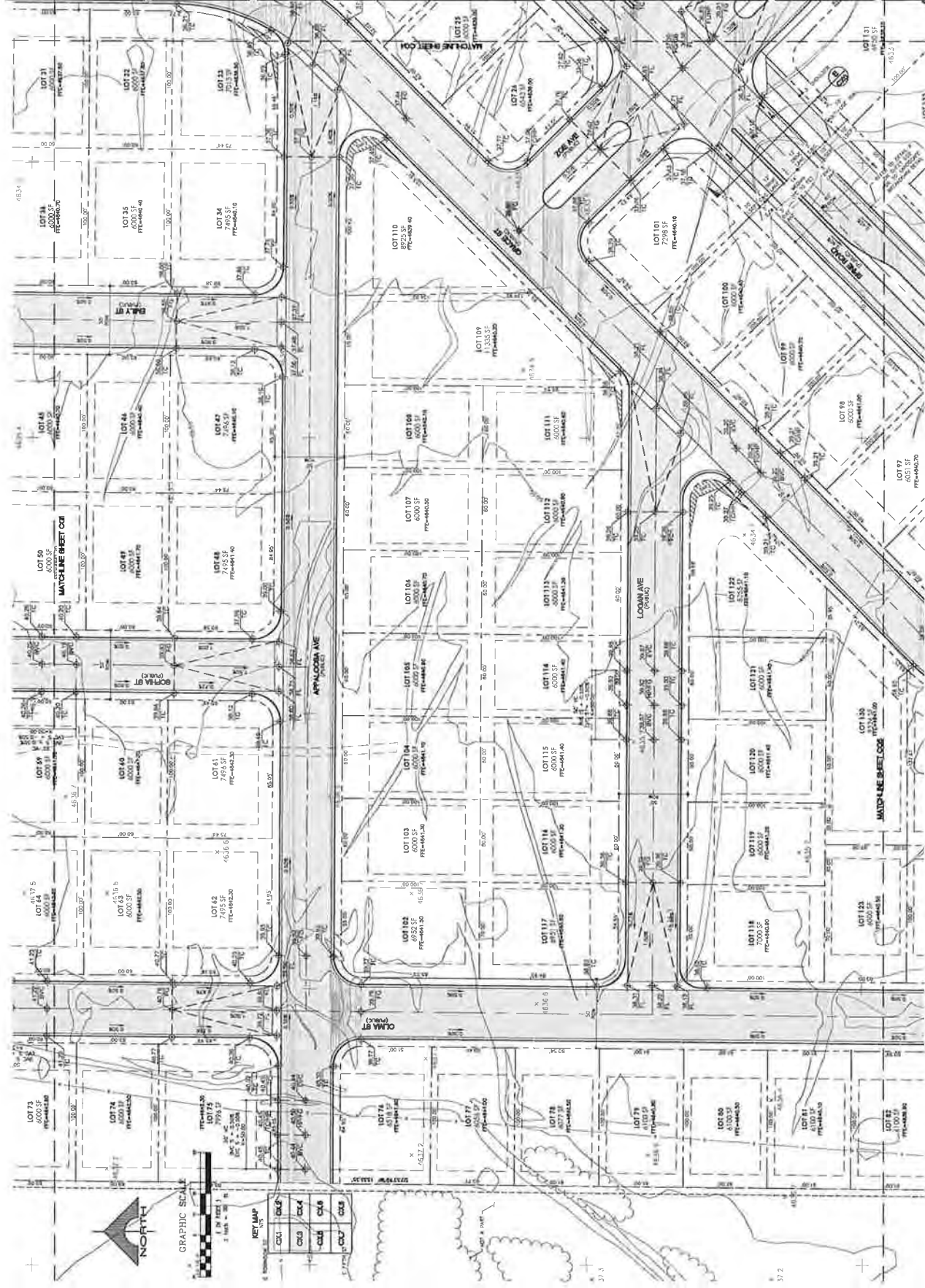


**CLMP**  
 MACHINERY DEVELOPMENT  
 437 FUMERAL  
 CONTACT: JESSICA MYERS  
 PHONE: (771) 225-0000

DATE	NO.	REVISIONS	APPROVED

**BLACKSTONE RANCH - PHASE 2**  
**GRADING PLAN (3 OF 8)**

DATE	2023.03.20
DESIGNED BY	JY
CHECKED BY	MAE
APPROVED BY	MAE
PROJECT NO.	23-001
SHEET NO.	37.3



**THE RED LTD**  
 1001 West 10th Ave  
 Suite 200  
 New York, NY 10018  
 (212) 333-7800 ext 100  
 www.thered.com  
 P: 1001 1001  
 E: ENGINEERING  
 D: DEVELOPMENT



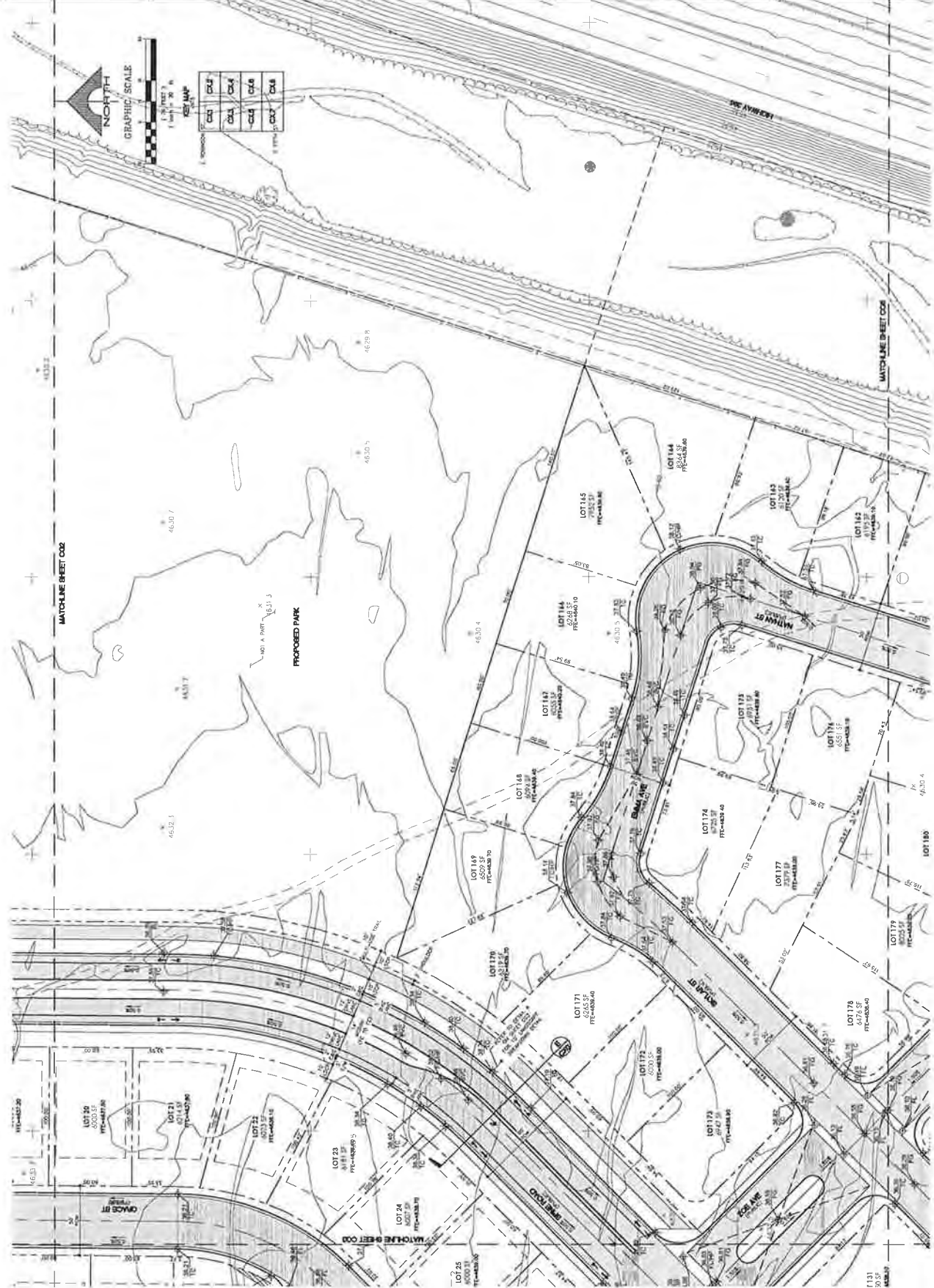
**CLIENT**  
 BLACKSTONE RANCH  
**GROUP**  
 1001 West 10th Ave  
 Suite 200  
 New York, NY 10018  
 (212) 333-7800 ext 100  
 www.thered.com

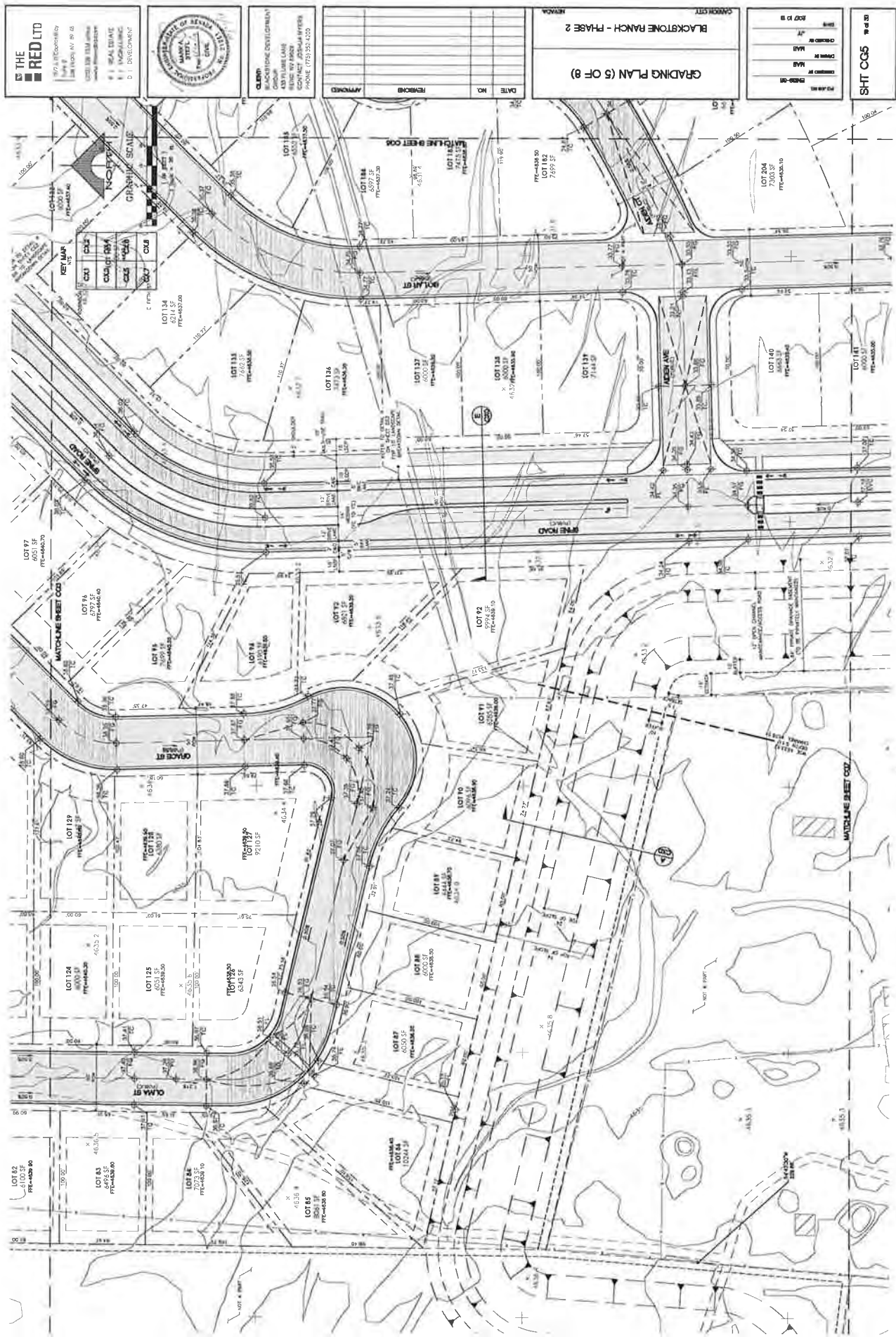
DATE	NO.	REVISION	APPROVED

**BLACKSTONE RANCH - PHASE 2**  
**GRADING PLAN (4 OF 8)**

DATE	2023.03.03
DESIGNED BY	JR
CHECKED BY	JR
DATE	2023.03.03
DESIGNED BY	JR
CHECKED BY	JR

**SHT C04**  
 1001 1001







**THE RED LTD**  
 1000 10th Avenue SW  
 Suite 100  
 Calgary, Alberta T2C 1A5  
 Phone: (403) 243-1000  
 Fax: (403) 243-1001  
 www.theredltd.com

D 1. REAL ESTATE  
 E 1. ENGINEERING  
 F 1. SURVEYING  
 G 1. DEVELOPMENT



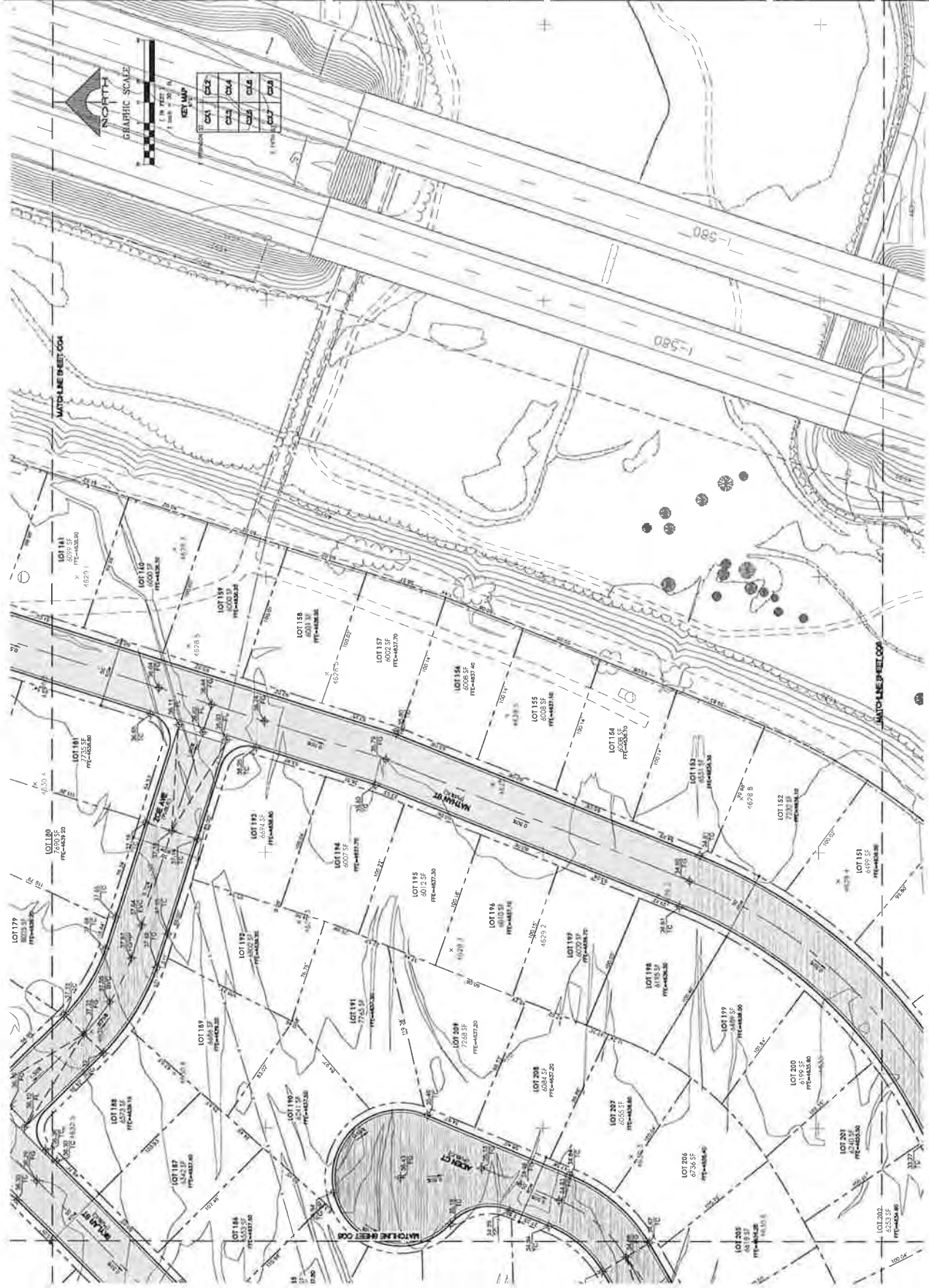
**CLIENT:** THE RED LTD.  
**PROJECT:** BLACKSTONE RANCH - PHASE 2  
**DATE:** 2010-01-15  
**BY:** [Signature]  
**FOR:** [Signature]

DATE	NO.	REVISIONS	APPROVED

**BLACKSTONE RANCH - PHASE 2**  
**GRADING PLAN (6 OF 8)**

DATE	NO.	REVISIONS	APPROVED

**SHEET 006**









**THE RED LTD**  
 1000 S. Independence  
 Las Vegas, NV 89102  
 (702) 735-1234  
 www.thered.com

A | LOCAL SERVICE  
 B | LOCAL SERVICE  
 C | LOCAL SERVICE  
 D | DEVELOPMENT

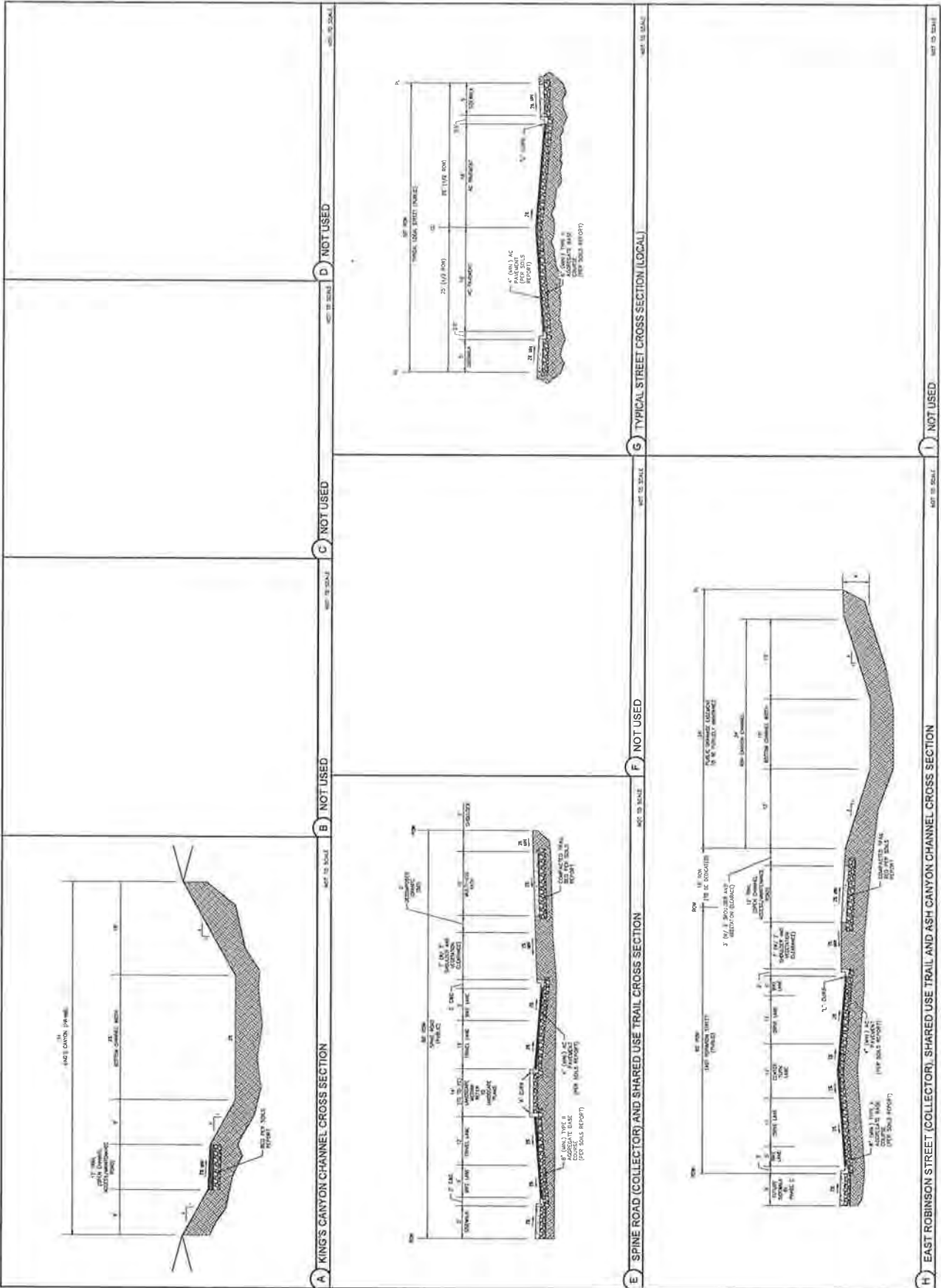


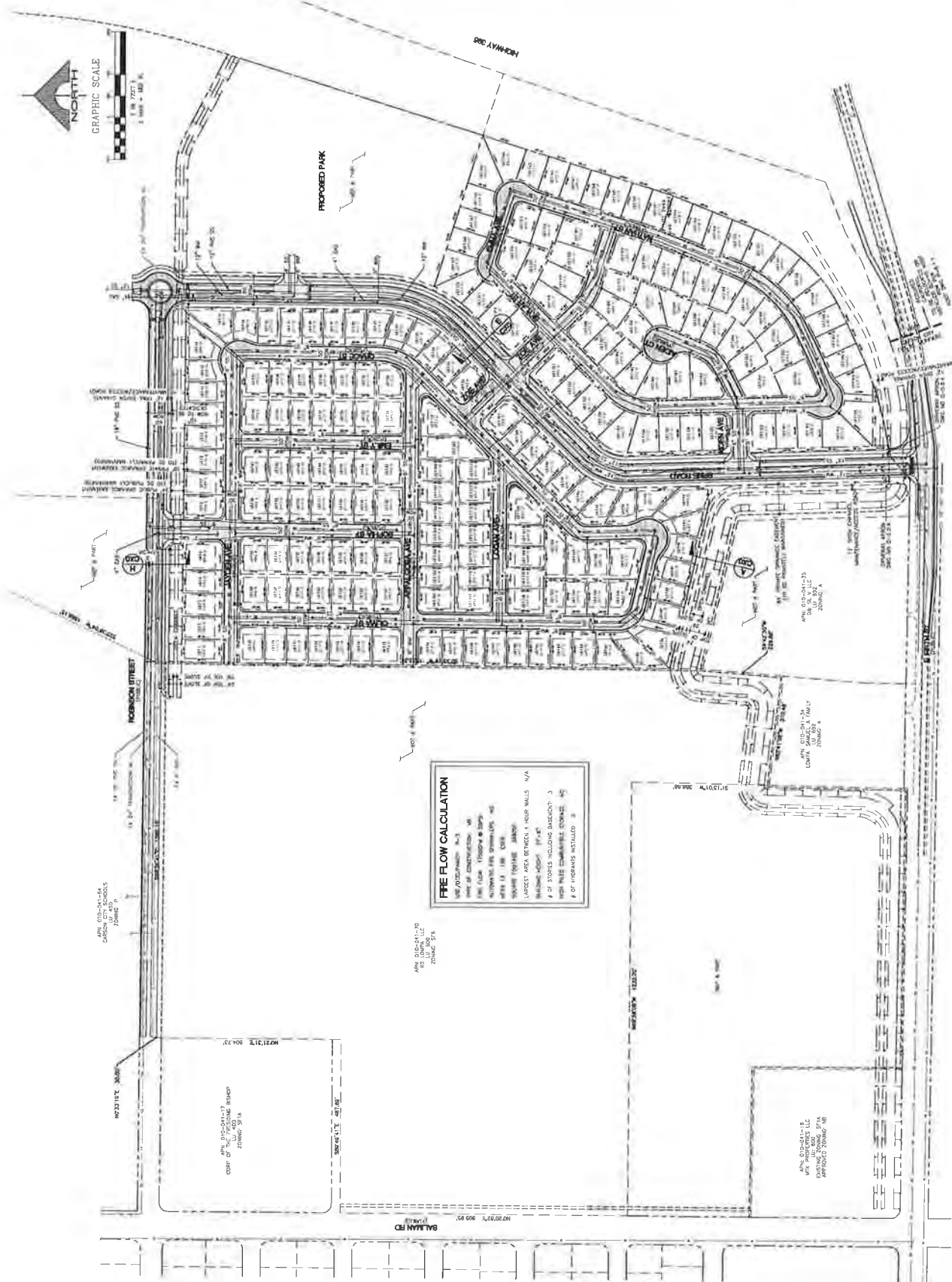
**CLARK COUNTY**  
 CLARK COUNTY DEVELOPMENT  
 430 PLAZA LANE  
 LAS VEGAS, NV 89102  
 PHONE (702) 552-4200

DATE	NO.	REVISIONS	APPROVED

**CROSS SECTIONS**  
 BLACKSTONE RANCH - PHASE 2  
 CANYON CITY

NO. 1000	NO. 1000
NO. 1000	NO. 1000
NO. 1000	NO. 1000
NO. 1000	NO. 1000
NO. 1000	NO. 1000
NO. 1000	NO. 1000





**THE RED LTD**  
 17751 Caprice Way  
 Irvine, CA 92614  
 www.theredltd.com  
 3 REAL ESTATE  
 3 DEVELOPMENT  
 3 DEVELOPMENT



**CLINT**  
 ONE BEACON STREET  
 GROUP  
 400 PLUM LANE  
 CONTACT: JESSICA BYRNE  
 PHONE: 775.523.4000

DATE	NO.	REVISIONS	APPROVED

**UTILITY PLAN (1 OF 8)**  
 BLACKSTONE RANCH - PHASE 2  
 HENNA

DATE	NO.	REVISIONS	APPROVED

**KEY MAP**

CD1	CD2	CD3	CD4	CD5	CD6	CD7	CD8

**GRAPHIC SCALE**  
 1" = 100' (1" = 30.48m)  
 1" = 100' (1" = 30.48m)

