APPENDIX J-1

Bordeaux at Boulevard South

Appendix J-1

Bordeaux
at
Boulevard South

A Luxury Senior Living Project

Table of Contents

Chapter 1– Introduction

Chapter 2 – Project Overview

Chapter 3 - Plans

Chapter 1 – Introduction

Purpose of Appendix J-1

The project in this Appendix J-1 may be developed as a specific plan (in the area depicted below Figure 1-1) in lieu of the development plan shown for this area in Appendix J. The intent is to allow the subject property to be developed in accordance with the standards and uses in Appendix J or Appendix J-1.

Project Location

Bordeaux is located within Planning Unit K-1 and consists of approximately 6.42+/- acres. Primary access to the site is off of South Meadows Parkway. Figure 1-1 below depicts the project location while Figure 1-2 (following page) depicts the project site plan including access points.

Figure 1-1

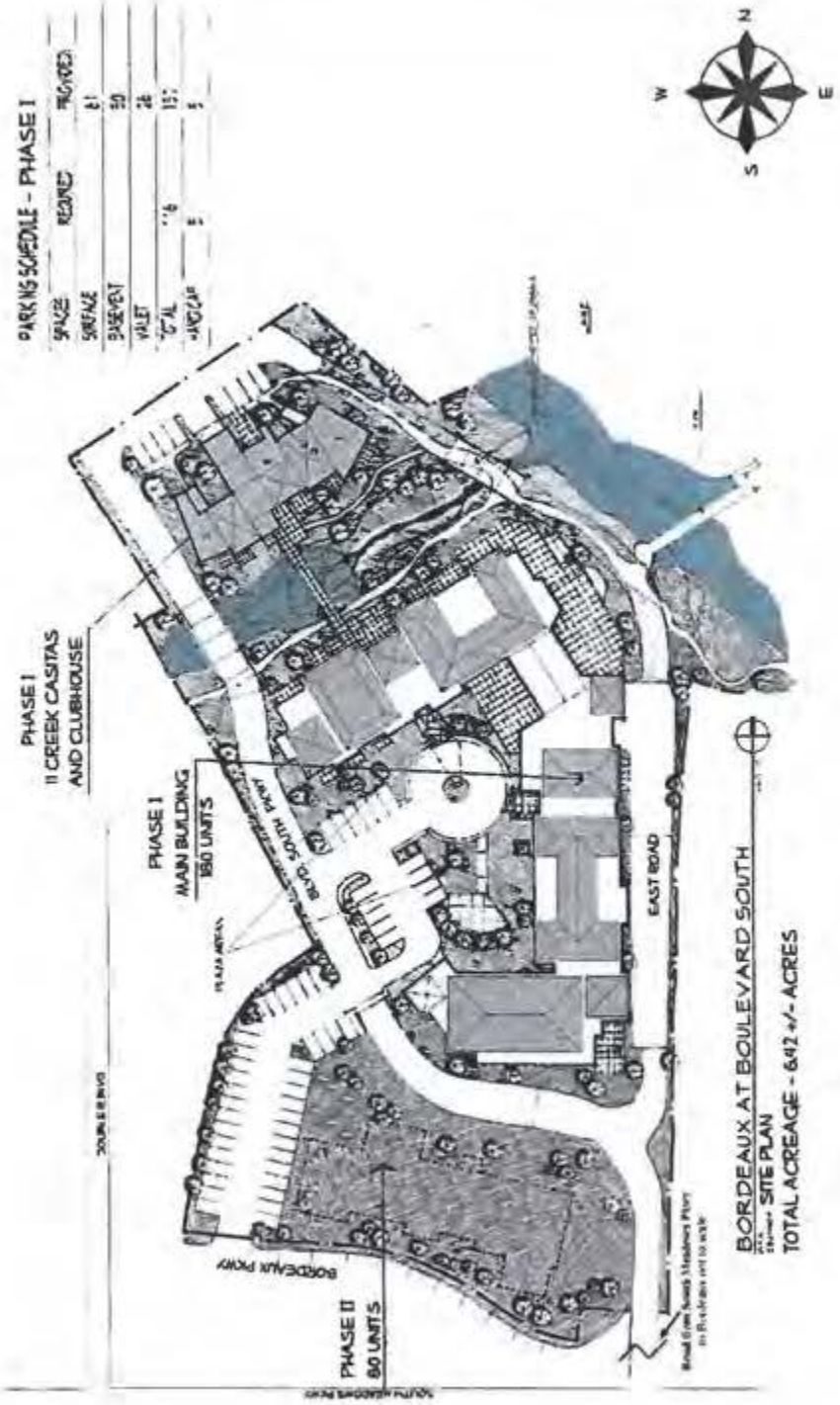

PARKING SCHEDULE - PHASE I
PHASE I
11 CREEK CASITAS
AND CLUBHOUSE
PHASE I
MAIN BUILDING
180 UNITS
PHASE II
80 UNITS
EAST ROAD
BORDEAUX AT BOULEVARD SOUTH
SITE PLAN
TOTAL ACREAGE - 642 +/- ACRES
N
S
E
W

Figure 1-2

Chapter 2 – Project Overview

Allowed Uses:

Senior Housing (see definition in Appendix J, Page 1-4, for Senior Housing).

Project Vision:

Bordeaux, the first phase of Boulevard South, is a luxury senior living project located on the south +/- 6.42 acres of Planning Unit K-1. The site is located in an area of south Reno where currently no senior living project exists. This project will provide for a senior living product with a target market of 62 years and older in a premier location. The project consists of 271 units and will be built in two phases. The first phase will consist of 191 units. Estimated construction start date for phase one is late fall of 2009 and estimated completion date is early spring of 2012. Phase two consists of no more than 80 units. The estimated construction start and completion dates for phase two have not yet been determined.

Unit Count and Project Phasing

Bordeaux will consist of two phases with a total of 271 units. The first phase of 191 units is made up of 180 units in the main building and 11 creek casitas. (See site plan, page 1-2). The second phase will be no more than 80 units and will be consistent with the architecture and design standards as the first phase. (See site plan, page 1-2).

Site Planning

Setbacks (See Figure 1-2):

Location	Requirement	Sections
North Property Line -Casitas	0 feet (Internal property line)	
South Property Line -Towards McDonald's	10 feet	AA
Southwest Property Line -Towards Hilton	30 feet	
East Property Line – Adjacent to Apartments	40 feet	BB
East Property Line – Lakefront	72 feet	CC

Building Height:

The overall building height for the main buildings is 50-55 feet. No architectural features such as a clock tower shall exceed 75 feet.

No shadowing shall be allowed on any residential buildings surrounding the site between the hours of 10:00am-2:00pm on December 21st. This shall be demonstrated prior to issuance of each building permit.

Parking:

Parking for Phase I shall be provided based on City code (18.12.1102 – 1 space/1.65 dwelling units) as amended for senior housing/assisted living. Parking will consist of 137 total spaces which include 76 underground (50 resident and 26 valet spaces) and 61 surface spaces (38 for employees, 15 guest, and 8 casita). Parking for Phase II shall utilize the same standards, with the actual number of spaces determined prior to issuance of a building permit.

See site plan, figure 1-2 page 1-2, for parking calculations.

Site Coverage

See landscape plan, page 2-25, for all site coverage calculations. The site coverage areas may vary no more than 10% from the table shown on page 2-25.

Access and Circulation

Primary access to Bordeaux is from the intersection of South Meadows Parkway and Boulevard South Parkway, via the main project entryway Boulevard South Parkway (see Site Plan, page 1-2).

Any access and circulation design standards not specifically addressed in this Appendix J-1 shall be subject to the design standards set forth in Appendix J, page 2-8.

Cross Sections

The following cross sections depict the setbacks from the main building, adjacent streets, and project structures(see Cross Section Map on page 2-26):

Section A, page 2-27, depicts the street section along Boulevard South Parkway and the main building. There is a 10'-25' landscape buffer located between the main building and Boulevard South Parkway.

Section B, page 2-28, depicts the street section between the main building and the East property line. There is a 40'- 45' setback from the main building to the east property line which includes a 5'-7' wide landscape buffer along the east property line.

Section C, page 2-29, depicts the street section between the main building and the lake. There is a 72' setback from the main building to water's edge. There is a 30' terrace buffer adjacent to the main building, then a 20' path/fire road and then a 22' landscape buffer adjacent to the lake.

Section D, page 2-30, depicts the creek section between the main building and the creek casitas. There is a 105' separation between the main structures. From each building, there is a 24' terrace and landscape buffer, an 8' path, then a 58' creek and lagoon, then a 15' terrace and landscape buffer.

Architecture

General Architecture:

The architecture shall be consistent with the designs as shown on pages 2-8 thru 2-18. Building architecture and colors may vary from what is shown on pages 2-8 thru 2-18. Final building architecture and building colors shall be determined prior to approval of each building permit.

Architecture of the Main Building:

The architecture of the main buildings shall be substantially the same as ~~to~~ the designs shown on pages 2-12 thru 2-18. Bordeaux will be a four story wood frame structure above one level of underground parking. The main exterior elements will be drivit stucco and wood siding in a variety of hues and accents. Areas near the ground level will be stone wainscoting with slate details to provide a sense of scale. Because of the relationship of the outside to the inside, and the openness of the plan, the interior detailing will reflect the same attention to detail.

Architecture of the Creek Casitas:

The architecture for the creek casitas shall be consistent with the designs as shown on pages 2-23 thru 2-24. The casitas will be a 2 story wood frame structure with similar architectural elements as the main buildings.

Green Building:

Bordeaux will be designed and constructed with environmental principals in mind and will adhere to the Green Building system as outlined in the "Build It Green" Multifamily Green Building Guidelines. With this project, the intent is to manage resources, conserve energy, minimize the consumption of non-renewable materials and resources, and monitor the environment. Points are earned based on Green building measures per the guidelines. A certified "GreenPoint Rater" will measure the project and submit verification results to "Build It Green". Once 50 points are earned and verified by "Build It Green", the project will be awarded the "GreenPoint Rated Label". It is envisioned over the process of building the project, that "green building" opportunities will expand in scope and availability. Prior to issuance of each building permit, the applicant shall provide a list of "Build it Green" items that will be incorporated into the building; and provide a process to verify that these items have been constructed prior to issuance of each certificate of occupancy.

Walls and Fencing:

Refer to appendix J, page 2-10 for wall and fencing standards.

Delivery Areas and Trash Enclosures:

The main delivery area and trash area will be along the East Road and will be screened from the public's view (see East Road on site plan, page 1-2. (See Appendix J, page 2-10 for general standards).

Any architectural design standards not specifically addressed in this Appendix J-1 shall be subject to the

design standards set forth in Appendix J.

Lighting

The final design, location and size of all lighting will be determined prior to the approval of the building permit based on the standards below.

Project and Building Entries:

Points of entering and exiting Bordeaux will be identified by distinctive lighting. The lighting of these areas will provide more illumination than that of surrounding areas and may be coordinated with distinctive architectural elements and any special directional signage. Since entrances and exits often are at the edge of a building or public space, this type of lighting will be coordinated with perimeter lighting to avoid conflict and excess illumination.

Pedestrian Plaza Area Standards:

1. The use of pedestrian-scale post-top light fixtures and bollards shall occur within pedestrian oriented spaces.

2. Fixtures shall be located in pedestrian areas at intervals that provide consistent and appropriate illumination for pedestrian circulation. Integration of fixtures with planters and retaining walls is encouraged.

Building Mounted Lighting Standards:

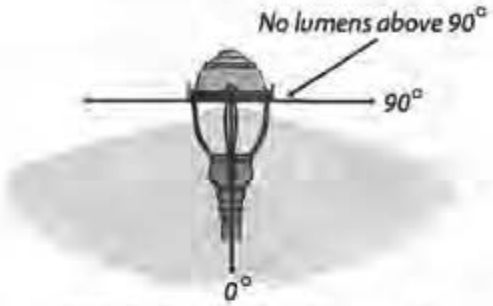
1. Decorative building mounted lighting will be used to illuminate adjacent pedestrian pathways for safety and to integrate with building architecture. The selected fixture style will be determined prior to the approval of the building permit and will be consistent throughout the project. Lighting for tenant and residential patios will be limited to recessed lighting.

2. Architectural accent lighting such as up lighting shall be designed to minimize light spill beyond the target. Such lighting will be restricted to accessory retail and entertainment uses.

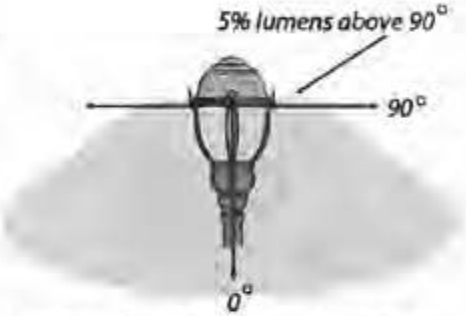
3. Service area lighting shall be contained within the service area boundaries and enclosure walls.

Structured Parking Lot Lighting Standards:

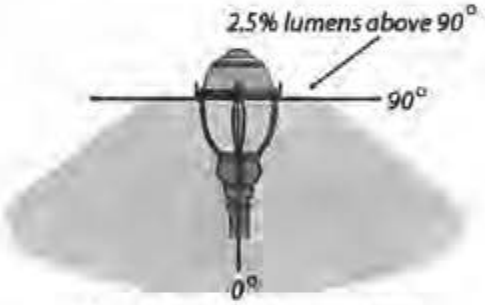
1. Parking lot lighting within the structures is required for public safety. Such lighting shall use full cut-off or cut-off light distributions to minimize light pollution and prevent view of the light source from above or outside of the parking structures.



IESNA "Full Cutoff Type" Luminaire



IESNA "Semi-Cutoff Type" Luminaire



IESNA "Cutoff Type" Luminaire

Landscape Lighting:

1. Softscape lighting of planted materials at entries to the site and buildings and in the plaza area shall define and soften these areas and may be integrated into hardscape materials.
2. Hardscape lighting of fountains, outdoor sculptures, and arbors in the plaza and pedestrian areas shall be from contained fixtures to minimize light beyond the intended target.
3. Landscape lighting will be minimized and limited to low wattage fixtures in planted areas adjacent to building entrances and pedestrian pathways and focused on the landscaped area to minimize any spillover.

Any lighting design standards not specifically addressed in this Appendix J-1 shall be subject to the standards set forth in Appendix J, pages 2-20 thru 2-22.

Landscaping:

Landscaping will be a focal point and will be maximized in order to help create a luxurious feel to the project and to maximize the premier location on the lake and creek. The main building entry will have a covered porte cochere with a turn around, courtyard, outdoor patio and garden area. This area will be landscaped and will contain water features, grass, trees, shrubs, flowers, benches and pavers. The perimeter of the buildings, all entryways, outdoor patio areas and the pedestrian paths throughout the

project and along the lake and creek will be landscaped similar to the main building entry in order to carry out the theme. A pedestrian bridge connects the main building to the creek casitas and will also have similar landscaping to the entry area. Thomas Creek will be enhanced as a beautiful water feature and a lagoon will be created underneath the pedestrian bridge that will waterfall down into the lake. The Creek Casitas entry will have landscaping similar to the main building entry (see pages 2-5 and 2-6 and the landscape plan, page 2-25 for details).

The landscape plan may vary no more than 10% from what is shown on page 2-25. A final landscape plan shall be approved prior to issuance of a building permit.

Any landscape, terrace or amenity design standard not specifically addressed in this Appendix J-1 shall be subject to the design standards set forth in Appendix J, pages 2-23 thru 2-26.

Signs

The final design, location and size of all signs shall be determined prior to approval of the building permit.

Project Identification Signs:

There will be 1 project identification sign located at the intersection of South Meadows Parkway and Boulevard South Parkway (see page 2-31).

Building Identification Signs:

There will be 3 building project identification signs as shown on page 2-31.

Any sign design standards, including sign sizes and heights not specifically addressed in this Appendix J-1 shall be subject to the design standards set forth in Appendix J, page 2-40 thru 2-41. Minor modifications to the building identification sign locations may be approved by the administrator.

Site Grading:

Refer to Appendix J, page 2-41 for site grading general standards.

Employee Trip Reduction Program

An Employee Trip Reduction program will be established with the submittal of the building permit. The ETR shall be continuously maintained throughout the lifetime of the project.

Utility, Drainage and Grading:

All improvement plans will be designed in accordance with the exhibits shown on pages 2-32 thru 2-34.

(To scale 24 x 36 copies of the improvement plans are on file with the Community Development Department).

Administrative Approval for Minor Revisions

The administrator shall have at his or her discretion the ability to administratively approve minor changes to the plans, standards, and guidelines as requested by the Master Developer prior to the submission of the building permit as long as the changes are equal to or better than what is outlined in this Appendix J-1 and any applicable standards contained in Appendix J. Minor changes include, but are not limited to, standards for parcel configurations, parcel sizes, setback conditions, etc. and shall not exceed 10%.

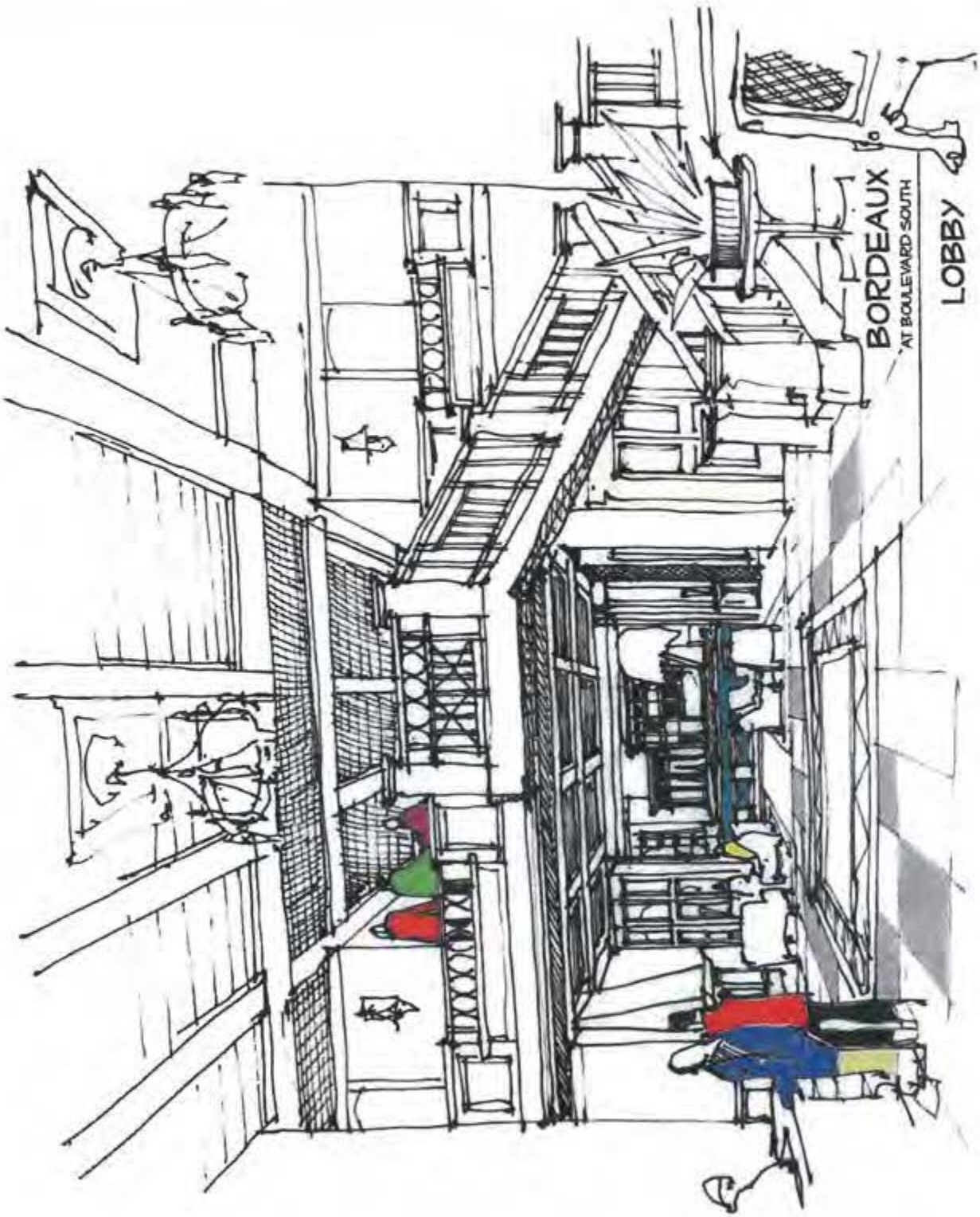
Conditions of Approval

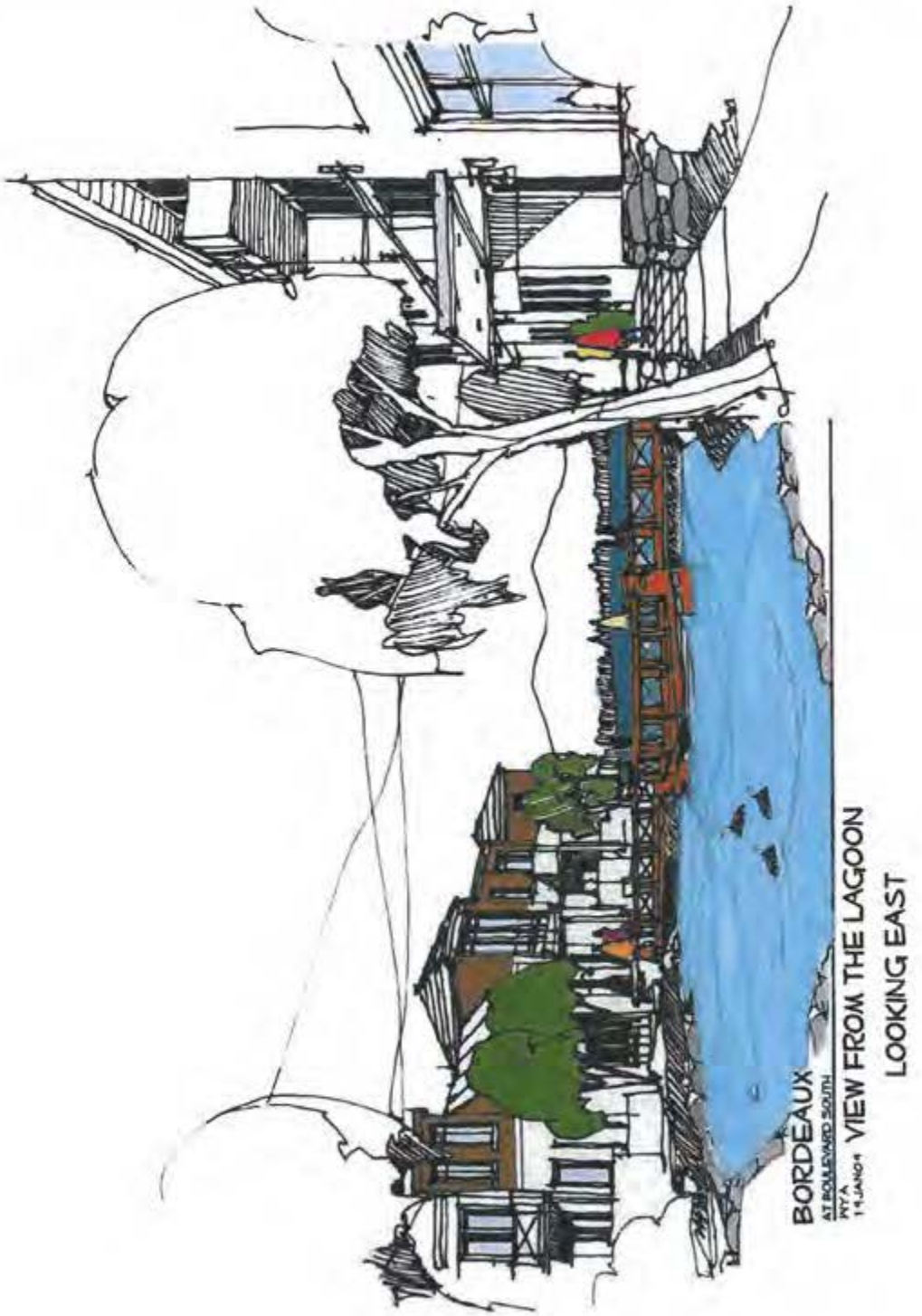
All conditions and standards contained in Appendix J of the South Meadows Phase III Design Guidelines, which are not otherwise modified in this Appendix J-1 shall apply to this project. All conditions in Appendix J which are triggered by final map approval shall be triggered prior to building permit approval for the senior facility contained in this Appendix J-1.

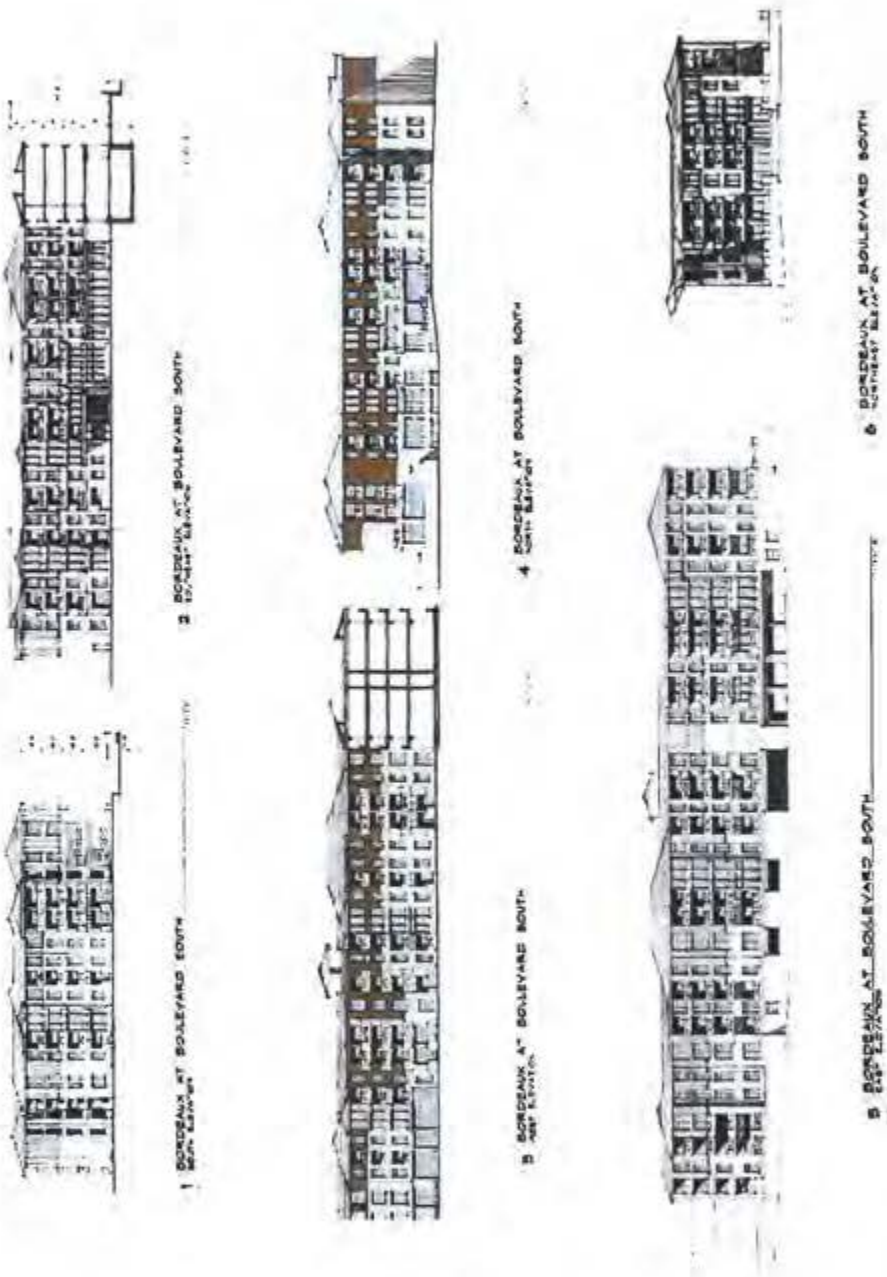
Provided the senior project is in substantial conformance with the standards and conditions contained in this Appendix J-1, no further discretionary review, such as a tentative map or special use permit, is required, and may proceed to the building permit process.

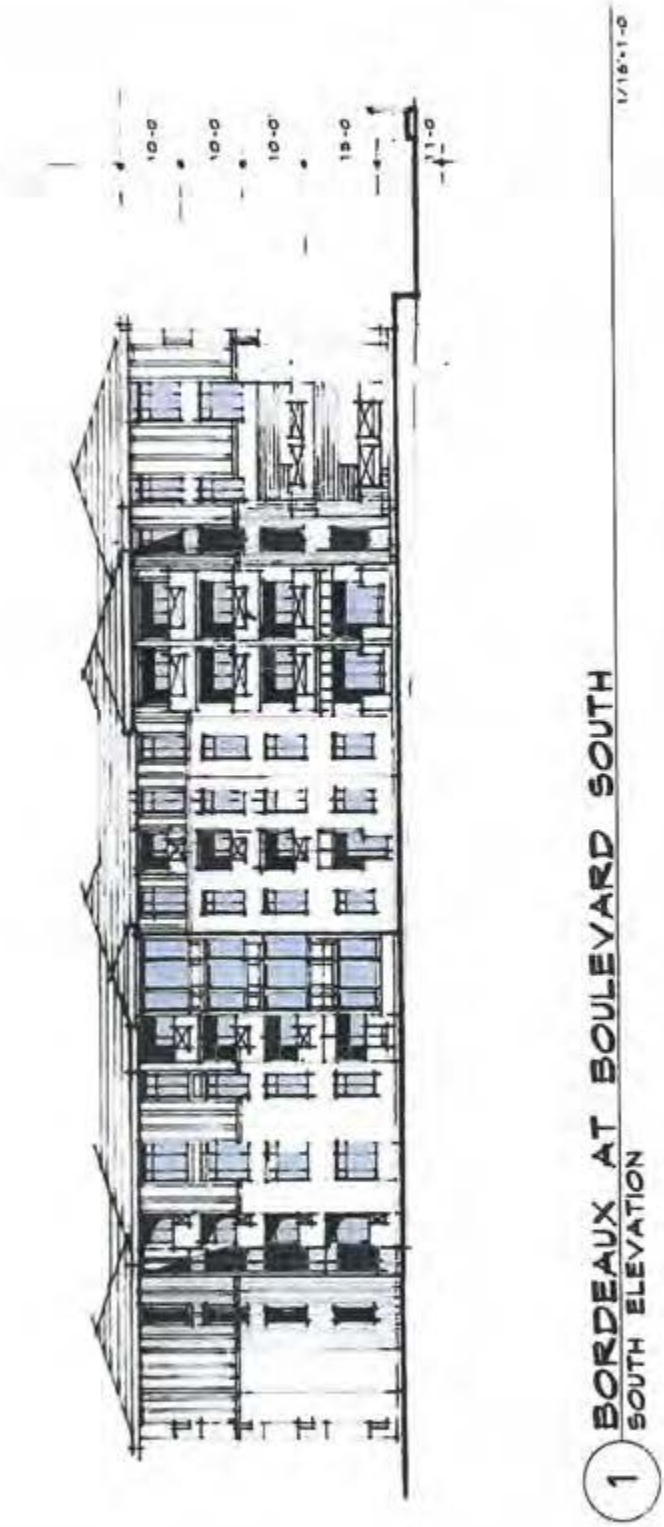
BORDEAUX
VIEW FROM LAKE
LOOKING WEST

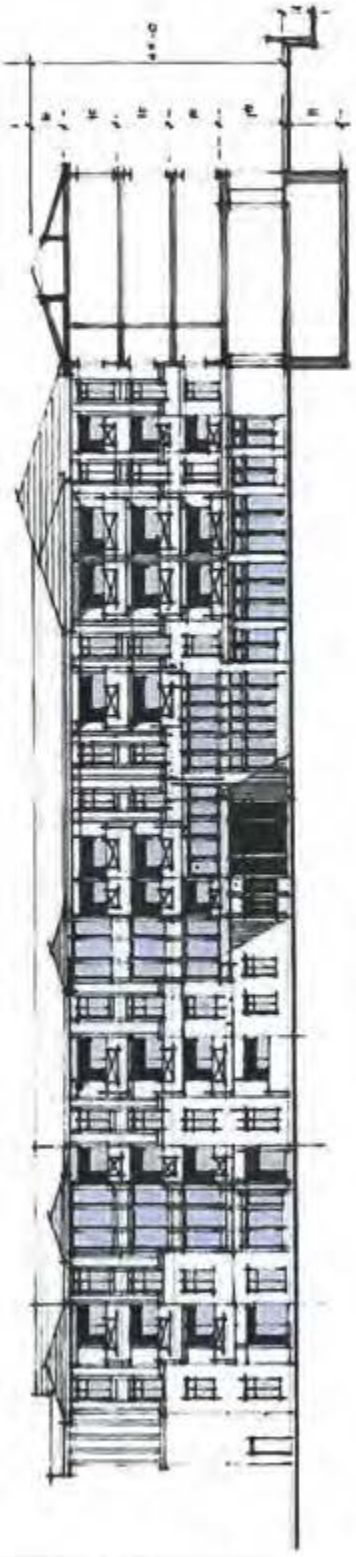

BORDEAUX
AT BOULEVARD SOUTH
MYA
14 JANOS
VIEW FROM THE ARRIVAL


BORDEAUX
AT BOULEVARD SOUTH
LOBBY

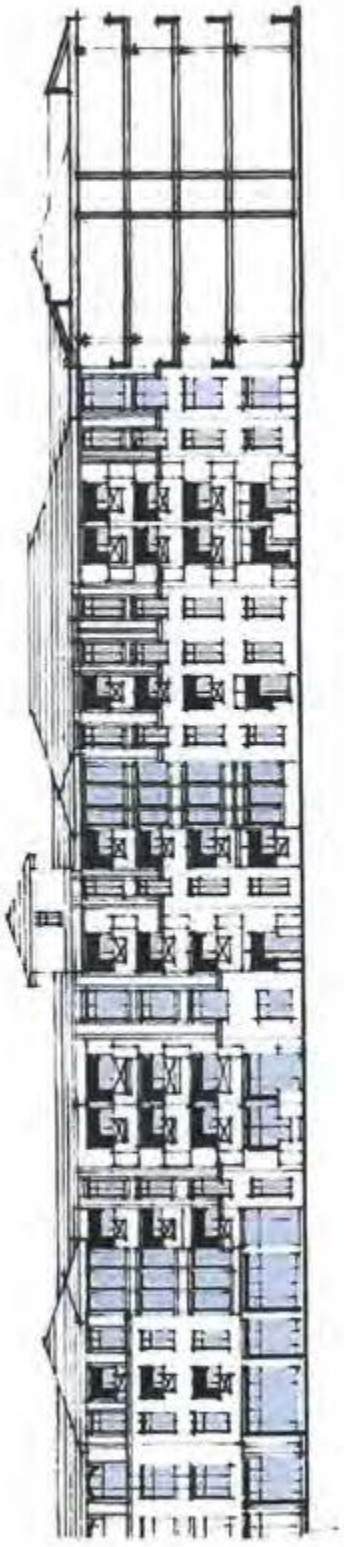

BORDEAUX
AT BOULEVARD SOUTH
VIEW FROM THE LAGOON
LOOKING EAST




10-0
10-0
10-0
15-0
11-0
1/16"=1'-0
1 BORDEAUX AT BOULEVARD SOUTH
SOUTH ELEVATION



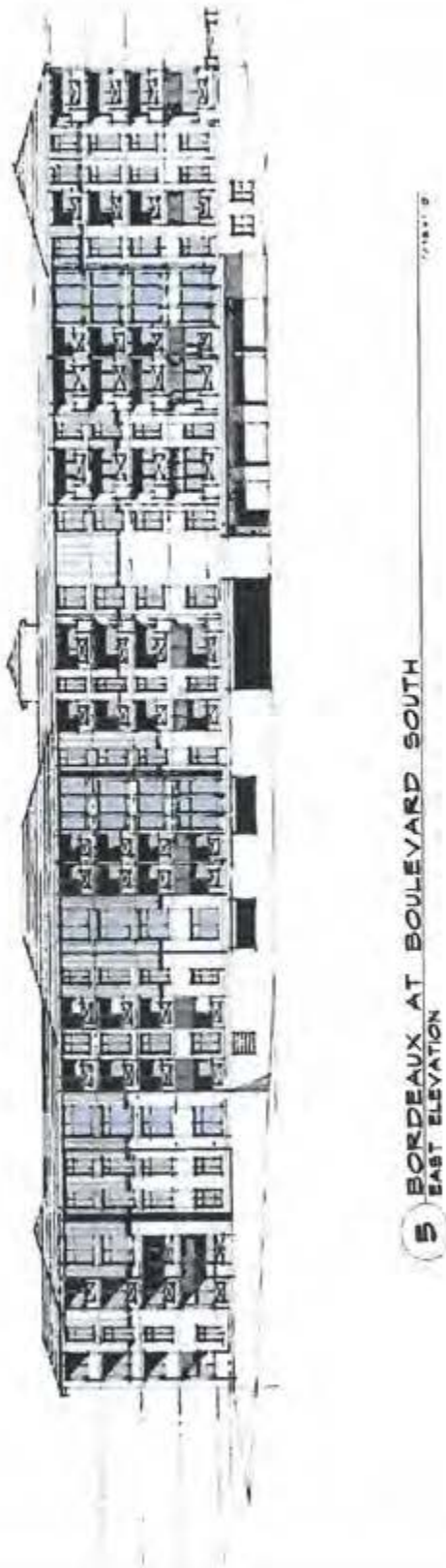
2 BORDEAUX AT BOULEVARD SOUTH
SOUTHEAST ELEVATION



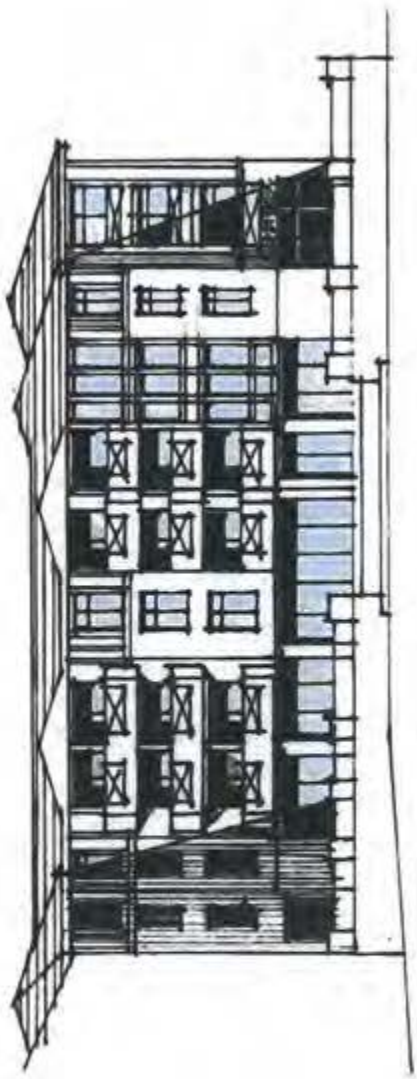
3 BORDEAUX AT BOULEVARD SOUTH
WEST ELEVATION

4 BORDEAUX AT BOULEVARD SOUTH
NORTH ELEVATION

1/16"=1'-0"



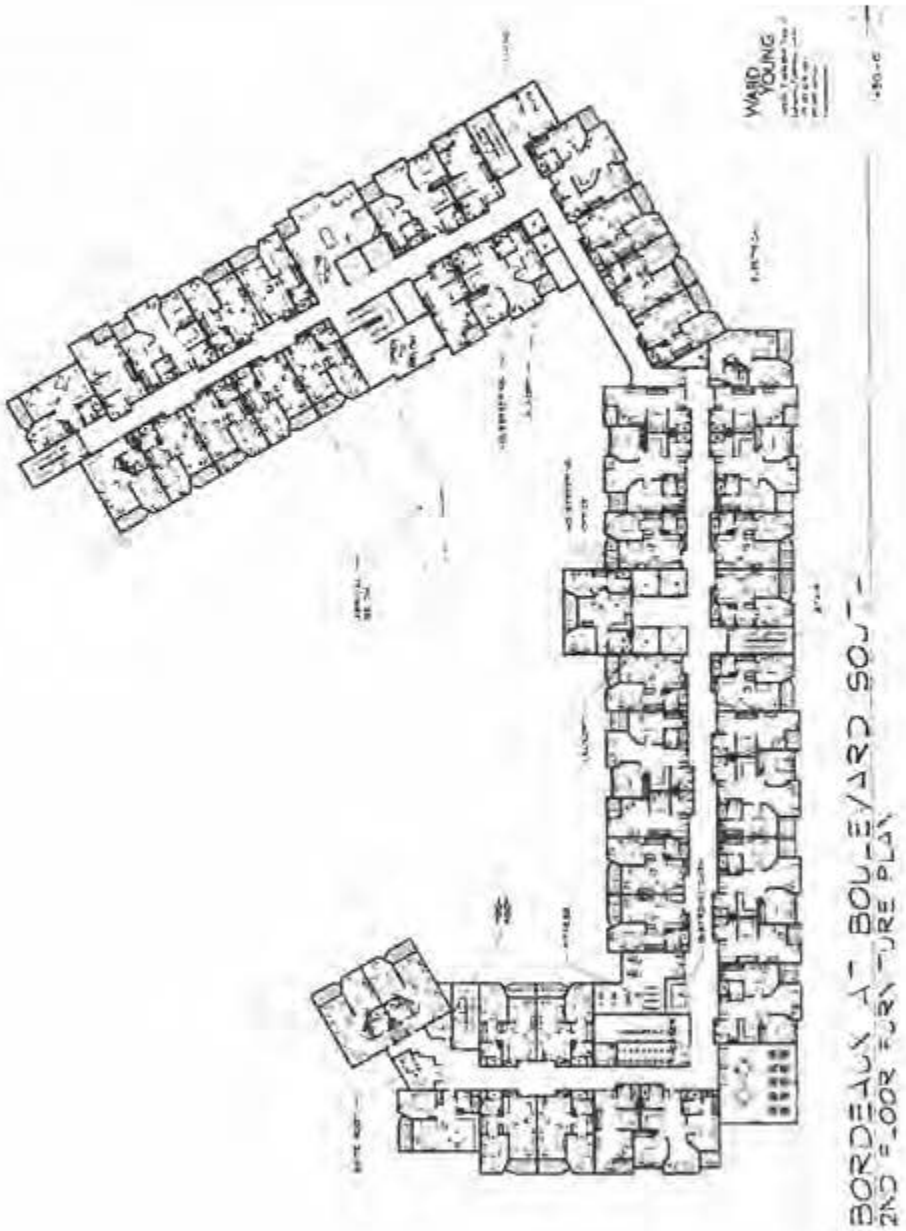
5 BORDEAUX AT BOULEVARD SOUTH
EAST ELEVATION

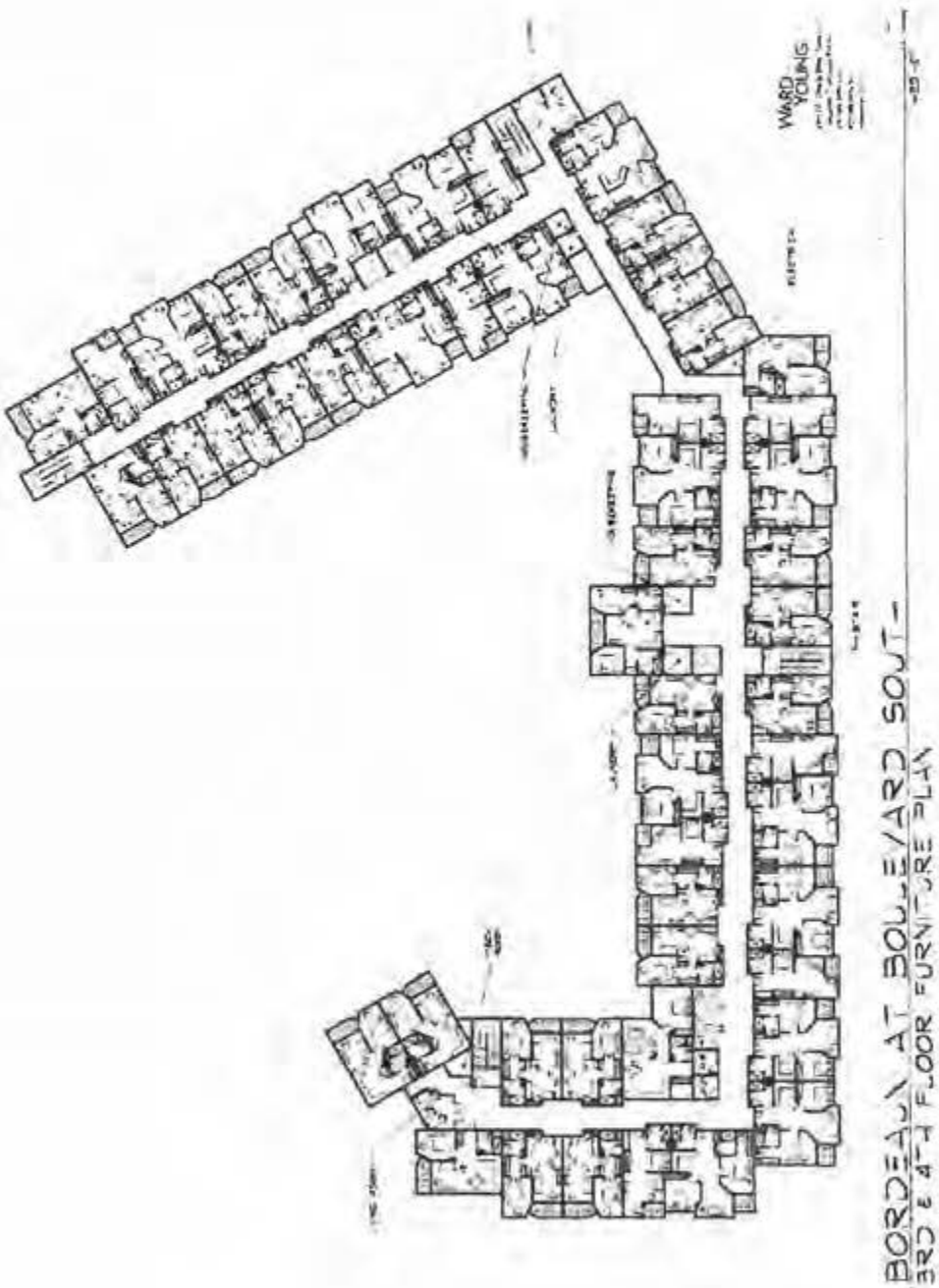


6 BORDEAUX AT BOULEVARD SOUTH
NORTHEAST ELEVATION


WARD YOUNG
BORDEAUX AT BOULEVARD SOUTH
LOWER LEVEL FURNITURE PLAN

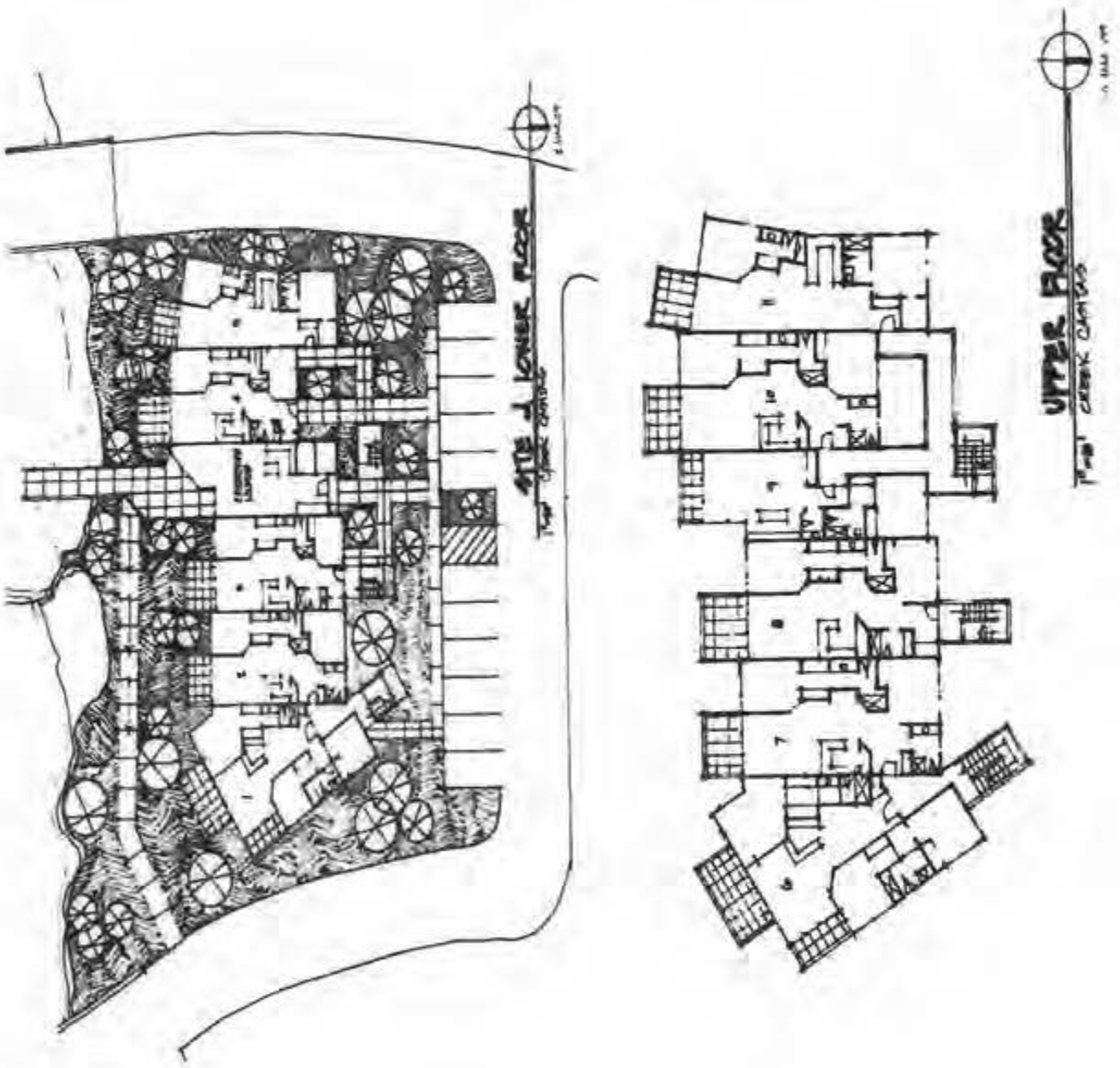

WARD YOUNG
BORDEAUX AT BOULEVARD SOUTH
GROUND FLOOR FURNITURE PLAN


WARD YOUNG
BORDEAUX AT BOULEVARD SOUTH
2ND FLOOR FURNITURE PLAN

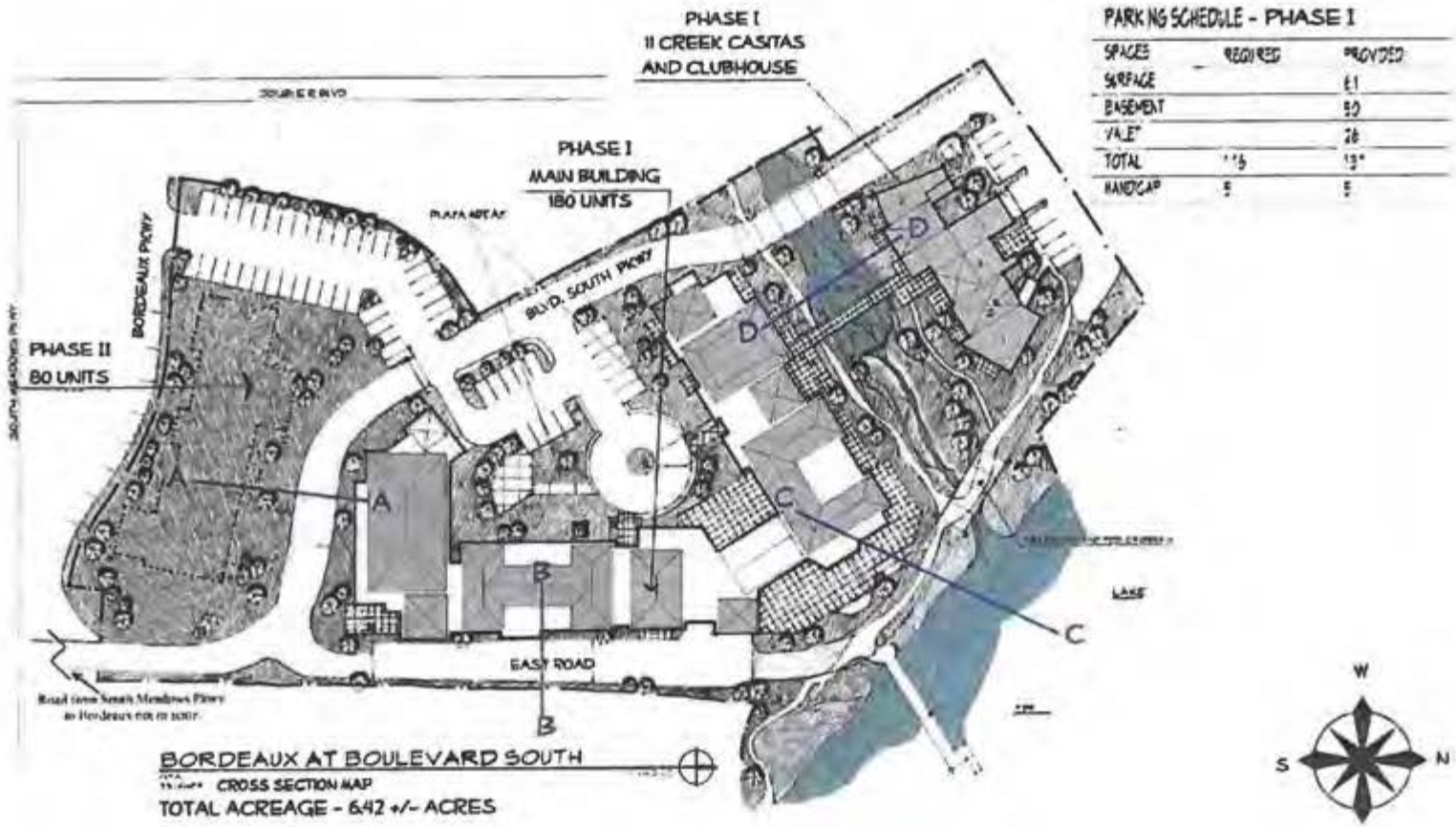

WARD YOUNG
BORDEAUX AT BOULEVARD SOUT-
3RD & 4TH FLOOR FURNITURE PLAN

BORDEAUX AT BOULEVARD SOUTH
CASITAS - NORTH AND EAST ELEVATION

BORDEAUX AT BOULEVARD SOUTH
CASITAS - SOUTH AND WEST ELEVATION




BORDEAUX AT BOULEVARD SOUTH
LANDSCAPE PLAN
LANDSCAPE CALCULATIONS
SITE COVERAGE CALCULATIONS
PHASE I LANDSCAPING
PHASE II LANDSCAPING
PLAZA AREAS
PHASE I
MAIN BUILDING
180 UNITS
PHASE II
80 UNITS
EAST ROAD
N
S
E
W



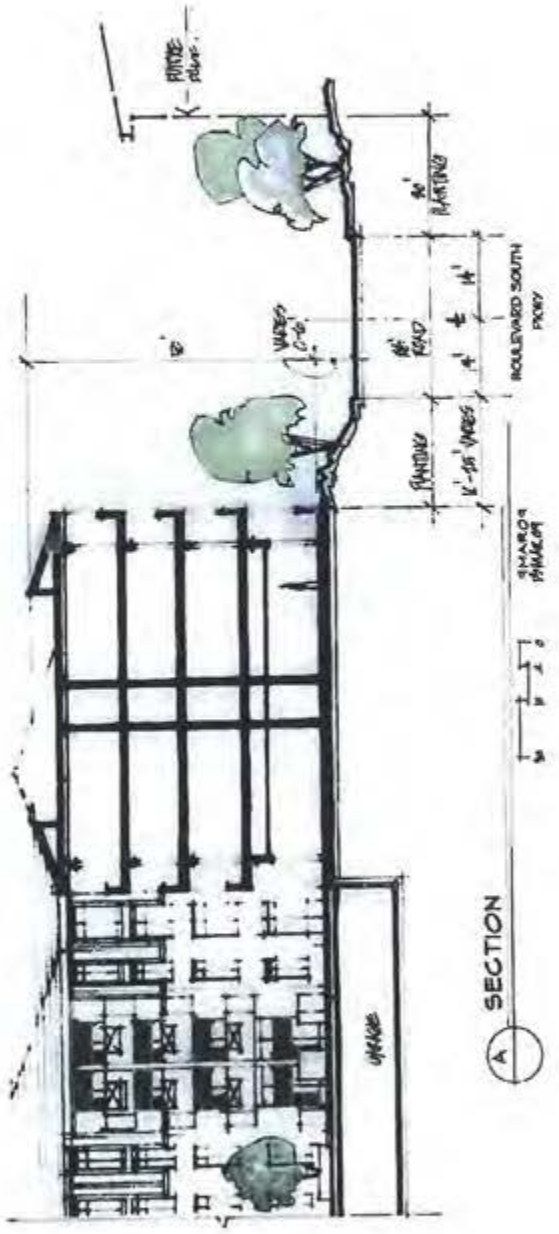
PARKING SCHEDULE - PHASE I

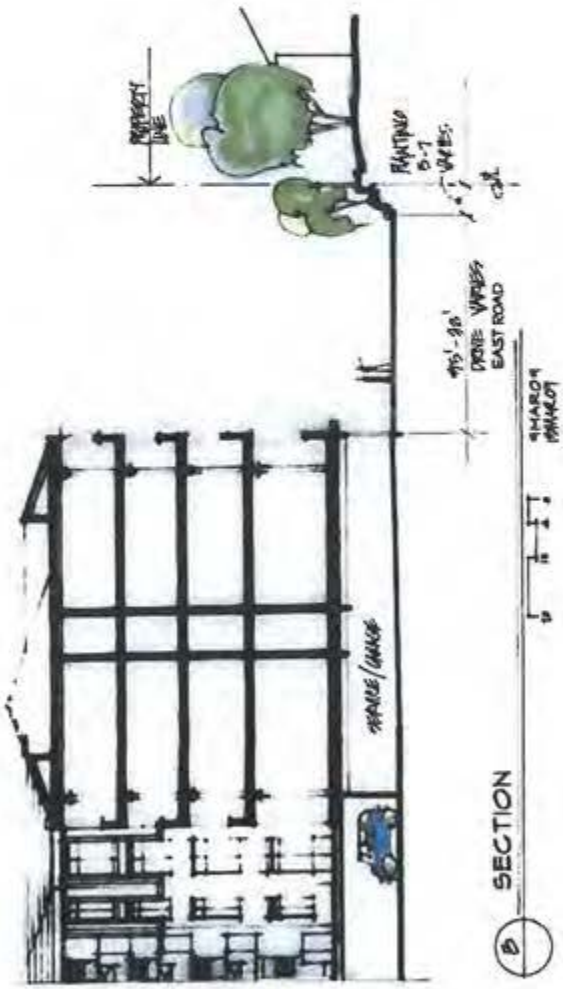
SPACES	REQUIRED	PROVIDED
SURFACE		61
BASEMENT		80
VALET		28
TOTAL	175	179
HANDICAP	5	5

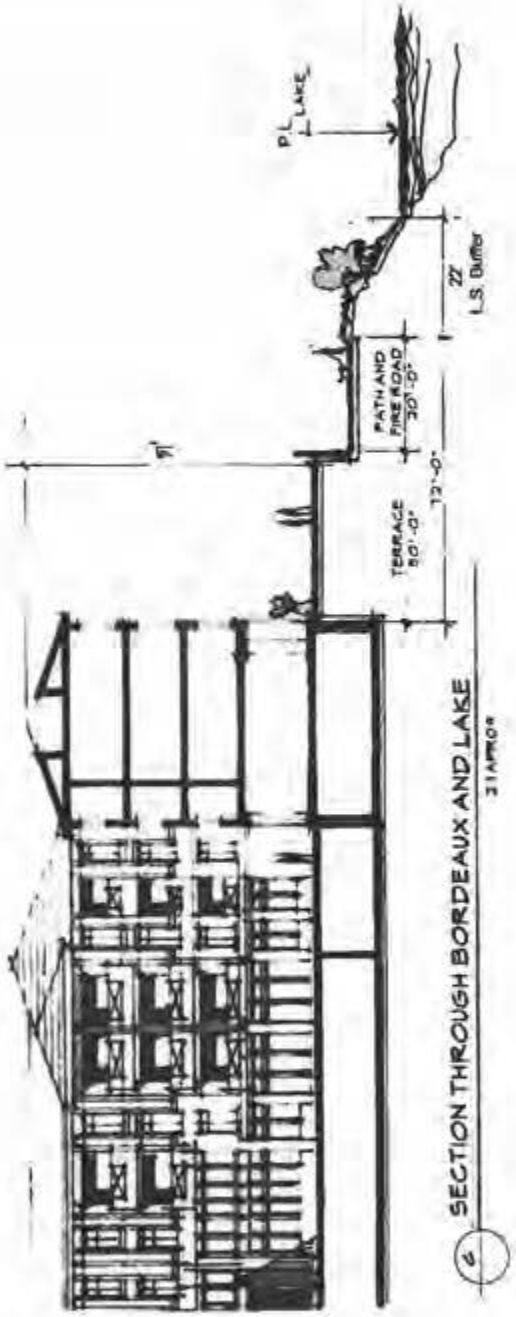
BORDEAUX AT BOULEVARD SOUTH

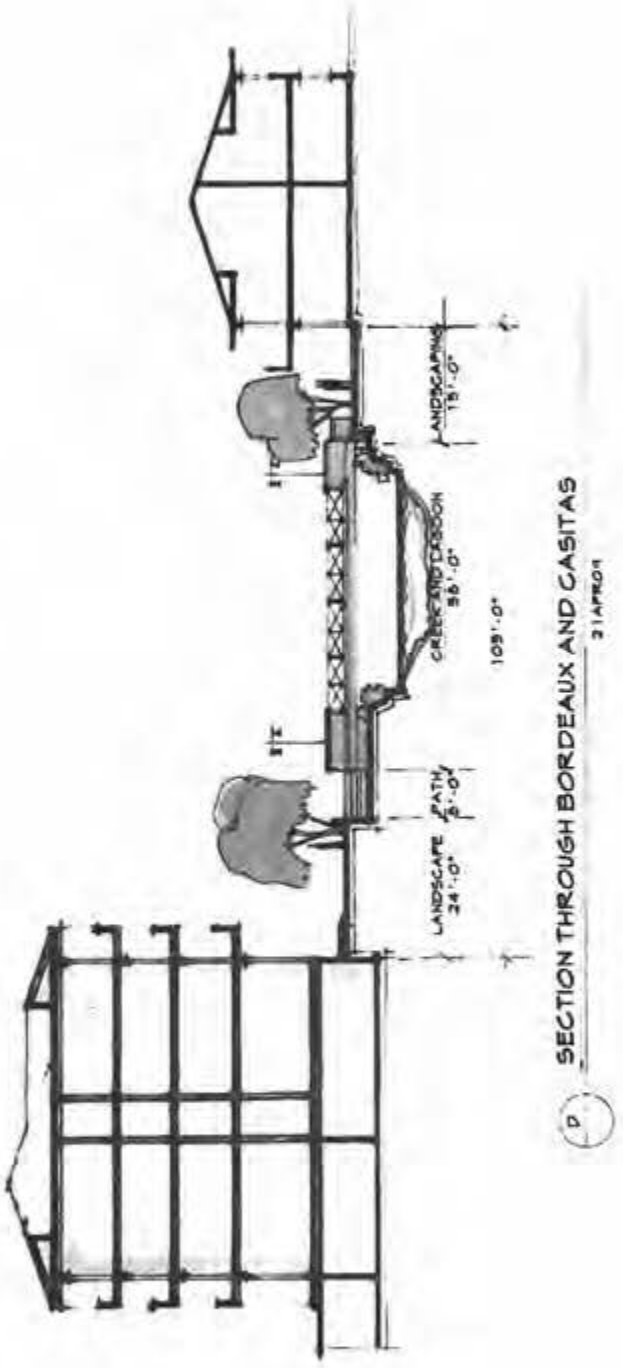
CROSS SECTION MAP

TOTAL ACREAGE - 6.42 +/- ACRES


SECTION
A
BOULEVARD SOUTH
PKWY

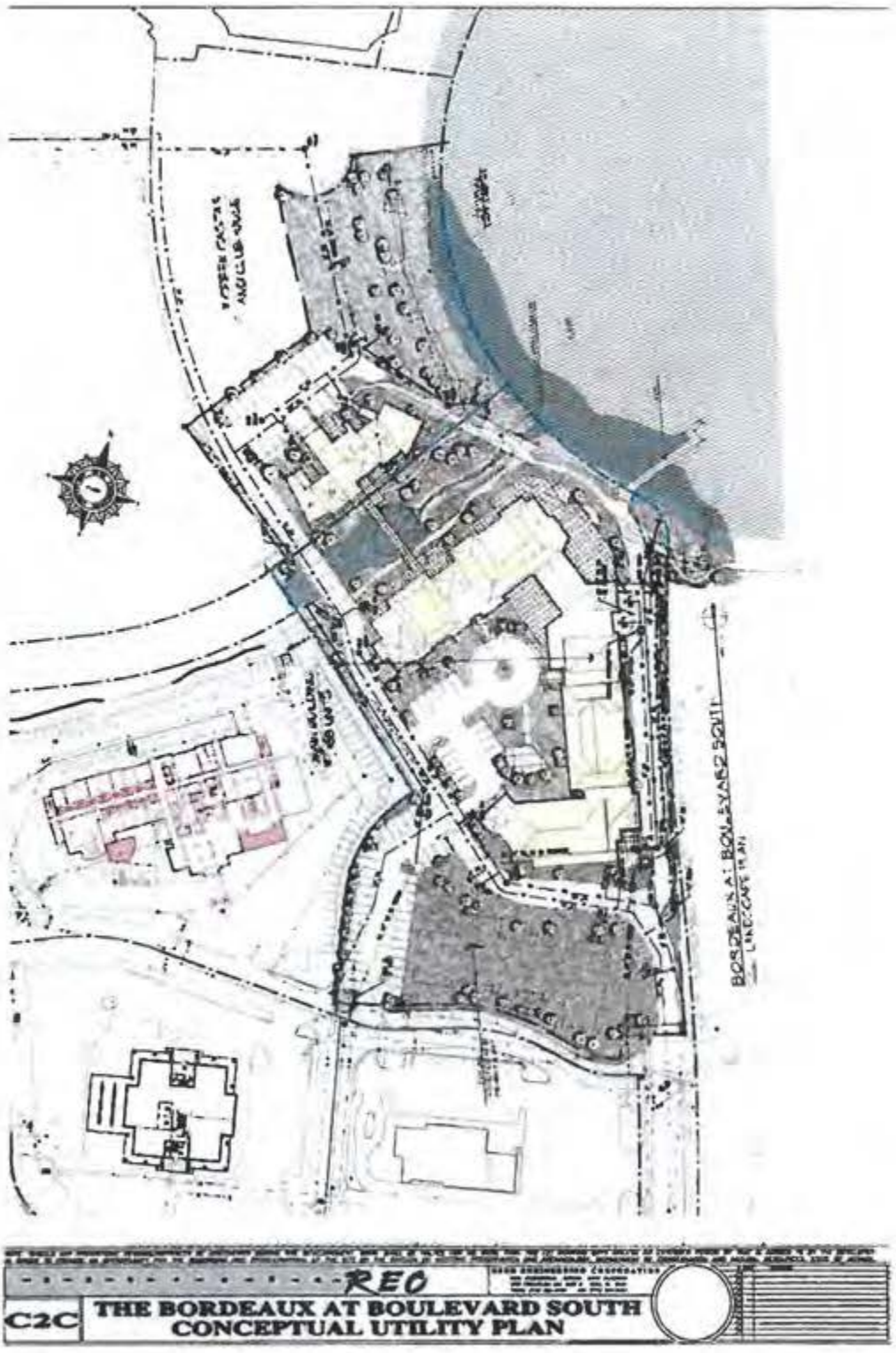

SECTION


P.L. LAKE
22'
L.S. Buffer
PATH AND FIRE ROAD 30'-0"
72'-0"
TERRACE 50'-0"
SECTION THROUGH BORDEAUX AND LAKE



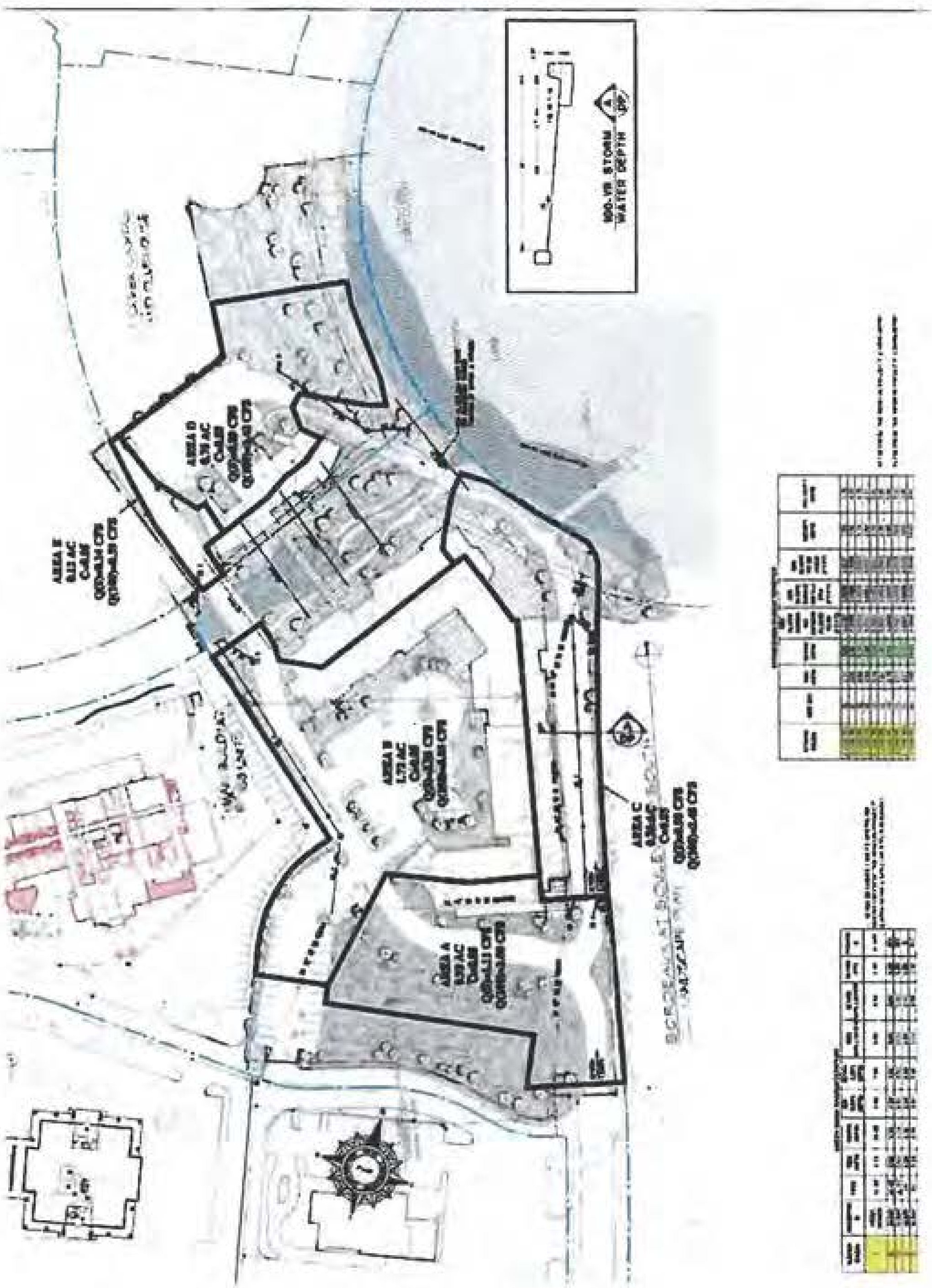
SECTION THROUGH BORDEAUX AND CASITAS

BUILDING IDENTIFICATION SIGNS
PROJECT IDENTIFICATION SIGNS
N
W
E
S
PHASE I
11 CREEK CASITAS
AND CLUBHOUSE
PHASE I
MAIN BUILDING
180 UNITS
EAST ROAD
PHASE II
80 UNITS
BORDEAUX AT BOULEVARD SOUTH
PROJECT SIGNAGE PLAN
TOTAL ACREAGE - 642 ACRES



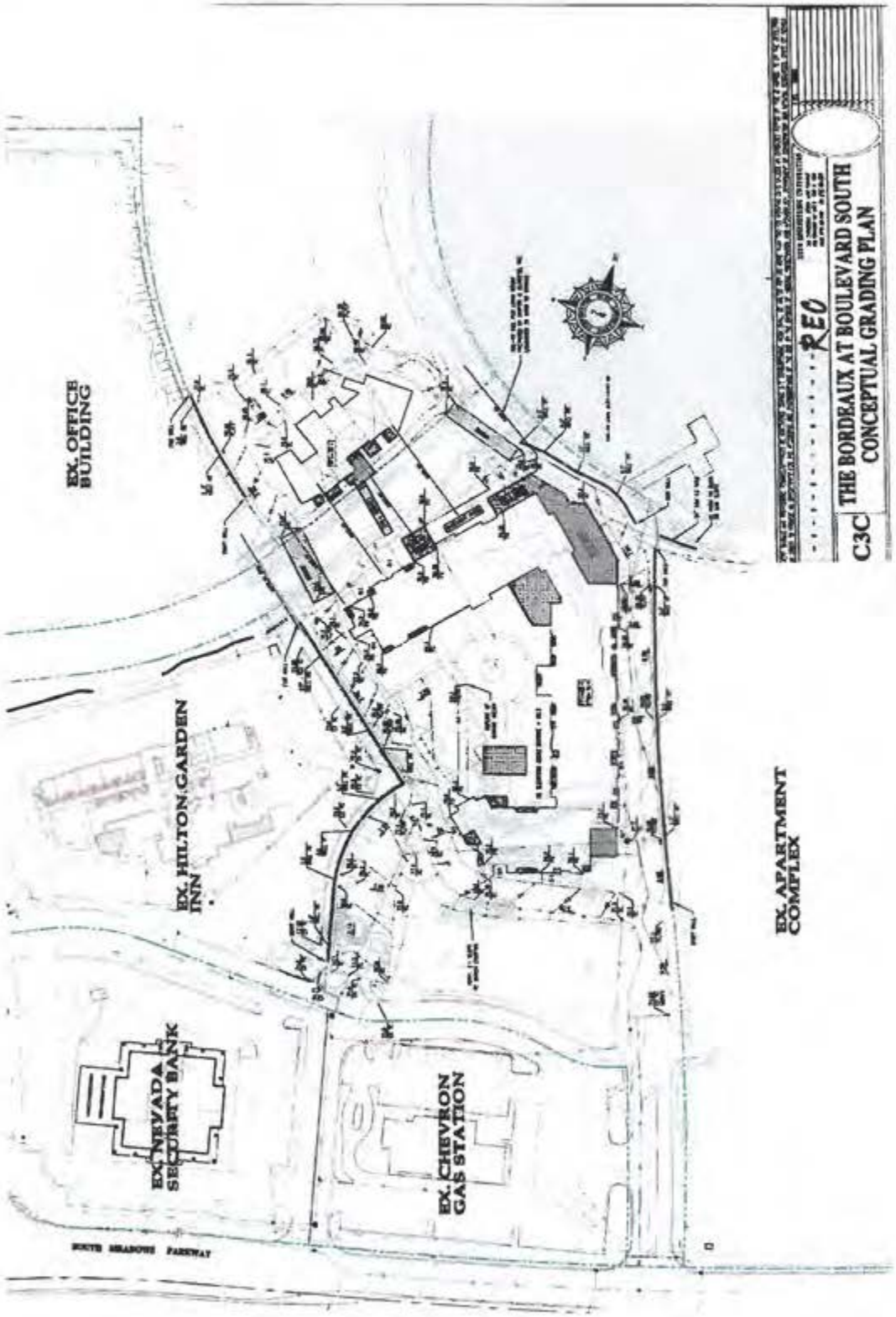
C2C

THE BORDEAUX AT BOULEVARD SOUTH
CONCEPTUAL UTILITY PLAN



REO

DP THE BORDEAUX AT BOULEVARD SOUTH DRAINAGE PLAN


EX. OFFICE BUILDING
EX. HILTON GARDEN INN
EX. NEVADA SECURITY BANK
EX. CHEVRON GAS STATION
EX. APARTMENT COMPLEX
SOUTH RAINBOW PARKWAY
C3C
THE BORDEAUX AT BOULEVARD SOUTH
CONCEPTUAL GRADING PLAN
REO

SENIOR PROJECT
APPENDIX J-1
LEGAL
DESCRIPTION

A parcel of land situate within the E1/2 of Section 8, T.18N., R.20E., M.D.M., Reno, Washoe County, Nevada; more particularly described as follows:

Parcel 1A of Record of Survey Map 4474, recorded October 19, 2004 as Document No. 3115062, Official Records of Washoe County, Nevada;
Parcels 2B and D2 of Record of Survey Map 4807, recorded October 11, 2006 as Document No. 3449556, Official Records of Washoe County, Nevada;
and a portion of Parcel C1 of Record of Survey Map 4998, recorded December 26, 2007 as Document No. 3605824, Official Records of Washoe County, Nevada, as follows:
Beginning at the most southerly corner of said Parcel C1;
thence along the southeasterly line of said Parcel C1 the following two (2) courses and distances:
on the arc of a 450.00 foot radius curve to the left from a tangent bearing N 36°46'10" E through a central angle of 02°32'53" a distance of 20.01 feet;
N 34°13'17" E, 268.51 feet to a point on the northeasterly line of said Parcel C1;
thence along said northeasterly line of Parcel C1 on the arc of a 371.17 foot radius curve to the right from a tangent bearing N 52°50'35" W through a central angle of 15°45'55" a distance of 102.13 feet;
thence S 34°13'17" W, 95.07 feet;
thence N 87°57'57" W, 20.84 feet;
thence along the arc of a 50.00 foot radius curve to the left through a central angle of 57°48'46" a distance of 50.45 feet;
thence S 34°13'17" W, 145.28 feet to a point on the southwesterly line of said Parcel C1;
thence along said southwesterly line of Parcel C1 on the arc of a 644.19 foot radius curve to the left from a tangent bearing S 43°51'19" E through a central angle of 12°35'14" a distance of 141.52 feet to the point of beginning.
Containing a total of 6.42 acres, more or less.

Basis of Bearings is the Nevada State Plane Coordinate System, West Zone Grid, NAD83/94, per Record of Survey Map 4998.

5/1/09

C and M Engineering
9498 Double R Boulevard, Suite B
Reno, NV 89521

APPENDIX J-2

Design Standards (7.1 Acres) Planning Unit K-1

Appendix J-2

Design Standards (7.1 Acres) Planning Unit K-1

TABLE OF CONTENTS **PAGE**

APPENDICES:

I. INTRODUCTION

a. Purpose

Appendix J-2 encompasses approximately 7.1± acres adjacent to the waterfront of Lake South Meadows and is a portion of Planning Unit K-1. The purpose of Appendix J-2 is to establish a zoning district and design standards for the development of a mixed use node within the South Meadows Phase III PUD that addresses compatibility with similar uses found in the adjacent developed portions of the PUD, sensitivity to and connectivity with adjacent open space features including Lake South Meadows, and provides a compatible mix of commercial, office, or residential products. Appendix J-2 extinguishes and supersedes the entitlements associated with the affected properties, as they are referred to in Appendices J and J-1.

b. Project Location

The 7.1± acre property is located on the east side of Double R Boulevard, north of South Meadows Parkway and includes the western edge of Lake South Meadows.

c. Conflicts

In the event of a conflict between these design standards and City Code, these standards shall govern development of the properties referenced herein. When a specific standard is not addressed by the PUD, then the applicable section of Reno Municipal Code Title 18, as amended, at the time of review shall prevail.

d. Modifications

The Administrator shall have the ability to grant minor deviations as outlined in RMC 18.06.411(a)(1), as amended. Minor deviations shall be subject to written approval from the master developer. Deviations of 10% or more shall conform to the City of Reno Variance process as outlined in RMC 18.06.408, as amended.

e. Project Development Concept

Appendix J-2 has been developed to allow for either: residential or non-residential uses, in an area that is surrounded by existing multifamily, retail, office and industrial uses. Specific design standards for residential and non-residential uses are provided herein. Due to the relatively small acreage associated with this portion of Planning Unit K-1, a mix of non-residential and residential shall not be allowed on the project site. With the first building permit for the parcels associated with Appendix J-2, the developer shall declare their intent to develop the entire acreage utilizing either the non-residential or residential standards contained below.

f. Permitted Uses:

<u>Residential Uses:</u>

- Single Family Detached
- Cluster Development
- Single Family Attached/Townhomes
- Multifamily/Lofts/Condominiums
- Live/Work
- Senior Housing/Assisted Living/Memory Care

Non-Residential Uses:

- Child Care Center
- Church/House of Worship
- Financial Institution, with or without drive thrus
- Fitness Center
- Free Standing ATM
- General Personal Service
- Hotel, non-gaming
- Medical Office
- Plant nursery
- Professional Office
- Laboratory
- Indoor Manufacturing
- Printing and Publishing
- Showroom/Flex Industrial
- Theater

Uses Requiring a Special Use Permit:

- All uses listed above are allowed by right to operate 24 hours a day
- Certain standards may be modified with the approval of a SUP, as noted below.

II. INFRASTRUCTURE

a. Access

Primary vehicle access to properties associated with Appendix J-2 is provided directly from Double R Boulevard by two shared driveways. Additionally, there is an existing thirty foot (30') access easement to the properties through the existing office parking lot (APN 163-050-04). All vehicle access will be in accordance with City of Reno public works and fire department requirements.

b. Sanitary Sewer Service

Sanitary sewer service to the site will be provided by the City of Reno with treatment at the South Truckee Meadows Water Reclamation facility. Sewer is available within Double R Boulevard to serve the project.

c. Water Service

The site is currently within the water service area of the Truckee Meadows Water Authority (TMWA). Facilities which could serve the property are located adjacent to the site in Double R Boulevard.

d. Other Utilities

Electric and gas service will be provided by NV Energy. Telephone and cable television service will be provided by AT&T and Charter. Services are located in close proximity to the property.

e. Traffic

A traffic analysis (see Attachment C) has been prepared to analyze a larger project that includes all of the properties that are identified in Planning Unit K-1, under the assumption that a development and land use pattern similar to what is proposed within this appendix is realized. **Table 1** shows the comparison of trips generated by three different potential land uses that could be built within the 7.1± acre South Meadows III PUD subject site.

The analysis provided with this appendix J-2 indicates that the affected properties of this appendix do not require mitigation of adjacent major intersections. Per the traffic study, necessary improvements include the on-site driveway modifications (separate left turn egress lanes) to serve the project driveways.

Based upon the assumptions in the traffic study, the trip generation for the proposes uses and intensities would be:

Table 1: Trip Generation Comparison

Land Use	AM Peak	PM Peak	Daily
140KSF General Office (~0.45 FAR)	217	209	1,541
155KSF Light Industrial (~0.5 FAR)	143	152	1,080
150 Multifamily Apartments	101	82.5	1,008

Therefore, total traffic generated by this 7.1± acre site shall not exceed 1,550 ADT by more than 10% without the approval of a special use permit. An updated cumulative traffic generation letter

shall be provided with each building permit to document the total traffic generation for the 7.1± acre site.

f. Pedestrian Access

With development of each parcel located adjacent to open space, pedestrian access to adjacent trails shall be provided in at least two locations as conceptually depicted on the Land Use Plan on page 4. Pedestrian trailhead access at these locations shall provide a minimum of 15 foot wide landscaped hedge rows including a minimum 5-foot wide paved trail connecting the development in Planning Unit K-1 to the existing Lake South Meadows loop trail. Small directional signs identifying the trailhead, consistent with the trail signs utilized on the open space trail system shall be provided for informational purposes. Pedestrian trailhead accesses shall be built at the time of construction of the building(s) adjacent to a planned trailhead location.

The Zoning Administrator may allow fewer trailhead access locations if it can be determined that fewer locations are logical based upon the final development plan for the project.


SANDHILL RD
DOUBLE R BLVD
DOUBLE EAGLE CT
GATEWAY DR
SOUTH MEADOWS PKWY
LAUREN CT
Legend
Trail Connections
Parcel Boundary
Appendix J-2
0 150 300
FEET
Land Use
Planning Unit K
Appendix J-2
WOOD RODGERS
5440 Reno Corporate Drive
Reno, NV 89511

III. DESIGN STANDARDS

a. Residential Site Planning Standards

1. Maximum Residential Density

The maximum residential density shall not exceed 21 du/acre. The maximum residential density may be increased with the approval of a special use permit.

2. Minimum Lot Size

Minimum lot size shall be 3,000 sq. ft. for single family detached lots. Single family attached, zero lot line, multifamily, condominiums or townhomes shall be exempt from a minimum lot size.

3. Minimum Lot Width

Minimum lot width shall be 40 feet for single family detached lots. Single family attached, zero lot line, multifamily, condominiums or townhomes shall be exempt from a minimum lot width, in accordance with RMC 18.12.101(b), as amended.

4. Building Setbacks

Building setbacks shall be as follows:

- Front: 10 feet
- Garage: 3 feet or 20 feet (or greater)
- Side: Zero or 5 feet (minimum 5 feet from any exterior project boundary)
- Rear: 10 feet

5. Building Height

Buildings shall be limited to 45 feet in height, as defined in RMC 18.24.108, as amended. The building height may be increased with the approval of a special use permit.

6. Building Separation

Buildings shall maintain a minimum building separation of at least 10 feet.

7. Architecture

Residential building architecture shall conform to the Architectural Standards contained in the South Meadows Phase III Planned Unit Development.

8. Landscaping

Multifamily, condominium, townhome or zero lot line developments shall provide a minimum 20% of the site as formal landscape area. Single family detached and single family attached shall landscape the entire front yard area. All landscaping requirements shall be in accordance with RMC 18.12.12.01 through 18.12.1213, as amended. All landscaping associated with the lake frontage parcel(s) and improvements shall contribute to the overall landscaping requirement.

9. Parking

Parking requirements shall be in accordance with RMC Article XI: Off-Street Parking and Loading, Chapter 18.12.1101 through 18.12.1108, as amended.

10. Fencing

Fencing may be used for safety and security and shall be used for screening as follows:

- Materials may include masonry, pre-cast stamped concrete panels, or wood consistent with the colors and materials of the building(s).
- The maximum fence height shall be six feet and comply with the standards set forth in RMC 18.12.1401 and 1402, as amended.
- Fencing adjacent to Lake South Meadows or the supply ditches that serve the lake shall either be open view (split rail, extruded aluminum, or equivalent) or semi-open view (4 foot solid fence with 2 foot open view on top).
- The Zoning Administrator may grant alternative fencing materials, including open view fencing, with the submittal of a building permit that proposes a mix of fencing and landscape that achieves appropriate screening.

11. Exterior Lighting

Site lighting may include exterior building lights, bollard lighting and light fixtures and standards to illuminate building entrances, parking, loading and yard areas. Light fixtures and standards shall not exceed 20 feet in height. Shoebox style light fixtures shall be required and directed downward and shielded. Site lighting for each project shall be consistent in color and style and shall be approved by the ARC. All exterior lighting shall utilize dark skies lighting techniques, which shall be verified with each building permit. Each permit containing exterior lighting shall provide a photometric plan showing the entire spill of lighting at ground level in foot candles. Lighting shall not exceed 0.5 foot candles at any perimeter property line of the industrial portion of the PUD.

12. Signage

Signage within a residential project in Planning Unit K-1 shall conform to City of Reno RMC Sections 18.16.101 through 701, as amended, for residential zoning.

13. School Disclosure Statement

Relative to public schools that may serve the project site, please refer to the school disclosure condition on page 11.

b. Non-Residential Site Planning Standards

1. Maximum Non-Residential Building Coverage

The maximum non-residential building coverage shall not exceed 0.5 FAR. The maximum building coverage may be increased with the approval of a special use permit.

2. Minimum Lot/Development Size

There shall be no minimum lot size for non-residential parcels. Non-residential condominiums or subdivisions shall be exempt from the minimum lot development standards, in accordance with RMC 18.12.101(b), as amended.

3. Building Setbacks

Building setbacks shall be as follows:

- Front: 10 feet
- Side: 5 feet

- Rear: 10 feet
- Adjacent to residential project within Planning Unit K-1: Conform to residential adjacency standards in RMC 18.12.304, as amended.

4. Building Height

Buildings shall be limited to 55 feet in height, as defined in RMC 18.24.108, as amended. The building height may be increased with the approval of a special use permit.

5. Building Separation

Buildings shall be separated by at least 10 feet.

7. Architecture

Non-residential building architecture shall conform to the Architectural Standards contained in the South Meadows Phase III Planned Unit Development.

8. Landscaping

Non-residential projects shall conform to "Community Commercial" landscape requirements contained in RMC. All landscaping requirements shall be in accordance with RMC 18.12.12.01 through 18.12.1213, as amended.

9. Parking

Parking requirements shall be in accordance with RMC Article XI: Off-Street Parking and Loading, Chapter 18.12.1101 through 18.12.1108, as amended.

10. Fencing

Fencing may be used for safety and security and shall be used for screening as follows:

- Materials may include masonry, pre-cast stamped concrete panels, or wood consistent with the colors and materials of the building(s).
- The maximum fence height shall be six feet and comply with the standards set forth in RMC 18.12.1041 and 1402, as amended.
- Fencing adjacent to Lake South Meadows or the supply ditches that serve the lake shall either be open view (split rail, extruded aluminum, or equivalent) or semi-open view (4 foot solid fence with 2 foot open view on top).
- The Zoning Administrator may grant alternative fencing materials, including open view fencing, with the submittal of a building permit that proposes a mix of fencing and landscape that achieves appropriate screening.

11. Exterior Lighting

Site lighting may include exterior building lights, bollard lighting and light fixtures and standards to illuminate building entrances, parking, loading and yard areas. Light fixtures and standards shall not exceed 20 feet in height. Shoebox style light fixtures shall be required and directed downward and shielded. Site lighting for each project shall be consistent in color and style and shall be approved by the ARC. All exterior lighting shall utilize dark skies lighting techniques, which shall be verified with each building permit. Each permit containing exterior lighting shall provide a photometric plan showing the entire spill of lighting at ground level in foot candles. Lighting shall not exceed 0.5 foot candles at any perimeter property line of the industrial portion of the PUD.

12. Signage

Signage within a non-residential project in Planning Unit K-1 shall conform to the "Community Commercial" zoning district contained in RMC Sections 18.16.101 through 701, as amended.

IV. CONDITIONS OF APPROVAL

Note: all existing conditions of approval previously applied to Appendices J and J-1 not listed below are not applicable to this Appendix J-2.

Public Safety and Improvements:

1. Prior to the approval of each building permit or final map as applicable, the applicant shall have an approved Sewerage Report in accordance with the Public Works Design Manual. Adequate access shall be provided for all sanitary sewer improvements per the Public Works Design Manual. All required on-site and off-site sanitary sewer improvements necessary to serve the project shall be complete and functional prior to the issuance of any certificate of occupancy.

2. Prior to the approval of each building permit or final map as applicable, the applicant shall have approved plans for all proposed public sanitary sewer system improvements, abandonment's, modifications, or relocations. Plans to be approved by Community Development to the satisfaction of the Public Works Sanitation Engineering Division. All applicable improvements shall be constructed prior to issuance of any certificate of occupancy for the associated final map phase.

3. All proposed on-site sewer facilities and improvements shall be privately owned and maintained and shall be designed and constructed, with adequate access, in accordance with the City's minimum standards as set forth in the Public Works Design Manual.

4. Prior to the approval of each building permit or final map as applicable, the applicant shall have an approved Hydrology Report addressing on-site and off-site storm water flows and facility capacities for the pre-development and post-development site conditions. Specifically, the report shall analyze and provide mitigations for any impacts to floodwater flows in the South Meadows drainage way network related to the development of the project.

5. Prior to the approval of each building permit or final map as applicable, the applicant shall demonstrate on-site storm water facilities meet minimum water quality standards for discharge into the South Meadows drainage way network in accordance with RMC sections 12.16.530 and 12.12.555. Plans for the collection and treatment of roof-top, parking garage area, and elevator basin storm water effluent discharges shall be approved by Community Development to the satisfaction of the Public Works Sanitation Engineering Environmental Control Division.

6. On-site storm water management facilities and appurtenances will be privately owned and maintained. Adequate maintenance access shall be provided for all storm water management improvements per the Public Works Design Manual.

7. Prior to approval of each building permit or final map as applicable, applicant shall demonstrate how flood waters are to be accommodated through the building/site design in accordance with FEMA and City regulations.

8. Prior to the approval of each final map, the applicant shall demonstrate adequate gravity flow overland escape routes are provided for all roof-top and surface storm water collection and conveyance facilities.

9. Prior to the approval of each building permit or final map as applicable, the applicant shall demonstrate compliance with flood control regulations regarding storm water detention and how the project will deal with parking garage levels if parking garage levels are situated below flood elevations in the South Meadows drainage way network. The applicant shall demonstrate how the subterranean elements of this project will be protected from shallow ground waters in accordance with the project geotechnical report.

10. The applicant shall provide sidewalks and demonstrate accessible and ADA compliant pedestrian routes from all adjacent public rights-of-way to the on-site buildings.

11. Prior to the approval of each building permit or final map as applicable, the applicant shall demonstrate adequate street lighting exists or shall propose street lighting in accordance with City standards for the project entrances and adjoining properties. If new lighting is required, a private on-site street light shall be installed at the back of sidewalk near the private roadway entrances. This street light can match other private on-site parking area lights provided adequate levels of lighting are achieved.

12. Prior to approval of each building permit or final map as applicable, the applicant shall demonstrate all necessary on-site and off-site easement vacations, relocations, and grants are complete or in place. These easements include, but are not limited to; project construction, site access and cross access, utility access, emergency access, maintenance access, sewer lines, surface drainage, storm drains, irrigation ditches, and utility improvements. All required access, sewer, storm drainage, and utility improvements shall be constructed prior to the issuance of any certificates of occupancy.

13. Prior to approval of each building permit or final map as applicable, the applicant shall have plans approved and shall obtain associated encroachment and excavation permits. Additionally, the applicant shall provide necessary dedications for rights-of-way and/or public use easements for the roadway, sidewalk, and pedestrian ramp improvements proposed along each project frontage.

14. Prior to the approval of each permit, the applicant shall have a preconstruction meeting and an approved Construction Management Plan. This plan shall include provisions for on-site and off-site construction material storage, employee parking and shuttle services (as appropriate), and construction activity phasing and staging. The plan shall also depict the proposed construction transportation and delivery routes within the project vicinity. Access to adjacent businesses and properties shall be maintained during construction.

15. Prior to the approval of each building permit or final map as applicable, the applicant shall comply with the Quality Assurance Program as set forth in the Public Works Design Manual, Chapter VI, titles "Inspection, Testing and Verification" and "Quality Assurance Program."

16. Prior to the approval of each building permit or final map as applicable, the applicant shall have plans approved to construct the on-site driveway improvements proposed in the traffic study (separate left turn egress lanes). Said improvements shall be constructed prior to issuance of a certificate of occupancy.

School District:

17. Prior to the approval of each building permit or final map as applicable for a residential project, the applicant shall provide a copy of a disclosure to be provided to each home buyer/renter with their closing documents, notifying them that students in this project may be assigned to the nearest school(s) with available capacity in the event that the zoned schools cannot accommodate additional students.

Appendix J-2

Attachment 1

Council Decision & Certification Letter and

Zoning Ordinance

Ashley D. Turney
City Clerk
(775) 334-2030
TurneyA@reno.gov

Beverly Beaty-Benadom
Chief Deputy City Clerk
(775) 334-2030
Beaty-BenadomB@reno.gov

Office of the City Clerk
Central Cashiering (775) 334-2030
Parking Tickets (775) 334-2293

FILED THIS DATE
6 / 09 / 16
BY: BBB
CITY CLERK

June 9, 2016

Lewis Investment Company of Nevada, LLC
c/o Ted Erkan
1380 Greg Street, Suite 231
Sparks, NV 89431

RE: Case No. LDC16-00051 (South Meadows Phase III PUD Amendment/Planning Unit K-1) – ***NOTICE OF FINAL ACTION, DECISION OR ORDER***

Dear Applicant:

At a regular meeting held June 8, 2016, the City Council passed and adopted Ordinance No. 6403, approving the above referenced case.

Sincerely,

for Ashley D. Turney
City Clerk

ADT:bbb

xc: Community Development
Vern Kloos, Community Development
Jeff Mann, Parks, Recreation & Community Services
Andy Durling, Wood Rodgers Inc., 5440 Reno Corporate Drive, Reno NV 89511

Ashley D. Turney
City Clerk
(775) 334-2030
TurneyA@reno.gov

Beverly Beaty-Benadom
Chief Deputy City Clerk
(775) 334-2030
Beaty-BenadomB@reno.gov

Office of the City Clerk
Central Cashiering (775) 334-2030
Parking Tickets (775) 334-2293

FILED THIS DATE
5 / 27 / 16
BY: BBB
CITY CLERK

May 27, 2016

Lewis Investment Company of Nevada, LLC
c/o Ted Erkan
1380 Greg Street, Suite 231
Sparks, NV 89431

RE: Case No. LDC16-00051 (South Meadows Phase III PUD Amendment/Planning Unit K-1)

Dear Applicant:

At a regular meeting held May 25, 2016, and following a public hearing thereon, the City Council upheld the recommendation of the Planning Commission and approved the request to amend the South Meadows Phase III Planned Unit Development (PUD) Design Guidelines to replace the development standards for a ±7.1 acre portion of Planning Unit K-1 to allow for either residential or non-residential uses in maximum 55 foot tall buildings, by ordinance, and subject to Condition A (see below). The ±7.1 acre site is located ±250 feet east of Double R Boulevard, ±575 feet south of its intersection with Sandhill Road and adjacent to the west side of Lake South Meadows in the PUD zone. The entire ±669 acre South Meadows Phase III PUD is generally located in the area bound by Double R Boulevard and I-580 to the west, Damonte Ranch Parkway to the south, and Alexander Lake to the east. The site has a Master Plan Land Use designation of Special Planning Area.

CONDITION A:
Approval of the amendment to the South Meadows Phase III Planned Unit Development (PUD) Design Guidelines is subject to the modifications to the Handbook as noted in Exhibit A, and any modifications made by the Planning Commission and City Council at their respective public hearings. The revisions shall be incorporated into the Final Design Guidelines and submitted to staff in both paper and electronic versions for review within two (2) months of the date of City Council approval; and certified by the City Council within four (4) months of the date of City Council approval. Failure by the applicant to conform to either time deadline shall render this approval null and void.

Sincerely,

Beverly Beaty-Benadom for
Ashley D. Turney
City Clerk

ADT:bbb

xc: Community Development
Vern Kloos, Community Development
Jeff Mann, Parks, Recreation & Community Services
Andy Durling, Wood Rodgers Inc., 5440 Reno Corporate Drive, Reno NV 89511

EXPLANATION: Matter underlined is new; matter in brackets and stricken [--] is material to be repealed.

BILL NO. 6972

ORDINANCE NO. 6403

AN ORDINANCE TO AMEND TITLE 18, CHAPTER 18.08 OF THE RENO MUNICIPAL CODE, ENTITLED "ZONING", SECTION 18.08.102(b).1337, TO CHANGE THE TEXT IN THE PUD DESIGN STANDARDS TO: SOUTH MEADOWS PHASE III PLANNED UNIT DEVELOPMENT (PUD) DESIGN GUIDELINES TO REPLACE THE DEVELOPMENT STANDARDS FOR A ±7.1 ACRE PORTION OF PLANNING UNIT K-1 TO ALLOW FOR A MIX OF RESIDENTIAL AND NON-RESIDENTIAL USES IN MAXIMUM 55 FOOT TALL BUILDINGS LOCATED ±250 FEET EAST OF DOUBLE R BOULEVARD, ±575 FEET SOUTH OF ITS INTERSECTION WITH SANDHILL ROAD AND ADJACENT TO THE WEST SIDE OF LAKE SOUTH MEADOWS IN A PUD ZONE; TOGETHER WITH OTHER MATTERS PROPERLY RELATING THERETO.

SPONSORED BY: RENO CITY PLANNING COMMISSION

THE CITY COUNCIL OF THE CITY OF RENO DO ORDAIN:

SECTION 1. Chapter 18.08 of the Reno Municipal Code is hereby amended by adding thereto a new section to be known as Section 18.08.102(b).1337 relating to a ±7.1 acre site located ±250 feet east of Double R Boulevard, ±575 feet south of its intersection with Sandhill Road and adjacent to the west side of Lake South Meadows in the PUD zone and more particularly described in the attached "Exhibit A"; to change the text in the PUD Design Guidelines to: replace the development standards for a ±7.1 acre portion of Planning Unit K-1 to allow for a mix of residential and non-residential uses in maximum 55 foot tall buildings, the same to read as follows:

Sec. 18.08.102(b).1337. The zoning of the City of Reno as heretofore established is hereby amended in the manner shown on the map labeled Case No. LDC16-00051, thereby changing the use of land indicated therein, relating to a ±7.1 acre site located ±250 feet east of Double R Boulevard, ±575 feet south of its intersection with Sandhill Road and adjacent to the west side of Lake South Meadows in the PUD zone, and more particularly described in the attached "Exhibit A"; to change the text in the PUD Design Guidelines to: replace the development standards for a ±7.1 acre portion of Planning Unit K-1 to allow for a mix of residential and non-residential uses in maximum 55 foot tall buildings.

CASE NO. LDC16-00051 (South Meadows Phase III PUD Amendment/Planning Unit K-1).

SECTION 2. This Ordinance shall be in effect from and after its passage, adoption and publication in one issue of a newspaper printed and published in the City of Reno; and upon certification by City Council of the amended PUD Design Guidelines for Case No. LDC16-00051 and recordation of the amended PUD Design Guidelines for Case No. LDC16-00051.

SECTION 3. The City Clerk and Clerk of the City Council of the City of Reno is hereby authorized and directed to have this Ordinance published in one issue of the Reno-Gazette Journal, a newspaper printed and published in the City of Reno.

PASSED AND ADOPTED this 8th day of June, 2016, by the following vote of the Council:

AYES: Duerr, Brekhus, Bobzien, Jardon, Schieve

NAYS: None

ABSTAIN: None ABSENT: Delgado, McKenzie

APPROVED this 8th day of June, 2016.

HILLARY L. SCHIEVE
MAYOR OF THE CITY OF RENO

ATTEST:

ASHLEY D. TURNEY
CITY CLERK AND CLERK OF THE CITY COUNCIL OF THE CITY OF RENO, NEVADA

CITY OF RENO CORPORATE SEAL WASHOE COUNTY, NEVADA

EFFECTIVE DATE: June 10, 2016.

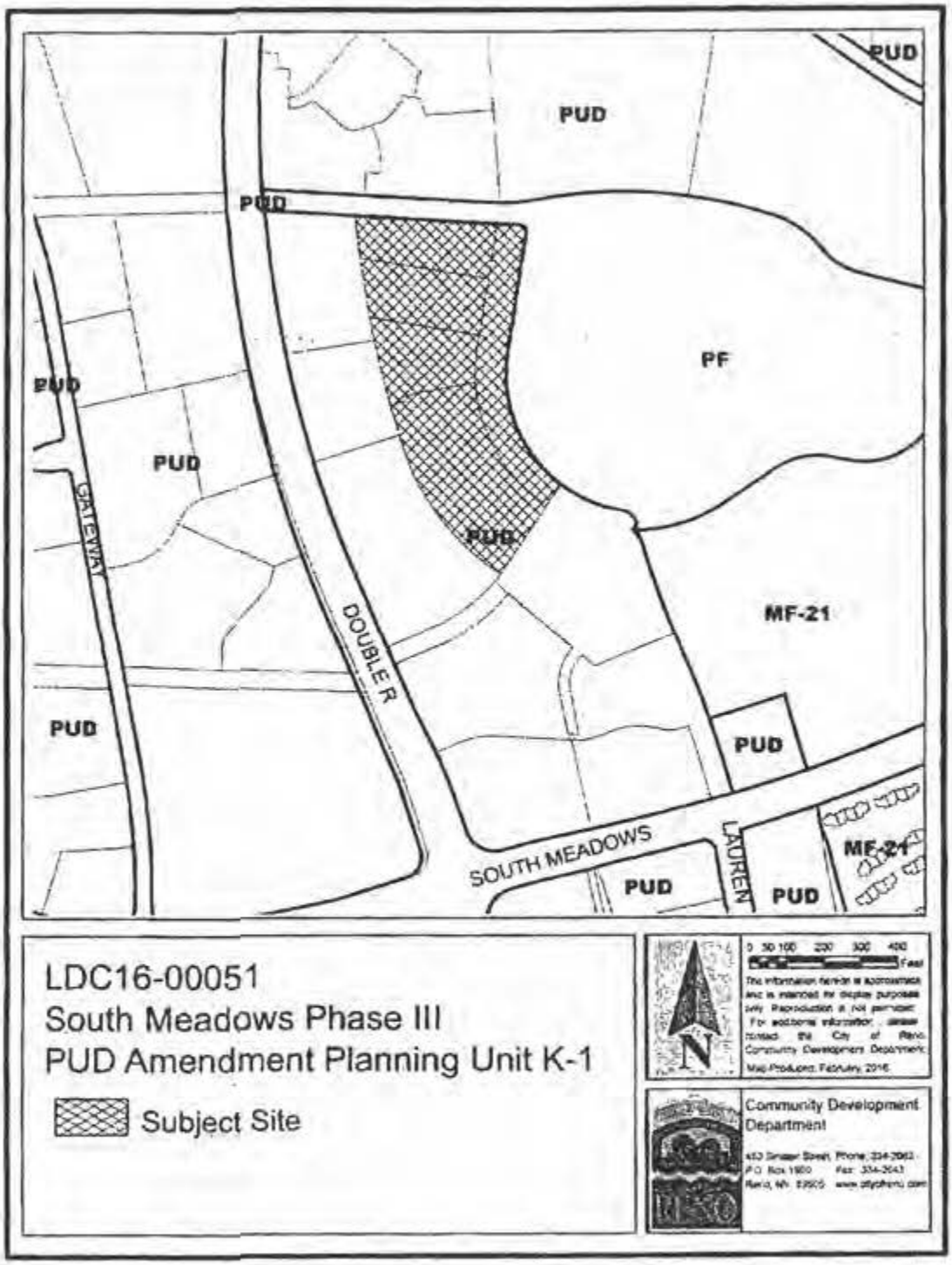
EXHIBIT "A"

LEGAL DESCRIPTION
FOR LEWIS INVESTMENT COMPANY OF NEVADA, LLC

All that certain real property situate within the Northeast One-Quarter (NE 1/4) of Section 8, Township 18 North, Range 20 East, Mount Diablo Base and Meridian, being Parcels C, D, E, F and G as described in Quitclaim Deed Document No. 4484981 and shown on Record of Survey No. 5647, File No. 4484982, both recorded June 29, 2015 in the Official Records of Washoe County, Nevada.

Prepared by:
Wood Rodgers, Inc.
5440 Reno Corporate Dr.
Reno, NV 89511

Daniel A. Bigrigg, P.L.S.
Nevada Certificate No. 19716



LDC16-00051
South Meadows Phase III
PUD Amendment Planning Unit K-1

Subject Site

0 50 100 200 300 400 Feet

This information herein is approximate and is intended for display purposes only. Reproduction is not permitted. For additional information, please contact the City of Reno, Community Development Department.

Map Produced: February, 2016

Community Development Department

450 Sinclair Street, Phone: 334-2063
P.O. Box 1900 Fax: 334-2043
Reno, NV 89505 www.cityofreno.com

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Legal Ad Cost: $207.00

STATE OF NEVADA
COUNTY OF WASHOE

Being first duly sworn, deposes and says: That as the legal clerk of the Reno Gazette-Journal, a daily newspaper of general circulation published in Reno, Washoe County, State of Nevada, that the notice referenced below has published in each regular and entire issue of said newspaper between the date: 06/10/2016 - 06/10/2016, for exact publication dates please see last line of Proof of Publication below.

Subscribed and sworn to before me

Signed: Kim Bird

AMERICA ACEVEDO
NOTARY PUBLIC - STATE OF NEVADA
My Commission Expires: 06-20-2018
Certificate No: 14-14486-2

NOTICE OF CITY ORDINANCES NOTICE IS HEREBY GIVEN that the ordinances, listed below by title and containing the vote of the Council, was prepared on May 25, 2016

Publish Dates:

06/10/16

NOTICE OF CITY ORDINANCES

NOTICE IS HEREBY GIVEN that the ordinances, listed below by title and containing the vote of the Council, was prepared on May 25, 2016 and final action and adoption of such ordinances took place on June 8, 2016.

BILL NO. [illegible] ORDINANCE NO. [illegible]: ORDINANCE TO AMEND TITLE 18, CHAPTER 18.08 OF THE RENO MUNICIPAL CODE, ENTITLED "ZONING", SECTION [illegible], TO CHANGE THE TEXT IN THE PUD DESIGN STANDARDS TO: SOUTH MEADOWS PHASE III PLANNED UNIT DEVELOPMENT (PUD) DESIGN GUIDELINES TO REPLACE THE DEVELOPMENT STANDARDS FOR A [illegible] ACRE PORTION OF PLANNING UNIT K-3 TO ALLOW FOR A MIX OF RESIDENTIAL AND NON-RESIDENTIAL USES IN MAXIMUM 35 FOOT TALL BUILDINGS LOCATED [illegible] FEET EAST OF DOUBLE R BOULEVARD, [illegible] FEET SOUTH OF ITS INTERSECTION WITH SANDHILL ROAD AND ADJACENT TO THE WEST SIDE OF LAKE SOUTH MEADOWS IN A PUD ZONE, TOGETHER WITH OTHER MATTERS PROPERLY RELATING THERETO.

AYES: Duerr, Brekhus, Schieve, Jardon, Sferrazza
NAYS: None.
ABSTAIN: None.
ABSENT: Delgado, McKenzie

These ordinances shall be in full force and effect from and after June 14, 2016. Notice is further given that copy of the above ordinance is available for inspection by all interested parties at the office of the City Clerk, City Hall, One East First Street, Second Floor, Reno, Nevada or by accessing our website at reno.gov.

ASHLEY D. TURNEY, CITY CLERK AND CLERK OF THE CITY COUNCIL

No 1347510 June 10, 2016

Appendix J-2

Attachment 2

Legal Description and Site Map

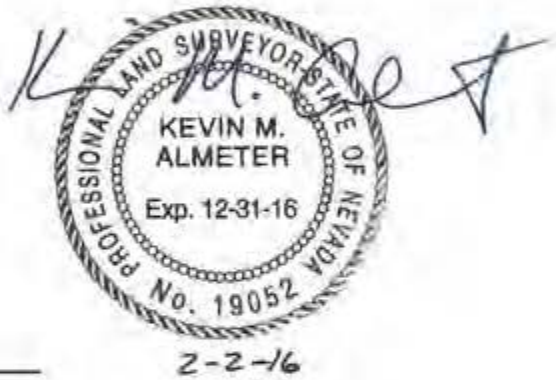
LEGAL DESCRIPTION
FOR
PUD AMENDMENT

All that certain real property situate within a portion of the East One-Half (E 1/2) of Section Eight (8), Township Eighteen (18) North, Range Twenty (20) East, Mount Diablo Meridian, City of Reno, County of Washoe, State of Nevada, and being more particularly described as follows:

BEING Parcels C, D, E, F and G as shown on the Record of Survey in Support of a Boundary Line Adjustment for "Lewis Investment Company of Nevada, LLC, Boulevard South at Reno, LLC, JPS Partners LTD. and Gary Brenner", recorded as Record of Survey Map No. 5647, on June 29, 2015, as File No. 4484982, filed in the Official Records of Washoe County, Nevada;

APNs: 163-050-31, 163-050-32, 163-050-33, 163-050-34 and 163-050-35

Prepared by:
Wood Rodgers, Inc.
5440 Reno Corporate Dr.
Reno, NV 89511



2-2-16

Kevin M. Almeter, P.L.S.
Nevada Certificate No. 19052

Land Use
Planning Unit K
Appendix J-2

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
5440 Reno Corporate Drive Tel: 775.823.4068
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J:\Jobs\3014_Double R Due Diligence\DOUBLE R-LEWIS_OA\GIS\Tasks\LandUse_20151116_V1.mxd 5/27/2016 2:01:08 PM eford

Appendix J-2

Attachment 3

Traffic Impact Analysis

TRAFFIC IMPACT STUDY

FOR

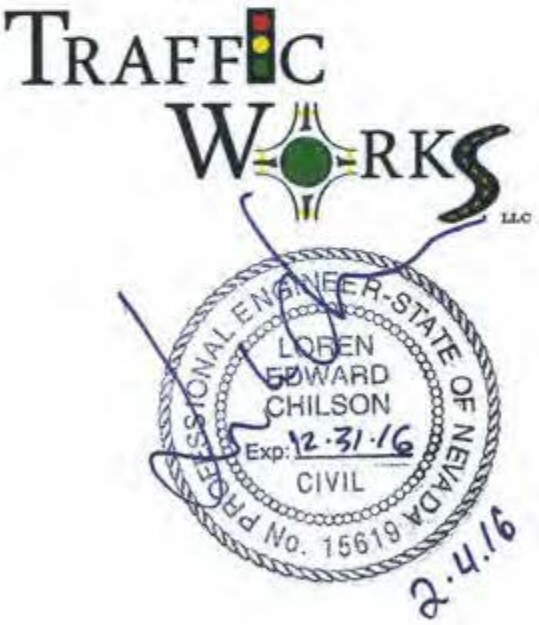
SOUTH MEADOWS III

PLANNED UNIT DEVELOPMENT

(AMENDMENT)

January 19, 2016

PREPARED BY:



TRAFFIC WORKS, LLC
6170 Ridgeview Court, Suite B, Reno, NV 89519
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YOUR QUESTIONS ANSWERED QUICKLY

Why did you perform this study?

This Traffic Impact Study evaluates the potential traffic impacts associated with modifying the current South Meadows III PUD to include a different land use mix.

What does the project consist of?

For the purposes of this study, the project could include: General Office, Medical-Dental Office, Light Industrial uses, Residential uses, or any mix of allowed land uses that generate a number of trips close to or less than the trip generation used in this analysis. The proposed project utilized for this study consists of 320,000 square feet of General Office space.

How much traffic will the project generate?

The proposed project (which is somewhat generic) is anticipated to generate a total of 3,178 daily trips, 485 AM peak hour trips, and 437 PM peak hour trips. Any project generating up to 3,200 daily trips or up to 500 peak hour trips should be considered an equivalent project from a traffic impact perspective.

Are there any traffic impacts?

There are no impacts at the signalized study intersections as all the signalized study intersections continue to operate at acceptable Level of Service (LOS) conditions during both the AM and PM peak hours. The LOS and delay on minor street approaches at all the un-signalized intersections worsens compared to existing conditions. However, all the major street movements, including the left-turn movements, at these un-signalized intersections operate at acceptable LOS conditions with the addition of the project traffic. It should be noted that at least one of the minor street approaches at each STOP controlled intersection operates at LOS "E/F" under existing conditions (without the project).

Since LOS "E/F" traffic operations would be limited to the side-street approaches during peak hours, this is not a condition that typically requires mitigation. There are countless minor streets and driveways throughout Reno that function at LOS "F" during peak hours. It is not feasible, nor desirable, to construct a traffic signal or roundabout at these minor street approaches due to the counter-productive effects of interrupting the high volume major street traffic at closely spaced locations.

Are any traffic related improvements proposed?

In addition to standard RRIF fees, we recommend increasing the capacity on the project driveway approaches (southbound Lauren Court, westbound Park Center North Driveway, and westbound Project North Driveway) by striping an exclusive left-turn lane at each location. We propose all three driveway approaches should have one left-turn lane and one shared through-right lane. This will provide additional space for queue storage on the minor street approaches and improve overall safety and operations.

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

This report presents the findings of a Traffic Impact Study completed to assess the potential traffic impacts on local intersections associated with the latest revision of the South Meadows III Planned Unit 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 current application will modify the South Meadows III PUD to consist of a project that is equivalent to 320,000 square feet of General Office space.

Study Area and Evaluated Scenarios

The project site is located east of Double R Boulevard and north of S. Meadows Parkway in Reno, NV. The study intersections were identified based on scoping conversations with City of Reno staff and are shown in **Figure 1**. The following intersections are included in this study:

- S. Meadows Parkway/Lauren Court
- Double R Boulevard/S. Meadows Parkway
- Double R Boulevard/Park Center North Driveway
- Double R Boulevard/Project North Driveway
- Double R Boulevard/Sandhill Road
- S. Meadows Parkway/Gateway Drive
- S. Meadows Parkway/I-580 Northbound Ramps
- S. Meadows Parkway/I-580 Southbound Ramps

The following roadways were analyzed:

- S. Meadows Parkway
- Double R Boulevard

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

- Existing Conditions (no project)
- Existing Plus Project Conditions

Analysis Methodology

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

is established in the Highway Capacity Manual (HCM), 2010, published by the Transportation Research Board.

Signalized and Un-signalized Intersections

Table 1 presents the delay thresholds for each level of service grade at un-signalized and signalized intersections.

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 calculations were performed for the study intersections using the Synchro 9 software suite, with analysis and results reported in accordance with the current HCM 2010 methodology.

Roadway Segments

Table 2 shows the level of service thresholds for roadway segments as established in the Washoe County *2035 Regional Transportation Plan* (2035 RTP). The average daily traffic volumes were compared to the daily volume thresholds shown in **Table 2** to determine roadway segment level of service.

Level of Service Policy

The 2035 Regional Transportation Plan (2035 RTP) establishes level of service criteria for regional roadway facilities within Washoe County, the City of Reno, and the City of Sparks. The current Level of Service policy is:

- "All regional roadway facilities projected to carry less than 27,000 ADT at the latest RTP horizon – LOS D or better."
- "All regional roadway facilities projected to carry 27,000 ADT or more at the latest RTP horizon – LOS E or better."

- "All intersections shall be designed to provide a level of service consistent with maintaining the policy level of service of the intersecting roadways".

According to the Nevada Department of Transportation's 2014 AADT data, the average daily volumes on S. Meadows Parkway and Double R Boulevard are significantly less than 27,000 ADT. Hence, the level of service threshold specific to the study roadways and intersections is LOS "D".

Table 2: Average Daily Traffic LOS Thresholds by Facility Type for Roadway Planning

Facility Type	Maximum Service Flow Rate (daily for given service level)				
Number of Lanes	LOS A	LOS B	LOS C	LOS D	LOS E
Freeway					
4	≤ 28,600	42,700	63,500	80,000	90,200
6	≤ 38,300	61,200	91,100	114,000	135,300
8	51,100	81,500	121,400	153,200	180,400
10	63,800	101,900	151,800	191,500	225,500
Arterial-High Access Control					
2	n/a	9,400	17,300	19,200	20,300
4	n/a	20,400	36,100	38,400	40,600
6	n/a	31,600	54,700	57,600	60,900
8	n/a	42,500	73,200	76,800	81,300
Arterial-Moderate Access Control					
2	n/a	5,500	14,800	17,500	18,600
4	n/a	12,000	32,200	35,200	36,900
6	n/a	18,800	49,600	52,900	55,400
8	n/a	25,600	66,800	70,600	73,900
Arterial/Collector-Low Access Control					
2	n/a	n/a	6,900	13,400	15,100
4	n/a	n/a	15,700	28,400	30,200
6	n/a	n/a	24,800	43,100	45,400
8	n/a	n/a	34,000	57,600	60,600
Arterial/Collector-Ultra-Low Access Control					
2	n/a	n/a	6,500	13,300	14,200
4	n/a	n/a	15,300	27,300	28,600
6	n/a	n/a	24,100	41,200	43,000
8	n/a	n/a	33,300	55,200	57,400
Source: Washoe County 2035 RTP Table 3-4.					

EXISTING TRANSPORTATION FACILITIES

Roadway Facilities

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

S. Meadows Parkway within the study area is a six-lane east-west roadway. It is classified as a "Medium Access Control Arterial" in the 2035 RTP. The posted speed limit is 35 mph in the study area.

Double R Boulevard is a four-lane north-south roadway that provides primary access to the project site. It is classified as a "Medium Access Control Arterial" in the 2035 RTP. The posted speed limit is 35 mph.

Table 3 provides a summary of existing characteristics for the study roadways.

Table 3: Configuration of Study Area Roadways

Street Name	2014 AADT	# of Lanes	Posted Speed (mph)
S. Meadows Parkway	12,500	6 plus turn lanes	35
Double R Boulevard	13,000	4 plus turn lanes	35

Alternate Travel Modes

There are currently sidewalks along the full length of S. Meadows Parkway and Double R Boulevard, on both sides of the roadway, throughout the study area.

Dedicated bike lanes exist in both the northbound and southbound directions on Double R Boulevard in the project vicinity.

The Regional Transportation Commission (RTC) operates public transit service on S. Meadows Parkway (Route 56) as shown **Exhibit 1**.

Exhibit 1. RTC Transit Routes

EXISTING CONDITIONS

Existing Traffic Volumes

Existing traffic volumes were determined by conducting new video counts at the study intersections. The counts were conducted on an average mid-week day in early December 2015. The existing peak hour intersection traffic volumes and lane configurations are shown on **Figure 2,** attached.

Existing Intersection Level of Service

Level of service calculations were performed using the existing traffic volumes, lane configurations, and traffic controls. The results are presented in **Table 4** and the calculation sheets are provided in **Appendix A**, attached.

Table 4: Existing Conditions Intersection Level of Service Summary

Name	Control	Existing PM		Existing AM	
		LOS	Delay	LOS	Delay
S. Meadows Pkwy and Lauren Ct	TWSC				
Northbound Approach		*F*	*65.7*	*E*	*42*
Southbound Approach		*D*	*34.3*	*D*	*29.7*
Eastbound Left		*B*	*11.7*	*B*	*13.9*
Westbound Left		*B*	*10.4*	*A*	*8.2*
S. Meadows Pkwy and Double R Blvd	Signal	C	34.9	D	38.2
Double R Blvd and Park Center North Dwy	TWSC				
Eastbound Approach		*D*	*33.5*	*D*	*29.6*
Westbound Approach		*E*	*37.7*	*D*	*27.9*
Northbound Left		*B*	*11.7*	*A*	*8.7*
Southbound Left		*A*	*9.6*	*B*	*10.6*
Double R Blvd and Project North Dwy	TWSC				
Eastbound Approach		*E*	*43.6*	*C*	*21.1*
Westbound Approach		*NA*	*NA*	*NA*	*NA*
Northbound Left		*B*	*10.9*	*A*	*8.9*
Southbound Left		*NA*	*NA*	*NA*	*NA*
Double R Blvd and Sandhill Rd	TWSC				
Eastbound Approach		*E*	*36.7*	*E*	*38.8*
Westbound Approach		*F*	*170.1*	*F*	*65.1*
Northbound Left		*B*	*10.7*	*A*	*8.9*
Southbound Left		*A*	*9.5*	*A*	*9.9*
S. Meadows Pkwy and Gateway Dr	Signal	C	22	B	13.3
S. Meadows Pkwy and 395 NB Ramps	Signal	C	21.5	B	15.3
S. Meadows Pkwy and 395 SB Ramps	Signal	C	30.9	C	30.6

TWSC = Two-Way Stop Control

As shown in **Table 4**, during the PM peak hour, at least one of the STOP controlled minor street approaches at each un-signalized study intersection operates at LOS "E/F". However, all the major street movements at these intersections operate within acceptable LOS conditions. It should be noted that the minor street left-turning volumes at these intersections are quite low compared to the overall intersection volume. The delay on the minor streets is associated with the conflicting high through volumes on the major streets rather than the side-street left/through volumes. During the AM peak hour, all the study intersections

operate at acceptable LOS conditions except for the S. Meadows Parkway/Lauren Court and Double R Boulevard/Sandhill Road intersections, which operate at LOS "E/F" on STOP controlled side street approaches. Again, the main street movements at the S. Meadows Parkway/Lauren Court and Double R Boulevard/Sandhill Road intersections operate at acceptable LOS conditions.

All the signalized study intersections currently operate at acceptable levels of service conditions.

Existing Roadway Level of Service

Table 5 summarizes the 2014 Annual Average Daily Traffic (AADT) volumes on S. Meadows Parkway and Double R Boulevard and the corresponding level of service.

Table 5: Existing Conditions Road Segment Level of Service Summary

Class	Segment	# Lanes	Daily Volume	LOS
MAC	S. Meadows Parkway	6	12,500	B
MAC	Double R Boulevard	4	13,000	C

As shown in **Table 5**, S. Meadows Parkway currently operates at LOS "B" and Double R Boulevard currently operates at LOS "C".

PROJECT GENERATED TRAFFIC

Project Description

The 16.2 acre project site is located east of Double R Boulevard and north of S. Meadows Parkway as shown in **Figure 3**. For the purposes of this analysis, the project will consist of the 320,000 square feet of General Office space or a mix of land uses that generates a similar number of project trips.

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 6** provides the PM peak hour, AM peak hour, and Daily trip generation calculation details for the proposed project. As shown in **Table 6**, the proposed project is estimated to generate a total of 3,178 daily trips, 485 AM peak hour trips, and 437 PM peak hour trips.

Any land use mix generating up to 3,200 daily trips or up to 500 peak hour trips should be considered an equivalent project from a traffic impact perspective.

Table 6: Trip Generation Estimates

ITE Land Use (#)	Size (ksf)	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
General Office	320.00	3,178	485	427	58	437	74	363

Project Access

Access to the project site is available via three existing access points, two on Double R Boulevard and one on S. Meadows Parkway. The approaches to the roadways are already constructed. On Double R Boulevard, access is provided via Park Center North Driveway and the Project North Driveway location. On S. Meadows Parkway, the access point is the north leg of Lauren Court. All three driveways are currently full-access configurations with STOP control on the driveway/minor street approaches.

We recommend improving the storage capacity on the project driveway approaches (southbound Lauren Court, westbound Park Center North Driveway, and westbound Project North Driveway) by striping an exclusive left-turn lane at each location within the existing pavement width.

Trip Distribution and Assignment

Traffic generated by the project was distributed to the road network based on the location of the project site, major activity centers, and the access connection points to arterial roadways.

The following trip distribution percentages were used for distributing the project traffic:

- 25% to/from the north via US 395
- 25% to/from the south via US 395
- 20% to/from the north via Double R Boulevard
- 20% to/from the south via Double R Boulevard
- 10% to/from the east via S. Meadows Parkway

Project generated trips were assigned to the adjacent roadway system based on the distributions outlined above. The project trip assignment is shown on **Figure 4**, attached.

EXISTING PLUS PROJECT CONDITIONS

Traffic Volumes

Existing plus project traffic volumes were developed by adding the project generated trips (**Figure 4**) to the existing traffic volumes (**Figure 2**) and are shown on **Figure 5**, attached. The "Plus Project" condition Peak Hour Factors (PHF) and travel patterns were assumed to remain the same as were observed under existing conditions.

Intersection Level of Service Analysis

Table 7 presents the level of service analysis summary for the "Plus Project" scenario assuming the existing intersection configurations. Detailed calculation sheets are provided in **Appendix B**, attached.

Table 7: Plus Project Intersection Level of Service Summary

Name	Control	Plus Project PM		Plus Project AM	
		LOS	Delay	LOS	Delay
S. Meadows Pkwy and Lauren Ct	TWSC				
Northbound Left		*F*	*>200*	*F*	*172.2*
Northbound Through-Right		*C*	*16.5*	*D*	*30.3*
Southbound Left		*F*	*143*	*F*	*97.9*
Southbound Through-Right		*B*	*14.3*	*D*	*30.3*
Eastbound Left		*B*	*11.9*	*C*	*17.4*
Westbound Left		*B*	*10.4*	*A*	*8.2*
S. Meadows Pkwy and Double R Blvd	Signal	D	36	D	46.1
Double R Blvd and Park Center North Dwy	TWSC				
Eastbound Approach		*E*	*41.6*	*E*	*46.3*
Westbound Left		*F*	*>200*	*F*	*116.1*
Westbound Through-Right		*B*	*14.3*	*B*	*13.9*
Northbound Left		*B*	*12.2*	*A*	*8.8*
Southbound Left		*A*	*9.8*	*B*	*12.8*
Double R Blvd and Project North Dwy	TWSC				
Eastbound Approach		*F*	*51.9*	*D*	*26.5*
Westbound Left		*F*	*199.2*	*F*	*70.9*
Westbound Through-Right		*B*	*12.3*	*B*	*13.1*
Northbound Left		*B*	*11*	*A*	*9.1*
Southbound Left		*B*	*10.1*	*B*	*11.6*
Double R Blvd and Sandhill Rd	TWSC				
Eastbound Approach		*E*	*45.5*	*E*	*47.7*
Westbound Left		*F*	*>200*	*F*	*119.9*
Westbound Through-Right		*E*	*45.1*	*F*	*57.6*
Northbound Left		*B*	*10.8*	*A*	*9.3*
Southbound Left		*A*	*9.9*	*A*	*10*
S. Meadows Pkwy and Gateway Dr	Signal	C	21.4	B	12.3
S. Meadows Pkwy and 395 NB Ramps	Signal	C	22.5	B	17.5
S. Meadows Pkwy and 395 SB Ramps	Signal	C	33.1	C	31.1

With the addition of the project traffic, all the signalized study intersections will continue to operate at acceptable Level of Service conditions (LOS "D" or better) during both the AM and PM peak hours.

LOS and delay on minor street approaches at un-signalized intersections will worsen compared to existing conditions. However, the major street movements, including the left-turn movements, at these un-signalized intersections will operate at acceptable LOS conditions. It should be noted that at least one of the minor street approaches at each of these intersections already operates at LOS "E/F" during existing hours (without the project).

Both project access driveways (westbound Park Center North Driveway and westbound Project North Driveway) on Double R Boulevard will serve less than 75 outbound left-turning movements during the PM peak hour with the project. The project access driveway on S. Meadows Parkway (southbound Lauren Court) will serve 233 vehicles during the PM peak hour (with the project) but more than 80% of that volume will be right-turning traffic. Less than 40 left-turning vehicles are projected during the PM peak hour from Lauren Court.

Since poor traffic operations would be limited to the STOP controlled side-street left-turn movement, LOS "E/F" on the side-street approaches is not a significant impact requiring mitigation. That condition exists today at the study locations. There are countless minor streets and driveways that function at LOS "F" during peak hours throughout the urban area. It is not feasible, nor desirable, to construct a traffic signal or roundabout at these locations as such an action would seriously disrupt throughput on the major streets/arterials.

Roadway Level of Service

Table 8 summarizes the "Plus Project" conditions roadway level of service.

Table 8: Plus Project Conditions Road Segment Level of Service Summary

Class	Segment	# Lanes	Existing		Plus Project	
			Volume	LOS	Volume	LOS
MAC	S. Meadows Parkway	6	12,500	B	14,089	B
MAC	Double R Boulevard	4	13,000	C	15,352	C

As shown in **Table 8**, both S. Meadows Parkway and Double R Boulevard will operate at acceptable LOS conditions during the "Plus Project" scenario. The roadway LOS remains unchanged after addition of the project traffic.

CONCLUSIONS & RECOMMENDATIONS

The following is a list of our key findings and recommendations to best manage the traffic generated by the proposed project:

Project Trips: The proposed project (which is somewhat generic) is anticipated to generate a total of 3,178 daily trips, 485 AM peak hour trips, and 437 PM peak hour trips. Any project generating up to 3,200 daily trips or up to 500 peak hour trips should be considered an equivalent project from a traffic impact perspective.

Project Access: Access to the project site is via three existing access points, two on Double R Boulevard, and one on S. Meadows Parkway. All three locations are currently full access intersections with STOP control on the driveway/minor street approaches and would remain in that configuration.

Existing Level of Service: All the signalized study intersections operate at acceptable levels of service during both the AM and PM peak hours. However, at least one of the minor street approaches at all the STOP controlled intersections currently operates at LOS "E/F" during the PM peak hour. It should be noted that all the major street movements operate within acceptable LOS conditions.

Plus Project Level of Service: With the addition of the project traffic, all the signalized study intersections continue to operate at acceptable Level of Service (LOS) conditions during both the AM and PM peak hours. The LOS and delay on minor street approaches at all the un-signalized intersections worsens compared to existing conditions. However, the major street movements, including the left-turn movements, at these un-signalized intersections operate at acceptable LOS conditions.

It seems inappropriate to signalize any of the project access points due to their proximity to other signalized intersections and the very low projected left-turn volumes. In this case, accepting LOS "E/F" for minor street left-turn movement is reasonable considering the major street movements will function at acceptable levels.

Recommendations: We recommend improving traffic operations and increasing storage capacity on the project driveway approaches (southbound Lauren Court, westbound Park Center North Driveway, and westbound Project North Driveway) by striping exclusive left-turn lanes within the existing roadway width. A minimum of 50 feet of left-turn lane pocket should be striped at each location (100 feet when feasible).

The project's contribution of standard Regional Road Impact Fees (RRIF) will mitigate the minor project effects on the overall roadway network.

TRAFFIC WORKS

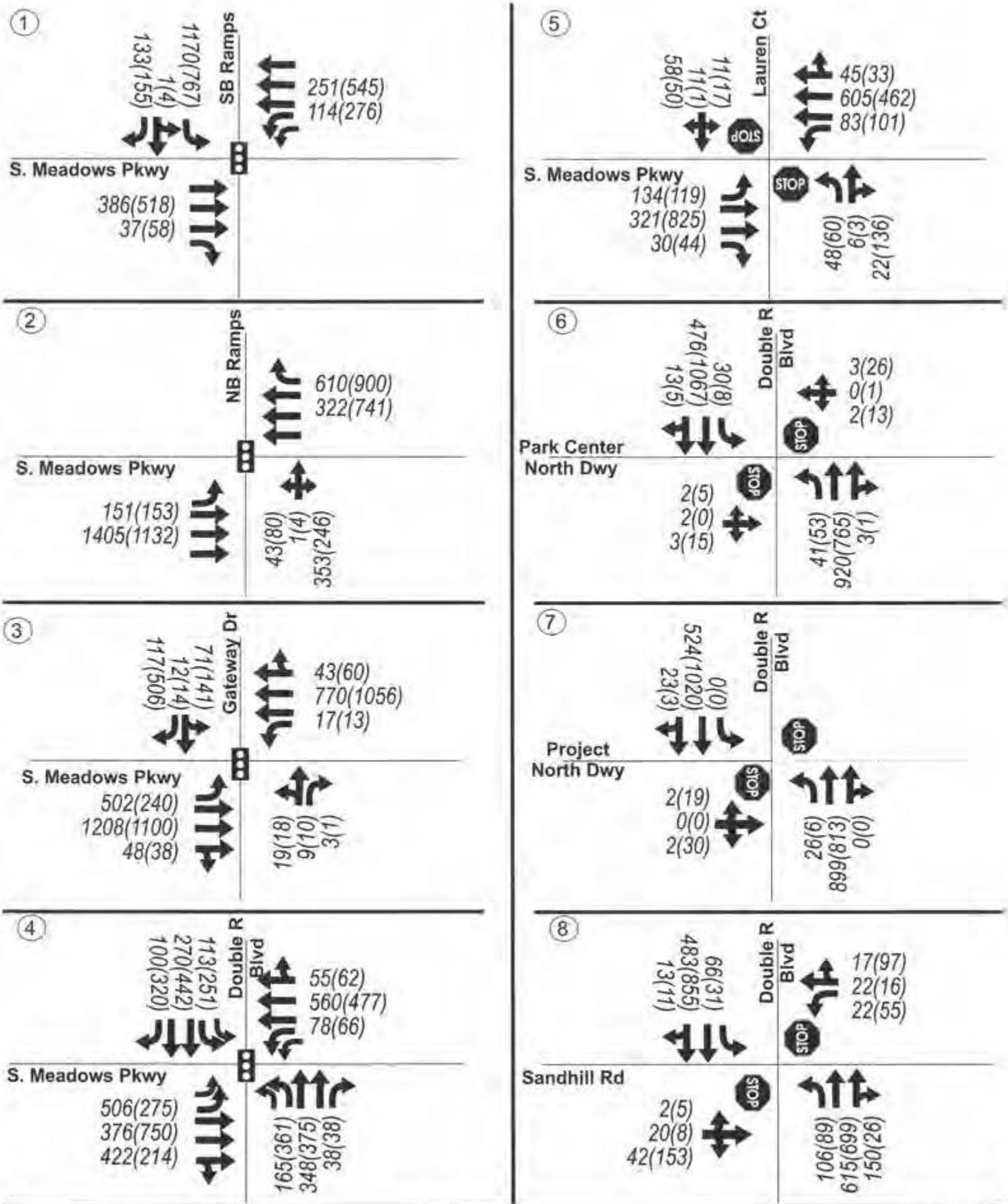
○ - Study Intersection

N

NO SCALE

Figure 1

SOUTH MEADOWS III PUD
TRAFFIC IMPACT STUDY
Study Area



TRAFFIC WORKS

LEGEND

AM(PM) - Peak Hour Traffic Volumes

- Lane Configuration

- Traffic Signal

STOP - Stop Sign

NO SCALE

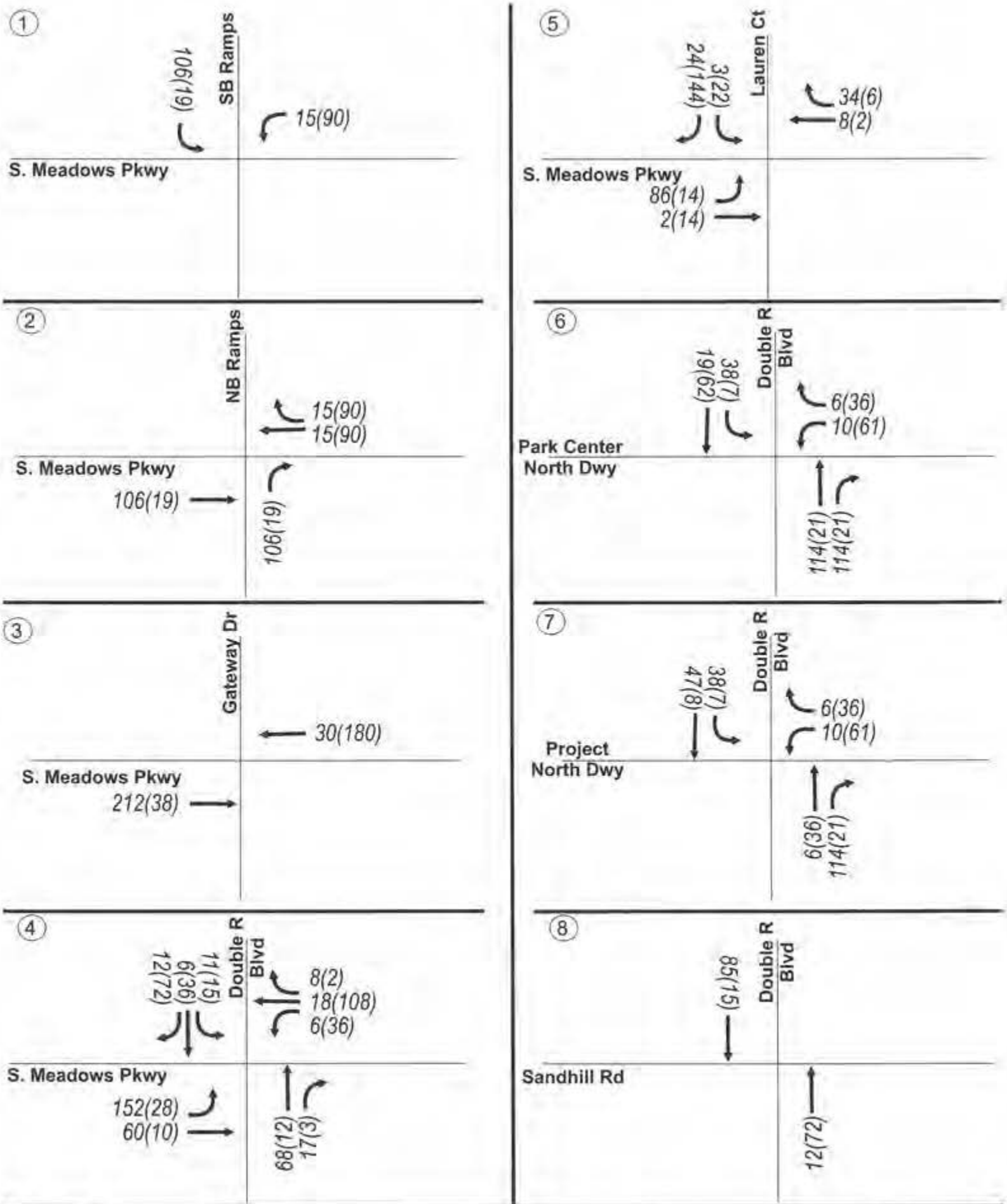
Figure 2

SOUTH MEADOWS III PUD
TRAFFIC IMPACT STUDY
Existing Traffic Volumes

TRAFFIC WORKS LLC

NO SCALE

Figure 3
SOUTH MEADOWS III PUD
TRAFFIC IMPACT STUDY
Site Plan



TRAFFIC WORKS

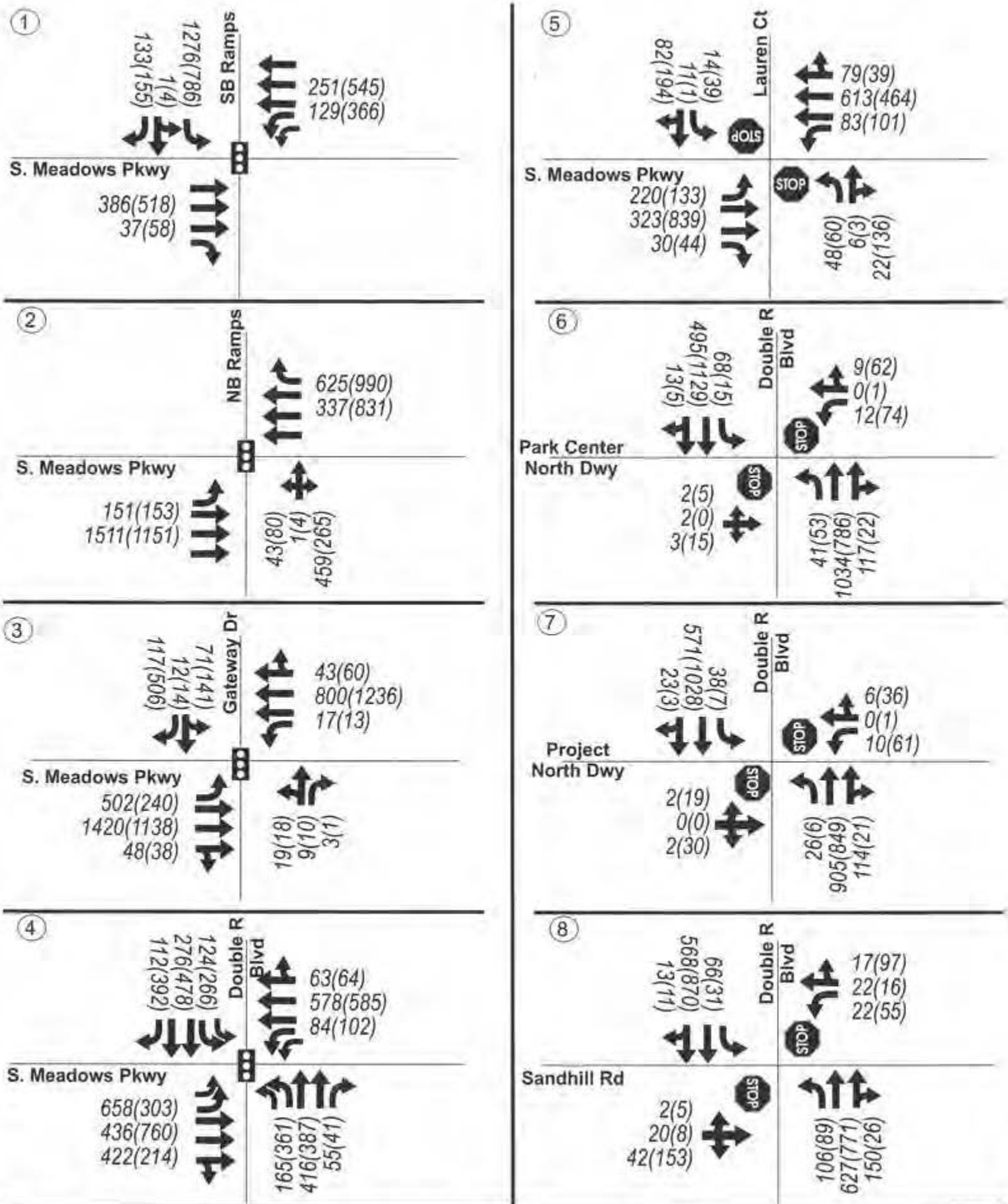
LEGEND

AM(PM) - Peak Hour Trip Assignment

NO SCALE

Figure 4

SOUTH MEADOWS III PUD
TRAFFIC IMPACT STUDY
Project Trips



TRAFFIC WORKS

LEGEND

AM(PM) - Peak Hour Traffic Volumes

- Lane Configuration

- Traffic Signal

STOP - Stop Sign

NO SCALE

Figure 5

SOUTH MEADOWS III PUD
TRAFFIC IMPACT STUDY

Existing Plus Project Traffic Volumes

APPENDIX A

Existing Conditions LOS Calculations

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	134	321	30	83	605	45	48	6	22	11	11	58
Future Vol, veh/h	134	321	30	83	605	45	48	6	22	11	11	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	0	270	-	270	160	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	144	345	32	89	651	48	52	6	24	12	12	62

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	699	0	0	345	0	0	1078	1510	173	1317	1486	349
Stage 1	-	-	-	-	-	-	633	633	-	853	853	-
Stage 2	-	-	-	-	-	-	445	877	-	464	633	-
Critical Hdwy	5.32	-	-	4.12	-	-	6.97	6.52	6.92	6.97	6.52	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.52	5.52	-	7.32	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	5.52	-	6.52	5.52	-
Follow-up Hdwy	3.11	-	-	2.21	-	-	3.66	4.01	3.31	3.66	4.01	3.91
Pot Cap-1 Maneuver	549	-	-	1218	-	-	201	120	844	139	125	555
Stage 1	-	-	-	-	-	-	424	474	-	260	376	-
Stage 2	-	-	-	-	-	-	533	367	-	532	474	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	549	-	-	1218	-	-	121	82	844	96	85	555
Mov Cap-2 Maneuver	-	-	-	-	-	-	121	82	-	96	85	-
Stage 1	-	-	-	-	-	-	313	350	-	192	349	-
Stage 2	-	-	-	-	-	-	424	340	-	374	350	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.8	0.9	42	29.7
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	121	282	549	-	-	1218	-	-	230
HCM Lane V/C Ratio	0.427	0.107	0.262	-	-	0.073	-	-	0.374
HCM Control Delay (s)	55.3	19.3	13.9	-	-	8.2	-	-	29.7
HCM Lane LOS	F	C	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1.8	0.4	1	-	-	0.2	-	-	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	506	376	422	78	560	55	165	348	38	113	270	100
Future Volume (veh/h)	506	376	422	78	560	55	165	348	38	113	270	100
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	569	422	0	88	629	0	185	391	0	127	303	0
Adj No. of Lanes	2	3	0	2	3	0	2	2	1	2	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	628	3081	0	138	2356	0	240	565	253	182	505	226
Arrive On Green	0.30	1.00	0.00	0.04	0.46	0.00	0.07	0.16	0.00	0.05	0.14	0.00
Sat Flow, veh/h	3476	5305	0	3476	5305	0	3476	3574	1599	3476	3574	1599
Grp Volume(v), veh/h	569	422	0	88	629	0	185	391	0	127	303	0
Grp Sat Flow(s),veh/h/ln	1738	1712	0	1738	1712	0	1738	1787	1599	1738	1787	1599
Q Serve(g_s), s	18.9	0.0	0.0	3.0	9.1	0.0	6.3	12.4	0.0	4.3	9.5	0.0
Cycle Q Clear(g_c), s	18.9	0.0	0.0	3.0	9.1	0.0	6.3	12.4	0.0	4.3	9.5	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	628	3081	0	138	2356	0	240	565	253	182	505	226
V/C Ratio(X)	0.91	0.14	0.00	0.64	0.27	0.00	0.77	0.69	0.00	0.70	0.60	0.00
Avail Cap(c_a), veh/h	710	3081	0	200	2356	0	258	1108	496	252	1102	493
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.9	0.0	0.0	56.8	20.0	0.0	54.9	47.8	0.0	55.9	48.3	0.0
Incr Delay (d2), s/veh	13.6	0.1	0.0	4.8	0.3	0.0	12.5	1.5	0.0	4.9	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	0.0	0.0	1.5	4.3	0.0	3.4	6.3	0.0	2.2	4.8	0.0
LnGrp Delay(d),s/veh	54.5	0.1	0.0	61.6	20.3	0.0	67.4	49.3	0.0	60.8	49.5	0.0
LnGrp LOS	D	A		E	C		E	D		E	D	
Approach Vol, veh/h		991			717			576			430	
Approach Delay, s/veh		31.3			25.4			55.1			52.8	
Approach LOS		C			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.3	76.5	12.8	21.4	26.2	59.6	10.8	23.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.9	49.2	8.9	37.0	24.5	31.6	8.7	37.2
Max Q Clear Time (g_c+I1), s	5.0	2.0	8.3	11.5	20.9	11.1	6.3	14.4
Green Ext Time (p_c), s	0.0	8.8	0.0	4.7	0.8	7.1	0.1	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	38.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	2	2	3	2	0	3	41	920	3	30	476	13
Future Vol, veh/h	2	2	3	2	0	3	41	920	3	30	476	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	210	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	2	3	2	0	3	46	1034	3	34	535	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1219	1739	275	1464	1745	519	549	0	0	1037	0	0
Stage 1	610	610	-	1128	1128	-	-	-	-	-	-	-
Stage 2	609	1129	-	336	617	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	137	87	726	90	86	504	1024	-	-	672	-	-
Stage 1	451	485	-	219	280	-	-	-	-	-	-	-
Stage 2	451	279	-	655	482	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	126	79	726	81	78	504	1024	-	-	672	-	-
Mov Cap-2 Maneuver	126	79	-	81	78	-	-	-	-	-	-	-
Stage 1	431	460	-	209	267	-	-	-	-	-	-	-
Stage 2	428	266	-	616	458	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.6	27.9	0.4	0.6
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1024	-	-	154	163	672	-	-
HCM Lane V/C Ratio	0.045	-	-	0.051	0.034	0.05	-	-
HCM Control Delay (s)	8.7	-	-	29.6	27.9	10.6	-	-
HCM Lane LOS	A	-	-	D	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	2	0	2	0	0	0	26	899	0	0	524	23
Future Vol, veh/h	2	0	2	0	0	0	26	899	0	0	524	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	160	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	0	2	0	0	0	30	1045	0	0	609	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1206	1729	318	1411	1742	523	636	0	0	1045	0	0
Stage 1	623	623	-	1106	1106	-	-	-	-	-	-	-
Stage 2	583	1106	-	305	636	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	140	88	681	99	87	501	950	-	-	667	-	-
Stage 1	443	479	-	226	286	-	-	-	-	-	-	-
Stage 2	468	286	-	682	473	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	137	85	681	96	84	501	950	-	-	667	-	-
Mov Cap-2 Maneuver	137	85	-	96	84	-	-	-	-	-	-	-
Stage 1	429	479	-	219	277	-	-	-	-	-	-	-
Stage 2	453	277	-	680	473	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.1	0	0.3	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	950	-	-	228	-	667	-	-
HCM Lane V/C Ratio	0.032	-	-	0.02	-	-	-	-
HCM Control Delay (s)	8.9	-	-	21.1	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	2	20	42	22	22	17	106	615	150	66	483	13
Future Vol, veh/h	2	20	42	22	22	17	106	615	150	66	483	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	120	-	-	160	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	22	46	24	24	18	115	668	163	72	525	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1253	1738	270	1397	1663	416	539	0	0	832	0	0
Stage 1	676	676	-	980	980	-	-	-	-	-	-	-
Stage 2	577	1062	-	417	683	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	130	87	731	101	97	588	1032	-	-	803	-	-
Stage 1	412	453	-	270	328	-	-	-	-	-	-	-
Stage 2	472	300	-	587	450	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	83	70	731	62	78	588	1032	-	-	803	-	-
Mov Cap-2 Maneuver	83	70	-	62	78	-	-	-	-	-	-	-
Stage 1	366	412	-	240	291	-	-	-	-	-	-	-
Stage 2	373	267	-	475	410	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	38.8	65.1	1.1	1.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1032	-	-	174	62	125	803	-	-
HCM Lane V/C Ratio	0.112	-	-	0.4	0.386	0.339	0.089	-	-
HCM Control Delay (s)	8.9	-	-	38.8	95.7	47.9	9.9	-	-
HCM Lane LOS	A	-	-	E	F	E	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	1.8	1.4	1.4	0.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	502	1208	48	17	770	43	19	9	3	71	12	117
Future Volume (veh/h)	502	1208	48	17	770	43	19	9	3	71	12	117
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1881	1900	1900	1881	1881
Adj Flow Rate, veh/h	540	1299	52	18	828	46	20	10	3	76	13	126
Adj No. of Lanes	1	3	0	1	3	0	0	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	560	3885	155	34	2354	130	82	35	7	174	23	163
Arrive On Green	0.63	1.00	1.00	0.04	0.95	0.95	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1792	5066	203	1792	4980	276	334	345	68	1165	229	1599
Grp Volume(v), veh/h	540	878	473	18	568	306	33	0	0	89	0	126
Grp Sat Flow(s),veh/h/ln	1792	1712	1845	1792	1712	1833	748	0	0	1394	0	1599
Q Serve(g_s), s	34.1	0.0	0.0	1.2	1.6	1.6	1.0	0.0	0.0	0.0	0.0	9.2
Cycle Q Clear(g_c), s	34.1	0.0	0.0	1.2	1.6	1.6	8.5	0.0	0.0	7.5	0.0	9.2
Prop In Lane	1.00		0.11	1.00		0.15	0.61		0.09	0.85		1.00
Lane Grp Cap(c), veh/h	560	2625	1415	34	1619	866	124	0	0	198	0	163
V/C Ratio(X)	0.96	0.33	0.33	0.53	0.35	0.35	0.27	0.00	0.00	0.45	0.00	0.77
Avail Cap(c_a), veh/h	709	2625	1415	81	1619	866	360	0	0	439	0	426
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	0.93	0.93	0.93	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.8	0.0	0.0	57.2	1.8	1.8	51.4	0.0	0.0	51.7	0.0	52.5
Incr Delay (d2), s/veh	19.7	0.3	0.5	11.7	0.6	1.1	1.1	0.0	0.0	1.6	0.0	7.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.6	0.1	0.2	0.7	0.8	0.9	1.1	0.0	0.0	2.9	0.0	4.4
LnGrp Delay(d),s/veh	41.5	0.3	0.5	69.0	2.3	2.8	52.5	0.0	0.0	53.3	0.0	60.1
LnGrp LOS	D	A	A	E	A	A	D			D		E
Approach Vol, veh/h		1891			892			33			215	
Approach Delay, s/veh		12.1			3.8			52.5			57.3	
Approach LOS		B			A			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.8	96.5		16.7	42.0	61.2		16.7
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.4	69.1		32.0	47.5	27.0		32.0
Max Q Clear Time (g_c+I1), s	3.2	2.0		11.2	36.1	3.6		10.5
Green Ext Time (p_c), s	0.0	28.3		1.0	1.4	16.0		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	1405	0	0	322	610	43	1	353	0	0	0
Future Volume (veh/h)	151	1405	0	0	322	610	43	1	353	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1881	1881	0	0	1881	1881	1900	1881	1900			
Adj Flow Rate, veh/h	159	1479	0	0	339	0	45	1	372			
Adj No. of Lanes	1	3	0	0	3	1	0	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	1	1	0	0	1	1	0	1	0			
Cap, veh/h	185	2692	0	0	1968	613	70	2	577			
Arrive On Green	0.21	1.00	0.00	0.00	0.13	0.00	0.40	0.40	0.40			
Sat Flow, veh/h	1792	5305	0	0	5305	1599	174	4	1440			
Grp Volume(v), veh/h	159	1479	0	0	339	0	418	0	0			
Grp Sat Flow(s),veh/h/ln	1792	1712	0	0	1712	1599	1618	0	0			
Q Serve(g_s), s	10.3	0.0	0.0	0.0	7.1	0.0	25.0	0.0	0.0			
Cycle Q Clear(g_c), s	10.3	0.0	0.0	0.0	7.1	0.0	25.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.11		0.89			
Lane Grp Cap(c), veh/h	185	2692	0	0	1968	613	649	0	0			
V/C Ratio(X)	0.86	0.55	0.00	0.00	0.17	0.00	0.64	0.00	0.00			
Avail Cap(c_a), veh/h	276	2692	0	0	1968	613	649	0	0			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	0.81	0.81	0.00	0.00	0.92	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	46.7	0.0	0.0	0.0	35.4	0.0	29.0	0.0	0.0			
Incr Delay (d2), s/veh	13.3	0.7	0.0	0.0	0.2	0.0	4.9	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.7	0.2	0.0	0.0	3.4	0.0	12.0	0.0	0.0			
LnGrp Delay(d),s/veh	60.0	0.7	0.0	0.0	35.6	0.0	33.9	0.0	0.0			
LnGrp LOS	E	A			D		C					
Approach Vol, veh/h		1638			339			418				
Approach Delay, s/veh		6.4			35.6			33.9				
Approach LOS		A			D			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		67.4			16.9	50.5		52.6
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5
Max Green Setting (Gmax), s		62.9			18.5	39.9		48.1
Max Q Clear Time (g_c+I1), s		2.0			12.3	9.1		27.0
Green Ext Time (p_c), s		22.2			0.2	16.7		2.9

Intersection Summary		
HCM 2010 Ctrl Delay		15.3
HCM 2010 LOS		B

HCM Signalized Intersection Capacity Analysis
8: SB Ramps & S Meadows Pkwy

1/18/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰↰	↑↑↑					↰	↰↑	↱
Traffic Volume (vph)	0	386	37	114	251	0	0	0	0	1170	1	133
Future Volume (vph)	0	386	37	114	251	0	0	0	0	1170	1	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5136	1599	3467	5136					1698	1702	1599
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5136	1599	3467	5136					1698	1702	1599
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	406	39	120	264	0	0	0	0	1232	1	140
RTOR Reduction (vph)	0	0	26	0	0	0	0	0	0	0	0	74
Lane Group Flow (vph)	0	406	13	120	264	0	0	0	0	616	617	66
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		40.6	40.6	9.0	54.1					56.9	56.9	56.9
Effective Green, g (s)		40.6	40.6	9.0	54.1					56.9	56.9	56.9
Actuated g/C Ratio		0.34	0.34	0.08	0.45					0.47	0.47	0.47
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1737	540	260	2315					805	807	758
v/s Ratio Prot		c0.08		c0.03	0.05							
v/s Ratio Perm			0.01							c0.36	0.36	0.04
v/c Ratio		0.23	0.02	0.46	0.11					0.77	0.76	0.09
Uniform Delay, d1		28.5	26.5	53.2	19.1					26.0	26.0	17.3
Progression Factor		1.00	1.00	1.20	1.36					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.1	1.3	0.1					4.4	4.3	0.1
Delay (s)		28.8	26.6	65.0	26.1					30.4	30.4	17.4
Level of Service		C	C	E	C					C	C	B
Approach Delay (s)		28.6			38.3			0.0			29.1	
Approach LOS		C			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	9.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	119	825	44	101	462	33	60	3	136	17	1	50
Future Vol, veh/h	119	825	44	101	462	33	60	3	136	17	1	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	0	270	-	270	160	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	125	868	46	106	486	35	63	3	143	18	1	53

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	521	0	0	868	0	0	1527	1853	434	1402	1835	261
Stage 1	-	-	-	-	-	-	1119	1119	-	716	716	-
Stage 2	-	-	-	-	-	-	408	734	-	686	1119	-
Critical Hdwy	5.32	-	-	4.12	-	-	6.97	6.52	6.92	6.97	6.52	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.52	5.52	-	7.32	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	5.52	-	6.52	5.52	-
Follow-up Hdwy	3.11	-	-	2.21	-	-	3.66	4.01	3.31	3.66	4.01	3.91
Pot Cap-1 Maneuver	666	-	-	778	-	-	101	74	573	122	76	631
Stage 1	-	-	-	-	-	-	217	282	-	323	435	-
Stage 2	-	-	-	-	-	-	561	426	-	394	282	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	666	-	-	778	-	-	70	52	573	67	53	631
Mov Cap-2 Maneuver	-	-	-	-	-	-	70	52	-	67	53	-
Stage 1	-	-	-	-	-	-	176	229	-	262	376	-
Stage 2	-	-	-	-	-	-	443	368	-	237	229	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	1.8	65.7	34.3
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	70	471	666	-	-	778	-	-	193
HCM Lane V/C Ratio	0.902	0.311	0.188	-	-	0.137	-	-	0.371
HCM Control Delay (s)	180.6	16.1	11.7	-	-	10.4	-	-	34.3
HCM Lane LOS	F	C	B	-	-	B	-	-	D
HCM 95th %tile Q(veh)	4.5	1.3	0.7	-	-	0.5	-	-	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	750	214	66	477	62	361	375	38	251	442	320
Future Volume (veh/h)	275	750	214	66	477	62	361	375	38	251	442	320
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	286	781	0	69	497	0	376	391	0	261	460	0
Adj No. of Lanes	2	3	0	2	3	0	2	2	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	341	2580	0	130	2268	0	441	776	347	324	655	293
Arrive On Green	0.20	1.00	0.00	0.04	0.44	0.00	0.13	0.22	0.00	0.09	0.18	0.00
Sat Flow, veh/h	3476	5305	0	3476	5305	0	3476	3574	1599	3476	3574	1599
Grp Volume(v), veh/h	286	781	0	69	497	0	376	391	0	261	460	0
Grp Sat Flow(s),veh/h/ln	1738	1712	0	1738	1712	0	1738	1787	1599	1738	1787	1599
Q Serve(g_s), s	9.5	0.0	0.0	2.3	7.2	0.0	12.7	11.5	0.0	8.8	14.5	0.0
Cycle Q Clear(g_c), s	9.5	0.0	0.0	2.3	7.2	0.0	12.7	11.5	0.0	8.8	14.5	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	341	2580	0	130	2268	0	441	776	347	324	655	293
V/C Ratio(X)	0.84	0.30	0.00	0.53	0.22	0.00	0.85	0.50	0.00	0.81	0.70	0.00
Avail Cap(c_a), veh/h	420	2580	0	165	2268	0	536	1206	540	434	1102	493
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	47.3	0.0	0.0	56.7	20.7	0.0	51.3	41.3	0.0	53.4	45.9	0.0
Incr Delay (d2), s/veh	11.2	0.3	0.0	3.3	0.2	0.0	10.8	0.5	0.0	8.0	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.1	0.0	1.2	3.5	0.0	6.8	5.8	0.0	4.6	7.3	0.0
LnGrp Delay(d),s/veh	58.5	0.3	0.0	60.0	20.9	0.0	62.1	41.8	0.0	61.3	47.3	0.0
LnGrp LOS	E	A		E	C		E	D		E	D	
Approach Vol, veh/h		1067			566			767			721	
Approach Delay, s/veh		15.9			25.7			51.8			52.4	
Approach LOS		B			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	64.8	19.7	26.5	16.3	57.5	15.7	30.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.7	40.8	18.5	37.0	14.5	32.0	15.0	40.5
Max Q Clear Time (g_c+I1), s	4.3	2.0	14.7	16.5	11.5	9.2	10.8	13.5
Green Ext Time (p_c), s	0.0	11.1	0.5	5.5	0.3	9.3	0.3	6.0

Intersection Summary	
HCM 2010 Ctrl Delay	34.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	0	15	13	1	26	53	765	1	8	1067	5
Future Vol, veh/h	5	0	15	13	1	26	53	765	1	8	1067	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	210	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	5	0	16	14	1	29	58	841	1	9	1173	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1730	2151	589	1562	2154	421	1178	0	0	842	0	0
Stage 1	1193	1193	-	958	958	-	-	-	-	-	-	-
Stage 2	537	958	-	604	1196	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	57	48	454	76	48	584	594	-	-	796	-	-
Stage 1	200	260	-	278	336	-	-	-	-	-	-	-
Stage 2	498	336	-	455	260	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	49	43	454	67	43	584	594	-	-	796	-	-
Mov Cap-2 Maneuver	49	43	-	67	43	-	-	-	-	-	-	-
Stage 1	180	257	-	251	303	-	-	-	-	-	-	-
Stage 2	426	303	-	434	257	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	33.5	37.7	0.8	0.1
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	594	-	-	148	153	796	-	-
HCM Lane V/C Ratio	0.098	-	-	0.149	0.287	0.011	-	-
HCM Control Delay (s)	11.7	-	-	33.5	37.7	9.6	-	-
HCM Lane LOS	B	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.5	1.1	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	19	0	30	0	0	0	6	813	0	1	1020	3
Future Vol, veh/h	19	0	30	0	0	0	6	813	0	1	1020	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	160	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	21	0	33	0	0	0	7	903	0	1	1133	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1602	2054	568	1486	2056	452	1137	0	0	903	0	0
Stage 1	1137	1137	-	917	917	-	-	-	-	-	-	-
Stage 2	465	917	-	569	1139	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	71	55	469	87	55	558	616	-	-	755	-	-
Stage 1	216	277	-	295	351	-	-	-	-	-	-	-
Stage 2	550	351	-	477	276	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	70	54	469	80	54	558	616	-	-	755	-	-
Mov Cap-2 Maneuver	70	54	-	80	54	-	-	-	-	-	-	-
Stage 1	214	277	-	292	347	-	-	-	-	-	-	-
Stage 2	544	347	-	443	276	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	43.6	0	0.1	0
HCM LOS	E	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	616	-	-	146	-	755	-	-
HCM Lane V/C Ratio	0.011	-	-	0.373	-	0.001	-	-
HCM Control Delay (s)	10.9	-	-	43.6	0	9.8	-	-
HCM Lane LOS	B	-	-	E	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.6	-	0	-	-

Intersection	
Int Delay, s/veh	17.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	8	153	55	16	97	89	699	26	31	855	11
Future Vol, veh/h	5	8	153	55	16	97	89	699	26	31	855	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	120	-	-	160	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	5	9	168	60	18	107	98	768	29	34	940	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1602	2006	476	1520	1998	398	952	0	0	797	0	0
Stage 1	1014	1014	-	978	978	-	-	-	-	-	-	-
Stage 2	588	992	-	542	1020	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	71	59	538	82	60	604	724	-	-	827	-	-
Stage 1	257	316	-	271	329	-	-	-	-	-	-	-
Stage 2	465	324	-	495	314	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	37	49	538	~ 42	50	604	724	-	-	827	-	-
Mov Cap-2 Maneuver	37	49	-	~ 42	50	-	-	-	-	-	-	-
Stage 1	222	303	-	234	284	-	-	-	-	-	-	-
Stage 2	311	280	-	317	301	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.6	170.1	1.2	0.3
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	724	-	-	285	42	235	827	-	-
HCM Lane V/C Ratio	0.135	-	-	0.64	1.439	0.528	0.041	-	-
HCM Control Delay (s)	10.7	-	-	37.6	$ 445	36.3	9.5	-	-
HCM Lane LOS	B	-	-	E	F	E	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	4.1	6.1	2.8	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	1100	38	13	1056	60	18	10	1	141	14	506
Future Volume (veh/h)	240	1100	38	13	1056	60	18	10	1	141	14	506
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1881	1900	1900	1881	1881
Adj Flow Rate, veh/h	247	1134	39	13	1089	62	19	10	1	145	14	522
Adj No. of Lanes	1	3	0	1	3	0	0	1	0	0	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	274	2772	95	26	2016	115	210	102	9	474	43	526
Arrive On Green	0.31	1.00	1.00	0.03	0.81	0.81	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1792	5099	175	1792	4972	283	489	310	28	1265	131	1599
Grp Volume(v), veh/h	247	761	412	13	750	401	30	0	0	159	0	522
Grp Sat Flow(s),veh/h/ln	1792	1712	1850	1792	1712	1831	827	0	0	1396	0	1599
Q Serve(g_s), s	15.9	0.0	0.0	0.9	8.8	8.9	0.6	0.0	0.0	0.0	0.0	39.0
Cycle Q Clear(g_c), s	15.9	0.0	0.0	0.9	8.8	8.9	11.9	0.0	0.0	11.3	0.0	39.0
Prop In Lane	1.00		0.09	1.00		0.15	0.63		0.03	0.91		1.00
Lane Grp Cap(c), veh/h	274	1861	1006	26	1388	743	321	0	0	517	0	526
V/C Ratio(X)	0.90	0.41	0.41	0.50	0.54	0.54	0.09	0.00	0.00	0.31	0.00	0.99
Avail Cap(c_a), veh/h	411	1861	1006	82	1388	743	321	0	0	517	0	526
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	0.85	0.85	0.85	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.8	0.0	0.0	57.8	7.6	7.6	28.7	0.0	0.0	30.8	0.0	40.1
Incr Delay (d2), s/veh	15.3	0.6	1.1	11.7	1.3	2.4	0.1	0.0	0.0	0.3	0.0	37.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	0.2	0.3	0.5	4.2	4.7	0.8	0.0	0.0	4.1	0.0	22.6
LnGrp Delay(d),s/veh	56.1	0.6	1.1	69.5	8.9	10.0	28.8	0.0	0.0	31.1	0.0	77.1
LnGrp LOS	E	A	A	E	A	A	C			C		E
Approach Vol, veh/h		1420			1164			30			681	
Approach Delay, s/veh		10.4			9.9			28.8			66.4	
Approach LOS		B			A			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	69.7		44.0	22.8	53.2		44.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.5	61.5		39.5	27.5	39.5		39.5
Max Q Clear Time (g_c+I1), s	2.9	2.0		41.0	17.9	10.9		13.9
Green Ext Time (p_c), s	0.0	29.0		0.0	0.5	19.2		3.3

Intersection Summary	
HCM 2010 Ctrl Delay	22.0
HCM 2010 LOS	C

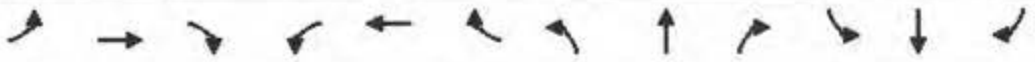
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	1132	0	0	741	900	80	4	246	0	0	0
Future Volume (veh/h)	153	1132	0	0	741	900	80	4	246	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1881	1881	0	0	1881	1881	1900	1881	1900			
Adj Flow Rate, veh/h	158	1167	0	0	764	0	82	4	254			
Adj No. of Lanes	1	3	0	0	3	1	0	1	0			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	0	1	0			
Cap, veh/h	183	2696	0	0	1980	616	159	8	491			
Arrive On Green	0.20	1.00	0.00	0.00	0.13	0.00	0.40	0.40	0.40			
Sat Flow, veh/h	1792	5305	0	0	5305	1599	397	19	1229			
Grp Volume(v), veh/h	158	1167	0	0	764	0	340	0	0			
Grp Sat Flow(s),veh/h/ln	1792	1712	0	0	1712	1599	1645	0	0			
Q Serve(g_s), s	10.2	0.0	0.0	0.0	16.4	0.0	18.8	0.0	0.0			
Cycle Q Clear(g_c), s	10.2	0.0	0.0	0.0	16.4	0.0	18.8	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.24		0.75			
Lane Grp Cap(c), veh/h	183	2696	0	0	1980	616	658	0	0			
V/C Ratio(X)	0.86	0.43	0.00	0.00	0.39	0.00	0.52	0.00	0.00			
Avail Cap(c_a), veh/h	216	2696	0	0	1980	616	658	0	0			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	0.89	0.89	0.00	0.00	0.81	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	46.9	0.0	0.0	0.0	39.3	0.0	27.2	0.0	0.0			
Incr Delay (d2), s/veh	23.2	0.5	0.0	0.0	0.5	0.0	2.9	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.2	0.1	0.0	0.0	7.9	0.0	9.0	0.0	0.0			
LnGrp Delay(d),s/veh	70.1	0.5	0.0	0.0	39.8	0.0	30.1	0.0	0.0			
LnGrp LOS	E	A			D		C					
Approach Vol, veh/h		1325			764			340				
Approach Delay, s/veh		8.8			39.8			30.1				
Approach LOS		A			D			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		67.5			16.7	50.8		52.5
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5
Max Green Setting (Gmax), s		63.0			14.5	44.0		48.0
Max Q Clear Time (g_c+I1), s		2.0			12.2	18.4		20.8
Green Ext Time (p_c), s		23.9			0.1	15.7		2.4

Intersection Summary		
HCM 2010 Ctrl Delay		21.5
HCM 2010 LOS		C

HCM Signalized Intersection Capacity Analysis
8: SB Ramps & S Meadows Pkwy

1/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	518	58	276	545	0	0	0	0	767	4	155
Future Volume (vph)	0	518	58	276	545	0	0	0	0	767	4	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5136	1599	3467	5136					1698	1703	1599
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5136	1599	3467	5136					1698	1703	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	557	62	297	586	0	0	0	0	825	4	167
RTOR Reduction (vph)	0	0	35	0	0	0	0	0	0	0	0	113
Lane Group Flow (vph)	0	557	27	297	586	0	0	0	0	412	417	54
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		52.1	52.1	15.5	72.1					38.9	38.9	38.9
Effective Green, g (s)		52.1	52.1	15.5	72.1					38.9	38.9	38.9
Actuated g/C Ratio		0.43	0.43	0.13	0.60					0.32	0.32	0.32
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2229	694	447	3085					550	552	518
v/s Ratio Prot		c0.11		c0.09	0.11							
v/s Ratio Perm			0.02							0.24	0.24	0.03
v/c Ratio		0.25	0.04	0.66	0.19					0.75	0.76	0.10
Uniform Delay, d1		21.5	19.5	49.8	10.8					36.2	36.3	28.4
Progression Factor		1.00	1.00	1.05	1.20					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.1	3.5	0.1					5.6	5.8	0.1
Delay (s)		21.8	19.6	55.7	13.1					41.7	42.1	28.5
Level of Service		C	B	E	B					D	D	C
Approach Delay (s)		21.6			27.4			0.0			39.7	
Approach LOS		C			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX B

Existing Plus Project Conditions LOS Calculations

Intersection	
Int Delay, s/veh	11.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	134	321	30	83	605	45	48	6	22	11	11	58
Future Vol, veh/h	220	323	30	83	613	79	48	6	22	14	11	82
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	0	270	-	270	160	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	237	347	32	89	659	85	52	6	24	15	12	88

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	744	0	0	347	0	0	1268	1743	174	1530	1700	372
Stage 1	-	-	-	-	-	-	820	820	-	880	880	-
Stage 2	-	-	-	-	-	-	448	923	-	650	820	-
Critical Hdwy	5.32	-	-	4.12	-	-	6.97	6.52	6.92	6.97	6.52	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.52	5.52	-	7.32	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	5.52	-	6.52	5.52	-
Follow-up Hdwy	3.11	-	-	2.21	-	-	3.66	4.01	3.31	3.66	4.01	3.91
Pot Cap-1 Maneuver	523	-	-	1216	-	-	150	87	842	100	92	536
Stage 1	-	-	-	-	-	-	328	389	-	249	365	-
Stage 2	-	-	-	-	-	-	531	349	-	414	389	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	523	-	-	1216	-	-	63	44	842	53	47	536
Mov Cap-2 Maneuver	-	-	-	-	-	-	63	44	-	53	47	-
Stage 1	-	-	-	-	-	-	179	213	-	136	338	-
Stage 2	-	-	-	-	-	-	397	323	-	213	213	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	6.7	0.9	119.9	39.1
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	63	172	523	-	-	1216	-	-	53	240
HCM Lane V/C Ratio	0.819	0.175	0.452	-	-	0.073	-	-	0.284	0.417
HCM Control Delay (s)	172.2	30.3	17.4	-	-	8.2	-	-	97.9	30.3
HCM Lane LOS	F	D	C	-	-	A	-	-	F	D
HCM 95th %tile Q(veh)	3.7	0.6	2.3	-	-	0.2	-	-	1	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	506	376	422	78	560	55	165	348	38	113	270	100
Future Volume (veh/h)	658	436	422	84	578	63	165	416	55	124	276	112
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	739	490	0	94	649	0	185	467	0	139	310	0
Adj No. of Lanes	2	3	0	2	3	0	2	2	1	2	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	710	2932	0	145	2098	0	240	648	290	195	601	269
Arrive On Green	0.34	0.95	0.00	0.04	0.41	0.00	0.07	0.18	0.00	0.06	0.17	0.00
Sat Flow, veh/h	3476	5305	0	3476	5305	0	3476	3574	1599	3476	3574	1599
Grp Volume(v), veh/h	739	490	0	94	649	0	185	467	0	139	310	0
Grp Sat Flow(s),veh/h/ln	1738	1712	0	1738	1712	0	1738	1787	1599	1738	1787	1599
Q Serve(g_s), s	24.5	0.6	0.0	3.2	10.3	0.0	6.3	14.8	0.0	4.7	9.5	0.0
Cycle Q Clear(g_c), s	24.5	0.6	0.0	3.2	10.3	0.0	6.3	14.8	0.0	4.7	9.5	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	710	2932	0	145	2098	0	240	648	290	195	601	269
V/C Ratio(X)	1.04	0.17	0.00	0.65	0.31	0.00	0.77	0.72	0.00	0.71	0.52	0.00
Avail Cap(c_a), veh/h	710	2932	0	200	2098	0	258	1108	496	252	1102	493
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.5	1.2	0.0	56.6	24.0	0.0	54.9	46.3	0.0	55.7	45.5	0.0
Incr Delay (d2), s/veh	43.7	0.1	0.0	4.8	0.4	0.0	12.5	1.5	0.0	6.5	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.0	0.3	0.0	1.6	4.9	0.0	3.4	7.4	0.0	2.4	4.8	0.0
LnGrp Delay(d),s/veh	83.3	1.3	0.0	61.4	24.4	0.0	67.4	47.8	0.0	62.2	46.1	0.0
LnGrp LOS	F	A		E	C		E	D		E	D	
Approach Vol, veh/h		1229			743			652			449	
Approach Delay, s/veh		50.6			29.1			53.3			51.1	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	73.0	12.8	24.7	29.0	53.5	11.2	26.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.9	49.2	8.9	37.0	24.5	31.6	8.7	37.2
Max Q Clear Time (g_c+I1), s	5.2	2.6	8.3	11.5	26.5	12.3	6.7	16.8
Green Ext Time (p_c), s	0.0	9.8	0.0	5.3	0.0	7.6	0.1	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	46.1
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	2	2	3	2	0	3	41	920	3	30	476	13
Future Vol, veh/h	2	2	3	12	0	9	41	1034	117	68	495	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	210	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	2	3	13	0	10	46	1162	131	76	556	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1389	2101	285	1752	2044	647	571	0	0	1293	0	0
Stage 1	716	716	-	1320	1320	-	-	-	-	-	-	-
Stage 2	673	1385	-	432	724	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	103	52	715	55	56	416	1005	-	-	537	-	-
Stage 1	390	435	-	167	226	-	-	-	-	-	-	-
Stage 2	413	211	-	575	431	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	87	43	715	45	46	416	1005	-	-	537	-	-
Mov Cap-2 Maneuver	87	43	-	45	46	-	-	-	-	-	-	-
Stage 1	372	373	-	159	216	-	-	-	-	-	-	-
Stage 2	385	201	-	488	370	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	46.3	72.3	0.3	1.5
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1005	-	-	95	45	416	537	-	-
HCM Lane V/C Ratio	0.046	-	-	0.083	0.3	0.024	0.142	-	-
HCM Control Delay (s)	8.8	-	-	46.3	116.1	13.9	12.8	-	-
HCM Lane LOS	A	-	-	E	F	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	1	0.1	0.5	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	2	0	2	0	0	0	26	899	0	0	524	23
Future Vol, veh/h	2	0	2	10	0	6	26	905	114	38	571	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	160	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	0	2	12	0	7	30	1052	133	44	664	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1353	2011	345	1599	1958	592	691	0	0	1185	0	0
Stage 1	766	766	-	1179	1179	-	-	-	-	-	-	-
Stage 2	587	1245	-	420	779	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	109	59	654	72	64	452	906	-	-	591	-	-
Stage 1	364	412	-	204	265	-	-	-	-	-	-	-
Stage 2	465	246	-	584	407	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	99	53	654	66	57	452	906	-	-	591	-	-
Mov Cap-2 Maneuver	99	53	-	66	57	-	-	-	-	-	-	-
Stage 1	352	381	-	197	256	-	-	-	-	-	-	-
Stage 2	443	238	-	539	377	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.5	49.2	0.2	0.7
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	906	-	-	172	66	452	591	-	-
HCM Lane V/C Ratio	0.033	-	-	0.027	0.176	0.015	0.075	-	-
HCM Control Delay (s)	9.1	-	-	26.5	70.9	13.1	11.6	-	-
HCM Lane LOS	A	-	-	D	F	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.6	0	0.2	-	-

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	2	20	42	22	22	17	106	615	150	66	483	13
Future Vol, veh/h	2	20	42	22	22	17	106	627	150	66	568	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	120	-	-	160	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	22	46	24	24	18	115	682	163	72	617	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1351	1843	316	1456	1768	422	632	0	0	845	0	0
Stage 1	768	768	-	993	993	-	-	-	-	-	-	-
Stage 2	583	1075	-	463	775	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	110	75	683	92	84	583	953	-	-	794	-	-
Stage 1	363	411	-	265	324	-	-	-	-	-	-	-
Stage 2	468	296	-	551	408	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	66	60	683	53	67	583	953	-	-	794	-	-
Mov Cap-2 Maneuver	66	60	-	53	67	-	-	-	-	-	-	-
Stage 1	319	374	-	233	285	-	-	-	-	-	-	-
Stage 2	365	260	-	440	371	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	47.7	80.1	1.1	1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	953	-	-	151	53	109	794	-	-
HCM Lane V/C Ratio	0.121	-	-	0.461	0.451	0.389	0.09	-	-
HCM Control Delay (s)	9.3	-	-	47.7	119.9	57.6	10	-	-
HCM Lane LOS	A	-	-	E	F	F	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	2.1	1.7	1.6	0.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	502	1208	48	17	770	43	19	9	3	71	12	117
Future Volume (veh/h)	502	1420	48	17	800	43	19	9	3	71	12	117
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1881	1900	1900	1881	1881
Adj Flow Rate, veh/h	540	1527	52	18	860	46	20	10	3	76	13	126
Adj No. of Lanes	1	3	0	1	3	0	0	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	560	3911	133	34	2360	126	82	35	7	174	23	163
Arrive On Green	0.63	1.00	1.00	0.04	0.95	0.95	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1792	5101	174	1792	4992	266	334	345	68	1165	229	1599
Grp Volume(v), veh/h	540	1025	554	18	589	317	33	0	0	89	0	126
Grp Sat Flow(s),veh/h/ln	1792	1712	1851	1792	1712	1834	748	0	0	1394	0	1599
Q Serve(g_s), s	34.1	0.0	0.0	1.2	1.7	1.7	1.0	0.0	0.0	0.0	0.0	9.2
Cycle Q Clear(g_c), s	34.1	0.0	0.0	1.2	1.7	1.7	8.5	0.0	0.0	7.5	0.0	9.2
Prop In Lane	1.00		0.09	1.00		0.15	0.61		0.09	0.85		1.00
Lane Grp Cap(c), veh/h	560	2625	1419	34	1619	867	124	0	0	198	0	163
V/C Ratio(X)	0.96	0.39	0.39	0.53	0.36	0.37	0.27	0.00	0.00	0.45	0.00	0.77
Avail Cap(c_a), veh/h	709	2625	1419	81	1619	867	360	0	0	439	0	426
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	0.88	0.88	0.88	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.8	0.0	0.0	57.2	1.8	1.8	51.4	0.0	0.0	51.7	0.0	52.5
Incr Delay (d2), s/veh	19.1	0.3	0.6	11.1	0.6	1.0	1.1	0.0	0.0	1.6	0.0	7.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.5	0.1	0.2	0.7	0.8	1.0	1.1	0.0	0.0	2.9	0.0	4.4
LnGrp Delay(d),s/veh	40.9	0.3	0.6	68.3	2.3	2.8	52.5	0.0	0.0	53.3	0.0	60.1
LnGrp LOS	D	A	A	E	A	A	D			D		E
Approach Vol, veh/h		2119			924			33			215	
Approach Delay, s/veh		10.8			3.8			52.5			57.3	
Approach LOS		B			A			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.8	96.5		16.7	42.0	61.2		16.7
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.4	69.1		32.0	47.5	27.0		32.0
Max Q Clear Time (g_c+I1), s	3.2	2.0		11.2	36.1	3.7		10.5
Green Ext Time (p_c), s	0.0	34.7		1.0	1.4	17.7		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	12.3
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	1405	0	0	322	610	43	1	353	0	0	0
Future Volume (veh/h)	151	1511	0	0	337	625	43	1	459	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1881	1881	0	0	1881	1881	1900	1881	1900			
Adj Flow Rate, veh/h	159	1591	0	0	355	0	45	1	483			
Adj No. of Lanes	1	3	0	0	3	1	0	1	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	1	1	0	0	1	1	0	1	0			
Cap, veh/h	185	2692	0	0	1968	613	55	1	591			
Arrive On Green	0.21	1.00	0.00	0.00	0.13	0.00	0.40	0.40	0.40			
Sat Flow, veh/h	1792	5305	0	0	5305	1599	137	3	1474			
Grp Volume(v), veh/h	159	1591	0	0	355	0	529	0	0			
Grp Sat Flow(s),veh/h/ln	1792	1712	0	0	1712	1599	1614	0	0			
Q Serve(g_s), s	10.3	0.0	0.0	0.0	7.4	0.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	10.3	0.0	0.0	0.0	7.4	0.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.09		0.91			
Lane Grp Cap(c), veh/h	185	2692	0	0	1968	613	647	0	0			
V/C Ratio(X)	0.86	0.59	0.00	0.00	0.18	0.00	0.82	0.00	0.00			
Avail Cap(c_a), veh/h	276	2692	0	0	1968	613	647	0	0			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	0.78	0.78	0.00	0.00	0.92	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	46.7	0.0	0.0	0.0	35.6	0.0	32.0	0.0	0.0			
Incr Delay (d2), s/veh	12.8	0.8	0.0	0.0	0.2	0.0	11.0	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.7	0.2	0.0	0.0	3.6	0.0	17.6	0.0	0.0			
LnGrp Delay(d),s/veh	59.6	0.8	0.0	0.0	35.7	0.0	43.0	0.0	0.0			
LnGrp LOS	E	A			D		D					
Approach Vol, veh/h		1750			355			529				
Approach Delay, s/veh		6.1			35.7			43.0				
Approach LOS		A			D			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		67.4			16.9	50.5		52.6
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5
Max Green Setting (Gmax), s		62.9			18.5	39.9		48.1
Max Q Clear Time (g_c+I1), s		2.0			12.3	9.4		37.0
Green Ext Time (p_c), s		25.0			0.2	18.0		2.9

Intersection Summary		
HCM 2010 Ctrl Delay		17.5
HCM 2010 LOS		B

HCM Signalized Intersection Capacity Analysis
8: SB Ramps & S Meadows Pkwy

1/18/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰↰	↑↑↑					↰	↰↑	↱
Traffic Volume (vph)	0	386	37	114	251	0	0	0	0	1170	1	133
Future Volume (vph)	0	386	37	129	251	0	0	0	0	1276	1	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5136	1599	3467	5136					1698	1702	1599
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5136	1599	3467	5136					1698	1702	1599
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	406	39	136	264	0	0	0	0	1343	1	140
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	0	0	0	70
Lane Group Flow (vph)	0	406	12	136	264	0	0	0	0	671	673	70
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		37.3	37.3	9.2	51.0					60.0	60.0	60.0
Effective Green, g (s)		37.3	37.3	9.2	51.0					60.0	60.0	60.0
Actuated g/C Ratio		0.31	0.31	0.08	0.42					0.50	0.50	0.50
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1596	497	265	2182					849	851	799
v/s Ratio Prot		c0.08		c0.04	0.05							
v/s Ratio Perm			0.01							0.40	0.40	0.04
v/c Ratio		0.25	0.02	0.51	0.12					0.79	0.79	0.09
Uniform Delay, d1		30.9	28.7	53.2	20.9					24.8	24.8	15.7
Progression Factor		1.00	1.00	1.25	1.26					1.00	1.00	1.00
Incremental Delay, d2		0.4	0.1	1.6	0.1					5.1	5.1	0.0
Delay (s)		31.3	28.8	68.1	26.4					29.9	29.9	15.7
Level of Service		C	C	E	C					C	C	B
Approach Delay (s)		31.1			40.6			0.0			28.5	
Approach LOS		C			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	17.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	119	825	44	101	462	33	60	3	136	17	1	50
Future Vol, veh/h	133	839	44	101	464	39	60	3	136	39	1	194
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	0	270	-	270	160	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	140	883	46	106	488	41	63	3	143	41	1	204

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	529	0	0	883	0	0	1572	1905	442	1445	1885	265
Stage 1	-	-	-	-	-	-	1163	1163	-	722	722	-
Stage 2	-	-	-	-	-	-	409	742	-	723	1163	-
Critical Hdwy	5.32	-	-	4.12	-	-	6.97	6.52	6.92	6.97	6.52	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.52	5.52	-	7.32	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	5.52	-	6.52	5.52	-
Follow-up Hdwy	3.11	-	-	2.21	-	-	3.66	4.01	3.31	3.66	4.01	3.91
Pot Cap-1 Maneuver	660	-	-	768	-	-	94	69	566	114	71	627
Stage 1	-	-	-	-	-	-	204	269	-	320	432	-
Stage 2	-	-	-	-	-	-	560	423	-	375	269	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	660	-	-	768	-	-	~ 47	47	566	61	48	627
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 47	47	-	61	48	-
Stage 1	-	-	-	-	-	-	161	212	-	252	372	-
Stage 2	-	-	-	-	-	-	325	365	-	217	212	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	1.7	128.4	35.8
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	47	457	660	-	-	768	-	-	61	590
HCM Lane V/C Ratio	1.344	0.32	0.212	-	-	0.138	-	-	0.673	0.348
HCM Control Delay (s)	$ 387.6	16.5	11.9	-	-	10.4	-	-	143	14.3
HCM Lane LOS	F	C	B	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	6	1.4	0.8	-	-	0.5	-	-	2.9	1.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	750	214	66	477	62	361	375	38	251	442	320
Future Volume (veh/h)	303	760	214	102	585	64	361	387	41	266	478	392
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	316	792	0	106	609	0	376	403	0	277	498	0
Adj No. of Lanes	2	3	0	2	3	0	2	2	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	369	2480	0	158	2167	0	441	802	359	339	697	312
Arrive On Green	0.21	0.97	0.00	0.05	0.42	0.00	0.13	0.22	0.00	0.10	0.20	0.00
Sat Flow, veh/h	3476	5305	0	3476	5305	0	3476	3574	1599	3476	3574	1599
Grp Volume(v), veh/h	316	792	0	106	609	0	376	403	0	277	498	0
Grp Sat Flow(s),veh/h/ln	1738	1712	0	1738	1712	0	1738	1787	1599	1738	1787	1599
Q Serve(g_s), s	10.5	0.9	0.0	3.6	9.3	0.0	12.7	11.8	0.0	9.4	15.6	0.0
Cycle Q Clear(g_c), s	10.5	0.9	0.0	3.6	9.3	0.0	12.7	11.8	0.0	9.4	15.6	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	369	2480	0	158	2167	0	441	802	359	339	697	312
V/C Ratio(X)	0.86	0.32	0.00	0.67	0.28	0.00	0.85	0.50	0.00	0.82	0.71	0.00
Avail Cap(c_a), veh/h	420	2480	0	165	2167	0	536	1206	540	434	1102	493
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.4	1.1	0.0	56.4	22.7	0.0	51.3	40.7	0.0	53.1	45.2	0.0
Incr Delay (d2), s/veh	13.9	0.3	0.0	9.7	0.3	0.0	10.8	0.5	0.0	9.2	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	0.4	0.0	1.9	4.5	0.0	6.8	5.9	0.0	4.9	7.9	0.0
LnGrp Delay(d),s/veh	60.3	1.4	0.0	66.1	23.1	0.0	62.1	41.2	0.0	62.3	46.6	0.0
LnGrp LOS	E	A		E	C		E	D		E	D	
Approach Vol, veh/h		1108			715			779			775	
Approach Delay, s/veh		18.2			29.4			51.3			52.2	
Approach LOS		B			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	62.4	19.7	27.9	17.2	55.1	16.2	31.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.7	40.8	18.5	37.0	14.5	32.0	15.0	40.5
Max Q Clear Time (g_c+I1), s	5.6	2.9	14.7	17.6	12.5	11.3	11.4	13.8
Green Ext Time (p_c), s	0.0	12.5	0.5	5.8	0.2	9.8	0.3	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	36.0
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	13.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	0	15	13	1	26	53	765	1	8	1067	5
Future Vol, veh/h	5	0	15	74	1	62	53	786	22	15	1129	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	210	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	5	0	16	81	1	68	58	864	24	16	1241	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1825	2280	623	1645	2271	444	1246	0	0	888	0	0
Stage 1	1276	1276	-	992	992	-	-	-	-	-	-	-
Stage 2	549	1004	-	653	1279	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	49	40	431	~ 66	40	564	560	-	-	765	-	-
Stage 1	178	238	-	265	324	-	-	-	-	-	-	-
Stage 2	490	320	-	425	237	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	38	35	431	~ 58	35	564	560	-	-	765	-	-
Mov Cap-2 Maneuver	38	35	-	~ 58	35	-	-	-	-	-	-	-
Stage 1	160	233	-	238	290	-	-	-	-	-	-	-
Stage 2	385	287	-	400	232	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	41.6	209.2	0.7	0.1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	560	-	-	120	58	455	765	-	-
HCM Lane V/C Ratio	0.104	-	-	0.183	1.402	0.152	0.022	-	-
HCM Control Delay (s)	12.2	-	-	41.6$	375.1	14.3	9.8	-	-
HCM Lane LOS	B	-	-	E	F	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.6	7.2	0.5	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	19	0	30	0	0	0	6	813	0	1	1020	3
Future Vol, veh/h	19	0	30	61	0	36	6	849	21	8	1028	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	160	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	21	0	33	68	0	40	7	943	23	9	1142	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1647	2142	573	1557	2131	483	1146	0	0	967	0	0
Stage 1	1162	1162	-	968	968	-	-	-	-	-	-	-
Stage 2	485	980	-	589	1163	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	66	49	465	77	50	532	611	-	-	714	-	-
Stage 1	209	269	-	275	333	-	-	-	-	-	-	-
Stage 2	535	328	-	464	269	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	60	48	465	70	49	532	611	-	-	714	-	-
Mov Cap-2 Maneuver	60	48	-	70	49	-	-	-	-	-	-	-
Stage 1	207	266	-	272	329	-	-	-	-	-	-	-
Stage 2	489	324	-	425	266	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	51.9	129.8	0.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	611	-	-	129	70	532	714	-	-
HCM Lane V/C Ratio	0.011	-	-	0.422	0.968	0.075	0.012	-	-
HCM Control Delay (s)	11	-	-	51.9	199.2	12.3	10.1	-	-
HCM Lane LOS	B	-	-	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.8	4.9	0.2	0	-	-

Intersection	
Int Delay, s/veh	21.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	8	153	55	16	97	89	699	26	31	855	11
Future Vol, veh/h	5	8	153	55	16	97	89	771	26	31	870	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	120	-	-	160	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	5	9	168	60	18	107	98	847	29	34	956	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1658	2101	484	1608	2093	438	968	0	0	876	0	0
Stage 1	1030	1030	-	1057	1057	-	-	-	-	-	-	-
Stage 2	628	1071	-	551	1036	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	65	52	531	71	52	569	714	-	-	773	-	-
Stage 1	252	311	-	242	302	-	-	-	-	-	-	-
Stage 2	440	298	-	489	309	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	31	43	531	~ 36	43	569	714	-	-	773	-	-
Mov Cap-2 Maneuver	31	43	-	~ 36	43	-	-	-	-	-	-	-
Stage 1	217	297	-	209	261	-	-	-	-	-	-	-
Stage 2	288	257	-	310	295	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.5	217.7	1.1	0.3
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	714	-	-	261	36	208	773	-	-
HCM Lane V/C Ratio	0.137	-	-	0.699	1.679	0.597	0.044	-	-
HCM Control Delay (s)	10.8	-	-	45.5$	572.2	45.1	9.9	-	-
HCM Lane LOS	B	-	-	E	F	E	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	4.7	6.5	3.4	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	1100	38	13	1056	60	18	10	1	141	14	506
Future Volume (veh/h)	240	1138	38	13	1236	60	18	10	1	141	14	506
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1881	1900	1900	1881	1881
Adj Flow Rate, veh/h	247	1173	39	13	1274	62	19	10	1	145	14	522
Adj No. of Lanes	1	3	0	1	3	0	0	1	0	0	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	274	2776	92	26	2035	99	210	102	9	474	43	526
Arrive On Green	0.31	1.00	1.00	0.03	0.81	0.81	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1792	5105	170	1792	5018	244	489	310	28	1265	131	1599
Grp Volume(v), veh/h	247	787	425	13	869	467	30	0	0	159	0	522
Grp Sat Flow(s),veh/h/ln	1792	1712	1851	1792	1712	1838	827	0	0	1396	0	1599
Q Serve(g_s), s	15.9	0.0	0.0	0.9	11.7	11.7	0.6	0.0	0.0	0.0	0.0	39.0
Cycle Q Clear(g_c), s	15.9	0.0	0.0	0.9	11.7	11.7	11.9	0.0	0.0	11.3	0.0	39.0
Prop In Lane	1.00		0.09	1.00		0.13	0.63		0.03	0.91		1.00
Lane Grp Cap(c), veh/h	274	1861	1006	26	1388	745	321	0	0	517	0	526
V/C Ratio(X)	0.90	0.42	0.42	0.50	0.63	0.63	0.09	0.00	0.00	0.31	0.00	0.99
Avail Cap(c_a), veh/h	411	1861	1006	82	1388	745	321	0	0	517	0	526
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	0.79	0.79	0.79	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.8	0.0	0.0	57.8	7.8	7.8	28.7	0.0	0.0	30.8	0.0	40.1
Incr Delay (d2), s/veh	15.2	0.6	1.2	11.0	1.7	3.1	0.1	0.0	0.0	0.3	0.0	37.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	0.2	0.3	0.5	5.6	6.3	0.8	0.0	0.0	4.1	0.0	22.6
LnGrp Delay(d),s/veh	56.0	0.6	1.2	68.8	9.5	11.0	28.8	0.0	0.0	31.1	0.0	77.1
LnGrp LOS	E	A	A	E	A	B	C			C		E
Approach Vol, veh/h		1459			1349			30			681	
Approach Delay, s/veh		10.2			10.6			28.8			66.4	
Approach LOS		B			B			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	69.7		44.0	22.8	53.2		44.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.5	61.5		39.5	27.5	39.5		39.5
Max Q Clear Time (g_c+I1), s	2.9	2.0		41.0	17.9	13.7		13.9
Green Ext Time (p_c), s	0.0	33.6		0.0	0.5	19.4		3.3

Intersection Summary			
HCM 2010 Ctrl Delay		21.4	
HCM 2010 LOS		C	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	1132	0	0	741	900	80	4	246	0	0	0
Future Volume (veh/h)	153	1151	0	0	831	990	80	4	265	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1881	1881	0	0	1881	1881	1900	1881	1900			
Adj Flow Rate, veh/h	158	1187	0	0	857	0	82	4	273			
Adj No. of Lanes	1	3	0	0	3	1	0	1	0			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	1	1	0	0	1	1	0	1	0			
Cap, veh/h	183	2696	0	0	1980	616	150	7	499			
Arrive On Green	0.20	1.00	0.00	0.00	0.13	0.00	0.40	0.40	0.40			
Sat Flow, veh/h	1792	5305	0	0	5305	1599	375	18	1249			
Grp Volume(v), veh/h	158	1187	0	0	857	0	359	0	0			
Grp Sat Flow(s),veh/h/ln	1792	1712	0	0	1712	1599	1642	0	0			
Q Serve(g_s), s	10.2	0.0	0.0	0.0	18.5	0.0	20.1	0.0	0.0			
Cycle Q Clear(g_c), s	10.2	0.0	0.0	0.0	18.5	0.0	20.1	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.23		0.76			
Lane Grp Cap(c), veh/h	183	2696	0	0	1980	616	657	0	0			
V/C Ratio(X)	0.86	0.44	0.00	0.00	0.43	0.00	0.55	0.00	0.00			
Avail Cap(c_a), veh/h	216	2696	0	0	1980	616	657	0	0			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	0.88	0.88	0.00	0.00	0.77	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	46.9	0.0	0.0	0.0	40.3	0.0	27.6	0.0	0.0			
Incr Delay (d2), s/veh	23.0	0.5	0.0	0.0	0.5	0.0	3.3	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.2	0.1	0.0	0.0	8.9	0.0	9.7	0.0	0.0			
LnGrp Delay(d),s/veh	69.9	0.5	0.0	0.0	40.8	0.0	30.9	0.0	0.0			
LnGrp LOS	E	A			D		C					
Approach Vol, veh/h		1345			857			359				
Approach Delay, s/veh		8.6			40.8			30.9				
Approach LOS		A			D			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		67.5			16.7	50.8		52.5
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5
Max Green Setting (Gmax), s		63.0			14.5	44.0		48.0
Max Q Clear Time (g_c+I1), s		2.0			12.2	20.5		22.1
Green Ext Time (p_c), s		26.2			0.1	15.7		2.5

Intersection Summary		
HCM 2010 Ctrl Delay		22.5
HCM 2010 LOS		C

HCM Signalized Intersection Capacity Analysis
8: SB Ramps & S Meadows Pkwy

1/18/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰↰	↑↑↑					↰	↰↑	↱
Traffic Volume (vph)	0	518	58	276	545	0	0	0	0	767	4	155
Future Volume (vph)	0	518	58	366	545	0	0	0	0	786	4	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5136	1599	3467	5136					1698	1703	1599
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5136	1599	3467	5136					1698	1703	1599
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	557	62	394	586	0	0	0	0	845	4	167
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	0	0	0	111
Lane Group Flow (vph)	0	557	25	394	586	0	0	0	0	422	427	56
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		48.0	48.0	18.5	71.0					40.0	40.0	40.0
Effective Green, g (s)		48.0	48.0	18.5	71.0					40.0	40.0	40.0
Actuated g/C Ratio		0.40	0.40	0.15	0.59					0.33	0.33	0.33
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2054	639	534	3038					566	567	533
v/s Ratio Prot		c0.11		c0.11	0.11							
v/s Ratio Perm			0.02							0.25	0.25	0.03
v/c Ratio		0.27	0.04	0.74	0.19					0.75	0.75	0.10
Uniform Delay, d1		24.2	21.9	48.4	11.3					35.5	35.6	27.6
Progression Factor		1.00	1.00	1.09	1.39					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.1	4.9	0.1					5.3	5.6	0.1
Delay (s)		24.6	22.1	57.7	15.8					40.8	41.2	27.7
Level of Service		C	C	E	B					D	D	C
Approach Delay (s)		24.3			32.7			0.0			38.8	
Approach LOS		C			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Appendix J-2

Attachment 4

Infrastructure Feasibility Analysis

WOOD RODGERS

February 8, 2016

Mr. Bill Gall, PE
City of Reno
PO Box 1900
Reno, NV 89501

Re: South Meadows III PUD Amendment (16th Revision)
Planning Unit K-1 – Infrastructure Feasibility

Dear Bill,

This letter is intended to serve as support for the proposed South Meadows III Amendment for a portion of Planning Unit K-1. This area encompasses an area of approximately 7 acres located North and East of the intersection of Double R Boulevard and South Meadows Parkway. The property sits adjacent to on the west side of Lake South Meadows.

The property is currently undeveloped but is nearly surrounded by developed properties. As part of previous improvements, utilities have been extended to the site in anticipation of future development. These utilities include sewer, water, reclaimed water, and storm drain. It is expected that the existing facilities will be sufficient to serve the land uses proposed with this Amendment. Of course, final determination of the adequacy of the existing facilities can only be determined once a specific land use is identified and a detailed analysis is performed.

SEWER

Sewer collection is provided by the City of Reno. Sewer flows from South Meadows are transmitted to the South Truckee Meadows Water Reclamation Facility (STMWRF) operated by Washoe County. A sewer lateral has been stubbed to the Amendment area. There is an 8" main that extends up a common driveway from the transmission main in Double R Boulevard. It is anticipated that the sewer extension will be sufficient to the serve the amendment area as it develops.

WATER

Water service is provided the Truckee Meadows Water Authority (TMWA). Water mains have been extended to the amendment area in multiple locations. A 10" water main extends east along common driveway from Double R Boulevard on the north. It is anticipated that the 10" main will be sufficient to serve the amendment area. It is possible that the water main may need to loop back to Double R Boulevard for pressure and redundancy purposes.

RECLAIMED WATER

STMWRF treats wastewater flows from the South Truckee Meadows area for use as reclaimed water for irrigation uses. Reclaimed water is distributed throughout the area and is used currently for common area landscaping. A 4" reclaimed water stubs has been provided to the amendment area. Reclaimed water will be used in the amendment area to irrigate common area landscaping.

STORM DRAIN

According the FEMA Flood Insurance Rate Map (FIRM) for the area, the Amendment area is outside of flood area designations with the exception of the existing drainage channels on the north and south sides of the property and the area within Lake South Meadows. Those area are designated Zone A.

The existing drainage channels were developed as part of the master plan infrastructure for the South Meadows PUD. Storm drainage from the Amendment area will discharge directly to these two channels. The channels both discharge to Lake South Meadows and ultimately drain the Steamboat Creek and the Truckee River.

In conclusion, the area included in the South Meadows III PUD Amendment (16th revision) has infrastructure extended to the site for use as the site develops. It is anticipated that the existing infrastructure will be adequate to serve development of the area, however, detailed analysis will be necessary once specific land use and development in identified. The attached Exhibit A identifies the boundary of the amendment area and shows the location of the stubs for the utilities as described above.

Please let me know if you have any questions regarding this letter.

Sincerely,
Wood Rodgers, Inc.

Steve Strickland, PE
Vice President

2/8/16

Exhibit A
Existing Utility Infrastructure
Planning Unit K-1
February, 2016

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
5440 Reno Corporate Drive Tel: 775.823.4068
Reno, NV 89511 Fax: 775.823.4066

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WASHOE COUNTY
RECORDER

OFFICE OF THE COUNTY RECORDER
LAWRENCE R. BURTNESS, RECORDER

1001 E. NINTH STREET
POST OFFICE BOX 11130
RENO, NEVADA 89520-0027
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LEGIBILITY NOTICE

The Washoe County Recorder's Office has determined that the attached document may not be suitable for recording by the method used by the Recorder to preserve the Recorder's records. The customer was advised that copies reproduced from the recorded document would not be legible. However, the customer demanded that the document be recorded without delay as the parties rights may be adversely affected because of a delay in recording. Therefore, pursuant to NRS 247.120 (3), the County Recorder accepted the document conditionally, based on the undersigned's representation (1) that a suitable copy will be submitted at a later date (2) it is impossible or impracticable to submit a more suitable copy.

By my signing below, I acknowledge that I have been advised that once the document has been microfilmed it may not reproduce a legible copy.

Amber Harmon
Signature

8-13-16
Date

Amber Harmon
Printed Name