Attachment 1-A: Public Comments on IS/MND

Dear Albert: 3-22-12

In reference to TRact 8057 Subdivision initial Study. We are interested in this Project because of the potential affect of any hillside run off of rain that could affect our property at 24430 Machado Ct

Zoning: 8057 is Zoned RI but it has been allowed to function as if it were Zoned RIL Why?

Strict Supervision of the project will be needed for fear that it will turn out to be another Telencio dr.
We will be attending the meeting on May 7th

Sincerely
Chris and Bob Sams
24430 Machado Ct
Hayward
510 363-9793

Tract 8057 Residential Subdivision Project

I take issue with the findings contained in the Tract 8057 Initial Study & Mitigated Negative Declaration.

Specifically: the Following Items

IX Hydrology and Water Quality Items a, c, d, e, g, and j. Most important is item J. This project will exacerbate a dangerous condition existing on the North Fork of Sulfur Creek. This creek has been above capacity where it crosses Madeiros Avenue for several years. Residents have notified the county and the county has refused to respond stating that this is private property. Howver the county has been transferring storm water runoff from the watershed serving the Don Castro basin and the South Fork of Sulfur Creek for several years. This project will move more storm water to the North Fork watershed. This exposes people and structures to a significant risk of loss injury or death.

XVI Transportation The project will substantially increase hazards due to design features. Specifically access to the development will be through a narrow private entrance situated between two blind curves. The traffic study does not adequately examine the projects' impact on two of the most congested intersections affecting Fairview

XVIII Mandatory Findings of Significance. Item c. The project will contribute to additional flooding of private property having substantial adverse effects on human beings. Further the access road located between 2 blind curves places people at risk of automobile collisions.

Listed below are my observations

1) Lots Stepped into the hillside. Some of the houses are being stepped into the hillside as required by the Fairview specific plan. But there are still a sizeable percentage being built on pads. The developer says this is OK because planning let other people violate the specific plan. I disagree with this. Further, the lots stepped into the hillside will rise above the ridgeline. This is not permitted in the Fairview specific plan. The report shows a number of cross sections of views from different areas of the communities. It relies on homes being built out of compliance with the Fairview specific plan to block view of these homes from locations B, G and H (pp 28-32). I do not see the logic in depending on another development violating the Fairview specific plan to allow a second development to violate the plan.
2) Number of lots permissible: Have you calculated how many homes may be built on this tract using the definitions in the Fairview Specific Plan? Seems like areas too steep etc are not supposed to be counted in the lot size.
    a. Gross acre of developable site area means: 1) Areas of less than 30% slope; 2) Areas outside of any private streets, access easements, stems, driveways that serve more than one lot, designated parking spaces, and any other unservable or unbuildable portion of the lot; and 3) Areas outside of riparian areas. For purposes of this Area Plan, a riparian area is defined as any area for which a watercourse, intermittent or perennial; pond; lake; marsh; or any other wetland; or the vegetation of wildlife dependent on or associated with any of the above, forms the environmental focal point. The limits of a

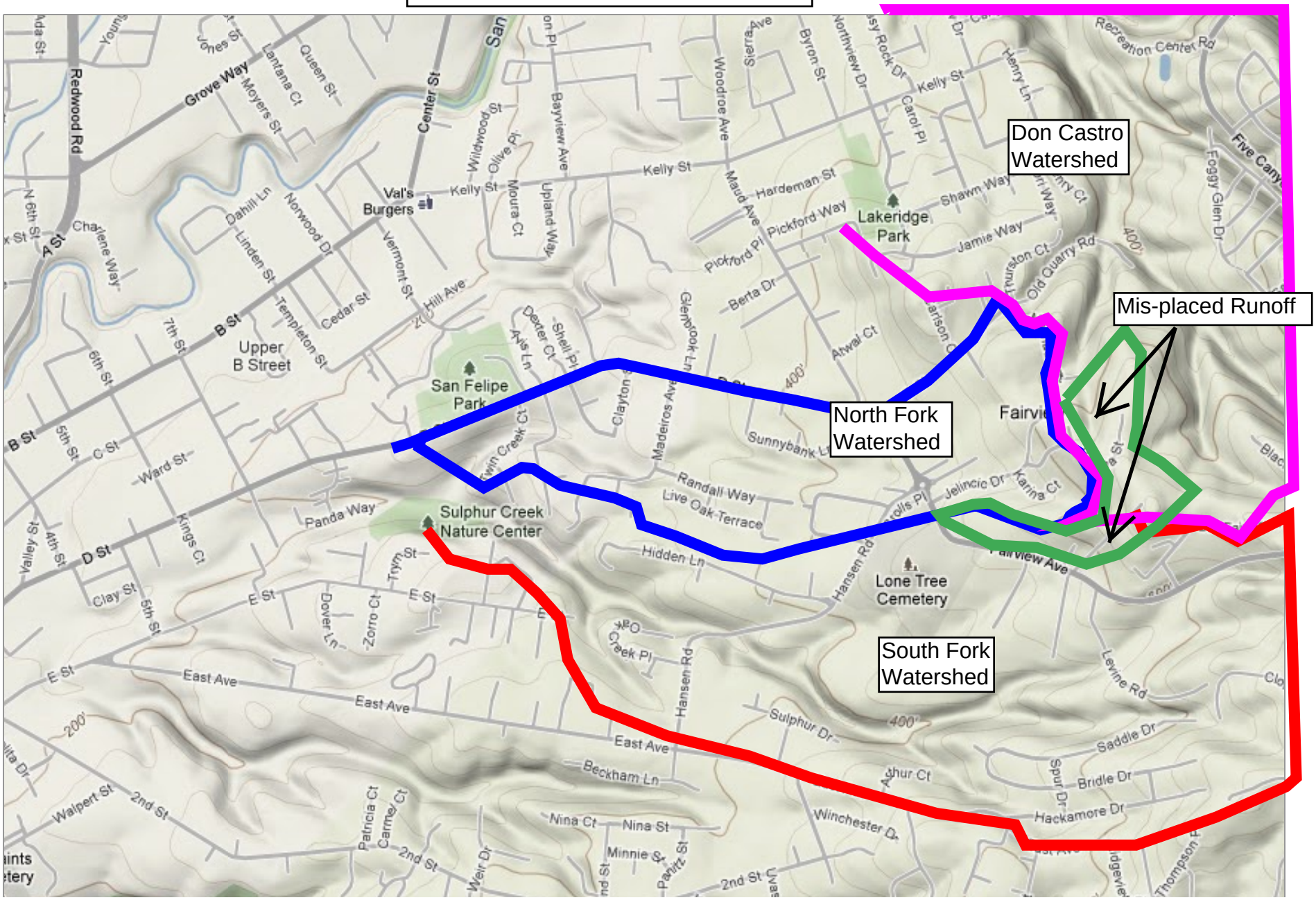
riparian area will normally be considered the demarcation line between the vegetation zones of wetland and upland.

3) ***Storm Water treatment***. The site spans 3 watersheds North Fork of Sulfur Creek, South Fork Sulfur Creek, un-named creek draining to Don Castro. It is not clear exactly where they propose to drop all runoff created by the development, but runoff from the access road and the entire side of the development facing the Sulfur Creek South Fork watershed will be dropped into existing storm drains that feed the North Fork of Sulfur Creek. This North Fork is already over capacity. In recent years this section of the North Branch has routinely left its banks flooding private property and washing over Madeiros Ave at its undercrossing. This seems to be occurring more frequently each year. We anticipate this will get worse as homes are built to complete the development above Jelincic Drive. That development has a storm water treatment plant that pumps runoff from the watershed of the un-named creek that drains to Don Castro, over the hill and into the North Fork of Sulfur Creek. The developer installed a detention facility to slow drainage for water that would normally flow into the North Fork of Sulfur Creek. Sadly this will not work because the storm drain intakes along the roads in the development were placed on the uphill side of the street. This is causing hardship on downstream homeowners.
4) ***Traffic impact***. First the section on traffic blandly asserts that the traffic impact will be minimal. It does not assess its impact on already bad situations at the intersections of D Street and 2nd Street as well as the Center, Kelley, B Street. Intersection. Peak flows at these intersections take multiple signal cycles to clear the intersection. Each development that adds 'negligible' amounts of traffic simply adds to a bad situation. Seems like someone ought to have some analysis on what we can expect at these intersections as the area gets built out. Second, access to the development is dependent on s 24 foot wide access road off of Fairview Ave. This road intersects Fairview ave between two blind curves. This looks like a very unsafe set up. At a minimum they should consider a cutout on the downhill direction of Fairview to let traffic exiting Fairview into the development to get out of the road quickly to protect against collisions from vehicles rounding the bend. Maybe they could put in one of those flashing speed signs. One is already installed just past the existing gravel road. What do the CHP and Sheriff think about this design?
5) Street lighting. Have residents on Walters Dinos and other adjacent streets had a chance to review the street lighting plan.
6) Grading. Have the residents on Walters Dinos and Old Fairview Ave had a chance to look at the grading plans? Somehow neighboring properties never seem to be notified of the huge mound of dirt they will soon be seeing from their kitchen window etc.
7) Construction hours. Why is it OK to work until 8PM on weekends? If I lived adjacent to the property I would request that no work be done on weekends. Also what is the penalty for working outside the posted work hours? Right now there is no penalty and constructions sites routinely ignore the posted working hours. Could you please enclose an appendix with the county noise ordinance in the next distribution of information?

Google

Sulfur Creek Watershed Storm Water Runoff Moved Between Watersheds Causing Flooding in First Half mile of the North Fortk

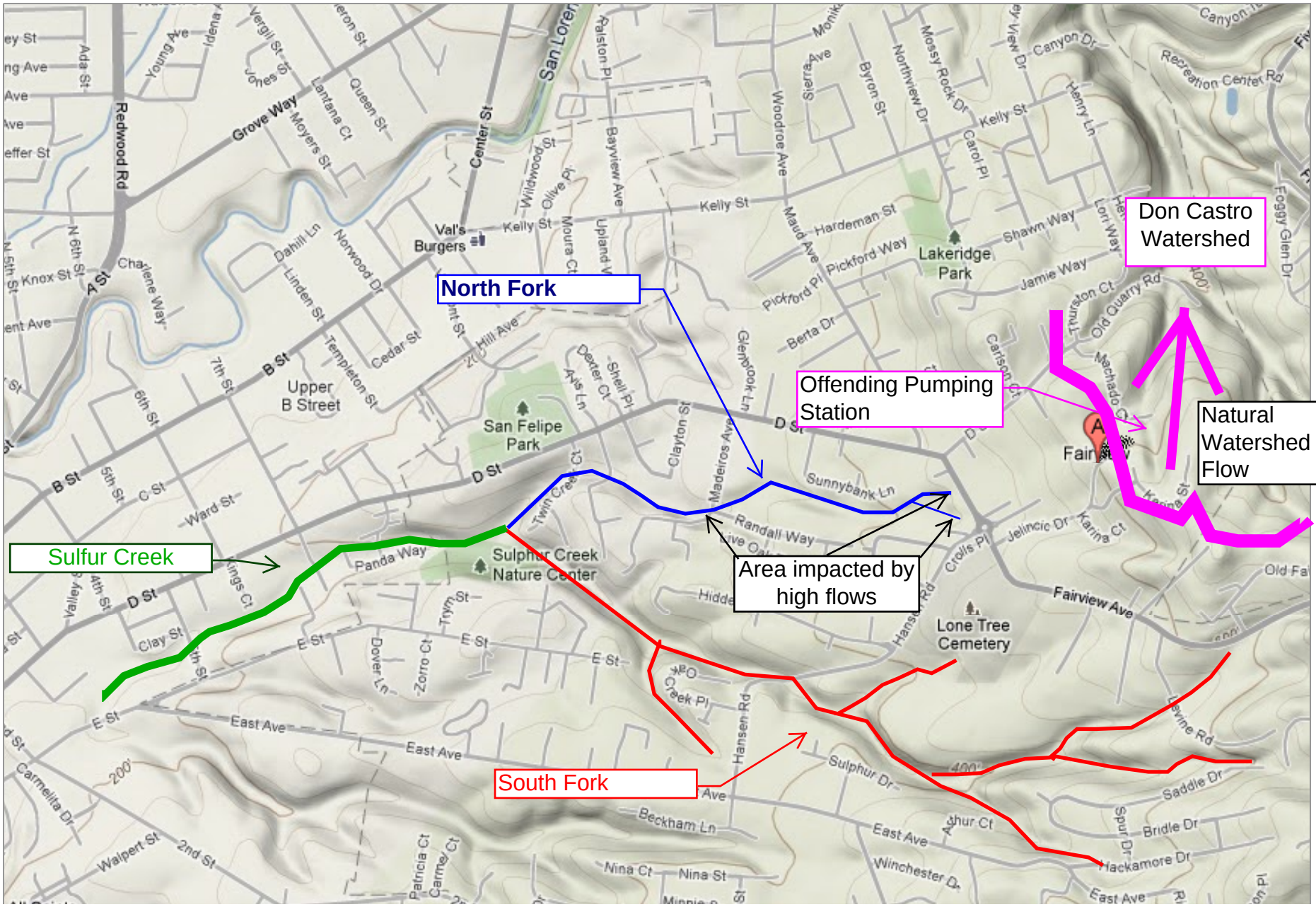
To see all the details that are visible on the screen, use the "Print" link next to the map.



Google

Sulfur Creek Area of Concern

To see all the details that are visible on the screen, use the "Print" link next to the map.




All Saints Cemetery
Tiegen Dr
Roxanne Ave
Marie Dr
Leona Dr
Highland Blvd
Sybil Ave
Palisade St
Mission Blvd
Carlos Bee Blvd
Mission - Foothill
Tanglewood
Highland Blvd
Morse Ct
University Ct
Campus Dr
Vista Greens
2nd St
Bland St
Weir St
Oakes Dr
Lancaster Ct
Lancaster Rd
Carisbrook Ct
Cromwell Pl
Oakes Dr
Old Highlands Park
Green
Map data ©2012 Google -

April13, 2012

Our Concerns and Comments Regarding the Mitigated Negative Declaration & Approval of PLN2010-00140: Vesting Tentative Tract Map 8057

Comments;

We were never contacted in any form about the MND/IS for Vesting Tentative Tract Map 8057. Only by chance in which we ran into a couple of Jelincic drive and Sulfur-Creak neighbors, who told us about this project. Although we will be one of the most impacted if this project goes forward, as we live on Walters Dinos ct. with the largest side of our property directly connected to the gravel access lane currently in place on PG&E land.

A couple days later on **March 29, 2012(post marked March 26, 2012)** we received a Public Hearing Notice indicating "Formal notice of the availability of the MND/IS as required by CEQA was provided on February 27, 2012, and indicated the comment period would end on **March 28, 2012**". Although you would extend the comment period to April 13, 2012, I did keep it in case you need proof.

We do not want to become the new Jelincic drive disaster!

Concerns;

1. On page 22 of the Proposed Finding that "a. The Project does not have environmental effects that will cause substantial adverse effect on human being, either directly or indirectly, because all adverse effect of the Project will be mitigated to an **insignificant level."**
   This is complete rubbish as we will have loud and heavy machines going up and down the gravel access road on Fairview Ave. The gravel access road is quite steep therefore the trucks/construction machines will have to accelerate and throw up a large amount dirt and gravel.
   *****On page 21 Noise-generating activities during construction **cannot be 7 days a week**, some of our neighbors work at night and sleep during the day. Week days will be slightly bearable but not weekends!
   Then once the development is complete we will have approximately 30 cars driving up and down street "A" in the mornings and at night. We will

have head lights and car exhaust into our windows and most of all the loss of privacy. The noise of acceleration going up street “A” and the potential for cars coming down street “A” too fast, if the cars miss the bend to the left they could end up on my property.

   a. Contractor/ engineer could find another area to access the development instead of using the PG&E land or we should not have to endure all the negative impact of this construction.
   b. The development should soundproof our home by installing double-paned windows to replace all existing windows on our property.
   c. Noise generating days and hours 7:00am to 7:00pm on weekdays and no hours on weekends.

2. Who is in charge of what? Who’s job is it to make sure the Project Sponsor, Developer and Contractor are doing the correct job and following the required conditions in the MND/IS ? When I asked this question in the April 5, 2012 meeting…. I got the impression no one will be able to do anything. Including the Sheriff’s department in case of any noise as they said they do not have jurisdiction.
   a. We need a list of names and numbers to whom we can call in case of any situation which may arise due to this project.
   b. The names on this list should be made aware and agree to their part before any construction is to start.
   c. If the contractor, Project Sponsor, engineer ext…ext... break the MND/IS agreement they should have to pay a fine. Fine can be used for schools or given to neighbors as we are the ones having to put up with it.

3. Water drainage must be done correctly! A lot of water comes down from that land and apparently there is an aquifer too. Who will take care of the storm water treatment before the houses are sold and therefore no homeowners association?
   a. If the contractor/developer/bank is not taking care of this then the planning commission should take it over?

We as home owners should not be subject to the negative impact of any new construction. As we saw on Jelincic Drive the MND/IS said one thing and the

developer did as they pleased. Planning Division/commission did not do much if anything at all. We need accountability before this plan gets approved so we do not end up like Jelincic Drive.

Concerned home owners,

Cinthia Josefina & Juan Manuel Martinez

3495 Walters Dinos Ct. Hayward, Ca 94542

FAIRVIEW COMMUNITY CLUB INC.

(A Non-Profit Organization)

HAYWARD, CALIFORNIA 94543

13 April 2012

Mr. Albert Lopez
Alameda County Planning Directors
Alameda County Planning Departments
224 W. Winton Avenue, Suite 111
Hayward, CA 94344

INITIAL STUDY & MITIGATED NEGATIVE DECLARATION TRACT 8057 RESIDENTIAL PROJECT, 24850 FAIRVIEW AVENUE, UNINCORPORTED FAIRVIEW AREAS, HAYWARD, CA 94542

This is to acknowledge receipt of your Initial Study & Mitigated Negative Declaration (IS/MND) for the Proposed Track Map 8057 Residential Subdivision Project.

The Fairview Community Club submits its objections to the Initial Study & Mitigated Negative Declaration of Tract Map 8057, Residential Project 24850 Fairview Avenue, Unincorporated Fairview Area, Hayward, CA 94542.

We take issue with the findings contained in the Tract 8057 Initial Study & Mitigated Negative Declaration.

Specifically the following items:

HYDROLOGY AND WATER QUALITY ITEMS a, c, d, e, g and j (page 68). This project will exacerbate a dangerous condition existing on the North Fork of Sulfur Creek. This creek has been above capacity where it crosses Madeiros Avenue for several years. Residents have notified the county and the county has refused to respond stating that this is private property. However the county has been transferring storm water runoff from the watershed serving the Don Castro basin and the South Fork of Sulfur Creek for several years. This project will move more storm water to the North Fork watershed. This exposes people and structures to a significant risk of loss injury or death.

Storm water treatment plans as presented by the developer fail to address flooding. Future drainage flow directions (page 73) fail to address the solution to existing flooding and proper disposition of drainage from this site.

The initial study of Negative Declaration does not address the problem; therefore a full EIR would cover all areas omitted from the Initial Study & Mitigated Negative Declaration.

TRANSPORTATION The project will substantially increase hazards due to design features. Specifically access to the development will be through a narrow private entrance situated between two blind curves on Fairview Avenue. The traffic study does not adequately examine the projects' impact on two of the most congested intersections affecting Fairview.

MANDATORY FINDINGS OF SIGNIFICANCE Item c. The project will contribute to additional flooding of private property having substantial adverse effects on human beings. Further the access road located between 2 blind curves places people at risk of automobile collisions.

Listed below are our observations

1) Lots Stepped into the hillside. Some of the houses are being stepped into the hillside as required by the Fairview specific plan. But there are still a sizeable percentage being built on pads. The developer says this is OK because planning let other people violate the specific plan. We disagree with this. Further, the lots stepped into the hillside will rise above the ridgeline. This is in violation of the Fairview specific plan. The report shows a number of cross sections of views from different areas of the communities. It relies on homes being built out of compliance with the Fairview specific plan to block view of these homes from locations B, G and H (pp 28-32). We do not see the logic in depending on another development violating the Fairview specific plan to allow a second development to violate the plan.

2) STORM WATER TREATMENT. The site spans 3 watersheds North Fork of Sulfur Creek, South Fork Sulfur Creek, un-named creek draining to Don Castro. It is not clear exactly where they propose to drop all runoff created by the development, but runoff from the access road and the entire side of the development facing the Sulfur Creek South Fork watershed will be dropped into existing storm drains that feed the North Fork of Sulfur Creek. This North Fork is already over capacity. In recent years this section of the North Branch has routinely left its banks flooding private property and washing over Madeiros Ave at its undercrossing. This seems to be occurring more frequently each year. We anticipate this will get worse as homes are built to complete the development above Jelincic Drive. That development has a storm water treatment plant that pumps runoff from the watershed of the un-named creek that drains to Don Castro, over the hill and into the North Fork of Sulfur Creek. The developer installed a detention facility to slow drainage for water that would normally flow into the North Fork of Sulfur Creek. Sadly this will not work because the storm drain intakes along the roads in the development were placed on the uphill side of the street. This is causing hardship on downstream homeowners. Future plans as presented to date fails to address flooding.

3) TRAFFIC IMPACT. First the section on traffic blandly asserts that the traffic impact will be minimal. It does not assess its impact on already bad situations at the intersections of D Street and 2nd Street as well as the Center, Kelley, B Street. Intersection. Peak flows at these intersections take multiple signal cycles to clear the intersection. Each development that adds 'negligible' amounts of traffic simply adds to a bad situation. Seems like someone ought to have some analysis on what we can expect at these intersections as the area gets built out. Second, access to the development is dependent on a 24 foot wide access road off of Fairview Ave. This road intersects Fairview Ave between two blind curves. This looks like a very unsafe set up. At a minimum they should consider a cutout on the downhill direction of Fairview to let traffic exiting Fairview into the development to get out of the road quickly to protect against collisions from vehicles rounding the bend. Maybe they could put in one of those flashing speed signs. One is already installed just past the existing gravel road. What do the CHP and Sheriff think about this design?

4) STREET LIGHTING. Have residents on Walters Dinos and other adjacent streets had a chance to review the street lighting plan?

5) SET BACKS. Should comply with the Fairview Ave specific plan as indicated on pages 4 and 5. The project should also comply totally with the Fairview specific plan.

6) CONSTRUCTION HOURS: weekends Saturday 8-6 pm, Sunday no work.

CONCLUSION. In view of the shortcomings of the Initial Study & Mitigated Negative Declaration, we feel that this IS/MND be rejected.

RECOMMENDATIONS. (1) The Initial Study & Mitigated Negative Declaration for Track 8057 does not completely give solutions to the drainage problems for this project, transportation and traffic and grading, therefore, it is recommended that a full environmental report be prepared for this project. (2) Natural and man-made slopes of 30% gradient or greater should not be developed or altered.

Sincerely Yours,

CHRIS HIGGINS
Chairman, Zoning Committee

CHARLES L. SNIPES
President

3) TRAFFIC IMPACT. First the section on traffic blandly asserts that the traffic impact will be minimal. It does not assess its impact on already bad situations at the intersections of D Street and 2nd Street as well as the Center, Kelley, B Street. Intersection. Peak flows at these intersections take multiple signal cycles to clear the intersection. Each development that adds 'negligible' amounts of traffic simply adds to a bad situation. Seems like someone ought to have some analysis on what we can expect at these intersections as the area gets built out. Second, access to the development is dependent on a 24 foot wide access road off of Fairview Ave. This road intersects Fairview Ave between two blind curves. This looks like a very unsafe set up. At a minimum they should consider a cutout on the downhill direction of Fairview to let traffic exiting Fairview into the development to get out of the road quickly to protect against collisions from vehicles rounding the bend. Maybe they could put in one of those flashing speed signs. One is already installed just past the existing gravel road. What do the CHP and Sheriff think about this design?

4) STREET LIGHTING. Have residents on Walters Dinos and other adjacent streets had a chance to review the street lighting plan?

5) SET BACKS. Should comply with the Fairview Ave specific plan as indicated on pages 4 and 5. The project should also comply totally with the Fairview specific plan.

6) CONSTRUCTION HOURS: weekends Saturday 8-6 pm, Sunday no work.

CONCLUSION. In view of the shortcomings of the Initial Study & Mitigated Negative Declaration, we feel that this IS/MND be rejected.

RECOMMENDATIONS. (1) The Initial Study & Mitigated Negative Declaration for Track 8057 does not completely give solutions to the drainage problems for this project, transportation and traffic and grading, therefore, it is recommended that a full environmental report be prepared for this project. (2) Natural and man-made slopes of 30% gradient or greater should not be developed or altered.

Sincerely Yours,

CHRIS HIGGINS
Chairman, Zoning Committee

CHARLES L. SNIPES
President

Tract 8057 Residential Subdivision Project

I take issue with the findings contained in the Tract 8057 Initial Study & Mitigated Negative Declaration.

Specifically: the Following Items

IX Hydrology and Water Quality Items a, c, d, e, g, and j. Most important is item J. This project will exacerbate a dangerous condition existing on the North Fork of Sulfur Creek. This creek has been above capacity where it crosses Madeiros Avenue for several years. Residents have notified the county and the county has refused to respond stating that this is private property. Howver the county has been transferring storm water runoff from the watershed serving the Don Castro basin and the South Fork of Sulfur Creek for several years. This project will move more storm water to the North Fork watershed. This exposes people and structures to a significant risk of loss injury or death.

XVI Transportation The project will substantially increase hazards due to design features. Specifically access to the development will be through a narrow private entrance situated between two blind curves. The traffic study does not adequately examine the projects' impact on two of the most congested intersections affecting Fairview

XVIII Mandatory Findings of Significance. Item c. The project will contribute to additional flooding of private property having substantial adverse effects on human beings. Further the access road located between 2 blind curves places people at risk of automobile collisions.

Listed below are my observations

1) Lots Stepped into the hillside. Some of the houses are being stepped into the hillside as required by the Fairview specific plan. But there are still a sizeable percentage being built on pads. The developer says this is OK because planning let other people violate the specific plan. I disagree with this. Further, the lots stepped into the hillside will rise above the ridgeline. This is not permitted in the Fairview specific plan. The report shows a number of cross sections of views from different areas of the communities. It relies on homes being built out of compliance with the Fairview specific plan to block view of these homes from locations B, G and H (pp 28-32). I do not see the logic in depending on another development violating the Fairview specific plan to allow a second development to violate the plan.
2) Number of lots permissible: Have you calculated how many homes may be built on this tract using the definitions in the Fairview Specific Plan? Seems like areas too steep etc are not supposed to be counted in the lot size.
    a. Gross acre of developable site area means: 1) Areas of less than 30% slope; 2) Areas outside of any private streets, access easements, stems, driveways that serve more than one lot, designated parking spaces, and any other unservable or unbuildable portion of the lot; and 3) Areas outside of riparian areas. For purposes of this Area Plan, a riparian area is defined as any area for which a watercourse, intermittent or perennial; pond; lake; marsh; or any other wetland; or the vegetation of wildlife dependent on or associated with any of the above, forms the environmental focal point. The limits of a

riparian area will normally be considered the demarcation line between the vegetation zones of wetland and upland.

3) ***Storm Water treatment***. The site spans 3 watersheds North Fork of Sulfur Creek, South Fork Sulfur Creek, un-named creek draining to Don Castro. It is not clear exactly where they propose to drop all runoff created by the development, but runoff from the access road and the entire side of the development facing the Sulfur Creek South Fork watershed will be dropped into existing storm drains that feed the North Fork of Sulfur Creek. This North Fork is already over capacity. In recent years this section of the North Branch has routinely left its banks flooding private property and washing over Madeiros Ave at its undercrossing. This seems to be occurring more frequently each year. We anticipate this will get worse as homes are built to complete the development above Jelincic Drive. That development has a storm water treatment plant that pumps runoff from the watershed of the un-named creek that drains to Don Castro, over the hill and into the North Fork of Sulfur Creek. The developer installed a detention facility to slow drainage for water that would normally flow into the North Fork of Sulfur Creek. Sadly this will not work because the storm drain intakes along the roads in the development were placed on the uphill side of the street. This is causing hardship on downstream homeowners.
4) ***Traffic impact***. First the section on traffic blandly asserts that the traffic impact will be minimal. It does not assess its impact on already bad situations at the intersections of D Street and 2nd Street as well as the Center, Kelley, B Street. Intersection. Peak flows at these intersections take multiple signal cycles to clear the intersection. Each development that adds 'negligible' amounts of traffic simply adds to a bad situation. Seems like someone ought to have some analysis on what we can expect at these intersections as the area gets built out. Second, access to the development is dependent on s 24 foot wide access road off of Fairview Ave. This road intersects Fairview ave between two blind curves. This looks like a very unsafe set up. At a minimum they should consider a cutout on the downhill direction of Fairview to let traffic exiting Fairview into the development to get out of the road quickly to protect against collisions from vehicles rounding the bend. Maybe they could put in one of those flashing speed signs. One is already installed just past the existing gravel road. What do the CHP and Sheriff think about this design?
5) Street lighting. Have residents on Walters Dinos and other adjacent streets had a chance to review the street lighting plan.
6) Grading. Have the residents on Walters Dinos and Old Fairview Ave had a chance to look at the grading plans? Somehow neighboring properties never seem to be notified of the huge mound of dirt they will soon be seeing from their kitchen window etc.
7) Construction hours. Why is it OK to work until 8PM on weekends? If I lived adjacent to the property I would request that no work be done on weekends. Also what is the penalty for working outside the posted work hours? Right now there is no penalty and constructions sites routinely ignore the posted working hours. Could you please enclose an appendix with the county noise ordinance in the next distribution of information?

Tract 8057 Residential Subdivision Project

I take issue with the findings contained in the Tract 8057 Initial Study & Mitigated Negative Declaration.

Specifically: the Following Items

IX Hydrology and Water Quality Items a, c, d, e, g, and j. Most important is item J. This project will exacerbate a dangerous condition existing on the North Fork of Sulfur Creek. This creek has been above capacity where it crosses Madeiros Avenue for several years. Residents have notified the county and the county has refused to respond stating that this is private property. Howver the county has been transferring storm water runoff from the watershed serving the Don Castro basin and the South Fork of Sulfur Creek for several years. This project will move more storm water to the North Fork watershed. This exposes people and structures to a significant risk of loss injury or death.

XVI Transportation The project will substantially increase hazards due to design features. Specifically access to the development will be through a narrow private entrance situated between two blind curves. The traffic study does not adequately examine the projects' impact on two of the most congested intersections affecting Fairview

XVIII Mandatory Findings of Significance. Item c. The project will contribute to additional flooding of private property having substantial adverse effects on human beings. Further the access road located between 2 blind curves places people at risk of automobile collisions.

Listed below are my observations

1) Lots Stepped into the hillside. Some of the houses are being stepped into the hillside as required by the Fairview specific plan. But there are still a sizeable percentage being built on pads. The developer says this is OK because planning let other people violate the specific plan. I disagree with this. Further, the lots stepped into the hillside will rise above the ridgeline. This is not permitted in the Fairview specific plan. The report shows a number of cross sections of views from different areas of the communities. It relies on homes being built out of compliance with the Fairview specific plan to block view of these homes from locations B, G and H (pp 28-32). I do not see the logic in depending on another development violating the Fairview specific plan to allow a second development to violate the plan.
2) Number of lots permissible: Have you calculated how many homes may be built on this tract using the definitions in the Fairview Specific Plan? Seems like areas too steep etc are not supposed to be counted in the lot size.
    a. Gross acre of developable site area means: 1) Areas of less than 30% slope; 2) Areas outside of any private streets, access easements, stems, driveways that serve more than one lot, designated parking spaces, and any other unservable or unbuildable portion of the lot; and 3) Areas outside of riparian areas. For purposes of this Area Plan, a riparian area is defined as any area for which a watercourse, intermittent or perennial; pond; lake; marsh; or any other wetland; or the vegetation of wildlife dependent on or associated with any of the above, forms the environmental focal point. The limits of a

riparian area will normally be considered the demarcation line between the vegetation zones of wetland and upland.

3) ***Storm Water treatment***. The site spans 3 watersheds North Fork of Sulfur Creek, South Fork Sulfur Creek, un-named creek draining to Don Castro. It is not clear exactly where they propose to drop all runoff created by the development, but runoff from the access road and the entire side of the development facing the Sulfur Creek South Fork watershed will be dropped into existing storm drains that feed the North Fork of Sulfur Creek. This North Fork is already over capacity. In recent years this section of the North Branch has routinely left its banks flooding private property and washing over Madeiros Ave at its undercrossing. This seems to be occurring more frequently each year. We anticipate this will get worse as homes are built to complete the development above Jelincic Drive. That development has a storm water treatment plant that pumps runoff from the watershed of the un-named creek that drains to Don Castro, over the hill and into the North Fork of Sulfur Creek. The developer installed a detention facility to slow drainage for water that would normally flow into the North Fork of Sulfur Creek. Sadly this will not work because the storm drain intakes along the roads in the development were placed on the uphill side of the street. This is causing hardship on downstream homeowners.
4) ***Traffic impact***. First the section on traffic blandly asserts that the traffic impact will be minimal. It does not assess its impact on already bad situations at the intersections of D Street and 2nd Street as well as the Center, Kelley, B Street. Intersection. Peak flows at these intersections take multiple signal cycles to clear the intersection. Each development that adds 'negligible' amounts of traffic simply adds to a bad situation. Seems like someone ought to have some analysis on what we can expect at these intersections as the area gets built out. Second, access to the development is dependent on s 24 foot wide access road off of Fairview Ave. This road intersects Fairview ave between two blind curves. This looks like a very unsafe set up. At a minimum they should consider a cutout on the downhill direction of Fairview to let traffic exiting Fairview into the development to get out of the road quickly to protect against collisions from vehicles rounding the bend. Maybe they could put in one of those flashing speed signs. One is already installed just past the existing gravel road. What do the CHP and Sheriff think about this design?
5) Street lighting. Have residents on Walters Dinos and other adjacent streets had a chance to review the street lighting plan.
6) Grading. Have the residents on Walters Dinos and Old Fairview Ave had a chance to look at the grading plans? Somehow neighboring properties never seem to be notified of the huge mound of dirt they will soon be seeing from their kitchen window etc.
7) Construction hours. Why is it OK to work until 8PM on weekends? If I lived adjacent to the property I would request that no work be done on weekends. Also what is the penalty for working outside the posted work hours? Right now there is no penalty and constructions sites routinely ignore the posted working hours. Could you please enclose an appendix with the county noise ordinance in the next distribution of information?

From: Jmquock@aol.com
To: Young, Andrew, CDA; Lopez, Albert, CDA; phil.sawrey-kubicek@acgov.com
Subject: Final Version of Part One Re Mit. Neg. Declar. Appvl, PLN2010-00140, Map 8057
Date: Friday, April 13, 2012 12:51:53 AM

Please ignore earlier e-mail sent on this subject and replace it with this version, which contains minor corrections and changes.

Preface: We would like to note that when we reference the "County" and "Planning Department," this does not include Planning Department Andrew Young, the only current employee whom I have found was and is willing to hear our concerns and follow through with his offer to provide information we were not privy to prior to our phone call.

We are e-mailing Mr. Young as well as Albert Lopez, who signed the draft MND/IC, our concerns and request that these concerns to be incorporated in the Final MND/IS. More importantly, we request that this e-mail and any and all attachments, be read by all agencies, Planning Commissioners, and other parties BEFORE a decision to approve or deny commencement of the above development is made.

Comments and Concerns Regarding the Mitigated Negative Declaration & Approval of PLN2010-00140: Vesting Tentative Tract Map 8057

Before addressing the above subject matter, we would like to make a few general comments. First, as residents since 1980 of 24842 Fairview Avenue, on the northeast corner of Fairview Avenue and Walters-Dinos Court, and adjacent to the PG&E access road, which forms the boundary on one side of our property, we feel we would be impacted more substantially than any other existing single family home owners due to the proposed location of “Street A” and to potential water drainage problems.

Yet we, and all the others residents living on Walters-Dinos Court were NOT notified (as claimed) of any meetings or tentative plans for this proposed housing project. It was only by chance that at least three of said residents learned of and attended the last meeting, which we could not, being out of the country at the time. The attendees informed us that at said meeting they were not allowed to ask questions or make comments until the very end, when their opportunity to do so was extremely limited and unsatisfactory – ninety percent of what they came to express and learn did not occur. Moreover, the developer was allowed to claim that all affected neighbors had been notified of what was going on and that they had no objections. His preposterous claim was not challenged by the Planning personnel, nor were any interested parties allowed to question this statement. If this is an indication of what this developer can

"get away with" and what the Planning Commission and Department allows to occur, we have every reason to assume the worst. It is nice to have all these assurances in writing that "all adverse effects of the Project will be mitigated to an insignificant level." Enforcement of these promises and assurances, however, is an entirely different matter, judging from our and other area residents' past experiences. If the Planning Department is responsible for drawing up a highly idealistic plan so that it can be approved, the Department needs to furnish in writing within the MND/IS the guarantee that it will conscientiously enforce the mitigations alluded to in the Report and not rely on the Developer's (questionable) word that they will carry out the requirements incorporated as part of the MND/IS.

In fact, we consider it highly misleading and untrue that, as stated on page 22 of the

Proposed Finding that "a. The Project does not have environmental effects that will cause substantial adverse effect on human being, either directly or indirectly, because all adverse

effect of the Project will be mitigated to an **insignificant level."** (Boldface mine)

It is our understanding that a number of residents from the Jelincic Development were present at this meeting. The negative experiences of the Jelincic residents does not bode well for this project. In fact, lawsuits are ongoing regarding water drainage problems caused by the developer's blatant disregard for written requirements for the road built (substantailly higher than specified), resulting in serious drainage problems for the existing residents located at a lower elevation!

Sales of the homes in this existing development are few and far between, if any, due to the shoddy work of the homes and infrastructure, as well as the lawsuits. In view of all this, we question why the Planning Commission would consider proceeding with a repeat of this disaster, particularly at a time when home sales in this entire area are and have been extremely slow – all new homes on Fairview between the two traffic circles are either sitting vacant or took years to finally sell! In fact, a brand new spec home has been vacant for years and is now in foreclosure.

In light of the above, why is another dubious housing project being rammed down the throats of local residents, most of, if not all of whom have not been receiving notices of meetings and intent, as claimed? We would like an answer to this question <u>now</u> by phone or e-mail because we will be out of state when the next meeting will take place (but hope to send a representative in our stead, if possible.)

We would like an answer to this question <u>now</u> by phone or e-mail

The two aspects of the tentative MND/IS we are most concerned with regard, first, “Street A” and, secondly, the substantial and increased drainage problems which will be exacerbating the already unsafe and unsatisfactory conditions existing on this section of Fairview Avenue

I. **Street A**

A. We are entirely opposed to the building of this Street and question its necessity. We think there should be <u>one</u> access road, not two, and that Street B should be configured to provide access to the development right from the start, rather than a vague mention of connecting Street B (a proposed cul de sac) to Street A at some point in the future.

1.

B. Traffic should be altered at a point east of the curve before Street B with a stop sign, followed by a speed bump before Street B enters Fairview Avenue.

2. C. If, despite our objections, Street A is implemented, we vigorously object to the location of the first one hundred feet or so (the exact length cannot be determined by the maps provided) of St. B where it intersects with Fairview Avenue. This location is the **absolute worst place** for this section of St. A for many reasons, as follows:

    1. We are already fronted by Fairview Avenue and (when facing our property) by Walters-Dinos Court on the left. By putting in St. A along the entire length of the right side of our property, we would land up with the dubious distinction of having a **house surrounded by roads on three sides.** This would result in our property being extremely undesirable and unmarketable, lowering its existing fair market value by approximately $150,000. We demand the developer pay us upfront for the exact damages, to be determined by an appraiser of our choice, **before any construction of St. A commences.**

    2. If the developer is unwilling to agree to the above monetary request, we ask that the developer and County Planner come up with a more amenable placement of St. A where St. A parallels the side of

our property described in the above paragraph. We understand the need to account for the grade/slope of St. A; however, we highly object to bearing the brunt of the negative impacts which would result from this placement. Surely, there could and should be a satisfactory alternative.

3. We could not determine from the maps, and Andrew Young was not able to tell us, whether St. A would be a number of feet distant from the PG&E road. A neighbor interpreted the location of St. A as actually **encroaching on the PGE road**! We shudder to think what this would mean, if true. Where would the sound wall (mentioned by Andrew Young) be built in that case? It seems such a sound and visual barrier would have to be constructed right along our property line, physically hemming us in to a degree we are unwilling to tolerate. A Street should be at least 30 feet from our side property line or it should not be built at all!

   In fact, St. A is one of the most terrible, inefficient, poorly designed example of land use we have ever seen. To approve of this access road would be criminal.

We consider it highly misleading and untrue that, as stated on page 22 of the

Proposed Finding that “a. The Project does not have environmental effects that will cause substantial adverse effect on human being, either directly or indirectly, because all adverse

effect of the Project will be mitigated to an **insignificant level.”** (Boldface mine)

4. We have already experienced the ill effects of construction noise, air pollution and traffic when another developer commenced preparatory steps in connection with the development of this same site. We suffered for four months before we were able to convince the developer to wet the dirt PG&E road and to erect a temporary chain link dust barrier fence in order to mitigate the resulting dust which

rendered our back and side yard unlivable. The County, incidentally, did nothing except to tell us to deal with the developer ourselves, just as the Jelincic residents were given the runaround as to who was responsible for ensuring the developer from having construction equipment working at 3 a.m. We have observed developers pretty much doing what they d---- please, beholden only to themselves, once they have the County's approval, based on written promises which are not carried out in reality.

5. The vehicular emissions and noise from cars entering and exiting St. A at Fairview Avenue once the development is completed, as well as the construction equipment doing so beforehand will be substantial. There will be a tendency to come down St A faster than desired because of the considerable downward slope; and the necessity to rev or “gun” the engine to start the climb up the slope will add to the noxious vehicular emissions and noise. Speed controls such as bumps, traffic lane “dots” and guard rails along the first 100 feet intersecting with Fairview Avenue, should, at the very least, be part of St. A.

6. However, in order to mitigate the construction and subsequent "to an insignificant level," as reported in the preliminary MND/IS, we propose the developer reimburse us **before** any work is done, the full cost for quality materials and installation of soundproof, double-paned windows and doors to replace all existing windows and sliding glass doors on our property.

7. We were pleasantly impressed with how effective this type of soundproofing was in blocking out the traffic noise coming from a heavily used street in San Francisco. A ballpark estimate for this noise abatement solution is $9800; we would be willing to obtain two or three bids for this work. The developer

should make the same offer to all homeowners on Walters-Dinos Court who will also be adversely affected by traffic noise as well.

8. We now are in the habit of exiting our driveway by backing up onto Fairview Avenue when it is safe to do so. If St. A were installed as proposed, we would be risking our lives every time

9. we entered Fairview Avenue in this manner. Even if we were to execute a difficult maneuver on our property allowing us to enter Fairview Avenue front first, we would still be substantial risk due to the added traffic from Sts. A and B, as well as the limited visibility up Fairview Avenue created by the proposed soundwall.

1.

10. St. A egress onto Fairview Avenue needs to have a clear driver sight line to view oncoming cross traffic as well. We have witnessed numerous vehicular accidents such as fatal crashes, spinouts, overturned cars, and animal encounters, not to mention innumerable near misses around the blind curve between Courtney Lane and Levine Road on Fairview Avenue. The number of accidents has been greatly reduced following the reconfiguration of the blind curve. We foresee this number increasing yet again, once St. A and St. B are installed.

Note: Part Two of this e-mail, addressing Drainage issues, will be sent in a separate e-mail

Joan and Stephen Quock

510-886-5188

Young, Andrew, CDA

From: Jmquock@aol.com
Sent: Friday, April 13, 2012 4:49 PM
To: Young, Andrew, CDA; Lopez, Albert, CDA; Sawrey-Kubicek, Phil, CDA
Subject: Part Two Re Mit. Neg. Declar. Appvl, PLN2010-00140, Map 8057

This is a continuation of Part One, which was e-mailed on 4/12/13, concerning comments on negative impacts to the property located at 24842 Fairview Avenue, on the northeast corner of said Avenue and Walter-Dinos Court.

II. Drainage

A. Slope on Northeast Side of our Property

1. The previous developer (Atwal?) had graded and graveled the PG&E access road, which raised the grade of the road. This resulted in allowing rainwater to flow onto our slope abutting the road, which did not occur before this "improvement." This developer planned to construct a paved road with an extensive drainage system which would have prevented the erosion and excess rainstorm water to flow onto our property. This mitigation procedure never occurred when the developer (Atwal?) did not go ahead with the housing project and, apparently, sold off the property to another developer sponsored by Northbrook Homes, LLC. There is no mention of such improvement for the PG&E access road in the MND/IS draft to which we are responding. ***It is imperative that this issue is addressed and resolved to our satisfaction in the next few months.***

This photo A (dated 4/12/12) shows part of the erosion and drainage problem discussed above. Last spring we spent over $1,000 in an attempt to have our gardeners remedy this situation. It is obvious a more effective, permanent solution will take considerable more money and effort by a professional landscaper, to be paid for by the new developer and/or PG&E.

B. Surface Drainage System on Fairview Avenue at front of our Property

1. Since we purchased the property in August of 1980, the curve on Fairview Avenue between Courney Lane and Levine Road
was realigned to help prevent the numerous spin-outs, crashes and fatalities which occurred regularly. Up to that time, all the rainwater was going to the south (across from us) side of Fairview, which was able to handle the runoff. We failed to convince the
people in charge who installed the new drainage system that by changing the slope of that portion of Fairview Avenue so that the runoff now is evenly divided to run down both sides of Fairview Avenue, the surface trench drainage system on our (north) side would have to be redesigned to handle the considerable additional runoff during and following rains.

To add insult to injury, The Road Maintenance Department rarely maintains the inadequate open trench drainage system which was installed on the north side and failed to make any improvement whatsoever to the open trench area which fronts our property. In the rare ("we'll get around to it" = not done in over 3 years) instances when the trench is weeded and mud removed, the crew stops all maintenance right where our property starts and work is absolutely needed for any water to be able to flow through!
I have resorted to hiring people to do this work; but am not happy about paying over $160,00 in property taxes to Alameda County
over the years and not receiving minimal justified service, even being told we would have to pay out-of-pocket to remedy a situation we did not ask for and warned would be a major problem.

Currently, there are weeds, rocks, mud and debris pushed by heavy rain runoff onto the surface trench drainage system, creating hazardous traffic conditions for people driving on Fairview Avenue. Additionally, our asphalt driveway has been heavily
damaged. (see photo B) We fear the proposed development will only exacerbate this situation. There is mention of the possibility of an overflow pipe becoming clogged, which seems inevitable unless it is adequately maintained but no mention of any maintenance requirement is included in the Draft. Likewise, the mention of hay bales and other materials to prevent erosion pm the development site does not mention periodic, seasonal replacement -- without such requirement, who will have the responsibility to do so?

Photo B showing driveway damage due to runoff flowing over our driveway due to inadequate drainage system

Photos C, D and E showing totally non-functional, non-maintained by County, inadequate drainage system in front of our property

Photo C - Other side of driveway

Photo D - This reminds me of Third World Country infrastructure!

2. In contrast to the above photo, somehow the County had the funds the install a fancy drainage system on the opposite (south) side of Fairview Avenue after that side was designed to receive only **half** the runoff it had been receiving. That side is also satisfactorily maintained. What is the reason for this outrageous discrepancy? We demand answers and solutions!!

Photo E: View of drainage system directly across from our driveway

Photo E - In case you think we live in a dump, judging by Photos B,C, & D, here is our "castle" we try to maintain to the best of our ability as senior citizens. We don't, however, want a "moat" as part of it.

This drainage problem on Fairview Avenue must be corrected before 40 or more new residents will be forced to deal with this safety issue.

III. Miscellaneous -

There is mention of 5 15-gallon trees replacing a very mature cypress tree which now screens (more or less) our view of a looming, unsightly "MacMansion" erected a few years ago. We were told

the owner of a nearby existing home was out of country when the McMansion went up so he no opportunity to protest; it now completely blocks his once "multi-million dollar view."

A handful of spindly one to two inch in diameter trees is not an adequate substitute for the existing grove of trees. Moreover, there is no provision for the care and maintenance of these replacement trees. They will not survive without adequate water for the first few years and what's to prevent the deer from eating them?

IV. Conclusion

Due to time constraints, we will limit our written comments although we have other issues.

Joan and Stephen Quock
510-886-5188

T

TWK Enterprises
Mergers & Acquisitions
Phone: (650) 259-9611 Fax: (650) 259-9668
Call Toll Free: (866) 524-6283

Offices in:
Millbrae, Ca
Torrance, Ca
Taipei, Taiwan

To Alameda County Planning Commission

From Jack Wan, 25358 Old Fairview Ave. Hayward, CA 94542

And Bob Cecchini, 25298 Old Fairview Ave, Hayward, CA 94542

Re: application PLN2010-00140

We have read the Negative Declaration in reference to the application above. Here are my two comments:

1. The proposed access road is built under high tension towers, how do you prevent traffic accidents that may take those towers down and cause major blackouts? The fall of any of those wires on the towers may cause damages to properties, fire or death.
2. We have experienced increase activities of gofers, ground hogs and other subterranean small animals due to building activities near our properties, such as the development of Karina Court and Street. As a result, our lawn suffers damages; please consider avoidance procedures or compensations when approving this project.

Regards,

, April 11, 2012

Jack Wan

Bob Cecchini

1350 Murchison Dr.
P. O. Box 1576
Web URL : www.twkinc.com

Millbrae, Ca 94030
Millbrae, Ca 94030
E-Mail: broker@twkinc.com

Robert and Patricia Smith
3552 Old Quarry Road
Hayward, California 94541
Telephone: 510/881-0693
Facsimile: 510/581-2543
e-mail: patricia@jennerlaw.com

March 15, 2012

Albert Lopez
Andrew Young
Alameda County Community Development Agency
Planning Department
224 West Winton Avenue, Room 111
Hayward, CA 94544

RE: Vesting Tentative Tract Map 8057, PLN2010-00140 - Lerob

Dear Planning Department Personnel:

We are interested parties to the referenced action and have reviewed your letter of February 27, 2012. We currently hold the PG&E lease property for cattle grazing as we have for the past 35 years. We will be attending the public hearing scheduled for May 7, 2012, as noted in your letter.

PG&E has not communicated to us that apparently the developer has obtained an easement through a portion of the PG&E property under our lease. Therefore, we would simply state the following concerns:

1. Under our lease with PG&E, we are required to provide liability insurance and weed abatement procedures on the property. We would like some assurance that we will not be held liable should anyone become injured from the County or representing the developer. Until we are notified by PG&E otherwise, anyone on the property is trespassing with the exception of Mr. Tuttle, our partner in managing the cattle.

2. There is an existing water line that provides water for our cattle. We would want this line preserved or a new line installed under the proposed road for that purpose.

3. We are concerned about the safety and security of our cattle, as well as any potential trespassers onto the PG&E property. We recently lost a pregnant cow to a direct shot to her head while penned up in a separate pen to give birth and she had nowhere to go. Any time there is a new track of homes built near our residence, there is always the potential for this type of activity from new residents. In that regard, we would request that secure fencing be installed between all portions of the PG&E property remaining for our use, as well as the property line between us and the referenced project, and the new development and easement area.

4. We have concerns about drainage and want to be assured that any runoff is taken away from the PG&E property and not just dumped down to what is now a small creek/stream, said creek/stream continuing onto our 12-acre parcel, and which could potentially cause flooding and erosion problems to us.

Thank you for the opportunity to present our concerns and we look forward to the meeting on May 7, 2012.

Sincerely,

Robert & Patricia Smith

RS/PS
cc: Gary Brooks
Mike Tuttle
PG&E

California Regional Water Quality Control Board
San Francisco Bay Region

Matthew Rodriquez
Secretary for
Environmental Protection

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • Fax (510) 622-2460
http://www.waterboards.ca.gov/sanfranciscobay

Edmund G. Brown, Jr.
Governor

March 13, 2012
CIWQS Place ID No. 778606

Sent via electronic mail: No hardcopy to follow

Alameda County Community Development Agency
Planning Division
224 West Winton Avenue, Room 111
Hayward, CA 94544

Attn: Albert Lopez (albert.lopez@acgov.org)

Subject: Initial Study / Mitigated Negative Declaration for the Tract 8057 Residential Subdivision Project near the City of Hayward in Alameda County

SCH # 2012022065

Dear Mr. Lopez:

San Francisco Bay Regional Water Quality Control Board (Water Board) staff have reviewed the *Initial Study / Mitigated Negative Declaration for the Tract 8057 Residential Subdivision near the City of Hayward in Alameda County (MND).* The MND evaluates the potential impacts of the proposed subdivision of the 10.1-acre development area into 15 home sites (Project). Water Board staff have the following comments on the MND.

Comment 1, Biological Resources, Wetlands and other Sensitive Natural Communities – Inadequate Assessment of Potential Jurisdictional Features at the Project Site (pages 50 and 51).

Water Board staff are concerned that the MND does not address all potential areas that may be subject to the jurisdiction of the Army Corps of Engineers (ACOE), the California Department of Fish and Game (CDFG), and the Water Board. In particular, the MND does not provide sufficient guidance on the need to consult with agencies other than the ACOE to determine the potential State regulatory status of wetlands and other waters at the Project site. The assessments performed by Olberding Environmental indicated three potential jurisdictional wetlands may be present at the Project site, while the initial assessment by Zander Associates disputed the presence of jurisdictional wetlands at the Project site. The assessment performed by Olberding Environmental was performed during a much more appropriate time of the year for making wetland determinations than the Zander Associates delineation inspection. Therefore, the ACOE and the Water Board should both be contacted to evaluate the potential presence of wetlands at the three locations identified by Olberding Environmental.

Also, the MND does not adequately address the potential regulatory status of the seasonal channel on site. The Olberding Environmental and Zander Associates reports differ in their assessment of the origin of the onsite channel. Based on the description of this feature and the

photograph in the *Biological Resources Analysis Report for the Borel Bank Property* (Olberding Environmental, June 2010), it is likely that this feature may be regulated by the ACOE, CDFG, and/or Water Board as a seasonal channel. These agencies should be contacted to determine the jurisdictional status of the channel.

The Water Board has regulatory authority over wetlands and waterways under both the federal Clean Water Act (CWA) and the State of California's Porter-Cologne Water Quality Control Act (California Water Code, Division 7). Under the CWA, the Water Board has regulatory authority over actions in waters of the United States, through the issuance of water quality certifications (certifications) under Section 401 of the CWA, which are issued in conjunction with permits issued by the Army Corps of Engineers (ACOE), under Section 404 of the CWA. When the Water Board issues Section 401 certifications, it simultaneously issues general Waste Discharge Requirements for the project, under the Porter-Cologne Water Quality Control Act. Activities in areas that are outside of the jurisdiction of the ACOE (e.g., isolated wetlands, vernal pools, seasonal streams, intermittent streams, channels that lack a nexus to navigable waters, or stream banks above the ordinary high water mark) are regulated by the Water Board, under the authority of the Porter-Cologne Water Quality Control Act. Activities that lie outside of ACOE jurisdiction may require the issuance of either individual or general waste discharge requirements (WDRs).

Comment 2, Biological Resources, Wetlands and other Sensitive Natural Communities – Inadequate Assessment of Potential Impacts to Jurisdictional Features at the Project Site and Inadequate Assessment of Potentially Necessary Mitigation Measures (pages 50 and 51).

While the current draft of the MND acknowledges that jurisdictional wetlands may be present onsite, the MND does not describe how each of these three potential wetlands may be impacted by the proposed Project. For any potential impact to a jurisdictional wetland, an MND should provide mitigation measures that would be sufficient to mitigate any impacts to such wetlands. The MND does not clearly identify the presence of adequate mitigation opportunities on the Project site to provide compensatory mitigation for any wetlands impacted by the proposed Project.

In addition, the MND lacks any discussion of potential Project impacts to the seasonal channel at the Project site, which may be subject to CDFG and Water Board jurisdictional authority, as well as ACOE jurisdiction. The MND should be revised to clarify the Project's impacts to the channel and to provide adequate mitigation for any impacts to the channel.

In a CEQA document, a project's potential impacts and proposed mitigation measures should be presented in sufficient detail for readers of the CEQA document to evaluate the likelihood that the proposed remedy will actually reduce impacts to a less than significant level. CEQA requires that mitigation measures for each significant environmental effect be adequate, timely, and resolved by the lead agency. In an adequate CEQA document, mitigation measures must be feasible and fully enforceable through permit conditions, agreements, or other legally binding instruments (CEQA Guidelines Section 15126.4). Mitigation measures to be identified at some

future time are not acceptable. It has been determined by court ruling that such mitigation measures would be improperly exempted from the process of public and governmental scrutiny which is required under the California Environmental Quality Act. The current draft of the MND lacks an adequate discussion of impacts and concrete proposals for mitigating those impacts.

The amount of proposed mitigation should include mitigation for temporal losses of any impacted waters of the State. If mitigation is out-of-kind and/or off-site, then the amount of the proposed mitigation should be increased.

If the MND is adopted without providing more detail related to the Project's impacts to jurisdictional waters and to provide more details related to concrete mitigation proposals for those impacts, it is likely that the MND will not be adequate to support the issuance of CWA Section 401 certification and WDRs.

Please contact me at (510) 622-5680 or bwines@waterboards.ca.gov if you have any questions.

Sincerely,

Brian Wines
Water Resources Control Engineer
South East Bay Counties
Watershed Division

cc: State Clearinghouse (state.clearinghouse@opr.ca.gov)
CDFG, Marcia Grefsrud (mgrefsrud@dfg.ca.gov)
USFWS, Cay Goode (cay_goode@fws.gov)
USFWS, Kim Squires (kim_squires@fws.gov)
Alameda County Community Development Agency, Planning Division, Phil Sawrey-Kubicek, Senior Planner (phil.sawrey-kubiceck@acgov.org)

Attachment 2: Notice of Preparation (NOP)

ORIGINAL

Notice of Preparation

Notice of Preparation

To: State Clearinghouse
1400 Tenth Street/P. O. Box 3044
Sacramento, CA 95814
(Address)

From: Phil Sawrey-Kubicek, Senior Planner
Alameda County Planning Department
224 W. Winton Ave. Hayward, CA 94544
(Address)

Subject: Notice of Preparation of a Draft Environmental Impact Report

The Alameda County Planning Department will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study (☐ is ☒ is not) attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to Phil Sawrey-Kubicek at the address shown above. We will need the name for a contact person in your agency.

Project Title: Tract 8057 Residential Subdivision Project

Project Applicant, if any: Northbrook Homes, on behalf of Lerob LLC

Date 2/27/2013

Signature [signature] for PSK

Title Senior Planner

Telephone 510/670-5400

Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

NOTICE OF PUBLIC SCOPING MEETING
for a
PROJECT EIR

NORTHBROOK HOMES
TENTATIVE TRACT MAP TR-8057, PLN2010-00140

Notice is hereby given that the Alameda County Planning Department, acting as the lead agency, will prepare an Environmental Impact Report (EIR) for the proposed Tract 8057 Residential Subdivision Project ("Project"), pursuant to the California Environmental Quality Act (CEQA) and State and County CEQA Guidelines. The Project is the proposal to subdivide two existing lots comprising 10.1 acres by Vesting Tentative Tract Map 8057 into 15 lots and one common lot for 15 new single family homes, with access from a new roadway to be constructed through an easement on an adjacent PG&E parcel, located on Fairview Avenue, unincorporated Fairview area of Alameda County, bearing Assessor's Parcel Numbers: 417-0260-004-00 and 417-0270-009-00, approximately 90 feet east of Walters Dinos Court.

Additional information, including the Initial Study for the Project and the Notice of Preparation (NOP) for the EIR, is available for review at the Planning Department, 224 W. Winton Avenue, Room 111, Hayward, CA and on the County's website: http://www.acgov.org/cda/planning/landuseprojects/currentprojects.htm

Any questions or comments should be directed in writing to: Phil Sawrey-Kubicek, Senior Planner, County of Alameda Planning Department, 224 W. Winton Avenue, Room 111, Hayward, CA 94544; (510)670-5400; or e-mailed to phil.sawrey-kubicek@acgov.org. Comments on the NOP must be received at the above mailing or e-mail address by 5:00 p.m. Monday April 1, 2013. Comments should focus on discussion of possible impacts on the physical environment, ways in which potential adverse effects might be minimized, and alternatives to the Project in light of the EIR's purpose to provide useful and accurate information about such factors. In addition, comments may be provided at the meeting indicated below.

SCOPING MEETING
Monday, March 18, 2013 6:00 p.m.
The Alameda County Planning Commission Hearing Room, 224 W. Winton Avenue, Hayward, CA.

All persons interested in the matter may appear and be heard at this meeting.

ALBERT LOPEZ - PLANNING DIRECTOR & SECRETARY
PLANNING COMMISSION OF ALAMEDA COUNTY

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #2012022065

Project Title: Tract 8057 Residential Subdivision Project

Lead Agency: County of Alameda | Contact Person: Phil Sawrey-Kubicek
Mailing Address: County Planning Dept., 224 W. Winton Ave. | Phone: 510-670-5400
City: Hayward | Zip: 94544 | County: Alameda

Project Location: County: Alameda | City/Nearest Community: Hayward
Cross Streets: Fairview Avenue at Levine Road | Zip Code: 94027
Longitude/Latitude (degrees, minutes and seconds): 37 ° 40 ′ 26.4 ″ N / 122 ° 02 ′ 36.96 ″ W | Total Acres: 10.1
Assessor's Parcel No.: 417-260-4-0; 417-270-9-0 | Section: | Twp.: | Range: | Base:
Within 2 Miles: State Hwy #: I-580 | Waterways: Sulphur Creek; San Lorenzo Creek headwaters
Airports: | Railways: | Schools: Fairview Elementary

Document Type:

CEQA: ☒ NOP ☐ Draft EIR | NEPA: ☐ NOI | Other: ☐ Joint Document
☐ Early Cons ☐ Supplement/Subsequent EIR | ☐ EA | ☐ Final Document
☐ Neg Dec (Prior SCH No.) | ☐ Draft EIS | ☐ Other:
☐ Mit Neg Dec ☐ Other: | ☐ FONSI

Local Action Type:

☐ General Plan Update ☐ Specific Plan ☐ Rezone ☐ Annexation
☐ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☐ Use Permit ☐ Coastal Permit
☐ Community Plan ☐ Site Plan ☒ Land Division (Subdivision, etc.) ☐ Other:

Development Type:

☒ Residential: Units 15 Acres 10.1
☐ Office: Sq.ft. Acres Employees ☐ Transportation: Type
☐ Commercial: Sq.ft. Acres Employees ☐ Mining: Mineral
☐ Industrial: Sq.ft. Acres Employees ☐ Power: Type MW
☐ Educational: ☐ Waste Treatment: Type MGD
☐ Recreational: ☐ Hazardous Waste: Type
☐ Water Facilities: Type MGD ☐ Other:

Project Issues Discussed in Document:

☐ Aesthetic/Visual ☐ Fiscal ☐ Recreation/Parks ☐ Vegetation
☐ Agricultural Land ☐ Flood Plain/Flooding ☐ Schools/Universities ☐ Water Quality
☐ Air Quality ☐ Forest Land/Fire Hazard ☐ Septic Systems ☐ Water Supply/Groundwater
☐ Archeological/Historical ☐ Geologic/Seismic ☐ Sewer Capacity ☐ Wetland/Riparian
☐ Biological Resources ☐ Minerals ☐ Soil Erosion/Compaction/Grading ☐ Growth Inducement
☐ Coastal Zone ☐ Noise ☐ Solid Waste ☐ Land Use
☐ Drainage/Absorption ☐ Population/Housing Balance ☐ Toxic/Hazardous ☐ Cumulative Effects
☐ Economic/Jobs ☐ Public Services/Facilities ☐ Traffic/Circulation ☐ Other:

Present Land Use/Zoning/General Plan Designation:

R-1-B-E Fairview Area Specific Plan; [single family residential, 10,000 sq. ft. minimum lot size]

Project Description: *(please use a separate page if necessary)*

Project would subdivide a 10.1-ac undeveloped site for 15 single family residences plus common area. Site access is via an easement over an adjacent PG&E high voltage power line corridor. Detailed project description is provided in the Initial Study.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

____	Air Resources Board	____	Office of Historic Preservation
____	Boating & Waterways, Department of	____	Office of Public School Construction
____	California Emergency Management Agency	____	Parks & Recreation, Department of
____	California Highway Patrol	____	Pesticide Regulation, Department of
X	Caltrans District #4	____	Public Utilities Commission
____	Caltrans Division of Aeronautics	X	Regional WQCB #2
____	Caltrans Planning	____	Resources Agency
____	Central Valley Flood Protection Board	____	Resources Recycling and Recovery, Department of
____	Coachella Valley Mtns. Conservancy	____	S.F. Bay Conservation & Development Comm.
____	Coastal Commission	____	San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
____	Colorado River Board	____	San Joaquin River Conservancy
____	Conservation, Department of	____	Santa Monica Mtns. Conservancy
____	Corrections, Department of	____	State Lands Commission
____	Delta Protection Commission	____	SWRCB: Clean Water Grants
____	Education, Department of	____	SWRCB: Water Quality
____	Energy Commission	____	SWRCB: Water Rights
X	Fish & Game Region #3	____	Tahoe Regional Planning Agency
____	Food & Agriculture, Department of	____	Toxic Substances Control, Department of
____	Forestry and Fire Protection, Department of	____	Water Resources, Department of
____	General Services, Department of		
____	Health Services, Department of	____	Other:
____	Housing & Community Development	____	Other:
____	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date Undetermined - NOP only Ending Date NOP only

Lead Agency (Complete if applicable):

Consulting Firm: Lamphier-Gregory
Address: 1944 Embarcadero
City/State/Zip: Oakland, CA 94606
Contact: Nathaniel Taylor
Phone: 510-535-6690

Applicant: Northbrook Homes
Address: 7020 Koll Center Parkway, Suite 101
City/State/Zip: Pleasanton, CA 94566
Phone: 925/417-8750

Signature of Lead Agency Representative: _____ **Date:** 2/27/13

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

ATTACHMENT A
NOTICE OF PREPARATION
TRACT 8057 RESIDENTIAL SUBDIVISION PROJECT
SCH# 2012022065

SITE LOCATION AND CONDITIONS

The Project site is located centrally in the unincorporated Fairview area of Alameda County (see **Figure 1**), and is comprised of two adjacent parcels that together form an approximately 10.1-acre development area: 1) a 2.56-acre southern parcel with no street frontage, located about 350 feet north of Fairview Avenue; and 2) an adjacent 7.52-acre northern parcel with a narrow, 20-foot wide and approximately 750-foot long stem connected to Fairview Avenue and developed with a primitive roadway. Neither parcel has a designated street address, but the stem is informally located at 24990 Fairview Avenue and 92 feet east of Walters Dinos Court. The Project site also includes an access easement on an approximately 2-acre portion of an adjacent PG&E property that directly borders Fairview Avenue and the stem of the northern parcel.

The Fairview area consists of gently rising elevations above and east of downtown Hayward. Historically, Hayward and the hills to the east were used for various forms of agriculture, the hilly area primarily being used for cattle and horse grazing and for chicken farms. Over the past 20 to 30 years, many large parcels in the Fairview area have been developed with suburban-style residential subdivisions of typically 10 to 15 homes, although large areas retain a rural residential character of one-acre or larger parcels. The main exception to this pattern is the Five Canyons area, a large 1990s era master-planned development of several hundred single family and attached homes, parks, park-land and community facilities, located in the northeastern Fairview area. Other land uses include the Lone Tree Cemetery, a very few commercial and institutional uses, a few parks and some agri-culturally-designated lands on the southeastern edge. Major arterial roadways within the area include Kelly Street, Maud Avenue, D Street, Fairview Avenue and Five Canyons Parkway.

The Project site is used for horse and cattle grazing and is undeveloped except for a primitive dirt road on a narrow stem that provides access from Fairview Avenue. There are no structures on the development site, and the PG&E property is only developed with high-tension power lines and pylons. The Project site's dimensions are approximately 1,250 feet from north to south and 340 feet wide, but the southern boundary narrows to about 220 feet. The site is mostly hilly with slopes of 20 to 30 percent on each side of a ridge dividing its northern and southern portions. The site is bounded on the north and east by large wooded parcels (including the PG&E parcel to the east), on the south by a small subdivision, and on the west by a moderately large subdivision (Tract 6102), that is approximately 30 percent developed. This subdivision contains a street that directly borders the western edge of the Project site, along a ridge that is the main area available for development within the Project site. This ridge is at an elevation of approximately 650 feet and is one of the highest promontories in the vicinity, providing wide vistas across Hayward, San Francisco Bay, and the East Bay Hills east and north of the Fairview area.

PROJECT DESCRIPTION

The Project consists of a subdivision of two existing parcels into 15 single family home lots with a minimum of 10,000 square feet each, and a separate lot for stormwater treatment and open space. Access to the site would be provided by means of a new roadway on the adjacent PG&E property,

connecting Fairview Avenue with the development area. Under an agreement with the homeowner's association for the adjacent Tract 6102, the new roadway would also provide an emergency vehicle connection to the at Karina Street, providing an emergency vehicular access (EVA) for both subdivisions. Water and wastewater utilities would be provided either by extending existing infrastructure from the adjacent subdivision or bringing utilities to the site from Fairview Avenue via the access road on the PG&E parcel. An on-site stormwater management system is designed for the project that would release stormwater in a controlled manner and provide treatment in compliance with current County clean water program requirements.

Future homes on the Project site would consist of three different house plans: two (2) two-story plans and one (1) single-story plan, with overall sizes ranging from 2,000 to 2,800 square feet. The lower elevation of the Project site, not disturbed or needed for the 15 houses, would be preserved as open space via a conservation easement. On-site mitigation for potential wetland disturbance or impacts to special status biological resources would be provided within the permanent open space conservation easement.

PROPOSED ANALYSIS

An Initial Study Checklist has been prepared for this Notice of Preparation The Initial Study and proposed Mitigated Negative Declaration (MND) were released for public review in February 2012 and a public hearing on the proposed MND was held by the Alameda County Planning Commission on June 4, 2012. Since the time of that hearing and in light of public comment and testimony and subsequent technical analysis on several issues the Lead Agency has determined that the proposed project has the potential to significantly affect the environment and consequently is requiring that an Environmental Impact Report (EIR) be prepared for the Project. The EIR will focus on issues related to aesthetics, biological resources, hydrology/water quality, land use and traffic. All other issues are shown in the initial study as not resulting in significant environmental impacts.

Because aesthetics, biology, land use, hydrology and traffic are anticipated to be important issues, a discussion of the issues and intended analysis is included below.

Aesthetics: Photo-simulations of the proposed grading plan and future homes will be prepared to provide the public and the Lead Agency with additional information regarding how the Project will appear from off-site viewing locations. This information will inform further consideration of the project's consistency with relevant policies of the Fairview Area Specific Plan (see Land Use, below).

Biological Resources: Prior biological surveys of the Project site, as summarized and included in Initial Study, found no special status plant or animal species present but didn't completely rule out that such resources might be present. Additional site surveys are required prior to the start of any site disturbance work (e.g., grading). These additional surveys may be undertaken as part of the technical work to be included in the EIR. In addition, the Initial Study included evidence that there may be one or two areas on the site that would be considered jurisdictional wetlands subject to the regulatory control of the US Army Corps of Engineers and/or the Regional Water Quality Control Board pursuant to Sections 401 and 404 of the federal Clean Water Act. For the EIR, a jurisdictional wetland mapping exercise will be undertaken to establish definitively whether these two areas are jurisdictional or not and if so, to define the elements of an acceptable mitigation measure consistent with applicable law.

Hydrology: Much of the public comment submitted in response to the Initial Study/ MND in 2012 and at the Planning Commission hearing on June 4, 2012 concerned the extent to which the Project would adversely affect downstream conditions on the eastern branch of Sulphur Creek into which stormwater runoff from the majority of the Project site would ultimately flow. In light of the continuing controversy regarding this issue a full examination of the stormwater characteristics of the existing site will be compared to the expected performance of the Project's proposed stormwater management plan and its compliance with current requirements for hydro-modification, on-site stormwater retention and bio-filtration to comply with Clean Water Act requirements.

Land Use: The Initial Study presented extensive evaluation of the proposed project relative to the policies of the FASP. The EIR will expand upon the prior analysis using the photo-simulations to be prepared for the Aesthetics chapter (see above) to illustrate issues about which there has been public comment and concern regarding compliance with policies of the FASP intended to avoid or mitigate environmental impacts.

Traffic: Subsequent to the June 2012 public hearing, the firm TJKM Transportation Consultants was retained to conduct and prepare a detailed analysis of local traffic conditions and an evaluation of how the project would affect local conditions. The following scenarios were analyzed for a.m. and p.m. peak hour conditions:

1. Existing (2012)
2. Existing (2012) plus Project
3. Future Baseline Conditions (existing plus cumulative future development) without Project
4. Future Baseline plus Project conditions

The impacts of the proposed project on traffic operations (both existing and cumulative conditions) will be presented based on the study prepared by TJKM. Alameda CTC CMP Compliance analysis is *not* proposed, as the Project is expected to generate less than 100 p.m. peak hour trips. The following seven intersections were chosen for analysis based on existing vicinity conditions, anticipated trip distribution, and coordination with County staff:

- Project Entry and Fairview Avenue
- D Street and Maud Avenue
- Fairview Avenue and 'D' Street
- Fairview Avenue and Jelincic Drive
- Fairview Avenue and Levine Drive
- Fairview Avenue / Five Canyons Parkway / Star Ridge Road
- Fairview Avenue / Hansen Road

The results of the TJKM study will be presented in the EIR along with a thorough evaluation of safety concerns and engineering standards regarding sight distance for cars entering and exiting the Project at the intersection of Street A and Fairview Avenue.

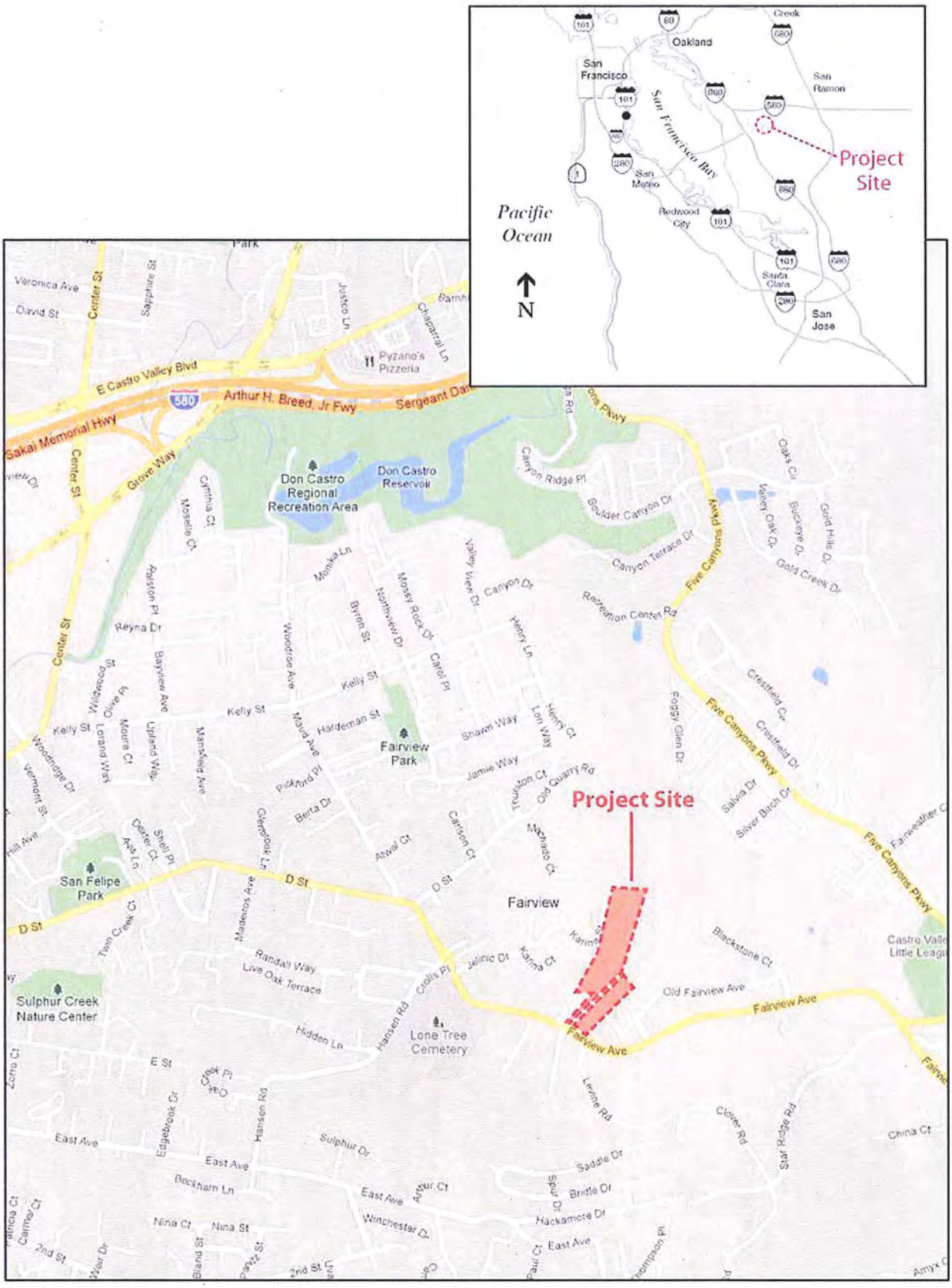


Figure 1. Site Location

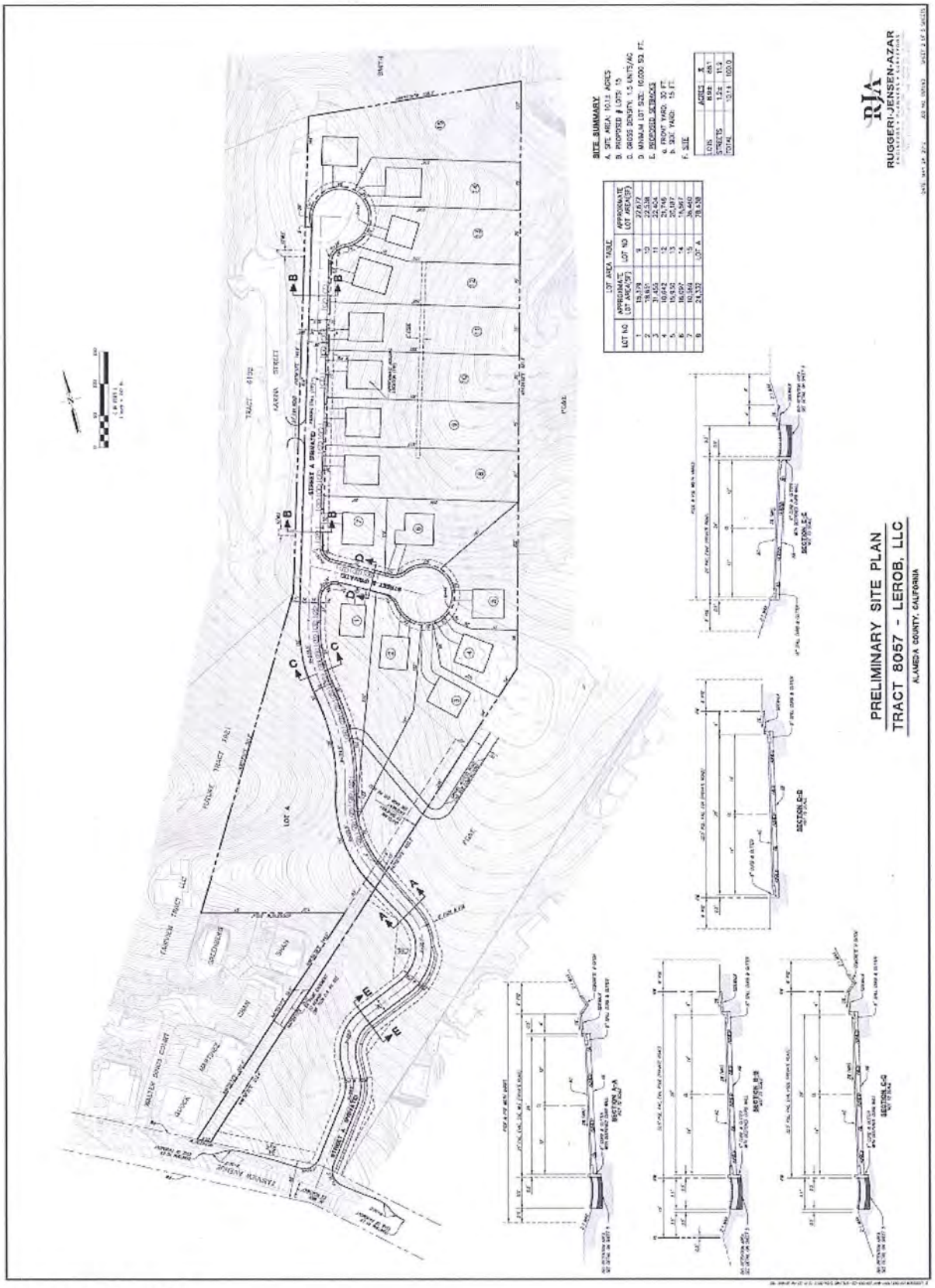


Figure 2. Site Plan

Attachment 2-A: Comments on the NOP and Scoping Meeting

Gary Brooks FAX 510 525-6699 Att.

From: Young, Andrew, CDA [andrew.young@acgov.org]
Sent: Monday, April 01, 2013 10:07 AM
To: Lopez, Albert, CDA; Fleishhacker, William M, County Counsel
Cc: 'Nat Taylor'; 'Gary Brooks'
Subject: FW: J Spalding comments on Scope for EIR - Northbrook Application/Owned by Borel Bank

FYI and records (but I'll have a printed copy in the PLN2010-140 file). I have not read through it carefully yet – we'll have to discuss soon what it actually means for the scope of the EIR. I anticipate litigisiousness by her throughout the process.

I had half a thought if in fact I had said the NOP was mailed on the 6th, that we could extend the comment period to the 6th – or next Monday the 8th of April – as I apparently did state in a hurried e-mail on the 18th that it was mailed on the 6th – but I had evidently confused that NOP with the Sand Hill Wind Project NOP that did go out on the 6th. I have an e-mail reporting to you that the NOP was mailed on the 1st of March – so I can bet [a LOT] that if any of the recipients looks at their envelope, it will have a postmark date of 3-1-13, not 3-6-13. If you do not have any objections, when I acknowledge receipt today – in no more than an hour, preferably – I will explain that error of reporting when the NOP was mailed, and that the close of the scoping period is still today at 5 p.m.

That's all I have for now.

ANDY

From: Jewell Spalding [mailto:jewellspalding@mac.com]
Sent: Sunday, March 31, 2013 9:51 PM
To: Young, Andrew, CDA; Sawrey-Kubicek, Phil, CDA
Cc: Lopez, Albert, CDA; Swanson, Bob, BOS Dist 4; Gee, Anna, BOS Dist 4; Chris Higgins; Charles & Ruby Snipes; Singh, Nilma, CDA; JIM TOWNSEND; Dale Silva; Jmquock@aol.com
Subject: Scope for EIR Northbrook Application/Owned by Borel Bank

Andy,

On behalf of myself and the Fairview Community Club, we have the following comments given the insufficient time provided comments on the scoping for the EIR. By copy, this is to request that the Planning Commission's secretary, Nilma, also forward these comments to the members of the Planning Commission.

As admitted by your March 18, 2013 email, the Notice of Preparation (NOP) was not even mailed out until approximately March 6, 2013. As a result, over numerous objections and requests that the insufficient closing date of April 1, 2013 be extended, you have consistently refused providing the public with less than 3 weeks, far short of the minimal required, having the close date the day after Easter, a major holiday, and in the midst of most schools' spring break.,

The Draft EIR is for the above application to subdivide two parcels of land, one approximately 3 acres and a second of 7 acres apparently both owned by Borel Bank. There is no vested right to subdivide these properties or guarantee for some "minimal" number of units and approval is completely discretionary. We are primarily interested in the least environmentally damaging alternative which is fully consistent with the Fairview Specific Plan and traffic calming, which,

as essentially admitted by the initial study and draft mitigated negative declaration (MND), is not this application by Northbrook to develop this bank owned property.

Air Quality:

According to your Initial Study and MND, this project will have a potentially significant impact on air quality, yet Attachment A to the NOP omits including air quality as a subject for the EIR to examine. Further your proposed mitigations listed on table 1, p. 16 are wholly insufficient. Part of the EIR needs to address air quality in the context of the application of the Fairview Specific Plan which prohibits construction on slopes of greater than 30%. The EIR needs to **clearly identify the property's present slopes** and how many houses could be developed **without any disturbance or any grading of any of the slopes as otherwise required by the Fairview Specific Plan.** This would substantially improve air quality impacts because this would result in substantially reducing the proposed grading, if not reduce the number of allowable units and be consistent with the Fairview Specific Plan.

Biology:

Attachment A qualifies that additional studies "may" be taken concerning the special status species present on or near these properties. These studies should be performed: identified by the June 2010 biological report as potentially present in the area are the Coopers Hawk, State protected, the Burrowing Owl, federal and state special concern, red-tailed and red shouldered hawks, state protected, white tailed kite, fully protected by State and federal law, and the American Kestrel, State protected.

Not listed is the golden eagle. This bird is present in the area and just within a mile has been observed within the past few months on multiple occasions by different persons, myself included, and nearby the property some years ago. Also, the white tailed kite is present in the area of which I have personally observed numerous times over the past few years. Unfortunately, just recently, a white tailed kite was struck by a car on Fairview. As for the proposed mitigations under your proposed NMD, they are wholly inadequate providing absolutely no real substantive protection at all.

Further, even though the California Red Legged Frog and Alameda County whip snake may not be presently present on the property, as mentioned in the 2010 biological report, "several occurrences of the [red legged frog]" (p. 20) and "recent occurrences" of the whip snake have been within the vicinity," p. 21. Of note is that just across the street is an area specifically set aside for the purpose of protecting the Alameda County whip snake as part of the approval of the 5 Canyons Development. As a result, the property is located such that substantial disturbance will likely adversely effect the nearby riparian habitats and interfere with the movement of these native residents. That this is likely is due is reflected in attachment A's observation that extensive public comment was that approval of this application "would adversely affect downstream conditions on the eastern branch of Sulphur Creek into which storm water runoff from the majority of the Project site would ultimately flow." Therefore, examination should not be limited to just storm water, but impacts on wildlife and riparian corridors. See also p. 22 of the Biological Report on grading and excavation. This is a particularly sensitive issue given Alameda County's serious failure to follow minimal mitigation practices for grading resulting in substantial deposits in Don Castro from the grading for Pacific Terraces for which the County was fined by the State and a $500,000 fine by the State Water Department for the County's practices in performing construction work on Fairview.

Staff should likewise follow through with the biological report's recommendation of further study of the big-scale balsam root and most beautiful jewel flower at page 22 as this property presents suitable habitat for these special status native plants.

Land Use

We seriously disagree that this application would result in "less than significant" or "no impact" under land use and planning. It would create a divided community separated from the remaining community, yet at the same time, would have two streets parallel next to each other, a highly disfavored and poor use of land. Further, at this time, it is premature to conclude that it would not conflict with any applicable habitat conservation plan or natural community conservation plan when in fact the west side of the property adjacent to the PG&E towers is a recognized wildlife corridor according to the Initial Study.

In this regard, Fairview was expressly excluded from both the Eden Amended General Plan and Castro Valley General Plan. Recently, with respect to requesting that the close date be extended to April 22, I asked for the last tiered EIR prepared applicable to Fairview. To date, your response has been silence. Please provide the last EIR prepared for Fairview as requested.

Also, the Initial Study Claims that only the Alameda County Zoning Ordinance applies, this cannot be correct. What general plan applies to Fairview? As Staff is well aware, since the development proposed along Bayview five years ago, we have been waiting for Staff to initiate a review of the Fairview Specific Plan given the serious disagreement between those of us involved in the last revision and Staff resulting in several published opinions and remand by the Supreme Court vacating the County's approval for Bayview. Staff's response has been that the Fairview Specific Plan can be amended, yet Staff now asserts that its incorrect and flawed interpretation and application of the Fairview Specific Plan will supersede and be applicable to this application, although Staff has now finally commenced an amendment process expressly timed after the premature closing of these scoping comments.

Most significantly, this application directly violates the Fairview Specific Plan. According to the initial study, this application would involve grading over 63,000 cubic yards of material over 50 percent of the total site area, over 5 acres, "to establish appropriate grades" and "alter the contour of the site," over ten acres. Based on the insufficient time provided, I have observed the following conflicts and violations of the Fairview Specific Plan:

Page 3, fn. 2: "Gross acre of developable site area means: 1) Areas of less than 30% slope . . ." This application develops slopes of 30% or greater.

Page 11: Guidelines 3. a., "slopes of 30% gradient or greater should not be developed or altered," b. only "individual lot grading should occur in areas exceeding 20% slope." This application impermissibly develops and alters slopes of 30% or greater and abandons individual lot grading as expressly required.

Section D. 2, pg.s 10-11: "Maximum retention of the natural topographic features . . . Planning . . . to fit the topography . . . Orientating development to the site so that grading and other site preparation is kept to a minimum . . . Minimizing disruption of existing plant and animal life . . ." The initial study essentially admits these principles are violated by observing the "grading plan [and] . . . project objective" is to "create an economically viable small-scale subdivision" by prohibited mass grading.

Section D.2. continued, page 11: "Locating building pads so that the views of prominent ridge lines are not interrupted or interfered with by buildings," compare, Initial Study, page 86: "Future homes would be grouped along the sites existing plateau which can appear as a ridgline from off site."

Section E, page 18: The County is supposed to work with HARD and EBRPD "to ensure hiking and equestrian trails within the Fairview area connect with the larger trail systems that run throughout Alameda County." That property is not only a wildlife corridor, but during the 5 Canyons project, after I appealed on behalf of the Hayward Hills Property Owners Association the failure of Staff to designate a

trail along 5 Canyons, the former Director James Sorenson affirmatively represented to the Board of Supervisors that the trail along 5 Canyons was "not needed" because this PG&E easement was an intended trail connection. This is an issue which I since raised with EBRPD many years prior to this application.

The violations go on and on. Almost every guideline under section 3 is violated. See initial Study, pages 88-90, concluding: " . . . the ***Project would be inconsistent with those specific policies and guidelines related to grading, slopes and ridge line development*** . . . because of the proposed mass grading plan and repetitive stepped building pad foundations on downslope lots."

Public Services: Although your Initial Study fails to check off public services, and Oro Loma has stated it has the capacity, there is absolutely no discussion on the substantial impact and whether pumps would likely be required. If so, that directly impacts neighbors through increased noise from large sewage pumps.

This is to also request that this application be distributed to both the CHP and the Sheriff's office as this cluster of 15 houses would not be readily visible or accessible. Will an additional patrol be necessary?

Traffic: The traffic study provided is inadequate. Fairview is a residential street operating as a collector street, which the County insists upon improperly designating as an "arterial." Absent from the present study is a proper map including the curve on Fairview in its entirety including the neighbor's driveway to the south along Fairview and the Blackstone intersection. Will this be a street adjacent to or parallel to an existing driveway? There are conflicting maps also, some showing the street intersecting with Fairview at the PG& E towers, others showing the street intersecting adjacent to the neighbor's existing driveway.

Also not discussed is that Public Works improperly designed the realigned Fairview for a design speed of approximately 50 mph approaching an unbanked curve, upon which this new "street" would intersect. It is the location of several accidents and property damage to the neighbor across the street. Further, a traffic circle was proposed for the intersection of Blackstone and Fairview, where the turn lane into Blackstone exists and is commonly used as a passing lane and also proposed by 6 prior traffic studies were speed humps near Walter Dinos. Completely ignored is the impact on Fairview south of 5 Canyons. TJKM should be provided with all prior numerous traffic studies, there are 6 in all.

Just what is being proposed for Fairview to accommodate "Street A" is extremely vague and unclear, other than payment of $1,600/house to Alameda County, adding a acceleration lane, directly contrary to traffic calming principles and which generally have resulted in encouraging faster traffic. **To address the sight distance violations, "The westbound distance is below Caltrans Highway Design Manual minimum standards *at 30 mph speed*,"** TJKM proposes a right hand turn only, which will result in additional trips up and and down the street for travelers needing to travel south. Page 2 of TJKM Dec. 4, 2012 Report. Under general traffic sight distance principles, the faster one travels, the longer distance one needs.

Here, sight distance is contrary to Caltrans minimum standard ***assuming*** traffic is traveling 30 mph. (This is not the only driveway suffering from this problem on Fairview either.) This is one reason why for many years residents of Fairview have advocated that the street needs much more serious traffic calming implementations, such as real humps, not the raised intersections which are generally viewed as a "joke." This application should be denied on this basis alone as the County has no business approving projects creating or aggravating existing hazardous conditions and highlights that additional traffic calming is needed right now regardless of this proposal. The traffic study needs to address the installation of the needed traffic circle at Blackstone as well as humps near Walter Dinos as consistently

recommended by the prior 6 traffic studies and consistent with the designation of Fairview as a Classification 3 Traffic Calming street.

The trip generation also appears understated, contending that only 11 trips during the a.m. peak hour and 15 trips during the pm peak house will be generated for 15 houses otherwise generating 144 trips daily. Most families have two income earners both utilizing cars. Additionally there are additional peak hour trips to accommodate childcare needs and/or school, not including teenage family drivers.

Please acknowledge receipt of these comments by or before 5 p.m. on April 1.

Jewell Spalding
510-889-5816
Fairview & for the Fairview Community Club
Charles Snipes, President

From: Jay Jelincic [mailto:jayjelincic@yahoo.com]
Sent: Monday, April 01, 2013 1:20 PM
To: Lopez, Albert, CDA
Cc: Chris Higgins; Sawrey-Kubicek, Phil, CDA; Swanson, Bob, BOS Dist 4; Jay Jelincic; Tim Becker; Kokotaylo, Kristopher J., BOS Dist 4
Subject: Re: Ridgeline 8057/6102

Good Afternoon Albert,

I would like these concerns to be addressed in the EIR for tract 8057.

1. Can tract 6102 and tract 8057 build on this prominent ridgeline in conflict to the FSP?
2. Did the homes planned to be built along the ridge line in tract 6102 need to be built and completed before the new Fairview Specific Plan (FSP) was adopted in 1997?
3. Would any home homes built on either side of this ridgeline be in violation of the FSP?
4. Why wasn't tract 6102 updated in 2005 as required by the BOS?
5. Can tract 8057 mitigate the view of their home by potential homes being built on the ridgeline of tract 6102?
6. Were the plans for developer David Atwal to build tract 6102 wrongly approved considering the fact that the BOS required the approved plans from 2000 be updated to reflect changes? Also the revised FSP doesn't allow building on prominent ridgelines.
7. Shouldn't any new construction on tract 6102 and 8057 be required to build to current specifications and guidelines?
8. Does tract 6102 have vesting approvals that would allow them to build in conflict to the FSP?
9. The view of homes along the ridge line of tract 8057 need to be consider looking from the East toward the West not just from the West looking East.
10. The safety of entering and exiting 8057 needs to be studied.
11. Water runoff and control needs to be studied. There is concerns about dumping any more water into already maxed creeks.

Thank-you
Jay Jelincic

From: Jay Jelincic <jayjelincic@yahoo.com>
To: Jay Jelincic <jayjelincic@yahoo.com>; Albert Lopez <albert.lopez@acgov.org>
Sent: Tuesday, March 19, 2013 4:38 PM
Subject: Re: Ridgeline 8057/6102

Hi Albert, Are you clear on my concerns and questions (all have been highlighted). Do I need to put it into a different format? FYI, I was out of town and never received any notification of this meeting. Thanks Jay Jelincic

---

From: Jay Jelincic <jayjelincic@yahoo.com>
To: Albert Lopez <albert.lopez@acgov.org>; Sawrey-Kubicek Phil <phil.sawrey-kubicek@acgov.org>; Jay Jelincic <jayjelincic@yahoo.com>; Tim Becker <tbecker@oroloma.org>; Chris Higgins <chris@higginsfamily.net>; Mike Tuttle <mtuttlesr@aol.com>
Sent: Monday, March 18, 2013 1:15 PM
Subject: Re: Ridgeline 8057/6102

Hi Albert, I just heard there is a meeting tonight 3/18/2013 addressing the EIR for tract 8057. I will not be able to attend on such short notice. Please make sure **all** the concerns I have listed in these e-mails are addressed in the EIR. Thanks Jay Jelincic

Albert,

This is very good. I understand completely the complexity of your concerns. My point the homes should have been built out before the new FSP was approved and they were not. They should now be required to conform with the new FSP regardless. The problem is why wasn't tract 6102 updated as required by the BOS in 2005. If this was done you wouldn't have the concerns you are telling me about now. You are right this could be a big mess for the County and I am afraid that is why they want to look the other way. As far as building on both sides of the ridge. I don't believe two wrongs make a right.

When a subdivision is approved as in tract 6102 do you approve the build site and where the house will be? In all the plans I have reviewed for tract 6102 I never saw anything that shows the building site or the house that was going to be built on a particular lot. Therefor no restrictions were needed until now.

My question is; Was David Atwal allowed to build and sell something that cannot be built on to today's requirements? As you can see no one has been looking at the big picture. I am not drawing to any conclusions either. I am simply asking questions and pointing out items of interest.

Was that you in the black car today around 2 pm? If it was, I waved but you didn't see me. I will do my best to help out if I can. If you have any questions don't hesitate to ask me. I have a pretty good background on all of this.

Jay J

From: "Lopez, Albert, CDA" <Albert.Lopez@acgov.org>
To: 'Jay Jelincic' <jayjelincic@yahoo.com>
Sent: Wednesday, February 20, 2013 5:32 PM
Subject: RE: Ridgeline 8057/6102

I'm glad it's more clear. Although you are correct that new buildings in 6102 have to be built to today's standards, we can't get around the fact that the lots are now legally created and recorded parcels, and they were created to clearly take advantage of the views and sit prominently on the ridge. To limit those homes to one story would be difficult considering the FSP allows two stories and most of all the other homes in that subdivision are two stories as well. There wasn't any restriction placed on those homes to be only one story, and to do so now would raise lots of concerns for the County - it could diminish the value of those homes and the County would be vulnerable to a takings claim. I don't want to ignore the whole thing and say there is nothing we can do, but hopefully after taking a look at the attached map you'll agree those lots were created for homes to sit on the ridge.

I was up there today and saw the house under construction does tuck into the hillside somewhat, which was a good sign but nonetheless is does present a challenge when you consider what the ridge will look like when all the lots are built out. Then, if you take that and consider what the Northbrook homes may look like, a fair argument could be made that their homes will have a less than significant impact on the ridgeline view. I am not drawing this conclusion myself, but this is the argument being made by Northbrook at this point, I believe.

Albert V. Lopez, MCP
Planning Director
County of Alameda

From: Jay Jelincic [mailto:jayjelincic@yahoo.com]
Sent: Wednesday, February 20, 2013 4:59 PM
To: Lopez, Albert, CDA
Cc: Jay Jelincic
Subject: Re: (No subject) Ridgeline 8057/6102

Albert,

Thank you for your response. It is more time consuming visiting with you in person. Having something in writing seems to be more helpful these days. I do appreciate the invitation. Like you I do have other irons in the fire which I try to resolve daily. If I get an answer that tells me something then I can move on. I now feel that you are hearing me and understand my concerns. I am not opposed to Gary building if it meets the requirements of the FSP. I feel it is the responsibility of Planning and Public Works to follow the FSP and that the residents should not be made to look like the bad guy. On Jan 30, 2013 Nate Miley had a meeting with the residents of Jelincic Drive. At that meeting we went over the recent audit that was performed regarding Planning and PW. We took away from that meeting that tract 6102 was built to the approved plans from 1990. Any new construction needed to follow the current regulations and guidelines. That is why I am even more concerned now. Thanks again for you response and look forward to continuing to work together to do the right thing for the residents of Fairview. Any updates on this matter you can provide would be appreciated.

Jay Jelincic

From: "Lopez, Albert, CDA" <Albert.Lopez@acgov.org>
To: 'Jay Jelincic' <jayjelincic@yahoo.com>
Cc: "Sawrey-Kubicek, Phil, CDA" <phil.sawrey-kubicek@acgov.org>; "Young, Andrew, CDA" <andrew.young@acgov.org>
Sent: Wednesday, February 20, 2013 2:47 PM
Subject: RE: (No subject) Ridgeline 8057/6102

Jay, if you have concerns you can always call me or come down and meet. I have multiple balls in the air and it's not my intent to frustrate you, but please understand I can't always give the whole story in an email.

That said, I'll try and let you know what I'm thinking. First, the applicant, after very little discussion, agreed that an EIR is needed to see this project to completion, and we'll be holding a scoping meeting very soon where you will be able to voice your concerns, and that will form the basis of what the EIR will

cover. The ridgeline issue is on my radar and I've asked, and Gary has agreed, to complete photo simulations that will show what the impact of his development will be on the Fairview Specific Plan relative to ridgeline obstructions. The issue is really about significant impacts and cumulative impacts, and whether this ridgline is determined to be prominent. All of this will be discussed and analyzed in the EIR. I believe that this project should in all ways comply with the specific plan, and you can help me by showing ways that it doesn't.

In regards to 6102, that project already has received its approvals, yet I see your point that houses are going up that conflict with this ridgeline issue. I've cc'd Phil and Andy on this because I'd like their help in getting an answer to this question: Does 6102 have vesting approvals that would allow them to build houses in conflict with the plan?

I hope this is more helpful and answers some of your questions. Let's keep talking about it.

Thanks,

Albert V. Lopez, MCP
Planning Director
County of Alameda

From: Jay Jelincic [mailto:jayjelincic@yahoo.com]
Sent: Wednesday, February 20, 2013 1:17 PM
To: Lopez, Albert, CDA
Cc: Jay Jelincic
Subject: Fw: (No subject) Ridgeline 8057/6102

Good Afternoon Albert,
I have been personally involved with tract 6102 and the Fairview community since 1978. I was on the committee that worked on revising the Fairview Specific Plan in 1997. It was my actions at the Fairview Community Club that made that revision happen. It took four years to complete the revision and having it adopted. It shouldn't be a surprise to you that I have concerns about tract 6102 & 8057 and what will be approved. It is very frustrating to everyone to ask direct questions and get empty answer. A little bit of honesty would go a long way in understanding how Planning is looking at these two projects and how they will effect the **ridgeline**. Your answer in blue doesn't address my questions to you. Can you elaborate a little bit more on my questions?
Thanks, Jay Jelincic

From: "Lopez, Albert, CDA" <Albert.Lopez@acgov.org>
To: Jay Jelincic <jayjelincic@yahoo.com>

Jay, asking for photo simulations can address this. We will ask Gary to provide some as part of his application.

Albert Lopez

----- Reply message -----
From: "Jay Jelincic" <jayjelincic@yahoo.com>
To: "Lopez, Albert, CDA" <Albert.Lopez@acgov.org>
Cc: "Jewell Spalding" <jewellspalding@mac.com>, "Dennis Gould" <dennisgould@gmail.com>, "Charles Snipes" <charleslsnipes@aol.com>, "Sawrey-Kubicek, Phil, CDA" <phil.sawrey-kubicek@acgov.org>, "Lepere, Bill" <bill@acpwa.org>, "Tim Becker" <tpbsarah@pacbell.net>, "Chris Higgins" <chris@higginsfamily.net>, "Swanson, Bob, BOS Dist 4" <bob.swanson@acgov.org>, "Kokotaylo, Kristopher J., BOS Dist 4" <Kristopher.Kokotaylo@acgov.org>, "Jay Jelincic" <jayjelincic@yahoo.com>
Subject:
Date: Thu, Feb 14, 2013 1:05 AM

Hi Albert,

At two previous Stakeholders meeting and the Planning Commission meeting on Feb. 4, 2013 I brought up building homes along the ridgeline of tract 8057. How is the Planning Department going to protect this prominent ridgeline? Although I keep bring this matter to everyone attention I have seen no changes to the plans for tract 8057 or tract 6102. Will the Planning Department uphold the Fairview Specific Plan (FSP)? It appears to me at this time everyone is just looking the other way when it comes to building homes on the ridge. The Committee that worked on revising the 1997 Fairview Specific Plan added stronger language to protect the prominent ridgelines. It is my experience that once something gets approved there is no correcting it later. I have heard no comments from Planning how they are going to deal with this situation. Please inform me how Planning is going to protect this ridgeline.You can see this ridgeline throughout the Fairview area which makes this a prominent ridgeline in my book.

Jay Jelincic

Part I

From: "joandduck@aol.com<mailto:joandduck@aol.com>"
<joandduck@aol.com<mailto:joandduck@aol.com>>
Date: March 17, 2013, 6:55:00 PM PDT
To: "Young, Andrew, CDA" <andrew.young@acgov.org<mailto:andrew.young@acgov.org>>
Subject: Project EIR March 18, 2013 Meeting - Part One of Two

I was disappointed to learn that none of my neighbors received notice of this meeting; but, hopefully, a few of them will be able to attend.

Before addressing new matters, I would like to point out that no action to date has been taken regarding any of the problems discussed earlier:

1. On May 23, 2012, Gary Borel, representing Borel Bank, wrote, "I will also be happy to look at the asphalt apron of your driveway to see what can be done to repair it." (See Photo C on p. 3 of my previous report)

2. I had also asked Mr. Borel to take a look at the drainage problem caused by overflow of rainwater from the PG&E access road. (See photo A and text entitled "Drainage" of Part Two of my previous report). He has not come by or contacted me as far as I'm aware.

3. Regarding the surface drainage system in front of our property, Commissioner Ratto, had declared (not his exact words), "At the very least, we ought to do something about this situation for the Quocks." Subsequently, two road maintenance people did come out and removed the weeds from the ditch. However, this is a temporary fix; and it doesn't look like a concrete (or even less desirable asphalt covering) of this ditch is in the works. (See number 2 reference above)

In other matters concerning curb and gutters, pavement, and fencing, my husband and I would like to know:

1. Will the merging lane have curb and gutters abutting our driveway?

2. What kind of pavement will be used for the PG&E access road and how is drainage controlled where this road intercepts Fairview Avenue?

3. Will a dust fence be erected to protect residences alongside the PG&E access road be erected during construction? This was provided (after vehement protest on our part) during the previous development attempt of said property.

4. What kind of fencing will be installed between the PG&E access road and adjacent properties? A ranch style split-rail fencing to blend in with the neighborhood is recommended.

In a separate e mail (Part Two), I will address traffic and other environmental matters.

Joan Quock

Part II

From: joandduck@aol.com<mailto:joandduck@aol.com> [mailto:joandduck@aol.com]
Sent: Sunday, March 17, 2013 11:35 PM
To: Andrew.young@acgov.net<mailto:Andrew.young@acgov.net>; Sawrey-Kubicek, Phil, CDA
Subject: Project EIR March 18, 2013 Meeting - Part Two of Two

We are in favor of a full-blown EIR report. We are leery whether the proposed holding pond will work as planned, and even more skeptical that proper maintenance (by whom?) will be done over the years to prevent leaks, overflow, malfunction and other occurrences detrimental to the environment. We also question whether this holding pond will present a safety hazard to the local fauna as well as an attractive nuisance to children. Would it not be better in the long run to have a regular sewer system installed, preventing potential environmental damage and/or liability lawsuits?

The rest of this message will address traffic concerns. All of the following concerns would disappear if the project entry street is relocated to Old Fairview Avenue, as proposed at the February 4, 2013 meeting by neighbor Mike Agosta, among others. Considering all the costs of keeping the project entry Street A at its currently proposed location, it may well be less costly to purchase an easement on Old Fairview Avenue, not to mention safer.

I will first discuss the problems caused by allowing only right turns onto Fairview Avenue from A Street. As planners have noted, many or most drivers wanting to go in the opposite direction would not travel 2/3 of a mile (roundtrip) to circle around the roundabout at Hansen Road and Vista Lane. More than likely, drivers will opt to make a U-turn at the more convenient and closest driveways, courts and streets, including the PG&E access road, our driveway, Walters-Dinos Court, and/or Rose-Rossow Road, all or which are privately maintained. We fully agree that "Such maneuvers may be a secondary hazard under some circumstances" and "additional review of the Study and analysis by Public Works Agency staff" is an absolute must.

If the above proposal is approved (despite our and neighbors' objections), then, at the very least, installation of aesthetically acceptable, quality motorized gates at the entrance to each and every of the above-mentioned roads and driveways be installed at the expense of the developer.

We also request that the proposed acceleration lane be as short as possible, ending at least 50 feet from our driveway.

We disagree that left turns from eastbound Fairview Avenue onto Street A should be permitted. The traffic study did not take into consideration the number of near misses (because there is no written record of them); but I have heard of such occurrences from Rancher Mike Tuttle and witnessed a number of others. In addition, there is a reason the house located at the other side of the field has changed hands numerous times and sits empty with a "For Sale" longer than it is occupied. For safety's sake, no left turn should be permitted into Street A from Fairview Avenue. Instead, drivers should continue east on Fairview and use the roundabout located at the entrance to Five Canyons Parkway.

Joan and Stephen Quock

I had a phone conversation with Mike Tuttle this morning and he will not be able to attend the meeting tonight. He indicated that he wanted 3 items discussed in the EIR:

1. The potential effect of the project on Don Castro Reservoir. He is concerned with silt and debris washing into the reservoir.
2. He is concerned with traffic/safety/site distance at Fairview Avenue at the entrance to the proposed private street.
3. Concerned with the effect of the development on the wildlife habitat. He said he has seen a badger on the site.

Attachment 3: Hydrologic Impact Analysis

Hydrology and Hydraulics Calculations

for

Tract 8057 - Lerob LLC
Alameda County, California

Prepared by:

RUGGERI-JENSEN-AZAR
ENGINEERS • PLANNERS • SURVEYORS

4690 Chabot Drive, Suite 200
Pleasanton, CA 94588
(925) 227-9100

July 5, 2013

Table of Contents

Introduction

The purpose of this report is to document the storm drain system design for Tract 8057 – Lerob LLC (Project).

Site Location and Description

The project is currently at the tentative map design phase. The project site is approximately 10.1 acres in size, is zoned R-1-B-E, and is currently vacant. It is located on Fairview Avenue, between Courtney Lane and Walter Dinos Court in the City of Hayward, Alameda County, California.

The site has significant topographic variation with existing slopes ranging from relatively flat hill tops to slopes in excess of 2:1 (H:V). Elevations range from approximately 555 feet at Fairview Avenue to 687 feet at the upper-most point on the property.

Climate

Hayward has a climate characterized by wet winters and dry summers. The site receives a mean annual precipitation of 23 inches per County rain data (ACFC&WCD, File MA-180). The typical wet season is from October to April with occasional, uncharacteristic rainfall during the other months.

Surface Water Run-off

Surface runoff begins when the soils reach their saturation level and additional rainfall develops into overland flow. The surface water begins as overland flow across the steep site following existing drainage patterns and making its way to the existing storm drain facilities.

Existing Hydrology

The existing 10.1 acres is currently split up into two drainage areas by existing topography. The lower 3.5 acres (area 1A) drains toward the west and onto the adjacent property owned by the Fairview Tract LLC, also known as Future Tract 7921 and then to Fairview Avenue. The upper 6.2 acres (area 2) drains toward the east onto property owned by PG&E. A small 0.4 acre sliver of the existing access road drains along with approximately 3.7 acres of PG&E's property, (a total of 4.1 acres - area 1B) directly to Fairview Avenue.

Refer to the "Existing and Proposed Drainage Exhibit" located in the appendix for area designations, existing and proposed topography and flow directions.

An existing 18 inch storm drain system runs down Fairview Avenue collecting drainage from the road and adjacent properties.

The BAHM calculations for Basin 1 show the pre-project flow rate generated by the 7.6 acres site draining to Fairview Avenue is 11.76 cfs during the 10 year event.

The BAHM calculations for Basin 2 show the pre-project flow rate generated by the 4.1 acres site draining toward the east onto PG&E property is 10.27 cfs during the 10 year event.

Proposed Hydrology

The proposed project will adjust the drainage patterns to direct 8.5 acres (areas 1A & 1B) down the proposed access road on PG&E's property to the existing storm drain system in Fairview Avenue. 3.7 acres (area 2) of the existing 6.2 acres will continue to drain towards PG&E's property and 1.6 acres of the existing 3.5 acres will continue to drain towards the Fairview Tract LLC property.

The increase in acreage and imperviousness draining to the existing system in Fairview Avenue will be attenuated by proposed bio-retention planned along the project main street and a detention basin designed to meet the Hydrograph Modification requirements of the Municipal Regional Permit (see BAHM model in appendix). The basin will also pass the 100 year storm with approximately one foot of freeboard as shown in the Hydrograph Report in the Detention System Calculations in the appendix.

Although the acreage of area tributary to Fairview Avenue is increased slightly, the BAHM calculations for Basin 1 show that with the proposed bio-retention and detention basin, the flow to Fairview Avenue is attenuated from 11.76 cfs to 9.40 cfs in the post-developed condition. BAHM calculations for Basin 2 shows a reduction in flow due to reduced drainage area, with flows reduced from 10.27 cfs to 6.82 cfs.

Calculations

Hydrology and hydraulic analysis for the onsite collection facilities will be based on the 10-year storm event and the Rational Method as outlined in the ACFC&WCD criteria shown below and Mannings Formula for hydraulic profiles as follows:

1. Hydrology

Rational Method

$Q = CiA$

Q	=	Peak Stormwater Flow, cubic feet per second (cfs)
C	=	Coefficient of Runoff
i	=	Rainfall Intensity, inches / hour
A	=	Area of Watershed, acres

The variables listed above C, i, and A, are determined using methods and criteria found ACFC&WCD guidelines.

The runoff coefficient "C" is based on land use type. "C" values range from 0.2 to 0.9 with higher values for land use types with higher percentages of impervious surface. C values of 0.2 are reserved for undeveloped land, parks, and golf courses which 100 percent of the land is pervious. C values up to 0.9 are for 100 percent impervious types of land use (streets, parking lots, roof tops, etc). The C value shall also be increased for areas with soils having a low permeability.

The rainfall intensity "i" is calculated by multiplying the Mean Annual Precipitation (MAP) for the site and the Unit Rainfall Intensity Factor (I).

- The MAP is found on the ACFC&WCD isohyetal map, file No. MA-180.
  - The MAP for the Tract 8057 is 23 in/yr.
- The Unit Rainfall Intensity Factor is based on time of concentration (T_c) and storm recurrence interval.
  - Per ACFC&WCD T_c for undeveloped watersheds is calculated using the following equation.

    Initial $T_c = L / 60(V)$

    T_c = Time of Concentration
    L = Overland flow length in feet
    V = Overland flow velocity in feet per second, from Figure 3.

  - Per ACFC&WCD T_c for urbanized watersheds shall be taken as "roof-to-gutter" time (in minutes) added to the equation above. See the equation below for urbanized watershed T_c:

    Initial $T_c = [L / 60(V)] +$ "roof to gutter"

  - The storm recurrence interval for the Tract 8057 is a 10-year storm event.

Hydraulic calculations specifically for this site are based on stormwater runoff collected at the upper portion of the site, then flow to the detention basin, where flows are attenuated thus increasing the time of concentration for flows discharging from the basin back into the onsite collection facilities and ultimately draining to the existing county storm drain system on Fairview Avenue.

Results and Recommendations

As noted above the pre-project runoff for the 10year event discharging to Fairview Avenue Storm drain system are 11.76 cfs, compared to post-project flows are 9.40 cfs. Pre-Project runoff for the 10year event discharging to the east onto the adjacent PG&E property are 10.27cfs compared to post-project flows are 6.82 cfs.

The results of the hydraulic modeling indicate that with bio-retention and detention, the site will attenuate the run-off to pre-project levels while reducing the tributary area that currently drains off to privately owned neighboring properties. In addition, the hydraulic calculations show that the pipes are adequately sized to convey the design storm.

References

1. "Hydrology and Hydraulics Criteria Summary," Alameda County Flood Control and Water Conservation District, issued by Alameda County Public Works Agency, 399 Elmhurst Street, Hayward, CA 94544, revised August 7, 1989

Appendix

Storm Drain System Calculations

BAHM Calculations

Detention System Calculations

Appendix

Storm Drain System Calculations

G:\Job2009\091093\Hydro\Pond-Sys
Input by : Jared Frey
Job Name : 091093
Project : Lerob LLC
Tract Name : tract 8057

07-24-2013
2.01f
0017:Hyd

Manual Losses	: No
Junction Losses	: Yes
Bend & Entry Losses	: Yes
Expansion & Contraction Losses	: Yes
Orifice Losses	: Yes
Last Date Printed	: 04-19-2013
Mean Annual Precipitation	: 23.00
Begining Water Surface	: 632.00
Minimum Free Board Requirement	: 1.75
Method of Analysis	: Alameda
Last Storm Frequency ran	: 10

Pt.	Area	Acres	"C"	"n"	Gnd Time	T.C.	F.L.	C/P	B/D	SS/#	Slope	Len.	Rad.	Ang.	Net.
DI1		1.48	0.8	0.0140	1.0	7.0	677.00	672.00	P	18.0	1.0	0.0130	88.00	0	0	DI2
DI2		0.20	0.8	0.0140	1.0	0.0	676.00	670.80	P	18.0	1.0	0.0100	148.00	0	0	DI3
DI3		1.82	0.5	0.0140	1.0	0.0	679.00	669.30	P	18.0	1.0	0.0480	130.00	0	0	DI13
DI13		0.10	0.8	0.0140	1.0	0.0	669.00	663.00	P	24.0	1.0	0.1300	154.00	0	0	DI14
DI14		0.40	0.5	0.0140	1.0	0.0	648.00	642.50	P	24.0	1.0	0.0820	143.00	0	0	DI15
DI15		0.54	0.5	0.0140	1.0	0.0	637.00	630.70	P	24.0	1.0	0.0500	30.00	0	90	OUT

Storm Frequency 10 & 15 years

Open & Closed System Calculations

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Pond-Sys | Date: 07-24-2013 Time: 09:32:33am

TLW_Hydr | Hydrology | Hydraulics | Page 1 of 6 -- version 2.01f

Pt. #	Area Descr.	dA base (Acres)	"C"	"C" G.	dCA Slope	Sum A (Acres)	Sum dCA (Acres)	Time of Conc.	Inten. "n"	Q CiA (cfs)	#/=Dia/ SS (in./ft.)	Width	Sf Sp	Length Dn (ft.)	Vel. (fps)	Sect Time (min)	Frict Loss (ft.)	Minor Loss (ft.)	HGL (ft.)	MTC HGL+ F.B.	Plan T.C. F.L.	Flow Cond. to Pt.
DI1		1.48	0.80		1.18	1.48	1.18	7.0	2.72									0.18	672.73	674.48	677.00	EB*
			0.80	1.00					0.014	3.22	1=	18.0	0.0011	88	1.8	0.8	0.10				672.00	
													0.0130	0.55	5.5	0.3						DI2
DI2		0.20	0.80		0.16	1.68	1.34	7.3	2.67									0.04	671.47	673.22	676.00	EB*
			0.80	1.00					0.014	3.58	1=	18.0	0.0013	148	2.0	1.2	0.20				670.80	
													0.0100	0.63	5.1	0.5						DI3
DI3		1.82	0.57		1.05	3.50	2.39	8.5	2.48									0.00	670.24	671.99	679.00	PM*
			0.50	1.00					0.014	5.92	1=	18.0	0.0037	130	3.3	0.6	0.48				669.30	
													0.0480	0.94	10.4	0.2						DI13
DI13		0.10	0.80		0.08	3.60	2.47	8.7	2.45									1.76	665.14	666.89	669.00	PM*
			0.80	1.00					0.014	6.05	1=	24.0	0.0008	154	1.9	1.3	0.13				663.00	
													0.1300	0.38	14.5	0.2						DI14
DI14		0.40	0.57		0.23	4.00	2.70	8.9	2.42									0.42	643.37	645.12	648.00	EB*
			0.50	1.00					0.014	6.53	1=	24.0	0.0010	143	2.1	1.1	0.14				642.50	
													0.0820	0.45	12.5	0.2						DI15
DI15		0.54	0.57		0.31	4.54	3.01	9.1	2.40									0.00	632.04	633.79	637.00	BW
			0.50	1.00					0.014	7.20	1=	24.0	0.0012	30	2.3	0.2	0.04				630.70	
													0.0500	Does not apply								OUT
														Beginning Water Surface =				632.00				

Storm Frequency 10 & 15 years

Junction Loss Calculations

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Pond-Sys | Date: 07-24-2013 Time: 09:32:33am

TLW_Hydr | Hydrology | Hydraulics | Page 2 of 6 -- version 2.01f

Point	Q2 / Q3 (cfs)	CA2 / CA3 (Acres)	a2 / a3 (sq ft)	th3 (deg)	Q2^2 Cos(0) / a2 g / Q3^2 Cos(Th3) / a3 g (feet)	Q1 / Q4 (cfs)	CA1 / CA4 (Acres)	a1 / a4 (sq ft)	th1 / th4 (deg)	Q1^2 Cos(Th1) / a1 g / Q4^2 Cos(Th4) / a4 g (feet)	(a2 + a1) / 2 (sq ft)	Hj (feet)
DI1	3.22	1.18	0.59									0.00
DI2	3.58	1.34	0.70		0.23	3.16	1.18	0.59	0.0	0.52	0.65	0.00
DI3	5.92	2.39	0.57		0.00	3.33	1.34	0.70	0.0	0.19	0.64	0.00
DI13	6.05	2.47	0.42		2.73	5.85	2.39	0.57	0.0	1.86	0.49	1.76
DI14	6.53	2.70	0.52		2.55	5.98	2.47	0.42	0.0	2.67	0.47	0.00
DI15	7.20	3.01	3.14		0.51	6.46	2.70	0.52	0.0	2.49	1.83	0.00

Storm Frequency 10 & 15 years

Bend & Entry Loss Calculations

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Pond-Sys | Date: 07-24-2013 Time: 09:32:33am

TLW_Hydr | Hydrology | Hydraulics | Page 3 of 6 -- version 2.01f

Point	Rad.	B/Dia	Vel.	Hb	Ht	Point	Rad.	B/Dia	Vel.	Hb	Ht
DI1	0.0	18.00	5.5	0.00	0.18	DI2	0.0	18.00	5.1	0.00	0.00
DI3	0.0	18.00	10.4	0.00	0.00	DI13	0.0	24.00	14.5	0.00	0.00
DI14	0.0	24.00	12.5	0.00	0.00	DI15	0.0	24.00	2.3	0.00	0.00

Storm Frequency 10 & 15 years

Expansion & Contraction Loss Calculations

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Pond-Sys | Date: 07-24-2013 Time: 09:32:33am

TLW_Hydr | Hydrology | Hydraulics | Page 4 of 6 -- version 2.01f

Point	a-in	a-out	Vel.	He	Hc	Point	a-in	a-out	Vel.	He	Hc
DI1	0.00	0.00	0.0	0.00	0.00	DI2	0.84	0.84	5.1	0.02	0.02
DI3	0.76	0.76	10.4	0.00	0.00	DI13	0.65	0.65	14.5	0.29	0.26
DI14	0.72	0.72	12.5	0.22	0.20	DI15	1.77	0.82	12.5	0.05	0.03

Orifice Loss Calculations @ Sub to Super Transitions

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Pond-Sys | Date: 07-24-2013 Time: 09:32:33am

TLW_Hydr | Hydrology | Hydraulics | Page 5 of 6 -- version 2.01f

Point	d-in	d-out	V-In	V-out	Ho	Point	d-in	d-out	V-in	V-out	Hc
DI1	Does Not Apply				0.00	DI2	Does Not Apply				0.00
DI3	1.50	0.94	2.0	10.4	0.28	DI13	Does Not Apply				0.00
DI14	Does Not Apply				0.00	DI15	Does Not Apply				0.00

Open & Closed System Summary

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Pond-Sys | Date: 07-24-2013 Time: 09:32:33am

TLW_Hydr | Hydrology | Hydraulics |

Pt	Area	Q	Vel	F.L.	Dn	Dc	HGL	EGL	MTC	Plan TC	Flow	Net.
DI1		3.22	5.45	672.00	0.55	0.68	672.73	673.19	674.48	677.00	EB*	DI2
DI2		3.58	5.09	670.80	0.63	0.72	671.47	671.87	673.22	676.00	EB*	DI3
DI3		5.92	10.36	669.30	0.94	0.94	670.24	671.91	671.99	679.00	PM*	DI13
DI13		6.05	14.50	663.00	0.38	0.87	665.14	668.41	666.89	669.00	PM*	DI14
DI14		6.53	12.54	642.50	0.45	0.91	643.37	645.81	645.12	648.00	EB*	DI15
DI15		7.20	2.29	630.70	N/A	N/A	632.04	632.12	633.79	637.00	BW	OUT

G:\Job2009\091093\Hydro\Fairview
Input by : Jared Frey
Job Name : 091093
Project : Lerob LLC
Tract Name : tract 8057

07-24-2013
2.01f
0017:Hyd

Manual Losses	: No
Junction Losses	: Yes
Bend & Entry Losses	: Yes
Expansion & Contraction Losses	: Yes
Orifice Losses	: Yes
Last Date Printed	: -N-ev-er.-
Mean Annual Precipitation	: 23.00
Begining Water Surface	: 548.15
Minimum Free Board Requirement	: 1.75
Method of Analysis	: Alameda
Last Storm Frequency ran	: 10

Pt.	Area	Acres	"C"	"n"	Gnd Time	T.C.	F.L.	C/P	B/D	SS/#	Slope	Len.	Rad.	Ang.	Net.
POND		4.42	0.8	0.0140	1.0	9.7	633.00	624.20	P	18.0	1.0	0.0100	1.00	0	0	RISR
RISR		0.00-2.5	0.0140	1.0	23.7	633.00	624.00	P	18.0	1.0	0.0313	128.00	0	0	DI4	
DI4		0.35	0.5	0.0140	1.0	0.0	632.00	620.00	P	18.0	1.0	0.0660	100.00	0	0	DI5
DI5		0.09	0.5	0.0140	1.0	10.0	620.00	613.40	P	18.0	1.0	0.0100	30.00	0	0	DI6
DI6		1.07	0.5	0.0140	1.0	0.0	620.00	613.20	P	18.0	1.0	0.1500	125.00	0	0	DI7
DI7		0.22	0.5	0.0140	1.0	0.0	595.00	589.60	P	18.0	1.0	0.0068	74.00	0	0	MH8
MH8		0.00	0.5	0.0140	1.0	0.0	595.00	588.00	P	18.0	1.0	0.1461	65.00	0	0	MH9
MH9		0.00	0.5	0.0140	1.0	0.0	585.00	578.00	P	18.0	1.0	0.2000	65.00	0	0	DI10
DI10		0.24	0.7	0.0140	1.0	0.0	572.00	556.00	P	18.0	1.0	0.0400	125.00	0	0	DI11
DI11		0.60	0.5	0.0140	1.0	0.0	554.20	551.00	P	18.0	1.0	0.0050	35.00	0	90	DI12
DI12		1.13	0.5	0.0140	1.0	0.0	554.00	550.00	P	18.0	1.0	0.0200	50.00	0	90	EX01

Storm Frequency 10 & 15 years

Open & Closed System Calculations

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Fairview | Date: 07-24-2013 Time: 11:27:52am

TLW_Hydr | Hydrology | Hydraulics | Page 1 of 6 -- version 2.01f

Pt. #	Area Descr.	dA base (Acres)	"C"	G.Slope	dCA	Sum A (Acres)	Sum dCA (Acres)	Time of Conc.	Inten. "n"	Q CiA (cfs)	#/=Dia/ SS (in./ft.)	Width	Sf Sp	Length Dn (ft.)	Vel. (fps)	Sect Time (min)	Fric Loss (ft.)	Minor Loss (ft.)	HGL (ft.)	MTC HGL+ F.B.	Plan F.L.	Flow T.C. to Pt.	Cond.
POND		4.42	0.76	3.37	4.42	3.37	9.7	2.32										0.23	625.45	627.20	633.00	EB*	
			0.75	1.00				0.014	7.81	1=	18.0	0.0064	1	4.4	0.0	0.01				624.20	
												0.0100	1.02	6.1	0.0							RISR
RISR		0.00	-2.54	-0.00	4.42	3.37	23.7	1.48										0.48	624.87	626.62	633.00	PM*	
			-2.54	1.00				0.014	2.54	1=	18.0	0.0007	128	1.4	1.5	0.09				624.00	
												0.0313	0.39	7.0	0.3							DI4
DI4		0.35	0.54	0.19	4.77	3.55	24.0	1.47										0.33	620.79	622.54	632.00	EB*	
			0.50	1.00				0.014	5.21	1=	18.0	0.0029	100	2.9	0.6	0.29				620.00	
												0.0660	0.46	11.2	0.1							DI5
DI5		0.09	0.57	0.05	4.86	3.60	10.0	2.29										0.00	614.61	616.36	620.00	BW	
			0.50	1.00				0.014	8.24	1=	18.0	0.0071	30	4.7	0.1	0.21				613.40	
												0.0100	Does not apply									DI6
DI6		1.07	0.57	0.61	5.93	4.21	10.1	2.27										0.00	614.40	616.15	620.00	EB*	
			0.50	1.00				0.014	9.58	1=	18.0	0.0096	125	5.4	0.4	1.21				613.20	
												0.1500	1.20	17.9	0.1							DI7
DI7		0.22	0.57	0.12	6.15	4.34	10.2	2.26										0.00	589.96	591.71	595.00	BW	
			0.50	1.00				0.014	9.81	1=	18.0	0.0101	74	5.6	0.2	0.75				589.60	
												0.0068	Does not apply									MH8
MH8		0.00	0.57	0.00	6.15	4.34	10.4	2.24										0.00	589.21	590.96	595.00	EB*	
			0.50	1.00				0.014	9.81	1=	18.0	0.0101	65	5.6	0.2	0.66				588.00	
												0.1461	1.21	17.8	0.1							MH9
MH9		0.00	0.57	0.00	6.15	4.34	10.5	2.23										1.23	579.71	581.46	585.00	PM*	
			0.50	1.00				0.014	9.81	1=	18.0	0.0101	65	5.6	0.2	0.66				578.00	
												0.2000	0.48	19.9	0.1							DI10
DI10		0.24	0.72	0.17	6.39	4.51	10.6	2.22										0.32	557.08	558.83	572.00	EB*	
			0.70	1.00				0.014	10.01	1=	18.0	0.0105	125	5.7	0.4	1.32				556.00	
												0.0400	0.76	11.1	0.2							DI11
DI11		0.60	0.56	0.34	6.99	4.85	10.8	2.20										0.00	553.59	555.34	554.20	BW	
			0.50	1.00				0.014	10.66	1=	18.0	0.0120	35	6.0	0.1	0.42				551.00	
												0.0050	Does not apply									DI12
DI12		1.13	0.56	0.64	8.12	5.49	10.9	2.19										2.09	553.17	554.92	554.00	PM*	
			0.50	1.00				0.014	12.01	1=	18.0	0.0152	50	6.8	0.1	0.76				550.00	
												0.0200	1.08	8.8	0.1							EX01

Beginning Water Surface = 548.15

Storm Frequency 10 & 15 years

Junction Loss Calculations

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Fairview | Date: 07-24-2013 Time: 11:27:52am

TLW_Hydr | Hydrology | Hydraulics | Page 2 of 6 -- version 2.01f

Point	Q2 / Q3 (cfs)	CA2 / CA3 (Acres)	a2 / a3 (sq ft)	th3 (deg)	Q2^2 Cos(0) / a2 g / Q3^2 Cos(Th3) / a3 g (feet)	Q1 / Q4 (cfs)	CA1 / CA4 (Acres)	a1 / a4 (sq ft)	th1 / th4 (deg)	Q1^2 Cos(Th1) / a1 g / Q4^2 Cos(Th4) / a4 g (feet)	(a2 + a1) / 2 (sq ft)	Hj (feet)
POND	7.81	3.37	1.27									0.00
RISR	2.54	3.37	0.36		0.55	2.54	3.37	1.27	0.0	0.16	0.82	0.48
DI4	5.21	3.55	0.47		1.81	4.93	3.37	0.36	0.0	2.08	0.42	0.00
DI5	8.24	3.60	1.77		1.19	8.12	3.55	0.47	0.0	4.40	1.12	0.00
DI6	9.58	4.21	0.54		0.00	8.20	3.60	1.77	0.0	1.18	1.15	0.00
DI7	9.81	4.34	1.77		1.69	9.53	4.21	0.54	0.0	5.27	1.15	0.00
MH8	9.81	4.34	0.55		0.00	9.81	4.34	1.77	0.0	1.69	1.16	0.00
MH9	9.81	4.34	0.49		6.08	9.81	4.34	0.55	0.0	5.44	0.52	1.23
DI10	10.01	4.51	0.90		3.46	9.63	4.34	0.49	0.0	5.85	0.70	0.00
DI11	10.66	4.85	1.77		2.00	9.92	4.51	0.90	0.0	3.39	1.33	0.00
DI12	12.01	5.49	1.37		3.28	10.62	4.85	1.77	90.0	0.00	1.57	2.09

Storm Frequency 10 & 15 years

Bend & Entry Loss Calculations

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Fairview | Date: 07-24-2013 Time: 11:27:52am

TLW_Hydr | Hydrology | Hydraulics | Page 3 of 6 -- version 2.01f

Point	Rad.	B/Dia	Vel.	Hb	Ht	Point	Rad.	B/Dia	Vel.	Hb	Ht
POND	0.0	18.00	6.1	0.00	0.23	RISR	0.0	18.00	7.0	0.00	0.00
DI4	0.0	18.00	11.2	0.00	0.00	DI5	0.0	18.00	4.7	0.00	0.00
DI6	0.0	18.00	17.9	0.00	0.00	DI7	0.0	18.00	5.6	0.00	0.00
MH8	0.0	18.00	17.8	0.00	0.00	MH9	0.0	18.00	19.9	0.00	0.00
DI10	0.0	18.00	11.1	0.00	0.00	DI11	0.0	18.00	6.0	0.00	0.00
DI12	0.0	18.00	8.8	0.00	0.00						

Storm Frequency 10 & 15 years

Expansion & Contraction Loss Calculations

Alameda County Method

Mean Annual Precipitation = 23.00 inches
Free Board Requirement = 1.75 feet
File = G:\Job2009\091093\Hydro\Fairview
TLW_Hydr

091093
tract 8057

Hydrology

Hydraulics

Project:Lerob LLC
Design :Jared Frey
Date: 07-24-2013 Time: 11:27:52am

Point	a-in	a-out	Vel.	He	Hc	Point	a-in	a-out	Vel.	He	Hc
POND	0.00	0.00	0.0	0.00	0.00	RISR	0.60	0.60	7.0	0.08	0.05
DI4	0.68	0.68	11.2	0.17	0.16	DI5	1.33	1.15	11.2	0.03	0.03
DI6	0.73	1.33	17.9	0.00	0.00	DI7	1.33	1.33	5.6	0.05	0.03
MH8	0.74	1.33	17.8	0.00	0.00	MH9	0.70	0.70	19.9	0.56	0.56
DI10	0.95	0.95	11.1	0.17	0.15	DI11	1.33	1.33	6.0	0.06	0.04
DI12	1.17	1.33	8.8	0.12	0.08						

Orifice Loss Calculations @ Sub to Super Transitions

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Fairview | Date: 07-24-2013 Time: 11:27:52am

TLW_Hydr | Hydrology | Hydraulics | Page 5 of 6 -- version 2.01f

Point	d-in	d-out	V-In	V-out	Ho	Point	d-in	d-out	V-in	V-out	Hc
POND	Does Not Apply				0.00	RISR	Does Not Apply				0.00
DI4	Does Not Apply				0.00	DI5	Does Not Apply				0.00
DI6	1.50	1.20	4.7	17.9	0.22	DI7	Does Not Apply				0.00
MH8	1.50	1.21	5.6	17.8	0.19	MH9	Does Not Apply				0.00
DI10	Does Not Apply				0.00	DI11	Does Not Apply				0.00
DI12	Does Not Apply				0.00						

Storm Frequency 10 & 15 years

Open & Closed System Summary

Alameda County Method

Mean Annual Precipitation = 23.00 inches | 091093 | Project:Lerob LLC

Free Board Requirement = 1.75 feet | tract 8057 | Design :Jared Frey

File = G:\Job2009\091093\Hydro\Fairview | Date: 07-24-2013 Time: 11:27:52am

TLW_Hydr | Hydrology | Hydraulics | Page 6 of 6 -- version 2.01f

Pt	Area	Q	Vel	F.L.	Dn	Dc	HGL	EGL	MTC	Plan TC	Flow	Net.
POND		7.81	6.14	624.20	1.02	1.08	625.45	626.03	627.20	633.00	EB*	RISR
RISR		2.54	6.97	624.00	0.39	0.60	624.87	625.62	626.62	633.00	PM*	DI4
DI4		5.21	11.18	620.00	0.46	0.88	620.79	622.73	622.54	632.00	EB*	DI5
DI5		8.24	4.66	613.40	N/A	N/A	614.61	614.95	616.36	620.00	BW	DI6
DI6		9.58	17.88	613.20	1.20	1.20	614.40	619.36	616.15	620.00	EB*	DI7
DI7		9.81	5.55	589.60	N/A	N/A	589.96	590.44	591.71	595.00	BW	MH8
MH8		9.81	17.83	588.00	1.21	1.21	589.21	594.15	590.96	595.00	EB*	MH9
MH9		9.81	19.94	578.00	0.48	1.21	579.71	585.88	581.46	585.00	PM*	DI10
DI10		10.01	11.11	556.00	0.76	1.22	557.08	559.00	558.83	572.00	EB*	DI11
DI11		10.66	6.04	551.00	N/A	N/A	553.59	554.16	555.34	554.20	BW	DI12
DI12		12.01	8.80	550.00	1.08	1.31	553.17	554.37	554.92	554.00	PM*	EX01

BAHM Calculations

Bay Area Hydrology Model
PROJECT REPORT

Project Name: 091093
Site Address: FAIRVIEW
City : ALAMEDA COUNTY
Report Date : 7/24/2013
Gage : NRWARK
Data Start : 1959/10/01
Data End : 2003/09/30
Precip Scale: 1.62
BAHM Version:

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C D,Urban,Very(>20%)	7.6

Impervious Land Use	Acres

Element Flows To:

Surface	Interflow	Groundwater

Name : Basin 1A
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C D,Grass,Mod(5-10%)	3.06

Impervious Land Use	Acres		
Roads,Flat(0-5%)	0.66	,Mod(5-10%)	0.19 Area
0.49			

Element Flows To:

Surface	Interflow	Groundwater
Bioretenti Surface 2,	Bioretenti Surface 2,	

Name : Trapezoidal Pond 1

Bottom Length: 80ft.
Bottom Width: 25ft.
Depth : 6ft.
Volume at riser head : 0.3654ft.
Infiltration On
Infiltration rate : 0.01
Infiltration saftey factor : 1
Wetted surface area On
Side slope 1: 2 To 1
Side slope 2: 2 To 1
Side slope 3: 2 To 1
Side slope 4: 2 To 1
Discharge Structure
Riser Height: 5 ft.
Riser Diameter: 18 in.
Notch Type : V-notch
Notch Angle : 45.000
Notch Height: 0.100 ft.
Orifice 1 Diameter: 3.75 in. **Elevation:** 0 ft.
Orifice 1 Diameter: 6.4 in. **Elevation:** 0.5 ft.
Orifice 1 Diameter: 8 in. **Elevation:** 3.2 ft.

Element Flows To:
Outlet 1 **Outlet 2**

Pond Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
629.0	0.046	0.000	0.000	0.000
629.1	0.047	0.003	0.095	0.000
629.1	0.047	0.006	0.135	0.000
629.2	0.048	0.009	0.165	0.000
629.3	0.049	0.013	0.191	0.000
629.3	0.049	0.016	0.213	0.000
629.4	0.050	0.019	0.234	0.001
629.5	0.050	0.022	0.252	0.001
629.5	0.051	0.026	0.466	0.001
629.6	0.052	0.029	0.626	0.001
629.7	0.053	0.033	0.741	0.001
629.7	0.053	0.036	0.836	0.001
629.8	0.054	0.040	0.920	0.001
629.9	0.055	0.043	0.995	0.001
629.9	0.055	0.047	1.065	0.001
630.0	0.056	0.051	1.130	0.001
630.1	0.057	0.055	1.191	0.001
630.1	0.057	0.058	1.249	0.001
630.2	0.058	0.062	1.305	0.001
630.3	0.059	0.066	1.358	0.001
630.3	0.059	0.070	1.409	0.001
630.4	0.060	0.074	1.458	0.001
630.5	0.061	0.078	1.505	0.001
630.5	0.062	0.082	1.551	0.001
630.6	0.062	0.086	1.595	0.001
630.7	0.063	0.090	1.639	0.001
630.7	0.064	0.095	1.681	0.001

630.8	0.064	0.099	1.722	0.001
630.9	0.065	0.103	1.762	0.001
630.9	0.066	0.108	1.801	0.001
631.0	0.067	0.112	1.840	0.001
631.1	0.067	0.117	1.877	0.001
631.1	0.068	0.121	1.914	0.001
631.2	0.069	0.126	1.950	0.001
631.3	0.070	0.130	1.986	0.001
631.3	0.070	0.135	2.021	0.001
631.4	0.071	0.140	2.055	0.001
631.5	0.072	0.144	2.089	0.001
631.5	0.073	0.149	2.122	0.001
631.6	0.073	0.154	2.154	0.001
631.7	0.074	0.159	2.187	0.001
631.7	0.075	0.164	2.218	0.001
631.8	0.076	0.169	2.250	0.001
631.9	0.077	0.174	2.280	0.001
631.9	0.077	0.179	2.311	0.001
632.0	0.078	0.184	2.341	0.001
632.1	0.079	0.190	2.370	0.001
632.1	0.080	0.195	2.399	0.001
632.2	0.081	0.200	2.428	0.001
632.3	0.081	0.206	2.891	0.001
632.3	0.082	0.211	3.099	0.001
632.4	0.083	0.217	3.265	0.001
632.5	0.084	0.222	3.409	0.001
632.5	0.085	0.228	3.538	0.001
632.6	0.085	0.233	3.658	0.001
632.7	0.086	0.239	3.770	0.001
632.7	0.087	0.245	3.876	0.001
632.8	0.088	0.251	3.976	0.001
632.9	0.089	0.257	4.073	0.001
632.9	0.090	0.263	4.165	0.001
633.0	0.090	0.269	4.255	0.001
633.1	0.091	0.275	4.341	0.001
633.1	0.092	0.281	4.425	0.001
633.2	0.093	0.287	4.507	0.001
633.3	0.094	0.293	4.587	0.001
633.3	0.095	0.299	4.665	0.001
633.4	0.095	0.306	4.741	0.001
633.5	0.096	0.312	4.815	0.001
633.5	0.097	0.319	4.888	0.001
633.6	0.098	0.325	4.959	0.001
633.7	0.099	0.332	5.029	0.001
633.7	0.100	0.338	5.098	0.001
633.8	0.101	0.345	5.166	0.001
633.9	0.102	0.352	5.233	0.001
633.9	0.102	0.359	5.299	0.001
634.0	0.103	0.365	5.367	0.001
634.1	0.104	0.372	5.682	0.001
634.1	0.105	0.379	6.204	0.001
634.2	0.106	0.386	6.862	0.001
634.3	0.107	0.393	7.628	0.001
634.3	0.108	0.401	8.488	0.001
634.4	0.109	0.408	9.432	0.001
634.5	0.110	0.415	10.45	0.001
634.5	0.111	0.422	11.54	0.001

634.6	0.111	0.430	12.70	0.001
634.7	0.112	0.437	13.92	0.001
634.7	0.113	0.445	15.20	0.001
634.8	0.114	0.452	16.53	0.001
634.9	0.115	0.460	17.92	0.001
634.9	0.116	0.468	19.36	0.001
635.0	0.117	0.475	20.85	0.001
635.1	0.118	0.483	22.39	0.001

Name : Basin 1B
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C D,Grass,Ste(10-20)	3.5

Impervious Land Use	Acres
Roads,Mod(5-10%)	0.6

Element Flows To:

Surface	Interflow	Groundwater
Bioretenti Surface 1,	Bioretenti Surface 1,	

Name : Bioretention Swale 1

Element Flows To:

Outlet 1	Outlet 2

Name : Bioretenti Surface 1

Element Flows To:

Outlet 1	Outlet 2
Bioretention Swale 1,	

Name : Bioretention Swale 2

Element Flows To:

Outlet 1	Outlet 2
Trapezoidal Pond 1,	

Name : Bioretenti Surface 2

Element Flows To:

Outlet 1	Outlet 2

Trapezoidal Pond 1, Bioretention Swale 2,

Name : Basin 2
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C D,Urban,Very(>20%)	6.2

Impervious Land Use	Acres

Element Flows To:
Surface Interflow Groundwater

Name : Basin 1C
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C D,Urban,St(10-20%)	1.6

Impervious Land Use	Acres

Element Flows To:
Surface Interflow Groundwater

Name : Basin 4
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C D,Grass,Very(>20%)	3.7

Impervious Land Use	Acres

Element Flows To:
Surface Interflow Groundwater

MITIGATED LAND USE

ANALYSIS RESULTS

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	4.249619
5 year	6.53159
10 year	8.400471
25 year	13.776122

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	3.705216
5 year	5.67425
10 year	7.919447
25 year	11.634989

Yearly Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1960	5.609	4.193
1961	6.266	5.550
1962	7.515	6.619
1963	12.130	11.556
1964	6.617	5.674
1965	2.788	2.218
1966	5.410	3.591
1967	13.749	10.069
1968	4.597	3.707
1969	6.532	7.787
1970	2.868	3.098
1971	4.904	5.511
1972	2.005	1.305
1973	7.915	8.085
1974	4.228	4.249
1975	7.568	5.546
1976	1.517	0.745
1977	1.739	1.189
1978	4.921	5.874
1979	5.480	4.126
1980	4.062	3.704
1981	2.250	1.995
1982	9.007	6.448
1983	4.272	4.869
1984	5.086	3.953
1985	2.990	2.721
1986	3.218	2.707
1987	2.512	2.725
1988	3.185	2.921
1989	3.013	2.325
1990	4.995	2.075
1991	3.986	2.636
1992	6.322	5.136

1993	4.400	4.432
1994	3.362	2.055
1995	13.992	12.270
1996	3.166	2.748
1997	4.046	4.470
1998	4.796	5.535
1999	2.655	2.204
2000	2.753	3.392
2001	2.834	2.062
2002	2.879	2.154
2003	4.610	4.651

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	13.9915	12.2701
2	13.7492	11.5556
3	12.1303	10.0689
4	9.0067	8.0849
5	7.9155	7.7871
6	7.5680	6.6191
7	7.5147	6.4477
8	6.6171	5.8736
9	6.5316	5.6743
10	6.3220	5.5500
11	6.2665	5.5458
12	5.6093	5.5348
13	5.4796	5.5115
14	5.4100	5.1363
15	5.0856	4.8691
16	4.9952	4.6508
17	4.9214	4.4704
18	4.9039	4.4323
19	4.7956	4.2494
20	4.6096	4.1933
21	4.5974	4.1256
22	4.4002	3.9532
23	4.2718	3.7065
24	4.2285	3.7040
25	4.0620	3.5912
26	4.0463	3.3916
27	3.9864	3.0980
28	3.3620	2.9212
29	3.2178	2.7485
30	3.1852	2.7254
31	3.1664	2.7207
32	3.0130	2.7071
33	2.9903	2.6365
34	2.8793	2.3253
35	2.8684	2.2184
36	2.8336	2.2043
37	2.7882	2.1540
38	2.7527	2.0751
39	2.6554	2.0624
40	2.5123	2.0549
41	2.2503	1.9946
42	2.0051	1.3046

43	1.7389	1.1889
44	1.5167	0.7450

POC #1

The Facility PASSED.

Flow(CFS)	Predev	Dev	Percentage	Pass/Fail
0.4250	2806	3043	108	Pass
0.5055	2473	2533	102	Pass
0.5861	2177	2150	98	Pass
0.6666	1923	1877	97	Pass
0.7472	1701	1640	96	Pass
0.8278	1518	1457	95	Pass
0.9083	1337	1297	97	Pass
0.9889	1194	1154	96	Pass
1.0694	1057	1043	98	Pass
1.1500	951	937	98	Pass
1.2306	846	858	101	Pass
1.3111	760	771	101	Pass
1.3917	689	704	102	Pass
1.4723	629	641	101	Pass
1.5528	576	580	100	Pass
1.6334	542	526	97	Pass
1.7139	493	485	98	Pass
1.7945	458	443	96	Pass
1.8751	398	416	104	Pass
1.9556	366	374	102	Pass
2.0362	334	333	99	Pass
2.1167	304	307	100	Pass
2.1973	285	272	95	Pass
2.2779	260	240	92	Pass
2.3584	244	221	90	Pass
2.4390	225	201	89	Pass
2.5195	201	187	93	Pass
2.6001	190	178	93	Pass
2.6807	175	160	91	Pass
2.7612	158	143	90	Pass
2.8418	149	134	89	Pass
2.9223	136	127	93	Pass
3.0029	126	117	92	Pass
3.0835	117	105	89	Pass
3.1640	112	99	88	Pass
3.2446	104	94	90	Pass
3.3251	101	89	88	Pass
3.4057	96	83	86	Pass
3.4863	91	81	89	Pass
3.5668	88	76	86	Pass
3.6474	82	72	87	Pass
3.7280	78	65	83	Pass
3.8085	76	61	80	Pass
3.8891	70	59	84	Pass
3.9696	65	56	86	Pass
4.0502	63	54	85	Pass
4.1308	59	52	88	Pass
4.2113	55	50	90	Pass

4.2919	52	48	92	Pass
4.3724	48	48	100	Pass
4.4530	46	47	102	Pass
4.5336	45	45	100	Pass
4.6141	42	41	97	Pass
4.6947	40	39	97	Pass
4.7752	36	37	102	Pass
4.8558	34	34	100	Pass
4.9364	32	30	93	Pass
5.0169	30	28	93	Pass
5.0975	29	27	93	Pass
5.1780	28	25	89	Pass
5.2586	26	24	92	Pass
5.3392	26	23	88	Pass
5.4197	25	23	92	Pass
5.5003	23	23	100	Pass
5.5808	22	19	86	Pass
5.6614	21	19	90	Pass
5.7420	21	18	85	Pass
5.8225	21	15	71	Pass
5.9031	20	13	65	Pass
5.9837	20	12	60	Pass
6.0642	19	12	63	Pass
6.1448	19	12	63	Pass
6.2253	18	12	66	Pass
6.3059	16	12	75	Pass
6.3865	13	12	92	Pass
6.4670	12	11	91	Pass
6.5476	11	11	100	Pass
6.6281	10	10	100	Pass
6.7087	10	10	100	Pass
6.7893	10	10	100	Pass
6.8698	10	10	100	Pass
6.9504	10	10	100	Pass
7.0309	10	9	90	Pass
7.1115	10	8	80	Pass
7.1921	10	8	80	Pass
7.2726	10	8	80	Pass
7.3532	10	8	80	Pass
7.4337	10	8	80	Pass
7.5143	10	8	80	Pass
7.5949	8	8	100	Pass
7.6754	8	8	100	Pass
7.7560	8	8	100	Pass
7.8365	8	7	87	Pass
7.9171	7	7	100	Pass
7.9977	7	7	100	Pass
8.0782	7	7	100	Pass
8.1588	7	6	85	Pass
8.2393	7	6	85	Pass
8.3199	6	6	100	Pass
8.4005	6	6	100	Pass

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	Flow(cfs)
2 year	3.466792
5 year	5.3284
10 year	6.853013
25 year	11.238456

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	Flow(cfs)
2 year	1.981091
5 year	3.066
10 year	3.958891
25 year	6.593782

Yearly Peaks for Predeveloped and Mitigated. POC #2

Year	Predeveloped	Mitigated
1960	4.576	2.642
1961	5.112	2.768
1962	6.130	3.646
1963	9.896	5.423
1964	5.398	3.034
1965	2.275	1.291
1966	4.413	2.458
1967	11.217	6.569
1968	3.751	2.007
1969	5.328	3.164
1970	2.340	1.376
1971	4.001	2.325
1972	1.636	0.786
1973	6.457	3.814
1974	3.450	2.025
1975	6.174	3.589
1976	1.237	0.322
1977	1.419	0.642
1978	4.015	2.379
1979	4.470	2.628
1980	3.314	1.957
1981	1.836	1.034
1982	7.348	4.140
1983	3.485	2.064
1984	4.149	2.431
1985	2.439	1.385
1986	2.625	1.547
1987	2.050	1.169
1988	2.598	1.524
1989	2.458	1.047
1990	4.075	1.118
1991	3.252	1.656
1992	5.157	3.066
1993	3.590	2.082
1994	2.743	0.937
1995	11.414	6.789
1996	2.583	1.523
1997	3.301	1.952
1998	3.912	2.270
1999	2.166	1.267
2000	2.246	1.310
2001	2.312	1.225
2002	2.349	1.077
2003	3.760	2.220

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #2

Rank	Predeveloped	Mitigated
1	11.4141	6.7891
2	11.2165	6.5694
3	9.8957	5.4228
4	7.3476	4.1403
5	6.4574	3.8137
6	6.1739	3.6458

7	6.1304	3.5887
8	5.3982	3.1638
9	5.3284	3.0660
10	5.1574	3.0339
11	5.1121	2.7682
12	4.5760	2.6423
13	4.4702	2.6281
14	4.4134	2.4577
15	4.1488	2.4313
16	4.0750	2.3794
17	4.0149	2.3252
18	4.0006	2.2697
19	3.9122	2.2195
20	3.7605	2.0817
21	3.7505	2.0642
22	3.5896	2.0252
23	3.4849	2.0068
24	3.4495	1.9565
25	3.3138	1.9522
26	3.3009	1.6557
27	3.2520	1.5474
28	2.7427	1.5244
29	2.6251	1.5225
30	2.5984	1.3848
31	2.5831	1.3756
32	2.4580	1.3102
33	2.4395	1.2911
34	2.3489	1.2675
35	2.3400	1.2250
36	2.3117	1.1695
37	2.2746	1.1180
38	2.2456	1.0769
39	2.1662	1.0474
40	2.0495	1.0342
41	1.8358	0.9369
42	1.6357	0.7863
43	1.4185	0.6424
44	1.2373	0.3225

POC #2

The Facility PASSED.

Flow(CFS)	Predev	Dev	Percentage	Pass/Fail
0.3467	2806	1461	52	Pass
0.4124	2473	1195	48	Pass
0.4781	2177	984	45	Pass
0.5438	1923	798	41	Pass
0.6096	1702	676	39	Pass
0.6753	1518	557	36	Pass
0.7410	1335	487	36	Pass
0.8067	1194	430	36	Pass
0.8724	1057	365	34	Pass
0.9382	952	308	32	Pass
1.0039	847	254	29	Pass
1.0696	761	230	30	Pass
1.1353	688	203	29	Pass
1.2010	629	167	26	Pass
1.2668	576	155	26	Pass
1.3325	542	133	24	Pass
1.3982	493	118	23	Pass
1.4639	458	104	22	Pass
1.5296	399	91	22	Pass
1.5954	366	84	22	Pass

1.6611	334	76	22	Pass
1.7268	304	69	22	Pass
1.7925	285	64	22	Pass
1.8583	260	56	21	Pass
1.9240	244	51	20	Pass
1.9897	225	47	20	Pass
2.0554	201	43	21	Pass
2.1211	190	38	20	Pass
2.1869	175	36	20	Pass
2.2526	158	33	20	Pass
2.3183	149	29	19	Pass
2.3840	136	26	19	Pass
2.4497	126	24	19	Pass
2.5155	117	23	19	Pass
2.5812	112	22	19	Pass
2.6469	104	20	19	Pass
2.7126	101	18	17	Pass
2.7783	96	17	17	Pass
2.8441	91	16	17	Pass
2.9098	88	16	18	Pass
2.9755	82	16	19	Pass
3.0412	78	14	17	Pass
3.1069	76	11	14	Pass
3.1727	70	9	12	Pass
3.2384	65	9	13	Pass
3.3041	63	9	14	Pass
3.3698	59	9	15	Pass
3.4355	55	8	14	Pass
3.5013	52	8	15	Pass
3.5670	49	8	16	Pass
3.6327	46	7	15	Pass
3.6984	45	6	13	Pass
3.7641	42	6	14	Pass
3.8299	40	4	10	Pass
3.8956	36	4	11	Pass
3.9613	34	4	11	Pass
4.0270	32	4	12	Pass
4.0928	30	4	13	Pass
4.1585	29	3	10	Pass
4.2242	28	3	10	Pass
4.2899	26	3	11	Pass
4.3556	26	3	11	Pass
4.4214	25	3	12	Pass
4.4871	23	3	13	Pass
4.5528	22	3	13	Pass
4.6185	21	3	14	Pass
4.6842	21	3	14	Pass
4.7500	21	3	14	Pass
4.8157	20	3	15	Pass
4.8814	20	3	15	Pass
4.9471	19	3	15	Pass
5.0128	19	3	15	Pass
5.0786	18	3	16	Pass
5.1443	16	3	18	Pass
5.2100	13	3	23	Pass
5.2757	12	3	25	Pass
5.3414	11	3	27	Pass

5.4072	10	3	30	Pass
5.4729	10	2	20	Pass
5.5386	10	2	20	Pass
5.6043	10	2	20	Pass
5.6700	10	2	20	Pass
5.7358	10	2	20	Pass
5.8015	10	2	20	Pass
5.8672	10	2	20	Pass
5.9329	10	2	20	Pass
5.9986	10	2	20	Pass
6.0644	10	2	20	Pass
6.1301	10	2	20	Pass
6.1958	8	2	25	Pass
6.2615	8	2	25	Pass
6.3272	8	2	25	Pass
6.3930	8	2	25	Pass
6.4587	7	2	28	Pass
6.5244	7	2	28	Pass
6.5901	7	1	14	Pass
6.6559	7	1	14	Pass
6.7216	7	1	14	Pass
6.7873	6	1	16	Pass
6.8530	6	0	0	Pass

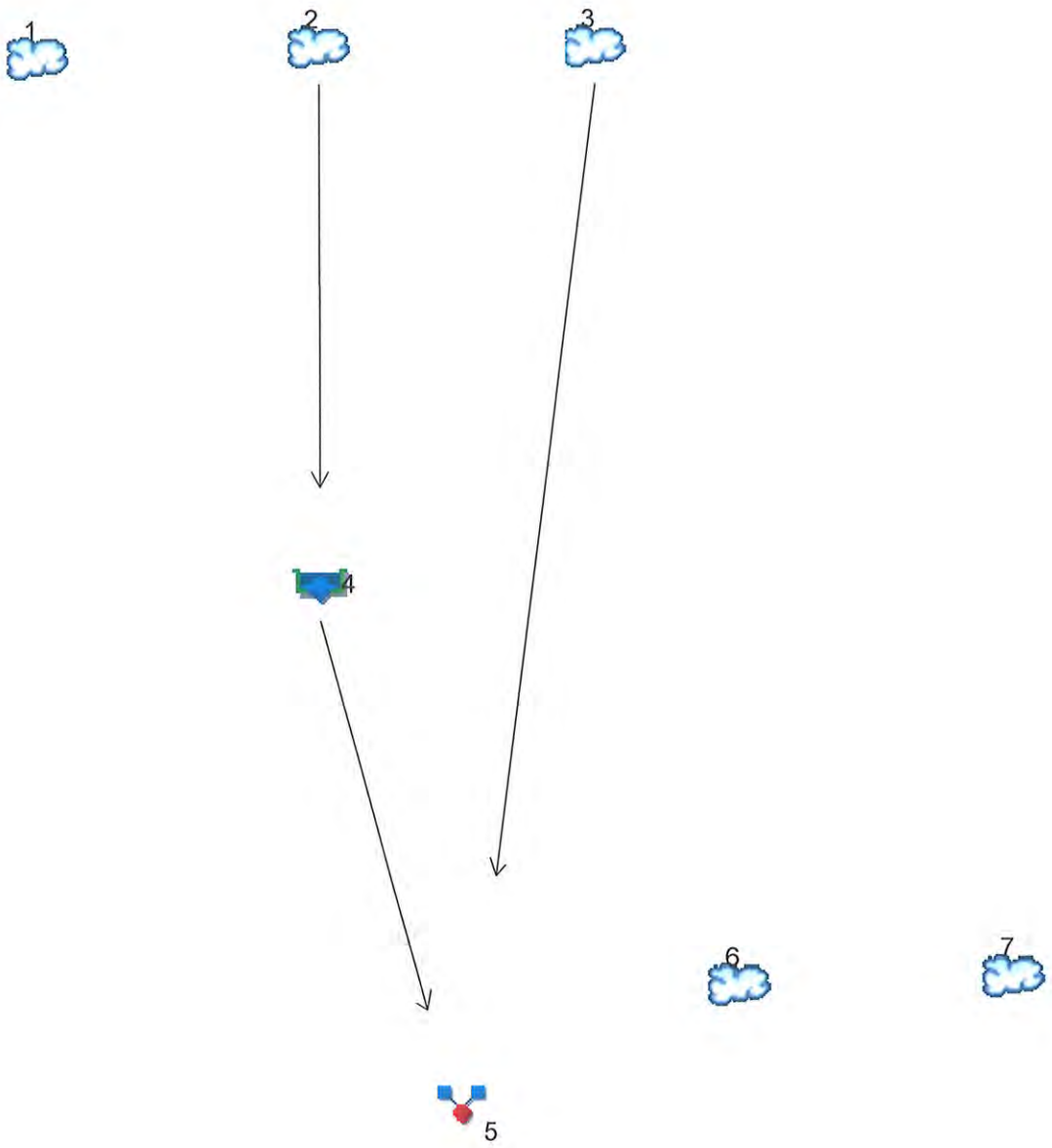
Perlnd and Implnd Changes

No changes have been made.

Detention System Calculations

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9



Legend

Hyd.	Origin	Description
1	SCS Runoff	EX 1
2	SCS Runoff	PROP 1A
3	SCS Runoff	PROP 1B
4	Reservoir	DETENTION BASIN
5	Combine	OUTFALL 1
6	SCS Runoff	EX 2
7	SCS Runoff	PROP 2

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	-------	-------	-------	11.76	-------	-------	20.20	EX 1
2	SCS Runoff	------	-------	-------	-------	-------	7.982	-------	-------	12.99	PROP 1A
3	SCS Runoff	------	-------	-------	-------	-------	7.558	-------	-------	12.27	PROP 1B
4	Reservoir	2	-------	-------	-------	-------	2.539	-------	-------	4.811	DETENTION BASIN
5	Combine	3, 4	-------	-------	-------	-------	9.396	-------	-------	15.30	OUTFALL 1
6	SCS Runoff	------	-------	-------	-------	-------	10.27	-------	-------	17.75	EX 2
7	SCS Runoff	------	-------	-------	-------	-------	6.821	-------	-------	11.07	PROP 2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

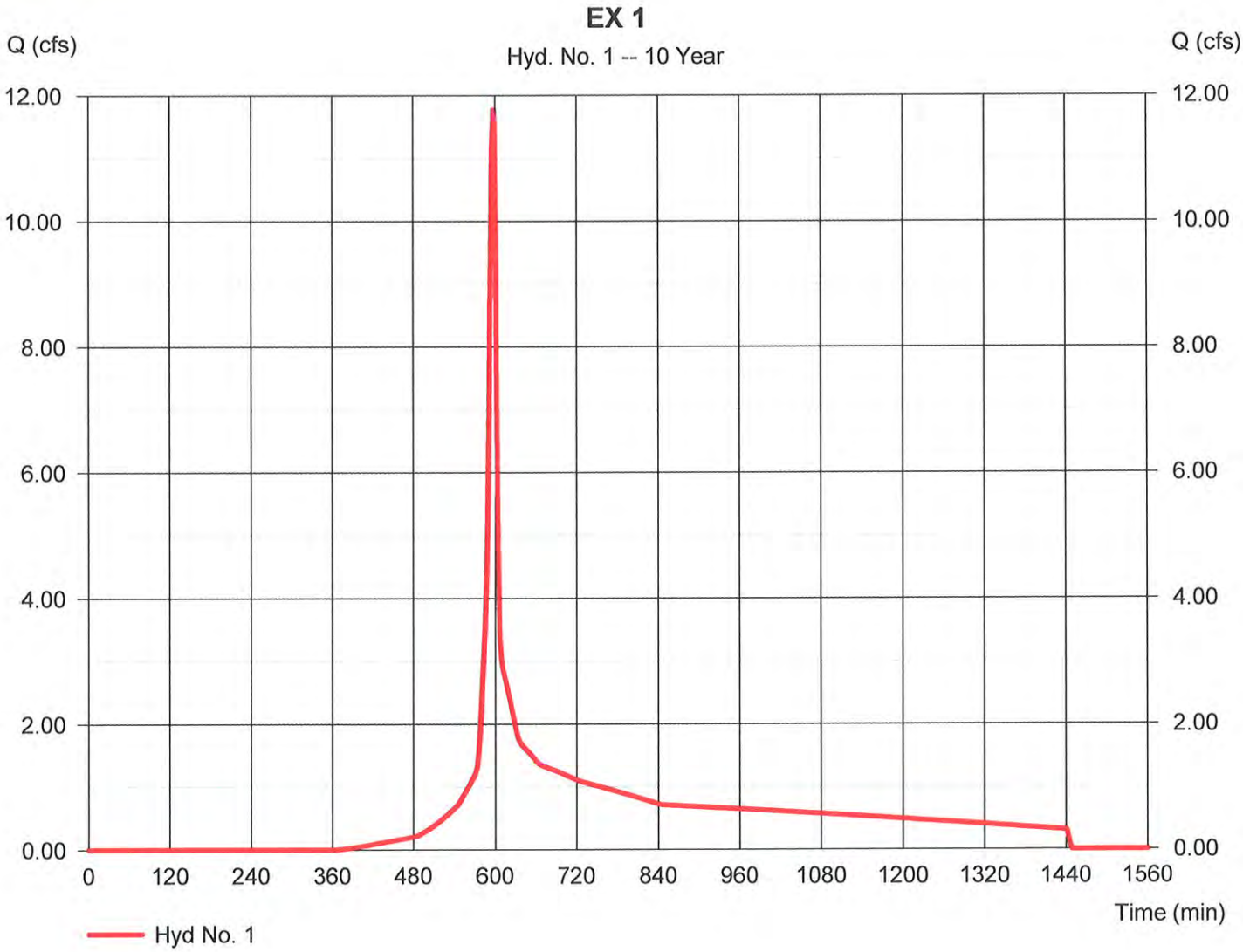
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	11.76	2	596	52,165	------	------	------	EX 1
2	SCS Runoff	7.982	2	598	37,449	------	------	------	PROP 1A
3	SCS Runoff	7.558	2	596	32,715	------	------	------	PROP 1B
4	Reservoir	2.539	2	610	37,438	2	632.40	7,049	DETENTION BASIN
5	Combine	9.396	2	596	70,153	3, 4	------	------	OUTFALL 1
6	SCS Runoff	10.27	1	593	42,555	------	------	------	EX 2
7	SCS Runoff	6.821	2	596	29,523	------	------	------	PROP 2

Hydrograph Report

Hyd. No. 1

EX 1

Hydrograph type	= SCS Runoff	Peak discharge	= 11.76 cfs
Storm frequency	= 10 yrs	Time to peak	= 596 min
Time interval	= 2 min	Hyd. volume	= 52,165 cuft
Drainage area	= 7.600 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.97 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



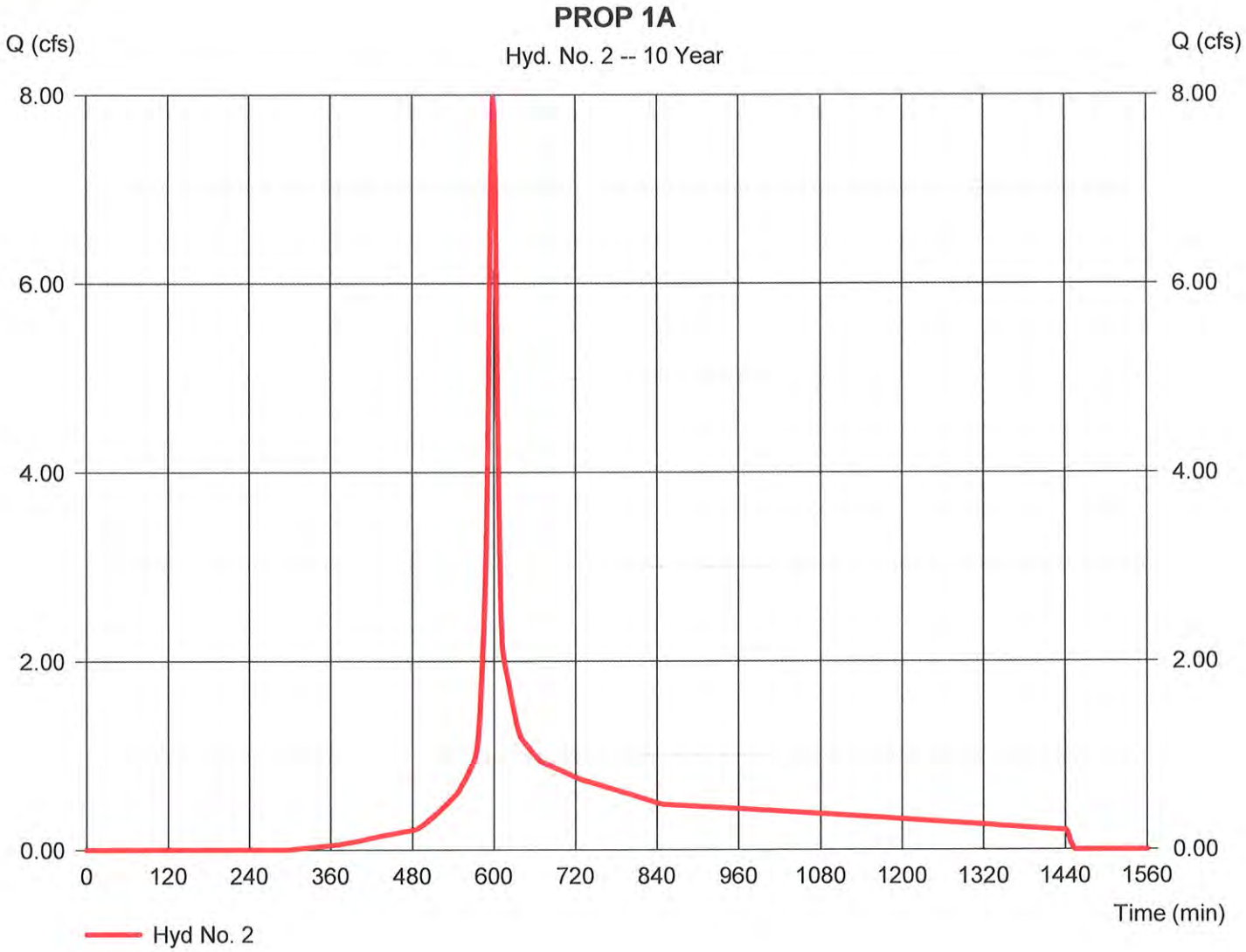
Hydrograph Report

Hyd. No. 2

PROP 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 7.982 cfs
Storm frequency	= 10 yrs	Time to peak	= 598 min
Time interval	= 2 min	Hyd. volume	= 37,449 cuft
Drainage area	= 4.400 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 3.97 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.960 x 79) + (1.610 x 98)] / 4.400



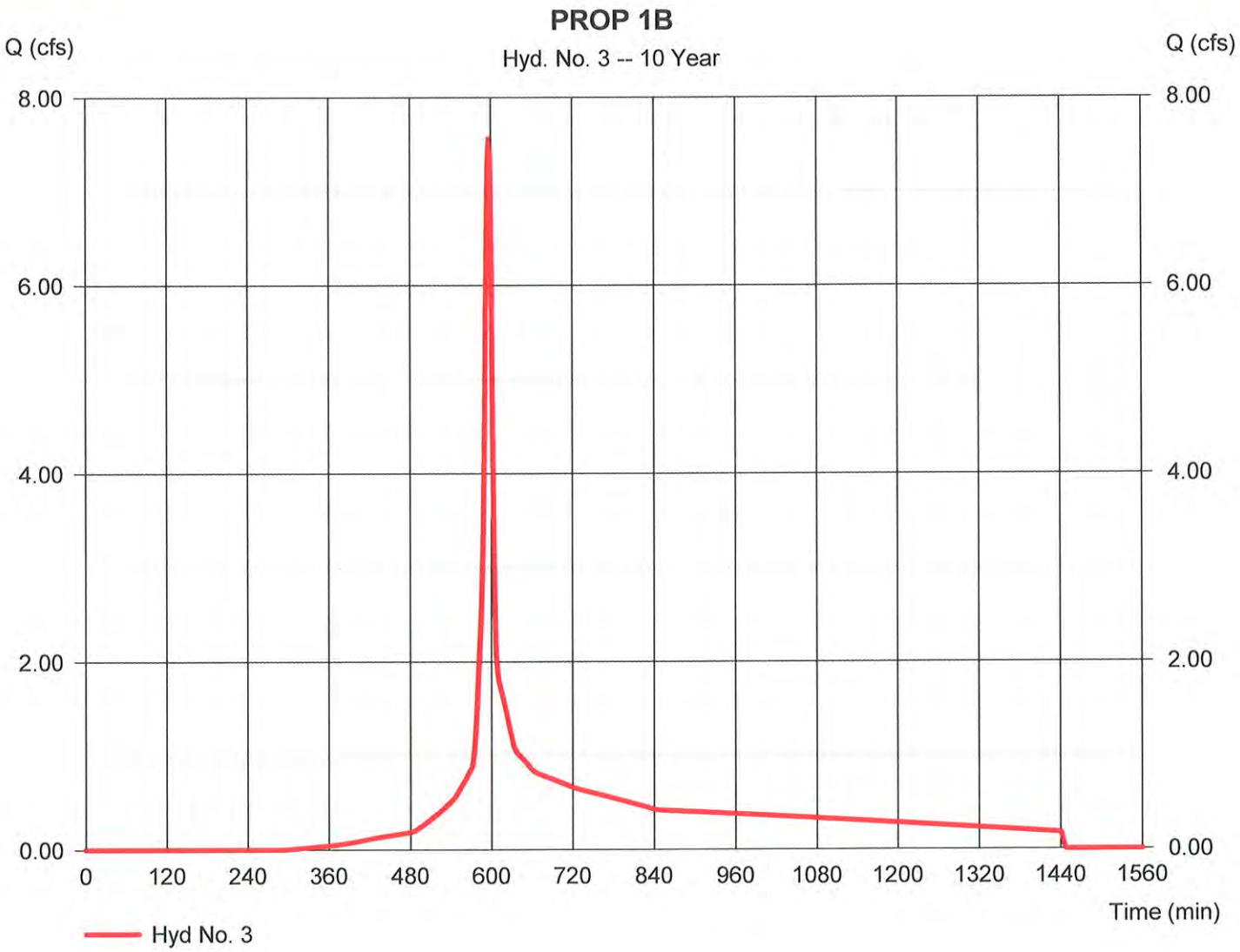
Hydrograph Report

Hyd. No. 3

PROP 1B

Hydrograph type	= SCS Runoff	Peak discharge	= 7.558 cfs
Storm frequency	= 10 yrs	Time to peak	= 596 min
Time interval	= 2 min	Hyd. volume	= 32,715 cuft
Drainage area	= 4.100 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.97 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.540 x 79) + (0.600 x 98)] / 4.100



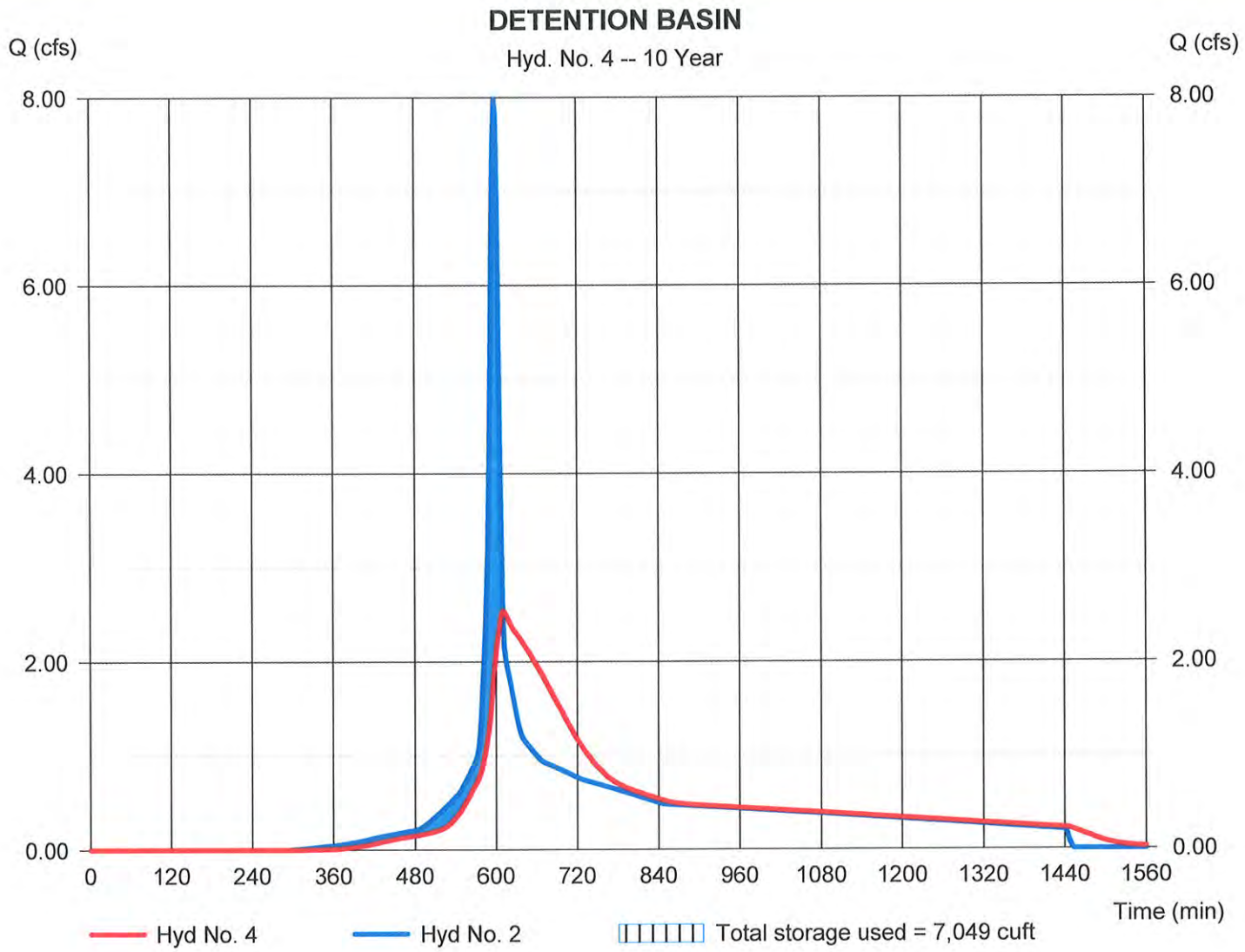
Hydrograph Report

Hyd. No. 4

DETENTION BASIN

Hydrograph type	= Reservoir	Peak discharge	= 2.539 cfs
Storm frequency	= 10 yrs	Time to peak	= 610 min
Time interval	= 2 min	Hyd. volume	= 37,438 cuft
Inflow hyd. No.	= 2 - PROP 1A	Max. Elevation	= 632.40 ft
Reservoir name	= Detention Basin	Max. Storage	= 7,049 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Detention Basin

Pond Data

Trapezoid -Bottom L x W = 70.0 x 20.0 ft, Side slope = 2.00:1, Bottom elev. = 629.00 ft, Depth = 5.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	629.00	1,400	0	0
0.55	629.55	1,603	825	825
1.10	630.10	1,815	940	1,765
1.65	630.65	2,038	1,059	2,824
2.20	631.20	2,269	1,184	4,008
2.75	631.75	2,511	1,314	5,322
3.30	632.30	2,762	1,450	6,772
3.85	632.85	3,023	1,591	8,362
4.40	633.40	3,294	1,737	10,099
4.95	633.95	3,574	1,888	11,987
5.50	634.50	3,864	2,045	14,032

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 3.75	6.40	8.00	0.00
Span (in)	= 3.75	6.40	8.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 629.00	629.50	632.20	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

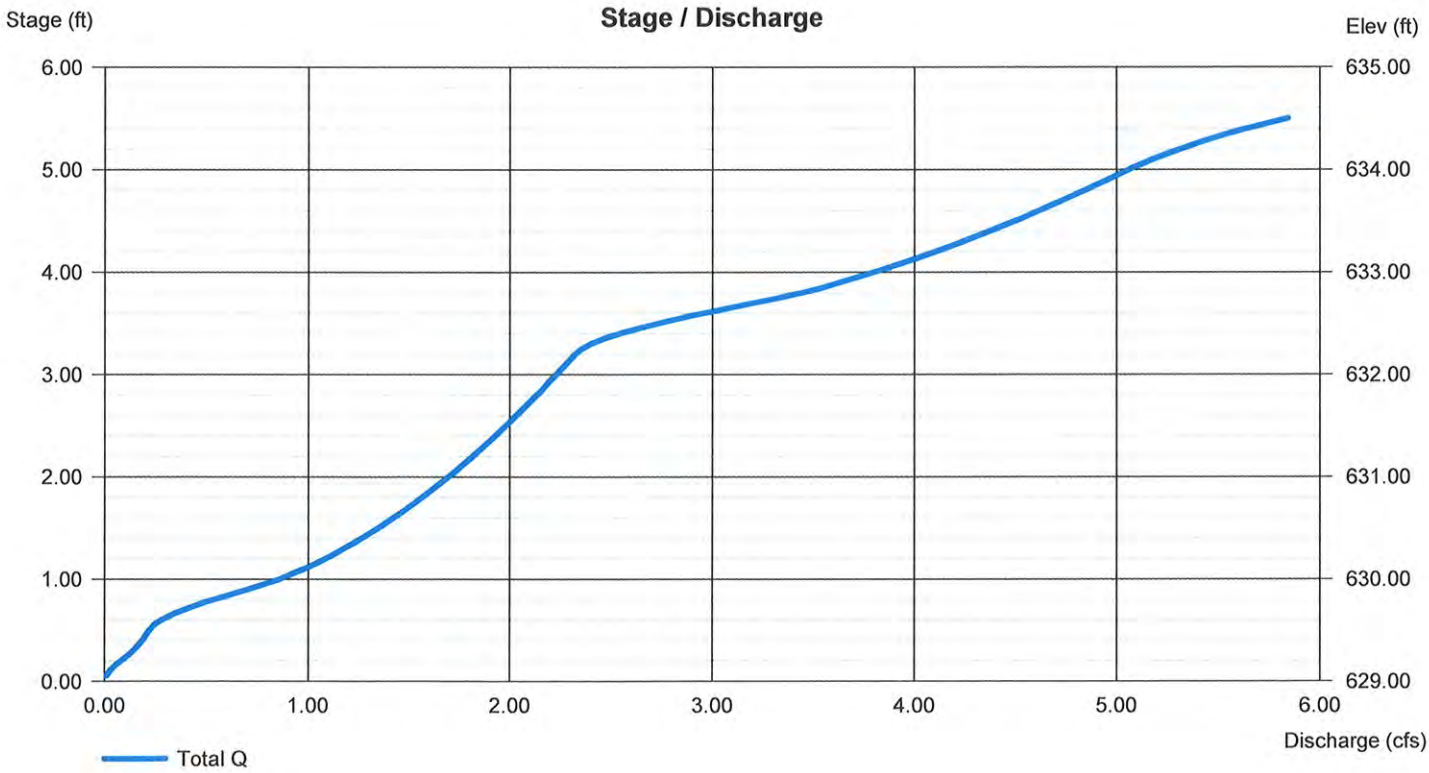
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 633.90	0.00	0.00	0.00
Weir Coeff.	= 1.05	3.33	3.33	3.33
Weir Type	= 45 degV	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

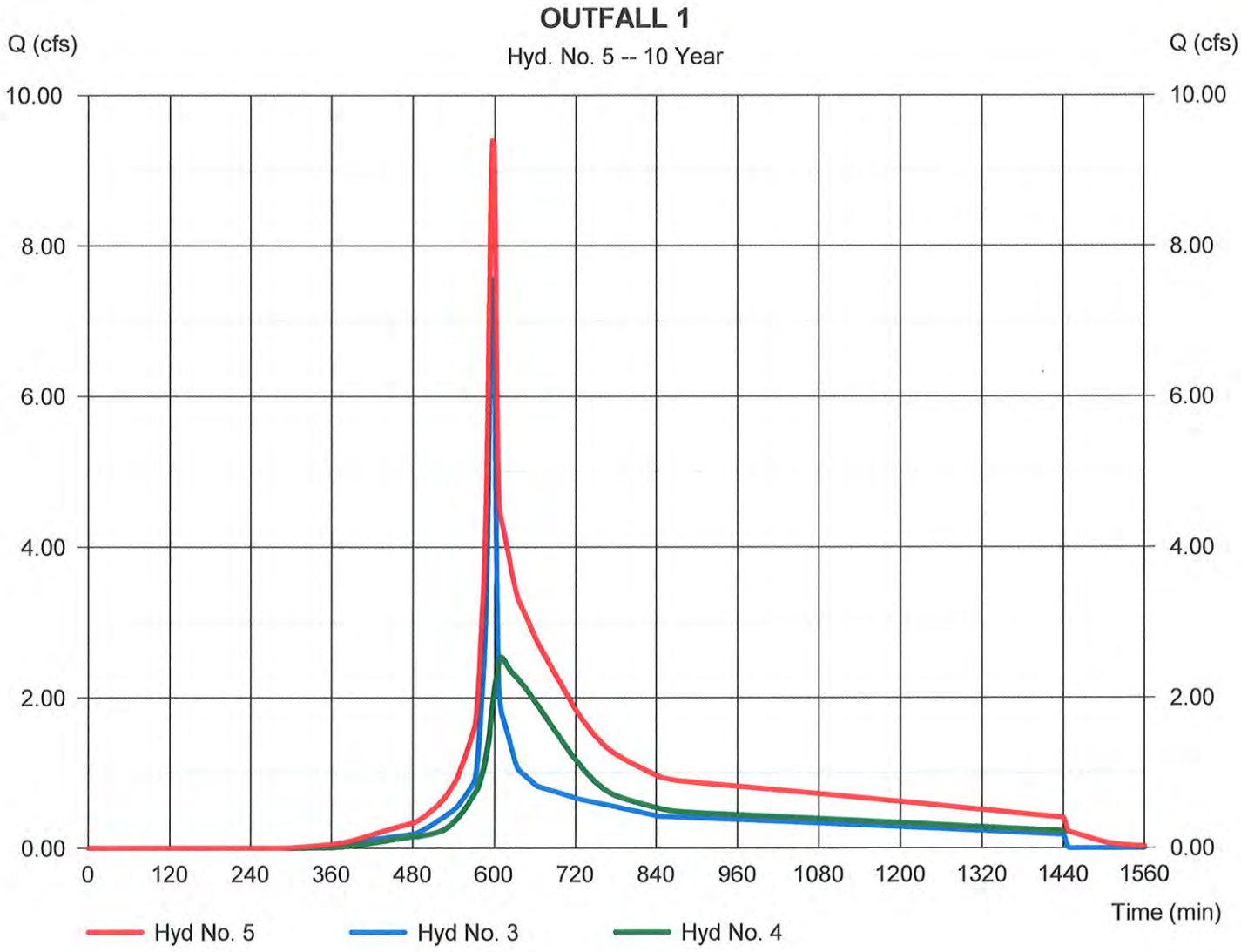


Hydrograph Report

Hyd. No. 5

OUTFALL 1

Hydrograph type	= Combine	Peak discharge	= 9.396 cfs
Storm frequency	= 10 yrs	Time to peak	= 596 min
Time interval	= 2 min	Hyd. volume	= 70,153 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 4.100 ac

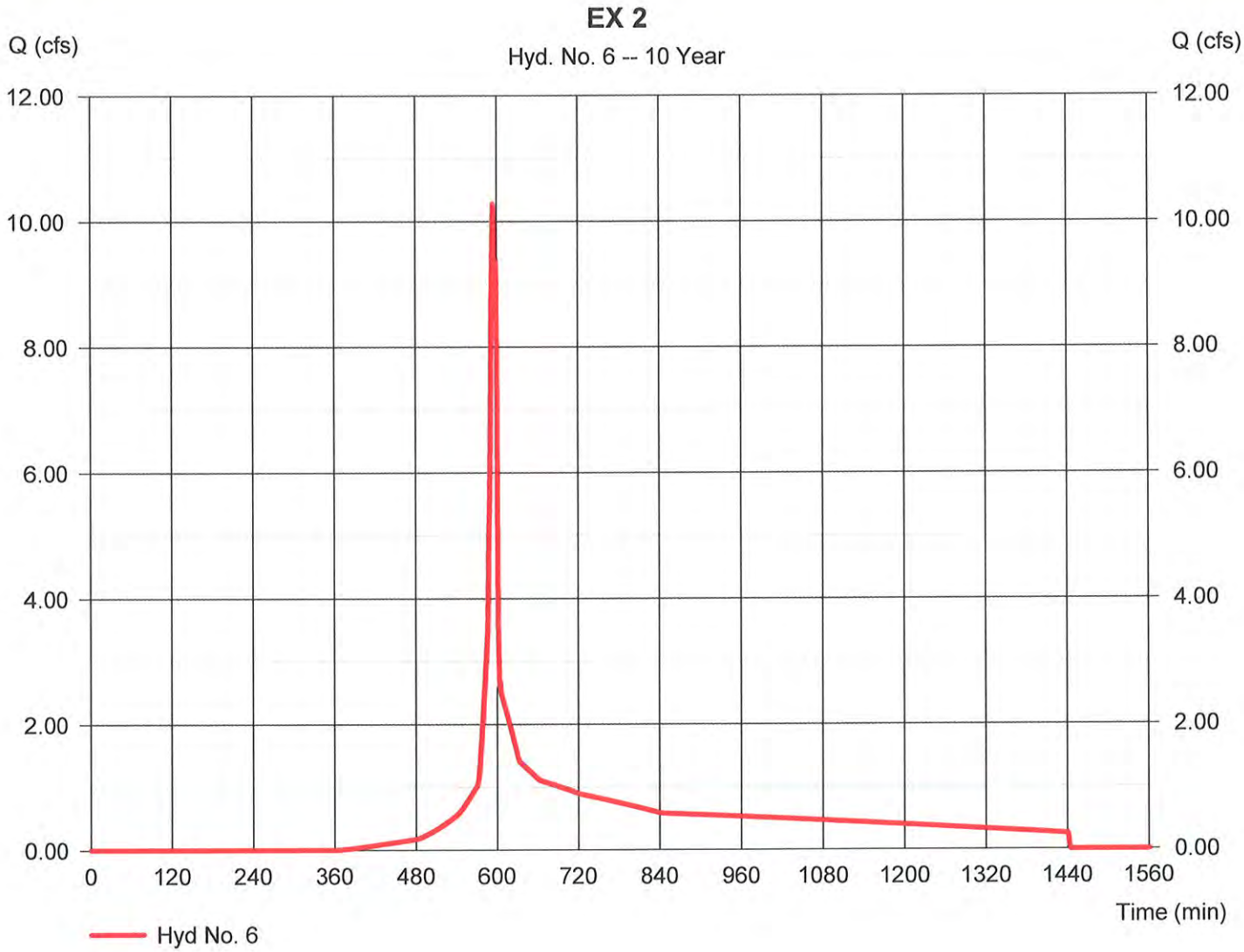


Hydrograph Report

Hyd. No. 6

EX 2

Hydrograph type	= SCS Runoff	Peak discharge	= 10.27 cfs
Storm frequency	= 10 yrs	Time to peak	= 593 min
Time interval	= 1 min	Hyd. volume	= 42,555 cuft
Drainage area	= 6.200 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 3.00 min
Total precip.	= 3.97 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



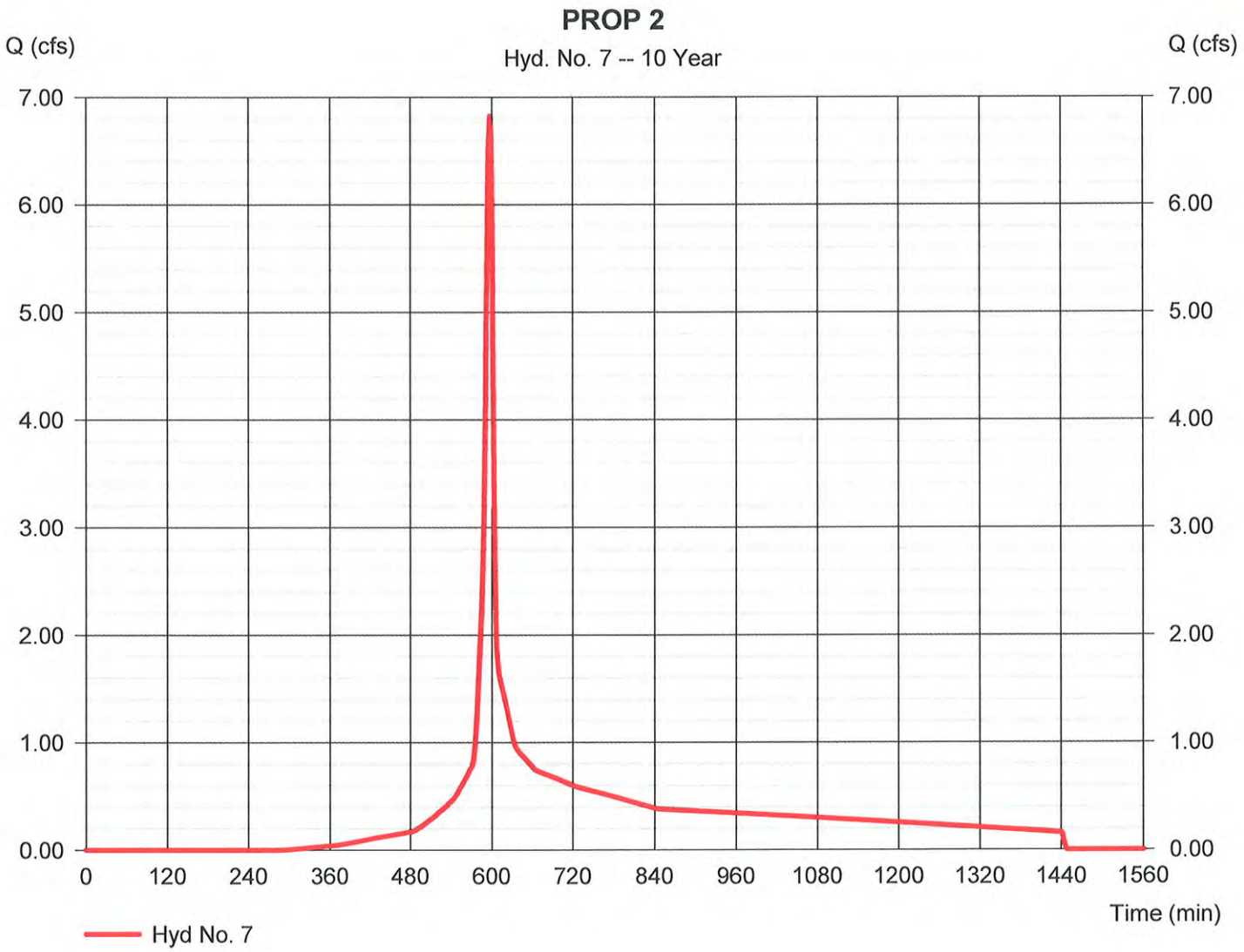
Hydrograph Report

Hyd. No. 7

PROP 2

Hydrograph type	= SCS Runoff	Peak discharge	= 6.821 cfs
Storm frequency	= 10 yrs	Time to peak	= 596 min
Time interval	= 2 min	Hyd. volume	= 29,523 cuft
Drainage area	= 3.700 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.97 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.730 x 79) + (0.320 x 98)] / 3.700



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	20.20	2	596	87,133	------	------	------	EX 1
2	SCS Runoff	12.99	2	598	60,181	------	------	------	PROP 1A
3	SCS Runoff	12.27	2	596	52,573	------	------	------	PROP 1B
4	Reservoir	4.811	2	608	60,170	2	633.77	11,360	DETENTION BASIN
5	Combine	15.30	2	598	112,742	3, 4	------	------	OUTFALL 1
6	SCS Runoff	17.75	1	593	71,082	------	------	------	EX 2
7	SCS Runoff	11.07	2	596	47,444	------	------	------	PROP 2

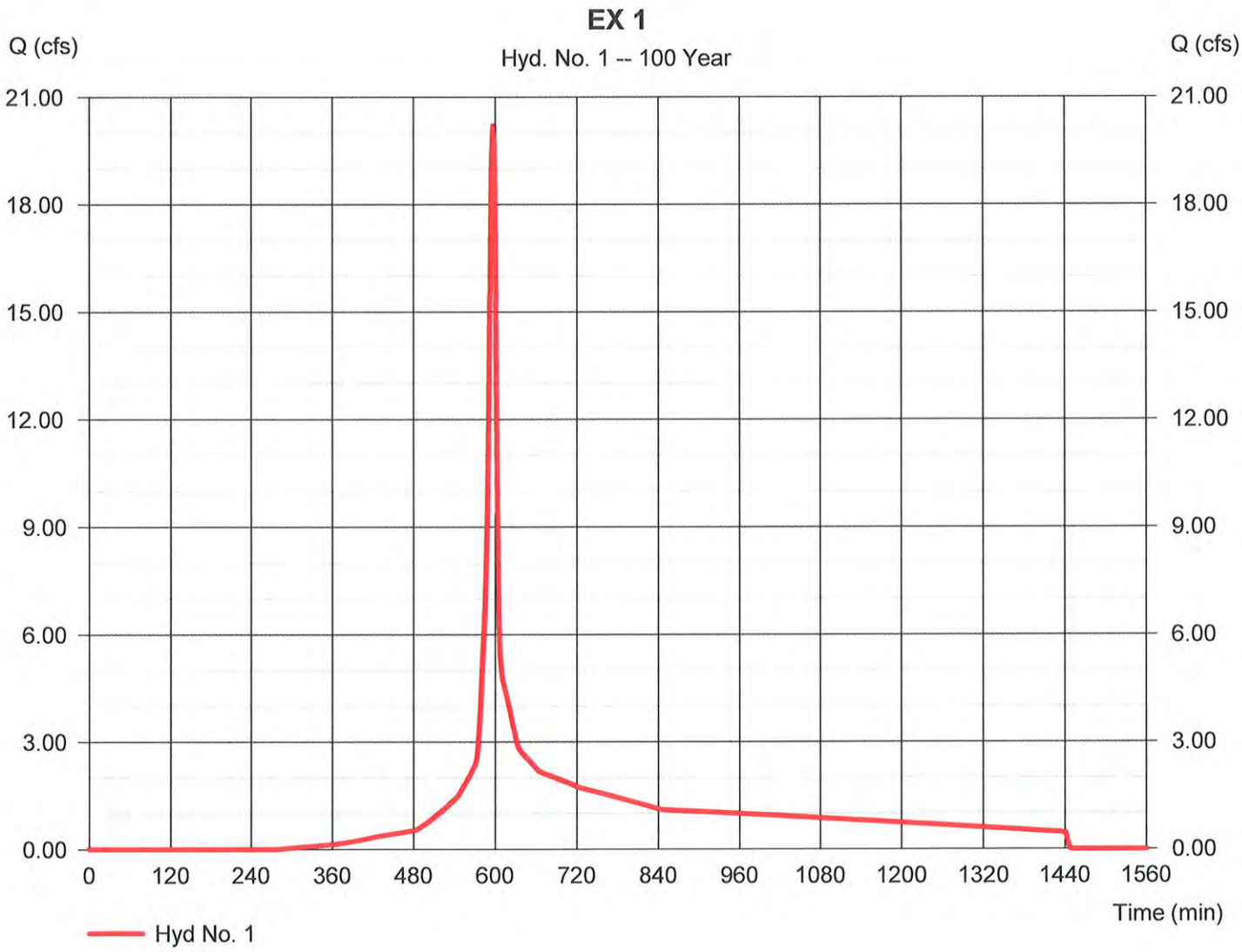
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9 Wednesday, 00 24, 2013

Hyd. No. 1

EX 1

Hydrograph type	= SCS Runoff	Peak discharge	= 20.20 cfs
Storm frequency	= 100 yrs	Time to peak	= 596 min
Time interval	= 2 min	Hyd. volume	= 87,133 cuft
Drainage area	= 7.600 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.54 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



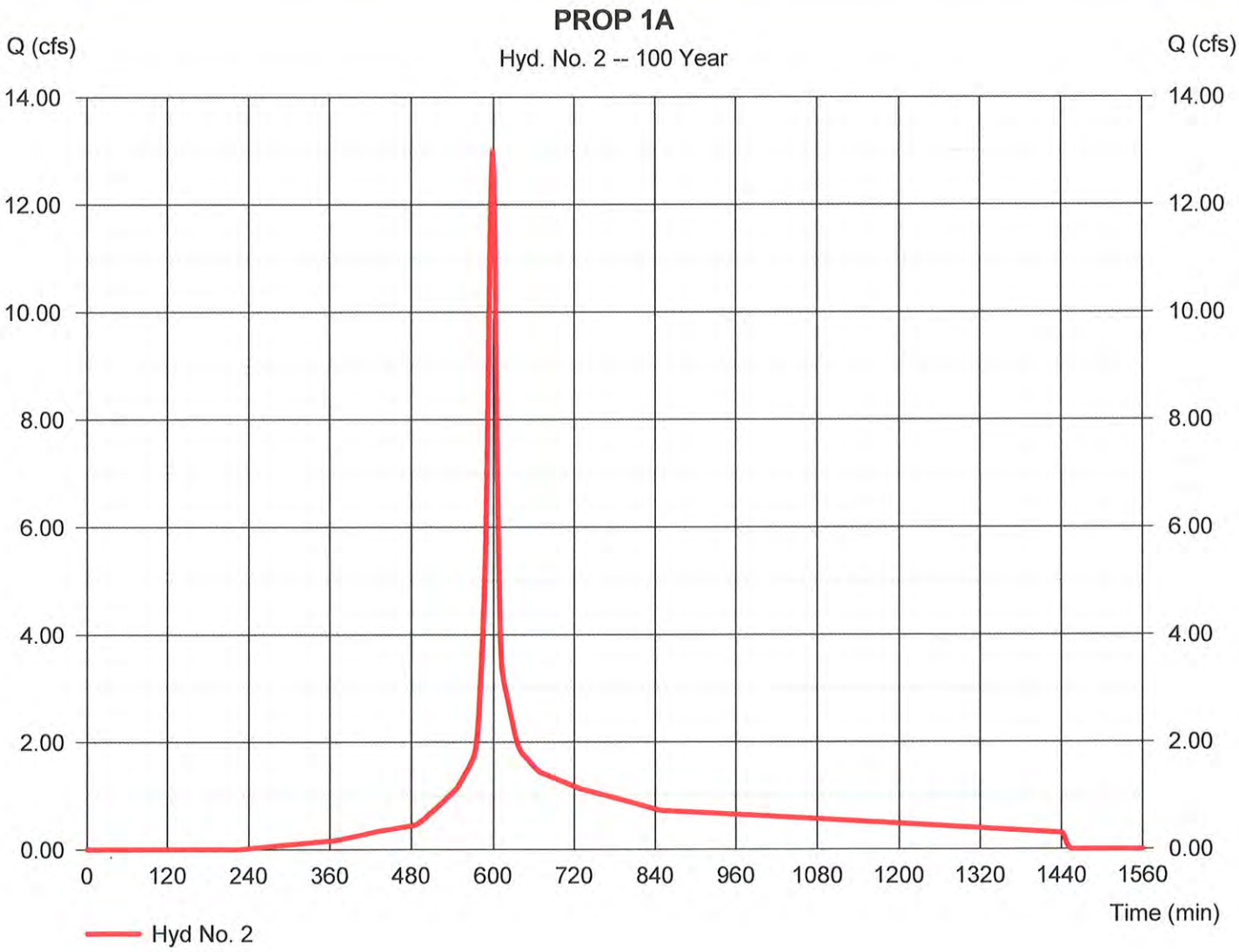
Hydrograph Report

Hyd. No. 2

PROP 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 12.99 cfs
Storm frequency	= 100 yrs	Time to peak	= 598 min
Time interval	= 2 min	Hyd. volume	= 60,181 cuft
Drainage area	= 4.400 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 5.54 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.960 x 79) + (1.610 x 98)] / 4.400



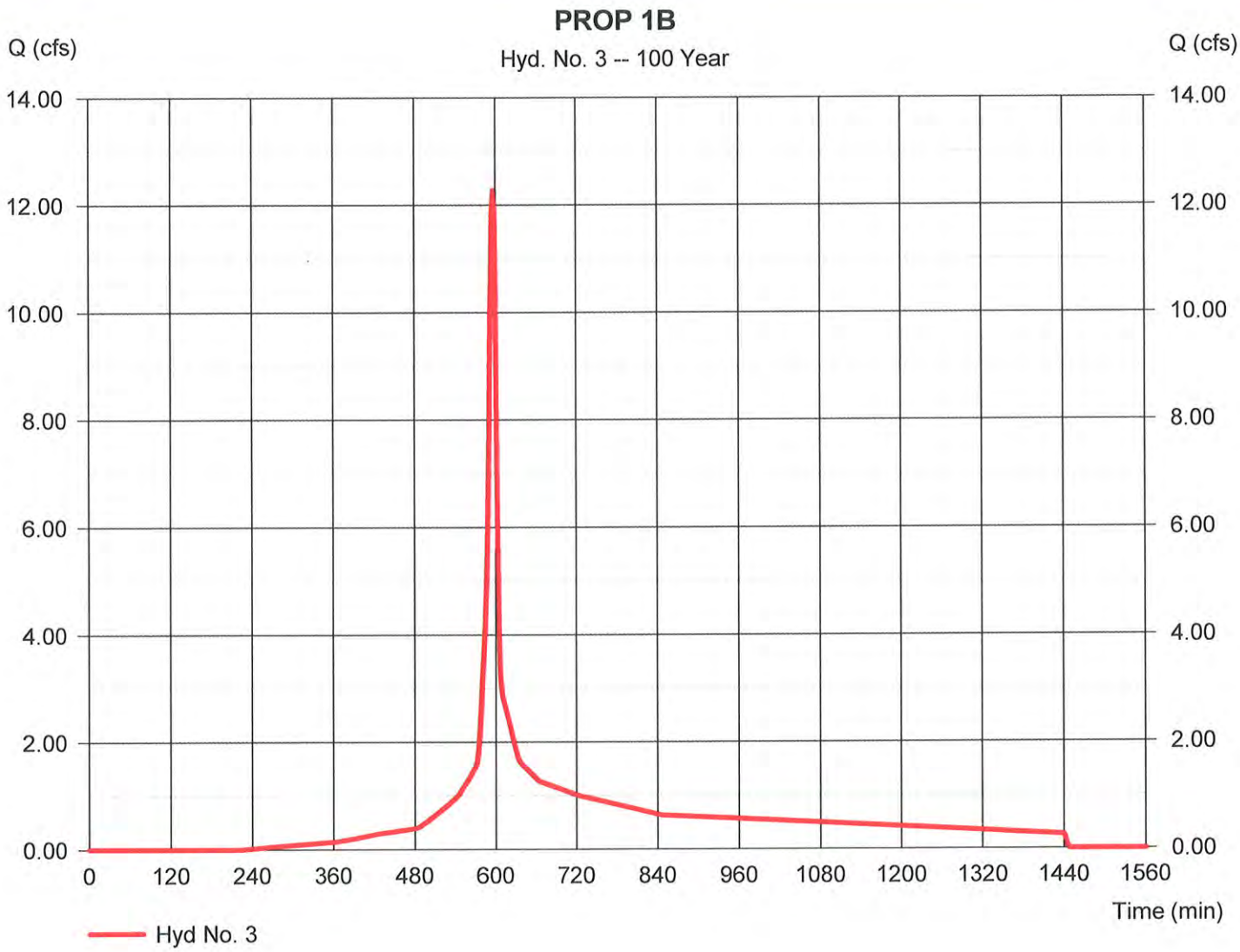
Hydrograph Report

Hyd. No. 3

PROP 1B

Hydrograph type	= SCS Runoff	Peak discharge	= 12.27 cfs
Storm frequency	= 100 yrs	Time to peak	= 596 min
Time interval	= 2 min	Hyd. volume	= 52,573 cuft
Drainage area	= 4.100 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.54 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.540 x 79) + (0.600 x 98)] / 4.100



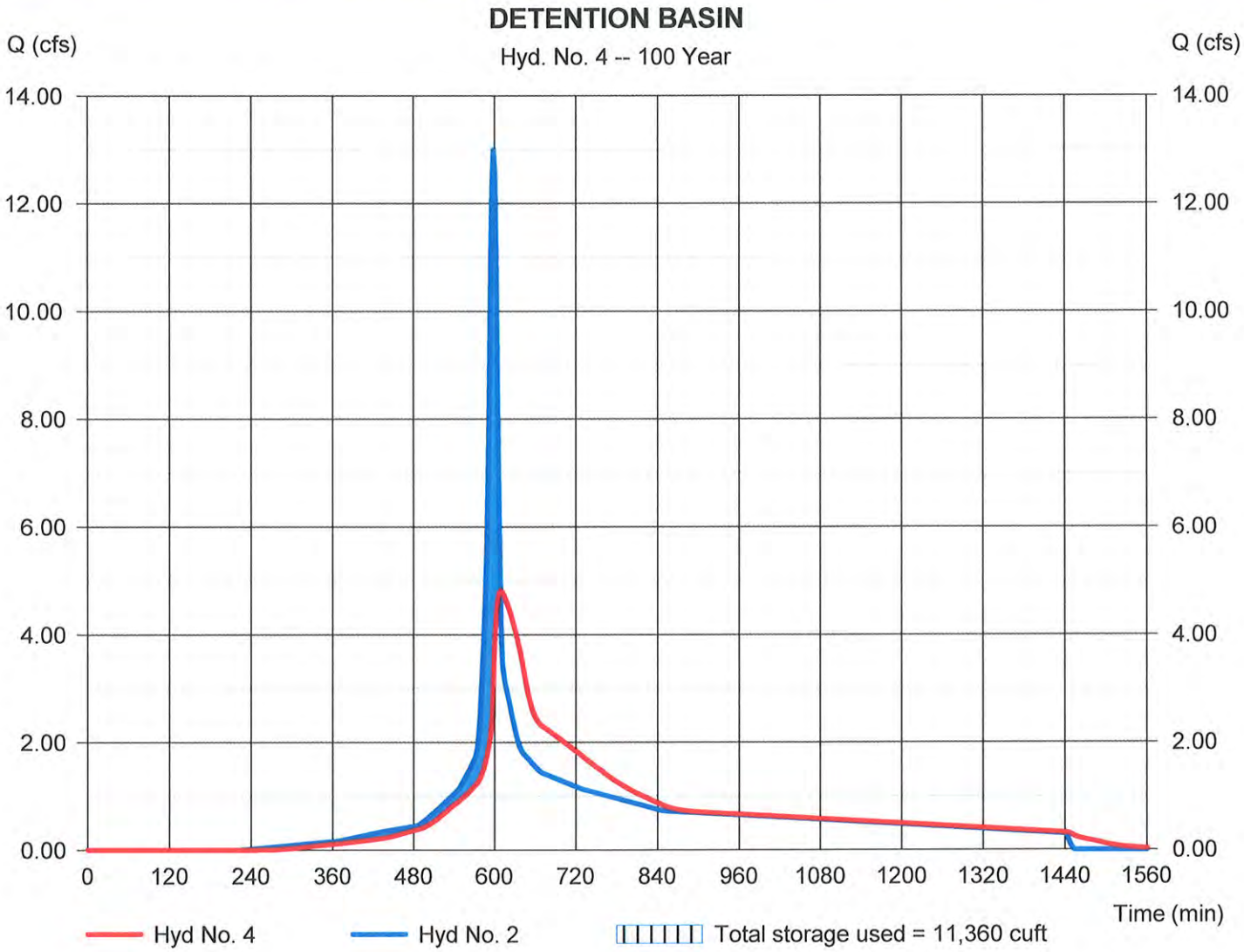
Hydrograph Report

Hyd. No. 4

DETENTION BASIN

Hydrograph type	= Reservoir	Peak discharge	= 4.811 cfs
Storm frequency	= 100 yrs	Time to peak	= 608 min
Time interval	= 2 min	Hyd. volume	= 60,170 cuft
Inflow hyd. No.	= 2 - PROP 1A	Max. Elevation	= 633.77 ft
Reservoir name	= Detention Basin	Max. Storage	= 11,360 cuft

Storage Indication method used.

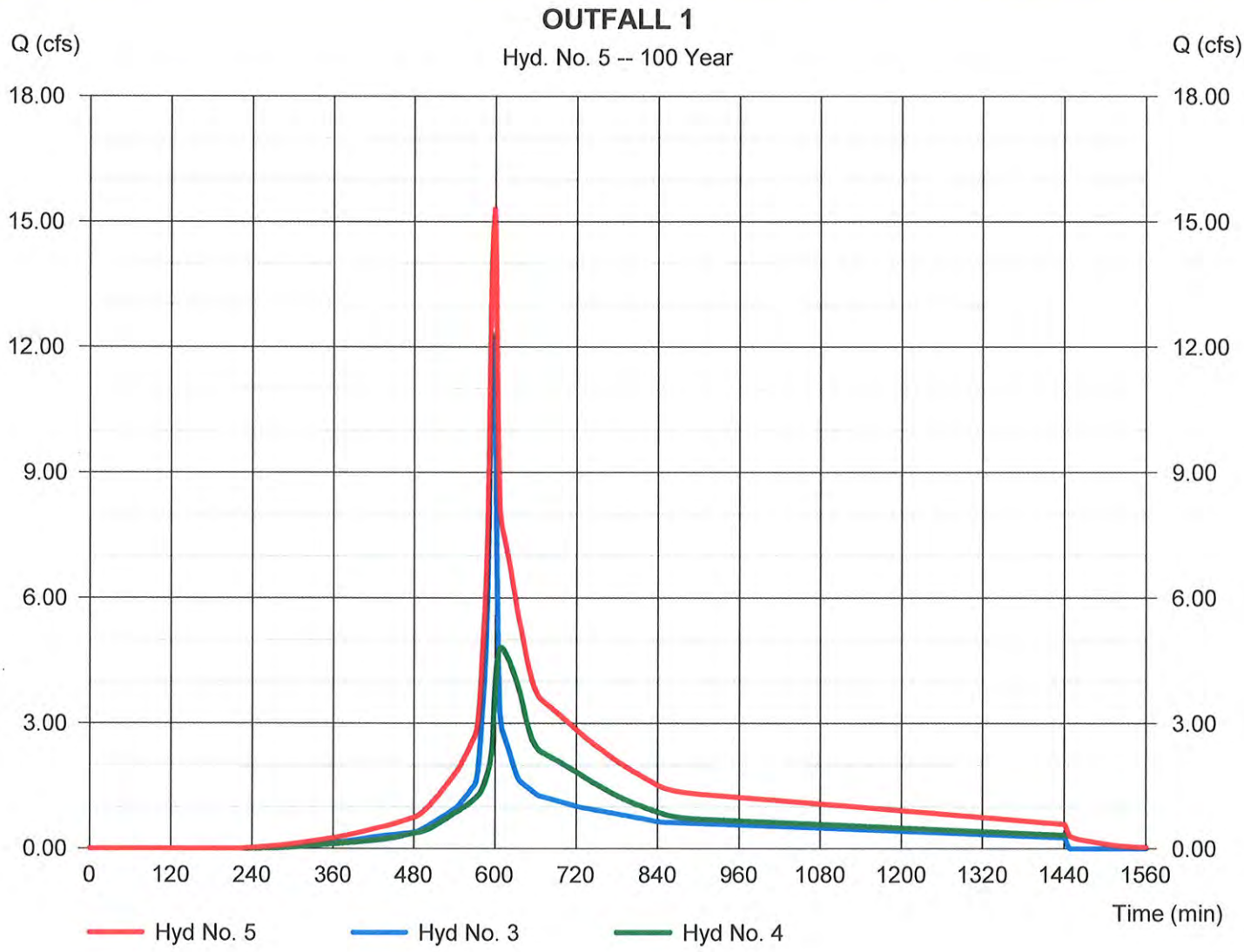


Hydrograph Report

Hyd. No. 5

OUTFALL 1

Hydrograph type	= Combine	Peak discharge	= 15.30 cfs
Storm frequency	= 100 yrs	Time to peak	= 598 min
Time interval	= 2 min	Hyd. volume	= 112,742 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 4.100 ac

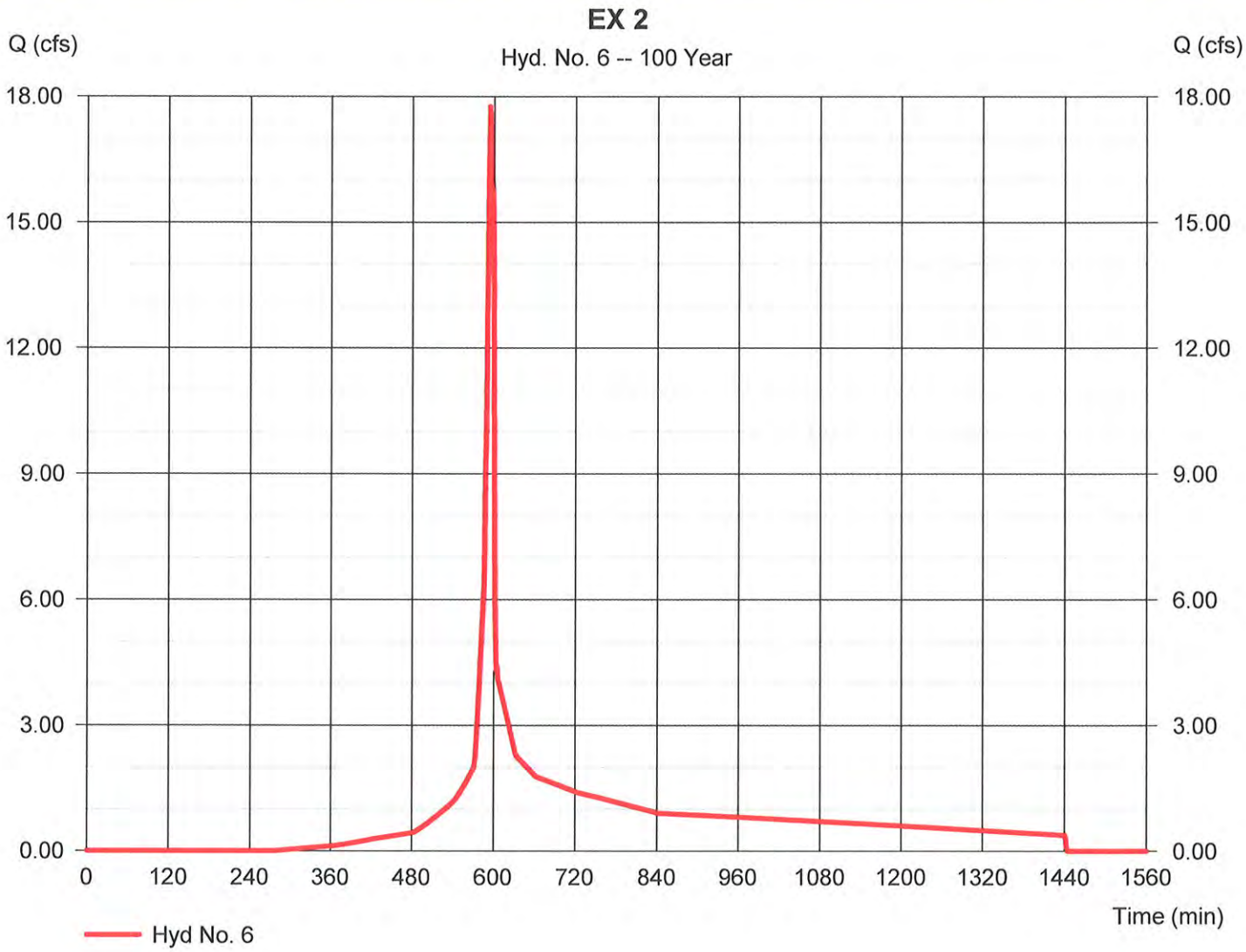


Hydrograph Report

Hyd. No. 6

EX 2

Hydrograph type	= SCS Runoff	Peak discharge	= 17.75 cfs
Storm frequency	= 100 yrs	Time to peak	= 593 min
Time interval	= 1 min	Hyd. volume	= 71,082 cuft
Drainage area	= 6.200 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 3.00 min
Total precip.	= 5.54 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



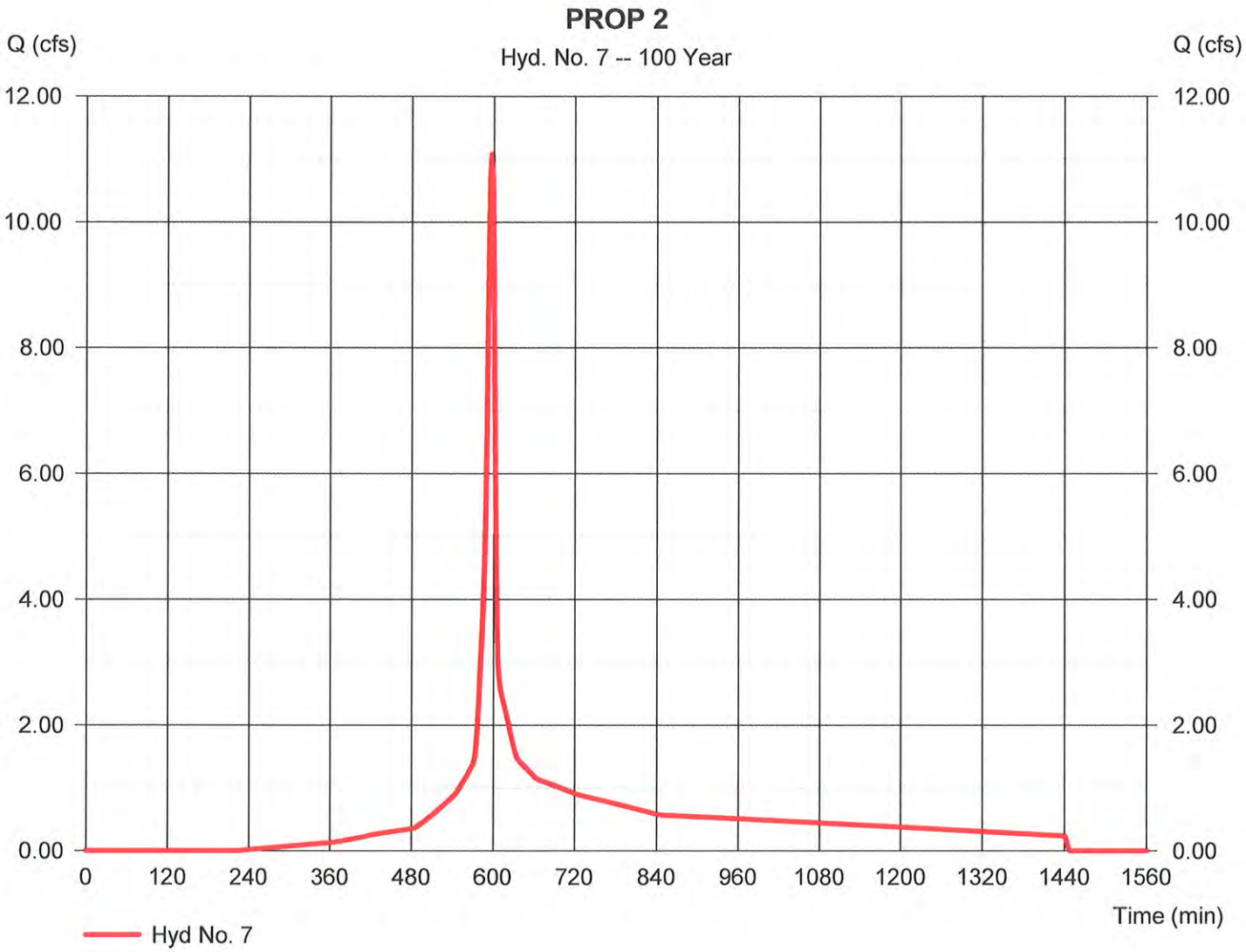
Hydrograph Report

Hyd. No. 7

PROP 2

Hydrograph type	= SCS Runoff	Peak discharge	= 11.07 cfs
Storm frequency	= 100 yrs	Time to peak	= 596 min
Time interval	= 2 min	Hyd. volume	= 47,444 cuft
Drainage area	= 3.700 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.54 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(3.730 x 79) + (0.320 x 98)] / 3.700



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	----------
2	0.0000	0.0000	0.0000	--------
3	0.0000	0.0000	0.0000	--------
5	5.9767	0.1000	0.4972	--------
10	7.6861	0.6000	0.5172	----------
25	10.4986	1.3000	0.5481	----------
50	0.0000	0.0000	0.0000	----------
100	11.2223	0.4000	0.5111	----------

File name: Alamed_23.IDF

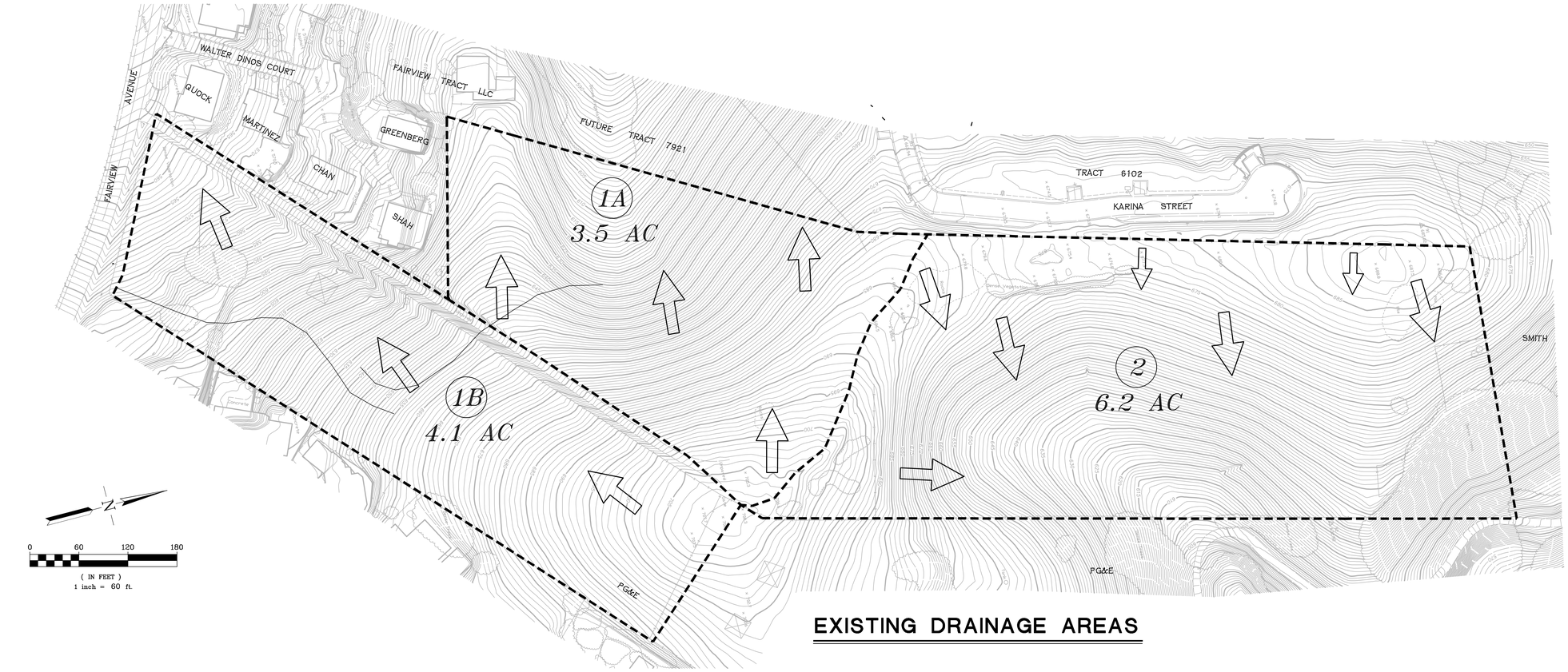
Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	2.66	1.89	1.55	1.34	1.20	1.10	1.02	0.95	0.90	0.85	0.81	0.78
10	3.15	2.27	1.86	1.61	1.44	1.31	1.21	1.13	1.07	1.01	0.96	0.92
25	3.83	2.78	2.27	1.96	1.75	1.59	1.47	1.37	1.28	1.21	1.15	1.10
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	4.74	3.39	2.77	2.40	2.15	1.96	1.81	1.69	1.60	1.51	1.44	1.38

Tc = time in minutes. Values may exceed 60.

Precip. file name: G:\STANDARDS\Hydraflow\Alameda Co-24hr_23 MAP.pcp

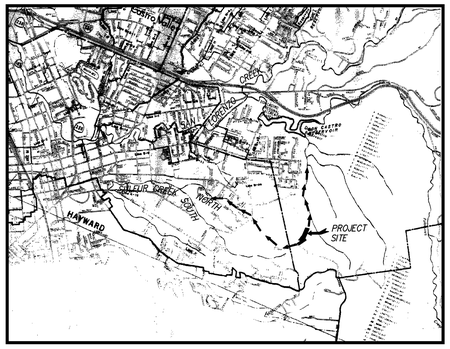
Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	0.00	0.00	3.69	3.97	4.47	0.00	5.54
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



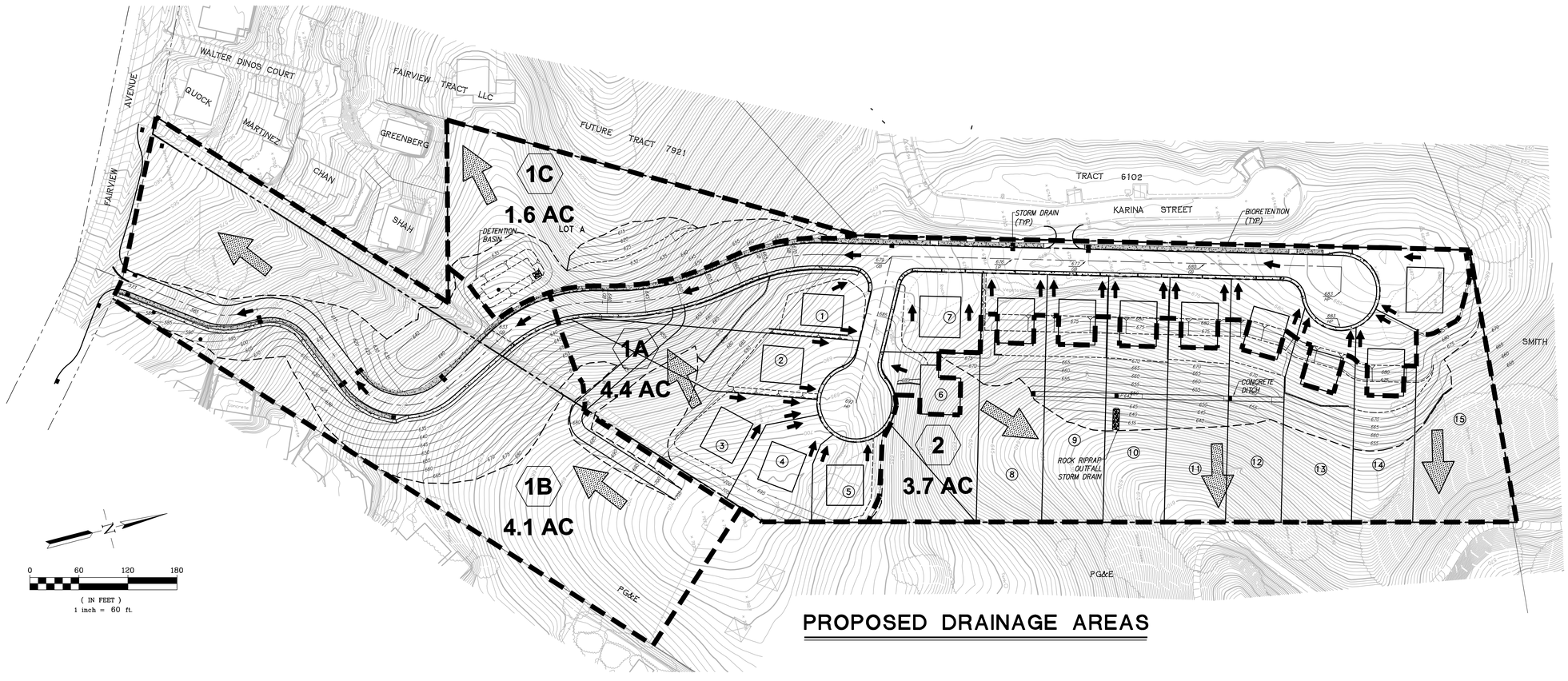
EXISTING DRAINAGE AREAS

LEGEND

PROPOSED	DESCRIPTION	EXISTING
2	DRAINAGE AREA	2
	DRAINAGE BOUNDARY	
	PERVIOUS DRAINAGE FLOW	
	IMPERVIOUS ON-SITE & STREET DRAINAGE	



ALAMEDA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
VICINITY MAP



PROPOSED DRAINAGE AREAS

PROPOSED DRAINAGE AREA	DESTINATION
1A & 1B	DRAINS TO COUNTY STORM DRAIN SYSTEM, THEN TO SULFUR CREEK, THEN TO SAN LORENZO CREEK.
2	DRAINS TO SAN LORENZO CREEK.

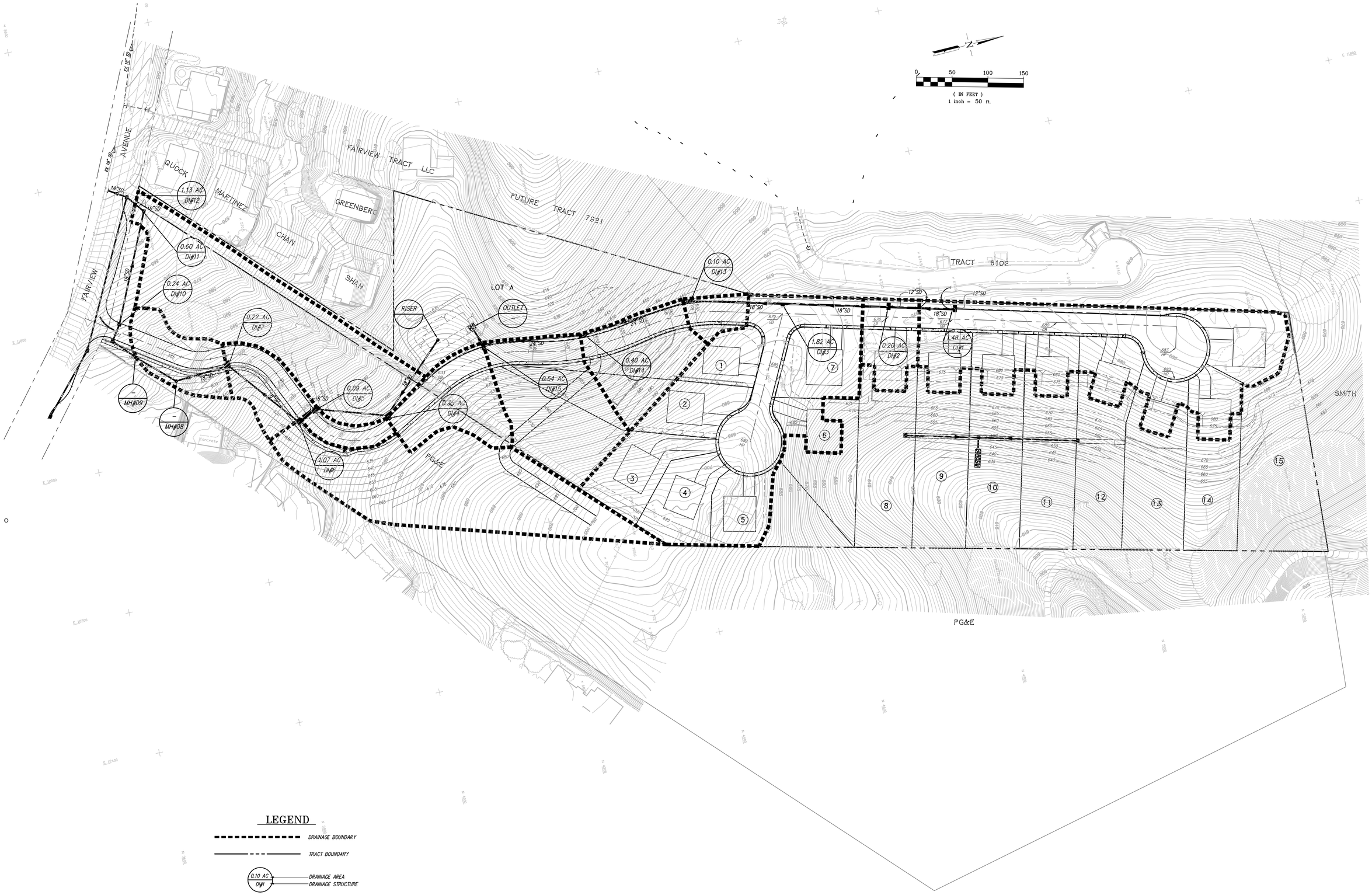
EXISTING AND PROPOSED DRAINAGE EXHIBIT

TRACT 8057 - LEROB, LLC

ALAMEDA COUNTY, CALIFORNIA

RJA
RUGGERI-JENSEN-AZAR
ENGINEERS ▪ PLANNERS ▪ SURVEYORS
4690 CHABOT DRIVE, SUITE 200 PLEASANTON, CA 94588
PHONE: (925) 227-9100 FAX: (925) 227-9300

DATE: JULY 10, 2013 JOB NO. 091093 SHEET 1 OF 1 SHEETS



LEGEND

- DRAINAGE BOUNDARY
- TRACT BOUNDARY
- 0.10 AC / DI#1 — DRAINAGE AREA / DRAINAGE STRUCTURE

DRAINAGE AREA MAP

TRACT 8057 - LEROB, LLC

ALAMEDA COUNTY, CALIFORNIA

RJA
RUGGERI-JENSEN-AZAR
ENGINEERS ▪ PLANNERS ▪ SURVEYORS
4690 CHABOT DRIVE, SUITE 200 PLEASANTON, CA 94588
PHONE: (925) 227-9100 FAX: (925) 227-9300

DATE: JULY 10, 2013 JOB NO. 091093 SHEET 1 OF 1 SHEETS

G:\JOBS\091093\TENT-MAP\091093-DRAINAGE AREA MAP.DWG 7/11/2013 9:12:57 AM JARED FREY

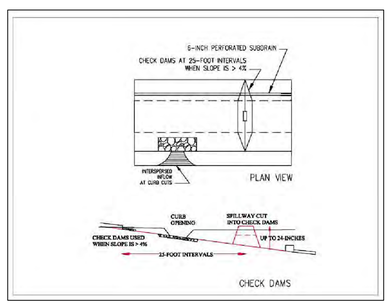
STORM WATER TREATMENT CALCULATION

AREA ID	SURFACE	IMPERVIOUS AREA (SF)	BMP USED	SIZING FACTOR	REQUIRED SURFACE AREA	SURFACE AREA AS PROVIDED
AREA 1	ROOF/PAVING	56,375	BIO-RETENTION AREA	0.04	2,255	2,260
AREA 2	ROOF/PAVING	43,275	BIO-RETENTION AREA	0.04	1,731	2,950
AREA 3	PAVING	3,520	BIO-RETENTION AREA	0.04	140	1,100
AREA 4	PAVING	9,495	BIO-RETENTION AREA	0.04	380	1,010
	TOTAL =	116,095				

NOTES:

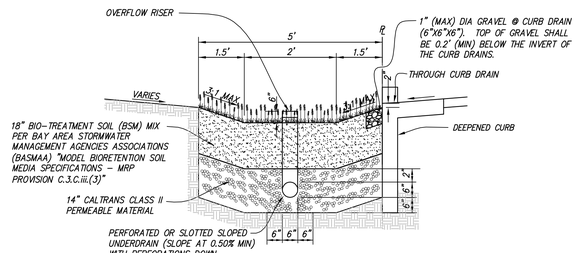
1. *THE ABOVE CALCULATIONS ARE BASED ON THE ALAMEDA COUNTYWIDE CLEAN WATER PROGRAM, C.3 STORMWATER TECHNICAL GUIDANCE, DATED MAY 2012, AND THE FOLLOWING CRITERIA:*
   a. *0.2 INCHES/HOUR RAINFALL INTENSITY ON 100% IMPERVIOUS AREA.*
   b. *SOIL FOR TREATMENT MEDIUM WITH A 5 INCHES/HOUR INFILTRATION RATE.*
   c. *A TREATMENT MEDIUM OF 0.04 SIZING FACTOR*
2. *SIZING FACTOR OF 0.04 NOTED ABOVE FOR BIO-RETENTION AREA IS CALCULATED BASED ON THE FOLLOWING CRITERIA:*
   a. *SIZING FACTOR=(0.2 IN/HR)/(5 IN/HR)=0.04*
3. *ASSUME EACH LOT = 2,850 SF IMPERVIOUS SURFACE.*

4' X 30' WALKWAY =	120 SF
16' X 30' DRIVEWAY =	480 SF
45' X 50' BUILDING =	2,250 SF
TOTAL =	2,850 SF

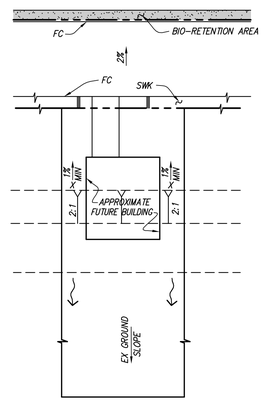


CHECK DAM DETAIL
NOT TO SCALE

NOTE:
CHECK DAM SHALL BE INSTALLED WHEN SLOPE IS GREATER THAN 4%

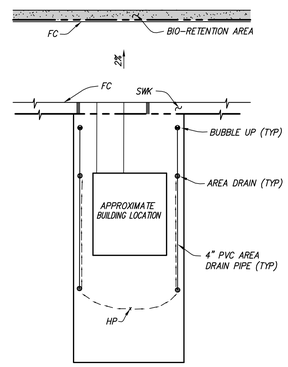


BIO-RETENTION AREA



NOTE: *DOWNSPOUTS SHALL DISCHARGE TOWARDS FRONT OF LOT ON UPPER PAD.*

TYPICAL LOT TREATMENT SPLIT LEVEL PAD
NOT TO SCALE



TYPICAL LOT GRADING SINGLE PAD
NOT TO SCALE

PRELIMINARY STORMWATER PROTECTION PLAN

TRACT 8057 - LEROB, LLC

ALAMEDA COUNTY, CALIFORNIA

RJA
RUGGERI-JENSEN-AZAR
ENGINEERS ▪ PLANNERS ▪ SURVEYORS
4690 CHABOT DRIVE, SUITE 200 PLEASANTON, CA 94588
PHONE: (925) 227-9100 FAX: (925) 227-9300

DATE: MAY 24, 2012 JOB NO. 091093 SHEET 5 OF 5 SHEETS

G:\2009\091093\ENT-MAP\091093-CSD-SWPP.DWG 4/20/2013 11:21:34 AM JARED DREY

Attachment 4: TJKM Traffic Study

TJKM
Transportation
Consultants

Vision That Moves Your Community

Final Report

Traffic Impact Study for the Fairview Tract # 8057 Residential Development

In Alameda County

December 4, 2012

Pleasanton
Fresno
Sacramento
Santa Rosa

www.tjkm.com

TJKM
Transportation
Consultants

Vision That Moves Your Community

Final Report

Traffic Impact Study for the Fairview Tract # 8057 Residential Development

In Alameda County

December 4, 2012

TJKM

www.tjkm.com

Prepared by:
TJKM Transportation Consultants
3875 Hopyard Road
Suite 200
Pleasanton, CA 94588-8526
Tel: 925.463.0611
Fax: 925.463.3690

J:\JURISDICTION\A\Alameda County\014-138 Fairview Tract TIS\Report\R120412.docx

Table of Contents

List of Appendices

List of Figures

List of Tables

Introduction and Summary

Introduction

This report presents the results of TJKM's traffic impact analysis for a proposed 15-lot single-family residential subdivision on a 10.1-acre undeveloped parcel known as Tract #8057. The parcel is located off Fairview Avenue near Jelincic Drive in the Fairview area of Alameda County. The development site and vicinity are shown in Figure 1. The project site plan is shown in Figure 2.

The purpose of this traffic study is to evaluate the potential traffic impacts on the adjacent roadway network resulting from the proposed residential development at Tract #8057 and to determine potential improvement measures.

Traffic operations were evaluated at the following six study intersections selected in consultation with County staff:

1. 'D' Street and Maud Avenue
2. Fairview Avenue and 'D' Street
3. Fairview Avenue and Jelincic Drive
4. Fairview Avenue and Levine Drive
5. Fairview Avenue / Five Canyons Parkway / Star Ridge Road
6. Fairview Avenue / Hansen Road

An intersection level of service (LOS) analysis was performed for the study intersections under the following four scenarios:

- Existing Conditions – this scenario evaluates the study intersections based on existing traffic counts and field surveys.
- Existing plus Project Conditions – this scenario is similar to the Existing Conditions scenario, but with the addition of traffic from the proposed residential development at Tract #8057.
- Future Baseline Conditions – this scenario evaluates the study intersections based on existing traffic plus traffic expected to be generated by a future potential residential build out of 219 additional single-family homes as defined by County staff.
- Future plus Project Conditions – this scenario is similar to the Future Baseline Conditions scenario, but with the addition of traffic from the proposed residential development at Tract #8057.

Summary

- The proposed 15-unit single-family residential development at Tract #8057 is expected to generate approximately 11 trips during the a.m. peak hour, 15 trips during the p.m. peak hour, and 144 average weekday daily trips.
- All study intersections are expected to operate at acceptable service levels of LOS B or better under all four study scenarios: Existing Conditions, Existing plus Project Conditions, Future Baseline Conditions, and Future plus Project Conditions. The Future Baseline condition assumes a maximum gross development potential of 219 single-family homes within the project vicinity (Scenario A).
- Both the Environmentally Constrained Scenario (Scenario B) and ABAG Growth Scenario (Scenario C), which assume lesser build outs of 130 and 57 single-family homes, respectively, are expected to generate fewer overall vehicle trips than Scenario A.

Since no significant traffic impacts were found under Scenario A for either Future Baseline or Future plus Project Conditions, it is reasonable to conclude that Scenarios B and C would also cause no significant traffic impacts under Future Baseline or Future plus Project Conditions.

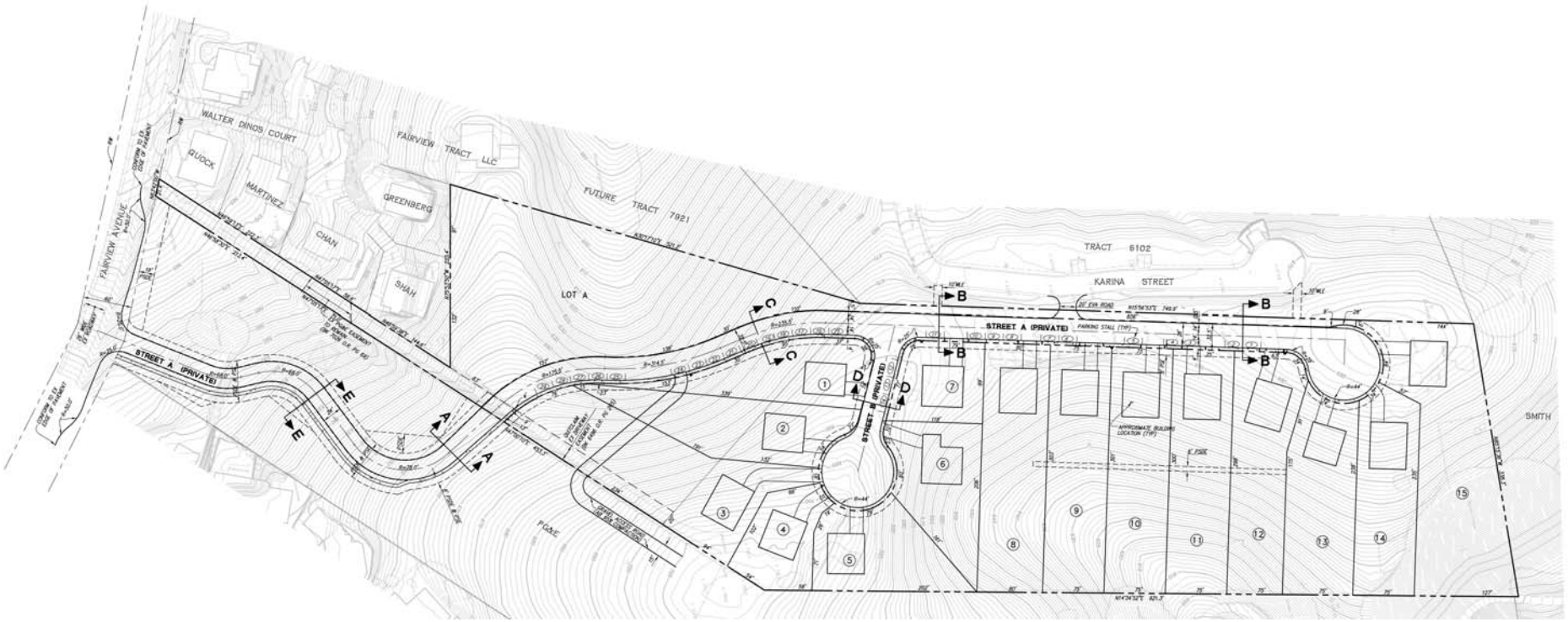
- Over the most recently available five-year period of collision data, only five collisions were reported within 500 feet of all study intersections. This intersection radius includes the project driveway at Fairview Avenue since it is near the Levine Drive intersection. None of the reported collisions involved bicyclists or pedestrians, and there were no reported injuries or fatalities. Due to the overall infrequency of collisions and the variety of reported collision types, there are no apparent collision trends that would suggest an existing safety concern at any of the study intersections or the proposed driveway location.
- The site plan incorporates TJKM's previously recommended measures to enhance safety for vehicle turns at Fairview Avenue and the project driveway, specifically acceleration and deceleration lanes for westbound Fairview Avenue traffic. Internally, the roadway cross sections and cul-de-sacs shown in the plan are expected to be adequate in accommodating general vehicle circulation, including emergency vehicles.
- The site plan identifies 29 parking spaces that can be accommodated on street within parking lanes provided along Streets A and B on site. This parking supply is expected to be adequate in serving residents and visitors on site. The 29 on-street parking spaces exclude parking capacity located off-street within the individual home sites, including driveways and garages.
- TJKM recommends that a stop sign be installed on the southbound Street A approach to Fairview Avenue. This measure would provide a clearly defined assignment of right-of-way to Fairview Avenue traffic at the new intersection.
- TJKM reviewed stopping sight distance in the field based on the proposed project driveway location. While available sight distance for eastbound approaching vehicles is adequate at over 450 feet, less than 240 feet of stopping sight distance is available for westbound approaching vehicles due to horizontal and vertical crest curves. The westbound distance is below Caltrans Highway Design Manual (HDM) minimum standards at 30 mph speed. The primary safety concern is outbound left turning vehicles from the driveway that must look for gaps in traffic in both the eastbound and westbound directions.
- To address the outbound left turn safety concern, TJKM recommends that outbound access to Fairview Avenue be restricted to right turns only by constructing a physical island that will prevent outbound vehicles from turning left, while still allowing for all inbound turns. TJKM also recommends that a R3-2 (No Left Turn) sign be installed to reinforce this feature. TJKM notes that only two peak hour project vehicles (a.m. or p.m.) would be affected by this restriction. These vehicles can divert to the Fairview Avenue / Hansen Road roundabout approximately 1,500 feet to the west to reverse direction and travel towards Five Canyons Parkway and points east.

Vicinity Map

NORTH
Not to Scale

TJKM

014-138 - 10/18/12 - AK



NORTH
Not to Scale
TJKM

Level of Service Analysis Methodology and Significance Criteria

Level of Service Analysis Methodology

Level of Service (LOS) is a qualitative description of intersection operations using an 'A' through 'F' letter rating system to describe travel delay and congestion. LOS A indicates free flow conditions with little or no delay and LOS F indicates jammed conditions with excessive delays and long back-ups. The LOS methodology is described in detail in Appendix A. To supplement Appendix A, the additional LOS methodology used to analyze the roundabout study intersection in this analysis is included in Appendix B.

Peak hour conditions at the study intersections are reported in terms of average delay (seconds/vehicle) with corresponding levels of service. The operating conditions at the study intersections, except for the roundabout intersection, were evaluated using the *2000 Highway Capacity Manual* (HCM 2000) Operations methodology contained in Synchro software. Operations at the roundabout study intersection were evaluated using the HCM 2000 methodology contained in SIDRA software. The HCM 2000 methodology provides an average delay and LOS rating for each intersection approach and also for the overall intersection performance.

For this traffic study, the overall intersection delay and LOS were reported for the roundabout and all-way stop study intersections. For the study intersections with stop or yield control on only the minor approaches, the delay and LOS were reported for the worst-case minor approach.

LOS Significance Criteria

According to the 2012 *Alameda Countywide Transportation Plan* published by the Alameda County Transportation Commission (ACTC), the LOS standard for highway systems is LOS D. For this study, LOS D is considered to be the acceptable threshold for intersections.

Existing Conditions

Roadway Network

'D' Street is an east-west arterial that extends eastward from Winton Avenue, through the City of Hayward, and into the Fairview area of the County of Alameda. At the Bassard Tract #7303 project site, 'D' Street is a two-lane two-way street running through a residential neighborhood.

Fairview Avenue is a northwest-southeast collector street that extends from 'D' Street, through the Fairview area of the County of Alameda, until it reaches Hayward Boulevard in the northwest part of the City of Hayward. At the Fairview LLC Tract #7921 project site, Fairview Avenue is a two-lane two-way roadway striped to prohibit passing in both directions.

Maud Avenue is a two-way collector street that extends from Kelly Street to 'D' Street.

Intersection Lane Geometry and Traffic Control

The intersection of 'D' Street and Maud Avenue is an unsignalized intersection with three approaches. All of the intersection movements are stop controlled except for the westbound right-turn movement from 'D' Street, which is controlled by a yield sign. The westbound approach on 'D' Street and the southbound approach on Maud Avenue have two lanes entering the intersection, while the eastbound approach on 'D' Street has one lane entering the intersection.

The intersection of Fairview Avenue and 'D' Street is an unsignalized intersection with three approaches. The minor street approach, which is the westbound approach on 'D' Street, is stop controlled. A left-turn pocket and a continuing through lane are provided for eastbound traffic on 'D' Street, while one lane in each direction is provided on the other approaches.

The intersection of Fairview Avenue and Levine Drive is an unsignalized intersection with three approaches. The minor approach, the northbound approach on Levine Drive, yields to the major approaches. All approaches consist of one lane.

The intersection of Fairview Avenue, Five Canyons Parkway, and Star Ridge Road is a roundabout with one-lane approaches under yield control in all directions.

The intersection of Fairview Avenue and Hansen Road is a roundabout with one-lane approaches under yield control in all directions.

Existing Traffic Volumes

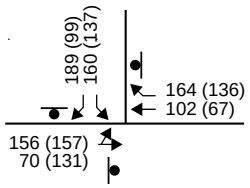
Existing vehicle, bicycle, and pedestrian counts were collected at the study intersections in September 2012, approximately four weeks after local public schools had returned to full session. The turning movement volumes for the study intersections were taken during the typical a.m. peak period, between 7:00 a.m. and 9:00 a.m., and during the typical p.m. peak period, between 4:00 p.m. and 6:00 p.m. The existing traffic volumes are included in Appendix C. Existing traffic volumes, lane geometry, and traffic controls for each study intersection are shown in Figure 3.

Alameda County - Traffic Impact Study for the Fairview Tract # 8057 Residential Development

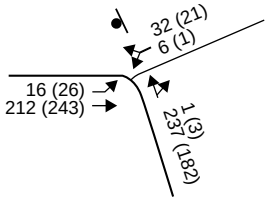
Existing Traffic Volumes, Lane Geometry, and Traffic Controls

Figure 3

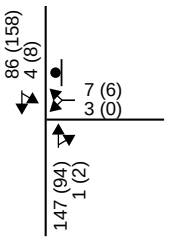
Intersection #1
Maud Ave./D. St.



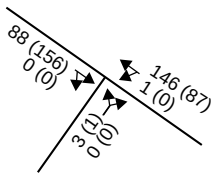
Intersection #2
Fairview Ave./D St.



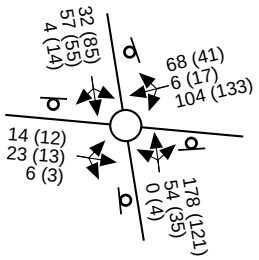
Intersection #3
Fairview Ave./Jelincic Dr.



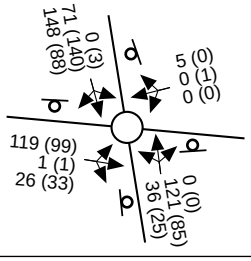
Intersection #4
Fairview Ave./Levine Dr.

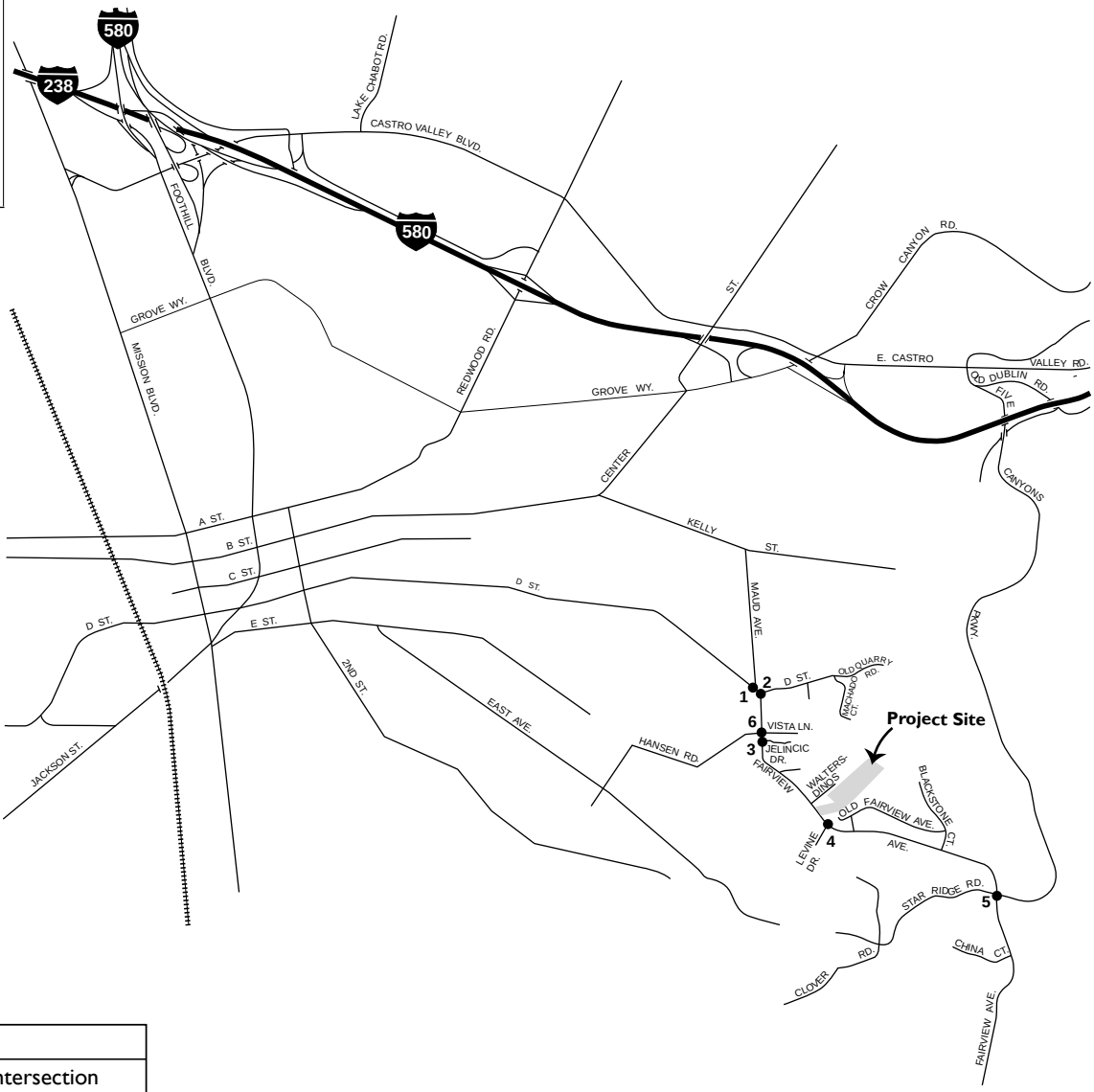


Intersection #5
Fairview Ave./Five Canyons Pkwy./Star Ridge Rd.



Intersection #6
Fairview Ave./Hansen Rd./Vista Ln.





LEGEND

- Study Intersection
- Roundabout
- Yield Sign
- Stop Sign
- XX AM Peak Hour Volume
- (XX) PM Peak Hour Volume

NORTH
Not to Scale

TJKM

Intersection Level of Service Analysis – Existing Conditions

Table 1 presents a summary of the peak hour level of service analysis for each of the study intersections under Existing Conditions. Level of service worksheets are provided in Appendix D. Under Existing Conditions, all study intersections currently operate at acceptable service levels of LOS B or better.

Table I: Peak Hour Intersection Levels of Service – Existing Conditions

ID	*Intersection*	*Control*	*A.M. Peak Hour*		*P.M. Peak Hour*	
			Delay	*LOS*	*Delay*	*LOS*
1	'D' Street / Maud Avenue	All-Way Stop	9.0	A	9.1	A
2	Fairview Avenue / 'D' Street	Minor Street Approach Stop	10.9	B	9.7	A
3	Fairview Avenue / Jelincic Drive	Minor Street Approach Stop	9.7	A	8.8	A
4	Fairview Avenue / Levine Drive	Minor Approach Yields	10.4	B	10.1	B
5	Fairview Avenue / Five Canyons Parkway / Star Ridge Road	Roundabout	5.0	A	5.4	A
6	Fairview Avenue / Vista Lane / Hansen Road	Roundabout	4.9	A	5.0	A

Notes: Delay = Average Delay in seconds per vehicle
LOS = Level of Service
The delay and LOS at the all-way stop controlled intersection are for the overall intersection performance.
The delay and LOS at intersections with stop or yield control on the minor approach are for the worst-case minor approach.
The delay and LOS at the roundabout intersection are for the overall intersection performance.

Roadway Collision History

TJKM assessed the most recent five-year collision history within the project study area to determine whether there are any current collision patterns that might suggest an existing safety concern. The analysis focused on locations within 500 feet of all study intersections, which includes the project driveway on Fairview Avenue since it is adjacent to the Levine Drive intersection.

From 2008 to the present (five-year period), only five collisions were reported. Specifically, four occurred within 250 feet of the Maud Avenue / D Street intersection, with one of each of the following collision types occurring: sideswipe, broadside, hit object, and a vehicle backing into another. The fifth collision was a broadside collision that occurred in 2009 within 250 feet of the Five Canyons Parkway / Fairview Avenue intersection. None of the reported collisions involved bicyclists or pedestrians, and there were no reported injuries or fatalities.

Due to the overall infrequency of collisions and the variety of reported collision types, there are no apparent collision trends that would suggest an existing safety concern at any of the study intersections or the proposed driveway location.

Existing plus Project Conditions

Project Description

The proposed residential development at Tract #8057 consists of 15 single-family homes on a parcel to be accessed by a new private driveway on Fairview Avenue located south of Jelincic Drive and just northwest of Levine Road. The proposed development is located in the unincorporated Fairview area of Alameda County near the City of Hayward. The development site and vicinity are shown in Figure 1. The project site plan is shown in Figure 2.

Trip Generation – Proposed Project

Trip generation for the proposed developments was determined using trip rates contained in *Trip Generation*, 8th Edition, published by the Institute of Transportation Engineers (ITE). The proposed development at Tract #8057 is expected to generate approximately 11 trips during the a.m. peak hour, 15 trips during the p.m. peak hour, and 144 average weekday daily trips. Trip generation for the proposed development during the peak hours and the average weekday is summarized in Table II and Table III, respectively.

Table II: Peak Hour Trip Generation for Proposed Development

Project	*Land Use (ITE Code)*	*Size*	*A.M. Peak Hour*					*P.M. Peak Hour*				
			Rate	*In: Out*	*In*	*Out*	*Total*	*Rate*	*In: Out*	*In*	*Out*	*Total*
Tract #8057	Single-Family Detached Housing (210)	15 Units	0.75	25:75	3	8	11	1.01	63:37	9	6	15

Table III: Weekday Daily Trip Generation for Proposed Development

Project	*Land Use (ITE Code)*	*Size*	*Weekday Daily*				
			Rate	*In: Out*	*In*	*Out*	*Total*
Tract #8057	Single-Family Detached Housing (210)	15 Units	9.57	50:50	72	72	144

Trip Distribution and Trip Assignment

Trip distribution determines the proportions of the total vehicles generated by a project that are expected to travel between the project site and various destinations outside the project area. Trip assignment determines the various routes that vehicles are expected to take while travelling between the project site and each destination. For the proposed development, the trip distribution and assignment were determined based on existing turning movements and TJKM's knowledge of the study area in consultation with County staff. The trip distribution and assignment for the proposed development is shown in Figure 4.

The assigned project trips were added to Existing Conditions traffic volumes to generate Existing plus Project Conditions traffic volumes. The resulting Existing plus Project traffic volumes, as well as lane geometry and traffic controls, are shown in Figure 5.

Intersection Level of Service Analysis – Existing plus Project Conditions

Table IV presents a summary of the peak hour level of service analysis for each of the study intersections under Existing plus Project Conditions. Level of service worksheets are provided in Appendix E. Under Existing plus Project Conditions, all study intersections are expected to continue operating at acceptable service levels of LOS B or better.

Table IV: Peak Hour Intersection Level of Service – Existing plus Project Conditions

ID	*Intersection*	*Control*	*Existing Conditions*				*Existing plus Project Conditions*			
			A.M. Peak Hour		*P.M. Peak Hour*		*A.M. Peak Hour*		*P.M. Peak Hour*	
			Delay	*LOS*	*Delay*	*LOS*	*Delay*	*LOS*	*Delay*	*LOS*
1	'D' Street / Maud Avenue	All-Way Stop	9.0	A	9.1	A	9.1	A	9.2	A
2	Fairview Avenue / 'D' Street	Minor Street Approach Stop	10.9	B	9.7	A	10.9	B	9.7	A
3	Fairview Avenue / Jelincic Drive	Minor Street Approach Stop	9.7	A	8.8	A	9.7	A	8.9	A
4	Fairview Avenue / Levine Drive	Minor Approaches Stop or Yield	10.4	B	10.1	B	10.5	B	10.1	B
5	Fairview Avenue / Five Canyons Parkway / Star Ridge Road	Roundabout	5.0	A	5.4	A	5.0	A	5.5	A
6	Fairview Avenue / Hansen Road	Roundabout	4.9	A	5.0	A	4.9	A	5.1	A

Notes: Delay = Average Delay in seconds per vehicle
LOS = Level of Service
The delay and LOS at the all-way stop controlled intersection are for the overall intersection performance.
The delay and LOS at intersections with stop or yield control on the minor approaches are for the worst-case minor approach.
The delay and LOS at the roundabout intersection are for the overall intersection performance.

Site Circulation and External Access

TJKM reviewed the latest project site plan to determine adequacy of internal site circulation and external access. The site plan incorporates TJKM's previously recommended measures to enhance safety for vehicle turns at Fairview Avenue and the project driveway. These measures consist of a deceleration lane for inbound right turns and acceleration lane for outbound right turns along westbound Fairview Avenue. The measures are intended to address a limited sight distance condition that TJKM had determined based on an earlier field evaluation.

In terms of internal site circulation, the site plan shows a standard 24-foot roadway cross section adequate for two-way traffic on Street A (private road) entering the site, as well as a sidewalk connecting Fairview Avenue to the proposed homes. Further uphill, this cross section expands to 28 feet, consisting of one eight-foot parking lane and two 10-foot travel lanes on both Street A and Street B onsite. Both streets end in cul-de-sacs with standard 44-foot turning radii. The cross sections and cul-de-sacs are expected to be adequate in accommodating general vehicle circulation, including emergency vehicles.

It should also be noted that the site plan identifies 29 parking spaces that can be accommodated on street within the parking lanes located along Streets A and B on site. This parking supply is expected to be adequate in serving residents and visitors on site. The on-street parking total excludes parking capacity located off-street within the individual home sites, including driveways and garages.

TJKM recommends that a stop sign be installed on the southbound Street A approach to Fairview Avenue. This measure would provide a clearly defined assignment of right-of-way to Fairview Avenue traffic at the new intersection.

Sight Distance Evaluation

TJKM reviewed the latest project site plan and conducted a field visit to determine adequacy of stopping sight distance entering and exiting the project site driveway. The minimum stopping sight distance is defined as the distance required by the driver of a vehicle, traveling at a given speed, to bring the vehicle to a stop after an object on a roadway becomes visible (e.g. a car exiting a driveway).

Fairview Avenue is a two-lane roadway with approximately east-west orientation at the project driveway. The westbound direction (towards Hayward) includes a downgrade of approximately six to ten percent. The roadway width varies from about 24 to 28 feet with curb and gutter along the road edge opposite the project frontage. The shoulder along the project frontage currently consists of a dirt shoulder. The existing posted regulatory speed limit is 30 miles per hour (mph) in the project vicinity. An electronic speed radar sign is installed near the proposed project driveway to advise motorists traveling westbound around the curve and on the downgrade. Fairview Avenue is accessed by several driveways on both sides to the east and to the west of the project driveway.

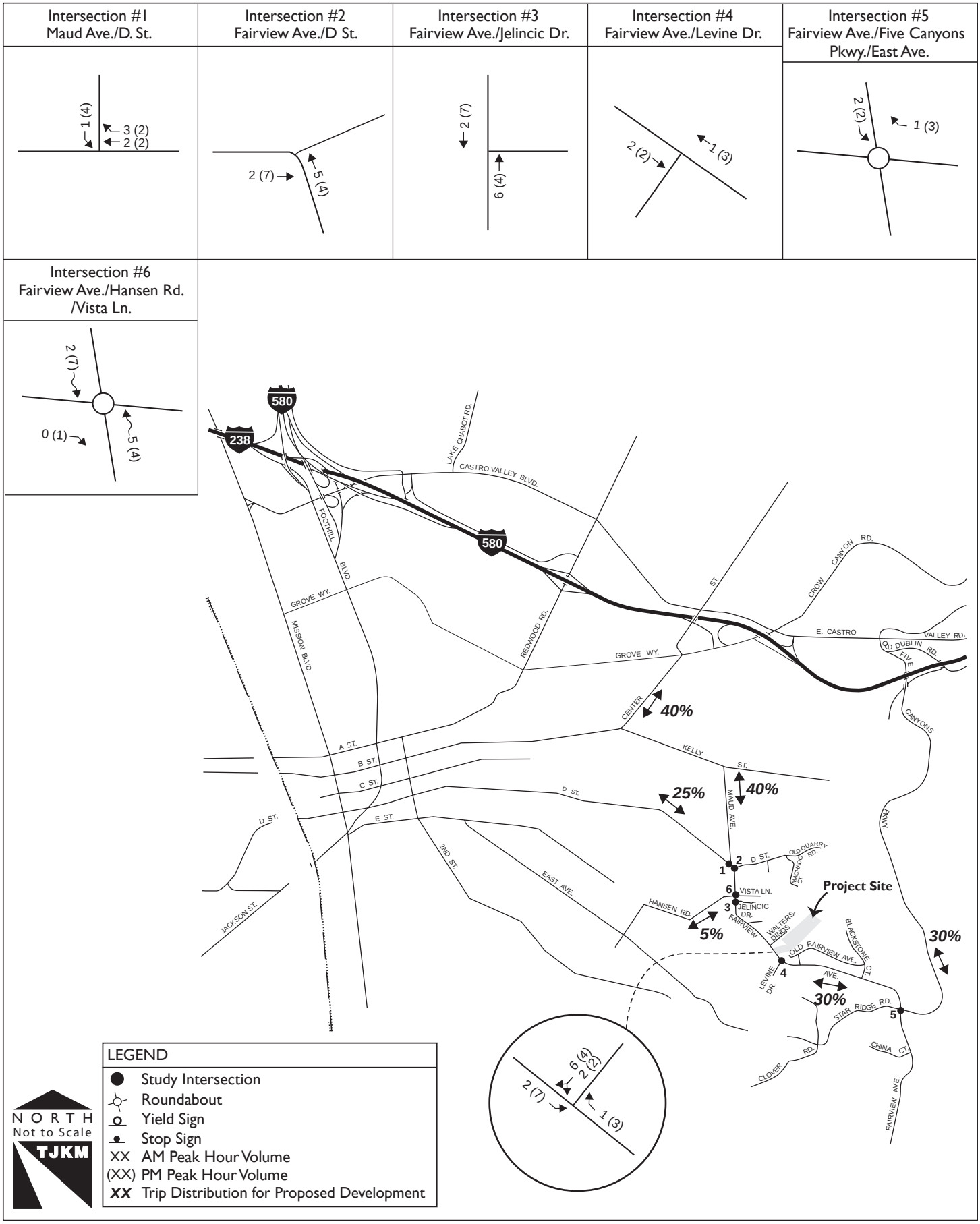
The minimum stopping sight distance required at 30 mph speed is 200 feet based on the Caltrans Highway Design Manual (HDM). This distance is increased by 20 percent for downgrades of greater than three percent. For the project driveway, the minimum required stopping sight distance based on the HDM is therefore 240 feet for the westbound down grade approach. The proposed project driveway location provides more than 450 feet of stopping sight distance for eastbound traffic approaching the driveway, which is adequate for the design speed. However, less than 240 feet of stopping sight distance is available for westbound approaching vehicles. Therefore, safety measures are necessary to address this sight distance deficiency.

The primary safety concern stemming from the deficient westbound stopping sight distance is outbound left turning vehicles from the driveway. These vehicles must look for gaps in traffic in both the eastbound and westbound directions in order to complete a left turn onto eastbound Fairview Avenue. Other turns are expected to be accommodated safely. Inbound left turns, which look for gaps to cross opposing westbound traffic, are expected to be adequate since they will enter a very low-volume residential driveway that is expected to be free of inbound queued vehicles. Inbound right turns will have an available right turn pocket that will allow vehicles to decelerate and turn while out of the westbound traffic stream. Lastly, outbound right turns will have an available acceleration lane which will provide additional merging and acceleration area for such vehicles entering the westbound traffic stream.

To address the outbound left turn safety concern, TJKM recommends that outbound access to Fairview Avenue be restricted to right turns only. This can be accomplished by constructing a physical island that will prevent outbound vehicles from turning left, while still allowing for all inbound turns. TJKM also recommends that a R3-2 (No Left Turn) sign be installed to reinforce this feature. TJKM notes that few project vehicles would be affected by this restriction during commute peak hours (worst case of two outbound vehicles during either a.m. or p.m. peak hour). These vehicles can divert to the Fairview Avenue / Hansen Road roundabout approximately 1,500 feet to the west to reverse direction and travel towards Five Canyons Parkway and points east.

Alameda County - Traffic Impact Study for the Fairview Tract # 8057 Residential Development Figure

Proposed Development Trip Distribution and Assignment 4



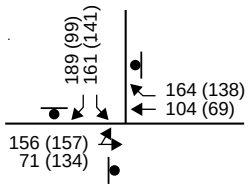
014-138 - 12/3/12 - AK

Alameda County - Traffic Impact Study for the Fairview Tract # 8057 Residential Development

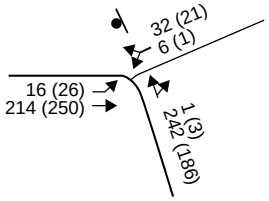
Existing plus Project Traffic Volumes, Lane Geometry, and Traffic Controls

Figure 5

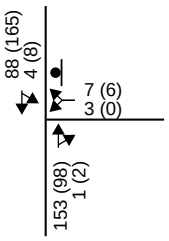
Intersection #1
Maud Ave./D. St.



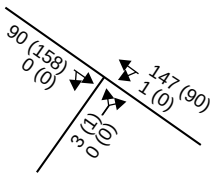
Intersection #2
Fairview Ave./D St.



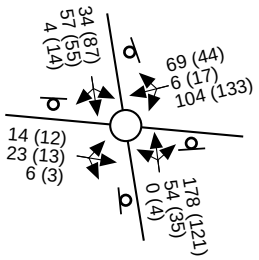
Intersection #3
Fairview Ave./Jelincic Dr.



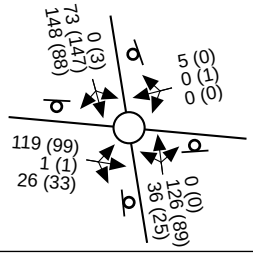
Intersection #4
Fairview Ave./Levine Dr.

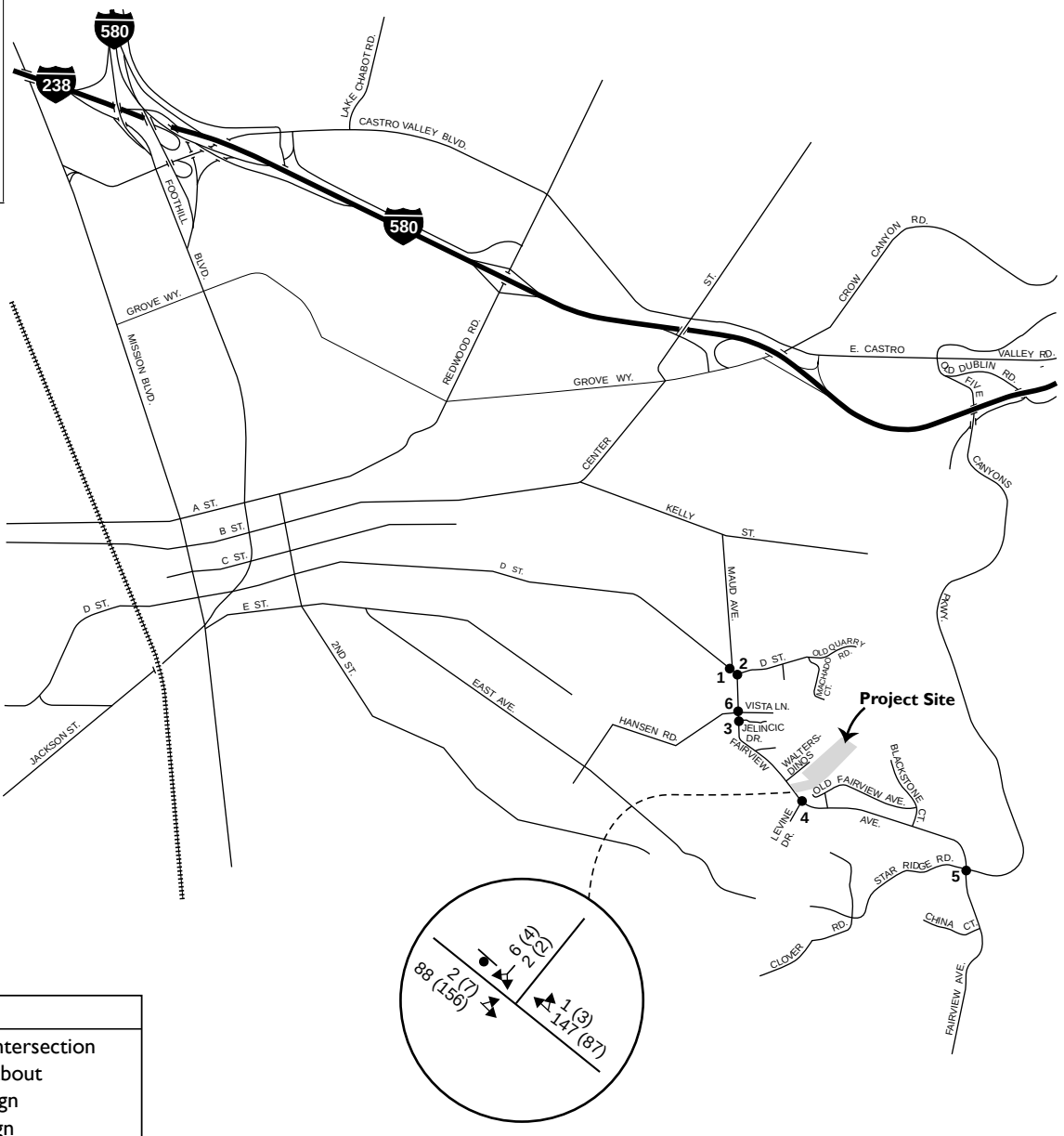


Intersection #5
Fairview Ave./Five Canyons Pkwy./Star Ridge Rd.



Intersection #6
Fairview Ave./Hansen Rd.
/Vista Ln.





LEGEND

- Study Intersection
- Roundabout
- Yield Sign
- Stop Sign
- XX AM Peak Hour Volume
- (XX) PM Peak Hour Volume

NORTH
Not to Scale

TJKM

014-138 - 12/3/12 - AK

Future Baseline Conditions

Future Baseline Development Scenarios

In consultation with County staff, a future year cumulative baseline with a 20-year horizon has been established to assess potential impacts from the proposed project. According to County staff, there are three potential build-out scenarios in the Fairview Area project vicinity:

a) Gross Development Potential - a total of 219 additional single-family residential dwelling units are assumed to be potentially approved and built on currently undeveloped or under-developed residentially-designated parcels in the general vicinity of proposed Tract #8057. The total is derived from 233 total parcels minus 14 existing homes already built. This estimate of future residential development is based on a tabulation prepared by County Planning Department staff and is considered the "worst case" scenario because it is a result of a mathematical calculation of lot sizes and allowable residential densities based on zoning; no constraining environmental or other factors have been taken into account. Staff notes that such development is not physically possible since this scenario would make approximately 30 percent of the parcels under this scenario landlocked (i.e. no access).

b) Environmentally Constrained - in which development of the same parcels as in (A) would potentially yield only 130 single-family homes due to slope and other environmental factors, based on the same Planning Department staff review.

c) ABAG Growth Scenario - assumes annual growth rate of 0.9 percent, consistent with current ABAG projections for the San Francisco Bay Area. Based on County staff estimation, this would result in 57 single-family homes in the project vicinity.

For conservative traffic analysis purposes, TJKM has analyzed the worst case (219-unit) Scenario A for the Future Baseline. A qualitative analysis of the other two potential build out scenarios (Scenarios B and C) is provided later in this study report.

Trip Generation - Future Baseline Development

Trip generation for the potential future development under Scenario A was determined using trip rates contained from ITE *Trip Generation*. Under Scenario A, the additional development of 219 net new single-family homes is expected to generate a cumulative total of 164 trips during the a.m. peak hour, 237 trips during the p.m. peak hour, and 2,096 average weekday daily trips. The locations and trip generation for the additional development during the peak hours are summarized in Table V in the following page.

The average daily weekday trip generation is summarized in Table VI. Figure 6 shows the locations of all individual future baseline developments.

Table V: Expected Peak Hour Trip Generation for Future Baseline Development

Figure 6 Symbol	*Parcel Location*	*Size*	*A.M. Peak Hour*					*P.M. Peak Hour*				
			Rate	*In: Out*	*In*	*Out*	*Total*	*Rate*	*In: Out*	*In*	*Out*	*Total*
A	3216 'D' St.	14 units	0.75	25:75	3	8	11	1.01	63:37	9	6	15
B	3230 'D' St.	2 units	0.75	25:75	0	1	2	1.01	63:37	2	1	3
C	3231 'D' St.	6 units	0.75	25:75	1	3	5	1.01	63:37	4	3	7
D	3247 'D' St.	12 units	0.75	25:75	2	7	9	1.01	63:37	8	5	13
E	3291 'D' St.	21 units	0.75	25:75	4	12	16	1.01	63:37	14	8	22
F	3290 Jelincic Dr.	19 units	0.75	25:75	4	11	14	1.01	63:37	13	7	20
G	24694 Fairview Ave.	12 units	0.75	25:75	2	7	9	1.01	63:37	8	5	13
H	24830 Fairview Ave.	18 units	0.75	25:75	3	10	14	1.01	63:37	12	7	19
I	24717 Fairview Ave.	7 units	0.75	25:75	1	4	5	1.01	63:37	5	3	8
J	24787 Fairview Ave.	6 units	0.75	25:75	1	3	5	1.01	63:37	4	3	7
K	24867 Fairview Ave.	11 units	0.75	25:75	2	6	8	1.01	63:37	8	4	12
L	3664 'D' St./Quarry Rd.	8 units	0.75	25:75	2	5	6	1.01	63:37	6	3	9
M	3552 'D' St./Quarry Rd.	11 units	0.75	25:75	2	6	8	1.01	63:37	8	4	12
N	5262 to 5499 Hilltop Rd.	24 units	0.75	25:75	5	14	18	1.01	63:37	16	9	25
O	'D' St./Ohlone Way	7 units	0.75	25:75	1	4	5	1.01	63:37	5	3	8
P	'D' St./Ohlone Way	6 units	0.75	25:75	1	3	5	1.01	63:37	4	3	7
Q	Noble Canyon, Fairview Ave east of 'D' St.	4 units	0.75	25:75	1	2	3	1.01	63:37	3	2	5
R	Sarita St./Karina St.	31 units	0.75	25:75	6	17	23	1.01	63:37	20	12	32
Other Development Total		**219 units**			**41**	**123**	**164**			**149**	**88**	**237**

Note: Single-Family Detached Housing Land Use (ITE Code 210) was assumed for all developments.

Table VI: Expected Weekday Daily Trip Generation for Future Baseline Development

Figure 6 Symbol	*Parcel Location*	*Size*	*Weekday Daily*				
			Rate	*In: Out*	*In*	*Out*	*Total*
A	3216 'D' St.	14 units	9.57	50:50	67	67	134
B	3230 'D' St.	2 units	9.57	50:50	10	10	19
C	3231 'D' St.	6 units	9.57	50:50	29	29	57
D	3247 'D' St.	12 units	9.57	50:50	57	57	115
E	3291 'D' St.	21 units	9.57	50:50	100	100	201
F	3290 Jelincic Dr.	19 units	9.57	50:50	91	91	182
G	24694 Fairview Ave.	12 units	9.57	50:50	57	57	115
H	24830 Fairview Ave.	18 units	9.57	50:50	86	86	172
I	24717 Fairview Ave.	7 units	9.57	50:50	33	33	67
J	24787 Fairview Ave.	6 units	9.57	50:50	29	29	57
K	24867 Fairview Ave.	11 units	9.57	50:50	53	53	105
L	3664 'D' St./Quarry Rd.	8 units	9.57	50:50	38	38	77
M	3552 'D' St./Quarry Rd.	11 units	9.57	50:50	53	53	105
N	5262 to 5499 Hilltop Rd.	24 units	9.57	50:50	115	115	230
O	'D' St./Ohlone Way	7 units	9.57	50:50	33	33	67
P	'D' St./Ohlone Way	6 units	9.57	50:50	29	29	57
Q	Noble Canyon, Fairview Ave east of 'D' St.	4 units	9.57	50:50	19	19	38
R	Sarita St./Karina St.	31 units	9.57	50:50	148	148	297
Other Development Total		**219 units**			**1,048**	**1,048**	**2,096**

Note: Single-Family Detached Housing Land Use (ITE Code 210) was assumed for all developments.

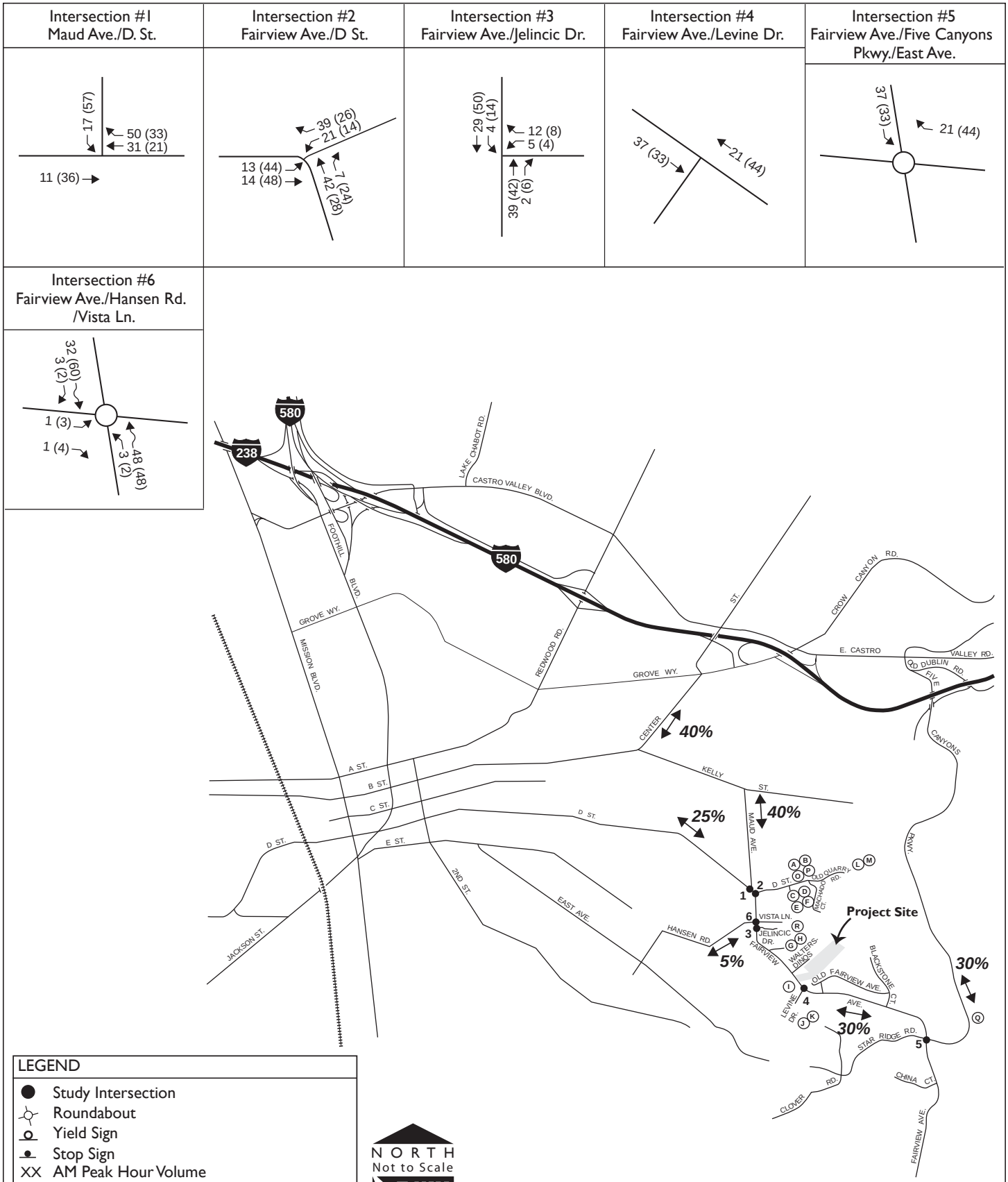
Future Baseline Trip Distribution and Assignment

TJKM used the same trip distribution and assignment for the potential future cumulative development under Scenario A as for the proposed project based on consultation with County staff, expected future area traffic volumes, and TJKM's knowledge of the study area.

The combined trip distribution and assignment for the future cumulative developments in the study area are shown in Figure 6. The assigned trips for the future cumulative developments were added to Existing Conditions traffic volumes to generate Future Baseline traffic volumes, which are shown in Figure 7. Figure 7 also shows expected lane geometry and traffic controls at the study intersections under Future Baseline Conditions, which are expected to be identical to Existing Conditions.

Future Area Buildout Development Trip Distribution and Assignment

Figure 6

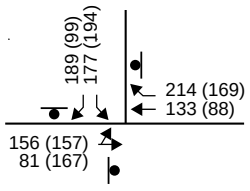


Alameda County - Traffic Impact Study for the Fairview Tract # 8057 Residential Development

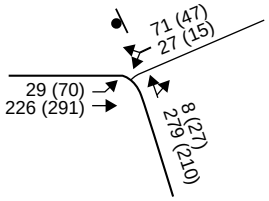
Future Traffic Volumes, Lane Geometry, and Traffic Controls

Figure 7

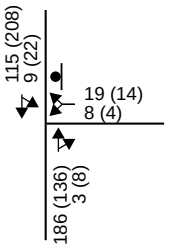
Intersection #1
Maud Ave./D. St.



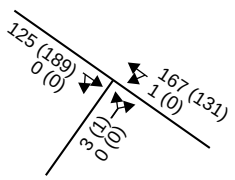
Intersection #2
Fairview Ave./D St.



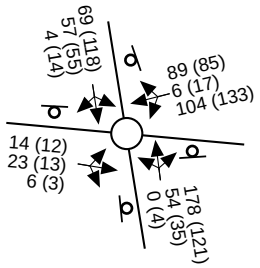
Intersection #3
Fairview Ave./Jelincic Dr.



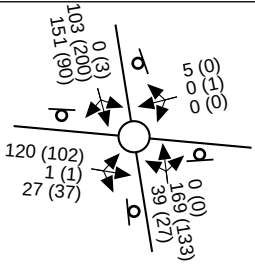
Intersection #4
Fairview Ave./Levine Dr.

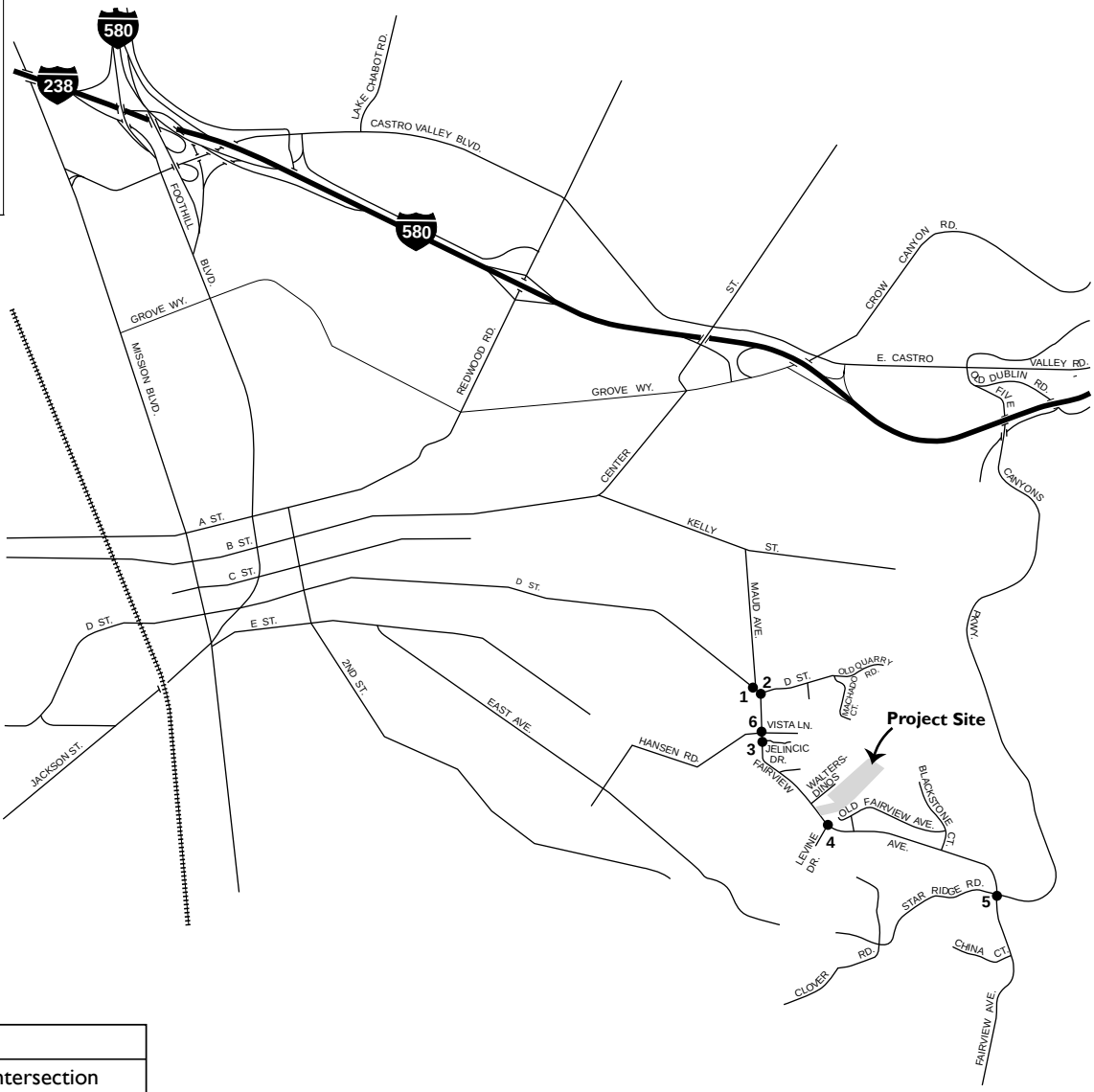


Intersection #5
Fairview Ave./Five Canyons Pkwy./Star Ridge Rd.



Intersection #6
Fairview Ave./Hansen Rd.
/Vista Ln.





LEGEND

- Study Intersection
- Roundabout
- Yield Sign
- Stop Sign
- XX AM Peak Hour Volume
- (XX) PM Peak Hour Volume

NORTH
Not to Scale

TJKM

014-138 - 10/18/12 - AK

Intersection Level of Service Analysis – Future Baseline Conditions

Table VIII presents a summary of the peak hour level of service analysis for all study intersections under Future Baseline Conditions. Level of service worksheets are provided in Appendix F. For Future Baseline Conditions, all study intersections are expected to remain operating at acceptable service levels of LOS B or better.

Table VII: Peak Hour Intersection Level of Service – Future Baseline Conditions

ID	*Intersection*	*Control*	*Existing Conditions*				*Future Baseline Conditions*			
			A.M. Peak Hour		*P.M. Peak Hour*		*A.M. Peak Hour*		*P.M. Peak Hour*	
			Delay	*LOS*	*Delay*	*LOS*	*Delay*	*LOS*	*Delay*	*LOS*
1	'D' Street / Maud Avenue	All-Way Stop	9.0	A	9.1	A	9.4	A	10.3	B
2	Fairview Avenue / 'D' Street	Minor Street Approach Stop	10.9	B	9.7	A	13.5	B	12.2	B
3	Fairview Avenue / Jelincic Drive	Minor Street Approach Stop	9.7	A	8.8	A	10.4	B	9.8	A
4	Fairview Avenue / Levine Drive	Minor Approaches Stop or Yield	10.4	B	10.1	B	11.1	B	10.7	B
5	Fairview Avenue / Five Canyons Parkway / Star Ridge Road	Roundabout	5.0	A	5.4	A	5.3	A	5.8	A
6	Fairview Avenue / Hansen Road	Roundabout	4.9	A	5.0	A	5.3	A	5.5	A

Notes: Delay = Average Delay in seconds per vehicle
LOS = Level of Service
The delay and LOS at the all-way stop controlled intersection are for the overall intersection performance.
The delay and LOS at intersections with stop or yield control on the minor approaches are for the worst-case minor approach.
The delay and LOS at the roundabout intersection are for the overall intersection performance.

Future plus Project Conditions

This scenario is identical to Future Baseline Conditions, but with the addition of expected vehicle trips from the proposed Tract #8057 project. The same trip distribution and assignment for the proposed project is assumed under Future plus Project Conditions as under Existing plus Project Conditions. The assigned project trips were added to Future Baseline Conditions traffic volumes to generate Future plus Project Conditions traffic volumes. The resulting traffic volumes at the study intersections under Future plus Project Conditions are shown in Figure 8.

Intersection Level of Service Analysis – Future plus Project Conditions

Table VIII presents a summary of the peak hour level of service analysis for all study intersections under Future plus Project Conditions. Level of service worksheets are provided in Appendix G. For Future plus Project Conditions, all study intersections are expected to continue operating at acceptable service levels of LOS B or better.

Table VIII: Peak Hour Intersection Level of Service – Future plus Project Conditions

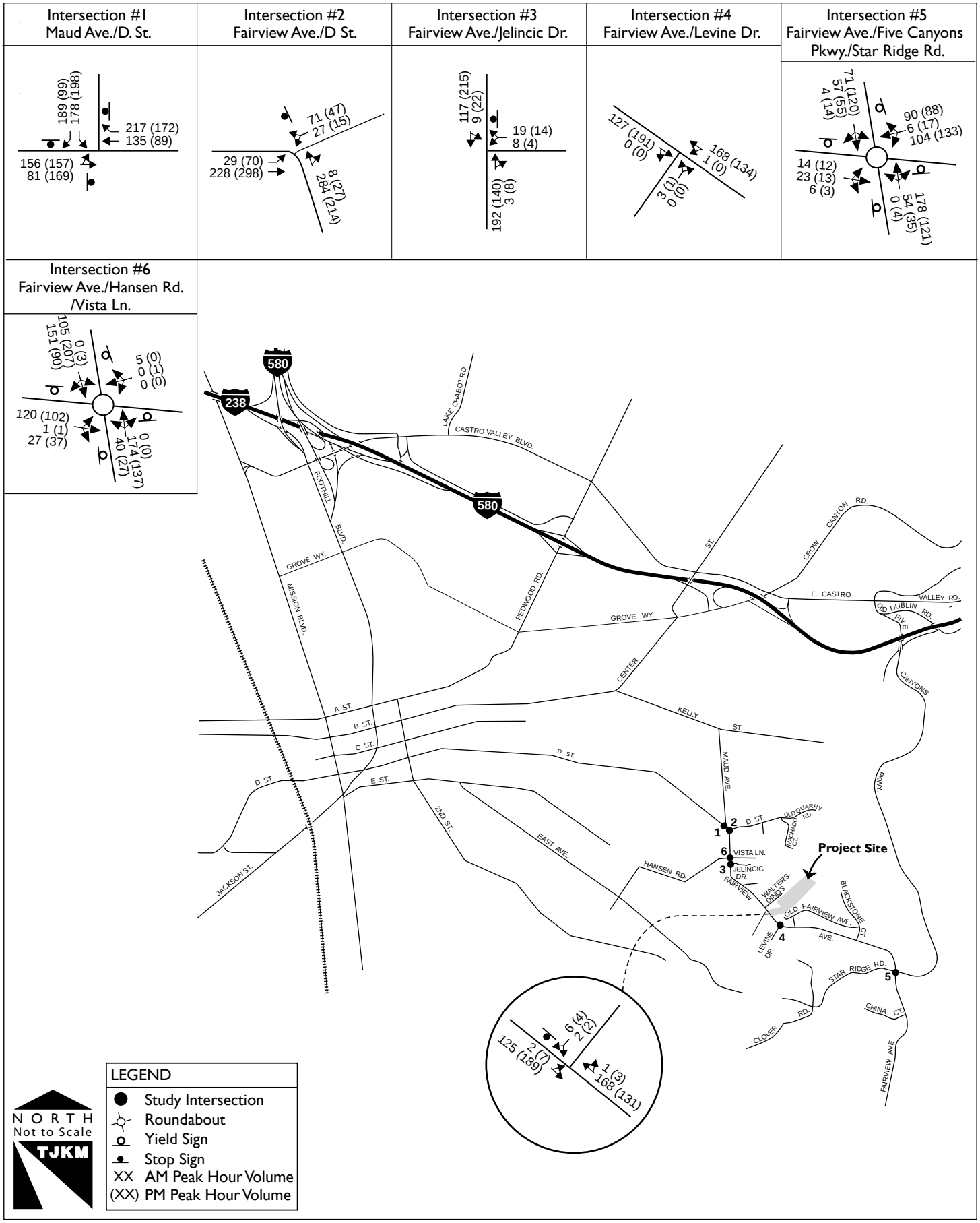
ID	*Intersection*	*Control*	*Future Baseline Conditions*				*Future plus Project Conditions*			
			A.M. Peak Hour		*P.M. Peak Hour*		*A.M. Peak Hour*		*P.M. Peak Hour*	
			Delay	*LOS*	*Delay*	*LOS*	*Delay*	*LOS*	*Delay*	*LOS*
1	'D' Street / Maud Avenue	All-Way Stop	9.4	A	10.3	B	9.4	A	10.4	B
2	Fairview Avenue / 'D' Street	Minor Street Approach Stop	13.5	B	12.2	B	13.7	B	12.3	B
3	Fairview Avenue / Jelincic Drive	Minor Street Approach Stop	10.4	B	9.8	A	10.4	B	9.9	A
4	Fairview Avenue / Levine Drive	Minor Approaches Stop or Yield	11.1	B	10.7	B	11.1	B	10.7	B
5	Fairview Avenue / Five Canyons Parkway / Star Ridge Road	Roundabout	5.3	A	5.8	A	5.3	A	5.9	A
6	Fairview Avenue / Hansen Road	Roundabout	5.3	A	5.5	A	5.3	A	5.6	A

Notes: Delay = Average Delay in seconds per vehicle
LOS = Level of Service
The delay and LOS at the all-way stop controlled intersection are for the overall intersection performance.
The delay and LOS at intersections with stop or yield control on the minor approaches are for the worst-case minor approach.
The delay and LOS at the roundabout intersection are for the overall intersection performance.

Alameda County - Traffic Impact Study for the Fairview Tract # 8057 Residential Development

Future plus Project Traffic Volumes, Lane Geometry, and Traffic Controls

Figure 8



014-138 - 12/3/12 - AK

Other Potential Development Scenarios and Impacts

TJKM evaluated two other potential future development build out scenarios as they relate to potential future traffic impacts. These two scenarios are as follows:

- Environmentally Constrained Scenario (Scenario B) - development of the same parcels as in Scenario A would potentially yield only 130 single-family homes due to slope and other environmental factors, based on County Planning Department staff review.
- ABAG Growth Scenario (Scenario C) - assumes annual growth rate of 0.9 percent, consistent with current ABAG projections for the San Francisco Bay Area. Based on County staff estimation, this would result in 57 single-family homes in the project vicinity.

Under the Environmentally Constrained Scenario, it is expected that a future baseline development of 130 single-family homes would generate approximately 1,244 vehicle trips on a typical weekday, including 98 trips during the a.m. commute peak hour and 131 trips during the p.m. commute peak hour. Similarly, under the ABAG Growth Scenario, 57 single-family homes are expected to generate approximately 545 vehicle trips during a typical weekday, including 43 a.m. peak hour trips and 58 p.m. peak hour trips.

It should be noted that the estimated vehicle trips under both the Environmentally Constrained and ABAG Growth Scenarios are fewer than those estimated under the Gross Development Scenario that was assumed in the preceding future baseline traffic analysis. With 219 single-family homes under the Gross Development Scenario, approximately 2,096 vehicle trips are expected to be generated on a typical weekday, including 164 a.m. peak hour trips and 237 p.m. peak hour trips. Given that no significant traffic impacts were found under the Gross Development Scenario for either Future Baseline or Future plus Project Conditions, it is reasonable to conclude that the Environmentally Constrained and ABAG Growth Scenarios would also cause no significant impacts under Future Baseline or Future plus Project Conditions, since both development scenarios would generate fewer trips than the Gross Development Scenario.

Conclusions

TJKM has reached the following conclusions regarding the proposed Fairview Tract #8057 residential development:

- The proposed development at Tract #8057 is expected to generate approximately 11 trips during the a.m. peak hour, 15 trips during the p.m. peak hour, and 144 average weekday daily trips.
- All study intersections are expected to operate at acceptable service levels of LOS B or better under all four study scenarios: Existing Conditions, Existing plus Project Conditions, Future Baseline Conditions, and Future plus Project Conditions. The Future Baseline condition assumes a maximum gross development potential of 219 single-family homes within the project vicinity (Scenario A).
- Both the Environmentally Constrained Scenario (Scenario B) and ABAG Growth Scenario (Scenario C), which assume a lesser build out of 130 and 57 single-family homes, respectively, would generate fewer overall vehicle trips than Scenario A. Since no significant traffic impacts were found under Scenario A for either Future Baseline or Future plus Project Conditions, it is reasonable to conclude that Scenarios B and C would also cause no significant traffic impacts under Future Baseline or Future plus Project Conditions.
- Over the most recently available five-year period of collision data, only five collisions were reported within 500 feet of all study intersections. This intersection radius includes the project driveway at Fairview Avenue since it is near the Levine Drive intersection. None of the reported collisions involved bicyclists or pedestrians, and there were no reported injuries or fatalities. Due to the overall infrequency of collisions and the variety of reported collision types, there are no apparent collision trends that would suggest an existing safety concern at any of the study intersections or the proposed driveway location.
- The site plan incorporates TJKM's previously recommended measures to enhance safety for vehicle turns at Fairview Avenue and the project driveway, specifically acceleration and deceleration lanes for westbound Fairview Avenue traffic. Internally, the roadway cross sections and cul-de-sacs shown in the plan are expected to be adequate in accommodating general vehicle circulation, including emergency vehicles.
- The site plan identifies 29 parking spaces that can be accommodated on street within parking lanes provided on Streets A and B on site. This parking supply is expected to be adequate in serving residents and visitors on site. The 29 on-street parking spaces exclude parking capacity located off-street within the individual home sites, including driveways and garages.
- TJKM recommends that a stop sign be installed on the southbound Street A approach to Fairview Avenue. This measure would provide a clearly defined assignment of right-of-way to Fairview Avenue traffic at the new intersection.
- TJKM reviewed stopping sight distance in the field based on the proposed project driveway location. While available sight distance for eastbound approaching vehicles is adequate at over 450 feet, less than 240 feet of stopping sight distance is available for westbound approaching vehicles due to horizontal and vertical crest curves. The westbound distance is below Caltrans Highway Design Manual (HDM) minimum standards at 30 mph speed. The primary safety concern is outbound left turning vehicles from the driveway that must look for gaps in traffic in both the eastbound and westbound directions.

- To address the outbound left turn safety concern, TJKM recommends that outbound access to Fairview Avenue be restricted to right turns only by constructing a physical island that will prevent outbound vehicles from turning left, while still allowing for all inbound turns.

  TJKM also recommends that a R3-2 (No Left Turn) sign be installed to reinforce this feature. TJKM notes that only two peak hour project vehicles (a.m. or p.m.) would be affected by this restriction. These vehicles can divert to the Fairview Avenue / Hansen Road roundabout approximately 1,500 feet to the west to reverse direction and travel towards Five Canyons Parkway and points east.

Study Participants and References

TJKM Transportation Consultants

Andrew Kluter, P.E.	Project Manager
Jeffrey Lacap	Project Engineer & Graphics
Kim Goodrich	Word Processing

Others

Phil Sawrey-Kubicek	Alameda County Community Development
Art Carrera	Alameda County Public Works
Rick Yeung	Alameda County Public Works
Gary Brooks	Northbrook Homes
Nat Taylor	Lamphier-Gregory
Jared Frey, P.E., LEED AP	Ruggeri~Jensen~Azar

References

Highway Capacity Manual, Transportation Research Board, 2000.

Highway Design Manual, California Department of Transportation.

Trip Generation, 8th Edition, Institute of Transportation Engineers, 2008.

Countywide Transportation Plan, Alameda County Transportation Commission, 2012.

Appendix A – Level of Service Methodology

APPENDIX A
LEVEL OF SERVICE

The description and procedures for calculating capacity and level of service (LOS) are found in Transportation Research Board, *Highway Capacity Manual 2000*. *Highway Capacity Manual 2000* represents the latest research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. LOS is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish service levels.

A general description of service levels for various types of facilities is shown in Table A-I

Table A-I: Level of Service Description

Facility Type	***Uninterrupted Flow***	***Interrupted Flow***
	Freeways Multi-lane Highways Two-lane Highways Urban Streets	Signalized Intersections Unsignalized Intersections Two-way Stop Control All-way Stop Control
LOS		
A	Free-flow	Very low delay.
B	Stable flow. Presence of other users noticeable.	Low delay.
C	Stable flow. Comfort and convenience starts to decline.	Acceptable delay.
D	High-density stable flow.	Tolerable delay.
E	Unstable flow.	Limit of acceptable delay.
F	Forced or breakdown flow.	Unacceptable delay

Source: *Highway Capacity Manual 2000*

Urban Streets

The term "urban streets" refers to urban arterials and collectors, including those in downtown areas.

Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials.
Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals.

Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks.

Pedestrian conflicts and lane obstructions created by stopping or standing buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control. As a result, these factors also affect quality of service.

The street environment includes the geometric characteristics of the facility, the character of roadside activity and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway density, spacing between signalized intersections, existence of parking, level of pedestrian activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic control (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds, however, such controls are needed to establish right-of-way.

The average travel speed for through vehicles along an urban street is the determinant of the operating LOS. The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

LOS A describes primarily free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal.

LOS B describes reasonably unimpeded operations. The ability to maneuver within the traffic stream is only slightly restricted, and control delays at signalized intersections are not significant.

LOS C describes stable operations, however, ability to maneuver and change lanes in midblock location may be more restricted than at LOS B. Longer queues, adverse signal coordination, or both may contribute to lower travel speeds.

LOS D borders on a range in which in which small increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors.

LOS E is characterized by significant delays and lower travel speeds. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

LOS F is characterized by urban street flow at extremely low speeds. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.

The methodology to determine LOS stratifies urban streets into four classifications. The classifications are complex, and are related to functional and design categories. Table A-II describes the functional and design categories, while Table A-III relates these to the urban street classification.

Once classified, the urban street is divided into segments for analysis. An urban street segment is a one-way section of street encompassing a series of blocks or links terminating at a signalized intersection. Adjacent segments of urban streets may be combined to form larger street sections, provided that the segments have similar demand flows and characteristics.

Levels of service are related to the average travel speed of vehicles along the urban street segment or section.

Travel times for existing conditions are obtained by field measurements. The maximum-car technique is used. The vehicle is driven at the posted speed limit unless impeded by actual traffic conditions. In the maximum-car technique, a safe level of vehicular operation is maintained by observing proper following distances and by changing speeds at reasonable rates of acceleration and deceleration. The maximum-car technique provides the best base for measuring traffic performance.

An observer records the travel time and locations and duration of delay. The beginning and ending points are the centers of intersections. Delays include times waiting in queues at signalized intersections. The travel speed is determined by dividing the length of the segment by the travel time. Once the travel speed on the arterial is determined, the LOS is found by comparing the speed to the criteria in Table A-IV. LOS criteria vary for the different classifications of urban street, reflecting differences in driver expectations.

Table A-II: Functional and Design Categories for Urban Streets

Criterion	***Functional Category***			
	Principal Arterial		***Minor Arterial***	
Mobility function	Very important		Important	
Access function	Very minor		Substantial	
Points connected	Freeways, important activity centers, major traffic generators		Principal arterials	
Predominant trips served	Relatively long trips between major points and through trips entering, leaving, and passing through city		Trips of moderate length within relatively small geographical areas	
Criterion	***Design Category***			
	High-Speed	***Suburban***	***Intermediate***	***Urban***
Driveway access density	Very low density	Low density	Moderate density	High density
Arterial type	Multilane divided; undivided or two-lane with shoulders	Multilane divided: undivided or two-lane with shoulders	Multilane divided or undivided; one way, two lane	Undivided one way; two way, two or more lanes
Parking	No	No	Some	Usually
Separate left-turn lanes	Yes	Yes	Usually	Some
Signals per mile	0.5 to 2	1 to 5	4 to 10	6 to 12
Speed limits	45 to 55 mph	40 to 45 mph	30 to 40 mph	25 to 35 mph
Pedestrian activity	Very little	Little	Some	Usually
Roadside development	Low density	Low to medium density	Medium to moderate density	High density

Source: *Highway Capacity Manual 2000*

Table A-III: Urban Street Class based on Function and Design Categories

Design Category	*Functional Category*	
	Principal Arterial	***Minor Arterial***
High-Speed	I	Not applicable
Suburban	II	II
Intermediate	II	III or IV
Urban	III or IV	IV

Source: *Highway Capacity Manual 2000*

Table A-IV: Urban Street Levels of Service by Class

Urban Street Class	***I***	***II***	***III***	***IV***
Range of Free Flow Speeds (mph)	45 to 55	35 to 45	30 to 35	25 to 35
Typical Free Flow Speed (mph)	50	40	33	30
LOS	***Average Travel Speed (mph)***			
A	>42	>35	>30	>25
B	>34	>28	>24	>19
C	>27	>22	>18	>13
D	>21	>17	>14	>9
E	>16	>13	>10	>7
F	≤16	≤13	≤10	≤7

Source: *Highway Capacity Manual 2000*

Interrupted Flow

One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs. These all operate quite differently and have differing impacts on overall flow.

Signalized Intersections

The capacity of a highway is related primarily to the geometric characteristics of the facility, as well as to the composition of the traffic stream on the facility. Geometrics are a fixed, or non-varying, characteristic of a facility.

At the signalized intersection, an additional element is introduced into the concept of capacity: time allocation. A traffic signal essentially allocates time among conflicting traffic movements seeking use of the same physical space. The way in which time is allocated has a significant impact on the operation of the intersection and on the capacity of the intersection and its approaches.

LOS for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, LOS criteria for traffic signals are stated in terms of average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the ratio of green time to cycle length and the volume to capacity ratio for the lane group.

For each intersection analyzed the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A LOS designation is given to the control delay to better describe the level of operation. A description of levels of service for signalized intersections can be found in Table A-V

Table A-V: Description of Level of Service for Signalized Intersections

LOS	*Description*
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase doe not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestions becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: *Highway Capacity Manual 2000*

The use of control delay, which may also be referred to as signal delay, was introduced in the 1997 update to the *Highway Capacity Manual*, and represents a departure from previous updates. In the third edition, published in 1985 and the 1994 update to the third edition, delay only included stopped delay. Thus, the LOS criteria listed in Table A-V differs from earlier criteria.

Unsignalized Intersections

The current procedures on unsignalized intersections were first introduced in the 1997 update to the *Highway Capacity Manual* and represent a revision of the methodology published in the 1994 update to the 1985 *Highway Capacity Manual*. The revised procedures use control delay as a measure of effectiveness to determine LOS. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

Two-Way Stop Controlled Intersections

Two-way stop controlled intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At two-way stop-controlled intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A LOS designation is given to the expected control delay for each minor movement. LOS is not defined for the intersection as a whole. Control delay is the increased time of travel for a vehicle approaching and passing through a stop-controlled intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection. A description of levels of service for two-way stop-controlled intersections is found in Table A-VI.

Table A-VI: Description of Level of Service for Two-Way Stop Controlled Intersections

LOS	*Description*
A	Very low control delay less than 10 seconds per vehicle for each movement subject to delay.
B	Low control delay greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Acceptable control delay greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Tolerable control delay greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Limit of tolerable control delay greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Unacceptable control delay in excess of 50 seconds per vehicle for each movement subject to delay.

Source: *Highway Capacity Manual 2000*

Appendix B – Level of Service Methodology: Roundabout Intersection Supplement

APPENDIX B
LEVEL OF SERVICE
ROUNDABOUT INTERSECTION SUPPLEMENT

The software package SIDRA INTERSECTION (ver 5.1) was used to analyze the study roundabout intersection. SIDRA uses advance gap acceptance techniques to analyze the roundabout capacity and performance based on empirical models. SIDRA's methodology provides that the capacity and performance of a roundabout are controlled by both driver behavior and the roundabout geometry, i.e. the inscribed circle diameter, circulatory width, and entry and exit radii. Using these and other factors, SIDRA determines the applicable gap-acceptance parameter. Adhering to HCM thresholds for a signalized intersection, the delay and LOS are calculated for each approach of the roundabout and the overall intersection.

Reference: SIDRA INTERSECTION User Guide, 2011.

Appendix C – Existing Traffic Counts

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

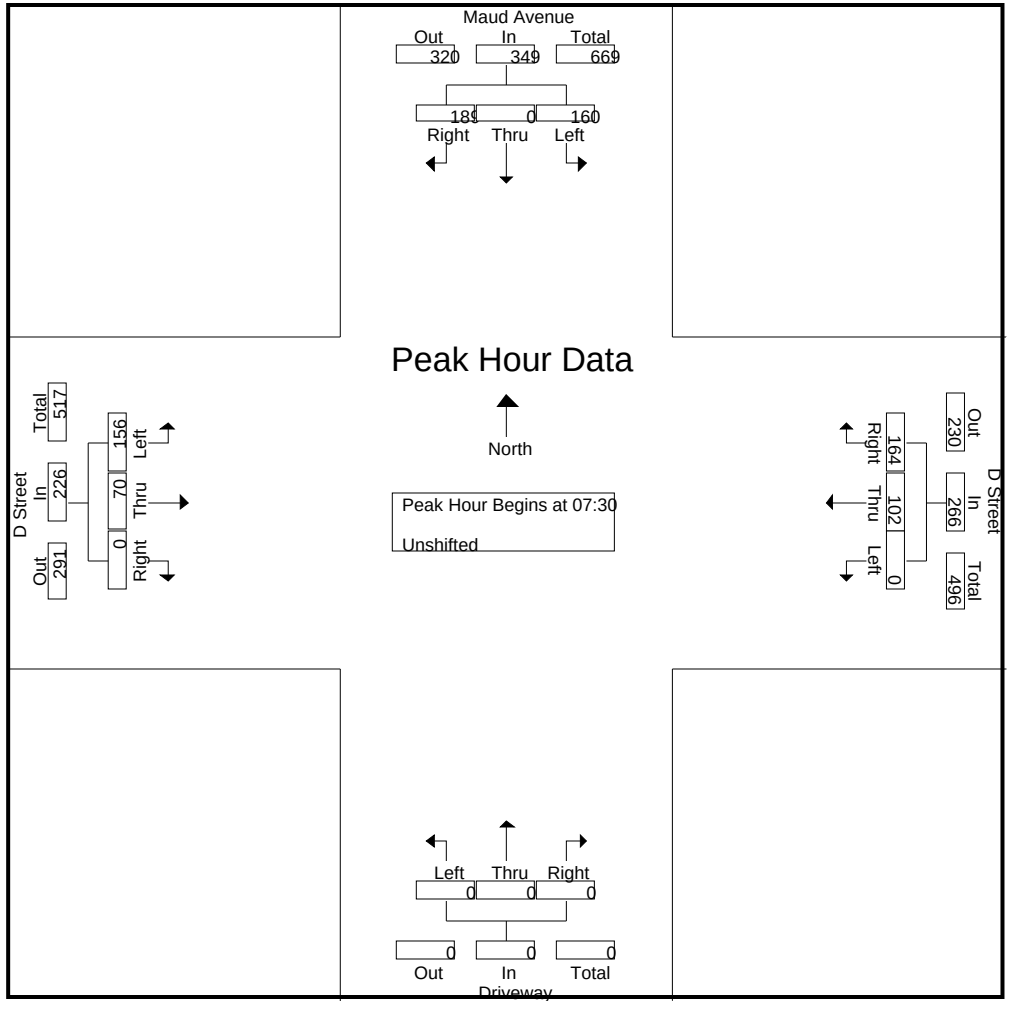
File Name : 12-7407-001 Maud-D
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Unshifted

	Maud Avenue Southbound					D Street Westbound					Driveway Northbound					D Street Eastbound							
Start Time	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	15	0	23	0	38	0	34	31	0	65	0	0	0	0	0	16	8	0	0	24	0	127	127
07:15	16	0	29	1	45	0	31	34	0	65	0	0	0	0	0	18	7	0	0	25	1	135	136
07:30	19	0	39	0	58	0	25	45	0	70	0	0	0	0	0	28	10	0	0	38	0	166	166
07:45	42	0	43	1	85	0	29	33	0	62	0	0	0	0	0	38	17	0	0	55	1	202	203
Total	92	0	134	2	226	0	119	143	0	262	0	0	0	0	0	100	42	0	0	142	2	630	632
08:00	52	0	45	1	97	0	24	33	0	57	0	0	0	0	0	52	26	0	4	78	5	232	237
08:15	47	0	62	1	109	0	24	53	0	77	0	0	0	1	0	38	17	0	4	55	6	241	247
08:30	20	1	25	0	46	0	34	38	1	72	0	0	0	0	0	17	8	0	0	25	1	143	144
08:45	27	2	23	0	52	0	18	26	0	44	0	0	0	1	0	11	14	0	0	25	1	121	122
Total	146	3	155	2	304	0	100	150	1	250	0	0	0	2	0	118	65	0	8	183	13	737	750
16:00	32	0	15	0	47	0	19	28	0	47	0	0	0	1	0	30	29	0	0	59	1	153	154
16:15	33	0	22	1	55	0	16	20	0	36	0	0	0	0	0	33	28	0	0	61	1	152	153
16:30	29	0	24	0	53	0	15	24	0	39	0	0	0	0	0	24	26	0	0	50	0	142	142
16:45	33	0	23	0	56	0	20	21	0	41	0	0	0	0	0	35	24	0	0	59	0	156	156
Total	127	0	84	1	211	0	70	93	0	163	0	0	0	1	0	122	107	0	0	229	2	603	605
17:00	26	0	20	0	46	0	13	40	0	53	0	0	0	0	0	26	30	0	0	56	0	155	155
17:15	21	0	20	0	41	0	12	37	0	49	0	0	0	0	0	38	39	0	0	77	0	167	167
17:30	42	0	27	0	69	0	28	32	0	60	0	0	0	0	0	48	33	0	0	81	0	210	210
17:45	48	1	32	0	81	0	14	27	0	41	0	0	0	0	0	45	29	0	0	74	0	196	196
Total	137	1	99	0	237	0	67	136	0	203	0	0	0	0	0	157	131	0	0	288	0	728	728
Grand Total	502	4	472	5	978	0	356	522	1	878	0	0	0	3	0	497	345	0	8	842	17	2698	2715
Apprch %	51.3	0.4	48.3			0	40.5	59.5			0	0	0			59	41	0					
Total %	18.6	0.1	17.5		36.2	0	13.2	19.3		32.5	0	0	0		0	18.4	12.8	0		31.2	0.6	99.4	

	Maud Avenue Southbound				D Street Westbound				Driveway Northbound				D Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	19	0	39	58	0	25	45	70	0	0	0	0	28	10	0	38	166
07:45	42	0	43	85	0	**29**	33	62	0	0	0	0	38	17	0	55	202
08:00	**52**	0	45	97	0	24	33	57	0	0	0	0	**52**	**26**	0	**78**	232
08:15	47	0	**62**	**109**	0	24	**53**	**77**	0	0	0	0	38	17	0	55	**241**
Total Volume	160	0	189	349	0	102	164	266	0	0	0	0	156	70	0	226	841

% App. Total	45.8	0	54.2		0	38.3	61.7		0	0	0		69	31	0			
PHF	.769	.000	.762	.800	.000	.879	.774	.864	.000	.000	.000	.000	.750	.673	.000	.724	.872	



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

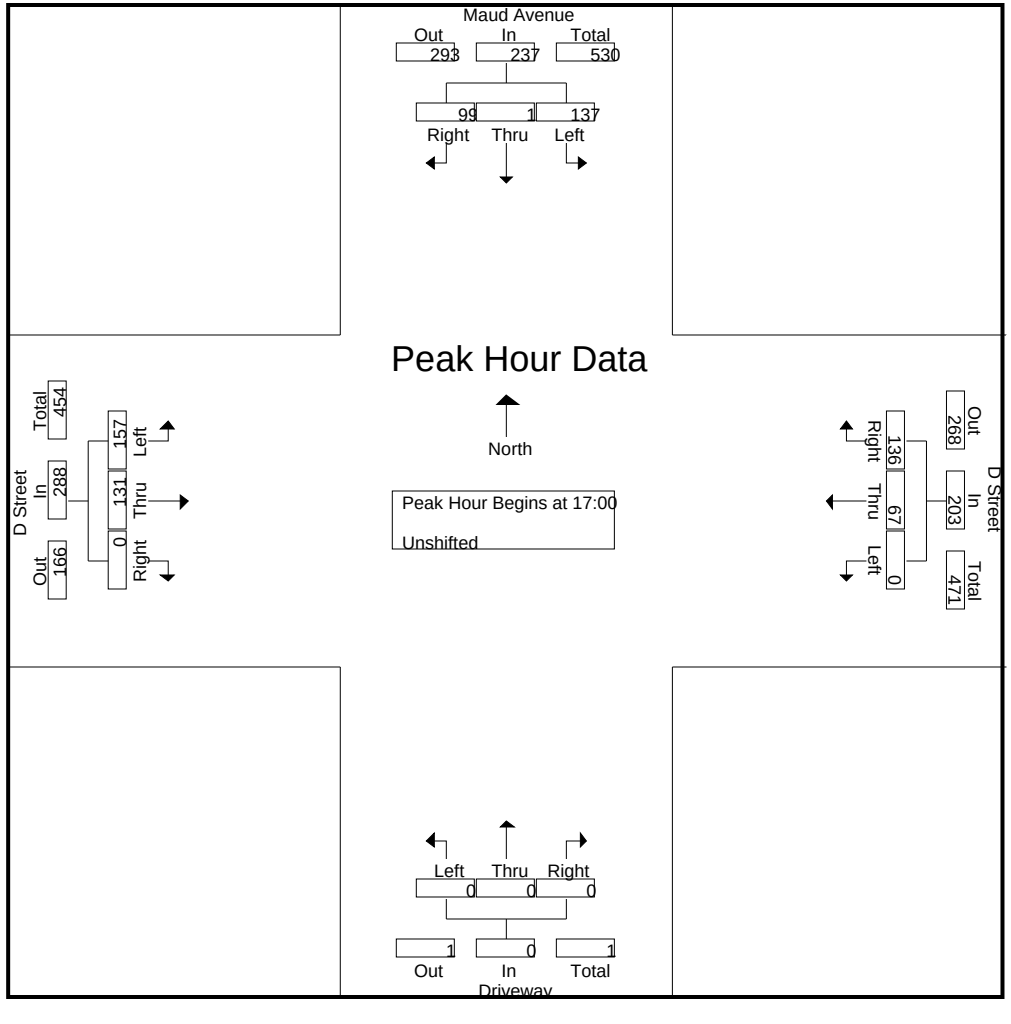
17:00	26	0	20	46	0	13	**40**	53	0	0	0	0	26	30	0	56	155	
17:15	21	0	20	41	0	12	37	49	0	0	0	0	38	**39**	0	77	167	
17:30	42	0	27	69	0	**28**	32	**60**	0	0	0	0	**48**	33	0	**81**	**210**	
17:45	**48**	**1**	**32**	**81**	0	14	27	41	0	0	0	0	45	29	0	74	196	
Total Volume	137	1	99	237	0	67	136	203	0	0	0	0	157	131	0	288	728	
% App. Total	57.8	0.4	41.8		0	33	67		0	0	0		54.5	45.5	0			
PHF	.714	.250	.773	.731	.000	.598	.850	.846	.000	.000	.000	.000	.818	.840	.000	.889	.867	

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-001 Maud-D
Site Code : 00000000
Start Date : 9/18/2012
Page No : 3



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

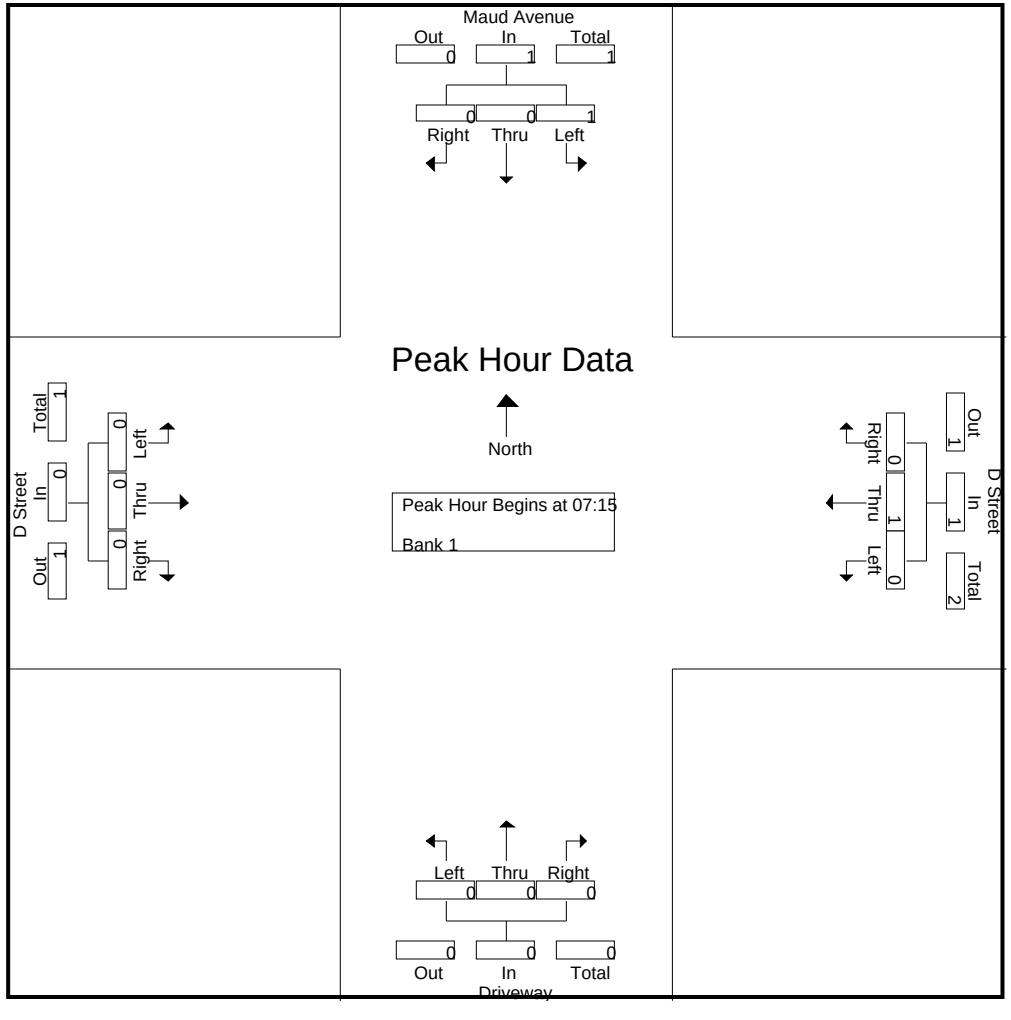
File Name : 12-7407-001 Maud-D
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Bank 1

	Maud Avenue Southbound				D Street Westbound				Driveway Northbound				D Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:45	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
16:00	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
16:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
16:30	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	2
16:45	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	0	1	1	0	0	0	0	2	0	0	2	1	1	0	2	5
17:00	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
17:15	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
17:45	1	0	0	1	0	0	2	2	0	0	0	0	0	0	0	0	3
Total	1	0	0	1	0	1	3	4	0	0	0	0	0	0	0	0	5
Grand Total	2	0	1	3	0	2	3	5	2	0	0	2	1	1	0	2	12
Apprch %	66.7	0	33.3		0	40	60		100	0	0		50	50	0		
Total %	16.7	0	8.3	25	0	16.7	25	41.7	16.7	0	0	16.7	8.3	8.3	0	16.7	

	Maud Avenue Southbound				D Street Westbound				Driveway Northbound				D Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	**1**
08:00	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2

% App. Total	100	0	0		0	100	0		0	0	0		0	0	0		
PHF	.250	.000	.000	.250	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.500



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:00

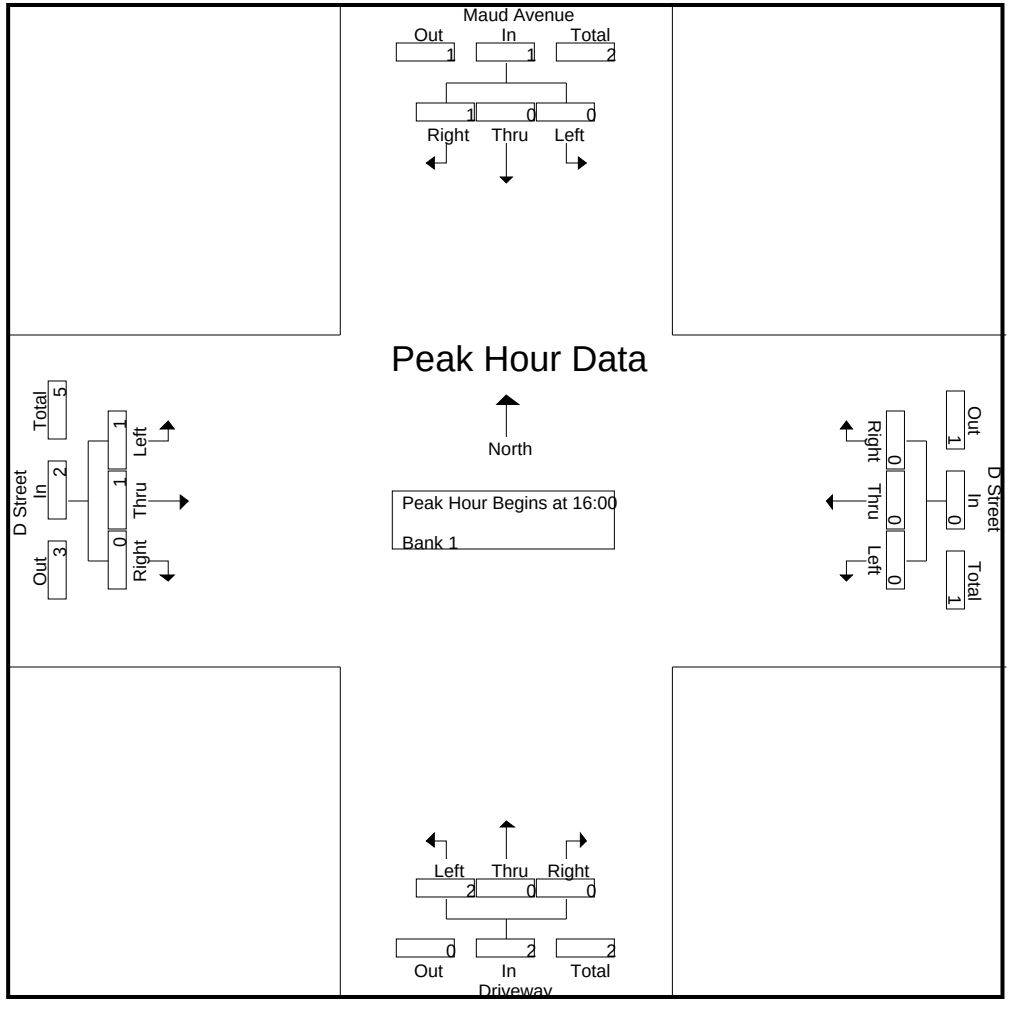
16:00	0	0	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	1
16:15	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	1
16:30	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	**1**	0	1	**2**
16:45	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Volume	0	0	1	1	0	0	0	0	2	0	0	2	1	1	0	2	5
% App. Total	0	0	100		0	0	0		100	0	0		50	50	0		
PHF	.000	.000	.250	.250	.000	.000	.000	.000	.500	.000	.000	.500	.250	.250	.000	.500	.625

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-001 Maud-D
Site Code : 00000000
Start Date : 9/18/2012
Page No : 3



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

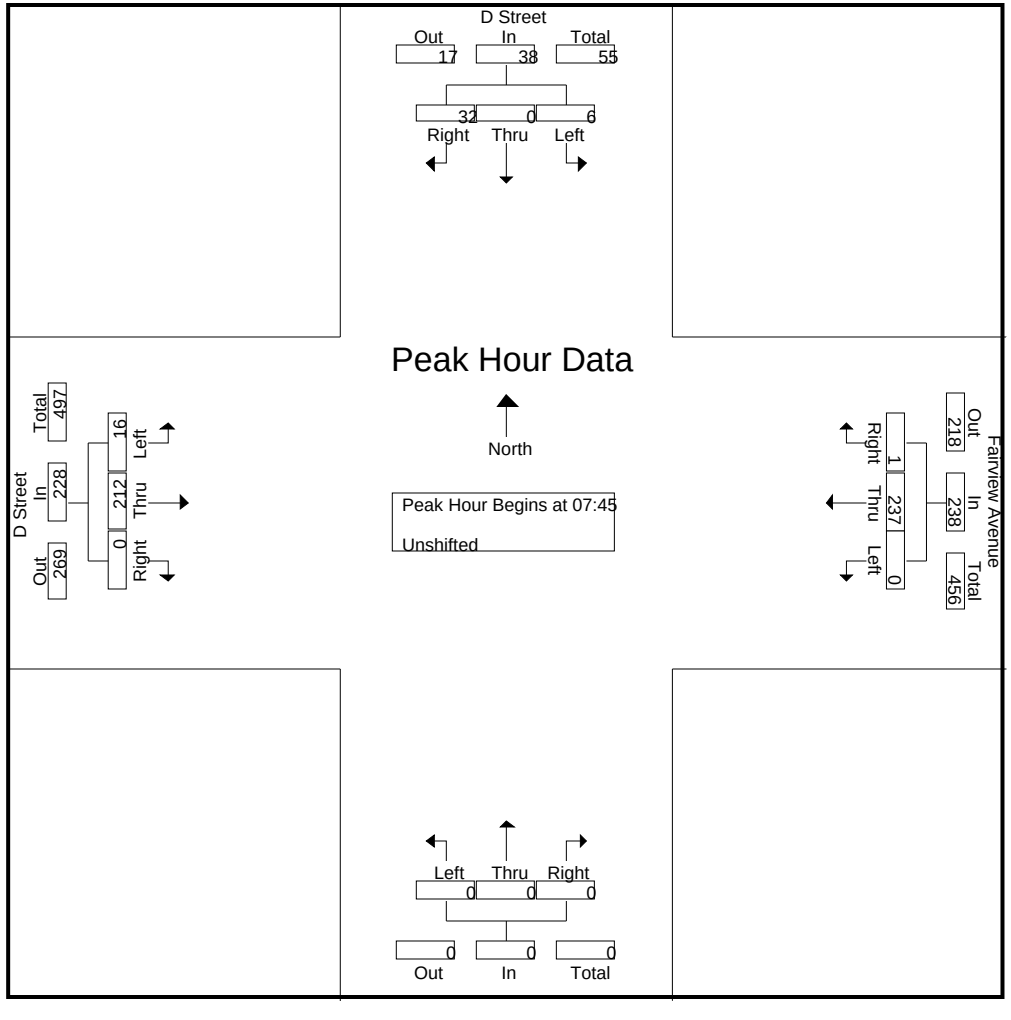
File Name : 12-7407-002 Fairview-D
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Unshifted

	D Street Southbound					Fairview Avenue Westbound					Northbound					D Street Eastbound							
Start Time	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	1	0	19	0	20	0	45	1	0	46	0	0	0	0	0	6	17	0	2	23	2	89	91
07:15	3	0	11	0	14	0	55	2	0	57	0	0	0	0	0	3	21	0	0	24	0	95	95
07:30	0	0	7	0	7	0	62	0	0	62	0	0	0	0	0	3	27	0	3	30	3	99	102
07:45	2	0	9	0	11	0	54	0	0	54	0	0	0	0	0	3	54	0	1	57	1	122	123
Total	6	0	46	0	52	0	216	3	0	219	0	0	0	0	0	15	119	0	6	134	6	405	411
08:00	2	0	7	0	9	0	49	0	1	49	0	0	0	0	0	5	73	0	0	78	1	136	137
08:15	1	0	4	0	5	0	74	0	1	74	0	0	0	0	0	6	58	0	0	64	1	143	144
08:30	1	0	12	0	13	0	60	1	0	61	0	0	0	0	0	2	27	0	1	29	1	103	104
08:45	2	0	5	0	7	0	39	0	0	39	0	0	0	0	0	8	31	0	0	39	0	85	85
Total	6	0	28	0	34	0	222	1	2	223	0	0	0	0	0	21	189	0	1	210	3	467	470
16:00	1	0	6	1	7	0	40	1	0	41	0	0	0	0	0	10	50	0	0	60	1	108	109
16:15	1	0	4	0	5	0	32	1	1	33	0	0	0	0	0	8	53	0	0	61	1	99	100
16:30	0	0	4	2	4	0	33	2	0	35	0	0	0	0	0	7	48	0	0	55	2	94	96
16:45	1	0	5	0	6	0	38	3	0	41	0	0	0	0	0	5	51	0	0	56	0	103	103
Total	3	0	19	3	22	0	143	7	1	150	0	0	0	0	0	30	202	0	0	232	4	404	408
17:00	1	0	4	0	5	0	50	1	0	51	0	0	0	0	0	8	49	0	0	57	0	113	113
17:15	0	0	3	0	3	0	45	1	0	46	0	0	0	0	0	5	56	0	0	61	0	110	110
17:30	0	0	10	0	10	0	50	0	0	50	0	0	0	0	0	5	69	0	0	74	0	134	134
17:45	0	0	4	0	4	0	37	1	0	38	0	0	0	0	0	8	69	0	0	77	0	119	119
Total	1	0	21	0	22	0	182	3	0	185	0	0	0	0	0	26	243	0	0	269	0	476	476
Grand Total	16	0	114	3	130	0	763	14	3	777	0	0	0	0	0	92	753	0	7	845	13	1752	1765
Apprch %	12.3	0	87.7			0	98.2	1.8			0	0	0			10.9	89.1	0					
Total %	0.9	0	6.5		7.4	0	43.6	0.8		44.3	0	0	0		0	5.3	43	0		48.2	0.7	99.3	

	D Street Southbound				Fairview Avenue Westbound				Northbound				D Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	**2**	0	9	11	0	54	0	54	0	0	0	0	3	54	0	57	122
08:00	2	0	7	9	0	49	0	49	0	0	0	0	5	**73**	0	**78**	136
08:15	1	0	4	5	0	**74**	0	**74**	0	0	0	0	**6**	58	0	64	**143**
08:30	1	0	**12**	**13**	0	60	**1**	61	0	0	0	0	2	27	0	29	103
Total Volume	6	0	32	38	0	237	1	238	0	0	0	0	16	212	0	228	504

% App. Total	15.8	0	84.2		0	99.6	0.4		0	0	0		7	93	0			
PHF	.750	.000	.667	.731	.000	.801	.250	.804	.000	.000	.000	.000	.667	.726	.000	.731	.881	



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

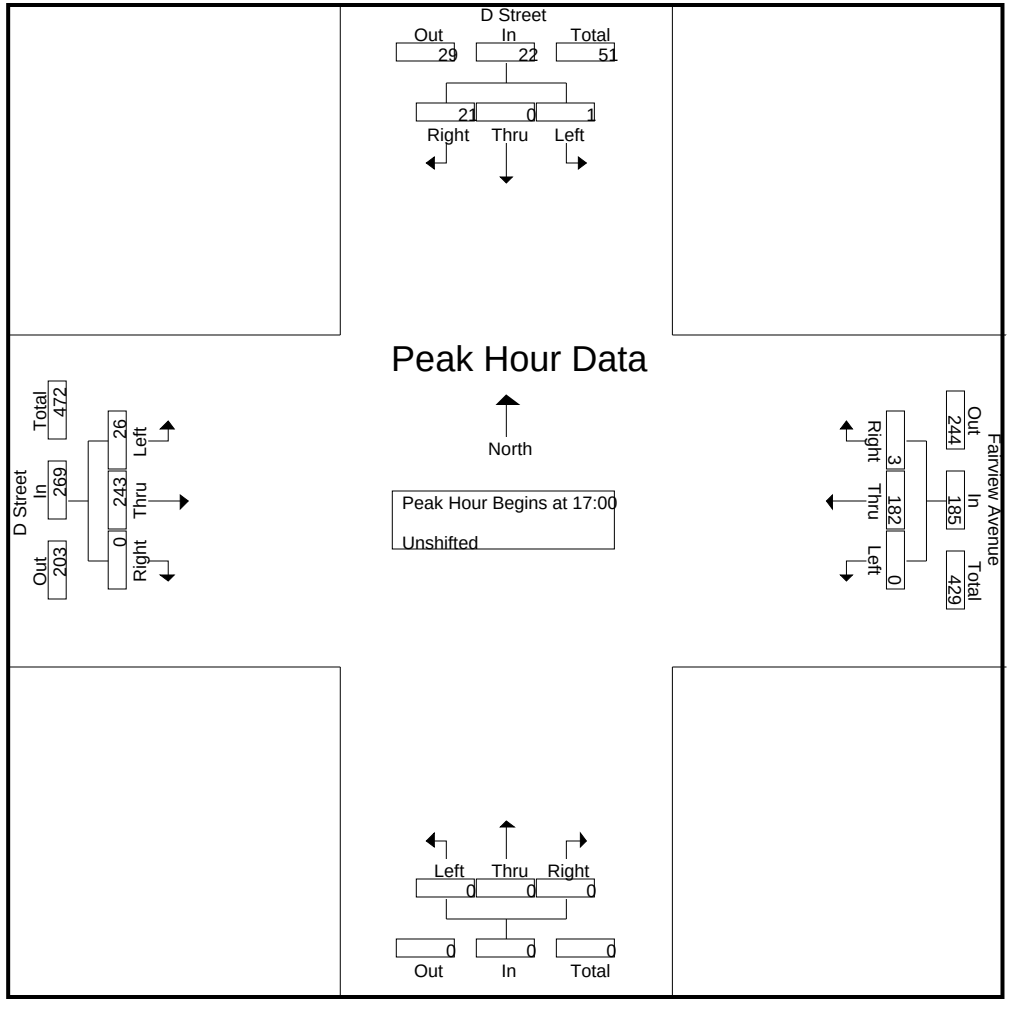
17:00	**1**	0	4	5	0	**50**	**1**	**51**	0	0	0	0	**8**	49	0	57	113	
17:15	0	0	3	3	0	45	1	46	0	0	0	0	5	56	0	61	110	
17:30	0	0	**10**	**10**	0	50	0	50	0	0	0	0	5	**69**	0	74	**134**	
17:45	0	0	4	4	0	37	1	38	0	0	0	0	8	69	0	**77**	119	
Total Volume	1	0	21	22	0	182	3	185	0	0	0	0	26	243	0	269	476	
% App. Total	4.5	0	95.5		0	98.4	1.6		0	0	0		9.7	90.3	0			
PHF	.250	.000	.525	.550	.000	.910	.750	.907	.000	.000	.000	.000	.813	.880	.000	.873	.888	

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-002 Fairview-D
Site Code : 00000000
Start Date : 9/18/2012
Page No : 3



All Traffic Data

(916) 771-8700

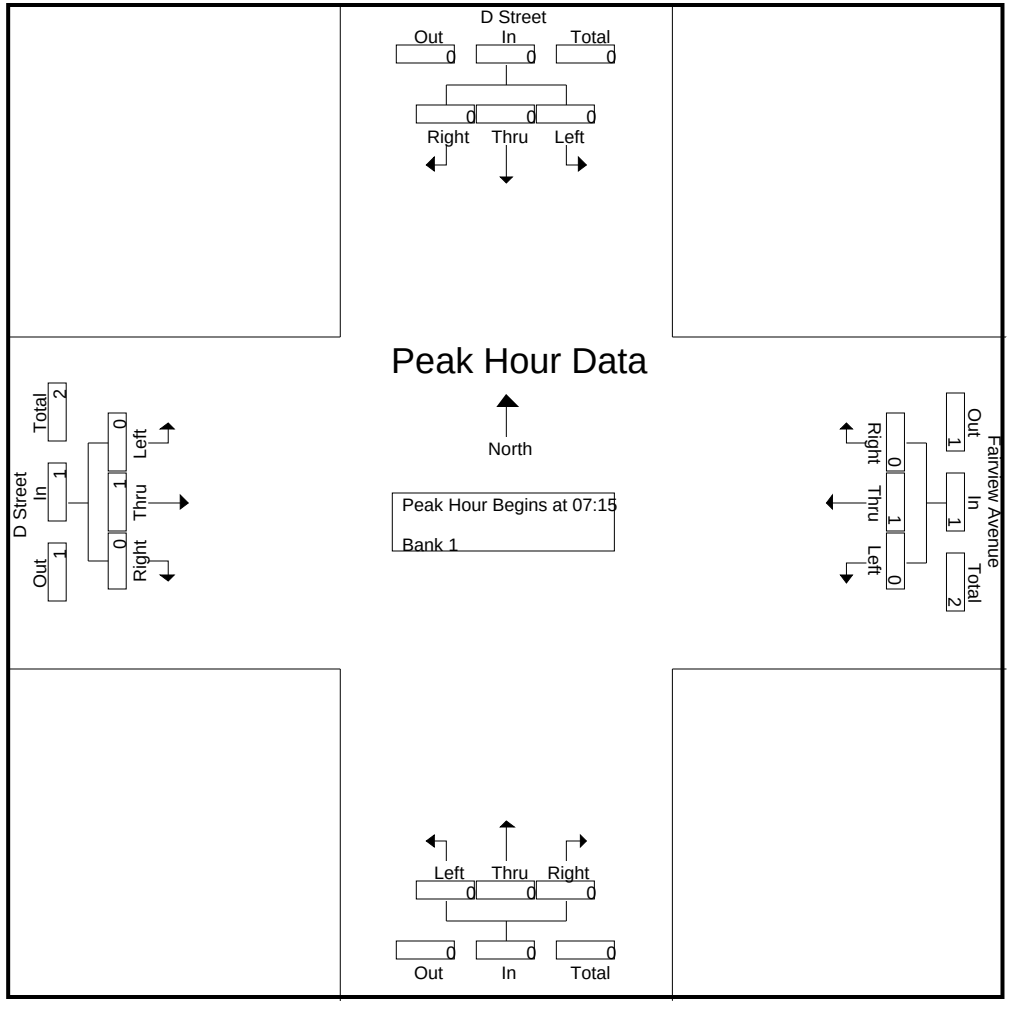
Alameda County
Bicycles on Bank 1

File Name : 12-7407-002 Fairview-D
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Bank 1

	D Street Southbound				Fairview Avenue Westbound				Northbound				D Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:45	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
17:00	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
17:15	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
17:45	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
Total	0	0	0	0	0	4	0	4	0	0	0	0	0	1	0	1	5
Grand Total	0	0	0	0	0	5	0	5	0	0	0	0	0	3	0	3	8
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0		
Total %	0	0	0	0	0	62.5	0	62.5	0	0	0	0	0	37.5	0	37.5	

	D Street Southbound				Fairview Avenue Westbound				Northbound				D Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	**1**
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	1
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.500



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 17:00

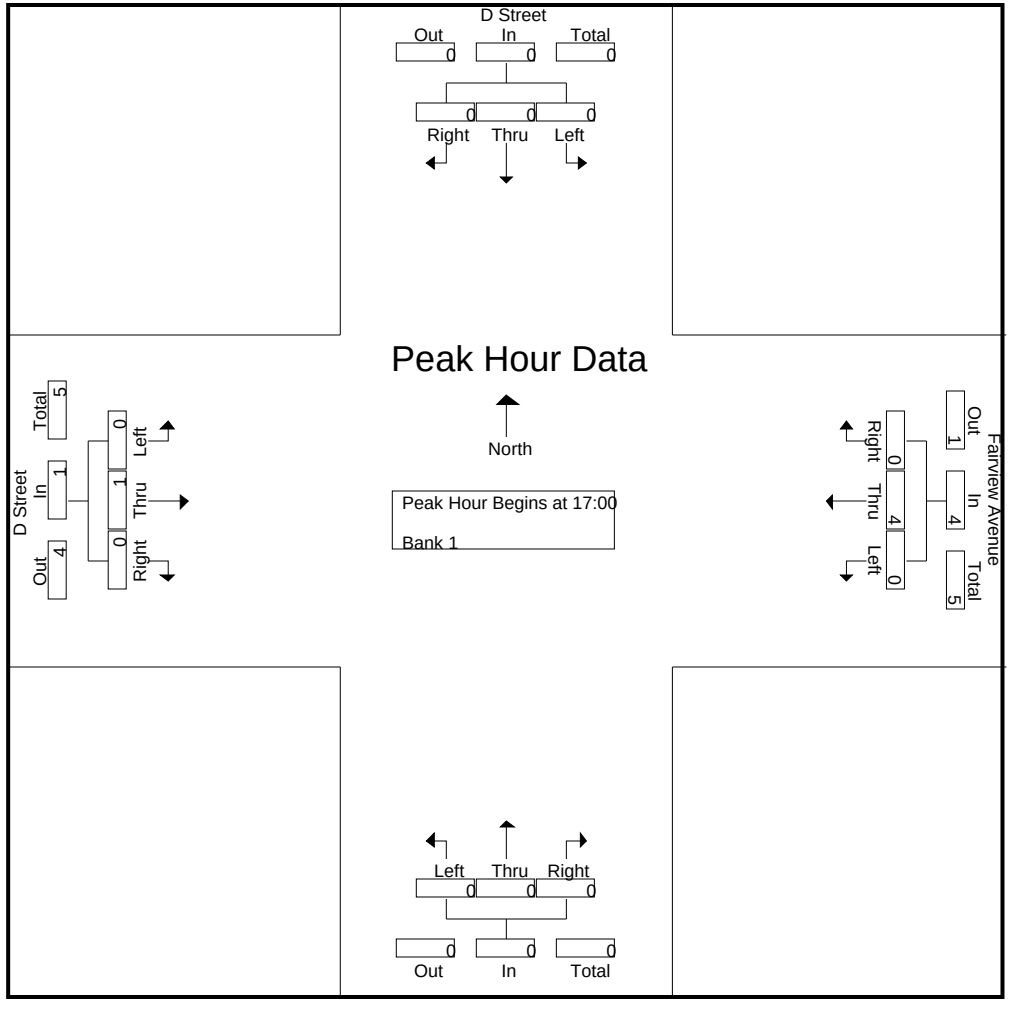
17:00	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
17:15	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	**1**	0	**1**	**3**
Total Volume	0	0	0	0	0	4	0	4	0	0	0	0	0	1	0	1	5
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.000	.250	.417

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-002 Fairview-D
Site Code : 00000000
Start Date : 9/18/2012
Page No : 3



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

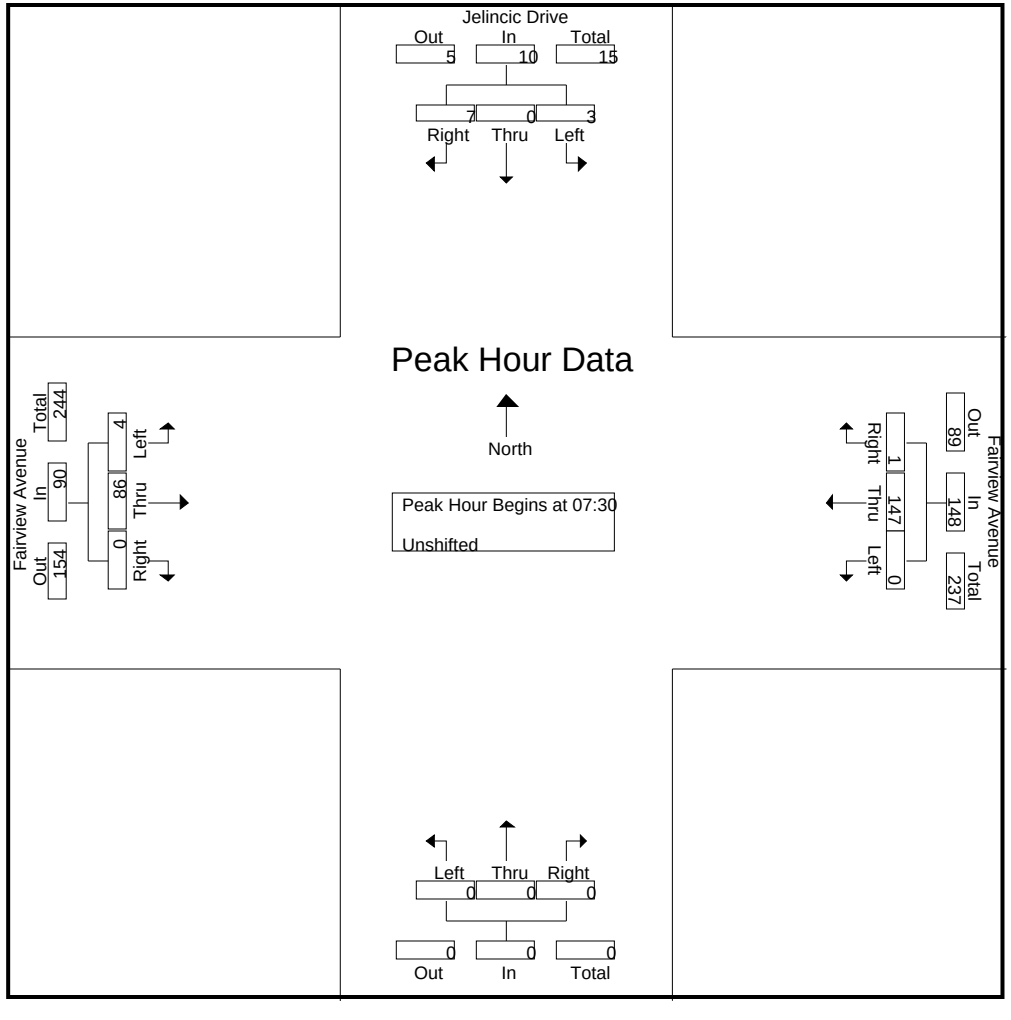
File Name : 12-7407-003 Fairview-Jelincic
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Unshifted

	Jelincic Drive Southbound					Fairview Avenue Westbound					Northbound					Fairview Avenue Eastbound							
Start Time	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	1	0	1	0	21	0	0	21	0	0	0	0	0	0	6	0	0	6	0	28	28
07:15	0	0	1	0	1	0	29	0	0	29	0	0	0	0	0	1	8	0	0	9	0	39	39
07:30	1	0	2	1	3	0	46	0	0	46	0	0	0	0	0	0	16	0	1	16	2	65	67
07:45	1	0	2	0	3	0	30	0	0	30	0	0	0	0	0	1	21	0	0	22	0	55	55
Total	2	0	6	1	8	0	126	0	0	126	0	0	0	0	0	2	51	0	1	53	2	187	189
08:00	1	0	3	0	4	0	28	1	0	29	0	0	0	0	0	2	32	0	0	34	0	67	67
08:15	0	0	0	0	0	0	43	0	0	43	0	0	0	0	0	1	17	0	0	18	0	61	61
08:30	0	0	1	0	1	0	36	0	0	36	0	0	0	0	0	0	14	0	0	14	0	51	51
08:45	0	0	3	0	3	0	26	0	0	26	0	0	0	0	0	0	13	0	0	13	0	42	42
Total	1	0	7	0	8	0	133	1	0	134	0	0	0	0	0	3	76	0	0	79	0	221	221
16:00	0	0	1	0	1	0	26	2	0	28	0	0	0	0	0	1	40	0	0	41	0	70	70
16:15	0	0	1	0	1	0	16	0	0	16	0	0	0	0	0	3	31	0	0	34	0	51	51
16:30	0	0	3	0	3	0	16	0	0	16	0	0	0	0	0	1	24	0	0	25	0	44	44
16:45	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	3	38	0	0	41	0	62	62
Total	0	0	5	0	5	0	79	2	0	81	0	0	0	0	0	8	133	0	0	141	0	227	227
17:00	0	0	1	0	1	0	23	0	0	23	0	0	0	0	0	1	29	0	0	30	0	54	54
17:15	0	0	1	0	1	0	24	1	0	25	0	0	0	0	0	3	43	0	0	46	0	72	72
17:30	0	0	1	0	1	0	27	0	0	27	0	0	0	0	0	3	39	0	0	42	0	70	70
17:45	0	0	3	0	3	0	20	1	0	21	0	0	0	0	0	1	47	0	0	48	0	72	72
Total	0	0	6	0	6	0	94	2	0	96	0	0	0	0	0	8	158	0	0	166	0	268	268
Grand Total	3	0	24	1	27	0	432	5	0	437	0	0	0	0	0	21	418	0	1	439	2	903	905
Apprch %	11.1	0	88.9			0	98.9	1.1			0	0	0			4.8	95.2	0					
Total %	0.3	0	2.7		3	0	47.8	0.6		48.4	0	0	0		0	2.3	46.3	0		48.6	0.2	99.8	

	Jelincic Drive Southbound				Fairview Avenue Westbound				Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	**1**	0	2	3	0	**46**	0	**46**	0	0	0	0	0	16	0	16	65
07:45	1	0	2	3	0	30	0	30	0	0	0	0	1	21	0	22	55
08:00	1	0	**3**	**4**	0	28	**1**	29	0	0	0	0	**2**	**32**	0	**34**	**67**
08:15	0	0	0	0	0	43	0	43	0	0	0	0	1	17	0	18	61
Total Volume	3	0	7	10	0	147	1	148	0	0	0	0	4	86	0	90	248

% App. Total	30	0	70		0	99.3	0.7		0	0	0		4.4	95.6	0			
PHF	.750	.000	.583	.625	.000	.799	.250	.804	.000	.000	.000	.000	.500	.672	.000	.662	.925	



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

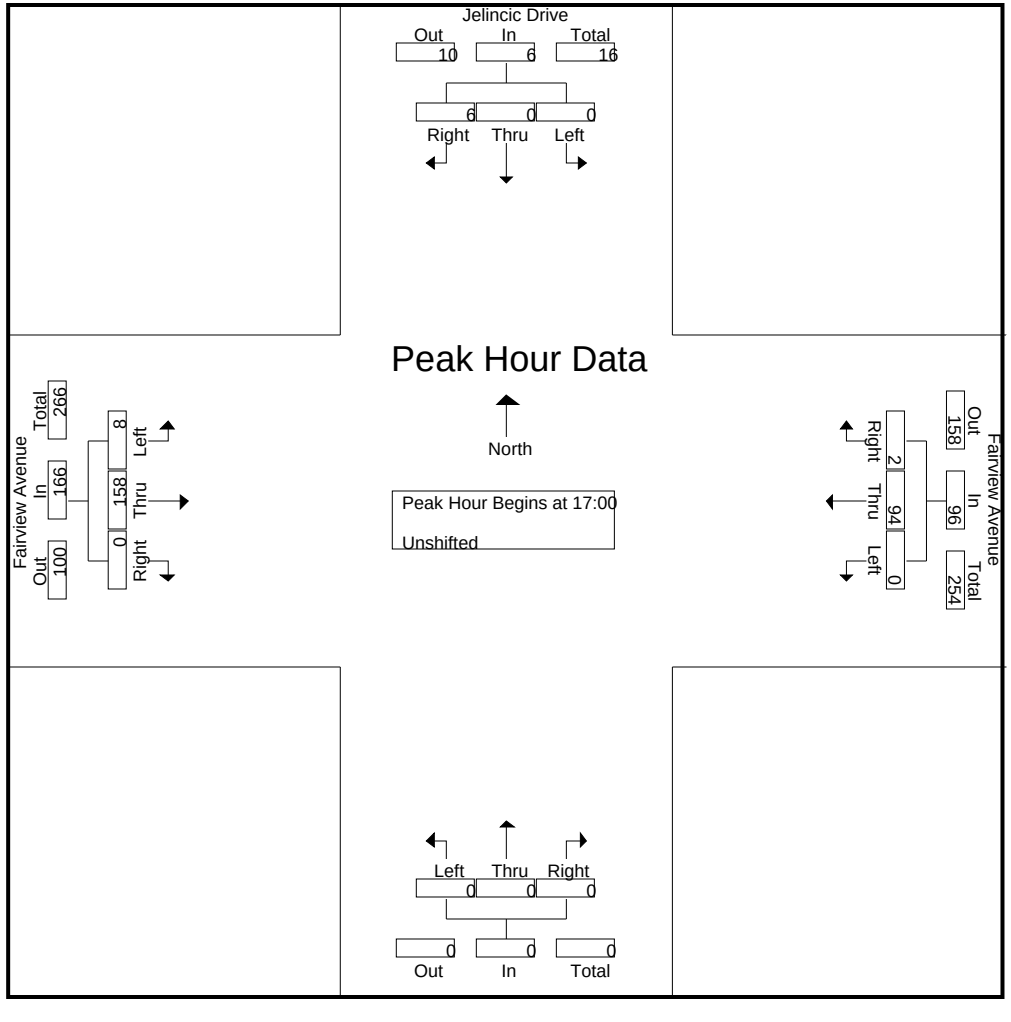
17:00	0	0	1	1	0	23	0	23	0	0	0	0	1	29	0	30	54	
17:15	0	0	1	1	0	24	**1**	25	0	0	0	0	**3**	43	0	46	**72**	
17:30	0	0	1	1	0	**27**	0	**27**	0	0	0	0	3	39	0	42	70	
17:45	0	0	**3**	**3**	0	20	1	21	0	0	0	0	1	**47**	0	**48**	72	
Total Volume	0	0	6	6	0	94	2	96	0	0	0	0	8	158	0	166	268	
% App. Total	0	0	100		0	97.9	2.1		0	0	0		4.8	95.2	0			
PHF	.000	.000	.500	.500	.000	.870	.500	.889	.000	.000	.000	.000	.667	.840	.000	.865	.931	

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-003 Fairview-Jelincic
Site Code : 00000000
Start Date : 9/18/2012
Page No : 3



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-003 Fairview-Jelincic
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Bank 1

	Jelincic Drive Southbound				Fairview Avenue Westbound				Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:30	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
16:15	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
16:30	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5
Grand Total	0	0	0	0	0	3	0	3	0	0	0	0	0	3	0	3	6
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0		
Total %	0	0	0	0	0	50	0	50	0	0	0	0	0	50	0	50	

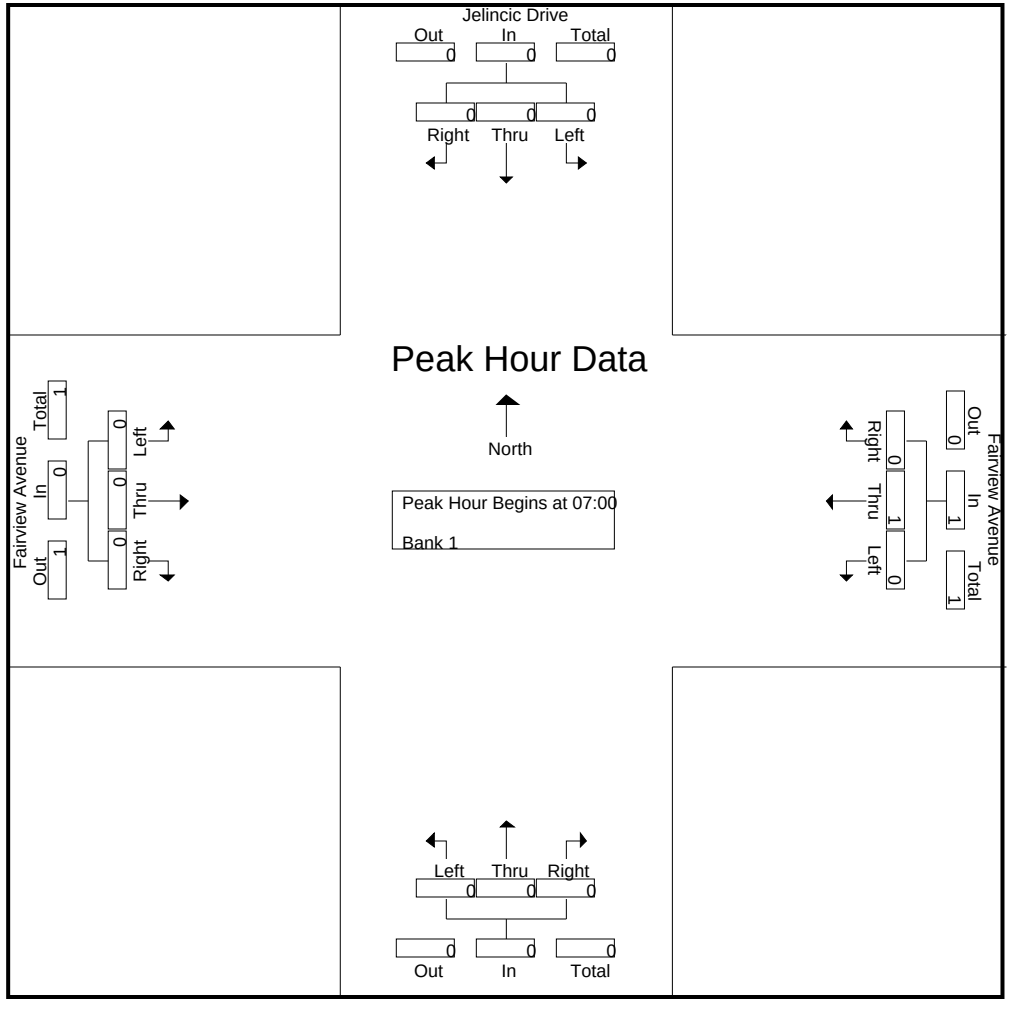
	Jelincic Drive Southbound				Fairview Avenue Westbound				Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	**1**
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0		0	100	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-003 Fairview-Jelincic
Site Code : 00000000
Start Date : 9/18/2012
Page No : 2



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-003 Fairview-Jelincic
Site Code : 00000000
Start Date : 9/18/2012
Page No : 3

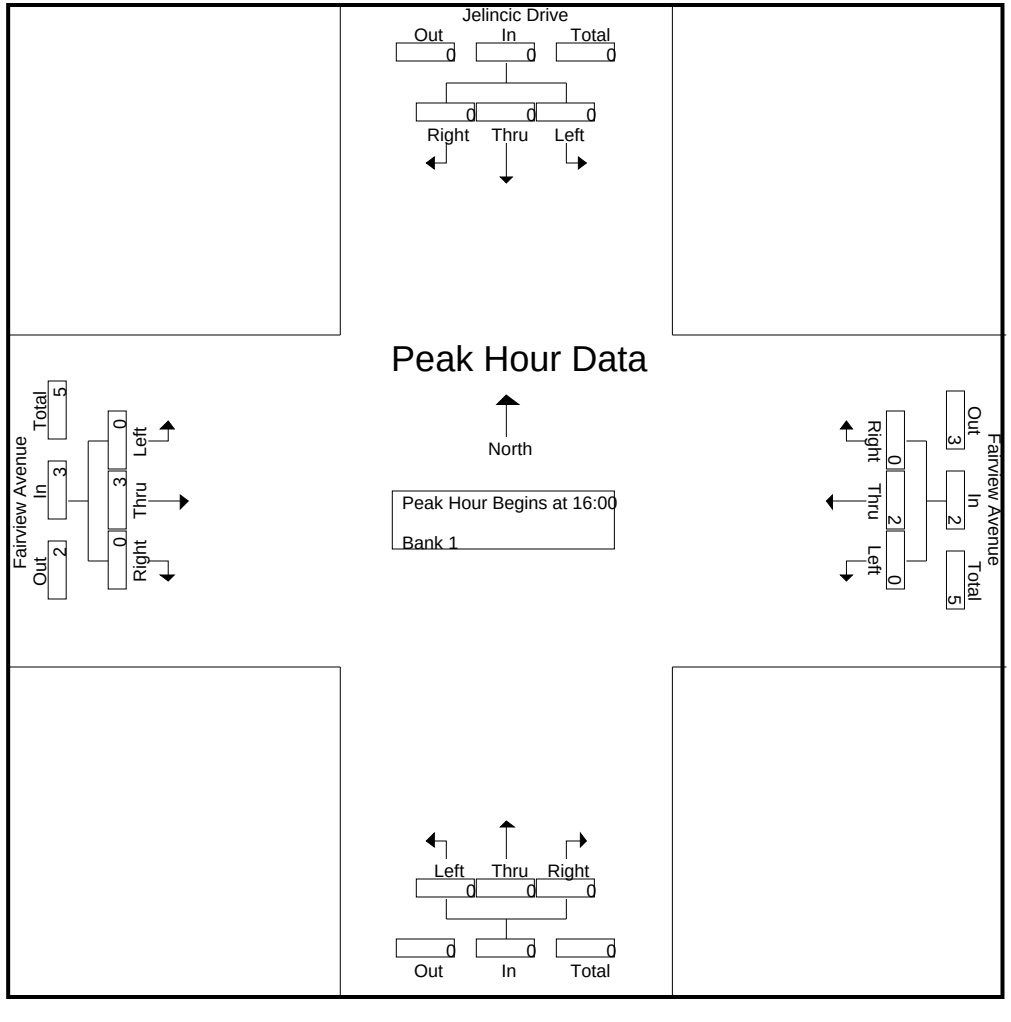
	Jelincic Drive Southbound				Fairview Avenue Westbound				Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
16:30	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	**2**
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	2
Total Volume	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.375	.000	.375	.625

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-003 Fairview-Jelincic
Site Code : 00000000
Start Date : 9/18/2012
Page No : 4



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

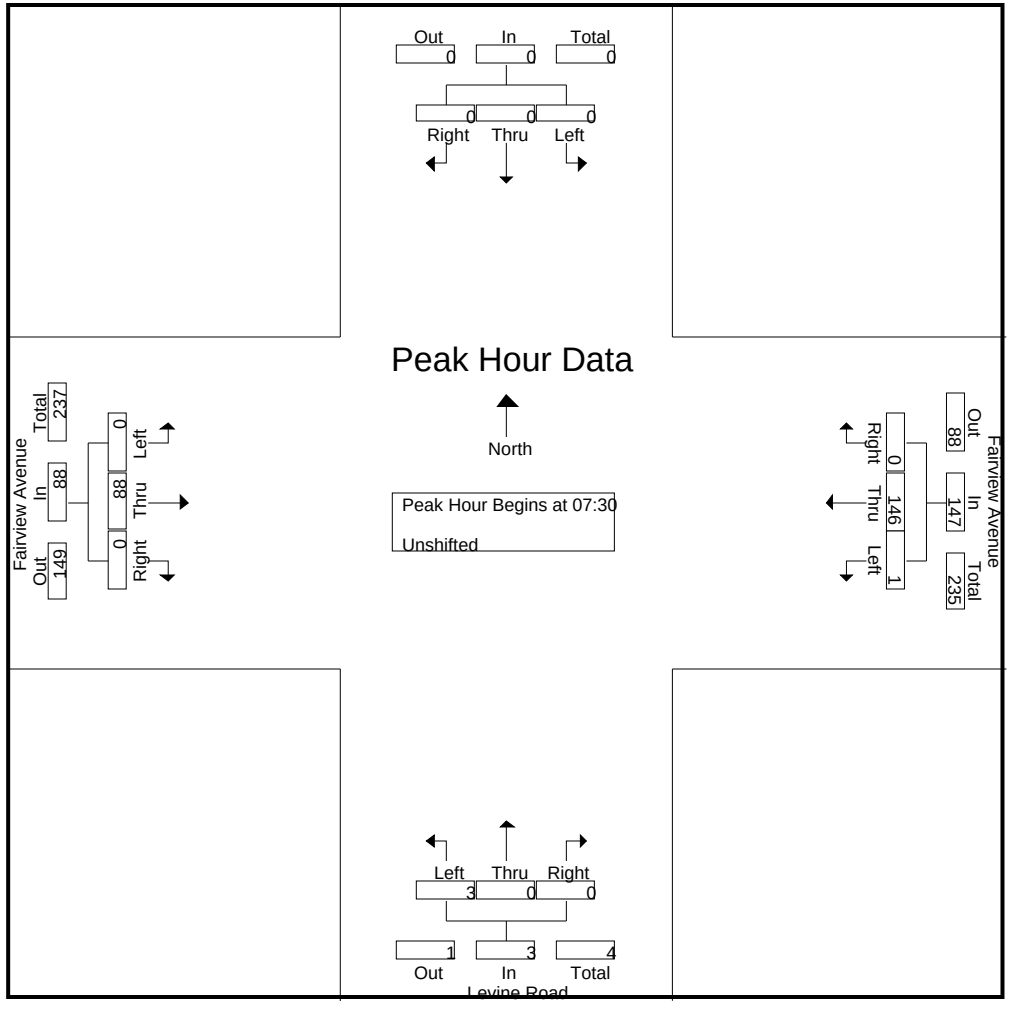
File Name : 12-7407-004 Levine-Fairview
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Unshifted

	Southbound					Fairview Avenue Westbound					Levine Road Northbound					Fairview Avenue Eastbound							
Start Time	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	0	0	0	0	17	0	0	17	0	0	1	0	1	0	4	0	0	4	0	22	22
07:15	0	0	0	0	0	1	24	0	0	25	1	0	0	0	1	0	8	0	0	8	0	34	34
07:30	0	0	0	0	0	0	41	0	0	41	1	0	0	0	1	0	16	0	0	16	0	58	58
07:45	0	0	0	0	0	1	29	0	0	30	1	0	0	0	1	0	20	0	0	20	0	51	51
Total	0	0	0	0	0	2	111	0	0	113	3	0	1	0	4	0	48	0	0	48	0	165	165
08:00	0	0	0	0	0	0	30	0	0	30	0	0	0	0	0	0	35	0	0	35	0	65	65
08:15	0	0	0	0	0	0	46	0	0	46	1	0	0	1	1	0	17	0	0	17	1	64	65
08:30	0	0	0	0	0	0	34	0	0	34	0	0	0	1	0	0	16	0	0	16	1	50	51
08:45	0	0	0	0	0	0	23	0	0	23	0	0	0	0	0	0	10	0	0	10	0	33	33
Total	0	0	0	0	0	0	133	0	0	133	1	0	0	2	1	0	78	0	0	78	2	212	214
16:00	0	0	0	0	0	0	28	0	0	28	0	0	2	0	2	0	34	1	0	35	0	65	65
16:15	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	0	27	1	0	28	0	44	44
16:30	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	0	19	0	0	19	0	34	34
16:45	0	0	0	0	0	0	18	0	0	18	0	0	0	0	0	0	35	0	0	35	0	53	53
Total	0	0	0	0	0	0	77	0	0	77	0	0	2	0	2	0	115	2	0	117	0	196	196
17:00	0	0	0	0	0	0	19	0	0	19	0	0	0	2	0	0	30	0	0	30	2	49	51
17:15	0	0	0	0	0	0	24	0	0	24	1	0	0	0	1	0	41	0	0	41	0	66	66
17:30	0	0	0	0	0	0	24	0	0	24	0	0	0	0	0	0	40	0	0	40	0	64	64
17:45	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	45	0	0	45	0	65	65
Total	0	0	0	0	0	0	87	0	0	87	1	0	0	2	1	0	156	0	0	156	2	244	246
Grand Total	0	0	0	0	0	2	408	0	0	410	5	0	3	4	8	0	397	2	0	399	4	817	821
Apprch %	0	0	0			0.5	99.5	0			62.5	0	37.5			0	99.5	0.5					
Total %	0	0	0		0	0.2	49.9	0		50.2	0.6	0	0.4		1	0	48.6	0.2		48.8	0.5	99.5	

	Southbound				Fairview Avenue Westbound				Levine Road Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	0	0	0	0	0	41	0	41	**1**	0	0	**1**	0	16	0	16	58
07:45	0	0	0	0	**1**	29	0	30	1	0	0	1	0	20	0	20	51
08:00	0	0	0	0	0	30	0	30	0	0	0	0	0	**35**	0	**35**	**65**
08:15	0	0	0	0	0	**46**	0	**46**	1	0	0	1	0	17	0	17	64
Total Volume	0	0	0	0	1	146	0	147	3	0	0	3	0	88	0	88	238

% App. Total	0	0	0		0.7	99.3	0		100	0	0		0	100	0			
PHF	.000	.000	.000	.000	.250	.793	.000	.799	.750	.000	.000	.750	.000	.629	.000	.629	.915	



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

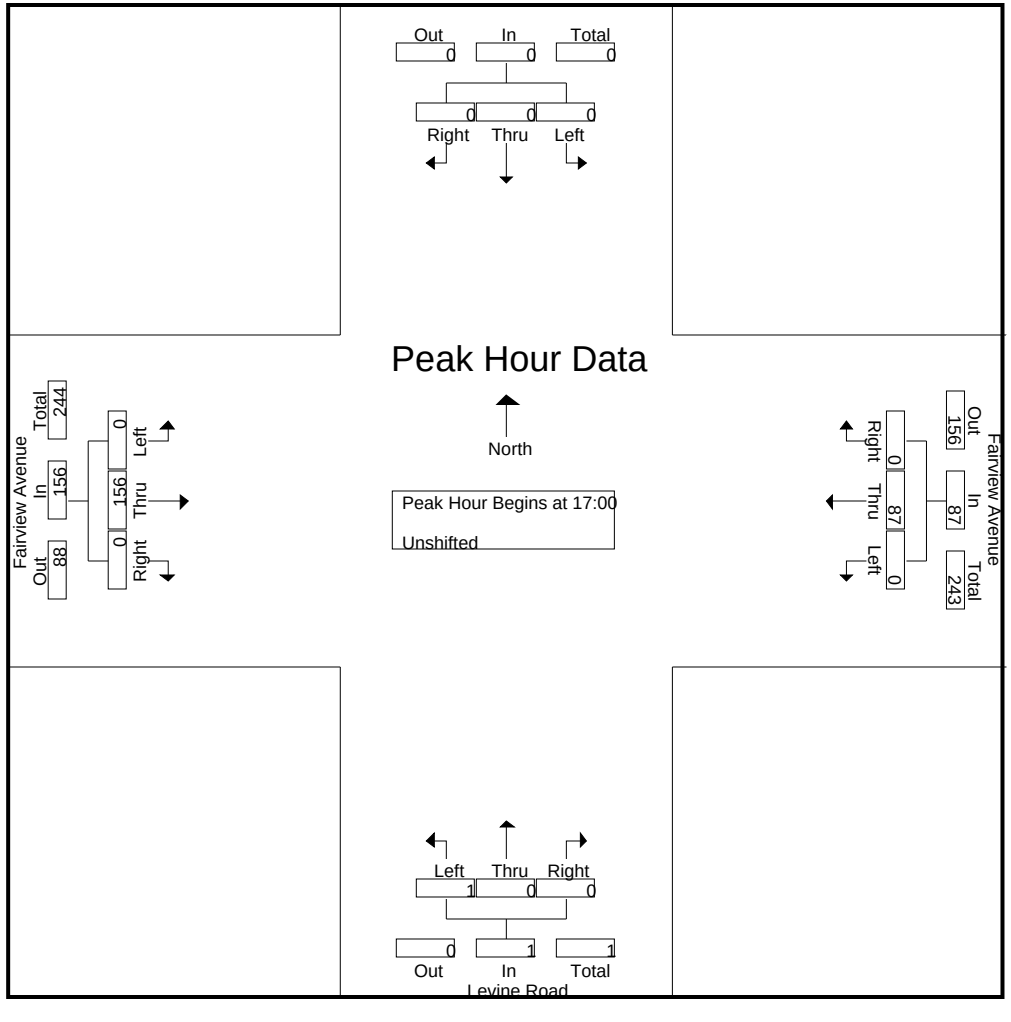
17:00	0	0	0	0	0	19	0	19	0	0	0	0	0	30	0	30	49	
17:15	0	0	0	0	0	**24**	0	**24**	**1**	0	0	**1**	0	41	0	41	**66**	
17:30	0	0	0	0	0	24	0	24	0	0	0	0	0	40	0	40	64	
17:45	0	0	0	0	0	20	0	20	0	0	0	0	0	**45**	0	**45**	65	
Total Volume	0	0	0	0	0	87	0	87	1	0	0	1	0	156	0	156	244	
% App. Total	0	0	0		0	100	0		100	0	0		0	100	0			
PHF	.000	.000	.000	.000	.000	.906	.000	.906	.250	.000	.000	.250	.000	.867	.000	.867	.924	

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-004 Levine-Fairview
Site Code : 00000000
Start Date : 9/18/2012
Page No : 3



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-004 Levine-Fairview
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Bank 1

	Southbound				Fairview Avenue Westbound				Levine Road Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
16:00	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
16:30	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5
17:00	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	3	0	3	0	0	0	0	0	3	0	3	6
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0		
Total %	0	0	0	0	0	50	0	50	0	0	0	0	0	50	0	50	

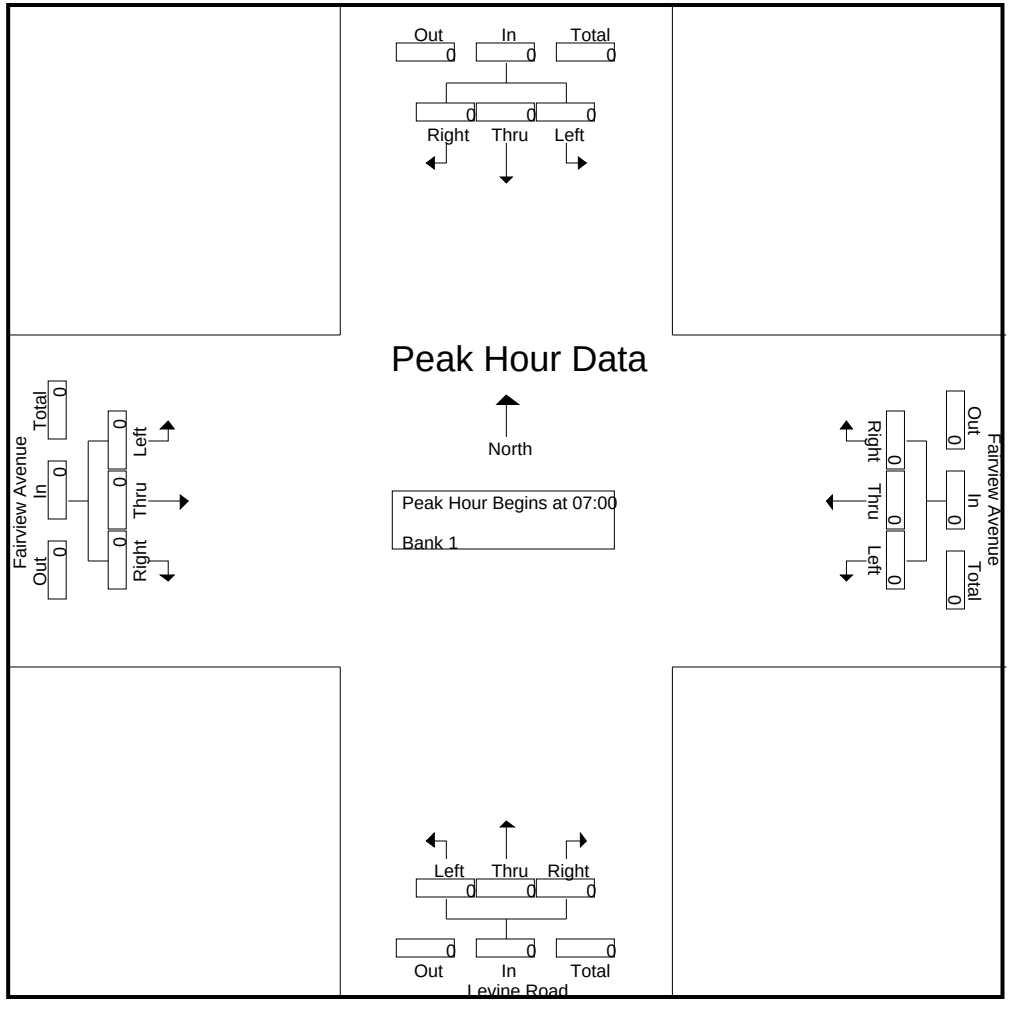
	Southbound				Fairview Avenue Westbound				Levine Road Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-004 Levine-Fairview
Site Code : 00000000
Start Date : 9/18/2012
Page No : 2



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-004 Levine-Fairview
Site Code : 00000000
Start Date : 9/18/2012
Page No : 3

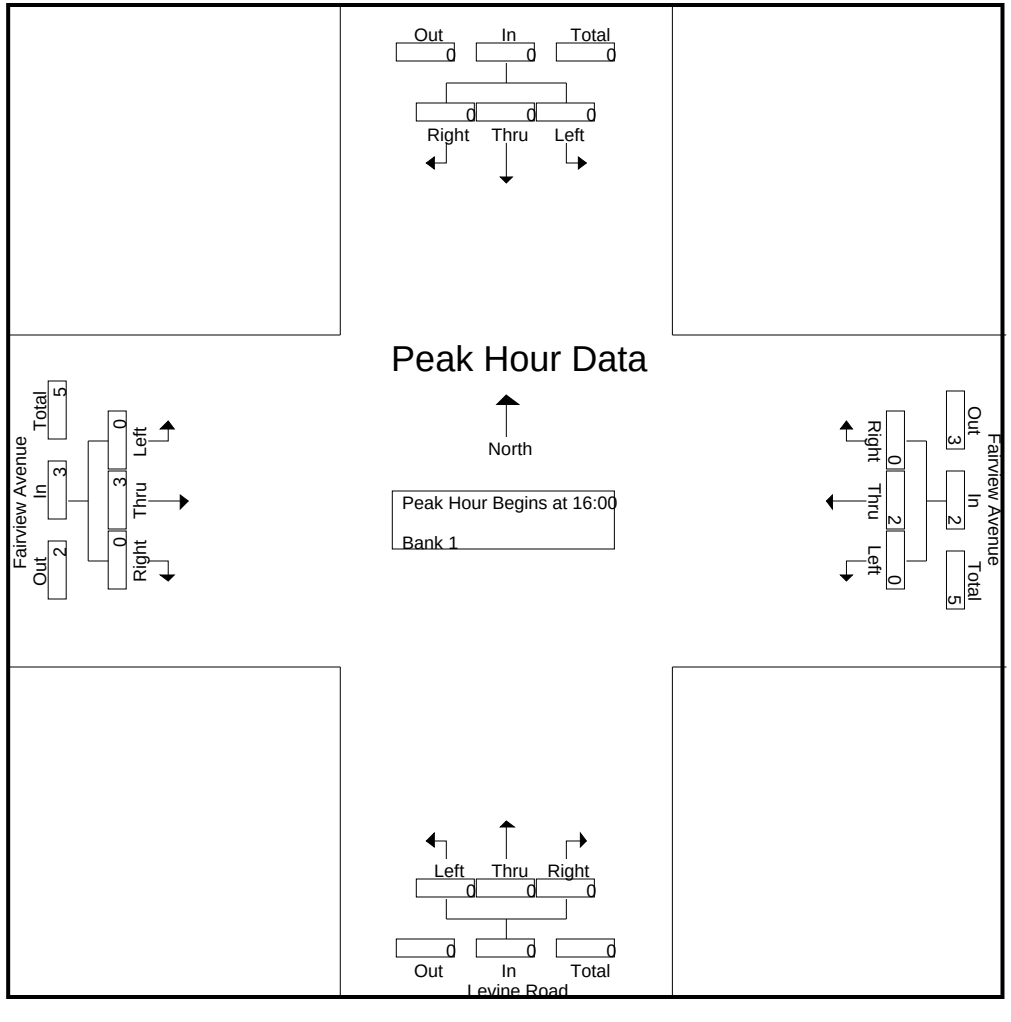
	Southbound				Fairview Avenue Westbound				Levine Road Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	**2**
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	2
Total Volume	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.375	.000	.375	.625

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-004 Levine-Fairview
Site Code : 00000000
Start Date : 9/18/2012
Page No : 4



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

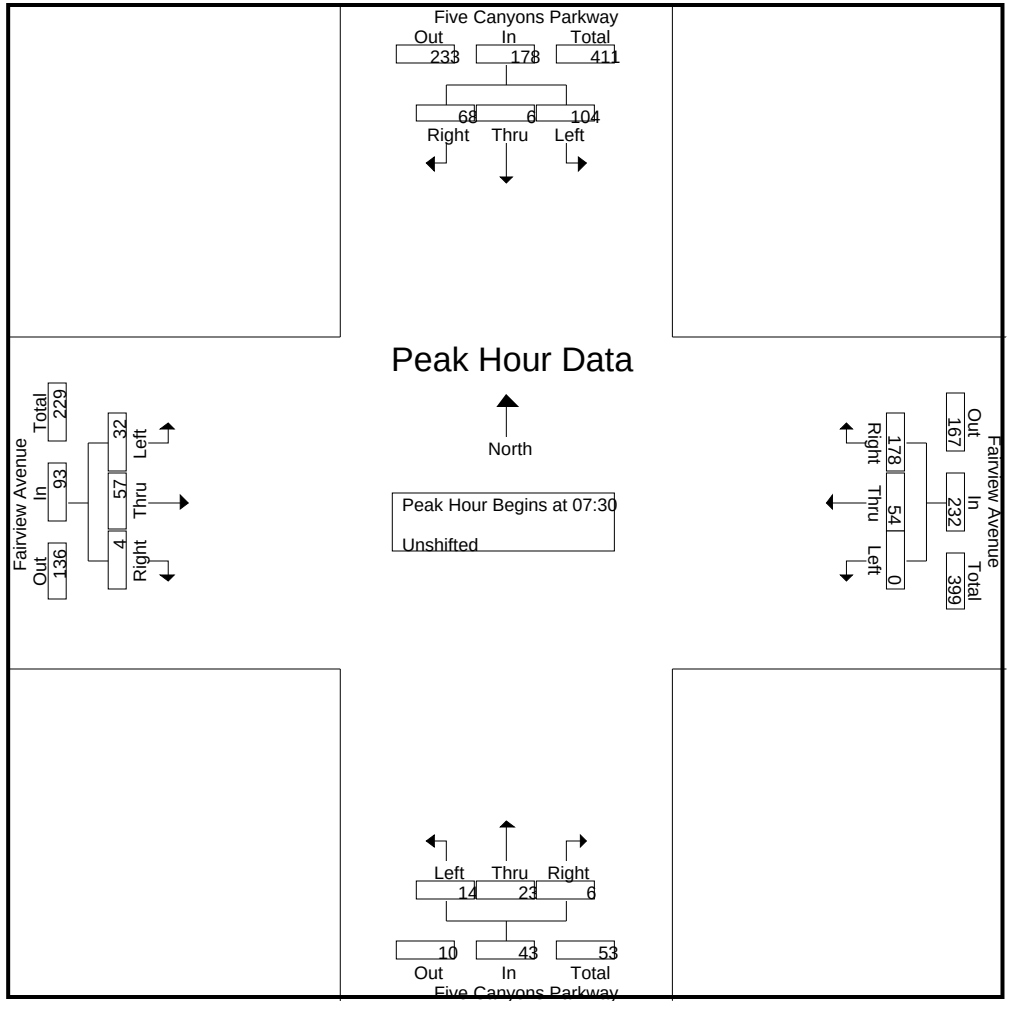
File Name : 12-7407-005 Fairview-Five Canyons
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Unshifted

	Five Canyons Parkway Southbound					Fairview Avenue Westbound					Five Canyons Parkway Northbound					Fairview Avenue Eastbound							
Start Time	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	8	0	11	0	19	0	8	31	0	39	1	3	1	0	5	4	2	0	0	6	0	69	69
07:15	16	1	13	2	30	0	5	39	1	44	2	2	0	0	4	4	4	1	0	9	3	87	90
07:30	20	0	18	0	38	0	15	51	0	66	4	7	0	0	11	12	6	0	1	18	1	133	134
07:45	19	1	11	0	31	0	7	44	0	51	4	6	0	0	10	8	16	1	0	25	0	117	117
Total	63	2	53	2	118	0	35	165	1	200	11	18	1	0	30	28	28	2	1	58	4	406	410
08:00	32	3	24	0	59	0	10	41	1	51	2	2	3	0	7	7	26	1	0	34	1	151	152
08:15	33	2	15	1	50	0	22	42	0	64	4	8	3	0	15	5	9	2	0	16	1	145	146
08:30	22	2	13	0	37	1	15	39	0	55	3	4	0	0	7	5	6	3	3	14	3	113	116
08:45	24	5	11	0	40	0	11	36	0	47	2	3	0	0	5	5	2	4	2	11	2	103	105
Total	111	12	63	1	186	1	58	158	1	217	11	17	6	0	34	22	43	10	5	75	7	512	519
16:00	22	3	7	0	32	0	15	29	0	44	3	3	0	0	6	21	11	4	2	36	2	118	120
16:15	24	3	8	0	35	0	8	26	0	34	2	2	0	0	4	10	16	5	0	31	0	104	104
16:30	25	5	5	0	35	0	9	38	1	47	0	1	1	0	2	6	10	4	0	20	1	104	105
16:45	22	1	6	0	29	0	11	24	0	35	2	0	1	0	3	11	11	4	1	26	1	93	94
Total	93	12	26	0	131	0	43	117	1	160	7	6	2	0	15	48	48	17	3	113	4	419	423
17:00	20	5	9	0	34	1	6	22	1	29	2	1	1	1	4	19	5	6	0	30	2	97	99
17:15	33	5	10	0	48	2	9	41	1	52	5	3	1	1	9	23	12	1	0	36	2	145	147
17:30	42	6	11	0	59	0	13	23	2	36	2	7	1	0	10	22	18	3	0	43	2	148	150
17:45	38	1	11	0	50	1	7	35	1	43	3	2	0	1	5	21	20	4	0	45	2	143	145
Total	133	17	41	0	191	4	35	121	5	160	12	13	3	3	28	85	55	14	0	154	8	533	541
Grand Total	400	43	183	3	626	5	171	561	8	737	41	54	12	3	107	183	174	43	9	400	23	1870	1893
Apprch %	63.9	6.9	29.2			0.7	23.2	76.1			38.3	50.5	11.2			45.8	43.5	10.8					
Total %	21.4	2.3	9.8		33.5	0.3	9.1	30		39.4	2.2	2.9	0.6		5.7	9.8	9.3	2.3		21.4	1.2	98.8	

	Five Canyons Parkway Southbound				Fairview Avenue Westbound				Five Canyons Parkway Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	20	0	18	38	0	15	**51**	**66**	**4**	7	0	11	**12**	6	0	18	133
07:45	19	1	11	31	0	7	44	51	4	6	0	10	8	16	1	25	117
08:00	32	**3**	**24**	**59**	0	10	41	51	2	2	**3**	7	7	**26**	1	**34**	**151**
08:15	**33**	2	15	50	0	**22**	42	64	4	**8**	3	**15**	5	9	**2**	16	145
Total Volume	104	6	68	178	0	54	178	232	14	23	6	43	32	57	4	93	546

% App. Total	58.4	3.4	38.2		0	23.3	76.7		32.6	53.5	14		34.4	61.3	4.3		
PHF	.788	.500	.708	.754	.000	.614	.873	.879	.875	.719	.500	.717	.667	.548	.500	.684	.904



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

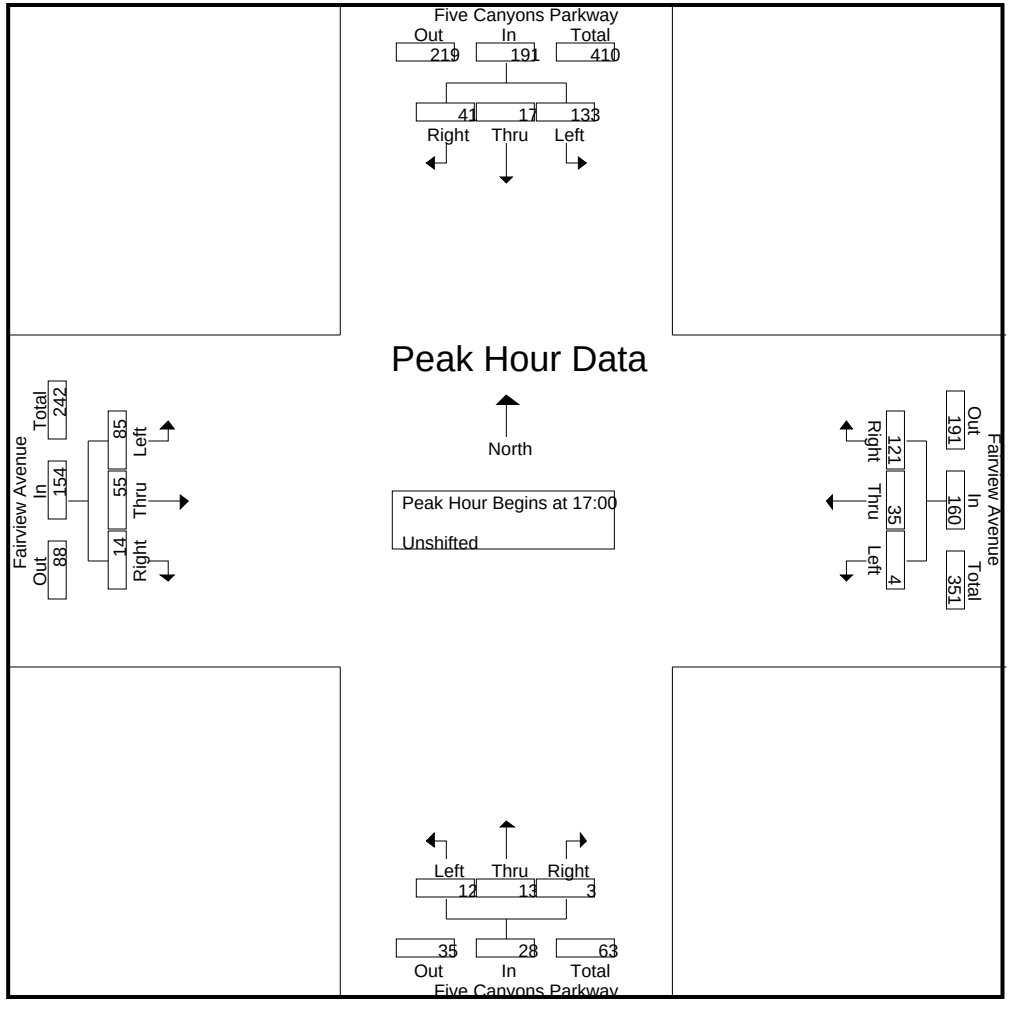
17:00	20	5	9	34	1	6	22	29	2	1	**1**	4	19	5	**6**	30	97
17:15	33	5	10	48	**2**	9	**41**	**52**	**5**	3	1	9	**23**	12	1	36	145
17:30	**42**	**6**	**11**	**59**	0	**13**	23	36	2	**7**	1	**10**	22	18	3	43	**148**
17:45	38	1	11	50	1	7	35	43	3	2	0	5	21	**20**	4	**45**	143
Total Volume	133	17	41	191	4	35	121	160	12	13	3	28	85	55	14	154	533
% App. Total	69.6	8.9	21.5		2.5	21.9	75.6		42.9	46.4	10.7		55.2	35.7	9.1		
PHF	.792	.708	.932	.809	.500	.673	.738	.769	.600	.464	.750	.700	.924	.688	.583	.856	.900

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-005 Fairview-Five Canyons
Site Code : 00000000
Start Date : 9/18/2012
Page No : 3



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-005 Fairview-Five Canyons
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Bank 1

	Five Canyons Parkway Southbound				Fairview Avenue Westbound				Five Canyons Parkway Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
16:30	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
16:45	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	1	0	0	0	0	1	0	0	1	0	0	0	0	2
17:00	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Grand Total	0	2	0	2	0	0	0	0	1	1	0	2	0	0	0	0	4
Apprch %	0	100	0		0	0	0		50	50	0		0	0	0		
Total %	0	50	0	50	0	0	0	0	25	25	0	50	0	0	0	0	

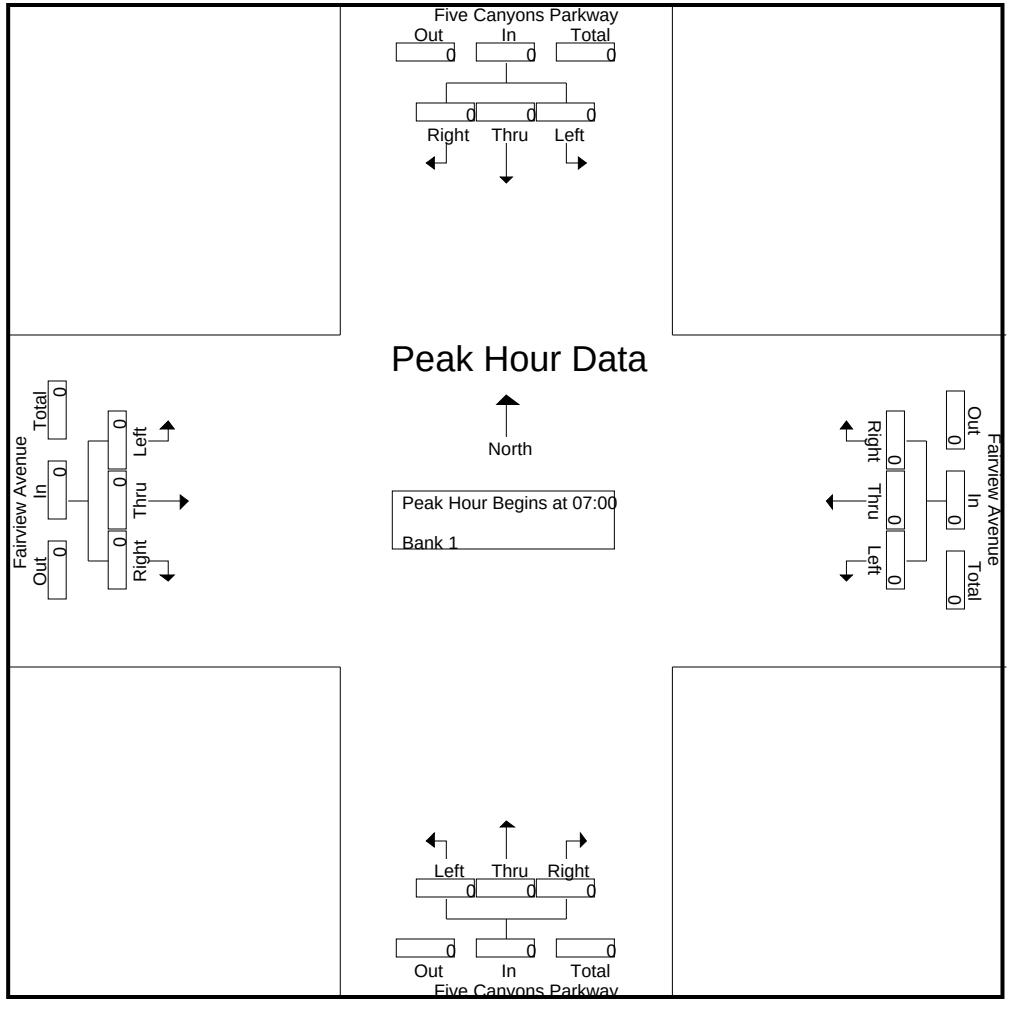
	Five Canyons Parkway Southbound				Fairview Avenue Westbound				Five Canyons Parkway Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-005 Fairview-Five Canyons
Site Code : 00000000
Start Date : 9/18/2012
Page No : 2



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-005 Fairview-Five Canyons
Site Code : 00000000
Start Date : 9/18/2012

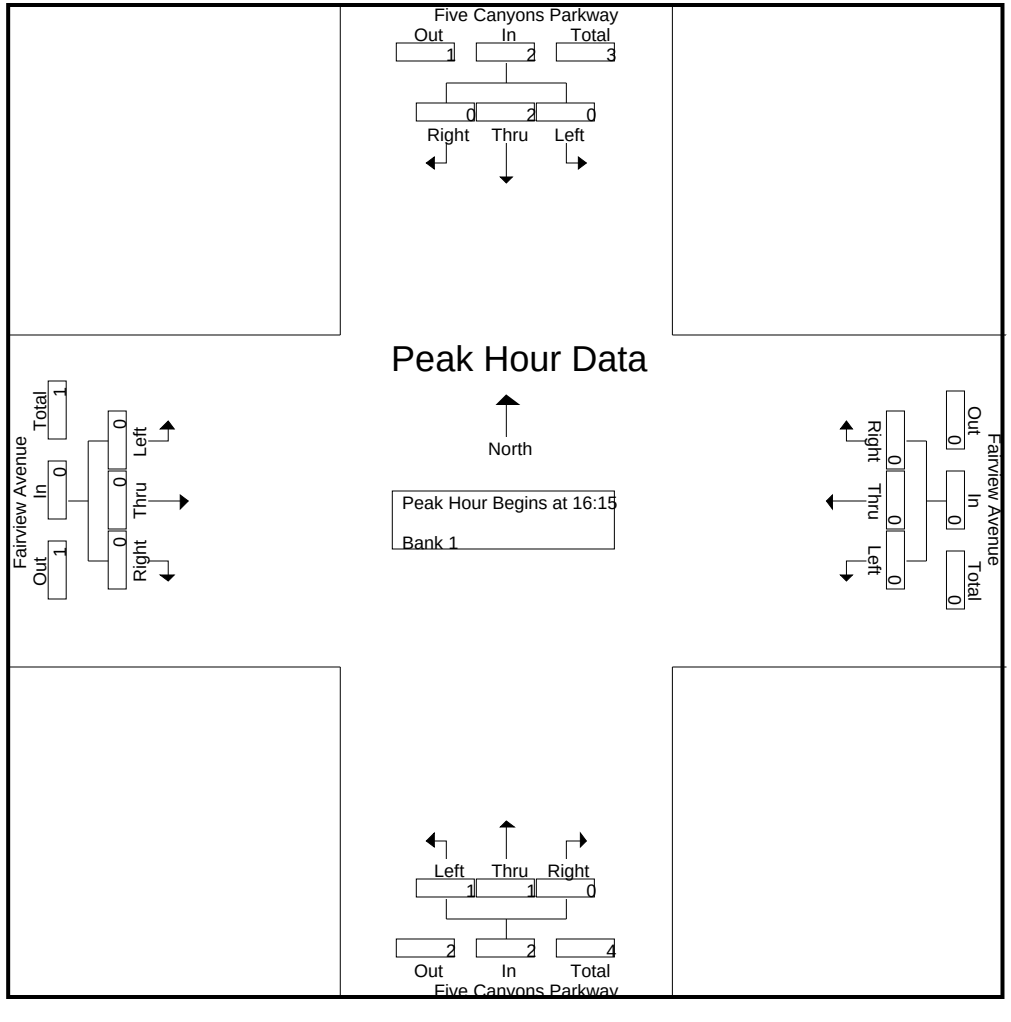
	Five Canyons Parkway Southbound				Fairview Avenue Westbound				Five Canyons Parkway Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:15																	
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	1
16:45	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	1
17:00	0	1	0	1	0	0	0	0	0	**1**	0	1	0	0	0	0	**2**
Total Volume	0	2	0	2	0	0	0	0	1	1	0	2	0	0	0	0	4
% App. Total	0	100	0		0	0	0		50	50	0		0	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.250	.250	.000	.500	.000	.000	.000	.000	.500

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-005 Fairview-Five Canyons
Site Code : 00000000
Start Date : 9/18/2012
Page No : 4



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

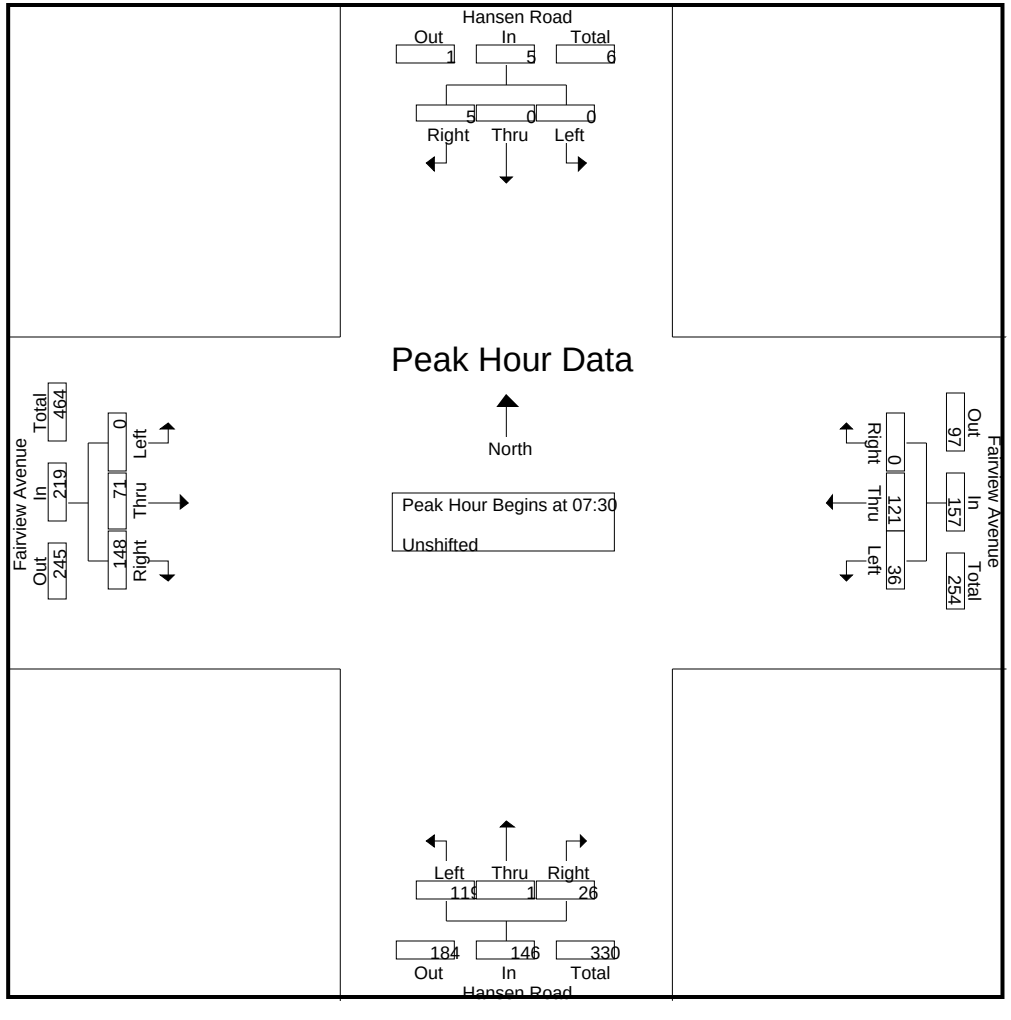
File Name : 12-7407-006 Fairview-Hansen
Site Code : 00000000
Start Date : 9/18/2012
Page No : 1

Groups Printed- Unshifted

	Hansen Road Southbound					Fairview Avenue Westbound					Hansen Road Northbound					Fairview Avenue Eastbound							
Start Time	Left	Thr	Rig	Ped	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	2	0	2	5	17	0	0	22	26	0	3	0	29	0	3	15	0	18	0	71	71
07:15	0	0	2	0	2	6	22	1	0	29	29	0	3	0	32	0	6	19	0	25	0	88	88
07:30	0	0	1	0	1	13	31	0	0	44	30	0	6	0	36	0	10	17	0	27	0	108	108
07:45	0	0	2	0	2	8	25	0	0	33	28	0	5	0	33	0	18	40	0	58	0	126	126
Total	0	0	7	0	7	32	95	1	0	128	113	0	17	0	130	0	37	91	0	128	0	393	393
08:00	0	0	2	0	2	9	27	0	0	36	26	1	8	0	35	0	30	46	0	76	0	149	149
08:15	0	0	0	0	0	6	38	0	1	44	35	0	7	1	42	0	13	45	0	58	2	144	146
08:30	0	0	1	0	1	7	30	0	0	37	25	0	4	0	29	0	10	16	0	26	0	93	93
08:45	0	0	1	0	1	4	27	0	0	31	11	0	2	0	13	2	12	14	0	28	0	73	73
Total	0	0	4	0	4	26	122	0	1	148	97	1	21	1	119	2	65	121	0	188	2	459	461
16:00	0	0	0	0	0	7	21	0	0	28	19	0	9	0	28	0	31	19	0	50	0	106	106
16:15	0	0	0	0	0	5	13	0	0	18	20	0	5	0	25	0	31	24	0	55	0	98	98
16:30	0	0	0	0	0	3	19	0	0	22	18	0	5	1	23	1	20	27	0	48	1	93	94
16:45	0	0	0	0	0	3	21	0	0	24	19	0	8	0	27	0	36	14	0	50	0	101	101
Total	0	0	0	0	0	18	74	0	0	92	76	0	27	1	103	1	118	84	0	203	1	398	399
17:00	0	0	0	0	0	7	19	0	0	26	30	0	7	0	37	0	27	23	0	50	0	113	113
17:15	0	1	0	0	1	5	22	0	0	27	26	0	17	0	43	1	33	16	0	50	0	121	121
17:30	0	0	0	0	0	6	26	0	0	32	24	0	2	0	26	1	40	25	0	66	0	124	124
17:45	0	0	0	0	0	7	18	0	0	25	19	1	7	0	27	1	40	24	0	65	0	117	117
Total	0	1	0	0	1	25	85	0	0	110	99	1	33	0	133	3	140	88	0	231	0	475	475
Grand Total	0	1	11	0	12	101	376	1	1	478	385	2	98	2	485	6	360	384	0	750	3	1725	1728
Apprch %	0	8.3	91.7			21.1	78.7	0.2			79.4	0.4	20.2			0.8	48	51.2					
Total %	0	0.1	0.6		0.7	5.9	21.8	0.1		27.7	22.3	0.1	5.7		28.1	0.3	20.9	22.3		43.5	0.2	99.8	

	Hansen Road Southbound				Fairview Avenue Westbound				Hansen Road Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	0	0	1	1	**13**	31	0	**44**	30	0	6	36	0	10	17	27	108
07:45	0	0	**2**	**2**	8	25	0	33	28	0	5	33	0	18	40	58	126
08:00	0	0	2	2	9	27	0	36	26	**1**	**8**	35	0	**30**	**46**	**76**	**149**
08:15	0	0	0	0	6	**38**	0	44	**35**	0	7	**42**	0	13	45	58	144
Total Volume	0	0	5	5	36	121	0	157	119	1	26	146	0	71	148	219	527

% App. Total	0	0	100		22.9	77.1	0		81.5	0.7	17.8		0	32.4	67.6		
PHF	.000	.000	.625	.625	.692	.796	.000	.892	.850	.250	.813	.869	.000	.592	.804	.720	.884



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

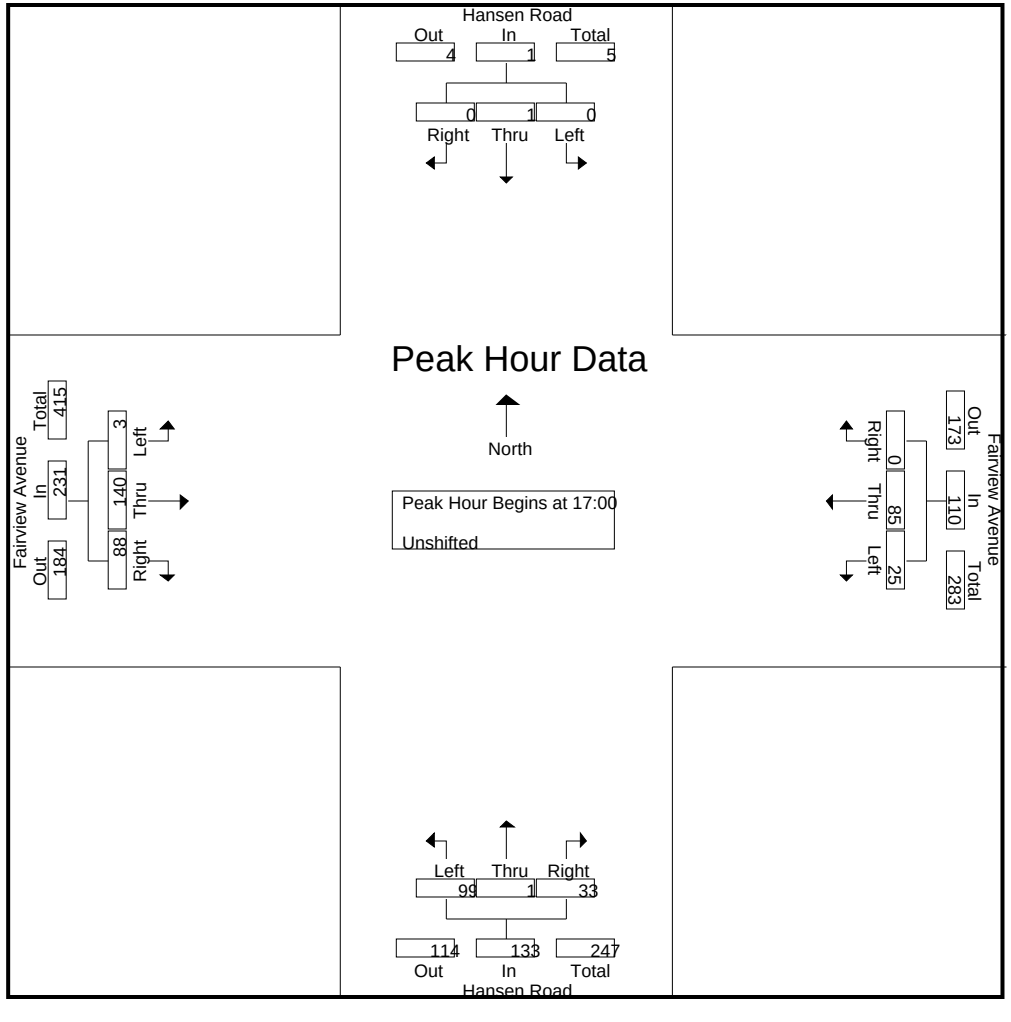
17:00	0	0	0	0	**7**	19	0	26	**30**	0	7	37	0	27	23	50	113
17:15	0	**1**	0	**1**	5	22	0	27	26	0	**17**	**43**	**1**	33	16	50	121
17:30	0	0	0	0	6	**26**	0	**32**	24	0	2	26	1	**40**	**25**	**66**	**124**
17:45	0	0	0	0	7	18	0	25	19	**1**	7	27	1	40	24	65	117
Total Volume	0	1	0	1	25	85	0	110	99	1	33	133	3	140	88	231	475
% App. Total	0	100	0		22.7	77.3	0		74.4	0.8	24.8		1.3	60.6	38.1		
PHF	.000	.250	.000	.250	.893	.817	.000	.859	.825	.250	.485	.773	.750	.875	.880	.875	.958

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-006 Fairview-Hansen
Site Code : 00000000
Start Date : 9/18/2012
Page No : 3



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-006 Fairview-Hansen
Site Code : 00000000
Start Date : 9/18/2012

Groups Printed- Bank 1

	Hansen Road Southbound				Fairview Avenue Westbound				Hansen Road Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:30	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
16:15	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
16:30	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	2	3
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5
17:45	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	2
Grand Total	0	0	0	0	1	2	0	3	2	0	0	2	0	3	0	3	8
Apprch %	0	0	0		33.3	66.7	0		100	0	0		0	100	0		
Total %	0	0	0	0	12.5	25	0	37.5	25	0	0	25	0	37.5	0	37.5	

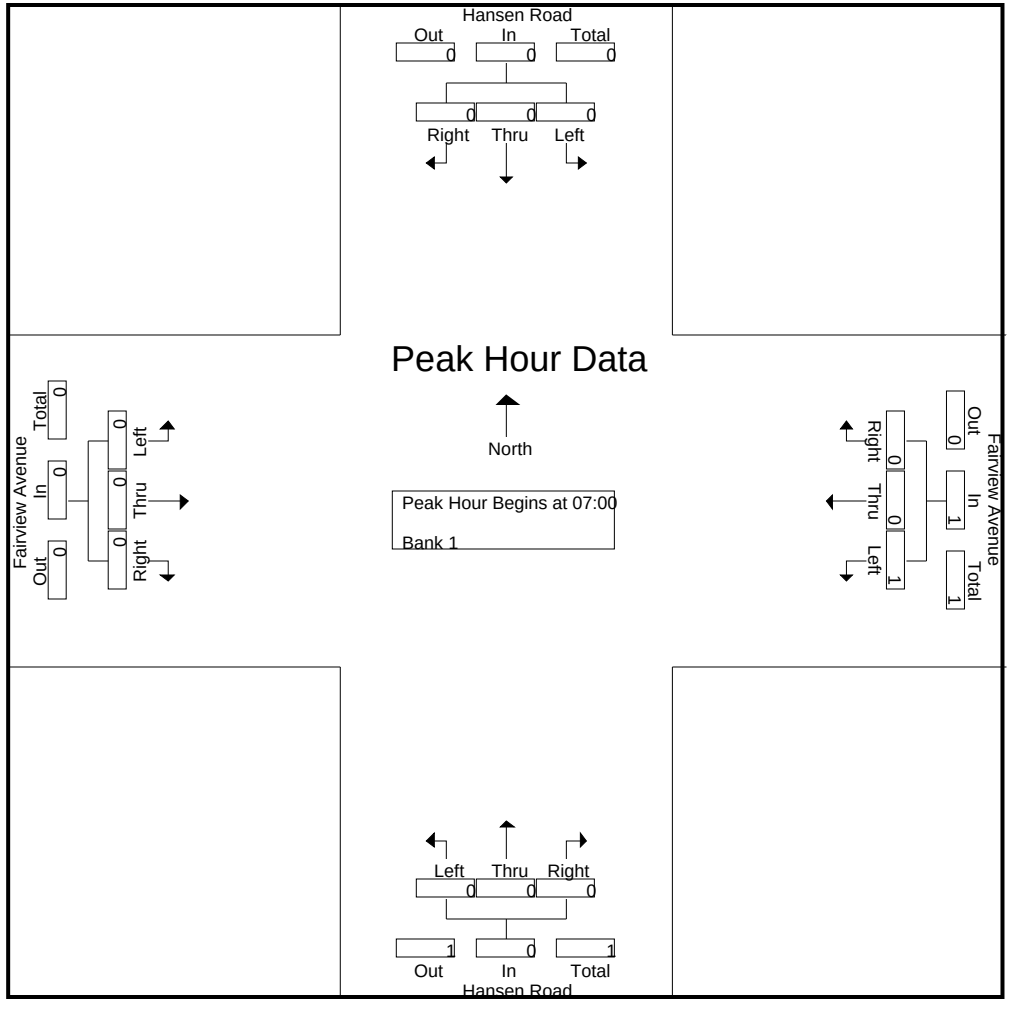
	Hansen Road Southbound				Fairview Avenue Westbound				Hansen Road Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	**1**
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0		100	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-006 Fairview-Hansen
Site Code : 00000000
Start Date : 9/18/2012
Page No : 2



All Traffic Data

(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-006 Fairview-Hansen
Site Code : 00000000
Start Date : 9/18/2012

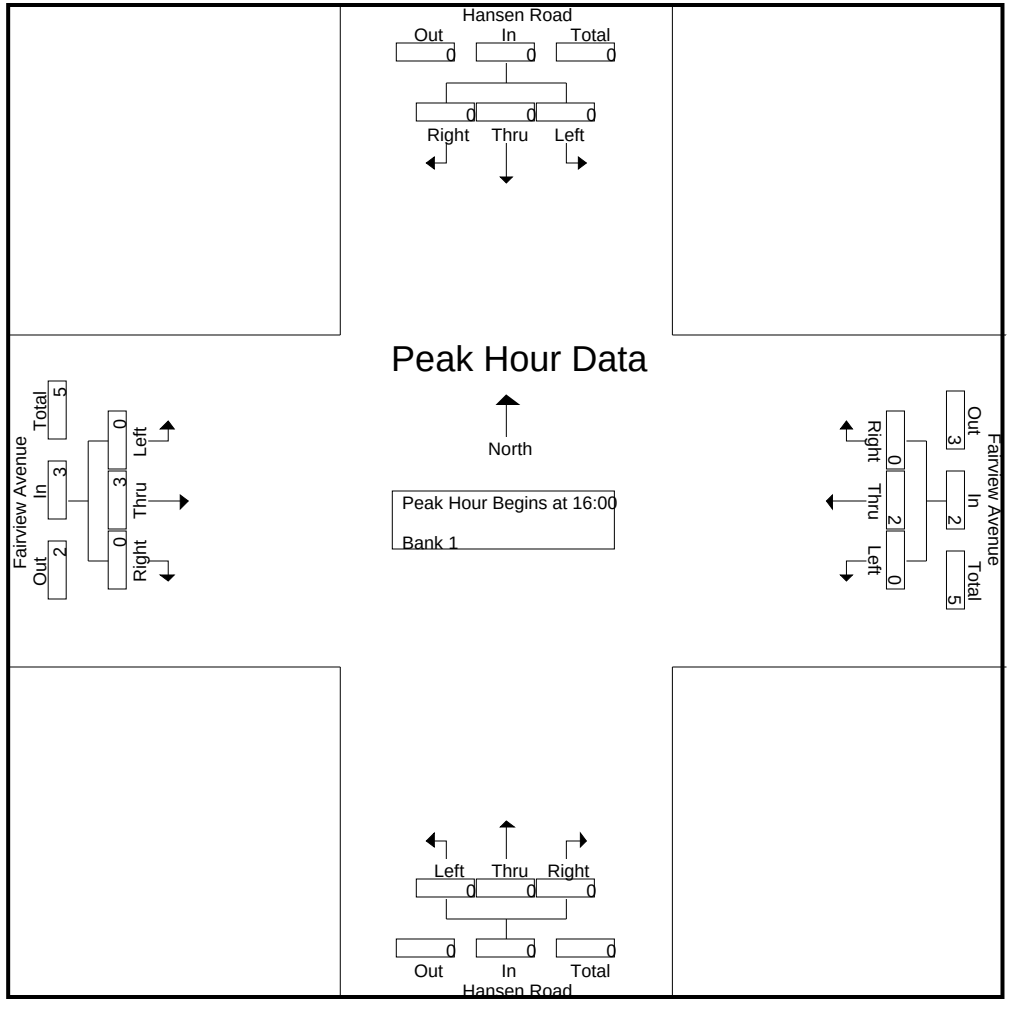
	Hansen Road Southbound				Fairview Avenue Westbound				Hansen Road Northbound				Fairview Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
16:30	0	0	0	0	0	1	0	1	0	0	0	0	0	**2**	0	**2**	**3**
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.375	.000	.375	.417

All Traffic Data

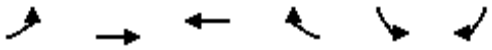
(916) 771-8700

Alameda County
Bicycles on Bank 1

File Name : 12-7407-006 Fairview-Hansen
Site Code : 00000000
Start Date : 9/18/2012
Page No : 4



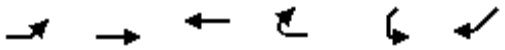
Appendix D – Level of Service Worksheets: Existing Conditions



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	156	70	102	164	160	189
Peak Hour Factor	0.72	0.72	0.86	0.86	0.80	0.80
Hourly flow rate (vph)	217	97	119	191	200	236

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	314	119	191	200	236
Volume Left (vph)	217	0	0	200	0
Volume Right (vph)	0	0	191	0	236
Hadj (s)	0.17	0.03	-0.57	0.23	-0.57
Departure Headway (s)	4.8	4.9	3.2	5.2	3.2
Degree Utilization, x	0.42	0.16	0.17	0.29	0.21
Capacity (veh/h)	726	691	1121	650	1122
Control Delay (s)	11.2	8.8	6.9	10.3	7.0
Approach Delay (s)	11.2	7.6		8.5	
Approach LOS	B	A		A	

Intersection Summary			
Delay	9.0		
HCM Level of Service	A		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	16	212	237	1	6	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.73	0.73	0.80	0.80	0.73	0.73
Hourly flow rate (vph)	22	290	296	1	8	44
Pedestrians		2	2			
Lane Width (ft)		11.5	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	298				633	299
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	298				633	299
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	94
cM capacity (veh/h)	1264				435	739

Direction, Lane #	EB 1	EB 2	WB 1	SW 1
Volume Total	22	290	298	52
Volume Left	22	0	0	8
Volume Right	0	0	1	44
cSH	1264	1700	1700	666
Volume to Capacity	0.02	0.17	0.17	0.08
Queue Length 95th (ft)	1	0	0	6
Control Delay (s)	7.9	0.0	0.0	10.9
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	10.9
Approach LOS				B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	7	147	1	4	86
Sign Control	Stop		Free			Free
Grade	15%		0%			0%
Peak Hour Factor	0.62	0.62	0.80	0.80	0.66	0.66
Hourly flow rate (vph)	5	11	184	1	6	130
Pedestrians	1					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	328	186			186	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	328	186			186	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	661	854			1387	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	16	185	136
Volume Left	5	0	6
Volume Right	11	1	0
cSH	785	1700	1387
Volume to Capacity	0.02	0.11	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	9.7	0.0	0.4
Lane LOS	A		A
Approach Delay (s)	9.7	0.0	0.4
Approach LOS	A		

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		18.3%	ICU Level of Service
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	88	0	1	146	3	0
Sign Control	Free			Free	Yield	
Grade	0%			0%	10%	
Peak Hour Factor	0.63	0.63	0.80	0.80	0.75	0.75
Hourly flow rate (vph)	140	0	1	182	4	0
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			141		326	141
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			141		326	141
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1441		666	906

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	140	184	4
Volume Left	0	1	4
Volume Right	0	0	0
cSH	1700	1441	666
Volume to Capacity	0.08	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.1	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	10.4
Approach LOS			B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		18.5%	ICU Level of Service
Analysis Period (min)		15	

MOVEMENT SUMMARY

Site: New Site - 1

Fairview Avenue/Five Canyon Parkway/Star Ridge Road
Existing Conditions: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	1	2.0	0.222	5.3	LOS A	1.3	34.0	0.28	0.66	17.0
8T	T	57	2.0	0.222	5.3	LOS A	1.3	34.0	0.28	0.33	19.8
8R	R	189	2.0	0.222	5.3	LOS A	1.3	34.0	0.28	0.56	20.3
Approach		248	2.0	0.222	5.3	LOS A	1.3	34.0	0.28	0.51	20.2
East: Five Canyons Road											
1L	L	111	2.0	0.172	4.8	LOS A	0.9	23.6	0.25	0.66	18.6
6T	T	6	2.0	0.172	4.8	LOS A	0.9	23.6	0.25	0.39	20.6
6R	R	72	2.0	0.172	4.8	LOS A	0.9	23.6	0.25	0.56	19.9
Approach		189	2.0	0.172	4.8	LOS A	0.9	23.6	0.25	0.61	19.1
North: Fairview Avenue											
7L	L	34	2.0	0.103	4.7	LOS A	0.6	14.6	0.35	0.74	19.5
4T	T	61	2.0	0.103	4.7	LOS A	0.6	14.6	0.35	0.38	20.3
4R	R	4	2.0	0.103	4.7	LOS A	0.6	14.6	0.35	0.66	18.1
Approach		99	2.0	0.103	4.7	LOS A	0.6	14.6	0.35	0.52	19.9
West: Star Ridge Road											
5L	L	15	2.0	0.052	4.6	LOS A	0.3	6.6	0.41	0.71	17.2
2T	T	24	2.0	0.052	4.6	LOS A	0.3	6.6	0.41	0.41	21.0
2R	R	6	2.0	0.052	4.6	LOS A	0.3	6.6	0.41	0.65	17.7
Approach		46	2.0	0.052	4.6	LOS A	0.3	6.6	0.41	0.54	19.2
All Vehicles		582	2.0	0.222	5.0	LOS A	1.3	34.0	0.29	0.55	19.7

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

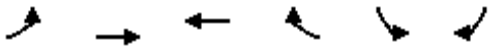
Site: New Site - 1

Fairview Avenue/Hansen Road/Vista Lane
Existing Conditions: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	38	2.0	0.173	5.4	LOS A	1.0	24.9	0.37	0.78	17.2
8T	T	129	2.0	0.173	5.4	LOS A	1.0	24.9	0.37	0.41	19.9
8R	R	1	0.0	0.173	5.4	LOS A	1.0	24.9	0.37	0.62	20.5
Approach		168	2.0	0.173	5.4	LOS A	1.0	24.9	0.37	0.49	19.2
East: Vista Lane											
1L	L	1	0.0	0.009	4.4	LOS A	0.0	1.1	0.45	0.67	18.9
6T	T	1	0.0	0.009	4.4	LOS A	0.0	1.1	0.45	0.46	20.7
6R	R	5	2.0	0.009	4.4	LOS A	0.0	1.1	0.45	0.59	20.3
Approach		7	1.4	0.009	4.4	LOS A	0.0	1.1	0.45	0.58	20.1
North: Fairview Avenue											
7L	L	1	0.0	0.194	4.7	LOS A	1.3	31.8	0.21	0.67	19.3
4T	T	76	2.0	0.194	4.7	LOS A	1.3	31.8	0.21	0.29	20.3
4R	R	157	2.0	0.194	4.7	LOS A	1.3	31.8	0.21	0.58	17.8
Approach		234	2.0	0.194	4.7	LOS A	1.3	31.8	0.21	0.49	18.6
West: Hansen Road											
5L	L	127	2.0	0.146	4.7	LOS A	0.8	20.5	0.27	0.58	16.9
2T	T	1	2.0	0.146	4.7	LOS A	0.8	20.5	0.27	0.31	20.8
2R	R	28	2.0	0.146	4.7	LOS A	0.8	20.5	0.27	0.55	17.3
Approach		155	2.0	0.146	4.7	LOS A	0.8	20.5	0.27	0.58	17.0
All Vehicles		565	2.0	0.194	4.9	LOS A	1.3	31.8	0.28	0.52	18.2

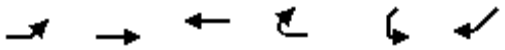
Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	157	131	67	136	137	99
Peak Hour Factor	0.89	0.89	0.85	0.85	0.73	0.73
Hourly flow rate (vph)	176	147	79	160	188	136

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	324	79	160	188	136
Volume Left (vph)	176	0	0	188	0
Volume Right (vph)	0	0	160	0	136
Hadj (s)	0.14	0.03	-0.57	0.23	-0.57
Departure Headway (s)	4.7	4.8	3.2	5.1	3.2
Degree Utilization, x	0.42	0.11	0.14	0.27	0.12
Capacity (veh/h)	747	696	1121	661	1121
Control Delay (s)	11.0	8.4	6.7	10.0	6.6
Approach Delay (s)	11.0	7.3		8.6	
Approach LOS	B	A		A	

Intersection Summary			
Delay	9.1		
HCM Level of Service	A		
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	26	243	182	3	1	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.91	0.91	0.55	0.55
Hourly flow rate (vph)	30	279	200	3	2	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	203				541	202
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	203				541	202
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	95
cM capacity (veh/h)	1368				491	839

Direction, Lane #	EB 1	EB 2	WB 1	SW 1
Volume Total	30	279	203	40
Volume Left	30	0	0	2
Volume Right	0	0	3	38
cSH	1368	1700	1700	813
Volume to Capacity	0.02	0.16	0.12	0.05
Queue Length 95th (ft)	2	0	0	4
Control Delay (s)	7.7	0.0	0.0	9.7
Lane LOS	A			A
Approach Delay (s)	0.7		0.0	9.7
Approach LOS				A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	6	94	2	8	158
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	12	106	2	9	184
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	309	107			108	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	309	107			108	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			99	
cM capacity (veh/h)	679	947			1483	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	108	193
Volume Left	0	0	9
Volume Right	12	2	0
cSH	947	1700	1483
Volume to Capacity	0.01	0.06	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.8	0.0	0.4
Lane LOS	A		A
Approach Delay (s)	8.8	0.0	0.4
Approach LOS	A		

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		24.8%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	156	0	0	87	1	0
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.91	0.91	0.25	0.25
Hourly flow rate (vph)	179	0	0	96	4	0
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			181		277	181
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			181		277	181
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1392		712	860

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	179	96	4
Volume Left	0	0	4
Volume Right	0	0	0
cSH	1700	1392	712
Volume to Capacity	0.11	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	10.1
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.1
Approach LOS			B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	18.5%	ICU Level of Service	A
Analysis Period (min)	15		

MOVEMENT SUMMARY

Site: New Site - 1

Fairview Avenue/Five Canyon Parkway/Star Ridge Road
Existing Conditions: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	5	2.0	0.194	5.6	LOS A	1.1	28.8	0.38	0.67	16.9
8T	T	41	2.0	0.194	5.6	LOS A	1.1	28.8	0.38	0.39	19.4
8R	R	142	2.0	0.194	5.6	LOS A	1.1	28.8	0.38	0.59	20.1
Approach		188	2.0	0.194	5.6	LOS A	1.1	28.8	0.38	0.55	19.9
East: Five Canyons Road											
1L	L	156	2.0	0.196	4.9	LOS A	1.1	28.0	0.23	0.66	18.5
6T	T	20	2.0	0.196	4.9	LOS A	1.1	28.0	0.23	0.39	20.6
6R	R	48	2.0	0.196	4.9	LOS A	1.1	28.0	0.23	0.56	19.9
Approach		225	2.0	0.196	4.9	LOS A	1.1	28.0	0.23	0.62	18.9
North: Fairview Avenue											
7L	L	100	2.0	0.203	6.1	LOS A	1.2	30.8	0.46	0.72	18.7
4T	T	65	2.0	0.203	6.1	LOS A	1.2	30.8	0.46	0.45	18.9
4R	R	16	2.0	0.203	6.1	LOS A	1.2	30.8	0.46	0.66	17.1
Approach		181	2.0	0.203	6.1	LOS A	1.2	30.8	0.46	0.62	18.6
West: Star Ridge Road											
5L	L	14	2.0	0.042	5.0	LOS A	0.2	5.4	0.51	0.72	17.0
2T	T	15	2.0	0.042	5.0	LOS A	0.2	5.4	0.51	0.48	20.6
2R	R	4	2.0	0.042	5.0	LOS A	0.2	5.4	0.51	0.67	17.5
Approach		33	2.0	0.042	5.0	LOS A	0.2	5.4	0.51	0.60	18.6
All Vehicles		627	2.0	0.203	5.4	LOS A	1.2	30.8	0.36	0.60	19.1

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Site: New Site - 1

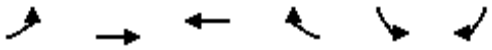
Fairview Avenue/Hansen Road/Vista Lane
Existing Conditions: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	29	2.0	0.135	5.0	LOS A	0.8	19.3	0.36	0.78	17.4
8T	T	100	2.0	0.135	5.0	LOS A	0.8	19.3	0.36	0.39	20.2
8R	R	1	0.0	0.135	5.0	LOS A	0.8	19.3	0.36	0.61	20.7
Approach		131	2.0	0.135	5.0	LOS A	0.8	19.3	0.36	0.48	19.5
East: Vista Lane											
1L	L	1	0.0	0.004	4.1	LOS A	0.0	0.5	0.41	0.67	19.2
6T	T	1	2.0	0.004	4.1	LOS A	0.0	0.5	0.41	0.43	21.2
6R	R	1	0.0	0.004	4.1	LOS A	0.0	0.5	0.41	0.57	20.7
Approach		4	0.7	0.004	4.1	LOS A	0.0	0.5	0.41	0.56	20.3
North: Fairview Avenue											
7L	L	4	2.0	0.216	4.7	LOS A	1.4	36.3	0.18	0.74	19.3
4T	T	165	2.0	0.216	4.7	LOS A	1.4	36.3	0.18	0.30	20.4
4R	R	104	2.0	0.216	4.7	LOS A	1.4	36.3	0.18	0.64	17.8
Approach		272	2.0	0.216	4.7	LOS A	1.4	36.3	0.18	0.44	19.4
West: Hansen Road											
5L	L	116	2.0	0.170	5.6	LOS A	0.9	23.8	0.41	0.63	16.5
2T	T	1	2.0	0.170	5.6	LOS A	0.9	23.8	0.41	0.41	20.0
2R	R	39	2.0	0.170	5.6	LOS A	0.9	23.8	0.41	0.60	16.8
Approach		156	2.0	0.170	5.6	LOS A	0.9	23.8	0.41	0.62	16.6
All Vehicles		562	2.0	0.216	5.0	LOS A	1.4	36.3	0.29	0.50	18.4

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

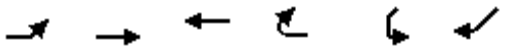
Appendix E – Level of Service Worksheets: Existing plus Project Conditions



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	156	71	104	167	161	189
Peak Hour Factor	0.72	0.72	0.86	0.86	0.80	0.80
Hourly flow rate (vph)	217	99	121	194	201	236

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	315	121	194	201	236
Volume Left (vph)	217	0	0	201	0
Volume Right (vph)	0	0	194	0	236
Hadj (s)	0.17	0.03	-0.57	0.23	-0.57
Departure Headway (s)	4.8	4.9	3.2	5.2	3.2
Degree Utilization, x	0.42	0.16	0.17	0.29	0.21
Capacity (veh/h)	724	690	1121	648	1122
Control Delay (s)	11.2	8.9	6.9	10.3	7.0
Approach Delay (s)	11.2	7.6		8.6	
Approach LOS	B	A		A	

Intersection Summary			
Delay	9.1		
HCM Level of Service	A		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	16	214	242	1	6	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.73	0.73	0.80	0.80	0.73	0.73
Hourly flow rate (vph)	22	293	302	1	8	44
Pedestrians		2	2			
Lane Width (ft)		11.5	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	304				642	305
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	304				642	305
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	94
cM capacity (veh/h)	1257				430	734

Direction, Lane #	EB 1	EB 2	WB 1	SW 1
Volume Total	22	293	304	52
Volume Left	22	0	0	8
Volume Right	0	0	1	44
cSH	1257	1700	1700	660
Volume to Capacity	0.02	0.17	0.18	0.08
Queue Length 95th (ft)	1	0	0	6
Control Delay (s)	7.9	0.0	0.0	10.9
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	10.9
Approach LOS				B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	7	153	1	4	88
Sign Control	Stop		Free			Free
Grade	15%		0%			0%
Peak Hour Factor	0.62	0.62	0.80	0.80	0.66	0.66
Hourly flow rate (vph)	5	11	191	1	6	133
Pedestrians	1					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	338	194			194	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	338	194			194	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	652	845			1379	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	16	192	139
Volume Left	5	0	6
Volume Right	11	1	0
cSH	776	1700	1379
Volume to Capacity	0.02	0.11	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	9.7	0.0	0.4
Lane LOS	A		A
Approach Delay (s)	9.7	0.0	0.4
Approach LOS	A		

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		18.6%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	90	0	1	147	3	0
Sign Control	Free			Free	Yield	
Grade	0%			0%	10%	
Peak Hour Factor	0.63	0.63	0.80	0.80	0.75	0.75
Hourly flow rate (vph)	143	0	1	184	4	0
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			144		330	144
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			144		330	144
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1437		662	902

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	143	185	4
Volume Left	0	1	4
Volume Right	0	0	0
cSH	1700	1437	662
Volume to Capacity	0.08	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.1	10.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	10.5
Approach LOS			B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		18.5%	ICU Level of Service
Analysis Period (min)		15	

MOVEMENT SUMMARY

Site: New Site - 1

Fairview Avenue/Five Canyon Parkway/Star Ridge Road
Existing Conditions: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	1	2.0	0.223	5.3	LOS A	1.3	34.1	0.28	0.66	17.0
8T	T	57	2.0	0.223	5.3	LOS A	1.3	34.1	0.28	0.34	19.7
8R	R	189	2.0	0.223	5.3	LOS A	1.3	34.1	0.28	0.56	20.3
Approach		248	2.0	0.223	5.3	LOS A	1.3	34.1	0.28	0.51	20.2
East: Five Canyons Road											
1L	L	111	2.0	0.173	4.8	LOS A	0.9	23.8	0.25	0.66	18.6
6T	T	6	2.0	0.173	4.8	LOS A	0.9	23.8	0.25	0.39	20.6
6R	R	73	2.0	0.173	4.8	LOS A	0.9	23.8	0.25	0.56	19.9
Approach		190	2.0	0.173	4.8	LOS A	0.9	23.8	0.25	0.61	19.1
North: Fairview Avenue											
7L	L	36	2.0	0.105	4.7	LOS A	0.6	15.0	0.35	0.74	19.5
4T	T	61	2.0	0.105	4.7	LOS A	0.6	15.0	0.35	0.38	20.3
4R	R	4	2.0	0.105	4.7	LOS A	0.6	15.0	0.35	0.66	18.1
Approach		101	2.0	0.105	4.7	LOS A	0.6	15.0	0.35	0.52	19.8
West: Star Ridge Road											
5L	L	15	2.0	0.052	4.6	LOS A	0.3	6.6	0.41	0.71	17.2
2T	T	24	2.0	0.052	4.6	LOS A	0.3	6.6	0.41	0.42	21.0
2R	R	6	2.0	0.052	4.6	LOS A	0.3	6.6	0.41	0.65	17.7
Approach		46	2.0	0.052	4.6	LOS A	0.3	6.6	0.41	0.54	19.2
All Vehicles		585	2.0	0.223	5.0	LOS A	1.3	34.1	0.30	0.55	19.7

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

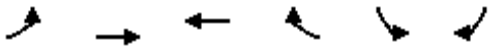
Site: New Site - 1

Fairview Avenue/Hansen Road/Vista Lane
Existing Conditions: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	38	2.0	0.179	5.4	LOS A	1.0	25.8	0.37	0.78	17.2
8T	T	134	2.0	0.179	5.4	LOS A	1.0	25.8	0.37	0.41	19.8
8R	R	1	0.0	0.179	5.4	LOS A	1.0	25.8	0.37	0.62	20.4
Approach		173	2.0	0.179	5.4	LOS A	1.0	25.8	0.37	0.49	19.2
East: Vista Lane											
1L	L	1	0.0	0.009	4.5	LOS A	0.0	1.1	0.46	0.67	18.9
6T	T	1	0.0	0.009	4.5	LOS A	0.0	1.1	0.46	0.46	20.7
6R	R	5	2.0	0.009	4.5	LOS A	0.0	1.1	0.46	0.59	20.3
Approach		7	1.4	0.009	4.5	LOS A	0.0	1.1	0.46	0.58	20.1
North: Fairview Avenue											
7L	L	1	0.0	0.196	4.7	LOS A	1.3	32.1	0.21	0.67	19.3
4T	T	78	2.0	0.196	4.7	LOS A	1.3	32.1	0.21	0.29	20.3
4R	R	157	2.0	0.196	4.7	LOS A	1.3	32.1	0.21	0.58	17.7
Approach		236	2.0	0.196	4.7	LOS A	1.3	32.1	0.21	0.49	18.6
West: Hansen Road											
5L	L	127	2.0	0.146	4.7	LOS A	0.8	20.6	0.28	0.58	16.9
2T	T	1	2.0	0.146	4.7	LOS A	0.8	20.6	0.28	0.32	20.8
2R	R	28	2.0	0.146	4.7	LOS A	0.8	20.6	0.28	0.56	17.3
Approach		155	2.0	0.146	4.7	LOS A	0.8	20.6	0.28	0.58	17.0
All Vehicles		572	2.0	0.196	4.9	LOS A	1.3	32.1	0.28	0.51	18.2

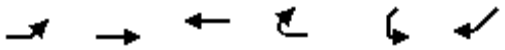
Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	157	134	69	138	141	99
Peak Hour Factor	0.89	0.89	0.85	0.85	0.73	0.73
Hourly flow rate (vph)	176	151	81	162	193	136

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	327	81	162	193	136
Volume Left (vph)	176	0	0	193	0
Volume Right (vph)	0	0	162	0	136
Hadj (s)	0.14	0.03	-0.57	0.23	-0.57
Departure Headway (s)	4.7	4.9	3.2	5.1	3.2
Degree Utilization, x	0.43	0.11	0.14	0.28	0.12
Capacity (veh/h)	743	692	1121	659	1121
Control Delay (s)	11.1	8.5	6.7	10.1	6.6
Approach Delay (s)	11.1	7.3		8.6	
Approach LOS	B	A		A	

Intersection Summary			
Delay	9.2		
HCM Level of Service	A		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	26	250	186	3	1	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.91	0.91	0.55	0.55
Hourly flow rate (vph)	30	287	204	3	2	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	208				553	206
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	208				553	206
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	95
cM capacity (veh/h)	1363				483	834

Direction, Lane #	EB 1	EB 2	WB 1	SW 1
Volume Total	30	287	208	40
Volume Left	30	0	0	2
Volume Right	0	0	3	38
cSH	1363	1700	1700	808
Volume to Capacity	0.02	0.17	0.12	0.05
Queue Length 95th (ft)	2	0	0	4
Control Delay (s)	7.7	0.0	0.0	9.7
Lane LOS	A			A
Approach Delay (s)	0.7		0.0	9.7
Approach LOS				A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	6	98	2	8	165
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	0	12	110	2	9	192
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	322	111			112	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	322	111			112	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			99	
cM capacity (veh/h)	668	942			1477	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	112	201
Volume Left	0	0	9
Volume Right	12	2	0
cSH	942	1700	1477
Volume to Capacity	0.01	0.07	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.9	0.0	0.4
Lane LOS	A		A
Approach Delay (s)	8.9	0.0	0.4
Approach LOS	A		

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		25.2%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	158	0	0	90	1	0
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.91	0.91	0.25	0.25
Hourly flow rate (vph)	182	0	0	99	4	0
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			184		283	184
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			184		283	184
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1389		706	857

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	182	99	4
Volume Left	0	0	4
Volume Right	0	0	0
cSH	1700	1389	706
Volume to Capacity	0.11	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	10.1
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.1
Approach LOS			B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

MOVEMENT SUMMARY

Site: New Site - 1

Fairview Avenue/Five Canyon Parkway/Star Ridge Road
Existing Conditions: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	5	2.0	0.194	5.6	LOS A	1.1	28.9	0.38	0.67	16.9
8T	T	41	2.0	0.194	5.6	LOS A	1.1	28.9	0.38	0.40	19.4
8R	R	142	2.0	0.194	5.6	LOS A	1.1	28.9	0.38	0.59	20.1
Approach		188	2.0	0.194	5.6	LOS A	1.1	28.9	0.38	0.55	19.9
East: Five Canyons Road											
1L	L	156	2.0	0.199	4.9	LOS A	1.1	28.5	0.23	0.66	18.5
6T	T	20	2.0	0.199	4.9	LOS A	1.1	28.5	0.23	0.39	20.6
6R	R	52	2.0	0.199	4.9	LOS A	1.1	28.5	0.23	0.56	19.9
Approach		228	2.0	0.199	4.9	LOS A	1.1	28.5	0.23	0.62	18.9
North: Fairview Avenue											
7L	L	102	2.0	0.206	6.1	LOS A	1.2	31.3	0.46	0.72	18.7
4T	T	65	2.0	0.206	6.1	LOS A	1.2	31.3	0.46	0.45	18.9
4R	R	16	2.0	0.206	6.1	LOS A	1.2	31.3	0.46	0.66	17.1
Approach		184	2.0	0.206	6.1	LOS A	1.2	31.3	0.46	0.62	18.6
West: Star Ridge Road											
5L	L	14	2.0	0.042	5.0	LOS A	0.2	5.4	0.51	0.72	17.0
2T	T	15	2.0	0.042	5.0	LOS A	0.2	5.4	0.51	0.48	20.5
2R	R	4	2.0	0.042	5.0	LOS A	0.2	5.4	0.51	0.67	17.4
Approach		33	2.0	0.042	5.0	LOS A	0.2	5.4	0.51	0.60	18.6
All Vehicles		633	2.0	0.206	5.5	LOS A	1.2	31.3	0.36	0.60	19.1

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Site: New Site - 1

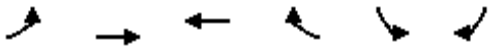
Fairview Avenue/Hansen Road/Vista Lane
Existing Conditions: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	29	2.0	0.140	5.0	LOS A	0.8	20.0	0.36	0.78	17.4
8T	T	105	2.0	0.140	5.0	LOS A	0.8	20.0	0.36	0.40	20.1
8R	R	1	0.0	0.140	5.0	LOS A	0.8	20.0	0.36	0.61	20.7
Approach		135	2.0	0.140	5.0	LOS A	0.8	20.0	0.36	0.48	19.4
East: Vista Lane											
1L	L	1	0.0	0.004	4.1	LOS A	0.0	0.5	0.42	0.67	19.2
6T	T	1	2.0	0.004	4.1	LOS A	0.0	0.5	0.42	0.43	21.2
6R	R	1	0.0	0.004	4.1	LOS A	0.0	0.5	0.42	0.57	20.7
Approach		4	0.7	0.004	4.1	LOS A	0.0	0.5	0.42	0.56	20.2
North: Fairview Avenue											
7L	L	4	2.0	0.222	4.8	LOS A	1.5	37.5	0.18	0.75	19.3
4T	T	173	2.0	0.222	4.8	LOS A	1.5	37.5	0.18	0.30	20.4
4R	R	104	2.0	0.222	4.8	LOS A	1.5	37.5	0.18	0.65	17.8
Approach		280	2.0	0.222	4.8	LOS A	1.5	37.5	0.18	0.43	19.4
West: Hansen Road											
5L	L	116	2.0	0.173	5.6	LOS A	1.0	24.3	0.42	0.63	16.4
2T	T	1	2.0	0.173	5.6	LOS A	1.0	24.3	0.42	0.42	19.9
2R	R	40	2.0	0.173	5.6	LOS A	1.0	24.3	0.42	0.61	16.7
Approach		158	2.0	0.173	5.6	LOS A	1.0	24.3	0.42	0.62	16.5
All Vehicles		576	2.0	0.222	5.1	LOS A	1.5	37.5	0.29	0.50	18.4

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

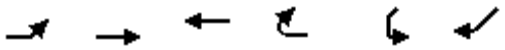
Appendix F – Level of Service Worksheets: Future Conditions



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	156	81	133	214	177	189
Peak Hour Factor	0.72	0.72	0.86	0.86	0.80	0.80
Hourly flow rate (vph)	217	112	155	249	221	236

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	329	155	249	221	236
Volume Left (vph)	217	0	0	221	0
Volume Right (vph)	0	0	249	0	236
Hadj (s)	0.17	0.03	-0.57	0.23	-0.57
Departure Headway (s)	4.9	5.0	3.2	5.3	3.2
Degree Utilization, x	0.45	0.21	0.22	0.33	0.21
Capacity (veh/h)	706	676	1122	632	1122
Control Delay (s)	11.8	9.4	7.1	10.9	7.0
Approach Delay (s)	11.8	8.0		8.9	
Approach LOS	B	A		A	

Intersection Summary			
Delay	9.4		
HCM Level of Service	A		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	29	226	279	8	27	71
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.73	0.73	0.80	0.80	0.73	0.73
Hourly flow rate (vph)	40	310	349	10	37	97
Pedestrians		2	2			
Lane Width (ft)		11.5	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				745	356
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				745	356
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				90	86
cM capacity (veh/h)	1200				368	687

Direction, Lane #	EB 1	EB 2	WB 1	SW 1
Volume Total	40	310	359	134
Volume Left	40	0	0	37
Volume Right	0	0	10	97
cSH	1200	1700	1700	555
Volume to Capacity	0.03	0.18	0.21	0.24
Queue Length 95th (ft)	3	0	0	24
Control Delay (s)	8.1	0.0	0.0	13.5
Lane LOS	A			B
Approach Delay (s)	0.9		0.0	13.5
Approach LOS				B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	8	19	186	3	8	115
Sign Control	Stop		Free			Free
Grade	15%		0%			0%
Peak Hour Factor	0.62	0.62	0.80	0.80	0.66	0.66
Hourly flow rate (vph)	13	31	232	4	12	174
Pedestrians	1					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	434	236			237	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	434	236			237	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			99	
cM capacity (veh/h)	571	800			1329	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	44	236	186
Volume Left	13	0	12
Volume Right	31	4	0
cSH	715	1700	1329
Volume to Capacity	0.06	0.14	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	10.4	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	10.4	0.0	0.6
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	125	0	1	167	3	0
Sign Control	Free			Free	Yield	
Grade	0%			0%	10%	
Peak Hour Factor	0.63	0.63	0.80	0.80	0.75	0.75
Hourly flow rate (vph)	198	0	1	209	4	0
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			199		411	199
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			199		411	199
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1372		595	840

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	198	210	4
Volume Left	0	1	4
Volume Right	0	0	0
cSH	1700	1372	595
Volume to Capacity	0.12	0.00	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.1	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	11.1
Approach LOS			B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		19.6%	ICU Level of Service
Analysis Period (min)		15	

MOVEMENT SUMMARY

Site: New Site - 1

Fairview Avenue/Five Canyon Parkway/Star Ridge Road
Existing Conditions: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	1	2.0	0.241	5.8	LOS A	1.5	37.0	0.36	0.67	16.7
8T	T	57	2.0	0.241	5.8	LOS A	1.5	37.0	0.36	0.38	19.3
8R	R	189	2.0	0.241	5.8	LOS A	1.5	37.0	0.36	0.58	19.9
Approach		248	2.0	0.241	5.8	LOS A	1.5	37.0	0.36	0.53	19.8
East: Five Canyons Road											
1L	L	111	2.0	0.191	5.0	LOS A	1.1	27.0	0.26	0.66	18.5
6T	T	6	2.0	0.191	5.0	LOS A	1.1	27.0	0.26	0.40	20.5
6R	R	95	2.0	0.191	5.0	LOS A	1.1	27.0	0.26	0.56	19.8
Approach		212	2.0	0.191	5.0	LOS A	1.1	27.0	0.26	0.61	19.1
North: Fairview Avenue											
7L	L	73	2.0	0.143	5.1	LOS A	0.8	21.1	0.36	0.71	19.2
4T	T	61	2.0	0.143	5.1	LOS A	0.8	21.1	0.36	0.38	19.9
4R	R	4	2.0	0.143	5.1	LOS A	0.8	21.1	0.36	0.64	17.7
Approach		138	2.0	0.143	5.1	LOS A	0.8	21.1	0.36	0.57	19.4
West: Star Ridge Road											
5L	L	15	2.0	0.054	4.8	LOS A	0.3	6.9	0.45	0.72	17.1
2T	T	24	2.0	0.054	4.8	LOS A	0.3	6.9	0.45	0.44	20.8
2R	R	6	2.0	0.054	4.8	LOS A	0.3	6.9	0.45	0.66	17.6
Approach		46	2.0	0.054	4.8	LOS A	0.3	6.9	0.45	0.56	19.1
All Vehicles		644	2.0	0.241	5.3	LOS A	1.5	37.0	0.33	0.57	19.4

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

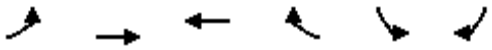
Site: New Site - 1

Fairview Avenue/Hansen Road/Vista Lane
Existing Conditions: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	41	2.0	0.225	5.8	LOS A	1.4	34.4	0.39	0.79	17.0
8T	T	180	2.0	0.225	5.8	LOS A	1.4	34.4	0.39	0.42	19.5
8R	R	1	0.0	0.225	5.8	LOS A	1.4	34.4	0.39	0.62	20.2
Approach		222	2.0	0.225	5.8	LOS A	1.4	34.4	0.39	0.49	19.0
East: Vista Lane											
1L	L	1	0.0	0.010	4.7	LOS A	0.0	1.1	0.49	0.68	18.8
6T	T	1	0.0	0.010	4.7	LOS A	0.0	1.1	0.49	0.48	20.4
6R	R	5	2.0	0.010	4.7	LOS A	0.0	1.1	0.49	0.60	20.1
Approach		7	1.4	0.010	4.7	LOS A	0.0	1.1	0.49	0.59	19.9
North: Fairview Avenue											
7L	L	1	0.0	0.225	5.0	LOS A	1.5	38.1	0.22	0.68	19.2
4T	T	110	2.0	0.225	5.0	LOS A	1.5	38.1	0.22	0.30	20.1
4R	R	161	2.0	0.225	5.0	LOS A	1.5	38.1	0.22	0.60	17.6
Approach		271	2.0	0.225	5.0	LOS A	1.5	38.1	0.22	0.48	18.6
West: Hansen Road											
5L	L	128	2.0	0.158	5.1	LOS A	0.9	22.4	0.34	0.60	16.7
2T	T	1	2.0	0.158	5.1	LOS A	0.9	22.4	0.34	0.35	20.4
2R	R	29	2.0	0.158	5.1	LOS A	0.9	22.4	0.34	0.57	17.1
Approach		157	2.0	0.158	5.1	LOS A	0.9	22.4	0.34	0.59	16.8
All Vehicles		659	2.0	0.225	5.3	LOS A	1.5	38.1	0.31	0.51	18.2

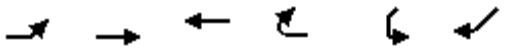
Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	157	167	88	169	194	99
Peak Hour Factor	0.89	0.89	0.85	0.85	0.73	0.73
Hourly flow rate (vph)	176	188	104	199	266	136

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	364	104	199	266	136
Volume Left (vph)	176	0	0	266	0
Volume Right (vph)	0	0	199	0	136
Hadj (s)	0.13	0.03	-0.57	0.23	-0.57
Departure Headway (s)	4.9	5.2	3.2	5.3	3.2
Degree Utilization, x	0.50	0.15	0.18	0.39	0.12
Capacity (veh/h)	702	643	1121	628	1121
Control Delay (s)	12.8	9.1	6.9	11.7	6.6
Approach Delay (s)	12.8	7.6		10.0	
Approach LOS	B	A		B	

Intersection Summary			
Delay	10.3		
HCM Level of Service	B		
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	70	291	210	27	15	47
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.91	0.91	0.55	0.55
Hourly flow rate (vph)	80	334	231	30	27	85
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	260				741	246
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260				741	246
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				92	89
cM capacity (veh/h)	1304				360	793

Direction, Lane #	EB 1	EB 2	WB 1	SW 1
Volume Total	80	334	260	113
Volume Left	80	0	0	27
Volume Right	0	0	30	85
cSH	1304	1700	1700	614
Volume to Capacity	0.06	0.20	0.15	0.18
Queue Length 95th (ft)	5	0	0	17
Control Delay (s)	7.9	0.0	0.0	12.2
Lane LOS	A			B
Approach Delay (s)	1.5		0.0	12.2
Approach LOS				B

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	14	136	8	22	208
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	8	28	153	9	26	242
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	450	157			162	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	450	157			162	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			98	
cM capacity (veh/h)	556	888			1417	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	162	267
Volume Left	8	0	26
Volume Right	28	9	0
cSH	784	1700	1417
Volume to Capacity	0.05	0.10	0.02
Queue Length 95th (ft)	4	0	1
Control Delay (s)	9.8	0.0	0.9
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	0.9
Approach LOS	A		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	189	0	0	131	1	0
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.91	0.91	0.25	0.25
Hourly flow rate (vph)	217	0	0	144	4	0
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			219		363	219
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			219		363	219
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1348		635	819

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	217	144	4
Volume Left	0	0	4
Volume Right	0	0	0
cSH	1700	1348	635
Volume to Capacity	0.13	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	10.7
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.7
Approach LOS			B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	20.2%	ICU Level of Service	A
Analysis Period (min)	15		

MOVEMENT SUMMARY

Site: New Site - 1

Fairview Avenue/Five Canyon Parkway/Star Ridge Road
Existing Conditions: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	5	2.0	0.206	6.0	LOS A	1.2	30.7	0.44	0.69	16.7
8T	T	41	2.0	0.206	6.0	LOS A	1.2	30.7	0.44	0.44	19.0
8R	R	142	2.0	0.206	6.0	LOS A	1.2	30.7	0.44	0.61	19.8
Approach		188	2.0	0.206	6.0	LOS A	1.2	30.7	0.44	0.58	19.6
East: Five Canyons Road											
1L	L	156	2.0	0.238	5.2	LOS A	1.4	35.8	0.24	0.66	18.3
6T	T	20	2.0	0.238	5.2	LOS A	1.4	35.8	0.24	0.39	20.3
6R	R	100	2.0	0.238	5.2	LOS A	1.4	35.8	0.24	0.56	19.6
Approach		276	2.0	0.238	5.2	LOS A	1.4	35.8	0.24	0.61	18.8
North: Fairview Avenue											
7L	L	139	2.0	0.246	6.6	LOS A	1.5	38.7	0.48	0.72	18.4
4T	T	65	2.0	0.246	6.6	LOS A	1.5	38.7	0.48	0.46	18.6
4R	R	16	2.0	0.246	6.6	LOS A	1.5	38.7	0.48	0.66	16.7
Approach		220	2.0	0.246	6.6	LOS A	1.5	38.7	0.48	0.64	18.3
West: Star Ridge Road											
5L	L	14	2.0	0.044	5.2	LOS A	0.2	5.6	0.54	0.73	16.9
2T	T	15	2.0	0.044	5.2	LOS A	0.2	5.6	0.54	0.50	20.4
2R	R	4	2.0	0.044	5.2	LOS A	0.2	5.6	0.54	0.68	17.3
Approach		33	2.0	0.044	5.2	LOS A	0.2	5.6	0.54	0.62	18.5
All Vehicles		718	2.0	0.246	5.8	LOS A	1.5	38.7	0.38	0.61	18.9

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Site: New Site - 1

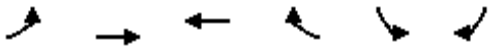
Fairview Avenue/Hansen Road/Vista Lane
Existing Conditions: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	32	2.0	0.194	5.5	LOS A	1.2	29.4	0.38	0.80	17.2
8T	T	156	2.0	0.194	5.5	LOS A	1.2	29.4	0.38	0.41	19.8
8R	R	1	0.0	0.194	5.5	LOS A	1.2	29.4	0.38	0.62	20.4
Approach		189	2.0	0.194	5.5	LOS A	1.2	29.4	0.38	0.48	19.3
East: Vista Lane											
1L	L	1	0.0	0.004	4.4	LOS A	0.0	0.5	0.46	0.67	19.1
6T	T	1	2.0	0.004	4.4	LOS A	0.0	0.5	0.46	0.45	20.9
6R	R	1	0.0	0.004	4.4	LOS A	0.0	0.5	0.46	0.58	20.5
Approach		4	0.7	0.004	4.4	LOS A	0.0	0.5	0.46	0.57	20.0
North: Fairview Avenue											
7L	L	4	2.0	0.271	5.2	LOS A	1.9	48.6	0.20	0.76	19.1
4T	T	235	2.0	0.271	5.2	LOS A	1.9	48.6	0.20	0.31	20.0
4R	R	106	2.0	0.271	5.2	LOS A	1.9	48.6	0.20	0.66	17.5
Approach		345	2.0	0.271	5.2	LOS A	1.9	48.6	0.20	0.42	19.2
West: Hansen Road											
5L	L	120	2.0	0.194	6.2	LOS A	1.1	27.4	0.49	0.67	16.2
2T	T	1	2.0	0.194	6.2	LOS A	1.1	27.4	0.49	0.48	19.5
2R	R	44	2.0	0.194	6.2	LOS A	1.1	27.4	0.49	0.65	16.4
Approach		165	2.0	0.194	6.2	LOS A	1.1	27.4	0.49	0.66	16.2
All Vehicles		702	2.0	0.271	5.5	LOS A	1.9	48.6	0.32	0.49	18.4

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

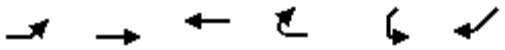
Appendix G – Level of Service Worksheets: Future plus Project Conditions



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	156	81	135	217	178	189
Peak Hour Factor	0.72	0.72	0.86	0.86	0.80	0.80
Hourly flow rate (vph)	217	112	157	252	222	236

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	329	157	252	223	236
Volume Left (vph)	217	0	0	223	0
Volume Right (vph)	0	0	252	0	236
Hadj (s)	0.17	0.03	-0.57	0.23	-0.57
Departure Headway (s)	4.9	5.0	3.2	5.3	3.2
Degree Utilization, x	0.45	0.22	0.22	0.33	0.21
Capacity (veh/h)	705	675	1122	631	1122
Control Delay (s)	11.9	9.4	7.1	11.0	7.0
Approach Delay (s)	11.9	8.0		8.9	
Approach LOS	B	A		A	

Intersection Summary			
Delay	9.4		
HCM Level of Service	A		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	29	228	284	8	27	71
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.73	0.73	0.80	0.80	0.73	0.73
Hourly flow rate (vph)	40	312	355	10	37	97
Pedestrians		2	2			
Lane Width (ft)		11.5	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	365				754	362
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	365				754	362
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				90	86
cM capacity (veh/h)	1194				364	682

Direction, Lane #	EB 1	EB 2	WB 1	SW 1
Volume Total	40	312	365	134
Volume Left	40	0	0	37
Volume Right	0	0	10	97
cSH	1194	1700	1700	549
Volume to Capacity	0.03	0.18	0.21	0.24
Queue Length 95th (ft)	3	0	0	24
Control Delay (s)	8.1	0.0	0.0	13.7
Lane LOS	A			B
Approach Delay (s)	0.9		0.0	13.7
Approach LOS				B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	8	19	192	3	8	117
Sign Control	Stop		Free			Free
Grade	15%		0%			0%
Peak Hour Factor	0.62	0.62	0.80	0.80	0.66	0.66
Hourly flow rate (vph)	13	31	240	4	12	177
Pedestrians	1					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	444	244			245	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	444	244			245	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			99	
cM capacity (veh/h)	563	793			1320	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	44	244	189
Volume Left	13	0	12
Volume Right	31	4	0
cSH	707	1700	1320
Volume to Capacity	0.06	0.14	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	10.4	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	10.4	0.0	0.6
Approach LOS	B		

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		23.1%	ICU Level of Service
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	127	0	1	168	3	0
Sign Control	Free			Free	Yield	
Grade	0%			0%	10%	
Peak Hour Factor	0.63	0.63	0.80	0.80	0.75	0.75
Hourly flow rate (vph)	202	0	1	210	4	0
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			203		415	203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			203		415	203
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1368		591	837

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	202	211	4
Volume Left	0	1	4
Volume Right	0	0	0
cSH	1700	1368	591
Volume to Capacity	0.12	0.00	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.1	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	11.1
Approach LOS			B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		19.6%	ICU Level of Service
Analysis Period (min)		15	

MOVEMENT SUMMARY

Site: New Site - 1

Fairview Avenue/Five Canyon Parkway/Star Ridge Road
Existing Conditions: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	1	2.0	0.242	5.8	LOS A	1.5	37.2	0.36	0.67	16.7
8T	T	57	2.0	0.242	5.8	LOS A	1.5	37.2	0.36	0.38	19.2
8R	R	189	2.0	0.242	5.8	LOS A	1.5	37.2	0.36	0.58	19.9
Approach		248	2.0	0.242	5.8	LOS A	1.5	37.2	0.36	0.54	19.8
East: Five Canyons Road											
1L	L	111	2.0	0.192	5.0	LOS A	1.1	27.2	0.26	0.66	18.5
6T	T	6	2.0	0.192	5.0	LOS A	1.1	27.2	0.26	0.40	20.5
6R	R	96	2.0	0.192	5.0	LOS A	1.1	27.2	0.26	0.56	19.8
Approach		213	2.0	0.192	5.0	LOS A	1.1	27.2	0.26	0.61	19.0
North: Fairview Avenue											
7L	L	76	2.0	0.145	5.1	LOS A	0.8	21.5	0.36	0.71	19.2
4T	T	61	2.0	0.145	5.1	LOS A	0.8	21.5	0.36	0.38	19.9
4R	R	4	2.0	0.145	5.1	LOS A	0.8	21.5	0.36	0.63	17.7
Approach		140	2.0	0.145	5.1	LOS A	0.8	21.5	0.36	0.57	19.4
West: Star Ridge Road											
5L	L	15	2.0	0.054	4.8	LOS A	0.3	6.9	0.45	0.72	17.1
2T	T	24	2.0	0.054	4.8	LOS A	0.3	6.9	0.45	0.44	20.8
2R	R	6	2.0	0.054	4.8	LOS A	0.3	6.9	0.45	0.66	17.6
Approach		46	2.0	0.054	4.8	LOS A	0.3	6.9	0.45	0.56	19.1
All Vehicles		647	2.0	0.242	5.3	LOS A	1.5	37.2	0.34	0.57	19.4

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

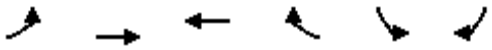
Site: New Site - 1

Fairview Avenue/Hansen Road/Vista Lane
Existing Conditions: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	43	2.0	0.231	5.9	LOS A	1.4	35.5	0.39	0.79	17.0
8T	T	185	2.0	0.231	5.9	LOS A	1.4	35.5	0.39	0.42	19.5
8R	R	1	0.0	0.231	5.9	LOS A	1.4	35.5	0.39	0.62	20.1
Approach		229	2.0	0.231	5.9	LOS A	1.4	35.5	0.39	0.49	18.9
East: Vista Lane											
1L	L	1	0.0	0.010	4.7	LOS A	0.0	1.1	0.50	0.68	18.8
6T	T	1	0.0	0.010	4.7	LOS A	0.0	1.1	0.50	0.49	20.4
6R	R	5	2.0	0.010	4.7	LOS A	0.0	1.1	0.50	0.60	20.1
Approach		7	1.4	0.010	4.7	LOS A	0.0	1.1	0.50	0.60	19.9
North: Fairview Avenue											
7L	L	1	0.0	0.227	5.0	LOS A	1.5	38.6	0.23	0.68	19.2
4T	T	112	2.0	0.227	5.0	LOS A	1.5	38.6	0.23	0.30	20.0
4R	R	161	2.0	0.227	5.0	LOS A	1.5	38.6	0.23	0.60	17.6
Approach		273	2.0	0.227	5.0	LOS A	1.5	38.6	0.23	0.48	18.6
West: Hansen Road											
5L	L	128	2.0	0.159	5.1	LOS A	0.9	22.5	0.34	0.60	16.7
2T	T	1	2.0	0.159	5.1	LOS A	0.9	22.5	0.34	0.35	20.4
2R	R	29	2.0	0.159	5.1	LOS A	0.9	22.5	0.34	0.57	17.0
Approach		157	2.0	0.159	5.1	LOS A	0.9	22.5	0.34	0.59	16.8
All Vehicles		667	2.0	0.231	5.3	LOS A	1.5	38.6	0.31	0.51	18.2

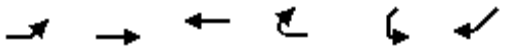
Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	157	169	89	172	198	99
Peak Hour Factor	0.89	0.89	0.85	0.85	0.73	0.73
Hourly flow rate (vph)	176	190	105	202	271	136

Direction, Lane #	EB 1	WB 1	WB 2	SB 1	SB 2
Volume Total (vph)	366	105	202	271	136
Volume Left (vph)	176	0	0	271	0
Volume Right (vph)	0	0	202	0	136
Hadj (s)	0.13	0.03	-0.57	0.23	-0.57
Departure Headway (s)	5.0	5.2	3.2	5.3	3.2
Degree Utilization, x	0.50	0.15	0.18	0.40	0.12
Capacity (veh/h)	699	640	1121	627	1121
Control Delay (s)	12.9	9.1	6.9	11.9	6.6
Approach Delay (s)	12.9	7.7		10.1	
Approach LOS	B	A		B	

Intersection Summary			
Delay	10.4		
HCM Level of Service	B		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	70	298	214	27	15	47
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.91	0.91	0.55	0.55
Hourly flow rate (vph)	80	343	235	30	27	85
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	265				753	250
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	265				753	250
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				92	89
cM capacity (veh/h)	1299				354	789

Direction, Lane #	EB 1	EB 2	WB 1	SW 1
Volume Total	80	343	265	113
Volume Left	80	0	0	27
Volume Right	0	0	30	85
cSH	1299	1700	1700	608
Volume to Capacity	0.06	0.20	0.16	0.19
Queue Length 95th (ft)	5	0	0	17
Control Delay (s)	8.0	0.0	0.0	12.3
Lane LOS	A			B
Approach Delay (s)	1.5		0.0	12.3
Approach LOS				B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	14	140	8	22	215
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.89	0.89	0.86	0.86
Hourly flow rate (vph)	8	28	157	9	26	250
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	463	162			166	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	463	162			166	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			98	
cM capacity (veh/h)	547	883			1412	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	166	276
Volume Left	8	0	26
Volume Right	28	9	0
cSH	777	1700	1412
Volume to Capacity	0.05	0.10	0.02
Queue Length 95th (ft)	4	0	1
Control Delay (s)	9.9	0.0	0.9
Lane LOS	A		A
Approach Delay (s)	9.9	0.0	0.9
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	191	0	0	134	1	0
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.91	0.91	0.25	0.25
Hourly flow rate (vph)	220	0	0	147	4	0
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			222		369	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			222		369	222
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1345		630	817

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	220	147	4
Volume Left	0	0	4
Volume Right	0	0	0
cSH	1700	1345	630
Volume to Capacity	0.13	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	10.7
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.7
Approach LOS			B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	20.3%	ICU Level of Service	A
Analysis Period (min)	15		

MOVEMENT SUMMARY

Site: New Site - 1

Fairview Avenue/Five Canyon Parkway/Star Ridge Road
Existing Conditions: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	5	2.0	0.207	6.0	LOS A	1.2	30.9	0.44	0.69	16.7
8T	T	41	2.0	0.207	6.0	LOS A	1.2	30.9	0.44	0.44	19.0
8R	R	142	2.0	0.207	6.0	LOS A	1.2	30.9	0.44	0.61	19.8
Approach		188	2.0	0.207	6.0	LOS A	1.2	30.9	0.44	0.58	19.6
East: Five Canyons Road											
1L	L	156	2.0	0.240	5.3	LOS A	1.4	36.4	0.24	0.66	18.3
6T	T	20	2.0	0.240	5.3	LOS A	1.4	36.4	0.24	0.39	20.3
6R	R	104	2.0	0.240	5.3	LOS A	1.4	36.4	0.24	0.56	19.6
Approach		280	2.0	0.240	5.3	LOS A	1.4	36.4	0.24	0.60	18.8
North: Fairview Avenue											
7L	L	142	2.0	0.249	6.6	LOS A	1.6	39.4	0.48	0.72	18.4
4T	T	65	2.0	0.249	6.6	LOS A	1.6	39.4	0.48	0.46	18.5
4R	R	16	2.0	0.249	6.6	LOS A	1.6	39.4	0.48	0.66	16.7
Approach		224	2.0	0.249	6.6	LOS A	1.6	39.4	0.48	0.64	18.3
West: Star Ridge Road											
5L	L	14	2.0	0.044	5.3	LOS A	0.2	5.7	0.54	0.73	16.9
2T	T	15	2.0	0.044	5.3	LOS A	0.2	5.7	0.54	0.50	20.4
2R	R	4	2.0	0.044	5.3	LOS A	0.2	5.7	0.54	0.68	17.3
Approach		33	2.0	0.044	5.3	LOS A	0.2	5.7	0.54	0.62	18.5
All Vehicles		725	2.0	0.249	5.9	LOS A	1.6	39.4	0.38	0.61	18.8

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Site: New Site - 1

Fairview Avenue/Hansen Road/Vista Lane
Existing Conditions: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Fairview Avenue											
3L	L	32	2.0	0.198	5.6	LOS A	1.2	30.3	0.38	0.80	17.1
8T	T	161	2.0	0.198	5.6	LOS A	1.2	30.3	0.38	0.41	19.7
8R	R	1	0.0	0.198	5.6	LOS A	1.2	30.3	0.38	0.62	20.4
Approach		194	2.0	0.198	5.6	LOS A	1.2	30.3	0.38	0.48	19.2
East: Vista Lane											
1L	L	1	0.0	0.004	4.4	LOS A	0.0	0.5	0.46	0.67	19.0
6T	T	1	2.0	0.004	4.4	LOS A	0.0	0.5	0.46	0.45	20.9
6R	R	1	0.0	0.004	4.4	LOS A	0.0	0.5	0.46	0.58	20.5
Approach		4	0.7	0.004	4.4	LOS A	0.0	0.5	0.46	0.57	20.0
North: Fairview Avenue											
7L	L	4	2.0	0.277	5.3	LOS A	2.0	50.1	0.20	0.76	19.1
4T	T	244	2.0	0.277	5.3	LOS A	2.0	50.1	0.20	0.31	20.0
4R	R	106	2.0	0.277	5.3	LOS A	2.0	50.1	0.20	0.66	17.5
Approach		353	2.0	0.277	5.3	LOS A	2.0	50.1	0.20	0.42	19.2
West: Hansen Road											
5L	L	120	2.0	0.195	6.3	LOS A	1.1	27.6	0.50	0.67	16.1
2T	T	1	2.0	0.195	6.3	LOS A	1.1	27.6	0.50	0.49	19.4
2R	R	44	2.0	0.195	6.3	LOS A	1.1	27.6	0.50	0.65	16.4
Approach		165	2.0	0.195	6.3	LOS A	1.1	27.6	0.50	0.67	16.2
All Vehicles		715	2.0	0.277	5.6	LOS A	2.0	50.1	0.32	0.49	18.4

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

Attachment 5: Preliminary Geotechnical Report

Via Email and Pickup

Revised May 1, 2014
Job No. 3255.001

BERLOGAR STEVENS & ASSOCIATES

Mr. Gary Brooks
Northbrook Homes, LLC
7020 Koll Center Parkway, Suite 101
Pleasanton, California 94566

Subject: Response to Comments
Borel Bank Residential Subdivision, Tract 8057
Fairview Avenue
Castro Valley, California

Dear Mr. Brooks:

Berlogar Stevens & Associates is providing our response to comments from the county. We reviewed the Preliminary Grading Plans by Ruggeri-Jensen-Azar dated March 6, 2014. We prepared a Preliminary Geotechnical Investigation dated July 5, 2010 for the subject site. Upon review of the Preliminary Grading Plan, it is our opinion that the conclusions and recommendation presented in our report are still applicable, except for the 2010 seismic design criteria. The updated 2013 seismic design criteria is presented below:

2013 Seismic Design Criteria

The subject site is located at approximately 37.6778 degrees north latitude and 122.0426 degrees west longitude. The peak ground acceleration (PGA) The PGA according to the 2013 CBC is 0.81g. We are providing the following 2013 California Building Code seismic design criteria per the USGS Seismic Design Maps program, Version 3.1.0, dated July 11, 2013.

California Building Code	**2013**
Mapped Spectral Acceleration for Short Periods, S_s	2.106 g
Mapped Spectral Acceleration for 1-Second Period, S_1	0.865 g
Site Class	D
Site Coefficient F_a (for Site Class D)	1.0
Site Coefficient F_v (for Site Class D)	1.5
Acceleration Parameter S_{MS} (adjusted for Site Class D)	2.106 g
Acceleration Parameter, S_{M1} (adjusted for Site Class D)	1.298 g
Acceleration Parameter, S_{DS}(adjusted for Site Class D)	1.404 g
Acceleration Parameter, S_{D1} (adjusted for Site Class D)	0.865 g

Northeastern Portion of the Site being within a Seismic Hazard Zone

The extreme northeast corner of the site is located in a Seismic Hazard Zone for Landslides. This zone is mapped as being below about elevation 620 feet and is shown on Plate 1, Site Plan. Cross section AA' on Plate 1 shows a geologic section through this area. Test Pit 7 located near this area shows the bedrock to be hard sandstone and mantled with approximately 3 feet of residual soil. The fill slope to be constructed above this zone will be keyed into competent sandstone bedrock and subdrains will be installed in the keyway and the benches. If the residual soil over the bedrock in the lower portion of the hillside were to move during a major seismic event, the fact that the fill is keyed into the hard bedrock and is drained should prevent the fill from failing.

Colluvium Rework

We reviewed the geologic mapping for the site presented in our report. There are two areas mapped with colluvium. One is on the western portion of the site crossing Lots C, F, 1 through 3, and Street A. The second area is located in the northeastern portion of the site, crossing Lot 9 and part of the fill slope above Lots 8 through 11. The colluvium will be overexcavated based on the soil conditions exposed during site grading. Colluvial soils will be removed and replaced with engineered fill, and therefore not affect the balance of earthwork quantities.

We trust this provides the necessary information. If you have any questions, please contact us at (925) 484-0220.

Respectfully Submitted,

BERLOGAR STEVENS & ASSOCIATES

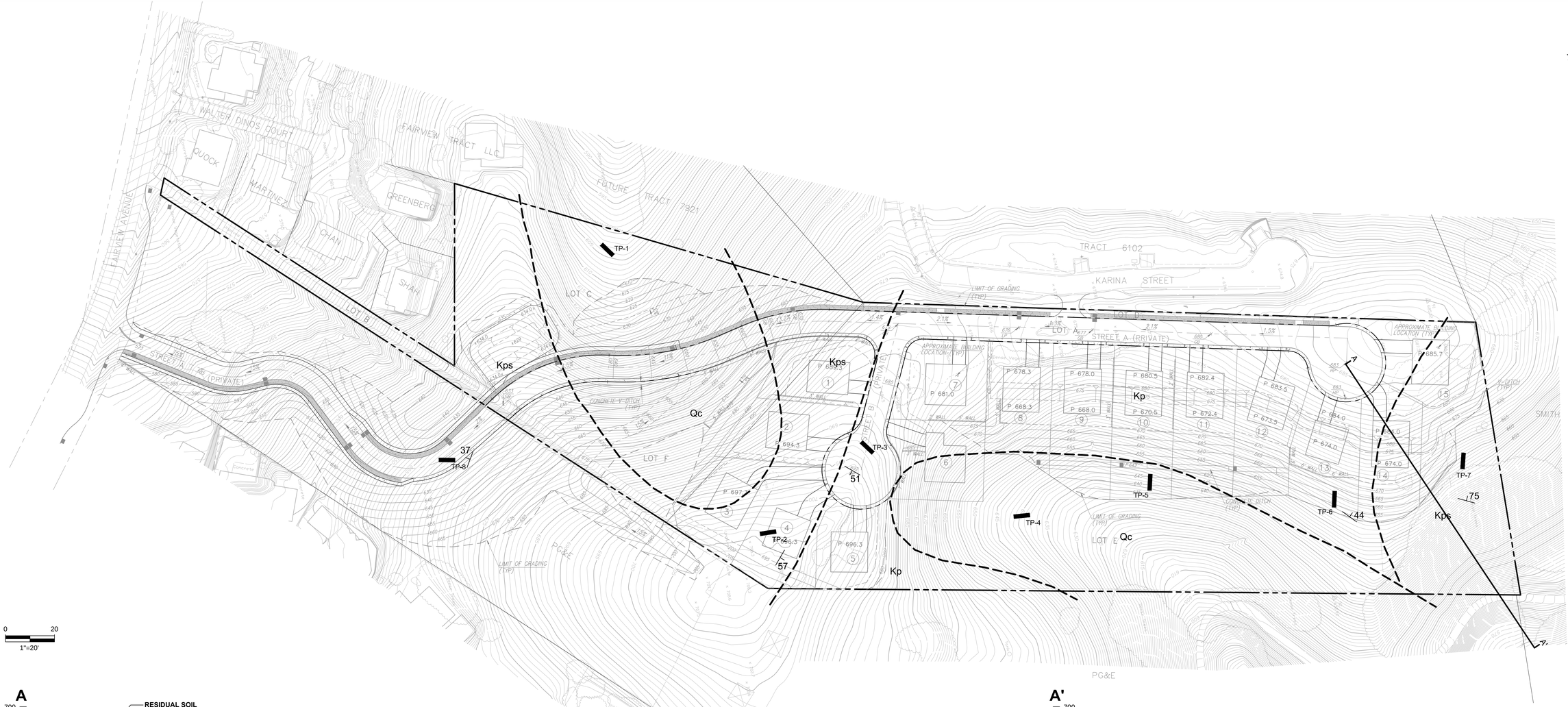
Nicholas Cardanini
Staff Engineer

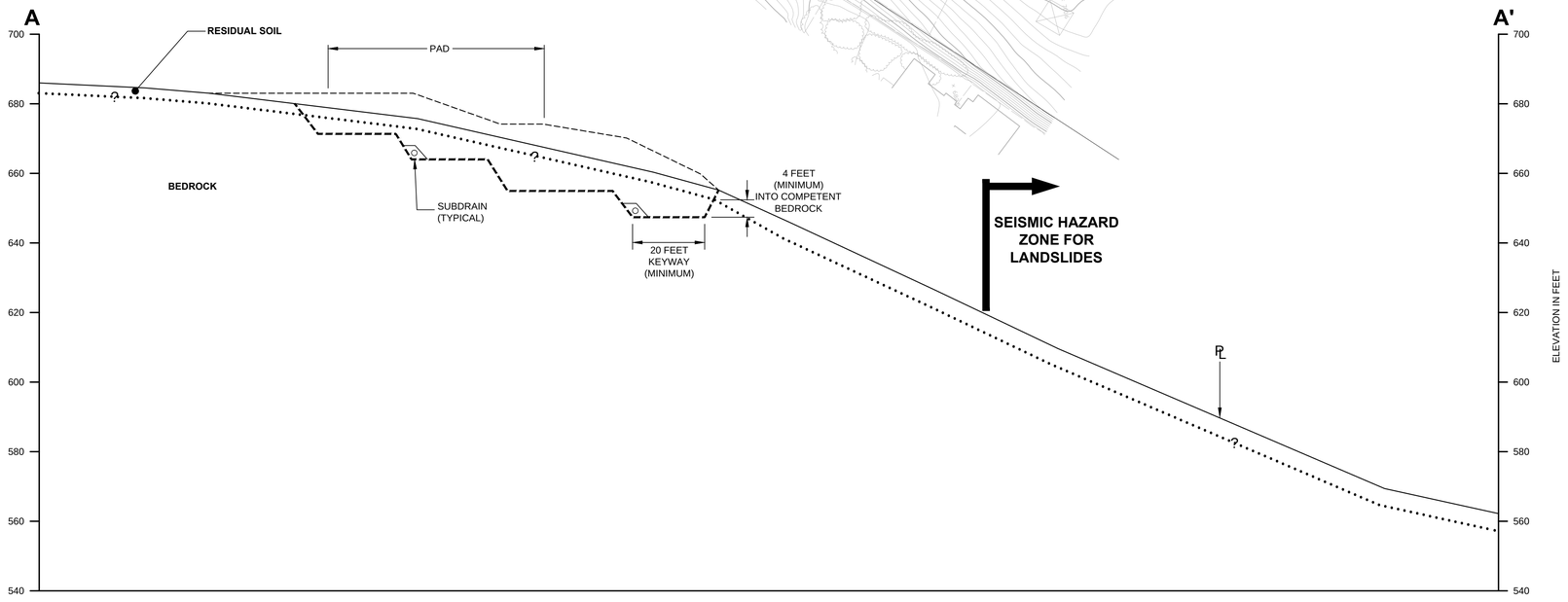
Frank Berlogar
RCE 20383

NC/FB;jmo/rd

Attachments: Plate 1 – Site Plan

U:\@@@Public\1-Pleasanton\3255-Borel Bank\001- Concultation II\Revised Borel Bank Comment Response.docx





EXPLANATION

- A — A' : CROSS SECTION LOCATION
- GEOLOGIC CONTACT
- TP-8 : TEST PIT LOCATION
- 57 : STRIKE AND DIP OF BEDDING
- Qc : COLLUVIUM, MORE THAN ABOUT 5 FEET DEEP
- Kp : PANOCHE FORMATION, CLAY SHALE WITH MINOR THIN SANDSTONE BEDS
- Kps : PANOCHE FORMATION, ARKOSIC SANDSTONE, SOME INTERBEDDED CLAY SHALE, LOCALLY CONTAINS LARGE CONCRETIONS

SITE PLAN

BOREL BANK PROPERTY

FAIRVIEW AVENUE
CASTRO VALLEY, CALIFORNIA
FOR
NORTHBROOK HOMES

Berlogar Stevens & Associates
SOIL ENGINEERS * ENGINEERING GEOLOGISTS

JOB NUMBER: 3255.001 DATE: 5-1-14 DRAWN BY: CC

BASE: SHHET C-3 TITLED, "PRELIMINARY GRADING PLAN - ALTERNATIVE TRACT 8057 - LEROB, LLC", PREPARED BY RUGGERI-JENSEN-AZAR, DATED 3-6-14

PLATE

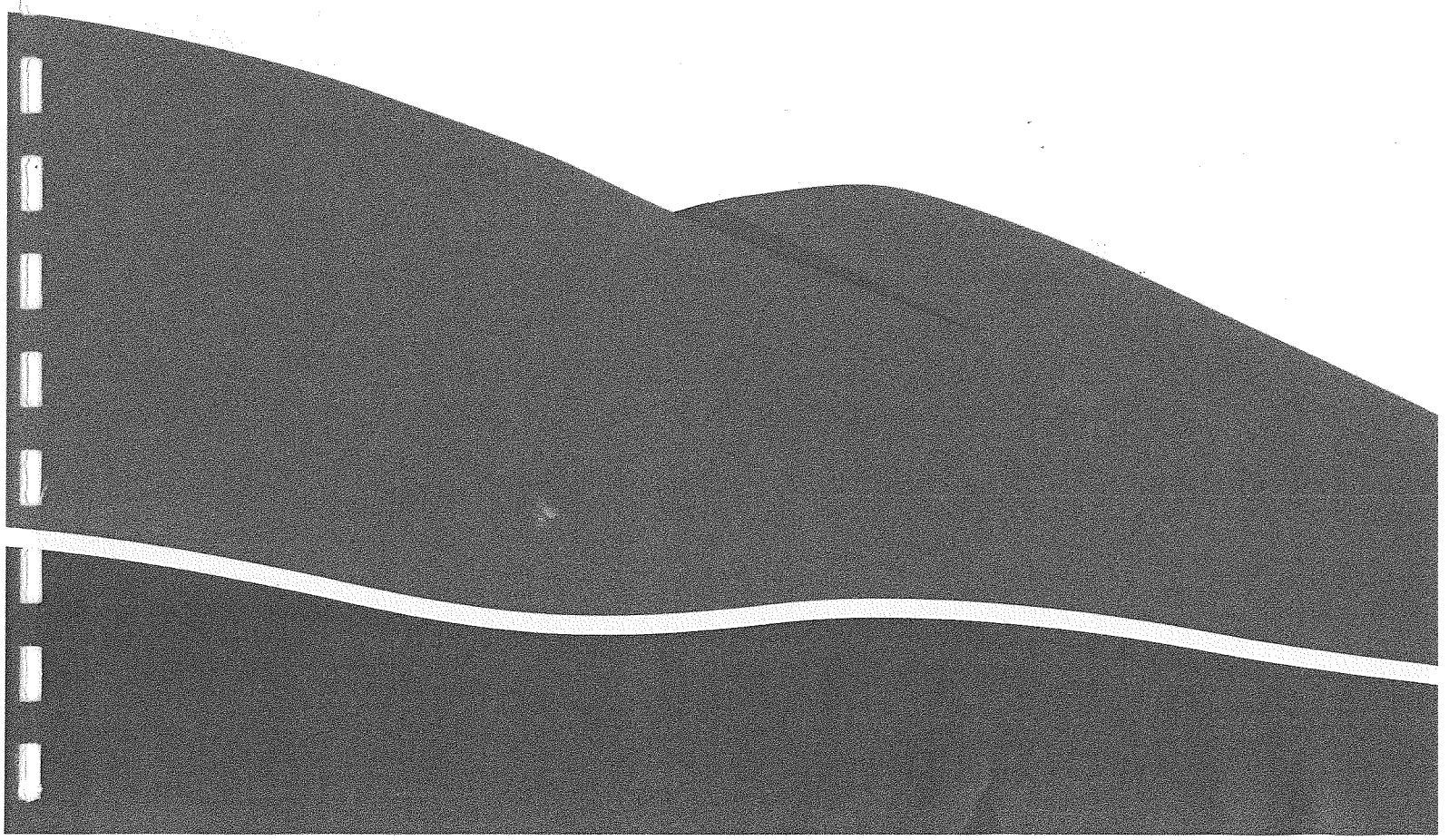
BGC

BERLOGAR
GEOTECHNICAL
CONSULTANTS

SOIL ENGINEERS
ENGINEERING GEOLOGISTS

PRELIMINARY GEOTECHNICAL INVESTIGATION
BOREL BANK PROPERTIES RESIDENTIAL SUBDIVISION
FAIRVIEW AVENUE
HAYWARD, CALIFORNIA

FOR
NORTHBROOK HOMES, LLC
July 8, 2010



July 8, 2010
Job No. 3255.100

BGC
BERLOGAR
GEOTECHNICAL
CONSULTANTS

Mr. Gary Brooks
Northbrook Homes, LLC
7020 Koll Center Parkway, Suite 101
Pleasanton, California 94566

Subject: Preliminary Geotechnical Investigation
Borel Bank Properties Residential Subdivision
Fairview Avenue
Hayward, California

Dear Mr. Brooks:

This report presents the results of our preliminary geotechnical investigation for a proposed 18-lot single-family residential subdivision in Hayward, California. Plate 1, Vicinity Map, shows the locations of the site. We expect the one and two-story residences will be supported on shallow foundations. The residential development will include cuts and fill up to about 20 feet deep. A new road will be constructed up from Fairview Avenue to access the development. A detention basin is proposed in the southwest corner of the property.

PURPOSE AND SCOPE OF SERVICES

The purpose of this preliminary investigation was to investigate the site soil, bedrock and groundwater conditions and to evaluate the feasibility of planned development from a geotechnical engineering standpoint. Our scope of services included:

1. Review of published maps and literature pertinent to the site and vicinity,
2. Reviewing existing geotechnical and geologic reports pertaining to the site,
3. Excavating and logging exploratory test pits,
4. Preliminary geotechnical engineering and geologic analysis,
5. Providing preliminary grading, retaining wall and foundation recommendations, and
6. Preparation of this report.

SITE CONDITIONS

SURFACE CONDITIONS

The approximate 10.1-acre, roughly rectangular-shaped site is located on the north side of Fairview Avenue as shown on Plate 2, Site Plan. The site is currently accessed from Fairview Avenue on the

south and from Karina Street on the west. A high knob is located in the south-central portion of the site with an elevation of about 710 feet MSL. The site slopes down from the knob in three directions: towards the northeast to 610 feet MSL, to the west to 600 ft MSL, and to the southwest to Fairview Avenue at about 560 ft MSL. The northwestern boundary abuts Karina Street along a ridgeline. A PG&E electric transmission tower easement runs northeasterly outside the eastern property boundary.

SUBSURFACE CONDITIONS

Eight test pits between 4 to 13 feet deep were excavated at the site on May 11, 2010. The test pits indicate that the site is underlain by a thin soil layer over Panoche shale and sandstone bedrock with colluvium over bedrock in the drainage swales as shown on the Site Plan. The soil mantling the bedrock was about 2 to 3 feet thick over the sandstone and 4 to 5 feet thick over the shale. The soil overlying the bedrock generally consisted of gray brown, moist, stiff silty and sandy clay. A sliver fill consisting of a mixture of sand, gravel, and silty clay was encountered in the upper foot of TP-2. Graphic test pit logs are contained on Plates 3 and 4.

Colluvium interpreted to be more than about 5 feet thick is shown on Plate 2, Site Plan. Colluvial soil encountered in TP-1 was about 10 feet thick over the bedrock and consisted of gray-brown, medium stiff to stiff, moist to wet sandy and silty clay. TP-4 was excavated to a depth of 13 feet and encountered moist to wet, stiff, silty and clayey sand colluvium. Bedrock was not exposed at the bottom of TP-4.

Panoche sandstone covers half the site in the higher elevation ridges and knobs and Panoche shale was encountered in the northern, lower lying portion of the site. The sandstone was found to be light gray brown, moderately hard to hard, highly weathered, moderately fractured, with fine to medium-grained sand particles. The Panoche shale material encountered in TP-3, TP-5, and TP-6 was found to be gray-brown, friable, highly weathered, highly fractured shale and sandstone. The strike and dip of bedding, where visible in the test pits, were obtained and are shown on the Site Plan. The bedrock has been folded, sheared, and deformed in this area due to the proximal Hayward fault. As such, bedding orientation varies throughout the site.

GROUNDWATER

Groundwater was not encountered in the test pits.

GEOLOGIC HAZARDS

LANDSLIDES

Mapped landslides at the sites were not found in the geologic literature in our files and we did not find evidence of active landslides during our field exploration.

EARTHQUAKES

The site is not located within a designated State of California Earthquake Fault Zone for active faults. We did not observe signs of active faults during our field exploration. Hence, the potential for surface fault rupture at the site is low. The peak ground acceleration at this site (37.6778 degrees latitude and -122.0426 degrees longitude) according to the California Geologic Survey website is 0.686 g.

LIQUEFACTION AND DYNAMIC COMPACTION

Liquefaction is the temporary transformation of saturated, loose cohesionless soils into a viscous liquid during strong ground shaking from a major earthquake. The site is underlain by clayey soils and bedrock. Therefore, the risk of liquefaction at the site is believed to be low. Dynamic compaction is the densification of dry, loose sandy soil above the water table. Loose, relatively clean sandy soil was not encountered in the test pits and borings, hence, the potential for dynamic compaction is considered to be low.

SOIL CORROSIVITY

A soil sample from TP-4 was submitted to CERCO Analytical, a California state certified laboratory, for corrosion testing. The test results and a brief evaluation by CERCO are attached. The soil was found to be mildly corrosive to buried steel and iron. The soil was not found to be corrosive to concrete in contact with the ground.

PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

GENERAL

From a geotechnical engineering standpoint, the proposed development appears to be feasible at the site, provided the preliminary conclusions and recommendations contained in this report are followed as project planning advances. The preliminary conclusions and recommendations are not adequate for final project design; therefore, a design-level geotechnical investigation should be performed to provide conclusions and recommendations for the design and construction of the project.

EXISTING COLLUVIUM

Two areas of colluvium are present at the site as shown on Plate 2, Site Plan. The colluvium on the south end of the project is located in an area of cut and fill grading, and the north end colluvium covers areas of graded fill and undisturbed ground. Colluvial soil within the development limits will likely have to be removed and replaced as engineered fill. A keyway and keyway drains will be required along the property boundary for the southern colluvial area at the proposed detention basin. A keyway and keyway drains may be needed for the northern colluvial zone in the proposed fill area. The keyway would be constructed within the proposed fill area along the boundary of the proposed

fill and undeveloped zone. The keyways may need to be internally reinforced with geogrid. Benching and intermediate subdrains will also be required (see Plate 5, Typical Subdrain Details).

HARD SANDSTONE BEDROCK

Our experience in the general area indicates that hard concretions of sandstone are present in the Panoche sandstone that are likely to be very difficult to excavate. Overexcavation should be considered during mass grading for deep utilities and street utility corridors in cut areas due to the potentially hard rock. Oversized rock will be generated and may need to be buried in deep fill, utilized for landscaping or removed from the site. The design level geotechnical investigation will need to address the potential for hard rock excavation during mass grading and underground utility trenching.

CUT/FILL TRANSITION LOTS

Overexcavation of the cut portion of cut and fill transition lots will be necessary to reduce the potential for differential settlement of the residences.

CUTSLOPE STABILITY

The bedding in the underlying bedrock is not oriented adversely in relation to the proposed grading plan. Our experience indicates that cuts in the sandstone may be relatively stable. Temporary cut slope stability in the sheared shale and sandstone in the central portion of the site will need to be addressed in the design level report.

EXISTING UNDOCUMENTED FILL

A sliver fill was encountered in TP-2. This fill material appears likely to be removed by cut grading in this area. If other areas of undocumented fill are encountered, the fill material would need to be removed and replaced as engineered fill.

EXPANSIVE SOIL

We performed Atterberg Limits tests on two clayey soil samples obtained from the site. The results are shown on the Test Pit logs. The Plasticity Index was found to be 6 and 9 with a corresponding Liquid Limit of 22 and 25. Hence, the soil at the site appears to have low expansion potential.

SITE PREPARATION AND GRADING

We anticipate that recommendations for site preparation and grading will be typical for residential projects in the vicinity. Detailed recommendations for clearing and stripping, over-excavation of the existing fill, subgrade preparation, selection and evaluation of fill material, relative compaction and moisture conditioning of fill materials, benching and subdrainage of fill should be provided in the future design-level geotechnical investigation.

OVEREXCAVATION RECOMMENDATIONS

The two areas of colluvium located within the development boundary, where not removed by mass grading, should be overexcavated and replaced as engineered fill. We expect the colluvium to be up to 20 feet thick in pockets with an average thickness of about 10 feet. Colluvium exposed in cut slopes will need to removed and built back as engineered fill slopes.

Overexcavation will likely be needed in cut and fill transition areas to reduce potential differential settlement. Due to the potentially hard sandstone bedrock in the southern half of the site, utility corridors in cut areas may need to be overexcavated during mass grading. It would be easier to overexcavate hard rock during large mass grading with heavy equipment rather than during utility trench installation with backhoes or excavators. Oversized rock generated during mass grading may be buried in deep fill areas, used in landscaping, or removed from the site.

CUT AND FILL SLOPES

On a preliminary basis, we recommend the following cut and fill slope inclinations.

- Cut and fill slopes up to 10 feet high can be inclined at 2H:1V.
- Cut slopes over 10 feet high in sandstone can be inclined at 2H:1V.
- Fill slopes over 10 feet high constructed with clayey soil should be inclined at 3H:1V
- Fill slopes over 10 feet high constructed with sandy soil can be inclined at 2H:1V.
- Cut and fill slopes more than 30 feet high should be evaluated further.

KEYWAYS

A keyway is recommended for the base of slopes located in the two areas of colluvium (see Site Plan). A keyway in colluvium may be required along the western property boundary at the detention basin location and above the northeastern swale along the grading limits. These keyways may need to be internally reinforced with geogrid.

SUBDRAINAGE

Subdrains may be required for rebuilt cut slopes, intermediate benches and keyways (see Plate 5, Typical Subdrain Details). We also recommend edge underdrains for streets in pavement areas as shown on Roadway Underdrain, Plate 6. Subdrains should consist of perforated PVC pipe conforming to ASTM Designation D 2751, Type SDR 35. Subdrain pipes should have two rows of holes and should be installed with holes facing downward. Subdrain pipes should be at least 6 inches in diameter. Subdrain pipes should be underlain and surrounded by at least 6 inches of Caltrans Class 2 permeable material, as defined in Section 68-1.025 of the State of California Standard Specification (May 2006). Subdrain systems should discharge into storm drain structures, where possible, or other suitable surface discharge points.

FOUNDATION CONSIDERATIONS

It is our opinion that, from a geotechnical engineering standpoint, the proposed houses be supported on post-tension concrete slab foundations. The PT slabs should be designed in accordance with the 2007 CBC requirements and to accommodate potential differential settlement from differential fill settlement.

CORROSION CONSIDERATIONS

A sample of soil was submitted CERCO Analytical laboratories for corrosivity testing. The results of the tests will be presented once the testing in completed.

SEISMIC DESIGN PARAMETERS

It is likely that the site will be subjected to strong ground shaking from at least one moderate to severe earthquake during the life span of the project. According to the United States Geological Survey, Earthquake Ground Motion Parameters program, version 5.0.9a dated 10-21-09, the following 2007 CBC seismic design parameters should be incorporated in the structural design of the proposed buildings (for a site located at 37.6778 degrees latitude and -122.0426 degrees longitude).

Site Class	**C**
Mapped Spectral Acceleration for Short Periods, S_s, for Site Class B with 5% damping	1.786 g
Mapped Spectral Acceleration for 1-second Period, S_1, for Site Class B with 5% damping	0.665 g
SM_s for Site Class C	1.786 g
SM_1 for Site Class C	0.864 g
SD_s for Site Class C	1.191 g
SD_1 for Site Class C	0.576 g

PRELIMINARY PAVEMENT SECTIONS

Pavement analyses are based upon an assumed resistance R-value of 10, which we expect to be representative of final pavement subgrade materials. We recommend the following preliminary pavement sections based on the Caltrans Design Method for Flexible Pavement.

Design Parameters		**Thickness (inches)**	
Traffic Index	R-Value	Asphalt Concrete	Class 2 Aggregate Base
4½	10	3	7
5	10	3	9
6	10	4	10

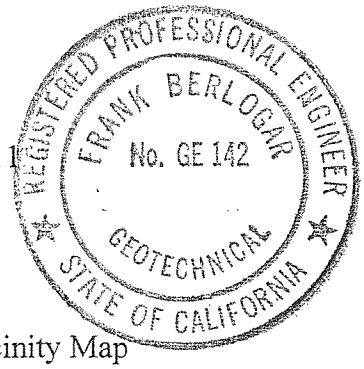
LIMITATIONS

The preliminary conclusions and recommendations of this report are based upon the information provided to us regarding the proposed residential development, subsurface conditions encountered at the test pit locations, our site reconnaissance, and professional judgment. The locations of the test pits were determined in the field by estimating from topographic and cultural features, and are to be considered approximate only. Site conditions are described in the text as they were observed during our site reconnaissance in the spring of 2010, and are not necessarily representative of such conditions at other locations and times. This study has been conducted in accordance with current professional geotechnical engineering and engineering geologic standards; no other warranty is expressed or implied.

We trust this provides the necessary information. If you have any questions, please contact the undersigned at (925) 484-0220. Thank you for the opportunity of providing professional services for you.

Respectfully submitted,

BERLOGAR GEOTECHNICAL CONSULTANTS



Frank Berlogar
GE 142, Exp. 9/30/11

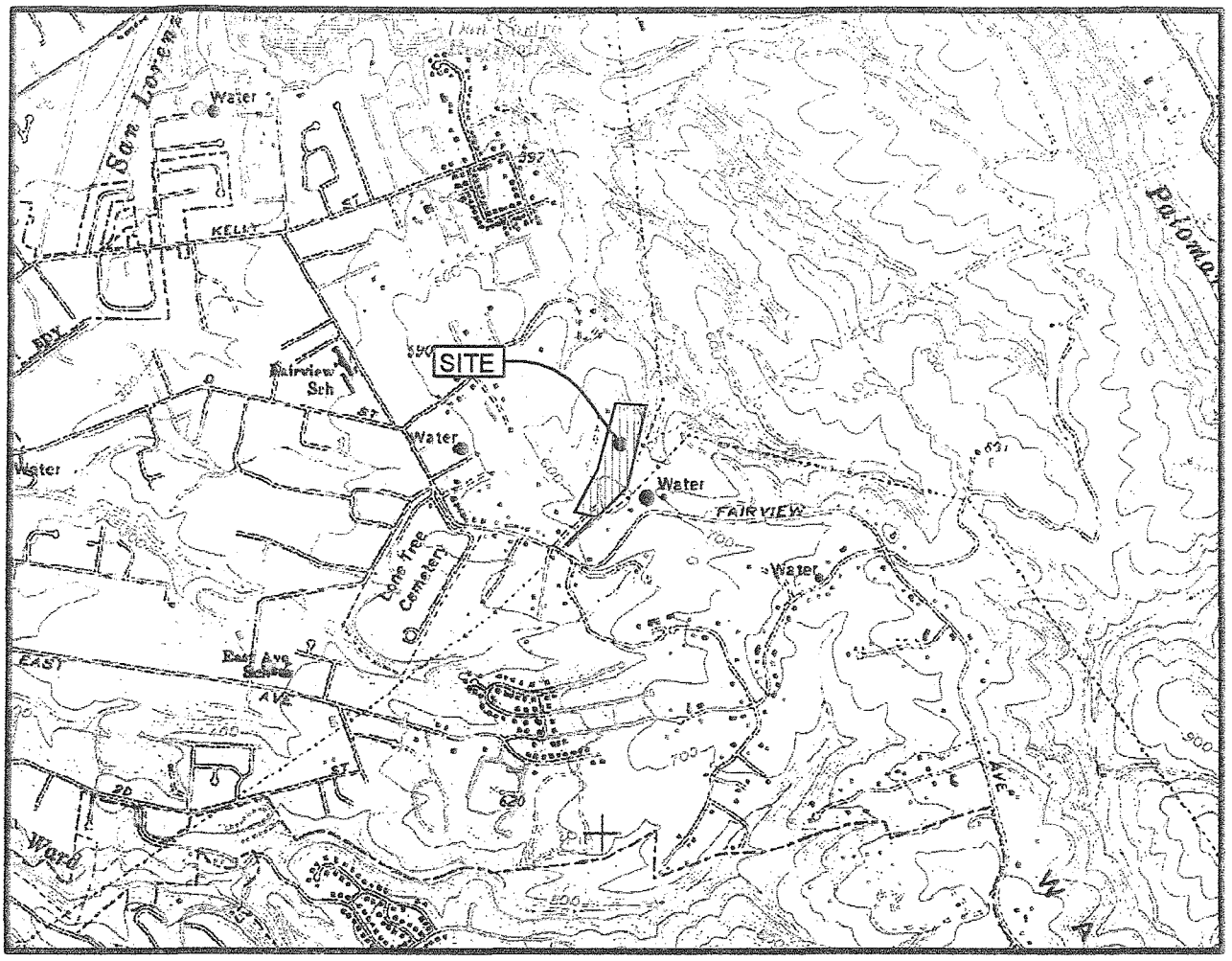
WRS/FB:jmb

Attachments:
- Plate 1 – Vicinity Map
- Plate 2 – Site Plan
- Plates 3 and 4 – Test Pit Logs
- Plate 5 – Typical Subdrain Details
- Plate 6 – Roadway Underdrain
- CERCO Corrosivity Test Results, 2 pages

Copies: Addressee (6)

3255.100/23011.doc

JOB NUMBER: 3255.100 DATE: 5-21-10 BY: CC



0 2000'

1"=2000'

VICINITY MAP

BOREL BANK RESIDENTIAL SUBDIVISION

CASTRO VALLEY, CALIFORNIA

FOR

NORTH BROOK HOMES

7/1/2010 8:52:44 AM

BASE: PORTION OF U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, HAYWARD, CALIFORNIA, PHOTOREVISED 1980, AT A SCALE OF 1:24,000.

PLATE 1