

Rowland Hall

Steiner Campus 1418 East Sunnyside Avenue

PLANNED DEVELOPMENT APPLICATION MAY 2, 2012





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 - b. Preliminary Utility Report, dated April 10, 2012 (including location and types of utilities serving the location and a general drainage plan)
 - c. Traffic Impact Study, dated April 2, 2012
 - d. Soils and Subsurface Conditions (Geotechnical) report
 - e. Prior Zoning Paperwork
 - i. SLC Ordinance No.21 of 2006 Amending the East Bench Master Plan and Rezoning Property generally located at 1443 East Sunnyside Avenue
 - ii. SLC Resolution No.54 of 2010 A resolution extending the time period for satisfying the conditions set forth in Ordinance No. 21 of 2006
 - f. Rocky Mountain Power review approval of transmission line setbacks and conditions, dated April 26, 2012



PROJECT MISSION

Rowland Hall provides a distinguished education based on distinctive values to nearly 1,000 students. Every member of our educational community enjoys the benefits of the school's long tradition of uncompromising excellence. While we are proud of our past accomplishments, administrators and trustees continue to pursue the ongoing educational vitality and sustainable future of our venerable institution.

Rowland Hall's history proves that the true essence of a remarkable school has less to do with place or space than it does with the creativity and commitment of teachers and staff. Yet, the success of the McCarthey Campus has proven that inspiring spaces go hand in hand with inspirational learning. These plans for the new Steiner Campus for the Middle School and Upper School provide many opportunities for enhanced teaching and learning. With this plan, Rowland Hall is poised to reap the benefits of an extraordinary 23-acre urban campus where older and younger students engage together in interactive learning, where classrooms become outdoor laboratories for teaching and reflection, where athletes engage in healthy competition – and not want for gym or field space and practice times.

Improvements to sports facilities and fields are, in fact, a driving force behind this campus plan. Rowland Hall has never had adequate space for sports teams, indoors in gymnasiums or outdoors on fields. This plan provides both. Classrooms and labs will be designed to support technology and promote the experiential, project-based learning required by our progressive tradition. The new cafeteria will be a place for "seeing and being seen," where students will enjoy light and airy surroundings. A fine arts suite will be designed to enhance the high value Rowland Hall has always placed on arts education and performance. EHDD Architecture's master plan evokes a distinct connection with the campus now enjoyed by the school's youngest students. While uniting Rowland Hall's four divisions, the plan preserves the unique identity of each.

In keeping with Rowland Hall's mission and commitment to preparing young people to live ethical lives, the concept of global citizenship is also a driving principle in the design of a new facility. The Board of Trustees has charged EHDD Architecture with designing a state-of-the-art facility that will serve as a teaching tool while maximizing energy efficiency in a fiscally responsible way.

Rowland Hall has been and remains a wonderful place to go to school. While it is

important that each division addresses the distinct developmental needs of children, having all of the divisions on one campus opens up tremendous possibilities for whole school activities, enhanced mentoring programs, and a true sense of community across the entire school.

The dream of uniting the nearly 1,000 students of Rowland Hall into one vital and vibrant learning community is at the very beginning stages of becoming reality. Not since Rowland Hall's founders first wrestled with the issue of limited space for the school's children has momentum been as favorably directed toward accomplishing this long-held goal.

PROJECT DESCRIPTION

Please describe your project

This project includes the construction of facilities for a middle and upper school (Steiner Campus) for Rowland Hall adjacent to their existing lower school (McCarthy Campus). The total planned gross square footage is 190,792 GSF to be built in phases. Phase 1 includes soccer fields, limited parking, storage shed (800 GSF) and a site access drive, plus rough grading for the entire site. Phase 2 would include the Physical Education building (44,924 GSF) and adjacent sitework and parking. Phase 3 would include the main academic building (145,068 GSF) – including classrooms, administrative offices, library, arts facilities, cafeteria and an auditorium, plus additional parking and sitework.

The overall project will target LEED Gold certification at a minimum.

List the primary street access(es) to this property

Sunnyside Avenue is the primary street access. Guardsman Way is a secondary street access.

What are the land uses adjacent to the property?

The contiguous adjacent land uses include East High School, the Carmen Pingree School, and Mt. Olivet Cemetary. Across Sunnyside Avenue is a residential neighborhood.

Have you discussed the project with nearby property owners?

Not in the past 5 years. When an initial round of master planning occurred in 2007, there were some discussions with the residential neighbors across Sunnyside.

What are the anticipated operating and delivery hours associated with the proposed use?

We anticipate that use of the fields will be from 9:00 morning until dusk (there will be no electric lighting for the fields). Once the academic campus is built it will probably be in use starting at 7:30 in the morning typically.

How many parking stalls will you provide as part of the project? The project provides 232 parking stalls, justified as follows:

	Code Requirement	Occupant Load	Per Code	Owner Requirement
For Staff	1 space : 3 persons	85	29	85
For High School Students	1 space : 10 students	300	30	137
Visitors	none	7	0	10
TOTAL			59	232

The addition of parking would follow the phases of construction. Phase 1 would include 10 spaces including. Phase 2 would include 69 spaces. Phase 3 would include all 232 spaces. All three phases would include the required number of accessible and van spaces suitable to that phase.

How many employees do you expect to have on-site during the highest shift? 85 faculty and staff.

If applicable, how many seats will you have? N/A

What is the gross floor area of the proposed building(s)? 190,792 GSF. See Project Description for further discussion.

What is the schedule for the development of phases of construction? Indicate the approximate beginning and completion of each phase. PHASE I construction: April 1, 2013 - August 31, 2013 PHASE II construction: June 1, 2014 - August 31, 2015 PHASE III construction: March 1, 2016 - August 31, 2017

Common open space shall be provided in each phase at the same percentage, at minimum, as will be provided in the final development. Understood and provided for.

Note on Zoning

Zoning review by Ken Brown dated 12/1/2011 (DRT2011-00407) identified the site to be within the CG zone. Previous definition from 2007 showed southern portion of site to be Open Space zone while the northern portion was Institutional zone. This impacts setbacks and building height requirements as well as other items. For now our site plan conforms to the I and OS zoning requirements.

DISCUSSION OF PLANNED DEVELOP-MENT OBJECTIVES & COMPATIBILITY

Rowland Hall, Steiner Campus

Rowland Hall's is seeking Planned Development approval in order to ensure that all project requirements - both those of the City and the Owner - can be met on a constrained site to be developed in a phased sequence. The best time to incorporate ideas and requirements in at a schematic design level and thus the Owner desires to confirm compliance with any and all requirements at this pre-building permit stage.

The "Standards for Planned Development" are being met as follows:

- Α. Planned Development Objective: Several of the objectives are achieves by the proposed design, including utilization of "green" building techniques in development. The project will seek LEED Gold certification at a minimum.
- Master Plan and Zoning Ordinance Compliance: Β. The proposed project went through a thorough zoning review by the City in 2007 to confirm compliance with the East Bench Master Plan. Ordinance No.21 of 2006 (included with this submittal) amended the Master Plan and Zoning of the site to allow the uses proposed.
- C. Compatibility:

The proposed design is indeed compatible with the character of the site and surroundings and will serve as a positive landmark for the neighborhood and city. Traffic patterns will not be adversely impacted. Pedestrian circulation around and through the site will be significantly improved with the construction of the trail system required in the original rezoning. Utilities will be provided as required without adversely impacting other properties. Landscaping and thoughtful grading will buffer the surrounding community from any adverse impacts of development. Finally the intensity, size and scale of the proposed buildings are carefully considered and work with the significant grade change across the site to minimize bulk while still achieving the requirements of the Owner's project program.

- Landscapina: No valuable landscaping currently exists on site. New landscaping will enhance the property and be drought tolerant.
- Ε. Preservation

D.

The only significant feature for preservation is the view from Sunnyside of downtown. Preservation of this view corridor was considered in the siting of site features.

Compliance with Other Applicable Regulations: F. The proposed development complies with all known codes and requirements.

MAY 02, 2012 5







Zoned Open Space



SITE ZONING

The southern portion of the site will be zoned Open Space. This part of the site will only be used for recreational purposes such as soccer and practice fields. This area will have no lighting to minimize the impact on the surrounding neighborhood and will be publicly accessible a minimum of 5 hours a week.

The northern portion of the site will be zoned Institutional. Within the Institutional zone, 40% of the land must remain open space with no parking or permanent buildings per Salt Lake City's zoning code. This requirement, combined with the 4.35 acres of open space to the south of the site, provides for a minimum of 60% open space preserved across the entire site.

Zoning also requires a 20' side setback and a 25' rear setback within the Institutional Zone. A 20' side setback and a 30' front setback are required in the southern Open Space zone. No setback is required between the site's two zones; the setback is maintained however, between the existing Rowland Hall Lower School Campus and the new site.

Zoned Institutional



ROWLAND HALL I SITE PLAN

SITE PLAN

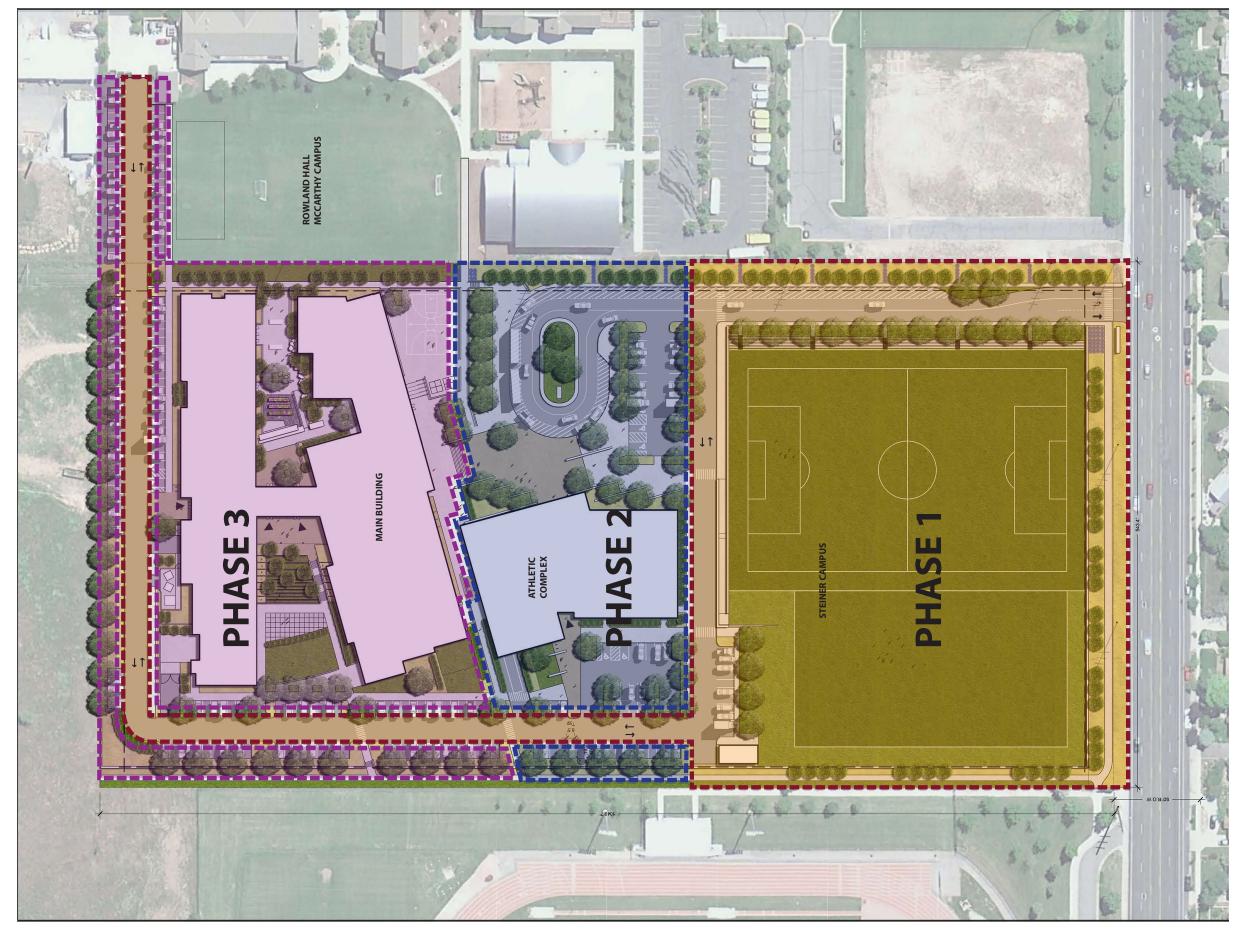


MAIN BUILDING AREA ATHLETIC COMPLEX AREA TOTAL BUILT AREA

145,929 GSF <u>45,000 GSF</u> 190,929 GSF

MAIN BUILDING AREA ATHLETIC COMPLEX AREA TOTAL BUILT FOOTPRINT 71,725 GSF <u>24,606 GSF</u> 96,331 GSF

SCALE 1" =100'



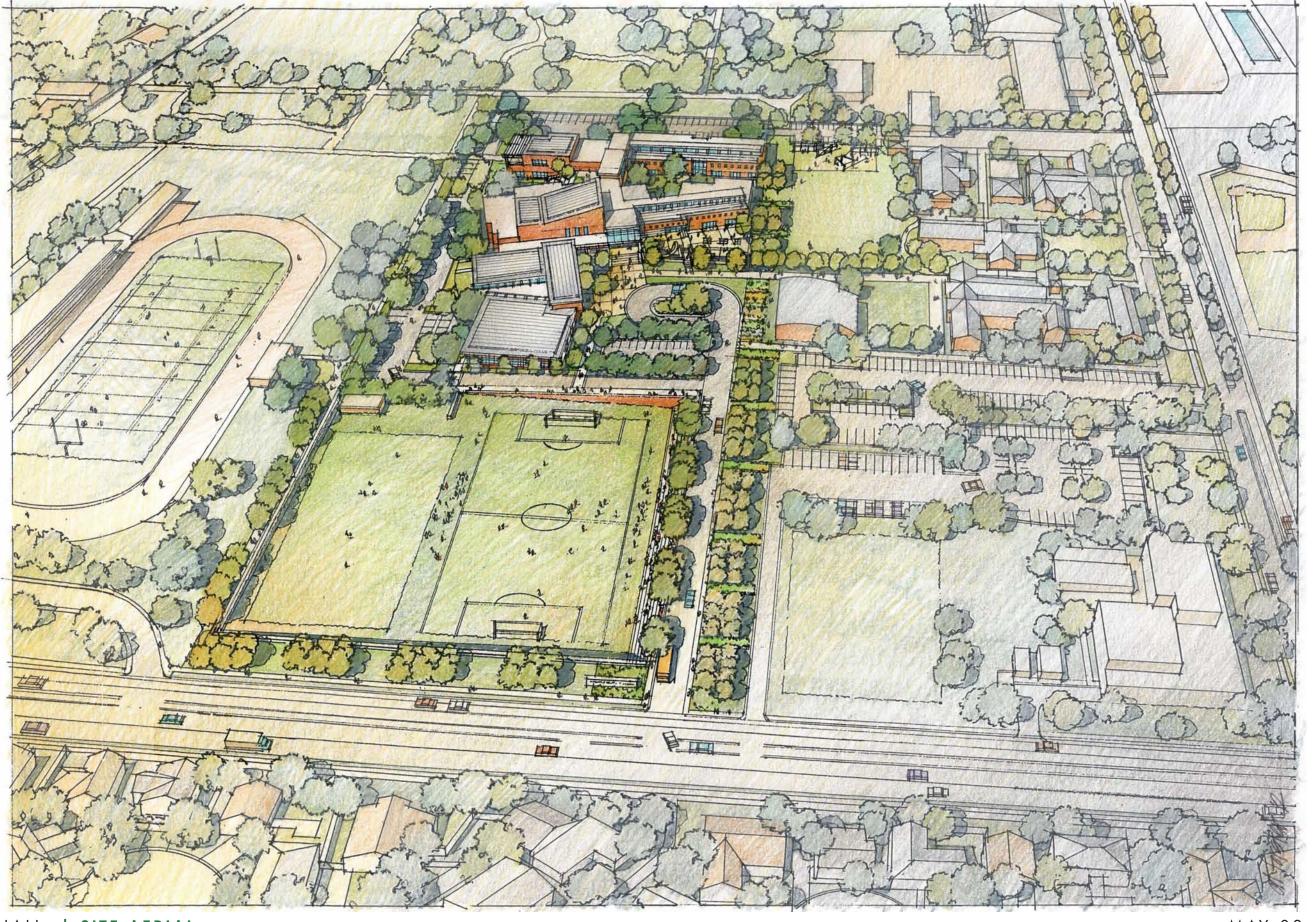
ROWLAND HALL





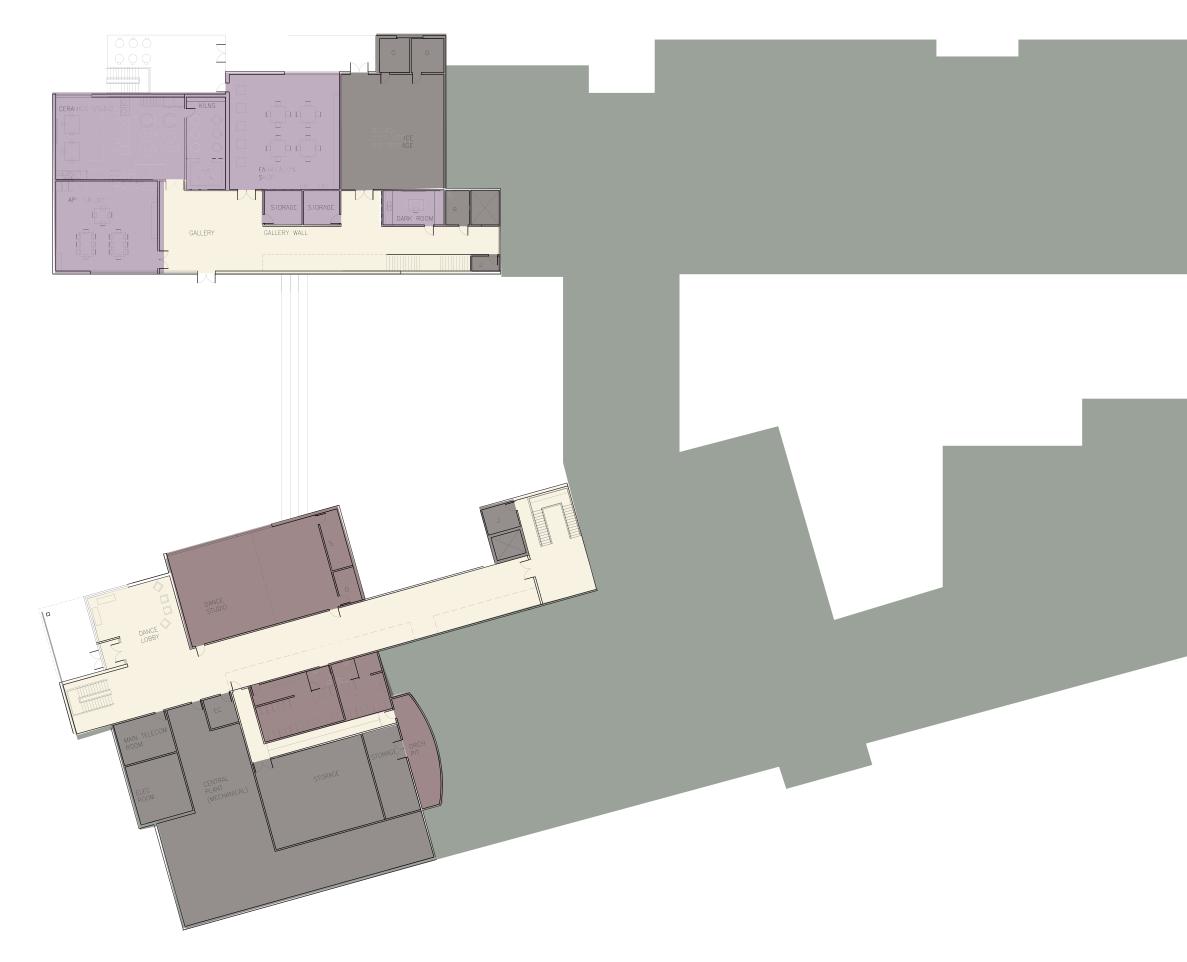
SCALE 1" =100'





ROWLAND HALL I SITE AERIAL

SITE AERIAL



MAIN BUILDING FLOOR PLAN LEVEL 1

LEVEL 1 AREA 22,377 SF



1/32'' = 1'-0''



ROWLAND HALL I FLOOR PLANS AND ELEVATIONS/RENDERINGS

MAIN BUILDING FLOOR PLAN LEVEL 2

LEVEL 2 AREA 71,545 SF

key

upper school
middle school
meeting rooms
library
commons
administration/faculty support
performing arts
physical education
rowmark
food service
student support
restrooms/service
circulation
fine arts

technology



MAIN BUILDING FLOOR PLAN LEVEL 3

LEVEL 3 AREA 51,146 SF

TOTAL MAIN BUILDING AREA 145,068 SF

ke	У
	upper school
	middle school
	meeting rooms
	library
	commons
	administration/faculty support
	performing arts
	physical education
	rowmark
	food service
	student support
	restrooms/service
	circulation
	fine arts
	technology

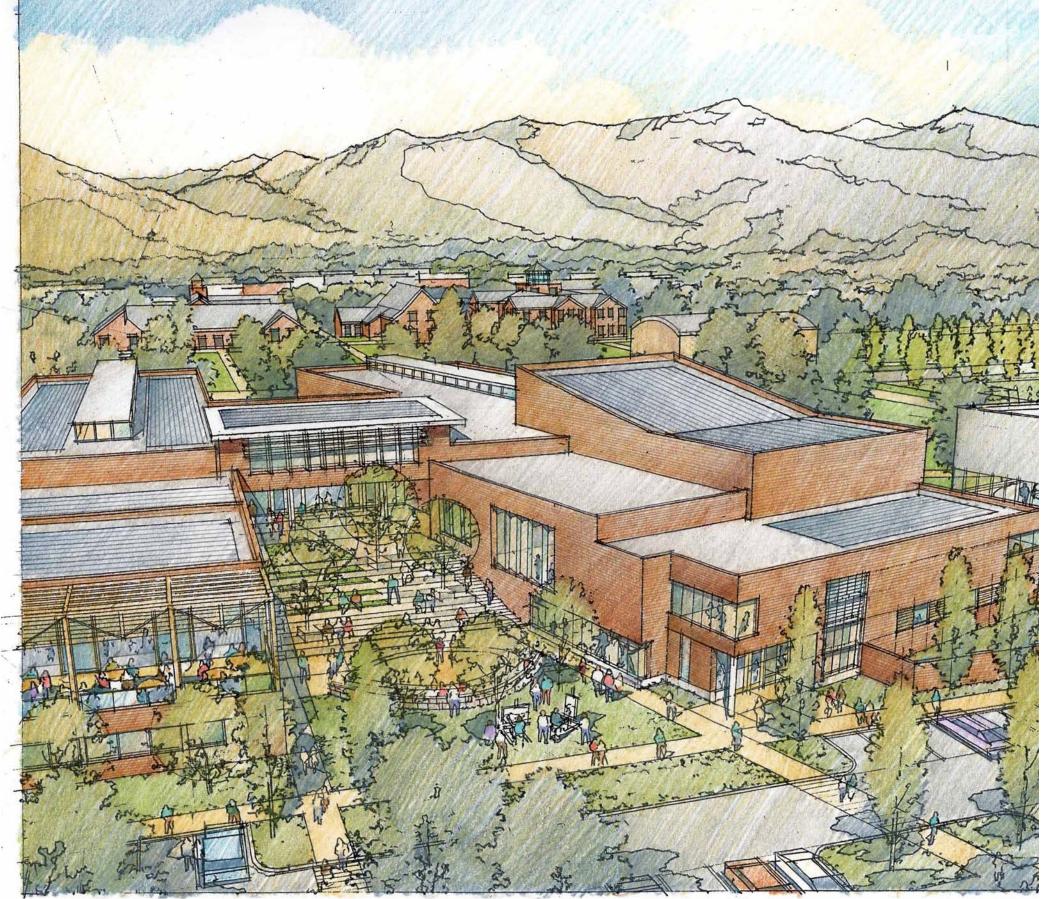
1/32'' = 1'-0''



ROWLAND HALL I FLOOR PLANS AND ELEVATIONS/RENDERINGS

MAIN BUILDING ENTRY RENDERING

MAIN BUILDING PERFORMANCE COURT RENDERING



ROWLAND HALL I FLOOR PLANS AND ELEVATIONS/RENDERINGS



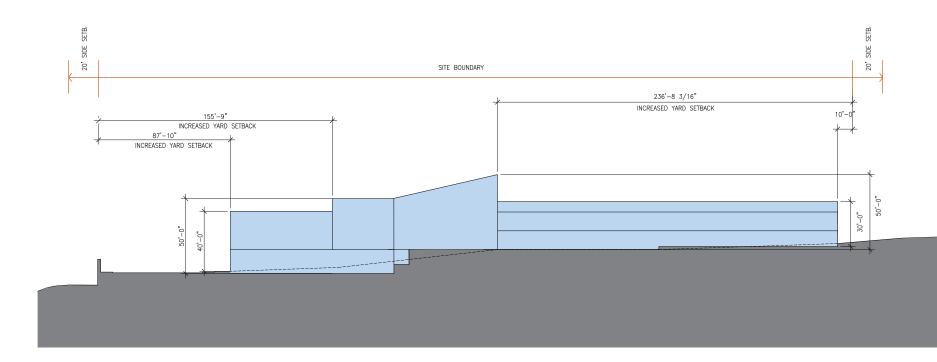
LEVEL 1	LEVEL 2	LEVEL 3
23,337 SF	15,750 SF	5,837 SF

TOTAL ATHLETIC COMPLEX AREA 44,924 GSF

1/32" = 1'-0" MAY 02, 2012 16



ATHLETIC COMPLEX RENDERING

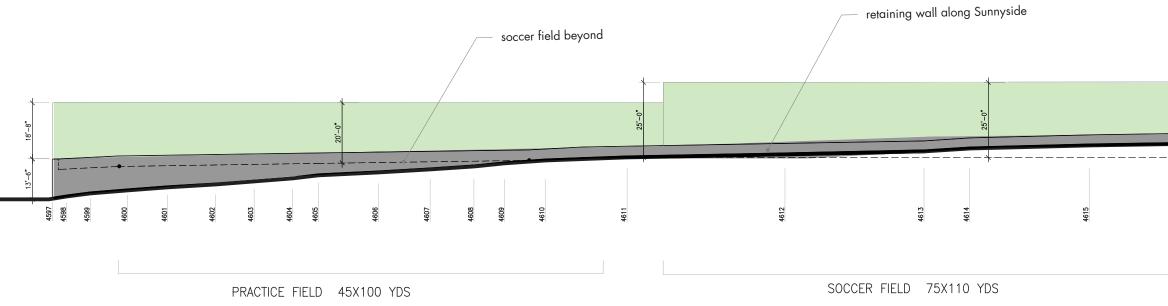


ROWLAND HALL I CONCEPTUAL BUILDING SECTION AND HEIGHTS

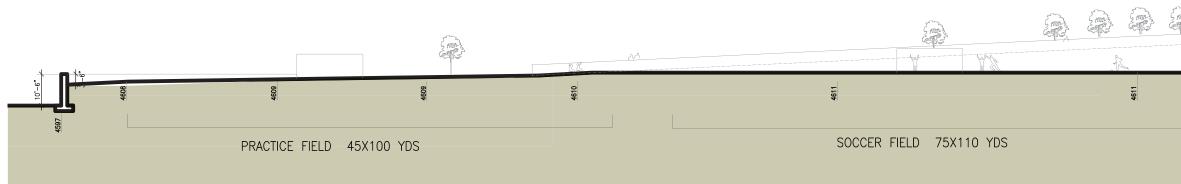
BUILDING HEIGHT JUSTIFICATION SECTION

1/32" = 1'-0" MAY 02, 2012 18

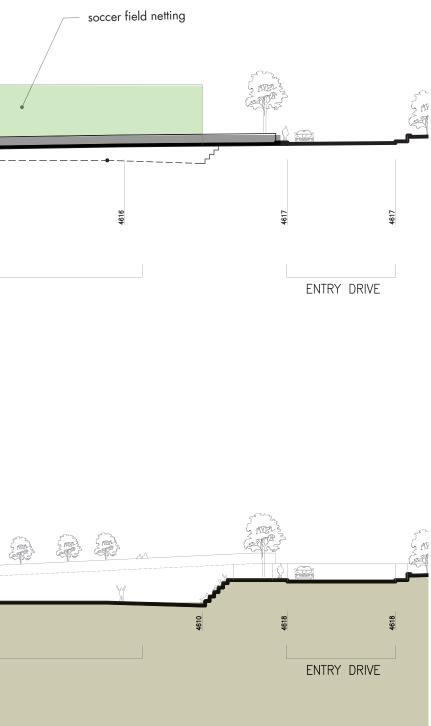
CONCEPT ELEVATION/SECTION OF FIELDS FROM SUNNYSIDE AVENUE



SITE SECTION B - THROUGH FRONT SETBACK ALONG SUNNYSIDE AVENUE



SITE SECTION A - THROUGH FIELDS





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STEWART TITLE GUARANTY COMPANY COMMITMENT FOR TITLE INSURANCE NO. 30119 [THIRD AMENDED] ISSUED BY LANDMARK TITLE COMPANY UNDER ORDER NO. 30119, PREPARED FOR:

CARY JONES **SNELL & WILMER** GATEWAY TOWER WEST 15 WEST SOUTH TEMPLE STREET, SUITE 1200 SALT LAKE CITY, UT 84101 EMAIL: cjones@swlaw.com

cc: GUY P. KROESCHE
STOEL RIVES, LLP
201 SOUTH MAIN STREET, SUITE 1100
SALT LAKE CITY, UT 84111
EMAIL: gpkroesche@stoel.com

- cc: JENNIFER DEVLIN EHDD ARCHITECTURE 500 TREAT AVENUE SAN FRANCISCO, CA 94110 EMAIL: J.Devlin@ehdd.com
- cc: CLINT PEATROSS
 BUSH & GUDGELL
 525 SOUTH 300 EAST
 SALT LAKE CITY, UT 84111
 EMAIL: cpeatross@bushandgudgell.com
- cc: JEFF JENSEN
 LANDMARK TITLE COMPANY
 675 EAST 2100 SOUTH, SUITE 200
 SALT LAKE CITY, UT 84106
 EMAIL: jeff@landmarktitleutah.com

FOR REFERENCE PURPOSES: MOUNT OLIVET CEMETERY ASSOCIATION ROWLAND HALL-ST. MARK'S SCHOOL APPROX. 1443 E. SUNNYSIDE AVE - SALT LAKE CITY, UT COMMITMENT FOR TITLE INSURANCE ISSUED BY



STEWART TITLE GUARANTY COMPANY, A Texas Corporation, herein called the Company, for a valuable consideration, hereby commits to issue its policy or policies of title insurance, as identified in Schedule A, in favor of the proposed Insured named in Schedule A, as owner or mortgagee of the estate or interest covered hereby in the land described or referred to in Schedule A, upon payment of the premiums and charges therefor; all subject to the provisions of Schedules A and B and to the Conditions and Stipulations hereof.

This Commitment shall be effective only when the identity of the proposed Insured and the amount of the policy or policies committed for have been inserted in Schedule A hereof by the Company, either at the time of the issuance of this Commitment or by subsequent endorsement.

This Commitment is preliminary to the issuance of such policy or policies of title insurance and all liability and obligations hereunder shall cease and terminate six months after the effective date hereof or when the policy or policies committed for shall issue, whichever first occurs, provided that the failure to issue such policy or policies is not the fault of the Company.

Signed under seal for the Company, but this Commitment shall not be valid or binding until it bears an authorized Countersignature.

IN WITNESS WHEREOF, Stewart Title Guaranty Company has caused its corporate name and seal to be hereunto affixed by its duly authorized officers on the date shown in Schedule A.

Chairman of

Countersigned by:

Authorized Signatory

LANDMARK TITLE COMPANY Company

SALT LAKE CITY, UTAH City, State





wolm S.



Plaza 7·21 • 675 East 2100 South, Suite 200 Salt Lake City, Utah 84106

CONDITIONS AND STIPULATIONS

- 1. The term mortgage, when used herein, shall include deed of trust, trust deed, or other security instrument.
- 2. If the proposed Insured has or acquires actual knowledge of any defect, lien, encumbrance, adverse claim or other matter affecting the estate or interest or mortgage thereon covered by this Commitment other than those shown in Schedule B hereof, and shall fail to disclose such knowledge to the Company in writing, the Company shall be relieved from liability for any loss or damage resulting from any act of reliance hereon to the extent the Company is prejudiced by failure to so disclose such knowledge. If the proposed Insured shall disclose such knowledge to the Company, or if the Company otherwise acquires actual knowledge of any such defect, lien, encumbrance, adverse claim or other matter, the Company at its option may amend Schedule B of this Commitment accordingly, but such amendment shall not relieve the Company from liability previously incurred pursuant to paragraph 3 of these Conditions and Stipulations.
- 3. Liability of the Company under this Commitment shall be only to the named proposed Insured and such parties included under the definition of Insured in the form of policy or policies committed for and only for actual loss incurred in reliance hereon in undertaking in good faith (a) to comply with the requirements hereof, or (b) to eliminate exceptions shown in Schedule B, or (c) to acquire or create the estate or interest or mortgage thereon covered by this Commitment. In no event shall such liability exceed the amount stated in Schedule A for the policy or policies committed for and such liability is subject to the insuring provisions, the Conditions and Stipulations, and the Exclusions from Coverage of the form of policy or policies committed for in favor of the proposed Insured which are hereby incorporated by reference and are made a part of this Commitment except as expressly modified herein.
- 4. Any action or actions or rights of action that the proposed Insured may have or may bring against the Company arising out of the status of the title to the estate or interest or the status of the mortgage thereon covered by this Commitment must be based on and are subject to the provisions of this Commitment.



All notices required to be given the Company and any statement in writing required to be furnished the Company shall be addressed to it at P.O. Box 2029, Houston, Texas 77252.

COMMITMENT SCHEDULE A

Order No. 30119 1. Effective Date: March 1, 2007 at 6:59 a.m.	Commitment	No. 30119 [THIRD AMENDED]
2. Policy or Policies to be issued:		
A. ALTA OWNER'S POLICY [10-17-92 Form] Proposed Insured: ROWLAND HALL-ST. MARK'S SCHOOL	AMOUNT \$TO BE DETERMINED	PREMIUM \$TO BE DETERMINED
B. ALTA LOAN POLICY [10-17-92 Form] Proposed Insured:	amount \$	PREMIUM \$
C. ENDORSEMENTS: TO BE DETERMINED		ȘT B D

- 3. The estate or interest in the land described or referred to in this Commitment and covered herein is: FEE SIMPLE
- 4. Title to said estate or interest in said land is at the effective date hereof vested in: MOUNT OLIVET CEMETERY ASSOCIATION
- 5. The land referred to in this Commitment is described as follows: situated in **Salt Lake** County, State of Utah, to-wit:

[SEE LEGAL DESCRIPTION CONTINUED ATTACHED HERETO AND MADE A PART HEREOF] (Continued)

INQUIRIES SHOULD BE DIRECTED TO:

Jeff Jensen- Escrow Officer (801)467-4111Janette Gull- Title Officer (801) 467-4111

STEWART TITLE GUARANTY COMPANY Issued by LANDMARK TITLE COMPANY, AGENT



SCHEDULE A

Order No. 30119

Commitment No. 30119 [THIRD AMENDED]

LEGAL DESCRIPTION CONTINUED

A PARCEL OF LAND BEING IN THE NORTHWEST QUARTER OF SECTION 9, TOWNSHIP 1 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN, AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING at the Southwest corner of THE ARMORY 4 LOT MINOR SUBDIVISION (the plat of which was filed in Book "2000P" of Plats at Page 282 of the Official Records of the Salt Lake County Recorder), said corner being located South 89°59'50" West 775.746 feet from the First Veterans Administration Monument, and said corner is also located North 89°59'50" East 10.60 feet from the U.S.A. Monument No. 3 in Section 9, Township 1 South, Range 1 East, Salt Lake Base and Meridian, and said corner is also located North 89°59'50" East 89.21 feet and North 0°02'01" West 58.20 feet from the Salt Lake City Survey Monument in the intersection of Amanda Avenue and Sunnyside Avenue, and running thence South 89°59'50" West along the North right of way line of Sunnyside Avenue 543.35 feet; thence North 0°00'10" West 1049.71 feet; thence North 89°59'50" East 542.78 feet to the Northwest corner of said ARMORY 4 LOT MINOR SUBDIVISION (said corner is also the Northwest corner of AMENDED PLAT OF PARCELS 2 AND 3 OF THE ARMORY 4 LOT MINOR SUBDIVISION, filed in Book "2001P" of Plats at Page 221 of the Official Records of the Salt Lake County Recorder); thence South 0°02'01" East along the West line of said Subdivisions 1049.71 feet to the point of BEGINNING.

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SCHEDULE B-SECTION 1

Order No. 30119

Commitment No. 30119 [THIRD AMENDED]

The following requirements must be met and completed to the satisfaction of the Company before its policy of title insurance will be issued:

- 1. Show that restrictions or restrictive covenants have not been violated.
- 2. Payment to or for the account of the grantors or mortgagors of the full consideration for the estate or interest, mortgage or lien to be insured.
- 3. Furnish proof of payment of all bills for labor and material furnished or to be furnished in connection with improvements erected or to be erected.
- 4. Pay all general and special taxes now due and payable.
- 5. Disposition of any defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records, or attaching subsequent to the effective date hereof, but prior to the date the proposed insured acquires of record for value the estate or interest or mortgage thereon covered by this Commitment.
- 6. Any additional documentation requested by LANDMARK TITLE COMPANY and/or its underwriter.
- 7. In the event that Exception No. 4 of Schedule B-Section 2 of this Commitment is to be deleted from any policy to be issued hereunder, the Company may require the submission of a current survey complying with the Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys as adopted by ALTA, ACSM, and NSPS. The parties to which said survey is certified should include Landmark Title Company and Stewart Title Guaranty Company, its underwriter. The Company hereby reserves the right to make amendments to this Commitment based upon any matters disclosed by such a survey, when same is delivered to the Company for an examination thereof. Such amendments may be in the form of additional Special Exceptions and/or revisions to the description contained in Paragraph 5 of Schedule "A".
- 8. [INTENTIONALLY DELETED BY THE COMPANY TO PRESERVE NUMBERING.]
- 9. This Commitment is subject to approval by Stewart Title Guaranty Company, and any additional limitations, requirements, and/or exceptions made by Stewart Title Guaranty Company. (Continued)



SCHEDULE B-SECTION 1 CONTINUED

Order No. 30119

Commitment No. 30119 [THIRD AMENDED]

REQUIREMENTS CONTINUED

10. Submit evidence that ROWLAND HALL-ST. MARK'S SCHOOL, MOUNT OLIVET CEMETERY ASSOCIATION, and MT. OLIVET CEMETERY ASSOCIATION are properly created entities capable of holding title to real property under the laws of the State of Utah, together with evidence of the authority of any person or persons executing documents on behalf of said entities. +++

NOTE: Judgments have been searched in the names of ROWLAND HALL-ST. MARK'S SCHOOL, MOUNT OLIVET CEMETERY ASSOCIATION, and MT. OLIVET CEMETERY ASSOCIATION, and any not satisfied of record, which in the opinion of the Company would constitute liens against the subject land, are set forth in Schedule B-Section 2 herein.

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Order No. 30119

Commitment No. 30119 [THIRD AMENDED]

1

SCHEDULE B - SECTION 2

The policy or policies to be issued will contain exceptions to the following unless the same are disposed of to the satisfaction of the Company:

- 1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records. Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
- 2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.
- 3. Easements, liens or encumbrances, or claims thereof, which are not shown by the public records.
- 4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
- 5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not such matters are shown by the public records.
- 6. Any lien, or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the public records.
- 7. Any adverse claim based upon the assertion that (a) some portion of the land forms the bed or bank of a navigable river or lake, or lies below the mean high water mark thereof; (b) the boundary of the land has been affected by a change in the course or water level of a navigable river or lake; (c) the land is subject to water rights, claims or title to water and to any law or governmental regulation pertaining to wetlands.
- 8. The lien of all general real and personal property taxes for the year 2007 and thereafter, not yet due or payable. [NOTE: At the Effective Date hereof, all of the subject land, except the East 10.60 feet (for which there is no Sidwell Number assigned) is assessed by Salt Lake County as a part of Tax Parcel No. 16-09-130-001.]
- 9. [Affects the East 10.60 feet of the subject land] Any loss or claim arising from the fact that property taxes were not assessed by Salt Lake County for the year 2006 and prior years. Any assessments and/or charges made by Salt Lake County as a result of a review of the tax assessment by the Salt Lake County Assessor and/or the Salt Lake County Board of Equalization for the year 2007 and prior years are also hereby excepted.

The Company further excepts any loss or claim arising from the fact that East 10.60 feet of the subject land does not appear on the current Salt Lake County ownership assessment rolls or on the Salt Lake County ownership plats. (Continued)



SCHEDULE B

Order No. 30119

Commitment No. 30119 [THIRD AMENDED]

EXCEPTIONS CONTINUED

- 10. Said property lies within the boundaries of Salt Lake City, and is subject to any and all charges and assessments thereof. [The records of the Salt Lake City Treasurer indicate there are no outstanding charges or assessments at the Effective Date hereof.]
- 11. Any rights, easements, interests or claims which arise by reason of the following matters disclosed by that certain "Boundary Survey", dated May 2, 2003 [bearing a latest certificate date of August 12, 2003], prepared by BUSH & GUDGELL, INC., as Job No. 46625, certified by ROBERT BYRON JONES, License No. 127636, and filed in the office of the Salt Lake County Surveyor as Survey No. S2004-12-0989:
 - (a) Metal power transmission poles, related power lines, and any appurtenant facilities.

The Company further excepts any rights, easements, interests, claims or any other facts which a correct survey made subsequent to August 12, 2003 would disclose. [NOTE: REFERENCE IS HEREBY MADE TO REQUIREMENT ITEM NO. 7 OF SCHEDULE B-SECTION 1 HEREOF.]

- 12. [INTENTIONALLY DELETED BY THE COMPANY]
- 13. Water rights, claims or title to water, whether or not such matters are shown by the public records.
- 14. [Affects all of the subject land, except the East 10.60 feet thereof] The following recital set forth in that certain Deed dated February 10, 1909, recorded March 17, 1909 as Entry No. 246923, in Book 8-F of Deeds, at Pages 58-59 of the Official Records, wherein the UNITED STATES OF AMERICA is the Grantor, and the MOUNT OLIVET CEMETERY ASSOCIATION is the Grantee, to-wit:

"To Have And To Hold the above-described premises unto and to the use of the said Mount Olivet Cemetery Association forever as a cemetery for the burial of the dead; Provided, That when the said premises shall cease to be used for such purpose they shall revert to the United States."

- 15. [Affects the East 10.60 feet of the subject land] The conditions and provisions recited in that certain Quitclaim Deed dated September 4, 1952, recorded September 18, 1952 as Entry No. 1300382, in Book 954, at Pages 473-474 of the Official Records. Said Quitclaim Deed being executed by the UNITED STATES OF AMERICA, acting through the Administrator of Veterans Affairs, and running to the MOUNT OLIVET CEMETERY ASSOCIATION.
- 16. [INTENTIONALLY DELETED BY THE COMPANY]

(Continued)



SCHEDULE B

Order No. 30119

Commitment No. 30119 [THIRD AMENDED]

EXCEPTIONS CONTINUED

17. A perpetual easement and right of way for the erection and continued maintenance, repair, alteration, and replacement of electric transmission, distribution and telephone circuits, and two guy anchors and ten poles, with the necessary guys, stubs, cross-arms and other attachments thereon, or affixed thereto, for the support of said circuits, together with other recited terms and conditions, as created in favor of UTAH POWER & LIGHT COMPANY, by Pole Line Easement recorded August 20, 1955 as Entry No. 1442555, in Book 1230, at Page 354 of the Official Records, through and across said property as follows:

Beginning at fence on the south boundary line of grantor's land at a point 55 feet north and 90 feet east, more or less, from the Salt Lake City Monument at the intersection of Amanda Avenue and Sunnyside Avenue, thence North 0°05' West 2445 feet, more or less, being two feet west from and parallel to the east boundary fence of Mt. Olivet Cemetery, thence North 5°56' West 244 feet to fence on the north boundary line of said land and south right of way line of Fifth South Street and being in Mt. Olivet Cemetery.

- 18. [INTENTIONALLY DELETED BY THE COMPANY]
- 19. Rights, interests and easements of any and all persons who have purchased burial lots or parts thereof located within the herein described land, together with any statutory rights and powers of the United States of America, the State of Utah, the County of Salt Lake, and the City of Salt Lake to regulate and control the use of the premises in question as a cemetery and also to regulate and control the interment or removal of dead bodies in or from the premises in question or any building located thereon. The Company further excepts any legal limitations imposed by the State of Utah in connection with land dedicated for cemetery purposes.
- 20. [INTENTIONALLY DELETED BY THE COMPANY]
- 21. [INTENTIONALLY DELETED BY THE COMPANY]
- 22. An apparent waterline running North and South within said land as disclosed by the Salt Lake City Map of Watermains.

(Continued)



SCHEDULE B

Order No. 30119

Commitment No. 30119 [THIRD AMENDED]

EXCEPTIONS CONTINUED

23. A right of way and easement twenty feet (20') in width to construct, maintain, operate, repair, inspect, protect, remove and replace utilities, together with other recited terms and conditions, as created in favor of the UNIVERSITY OF UTAH by an unrecorded Easement, dated June 23, 1989, executed by THE STATE ARMORY BOARD, as Grantor, the existence of which is disclosed by a copy of said instrument provided to the Company, through and across said property as follows:

Land of the Grantor located in Section 9, Township 1 South, Range 1 East, Salt Lake Base and Meridian; the centerline of said right of way and easement shall extend through and across the above described land and premises (10) feet Easterly of and parallel to the Westerly fenceline of Grantor's Property as follows, to-wit: Beginning at a point on the North property line of the Grantor's property, which point is located North 01°05'31" East 1049.89 feet from U.S. Monument #3; said point also being North 89°59'39" West 1279.53 feet from S.L.C. Monument #21; running thence South 01°53'11" West 386.93 feet; thence South 01°10'15" East 663.15 feet to a point on the South Property line of Grantor, said point being North 89°59'50" East 20.82 feet from U.S. Monument #3, said point being the terminus of the described centerline.

[NOTE: Said instrument appears to contain an incorrect description.]

- 24. [INTENTIONALLY DELETED BY THE COMPANY]
- 25. [INTENTIONALLY DELETED BY THE COMPANY]
- 26. [INTENTIONALLY DELETED BY THE COMPANY]
- 27. The terms, conditions and restrictions set forth in that certain **unrecorded** Real Estate Acquisition Agreement, dated as of March 13, 2003, by and between ROWLAND HALL-ST. MARK'S SCHOOL, a Utah nonprofit corporation, and MOUNT OLIVET CEMETERY ASSOCIATION, a Utah nonprofit corporation, and MOUNT OLIVET CEMETERY ASSOCIATION, an unincorporated association, the existence of which Real Estate Acquisition Agreement is disclosed by that certain Notice Of Contract recorded July 23, 2003 as Entry No. 8743122, in Book 8847, at Page 1275 of the Official Records.

+++

JTG/jtg [1st amd-jtg] [2nd amd-jtg] [3rd amd/jtg 3-9-2007]



Order No. 30119

Commitment No. 30119 [THIRD AMENDED]

NOTE TO PROPOSED INSURED:

ANY MATTER IN DISPUTE BETWEEN YOU AND THE COMPANY MAY BE SUBJECT TO ARBITRATION AS AN ALTERNATIVE TO COURT ACTION PURSUANT TO THE RULES OF THE AMERICAN ARBITRATION ASSOCIATION OR OTHER RECOGNIZED ARBITRATOR. A COPY OF SAID RULES ARE AVAILABLE ON REQUEST FROM THE COMPANY. ANY DECISION REACHED BY ARBITRATION SHALL BE BINDING UPON BOTH YOU AND THE COMPANY. THE ARBITRATION AWARD MAY INCLUDE ATTORNEY'S FEES IF ALLOWED BY STATE LAW AND MAY BE ENTERED AS A JUDGMENT IN ANY COURT OF PROPER JURISDICTION.

NOTICE TO APPLICANT AND/OR PROPOSED INSURED: If you require copies of any documents identified in this Commitment for Title Insurance, the Company will furnish the same upon specific request, either free of charge or for the actual cost of duplication for those copies requiring payment by the Company to obtain.

NOTICE TO APPLICANT AND/OR PROPOSED INSURED: The land described in this Commitment may be serviced by services provided by cities, towns, public utility companies and other firms providing municipal type services which do not constitute liens upon the land and for which no notice of the existence of such service charges is evidenced in the Public Records. The applicant and/or proposed insured should directly contact all entities providing such services and make the necessary arrangements to insure payment for such services and continuation of services to the land.

+++



STEWART TITLE GUARANTY COMPANY

LANDMARK TITLE COMPANY

PRIVACY POLICY NOTICE

Title V of the Gramm-Leach-Bliley Act (GLBA) generally prohibits any financial institution, directly or through its affiliates, from sharing nonpublic personal information about you with a nonaffiliated third party unless the institution provides you with a notice of its privacy policies and practices, such as the type of information that it collects about you and the categories of persons or entities to whom it may be disclosed. In compliance with the GLBA, we are providing you with this document, which notifies you of the privacy policies and practices of Landmark Title Company, Stewart Title Guaranty Company, Stewart Title Insurance Company, Stewart Title Insurance Company of Oregon, National Land Title Insurance Company, Arkansas Title Insurance Company, Charter Land Title Insurance Company.

We may collect nonpublic personal information about you from the following sources:

- Information we receive from you, such as on applications or other forms.
- Information about your transactions we secure from our files, or from our affiliates or others.
- Information we receive from a consumer reporting agency.
- Information that we receive from others involved in your transaction, such as the real estate agent or lender.

Unless it is specifically stated otherwise in an amended Privacy Policy Notice, no additional nonpublic personal information will be collected about you.

We may disclose any of the above information that we collect about our customers or other customers to our affiliates or to nonaffiliated third parties as permitted by law.

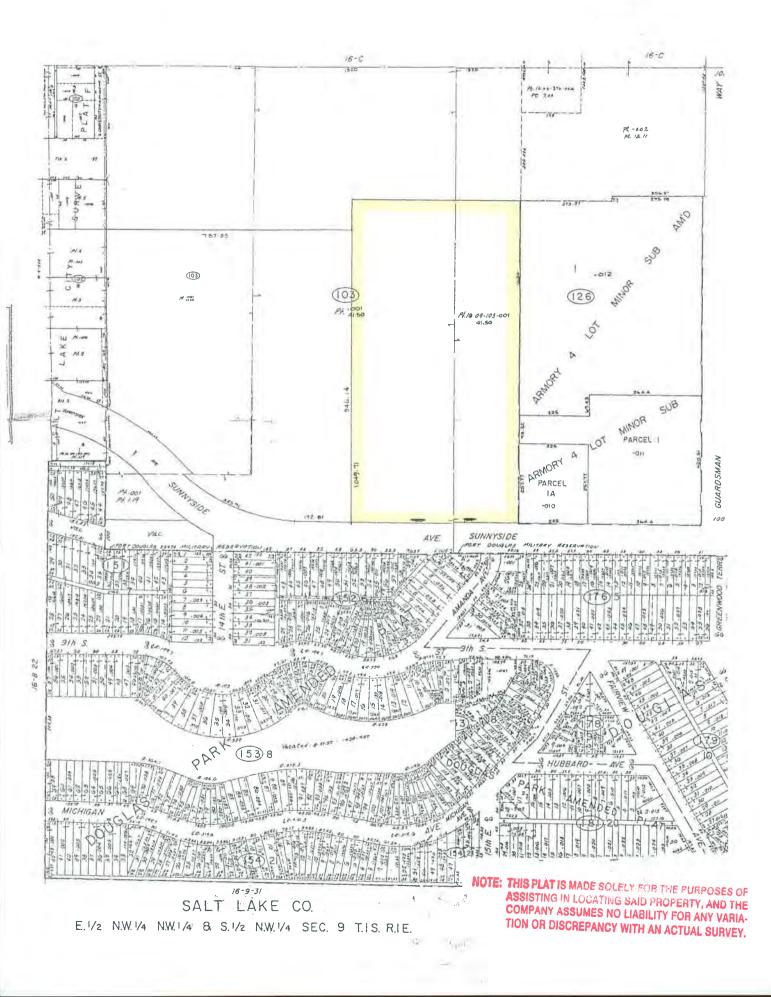
We also may disclose this information about our customers or former customers to the following types of nonaffiliated companies that perform marketing services on our behalf or with whom we have joint marketing agreements:

- Financial service providers such as companies engaged in banking, consumer finance, securities and insurance.
- Non-financial companies such as envelope stuffers and other fulfillment service providers.

WE DO NOT DISCLOSE ANY NONPUBLIC PERSONAL INFORMATION ABOUT YOU WITH ANYONE FOR ANY PURPOSE THAT IS NOT SPECIFICALLY PERMITTED BY LAW.

We restrict access to nonpublic personal information about you to those employees who need to know that information in order to provide products or services to you. We maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.





PRELIMINARY UTILITY REPORT

ROWLAND HALL SALT LAKE CITY, UTAH

PREPARED FOR: EHDD ARCHITECTURE BRAD JACOBSON 500 TREAT AVE #201 SAN FRANCISCO, CA 94110 (415) 285-9193

PREPARED BY: ENSIGN ENGINEERING KOBY MORGAN 45 WEST 10000 SOUTH #500 SANDY, UT 84070 (801) 255-0529

Linen Survey ingineering

APRIL 10, 2012

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1.0 PROJECT OVERVIEW

The proposed Rowland Hall expansion is located in; Section 9, Township 1 South, Range 1 East, Salt Lake Base and Meridian, Salt Lake City, Utah. The project is bounded by the Mt. Olivet Cemetery on the north, the existing Rowland Hall facility on the east, Sunnyside Avenue on the south, and the East High School football field on the west. The proposed school will consist of offices, classrooms, an auditorium, gymnasium, and storage areas. In addition the project will also include the construction of parking lots, two soccer fields, and other grassed and hardscape play areas.

Rowland Hall intends to create a campus which will be LEED Gold Certified. As a result, the preliminary values for storm runoff, sewer demand, and water demand provided in this report are likely higher than the quantities that will actually be required. In other words, the demands used in this report are prescribed based on published standards, actual demands based on the mechanical systems being installed will likely differ from these published values. To meet the LEED Certification, our design team will be utilizing low flow fixtures, retaining storm water runoff on-site, and providing xeriscaping coupled with water conscious landscape materials.

2.0 SANITARY SEWER SYSTEM

A. EXISTING SEWER SYSTEM

There are two sanitary sewer mains that exist south of the property in Sunnyside Avenue. The first is a 24-inch diameter reinforced concrete pipe that sits approximately 20-feet south of the road centerline. The second is an 8-inch diameter vitrified clay pipe that runs just north of the south curb line in Sunnyside Avenue.

B. FLOW CALCULATIONS

Sanitary sewer flow calculations for the project have been completed in accordance with Utah State Administrative Code (USAC) R317-4 "Onsite Wastewater Systems". Table 3 (included in Appendix B) in USAC R317-4 provides estimates of waste water flow based on the type of establishment being proposed, in this case a school. According to this standard a school with a cafeteria, gymnasium, and showers will generate 25 gallons per person per day. Utilizing 25 gallons per person per day and an estimate of the number of persons expected to utilize the school on a daily bases of 610 people (610 people provided by EHDD Architecture) the Average Annual Daily Flow (AADF) would be **15,250 gpd**. AADF provides the basis for collection system sizing associated with sanitary sewer.

C. SEWER DESIGN

While AADF provides the basis for all sanitary sewer sizing calculations, various peaking factors are applied to the AADF to size other systems. A peaking factor of four (4) is required to size collection systems. Applying a peaking factor to the AADF yields a total design flow of **61,000 gpd** or a rate of **42.36 gpm**. Figure 1 shows the preliminary proposed location of the sewer connection. At this time it is anticipated that a connection will be made to the existing 24-inch diameter main via an existing manhole located

approximately 18-feet east of the west property line within the Sunnyside Avenue right-ofway. A slope for the proposed pipe was estimated based on existing topography and represents a minimum slope. The following table summarizes the proposed sewer service size and capacity.

Pipe Material	Manning's n	Q (gpm)	Diameter (in)	Slope (%)	Depth (in)	Velocity (ft/s)	Pipe Capacity @ Given Slope (gpm)	Percent Full By Depth (%)	Percent Full By Flow (%)
PVC	0.013	42.4	6	1.00%	1.66	2.13	271	27.7%	15.6%

 TABLE 2-1
 SEWER COLLECTION SYSTEM SIZING

3.0 CULINARY WATER SYSTEM

A. EXISTING SYSTEM

Salt Lake City Public Utilities has existing water mains in Sunnyside Avenue to the south and Guardsman Way to the east of the proposed project. Both of the existing mains are 6-inches in diameter with the main in Sunnyside being behind the curb on the south side of the road and the main in Guardsman being behind the curb on the east side of the road.

B. DEMAND REQUIREMENTS

Water system demands have been completed based on square footages provided by EHDD Architecture and assuming that the buildings will be fire sprinkled. In addition peak day demands have been determined based on state requirements and utilizing the 610 person occupancy. USAC R309-510-7 provides a peak day demand of 25 gallons per person per day which, for this project will equate to **15,250 gpd** or **10.59gpm**. Due to the lack of secondary water service in the area irrigation demands will also need to be provided by the culinary service. According to table 510-3 "Source Demand for Irrigation" found in USAC R309-510 a peak day demand of 3.96 gpm/irrigated acre should be applied to the project. Based on the current concept plan there will be approximately 4.50 acres requiring irrigation on the project for a total demand of **25,660 gpd** or **17.82gpm**. The controlling demand for this project will be fire flow which is based on the 2009 International Fire Code. Table B105.1 "Minimum Required Fire-Flow and Flow Duration for Buildings" provides fire flow in gallons per minute based on construction type and building square footage. According to EHDD Architecture the total square footage for the buildings will be 162,710 s.f. with construction types of "Type II-B" and "Type V-B" occurring. Based on Table B105.1 (attached in Appendix C) a fire demand of 8,000 gallons per minute will be required however, section B105.2 allow for the following exception in fire sprinkled buildings "a reduction in fire-flow of up to 75 percent, as approved, is allowed when the building is provided with an approved automatic sprinkler system installed in accordance with Section

903.1.1 or 903.1.2. The resulting fire-flow shall not be less than 1,500 gallons per minute (5678 L/min) for the prescribed duration as specified in Table B105.1". The following table shows the project fire flow demand using various reductions:

Project Fire Flow Demand (gpm)	Percentage of Reduction (%)	Resulting Fire Flow Demand (gpm)
8000	50	4000
8000	55	3600
8000	60	3200
8000	65	2800
8000	70	2400
8000	75	2000

 TABLE 3-1
 FIRE FLOW DEMAND BASED ON PERCENTAGE OF REDUCTION

USAC states that fire flows must be provided with a minimum pressure of 20 psi to the site.

C. PROPOSED WATER SYSTEM

The proposed water system will connect to existing water mains in both Sunnyside Avenue and Guardsman Way as shown on Figure 1 attached in Appendix A. These two connections will create a "looped" system through the project allowing water to be delivered to the site if one line is temporarily shut down and allowing greater flow in a fire scenario. The proposed line will be an 8-inch diameter pipe. As mentioned in the demand section fire flow will control for the site, in order to determine available fire flow, Salt Lake City Public Utilities (SLCPU) was contacted. Utilizing existing water models for the area SLCPU was able to determine an available flow of 2,920 gpm at a residual pressure of 20psi and a static pressure at this location of 89psi (see Figure 2). This would require a reduction in fire flow of approximately 64%. Based on table 3-1 we recommend that a request be made for a reduction of 70% to ensure adequate fire flow is available to the project. The proposed 8inch pipes will also adequately provide demands for peak day flow.

4.0 STORM DRAINAGE

A. EXISTING DRAINAGE CONDITIONS

The study area is relatively small consisting of approximately 13 acres. Slopes across the site range from approximately 3% to 9% on average with isolated areas sloping steeper. The site is vegetated with native grasses and small plants with some barren areas. According to soil surveys available for the project site, soils are described as Bingham Gravelly Loams which are considered to be a well-drained soil. The soil is classified as Hydrologic Soil Group B. Currently any stormwater runoff from the site will flow south by southwest off of the property onto the East High School football field or into the Sunnyside Avenue right-of-way. Water in Sunnyside Avenue is collected in a series of catch basins and piped west through an existing 18-inch reinforced concrete pipe.

B. DESIGN OBJECTIVES AND METHODOLOGY

The site drainage system will be designed to conform to the requirements of Salt Lake City Public Utilities. The proposed drainage system is intended to both reduce the post developed peak runoff as well as reduce development impact on the environment.

The proposed construction will increase the impervious area on the site and in so doing increate the site runoff. To mitigate this increase, a detention basin has been designed to help reduce runoff and provide an increased residence time to allow pollutants to settle out. In addition the detention basin will provide an opportunity for infiltration of stormwater.

For modeling purposes the project has been separated into three drainage catchments with respective design points for analysis. Each of the respective catchments was assigned a Soil Conservation Service (SCS) curve number based on ground cover, impervious area, and Hydrologic soils Group. As mentioned previously the site has been determined to be categorized as Hydrologic Soil Group B. SCS Curve Numbers (CN) establish a relationship between rainfall and runoff from a given catchment. The NRCS Technical Release 55 (TR-55) method was used in Autodesk Storm and Sanitary Analysis 2012 to model the hydrology and hydraulics for the project.

Design criteria include the following

- The 10-year storm event was used to size underground conveyance systems.
- Surface systems are planned to safely pass the 100-year storm event.
- Detain post-development site discharge to 0.2 cfs/acre

The following rainfall data was used to analyze the system (Rainfall data obtained from the NOAA Atlas 14, Volume 1, Version 4, published by the National Weather Service):

Frequency (years)	*Precipitation (inches)
2	1.64
10	2.22
25	2.59
100	3.16

 TABLE 4-1
 24-HOUR RAINFALL DATA

According to TR-55 a type II design storm should be used to create rainfall hydrographs of this region of the country. A type II distribution shows 50% to 75% of the total rainfall occurring over an approximately 2-hour time period and has been found to occur at the center of the storm. This type of intense short duration storm would be typical of those within Salt Lake City.

C. PROPOSED DRAINAGE CONDITIONS

The proposed site will be designed to direct runoff from paved and other hardscape areas into waterways and gutters which will be collected in catch basins. Once stormwater has entered the pipe system it will be conveyed to the detention pond and released at the

approved 0.2 cfs/acre rate into the existing Sunnyside Avenue drainage system. The connection to the existing system will most likely be made in the existing catch basin located on the north side of Sunnyside Avenue approximately 190-feet east of the west property line (see Figure 3).

D. STORMWATER MANAGEMENT

The following table summarizes the post development flows prior to entering the detention system for the project. The data is based on the construction of the project as shown on Figure 3 in Appendix A.

RUNOFF DATA

Drainage Area	Area (acre)	Curve Number (CN)	Time of Concentration (min)	10-Year Peak Discharge (cfs)	100-Year Peak Discharge (cfs)
1	8.40	92	12	17.46	25.13
2	2.54	69	8	1.52	2.59
3	2.43	69	6	1.50	2.56

TABLE 4-2

The proposed detention basin has been sized to attenuate the post-developed peak flow to a rate of 0.2 cfs/acre. The following table summarizes the required basin volume.

TABLE 4-3	DETENTION BASIN DATA

Peak	Peak	Required	Required
Inflow	Outflow	Orifce	Detention
(cfs)	(cfs)	Size (in)	Volume (ft ³)
33.66	2.58	7.75	37,892

Outputs from the stormwater model can be found in Appendix D.

E. CONCLUSIONS

The drainage system as outlined will safely convey stormwater into the existing drainage system. In addition the design will mitigate impacts from increased impervious area on downstream infrastructure. The drainage system will help to maintain groundwater recharge by allowing an opportunity for infiltration. At the time of this report, the proposed system meets Salt Lake City Public Utility requirements.

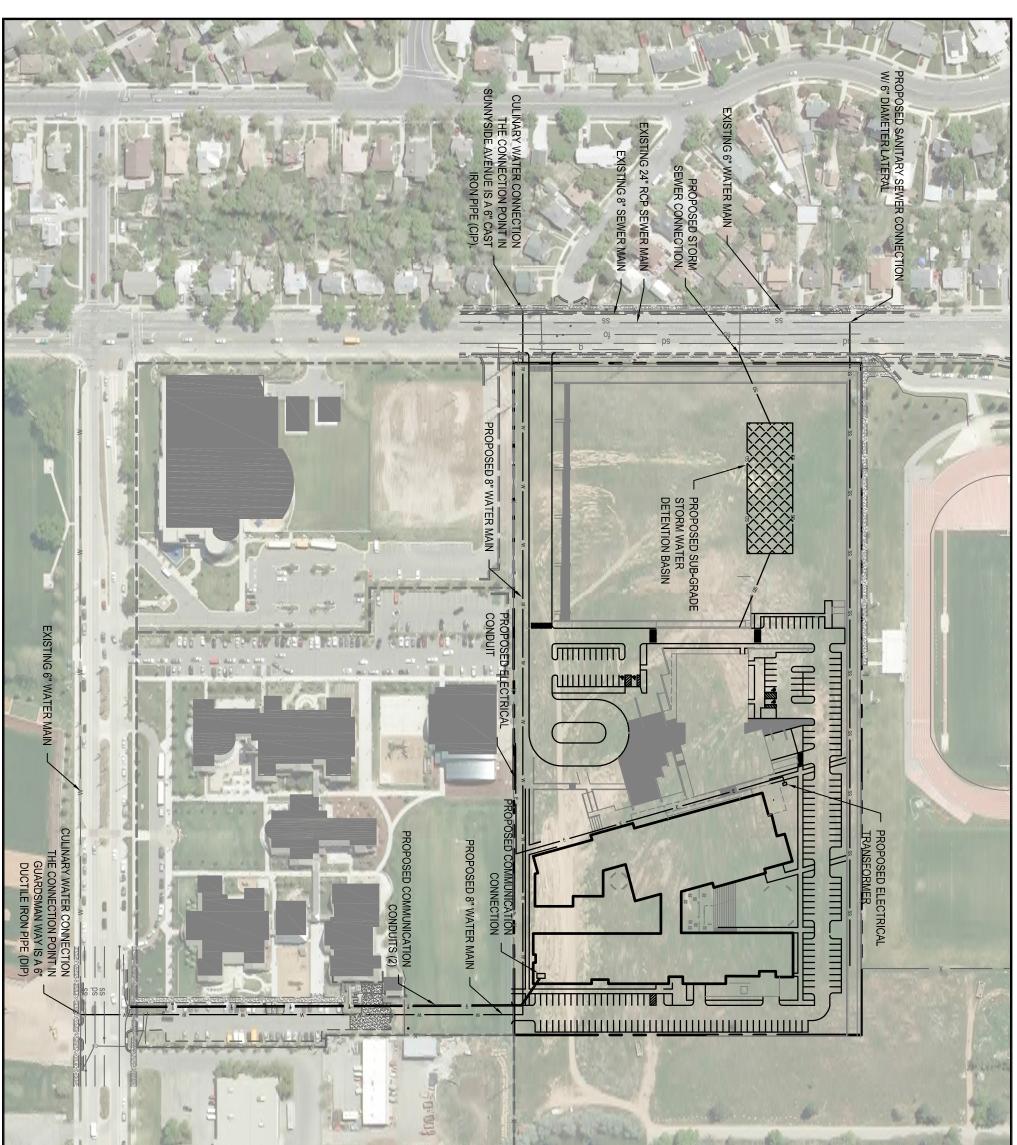
Ensign Engineering

Reviewed By

Jared K. Ford, P.E. Project Engineer Koby Morgan, P.E. Project Manager

5.0 APPENDIX A – FIGURES

Figure 1 Conceptual Utility Layout



HORIZONTAL GRAPHIC SCALE				
CONCEPTUAL UTILITY LAYOUT	SC-1810	AKE CITY, UTAH	CEDAR CITY Phone:435.865.1453 www.ensignuTah.com EHDD ARCHITECTURE 500 TREAT WE # 201 SMU FRANCSICO.CA 94110 SMU FRANCSICO.CA 94110	SALT LAKE CITY 45 W. 10,000 S. Ste 500 Sandy, UT 84070 Phone: 801.255.0529 Fax: 801.255.0449 Fax: 801.255.4449 Phone: 801.547.1100 TOOELE Phone: 435.843 3550

Figure 2 Salt Lake City Public Utilities Fire Flow Exhibit

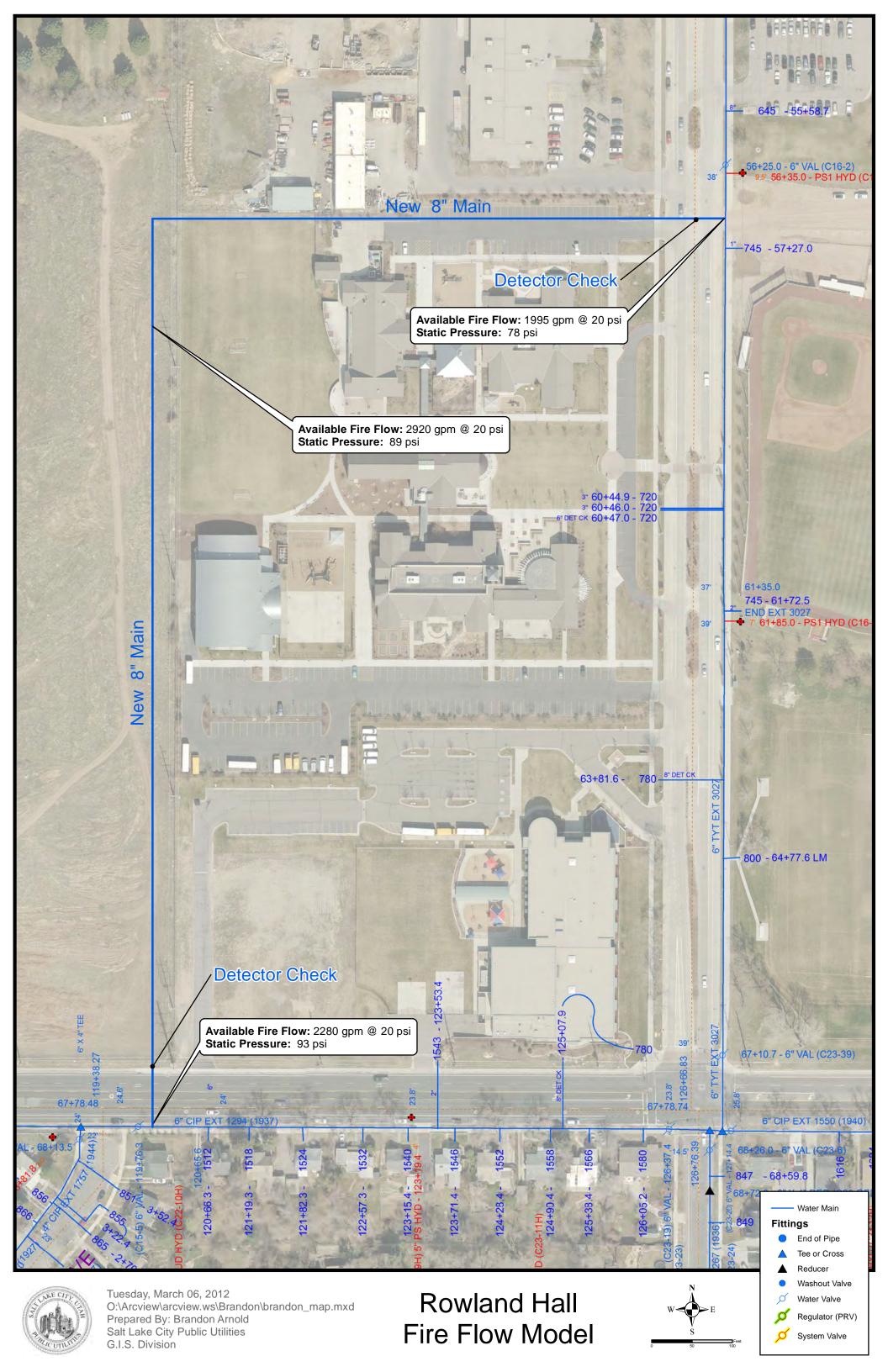
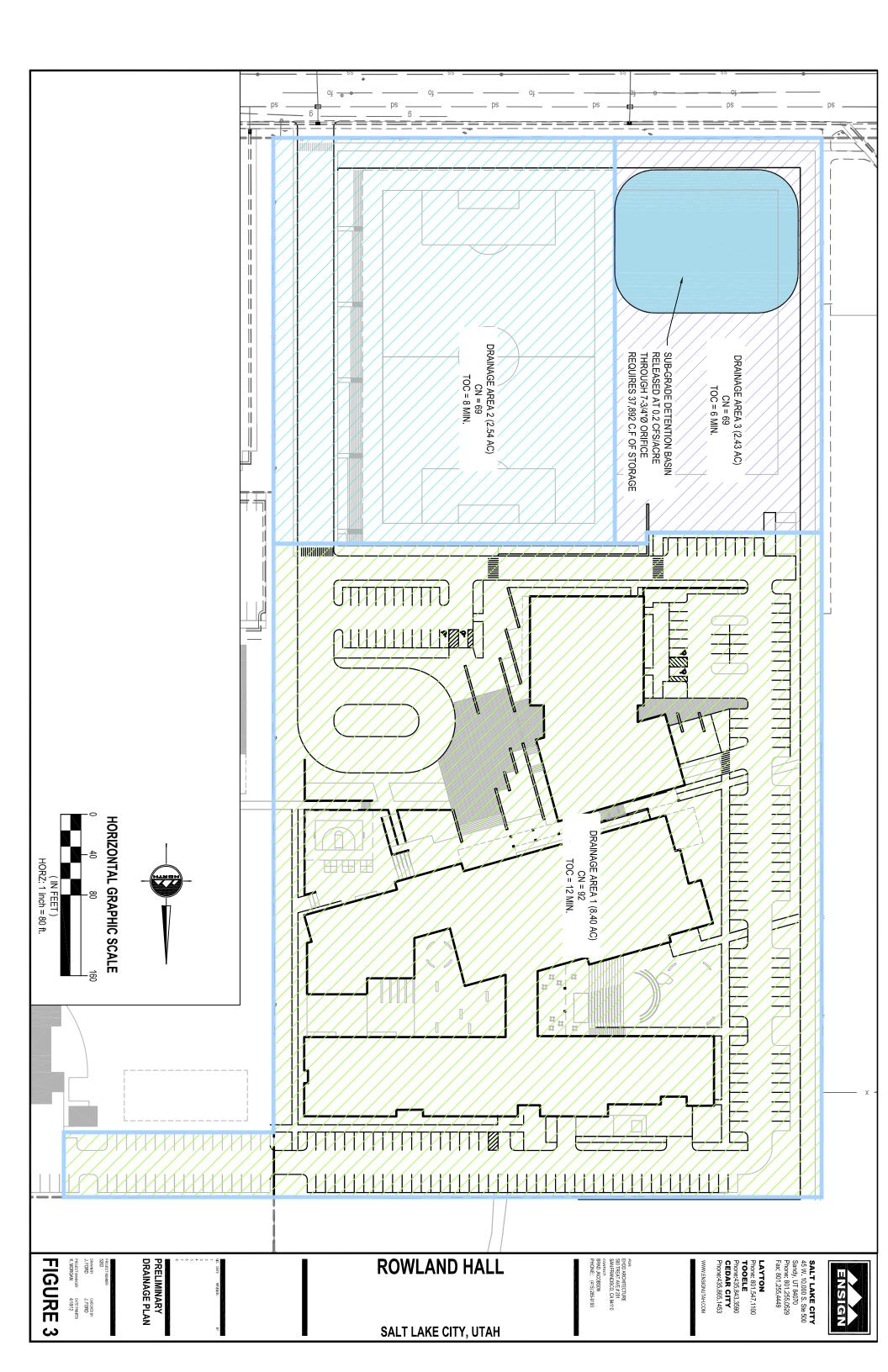


Figure 3 Drainage Drawing



6.0 APPENDIX B - TABLE 3 USAC 317-4

protection requirements, protection of public health and potential for pollution of water source.

(e) Although this distance shall be generally adhered to as the minimum required separation distance, exceptions may be approved by the regulatory authority, taking into account geology, hydrology, topography, existing land use agreements, consideration of the drinking water source protection requirements, protection of public health and potential for pollution of water source. Any person proposing to locate an absorption system closer than 200 feet to an individual or nonpublic ungrouted well or spring must submit a report to the regulatory authority which considers the above items. In no case shall the regulatory authority grant approval for an onsite wastewater system to be closer than 100 feet from an ungrouted well or a spring.

(f) Lining or enclosing watercourses with an acceptable impervious material may permit a reduction in the separation requirement. In situations where the bottom of a canal or watercourse is at a higher elevation than the ground in which the absorption system is to be installed, a reduction in the distance requirement may be justified, but each case must be decided on its own merits by the regulatory authority.

(g) If the water supply line is for a public water supply, the separation distance must comply with the requirements of R309. No water service line shall pass over any portion of an onsite wastewater system.

(h) Components which are not watertight should not extend into actual or anticipated root systems of nearby trees. Trees and other large rooted plants shall not be allowed to grow over onsite wastewater systems. However, it is desirable to cover the area over onsite wastewater systems with lawn grass or other shallow-rooted plants. Onsite wastewater systems should not be located under vegetable gardens.

(i) For deep wall trenches, the separation distance must be at least equal to 3 times the deepest effective depth of either trench with a minimum separation of 12 feet between trenches.

(j) See R317-4-9, Table 9.

(k) A grouted well is a well constructed as required in the drinking water rules R309.

4.4. Estimates of Wastewater Quantity. Quantity of wastewater to be disposed of shall be determined accurately, preferably by actual measurement. Metered water supply figures for similar installations can usually be relied upon, providing the nondisposable consumption, if any, is subtracted. Where this data is not available, the minimum design flow figures in Table 3 shall be used to make estimates of flow. In no event shall the septic tank or absorption system be designed such that the anticipated maximum daily sewage flow exceeds the capacity for which the system was designed.

TABLE 3 Estimated Quantity of Domestic Wastewater(a)

Typ	e of Establishment	Gal	lons	per day
Air	ports			
a.	per passenger	3		
b.	per employee	15		
Boa	rding Houses			
a.	for each resident boarder and			
	employee	50	per	person
b.	additional for each nonresident		0.11	
	boarders	10	per	person
Bow	ling Alleys			
a.	with snack bar	100	per	alley
b.	with no snack bar	85	per	alley
Can	nps			
a.	modern camp	30	per	person
b.	semi-developed with flush toilets	30	per	person
c.	semi-developed with no flush			The same case of

UT Admin Code R317-4. Onsite Wastewater Systems. March 1, 2012

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toilets	5	per	person
Churches	1.1		
a. per person	5		
Condominiums, Multiple Family			
Dwellings, or Apartments a. with individual or common			
laundry facilities	400	per	unit
. with no individual or common		Leen	
laundry facilities	75	per	person
ountry Clubs		0.00	3
. per resident member	100		
. per nonresident member present	25		
, per employee	15		
entist's Office	200		
. per chair . per staff member	200		
octor's Office	55		
. per patient	10		
. per staff member	35		
airgrounds	1	per	person
ire Stations		1	
. with full-time employees and			
food preparation	70	per	person
. with no full-time employees	-		
and no food preparation	5	per	person
yms	25		
. participant . spectator			person person
airdresser	4	ber	person
. per chair	50		
. per operator	35		
ighway Rest Stops (improved,			
with restroom facilities)	5	per	vehicle
ospitals	250	per	bed
and the second of the second second		spa	
otels, Motels, and Resorts	125	per	unit
ndustrial Buildings (exclusive of			
industrial waste)	35	nor	person
with showers, per 8 hour shiftwith no showers, per 8 hour shift			person
abor or Construction Camps			person
aunderette			washer
obile Home Parks			unit
ovie Theaters			
. auditorium	5	per	seat
. drive-in		per	
and the second		spa	
ursing Homes	200	121.00	bed
Efter Dellaters and Declaras		spa	ce
ffice Buildings and Business Establishments (Sanitary			
wastes only, per shift)			
. with cafeteria	25	per	employee
. with no cafeteria			employee
icnic Parks (toilet wastes only)			person
estaurants(b)			90.000
. ordinary restaurants (not 24			
hour service)			seat
. 24 hour service	50	per	seat
. single service customer utensils			an a ferrar an
only	2	per	customer
. or, per customer served			
(includes toilet and kitchen wastes)	10		
	10		
ecreational Vehicle Parks			
ecreational Vehicle Parks . sanitary stations for	50	per	space
Accreational Vehicle Parks . sanitary stations for self-contained vehicles	50	per	space
ecreational Vehicle Parks . sanitary stations for self-contained vehicles	50	per	space
 Recreational Vehicle Parks sanitary stations for self-contained vehicles dependent spaces (temporary or transient with no sewer connections) 			space
Recreational Vehicle Parks a. sanitary stations for self-contained vehicles b. dependent spaces (temporary or transient with no			

UT Admin Code R317-4. Onsite Wastewater Systems. March 1, 2012

	connections)	125	per	space
Roo	ming House	40	per	person
San	itary Stations (per			
	self-contained vehicle)	50		
Sch	ools			
a.	boarding	75	per	person
b.	day, without cafeteria,		2.0	
	gymnasiums or showers	15	per	person
c.	day, with cafeteria, but no		S	
	gymnasiums and showers	20	per	person
d.	day, with cafeteria, gymnasium			Gunzand
	and showers	25	per	person
Ser	vice Stations(c) (per vehicle			
	served)	10		
Sin	gle-Family Dwellings	(See	e Tal	oles 7,
		10,	and	13)
Ska	ting Rink, Dance Halls, etc.			
	no kitchen wastes	10	per	person
b.	additional for kitchen wastes			person
	Areas			
Ski	Aleas			
	no kitchen wastes	10	per	person
a.				person person
a. b.	no kitchen wastes			person person
a. b. Stc	no kitchen wastes Additional for kitchen wastes ores		per	• · · · · · · · · · · · · · · · · · · ·
a. b. Sto a.	no kitchen wastes Additional for kitchen wastes pres per public toilet room	3	per	• · · · · · · · · · · · · · · · · · · ·
a. b. Stc a. b.	no kitchen wastes Additional for kitchen wastes ores	3 500 11	per	person
a. b. stc a. b. Swi	no kitchen wastes Additional for kitchen wastes pres per public toilet room per employee	3 500 11 10	per	• • • • • • • • • • • • • • • • • • •

FOOTNOTES

(a) When more than one use will occur, the multiple use shall be considered in determining total flow. Small industrial plants maintaining a cafeteria or showers and club houses or motels maintaining swimming pools or laundries are typical examples of multiple uses. Uses other than those listed above shall be considered in relation to established flows from known or similar installations.

(b) No commercial food waste disposal unit shall be connected to an onsite wastewater system unless first approved by the regulatory authority.

(c) Or, 250 gallons per day per pump.

(d) Or, 20 x water area + deck area.

4.5. Installation in Sloping Ground.

A. Construction of absorption systems on slopes in excess of 15 percent but not greater than 25 percent may be allowed providing that subsoil profiles indicate no restrictive layers of soil and appropriate engineering design is provided. Absorption systems placed in sloping ground shall be so constructed that there is a minimum of 10 feet of undisturbed earth measured horizontally from the bottom of the distribution line to the ground surface. Where the addition of fluids is judged to create an unstable slope, absorption systems will be prohibited.

B. Absorption systems shall be so located and constructed that there is a minimum of 50 feet from downhill slopes that exceed 35 percent.

C. Alternative systems shall be subject to the site slope limits specified in R317-4-11 for earth fill, "at-grade" systems and in mound systems.

4.6. Replacement Area for Absorption System. Adequate and suitable land shall be reserved and kept free of permanent structures, traffic, or adverse soil modification for 100 percent replacement of each absorption system. If approved by the regulatory authority, the area between standard trenches or deep wall trenches may be regarded as replacement area.

4.7. Variance to Design Requirements

1. Requirements for which a variance may be approved.

7.0 APPENDIX C – INTERNATIONAL FIRE CODE APPENDIX B "FIRE FLOW REQUIREMENTS FOR BUILDINGS"

	FIRE-FLOW		3.2			
Type IA and IB ^b	Type IIA and IIIA ^b	Type IV and V-A ^b	Type IIB and IIIB ^b	Type V-B ^b	FIRE-FLOW (gallons per minute) ^c	FLOW DURATION (hours)
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	2
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	3
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	-0
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	18
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	, sata Artif
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	Juli
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	12.4 Aug
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	ofi-
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	.4.
-	_	115,801-125,500	83,701-90,600	51,501-55,700	6,250	1.6.29
	_	125,501-135,500	90,601-97,900	55,701-60,200	6,500	ayura miliye
	_	135,501-145,800	97,901-106,800	60,201-64,800	6,750	1. 70799
		145,801-156,700	106,801-113,200	64,801-69,600	7,000	W.L.do
-	-	156,701-167,900	113,201-121,300	69,601-74,600	7,250	dunt 20
<u></u> C	_	167,901-179,400	121,301-129,600	74,601-79,800	7,500	and a
	-	179,401-191,400	129,601-138,300	79,801-85,100	7,750	4
-		191,401-Greater	138,301-Greater	85,101-Greater	8,000	

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

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

a. The minimum required fire flow shall be allowed to be reduced by 25 percent for Group R.

b. Types of construction are based on the International Building Code.

c. Measured at 20 psi.

8.0 APPENDIX D – STORMWATER MODEL OUTPUTS

Autodesk® Storm and Sanitary Analysis 2012 - Version 6.4.29 (Build 6198) _____ ***** Project Description ************* File Name Drainage Model.SPF * * * * * * * * * * * * * * * * Analysis Options ***** Flow Units cfs Subbasin Hydrograph Method. SCS TR-55 Time of Concentration..... Kirpich Link Routing Method Kinematic Wave Storage Node Exfiltration.. None Starting Date NOV-17-2011 00:00:00 Ending Date NOV-18-2011 00:00:00 Report Time Step 00:05:00 ***** Element Count ******* Number of rain gages 1 Number of subbasins 3 Number of nodes 2 Number of links 1 **** Subbasin Summary * * * * * * * * * * * * * * * Total Flow Average Raingage Subbasin Area Length Slope acres ft % ID ------------_____
 Sub-01
 8.42
 1200.00
 4.0000
 StormGage

 Sub-02
 2.54
 500.00
 2.0000
 StormGage

 Sub-03
 2.43
 250.00
 2.0000
 StormGage
 * * * * * * * * * * * * Node Summary * * * * * * * * * * * * _____
 Out-01
 OUTFALL
 4592.00
 4592.65
 0.00

 Stor-01
 STORAGE
 4600.00
 4604.50
 0.00
 * * * * * * * * * * * * Link Summary ********* Element Length Slope Manning's Type ft % Roughness From Node To Node Link ID ----_____ _____ _____ _____ Out-01 ORIFICE Orifice-01 Stor-01

Autodesk Storm and Sanitary Analysis

| 3.570 | 3,199 | | | |
|---|---|--|--|--|
| 0.193 | 0.173 | | | |
| Volume
acre-ft | Volume
Mgallons | | | |
| 0.000
1.916
0.000
0.013
0.000 | 0.000
0.624
0.000
0.004 | | | |
| utations Report | | | | |
| | | | | |
| | | Area
(acres) | Soil
Group | CN |
|
N | | 8.42
8.42
8.42 | В | 92.00
92.00 |
| | | | | |
| | | Area
(acres) | Soil
Group | CN |
| N | | 2.54
2.54 | В | 69.00
69.00 |
| | | | | |
| | | Area
(acres) | Soil
Group | CN |
| N | | 2.43
2.43 | В | 69.00
69.00 |
| on Computations H | Report | | | |
| .77) * (S^-0.385 |)) | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | -0.000
Volume
acre-ft

0.000
1.916
0.000
0.013
0.000
******************************* | 0.193 0.173
-0.000
Volume Volume
acre-ft Mgallons

0.000 0.000
1.916 0.624
0.000 0.000
0.013 0.004
0.000
******************************* | 0.193 0.173
-0.000
Volume Volume
acre-ft Mgallons

0.000 0.000
1.916 0.624
0.000 0.004
0.000
 | 0.193 0.173
-0.000
Volume Volume
acre-ft Mgallons

0.000 0.000
1.916 0.624
0.000 0.000
0.013 0.004
 |

Autodesk Storm and Sanitary Analysis

User-Defined TOC override (minutes): 8.00

Subbasin Sub-03

User-Defined TOC override (minutes): 6.00

| Subbasin
ID | Total
Precip
in | Total
Runoff
in | Peak
Runoff
cfs | Weighted
Curve
Number | Time of
Concentration
days hh:mm:ss |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------------|---|
| Sub-01 | 3.16 | 2.31 | 25.13 | 92.000 | 0 00:12:00 |
| Sub-02 | 3.16 | 0.76 | 2.59 | 69.000 | 0 00:08:00 |
| Sub-03 | 3.16 | 0.76 | 2.56 | 69.000 | 0 00:06:00 |

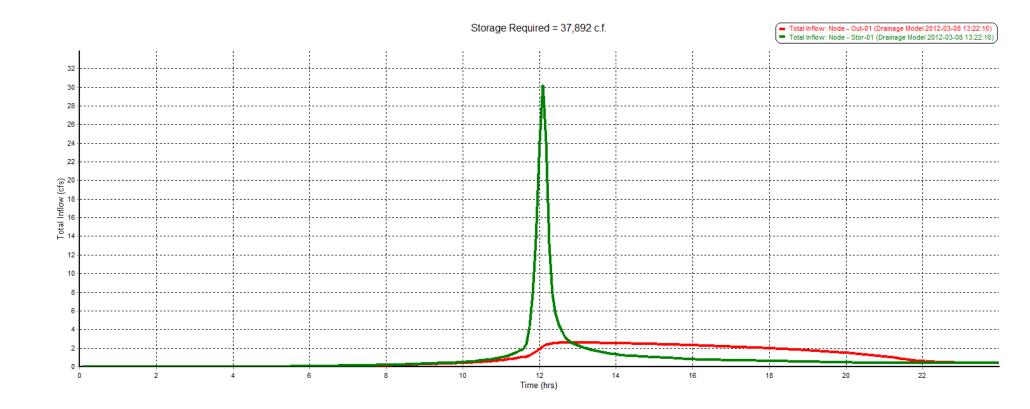
| Node
ID | Average
Depth
Attained | Maximum
Depth
Attained | Maximum
HGL
Attained | Time c
Occur | of Max
rrence | Total
Flooded
Volume | Total
Time
Flooded | Retention
Time |
|-------------------|------------------------------|------------------------------|----------------------------|-----------------|------------------|----------------------------|--------------------------|--------------------|
| | ft | ft | ft | days | hh:mm | acre-in | minutes | hh:mm:ss |
| Out-01
Stor-01 | 0.00
0.94 | 0.00
2.88 | 4592.00
4602.88 | - | 00:00
12:51 | 0
0 | 0
0 | 0:00:00
0:00:00 |

Node Flow Summary *********

| Node
ID | Element
Type | Maximum
Lateral
Inflow
cfs | | Peak
Occu | Inflow
rrence | Flooding
Overflow | Time of Peak
Flooding
Occurrence
days hh:mm |
|-------------------|--------------------|-------------------------------------|---------------|--------------|------------------|----------------------|--|
| Out-01
Stor-01 | OUTFALL
STORAGE | 0.00
30.21 | 2.58
30.21 | - | 12:51
12:05 | 0.00
0.00 | |

| Storage Node
Maximum Time | | Maximum
Total | Maximum | Time of Max | Average | Average | Maximum |
|------------------------------|-----------|--------------------|---------|-------------|----------|---------|--------------|
| | | Ponded | Ponded | Ponded | Ponded | Ponded | Storage Node |
| Exfiltration | Exfiltrat | ion Exfiltr | ated | | | | |
| | | Volume | Volume | Volume | Volume | Volume | Outflow |
| Rate | Rate | Volume
1000 ft³ | (응) | days hh:mm | 1000 ft³ | (%) | cfs |

| cfm | hh:mm:ss | 1000 ft³ | | | | | | | | |
|-----------------|--|--------------------------|------------------------|------|----------------------|-----|--------|-----------|----------|----------|
| | | | 2 | 35 | | 0 1 | .2:51 | 8.365 | 8 | 2.58 |
| Outfa | ************************************** | ummary | | | | | | | | |
| Outfa | all Node ID | Flow
Frequency
(%) | Average
Flow
cfs | Ir | Peak
nflow
cfs | | | | | |
| Out-0 | | 80.22 | 1.20 | | 2.58 | | | | | |
| Syste | | 80.22 | | | | | | | | |
| Link
**** | ***************
Flow Summary
************* | - | | | | | | | | |
| Link | | Element | | e of | | | Length | Peak Flow | Design | Ratio of |
| Ratio c | | l Reported
Type | Peak | Flow | Veloc | ity | Factor | during | Flow | Maximum |
| Maximun | | Condition | Occurr | ence | Attai | ned | | Analysis | Capacity | /Design |
| Flow S
Depth | Surcharged
minutes | | days h | h∶mm | ft/ | sec | | cfs | cfs | Flow |
| | | | | | | | | | | |
| | ice-01 | | 0 1 | 2:51 | | | | 2.58 | | |
| Highe
***** | ***************
est Flow Inst
************************************ | ability Inde | xes | | | | | | | |
| Analy | ysis began on
ysis ended on
L elapsed tim | : Thu Mar O | | | | | | | | |



Fehr / Peers



Traffic Impact Study for **ROWLAND HALL**

Prepared by:

Fehr & Peers 2180 South 1300 East, Suite 220 Salt Lake City, UT 84106 801.463.7600

April 2012



EXECUTIVE SUMMARY

This study addresses the traffic impacts associated with the proposed Rowland Hall development on Sunnyside Avenue located in Salt Lake City, Utah.

This study analyzed the traffic operations for existing 2012 conditions and plus project conditions (after development of the proposed project) at key intersections and roadways in the vicinity of the site. Future 2030 background and plus project conditions were also analyzed.

A. Project Description

The Rowland Hall development is a proposed High School (Grades 9-12) and Middle School (Grades 6-8) located at approximately Sunnyside Avenue and Guardsman Way in Salt Lake City, Utah.

B. Traffic Conditions

Traffic Volumes:

Traffic counts at the study intersections were collected to establish a baseline of existing conditions and operations for the study area. Fehr & Peers collected AM and PM peak period traffic counts from 7:00 AM to 9:00 AM and 2:00 PM to 4:00 PM on Tuesday, March 20, 2012. To obtain future 2030 volumes, existing volumes were grown based on annual linear growth rates derived from the Wasatch Front Regional Council's (WFRC) 2040 Travel Demand Model.

Existing 2012 Conditions:

All study intersections operate at LOS C or better during the AM and PM peak hours for the existing 2012 conditions.

Existing 2012 Plus Project Conditions:

All study intersections operate at LOS C or better during the AM and PM peak hours for the existing 2012 plus project conditions.

Future 2030 Background Conditions:

All study intersections operate at LOS D or better during the AM and PM peak hours for the future 2030 background conditions.

Future 2030 Plus Project Conditions:

All study intersections operate at LOS D or better during the AM and PM peak hours for the future 2030 plus project conditions.

Project Conditions Analysis:

The proposed Rowland Hall development is expected to generate 571 AM peak hour trips and 355 PM peak hour trips. AM and PM peak hour project-generated trips were assigned to study intersections to assess impacts of the project.

C. Conclusion

All study intersections operate at acceptable LOS (LOS D or better) during the four scenarios analyzed: existing 2012, existing 2012 plus project, future 2030 background, and future 2030 plus project. This study shows that the additional traffic generated by the proposed Rowland Hall development would have minimal impact to the existing traffic conditions within the study area and in the future. Since no significant impacts were identified, no mitigations are recommended.

D. LOS Summary

Table ES-1 and ES-2 report the overall intersection delay and LOS for the signalized intersections and worst movement intersection delay and LOS for the unsignalized intersections for the different analyzed periods, during the AM and PM peak hours, respectively. Detailed descriptions of the intersection operations can be found in the subsequent chapters.

| | TABLE ES-1 ROWLAND HALL
AM PEAK HOUR LEVEL OF SERVICE SUMMARY | | | | | | |
|----|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--|--|
| | Intersection | Existing 2012
Background | Existing 2012
Plus Project | Future 2030
Background | Future 2030
Plus Project | | |
| ID | Location | LOS &
Sec/Veh ¹ | LOS &
Sec/Veh ¹ | LOS &
Sec/Veh ¹ | LOS &
Sec/Veh ¹ | | |
| 1 | Guardsman Way / Sunnyside Ave | C
28.8 | C
34.5 | D
38.3 | D
49.7 | | |
| 2 | Guardsman Way / North Rowland Hall
Access | B
11.3 | C
16.1 | C
15.2 | C
18.9 | | |
| A1 | Access 1 / Sunnyside Ave | N/A ² | C
16.0 | N/A ² | C
17.0 | | |

1. Overall intersection LOS and average delay (seconds/vehicle) for the signalized intersections and worst movement LOS and average delay for the unsignalized intersections.

2. This intersection is a plus project access and was only analyzed in the plus project scenarios. Source: Fehr & Peers, April 2012.

| TABLE ES-2 ROWLAND HALL
PM PEAK HOUR LEVEL OF SERVICE SUMMARY | | | | | | |
|--|--|--|--|--|--|--|
| Plus Project | | | | | | |
| 5 &
Veh ¹ | | | | | | |
| . .9 | | | | | | |
| :
8.1 | | | | | | |
| :
.4 | | | | | | |
| | | | | | | |

 Overall intersection LOS and average delay average delay for the unsignalized intersections. onds/venicle) for ea intersect

2. This intersection is a plus project access and was only analyzed in the plus project scenarios. Source: Fehr & Peers, April 2012.

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| C.# | Level of Service Analysis | |
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| | |



I. INTRODUCTION

A. Purpose

The purpose of this study is to provide a summary of the transportation-related impacts from the proposed Rowland Hall development located on Sunnyside Avenue in Salt Lake City, Utah (see Figure 1 for a project location map).

This study analyzes the traffic operations and impacts for existing 2012, and future 2030 conditions at key intersections and roadways in the vicinity of the site. Two analysis scenarios were performed for existing, and 2030 time periods: background and plus project.

This report examines the feasibility of the development from a traffic perspective and includes an analysis of the associated impacts on the adjacent roadways and intersections.

B. Scope

This study analyzes the traffic impacts of the site in conjunction with adjacent intersections. Where changes are needed to maintain acceptable level of service (LOS), improvements are proposed. Impacts are specifically addressed at the following study intersections and roadways:

- Guardsman Way / Sunnyside Ave
- Guardsman Way / North Rowland Hall Access
- One new proposed project access (Access 1 / Sunnyside Ave) approximately 630 feet west of Guardsman Way

The AM and PM peak hour site generated traffic were evaluated for all scenarios.

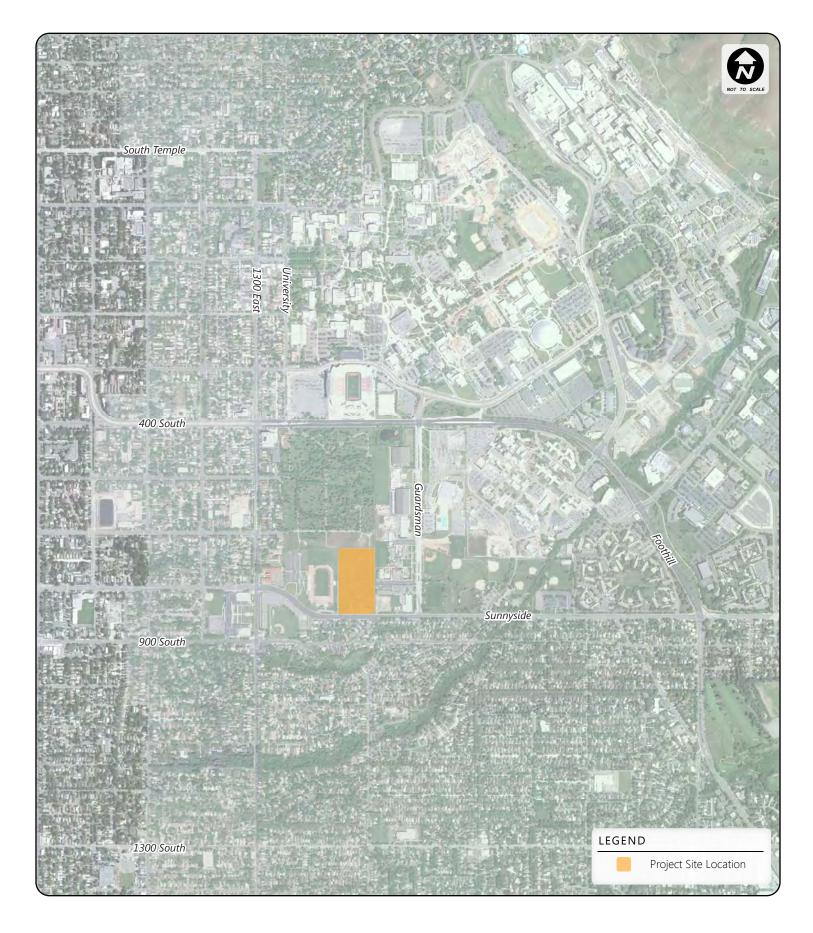
C. Analysis Methodology

LOS is a term that describes the operating performance of an intersection or roadway. LOS is measured quantitatively and reported on a scale from A to F, with A representing the best performance and F the worst. Table 1 provides a brief description of each LOS letter designation and an accompanying average delay per vehicle for both signalized and unsignalized intersections. The Highway Capacity Manual 2000 (HCM 2000) methodology was used in this study to remain consistent with "state-of-the-practice" professional standards. This methodology has different quantitative evaluations for signalized and unsignalized intersections, the LOS is provided for the overall intersection (weighted average of all approach delays).

For unsignalized intersections, LOS is reported based on the worst movement. Fehr & Peers has also calculated overall delay values for unsignalized intersections, which provides additional information and represents the overall intersection conditions rather than just the worst movement. Both are reported in their respective tables throughout the report.

The software package Synchro was used for this study. Synchro is common traffic modeling software based on procedures outlined in the HCM 2000.

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ROWLAND HALL Project Location



For the purposes of this study, a minimum overall intersection performance for each of the study intersections was set at LOS D (per Utah Department of Transportation [UDOT] urban standards). However, if LOS E or F for an individual approach at an intersection resulted, explanation and/or mitigation measures are presented where feasible and realistic. A LOS D threshold is consistent with "state-of-the-practice" traffic engineering principles for suburban and non-Central Business District (CBD) urbanized intersections.

| TABLE 1
LEVEL OF SERVICE DESCRIPTIONS | | | | | | |
|--|--|---|--|--|--|--|
| LOS | Description of Traffic Conditions | Signalized
Intersections
Avg. Delay ¹
(sec/veh) | Unsignalized
Intersections
Delay ²
(sec/veh) | | | |
| А | <i>Free Flow / Insignificant Delay</i>
Extremely favorable progression. Individual users are
virtually unaffected by others in the traffic stream. | 0 to 10 | 0 to 10 | | | |
| В | Stable Operations / Minimum Delays
Good progression. The presence of other users in the
traffic stream becomes noticeable. | > 10 to 20 | > 10 to 15 | | | |
| С | Stable Operations / Acceptable Delays
Fair progression. The operation of individual users is
affected by interactions with others in the traffic stream. | > 20 to 35 | > 15 to 25 | | | |
| D | Approaching Unstable Flows / Tolerable Delays
Marginal progression. Operating conditions are
noticeably more constrained. | > 35 to 55 | > 25 to 35 | | | |
| E | Unstable Operations / Significant Delays Can Occur
Poor progression. Operating conditions are at or near
capacity. | > 55 to 80 | > 35 to 50 | | | |
| F | <i>Forced, Unpredictable Flows / Excessive Delays</i>
Unacceptable progression with forced or breakdown of
operating conditions. | > 80 | > 50 | | | |
| 2. Wors
3. Volu | Overall intersection LOS and average delay (seconds/vehicle) for all approaches. Worst approach LOS and delay (seconds/vehicle) only. Volume to capacity (v/c) ratio, average values. Source: Fehr & Peers Descriptions, based on <i>Highway Capacity Manual</i>, 2000 Methodology (Transportation Research Board). | | | | | |

II. EXISTING 2012 CONDITIONS

A. Purpose

The purpose of the 2012 existing conditions analysis is to study the pertinent intersections and roadways during the peak travel periods of the day under existing traffic and geometric conditions. Through this analysis, existing traffic operational deficiencies can be identified and potential mitigation measures recommended.

B. Roadway System

The primary roadways that will provide access to the project site are described below:

- <u>Guardsman Way</u> is classified as a minor arterial with a posted speed limit of 30 miles per hour (mph). Guardsman Way consists of one travel lane in each direction with raised center medians, left-turn pockets with sections of two-way left-turn lanes (TWLTL).
- <u>Sunnyside Ave</u> is classified as a minor arterial, and has a posted speed limit of 30 mph. Sunnyside Ave currently has a four-lane cross section with two travel lanes in each direction and a TWLTL, in the vicinity of the project.

C. Traffic Volumes

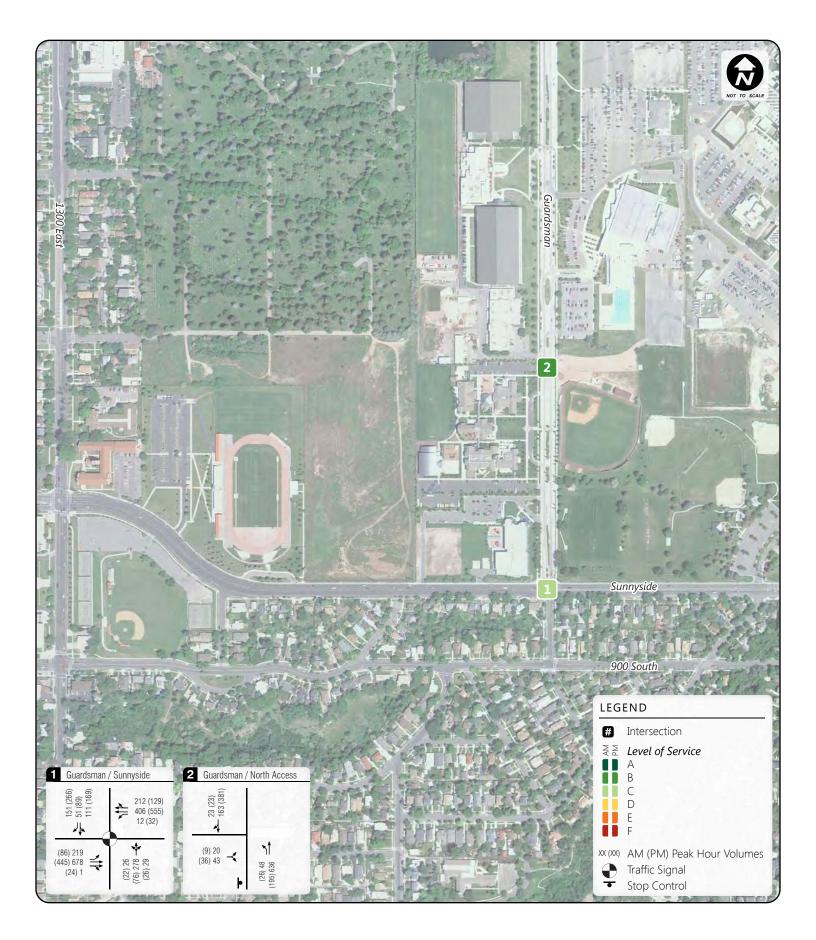
Fehr & Peers recorded AM and PM peak period traffic counts from 7:00 AM to 9:00 AM and 2:00 PM to 4:00 PM on Tuesday, March 20, 2012 at the following intersections:

- Guardsman Way / Sunnyside Ave
- Guardsman Way / North Rowland Hall Access
- Pingree Center Parking Access / Sunnyside Ave

The Pingree Center Parking Access / Sunnyside Ave intersection LOS was not reported in this analysis. Traffic counts were collected as a result of the close proximity to the new proposed Rowland Hall access on Sunnyside Ave to determine potential conflicts at the new access.

The traffic counts were adjusted to represent volumes for an average day of the year. The traffic volume adjustments were based on daily and monthly adjustment factors published by Utah Department of Transportation (UDOT).

The existing 2012 weekday AM and PM peak hour traffic volumes are shown in Figure 2.



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ROWLAND HALL Existing 2012 AM and PM Peak Hour Conditions



Using Synchro software and the HCM 2000 delay thresholds introduced in Chapter I, the existing 2012 weekday AM and PM peak hour LOS was computed for each study intersection. The results of this analysis for the AM and PM peak hours are reported in Table 2A and Table 2B, respectively. (see Appendix for the detailed LOS reports). These results serve as a base for the analysis of the impacts of the proposed development.

| | EXIST | FING 2012 AM | TABLE 2A
PEAK HOUR | LEVEL OF SERVIC | E | | |
|-------|--|---------------------|-----------------------|----------------------------|-----------|--------------------------------------|-------|
| | Intersection | | Wo | orst Movement ¹ | | Overall Interse | ction |
| ID | Location | Control | Movement | Delay (Sec/Veh) | LOS | Avg. Delay
(Sec/Veh) ² | LOS |
| 1 | Guardsman Way / Sunnyside
Ave | Signal | N/A | N/A | N/A | 28.8 | С |
| 2 | Guardsman Way / North
Rowland Hall Access | Side-street
Stop | EB LT | 11.3 | В | <5.0 | А |
| 2. Th | is represents the worst movement L
is represents the overall intersection
e: Fehr & Peers, April 2012. | , · | . , | , , | or unsigr | alized intersections. | |

As shown in Table 2A, all study intersections operate at LOS C or better during the AM peak hour for the existing 2012 conditions.

| | EXIS | TING 2012 PM | TABLE 2B
PEAK HOUR | LEVEL OF SERVIC | E | | |
|-------|--|---------------------|-----------------------|----------------------------|-----------|--------------------------------------|--------|
| | Intersection | | Wo | orst Movement ¹ | | Overall Interse | ection |
| ID | Location | Control | Movement | Delay (Sec/Veh) | LOS | Avg. Delay
(Sec/Veh) ² | LOS |
| 1 | Guardsman Way / Sunnyside
Ave | Signal | N/A | N/A | N/A | 23.3 | С |
| 2 | Guardsman Way / North
Rowland Hall Access | Side-street
Stop | EB LT | 11.4 | В | <5.0 | А |
| 4. Tł | his represents the worst movement L
his represents the overall intersection
e: Fehr & Peers, April 2012. | , , | . , | , , | or unsigr | alized intersections. | |

As shown in Table 2B, all study intersections operate at LOS C or better during the PM peak hour for the existing 2012 conditions.

E. Mitigation Measures

No mitigation measures are recommended for the existing (2012) conditions.



III. PROJECT CONDITIONS

A. Purpose

The project conditions analysis explains the type and intensity of development. This provides the basis for trip generation, distribution, and assignment of project trips to the surrounding study intersections defined in the Introduction.

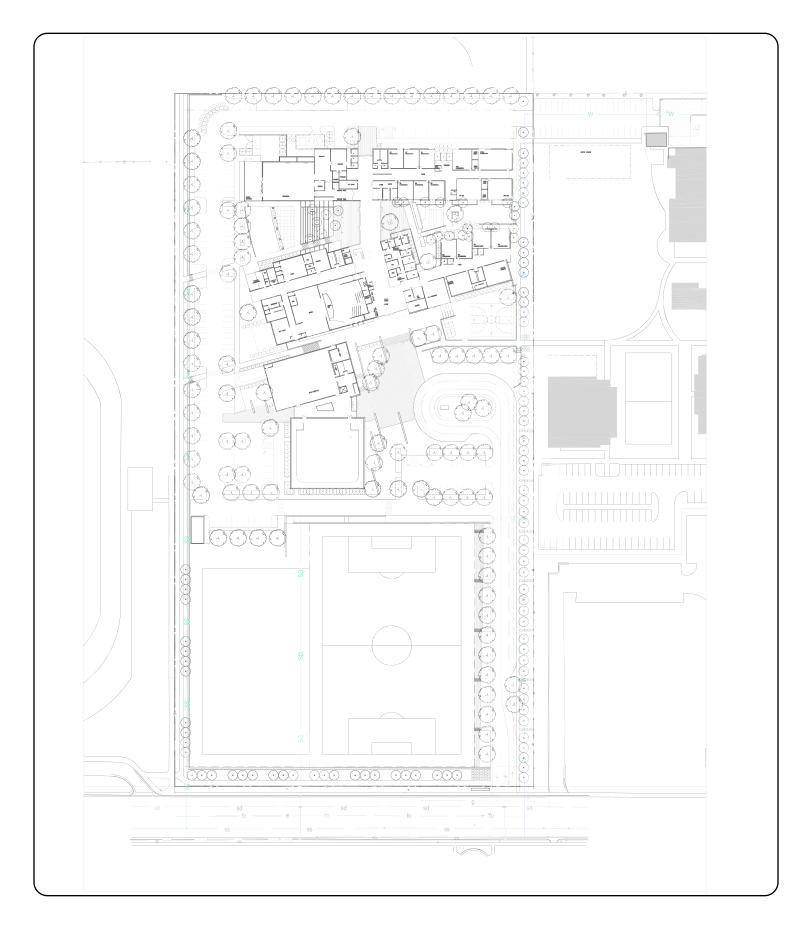
B. Project Description

The proposed Rowland Hall development will occur at approximately Guardsman Way and Sunnyside Ave in Salt Lake City, Utah. It will include a new access point (Access 1) along Sunnyside Ave approximately 630 feet west of Guardsman Way. Another access will tie into the existing north Rowland Hall access, which is approximately 1,015 feet north of Sunnyside Ave. Figure 3 shows the proposed project site plan.

C. Trip Generation

Trip generation for the Rowland Hall development was collected from a local trip generation analysis. AM peak period trip generation was collected from the existing Rowland Hall Schools located near 800 South and Lincoln Street by Fehr & Peers in January 2005; PM peak period trip generation was collected from the existing Rowland Hall Schools on March 6, 2012. The proposed Rowland Hall development will have the same grades as the existing Rowland Hall where the local trip generation was conducted; therefore, resulting in a direct trip generation comparison. The resulting net trips are as follows:

| | ROWLAND | TABLE 3
HALL TRIP | GENERATIO | N | |
|-----------------------------------|-------------------|----------------------|---------------|--------------|-------------|
| Time Period | Trips
Entering | Trips
Exiting | %
Entering | %
Exiting | Total Trips |
| AM Peak Hour | 338 | 233 | 59 | 41 | 571 |
| PM Peak Hour | 152 | 203 | 43 | 57 | 355 |
| Source: Fehr & Peers, April 2012. | | | | | |



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ROWLAND HALL Site Plan



D. Trip Distribution and Assignment

Project traffic was assigned to the roadway network based on the proximity of project access points to major streets and freeways, high population densities, and regional and local trip attractions. Existing travel patterns observed during data collection also provided helpful guidance to establish these distribution percentages, especially in close proximity to the site.

The project-generated trips were distributed to and from these directions, in the corresponding percentages.

AM Peak Hour:

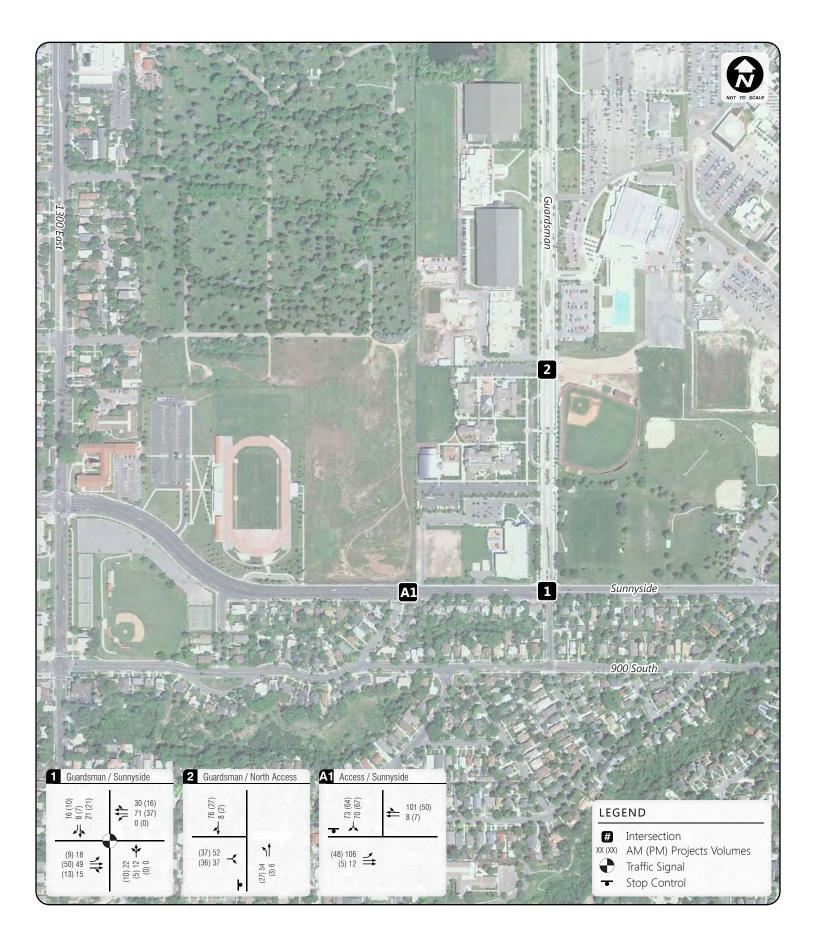
- 35% East on Sunnyside Ave
- 35% West on Sunnyside Ave
- 10% North on Guardsman Way
- 20% South on Guardsman Way

PM Peak Hour:

- 35% East on Sunnyside Ave
- 30% West on Sunnyside Ave
- 10% North on Guardsman Way
- 25% South on Guardsman Way

These trip distribution assumptions were used to distribute project-generated traffic to the study area intersections. Figures 4 shows the resulting project generated AM and PM peak hour trips assigned to each study intersection.

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ROWLAND HALL AM and PM Peak Hour Project-Generated Trips



A. Purpose

The purpose of the existing 2012 plus project conditions analysis is to evaluate the impact of the project traffic on the surrounding roadway network in the year 2012. In order to analyze this impact, the projected 2012 background traffic volumes were combined with those generated by the proposed project. Intersection LOS analyses were then performed and compared to the results of the existing 2012 background analysis. This comparison shows the impact of the proposed project.

B. Traffic Volumes

Project-generated traffic (Figure 4) was added to the existing 2012 background volumes (Figure 2) to yield "existing 2012 plus project" AM and PM peak hour traffic volumes at the study intersections. The resulting weekday AM and PM peak hour traffic volumes are displayed in Figure 5.

C. Level of Service Analysis

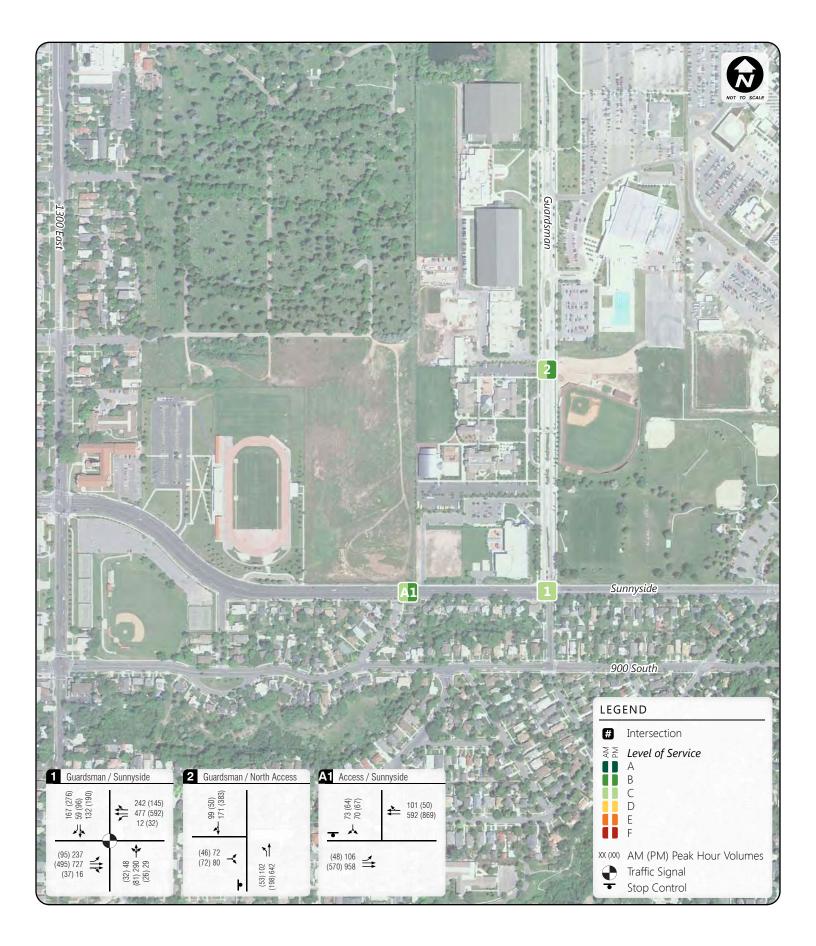
Using Synchro software and the HCM 2000 delay thresholds introduced in Chapter I, the existing 2012 plus project weekday AM and PM peak hour LOS was computed for each study intersection. The results of this analysis for the AM and PM peak hours are reported in Table 4A and Table 4B, respectively. (see Appendix for the detailed LOS reports). These results serve as a base for the analysis of the impacts of the proposed development.

| | EXISTING 20 | 12 PLUS PROJ | TABLE 4A
ECT AM PEAI | K HOUR LEVEL OF | SERVIC | E | |
|-------|--|---------------------|-------------------------|----------------------------|-----------|--------------------------------------|-------|
| | Intersection | | Wo | orst Movement ¹ | | Overall Interse | ction |
| ID | Location | Control | Movement | Delay (Sec/Veh) | LOS | Avg. Delay
(Sec/Veh) ² | LOS |
| 1 | Guardsman Way / Sunnyside
Ave | Signal | N/A | N/A | N/A | 34.5 | С |
| 2 | Guardsman Way / North
Rowland Hall Access | Side-street
Stop | EB LT | 16.1 | С | <5.0 | А |
| A1 | Access 1 / Sunnyside Ave | Side-street
Stop | SB LT | 16.0 | С | <5.0 | А |
| 6. Tł | is represents the worst movement L
is represents the overall intersection | | | | or unsign | alized intersections. | |

Source: Fehr & Peers, April 2012.

As shown in Table 4A, all study intersections operate at LOS C or better during the AM peak hour for the existing 2012 plus project conditions.





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ROWLAND HALL Existing 2012 Plus Project AM and PM Peak Hour Conditions

| | EXISTING 20 | 12 PLUS PROJ | TABLE 4B
ECT PM PEAI | (HOUR LEVEL OF | SERVIC | E | |
|-------|--|---------------------|-------------------------|----------------------------|-----------|--------------------------------------|-------|
| | Intersection | | Wo | orst Movement ¹ | | Overall Interse | ction |
| ID | Location | Control | Movement | Delay (Sec/Veh) | LOS | Avg. Delay
(Sec/Veh) ² | LOS |
| 1 | Guardsman Way / Sunnyside
Ave | Signal | N/A | N/A | N/A | 25.0 | С |
| 2 | Guardsman Way / North
Rowland Hall Access | Side-street
Stop | EB LT | 12.9 | В | <5.0 | А |
| A1 | Access 1 / Sunnyside Ave | Side-street
Stop | SB LT | 14.6 | В | <5.0 | А |
| 8. Tł | his represents the worst movement L
his represents the overall intersectior
e: Fehr & Peers, April 2012. | , , | . , | , , | or unsign | alized intersections. | |

As shown in Table 4B, all study intersections operate at LOS C or better during the PM peak hour for the existing 2012 plus project conditions.

The close proximity of the proposed Rowland Hall access on Sunnyside Ave to the existing Pingree Center Parking access does create more conflict points than if the accesses were spaced farther apart. However, due to the low volume of vehicles at the Pingree Center access the number of conflict points will help reduce the number of conflicts.

D. Mitigation Measures

No mitigation measures are recommended for the existing 2012 plus project conditions.

V. FUTURE 2030 BACKGROUND CONDITIONS

A. Purpose

The purpose of the future 2030 background conditions analysis is to evaluate the intersections and roadways under projected 2030 peak hour traffic volumes and roadway conditions. This evaluation reveals potential non-project problems that may be anticipated for the year 2030. This analysis also provides a baseline condition for the year 2030, which can be used to determine project impacts in the future.

B. Traffic Volumes

Fehr & Peers projected 2030 volumes using growth rates based on the Wasatch Front Regional Council's (WFRC) 2040 travel demand model.

Traffic volumes for the future year 2030 were forecasted using the following annual linear growth rates for 18 years:

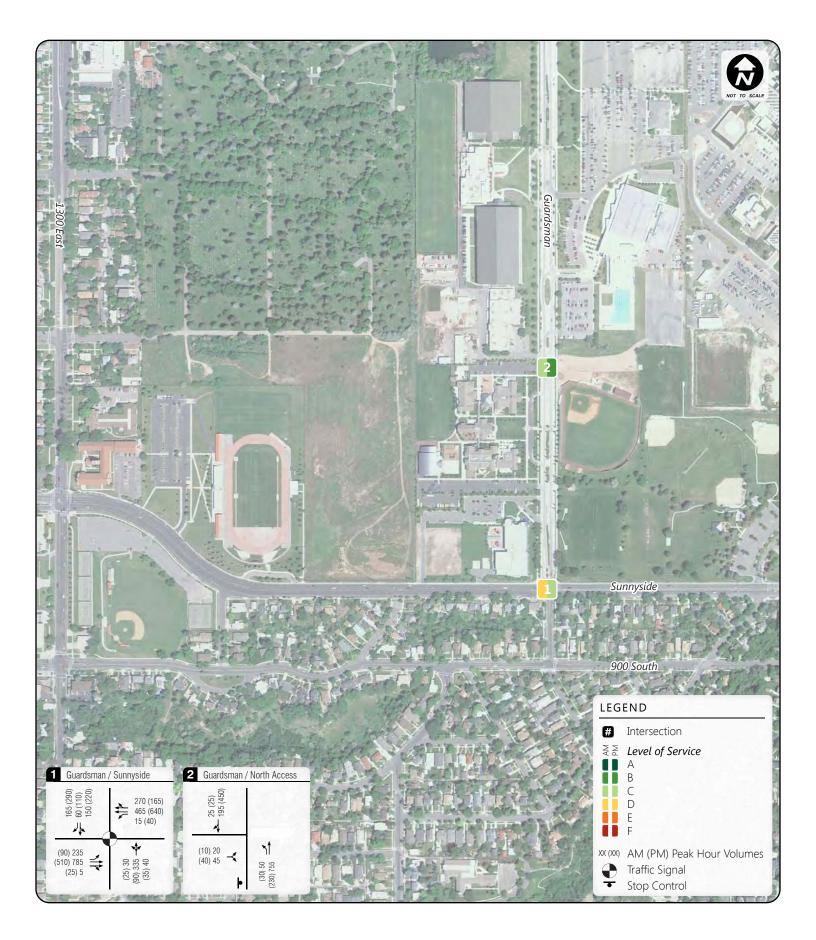
- 0.7% for Sunnyside Ave, west of Guardsman Way
- 1.1% for Sunnyside Ave, east of Guardsman Way
- 1.1% for Guardsman Way, north of Sunnyside Ave
- 1.1% for Guardsman Way, south of Sunnyside Ave

These volumes represent the future 2030 background AM and PM peak hour traffic volumes and are shown in Figure 6.

C. Level of Service Analysis

Using Synchro software and the HCM 2000 delay thresholds introduced in Chapter I, the future 2030 background weekday AM and PM peak hour LOS was computed for each study intersection. The results of this analysis for the AM and PM peak hours are reported in Table 5A and Table 5B, respectively. (see Appendix for the detailed LOS report). These results serve as a base for the analysis of the impacts of the proposed development.

| | FUT | URE 2030 AM | TABLE 5A
PEAK HOUR | LEVEL OF SERVICE | | | |
|--------|--|---------------------|-----------------------|----------------------------|-----------|--------------------------------------|-------|
| | Intersection | | Wo | orst Movement ¹ | | Overall Interse | ction |
| ID | Location | Control | Movement | Delay (Sec/Veh) | LOS | Avg. Delay
(Sec/Veh) ² | LOS |
| 1 | Guardsman Way / Sunnyside
Ave | Signal | N/A | N/A | N/A | 38.3 | D |
| 2 | Guardsman Way / North
Rowland Hall Access | Side-street
Stop | EB LT | 15.2 | С | < 5.0 | А |
| 10. Th | is represents the worst movement L
is represents the overall intersection
e: Fehr & Peers, April 2012. | , , | . , | , , | or unsigr | nalized intersections. | |



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ROWLAND HALL Future 2030 AM and PM Peak Hour Conditions

As shown in Table 5A, all study intersections operate at LOS D or better during the AM peak hour for the future 2030 background conditions.

| | FUT | URE 2030 PM | TABLE 5B
PEAK HOUR | LEVEL OF SERVICE | | | |
|--------|--|---------------------|-----------------------|----------------------------|-----------|--------------------------------------|--------|
| | Intersection | | Wo | orst Movement ¹ | | Overall Interse | ection |
| ID | Location | Control | Movement | Delay (Sec/Veh) | LOS | Avg. Delay
(Sec/Veh) ² | LOS |
| 1 | Guardsman Way / Sunnyside
Ave | Signal | N/A | N/A | N/A | 29.1 | С |
| 2 | Guardsman Way / North
Rowland Hall Access | Side-street
Stop | EB LT | 13.2 | В | <5.0 | А |
| 12. Tł | his represents the worst movement L
his represents the overall intersection
e: Fehr & Peers, April 2012. | | | , , | or unsign | alized intersections. | |

As shown in Table 5B, all study intersections operate at LOS C or better during the PM peak hour for the future 2030 background conditions.

D. Mitigation Measures

No mitigation measures are recommended for the future 2030 background conditions.



A. Purpose

The purpose of the future 2030 plus project conditions analysis is to evaluate the impact of the project traffic on the surrounding roadway network in the year 2030. In order to analyze this impact, the projected 2030 background traffic volumes were combined with those generated by the proposed project. Intersection LOS analyses were then performed and compared to the results of the projected 2030 background traffic volumes. This comparison shows the impact of the proposed project in the future.

B. Traffic Volumes

Project-generated traffic (Figure 4) was added to the future 2030 background volumes (Figure 6) to yield "future 2030 plus project" AM and PM peak hour traffic volumes at the study intersections. The resulting weekday AM and PM peak hour traffic volumes are displayed in Figure 7.

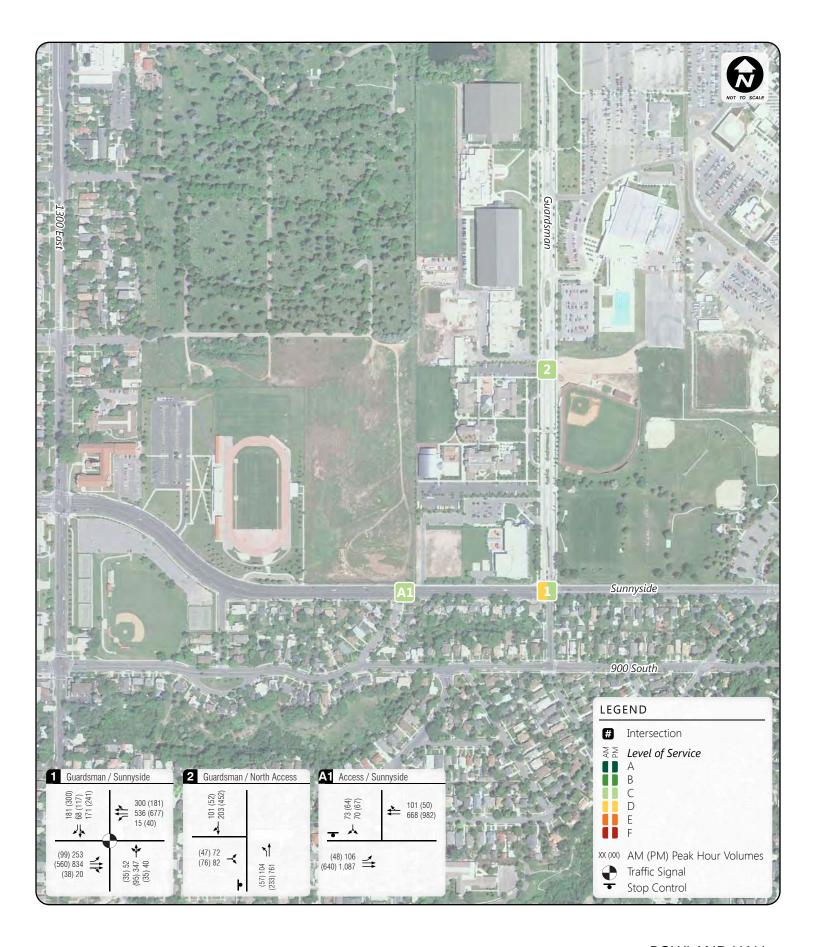
C. Level of Service Analysis

Using Synchro software and the HCM 2000 delay thresholds introduced in Chapter I, the future 2030 plus project weekday AM and PM peak hour LOS was computed for each study intersection. The results of this analysis for the AM and PM peak hours are reported in Table 6A and Table 6B, respectively. (see Appendix for the detailed LOS report). These results serve as a base for the analysis of the impacts of the proposed development.

| | FUTURE 203 | 0 PLUS PROJE | TABLE 6A
CT AM PEAK | HOUR LEVEL OF S | SERVICE | 1 | |
|--------|--|---------------------|------------------------|----------------------------|-----------|--------------------------------------|-------|
| | Intersection | | Wo | orst Movement ¹ | | Overall Interse | ction |
| ID | Location | Control | Movement | Delay (Sec/Veh) | LOS | Avg. Delay
(Sec/Veh) ² | LOS |
| 1 | Guardsman Way / Sunnyside
Ave | Signal | N/A | N/A | N/A | 49.7 | D |
| 2 | Guardsman Way / North
Rowland Hall Access | Side-street
Stop | EB LT | 18.9 | С | <5.0 | А |
| A1 | Access 1 / Sunnyside Ave | Side-street
Stop | SB LT | 17.0 | С | <5.0 | А |
| 14. Th | is represents the worst movement L
is represents the overall intersectior
e: Fehr & Peers, April 2012. | , , | . , | , , | or unsign | alized intersections. | |

As shown in Table 6A, all study intersections operate at LOS D or better during the AM peak hour for the future 2030 plus project conditions.





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ROWLAND HALL Future 2030 Plus Project AM and PM Peak Hour Conditions

| | FUTURE 203 | 80 PLUS PROJE | TABLE 6B
CT PM PEAK | HOUR LEVEL OF S | SERVICE | : | |
|--------|--|---------------------|------------------------|----------------------------|-----------|--------------------------------------|-------|
| | Intersection | | Wo | orst Movement ¹ | | Overall Interse | ction |
| ID | Location | Control | Movement | Delay (Sec/Veh) | LOS | Avg. Delay
(Sec/Veh) ² | LOS |
| 1 | Guardsman Way / Sunnyside
Ave | Signal | N/A | N/A | N/A | 32.9 | С |
| 2 | Guardsman Way / North
Rowland Hall Access | Side-street
Stop | EB LT | 18.1 | С | <5.0 | А |
| A1 | Access 1 / Sunnyside Ave | Side-street
Stop | SB LT | 15.4 | С | <5.0 | А |
| 16. Th | is represents the worst movement L
is represents the overall intersectior
e: Fehr & Peers, April 2012. | | . , | , , | or unsign | alized intersections. | |

As shown in Table 6B, all study intersections operate at LOS C or better during the PM peak hour for the future 2030 plus project conditions.

The close proximity of the proposed Rowland Hall access on Sunnyside Ave to the existing Pingree Center Parking access does create more conflict points than if the accesses were spaced farther apart. However, due to the low volume of vehicles at the Pingree Center access the number of conflict points will help reduce the number of conflicts.

D. Mitigation Measures

No mitigation measures are recommended for the future 2030 plus project conditions.



VII. CONCLUSION

All study intersections operate at acceptable LOS (LOS D or better) during the four scenarios analyzed: existing 2012, existing 2012 plus project, future 2030 background, and future 2030 plus project. This study shows that the additional traffic generated by the proposed Rowland Hall development would have minimal impact to the existing traffic conditions within the study area and in the future. Since no significant impacts were identified, no mitigations are recommended.

Appendix

Traffic Counts

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Detailed Level of Service Reports

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|-------------------------------|-------|-----------|--------------|----------|-------------|------------|-------|-------|------|-------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | <u>††</u> | 1 | <u>۲</u> | ≜1 ≱ | | | र्भ | 1 | | र्स | 1 |
| Volume (vph) | 219 | 678 | 1 | 12 | 406 | 212 | 26 | 278 | 29 | 111 | 51 | 151 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.95 | | | 1.00 | 0.85 | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | | 1.00 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3357 | | | 1855 | 1583 | | 1801 | 1583 |
| Flt Permitted | 0.16 | 1.00 | 1.00 | 0.37 | 1.00 | | | 1.00 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (perm) | 307 | 3539 | 1583 | 692 | 3357 | | | 1855 | 1583 | | 1801 | 1583 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 238 | 737 | 1 | 13 | 441 | 230 | 28 | 302 | 32 | 121 | 55 | 164 |
| RTOR Reduction (vph) | 0 | 0 | 1 | 0 | 68 | 0 | 0 | 0 | 6 | 0 | 0 | 139 |
| Lane Group Flow (vph) | 238 | 737 | 0 | 13 | 603 | 0 | 0 | 330 | 26 | 0 | 176 | 25 |
| Turn Type | pm+pt | | Perm | Perm | | | Split | | Perm | Split | | Perm |
| Protected Phases | 5 | 2 | | | 6 | | 3 | 3 | | 4 | 4 | |
| Permitted Phases | 2 | | 2 | 6 | | | | | 3 | | | 4 |
| Actuated Green, G (s) | 40.5 | 40.5 | 40.5 | 22.3 | 22.3 | | | 20.0 | 20.0 | | 13.9 | 13.9 |
| Effective Green, g (s) | 40.5 | 40.5 | 40.5 | 22.3 | 22.3 | | | 20.0 | 20.0 | | 13.9 | 13.9 |
| Actuated g/C Ratio | 0.45 | 0.45 | 0.45 | 0.25 | 0.25 | | | 0.22 | 0.22 | | 0.16 | 0.16 |
| Clearance Time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 371 | 1603 | 717 | 173 | 837 | | | 415 | 354 | | 280 | 246 |
| v/s Ratio Prot | c0.10 | 0.21 | | | c0.18 | | | c0.18 | | | c0.10 | |
| v/s Ratio Perm | 0.19 | | 0.00 | 0.02 | | | | | 0.02 | | | 0.02 |
| v/c Ratio | 0.64 | 0.46 | 0.00 | 0.08 | 0.72 | | | 0.80 | 0.07 | | 0.63 | 0.10 |
| Uniform Delay, d1 | 17.4 | 16.9 | 13.4 | 25.7 | 30.7 | | | 32.8 | 27.4 | | 35.3 | 32.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.8 | 0.2 | 0.0 | 0.2 | 3.1 | | | 10.1 | 0.1 | | 4.4 | 0.2 |
| Delay (s) | 21.2 | 17.1 | 13.4 | 25.8 | 33.8 | | | 42.9 | 27.5 | | 39.7 | 32.6 |
| Level of Service | С | В | В | С | С | | | D | С | | D | С |
| Approach Delay (s) | | 18.1 | | | 33.6 | | | 41.5 | | | 36.3 | |
| Approach LOS | | В | | | С | | | D | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM Average Control Delay | | | 28.8 | Н | CM Level | of Service | | | С | | | |
| HCM Volume to Capacity ra | atio | | 0.71 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 89.4 | | um of lost | | | | 19.0 | | | |
| Intersection Capacity Utiliza | tion | | 70.9% | IC | U Level o | of Service | | | С | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

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|-------------------------------|-------------|--------------|-------|-------|------------|------------|--|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR | |
| Lane Configurations | Y | | ሻ | 1 | 4Î | | |
| Volume (veh/h) | 20 | 43 | 48 | 636 | 163 | 23 | |
| Sign Control | Stop | | | Free | Free | | |
| Grade | 0% | | | 0% | 0% | | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | |
| Hourly flow rate (vph) | 21 | 46 | 51 | 677 | 173 | 24 | |
| Pedestrians | | 10 | 0. | 0.1 | | | |
| Lane Width (ft) | | | | | | | |
| Walking Speed (ft/s) | | | | | | | |
| Percent Blockage | | | | | | | |
| Right turn flare (veh) | | | | | | | |
| Median type | | | | TWLTL | None | | |
| Median storage veh) | | | | 2 | NULLE | | |
| Upstream signal (ft) | | | | 1151 | | | |
| pX, platoon unblocked | 0.90 | | | 1131 | | | |
| vC, conflicting volume | 0.90
964 | 186 | 198 | | | | |
| vC1, stage 1 conf vol | 964
186 | 100 | 190 | | | | |
| | 779 | | | | | | |
| vC2, stage 2 conf vol | 907 | 186 | 198 | | | | |
| vCu, unblocked vol | | | 4.1 | | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | | |
| tC, 2 stage (s) | 5.4 | 0.0 | 0.0 | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | | |
| p0 queue free % | 95 | 95 | 96 | | | | |
| cM capacity (veh/h) | 408 | 857 | 1375 | | | | |
| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | | | |
| Volume Total | 67 | 51 | 677 | 198 | | | |
| Volume Left | 21 | 51 | 0 | 0 | | | |
| Volume Right | 46 | 0 | 0 | 24 | | | |
| cSH | 635 | 1375 | 1700 | 1700 | | | |
| Volume to Capacity | 0.11 | 0.04 | 0.40 | 0.12 | | | |
| Queue Length 95th (ft) | 9 | 3 | 0 | 0 | | | |
| Control Delay (s) | 11.3 | 7.7 | 0.0 | 0.0 | | | |
| Lane LOS | В | А | | | | | |
| Approach Delay (s) | 11.3 | 0.5 | | 0.0 | | | |
| Approach LOS | В | | | | | | |
| Intersection Summary | | | | | | | |
| Average Delay | | | 1.2 | | | | |
| Intersection Capacity Utiliza | ation | | 43.9% | 10 | CU Level c | of Service | |
| Analysis Period (min) | | | 15 | | | | |
| | | | 10 | | | | |

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|-----------------------------------|------|---------|-------------|------|------------|------------|---|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | |
| Lane Configurations | ľ | <u></u> | ∱ î≽ | | Y | | |
| Volume (veh/h) | 48 | 898 | 582 | 1 | 0 | 2 | |
| Sign Control | | Free | Free | | Stop | | |
| Grade | | 0% | 0% | | 0% | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | |
| Hourly flow rate (vph) | 52 | 976 | 633 | 1 | 0 | 2 | |
| Pedestrians | | | | | | | |
| Lane Width (ft) | | | | | | | |
| Walking Speed (ft/s) | | | | | | | |
| Percent Blockage | | | | | | | |
| Right turn flare (veh) | | | | | | | |
| Median type | | TWLTL | TWLTL | | | | |
| Median storage veh) | | 2 | 2 | | | | |
| Upstream signal (ft) | | - | 637 | | | | |
| pX, platoon unblocked | 0.92 | | | | 0.92 | 0.92 | |
| vC, conflicting volume | 634 | | | | 1226 | 317 | |
| vC1, stage 1 conf vol | | | | | 633 | | |
| vC2, stage 2 conf vol | | | | | 592 | | |
| vCu, unblocked vol | 428 | | | | 1071 | 83 | |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 | |
| tC, 2 stage (s) | | | | | 5.8 | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 | |
| p0 queue free % | 95 | | | | 100 | 100 | |
| cM capacity (veh/h) | 1038 | | | | 403 | 882 | |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | SB 1 | |
| Volume Total | 52 | 488 | 488 | 422 | 212 | 2 | |
| Volume Left | 52 | 0 | 0 | 0 | 0 | 0 | |
| Volume Right | 0 | 0 | 0 | 0 | 1 | 2 | |
| cSH | 1038 | 1700 | 1700 | 1700 | 1700 | 882 | |
| Volume to Capacity | 0.05 | 0.29 | 0.29 | 0.25 | 0.12 | 0.00 | |
| Queue Length 95th (ft) | 4 | 0.20 | 0.20 | 0.20 | 0.12 | 0.00 | |
| Control Delay (s) | 8.7 | 0.0 | 0.0 | 0.0 | 0.0 | 9.1 | |
| Lane LOS | A | 0.0 | 0.0 | 0.0 | 0.0 | A | |
| Approach Delay (s) | 0.4 | | | 0.0 | | 9.1 | |
| Approach LOS | 0.1 | | | 0.0 | | A | |
| Intersection Summary | | | | | | | |
| Average Delay | | | 0.3 | | | | |
| Intersection Capacity Utilization | on | | 34.8% | IC | CU Level o | of Service | А |
| Analysis Period (min) | | | 15 | | | | |
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HCM Signalized Intersection Capacity Analysis 1: Sunnyside Ave & Guardsman Way

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| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | - †† | 1 | <u>۲</u> | ≜ ⊅ | | | र्भ | 1 | | र्भ | 1 |
| Volume (vph) | 86 | 445 | 24 | 32 | 555 | 129 | 22 | 76 | 26 | 169 | 89 | 266 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | | 1.00 | 0.85 | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3439 | | | 1842 | 1583 | | 1804 | 1583 |
| Flt Permitted | 0.18 | 1.00 | 1.00 | 0.47 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (perm) | 335 | 3539 | 1583 | 882 | 3439 | | | 1842 | 1583 | | 1804 | 1583 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 95 | 489 | 26 | 35 | 610 | 142 | 24 | 84 | 29 | 186 | 98 | 292 |
| RTOR Reduction (vph) | 0 | 0 | 11 | 0 | 19 | 0 | 0 | 0 | 20 | 0 | 0 | 221 |
| Lane Group Flow (vph) | 95 | 489 | 15 | 35 | 733 | 0 | 0 | 108 | 9 | 0 | 284 | 71 |
| Turn Type | pm+pt | | Perm | Perm | | | Split | | Perm | Split | | Perm |
| Protected Phases | 5 | 2 | | | 6 | | 3 | 3 | | 4 | 4 | |
| Permitted Phases | 2 | | 2 | 6 | | | | | 3 | | | 4 |
| Actuated Green, G (s) | 35.9 | 35.9 | 35.9 | 24.4 | 24.4 | | | 9.2 | 9.2 | | 19.2 | 19.2 |
| Effective Green, g (s) | 35.9 | 35.9 | 35.9 | 24.4 | 24.4 | | | 9.2 | 9.2 | | 19.2 | 19.2 |
| Actuated g/C Ratio | 0.45 | 0.45 | 0.45 | 0.31 | 0.31 | | | 0.12 | 0.12 | | 0.24 | 0.24 |
| Clearance Time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 287 | 1602 | 717 | 271 | 1058 | | | 214 | 184 | | 437 | 383 |
| v/s Ratio Prot | 0.03 | c0.14 | | | c0.21 | | | c0.06 | | | c0.16 | |
| v/s Ratio Perm | 0.12 | | 0.01 | 0.04 | | | | | 0.01 | | | 0.04 |
| v/c Ratio | 0.33 | 0.31 | 0.02 | 0.13 | 0.69 | | | 0.50 | 0.05 | | 0.65 | 0.18 |
| Uniform Delay, d1 | 14.1 | 13.8 | 12.0 | 19.8 | 24.2 | | | 32.9 | 31.2 | | 27.0 | 23.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.7 | 0.1 | 0.0 | 0.2 | 2.0 | | | 1.9 | 0.1 | | 3.3 | 0.2 |
| Delay (s) | 14.8 | 13.9 | 12.0 | 20.0 | 26.1 | | | 34.8 | 31.3 | | 30.4 | 24.1 |
| Level of Service | В | В | В | С | С | | | С | С | | С | С |
| Approach Delay (s) | | 13.9 | | | 25.9 | | | 34.0 | | | 27.2 | |
| Approach LOS | | В | | | С | | | С | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM Average Control Delay | | | 23.3 | Н | CM Level | of Service | | | С | | | |
| HCM Volume to Capacity rati | 0 | | 0.62 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 79.3 | | um of lost | | | | 20.0 | | | |
| Intersection Capacity Utilization | on | | 56.6% | IC | CU Level o | of Service | | | В | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

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|--|-------|------|-------|-------|------------|-----------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | Y | | ሻ | 1 | 4Î | |
| Volume (veh/h) | 9 | 36 | 26 | 195 | 381 | 23 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 10 | 40 | 29 | 214 | 419 | 25 |
| Pedestrians | | | 20 | | 110 | 20 |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | TWLTL | None | |
| Median storage veh) | | | | 2 | NONE | |
| | | | | 1151 | | |
| Upstream signal (ft) | | | | 1101 | | |
| pX, platoon unblocked vC, conflicting volume | 703 | 431 | 444 | | | |
| | 431 | 431 | 444 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | 271 | 404 | 444 | | | |
| vCu, unblocked vol | 703 | 431 | | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | 5.4 | 0.0 | 0.0 | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 94 | 97 | | | |
| cM capacity (veh/h) | 580 | 624 | 1116 | | | |
| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | | |
| Volume Total | 49 | 29 | 214 | 444 | | |
| Volume Left | 10 | 29 | 0 | 0 | | |
| Volume Right | 40 | 0 | 0 | 25 | | |
| cSH | 615 | 1116 | 1700 | 1700 | | |
| Volume to Capacity | 0.08 | 0.03 | 0.13 | 0.26 | | |
| Queue Length 95th (ft) | 7 | 2 | 0 | 0 | | |
| Control Delay (s) | 11.4 | 8.3 | 0.0 | 0.0 | | |
| Lane LOS | В | А | | | | |
| Approach Delay (s) | 11.4 | 1.0 | | 0.0 | | |
| Approach LOS | В | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.1 | | | |
| Intersection Capacity Utiliza | ation | | 31.6% | IC | CU Level o | f Service |
| Analysis Period (min) | | | 15 | | | |
| | | | 13 | | | |

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|---------------------------------|------|---------|-------|------|-----------|------------|--|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | |
| Lane Configurations | 7 | <u></u> | A1⊅ | | Y | | |
| Volume (veh/h) | 11 | 554 | 841 | 2 | 1 | 21 | |
| Sign Control | | Free | Free | | Stop | | |
| Grade | | 0% | 0% | | 0% | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | |
| Hourly flow rate (vph) | 12 | 602 | 914 | 2 | 1 | 23 | |
| Pedestrians | | | | | | | |
| Lane Width (ft) | | | | | | | |
| Walking Speed (ft/s) | | | | | | | |
| Percent Blockage | | | | | | | |
| Right turn flare (veh) | | | | | | | |
| Median type | | TWLTL | TWLTL | | | | |
| Median storage veh) | | 2 | 2 | | | | |
| Upstream signal (ft) | | | 637 | | | | |
| pX, platoon unblocked | 0.85 | | | | 0.85 | 0.85 | |
| vC, conflicting volume | 916 | | | | 1240 | 458 | |
| vC1, stage 1 conf vol | | | | | 915 | | |
| vC2, stage 2 conf vol | | | | | 325 | | |
| vCu, unblocked vol | 560 | | | | 939 | 23 | |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 | |
| tC, 2 stage (s) | | | | | 5.8 | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 | |
| p0 queue free % | 99 | | | | 100 | 97 | |
| cM capacity (veh/h) | 860 | | | | 414 | 895 | |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | SB 1 | |
| Volume Total | 12 | 301 | 301 | 609 | 307 | 24 | |
| Volume Left | 12 | 0 | 0 | 0 | 0 | 1 | |
| Volume Right | 0 | 0 | 0 | 0 | 2 | 23 | |
| cSH | 860 | 1700 | 1700 | 1700 | 1700 | 850 | |
| Volume to Capacity | 0.01 | 0.18 | 0.18 | 0.36 | 0.18 | 0.03 | |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 | 2 | |
| Control Delay (s) | 9.2 | 0.0 | 0.0 | 0.0 | 0.0 | 9.4 | |
| Lane LOS | А | | | | | А | |
| Approach Delay (s) | 0.2 | | | 0.0 | | 9.4 | |
| Approach LOS | | | | | | А | |
| Intersection Summary | | | | | | | |
| Average Delay | | | 0.2 | | | | |
| Intersection Capacity Utilizati | on | | 33.3% | IC | U Level c | of Service | |
| Analysis Period (min) | | | 15 | | | | |

HCM Signalized Intersection Capacity Analysis 1: Sunnyside Ave & Guardsman Way

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|-------------------------------|-------|-------------|--------------|----------|-------------|------------|-------|-------|------|-------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | - †† | 1 | <u>۲</u> | ≜ †≱ | | | र्भ | 1 | | र्भ | 1 |
| Volume (vph) | 237 | 727 | 16 | 12 | 477 | 242 | 48 | 290 | 29 | 132 | 59 | 167 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.95 | | | 1.00 | 0.85 | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3360 | | | 1850 | 1583 | | 1801 | 1583 |
| Flt Permitted | 0.14 | 1.00 | 1.00 | 0.35 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (perm) | 253 | 3539 | 1583 | 657 | 3360 | | | 1850 | 1583 | | 1801 | 1583 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 258 | 790 | 17 | 13 | 518 | 263 | 52 | 315 | 32 | 143 | 64 | 182 |
| RTOR Reduction (vph) | 0 | 0 | 4 | 0 | 62 | 0 | 0 | 0 | 6 | 0 | 0 | 152 |
| Lane Group Flow (vph) | 258 | 790 | 13 | 13 | 719 | 0 | 0 | 367 | 26 | 0 | 207 | 30 |
| Turn Type | pm+pt | | Perm | Perm | | | Split | | Perm | Split | | Perm |
| Protected Phases | 5 | 2 | | | 6 | | 3 | 3 | | 4 | 4 | |
| Permitted Phases | 2 | | 2 | 6 | | | | | 3 | | | 4 |
| Actuated Green, G (s) | 44.4 | 44.4 | 44.4 | 25.5 | 25.5 | | | 20.3 | 20.3 | | 15.7 | 15.7 |
| Effective Green, g (s) | 44.4 | 44.4 | 44.4 | 25.5 | 25.5 | | | 20.3 | 20.3 | | 15.7 | 15.7 |
| Actuated g/C Ratio | 0.47 | 0.47 | 0.47 | 0.27 | 0.27 | | | 0.21 | 0.21 | | 0.16 | 0.16 |
| Clearance Time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 355 | 1647 | 737 | 176 | 898 | | | 394 | 337 | | 296 | 261 |
| v/s Ratio Prot | c0.11 | 0.22 | | | c0.21 | | | c0.20 | | | c0.11 | |
| v/s Ratio Perm | 0.23 | | 0.01 | 0.02 | | | | | 0.02 | | | 0.02 |
| v/c Ratio | 0.73 | 0.48 | 0.02 | 0.07 | 0.80 | | | 0.93 | 0.08 | | 0.70 | 0.11 |
| Uniform Delay, d1 | 19.4 | 17.5 | 13.7 | 26.1 | 32.6 | | | 36.9 | 30.1 | | 37.6 | 33.9 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 7.2 | 0.2 | 0.0 | 0.2 | 5.2 | | | 28.6 | 0.1 | | 7.0 | 0.2 |
| Delay (s) | 26.7 | 17.8 | 13.8 | 26.3 | 37.7 | | | 65.5 | 30.2 | | 44.7 | 34.1 |
| Level of Service | С | В | В | С | D | | | E | С | | D | С |
| Approach Delay (s) | | 19.9 | | | 37.6 | | | 62.6 | | | 39.7 | |
| Approach LOS | | В | | | D | | | E | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM Average Control Delay | • | | 34.5 | Н | CM Level | of Service | | | С | | | |
| HCM Volume to Capacity ra | itio | | 0.80 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 95.4 | | um of lost | | | | 19.0 | | | |
| Intersection Capacity Utiliza | ition | | 78.2% | IC | U Level o | of Service | | | D | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

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|-------------------------------|-------|------|-------|-------|------------|-----------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | Y | | ۲ | 1 | ¢Î, | |
| Volume (veh/h) | 72 | 80 | 102 | 642 | 171 | 99 |
| Sign Control | Stop | 00 | 102 | Free | Free | 00 |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 77 | 85 | 109 | 683 | 182 | 105 |
| Pedestrians | 11 | 00 | 109 | 005 | 102 | 105 |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| | | | | | | |
| Right turn flare (veh) | | | | | None | |
| Median type | | | | TWLTL | None | |
| Median storage veh) | | | | 2 | | |
| Upstream signal (ft) | 0.04 | | | 1151 | | |
| pX, platoon unblocked | 0.91 | 005 | 007 | | | |
| vC, conflicting volume | 1135 | 235 | 287 | | | |
| vC1, stage 1 conf vol | 235 | | | | | |
| vC2, stage 2 conf vol | 900 | | | | | |
| vCu, unblocked vol | 1099 | 235 | 287 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 77 | 89 | 91 | | | |
| cM capacity (veh/h) | 336 | 804 | 1275 | | | |
| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | | |
| Volume Total | 162 | 109 | 683 | 287 | | |
| Volume Left | 77 | 109 | 0 | 0 | | |
| Volume Right | 85 | 0 | 0 | 105 | | |
| cSH | 485 | 1275 | 1700 | 1700 | | |
| Volume to Capacity | 0.33 | 0.09 | 0.40 | 0.17 | | |
| Queue Length 95th (ft) | 36 | 7 | 0 | 0 | | |
| Control Delay (s) | 16.1 | 8.1 | 0.0 | 0.0 | | |
| Lane LOS | С | A | | | | |
| Approach Delay (s) | 16.1 | 1.1 | | 0.0 | | |
| Approach LOS | С | | | 0.0 | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.8 | | | |
| Intersection Capacity Utiliza | ation | | 49.4% | IC | CU Level c | f Service |
| Analysis Period (min) | | | 49.4% | | | |
| | | | 10 | | | |

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|--|------|------------|----------|------|------------|-----------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | ٦ | † † | A | | Y | |
| Volume (veh/h) | 106 | 958 | 592 | 101 | 70 | 73 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 115 | 1041 | 643 | 110 | 76 | 79 |
| Pedestrians | 115 | 10-11 | 0-0 | 110 | 10 | 15 |
| Lane Width (ft) | | | | | | |
| | | | | | | |
| Walking Speed (ft/s)
Percent Blockage | | | | | | |
| Ū. | | | | | | |
| Right turn flare (veh) | | T\/// TI | T\A/I TI | | | |
| Median type | | | | | | |
| Median storage veh) | | 2 | 2 | | | |
| Upstream signal (ft) | 0.00 | | 750 | | 0.00 | 0.00 |
| pX, platoon unblocked | 0.89 | | | | 0.89 | 0.89 |
| vC, conflicting volume | 753 | | | | 1449 | 377 |
| vC1, stage 1 conf vol | | | | | 698 | |
| vC2, stage 2 conf vol | | | | | 751 | |
| vCu, unblocked vol | 475 | | | | 1257 | 52 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | 5.8 | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 88 | | | | 77 | 91 |
| cM capacity (veh/h) | 964 | | | | 326 | 894 |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | SB 1 |
| Volume Total | 115 | 521 | 521 | 429 | 324 | 155 |
| Volume Left | 115 | 0 | 0 | 0 | 0 | 76 |
| Volume Right | 0 | 0 | 0 | 0 | 110 | 79 |
| cSH | 964 | 1700 | 1700 | 1700 | 1700 | 482 |
| Volume to Capacity | 0.12 | 0.31 | 0.31 | 0.25 | 0.19 | 0.32 |
| Queue Length 95th (ft) | 10 | 0 | 0 | 0 | 0 | 34 |
| Control Delay (s) | 9.2 | 0.0 | 0.0 | 0.0 | 0.0 | 16.0 |
| Lane LOS | A | 0.0 | 0.0 | 0.0 | 0.0 | C |
| Approach Delay (s) | 0.9 | | | 0.0 | | 16.0 |
| Approach LOS | 0.5 | | | 0.0 | | 10.0
C |
| | | | | | | Ű |
| Intersection Summary | | | 4 7 | | | |
| Average Delay | - | | 1.7 | | | 4 Carda |
| Intersection Capacity Utilization | n | | 43.8% | IC | CU Level o | Service |
| Analysis Period (min) | | | 15 | | | |

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|-------------------------------|-------|------------|------------|------|------------|------------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | ሻ | † † | ∱ ⊅ | | Ý | |
| Volume (veh/h) | 48 | 980 | 691 | 1 | 0 | 2 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 52 | 1065 | 751 | 1 | 0 | 2 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | TWLTL | TWLTL | | | |
| Median storage veh) | | 2 | 2 | | | |
| Upstream signal (ft) | | - | 641 | | | |
| pX, platoon unblocked | 0.87 | | 011 | | 0.87 | 0.87 |
| vC, conflicting volume | 752 | | | | 1389 | 376 |
| vC1, stage 1 conf vol | 102 | | | | 752 | 010 |
| vC2, stage 2 conf vol | | | | | 637 | |
| vCu, unblocked vol | 428 | | | | 1156 | 0 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | 7.1 | | | | 5.8 | 0.5 |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 95 | | | | 100 | 100 |
| cM capacity (veh/h) | 986 | | | | 375 | 948 |
| | | | | | | |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | SB 1 |
| Volume Total | 52 | 533 | 533 | 501 | 251 | 2 |
| Volume Left | 52 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 1 | 2 |
| cSH | 986 | 1700 | 1700 | 1700 | 1700 | 948 |
| Volume to Capacity | 0.05 | 0.31 | 0.31 | 0.29 | 0.15 | 0.00 |
| Queue Length 95th (ft) | 4 | 0 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 8.9 | 0.0 | 0.0 | 0.0 | 0.0 | 8.8 |
| Lane LOS | A | | | | | А |
| Approach Delay (s) | 0.4 | | | 0.0 | | 8.8 |
| Approach LOS | | | | | | А |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.3 | | | |
| Intersection Capacity Utiliza | ation | | 37.1% | IC | CU Level o | of Service |
| Analysis Period (min) | | | 15 | | | |
| , | | | | | | |

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|--------------------------------|-------|---------|--------------|------|------------|------------|-------|-------|------|-------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ٦ | <u></u> | 1 | ٦ | ≜ ⊅ | | | र्भ | 1 | | 4 | 1 |
| Volume (vph) | 95 | 495 | 37 | 32 | 592 | 145 | 32 | 81 | 26 | 190 | 96 | 276 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | | 1.00 | 0.85 | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3435 | | | 1837 | 1583 | | 1803 | 1583 |
| Flt Permitted | 0.15 | 1.00 | 1.00 | 0.45 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (perm) | 283 | 3539 | 1583 | 836 | 3435 | | | 1837 | 1583 | | 1803 | 1583 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 104 | 544 | 41 | 35 | 651 | 159 | 35 | 89 | 29 | 209 | 105 | 303 |
| RTOR Reduction (vph) | 0 | 0 | 15 | 0 | 20 | 0 | 0 | 0 | 18 | 0 | 0 | 228 |
| Lane Group Flow (vph) | 104 | 544 | 26 | 35 | 790 | 0 | 0 | 124 | 11 | 0 | 314 | 75 |
| Turn Type | pm+pt | | Perm | Perm | | | Split | | Perm | Split | | Perm |
| Protected Phases | 5 | 2 | | | 6 | | 3 | 3 | | 4 | 4 | |
| Permitted Phases | 2 | | 2 | 6 | | | | | 3 | | | 4 |
| Actuated Green, G (s) | 37.7 | 37.7 | 37.7 | 25.9 | 25.9 | | | 9.8 | 9.8 | | 20.6 | 20.6 |
| Effective Green, g (s) | 37.7 | 37.7 | 37.7 | 25.9 | 25.9 | | | 9.8 | 9.8 | | 20.6 | 20.6 |
| Actuated g/C Ratio | 0.45 | 0.45 | 0.45 | 0.31 | 0.31 | | | 0.12 | 0.12 | | 0.25 | 0.25 |
| Clearance Time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 268 | 1606 | 718 | 261 | 1071 | | | 217 | 187 | | 447 | 392 |
| v/s Ratio Prot | 0.04 | c0.15 | | | c0.23 | | | c0.07 | | | c0.17 | |
| v/s Ratio Perm | 0.14 | | 0.02 | 0.04 | | | | | 0.01 | | | 0.05 |
| v/c Ratio | 0.39 | 0.34 | 0.04 | 0.13 | 0.74 | | | 0.57 | 0.06 | | 0.70 | 0.19 |
| Uniform Delay, d1 | 15.2 | 14.7 | 12.6 | 20.5 | 25.6 | | | 34.7 | 32.6 | | 28.5 | 24.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.9 | 0.1 | 0.0 | 0.2 | 2.7 | | | 3.6 | 0.1 | | 5.0 | 0.2 |
| Delay (s) | 16.1 | 14.8 | 12.6 | 20.8 | 28.3 | | | 38.3 | 32.7 | | 33.4 | 24.9 |
| Level of Service | В | В | В | С | С | | | D | С | | С | С |
| Approach Delay (s) | | 14.9 | | | 27.9 | | | 37.2 | | | 29.2 | |
| Approach LOS | | В | | | С | | | D | | | С | |
| Intersection Summary | | | | | | | | | | | | |
| HCM Average Control Delay | | | 25.0 | Н | CM Level | of Service | | | С | | | |
| HCM Volume to Capacity rat | io | | 0.67 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 83.1 | | um of lost | | | | 20.0 | | | |
| Intersection Capacity Utilizat | ion | | 60.2% | IC | CU Level o | of Service | | | В | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

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|-------------------------------|-------|--------------|-------|------------|------------|-----------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | Y | | 5 | 1.0.1 | 100
1 | |
| Volume (veh/h) | 46 | 72 | 53 | 198 | 383 | 50 |
| Sign Control | Stop | 12 | 00 | Free | Free | 00 |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 51 | 79 | 58 | 218 | 421 | 55 |
| Pedestrians | JI | 19 | 50 | 210 | 421 | 55 |
| Lane Width (ft) | | | | | | |
| () | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | T\ \ / T | NI | |
| Median type | | | | TWLTL | None | |
| Median storage veh) | | | | 2 | | |
| Upstream signal (ft) | | | | 1151 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 782 | 448 | 476 | | | |
| vC1, stage 1 conf vol | 448 | | | | | |
| vC2, stage 2 conf vol | 334 | | | | | |
| vCu, unblocked vol | 782 | 448 | 476 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 91 | 87 | 95 | | | |
| cM capacity (veh/h) | 543 | 610 | 1086 | | | |
| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | | |
| Volume Total | 130 | 58 | 218 | 476 | | |
| Volume Left | 51 | 58 | 0 | 0 | | |
| Volume Right | 79 | 0 | 0 | 55 | | |
| cSH | 582 | 1086 | 1700 | 1700 | | |
| Volume to Capacity | 0.22 | 0.05 | 0.13 | 0.28 | | |
| Queue Length 95th (ft) | 21 | 4 | 0 | 0 | | |
| Control Delay (s) | 12.9 | 8.5 | 0.0 | 0.0 | | |
| Lane LOS | | A | 0.0 | 0.0 | | |
| Approach Delay (s) | 12.9 | 1.8 | | 0.0 | | |
| Approach LOS | B | 1.0 | | 0.0 | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.5 | | | |
| Intersection Capacity Utiliza | ation | | 43.5% | IC | CU Level o | f Service |
| Analysis Period (min) | | | 15 | | | |
| | | | IJ | | | |

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|---|------|------------|----------------------|------|------|------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | ۲ | † † | A1⊅ | | Y | |
| Volume (veh/h) | 48 | 570 | 869 | 50 | 67 | 64 |
| Sign Control | | Free | Free | | Stop | • • |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 52 | 620 | 945 | 54 | 73 | 70 |
| Pedestrians | 02 | 020 | 0.0 | 01 | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | TWLTL | TWLTL | | | |
| Median storage veh) | | 2 | 2 | | | |
| | | Z | 750 | | | |
| Upstream signal (ft) | 0.04 | | 750 | | 0.84 | 0.84 |
| pX, platoon unblocked | 0.84 | | | | | |
| vC, conflicting volume | 999 | | | | 1386 | 499 |
| vC1, stage 1 conf vol | | | | | 972 | |
| vC2, stage 2 conf vol | 000 | | | | 414 | 00 |
| vCu, unblocked vol | 626 | | | | 1085 | 33 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | 5.8 | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 93 | | | | 80 | 92 |
| cM capacity (veh/h) | 802 | | | | 373 | 870 |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | SB 1 |
| Volume Total | 52 | 310 | 310 | 630 | 369 | 142 |
| Volume Left | 52 | 0 | 0 | 0 | 0 | 73 |
| Volume Right | 0 | 0 | 0 | 0 | 54 | 70 |
| cSH | 802 | 1700 | 1700 | 1700 | 1700 | 517 |
| Volume to Capacity | 0.07 | 0.18 | 0.18 | 0.37 | 0.22 | 0.28 |
| Queue Length 95th (ft) | 5 | 0 | 0 | 0 | 0 | 28 |
| Control Delay (s) | 9.8 | 0.0 | 0.0 | 0.0 | 0.0 | 14.6 |
| Lane LOS | А | | | | | В |
| Approach Delay (s) | 0.8 | | | 0.0 | | 14.6 |
| Approach LOS | | | | | | В |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.4 | | | |
| Intersection Capacity Utilization 46.6% | | | ICU Level of Service | | | |
| Analysis Period (min) | | | 15 | | | |
| | | | 10 | | | |

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|---|------|----------------------|-------------|------|------|------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | ሻ | † † | ∱ ⊅ | | Y | |
| Volume (veh/h) | 11 | 626 | 898 | 2 | 1 | 21 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 12 | 680 | 976 | 2 | 1 | 23 |
| Pedestrians | | | | _ | - | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | TWLTL | TWLTL | | | |
| Median storage veh) | | 2 | 2 | | | |
| Upstream signal (ft) | | - | 641 | | | |
| pX, platoon unblocked | 0.83 | | U 11 | | 0.83 | 0.83 |
| vC, conflicting volume | 978 | | | | 1341 | 489 |
| vC1, stage 1 conf vol | 0/0 | | | | 977 | 100 |
| vC2, stage 2 conf vol | | | | | 364 | |
| vCu, unblocked vol | 577 | | | | 1012 | 0 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | 1.1 | | | | 5.8 | 0.0 |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 100 | 97 |
| cM capacity (veh/h) | 828 | | | | 392 | 905 |
| | | | | | | |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | SB 1 |
| Volume Total | 12 | 340 | 340 | 651 | 328 | 24 |
| Volume Left | 12 | 0 | 0 | 0 | 0 | 1 |
| Volume Right | 0 | 0 | 0 | 0 | 2 | 23 |
| cSH | 828 | 1700 | 1700 | 1700 | 1700 | 854 |
| Volume to Capacity | 0.01 | 0.20 | 0.20 | 0.38 | 0.19 | 0.03 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 | 2 |
| Control Delay (s) | 9.4 | 0.0 | 0.0 | 0.0 | 0.0 | 9.3 |
| Lane LOS | А | | | | | А |
| Approach Delay (s) | 0.2 | | | 0.0 | | 9.3 |
| Approach LOS | | | | | | А |
| Intersection Summary | | | | | | |
| Average Delay 0.2 | | | | | | |
| Intersection Capacity Utilization 34.9% | | ICU Level of Service | | | | |
| Analysis Period (min) | | | 15 | | | |
| , | | | - | | | |

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|-----------------------------------|-------|----------|--------------------|----------------------|------------|------------|-------|-------|------|-------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | ^ | 1 | <u>۲</u> | ≜ ⊅ | | | र्भ | 1 | | र्भ | 1 |
| Volume (vph) | 235 | 785 | 5 | 15 | 465 | 270 | 30 | 335 | 40 | 150 | 60 | 165 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.94 | | | 1.00 | 0.85 | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | | 1.00 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3344 | | | 1855 | 1583 | | 1798 | 1583 |
| Flt Permitted | 0.13 | 1.00 | 1.00 | 0.33 | 1.00 | | | 1.00 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (perm) | 251 | 3539 | 1583 | 618 | 3344 | | | 1855 | 1583 | | 1798 | 1583 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 255 | 853 | 5 | 16 | 505 | 293 | 33 | 364 | 43 | 163 | 65 | 179 |
| RTOR Reduction (vph) | 0 | 0 | 1 | 0 | 82 | 0 | 0 | 0 | 7 | 0 | 0 | 148 |
| Lane Group Flow (vph) | 255 | 853 | 4 | 16 | 716 | 0 | 0 | 397 | 36 | 0 | 228 | 31 |
| Turn Type | pm+pt | | Perm | Perm | | | Split | | Perm | Split | | Perm |
| Protected Phases | 5 | 2 | | | 6 | | 3 | 3 | | 4 | 4 | |
| Permitted Phases | 2 | | 2 | 6 | | | | | 3 | | | 4 |
| Actuated Green, G (s) | 44.5 | 44.5 | 44.5 | 25.7 | 25.7 | | | 20.8 | 20.8 | | 16.8 | 16.8 |
| Effective Green, g (s) | 44.5 | 44.5 | 44.5 | 25.7 | 25.7 | | | 20.8 | 20.8 | | 16.8 | 16.8 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.46 | 0.26 | 0.26 | | | 0.21 | 0.21 | | 0.17 | 0.17 |
| Clearance Time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 347 | 1622 | 725 | 164 | 885 | | | 397 | 339 | | 311 | 274 |
| v/s Ratio Prot | c0.11 | 0.24 | | | c0.21 | | | c0.21 | | | c0.13 | |
| v/s Ratio Perm | 0.23 | | 0.00 | 0.03 | | | | | 0.02 | | | 0.02 |
| v/c Ratio | 0.73 | 0.53 | 0.01 | 0.10 | 0.81 | | | 1.00 | 0.11 | | 0.73 | 0.11 |
| Uniform Delay, d1 | 20.1 | 18.8 | 14.3 | 26.9 | 33.4 | | | 38.1 | 30.7 | | 38.0 | 33.9 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 7.9 | 0.3 | 0.0 | 0.3 | 5.5 | | | 45.2 | 0.1 | | 8.6 | 0.2 |
| Delay (s) | 28.0 | 19.1 | 14.3 | 27.2 | 38.9 | | | 83.3 | 30.8 | | 46.7 | 34.0 |
| Level of Service | С | В | В | С | D | | | F | С | | D | С |
| Approach Delay (s) | | 21.1 | | | 38.7 | | | 78.2 | | | 41.1 | |
| Approach LOS | | С | | | D | | | Е | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM Average Control Delay | | | 38.3 | Н | CM Level | of Service | | | D | | | |
| HCM Volume to Capacity ratio | | | 0.83 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 97.1 | Sum of lost time (s) | | | | | 19.0 | | | |
| Intersection Capacity Utilization | | | 81.1% | ICU Level of Service | | | | | D | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

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|------------------------------|-----------|--------------|-------|------|------------|-----------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ¥ | | ۲ | 1 | ţ, | •== |
| Volume (veh/h) | 20 | 45 | 50 | 755 | 195 | 25 |
| Sign Control | Stop | -10 | 50 | Free | Free | 20 |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 21 | 48 | 53 | 803 | 207 | 27 |
| Pedestrians | 21 | 40 | 55 | 003 | 207 | 21 |
| | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 1151 | | |
| pX, platoon unblocked | 0.87 | | | | | |
| vC, conflicting volume | 1130 | 221 | 234 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1075 | 221 | 234 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 90 | 94 | 96 | | | |
| cM capacity (veh/h) | 203 | 819 | 1333 | | | |
| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | | |
| Volume Total | 69 | 53 | 803 | 234 | | |
| Volume Left | 21 | 53 | 0 | 0 | | |
| Volume Right | 48 | 0 | 0 | 27 | | |
| cSH | 423 | 1333 | 1700 | 1700 | | |
| Volume to Capacity | 0.16 | 0.04 | 0.47 | 0.14 | | |
| Queue Length 95th (ft) | 14 | 3 | 0.47 | 0.14 | | |
| Control Delay (s) | 15.2 | 7.8 | 0.0 | 0.0 | | |
| Lane LOS | 15.2
C | 7.0
A | 0.0 | 0.0 | | |
| | - | | | 0.0 | | |
| Approach Delay (s) | 15.2 | 0.5 | | 0.0 | | |
| Approach LOS | С | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.3 | | | |
| Intersection Capacity Utiliz | ation | | 50.3% | IC | CU Level c | f Service |
| Analysis Period (min) | | | 15 | | | |
| | | | | | | |

| Movement EBL EBT WBT WBR SBL SBR |
|--|
| Lane Configurations 🎢 👫 🎋 🦞 |
| Volume (veh/h) 50 1025 655 5 0 5 |
| Sign Control Free Free Stop |
| Grade 0% 0% 0% |
| Peak Hour Factor 0.92 0.92 0.92 0.92 0.92 0.92 |
| Hourly flow rate (vph) 54 1114 712 5 0 5 |
| Pedestrians |
| Lane Width (ft) |
| Walking Speed (ft/s) |
| Percent Blockage |
| Right turn flare (veh) |
| Median type TWLTL TWLTL |
| Median storage veh) 2 2 |
| Upstream signal (ft) 637 |
| pX, platoon unblocked 0.89 0.89 0.89 |
| vC, conflicting volume 717 1380 359 |
| vC1, stage 1 conf vol 715 |
| vC2, stage 2 conf vol 666 |
| vCu, unblocked vol 444 1187 43 |
| tC, single (s) 4.1 6.8 6.9 |
| tC, 2 stage (s) 5.8 |
| tF (s) 2.2 3.5 3.3 |
| p0 queue free % 95 100 99 |
| cM capacity (veh/h) 993 367 910 |
| Direction, Lane # EB 1 EB 2 EB 3 WB 1 WB 2 SB 1 |
| Volume Total 54 557 557 475 243 5 |
| Volume Left 54 0 0 0 0 0 |
| Volume Right 0 0 0 0 5 5 |
| cSH 993 1700 1700 1700 910 |
| Volume to Capacity 0.05 0.33 0.33 0.28 0.14 0.01 |
| Queue Length 95th (ft) 4 0 0 0 0 |
| Control Delay (s) 8.8 0.0 0.0 0.0 0.0 9.0 |
| Lane LOS A A |
| Approach Delay (s) 0.4 0.0 9.0 |
| Approach LOS A |
| Intersection Summary |
| Average Delay 0.3 |
| Intersection Capacity Utilization 38.3% ICU Level of Service |
| Analysis Period (min) 15 |

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|---------------------------------|----------|-------------|---------------|----------|------------|------------|-------|-------|------|-------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | <u>۲</u> | - †† | 1 | <u>۲</u> | ≜ ⊅ | | | - सी | 1 | | र्भ | 1 |
| Volume (vph) | 90 | 510 | 25 | 40 | 640 | 165 | 25 | 90 | 35 | 220 | 110 | 290 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | | 1.00 | 0.85 | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3431 | | | 1843 | 1583 | | 1803 | 1583 |
| Flt Permitted | 0.13 | 1.00 | 1.00 | 0.44 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (perm) | 239 | 3539 | 1583 | 823 | 3431 | | | 1843 | 1583 | | 1803 | 1583 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 99 | 560 | 27 | 44 | 703 | 181 | 27 | 99 | 38 | 242 | 121 | 319 |
| RTOR Reduction (vph) | 0 | 0 | 10 | 0 | 21 | 0 | 0 | 0 | 22 | 0 | 0 | 242 |
| Lane Group Flow (vph) | 99 | 560 | 17 | 44 | 863 | 0 | 0 | 126 | 16 | 0 | 363 | 77 |
| Turn Type | pm+pt | | Perm | Perm | | | Split | | Perm | Split | | Perm |
| Protected Phases | 5 | 2 | | | 6 | | 3 | 3 | | 4 | 4 | |
| Permitted Phases | 2 | | 2 | 6 | | | | | 3 | | | 4 |
| Actuated Green, G (s) | 39.2 | 39.2 | 39.2 | 27.2 | 27.2 | | | 12.3 | 12.3 | | 21.3 | 21.3 |
| Effective Green, g (s) | 39.2 | 39.2 | 39.2 | 27.2 | 27.2 | | | 12.3 | 12.3 | | 21.3 | 21.3 |
| Actuated g/C Ratio | 0.45 | 0.45 | 0.45 | 0.31 | 0.31 | | | 0.14 | 0.14 | | 0.24 | 0.24 |
| Clearance Time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 246 | 1580 | 707 | 255 | 1063 | | | 258 | 222 | | 437 | 384 |
| v/s Ratio Prot | 0.04 | c0.16 | | | c0.25 | | | c0.07 | | | c0.20 | |
| v/s Ratio Perm | 0.14 | | 0.01 | 0.05 | | | | | 0.01 | | | 0.05 |
| v/c Ratio | 0.40 | 0.35 | 0.02 | 0.17 | 0.81 | | | 0.49 | 0.07 | | 0.83 | 0.20 |
| Uniform Delay, d1 | 17.0 | 16.0 | 13.6 | 22.1 | 27.9 | | | 34.8 | 32.8 | | 31.5 | 26.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.1 | 0.1 | 0.0 | 0.3 | 4.8 | | | 1.5 | 0.1 | | 12.6 | 0.3 |
| Delay (s) | 18.0 | 16.1 | 13.6 | 22.4 | 32.7 | | | 36.3 | 32.9 | | 44.2 | 26.7 |
| Level of Service | В | В | В | С | С | | | D | С | | D | С |
| Approach Delay (s) | | 16.3 | | | 32.2 | | | 35.5 | | | 36.0 | |
| Approach LOS | | В | | | С | | | D | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM Average Control Delay | | | 29.1 | Н | CM Level | of Service | | | С | | | |
| HCM Volume to Capacity rati | 0 | | 0.72 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 87.8 | | um of lost | | | | 20.0 | | | |
| Intersection Capacity Utilizati | on | | 64.2% | IC | U Level o | of Service | | | С | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

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|---------------------------------------|----------|--------------|-------|-----------------|-----------------|------------|--|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR | |
| Lane Configurations | Y | LDIX | | | | | |
| Volume (veh/h) | 10 | 40 | 30 | T
230 | ₽
450 | 25 | |
| Sign Control | Stop | 40 | 50 | Free | Free | 20 | |
| Grade | 0% | | | 0% | 0% | | |
| Peak Hour Factor | 0% | 0.01 | 0.91 | 0% | 0.91 | 0.91 | |
| | 0.91 | 0.91
44 | 0.91 | 253 | 495 | 27 | |
| Hourly flow rate (vph)
Pedestrians | 11 | 44 | 33 | 200 | 490 | 21 | |
| | | | | | | | |
| Lane Width (ft) | | | | | | | |
| Walking Speed (ft/s) | | | | | | | |
| Percent Blockage | | | | | | | |
| Right turn flare (veh) | | | | Marra | Nerre | | |
| Median type | | | | None | None | | |
| Median storage veh) | | | | 4454 | | | |
| Upstream signal (ft) | | | | 1151 | | | |
| pX, platoon unblocked | 007 | 500 | 500 | | | | |
| vC, conflicting volume | 827 | 508 | 522 | | | | |
| vC1, stage 1 conf vol | | | | | | | |
| vC2, stage 2 conf vol | 007 | 500 | 500 | | | | |
| vCu, unblocked vol | 827 | 508 | 522 | | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | | |
| tC, 2 stage (s) | <u> </u> | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | | |
| p0 queue free % | 97 | 92 | 97 | | | | |
| cM capacity (veh/h) | 331 | 565 | 1044 | | | | |
| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | | | |
| Volume Total | 55 | 33 | 253 | 522 | | | |
| Volume Left | 11 | 33 | 0 | 0 | | | |
| Volume Right | 44 | 0 | 0 | 27 | | | |
| cSH | 495 | 1044 | 1700 | 1700 | | | |
| Volume to Capacity | 0.11 | 0.03 | 0.15 | 0.31 | | | |
| Queue Length 95th (ft) | 9 | 2 | 0 | 0 | | | |
| Control Delay (s) | 13.2 | 8.6 | 0.0 | 0.0 | | | |
| Lane LOS | В | А | | | | | |
| Approach Delay (s) | 13.2 | 1.0 | | 0.0 | | | |
| Approach LOS | В | | | | | | |
| Intersection Summary | | | | | | | |
| Average Delay | | | 1.2 | | | | |
| Intersection Capacity Utiliza | ation | | 35.2% | IC | CU Level c | of Service | |
| Analysis Period (min) | - | | 15 | | | | |
| | | | 10 | | | | |

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|-----------------------------------|-------|------------|-------|------|-----------|------------|--|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | |
| Lane Configurations | ኘ | † † | A | | Y | | |
| Volume (veh/h) | 15 | 620 | 950 | 5 | 5 | 25 | |
| Sign Control | | Free | Free | | Stop | | |
| Grade | | 0% | 0% | | 0% | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | |
| Hourly flow rate (vph) | 16 | 674 | 1033 | 5 | 5 | 27 | |
| Pedestrians | | •••• | | , T | • | | |
| Lane Width (ft) | | | | | | | |
| Walking Speed (ft/s) | | | | | | | |
| Percent Blockage | | | | | | | |
| Right turn flare (veh) | | | | | | | |
| Median type | | TWLTL | TWLTL | | | | |
| Median storage veh) | | 2 | 2 | | | | |
| Upstream signal (ft) | | - | 637 | | | | |
| pX, platoon unblocked | 0.81 | | 001 | | 0.81 | 0.81 | |
| vC, conflicting volume | 1038 | | | | 1405 | 519 | |
| vC1, stage 1 conf vol | 1000 | | | | 1035 | 010 | |
| vC2, stage 2 conf vol | | | | | 370 | | |
| vCu, unblocked vol | 564 | | | | 1019 | 0 | |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 | |
| tC, 2 stage (s) | 1.1 | | | | 5.8 | 0.0 | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 | |
| p0 queue free % | 98 | | | | 99 | 97 | |
| cM capacity (veh/h) | 809 | | | | 384 | 873 | |
| | | | | | | | |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | SB 1 | |
| Volume Total | 16 | 337 | 337 | 688 | 350 | 33 | |
| Volume Left | 16 | 0 | 0 | 0 | 0 | 5 | |
| Volume Right | 0 | 0 | 0 | 0 | 5 | 27 | |
| cSH | 809 | 1700 | 1700 | 1700 | 1700 | 720 | |
| Volume to Capacity | 0.02 | 0.20 | 0.20 | 0.40 | 0.21 | 0.05 | |
| Queue Length 95th (ft) | 2 | 0 | 0 | 0 | 0 | 4 | |
| Control Delay (s) | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 10.2 | |
| Lane LOS | A | | | | | В | |
| Approach Delay (s) | 0.2 | | | 0.0 | | 10.2 | |
| Approach LOS | | | | | | В | |
| Intersection Summary | | | | | | | |
| Average Delay | | | 0.3 | | | | |
| Intersection Capacity Utilization | ation | | 36.4% | IC | U Level o | of Service | |
| Analysis Period (min) | | | 15 | | | | |
| | | | | | | | |

HCM Signalized Intersection Capacity Analysis 1: Sunnyside Ave & Guardsman Way

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|-------------------------------|-------|-----------|--------------|------|-------------|------------|-------|-------|------|-------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | †† | 1 | ሻ | ↑ ĵ≽ | | | र्भ | 1 | | र्भ | 1 |
| Volume (vph) | 253 | 834 | 20 | 15 | 536 | 300 | 52 | 347 | 40 | 171 | 68 | 181 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.95 | | | 1.00 | 0.85 | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3349 | | | 1851 | 1583 | | 1798 | 1583 |
| Flt Permitted | 0.12 | 1.00 | 1.00 | 0.31 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (perm) | 229 | 3539 | 1583 | 585 | 3349 | | | 1851 | 1583 | | 1798 | 1583 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 275 | 907 | 22 | 16 | 583 | 326 | 57 | 377 | 43 | 186 | 74 | 197 |
| RTOR Reduction (vph) | 0 | 0 | 5 | 0 | 74 | 0 | 0 | 0 | 6 | 0 | 0 | 161 |
| Lane Group Flow (vph) | 275 | 907 | 17 | 16 | 835 | 0 | 0 | 434 | 37 | 0 | 260 | 36 |
| Turn Type | pm+pt | | Perm | Perm | | | Split | | Perm | Split | | Perm |
| Protected Phases | 5 | 2 | | | 6 | | 3 | 3 | | 4 | 4 | |
| Permitted Phases | 2 | | 2 | 6 | | | | | 3 | | | 4 |
| Actuated Green, G (s) | 47.9 | 47.9 | 47.9 | 28.5 | 28.5 | | | 20.7 | 20.7 | | 18.4 | 18.4 |
| Effective Green, g (s) | 47.9 | 47.9 | 47.9 | 28.5 | 28.5 | | | 20.7 | 20.7 | | 18.4 | 18.4 |
| Actuated g/C Ratio | 0.47 | 0.47 | 0.47 | 0.28 | 0.28 | | | 0.20 | 0.20 | | 0.18 | 0.18 |
| Clearance Time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 340 | 1662 | 743 | 163 | 936 | | | 376 | 321 | | 324 | 286 |
| v/s Ratio Prot | c0.12 | 0.26 | | | c0.25 | | | c0.23 | | | c0.14 | |
| v/s Ratio Perm | 0.26 | | 0.01 | 0.03 | | | | | 0.02 | | | 0.02 |
| v/c Ratio | 0.81 | 0.55 | 0.02 | 0.10 | 0.89 | | | 1.15 | 0.11 | | 0.80 | 0.12 |
| Uniform Delay, d1 | 24.7 | 19.3 | 14.5 | 27.2 | 35.3 | | | 40.6 | 33.2 | | 40.1 | 35.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 13.2 | 0.4 | 0.0 | 0.3 | 10.7 | | | 95.5 | 0.2 | | 13.3 | 0.2 |
| Delay (s) | 37.9 | 19.7 | 14.5 | 27.5 | 46.0 | | | 136.1 | 33.3 | | 53.4 | 35.2 |
| Level of Service | D | В | В | С | D | | | F | С | | D | D |
| Approach Delay (s) | | 23.7 | | | 45.7 | | | 126.8 | | | 45.6 | |
| Approach LOS | | С | | | D | | | F | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM Average Control Dela | | | 49.7 | H | CM Level | of Service |) | | D | | | |
| HCM Volume to Capacity ra | atio | | 0.92 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 102.0 | | um of lost | | | | 19.0 | | | |
| Intersection Capacity Utiliza | ation | | 88.5% | IC | U Level o | of Service | | | E | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

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|------------------------------|-------|--------------|-------|-------|---------------|---------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | Y | | ۲ | 1 | م | |
| Volume (veh/h) | 72 | 82 | 104 | 761 | 203 | 101 |
| Sign Control | Stop | 02 | 101 | Free | Free | 101 |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | | 0.94 |
| Hourly flow rate (vph) | 77 | 87 | 111 | 810 | 216 | 107 |
| Pedestrians | | 07 | | 010 | 210 | 107 |
| Lane Width (ft) | | | | | | |
| 、 <i>/</i> | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | Nore | |
| Median type | | | | TWLTL | None | |
| Median storage veh) | | | | 2 | | |
| Upstream signal (ft) | 0.04 | | | 1151 | | |
| pX, platoon unblocked | 0.84 | 070 | | | | |
| vC, conflicting volume | 1301 | 270 | 323 | | | |
| vC1, stage 1 conf vol | 270 | | | | | |
| vC2, stage 2 conf vol | 1031 | | | | | |
| vCu, unblocked vol | 1262 | 270 | 323 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | 5.4 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 72 | 89 | 91 | | | |
| cM capacity (veh/h) | 277 | 769 | 1236 | | | |
| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | | |
| Volume Total | 164 | 111 | 810 | 323 | | |
| Volume Left | 77 | 111 | 0 | 0 | | |
| Volume Right | 87 | 0 | 0 | 107 | | |
| cSH | 420 | 1236 | 1700 | 1700 | | |
| Volume to Capacity | 0.39 | 0.09 | 0.48 | 0.19 | | |
| Queue Length 95th (ft) | 45 | 7 | 0 | 0 | | |
| Control Delay (s) | 18.9 | 8.2 | 0.0 | 0.0 | | |
| Lane LOS | С | A | | | | |
| Approach Delay (s) | 18.9 | 1.0 | | 0.0 | | |
| Approach LOS | C | | | 0.0 | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.8 | | | |
| Intersection Capacity Utiliz | ation | | 55.7% | IC | CU Level of S | Service |
| Analysis Period (min) | | | 15 | | | |
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|------------------------------|--------|---------|-------------|------|------------|------------|--|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR | |
| Lane Configurations | ۲ | <u></u> | ∱1 ≽ | | Y | | |
| Volume (veh/h) | 106 | 1087 | 668 | 101 | 70 | 73 | |
| Sign Control | | Free | Free | | Stop | | |
| Grade | | 0% | 0% | | 0% | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | |
| Hourly flow rate (vph) | 115 | 1182 | 726 | 110 | 76 | 79 | |
| Pedestrians | | | | | | | |
| Lane Width (ft) | | | | | | | |
| Walking Speed (ft/s) | | | | | | | |
| Percent Blockage | | | | | | | |
| Right turn flare (veh) | | | | | | | |
| Median type | | TWLTL | TWLTL | | | | |
| Median storage veh) | | 2 | 2 | | | | |
| Upstream signal (ft) | | | 750 | | | | |
| pX, platoon unblocked | 0.86 | | | | 0.86 | 0.86 | |
| vC, conflicting volume | 836 | | | | 1602 | 418 | |
| vC1, stage 1 conf vol | | | | | 781 | | |
| vC2, stage 2 conf vol | | | | | 821 | | |
| vCu, unblocked vol | 491 | | | | 1379 | 7 | |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 | |
| tC, 2 stage (s) | | | | | 5.8 | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 | |
| p0 queue free % | 87 | | | | 74 | 91 | |
| cM capacity (veh/h) | 922 | | | | 297 | 926 | |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | SB 1 | |
| Volume Total | 115 | 591 | 591 | 484 | 352 | 155 | |
| Volume Left | 115 | 0 | 0 | 0 | 0 | 76 | |
| Volume Right | 0 | 0 | 0 | 0 | 110 | 79 | |
| cSH | 922 | 1700 | 1700 | 1700 | 1700 | 454 | |
| Volume to Capacity | 0.13 | 0.35 | 0.35 | 0.28 | 0.21 | 0.34 | |
| Queue Length 95th (ft) | 11 | 0 | 0 | 0 | 0 | 37 | |
| Control Delay (s) | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | 17.0 | |
| Lane LOS | A | 0.0 | 0.0 | 0.0 | 0.0 | C | |
| Approach Delay (s) | 0.8 | | | 0.0 | | 17.0 | |
| Approach LOS | 0.0 | | | 0.0 | | C | |
| Intersection Summary | | | | | | | |
| Average Delay | | | 1.6 | | | | |
| Intersection Capacity Utiliz | zation | | 45.9% | IC | CU Level c | of Service | |
| Analysis Period (min) | | | 15 | | | | |
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|---|-------|------------|-------------|---|------------|------------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | 5 | <u>†</u> † | ≜ †⊅ | | Y | |
| Volume (veh/h) | 50 | 1107 | 764 | 5 | 0 | 5 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 54 | 1203 | 830 | 5 | 0 | 5 |
| Pedestrians | •. | | | , in the second s | • | • |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | TWLTL | TWLTL | | | |
| Median storage veh) | | 2 | 2 | | | |
| Upstream signal (ft) | | 2 | 641 | | | |
| pX, platoon unblocked | 0.84 | | 041 | | 0.84 | 0.84 |
| vC, conflicting volume | 836 | | | | 1543 | 418 |
| | 030 | | | | 833 | 410 |
| vC1, stage 1 conf vol | | | | | oss
710 | |
| vC2, stage 2 conf vol
vCu, unblocked vol | 427 | | | | 1268 | 0 |
| | 427 | | | | | |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | 0.0 | | | | 5.8 | • • |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 94 | | | | 100 | 99 |
| cM capacity (veh/h) | 950 | | | | 344 | 912 |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | SB 1 |
| Volume Total | 54 | 602 | 602 | 554 | 282 | 5 |
| Volume Left | 54 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 5 | 5 |
| cSH | 950 | 1700 | 1700 | 1700 | 1700 | 912 |
| Volume to Capacity | 0.06 | 0.35 | 0.35 | 0.33 | 0.17 | 0.01 |
| Queue Length 95th (ft) | 5 | 0 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 9.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.0 |
| Lane LOS | А | | | | | А |
| Approach Delay (s) | 0.4 | | | 0.0 | | 9.0 |
| Approach LOS | | | | | | А |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.3 | | | |
| Intersection Capacity Utiliza | ation | | 40.6% | IC | U Level o | of Service |
| Analysis Period (min) | | | 15 | | | |
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HCM Signalized Intersection Capacity Analysis 1: Sunnyside Ave & Guardsman Way

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|-------------------------------|-------|--------------|--------------|------|-------------|------------|-------|-------|------|-------|-------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ሻ | - † † | 1 | ሻ | ↑ ĵ≽ | | | र्स | 1 | | र्भ | 1 |
| Volume (vph) | 99 | 560 | 38 | 40 | 677 | 181 | 35 | 95 | 35 | 241 | 117 | 300 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | | 1.00 | 0.85 | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3427 | | | 1838 | 1583 | | 1802 | 1583 |
| Flt Permitted | 0.12 | 1.00 | 1.00 | 0.42 | 1.00 | | | 0.99 | 1.00 | | 0.97 | 1.00 |
| Satd. Flow (perm) | 224 | 3539 | 1583 | 780 | 3427 | | | 1838 | 1583 | | 1802 | 1583 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 109 | 615 | 42 | 44 | 744 | 199 | 38 | 104 | 38 | 265 | 129 | 330 |
| RTOR Reduction (vph) | 0 | 0 | 14 | 0 | 22 | 0 | 0 | 0 | 20 | 0 | 0 | 254 |
| Lane Group Flow (vph) | 109 | 615 | 28 | 44 | 921 | 0 | 0 | 142 | 18 | 0 | 394 | 76 |
| Turn Type | pm+pt | | Perm | Perm | | | Split | | Perm | Split | | Perm |
| Protected Phases | 5 | 2 | | | 6 | | 3 | 3 | | 4 | 4 | |
| Permitted Phases | 2 | | 2 | 6 | | | | | 3 | | | 4 |
| Actuated Green, G (s) | 41.7 | 41.7 | 41.7 | 29.2 | 29.2 | | | 13.1 | 13.1 | | 21.0 | 21.0 |
| Effective Green, g (s) | 41.7 | 41.7 | 41.7 | 29.2 | 29.2 | | | 13.1 | 13.1 | | 21.0 | 21.0 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.46 | 0.32 | 0.32 | | | 0.14 | 0.14 | | 0.23 | 0.23 |
| Clearance Time (s) | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 248 | 1625 | 727 | 251 | 1102 | | | 265 | 228 | | 417 | 366 |
| v/s Ratio Prot | c0.04 | 0.17 | | | c0.27 | | | c0.08 | | | c0.22 | |
| v/s Ratio Perm | 0.16 | | 0.02 | 0.06 | | | | | 0.01 | | | 0.05 |
| v/c Ratio | 0.44 | 0.38 | 0.04 | 0.18 | 0.84 | | | 0.54 | 0.08 | | 0.94 | 0.21 |
| Uniform Delay, d1 | 17.4 | 16.1 | 13.5 | 22.1 | 28.6 | | | 36.0 | 33.6 | | 34.3 | 28.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.2 | 0.1 | 0.0 | 0.3 | 5.6 | | | 2.1 | 0.2 | | 30.2 | 0.3 |
| Delay (s) | 18.7 | 16.2 | 13.5 | 22.5 | 34.2 | | | 38.1 | 33.8 | | 64.5 | 28.5 |
| Level of Service | В | В | В | С | С | | | D | С | | E | С |
| Approach Delay (s) | | 16.4 | | | 33.7 | | | 37.2 | | | 48.1 | |
| Approach LOS | | В | | | С | | | D | | | D | |
| Intersection Summary | | | | | | | | | | | | |
| HCM Average Control Dela | , | | 32.9 | Н | CM Level | of Service | | | С | | | |
| HCM Volume to Capacity ra | atio | | 0.77 | | - | | | | | | | |
| Actuated Cycle Length (s) | | | 90.8 | | um of lost | | | | 19.0 | | | |
| Intersection Capacity Utiliza | ation | | 67.8% | IC | U Level o | of Service | | | С | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

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|-----------------------------------|-----------|--------------|-------|------|---------------|---------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | Y | | ۲ | 1 | ¢ | |
| Volume (veh/h) | 47 | 76 | 57 | 233 | 452 | 52 |
| Sign Control | Stop | 10 | 01 | Free | Free | 02 |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | | 0.91 |
| Hourly flow rate (vph) | 52 | 84 | 63 | 256 | 497 | 57 |
| Pedestrians | JZ | 04 | 05 | 200 | 437 | 57 |
| | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | NI- | New | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 1151 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 907 | 525 | 554 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 907 | 525 | 554 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 82 | 85 | 94 | | | |
| cM capacity (veh/h) | 287 | 552 | 1016 | | | |
| Direction, Lane # | EB 1 | NB 1 | NB 2 | SB 1 | | |
| Volume Total | 135 | 63 | 256 | 554 | | |
| Volume Left | 52 | 63 | 230 | 0 | | |
| Volume Right | 84 | 0 | 0 | 57 | | |
| cSH | 408 | 1016 | 1700 | 1700 | | |
| Volume to Capacity | 0.33 | 0.06 | 0.15 | 0.33 | | |
| Queue Length 95th (ft) | 36 | 0.00 | 0.15 | 0.55 | | |
| Control Delay (s) | 18.1 | 8.8 | 0.0 | 0.0 | | |
| Lane LOS | 10.1
C | | 0.0 | 0.0 | | |
| | - | A | | 0.0 | | |
| Approach Delay (s) | 18.1 | 1.7 | | 0.0 | | |
| Approach LOS | С | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.0 | | | |
| Intersection Capacity Utilization | ation | | 47.6% | IC | CU Level of S | Service |
| Analysis Period (min) | | | 15 | | | |
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|-------------------------------|----------|------------|-------|------|------------|------------|
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | 1 | † † | A | | Y | |
| Volume (veh/h) | 48 | 640 | 982 | 50 | 67 | 64 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 52 | 696 | 1067 | 54 | 73 | 70 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | TWLTL | TWLTL | | | |
| Median storage veh) | | 2 | 2 | | | |
| Upstream signal (ft) | | | 750 | | | |
| pX, platoon unblocked | 0.80 | | | | 0.80 | 0.80 |
| vC, conflicting volume | 1122 | | | | 1547 | 561 |
| vC1, stage 1 conf vol | | | | | 1095 | |
| vC2, stage 2 conf vol | | | | | 452 | |
| vCu, unblocked vol | 640 | | | | 1174 | 0 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | 5.8 | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 93 | | | | 79 | 92 |
| cM capacity (veh/h) | 748 | | | | 344 | 863 |
| Direction, Lane # | EB 1 | EB 2 | | WB 1 | WB 2 | SB 1 |
| | | | EB 3 | | | |
| Volume Total | 52 | 348 | 348 | 712 | 410 | 142 |
| Volume Left | 52 | 0 | 0 | 0 | 0 | 73 |
| Volume Right | 0 | 0 | 0 | 0 | 54 | 70 |
| cSH | 748 | 1700 | 1700 | 1700 | 1700 | 487 |
| Volume to Capacity | 0.07 | 0.20 | 0.20 | 0.42 | 0.24 | 0.29 |
| Queue Length 95th (ft) | 6 | 0 | 0 | 0 | 0 | 30 |
| Control Delay (s) | 10.2 | 0.0 | 0.0 | 0.0 | 0.0 | 15.4 |
| Lane LOS | В | | | | | С |
| Approach Delay (s) | 0.7 | | | 0.0 | | 15.4 |
| Approach LOS | | | | | | С |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.4 | | | |
| Intersection Capacity Utiliza | ation | | 49.7% | IC | CU Level o | of Service |
| Analysis Period (min) | | | 15 | | | |
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| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
| Lane Configurations | ۲. | †† | ≜ ⊅ | | Y | |
| Volume (veh/h) | 15 | 692 | 1007 | 5 | 5 | 25 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 16 | 752 | 1095 | 5 | 5 | 27 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | TWLTL | TWLTL | | | |
| Median storage veh) | | 2 | 2 | | | |
| Upstream signal (ft) | | _ | 641 | | | |
| pX, platoon unblocked | 0.79 | | | | 0.79 | 0.79 |
| vC, conflicting volume | 1100 | | | | 1506 | 550 |
| vC1, stage 1 conf vol | | | | | 1097 | |
| vC2, stage 2 conf vol | | | | | 409 | |
| vCu, unblocked vol | 587 | | | | 1102 | 0 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | 5.8 | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 98 | 97 |
| cM capacity (veh/h) | 775 | | | | 361 | 854 |
| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | SB 1 |
| | | | | | | |
| Volume Total | 16 | 376 | 376 | 730 | 370 | 33 |
| Volume Left | 16 | 0 | 0 | 0 | 0 | 5 |
| Volume Right | 0 | 0 | 0 | 0 | 5 | 27 |
| cSH | 775 | 1700 | 1700 | 1700 | 1700 | 696 |
| Volume to Capacity | 0.02 | 0.22 | 0.22 | 0.43 | 0.22 | 0.05 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 0 | 0 | 4 |
| Control Delay (s) | 9.7 | 0.0 | 0.0 | 0.0 | 0.0 | 10.4 |
| Lane LOS | A | | | 0.0 | | B |
| Approach Delay (s) | 0.2 | | | 0.0 | | 10.4 |
| Approach LOS | | | | | | В |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.3 | | | |
| Intersection Capacity Utilizatio | n | | 38.0% | IC | CU Level o | of Service |
| Analysis Period (min) | | | 15 | | | |

Detailed Queuing Reports

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|------------------------|------|------|--------------|------|------|------|------|------|------|--|
| Lane Group | EBL | EBT | EBR | WBL | WBT | NBT | NBR | SBT | SBR | |
| Lane Group Flow (vph) | 238 | 737 | 1 | 13 | 671 | 330 | 32 | 176 | 164 | |
| v/c Ratio | 0.64 | 0.46 | 0.00 | 0.08 | 0.75 | 0.80 | 0.09 | 0.63 | 0.43 | |
| Control Delay | 25.0 | 18.5 | 12.0 | 29.2 | 33.1 | 51.4 | 27.0 | 48.1 | 9.9 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| otal Delay | 25.0 | 18.5 | 12.0 | 29.2 | 33.1 | 51.4 | 27.0 | 48.1 | 9.9 | |
| ueue Length 50th (ft) | 80 | 146 | 0 | 6 | 165 | 183 | 11 | 97 | 0 | |
| Queue Length 95th (ft) | 165 | 227 | 3 | 22 | 254 | #369 | 40 | 182 | 56 | |
| iternal Link Dist (ft) | | 557 | | | 1890 | 320 | | 1071 | | |
| urn Bay Length (ft) | 205 | | 50 | 190 | | | 25 | | 325 | |
| ase Capacity (vph) | 410 | 2024 | 906 | 238 | 1212 | 435 | 377 | 412 | 488 | |
| tarvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| pillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| torage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| educed v/c Ratio | 0.58 | 0.36 | 0.00 | 0.05 | 0.55 | 0.76 | 0.08 | 0.43 | 0.34 | |
| Interpretion Summary | | | | | | | | | | |

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

| | ٦ | - | \mathbf{r} | 4 | - | 1 | 1 | Ŧ | - |
|-------------------------|------|------|--------------|------|------|------|------|------|------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | NBT | NBR | SBT | SBR |
| Lane Group Flow (vph) | 95 | 489 | 26 | 35 | 752 | 108 | 29 | 284 | 292 |
| v/c Ratio | 0.28 | 0.31 | 0.04 | 0.13 | 0.69 | 0.38 | 0.11 | 0.64 | 0.48 |
| Control Delay | 16.5 | 15.7 | 8.2 | 27.1 | 30.1 | 39.5 | 17.9 | 40.0 | 7.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 16.5 | 15.7 | 8.2 | 27.1 | 30.1 | 39.5 | 17.9 | 40.0 | 7.4 |
| Queue Length 50th (ft) | 27 | 81 | 2 | 13 | 178 | 54 | 3 | 136 | 0 |
| Queue Length 95th (ft) | 70 | 153 | 19 | 46 | 320 | 115 | 28 | #306 | 71 |
| Internal Link Dist (ft) | | 557 | | | 1890 | 320 | | 1071 | |
| Turn Bay Length (ft) | 205 | | 50 | 190 | | | 25 | | 325 |
| Base Capacity (vph) | 499 | 2324 | 1046 | 396 | 1556 | 560 | 497 | 548 | 685 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.19 | 0.21 | 0.02 | 0.09 | 0.48 | 0.19 | 0.06 | 0.52 | 0.43 |
| Interpretion Summary | | | | | | | | | |

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

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|-------------------------|------|------|--------------|------|------|------|------|------|------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | NBT | NBR | SBT | SBR |
| Lane Group Flow (vph) | 258 | 790 | 17 | 13 | 781 | 367 | 32 | 207 | 182 |
| v/c Ratio | 0.72 | 0.48 | 0.02 | 0.07 | 0.81 | 0.94 | 0.09 | 0.70 | 0.44 |
| Control Delay | 32.3 | 18.9 | 10.6 | 28.7 | 37.2 | 72.4 | 29.5 | 52.1 | 9.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 32.3 | 18.9 | 10.6 | 28.7 | 37.2 | 72.4 | 29.5 | 52.1 | 9.3 |
| Queue Length 50th (ft) | 95 | 169 | 3 | 6 | 215 | 235 | 13 | 126 | 0 |
| Queue Length 95th (ft) | #213 | 234 | 15 | 22 | 299 | #450 | 40 | 206 | 58 |
| Internal Link Dist (ft) | | 561 | | | 1890 | 320 | | 1071 | |
| Turn Bay Length (ft) | 205 | | 50 | 190 | | | 25 | | 325 |
| Base Capacity (vph) | 378 | 1877 | 843 | 209 | 1127 | 392 | 341 | 382 | 479 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.42 | 0.02 | 0.06 | 0.69 | 0.94 | 0.09 | 0.54 | 0.38 |
| Intersection Summary | | | | | | | | | |

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

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|-------------------------|------|------|--------------|------|------|------|------|------|------|--|
| Lane Group | EBL | EBT | EBR | WBL | WBT | NBT | NBR | SBT | SBR | |
| Lane Group Flow (vph) | 104 | 544 | 41 | 35 | 810 | 124 | 29 | 314 | 303 | |
| v/c Ratio | 0.33 | 0.34 | 0.06 | 0.13 | 0.73 | 0.44 | 0.11 | 0.69 | 0.48 | |
| Control Delay | 17.4 | 16.3 | 8.0 | 27.5 | 31.9 | 41.7 | 20.1 | 43.0 | 7.3 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 17.4 | 16.3 | 8.0 | 27.5 | 31.9 | 41.7 | 20.1 | 43.0 | 7.3 | |
| Queue Length 50th (ft) | 30 | 94 | 4 | 14 | 202 | 65 | 4 | 162 | 0 | |
| Queue Length 95th (ft) | 75 | 172 | 25 | 47 | #357 | 130 | 30 | #358 | 72 | |
| Internal Link Dist (ft) | | 561 | | | 1890 | 320 | | 1071 | | |
| Turn Bay Length (ft) | 205 | | 50 | 190 | | | 25 | | 325 | |
| Base Capacity (vph) | 460 | 2258 | 1020 | 348 | 1446 | 519 | 462 | 510 | 665 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.23 | 0.24 | 0.04 | 0.10 | 0.56 | 0.24 | 0.06 | 0.62 | 0.46 | |
| Intersection Summary | | | | | | | | | | |

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

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|-------------------------|------|------|--------------|------|------|------|------|------|------|--|
| Lane Group | EBL | EBT | EBR | WBL | WBT | NBT | NBR | SBT | SBR | |
| Lane Group Flow (vph) | 255 | 853 | 5 | 16 | 798 | 397 | 43 | 228 | 179 | |
| v/c Ratio | 0.73 | 0.53 | 0.01 | 0.10 | 0.83 | 1.00 | 0.12 | 0.73 | 0.43 | |
| Control Delay | 34.0 | 20.6 | 13.4 | 30.8 | 37.9 | 87.0 | 30.2 | 53.8 | 9.0 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 34.0 | 20.6 | 13.4 | 30.8 | 37.9 | 87.0 | 30.2 | 53.8 | 9.0 | |
| Queue Length 50th (ft) | 96 | 193 | 1 | 8 | 217 | ~292 | 18 | 141 | 0 | |
| Queue Length 95th (ft) | #234 | 285 | 8 | 27 | 321 | #496 | 51 | 232 | 58 | |
| Internal Link Dist (ft) | | 557 | | | 1890 | 320 | | 1071 | | |
| Turn Bay Length (ft) | 205 | | 50 | 190 | | | 25 | | 325 | |
| Base Capacity (vph) | 371 | 1845 | 826 | 193 | 1123 | 397 | 346 | 385 | 479 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.69 | 0.46 | 0.01 | 0.08 | 0.71 | 1.00 | 0.12 | 0.59 | 0.37 | |
| | | | | | | | | | | |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.Queue shown is maximum after two cycles.

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|------------------------|------|------|--------------|------|------|------|------|------|------|--|
| Lane Group | EBL | EBT | EBR | WBL | WBT | NBT | NBR | SBT | SBR | |
| Lane Group Flow (vph) | 99 | 560 | 27 | 44 | 884 | 126 | 38 | 363 | 319 | |
| v/c Ratio | 0.36 | 0.36 | 0.04 | 0.17 | 0.81 | 0.48 | 0.15 | 0.83 | 0.51 | |
| Control Delay | 18.0 | 17.1 | 8.8 | 27.8 | 35.4 | 43.3 | 19.5 | 52.5 | 7.3 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 18.0 | 17.1 | 8.8 | 27.8 | 35.4 | 43.3 | 19.5 | 52.5 | 7.3 | |
| Queue Length 50th (ft) | 29 | 98 | 3 | 17 | 226 | 68 | 6 | 202 | 0 | |
| Queue Length 95th (ft) | 73 | 177 | 20 | 55 | #428 | 131 | 35 | #437 | 74 | |
| nternal Link Dist (ft) | | 557 | | | 1890 | 320 | | 1071 | | |
| Furn Bay Length (ft) | 205 | | 50 | 190 | | | 25 | | 325 | |
| Base Capacity (vph) | 398 | 2104 | 948 | 293 | 1243 | 448 | 405 | 439 | 627 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.25 | 0.27 | 0.03 | 0.15 | 0.71 | 0.28 | 0.09 | 0.83 | 0.51 | |
| Intersection Summary | | | | | | | | | | |

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

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|-------------------------|------|------|--------------|------|------|-------|------|------|------|
| Lane Group | EBL | EBT | EBR | WBL | WBT | NBT | NBR | SBT | SBR |
| Lane Group Flow (vph) | 275 | 907 | 22 | 16 | 909 | 434 | 43 | 260 | 197 |
| v/c Ratio | 0.81 | 0.55 | 0.03 | 0.10 | 0.90 | 1.16 | 0.13 | 0.80 | 0.44 |
| Control Delay | 42.2 | 21.3 | 11.6 | 31.0 | 44.9 | 135.9 | 31.5 | 59.6 | 8.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.2 | 21.3 | 11.6 | 31.0 | 44.9 | 135.9 | 31.5 | 59.6 | 8.7 |
| Queue Length 50th (ft) | 122 | 218 | 4 | 8 | 275 | ~362 | 20 | 167 | 0 |
| Queue Length 95th (ft) | #278 | 308 | 20 | 27 | #426 | #557 | 52 | 266 | 59 |
| Internal Link Dist (ft) | | 561 | | | 1890 | 320 | | 1071 | |
| Turn Bay Length (ft) | 205 | | 50 | 190 | | | 25 | | 325 |
| Base Capacity (vph) | 353 | 1744 | 785 | 173 | 1062 | 374 | 327 | 364 | 478 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.78 | 0.52 | 0.03 | 0.09 | 0.86 | 1.16 | 0.13 | 0.71 | 0.41 |
| | | | | | | | | | |

Intersection Summary

Volume exceeds capacity, queue is theoretically infinite. ~

Queue shown is maximum after two cycles.# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

| | ٦ | - | \mathbf{r} | ∢ | + | 1 | 1 | Ļ | 1 | |
|------------------------|------|------|--------------|------|------|------|------|------|------|--|
| Lane Group | EBL | EBT | EBR | WBL | WBT | NBT | NBR | SBT | SBR | |
| Lane Group Flow (vph) | 109 | 615 | 42 | 44 | 943 | 142 | 38 | 394 | 330 | |
| v/c Ratio | 0.39 | 0.38 | 0.06 | 0.17 | 0.83 | 0.53 | 0.15 | 0.94 | 0.53 | |
| Control Delay | 18.7 | 17.5 | 8.8 | 28.4 | 36.9 | 44.9 | 21.1 | 69.3 | 7.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 18.7 | 17.5 | 8.8 | 28.4 | 36.9 | 44.9 | 21.1 | 69.3 | 7.5 | |
| Queue Length 50th (ft) | 32 | 112 | 5 | 18 | 253 | 78 | 8 | 229 | 0 | |
| Queue Length 95th (ft) | 78 | 195 | 27 | 55 | #480 | 147 | 37 | #492 | 76 | |
| nternal Link Dist (ft) | | 561 | | | 1890 | 320 | | 1071 | | |
| urn Bay Length (ft) | 205 | | 50 | 190 | | | 25 | | 325 | |
| Base Capacity (vph) | 385 | 2012 | 910 | 266 | 1189 | 428 | 386 | 419 | 622 | |
| tarvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| educed v/c Ratio | 0.28 | 0.31 | 0.05 | 0.17 | 0.79 | 0.33 | 0.10 | 0.94 | 0.53 | |
| Intersection Summary | | | | | | | | | | |

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.



REPORT GEOTECHNICAL STUDY PROPOSED ROWLAND HALL HIGH SCHOOL WEST AND NORTHWEST OF THE NORTHWEST CORNER OF SUNNYSIDE AVENUE AND GUARDSMAN WAY SALT LAKE CITY, UTAH

Submitted To:

Rowland Hall/St. Marks School % Construction Control Corp. 460 South 400 East Salt Lake City, Utah 84111

Submitted By:

Gordon Spilker Huber Geotechnical Consultants, Inc. 4426 South Century Drive, Suite 100 Salt Lake City, Utah 84123

December 2, 2010

Job No. 1087-001-10



December 2, 2010 Job No. 1087-001-10

Rowland Hall/St. Marks School % Construction Control Corp. 460 South 400 East Salt Lake City, Utah 84111

Attention: Mr. Kenneth Ament

Gentlemen:

Re: Report Geotechnical Study Proposed Rowland Hall High School West and Northwest of the Northwest Corner of Sunnyside Avenue and Guardsman Way Salt Lake City, Utah

1. INTRODUCTION

1.1 GENERAL

This report presents the results of our geotechnical study performed at the site of the proposed Rowland Hall High School, which is located west and northwest of the northwest corner of Sunnyside Avenue and Guardsman Way in Salt Lake City, Utah. The general location of the site with respect to major topographic features and existing facilities, as of 1998, is presented on Figure 1, Vicinity Map. A site plan showing site boundaries along with the existing and proposed buildings and roadways is presented on Figure 2, Site Plan. The locations of the eight borings drilled and the two test pits excavated in conjunction with this study and a trench excavated in conjunction with our recently performed surface fault rupture hazard study dated December 1, 2010¹ are also presented on Figure 2.

During the course of this study, many of the conclusions and recommendations summarized herein were transmitted verbally to representatives of the owner and design team.

¹ "Report, Surface Fault Rupture Hazard Study, Proposed Rowland Hall High School, West and Northwest of the Northwest Corner of Sunnyside Avenue and Guardsman Way, Salt Lake City, Utah," GSH Job No. 1087-001-10.



1.2 OBJECTIVES AND SCOPE

The objectives and scope of this study were planned in discussions between Mr. Kenneth Ament of Construction Control Corp. and Messrs. Bill Gordon and Josh Whitney of Gordon Spilker Huber Geotechnical Consultants, Inc. (GSH).

In general, the objectives of this study were to:

- 1. Define and evaluate the subsurface soil and groundwater conditions across the site.
- 2. Provide appropriate foundation, earthwork, pavement, and geoseismic recommendations to be utilized in the design and construction of the proposed development.

In accomplishing these objectives, our scope has included the following:

- 1. A field program consisting of the exploration, logging, and sampling of eight borings and two test pits.
- 2. A laboratory testing program.
- 3. An office program consisting of the correlation of available data, engineering analyses, and the preparation of this summary report.

1.3 AUTHORIZATION

Authorization was provided by returning a signed copy of our Professional Services Agreement No. 10-1002rev1 dated October 1, 2010 and executed on October 28, 2010.

1.4 PROFESSIONAL STATEMENTS

Supporting data upon which our recommendations are based are presented in subsequent sections of this report. Recommendations presented herein are governed by the physical properties of the soils encountered in the exploration borings, test pits, and the fault trench excavation; projected groundwater conditions; and the layout and design data discussed in Section 2., Proposed Construction, of this report. If subsurface conditions other than those described in this report are encountered and/or if design and layout changes are implemented, GSH must be informed so that our recommendations can be reviewed and amended, if necessary.

Our professional services have been performed, our findings developed, and our recommendations prepared in accordance with generally accepted engineering principles and practices in this area at this time.

Rowland Hall/St. Marks School Job No. 1087-001-10 Geotechnical Study December 2, 2010



2. **PROPOSED CONSTRUCTION**

A high school campus is planned for the 13.2 acre site. The campus will include cafeteria, auditorium, administration, classroom buildings, playfields, and courts. The buildings will be one to two levels in height, slab-on-grade, and of CMU and light steel construction. Structural loads will be transmitted down through columns and bearing walls to the supporting foundations. Maximum column and wall loads are anticipated to be on the order of 200 to 250 kips and 10 to 12 kips per lineal foot, respectively. Average uniform floor slab loads on the order of 200 pounds per square foot are anticipated. The building will be established within one to two feet of existing grade.

Extensive at-grade paved parking and roadway areas will be part of overall development. Projected traffic in the parking areas should consist of a light volume of automobiles and light trucks, and occasional medium-weight trucks. In primary roadway areas, traffic is projected to consist of a moderate volume of automobiles and light trucks, a light volume of medium-weight trucks and occasional heavy-weight trucks.

As part of site development, there will be a moderate amount of earthwork in the form of cutting and filling to obtain desired grades. Cuts and fills associated with general grading are not anticipated to exceed three to four feet.

3. INVESTIGATIONS

3.1 FIELD PROGRAM

Concurrently with this geotechnical study, GSH performed a hazard study looking for evidence of surface fault rupture. Our geoseismic study of the site uncovered no evidence of active faulting.

Eight borings were drilled to depths ranging from 4.8 to 21.0 feet with a truck-mounted drill rig equipped with hollow-stem augers and 2 test pits were excavated across the site with a moderate-sized hydraulic trackhoe to a depth of 20 feet in order to further define and evaluate the soil sequence. The drilling and excavation operations were relatively difficult due to the presence of cobbles, boulders, and cemented sands and gravels. Locations of the test pits and borings and fault study trench are presented on Figure 2.

The field portion of our study was under the direct control and continual supervision of an experienced member of our geotechnical staff. During the course of the drilling and excavating operations, a continuous log of the subsurface conditions encountered was maintained. In addition, relatively undisturbed samples of the typical soils were obtained for subsequent laboratory testing and examination. The soils were classified in the field based upon visual and textural examination. These classifications were later supplemented by subsequent inspection and testing in our laboratory. Detailed graphical representation of the subsurface conditions encountered during this study is presented on Figures 3A and 3B, Log of Test Pits, and



Figures 4A through 4H, Log of Borings. Soils were classified in accordance with the nomenclature described on Figure 5, Unified Soil Classification System.

A 2.42-inch inside diameter thin-wall hand sampler was utilized in the subsurface sampling of the test pits at the site.

A 3.25-inch outside diameter, 2.42-inch inside diameter drive sampler (Dames & Moore) was utilized in the subsurface sampling of the borings at the site. The blow counts recorded on the boring logs were those required to drive the sampler 12 inches with a 140-pound hammer dropping 30 inches.

Following completion of excavating and drilling operations, one and one-quarter-inch diameter slotted PVC pipe was installed in Test Pit TP-1 and Borings B-1 and B-5, respectively, in order to provide a means of monitoring the groundwater fluctuations.

Upon completion of excavating and logging, each test pit was backfilled. Although an effort was made to compact the backfill with the backhoe, backfill was not placed in uniform lifts and compacted to a specific density. Consequently, settlement of the backfill with time is likely to occur.

3.2 LABORATORY TESTING

3.2.1 General

In order to provide data necessary for our engineering analyses, a laboratory testing program was performed. The program included moisture and density, collapse-consolidation, and chemical tests. The following paragraphs describe the tests and summarize the test data.

3.2.2 Moisture and Density Tests

To aid in classifying the soils and to help correlate other test data, moisture and density tests were performed on selected undisturbed samples. The results of these tests are presented on Figures 3A and 3B, Log of Test Pits, and Figures 4A through 4H, Log of Borings.

3.2.3 Collapse-Consolidation Tests

To provide data necessary for our settlement analyses, a collapse-consolidation test was performed on each of three representative samples of the fine-grained soils encountered in the exploration borings and test pits.

The collapse portion of the test was performed in accordance with the following procedure:

- 1. Load sample at in-situ moisture content to specific axial pressure.
- 2. Measure and record axial deflection.



- 3. Saturate sample.
- 4. Measure and record resulting collapse.

Test results are tabulated below:

| Test Pit /
Boring
No. | Depth
(feet) | Soil
Classification | Natural
Dry
Density
(pcf) | Natural
Moisture
Content
(%) | Axial Load
When
Saturated
(psf) | Collapse (-)
or Swell (+) |
|-----------------------------|-----------------|------------------------|------------------------------------|---------------------------------------|--|------------------------------|
| B-1 | 15.0 | CL | 107 | 17.7 | 100 | 0.0 |
| B-4 | 1.5 | CL/SC | 97 | 5.1 | 1,600 | (-) 6.24 |
| TP-1 | 8.0 | CL | 101 | 19.4 | 100 | 0.0 |

The results of the tests indicate that surface finer-grained soils tested encountered at Boring B-4 are moderately to highly collapsible.

Following the collapse portion of the tests, normal consolidation test loading was applied. The surface finer-grained soils from Boring B-4 which exhibited significant collapse potential, after saturation, are highly compressible. The samples from Boring B-1 and Test Pit TP-1 are moderately over-consolidated and will exhibit moderate compressibility characteristics when loaded below the over-consolidation pressure.

Detailed results of the tests are maintained within our files and can be transmitted to you, upon your request.

3.2.4 Chemical Tests

In order to determine if the site soils will react detrimentally with concrete, chemical tests were performed on a representative sample. The results of the chemical tests are tabulated below:

| Borin
No. | g Depth
(feet) | Soil
Classification | рН | Total Water Soluble
Sulfate SO ₄
(mg/kg-dry) |
|--------------|-------------------|------------------------|------|---|
| B-4 | 1.5 | CL/SC | 8.73 | <5.25 |



4. SITE CONDITIONS

4.1 SURFACE

The site is west and northwest of the northwest corner of Sunnyside Avenue and Guardsman Way in Salt Lake City, Utah. Mt. Olivet Cemetery bounds the site to the north. The site is bounded by East High School football field to the west. Sunnyside Avenue bounds the site to the south. The site is bounded by the existing Rowland Hall campus and Pingree School to the east.

The site slopes downhill to the west. Overall elevation change across the site is on the order of 15 to 20 feet. Numerous surficial fill piles up to one to three feet high were observed across the site.

The property covers an area of 13.2 acres and is open and undeveloped. No structures currently occupy the site. The site is covered with weeds and grasses.

4.2 SUBSURFACE SOIL

The soil conditions encountered in each of the borings, test pits, and fault study trench, to the depths explored, are relatively similar. In Borings B-1, B-2, B-5, B-7, and B-8 and Test Pits TP-1 and TP-2, a one-half- to one and one-half-foot layer of silty clay/silty sand and gravel fill was encountered. The fill will exhibit variable and, in most cases, poor engineering characteristics. The upper one to four inches of all surface soil contain major roots and have been classified as topsoil. The upper approximately 3 to 12 inches, including topsoil, are loose as the result of normal weathering.

At the surface in Boring B-4, natural silty clays/clayey sands were encountered that extend to a depth of four feet. These clays/sands are moist, brown, very stiff/medium dense, and exhibit a "pinhole"-type structure. The soils, which have a "pinhole"-type structure, typically have relatively low dry densities and low moisture contents, all of which are commonly indicative of a moisture sensitive (collapsible) soil. Collapsible soils, in this case, are defined as soils which exhibit moderately high strength and low compressibility characteristics when dry, but lose strength, become highly compressible, and collapse with an increase in moisture content. Laboratory data shows that a sample of this soil exhibits a moderate to high collapse potential.

In Borings B-1, B-3, B-6, and B-7, underlying the surficial fills and from the ground surface at the remaining borings, natural silty clays were encountered that extend to depths of one and one-half to five feet. The clays are brown, moist, medium stiff, and exhibit moderate strength and compressibility characteristics. The natural silty clays, which do not exhibit a "pinhole"-type structure, are not moisture sensitive.

Underlying the surficial fills and silty clays, natural silty sands and gravels were encountered that extend to the full depths explored of 4.8 to 21.0 feet. The sands and gravels are brown, moist, loose to very dense, and will exhibit relatively high strength and low compressibility



characteristics and are not moisture sensitive. It should be noted the silty sands and gravels contained occasional to numerous cobbles and boulders and exhibit moderate cementation in zones. Also, it should be noted the soils encountered in the upper three and one-half to eight feet consisted primarily of silty fine sands.

Refusal was encountered at some of the boring locations on the moderately cemented sands, gravels, cobbles, and boulders. The borings were drilled with a truck-mounted drill rig equipped with hollow-stem augers. Depth of refusal or near-refusal is defined as the depth at which the augers were either stopped on cobbles and boulders or progress was significantly slowed due to the presence of moderately cemented soils. The following table summarizes the conditions encountered:

| Boring
No. | Depth to Refusal or
Near-Refusal
(feet) |
|---------------|---|
| B-2 | 6.8 |
| B-3 | 12.5 |
| B-4 | 4.8 |

It should be noted that the test pits could be excavated to a depth of 20 feet utilizing a moderatesized hydraulic trackhoe.

The lines designating the interface between soil types on the test pit and boring logs generally represent approximate boundaries. In-situ, the transition between soil types may be gradual.

4.3 GROUNDWATER

Immediately following drilling and excavating operations, groundwater was not encountered to the depths explored, 4.8 to 21.0 feet. Groundwater was not encountered one week following excavating and drilling operations in Borings B-1 and B-5, and Test Pit TP-1, respectively.

Groundwater is projected to be at least 30 to 40 feet below grade.

5. DISCUSSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

The structures can be supported upon conventional spread and continuous wall foundations established upon suitable natural soils and/or upon structural fill extending to suitable natural soils.



The geotechnical aspects of the site that will most influence the design and construction of the proposed structures and pavements are:

- 1. The moisture sensitive (collapsible) soils, which were encountered to a depth of approximately three to four feet at Boring B-4.
- 2. The non-engineered fills encountered to depths of one-half to one and one-half feet at numerous boring and test pit locations. Additionally, the numerous surficial fill piles up to one to three feet high observed across the site.
- 3. The relatively shallow moderately cemented sand, gravel, cobble, and boulder zones encountered at some test pit and boring locations.

The collapsible soils and non-engineered fills will exhibit extremely poor engineering characteristics and are unsuitable to support the proposed structures. The underlying granular and non-collapsible fine-grained soils exhibit favorable engineering characteristics. It is projected that potentially collapsible soils and non-engineered fills will be sporadic with respect to thickness and lateral extent across the site.

Considering the relatively limited depth of the potentially collapsible soils and non-engineered fills and the type of proposed structures, it is our opinion that the most economic solution for support of the structures will be to utilize conventional spread and continuous wall foundations after the removal, where encountered, of the unsuitable soils and fills from an area extending at least two feet from the perimeter of the structures, exterior flatwork, and rigid pavements.

Potentially collapsible soils and non-engineered fills may remain beneath the flexible pavement sections provided the soils are properly prepared. The flexible pavements established overlying these soils, however, may be subjected to long-term settlements unless these soils are completely removed.

The potentially collapsible soils and non-engineered fills can be re-used as structural site grading fill, if they meet the requirements of such. Fine-grained soils will require very close moisture control during placement and compaction. This will be extremely difficult during wet and cold periods of the year.

Earthwork and utility contractors should be prepared for the presence of moderately cemented sands, gravels, cobbles, and boulders. It should be noted that the test pits and fault trench could be excavated to depths of 6 to 20 feet utilizing a moderate-sized hydraulic trackhoe.

Due to the presence of surface unsuitable soils, it is our recommendation that a qualified geotechnical engineer observe the earthwork and foundation excavation operation.

In the following sections, detailed discussions pertaining to earthwork, foundations, at-grade concrete slabs, and the geoseismic setting of the site are provided.



5.2 EARTHWORK

5.2.1 Site Preparation

Initial site preparation will consist of the stripping of all potentially collapsible soils, nonengineered fills, surface vegetation, topsoil, and other deleterious materials from beneath an area extending out at least two feet beyond the perimeter of the proposed building, exterior flatwork, and rigid pavement areas. Potentially collapsible soils and non-engineered fills may remain beneath the flexible pavement sections provided the soils are properly prepared. The flexible pavements established overlying these soils/fills, however, may be subjected to some long-term settlements unless these soils/fills are completely removed.

Prior to the placement of structural site grading fill, pavements, floor slabs, or footings, the exposed natural subgrade should be proofrolled by running moderate-weight rubber tire-mounted construction equipment uniformly over the surface at least three times. If excessively soft or otherwise unsuitable soils are encountered beneath footings, they must be completely removed. In pavement, unsuitable natural soils should be removed to a maximum depth of two feet and replaced with compacted granular structural fill.

As an option to complete removal, some potential collapse soil and non-engineered fills may remain beneath the flexible pavement sections provided that the upper 9 to 12 inches are scarified, moisture prepared, and recompacted to the requirements of structural fill. The finegrained soils will require that very close moisture control be maintained during placement and compaction. It will be very difficult, if not impossible, to recompact these soils during wet and cold periods of the year. As an option to recompaction, the upper 12 inches of potentially collapsible soils and non-engineered fills may be removed and replaced with granular subbase over proofrolled subgrade. Even with proper preparation, flexible pavements established overlying potentially collapsible soils and non-engineered fills may encounter some long-term movements unless the potentially collapsible soils and non-engineered fills are completely removed.

Surface vegetation and other deleterious materials should generally be removed from the site. Topsoil, although unsuitable for utilization as structural fill, may be stockpiled for subsequent landscaping purposes.

5.2.2 Temporary Excavations

Temporary construction excavations through cohesive soils, not exceeding four feet in depth, may be constructed with near-vertical sideslopes. Temporary construction excavations through granular soils, not exceeding four feet in depth, should be constructed with excavation sideslopes no steeper than one-half horizontal to one vertical. For deeper excavations up to eight feet though fine-grained soils, excavation sideslopes should not exceed one-half horizontal to one vertical. For deeper excavation sideslopes should not exceed one horizontal to one vertical. If excessive sloughing occurs, if layers of clean



granular material are encountered, or where groundwater is encountered, the sideslopes should be flattened and dewatering and/or shoring provided. To reduce disturbance, we recommend that excavation for footings be accomplished utilizing a backhoe with a smooth-lip bucket.

Excavations up to eight feet in moderately cemented sands, gravels, and cobbles may be constructed with near-vertical sideslopes. Deeper excavations in moderately cemented soils are not anticipated.

Excavations into moderately cemented soils can generally be accomplished using heavy construction equipment or a "stinger."

All excavations must be inspected periodically by qualified personnel. If any signs of instability are noted, immediate remedial action must be initiated.

5.2.3 Structural Fill

Structural fill will be required as site grading fill, as backfill over foundations and utilities, and possibly as replacement fill beneath structures. All structural fill must be free of sod, rubbish, construction debris, frozen soil, and other deleterious materials. Structural site grading fill is defined as fill placed over fairly large open areas to raise overall site grade.

The maximum particle size within structural site grading fill should generally not exceed four inches; although, occasional particles up to six to eight inches may be incorporated provided that they do not result in "honeycombing" or preclude the obtainment of the desired degree of compaction. In confined areas, the maximum particle size should generally be restricted to two and one-half inches.

On-site soils may be re-utilized as structural site grading fill if they meet the requirements of structural fill. <u>Fine-grained soils will require very close moisture control and may be very difficult, if not impossible, to properly place and compact during wet and cold periods of the year</u>. Only granular soils are recommended in confined areas. The upper nine inches of structural site grading fills in building and pavement areas should preferably consist of granular soil. Generally, we recommend that all imported granular structural fill consist of a well-graded mixture of sands and gravels with no more than 18 percent fines (material passing the No. 200 sieve). Excavated moderately cemented soils can be re-utilized as structural fill provided it meets the maximum particle size requirements.

5.2.4 Fill Placement and Compaction

All structural fill should be placed in lifts not exceeding eight inches in loose thickness. Fills up to 10 feet thick and beneath all footings and floor slabs must be compacted to at least 95 percent



of the maximum dry density as determined by the $AASHTO^2$ T-180 (ASTM³ D-1557) compaction criteria. Structural fills greater than 10 feet are not anticipated at the site.

Fills less than 5 feet thick, which are not beneath an area extending out at least 2 feet from the perimeter of the structure, should be compacted to at least 90 percent of the above-defined criteria.

Prior to the placement of structural site grading fill, pavements, floor slabs, or footings, the exposed subgrade must be prepared as discussed in Section 5.2.1, Site Preparation, of this report. In confined areas, subgrade preparation must consist of the removal of all loose or disturbed soils.

Non-structural fill may be placed in lifts not exceeding 12 inches in loose thickness and compacted by passing construction, spreading, or hauling equipment over the surface at least twice.

5.2.5 Utility Trenches

All utility trench backfill material below structurally loaded facilities (flatwork, floor slabs, roads, etc.) should be placed at the same density requirements established for structural fill. If the surface of the backfill becomes disturbed during the course of construction, the backfill should be proofrolled and/or properly compacted prior to the construction of any exterior flatwork over a backfilled trench. Proofrolling may be performed by passing moderately loaded rubber tire-mounted construction equipment uniformly over the surface at least twice. If excessively loose or soft areas are encountered during proofrolling, they should be removed to a maximum depth of two feet below design finish grade and replaced with structural fill.

Most utility companies and City-County governments are now requiring that Type A-1 or A-1a (AASHTO Designation – basically granular soils with limited fines) soils be used as backfill over utilities. These organizations are also requiring that in public roadways the backfill over major utilities be compacted over the full depth of fill to at least 96 percent of the maximum dry density as determined by the AASHTO T-180 (ASTM D-1557) method of compaction. We recommend that as the major utilities continue onto the site that these compaction specifications are followed.

The on-site fine-grained cohesive soils are not recommended for use as trench backfill. The moderately cemented sands, gravels, and cobbles may be difficult to excavate through. The utility contractor should prepare accordingly.

² American Association of State Highway and Transportation Officials

³ American Society for Testing and Materials



5.3 SPREAD AND CONTINUOUS WALL FOUNDATIONS

5.3.1 Design Data

The proposed structures may be supported upon conventional spread and continuous wall foundations established upon suitable undisturbed natural clay and granular soils and/or upon structural fill extending to suitable soils. Under no circumstances shall the proposed structures be established on the potentially collapsible soils or non-engineered fills. For design, the following parameters are recommended:

| Minimum Recommended Depth of Embedment for
Frost Protection | - 30 inches |
|--|---|
| Minimum Recommended Depth of Embedment for
Non-frost Conditions | - 15 inches |
| Recommended Minimum Width for Continuous
Wall Footings | - 18 inches |
| Minimum Recommended Width for Isolated Spread
Footings | - 24 inches |
| Recommended Net Bearing Pressure for Real Load Conditions | |
| Suitable Natural Soils and/or Structural Fill Extending to These Soils | 3,000 pounds
per square foot* |
| Bearing Pressure Increase for Seismic Loading | |
| Soils | - 50 percent |
| * The bearing another is controlled by the fine anoined soil lower | |

* The bearing pressure is controlled by the fine-grained soil layers.

The term "net bearing pressure" refers to the pressure imposed by the portion of the structure located above lowest adjacent final grade. Therefore, the weight of the footing and backfill to lowest adjacent final grade need not be considered. Real loads are defined as the total of all dead plus frequently applied live loads. Total load includes all dead and live loads, including seismic and wind.

5.3.2 Installation

Under no circumstances should the footings be established upon potentially collapsible soils, non-engineered fills, loose or disturbed soils, sod, rubbish, construction debris, frozen soil, or



other deleterious materials. If unsuitable soils are encountered, they must be removed and replaced with compacted granular fill.

The width of structural replacement fill below footings should be equal to the width of the footing plus one foot for each foot of fill thickness.

5.3.3 Settlements

Settlements of foundations established on soil designed and installed in accordance with above recommendations and supporting maximum anticipated structural loads are anticipated to be approximately three-eighths to five-eighths of an inch. Settlements are expected to occur rapidly, with approximately 50 to 60 percent of the settlements occurring during construction.

5.4 LATERAL RESISTANCE

Lateral loads imposed upon foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and friction between the base of the footings and the supporting soils. For estimated frictional resistance, a coefficient of friction of 0.40 should be utilized for fine grained soils. For estimated frictional resistance, a coefficient of friction of 0.45 should be utilized for granular soils. Passive resistance provided by properly placed and compacted granular structural fill above the water table may be considered equivalent to a fluid with a density of 300 pounds per cubic foot. Below the water table, this granular soil should be considered equivalent to a fluid with a density of 150 pounds per cubic foot.

A combination of passive earth resistance and friction may be utilized provided that the friction component of the total is divided by 1.5.

5.5 LATERAL PRESSURES

The lateral pressure parameters, as presented within this section, assume that the backfill will consist of a drained granular soil placed and compacted in accordance with the recommendations presented herein. The lateral pressures imposed upon subgrade facilities will, therefore, be basically dependent upon the relative rigidity and movement of the backfilled structure. For active walls, such as retaining walls which can move outward (away from the backfill), granular backfill shall be considered equivalent to a fluid with a density of 35 pounds per cubic foot in computing lateral pressures. For more rigid walls that are not more than 10 inches thick and 4 feet or less in height, granular backfill shall be considered equivalent to a fluid with a density of 45 pounds per cubic foot. For very rigid non-yielding walls, granular backfill shall be considered equivalent to a fluid with a density of at least 55 pounds per cubic foot. The above values assume that the surface of the soils slope behind the wall is horizontal and that the granular fill has been placed and <u>lightly</u> compacted, not as a structural fill.

For seismic loading, a uniform pressure of 75 pounds per square foot shall be added for maximum wall height of 4 feet.



5.6 **FLOOR SLABS**

Floor slabs must be established upon suitable, non-collapsible, natural soils and/or upon structural fill extending to suitable natural soils. Under no circumstances should floor slabs be established over potentially collapsible soils, non-engineered fills, loose or disturbed soils, sod, rubbish, construction debris, non-engineered fills, other deleterious materials, frozen soils, or within ponded water.

In order to facilitate construction, it is recommended that floor slabs be directly underlain by at least four inches of "free-draining" fill, such as "pea" gravel or three-quarters- to one-inch minus clean gap-graded gravel. In areas where "damp floors" could be tolerated, the slabs could be immediately underlain by a minimum of four inches of aggregate base as an alternative.

Settlements of floor slabs established on the natural suitable soils and/or structural fill extending to these soils should be negligible (less than one-quarter of an inch).

5.7 **PAVEMENTS**

The existing natural potentially collapsible soils and non-engineered fills encountered at the site will exhibit very poor pavement support characteristics when saturated or near saturated. The existing natural granular soils encountered at the site will exhibit moderate pavement support characteristics when saturated or near saturated. Subgrade must be prepared as described in Section 5.2.1, Site Preparation. These pavement sections have been designed for the proposed traffic; if higher traffic is anticipated, these pavement sections will need to be modified. For this subgrade condition and projected traffic, the following pavement sections are recommended:

Parking Areas

(Light Volume of Automobiles and Light Trucks, Occasional Medium-Weight Trucks, and No Heavy-Weight Trucks) [1 equivalent 18-kip axle load per day]

Flexible Pavements: (Asphalt Concrete)

| 2.5 inches | Asphalt concrete |
|------------|---|
| 7.0 inches | Aggregate base course |
| Over | Properly prepared potentially collapsible
soils and non-engineered fills, properly
prepared suitable natural subgrade soils,
and/or structural site grading fill extending |

to suitable natural subgrade soils

Rowland Hall/St. Marks School Job No. 1087-001-10 Geotechnical Study December 2, 2010



Rigid pavements are not recommended over potentially collapsible soils or non-engineered fills. If the potentially collapsible soils and non-engineered fills are completely removed, the following section is recommended:

Rigid Pavements: (Non-Reinforced Concrete)

| 5.0 inches | Portland cement concrete
(non-reinforced) |
|------------|--|
| 4.0 inches | Aggregate base course |
| Over | Properly prepared suitable natural subgrade
soils and/or structural site grading fill
extending to suitable natural subgrade soils |

Roadway Areas

(Moderate Volume of Automobiles and Light Trucks, Light Volume of Medium-Weight Trucks, and Occasional Heavy-Weight Trucks) [5 equivalent 18-kip axle loads per day]

Flexible Pavements: (Asphalt Concrete)

| 3.0 inches | Asphalt concrete |
|------------|---|
| 8.0 inches | Aggregate base course |
| Over | Properly prepared potentially collapsible
soils and non-engineered fills, properly
prepared suitable natural subgrade soils,
and/or structural site grading fill extending
to suitable natural subgrade soils |

Rowland Hall/St. Marks School Job No. 1087-001-10 Geotechnical Study December 2, 2010



Rigid pavements are not recommended over potentially collapsible soils or non-engineered fills. If the potentially collapsible soils and non-engineered fills are completely removed, the following section is recommended:

<u>Rigid Pavements:</u> (Non-Reinforced Concrete)

| 6.0 inches | Portland cement concrete
(non-reinforced) |
|------------|--|
| 4.0 inches | Aggregate base course |
| Over | Properly prepared suitable natural subgrade
soils and/or structural site grading fill
extending to suitable natural subgrade soils |

For dumpster pads, we recommend a pavement section consisting of six and one-half inches of Portland cement concrete, four inches of aggregate base course, over properly prepared natural subgrade or site grading structural fills.

These rigid pavement sections are for reinforced Portland cement concrete. Construction of the rigid pavement should be in sections 10 to 12 feet in width with construction or expansion joints or one-quarter depth saw-cuts on no more than 12-foot centers. Saw-cuts must be completed within 24 hours of the "initial set" of the concrete and should be performed under the direction of the concrete paving contractor. The concrete should have a minimum 28-day unconfined compressive strength of 4,000 pounds per square inch and contain 6 percent ± 1 percent air-entrainment.

5.8 CEMENT TYPES

Laboratory tests indicate that the site soils contain negligible amounts of water soluble sulfates. Therefore, all concrete which will be in contact with the site soils may be prepared using Type I or IA cement.

5.9 GEOSEISMIC SETTING

5.9.1 General

Most Utah municipalities have adopted the International Building Code (IBC) 2009. The IBC 2009 code determines the seismic hazard for a site based upon 2002 mapping of bedrock accelerations prepared by the United States Geologic Survey (USGS) and the soil site class. The USGS values are presented on maps incorporated into the IBC code and are also available based on latitude and longitude coordinates (grid points).



The structure must be designed in accordance with the procedure presented in Section 1613, Earthquake Loads, of the IBC 2009 edition.

5.9.2 Faulting

Our surface fault rupture hazard study dated December 2, 2010 of the site uncovered no evidence of active faulting.

5.9.3 Soil Class

For dynamic structural analysis, the Site Class D - Stiff Soil Profile as defined in Table 1613.5.2, Site Class Definitions, of the IBC 2009 can be utilized.

5.9.4 Ground Motions

The IBC 2009 code is based on 2002 USGS mapping, which provides values of short and long period accelerations for the Site Class B-C boundary for the Maximum Considered Earthquake (MCE). This Site Class B-C boundary represents a hypothetical bedrock surface and must be corrected for local soil conditions. The following table summarizes the peak ground and short and long period accelerations for a MCE event and incorporates a soil amplification factor for a Site Class D soil profile in the second column. Based on the site latitude and longitude (40.7531 degrees north and 111.8486 degrees west, respectively), the values for this site are tabulated below:

| Spectral Acceleration Value, T
Seconds | Site Class B-C
Boundary
[mapped values]
(% g) | Site Class D
[adjusted for site
class effects]
(% g) |
|---|--|---|
| Peak Ground Acceleration | 65.5 | 65.5 |
| 0.2 Seconds, (Short Period
Acceleration) | S _S = 163.8 | S _{MS} = 163.8 |
| 1.0 Seconds (Long Period
Acceleration) | S ₁ = 65.7 | $S_{M1} = 98.6$ |

The IBC 2009 code design accelerations (S_{DS} and S_{D1}) are based on multiplying the above accelerations (adjusted for site class effects) for the MCE event by two-thirds ($\frac{2}{3}$).

5.9.5 Liquefaction

The site is located in an area that has been identified by Salt Lake County as having a "very low" liquefaction potential. Liquefaction is defined as the condition when saturated, loose, granular-



type soils lose their support capabilities because of excessive pore water pressure which develops during a seismic event.

Due to the absence of groundwater and the dense to very dense nature of the granular soils, the potential for liquefaction is considered low.

5.10 SITE OBSERVATIONS

As previously mentioned, potentially collapsible soils and non-engineered fills are present across much of the site to varying depths. Therefore, we recommend that a qualified geotechnical engineer observe the foundation excavations to identify that all unsuitable soils have been removed and that suitable soils have been encountered.

We appreciate the opportunity of providing this service for you. If you have any questions or require additional information, please do not hesitate to contact us.

Respectfully submitted,

GSH Geotechnical Consultants, Inc.

Joshua M. Whitney, P.E. State of Utah No. 6252902 Project Geotechnical Engineer

JMW/WJG:sn

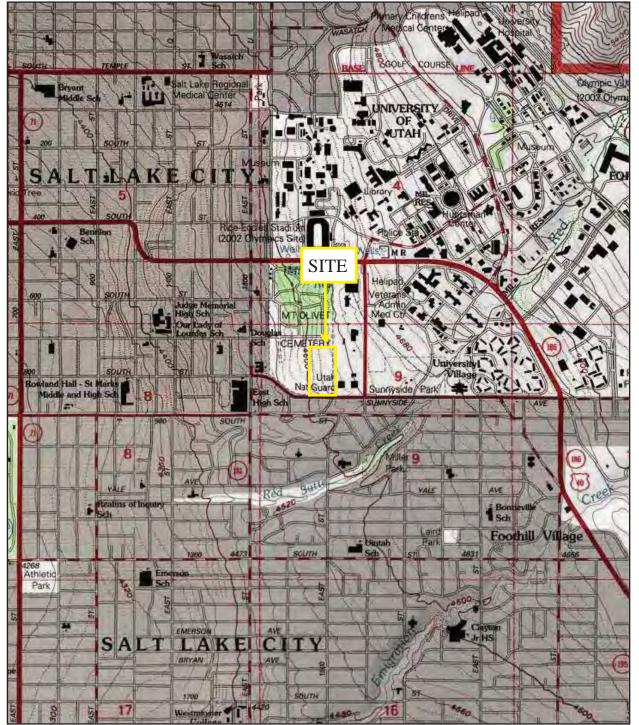
Reviewed by:

William J. Gordon, P.E. State of Utah No. 146417 President/Senior Geotechnical Engineer

| Encl. | Figure | 1, | Vicinity Map |
|-------|---------|----|------------------------------------|
| | Figure | 2, | Site Plan |
| | Figures | 3A | and 3B, Log of Test Pits |
| | Figures | 4A | through 4H, Log of Borings |
| | Figure | 5, | Unified Soil Classification System |
| | | | |

Addressee (4 + email)

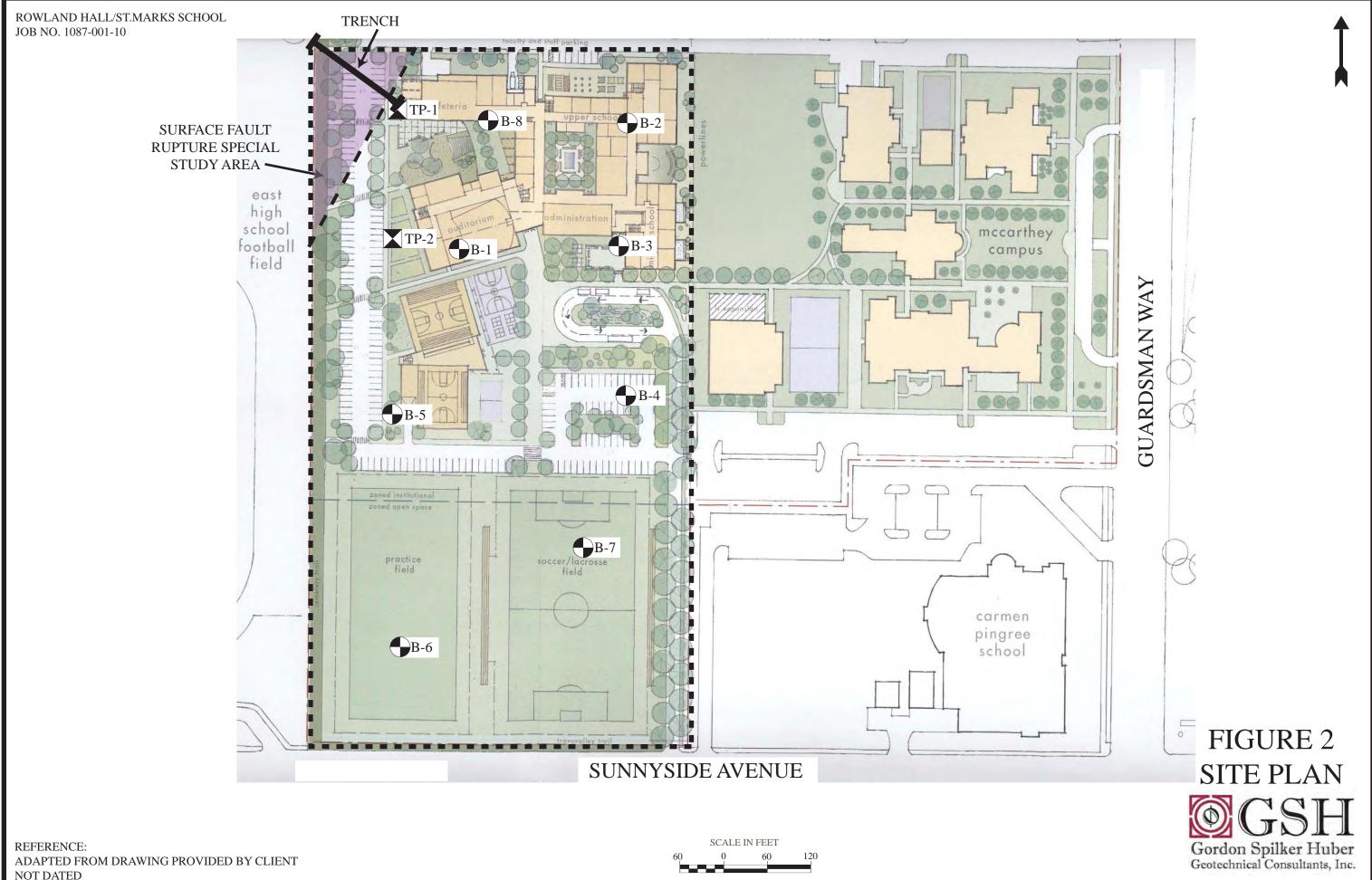
ROWLAND HALL/ST. MARKS SCHOOL JOB NO. 1087-001-10



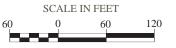
SCALE IN FEET 1000 0 1000 2000

REFERENCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE MAPS TITLED "FORT DOUGLAS, UTAH" AND "SUGAR HOUSE, UTAH" BOTH DATED 1998

FIGURE 1 VICINITY MAP OCSH Gordon Spilker Huber Geotechnical Consultants, Inc.



NOT DATED



TEST PIT TP-1

GSH Field Rep.: PRE

Page: 1 of 1

Project Name: Proposed Rowland Hall High School

Location: NW Cnr Sunnyside Ave./Guardsman Way, SLC, UT

Excavating Method: Trackhoe

Elevation: - - -

Remarks:

SAMPLE SYMBOI Liquid Limit (%) **MOISTURE (%)** % PASSING 200 Plastic Limit (%) DRY DENSITY (PCF) **Graphical Log** Water Level DEPTH FT. DESCRIPTION REMARKS Ground Surface 0 loose to 6" SILTY FINE SAND, FILL major roots (topsoil) to 2"; brown (SM-FILL) moist SILTY FINE SAND "medium dense" reddish-brown (SM) - 5 moist SILTY FINE AND COARSE GRAVEL AND FINE TO "very dense" COARSE SAND with occasional cobbles and boulders up to 3' in diameter; brown (SM/GM) moist SILTY CLAY "stiff" 19.4 101 with some fine to coarse sand and fine and coarse gravel and occasional cobbles; brown (CL) 10 moist SILTY FINE AND COARSE GRAVEL AND FINE TO "very dense" COARSE SAND with occasional cobbles; brown (SM/GM) 15 20Stopped excavating at 20.0'. Stopped sampling at 18.0'. Some sidewall caving. No groundwater encountered.

Project No.: 1087-001-10

Date Excavated: 11-04-10

Client: Rowland Hall/St. Marks School

Water Level: No groundwater encountered (11-04-10 & 11-11-10)

TEST PIT TP-2

GSH Field Rep.: PRE

Page: 1 of 1

Project Name: Proposed Rowland Hall High School

Location: NW Cnr Sunnyside Ave./Guardsman Way, SLC, UT

Excavating Method: Trackhoe

Elevation: - - -

Remarks:

SAMPLE SYMBOL **MOISTURE (%)** % PASSING 200 Liquid Limit (%) Plastic Limit (%) DRY DENSITY (PCF) **Graphical Log** Water Level DEPTH FT. REMARKS DESCRIPTION Ground Surface 0 loose to 3"-6" SILTY FINE SAND, FILL major roots (topsoil) to 1"-2"; brown (SM-FILL) moist SILTY FINE SAND "medium dense" brown (SM) 5 "dense" moist SILTY FINE AND COARSE GRAVEL AND FINE TO COARSE SAND with occasional cobbles; brown (SM/GM) 10 grades with numerous cobbles -15 -20 Stopped excavating at 20.0'. Stopped sampling at 20.5'. Some sidewall caving. No groundwater encountered at time of excavation.

The discussion in the text under the section titled, SUBSURFACE CONDITIONS, is necessary for a proper understanding of the nature of the subsurface material.

FIUGRE 3B

Project No.: 1087-001-10

Client: Rowland Hall/St. Marks School Date Excavated: 11-04-10

Water Level: No groundwater encountered (11-04-10)

BOREHOLE B-1

REMARKS

Page: 1 of 1

Project Name: Proposed Rowland Hall High School

Location: NW Cnr Sunnyside Ave./Guardsman Way, SLC, UT

Drilling Method: 3 3/4" ID Hollow-Stem Auger

Elevation: - - -

Remarks:

phical Log er Level

GSH Field Rep.: PRE IPLE SYMBOL STURE (%) **ASSING 200** id Limit (%) tic Limit (%) DENSITY TH FT. WS/FT DESCRIPTION

| Grapl | Wate | | DEPT | BLOV | SAMI | MOIS | % PA | DRY
(PCF) | Liqui | Plasti | |
|-------|------|---|-----------|------|------|------|------|--------------|-------|--------|-----------------------|
| | | Ground Surface SILTY CLAY, FILL with some fine to coarse sand and fine and coarse gravel; major roots (topsoil) to 1"-2"; brown (CL-FILL) | -0 | | | | | | | | loose to 6" |
| | | SILTY CLAY
with some fine sand; brown (CL)
SILTY FINE SAND
reddish-brown (SM) | | 22 | X | | | | | | moist
loose |
| | | | -5 | 22 | X | 5.3 | | 96 | | | |
| | | SILTY FINE AND COARSE GRAVEL AND FINE TO
COARSE SAND
with occasional cobbles; brown (SM/GM) | - | | | | | | | | moist
medium dense |
| | | | -10 | 50 | X | | | | | | |
| | | | - | | | | | | | | |
| | | SILTY CLAY
with some fine to coarse sand; brown (CL) | - 15
- | 12 | X | 17.7 | | 107 | | | moist
stiff |
| | | SILTY FINE AND COARSE GRAVEL AND FINE TO
COARSE SAND | - | | | | | | | | moist
medium dense |
| | | brown (SM/GM) | -20 | 58 | X | | | | | | |
| | | Stopped drilling at 19.5'.
Stopped sampling at 21.0'. | - | | | | | | | | |
| | | No groundwater encountered. | - | | | | | | | | |
| The d | isou | Installed 1-1/4" diameter slotted PVC pipe to 21.0'. | | | | | | | | | FIGURE 4A |

Project No.: 1087-001-10 Client: Rowland Hall/St. Marks School

Date Drilled: 11-04-10

Water Level: No groundwater encountered (11-04-10 & 11-11-10)

BOREHOLE B-2

GSH Field Rep.: PRE

Page: 1 of 1

Project Name: Proposed Rowland Hall High School

Location: NW Cnr Sunnyside Ave./Guardsman Way, SLC, UT

Drilling Method: 3 3/4" ID Hollow-Stem Auger

Elevation: - - -

Remarks:

SAMPLE SYMBOI Liquid Limit (%) **MOISTURE (%)** % PASSING 200 Plastic Limit (%) DRY DENSITY (PCF) **Graphical Log** Water Level DEPTH FT. **BLOWS/FT** DESCRIPTION REMARKS Ground Surface -0 loose to 6"-9" SILTY CLAY, FILL with some fine to coarse sand and fine and coarse gravel; brown (CL-FILL) moist SILTY FINE SAND medium dense reddish-brown (SM) 102 65 2.4 moist SILTY CLAY -5 very dense with some fine to coarse sand and fine and coarse gravel and occasional cobbles; brown (SM/GM) 100 Λ Drilling refusal at 6.8'. Stopped sampling at 6.8'. ·10 No groundwater encountered at time of drilling. -15 -20

Project No.: 1087-001-10

Date Drilled: 11-04-10

Client: Rowland Hall/St. Marks School

Water Level: No groundwater encountered (11-04-10)

BOREHOLE B-3

GSH Field Rep.: PRE

Page: 1 of 1

Project Name: Proposed Rowland Hall High School

Location: NW Cnr Sunnyside Ave./Guardsman Way, SLC, UT

Drilling Method: 3 3/4" ID Hollow-Stem Auger

Elevation: - - -

Remarks:

SAMPLE SYMBOI Liquid Limit (%) **MOISTURE (%)** % PASSING 200 DRY DENSITY (PCF) Plastic Limit (%) **Graphical Log** Water Level DEPTH FT. **BLOWS/FT** DESCRIPTION REMARKS Ground Surface -0 loose to 4" SILTY CLAY with some fine sand; major roots (topsoil) to 2"; brown (CL) moist SILTY FINE SAND very dense brown (SM) 100 5" moist SILTY FINE AND COARSE GRAVEL AND FINE TO medium dense COARSE SAND with occasional cobbles; brown (SM/GM) -5 27 moist SILTY CLAY with some fine to coarse sand; brown (CL) moist SILTY FINE AND COARSE GRAVEL AND FINE TO dense COARSE SAND with occasional cobbles; brown (SM/GM) -10 88 Drilling refusal at 12.5'. Stopped sampling at 11.0'. ·15 No groundwater encountered at time of drilling. -20

Project No.: 1087-001-10

Date Drilled: 11-04-10

Client: Rowland Hall/St. Marks School

Water Level: No groundwater encountered (11-04-10)

BOREHOLE B-4

GSH Field Rep.: PRE

Page: 1 of 1

Project Name: Proposed Rowland Hall High School

Location: NW Cnr Sunnyside Ave./Guardsman Way, SLC, UT

Drilling Method: 3 3/4" ID Hollow-Stem Auger

Elevation: - - -

Remarks:

SAMPLE SYMBOL Liquid Limit (%) **MOISTURE (%)** % PASSING 200 Plastic Limit (%) DRY DENSITY (PCF) **Graphical Log** Water Level DEPTH FT. **BLOWS/FT** DESCRIPTION REMARKS Ground Surface -0 loose to 4" SILTY CLAY/CLAYEY FINE TO COARSE SAND with some fine and coarse gravel; major roots (topsoil) to 2"; moist brown (CL/SC) very stiff to 5.1 97 36 medium dense 100 3" slightly moist SILTY FINE AND COARSE GRAVEL AND FINE TO H**H** very dense * COARSE SAND -5 with occasional cobbles; brown (SM/GM) Drilling refusal at 4.8'. Stopped sampling at 4.8'. No groundwater encountered at time of drilling. -10 -15 -20

Project No.: 1087-001-10

Date Drilled: 11-04-10

Client: Rowland Hall/St. Marks School

Water Level: No groundwater encountered (11-04-10)

BOREHOLE B-5

Page: 1 of 1

Project Name: Proposed Rowland Hall High School

Location: NW Cnr Sunnyside Ave./Guardsman Way, SLC, UT

Drilling Method: 3 3/4" ID Hollow-Stem Auger

Elevation: - - -

Remarks:

SAMPLE SYMBOL Liquid Limit (%) **MOISTURE (%)** % PASSING 200 DRY DENSITY (PCF) Plastic Limit (%) **Graphical Log** Water Level DEPTH FT. **BLOWS/FT** DESCRIPTION REMARKS Ground Surface -0 loose to 3"-6" SILTY CLAY, FILL with some fine sand; brown (CL-FILL) moist SILTY FINE SAND loose reddish-brown (SM) 16 5 50 moist SILTY FINE AND COARSE GRAVEL AND FINE TO 2" very dense COARSE SAND with occasional cobbles; brown (SM/GM) dense -10 77 4.2 127 very dense -15 100 5" 100 grades with occasional layers up to 4" thick of silty clay 5" with some fine and coarse gravel 9.4 109 20Stopped drilling at 19.5'. Stopped sampling at 20.0'. No groundwater encountered. Installed 1-1/4" diameter slotted PVC pipe to 20.0'.

The discussion in the text under the section titled, SUBSURFACE CONDITIONS, is necessary for a proper understanding of the nature of the subsurface material.

FIGURE 4E

Client: Rowland Hall/St. Marks School
Date Drilled: 11-04-10 GSH Field Rep.: PRE

Project No.: 1087-001-10

Water Level: No groundwater encountered (11-04-10 & 11-11-10)

BOREHOLE B-6

GSH Field Rep.: PRE

Page: 1 of 1

Project Name: Proposed Rowland Hall High School

Location: NW Cnr Sunnyside Ave./Guardsman Way, SLC, UT

Drilling Method: 3 3/4" ID Hollow-Stem Auger

Elevation: - - -

Remarks:

SAMPLE SYMBOL Liquid Limit (%) **MOISTURE (%)** % PASSING 200 Plastic Limit (%) DRY DENSITY (PCF) **Graphical Log** Water Level DEPTH FT. **BLOWS/FT** DESCRIPTION REMARKS Ground Surface -0 loose to 6" SILTY CLAY moist with some fine sand; major roots (topsoil) to 4"; brown (CL) "medium stiff" Stopped drilling at 5.0'. Stopped sampling at 3.0'. No groundwater encountered at time of drilling. -10 -15 -20

Project No.: 1087-001-10

Date Drilled: 11-04-10

Client: Rowland Hall/St. Marks School

Water Level: No groundwater encountered (11-04-10)

BOREHOLE B-7

GSH Field Rep.: PRE

Page: 1 of 1

Project Name: Proposed Rowland Hall High School

Location: NW Cnr Sunnyside Ave./Guardsman Way, SLC, UT

Drilling Method: 3 3/4" ID Hollow-Stem Auger

Elevation: - - -

Remarks:

| Graphical Log | Water Level | DESCRIPTION | DEPTH FT. | BLOWS/FT | SAMPLE SYMBOL | MOISTURE (%) | % PASSING 200 | DRY DENSITY
(PCF) | Liquid Limit (%) | Plastic Limit (%) | REMARKS |
|---------------|-------------|--|-----------|-----------------|---------------|--------------|---------------|----------------------|------------------|-------------------|-----------------|
| | | Ground Surface | -0 | | | | | | | | loose to 9"-12" |
| | | SILTY FINE AND COARSE GRAVEL AND FINE TO COARSE SAND, FILL | | | | | | | | | 10030 10 9 12 |
| <u> </u> | | with occasional cobbles; brown (SM/GM-FILL) | F | | | | | | | | moist |
| | | SILTY CLAY with some fine to coarse sand and fine and coarse gravel; brown (CL) | - | | | | | | | | "stiff" |
| | | | | | | | | | | | |
| | | | F | | | | | | | | |
| | - | | -5 | | | | | | | | |
| | | Stopped drilling at 5.0'. | - | | | | | | | | |
| | | Stopped sampling at 4.0'. | F | | | | | | | | |
| | | | | | | | | | | | |
| | | No groundwater encountered at time of drilling. | Γ | | | | | | | | |
| | | | F | | | | | | | | |
| | | | -10 | | | | | | | | |
| | | | L | | | | | | | | |
| | | | | | | | | | | | |
| | | | - | | | | | | | | |
| | | | F | | | | | | | | |
| | | | L | | | | | | | | |
| | | | | | | | | | | | |
| | | | -15 | | | | | | | | |
| | | | ╞ | | | | | | | | |
| | | | L | | | | | | | | |
| | | | | | | | | | | | |
| | | | F | | | | | | | | |
| | | | F | | | | | | | | |
| | | | 20 | | | | | | | | |
| | | | -20 | | | | | | | | |
| | | | F | | | | | | | | |
| | | | ╞ | | | | | | | | |
| | | | L | | | | | | | | |
| | | | | | | | | | | | |
| | | | F | | | | | | | | |
| | | | -25 | | | | | | | | |

Project No.: 1087-001-10

Date Drilled: 11-04-10

Client: Rowland Hall/St. Marks School

Water Level: No groundwater encountered (11-04-10)

BOREHOLE B-8

GSH Field Rep.: PRE

Page: 1 of 1

Project Name: Proposed Rowland Hall High School

Location: NW Cnr Sunnyside Ave./Guardsman Way, SLC, UT

Drilling Method: 3 3/4" ID Hollow-Stem Auger

Elevation: - - -

Remarks:

SAMPLE SYMBOL Liquid Limit (%) **MOISTURE (%)** % PASSING 200 Plastic Limit (%) DRY DENSITY (PCF) **Graphical Log** Water Level DEPTH FT. **BLOWS/FT** DESCRIPTION REMARKS Ground Surface 0 loose to 3" SILTY FINE AND COARSE GRAVEL AND FINE TO COARSE SAND, FILL brown (SM/GM-FILL) moist SILTY FINE TO MEDIUM SAND loose brown (SM) 16 -5 22 moist SILTY FINE AND COARSE GRAVEL AND FINE TO dense COARSE SAND with some clay and occasional cobbles; brown (SM/GM) -10 73 Stopped drilling at 9.5'. Stopped sampling at 11.0'. No groundwater encountered at time of drilling. -15 -20

Project No.: 1087-001-10

Date Drilled: 11-04-10

Client: Rowland Hall/St. Marks School

Water Level: No groundwater encountered (11-04-10)

| | | | | | | | | GRAPH | LETTER | | _ |
|--|--|--|---|---|--|--|---|--|---|--|-----------------------|
| | | | INTIFICATION PE | | ES | | | SYMBOL | SYMBOL
L | TYPICAL DESCRIPTIONS | |
| | | GRAVELS | CLEAN
GRAVELS | W | Wide range in grain size and substantial
amounts of all Intermediate particle sizes. | | | 000 | GW | Well graded gravels, gravel-sand mixtures,
little or no fines. | |
| | COARSE GRAINED
SOILS | More than half of
coarse fraction is
larger than No. 4
sleve slze. | (Little or
no fines) | | | one size or a rang
ermediate sizes m | | 00 | GP | Poorly graded gravels, gravel-sand mixtures,
little or no fines. | |
| | More than half of
material is lar <u>ger</u> | (For visual classifications,
the 1/4" size may be | GRAVELS WI | пн | on-plastic fine
see ML below | es (for Identification). | on procedures | | GM | Silty gravels, poorly graded gravel-sand-
silt mixtures. | |
| | than No. 200
sleve size. 🕼 | used as equivalent to
the No. 4 sleve size.) | (Appreclable
amount of
flnes) | Pla | astic fines (fo
see CL below | r Identification pro
). | ocedures | ZZ. | GC | Clayey gravels, poorly graded gravel-sand-
clay mixtures. | |
| | | SANDS | CLEAN SAND | | | rain sizes and sui
I intermediate par | | | SW | Well graded sands, gravelly sands, little or no fines. | |
| | (The No. 200 sieve | More than half of
coarse fraction is
smaller than No. 4
sleve size. | (Little or
no fines) | Pr | edominantly
some interme | one size or a rang
diate sizes missir | e of sizes with
Ig. | | SP | Poorly graded sands, gravelly sands, little or no fines. | |
| | size is about the
smallest particle
visible to the | (For visual classifications, | SANDS WIT
FINES | | on-plastic fine
see ML below | es (for identificatio
). | on procedures | | SM | Silty sands, poorly graded sand-silt mixtures. | |
| | naked eye) | the 1/4" size may be
used as equivalent to
the No. 4 sieve size.) | (Appreclable
amount of
fines) | Pla | see CL below | | | | SC | Clayey sands, poorly graded sand-clay mixtures. | |
| | | IDENTIFICATION | FROCEDUKES (| DF | ION SMALLEI
RYSTRENGTH
(CRUSHING
ARACTERISTICS) | THAN No. 40 SIE
DILATANCY
(REACTION
TO SHAKING) | TOUGHNESS
(CONSISTENCY
NEAR PLASTIC LIMIT) | | | | |
| | FINE GRAINED
SOILS | SILTS AND | CLAYS | Nor | ne to slight | Quick to si | low None | | ML | Inorganic silts and very fine sands, rock flour,
sllty or clayey fine sand with slight plasticity. | |
| | More than half of
material is sm <u>aller</u>
than No. 200 | Liquid limit less that | n 50 | Med | llum to high | None to
very slow | , Medlum | | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. | |
| | sjeve size. | | | | Slight to
medlum | Slow | Slight | | OL | Organic silts and organic silt-clays of low
plasticity. | |
| | (The No. 200 sleve | SILTS AND CLAYS | | | Slight to
medium | Slow to none | e Slight to medium | | MH | Inorganic silts, micaceous or diatomaceous fine sandy or slity solls, elastic slits. | |
| | size is about the
smallest particle
visible to the | Liquid limit greater the | | | High to
very high | | High | | СН | Inorganic clays of high plasticity, fat clays. | |
| | naked eye) | | | Med | lum to high | None to
very slow | Slight to
medium | | OH | Organic clays of medium to high plasticity. | |
| | | ILY ORGANIC SOILS | intion of two a | | frequently by | d by color, odor, :
/ flbrous texture. | | | Pt | Peat and other highly organic soils. | |
| ENE | 2 All sieve sizes on this of RAL NOTES | chart are U.S. standard. | sites of two g | | designated | by combinations | s or group symbols. r | or example o | | graded grade-sand finkare war day bilder. | |
| | eneral, Unified Soil Class | | | | | | | ODVANE | POCKI | | |
| In ge | | ification Designations pres | ented | | - | FINE - GRAINI | ED SOIL T | ORVANE | PENETRO | METER | |
| n the | | ification Designations pres
visual methods only. There
laboratory testing) may dif | rore, | | (| FINE - GRAINI | UI | NDRAINED
SHEAR
RENGTH (tsf) | | FINED
SSIVE FIELD TEST | |
| the
tual
Line | designations (based on l
es seperating strata on the
arles only Actual transition | visual methods only. There
laboratory testing) may dif
e logs represent approxIm
ons may be gradual. | rore,
ier.
ate | | | CONSISTENCY
Very Soft | UI
SPT
(blows/ft) STI
<2 | NDRAINED
SHEAR
RENGTH (tsf)
<0.125 | VNCONF
COMPRES
STRENGT | EINED FIELD TEST ISSIVE FIELD TEST 25 Easily penetrated several inches by Thuis Squeezes through fingers. Squeezes through fingers. Easily penetrated 'I' by Thumb. Modeled | |
| Line
Line
Log
Log | designations (based on I
es seperating strata on th
arles only Actual transitions
s represent general soil of
loration onthe date indica | visual method's only. There
aboratory testing) may dif
e logs represent approxim
ons may be gradual.
conditions observed at teh
ated. | rore,
fer.
ate
point | | - | CONSISTENCY | Uf
SPT
(blows/ft) STI
<2
2 - 4 0, | NDRAINED
SHEAR
RENGTH (tsf) | UNCONF
COMPRES
STRENGT | ENED FIELD TEST (SSIVE FIELD TEST 15 Easily penetrated several inches by Thuis Squeezes through fingers. 0.5 Easily penetrated 1 " by Thumb . Molded light finger pressure. 0.5 Penetrated versities of the pressure. | by
erate |
| Line
Line
Log
fexp | designations (based on I
es seperating strata on th
arles only Actual transitions
s represent general soil of
loration onthe date indica | visual method's only. There
aboratory testing) may dif
e logs represent approxim
ons may be gradual.
conditions observed at teh
ated.
o the continuity of soil con | rore,
fer.
ate
point | | | CONSISTENCY
Very Soft
Soft | Uł
SPT
(błows/tł) STI
<2
2 - 4 0,
4 - 8 | NDRAINED
SHEAR
RENGTH (tsf)
<0.125
125 - 0.25 | PENETROI
UNCONF
COMPRES
STRENGTI
<0.23
0.25 - (| ENED
INSU/E FIELD TEST 15 Easily penetrated several inches by Thun
Squeezes through fingers. 0.5 Easily penetrated 1 " by Thumb . Molded
light finger pressure. 1.0 Penetrated over 1/2 " by Thumb with mo
effort. Molded by strong finger pressure. | by
erate |
| n the
ctual
Line
ound
Log
f exp
No v | designations (based on I
es seperating strata on the
arles only Actual transition
s represent general soil of
loration onthe date indica
warranty is provided as to | visual method's only. There
aboratory testing) may dif
e logs represent approxim
ons may be gradual.
conditions observed at teh
ated.
o the continuity of soil con | rore,
fer.
ate
point | | - | CONSISTENCY
Very Soft
Soft
Medlum Stiff
Stiff
Very Stiff | Ut
SPT
(blows/ft) STI
<2
2 - 4 0,
4 - 8 0
8 - 15
15 - 30 | NDRAINED
SHEAR
RENGTH (tsf)
<0.125
125 - 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 2.0 | PENETROI
UNCONF
COMPRE:
STRENGT
0.25 - 0
0.5 - 1
1.0 - 2
2.0 - 4 | ENED
INED
ISSIVE FIELD TEST 5 Easily penetrated several inches by Thurs
Squeezes through fingers. 0.5 Easily penetrated 1 " by Thumb . Molded
light finger pressure. 1.0 Penetrated over 1/2 " by Thumb with mo
effort. Molded by strong finger pressure. 2.0 Indented about 1/2 " by Thumb but pene
only with great effort 4.0 Readily indented by Thumbnail | by
erate |
| Line
Line
Log
exp | designations (based on l
es seperating strata on th
arles only Actual transition
s represent general soil of
loration onthe date indica
warranty is provided as to
en Individual sample loca | visual method's only. There
aboratory testing) may dif
e logs represent approxim
ons may be gradual.
conditions observed at teh
ated.
o the continuity of soil con | rore,
ier.
ate
point
ditions | SE -GRA | | Very Soft
Soft
Medlum Stiff | Uł
SPT
(blows/ft) STI
<2
2 - 4 0,
4 - 8 4
8 - 15 | NDRAINED
SHEAR
RENGTH (tst)
<0.125
.125 - 0.25
0.25 - 0.5
0.5 - 1.0 | PENETROI
UNCONF
COMPRES
STRENGT
<0.25
0.25 - 0
0.5 - 1
1.0 - 2 | FIRED FIELD TEST SSIVE FIELD TEST 55 Easily penetrated several inches by Thurs
Squeezes through fingers. 0.5 Easily penetrated 1 " by Thumb . Molded
light finger pressure. 1.0 Penetrated over 1/2 " by Thumb with mo
effort. Molded by strong finger pressure. 2.0 Indented about 1/2 " by Thumb but pene
only with great effort 4.0 Readily indented by Thumbnail | by
erate |
| n the
ctual
Line
ound
Log
f exp
No v | designations (based on I
es seperating strata on th
arles only Actual transitions
is represent general soil of
loration onthe date indices
warranty is provided as to
en Individual sample loca
KEY SYMBOLS
Bulk / Bag Sample
Standard Penetration | risual methods only. There
laboratory testing) may dif
e logs represent approxim
ons may be gradual.
conditions observed at teh
ated.
b the continuity of soil con
tions. | rore,
ier.
ate
point
ditions | RENT | - | CONSISTENCY
Very Soft
Soft
Medlum Stiff
Stiff
Very Stiff | Ut
SPT
(blows/ft) STI
<2
2 - 4 0,
4 - 8 0
8 - 15
15 - 30 | NDRAINED
SHEAR
RENGTH (Ist)
<0.125
125 - 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 2.0
>2.0 | PENETROI
UNCONF
COMPRE:
STRENGT
0.25 - 0
0.5 - 1
1.0 - 2
2.0 - 4 | INED
ISSIVE FIELD TEST 1'H (ts) Easily penetrated several inches by Thui
Squeezes through fingers. 0.5 Easily penetrated 1 " by Thumb . Molded
light finger pressure. 1.0 Penetrated over 1/2 " by Thumb with mo
effort. Molded by strong finger pressure. 2.0 Indented about 1/2 " by Thumb but pene
only with great effort 3.0 Readily indented by Thumbnail 0 Indented with difficulty by Thumbnail | by
erate |
| n the
ctual
Line
ound
Log
f exp
No v | designations (based on I
es seperating strata on the
arles only Actual translife
s represent general soil of
loration onthe date indice
warrantly is provided as to
en Individual sample loca
KEY SYMBOLS
Bulk / Bag Sample | isual method's only. There
laboratory testing) may dif
laboratory testing) may dif
le logs represent approxim
ons may be gradual.
conditions observed at teh
ated.
b the continuity of soil con
titons.
Thin Wall
↓ No Recovory
↓ 3-3/4″ ID | rore,
ier.
ate
ditions
COAR
APPE
DEN
Very I | RENT
SITY
.oose | UNDE SOIL
SPT
(blows/ft)
<4 | CONSISTENCY
Very Soft
Soft
Medlum Stiff
Stiff
Very Stiff
Hard
RELATIVE
DENSITY
(%)
0 - 15 | Ut
SPT
(blows/tt) STI
<2
2 - 4 0.
4 - 8 1
8 - 15
15 - 30
>30
FIELD TEST
assily penetrated with
ushed by hand | NDRAINED
SHEAR
RENGTH (Ist)
<0.125
125 - 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 2.0
>2.0 | PENETROI
UNCONF
COMPRE:
STRENGT
<0.2:
0.25 - 0
0.5 - 1
1.0 - 2
2.0 - 4
>4.0 | EINED
INED
(H (sf)) FIELD TEST 55 Easily penetrated several inches by Thun
Squeezes through fingers. 0.5 Easily penetrated 1 " by Thumb . Molded
light finger pressure. 1.0 Penetrated over 1/2 " by Thumb with mo
effort. Molded by strong finger pressure. 2.0 Indented about 1/2 " by Thumb but pene
only with great effort 4.0 Readily indented by Thumbnail 0 Indented with difficulty by Thumbnail 0 STRATIFICATION DESCRIPTION THICKNESS
SEAM 1/16 - 1/2 "
LAYER 1/2 - 12 " | by
erate
trated |
| n the
ctual
LIne
ound
Log
f exp | designations (based on I
es seperating strata on th
arles only Actual transitions
to a strate on the date indication
warranty is provided as to
en Individual sample location
KEY SYMBOLS
Bulk / Bag Sample
Standard Penetration
Split Spoon Sampler | isual method's only. There
laboratory testing) may dif
e logs represent approxim
ons may be gradual.
conditions observed at teh
ated.
the continuity of soil con
titons.
Thin Wall | rore,
ier.
ate
ditions
COAR
APPE
DEN | RENT
SITY
.oose
ose | INDE SOIL
SPT
(blows/tt) | CONSISTENCY
Very Soft
Soft
Medlum Stiff
Very Stiff
Hard
RELATIVE
DENSITY
(%)
0 - 15 pi
15 - 35 pi
re | Ut
SPT
(blows/ft) STI
<2
2 - 4 0,
4 - 8 0
8 - 15
15 - 30
>30
FIELD TEST
aslly penetrated with | ADRAINED
SHEAR
RENGTH (Ist)
<0.125
125 - 0.25
0.25 - 0.25
0.5 - 1.0
1.0 - 2.0
>2.0
7
1/2 " reinforc
with 1/2 " reinforc | PENETROI
UNCONF
COMPRES
STRENGT
<0.25 - (
0.55 - 1
1.0 - 2
2.0 - 4
>4.0 | EINED
INSERVIE FIELD TEST 15 Easily penetrated several inches by Thun
Squeezes through fingers. 0.5 Easily penetrated 1 " by Thumb . Molded
light finger pressure. 1.0 Penetrated over 1/2 " by Thumb with mo
effort. Molded by strong finger pressure. 2.0 Indented about 1/2 " by Thumb but pene
only with great effort 4.0 Readily indented by Thumbnail 0 Indented with difficulty by Thumbnail 0 Indented with difficulty by Thumbnail 0 ESCRIPTION THICKNESS
SEAM 1/16 - 1/2 "
LAYER 1/2 - 12 " DESCRIPTION THICKNESS
Occasional One or less p | by
erate
trated |
| n the
ctual
LIne
ound
Log
f exp | designations (based on I
es seperating strata on th
arles only Actual transitions
to a strate on the date indication
warranty is provided as to
en Individual sample location
KEY SYMBOLS
Bulk / Bag Sample
Standard Penetration
Split Spoon Sampler | isual methods only. There
laboratory testing) may dif
e logs represent approxim
ons may be gradual.
:conditions observed at teh
ated.
the continuity of soil con
tions.
Thin Wall
Mo Recovory
3-34" ID
D&M Sampler
D&M Sampler | rore,
ier.
ate
ditions
COAR
APPE
DEN
Very I
Loo | RENT
SITY
.oose
ose
Dense | NINDE SOIL
SPT
(blows/ft)
<4
4 - 10 | CONSISTENCY
Very Soft
Soft
Medlum Stiff
Very Stiff
Hard
RELATIVE
DENSITY
(%)
0 - 15
15 - 35
15 - 35
5 - 65
Fer
e65 - 85 | Ut SPT (blows/ft) <2 | UDRAINED
SHEAR
RENGTH (Ist)
<0.125
125 - 0.25
0.25 - 0.25
0.5 - 1.0
1.0 - 2.0
>2.0
1/2 " reinforce
with 1/2 " reinforce
t with 1/2 " reinforce
t with 1/2 " reinforce
t with 1/2 " reinforce
t foot with 1/2 " reinforce
t foot with 1/2 " reinforce
t statistical | PENETROI
UNCONF
COMPRES
STRENGT
<0.2:
0.25 - (
0.5 - 1
1.0 - 2
2.0 - 4
>4.0
 | EINED
INSOL FIELD TEST 55 Easily penetrated several inches by Thun
Squeezes through fingers. 0.5 Easily penetrated 1 " by Thumb . Molded
light finger pressure. 1.0 Penetrated over 1/2 " by Thumb with mo
effort. Molded by strong finger pressure. 2.0 Indented about 1/2 " by Thumb but pene
only with great effort 4.0 Readily indented by Thumbnail b Indented with difficulty by Thumbnail D ESCRIPTION THICKNESS
SEAM 1/16 - 1/2 "
LAYER 1/2 - 12 " DESCRIPTION THICKNESS | by
trated |
| n the
ctual
. Line
ound
. Log
f exp
. No t
etwee | designations (based on I
es seperating strata on the
arles only Actual translife
s represent general soil of
loration onthe date indice
warranty is provided as to
en Individual sample loca
KEY SYMBOLS
Bulk / Bag Sample
Standard Penetration
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SALT LAKE CITY ORDINANCE No. 21 of 2006

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111.24125 01/28/2011 08:55 AM ≢O.00 Book - 9901 Pg - 3254-3261 GAFZY W. OTT RECORDER, SALT LAKE COUNTY, UTAH SL CITY RECORDER PO BOX 145455 SALT LAKE CITY UT 84114 BY: SLR

(Amending the East Bench Master Plan and Rezoning property generall) Vocaled at F443 East 8 P. Sunnyside Avenue)

AMENDING THE EAST BENCH MASTER PLAN AND REZONING PROPERTY GENERALLY LOCATED AT 1443 EAST SUNNYSIDE AVENUE FROM OPEN SPACE (OS) TO INSTITUTIONAL (I), PURSUANT TO PETITION NOS. 400-05-08 AND 400-05-09.

WHEREAS, the Planning Commission and the City Council of Salt Lake City, Utah, have held public hearings and have taken into consideration citizen testimony, filing, and demographic details of the area, the long range general plans of the City, and any local master plan as part of their deliberations. Pursuant to these deliberations, the City Council has concluded that the proposed amendments to the East Bench Master Plan and change of zoning for the property generally located at 1443 East Sunnyside Avenue is appropriate for the development of the community in that area and in the best interest of the City.

NOW, THEREFORE, be it ordained by the City Council of Salt Lake City, Utah:

SECTION 1. AMENDMENT OF MASTER PLAN. The East Bench Master Plan, as previously adopted by the Salt Lake City Council, shall be, and hereby is amended consistent with the rezoning set forth herein.

SECTION 2. REZONING OF PROPERTY. The property generally located at 1443 East Sunnyside Avenue, which is more particularly described on Exhibit "A" attached hereto, shall be and hereby is rezoned from open space (OS) to institutional (I).

SECTION 3. AMENDMENT TO ZONING MAP. The Salt Lake City Zoning Map, adopted by the Salt Lake City Code, relating to the fixing of boundaries and zoning districts, shall be, and hereby is amended consistent with the rezoning of property identified above.

SECTION 4. CONDITIONS. This Ordinance is conditioned upon the following:

(a) Removal of the reversionary clause on the property by the United States Congress;

(b) Sale of the property from Mount Olivet Cemetery to Rowland Hall-St. Mark's School and recording documentation of such sale with the Salt Lake County Recorder; and

(c) Execution and recordation of a Development Agreement between the City and Rowland Hall-St. Mark's School substantially in the form of the draft Agreement attached hereto as Exhibit B.

SECTION 5. EFFECTIVE DATE. This Ordinance shall become effective on the date of its first publication. The City Recorder is instructed not to record or publish this Ordinance until the conditions identified herein have been satisfied, as certified by the Salt Lake City Attorney. If the conditions identified herein have not been satisfied within two years from the date of adoption, this Ordinance shall become null and void.

SECTION 6. TIME. The City Council may, by resolution, for good cause shown, extend the time period for satisfying the conditions identified herein.

Passed by the City Council of Salt Lake City, Utah this <u>/8</u> day of <u>Apri</u>, 2006.

CHAIRPERSON

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| | Transmitted to Mayor on | April 21, | 2006 | • | |
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| Ī | Mayor's Action: | Approved. | / | Vetoed. | |
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Bill No. <u>21</u> of 2006. Published: _____.

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Exhibit "A"

A Parcel of land being in the Northwest Quarter of Section 9, Township 1 South, Range 1 East, Salt Lake Base and Meridian and described as follows:

Beginning at the Southwest corner of the Armory 4 Lot Minor Subdivision, said corner being located South 89° 59' 50" West 775.746 feet from the First Veterans Administration Monument and said corner is also located North 89° 59' 50" East 10.60 feet from the U.S.A. Monument No. 3 and said corner is also located North 89° 59' 50" East 89.21 feet and North 0° 02' 01" West 58.20 feet from the Salt Lake City Survey Monument in the intersection of Amanda Avenue and Sunnyside Avenue and running thence South 89° 59' 50" West along the North right of way line of Sunnyside Avenue 543.35 feet; thence North 0° 00' 10" West 1049.71 feet; thence North 89° 59' 50" East 542.78 feet to the Northwest corner of said Armory 4 Lot Minor Subdivision, (said corner is also the Northeast corner of the amended plat of Parcels 2 & 3 of the Armory 4 Lot Minor Subdivision); thence South 0° 02' 01" East along the West line of said Subdivisions 1049.71 feet to the point of beginning.

Less and excluding the following:

Beginning at a point on the North line of Sunnyside Avenue, said point being South 89° 59' 50" West along said North line 32.00 feet from the Southwest Corner of the Armory 4 Lot Minor Subdivision, said corner being located South 89° 59' 50" West 775.746 feet from the First Veterans Administration Monument and said corner is also located North 89° 59' 50" East 10.60 feet from the U.S.A. Monument No. 3 and said corner is also located North 89° 59' 50" East 89.21 feet and North 0° 02' 01" West 58.20 feet from the Salt Lake City Survey Monument in the intersection of Amanda Avenue and Sunnyside Avenue and running thence South 89° 59' 50" West 370.50 feet; thence North 89° 59' 50" East 370.50 feet to the point of beginning.

Contains approximately 8.7383 Acres.

18 April 06 Everet April

CHRISTINE R. MEEKER

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City Recorder

STATE OF UTAH,

City and County of Salt Lake,

I, Christine Meeker, City Recorder of Salt Lake City, Utah, do hereby certify that the attached Ordinance 21 of 2006, amending the East Bench Master Plan and Rezoning property generally located at 1443 East Sunnyside Avenue is a true and correct copy.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal of said City, this 27th day of January, 2011.

Recorder

LOCATION: 451 SOUTH STATE STREET, ROOM 415, SALT LAKE CITY, UTAH 84111 MAILING ADDRESS: PO BOX 145515, SALT LAKE CITY, UTAH 84114-5515 TELEPHONE: 801-535-7671 FAX: 801-535-7681

VTRU 16-09-103-004-0000 BOOK 9891 PAGE 6921 DATE 01/04/2011 LEGAL D PAGE 1 NAME ROWLAND HALL-ST MARK'S NEW/UPDT N TAX DIST OK 13 CONT SCHOOL ASR DATE 01/19/2011 C/O,AT ACREAGE 13.09 STREET 720 S GUARDSMAN WY EDIT ADDR SUPPRESS SALT LAKE CITY UT ZIP 84108137420 COUNTRY CITY LOCATE 1443 E SUNNYSIDE AVE EDIT CERTIFY ASSR BATCH NO 58694 SEQ 51 SECTN SEC 09 TWNSHP 1S RNG 1E EDIT Y PLAT PROPERTY DESCRIPTION DESC 1 BEG AT SW COR OF ARMORY 4 LOT MINOR SUB, SD PT BEING WORK CRD 2 S 89^59'50" W 775.746 FT FR FIRST VETERANS ADMINISTRATION PRINTED DESC 3 MONUMENT, SD PT ALSO BEING N 89⁵⁹50" E 10.60 FT FR USA DESC DESC 4 MONUMENT #3, SEC 9, T1S, R1E, SLM, SD PT ALSO BEING DESC 5 N 89⁵⁹50" E 89.21 FT & N 0⁰²01" W 58.20 FT FR SLC SUR 6 MONUMENT IN INTERSECTION OF AMANDA AVE & SUNNYSIDE AVE; DESC 7 S 89⁵⁹ 50" W 543.35 FT; N 0⁰⁰ 10" W 1049.71 FT; DESC 10 DESC 8 N 89⁵⁹50" E 542.78 FT TO NW COR OF ARMORY 4 LOT MINOR SUB; DESC LINES 9 S 0^02'01" E 1049.71 FT TO BEG. 13.09 AC M OR L. DESC DESC 10 8F-0058,0009 9891-6885,6910,6914,6923 MORE OLD PARCEL NUMBERS 16-09-103-001-0000

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SLC RECORDER

PAGE 02/03 R 10-1 P 06-7

RESOLUTION NO. 54 OF 2010

A resolution extending the time period for satisfying the conditions set forth in Ordinance No. 21 of 2006. (Property located at approximately 1443 E. Sunnyside Avenue)

WHEREAS, the City Council enacted Ordinance No. 21 of 2006 on April 18, 2006; and WHEREAS, that ordinance imposed certain conditions and required that those conditions be met within two (2) years from the date that the ordinance was approved; and

WHEREAS, the ordinance also provided that the City Council may extend the time period for satisfying the conditions set forth in the ordinance; and

WHEREAS, on December 11, 2007, the City Council further extended the deadline for satisfying the conditions in the ordinance to December 31, 2010 pursuant to Resolution No. 80 of 2007; and

WHEREAS, one of the conditions of Ordinance No. 21 of 2006 requires an act of the United States Congress and the remaining conditions are dependent upon approval of the federal legislation; and

WHEREAS, the Applicant's efforts for federal legislative relief have been successful and Applicant is now working with the U.S. Bureau of Land Management ("BLM") to complete the property transaction contemplated by Ordinance No. 21 of 2006; and

WHEREAS, the Applicant has requested another short extension of the deadline to satisfy the conditions of Ordinance No. 21 of 2006 in order to complete transactions with the BLM; and

WHEREAS, the City Council finds that there is good cause to extend the deadline in the ordinance;

NOW, THEREFORE, be it resolved by the City Council of Salt Lake City, Utah:

02/01/2011 08:59 535-7681

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SLC RECORDER

PAGE 03/03

SECTION 1. The deadline set forth in Section 5 of Ordinance No. 21 of 2006, as extended by Resolution No. 80 of 2007, shall be and hereby is extended from December 31, 2010 to March 31, 2011 for the applicant to satisfy the conditions set forth in Section 4 of that ordinance.

DATED this 14th day of December , 2010.

Passed by the City Council of Salt Lake City, Utah, this <u>14th</u> day of December , 2010.

SALT LAKE CITY COUNCIL

utin By: CHAIRPERSON

ATTEST AND COUNTERSIGN:

Decker



| APPROVED AS TO FORM
Salt Lake City Attorney's Office |
|---|
| Date: Norlon Rep. 7, 2010 |
| By: Paul C. Niclson Steplor City Attorney |

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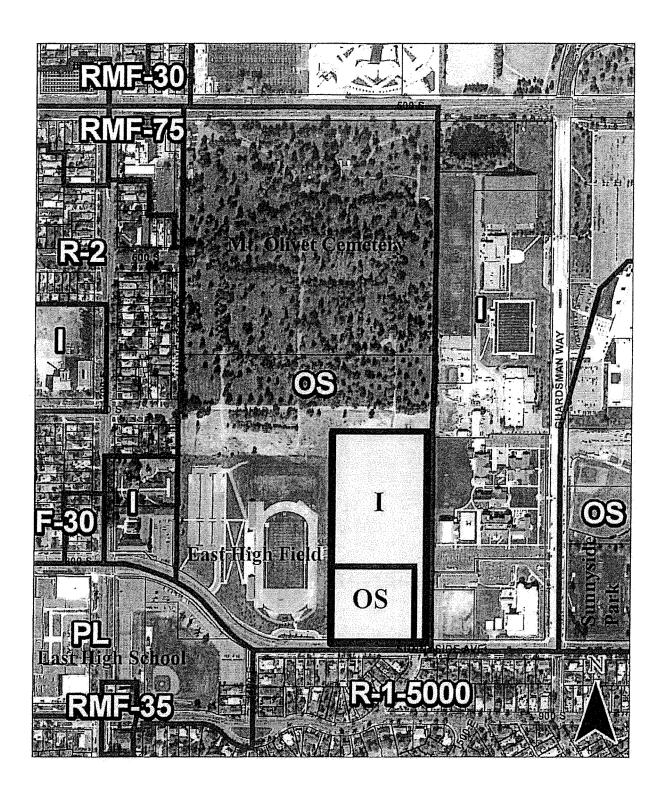
| MEMORANDUM | | | |
|------------|---|--|--|
| DATE: | December 9, 2010 | | |
| TO: | Council Members | | |
| SUBJECT: | Resolution extending the time period for satisfying conditions relating to Mt. Olivet
Cemetery Association and Rowland Hall-St. Mark's School's petition to amend the East
Bench Master Plan and rezone property generally located at 1443 East Sunnyside Avenue
from Open Space OS to Institutional I | | |

POTENTIAL MOTIONS:

- 1. ["I move that the Council"] Adopt a resolution extending the time period for satisfying the conditions in Ordinance No. 21 of 2006, regarding Mt. Olivet Cemetery and Rowland Hall-St. Mark's School's request to amend the East Bench Master Plan and rezoning of property generally located at 1443 East Sunnyside Avenue as requested.
- 2. ["I move that the Council"] Not Adopt a resolution extending the time period for satisfying the conditions in Ordinance No. 21 of 2006, regarding Mt. Olivet Cemetery and Rowland Hall-St. Mark's School's request to amend the East Bench Master Plan and rezoning of property generally located at 1443 East Sunnyside Avenue.
- 3. Other options/motions that may be identified by Council Members.
 - The March 31, 2006 Council staff report is attached for background purposes.
- A. A resolution has been prepared for Council consideration extending the time period for satisfying conditions relating to Mt. Olivet Cemetery Association and Rowland Hall-St. Mark's School's petition to amend the East Bench Master Plan and rezone property generally located at 1443 East Sunnyside Avenue.
- B. The deadline will be extended from December 31, 2010 to March 31, 2011 as requested by Mt. Olivet Cemetery Association and Rowland Hall-St. Mark's.
- C. This action would allow time to complete conditions to remove the reversionary clause by the US Congress, convey the property from the Federal government to Mt. Olivet Cemetery Association and sell approximately 13 acres to Rowland Hall-St. Mark's School. The Administration's transmittal notes:
 - 1. In late May 2010, Congress passed bill H.R. 1442 that allows sale of the Federal Government's reversionary interest in approximately 60 acres of land originally conveyed to Mt. Olivet Cemetery Association in January 1909.
 - 2. Mt. Olivet Cemetery Association has been working closely with the Bureau of Land Management to survey the property, inclusive of the value of the federal reversionary interest, to complete the property conveyance.
 - 3. The applicant has been advised that the BLM survey, appraisal and related work may not be completed in a time frame to allow transfer of property ownership to Rowland Hall by late December 2010.



- D. On December 11, 2007, the Council adopted Resolution 80 of 2007 extending the timeframe to complete the conditions of approval to December 31, 2010.
- E. On April 18, 2006, the ordinance relating to this petition was approved by the Council with the following conditions. Conditions of approval:
 - 1. Removal of the reversionary clause on the property by the United States Congress;
 - 2. Sale of the property from Mount Olivet Cemetery to Rowland Hall-St. Mark's School and recording documentation of such sale with the Salt Lake County Recorder; and
 - 3. Execution and recordation of a Development Agreement between the City and Rowland Hall-St. Mark's School substantially in the form of the draft Agreement attached to the ordinance. (Exhibit B)
- F. The ordinance established a 2-year timeframe to complete the conditions of approval. The City Recorder cannot publish the ordinance until the City Attorney certifies that the conditions have been satisfied.



SALT LAKE CITY COUNCIL STAFF REPORT

| DATE: | March 31, 2006 |
|---|---|
| SUBJECT: | Petitions 400-05-08 & 400-05-09 – Rowland Hall–St. Mark's School request to: Rezone property located at approximately 1443 East Sunnyside Avenue from Open Space OS to Institutional I Amend the East Bench Community Master Plan |
| AFFECTED COUNCIL DISTRICTS: | If the ordinance is adopted the rezoning and master plan amendment will affect Council District 6 |
| STAFF REPORT BY: | Janice Jardine, Land Use Policy Analyst |
| ADMINISTRATIVE DEPT.
AND CONTACT PERSON: | Community Development Department, Planning Division
Everett Joyce, Senior Planner |
| NOTICE REQUIREMENTS: | Newspaper advertisement and written notification to surrounding property owners 14 days prior to the Public Hearing |

WORK SESSION SUMMARY AND NEW INFORMATION

WORK SESSION SUMMARY:

The Council received a briefing on the proposed rezoning and master plan amendment on March 7, 2003. Issues discussed included:

- A. Clarification of the findings of fact and recommendation stated in the Planning staff report and the intent of the Planning Commission motion to deny the request based on the findings of fact. (Please see pgs.13-18 in the Planning staff report and pgs. 5-7 of this staff report for the specific findings and Planning staff recommendation.)
- B. The history of zoning, master plan recommendations, past development proposals for the property and historic use of the property for agricultural purposes.
- C. Potential options that could be considered such as rezoning a portion of the property and/or use of restrictive covenants, a conservation easement held by the City or a third party non-profit organization, or a development agreement.
- D. The history and value of adopted master plans as guiding documents for future development.
- E. The reversionary clause and restrictions established on the property by the federal government in deeding the property to the Mt. Olivet Cemetery Association.
- F. Other potential purchasers of the property.
- G. Whether uses that may be appropriate for the property have been identified or evaluated.
- H. Future use of the Rowland Hall-St. Mark's property and school at the 800 South and Lincoln Street location.
- I. The current percentage/amount of subsidy from the General Fund used for operation/maintenance for the City cemetery.
- J. Whether long-range planning and analysis (50 to 100 years) has been done to address City cemetery space and long-term needs.



- K. The need for open space and protection of open space and a comprehensive citywide open space policy direction. City open space policies historically addressed general foothill preservation and parks and recreation.
- L. Planning staff noted that a Critical Open Lands Inventory and Preservation Priority Assessment project is currently underway in the Planning Division. Planning staff is working with a consultant to provide a critical lands inventory and map and a refinement of open space categories and zoning districts.
- M. Whether the City has an inventory or analysis of natural open space areas within the developed area of the City. Types of uses in non-programmed open space include non-developed trails.
- N. Whether potential impacts to wildlife habitat in the area has been analyzed.
- O. Mechanisms available to address City parks and recreation needs such as funding allocation from the Capital Improvement Program and the recent bond election for Open Space and the Salt Lake Regional Sports Complex.

POTENTIAL OPTIONS AND MOTIONS:

OPTIONS:

- 1. Close the public hearing and continue action to a future Council meeting.
- 2. Adopt an ordinance rezoning the property and amending the East Bench Community Master Plan.
- 3. Do not adopt an ordinance rezoning the property and amending the East Bench Community Master Plan.
- 4. Other options that may be identified by Council Members

POTENTIAL MOTIONS:

- 1. ["I move that the Council"] Close the public hearing and continue action to a future Council meeting.
- 2. ["I move that the Council"] Adopt an ordinance rezoning property located at approximately 1443 East Sunnyside Avenue from Open Space OS to Institutional I and amending the East Bench Community Master Plan.
- 3. ["I move that the Council"] Not adopt an ordinance rezoning property located at approximately 1443 East Sunnyside Avenue from Open Space OS to Institutional I and amending the East Bench Community Master Plan.

The following information was provided previously for the Council Work Session on March 7, 2006. It is provided again for your reference.

KEY ELEMENTS:

- A. An ordinance has been prepared for Council consideration to:
 - 1. Rezone approximately 13 acres of property at approximately 1443 E. Sunnyside Avenue (currently owned by Mt. Olivet Cemetery) from Open Space OS to Institutional I. (Note: The property is within the Groundwater Source Protection Overlay District. The overlay district requirements and standards would still apply with the proposed rezoning.)
 - 2. Amend the East Bench Community Master Plan.

- B. Prior to adoption of the 1995 city-wide Zoning Rewrite, the East Bench Master Plan identified this property for institutional land uses and the property was zoned Residential R-2. The R-2 zoning accommodated a variety of institutional and open space uses such as schools (public & private), churches, public parks, libraries, recreational areas and cemeteries. The City did not have a specific zoning classification for institutional and open space uses.
- C. Between 1874 and 1909 through acts of Congress the Mt. Olivet Cemetery was established. Land was conveyed to the Mt. Olivet Cemetery Association and rules and regulations for the cemetery were established specifically noting that the subject property is to be used permanently as a cemetery. The written documentation from this time period indicates that if the land ceases to be used as a cemetery the property will revert to the United States. In actuality this can be changed through an act of Congress. (Please see Attachment A for additional information.)
- D. The ordinance adopted in 1995 that enacted the city-wide Zoning Rewrite project rezoned property throughout the City and amended the adopted community master plans to maintain consistency with the new zoning. The zoning on this property was changed to Open Space and the East Bench Plan was considered updated consistent with the zoning. (The Institutional Zoning District does not allow cemeteries as a permitted or conditional use. The Open Space Zoning District does allow cemeteries as a permitted use.)
- E. The requested rezoning and master plan amendment would facilitate development of a future private middle and upper school for Rowland Hall-St. Mark's with a soccer field and open space area on the southern two-thirds of the 13-acre parcel and school buildings and parking areas on the northern one-third of the property. The property is currently undeveloped. The Planning staff report notes that the property, if developed as proposed, would have access from Sunnyside Avenue and Guardsman Way through the adjacent property. The adjacent property immediately east of the Mt. Olivet property is the Rowland Hall-St. Mark's McCarthey Lower/Beginning School campus. Surrounding land uses include the Mt. Olivet Cemetery to the north, single-family residences to the south, the East High football field (on property leased from Mt. Olivet to the west), the McCarthey Lower/Beginning School campus and the Carmen Pingree School. (Please see attached maps for details.)
- F. Information submitted by Rowland Hall-St. Mark's notes:
 - 1. On April 10, 2003, Rowland Hall-St. Mark's entered into a contract with the Mt. Olivet Cemetery Association to purchase approximately 13 acres of cemetery property fronting on Sunnyside Avenue.
 - 2. The Mt. Olivet Association needs to sell the property to have sufficient funds to make needed capital improvements and perpetually maintain the cemetery.
 - 3. The contract between Rowland Hall-St. Mark's and the Mt. Olivet Cemetery Association is subject to a number of conditions including rezoning the property from Open Space OS to Institutional I zoning classification and removal of the reversionary clause established by the Federal government in the deed held by the Association.
 - 4. Release of reversionary interest includes Congressional consideration of the following:
 - a. The property is not used for the purpose specified in the reversionary clause.
 - b. The owner of the property no longer needs the property.
 - c. The property is inconvenient or inappropriate for the owner's use.
 - d. The property is needed by another entity that provides some public benefit.
 - e. The U.S. Government does not need the property.
 - f. There would be no significant costs to Federal, State or local governments from a release of the reversionary interest
 - 5. As part of Rowland Hall-St. Mark's efforts to secure the removal of the reversionary interest and to ensure the support of Utah's congressional representatives and senators, Rowland Hall-St. Mark's needs the support of the City and, if at all possible, the surrounding community.

- 6. Rowland Hall-St. Mark's needs to obtain the release of the reversionary interest by early 2007 in order to complete the purchase of the property within the terms of the contract.
- 7. Rowland Hall-St. Mark's believes that its ownership of the property will deliver a net benefit to the City and the surrounding community, both in the immediate neighborhood and more broadly.
- 8. It may be many years before Rowland Hall-St. Mark's could raise the money needed to build a new campus on the property.
- 9. It is possible that Rowland Hall-St. Mark's could take the interim step of developing the playing fields in the near term, in a way not to interfere with construction at the north end of the property (proposed school site).
- G. The public process included:
 - 1. Presentation to the Yalecrest Community Council and written notification of the Planning Commission hearing to surrounding property owners. The Administration's transmittal notes the Yalecrest Community Council opposed the proposed master plan and zone change. In addition, other Community Councils - East Central, Bonneville Hills, and Wasatch Hollow - submitted letters regarding the proposal. None of the Community Councils supported the request. (Please see the Planning staff report pgs 6-9 for details.)
 - 2. The proposal was also presented to and discussed by the Open Space Lands Advisory Board on November 2, 8, and 16, 2005. The Open Space Lands Advisory Board recommended against the request to rezone the Mt. Olivet property from Open Space to Institutional.
- H. The City's Fire, Police, Public Services and Public Utilities Departments and Transportation and Engineering Divisions have reviewed the request. (Please see the Planning staff report pgs. 3-5 for specific comments and detailed discussion.) The development proposal will be required to comply with City standards and regulations and demonstrate that there are adequate services to meet the needs of the project such as, but not limited to, a detailed traffic and parking impact study, adequate infrastructure (water/sewer) capacity, geotechnical report relating to inferred fault line location is at the northwest corner of the property. In addition, the petitioner will be required to apply for subdivision approval from the City.
- On November 30, 2005, based on the Planning staff report findings and public hearing input, the Planning Commission voted to forward a recommendation to the City Council to deny the request to rezone the property and amend the East Bench Community Master Plan. (Please see the Planning staff report and Planning Commission minutes for details.)
- J. Issues discussed at the Planning Commission hearing included the following. The Planning Commission minutes note that due to amount of public interest regarding the proposed petition, the general public comments were summarized.
 - 1. Information provided from the Community Councils and the Open Space Lands Advisory Board.
 - 2. Whether the rezoning and master plan amendment should be considered before the reversionary clause on the property is removed by Congress.
 - 3. Specific uses and requirements in the Open Space and Institutional zones.
 - 4. Discussion of specific details of the development plan proposed by Rowland Hall-St. Mark's.
 - 5. Potential inconsistencies of the City's open space policies, specifically the City's position on the North Salt Lake property and preservation of the Mt. Olivet property.
 - 6. Those in support of the petition stated the following reasons:
 - Open Space should be defined as a livable area, rather than a field with trash and a barbed wire fence.
 - Care of the land would be maintained in a manner to make the City proud, as Rowland Hall has previously proved itself in the Avenues area.
 - The desire of Rowland Hall for the proposed petition is not to ask for an increase in school population, but rather a request for more space.

- Many other options could be considered by the Mt. Olivet Association to sell the property for financial gain, including federal or state government who are exempt from specific zoning requirements; while Rowland Hall is proposing a petition to enhance the City within the guidelines.
- An assurance for the land to be maintained as a mechanism for public use will be considered in a deed restriction.
- Only four of thirteen acres will be used for buildings, lending the remainder to the community.
- Open Space is a rhetorical term in Utah; given the many options for a specific definition and should consider the terms of being a usable and livable place for the public.
- The present lease on Mt. Olivet has more impervious area than the proposed petition.
- Traffic will be decreased as the proposed plan will create a unified school area. (Families with students attending schools on this campus can make single trips to this site, rather than trips to various sites.)
- 7. Those in opposition of the petition stated the following reasons:
 - Open Space is a natural area of land and should be preserved as a legacy.
 - Traffic in the area will increase-reducing the safety of the surrounding area.
 - Mt. Olivet Association has not found enough resources to financially sustain itself, and more time should be allowed for tools to be provided to the association and for the preservation of Open Space.
 - The value of an area of land for the earth to recharge itself is immeasurable and should be considered a premium space for the community.
 - Open Space is found less often as city growth continues.
 - Tools for rating the degree of importance of Open Space are being researched, and given time, will be considered as possible trading options. (This was taken directly from the Planning Commission minutes. Council staff does not have additional information that would clarify the intent of this statement.)
 - The land is irreplaceable.

K. Planning Staff Findings and Recommendation

- The Planning staff report provides the following findings for the Zoning Ordinance Section 21A.50.050 - Standards for General Amendments. The standards were evaluated in the Planning staff report and considered by the Planning Commission. (Please see pgs. 13-17 in the Planning staff report for additional details.)
 - a. Whether the proposed amendment is consistent with the purposes, goals, objectives, and policies of the adopted general plan of Salt Lake City.

Findings: Land use designations in the adopted master plans identify the City's policy for future land uses. Properties that do not conform to the master plan objectives are either, developed with a nonconforming use or undeveloped. Undeveloped properties do not conflict with the Future Land Use Plan. A zoning amendment to an Institutional zoning classification does not ensure continued open space use of the property. The proposed amendment is not consistent with the purposes, goals, objectives and policies of the adopted general plan of Salt Lake City. Modification of the Open Space zoning boundaries for a portion of the Mt. Olivet Cemetery property would set precedent for removal of additional properties within the Mt. Olivet Cemetery Association boundaries not actively used for burial purposes from the Open Space designation.

b. Whether the proposed amendment is harmonious with the overall character of existing development in the immediate vicinity of the subject property.

Findings: The proposed development plan presented by Rowland Hall St. Mark's is harmonious with the overall character of existing development. However, the Institutional

zoning classification allows development intensification that would not be harmonious with the character of existing development.

- c. The extent to which the proposed amendment will adversely affect adjacent properties. Findings: Rezoning the Mt Olivet parcel to Institutional would permit more intensive development than allowed within the existing Open Space Zoning District. The increased level of potential development could increase traffic generation levels and impact adjacent properties. The traffic generated by the proposed uses of an upper and middle school, soccer field and open space would not adversely affect adjacent properties.
- d. Whether the proposed amendment is consistent with the provisions of any applicable overlay zoning districts which may impose additional standards.

Findings: The proposed development concept plans through implementation of any necessary site design modifications and operational controls can be consistent with applicable zoning overlay districts.

e. The adequacy of public facilities and services intended to serve the subject property, including but not limited to roadways, parks and recreational facilities, police and fire protection, schools, storm water drainage systems, water supplies, and waste water and refuse collection.

Findings: The public facility services and utilities are in place to serve the subject 13-acre parcel. The final intensity of development and needs that the future development would place on services and utilities is unknown. If a specific developments demand exceeds service capacity, then the developer would be required to make system improvements as part of obtaining a building permit. The adjacent arterial streets can absorb the traffic generated by the proposed uses.

- 2. The Planning staff report provides the following findings for the requested master plan amendment.
 - a. Land use designations in master plans identify the City's policy for future land uses. Developed properties that do not conform to the master plan objectives and existing zoning are nonconforming. Properties that lie in an undeveloped state do not conflict with the Future Land Use Plans. The amended East Bench Community Master Plan land use designation for the Mt. Olivet property is for open space uses.
 - b. Operational financing difficulties could be alleviated by lease or sale of property to land uses that are consistent with the East Bench Master Plan Future Land Use designation and existing Open Space Zoning classification.

3. Recommendation:

- a. The findings of fact show that the requested master plan amendment and rezoning of the Mt. Olivet property is not consistent with the East Bench Community Master Plan. Rezoning the property from open space to institutional land uses is not consistent with the intent and purpose of the Open Space Zoning District. This purpose is to preserve and protect areas of public and private open space and exert a greater level of control over any potential redevelopment of existing open space areas.
- b. Potential development intensities of the Institutional Zoning District are greater than permitted uses within the Open Space Zoning District and have potential conflicts with the overall character of development in the immediate vicinity. Minimizing potential intensities and conflicts could occur through restrictive covenants or modification of the zoning request to ensure that the proposed open space areas would remain open in the future.
- c. Based on the findings of fact, staff recommends that the Planning Commission forward a recommendation to the City Council to deny the requests of Petition 400-05-08 and Petition 400-05-09, to amend the East Bench Master Plan and rezone the 13 acres portion of Mt. Olivet Cemetery property from Open Space to Institutional land use and zoning classifications.

L. Zoning Information

- 1. The purpose of the Open Space Zoning District is to preserve and protect areas of public and private open space and exert a greater level of control over any potential redevelopment of existing open space areas.
 - a. Area requirements:
 - Minimum lot size: 10,000 sq. ft.
 - Maximum building height: 35 ft. provided that for each foot of height over 20 ft. each yard and landscaped yard requirement shall be increased 1 ft.
 - Minimum yard requirements: front 30 ft., side 20 ft., rear 30 ft.
 - Landscaped yard requirements: front 20 ft., side (interior) 10 ft., rear 10 ft.
 - Landscape buffer required when abutting a residential district
 - b. Special conditional use controls over communications towers are required.
 - c. Permitted and conditional uses:
 - cemeteries and accessory crematoriums, community/recreation centers, pet cemetery, country clubs, golf courses, natural open space, conservation areas, public/private nature preserves/conservation areas, public parks, private recreational facilities, zoological park, accessory uses, public/private utility buildings/transmission wires/poles/pipes, transportation terminals bus/rail/trucking
- 2. The purpose of the Institutional Zoning District is to regulate the development of larger public and semipublic uses in a manner harmonious with surrounding uses. The uses regulated by this district are generally those having multiple buildings on a campus-like site.
 - a. Area requirements:
 - Minimum lot size: 2 acres for places of worship and 20,000 sq. ft. for other uses
 - Maximum building height: 35 ft. and 75 ft. through conditional use provided that for each foot of height over 35 ft. each yard requirement shall be increased 1 ft.
 - Minimum yard requirements: front 20 ft., side 20 ft., rear 25 ft.
 - Landscaped yard requirements: front 20 ft., side (interior) 8 ft., rear 8 ft.
 - Landscape buffer required when abutting a residential district
 - b. Traffic and parking study required. New or expansion of institutional uses shall not be permitted unless the traffic and parking study provides clear and convincing evidence that no significant impacts will occur. The Zoning Administrator may waive this requirement
 - c. Lighting all uses shall provide adequate lighting to assure safety and security. Lighting installations shall not have an adverse impact on traffic safety or surrounding properties and uses and shall be shielded to minimize light spillover onto adjacent properties.
 - d. Permitted and conditional uses:

congregate care facility, caretaker/security guard living quarters, government offices, accessory retail sales/services within the principal building operated for employees, adult/child daycare centers, community/recreation centers, conference centers, dental/medical laboratories/research facilities/clinics/offices, medical/nursing schools, emergency response/medical service facilities, nursing care/sanitarium facilities, exhibition hall, hospitals, libraries, meeting halls for membership organizations, philanthropic uses, places or worship, religious assembly with exhibit hall, convents/monasteries, reuse of schools/churches, seminaries/religious institutes, colleges/universities, private schools K-12, professional/vocational schools, arenas, stadiums, fairgrounds, museums, private recreational facilities, heliport, accessory uses, bed and breakfast facilities, communication towers, off-site parking, park and ride parking with existing use, parking structure, public/private utility buildings/transmission wires/poles/pipes, transportation terminals – bus/rail/trucking

MATTERS AT ISSUE / POTENTIAL QUESTIONS FOR THE ADMINISTRATION:

- A. Issues relating to this request have been raised in many different ways and in many different forums throughout the process. The core issues that the Council must weigh include:
 - 1. Whether to amend the zoning and the master plan to allow this project to move forward and seek Congressional action to remove the reversionary clause from the deed and allow Mt. Olivet to sell the property.
 - 2. Whether to continue the current policy to require the property be maintained as open space consistent with the current zoning and master plan and past legal action taken by the City.
 - 3. Whether to take in to consideration the potential risk that, should the Council not approve the master plan amendment and rezoning, the University of Utah (not subject to City zoning regulations) could purchase and develop the property at a greater intensity than proposed by Rowland Hall-St. Mark's. The Council may wish to evaluate whether that potential risk is significant enough that it justifies the rezoning for a lower intensity to preclude potential higher intensity use. (Please see Attachments B and C for additional information.)
 - 4. If the Council does approve the request, the Council could consider the use of a development agreement, restrictive covenant and/or conservation easement to provide assurance to the community that the proposed development would occur as presented at the time of the rezoning request and provide an additional level of control on the property.
 - a. The Planning staff report notes that minimizing potential intensities and conflicts could occur through restrictive covenants or modification of the zoning request to ensure that the proposed open space areas would remain open in the future.
 - b. The petitioner's information notes :
 - It may be many years before Rowland Hall-St. Mark's could raise the money needed to build a new campus on the property.
 - It is possible that Rowland Hall-St. Mark's could take the interim step of developing the playing fields in the near term, in a way not to interfere with construction at the north end of the property (proposed school site).
- B. The Planning staff report notes that a narrow parcel along the northwest corner of the Mt. Olivet Cemetery property is presently zoned RMF-75. Planning staff recommended that the Planning Commission initiate action to have the RMF-75 zoned portion of the Mt. Olivet property for a map amendment as part of a zoning map fine-tuning petition. The Planning Commission minutes do not indicate that this action was initiated by the Commission. Council Members may wish to discuss with the Administration if this issue requires action by the Council or Planning Commission.
- C. Council Members may wish to consider a future discussion to establish a clear policy direction relating to cemeteries and open space. The Planning staff report includes the following information provided by the City Public Services Department.
 - 1. Presently the City has no plans to either expand the (Salt Lake City) cemetery space (the only potential expansion would be into Lindsay Gardens Park) or start a second cemetery in a new location in the City. Any decision to move in this direction would result from a policy discussion and agreement between the Mayor and City Council. If the City fills the cemetery without further expansion or new development, other public or private cemeteries will need to fill the public demand.

- 2. Development of the Salt Lake City Cemetery started in 1847. The cemetery is approximately 250 acres in size and plotted for 140,823 graves. The entire cemetery space is plotted out and developed. There is no additional space for expansion. To date, approximately 119,000 plots are used. Of the 21,800 remaining, 17,300 have been pre-sold. Only 4,500 burial sites remain for sale. Historically, on an annual basis approximately 600 burials occur each year. If the historical numbers hold, use of all available cemetery sites will occur within 36 years. The historical cemetery sales rate is 350 graves sites each year. Based on the 4,500 available burial sites for sale and historical sale rates, in 13 years there will be no sites available.
- 3. The present day data suggests that the cemetery will use up its available burial space in 13 years. Within another 23 years, all burial sites will be filled. Beyond that point in time, the City will continue to fulfill its obligation to care for and maintain the cemetery in perpetuity without the offsetting annual revenue generated by property sales and burials.
- 4. Salt Lake City has one public cemetery, the Salt Lake City Cemetery. Four (4) additional active cemeteries are located within the boundaries of the City: Mt. Olivet, a private cemetery owned by a consortium of local churches; Mt. Calvary, a private cemetery owned by the Catholic Diocese; B'nai Israel Cemetery, a private cemetery owned by the Temple Kol Ami Synagogue; and Larkin Sunset Lawn, a private cemetery owned by the Larkin family. It is my understanding that the public has access to each of these cemeteries regardless of affiliation except B'nai. I also understand that with the exception of Mt. Olivet and Larkin cemeteries, the others face the same capacity challenges as the City's cemetery.
- 5. Though the City has a municipal cemetery that it must maintain and operate in perpetuity, the City has no legal obligation to maintain an "active" cemetery.
- 6. The following actions may extend the Cemetery's "active" period:
 - a. The historical consumption numbers may change over time;
 - b. Resale burial plots that have been sold, but have not been used in a 60 year period (this could add a few hundred graves to the inventory over time);
 - c. Develop double deep burials, which means that one burial plot may be used for two burials; and
 - d. The construction of mausoleums, which allow burials to occur above ground in structures.

MASTER PLAN AND POLICY CONSIDERATIONS:

- A. The Administration's transmittal and Planning staff report note:
 - 1. The East Bench Community Master Plan and the Salt Lake City Open Space Master Plan documents address the land use policy related to the Mt. Olivet Cemetery property. (Note: Amending the Open Space Plan is not required and is not part of Rowland Hall-St. Mark's request.)
 - 2. Most master plans do not contain specific land use policy regarding cemeteries. The Plans do address a variety of general land use categories such as residential, commercial, open space and institutional land uses.
 - 3. The East Bench Community Master Plan (April 1987) is the adopted land-use policy document that guides new development in the area surrounding the proposed rezoning and master plan amendment.
 - 4. Prior to the 1995 Zoning Rewrite project, the Plan designated the Mount Olivet Cemetery property and Sunset Lawns Memorial Cemetery located at 2352 East 1300 South Street for Institutional uses.
 - 5. In 1995, the Citywide Zoning Rewrite Project amended the land use designation of both these properties from Institutional to Open Space.
 - 6. The Salt Lake City Open Space Plan (October 1992) defined a comprehensive corridor approach to connecting the City's open space resources to provide a safe, enjoyable experience of the natural features of Salt Lake City. The Open Space Master Plan defines policy for connecting open space amenities and does not provide land use policy. The land use policy of open space for the Mt. Olivet property is defined in the amended East Bench Master Plan.

- B. The Open Space Master Plan identifies a system of non-motorized transportation corridors that would reestablish connections between urban and natural land forms of the City. The Plan discusses the value of open space including recreational opportunities and preservation of wildlife habitat, wetlands, riparian and stream corridors, and the foothills.
 - 1. The Plan identifies the following goals:
 - a. Conservation of the natural environment.
 - b. Enhancement of open space amenities.
 - c. Connecting various parts of the City to natural environments.
 - d. Educating citizens on proper use of open space.
 - 2. The Open Space Plan identifies Sunnyside Avenue and 800 South as part of the Transvalley Corridor (Foothill Section). A future trail corridor is shown along the north side of Sunnyside/800 South on the sidewalk/right-of-way. Specific reference to Mt. Olivet states "The north side of Sunnyside Avenue is lined with both private and public open space. The south half of the Mt. Olivet Cemetery parcel is vacant and could generate development pressure in the future. This should be monitored to assure the corridor is kept wide enough for adequate walkways and open space. A crosswalk could be developed to connect at the baseball area on the east side of 1300 East to the adjacent trail corridor and residential area."
- C. Several adopted community master plans and small area plans contain policies and recommendations that emphasize the need for preservation, acquisition, protection, maintenance and management of watershed, foothills, wetlands, wildlife habitat, riparian/stream corridors, and natural open spaces. Implementation strategies include a range of options such as refining zoning regulations relating to open lands.
- D. The City's recently adopted Open Lands Ordinance notes:
 - 1. The need to protect diminishing open lands within Salt Lake City or its environs.
 - 2. The City has adopted an Open Space Master Plan to identify, protect and manage open lands.
 - 3. The City's general plan, zoning ordinance and site development ordinance recognize the need to protect the unique values offered by wetlands, foothills and urban trails.
- E. The Transportation Master Plan contains policy statements that include support of alternative forms of transportation, considering impacts on neighborhoods on at least an equal basis with impacts on transportation systems and giving all neighborhoods equal consideration in transportation decisions.
- F. The City's Strategic Plan and the Futures Commission Report express concepts such as maintaining a prominent sustainable city, ensuring the City is designed to the highest aesthetic standards and is pedestrian friendly, convenient, and inviting, but not at the expense of minimizing environmental stewardship or neighborhood vitality.
- G. The Council's growth policy notes that growth in Salt Lake City will be deemed the most desirable if it meets the following criteria:
 - 1. Is aesthetically pleasing;
 - 2. Contributes to a livable community environment;
 - 3. Yields no negative net fiscal impact unless an overriding public purpose is served; and
 - 4. Forestalls negative impacts associated with inactivity.
- H. The City's 1990 Urban Design Element includes statements that emphasize preserving the City's image, neighborhood character and maintaining livability while being sensitive to social and economic realities.

CHRONOLOGY:

June 29, 2005

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The Administration's transmittal provides a chronology of events relating to the proposed rezoning and master plan amendment. Key dates are listed below. Please refer to the Administration's chronology for details.

- April 21, 2005
 Applicant presentation to the Yalecrest Community Council
- April 25, 2005 Petitions delivered to Planning office
- June 1, 2005 Petitions reassigned to planner
 - Additional information received (requested by Planning Division)
- November 2, 8, & 16, 2005 Open Space Lands Advisory Board meetings
- November 30, 2005
 Planning Commission hearing
- December 13, 2005 Ordinance requested from City Attorney's office
- cc: Sam Guevara, Rocky Fluhart, DJ Baxter, Ed Rutan, Lynn Pace, Rick Graham, Lisa Romney, Louis Zunguze, Brent Wilde, Alex Ikefuna, Doug Wheelwright, Cheri Coffey, Everett Joyce, Jennifer Bruno, Jan Aramaki, Marge Harvey, Sylvia Jones, Lehua Weaver, Annette Daley, Barry Esham, Gwen Springmeyer

File Location: Community Development Dept., Planning Division, Rezoning and Master Plan Amendment, Rowland Hall-St. Mark's School / Mt. Olivet, approximately 1443 E. Sunnyside Avenue

RECEIVED

| IARY [| FRANK B. GRAY
Director
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RALPH BECKER
Salt Lake City Mayor | | | |
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| ROBE | DEPUTY DIRECTOR
ERT FARRINGTON
DEPUTY DIRECTOR
DEPUTY DIRECTOR | | CITY COUNCIL TRANSMITTAL Date Received: Date Sent to City Council: | halan | | | |
| | то: | Salt Lake City Co
JT Martin, Chair | | ember 9, 2010 | | | |
| | FROM: | Frank Gray, Community & Economic
Development Department Director | | | | | |
| | RE : | Resolution for an additional time extension to satisfy the conditions set forth in
Ordinance 21 of 2006. Resolution 80 of 2007 approved a time extension that expires
December 31, 2010. Ordinance 21 of 2006 pertains to Rowland Hall-St. Mark's
School's Petitions 400-05-08 and 400-05-09 to amend the East Bench Master Plan
and rezone property at 1443 East Sunnyside Avenue. | | | | | |
| | STAFF C | ONTACTS: | Everett Joyce, Senior Planner, at 801-535-7
everett.joyce@slcgov.com | 930 or | | | |
| | RECOMMENDATION: | | That the City Council consider the resolutio 21 of 2006. | n extending Ordinance | | | |
| DOCUMENT T | | ENT TYPE: | Resolution | | | | |
| | BUDGET IMPACT: | | None | | | | |
| | DISCUSS | ION: | | | | | |

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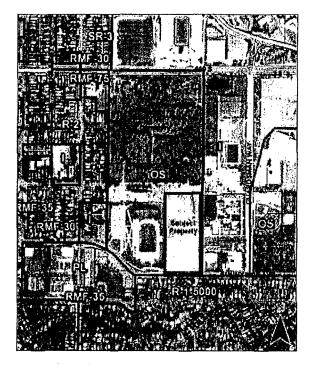
MARY

Issue Origin: On April 18, 2006, in response to Petitions 400-05-08 and 400-05-09 by Rowland Hall St. Mark's School the City Council passed Ordinance 21 of 2006 to amend the East Bench Master Plan land use designation from Open Space to Institutional and to rezone 13 acres of the Mount Olivet Cemetery Association property at 1443 East Sunnyside Avenue from Open Space to Institutional zoning classification. (See Vicinity Map below)

> 451 SOUTH STATE STREET, ROOM 404 P.O. BOX 145486, SALT LAKE CITY, UTAH 84114-5486 TELEPHONE: 801-535-6230 FAX: 801-535-6005 WWW.SLCGOV.COM/CED



Subject Property of Petitions 400-05-08 and 400-05-09



Vicinity Map

Ordinance 21 0f 2006 is conditioned upon the following:

- (a) Removal of the reversionary clause on the property by the United States Congress;
- (b) Sale of the property from Mount Olivet Cemetery to Rowland Hall-St. Mark's School and recording documentation of such sale with the Salt Lake County Recorder; and
- (c) Execution and recordation of a Development Agreement between the City and Rowland Hall-St. Mark's School substantially in the form of the draft Agreement attached to the ordinance as Exhibit B.

Condition (a)

Congress passed H.R. 1442, in late May 2010, which directs the Secretary of Interior to convey the federal reversionary interest in the subject parcel to the Mt. Olivet Cemetery Association. Since then, the Mt. Olivet Cemetery Association has been working closely with the Bureau of Land Management to survey the Mt. Olivet Cemetery Association property, inclusive of the value of the federal reversionary interest and, then, complete the conveyance.

However, the applicant has been advised that the BLM survey, appraisal and related work may not be completed in a time frame to allow transfer of property ownership to Rowland Hall, by late December 2010. Consequently, a request has been submitted to extend the December 31, 2010 deadline of Ordinance 21 of 2006.

Ordinance 21 of 2006 Extension of Time - Petitions 400-05-08 and 400-05-09 - Rowland Hall St. Mark's School Page 2 of 3

Condition (b)

The applicant has submitted a minor subdivision application to facilitate the acquisition of the subject parcel.

Condition (c)

The Development Agreement restricts uses on approximately nine acres of the 13 acre parcel. Four acres of the restricted portion is to be used as a recreation area. Declarant agrees to construct, improve and maintain one or more recreation fields and related improvements with no permanent buildings. Declarant agrees that upon completion of the recreation field(s), to relinquish its lease (right to exclusive use) of the City owned recreation field located at the corner of Sunnyside Avenue and Guardsman Way.

Declarant agrees to designate, develop, dedicate and maintain a public trail easement (the "Cemetery Trail"), at least twenty (20) feet in width, to provide public access and passage between Sunnyside Avenue and the MOW1t Olivet Cemetery across the western portion of the Property.

Declarant agrees to designate, develop, dedicate and maintain a public trail easement (the "Transvalley Corridor Trail"), at least ten (10) feet in width, to provide public access and passage along Sunnyside Avenue across the southern portion of the Property.

Analysis: The original Ordinance 21 of 2006 states that City Council may, by resolution, for good cause shown, extend the time period for satisfying the conditions of the ordinance, specifically condition (a), removal of the reversionary clause. On December 11, 2007, the City Council passed Resolution No. 80 of 2007 extending the deadline for satisfying the conditions set forth in Ordinance No. 21 of 2006 to December 31, 2010.

Therefore the applicant is requesting an additional extension of Ordinance 21 of 2006 to make the effective deadline to satisfy the conditions of the ordinance March 31, 2011.

The resolution prepared by the City Attorney's Office, the applicants request letter and related ordinances are attached.

Master Plan Considerations: Not applicable

PUBLIC PROCESS: Not applicable

RELEVANT ORDINANCES: Ordinance 21 of 2006 which allows an extension of time by resolution.

Table of Contents

- **1.** Chronology
- 2. Resolution
- 3. Request Letter
- **4.** Ordinance 21 of 2006
- **5.** Resolution 80 of 2007
- 6. Draft Development Agreement
- 7. Copy of the Act Removal of Reversionary Interest

1. Chronology

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CHRONOLOGY

Extension of Time for Ordinance 21 of 2006

| April 18, 2006 | City Council passed Ordinance 21 of 2006 pursuant to Petitions 400-05-08 and 400-05-09 |
|-------------------|--|
| December 11, 2007 | City Council passed Resolution 80 of 2007 extending the time period to satisfy conditions of Ordinance 21 of 2006 to December 11, 2010 |
| October 19, 2010 | Letter submitted to Mayor Becker requesting an extension of time to fulfill conditions of Ordinance 21 of 2006 |
| November 2, 2010 | Project assigned to Everett Joyce |
| November 3, 2010 | Requested resolution from City Attorney's Office |
| November 8, 2010 | Received draft resolution from City Attorney's Office |

2. Resolution

RESOLUTION NO. ____ OF 2010

A resolution extending the time period for satisfying the conditions set forth in Ordinance No. 21 of 2006. (Property located at approximately 1443 E. Sunnyside Avenue)

WHEREAS, the City Council enacted Ordinance No. 21 of 2006 on April 18, 2006; and WHEREAS, that ordinance imposed certain conditions and required that those conditions be met within two (2) years from the date that the ordinance was approved; and

WHEREAS, the ordinance also provided that the City Council may extend the time period for satisfying the conditions set forth in the ordinance; and

WHEREAS, on December 11, 2007, the City Council further extended the deadline for satisfying the conditions in the ordinance to December 31, 2010 pursuant to Resolution No. 80 of 2007; and

WHEREAS, one of the conditions of Ordinance No. 21 of 2006 requires an act of the United States Congress and the remaining conditions are dependent upon approval of the federal legislation; and

WHEREAS, the Applicant's efforts for federal legislative relief have been successful and Applicant is now working with the U.S. Bureau of Land Management ("BLM") to complete the property transaction contemplated by Ordinance No. 21 of 2006; and

WHEREAS, the Applicant has requested another short extension of the deadline to satisfy the conditions of Ordinance No. 21 of 2006 in order to complete transactions with the BLM; and

WHEREAS, the City Council finds that there is good cause to extend the deadline in the ordinance;

NOW, THEREFORE, be it resolved by the City Council of Salt Lake City, Utah:

SECTION 1. The deadline set forth in Section 5 of Ordinance No. 21 of 2006, as extended by Resolution No. 80 of 2007, shall be and hereby is extended from December 31, 2010 to March 31, 2011 for the applicant to satisfy the conditions set forth in Section 4 of that ordinance.

DATED this _____ day of _____, 2010.

Passed by the City Council of Salt Lake City, Utah, this _____ day of

_____, 2010.

SALT LAKE CITY COUNCIL

By:_____ CHAIRPERSON

ATTEST AND COUNTERSIGN:

CITY RECORDER

| | DVED AS TO FORM
ke City Attorney's Office | |
|-----------|--|--|
| Date:_ | NovomBep 79, 2010 | |
| By:
Pá | I C. Nielson, Sentor City Attorney | |

HB_ATTY-#15379-v1-Resolution_extending_conditions_deadline_Rowland_Hall.DOC

3. Request Letter



RECEIVED OCT 1 9 2010

ROWLAND HALL . ST. MARK'S SCHOOL

Phillip G. McCarthey Campus October 19, 2010

The Honorable Ralph Becker Mayor of Salt Lake City SALT LAKE CITY CORPORATION 451 South State Street, Room 306 Salt Lake City, Utah 84111

Re: Salt Lake City Ordinance No. 21, Request for Extension of Time to Fulfill Conditions

Dear Mayor Becker:

This letter is to respectfully request that the Salt Lake City Council further extend the expiration deadline of the Salt Lake City Ordinance No. 21, which is set to expire December 31, 2010, through March 31, 2011. Since the Council passed the Ordinance in 2006 (which, as you know, was extended for good cause by the Council in 2008), Rowland Hall-St. Mark's School and Mt. Olivet Cemetery Association have worked diligently to meet the conditions specified in Section 4 of the ordinance, which I repeat here for your convenience:

"(a) Removal of the reversionary clause on the property by the United States Congress;

(b) Sale of the property from Mount Olivet Cemetery to Rowland Hall-St. Mark's School and recording documentation of such sale with the Salt Lake County Recorder; and

(c) Execution and recordation of a Development Agreement between the City and Rowland Hall-St. Mark's School substantially in the form of the draft Agreement attached hereto as Exhibit B."

A copy of the Ordinance, inclusive of the extension, is attached as Exhibit "A" for your case of reference.

After years of effort, Congress finally passed H.R. 1442 (see attached *Exhibit "B*," the "Act"), in late May 2010 (this year), which directs the Secretary of Interior to convey the federal reversionary interest in the Mt. Olivet Parcel (and related Mt. Olivet Cemetery Association property) to the Mt. Olivet Cemetery Association has been working closely with the Bureau of Land Management to survey the Mt. Olivet Cemetery Association property, inclusive of the Mt. Olivet Parcel, value the federal reversionary interest and, then, complete the conveyance. Likewise, the Mt. Olivet Cemetery Association and Rowland Hall-St. Mark's School are taking the necessary steps to complete the sale of the RHSM Parcel by December 31, 2010, as currently required by the Ordinance.

However, we are advised that the BLM survey, appraisal and related work may not be completed until late November, which, as you can see from the Act, means that, with the BLM's acceptance of Mt. Olivet's offer to purchase the reversionary interest, and the necessary title, survey, legal division, and closing matters that need to be addressed before Mt. Olivet can acquire the reversionary interest and, then, convey part of the Mt. Olivet property, as contemplated by the Ordinance, to Rowland Hall, may not occur until, at the earliest, late December 2010. Consequently, despite our best efforts and through no fault of any involved parties, it may prove difficult, if not impossible, to meet the December 31, 2010 deadline to satisfy the conditions precedent to the effectiveness of the Ordinance. Those conditions, as

720 Guardaman Way Salt Lake City, Ulah 84108 · phone 801,365,7486 · fax 801,363,6521 · www.rhem.org

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The Honorable Ralph Becker Mayor of Salt Lake City October 19, 2010 Page 2

noted, include the execution and recording of the Development Agreement, as well as the approval of the legal division of the Rowland Hall property from the Mt. Olivet property of which it is a part, title, survey and other closing matters. After all of the time, effort and expense to satisfy the conditions precedent in the Ordinance, it would be tragic if matters outside the control of the parties caused the deadline to be missed and, as a result, the opportunities presented by the Ordinance (including the contribution to the City's Open Space Fund) to be missed, particularly when there is good reason (and cause) to extend the Ordinance.

As such, this letter is to respectfully request that the Council further extend the expiration deadline of the Ordinance. Given that the closing is imminent, however, we are not asking that you extend the deadline for two years, as was the case in 2008. Rather, in anticipation of the closings occurring before or shortly following the end of the year, we are requesting enough time to ensure that possible and, given the upcoming holiday season, likely delays in signatures, surveys, appraisals, City approvals or signatures, title and closing matters, despite the efforts of the parties, will not upset the Ordinance at this point.¹ Specifically, since Rowland Hall and Mt. Olivet already have a March 31, 2011 deadline for the closing of the subject transactions, we are asking that the Ordinance be extended to that date as well, or March 31, 2011, so that there is enough time to conclude this matter under the circumstances and not, due to unexpected delays, missing signatures or other technicalities (or, possibly, an unwarranted appeal of the City's expected approval, consistent with the Ordinance, of the legal division of the Rowland Hall land from the balance of the Mt. Olivet property), waste all of the time. effort and expense in reaching this point.

As you are aware, the Ordinance states that "The City Council may, by resolution, for good cause shown, extend the time period for satisfying the conditions identified herein." As such, under the circumstances and for good cause being shown, we respectfully request that, pursuant to the express terms of the Ordinance, the City Council extend the time period in Section 5 of the Ordinance through March 31, 2011, which also is the required closing date between Rowland Hall and Mt. Olivet, to ensure that there will be sufficient time to conclude this matter.

We greatly appreciate your continued support for this important project and respectfully ask that you consider this request at the earliest opportunity.

Very truly yours,

ROWLAND HALL-ST. MARK'S SCHOOL

Robert Steiner, Board Chair

MOUNT OLIVET GEMETERY ASSOCIATION 1 pm

William H. Adams, President

GPK/mg/Encls.

cc. Mr. J.T. Martin, Chair, Salt Lake City Council Lynn Pace, Esq. Guy P. Kroesche, Esq. Ms. Julie Barrett, Asst. Headmaster

¹ Of course, in the event of any administrative delays or legal challenges to the proposed legal division or, perhaps, other matters outside our control, we may need to ask for further extensions at that time. Again, though, we do not anticipate any further extensions and, as you can appreciate, certainly hope that no further extensions will be necessary.

4. Ordinance 21 of 2006

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0 06-1 P 06-7

SALT LAKE CITY ORDINANCE No. 21 of 2006

(Amending the East Bench Master Plan and Rezoning property generally located at 1443 East Sunnyside Avenue)

AMENDING THE EAST BENCH MASTER PLAN AND REZONING PROPERTY GENERALLY LOCATED AT 1443 EAST SUNNYSIDE AVENUE FROM OPEN SPACE (OS) TO INSTITUTIONAL (I), PURSUANT TO PETITION NOS. 400-05-08 AND 400-05-09.

WHEREAS, the Planning Commission and the City Council of Salt Lake City, Utah, have held public hearings and have taken into consideration citizen testimony, filing, and demographic details of the area, the long range general plans of the City, and any local master plan as part of their deliberations. Pursuant to these deliberations, the City Council has concluded that the proposed amendments to the East Bench Master Plan and change of zoning for the property generally located at 1443 East Sunnyside Avenue is appropriate for the development of the community in that area and in the best interest of the City.

NOW. THEREFORE, be it ordained by the City Council of Salt Lake City, Utah:

SECTION 1. AMENDMENT OF MASTER PLAN. The East Bench Master Plan, as previously adopted by the Salt Lake City Council, shall be, and hereby is amended consistent with the rezoning set forth herein.

SECTION 2. REZONING OF PROPERTY. The property generally located at 1443 Hast Sunnyside Avenue, which is more particularly described on Exhibit "A" attached hereto, shall be and hereby is rezoned from open space (OS) to institutional (I).

SECTION 3. AMENDMENT TO ZONING MAP. The Salt Lake City Zoning Map, adopted by the Salt Lake City Code, relating to the fixing of boundaries and zoning districts, shall be, and hereby is amended consistent with the rezoning of property identified above. SECTION 4. CONDITIONS. This Ordinance is conditioned upon the following:

(a) Removal of the reversionary clause on the property by the United States Congress;

(b) Sale of the property from Mount Olivet Cemetery to Rowland Hall-St. Mark's School and recording documentation of such sale with the Salt Lake County Recorder; and

(c) Execution and recordation of a Development Agreement between the City and Rowland Hall-St, Mark's School substantially in the form of the draft Agreement attached hereto as Exhibit B.

SECTION 5. EFFECTIVE DATE. This Ordinance shall become effective on the date of its first publication. The City Recorder is instructed not to record or publish this Ordinance until the conditions identified herein have been satisfied, as certified by the Salt Lake City Attorney. If the conditions identified herein have not been satisfied within two years from the date of adoption, this Ordinance shall become null and void.

SECTION 6. TIME. The City Council may, by resolution, for good cause shown, extend the time period for satisfying the conditions identified herein.

Passed by the City Council of Sait Lake City, Utah this _____/8_ day of ______, 2006.

2

CHAIRPERSON

ORDER

Transmitted to Mayor on April 21, 2006 Mayor's Action: _X_ Approved. _____Votoed. la Δ CHIEF DEPUTY CHY RECORDER APPROVED AS TO FORM Balt Lake City Attorney's Office Date 4-11-de Dalo, (SEAL) FRAN By.

Bill No. 21 of 2006. Published:

ExOntinance Of Mexoning 1443 East Sunnyside Avenue --- 03-14-06 draft.doc



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Exhibit "A"

A Parcel of land being in the Northwest Quarter of Section 9, Township 1 South, Range 1 East, Salt Lake Base and Moridian and described as follows:

Beginning at the Southwest corner of the Armory 4 Lot Minor Subdivision, said corner being located South 89° 59' 50" West 775.746 feet from the First Veterans Administration Monument and said corner is also located North 89° 59' 50" East 10.60 feet from the U.S.A. Monument No. 3 and said corner is also located North 89° 59' 50" Bast 89.21 feet and North 0° 02' 01" West 58.20 feet from the Salt Lake City Survey Monument in the intersection of Amanda Avenue and Sunnyside Avenue and running thence South 89° 59' 50" West along the North right of way line of Sunnyside Avenue 543.35 feet; thence North 0° 00' 10" West 1049.71 feet; thence North 89° 59' 50" East 542.78 feet to the Northwest corner of said Armory 4 Lot Minor Subdivision, (said corner is also the Northeast corner of the amended plat of Parcels 2 & 3 of the Armory 4 Lot Minor Subdivision); thence South 0° 02' 01" East along the West line of said Subdivisions 1049.71 feet to the point of beginning.

Less and excluding the following:

Beginning at a point on the North line of Sunnyside Avenue, said point being South 89° 59' 50" West along said North line 32.00 feet from the Southwest Corner of the Armory 4 Lot Minor Subdivision, said corner being located South 89° 59' 50" West 775.746 feet from the First Veterans Administration Monument and said corner is also located North 89° 59' 50" East 10.60 feet from the U.S.A. Monument No. 3 and said corner is also located North 89° 59' 50" East 89.21 feet and North 0° 02' 01" West 58.20 feet from the Salt Lake City Survey Monument in the intersection of Amanda Avenue and Sunnyside Avenue and running thence South 89° 59' 50" West 370.50 feet; thence North 0° 02' 01" East 511.15 feet; thence North 0° 02' 01" East 511.15 feet; thence South 0° 02' 01" East 511.15 feet;

Contains approximately 8.7383 Acres.

18 April 06 Everettyon

5. Resolution 80 of 2007

RESOLUTION NO. <u>80</u> OF 2007

A RESOLUTION EXTENDING THE TIME PERIOD FOR SATISFYING THE CONDITIONS SET FORTH IN ORDINANCE NO. 21 OF 2006, PERTAINING TO ROWLAND HALL-ST. MARK'S SCHOOL'S PETITION TO AMEND THE BAST BENCH MASTER PLAN AND REZONING OF PROPERTY GENERALLY LOCATED AT 1443 EAST SUNNYSIDE AVENUE

WHEREAS, the City Council enacted Ordinance No. 21 of 2006 on April 18, 2006; and

WHEREAS, that ordinance imposed certain conditions and required that those conditions

be met within two years from the date that the ordinance was signed; and

WHEREAS, the ordinance also provided that the City Council may extend the time

period for satisfying the conditions set forth in the ordinance; and

WHEREAS, the City Council finds that there is good cause to extend the deadline for

satisfying the conditions set forth in the ordinance.

NOW, THEREFORE, be it resolved by the City Council of Salt Lake City, Utah:

SECTION 1. The deadline for satisfying the conditions set forth in Ordinance No. 21 of

2006 shall be and hereby is extended to December 31, 2010.

DATED this <u>11th</u> day of <u>December</u>, 2007.

Passed by the City Council of Salt Lake City, Utah, this 11th day of

December ,2007.

SALT LAKE CITY COUNCIL Bv CHĂÍRPERSON

6. Draft Development Agreement

DRAFT 4/18/06A

When Recorded Return to:

Salt Lake City Corporation Attn: Planning Director 451 South State Street Salt Lake City, UT 84111

DEVELOPMENT AGREEMENT

AND

DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS

FOR

ROWLAND HALL - ST. MARK'S SCHOOL PROPERTY LOCATED AT

1443 EAST SUNNYSIDE AVENUE, SALT LAKE CITY, UTAH

THIS DEVELOPMENT AGREEMENT AND DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS ("AGREEMENT") FOR ROWLAND HALL — ST. MARK'S SCHOOL PROPERTY LOCATED AT 1443 EAST SUNNYSIDE AVENUE, SALT LAKE CITY, UTAH is made as of ______, 200_ (the "Effective Date") between Rowland Hall-St. Mark's School, a Utah non-profit corporation (the "Declarant") and Salt Lake City Corporation (the "City").

RECITALS

A. The Declarant is the owner of real property located at 1443 East Sunnyside Avenue, Salt Lake City, Utah, more particularly described on Exhibit A attached hereto (the "Property").

B. The Declarant desires to restrict use of the portion of the Property described on Exhibit B attached hereto (the "Restricted Portion") so that at least 25% of the Restricted Portion will be free of buildings, paved parking areas and paved driveways, independent of any zoning requirement.

C The Declarant desires to develop and use a portion of the property described on Exhibit C hereto (the "Open Space Portion") as a recreation area.

D. The Declarant desires that the Property is to be held, conveyed, encumbered, leased, used, occupied and improved subject to the restrictions, rights, conditions and covenants in this Agreement.

E. This Agreement is executed voluntarily by both parties hereto for the mutual benefits set forth herein.

NOW, THEREFORE, the Declarant hereby covenants and declares the Property and every portion or interest therein, is now held and shall hereafter be held, conveyed, encumbered, leased, used, occupied and improved subject to the restrictions, rights, conditions, and covenants herein set forth, each and all of which is and are for, and shall inure to the benefit of and pass with the Property and every portion of or interest in the Property, and shall apply to every owner and occupant thereof, and their successors and assigns. All restrictions, rights, conditions and covenants in this Agreement shall run with and burden the Property and shall be binding on and for the benefit of the Property and all other persons having or acquiring any interest in the Property.

ARTICLE 1 RESTRICTED PORTION USE RESTRICTIONS

1.1 <u>Prohibited Uses.</u> Independent of any zoning requirement, at least twenty-five percent (25%) of the Restricted Portion (the "25% Portion") shall be at all times free of buildings, paved parking areas and paved driveways; provided that the Declarant shall have the right to relocate, move, reposition or adjust from time to time, subject to appropriate City regulation and approval, the 25% Portion within the Restricted Portion. City acknowledges that the 25% Portion shall be included and counted toward the forty percent (40%) open space requirement applicable to the Institutional zone and will not decrease the developable building square footage under the City ordinances for the Restricted Portion. If City reduces the forty percent (40%) open space requirement for properties in Institutional zones prior to the time that Declarant files for a building permit on the Restricted Portion, then such reduced open space requirement shall be applicable to the Restricted Portion and zones prior to the time that Declarant files for a building permit on the Restricted Portion, then such reduced open space requirement shall be applicable to the Restricted Portion, and space requirement shall be applicable to the Restricted Portion, provided that any such reduction shall not affect the requirement to establish the 25% Portion as provided above.

1.2 <u>Permitted Uses.</u> Except as otherwise prohibited in Section 1.1 of this Agreement, the 25% Portion may be used for any uses allowed in the Institutional zoning classification, which may include the following uses (it being understood that the following uses are not exclusive

(a) Recreational uses, including, without limitation, playing fields, tennis courts, outdoor basketball, track, baseball, soccer, and field facilities;

(b) Park-like uses including, without limitation, picnic facilities, outdoor stages and amphitheaters, gazebos, and playground equipment;

(c) Pedestrian landscaped amenities including, without limitation, pathways, sidewalks, walkways, patios, courtyard areas, trails, terraces, benches, water features, decorative walls, and other omamental features;

(d) Landscaping, including, without limitation, trees, bushes, water sprinkler systems and other utility systems, water features, light poles, and other ornamental features.

(e) Uncovered and unenclosed decks and patios;

(f) Uses necessary to secure the stability, safety, and practical use of the ground, such as earth retaining wall terracing or similar improvements which support ground leveling, subject to appropriate City regulation and approval; and

(g) Fencing, subject to applicable City processes

1.3 <u>View Corridor from Transvalley Corridor Trail</u>. At such time as Declarant applies for a building permit for buildings on the Restricted Portion, Declarant shall cooperate in good faith with the City Planning Director to locate such buildings in a manner that reasonably preserves the northwest view corridor from the "Transvalley Corridor Trail" and the "Cemetery Trail" (both defined later).

3

ARTICLE 2

OPEN SPACE PORTION RESTRICTIONS

2.1 <u>Restriction on Buildings</u>. Declarant agrees to construct, improve and maintain the Open Space Portion for one or more recreation fields and for related improvements. No permanent buildings may be constructed upon the Open Space Portion.

2.2 <u>Access</u>. Declarant agrees to allow public access to and use of the Open Space Portion during daylight hours at times when the Open Space Portion is not used for

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permitted uses):

Declarant's own activities, subject to reasonable and customary scheduling control, maintenance and upkeep, management and safety regulations of Declarant. Subject to adverse weather conditions and closure of the Open Space Portion during periods of repair and maintenance, such public access shall be made available at least five (5) hours per week.

2.3 <u>Sunnyside Lease</u>. Declarant agrees that upon completion of the recreation field(s) upon the Open Space Portion, Declarant shall relinquish its lease (right to exclusive use) of the City owned recreation field located at the corner of Sunnyside Avenue and Guardsman Way.

2.4 <u>Lighting</u>. Declarant shall not construct or install any lighting for the recreation field(s) on the Open Space Portion. Declarant may install such lighting as may be appropriate for security and to prevent crime.

ARTICLE 3 TRAILS

3.1 <u>Cemetery Trail</u>. Declarant agrees to designate, develop, dedicate and maintain a public trail easement (the "Cemetery Trail"), at least twenty (20) feet in width, to provide public access and passage between Sunnyside Avenue and the Mount Olivet Cemetery across the western portion of the Property. The Cemetery Trail shall be open and available for use by the public during all times that the Mount Olivet Cemetery is open to the public. At Declarant's option, all or a portion of the Cemetery Trail may be located within the setback applicable to the western boundary of the Property.

3.2 <u>Transvalley Corridor Trail</u>. Declarant also agrees to designate, develop, dedicate and maintain a public trail easement (the "Transvalley Corridor Trail"), at least ten (10) feet in width, to provide public access and passage along Sumyside Avenue across the southern portion of the Property. At the Declarant's option, all or a portion of the Transvalley Corridor Trail may be located within the setback applicable to the southern boundary of the Property.

ARTICLE 4

GENERAL PROVISIONS

4.1 <u>Maintenance</u>. The Declarant shall be solely responsible for the maintenance of the Property.

4.2 <u>Traffic Mitigation</u>. Declarant acknowledges that its development of the Property will create an impact upon the vehicle traffic in the area. Accordingly, upon Declarant's application for a building permit for buildings on the Restricted Portion, Declarant shall contribute \$100,000 to the City to be used for traffic calming/pedestrian safety on Sunnyside Avenue.

4.3 <u>Site Plan Approval.</u> Declarant's site plan for the development of the Property shall be approved through the appropriate City process, as determined by the City Planning Director prior to the issuance of any permits, which approval shall not be unreasonably withheld or delayed. Declarant also expressly acknowledges and agrees that nothing in this Agreement shall be deemed to relieve Declarant from the obligation to comply with all applicable ordinances, resolutions, regulations, policies and procedures of the City in connection with the development of the Property.

4.4 <u>Duration</u>. This Agreement shall continue in full force for a period of one hundred (100) years from the Effective Date (the "Term"). Within the last year of the Term, the owner of the Property and Salt Lake City Corporation (the "City") shall review the covenants and restrictions of this Agreement in light of conditions existing at that time, and determine whether and for how long the

covenants and restrictions shall remain in effect. If no agreement is reached and recorded within the last year of the Term, then the Term shall extend for another one hundred (100) years.

4.5 <u>Enforcement</u>. Each of Declarant and the City shall have the right to enforce, by any proceeding in law or in equity, all covenants and restrictions now or hereafter imposed by the provisions of this Agreement. Declarant and the City shall retain the right to contest the existence of any alleged violation of this Agreement.

4.6 <u>Amendments.</u> This Agreement may be amended by duly recording an instrument executed and acknowledged by the owner of the Property; provided that this Agreement cannot be amended without the prior written consent of the City, which consent shall not be unreasonably withheld or delayed. Declarant and City agree that they will cooperate in good faith in making reasonable amendments to this Agreement, subject at all times to City ordinances, in the event such amendments are necessary based on Declarant's eventual development plan for the Property.

4.7. <u>Covenants Run With the Land.</u> This Agreement shall be recorded against the Property with the Salt Lake County Recorder, and all restrictions, rights, conditions and covenants in this Agreement shall run with and bind the Property as covenants running with the land and shall inure with and burden the Property and shall be binding on and for the benefit of the Property and the Declarant and other persons having or acquiring any interest in the Property.

4.8 <u>Persons Bound.</u> This Agreement and the restrictions created hereby shall inure to the benefit of and be binding upon the Declarant, its successors and assigns; all occupants, tenants, licensees and invitees of the Property; and upon any person acquiring the Property, or any portion thereof, or any interest therein, whether by operation of law or otherwise. The new owner of the Property, including, without limitation, any owner or lien holder, who acquires its interest by foreclosure, trustee's sale or otherwise, shall be liable for all obligations arising under this Agreement with respect to the Property after the date of sale and conveyance of title.

4.9 <u>No Public Right or Dedication.</u> Except for the anticipated public use of the trails and the Open Space Portion, nothing in this Agreement is a gift or dedication of all or any part of the Property to the public, or for any public use.

4.10 <u>Attorney's Fees.</u> In the event the Declarant or the City initiates or defends any legal action or proceeding in any way connected with this Agreement, the prevailing party in any such action or proceeding (in addition to any other relief which may be granted, whether legal or equitable), shall be entitled to recover from the losing party in any such action or proceeding its reasonable costs and attorney's fees (including, without limitation, its reasonable costs and attorney's fees on any appeal). All such costs and attorney's fees shall be deemed to have accrued on commencement of any legal action or proceeding its prosecuted to judgment.

4.11 <u>No Waiver</u>. Failure to enforce any provision of this Agreement does not waive the right to enforce that provision, or any other provision of this Agreement.

4.12 <u>Articles, Sections and Exhibits.</u> The Article and Section headings have been inserted for convenience only and may not be considered in resolving questions of interpretation or construction. Unless otherwise indicated, any references in this Agreement to articles, sections or exhibits are to Articles, Sections and Exhibits of this Agreement. Exhibits A, B and C attached to this Agreement are each incorporated herein by this reference.

4.13<u>Notices.</u> All notices given pursuant to this Agreement shall be in writing and shall be given by personal service, by United States mail or by United States express mail or other established express delivery service (such as Federal Express), postage or delivery charge prepaid, return receipt requested, addressed to the Declarant or the City at the address set forth below:

Rowland Hall — St. Mark's School 720 Guardsman Way Salt Lake City, Utah 84108

ATTN: Headmaster

| Salt Lake City Corporation |
|--------------------------------|
| 451 South State Street |
| Salt Lake City, Utah 84111 |
| ATTN: Planning Director |

4.14 <u>Severability.</u> If any term, condition, or provision of this instrument is held by a court of competent jurisdiction to be invalid, illegal or unenforceable to any reason, all other terms, conditions and provisions of this instrument shall nevertheless remain in full force and effect so long as the primary purposes of the instrument are not thereby affected in any manner materially adverse to any party. Upon such determination that any term, condition or other provision is invalid, illegal or unenforceable, the Parties hereto shall negotiate in good faith to modify this instrument so as to effect as closely as possible the original intent of the Parties in a mutually acceptable manner to the fullest extent permitted by applicable law.

EXECUTED as of the date first set forth above.

Rowland Hall --- St. Marks School, a Utah non-profit corporation

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|--|-----------|------------------------------|---------------------------|--|
| STATE OF) | | | | |
| COUNTY OF) \$\$, | | | | |
| This instrument | Was
as | acknowledged | | me on 2006, by
of Rowland Hall — St. Mark's School, a |
| Utah non-profit corporation. | | | | |
| My Commission Expires: | | | | |
| **** | | | ***** | NOTARY PUBLIC |
| | | Salt Lake C
a municipal c | lity Corpe
corporation | pration,
1 |
| STATE OF) | | Ross C. And | erson, Ma | yor |
|) ss. | | | | |
| COUNTY OF) | | | | |
| This instrument was a
of Salt Lake City Corporation | cknow | vledged before me | on | , 2006, by Ross C. Anderson, Mayor |
| My Commission Expires: | | | | |
| | ***** | | ***** | NOTARY PUBLIC |
| | | | | |

STATE OF _____) ss. COUNTY OF _____)

This instrument was acknowledged before me on _____, 2006, by Christine Meeker, Deputy City Record for Salt Lake City Corporation

My Commission Expires:

NOTARY PUBLIC

Exhibit A

Property Legal Description

A Parcel of land being in the Northwest Quarter of Section 9, Township 1 South, Range 1 East, Salt Lake Base and Meridian and described as follows:

Beginning at the Southwest corner of the Armory 4 Lot Minor Subdivision, said corner being located South 89° 59' 50" West 775.746 feet from the First Veterans Administration Monument and said corner is also located North 89° 59' 50" East 10.60 feet from the U.S.A. Monument No. 3 and said corner is also located North 89° 59' 50" East 89.21 feet and North 0° 02' 01" West 58.20 feet from the Salt Lake City Survey Monument in the intersection of Amanda Avenue and Sunnyside Avenue and running thence South 89° 59' 50" West 1049.71 feet; thence North right of way line of Sunnyside Avenue 543.35 feet; thence North 0° 00' 10" West 1049.71 feet; thence North 89° 59' 50" East 542.78 feet to the Northwest corner of said Armory 4 Lot Minor Subdivision, (said corner is also the Northeast corner of the amended plat of Parcels 2 & 3 of the Armory 4 Lot Minor Subdivision); thence South 0° 02' 01" East along the West line of said Subdivisions 1049.71 feet to the point of beginning.

Contains approximately 13.0867 acres.

Exhibit B

Legal Description of Restricted Portion

A Parcel of land being in the Northwest Quarter of Section 9, Township 1 South, Range 1 East Salt Lake Base and Meridian and described as follows:

Beginning at the Southwest corner of the Armory 4 Lot Minor Subdivision, said corner being located South 89° 59' 50" West 775.746 feet from the First Veterans Administration Monument and said corner is also located North 89° 59' 50" East 10.60 feet from the U.S.A. Monument No. 3 and said corner is also located North 89° 59' 50" East 89.21 feet and North 0° 02' 01" West 58.20 feet from the Salt Lake City Survey Monument in the intersection of Amanda Avenue and Sunnyside Avenue and running thence South 89° 59' 50" West along the North right of way line of Sunnyside Avenue 543.35 feet; thence North 0° 00' 10" West 1049.71 feet; thence North 89° 59' 50" East 542.78 feet to the Northwest corner of said Armory 4 Lot Minor Subdivision, (said corner is also the Northeast corner of the amended plat of Parcels 2 & 3 of the Armory 4 Lot Minor Subdivision); thence South 0° 02' 01" East along the West line of said Subdivisions 1049.71 feet to the point of beginning.

Less and excluding the following:

Beginning at a point on the North line of Sunnyside Avenue, said point being South 89° 59' 50" West along said North line 32.00 feet from the Southwest Corner of the Armory 4 Lot Minor Subdivision, said corner being located South 89° 59' 50" West 775.746 feet from the First Veterans Administration Monument and said corner is also located North 89° 59' 50" East 10.60 feet from the U.S.A. Monument No. 3 and said corner is also located North 89° 59' 50" East 89.21 feet and North 0° 02' 01" West 58.20 feet from the Salt Lake City Survey Monument in the intersection of Amanda Avenue and Sunnyside Avenue and running thence South 89° 59' 50" West along said North line, 511.35 feet; thence North 0° 00' 10" West 370.50 feet; thence North 89° 59' 50" East 511.15 feet; thence South 0° 02' 01" East 370.50 feet to the point of beginning.

Contains approximately 8.7383 acres,

Exhibit C

Legal Description of Open Space Portion

A Parcel of land being in the Northwest Quarter of Section 9, Township 1 South, Range 1 East, Salt Lake Base and Meridian and described as follows:

Beginning at a point on the North line of Sunnyside Avenue, said point being South 89° 59' 50" West along said North line 32.00 feet from the Southwest Comer of the Annory 4 Lot Minor Subdivision, said corner being located South 89° 59' 50" West 775.746 feet from the First Veterans Administration Monument and said corner is also located North 89° 59' 50" East 10.60 feet from the U.S.A. Monument No. 3 and said corner is also located North 89° 59' 50" East 89.21 feet and North 0° 02' 01" West 58.20 feet from the Salt Lake City Survey Monument in the intersection of Amanda Avenue and Sunnyside Avenue and running thence South 89° 59' 50" East 311.15 feet; thence North 0° 02' 01" West 370.50 feet to the point of beginning.

Contains approximately 4.3484 acres,

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ATTEST AND COUNTERSIGN:

× 4

CHIEF DEPUTY CITY RECORDER

APPROVED AS TO FORM:



11 (Jamie) Pieif (Dec). 6,2007) SALE LAKE CITY ACTORNEY

HB_ATTY-#2675-v1-Extending_time_for_satisfying_Ord_no__21_of_2006.DOC

7. Copy of the Act – Removal of Reversionary Interest

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H.R. 1442

One Hundred Eleventh Congress of the Anited States of America

AT THE SECOND SESSION

Royan and hold at the City of Washington on Tuesday, the fifth day of January, two thousand and tan

An Act

To provide for the sole of the Federal Government's reversionary interest in approxi-topicity 60 acres of land in Solt Lake City, Utah, ariginally coavayed to the Mount Olivet Cometory Association under the Act of January 23, 1008.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

the United States of America in Congruss assembled, BECTION 1. CONVEYANCE OF FEDERAL REVERSIONARY INTEREST, MT. GLIVET CEMETERY, SALT LAKE CITY, UTAIL (a) CONVEYANCE REQUIRED.—If, within one year after the completion of the approisal required by subsection (c), the Mount Clivet Cemetery Association 7, submits to the Secretary of the interior an offer to acquire the Pederal reversionary interest in aft of the approximately 60 seres of land in Sait Lake City, Utsh, convoyed to the Association under the Act of January 23, 1900 (chapter 37, 35 Stat, 589), the Secretary shall converse to the socia-tion such reversionary interest in the lands covered by the offer. This Secretary shall complete the convoyance not inter than 30 days after the date of the site of the Secretary shall covered by the offer. (b) SURVEY.—Not later than 90 days after the date of the consetment of this Act, the Secretary shall correlate a survey of the lands chardbaction (a) to determine the precise bound-aries and acreage of the lands subject to the Federal reversionary (c) Appendical.—Not later than 180 days after the date of angel-meters.

aries and zereage of the innes subject to the reversi reversionary interest. (c) APPRAISAL.—Not later than 180 days after the date of enact-ment of this Act, the Secretary shall complete an appraisal of the Federal reversionary interest in the lands identified by the survey in subsection (b). The appraisal shall be completed in accord-ance with the "Uniform Appraisal Standards for Federal Land Acquisitions" and the "Uniform Standards of Prefeasional Appraisal Practice". (d) CONSIDERATION.—As consideration for the conveyance of the Federal reversionary interest under subsection (a), the Associa-tion shall pay to the Secretary an amount equal to the appraised value of the Federal interest, as determined under subsection (c). The consideration shall be paid not later than 80 days after the date the sconveyance is made. (e) CONTO FEDERATION (CONTRET) as condition of the conveyance under subsection (a), including the cost of the survey required by sub-section (b) and the appraisal required by subjection (c), shall be paid by the Association.

H. R. 1442-2

(f) DEPOSIT AND USE OF PROCEEDS.—The Secretary shall deposit the proceeds from the conveyance under subsection (a) in the Federal Land Disposal Account satabilished by section 206 of the Federal Land Transaction Facilitation Act (48 U.S.C. 2305). The proceeds so deposited shall be available to the Secretary for expenditure in accordance with subsection (c) of such section.

Speaker of the House of Representatives.

Vice President of the United States and President of the Senate.

4.7

Property Management



1407 West North Temple, Suite #110 Salt Lake City, Utah 84116 801-220-2409(office) 801-220-4373 (Fax)

EEHD Architecture Attention: Mr. Brad Jacobson 500 Treat Avenue #201 San Francisco, CA 94110

Re: Rocky Mountain Power review and comments Rowland Hall St. Marks site plan

Dear Mr. Jacobson:

Rocky Mountain Power has completed its review of the Rowland Hall site plan you provided to the company in your email dated March 12, 2012. Rocky Mountain Power agrees with the development plans provided the following conditions are met:

- 1. A 30 foot setback from the transmission line along Sunnyside Avenue is maintained.
- 2. A 30 foot setback away from the transmission line of any buildings along the easterly property line is maintained.
- 3. A 20 foot setback away from the transmission line of any road, curb and gutter along the easterly property line is maintained and the existing grade is not changed without prior written approval from Rocky Mountain Power.
- 4. Trees growing to a height of no more than 15 feet may be planted within the power line corridor along the easterly property line.
- 5. The Kentucky Coffee Trees within the power line corridor along the easterly property line be removed.

Any changes to the site plan provided need to either meet the conditions set forth above or be reviewed and approved of by Rocky Mountain Power prior to the beginning of construction.

Please do not hesitate to contact me with any additional questions you may have regarding this project.

Sincerely,

Michael K. Imes Lead Senior Property Agent