

City of St. Helens

Planning Commission

October 11, 2016

Agenda

1. **7:00 p.m. Call to Order and Flag Salute**
2. **Consent Agenda**
 - a. Planning Commission Minutes dated September 13, 2016
3. **Topics from the Floor:** Limited to 5 minutes per topic (Not on Public Hearing Agenda)
4. **Public Hearing Agenda:** (times are earliest start time)
 - a. 7:00 p.m. - Subdivision (Elk Ridge Estates Phase 6) at Elk Meadows Dr. - 3J Consulting, Inc.
5. **Acceptance Agenda: Planning Administrator Site Design Review:**
 - a. Site Design Review at Lots 1-16, Block 27 of the South St. Helens Addition - OHM Equity Partners, LLC
6. **Planning Director Decisions:** (previously e-mailed to the Commission)
 - a. Sign Permit (Banner) at 2100 Block of Columbia Blvd. - Kick-off Halloween Parade
 - b. Home Occupation (Type I) at 48 Red Cedar St. - Cupcake bakery delivery business
 - c. Sign Permit (Wall) at 58731 S. Columbia River Hwy - Replace existing Papa Murphy's sign
 - d. Sign Permit (Wall) at 745 S. Columbia River Hwy - Replace gas station canopy signs
 - e. Home Occupation (Type I) at 34966 Roberts Ln. - Home office/brewery
 - f. Tree Removal Permit at 203 S. Columbia River Hwy - Remove six trees (2 clusters) along Milton Creek
7. **Planning Department Activity Reports**
 - a. September 26, 2016
8. **For Your Information Items**
9. **Next Regular Meeting: November 8, 2016**

Adjournment

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City of St. Helens
Planning Commission Meeting
September 13, 2016
Minutes

Members Present:

Dan Cary, Chair
Al Petersen, Vice Chair
Greg Cohen, Commissioner
Sheila Semling, Commissioner
Audrey Webster, Commissioner
Kathryn Lawrence, Commissioner
Russell Hubbard, Commissioner

Staff Present:

Jacob Graichen, City Planner
Jennifer Dimsho, Assistant Planner & Planning Secretary

Councilors Present:

Ginny Carlson, City Council Liaison

Others Present:

Robert & Muriel Wenner
Annie & Richard Buell
John Warneke

The Planning Commission meeting was called to order by Chair Dan Cary at 7:00 p.m. Chair Cary led the flag salute.

Consent Agenda

Approval of Minutes

Vice Chair Petersen noted that the word "announced" on page two should be "unannounced." Commissioner Cohen said in the first paragraph of deliberations on page three, Chair Cary should be changed to Vice Chair Petersen. Commissioner Webster moved to approve the minutes of the July 12, 2016 Planning Commission meeting with the two corrections as noted. Commissioner Semling seconded the motion. Motion carried with all in favor. Chair Cary did not vote as per operating rules.

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Topics From The Floor

There were no topics from the floor.

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CLG Historic Preservation Grant Project Summary Report

Assistant Planner Jenny Dimsho discussed the four projects that were completed, as presented in the memo. Commissioner Cohen asked if this program will continue. Dimsho said as long as the State Historic Preservation Office (SHPO) continues to offer the grant program, we will apply. Commissioner Webster and Commissioner Cohen thanked staff for preparing this summary report.

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Public Hearing

Wayne Weigandt

**Comprehensive Plan/Zoning Map Amendment / CPZA.1.16
35090 Pittsburg Rd.**

It is now 7:08 p.m. and Chair Cary opened the public hearing. There were no conflicts of interest or personal bias in this matter.

Graichen entered the following items into the record:

- Staff report packet dated September 6, 2016 with attachments

Graichen provided a letter in opposition to the proposal to the Commission. It was entered into the record last week. Graichen explained the background of the proposal, as presented in the staff report. The applicant is requesting a Comprehensive Plan Amendment from Suburban Residential (SR) to General Residential (GR) and a Zoning Amendment from Moderate Residential (R7) to General Residential (R5). He said the Commission's recommendation to City Council could focus on compatibility with adjacent land uses.

Vice Chair Petersen asked when the property was originally annexed. Graichen said the western tax lot was annexed after the other tax lot, but he did not know exactly when. Commissioner Cohen asked if the City had conducted a housing needs analysis that identified the types of housing we need. Graichen said no, there is only anecdotal evidence of the need for additional housing.

Commissioner Lawrence asked if there are still vacant homes from the recession. Graichen said the building department would have better knowledge about that. Commissioner Cohen noted that houses are on the market for very few days before they are bought, some receiving many offers before selling.

IN FAVOR

Weigandt, Wayne. Applicant. Weigandt explained that he has owned the property since 2006. He had a preliminary plat for the property, but then the market collapsed. He would like to resurrect the old proposal. Weigandt explained the approved preliminary plat does not have adequate street widths according to the new Transportation Systems Plan standards. Following staff's suggestion, he is pursuing an R5 zone change in order to accommodate the new wider road width standards. Weigandt also pointed out that there is a BPA easement encumbering some of the southern lots. He doesn't feel this proposal is a spot zone.

Commissioner Hubbard asked if Weigandt plans on developing any multi-family units on the property. Weigandt said R5 does allow some multi-family conditionally, but he does not foresee any in his proposal. He re-iterated that the zone change request isn't for the different uses, but to provide flexibility to accommodate the wider streets.

Commissioner Semling asked how they plan to access the property. Weigandt said they would work with City Engineering to develop an adequate street plan, but they will likely access the property through N. Vernonia Rd. He said Pittsburg Rd. is more dangerous, so it is preferred to access via Vernonia Rd.

IN OPPOSITION

Wenner, Robert. 510 Hillcrest Rd. Wenner said that if two and three story homes are built on the subject property, all the residents on Hillcrest Rd. will lose their view.

END OF ORAL TESTIMONY

There were no requests to continue the hearing or leave the record open.

CLOSE PUBLIC HEARING & RECORD

The applicant waived the opportunity to submit final written argument after the close of the record.

DELIBERATIONS

Commissioner Russell asked how many more houses they could potentially develop with R5 versus R7. The Commission estimated it would be about 30-35 more units (purely on a conceptual level). Graichen said it is fairer to use the percentage increase in units, rather than gross numbers.

Vice Chair Petersen asked which property the letter in opposition came from. Graichen pointed to 35186 Pittsburg Rd. on the map.

Commissioner Cohen asked if other departments had been consulted regarding this proposal. Graichen said any development will have to address storm water with a management plan, but there are no obvious deficiencies with storm, sewer, or water at this point. Graichen also said any proposal will have to conduct a traffic impact analysis to determine how the housing density will impact the transportation network.

Commissioner Cohen said the Commission needs to consider how well this proposal fits with the Comprehensive Plan and the surrounding area. Chair Cary feels the proposal is in line with the surrounding area. Commissioner Webster feels there is plenty of vacant R5 property available elsewhere. Commissioner Cohen said he would feel more comfortable if there was a housing needs survey that broke down the housing need by type.

Chair Cary noted that the zoning map seems to contain the densest property at the center and the least dense on the outskirts. He said if this zone change is approved, it would push the denser properties closer to the edge. Commissioner Hubbard pointed out there would still a ring of less dense property in the Urban Growth Boundary. Chair Cary understands the need to rezone in order to accommodate the wider road width. Commissioner Hubbard agrees that the site is difficult to develop as R7.

Commissioner Semling suggested R5 zoning for the eastern lot between Catarin Street and Camden Street to fit the road in, with the rest of the property R7. Graichen cautioned the Commission not to base their decision based on one use (single-family subdivision). He said ownership could change before development and a completely different proposal with other allowed uses could be submitted. He said there is a high probability it will be developed as a single-family subdivision based on conversations with the applicant, but probable is not 100 percent.

Chair Cary asked if *any* development on this property would require that the main access be from Vernonia Rd. Graichen said it is very possible that there will not be access from Vernonia Rd. because of spacing requirements between other roads. He said Pittsburg Rd. and Vernonia Rd. are both higher classified streets and staff would prefer to direct traffic to the lower classified streets of Camden Street, Catarin Street, and Helens Way. However, he noted that a traffic impact analysis would show more detail.

MOTION_A

Commissioner Semling moved to recommend approval of the Zone Change/Comprehensive Map Amendment

to R5 for the eastern tax lot in order to facilitate the wider road width, and to leave the rest of the property R7. Commissioner Lawrence seconded. Commissioner Lawrence and Commissioner Semling voted in favor; Vice Chair Petersen, Commissioner Webster, Commissioner Hubbard, and Commissioner Cohen opposed; motion fails.

MOTION_B

Commissioner Semling moved to recommend denial of the Zone Change/Comprehensive Map Amendment. Commissioner Cohen seconded. Commissioner Semling, Commissioner Webster, Commissioner Cohen, and Commissioner Lawrence voted in favor; Vice Chair Petersen and Commissioner Hubbard opposed; motion carries.

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Term Expirations

Graichen said Commissioner Cohen and Chair Cary's terms expire in December. If Commissioner Cohen wishes to continue, the City has to advertise for the opening because he has served at least two consecutive terms. Commissioner Cohen and Chair Cary said they would like to continue. Graichen said the advertisement could note that the incumbent wishes to stay.

Councilor Carlson asked if two commissioners and an alternate would like to be on the interview committee with her. Commissioner Semling, Vice Chair Petersen, and Commissioner Lawrence volunteered. Graichen said if there are no applicants, then the incumbents will continue in their roles, assuming the City Council liaison does not want to continue advertising the opening.

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Ordinance 3209 Review

Graichen said this ordinance was discussed with City Council in August and they suggested a slight change, as noted in the memo. The Council wants all Commissioners who participate to vote (ex. no abstentions if they have participated in the process).

Commissioner Cohen is concerned about a situation where a commissioner is present at the start of the hearing, but is absent during the decision. He said with the proposed language, it would require a vote, even if they are absent for the decision. Graichen suggested adding "who are present" in the second sentence in the proposed language to fix this. Commissioner Webster suggested adding "in attendance" in the first sentence instead. The Commission likes this change.

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Planning Director Decisions

- a. Accessory Structure at 2154 Oregon Street #18 – New storage shed
- b. Home Occupation (Type I) at 244 S. 12th St. – Craft creation and online sales
- c. Home Occupation (Type II) at 464 Grey Cliffs Ct. – House cleaning/janitorial business
- d. Home Occupation (Type I) at 34566 Noble Rd. - Custom design glassware and apparel
- e. Accessory Structure at 2154 Oregon Street #26 - New storage shed
- f. Accessory Structure at 2154 Oregon Street #15 - New storage shed

There were no comments.

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Planning Department Activity Reports

Vice Chair Petersen suggested allowing the uses Commercial Recreational Facility, Cultural Exhibits & Library Services, and Community Recreation Including Structures in both R5 and R7 zoning districts. Graichen said he will include this topic in the next batch of code changes.

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For Your Information Items

Dimsho said the final Waterfront Redevelopment Open House is on Wednesday, October 12. Time and location are still being finalized, but she said it will hopefully be in a tent on the Veneer property around 5 p.m. She encouraged the Commission to watch for information in the October E-Newsletter or on the City's Facebook page. The event will be a celebration of the process and final framework plan product.

Vice Chair Petersen discussed the Seminar Group session fliers. He said they host classes that are very informative and recommends attending or getting the City Council to pay for Commission members to attend.

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There being no further business before the Planning Commission, the meeting was adjourned at 8:30 p.m.

Respectfully submitted,

Jennifer Dimsho
Planning Secretary

P
C
A
d
R

P=Present A=Absent Can=Cancelled

D	Petersen	Hubbard	Lawrence	Cohen	Cary	Semling	Webster
01/12/16	P	P	P	A	A	P	P
02/09/16	A	P	P	P	P	P	P
03/08/16	P	P	P	A	P	P	P
04/12/16	P	P	P	P	P	P	P
05/10/16	P	P	A	P	P	P	P
06/14/16	P	P	P	P	P	A	P
07/12/16	P	P	P	P	P	P	P
08/09/16	CAN	CAN	CAN	CAN	CAN	CAN	CAN
09/13/16	P	P	P	P	P	P	P
10/11/16							
11/08/16							
12/13/16							

**CITY OF ST. HELENS PLANNING DEPARTMENT
STAFF REPORT
Subdivision Preliminary Plat SUB.1.16**

DATE: October 4, 2016
TO: Planning Commission
FROM: Jacob A. Graichen, AICP, City Planner

APPLICANT: Andrew Tull, 3J Consulting, Inc.
OWNER: St. Helens Assets, LLC

ZONING: Moderate Residential, R7
LOCATION: 5N1W-32C-100 & 200; 5N1W-32DB-100; 5N1W-32DC-900
PROPOSAL: Elk Ridge Estates, Phase 6 (an approximate 58 lot subdivision)

The 120-day rule (ORS 227.178) for final action for this land use decision is January 7, 2016.

SITE INFORMATION / BACKGROUND

This preliminary plat approval is essential a reboot of this Elk Ridge Estates Phase approval from 2013 (file SUB.1.13). The original approval was valid for 12 months and the city granted 2 subsequent 12-month time extensions. Within this three-year time period, much has been completed for this phase, though preliminary plat approval is necessary for the project to continue. See **attached Findings of Fact and Conclusions of Law for SUB.1.13.**

PUBLIC HEARING & NOTICE

Hearing dates are as follows: October 11, 2016 before the Planning Commission

Notice of this proposal was sent to surrounding property owners within 300 feet of the subject property(ies) on September 22, 2016 via first class mail. Notice was sent to agencies by mail or e-mail on the same date. Notice was published in the The Chronicle on September 28, 2016.

AGENCY REFERRALS & COMMENTS

As of the date of this staff report, the following agency referrals/comments have been received that are pertinent to the analysis of this proposal:

City Engineering Manager: Water pressure for all home sites shall meet the required operating pressure range of 50 psi to 90 psi at all times, in accordance with the Municipal Code 18.28.005(12).

This operating range may require the installation of a booster pump station. If so, the booster pump station shall be designed to meet the current needs of the subdivision and be able to be upgraded in the future to provide the required water pressure operating range for any/all future phases of the development. The booster pump station and all required public infrastructure shall

be completed, inspected, tested, and accepted with required bonds in place before Engineering and Public Works will sign off on the final plat.

APPLICABLE CRITERIA, ANALYSIS & FINDINGS

See the **Findings of Fact and Conclusions of Law for SUB.1.13**. Staff's intent is to use that decision as the foundation of this one, highlighting what has changed and amending the 2013 conditions as appropriate.

FINDINGS:

- As a new application, this allows in the inclusion of any new development code laws to apply to this proposal, even though it has been under construction for several years. However, there hasn't been any substantial change in the Development Code to warrant changes in the conditions. There has been changes to the site/circumstances as explained below though. **The conditions of SUB.1.13 shall apply to this proposal except as noted below.**
- In 2013 this phase of the development was known as Phase 5. Since then, Lots 1-7 of Elk Ridge Estates Phase 1 were replatted (file SUB.2.13). That replat became Phase 5. So this phase is number 6, being the next in line. **A condition shall be added under #3 (final plat content requirements) as follows: "Proper phase shall be indicated."**

Note that this is why the lot numbering differs from the 2013 application.

- There is one new street name for this phase. In 2013, Columbia 9-1-1 noted concern about the proposed "Ridge View Drive" street name. In 2014, Columbia 9-1-1 confirmed that "Miles Lane" or "Miles Drive" was as acceptable alternative. This is already sufficiently addressed by 2013 condition 3.b.
- Note that 2013 condition 4.c notes the city's street access requirements. All rights-of-way for this phase are classified as local streets. In 2013 there was a spacing requirement for driveways on local streets. This was amended in 2015 to eliminate drive-to-drive spacing in local streets (ref. SHMC Table 17.84.040-2). This doesn't warrant a revised decision since the condition references current law, but is worthy of noting nonetheless.
- Most of the required physical improvements have been completed. This includes the required sidewalk along Hankey Road from the entry of the development (Valley View Drive) to Pittsburg Road. However, there is still work to be done. The important thing to note here is the project has been progressing, albeit slowly. This doesn't warrant any revised conditions.
- Adequate water pressure is one of the issues yet to be resolved for this subdivision phase. **Note City Engineering comments above.** Water pressure for this phase's lots are addressed in condition 2.a.iii (things required before the city accepts a final plat).

A related matter and an important public improvement yet to be done in the installation of a pump station (proposed to be located in a Tract of Phase 1). This is necessary for adequate water pressure to serve at least some the homes that will eventually will be built on the lots of proposed Phase 6 (as determined by the applicant’s engineer, subject to city approval). However, as noted by the City Engineer, **the booster pump system needs to be designed so it can be upgraded to provide adequate water service for this Phase and all future Phases of the Elk Ridge Estates development. This shall be an added as a condition under #2.**

- Actual site grading of the site differs from the plans submitted. To explain, see the proposed grading plan around the area of proposed block (the “island” of lots surrounded on all sides by street rights-of-way) where a gradual slope is shown. The grading work, in process during the time of this application, shows a much more dramatic terraced change in elevation.



The block of lots facing NW. Note the terraced grading and compare to the more gradual slope shown in the submitted plans.



The block of lots facing SE.

There are some issues to consider given this approach to site grading. First, note the private storm drainage system (including easements) shown on the plans amongst the block of lots. Per the City Engineer, the system may need to be at the bottom of the slope. It appears that in this case, they are at the top. **Revised grade plans are necessary to ensure storm drainage infrastructure (private or public) is built/located properly and to ensure easements for such infrastructure is placed properly. Revised grading plans shall be a new condition under #2. Completion of private or public improvements affected by the new grading scheme to function properly given new grading shall also be a new condition under #2.**

Second, if the developer wants to install a retaining wall (or walls) an easement would be necessary to ensure access for wall maintenance. For example, a single wall crossing multiple lots would warrant an easement to ensure future access for maintenance. This

would be a private easement. A private maintenance agreement would be necessary for shared retaining walls too. **A new condition under #3 shall include any all private easements related to the actually subdivision (land division action). Further, a new condition under #4 shall specify easements for retaining walls (shared or stand-alone) as necessary and related maintenance agreements for shared.** Note that public easements are already addressed by 2013 condition 3.c.

In regards to home building and the new grading scheme, there is already a condition that requires a geotechnical report for each lot (2013 condition 4.a). The developer may want a retaining wall due to Building Code requirements (distance required from slopes).

Given the substantial grade change as discussed, there could be more. So conditions pertaining to such should include the entire subdivision phase, not just the block.

CONCLUSION & RECOMMENDATION

Based upon the facts and findings herein, staff recommends approval or of this Subdivision Preliminary Plat with the following conditions.

****Note these conditions reflect those of the final decision of SDR.1.13. These conditions have been revised based on this SUB.1.16 proposal. Underlined words are added. ~~Words striken area deleted.~~****

- 1. This Subdivision preliminary plat approval shall be effective for a period of twelve (12) months from the date of approval.** The approval shall become void if a final plat prepared by a professional registered surveyor in accordance with 1) the approved preliminary plat, 2) the conditions herein, and 3) the form and content requirements of the City of St. Helens Development Code (SHMC Title 17) and Oregon Revised Statutes is not submitted within the twelve (12) month approval period. **Note: two time extensions are possible per SHMC 17.136.040(2).**
- 2. The following shall be completed prior to submission and the City's acceptance of a final plat application:**
 - a. Engineering/construction plans for all public and other applicable improvements shall be submitted to the City for review and approval in compliance with all City of St. Helens laws and standards and in accordance with the conditions herein. As specific conditions of approval, these plans shall include:
 - i. Joint mailbox facility shall be included on engineering/construction plans per City standards and the USPS.
 - ii. Street lights are required at each intersection, at such locations to provide overlapping lighting to sufficiently illuminate the street, and per Columbia River PUD standards.

- iii. Adequate water pressure will need to be verified for each lot (booster pump and/or individual booster pumps may be necessary). Also see condition 2.f.
 - iv. Grading and slope stability (e.g., to mitigate rock/debris fall onto road) of portions of Hankey Road and Perry Creek Road that abut the subject property.
- b. Plans for sidewalk and slope stabilization along the east side of Hankey Road between Elk Meadows Drive and Pittsburg Road shall be submitted for review and approval by the City and County.
 - c. All public improvements shall be completed, in place and acceptable to the City (and County in the case of Hankey Road). This includes on-site improvements and off-site improvements (e.g. Hankey Road improvements) and joint mailbox facility. The exception to this are the portions of sidewalk that abut lots created by this subdivision where there may be a driveway approach to serve the development of said lot. For these portions of sidewalk allowed to be left unfinished for the final plat, a performance guarantee shall be required as approved by City Engineering.
 - d. Applicant shall submit a street tree plan for local classified streets (also see condition 4).
 - e. Homeowners Association (HOA) and CC&Rs for establishing the HOA shall be approved (see condition 9). In addition, the restriction per condition 3.d shall be included in this documentation.
 - f. The booster pump system shall be designed such that it can be upgraded to provide adequate water pressure for this Phase and all future Phases of the Elk Ridge Estates development/subdivision. The booster pump shall be completed, inspected, tested, and accepted by the City with required bonds in place.
 - g. Revised grading plans shall be required. In addition, any changes to private or public infrastructure necessary for proper function to accommodate the grading shall be completed (subject to review and approval by the City).

3. In addition to compliance with local, county, state and other requirements, the following shall be included on the final plat:

- a. Five foot of additional right-of-way dedication along the portions of Hankey Road and Perry Creek Road that abut the subject property.
- b. A street name acceptable to Columbia 9-1-1 shall be used instead of Ridge View Drive, which shall not be used.
- c. 8' wide public utility easements will be required along the street frontage of all lots unless a greater width is determined necessary by City Engineering. Moreover, other utility easements necessary, as identified on approved engineering/construction plans shall be included on the final plat.
- d. The following shall be included as a plat restriction:

“This property is located in the vicinity of properties which have the right to exist to conduct mining operations. Those activities may include extraction, processing and distribution of aggregate, so long as the quarries operate within the law and appropriate government regulations.”

- e. Proper phase shall be indicated.

- f. Private easements in their proper location (e.g., private storm drainage).
4. **The following shall be required prior to building permit issuance to develop any lot of this subdivision:**
- a. A geotechnical report is required to be submitted to the Building Official for each lot before home foundations are approved.
 - b. Plans submitted for a building permit shall reflect the approved street trees plan (see condition 2).
 - c. Development of lots shall meet the access requirements for driveways per Chapter 17.84 SHMC. This includes but is not limited to width, number of access points allowed and spacing of driveway approaches.
 - d. If not otherwise recorded with the final plat as required, a Declaration of Protective Covenants, Conditions and Restrictions (CCRs) and Establishment of a Homeowners Association (HOA) shall be recorded (see condition 9).
 - e. Easements for any proposed retaining wall(s) (e.g., shared retaining walls serving multiple lots) shall be reviewed and approved by the City and recorded with the Columbia County Clerk. In addition, maintenance agreements shall be required to be recorded for shared retaining walls, subject to city review and approval prior to recordation.
5. **Prior to any construction or development of the subject property** performance guarantees (e.g., performance bond) as approved by City Engineering shall be required for storm drainage systems, grading and erosion control. In addition, engineering/construction plans shall be approved.
6. After completion of construction and City approval, all public improvements shall be guaranteed (e.g., warranty bond) for at least two years as to workmanship in a form and value as required by City Engineering.
7. Portions of the property are encumbered by easements for high voltage transmission lines owned by Bonneville Power Administration (“BPA”). BPA acquired rights for these easements that limit the landowner’s use of these areas. **All activities planned within the BPA easements, including but not limited to, fences, roadways, and utilities need to be reviewed and approved by BPA prior to their occurrence.** Do not build, dig or plant within the BPA easement areas without first contacting BPA. Information regarding land uses and the process for reviewing proposed uses within BPA’s easements may be obtained by calling (800) 836-6619.
8. Healthy and safe trees in common areas that are 12” or greater diameter at breast (DBH) height shall not be removed without further public hearings and review by the Planning Commission.
9. A Declaration of Protective Covenants, Conditions and Restrictions (CCRs) and establishment of a Homeowners Association (HOA) shall be recorded for HOA responsibility for common improvement maintenance. New or revised CCRs (existing

document recorded as Columbia County Clerk Instrument No. 2013-2129) shall be required to include Phase 5 and its newly created tracts and emergency access per condition 12. **This document shall be recorded with the final plat.**

10. Curb/sidewalk and street trees will be required along all local streets.
11. All utilities shall be underground pursuant to SHMC 17.152.120.
12. An emergency access road that meets at least Fire Code standards must be maintained until such time as there is an acceptable second route or street into this development and the Homeowners Association shall be responsible to maintain this emergency access.
13. Curb-tight sidewalk without additional street trees is acceptable for Hankey Road improvements.
14. Owner/Developer shall be solely responsible for obtaining all approvals, permits, licenses, and authorizations from the responsible Federal, State and local authorities, or other entities, necessary to perform land clearing, construction and improvement of the subject property in the location and manner contemplated by Owner/Developer. City has no duty, responsibility or liability for requesting, obtaining, ensuring, or verifying Owner/Developer compliance with the applicable State and Federal agency permit or other approval requirements. This land use approval shall not be interpreted as a waiver, modification, or grant of any State or Federal agency or other permits or authorizations.
15. Owner/applicant is still responsible to comply with the City Development Code (SHMC Title 17).

Attachment(s): Findings of Fact and Conclusions of Law for SUB.1.13
Applicant's application narrative
Applicant's plans

**CITY OF ST. HELENS PLANNING DEPARTMENT
FINDINGS OF FACT AND CONCLUSIONS OF LAW
Subdivision Preliminary Plat SUB.1.13**

APPLICANT: St. Helens Assets, LLC

OWNER: same as applicant

ZONING: Moderate Residential, R7

LOCATION: 5N1W-32C-100 & 200; 5N1W-32DB-100; 5N1W-32DC-900

PROPOSAL: Elk Ridge Estates, Phase 5 (an approximate 58 lot subdivision)

SITE INFORMATION

The site is partially developed with Elk Ridge Phase 1, 2 and 4 for residential lots. Phase 3 is done too, but is a one lot phase specifically for a city water reservoir. Some work regarding the proposed Phase 5 is done. For example, the proposed streets are graveled and there may be some utility infrastructure in place, though, no public improvement for Phase 5 has been approved. This is a reflection of past efforts that were abandoned a few years ago.



Left: Near the proposed cul-de-sac looking southerly down a proposed right-of-way. Note the gravel road improvements. The tree line in the background is proposed open space tract E.

Right: An existing patch of trees abutting proposed lots 73, 74, and 75.



PUBLIC HEARING & NOTICE

Hearing dates are as follows:

May 7, 2013 before the Planning Commission

Notice of this proposal was sent to surrounding property owners within 300 feet of the subject property(ies) on April 15, 2013 via first class mail. Notice was sent to agencies by mail or e-mail on the same date. Notice was published in the The Chronicle on April 24, 2013.

AGENCY REFERRALS & COMMENTS

As of the date of this staff report, the following agency referrals/comments have been received that are pertinent to the analysis of this proposal:

City Building Official: A geotechnical report is required to be submitted to the Building Official for each lot before home foundations are approved.

Bonneville Power Administration (BPA): See letter submitted to the City dated April 26, 2013. Note that this includes a recommended condition of approval.

County Road Department: The County Road Departments will require a five foot dedication of additional right-of-way fronting the property being developed in Phase 5, for both Hankey and Perry Creek Roads. If the City is requiring sidewalks, the County Road Department supports that requirement. If slope stabilization is required for the sidewalk construction, that requirement is also supported.

Columbia 911: We currently have a Ridgeview Terrace and a Ridge Drive, as well as numerous other “view” street names county wide. For this reason we are very concerned Ridgeview Drive is not a good choice and has the potential to cause confusion/delays for public safety responders. We suggest the developers submit alternate street names and wish to have an opportunity to comment on those as well.

APPLICABLE CRITERIA, ANALYSIS & FINDINGS

SHMC 17.136.040(1)

(1) The preliminary plat approval by the planning commission or final approving authority shall lapse if:

(a) A final plat (first phase in an approved phased development) has not been submitted within a one-year period; or

(b) The final plat does not conform to the preliminary plat as approved or approved with conditions.

Discussion: This is a stand alone subdivision request. Phases 1 to 4 of the Elk Ridge Estates Subdivision have been approved previously. This review only addresses proposed Phase 5.

Finding: This Subdivision preliminary plat approval shall be effective for a period of twelve (12) months from the date of approval per this section.

SHMC 17.136.060 – Approval standards – Preliminary plat.

(1) The planning commission may approve, approve with conditions or deny a preliminary plat based on the following approval criteria:

(a) The proposed preliminary plat complies with the city's comprehensive plan, the applicable sections of this code and other applicable ordinances and regulations;

(b) The proposed plat name is not duplicative or otherwise satisfies the provisions of ORS Chapter 92[.090(1)];

(c) The streets and roads are laid out so as to conform to the plats of subdivisions and maps of partitions already approved for adjoining property as to width, general direction and in all other respects unless the city determines it is in the public interest to modify the street or road pattern; and

(d) An explanation has been provided for all common improvements.

Discussion: (a) The City's development code (SHMC Title 17) implements the Comprehensive Plan. The Development Code standards are addressed herein.

There are no known conflicts with the Comprehensive Plan. However note that the subject property has a Comprehensive Plan designation of Suburban Residential and a policy of that includes: *Review diligently all subdivision plats in the suburban residential category to ensure the establishment of a safe and efficient road system.*

This is important, especially with regards to Hankey Road. This is addressed further below.

Applicable provisions of the Development Code are addressed per Chapter as follows:

17.32 – Zones and Uses → The subject property is zoned Moderate Residential, R7. The minimum lot size is 7,000 square feet for all uses except duplexes require 10,000 square feet on interior lots. Proposed lot sizes range from 7,000 to approximately 12,250 square feet.

The minimum lot width required at the building line (i.e., the line that coincides with the front side of the principal building, which is the 20 foot required front yard or a greater front yard provided there is still reasonable building area) is required to be 60 feet, except on corner lots where 85 feet is required. This appears to be met; potential building envelopes seem reasonable.

The minimum lot width at the street is required to be 50 feet, except 60 feet is required for duplexes. For cul-de-sacs, the minimum is 30 feet. All lots appear to meet or exceed this. A cul-de-sac is proposed and those lots appear to meet or exceed the 30' minimum.

The minimum required lot depth is 85 feet. All proposed lots appear to meet or exceed this.

Note that flag lots are not allowed in the R7 zone. None are proposed.

17.56 – Density Computations → This chapter includes maximum density, but not minimum. The total approximate area for this proposal is 16 acres. Subtracting approximate local street right-of-way (2.6 ac.) and open spaced (3.8 ac.) results in a net development area of approximately 9.6 acres (418,176 s.f.). $418,176 / 7,000$ (min lot size) = 59 lots maximum. 58 lots are proposed and within the density limit.

17.64 – Additional Yard Setback Requirements & Exceptions → This chapter is relevant as Hankey Road will not meet the 30 foot from centerline requirement as discussed in **17.136.060(2)** below. This requires an additional setback of buildings when rights-of-way are insufficient in width. However, because of the proposed open space tract, rear yard setbacks of lots along Hankey Road should be normal.

17.72 – Landscaping and Screening → Street trees are required per this Chapter. Trees shall be planted per this chapter along local classified streets as development occurs. Applicant shall submit a street tree plan for City approval in conjunction with the final plat. Note that SHMC 17.72.060 allows an exemption to street trees, for example, when there is inadequate space within public rights-of-way. Hankey Road has topographic challenges and is also lined with trees. Street trees will not be required for Hankey Road improvements. Curb-tight sidewalk, though not ideal, is acceptable in this case.

17.84 – Access, Egress & Circulation → Driveways will be required to meet the appropriate spacing requirement (e.g., 50' as measured from center of driveway along local streets). Only one driveway (access point) shall be allowed per lot for single-family dwelling development. Two are allowed for duplexes on corner lots (with only one access per street). This chapter also addresses driveway widths allowed.

17.132 – Tree Removal → This chapter requires a tree plan to protect and replace certain trees. This includes trees removed within a period of one year prior to development. The area for Elk Ridge Estates Phase 5 as proposes was cleared during the original construction several years ago. There are some trees in the proposed open space along Hankey Road/Perry Creek Road and along the north edge of the plat. Applicant submitted a plan showing the location of groups of trees. Applicant does not propose any disturbance of existing trees. Generally, this chapter focuses on preservation of trees 12 inches or greater diameter at breast height (DBH).

Conditions for previous phases of Elk Ridge Estates noted: *Healthy and safe trees in common areas will not be removed without further public hearings and review by the Planning Commission.* As this chapter focuses on trees over 12 inches diameter at breast height (DBH), this shall be a condition of approval with the added emphasis on 12" DBH.

17.152 – Street & Utility Improvement Standards → Development is required to have frontage along a public street improved to city standards. Proposed local streets are proposed to be dedicated and improved. The minimum right-of-way for local classified streets is 50 feet and that is what's proposed. Local streets will be required to be

improved per this section, the City Transportation Systems Plan, and per the City's engineering standards. Generally, the street plan seems to comply with this chapter.

Right-of-way dedication requirements for Hankey Road and Perry Creek Road are addressed under **17.136.060(2)** below. Improvements to the portions of these streets that abut the subject property could be required; however, as described below, improvement of Hankey Road south of Elk Meadows Drive does more to advance public health, safety and welfare.

There are no future street connections proposed for this proposal.

Cul-de-sacs are allowed only under certain circumstances and per certain requirements. Applicant submitted justification to allow the cul-de-sac proposed.

New street names cannot conflict with other names in Columbia County. Columbia 9-1-1 commented that one of the proposed names is problematic (see agency comments above). Columbia 9-1-1 shall approve an appropriate street name prior to final plat submittal.

Street grades for proposed local classified streets appear to be met, generally less than 12%, except there are portions that exceed this but appear to remain under 15%. This will be determined further with engineering/construction plans required before the final plat.

Mailboxes are addressed by SHMC 17.152.030. This section requires a joint mailbox facility. This section also notes that:

- Joint mailbox structures shall be placed adjacent to roadway curbs;
- Proposed locations of joint mailboxes shall be designated on a copy of the preliminary plat or development plan, and shall be approved by the city engineer/U.S. Post Office prior to final plan approval;
- Plans for the joint mailbox structures to be used shall be submitted for approval by the city engineer/U.S. Post Office prior to final approval; and
- *There shall be at least one accessible route from the principal use(s) to the respective joint mailbox which...as located within a public right-of-way or public street, shall comply with SHMC 18.12.110 or as required by the City Engineer.*

Joining mailbox facility shall be included on engineering/construction plans per City standards and the USPS.

Street lights are required to adequately illuminate streets proposed by this subdivision. This shall be addressed on engineering/construction plans.

Blocks. The proposal creates a "block" with a perimeter of approximately 1,844 as measured along the proposed right-of-way lines. This exceeds the maximum 1,800 which can be accepted based on topography. There is also a requirement that blocks greater than 600 feet require pedestrian/bike connections midway. Given the location of this subdivision, most people will want to get to Hankey Road to take advantage of urban

amenities; existing open space can provide ped-bike connections. The Planning Commission determined that addition ped-bike connections are not warranted.

Easements. 8' wide public utility easements will be required along the street frontage of all lots unless a greater width is determined necessary by City Engineering. Moreover, other utility easements necessary, as identified on approved engineering/construction plans shall be included on the final plat. Approved engineering/construction plans will be required before submission of the final plat.

Curb/sidewalk will be required along all local streets.

Water, sanitary sewer, and storm water system plans will be required in accordance with city requirements. City Engineering has noted issues with water pressure for certain lots including but not necessarily limited to those on the north side of Valley View Drive. Adequate water pressure will need to be verified for each lot (booster pump may be necessary). The City has no plans for additional water infrastructure in the area.

All utilities shall be underground pursuant to SHMC 17.152.120.

Developments require guarantees (e.g., bonds) of workmanship and guarantees of performance for public improvements. Prior to submission of the final plat all public improvements shall be completed, in place and acceptable to the City (and County in the case of Hankey Road). This includes all Hankey Road (or Perry Creek Road) improvements required to be done. The only exception to this is that portions of sidewalk that abut buildable lots created by this subdivision where there may be a driveway approach are often not built until the lot is developed. Though some portions of sidewalk will be required where there will be no driveway approach such as corners and along non-buildable tracts. For these portions of sidewalk allowed to be left unfinished for the final plat, a performance guarantee will be required prior to final plat application submittal.

Before construction, performance guarantees will be required for storm drainage systems, grading and erosion control. This is necessary for public health, safety and welfare, because if this work is only partially done and the developer/owner abandons the project, these could have negative impacts on other property owners. Other improvements left unfinished (e.g., streets, water and sewer infrastructure) do not necessarily have the same impact to a neighboring property owner. This initial guarantee should not be encumbered by other "non-impact" issues as it complicates executing the security; thus, dealing with storm drainage systems, grading and erosion control specifically.

All public improvements shall be guaranteed (e.g. warranty bond) as to workmanship in a form and value as required by City Engineering.

17.156 – Traffic Impact Analysis (TIA) → The magnitude of the proposal is such that a TIA is warranted per SHMC 17.156.030. Such analysis was submitted as required.

Pursuant to the transportation systems plan (TSP) (see TSP Section 4), the following minimum operating standards apply to city-maintained intersections. As measured using the Highway Capacity Manual, latest edition, Level of Service "D" is considered acceptable at signalized and all-way stop controlled intersections if the intersection volume-to-capacity ratio is not higher than 1.0 for the sum of critical movements. Level of Service "E" is considered acceptable for the poorest operating approach at two-way stop intersections. Level of Service "F" is allowed in situations where a traffic signal is not warranted.

The city may deny, approve, or approve a development proposal with appropriate conditions needed to meet operations and safety standards and provide the necessary right-of-way and improvements to develop the future planned transportation system.

The TIA submitted by the applicant addresses vehicle trips only (as opposed to non-vehicular trip demand). The findings of the TIA indicate no impact to the City's or County's transportation system with regards to vehicular capacity.

The length of Hankey Road between Elk Meadows Drive and Pittsburg Road will inevitable see the brunt of ingress and egress traffic from the subdivision as most people's destination will not be north of Elk Meadows Drive into rural Columbia County. This pertains to all modes of travel including vehicular and non-vehicular. Note that page 7 of the TIA notes that "the site is not ideally located for biking or walking strips."

(b) The name proposed is a continuation of the previous Elk Ridge Estates and is not duplicative given the phase distinction. Applicant proposes a continuation of lot numbers per ORS 92.090 (i.e., starting with Lot 67 as opposed to Lot 1 for this propose phase).

(c) The proposed Elk Ridge Estates Phase 5 utilizes existing right-of-way, Valley View Drive, as was dedicated in Elk Ridge Estates Phase 1. This is the logical connection.

(d) There are some common improvements proposed. These are tracts D and E for open space. They correlate with a Bonneville Power Administration (BPA) easement and/or slopes along Hankey and Perry Creek Roads. For previous phases a **Declaration of Protective Covenants, Conditions and Restrictions (CCRs)** and Establishment of a Homeowners Association (HOA) was recorded (Columbia County Clerk Instrument No. 2013-2129) for common improvement maintenance. That document only addresses common areas related to phases 1, 2 and 4 and includes a provision that future phases (such as this proposed Phase 5) can be excluded. New or revised CCRs shall be required to include Phase 5 and its newly created tracts. Homeowners Association rules and CC&R's for establishing the HOA must be approved by the City prior to approval of the final plat for Phase 5. Said document shall be recorded with the Columbia County Clerk with the final plat. No building permit for any lot within Elk Ridge estates Phase 5 may be submitted until the City approved document is recorded.

Finding: These criteria are met with conditions.

SHMC 17.136.060(2) – Lot Dimensions

(a) Lot size, width, shape and orientation shall be appropriate for the location of the development and for the type of use contemplated, and:

(i) No lot shall be dimensioned to contain part of an existing or proposed public right-of-way;

(ii) The depth of all lots shall not exceed two and one-half times the average width, unless the parcel is less than one and one-half times the minimum lot size of the applicable zoning district; and

(iii) Depth and width of properties zoned for commercial and industrial purposes shall be adequate to provide for the off-street parking and service facilities required by the type of use proposed

Discussion: (i) Some right-of-way that will be dedicated as part of this proposal will be local classified streets, which meet the minimum 50' width for such streets. The City's current Transportation Systems Plan (TSP) (2011) and the previous one (1997) both classify Hankey Road as a collector street. Both TSP versions require a 60' wide right-of-way for collector streets. In past final plats (Phase 1 recorded in 1999 and Phase 2 recorded in 2008), 5 feet of right-of-way dedication was required wherever the development abutted Hankey Road. This has resulted in a 45' wide Hankey Road right-of-way south of Elk Meadows Drive while the right-of-way north of Elk Meadows Drive is only 40' wide. Though current standards would normally require a 10 foot dedication (i.e. half of the 20 needed to achieve a 60' width), 5' would be consistent with what has occurred thus far. As such, five feet of right-of-way shall be dedicated (25' from centerline) where Hankey Road abuts the development. In addition, Columbia County requires five feet of dedication along Perry Creek Road too.

(ii) No proposed lot exceeds the depth to width ratio.

(iii) The property is not zoned or intended for commercial or industrial use.

Finding: These criteria are met with conditions.

SHMC 17.136.060(3) – Through Lots

(a) Through lots shall be avoided except where they are essential to provide separation of residential development from major traffic arterials or to overcome specific disadvantages of topography and orientation, and:

(i) A planting buffer at least 10 feet wide is required abutting the arterial rights-of-way; and

(ii) All through lots shall provide the required front yard setback on each street.

Discussion: A through lot is a lot having frontage on two parallel or approximately parallel streets. No through lot is proposed.

Finding: These criteria are not applicable.

SHMC 17.136.060(4) – Large Lots

(a) In dividing tracts into large lots or parcels which at some future time are likely to be redivided, the approving authority may require that the lots be of such size and shape, and be so divided into building sites, and contain such site restrictions as will provide for the extension and opening of streets at intervals which will permit a subsequent division of any tract into lots or parcels of smaller size, and:

(i) The land division shall be denied if the proposed large development lot does not provide for the future division of the lots and future extension of public facilities.

Discussion: The minimum lot size for detached single-family dwellings is 7,000 square feet. Proposes lot sizes will range from around 7,000 to approximately 12,250 square feet. No proposed lot exceeds the minimum lot size x 2 and thus cannot be divided further based on current law. Future development plans or “shadow plans” are not warranted.

Finding: This criterion is met.

SHMC 17.136.060(5) – Other Provisions

The planning commission may attach such conditions as are necessary to carry out the comprehensive plan and other applicable ordinances and regulations and may require:

(a) Reserve strips be granted to the city for the purpose of controlling access to adjoining undeveloped properties.

Discussion: (a) Reserve strips or related access control guarantees are not warranted.

Nearby Rock Quarry. On the west side of the site across from Pittsburg Road, there is an existing rock quarry. This has been in place for years. As a result the final plat for Elk Ridge Estates Phases 2 and 4 include the following language as plat restrictions:

“This property is located in the vicinity of properties which have the right to exist to conduct mining operations. Those activities may include extraction, processing and distribution of aggregate, so long as the quarries operate within the law and appropriate government regulations.”

This issue was not brought up for Phase 1 (of 1990s vintage) and Phase 3 (consisting of only one lot for the City’s water reservoir and not intended for residential use). This language needs to be included on the final plat for this phase to be consistent with recent residential platting of Elk Ridge Estates.

Bonneville Power Administration (BPA). As shown on the preliminary plat, there is a BPA easement that cuts a swath through the subject property. Applicant bears the burden of

approval of roads and uses within the easement. Note that BPA commented on this proposal and recommended a condition of approval, which has been incorporated herein.

Emergency Access. There is only one access to the site currently: Elk Meadows Drive. Typically, a second access is desired for emergency access. This is reflected in conditions of past phases as follows: *An emergency access road that meets at least Fire Code standards must be maintained until such time as there is an acceptable second route or street into this development and the Homeowners Association is responsible to maintain this emergency access.* There is still no second public street access. This shall be a condition of approval and be reflected in any new or modified HOA/CCR document required to be recorded with the County Clerk.

Hankey Road Improvements. Due to the location of the subdivision and surrounding street network, the only current way of efficiently and legally getting to Pittsburg Road (and the St. Helens' city center and US30 which leads to other cities and access to the region) whether by vehicle, automobile or bicycle is via Hankey Road. Hankey Road poses challenges for non-motorized transportation, pedestrian in particular. As noted above, the TIA submitted by the applicant notes "the site is not ideally located for biking or walking strips." The City's Comprehensive Plan also calls for a safe and efficient road system.

When conceived in the past, Elk Ridge Estates, was proposed as a roughly 250 lot development. Currently, approximately 62 residential lots have been created or 25% potential lots more-or-less. There area is still has much to go before complete build-out. With the lots proposed for Phase 5, the total lots would be approximately 100 or about 40% of potential lots more-or-less. With this building potential, pedestrian improvements are necessary so that such quantity of residents are not strictly automobile-bound to their subdivision due to lack of pedestrian safety.

Per Chapter 17.152, streets abutting a property can be required to be built to current standards. Hankey Road is paved along the subject property but lacks sidewalk, though there is curb south of Elk Meadows Drive. Perry Creek road is gravel and lacks curb/sidewalk. The linear feet of these road abutting the subject property and that which lies between Elk Meadows Drive and Pittsburg Road is as follows:

- Approximate linear feet of Hankey Road along proposed Phase 5 (north of Elk Meadows Drive)→ 930'
- Approximate linear feet of Perry Creek Road along proposed Phase 5→ 780'

- Approximate linear feet of Hankey Road between Elk Meadows Drive and Steinke Drive→ 930'
- Approximate linear feet of Hankey Road between Steinke Drive and Pittsburg Road→ 830'

As shown, the abutting right-of-way of Hankey and Perry Creek Roads is very similar to the distance of Hankey Road between Elk Meadows Drive and Pittsburg Road.

Note that there is only about 70' of curb/sidewalk along and on the east side Hankey Road, located roughly 100 feet north of Pittsburg Road. The remainder of Hankey Road between Pittsburg Road and Elk Meadows Drive has curbing on the east side and curb/guardrail on the west side. North of Elk Meadows Drive, there is no curb or guardrail. Thus,

improvements to Hankey Road between Elk Meadows Drive and Pittsburg Road would be less of a task as only sidewalks (along the east side) and slope stabilization measures are necessary.

Hankey Road is designated as a Collector Street per the City's Transportation Systems Plan, which calls for a 5 foot landscape strip and street trees. However, given many constraints (topography), heavily wooded area on both sides of much of Hankey and that Hankey is a street beginning on the fringe of the city and extending into rural Columbia County, this is a circumstance where a curb-tight sidewalk is acceptable.

Engineering/construction plans shall be approved by the City and County (Hankey is a County Road) for these improvements and shall include slope stabilization. These improvements shall be completed prior to submission of the final plat.

Also related to Hankey Road is grading effects of slope stability. It is common for rocks to fall into the roadway and grading could exacerbate this. Grading and slope stability measures shall be required along both Hankey Road and Perry Creek Road. This will be a required aspect of the engineering/construction plans.

Finding: This criterion is met with conditions.

CONCLUSION & DECISION

Based upon the facts and findings herein, the City Planning Commission approves this preliminary subdivision plat with the following conditions:

- 1. This Subdivision preliminary plat approval shall be effective for a period of twelve (12) months from the date of approval.** The approval shall become void if a final plat prepared by a professional registered surveyor in accordance with 1) the approved preliminary plat, 2) the conditions herein, and 3) the form and content requirements of the City of St. Helens Development Code (SHMC Title 17) and Oregon Revised Statutes is not submitted within the twelve (12) month approval period. **Note: two time extensions are possible per SHMC 17.136.040(2).**
- 2. The following shall be completed prior to submission and the City's acceptance of a final plat application:**
 - a. Engineering/construction plans for all public and other applicable improvements shall be submitted to the City for review and approval in compliance with all City of St. Helens laws and standards and in accordance with the conditions herein. As specific conditions of approval, these plans shall include:
 - i. Joint mailbox facility shall be included on engineering/construction plans per City standards and the USPS.

- ii. Street lights are required at each intersection, at such locations to provide overlapping lighting to sufficiently illuminate the street, and per Columbia River PUD standards.
 - iii. Adequate water pressure will need to be verified for each lot (booster pump and/or individual booster pumps may be necessary).
 - iv. Grading and slope stability (e.g., to mitigate rock/debris fall onto road) of portions of Hankey Road and Perry Creek Road that abut the subject property.
- b. Plans for sidewalk and slope stabilization along the east side of Hankey Road between Elk Meadows Drive and Pittsburg Road shall be submitted for review and approval by the City and County.
 - c. All public improvements shall be completed, in place and acceptable to the City (and County in the case of Hankey Road). This includes on-site improvements and off-site improvements (e.g. Hankey Road improvements) and joint mailbox facility. The exception to this are the portions of sidewalk that abut lots created by this subdivision where there may be a driveway approach to serve the development of said lot. For these portions of sidewalk allowed to be left unfinished for the final plat, a performance guarantee shall be required as approved by City Engineering. ↓ THIS INCLUDES AS-BUILTS
 - d. Applicant shall submit a street tree plan for local classified streets (also see condition 4).
 - e. Homeowners Association (HOA) and CC&Rs for establishing the HOA shall be approved (see condition 9). In addition, the restriction per condition 3.d shall be included in this documentation.

3. In addition to compliance with local, county, state and other requirements, the following shall be included on the final plat:

- a. Five foot of additional right-of-way dedication along the portions of Hankey Road and Perry Creek Road that abut the subject property.
- b. A street name acceptable to Columbia 9-1-1 shall be used instead of Ridge View Drive, which shall not be used.
- c. 8' wide public utility easements will be required along the street frontage of all lots unless a greater width is determined necessary by City Engineering. Moreover, other utility easements necessary, as identified on approved engineering/construction plans shall be included on the final plat.
- d. The following shall be included as a plat restriction:


"This property is located in the vicinity of properties which have the right to exist to conduct mining operations. Those activities may include extraction, processing and distribution of aggregate, so long as the quarries operate within the law and appropriate government regulations."

4. The following shall be required prior to building permit issuance to develop any lot of this subdivision:

- a. A geotechnical report is required to be submitted to the Building Official for each lot before home foundations are approved.

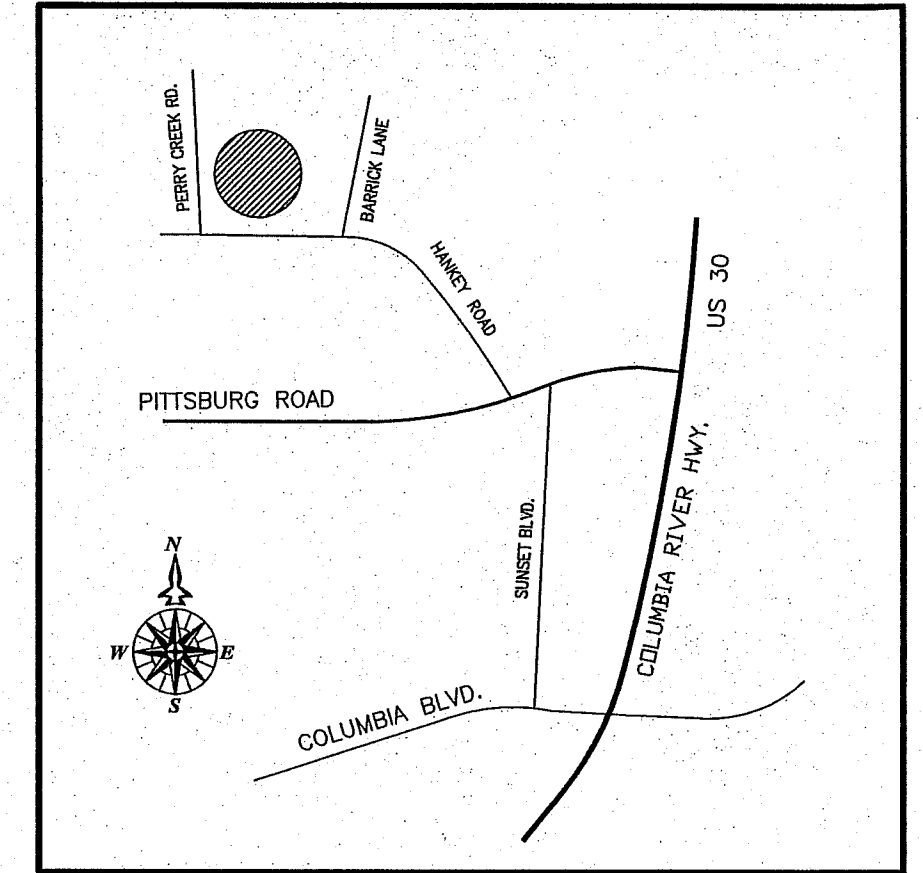
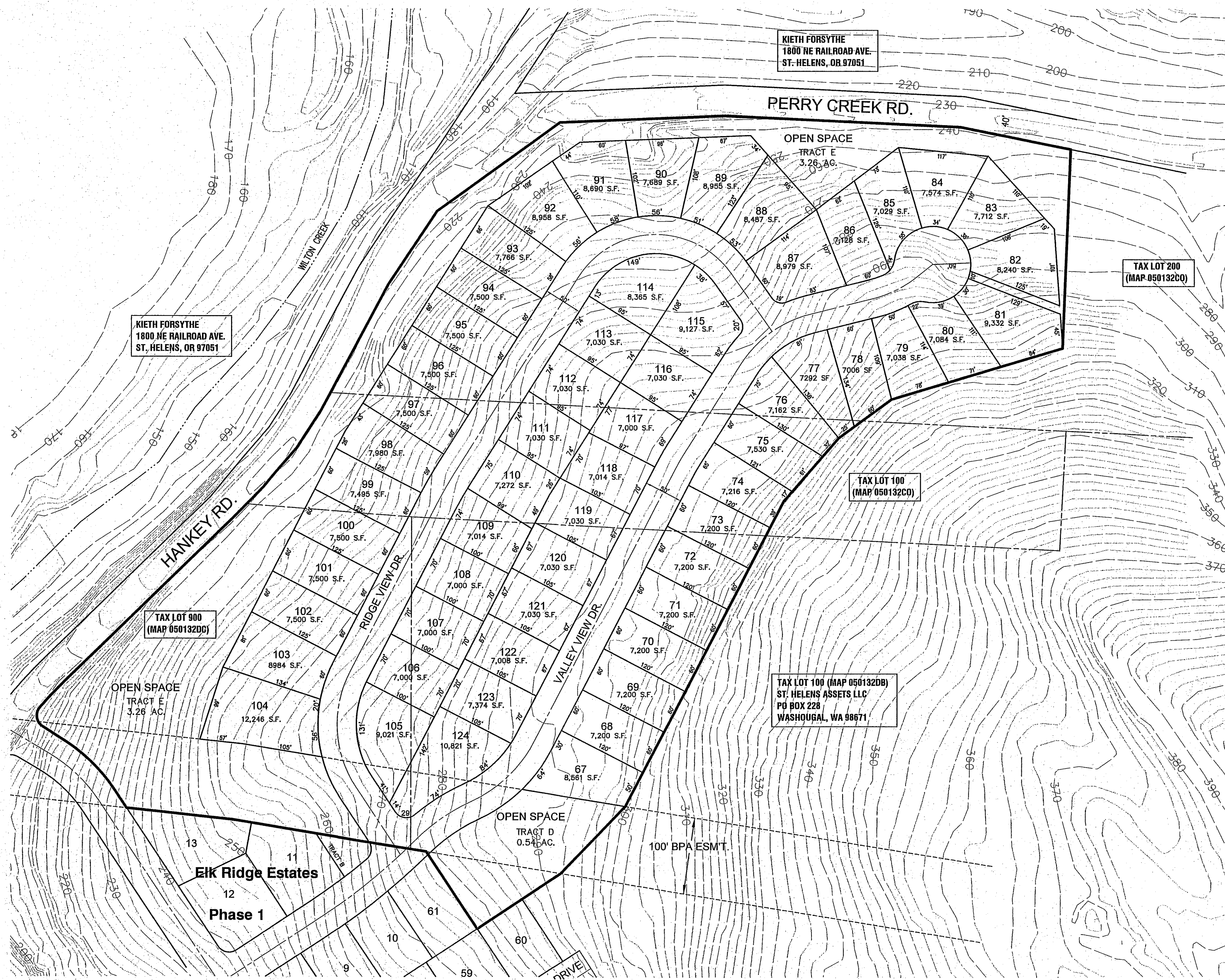
- b. Plans submitted for a building permit shall reflect the approved street trees plan (see condition 2).
 - c. Development of lots shall meet the access requirements for driveways per Chapter 17.84 SHMC. This includes but is not limited to width, number of access points allowed and spacing of driveway approaches.
 - d. If not otherwise recorded with the final plat as required, a Declaration of Protective Covenants, Conditions and Restrictions (CCRs) and Establishment of a Homeowners Association (HOA) shall be recorded (see condition 9).
5. **Prior to any construction or development of the subject property** performance guarantees (e.g., performance bond) as approved by City Engineering shall be required for storm drainage systems, grading and erosion control. In addition, engineering/construction plans shall be approved.
 6. After completion of construction and City approval, all public improvements shall be guaranteed (e.g., warranty bond) for at least two years as to workmanship in a form and value as required by City Engineering.
 7. Portions of the property are encumbered by easements for high voltage transmission lines owned by Bonneville Power Administration (“BPA”). BPA acquired rights for these easements that limit the landowner’s use of these areas. **All activities planned within the BPA easements, including but not limited to, fences, roadways, and utilities need to be reviewed and approved by BPA prior to their occurrence.** Do not build, dig or plant within the BPA easement areas without first contacting BPA. Information regarding land uses and the process for reviewing proposed uses within BPA’s easements may be obtained by calling (800) 836-6619.
 8. Healthy and safe trees in common areas that are 12” or greater diameter at breast (DBH) height shall not be removed without further public hearings and review by the Planning Commission.
 9. A Declaration of Protective Covenants, Conditions and Restrictions (CCRs) and establishment of a Homeowners Association (HOA) shall be recorded for HOA responsibility for common improvement maintenance. New or revised CCRs (existing document recorded as Columbia County Clerk Instrument No. 2013-2129) shall be required to include Phase 5 and its newly created tracts and emergency access per condition 12. **This document shall be recorded with the final plat.**
 10. Curb/sidewalk and street trees will be required along all local streets.
 11. All utilities shall be underground pursuant to SHMC 17.152.120.
 12. An emergency access road that meets at least Fire Code standards must be maintained until such time as there is an acceptable second route or street into this development and the Homeowners Association shall be responsible to maintain this emergency access.

13. Curb-tight sidewalk without additional street trees is acceptable for Hankey Road improvements.
14. Owner/Developer shall be solely responsible for obtaining all approvals, permits, licenses, and authorizations from the responsible Federal, State and local authorities, or other entities, necessary to perform land clearing, construction and improvement of the subject property in the location and manner contemplated by Owner/Developer. City has no duty, responsibility or liability for requesting, obtaining, ensuring, or verifying Owner/Developer compliance with the applicable State and Federal agency permit or other approval requirements. This land use approval shall not be interpreted as a waiver, modification, or grant of any State or Federal agency or other permits or authorizations.
15. Owner/applicant is still responsible to comply with the City Development Code (SHMC Title 17).



Al Petersen, Chairman, Planning Commission

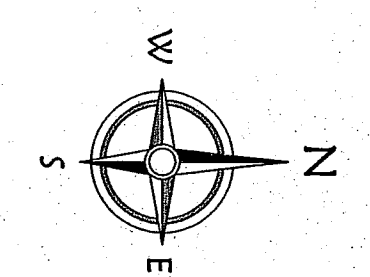
05/16/2013
Date



OWNER/DEVELOPER:
ST. HELENS ASSETS LLC
82 15TH STREET, SUITE 111
WASHOUGAL, WASHINGTON 98671

ENGINEER/SURVEYOR:
COMPASS ENGINEERING
4107 SE INTERNATIONAL WAY, SUITE 705
MILWAUKIE, OREGON 97222
503-653-9093

NO AREAS ARE SUBJECT TO INUNDATION ON STORM WATER OVERFLOW.
EXISTING USE OF PROPERTY: FALLOW WITH NO STRUCTURES.
NO TREES WILL BE REMOVED WITH THIS PROPOSAL.
NO WETLANDS, ROCK OUT CROPPINGS OR MARCH AREAS EXIST ON THE SITE.



Scale: 1" = 100'

Proposed Elk Ridge Estates Phase 5

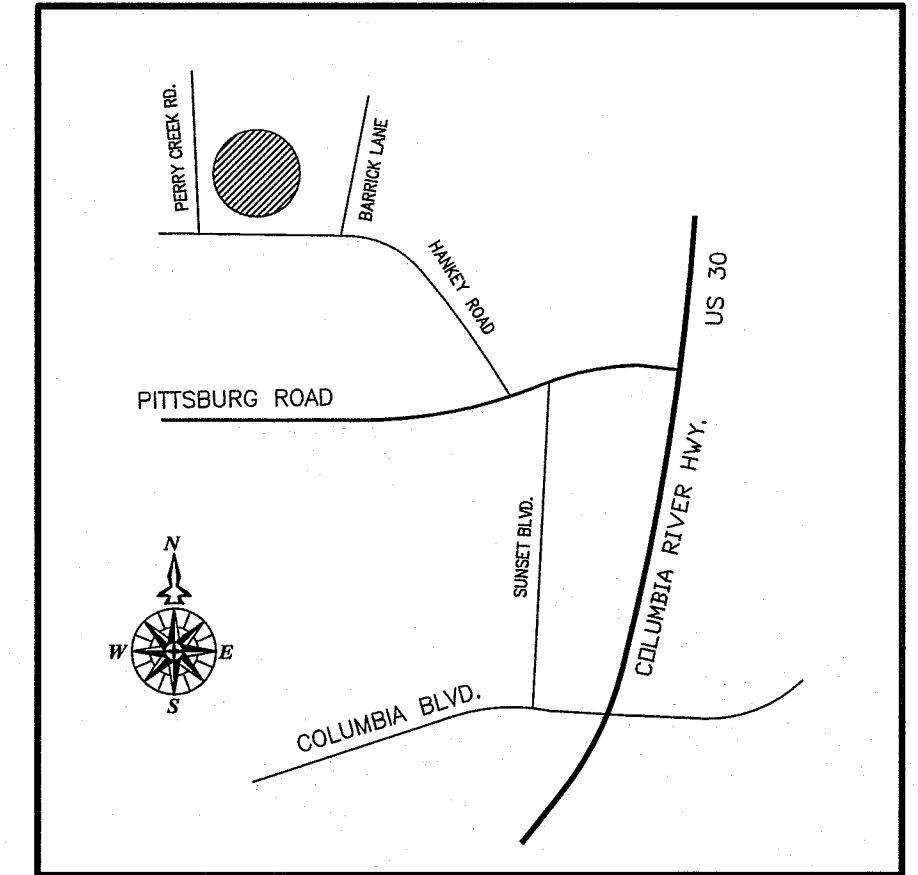
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COMPASS ENGINEERING
engineering surveying planning
4107 SE International Way, Suite 705
Milwaukie, Oregon 97222
503.653.9093
www.compass-engineering.com

ST. HELENS ASSETS LLC
82 15th Street, Suite 111
Washougal, Washington 98671

A PORTION OF TAX LOTS 100 AND 200 OF THE SW 1/4, A PORTION OF TAX LOT 100 OF THE NW 1/4 OF THE SE 1/4 AND TAX LOT 900 OF THE SW 1/4 OF THE SE 1/4 OF SECTION 32, T.5N., R.1W., W.M., CITY OF ST. HELENS, COLUMBIA COUNTY, OREGON



VICINITY MAP
SCALE: NTS



OWNER/DEVELOPER:

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82 15TH STREET, SUITE 111
WASHOUGAL, WASHINGTON 98671

ENGINEER/SURVEYOR:

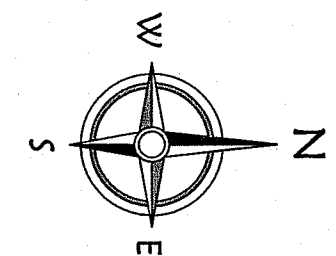
COMPASS ENGINEERING
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MILWAUKIE, OREGON 97222
503-653-9093

NO AREAS ARE SUBJECT TO INUNDATION ON STORM WATER OVERFLOW.

EXISTING USE OF PROPERTY: FALLOW WITH NO STRUCTURES.

NO TREES WILL BE REMOVED WITH THIS PROPOSAL.

NO WETLANDS, ROCK OUT CROPPINGS OR MARCH AREAS EXIST ON THE SITE.



Scale: 1" = 100'

**Proposed Elk Ridge Estates Phase 5
Tree Preservation Plan**

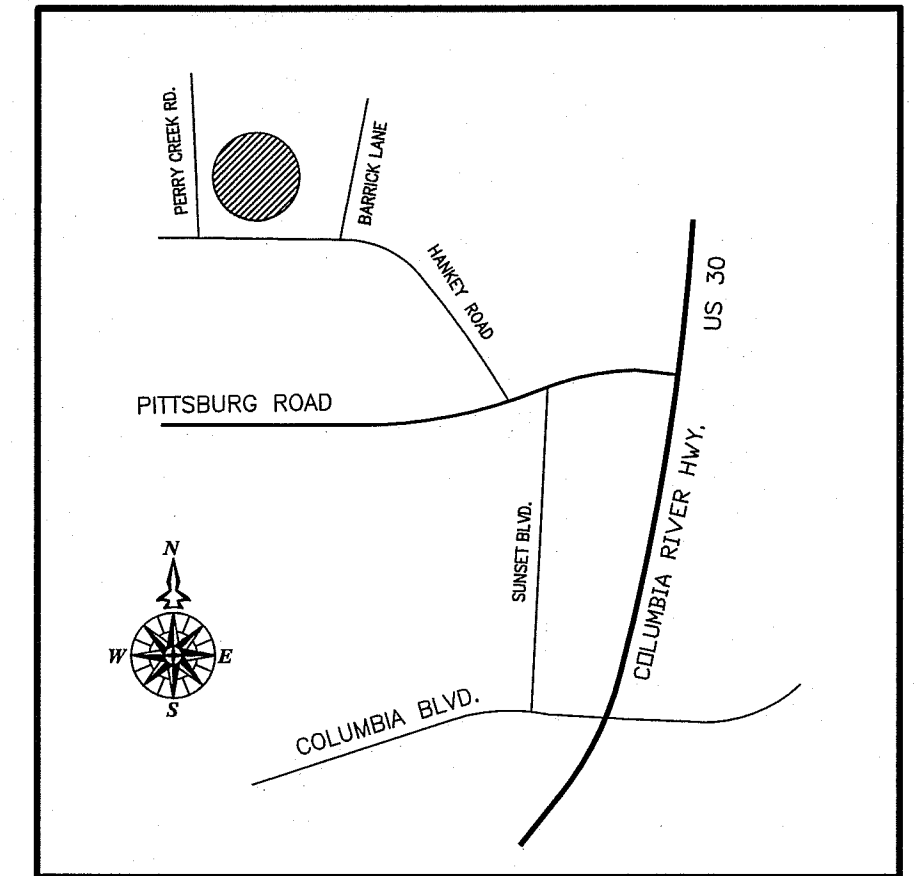
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A PORTION OF TAX LOTS 100 AND 200 OF THE SW 1/4, A PORTION OF TAX LOT 100 OF THE NW 1/4 OF THE SE 1/4 AND TAX LOT 900 OF THE SW 1/4 OF THE SE 1/4 OF SECTION 32, T.5N., R.1W., W.M., CITY OF ST. HELENS, COLUMBIA COUNTY, OREGON



VICINITY MAP
SCALE: NTS



OWNER/DEVELOPER:

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82 15TH STREET, SUITE 111
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ENGINEER/SURVEYOR:

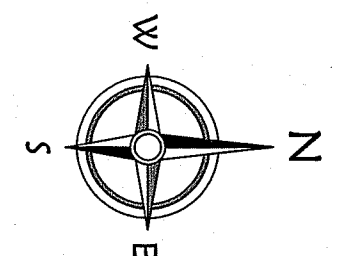
COMPASS ENGINEERING
4107 SE INTERNATIONAL WAY, SUITE 705
MILWAUKIE, OREGON 97222
503-653-9093

NO AREAS ARE SUBJECT TO INUNDATION ON STORM WATER OVERFLOW.

EXISTING USE OF PROPERTY: FALLOW WITH NO STRUCTURES.

NO TREES WILL BE REMOVED WITH THIS PROPOSAL.

NO WETLANDS, ROCK OUT CROPPINGS OR MARCH AREAS EXIST ON THE SITE.



Scale: 1" = 100'

**Proposed Elk Ridge Estates Phase 5
Tree Preservation Plan**

DRAWN	MM	DESIGNED	NH	CHECKED
SCALE	1" = 100'	DATE	FEB. , 2013	
REVISIONS	PLAN	4389.6 Tree Preservation.dwg		



COMPASS ENGINEERING
engineering surveying planning
4107 SE International Way, Suite 705
Milwaukie, Oregon 97222
503.653.9093
www.compass-engineering.com

ST. HELENS ASSETS LLC
82 15th Street, Suite 111
Washougal, Washington 98671

A PORTION OF TAX LOTS 100 AND 200 OF THE SW 1/4, A PORTION OF TAX LOT 100 OF THE NW 1/4 OF THE SE 1/4 AND TAX LOT 900 OF THE SW 1/4 OF THE SE 1/4 OF SECTION 32, T.5N., R.1W., W.M., CITY OF ST. HELENS, COLUMBIA COUNTY, OREGON

P:\4300\4389.6\AutoCAD\4389.6 Tree Preservation.dwg, 3/7/2013 1:50:16 PM

GENERAL NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF ST. HELENS, OREGON STANDARD SPECIFICATIONS AND STANDARD DRAWINGS FOR CONSTRUCTION, DEC, AND OREGON STATE HEALTH DEPARTMENT STANDARD PLANS AND SPECIFICATIONS, AS APPLICABLE.
- PRIOR TO ANY CONSTRUCTION, LOCATIONS OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR. WHEN ACTUAL CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
- PRIOR TO CONSTRUCTION ALL UTILITY LOCATES SHALL BE COMPLETED IN FULL. IT IS THE CONTRACTORS RESPONSIBILITY TO MAINTAIN THESE MARKINGS AT ALL TIMES DURING ANY CONSTRUCTION PHASE OF THE PROJECT.
- ORGANIC AND UNDESIRABLE MATERIAL SHALL BE REMOVED FROM THE CONSTRUCTION AREA AS DIRECTED BY THE ENGINEER.
- CONTRACTOR TO LEAVE ALL AREAS OF PROJECT FREE OF DEBRIS AND UNUSED CONSTRUCTION MATERIAL.
- ALL FILL AREAS SHALL BE STRIPPED OF ORGANIC MATERIAL. FILL WILL BE PLACED IN 9-INCH LIFTS AND COMPACTED TO 95% RELATIVE MAXIMUM DENSITY ACCORDING TO AASHTO T-99 STANDARDS. BASE ROCK IN THE STREET WILL BE COMPACTED TO 94% AASHTO T-100. LANDSCAPE AREAS WILL BE COMPACTED TO 90%. THE CONTRACTOR WILL PROVIDE DENSITY TESTING A MINIMUM OF ONE FOR EVERY 10,000 SQUARE FEET OF AREA AND 2 FEET OF FILL PLACED. ADDITIONAL COMPACTION TESTS MAY BE REQUIRED BY THE CITY AND THE ENGINEER OF RECORD IF POOR COMPACTION EFFORTS ARE OBSERVED DURING CONSTRUCTION. COMPACTION REPORTS FROM A REPUTABLE TESTING LAB WILL BE SUPPLIED TO THE ENGINEER.
- ADA STANDARD SIDEWALK RAMP WITH CURB DROPS, PER CITY DETAILS, WILL BE INSTALLED WITH PROJECT INCLUDING ONE 5' PANEL ON EACH SIDE OR FROM PC TO PT ON CORNERS. LOCATIONS SHALL BE AS SHOWN ON PLANS UNLESS OTHERWISE DIRECTED BY ENGINEER AND APPROVED BY CITY.
- ALL DISTURBED AREAS NOT LANDSCAPED ARE TO BE HYDROSEED OR BEDDED IN STRAW TO PREVENT EROSION.
- ANY CHANGES TO APPROVED PLANS SHALL BE REQUESTED BY THE DESIGN ENGINEER AND APPROVED BY THE APPROPRIATE AGENCIES. COMPLEXITY OF MODIFICATIONS WILL DETERMINE IF REVISED PLANS ARE REQUIRED OR CITY APPROVALS PRIOR TO CONSTRUCTION CHANGES.
- CAREFULLY REVIEW FUTURE LOCATION OF SIDEWALK WHEN INSTALLING STREET LIGHTS AND MAILBOX STANDS TO AVOID CONFLICT IN AREAS WHERE SIDEWALKS WILL BE INSTALLED.
- MANHOLE CONSTRUCTION SHALL BE AS SHOWN ON STANDARD DETAILS.
- HDPE STORM SEWER PIPE SHALL BE ASTM SDR-26 OR C-900 AS SHOWN ON THE PLANS. CONCRETE STORM PIPE SHALL BE ASTM C-14 CLASS 3 WITH BELL AND SPIGOT. HDPE- HIGH DENSITY POLYETHYLENE DOUBLE WALL ASTM F-667, ASTM D-1248.
- STORM & SANITARY SEWER LATERALS SHALL BE OF PVC MATERIAL (4" MIN. DIA.). ALL LATERALS MUST HAVE #10 GAUGE COPPER WIRE AND TRACER TAPE 1 FOOT BELOW SURFACE OF PAVING OR LEVELED AND COMPACTED FILL PRIOR TO LAST LAYER OF FILL MATERIAL. THE TAPE SHOULD BE MAGNETIC. THE ENDS OF SANITARY LATERALS SHALL BE MARKED WITH A PRESSURE TREATED 2"x4" PAINTED RED, WITH DEPTH OF LATERAL CLEARLY MARKED AND "SM" CLEARLY VISIBLE. STORM LATERAL ENDS SHALL BE MARKED WITH A PRESSURE TREATED 2"x4" PAINTED GREEN, WITH DEPTH OF LATERAL CLEARLY MARKED AND "STM" CLEARLY VISIBLE.
- ALL STORM AND SANITARY SEWER PIPE TO HAVE A MIN. OF 30" COVER UNLESS SHOWN OTHERWISE ON PLANS.
- ALL SANITARY SEWER PIPE TO BE PVC PER ASTM D-3034.
- PRIOR TO ACCEPTANCE, ALL PUBLIC STORM AND SANITARY SEWER SHALL BE AIR TESTED IN ACCORDANCE WITH THE CITY AND APWA REQUIREMENTS FOR SUCH TESTS. PVC PIPE SHALL ALSO BE TESTED FOR DEFLECTION, USING A MANDREL DESIGNED AT NO LESS THAN 95% OF INTERIOR DIAMETER. CONTRACTOR TO PREPARE PIPE IN ACCORDANCE WITH OREGON APWA SPECIFICATIONS PRIOR TO THE INSPECTING ENGINEER AND OR CITY'S DESIGNATE WITNESSING THE TEST. ALL SANITARY SEWER LINES IN GRADE SHALL BE VIDEO TAPED, BY CONTRACTOR, TO ASSURE THAT THERE ARE NO FLAT SPOTS IN THE LINE.
- BEDDING AND PIPE ZONE BACKFILL REQUIREMENTS WILL BE IN ACCORDANCE WITH APPLICABLE SPECIFICATIONS, DETAILS, AND CITY OF ST. HELENS STANDARD CONSTRUCTION MANUAL AND DETAILS.
- TRENCH BACKFILL IN PUBLIC ROW WILL BE 3/4-INCH TO 0-INCH CRUSHED ROCK COMPACTED TO 95% RELATIVE MAXIMUM DENSITY, AASHTO T-99. COMPACTION AND BACKFILL IN COUNTY ROW MUST MEET COUNTY STANDARDS AND BE APPROVED BY THE COUNTY ENGINEERING STAFF.
- MINIMUM COVER OVER WATERLINES IS TO BE 30 INCHES AS MEASURED FROM FINISH GRADE TO TOP OF PIPE. MINIMUM VERTICAL SEPARATION BETWEEN WATERLINE AND SANITARY SEWER AT A CROSSING IS 18 INCHES. SANITARY SEWER AT WATERLINE CROSSINGS WITH LESS THAN THE MINIMUM VERTICAL SEPARATION SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE OR C-900 WITH WATER-TIGHT JOINTS. IN SUCH CASES THE 18-FOOT LENGTH OF SANITARY SEWER SHALL BE CENTERED AT THE CROSSING.
- ALL WATER PIPE AND FITTING SHALL BE CEMENT-LINED DUCTILE IRON PIPE, CLASS 50 WITH TYTON JOINTS OR APPROVED EQUAL.
- WATERLINES SHALL BE PRESSURE TESTED FOLLOWING COMPLETION. TEST PRESSURE SHALL BE 150 PSI (AT LOWEST POINT IN TEST SECTION) TO BE HELD FOR A PERIOD OF 1 HOUR AND SHALL NOT VARY BY MORE THAN 5 PSI SAID TEST SHALL BE WITNESSED BY THE INSPECTING ENGINEER AND OR CITY'S DESIGNATE.
- PRIOR TO BEING PLACED IN SERVICE, THE WATERLINE AND SERVICES SHALL BE FLUSHED, STERILIZED, AND RE-FLUSHED, ALL IN ACCORDANCE WITH STANDARD METHODS OF THE HEALTH DIVISION, DEPARTMENT OF HUMAN RESOURCES, STATE OF OREGON. CITY CREWS WILL TAKE BACTERIOLOGICAL TESTS WHEN SO REQUESTED BY THE CONTRACTOR. THE CONTRACTOR SHALL PAY FOR SAID TESTING.
- CONCRETE THRUST BLOCKING SHALL BE PROVIDED AT ALL WATERLINE FITTINGS AS REQUIRED BY APWA STDS. BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH AND CLEAR OF JOINT ACCESSORIES. BEARING AREA OF THRUST BLOCK SHALL BE COMPUTED ON THE BASIS OF ALLOWABLE SOIL BEARING PRESSURE.
- ALL WATERLINES CONSTRUCTED SHALL BE IN ACCORDANCE WITH CITY, APWA AND APWA STANDARDS.
- ONE SET OF AS-BUILT MYLARS SHOWING ALL IMPROVEMENTS SHALL BE PROVIDED TO THE CITY BY DEVELOPER'S ENGINEER. IN ADDITION, THE CONTRACTOR SHALL PROVIDE AS-BUILT FIELD MEASUREMENTS REFERENCE ALL VALVE BOXES AND BLOW OFFS TO PERMANENT FEATURES (M/COVERS, FIRE HYDRANTS, AND ETC.) AND ROCK DEPTHS AS RECORDED DURING CONSTRUCTION. TWO TO THREE SWING TIES FOR EACH VALVE BOX SHALL BE SHOWN IN RED MARKS ON A SET OF WATER PLANS. THESE PLANS SHALL BE SUBMITTED TO THE CITY PRIOR TO SERVICE INSTALLATION.
- SANITARY MANHOLES SHALL BE TESTED IN ACCORDANCE WITH OREGON APWA AND DEO SPECS.
- PERMANENT STREET SIGNAGE TO BE INSTALLED BY CITY CREWS IN ACCORDANCE NORMAL TRAFFIC REGULATIONS. INSTALLATION SHALL BE PAID FOR BY THE CONTRACTOR ON A TIME AND MATERIALS BASIS.
- STREET TREES TO BE PLANTED IN ACCORDANCE WITH CHAPTER 17.72 OF THE CITY OF ST. HELENS COMMUNITY DEVELOPMENT CODE.
- A PRE-CONSTRUCTION MEETING WITH THE CITY, CONTRACTOR, AND INCEPTING ENGINEER IS REQUIRED PRIOR TO THE START OF CONSTRUCTION.
- UNTIL FINAL ACCEPTANCE BY THE CITY, CITY PERSONNEL WILL OPERATE (OPEN/CLOSE) ALL VALVES CONTROLLING WATER FLOW TO NEW PIPING FROM THE CITY'S POTABLE WATER SYSTEM.
- ENGINEER SHALL PROVIDE THE CITY WITH AN AUTO CAD R14 OR ABOVE, COPY OF THE AS-BUILT DRAWINGS AT COMPLETION OF THE PROJECT USING THE ENGINEER'S STANDARD AUTO CAD LAYERING. IN ADDITION AN AUTO CAD R14 OR ABOVE, COPY OF SAME USING THE CITY'S STANDARD AUTO CAD LAYERING SHALL BE PROVIDED BY THE ENGINEER.
- SURVEYOR SHALL PROVIDE THE CITY A COORDINATE FILE SHOWING COORDINATES FOR ALL LOT CORNERS, PC'S, PT'S INTERSECTIONS, AND BOUNDARY AS RECORDED. DISTANCES SHALL BE SUPPLIED TO SIX PL'S AND ANGLES TO TWO PL'C'S. TWO GPS POINTS SHALL BE USED TO ROTATE BASIS OF BEARING TO. STANDARD MONUMENT BOXES SHALL BE INSTALLED PER CITY STANDARD DETAIL 266.
- THE LETTER "W" SHALL BE STAMPED IN THE TOP OF THE CURB SECTION DIRECTLY ABOVE THE WATER SERVICE CROSSING. THE LETTERS "S" SHALL BE STAMPED THE TOP OF THE CURB DIRECTLY ABOVE THE SANITARY CROSSING AND STORM DRAIN CROSSINGS WITH "SM" OR "D".
- EROSION CONTROL MUST BE FULLY CONSTRUCTED AS APPROVED BY THE PROJECT ENGINEER PRIOR TO BEGINNING ANY CONSTRUCTION.
- CITY ENGINEERING STAFF SHALL BE SUPPLIED WITH MATERIAL CERTIFICATIONS FOR ALL MATERIALS USED ON PUBLIC INFRASTRUCTURE.
- IF DRILLING OR BASTING ARE REQUIRED, A BLASTING PLAN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO ANY WORK.

BENCH MARK:
Brass Disk at the Northeast corner of Milton Creek Bridge and Pittsburg Road.
Elevation: 139.06, NGVD 29/47.

LOCATES (48 HOUR NOTICE PRIOR TO EXCAVATION)

ATTENTION
OREGON LAW REQUIRES YOU TO FOLLOW THE RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER BY CALLING (503) 246-1987.

ONE CALL SYSTEM 1-800-332-2344

THE PUBLIC WORKS MAINTENANCE SUPERVISOR (NEAL SHEPPARD) 503-397-3532 MUST BE NOTIFIED 48 HOURS IN ADVANCE TO COORDINATE ANY TAPS AND/OR WATER VALVE OPERATION. THE CONTRACTOR IS NOT ALLOWED TO OPERATE ANY WATER VALVES CONTROLLING FLOW TO NEW PIPING FROM CITY'S POTABLE WATER SYSTEM.

CITY APPROVAL IS REQUIRED FOR THIS PROJECT.
A COUNTY PERMIT IS REQUIRED FOR WORK IN THE HANLEY ROAD R.O.W.

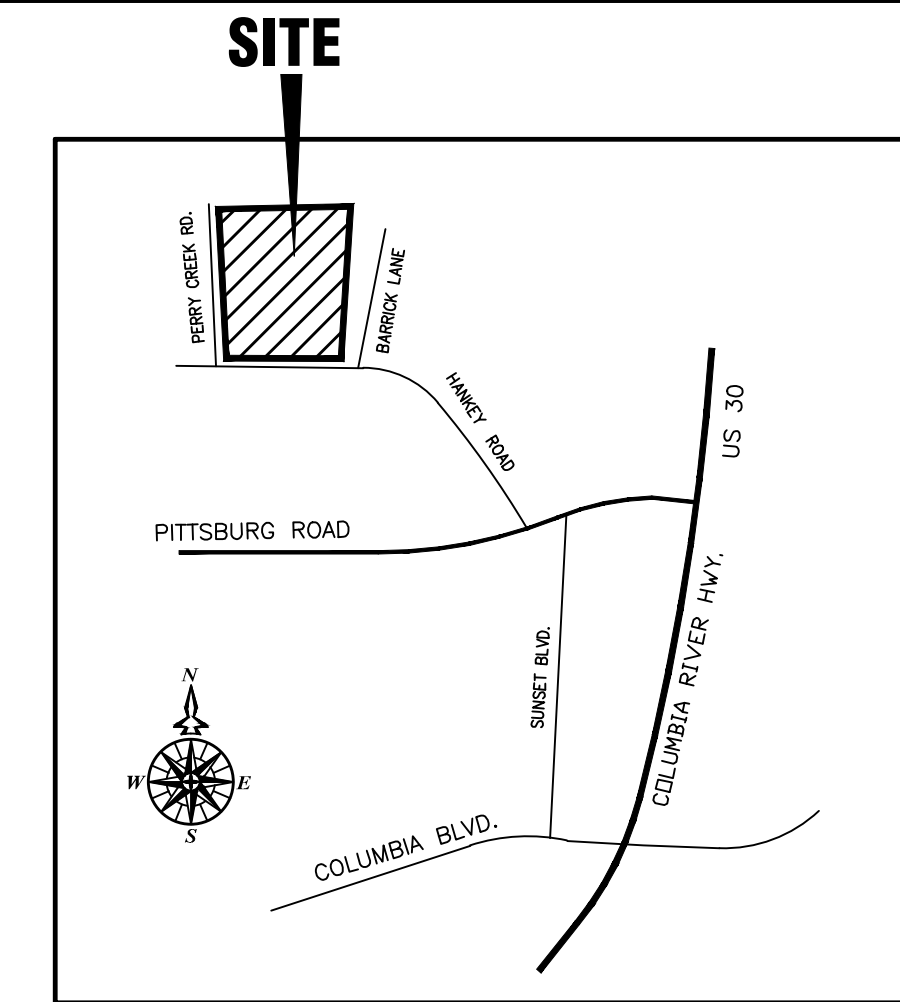
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ELK RIDGE ESTATES PHASE 5

CITY OF ST. HELENS

COLUMBIA COUNTY, OREGON

TAX LOTS: 5N1W-32C-100 & 200; 5N1W-32DB-100; 5N1W-32DC-900



VICINITY MAP
SCALE: NTS

PROJECT TEAM

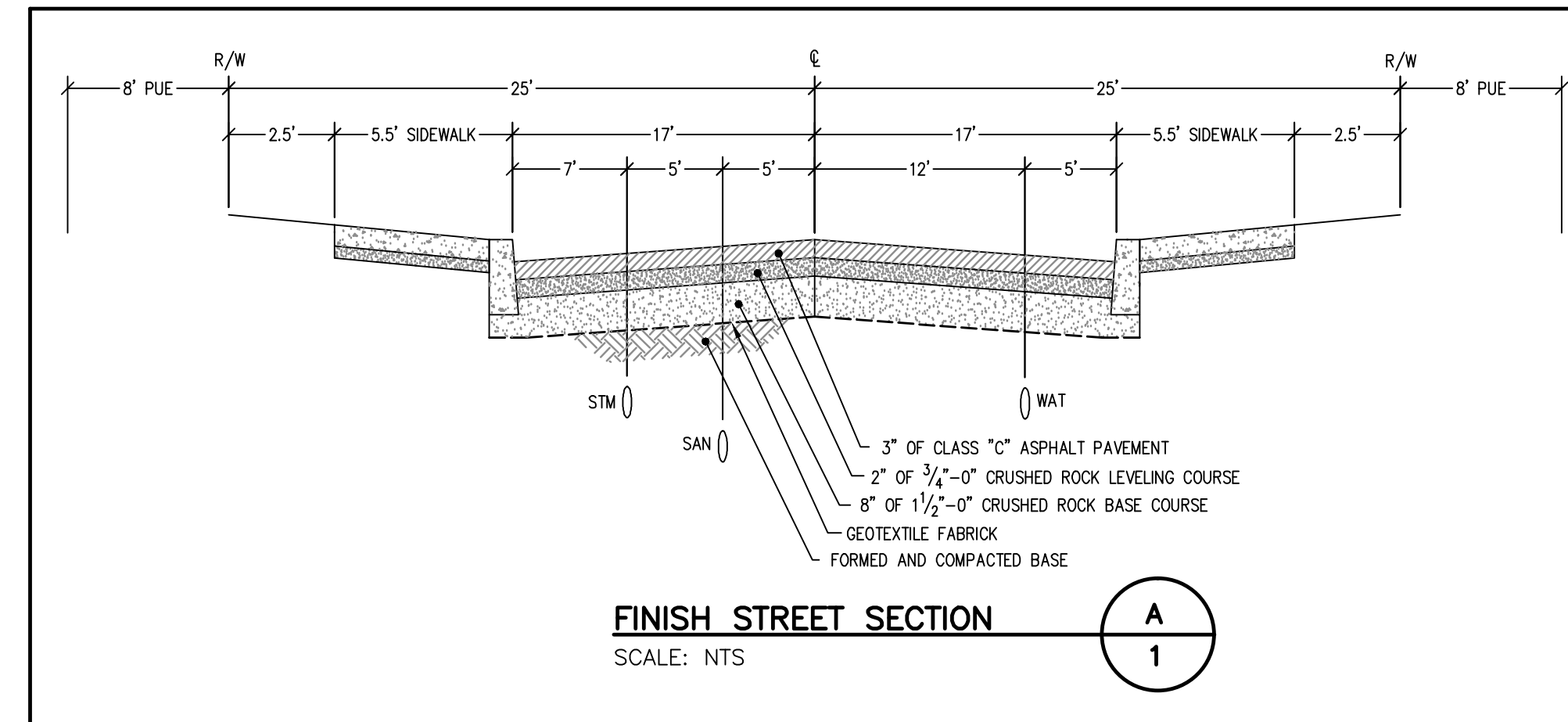
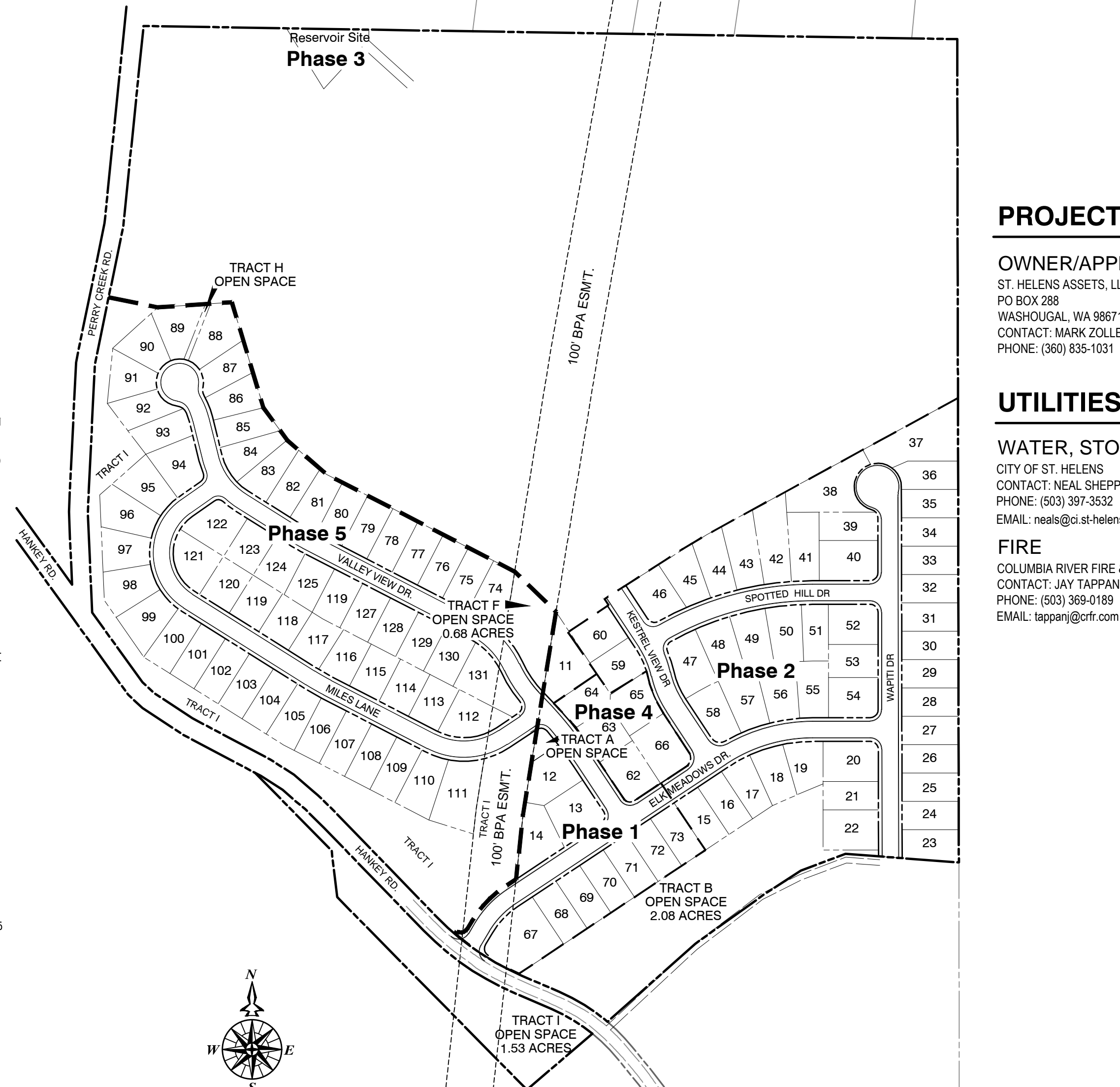
OWNER/APPLICANT ST. HELENS ASSETS, LLC PO BOX 288 WASHOUGAL WA 98671 CONTACT: MARK ZOLLER PHONE: (360) 835-1031	CIVIL ENGINEER 3J CONSULTING, INC. 5075 SW GRIFFITH DR, SUITE 150 BEAVERTON, OR 97005 CONTACT: JOHN HOWORTH PHONE: (503) 946-9365 EX. 201 EMAIL: john.howorth@3j-consulting.com	LAND SURVEYOR COMPASS SURVEYING 4107 SE INTERNATIONAL WAY, SUITE 705 MILWAUKIE, OR 97122 CONTACT: Mike Rademacher PHONE: (503) 860-9497 EMAIL: MikeR@compass-landsurveyors.com
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UTILITIES & SERVICES

WATER, STORM, SEWER CITY OF ST. HELENS CONTACT: NEAL SHEPPARD PHONE: (503) 397-3532 EMAIL: neals@csl-st-helens.or.us	POWER COLUMBIA RIVER PUD CONTACT: Karl Webster PHONE: (503) 397-8154 EMAIL: kwebster@crpud.org	GAS NORTHWEST NATURAL CONTACT: BRENDA HARTZOG PHONE: (503) 721-2460 EMAIL: brenda.hartzog@nwnatural.com
FIRE COLUMBIA RIVER FIRE & RESCUE CONTACT: JAY TAPPAN PHONE: (503) 369-0189 EMAIL: tappan@crrf.com	CABLE COMCAST CONTACT: KEN PARRIS PHONE: (503) 596-3811 EMAIL: kenneth_parris@cable.comcast.com	PHONE CENTURYLINK CONTACT: TYLER WADE PHONE: (360) 699-3718 EMAIL: Tyler.Wade@CenturyLink.com

GOVERNING AGENCIES

CITY PLANNING CITY OF ST. HELENS LAND USE PLANNING 265 STRAND STREET ST. HELENS, OR 97051 CONTACT: JACOB GRAICHEN PHONE: (503) 397-6272 EMAIL: jacobg@csl-st-helens.or.us	CITY ENGINEERING CITY OF ST. HELENS ENGINEERING AND PUBLIC WORKS 265 STRAND STREET ST. HELENS, OR 97051 CONTACT: SUE NELSON PHONE: (503) 397-6272, EXT. 123 EMAIL: suen@csl-st-helens.or.us	OREGON DEQ DEPARTMENT OF ENVIRONMENTAL QUALITY NATURAL RESOURCE SPECIALIST, STORMWATER 2020 SW 4TH AVE., STE. 400 PORTLAND, OR 97201 CONTACT: JENNIFER WEAVER PHONE: (503) 229-6855 EMAIL: WEAVER.Jennifir@deq.state.or.us
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LEGEND

<ul style="list-style-type: none"> ⊙ EXISTING CENTERLINE MONUMENT ⊙ EXISTING UTILITY POLE ○ EXISTING SANITARY MANHOLE ○ EXISTING CLEANOUT ⊙ EXISTING STORM MANHOLE □ EXISTING CATCH BASIN ⊙ EXISTING WATER METER ⊙ EXISTING WATER VALVE △ EXISTING THRUST BLOCKING ⊙ EXISTING FIRE HYDRANT ⊙ EXISTING BUTTERFLY VALVE ⊙ EXISTING BLOW OFF ASSEMBLY ▷ EXISTING REDUCER ⊙ EXISTING AIR RELEASE VALVE ● NEW SANITARY MANHOLE ● NEW CLEANOUT ⊙ NEW STORM MANHOLE ■ NEW CATCH BASIN ⊙ ROOF DRAIN ● NEW FIRE HYDRANT ⊙ NEW WATER VALVE ⊙ NEW BLOW OFF ASSEMBLY △ NEW THRUST BLOCKING ⊙ NEW WATER METER ⊙ NEW CENTERLINE MONUMENT ■ CATCH BASIN PROTECTION 	<ul style="list-style-type: none"> --- EXISTING RIGHT-OF-WAY --- EXISTING PROPERTY LINE --- EXISTING CURB --- EXISTING EDGE OF PAVEMENT --- EXISTING EASEMENT --- EXISTING POWER LINE --- EXISTING STORM SEWER LINE --- EXISTING SANITARY SEWER LINE --- EXISTING WATER LINE --- PROPERTY BOUNDARY --- NEW RIGHT-OF-WAY --- NEW PROPERTY LINE --- NEW CURB --- NEW EASEMENT --- NEW SANITARY SEWER LINE --- NEW STORM SEWER LINE --- NEW WATER LINE --- NEW SIDEWALK --- NEW SIDEWALK BY HOME BUILDER
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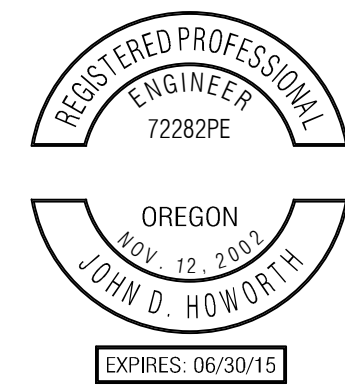
SHEET INDEX

1	COVER
2	STREET PLAN
3	STREET PROFILES
4	STORM DRAINAGE PLAN
4A	STORM DRAINAGE PLAN WITH CONTOURS
5	STORM DRAINAGE PROFILES
6	SANITARY SEWER PLAN
7	SANITARY SEWER PROFILES
8	WATER PLAN
9	WATER PROFILES
10	GRADING AND EROSION CONTROL PLAN
11	STREET TREE PLANTING PLAN
D1	STANDARD DETAILS I
D2	STANDARD DETAILS II
D3	STANDARD DETAILS III
D4	STANDARD DETAILS IV
D5	STANDARD DETAILS V

INFRASTRUCTURE SUMMARY:

Street Improvements:	2293 LF
8" Sanitary Sewer:	2151 LF
Water:	5972 LF (8")
	1275 LF (6")
Storm Sewer:	1083 LF (12")
	162 LF (10")
	120 LF (8")
	556 LF (6")
Sidewalk:	4382 LF

P-371-D
S-635
SD-151
W-447
R-640



DATE	NO.	REVISION

3J CONSULTING, INC.
3J
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING

3J CONSULTING, INC.
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

St Helens Assets, LLC
PO Box 288
Washougal, WA 98671

Elk Ridge Phases 5
Hanley Road
St Helens, Columbia County, Oregon

Cover

CONSTRUCTION NOTES

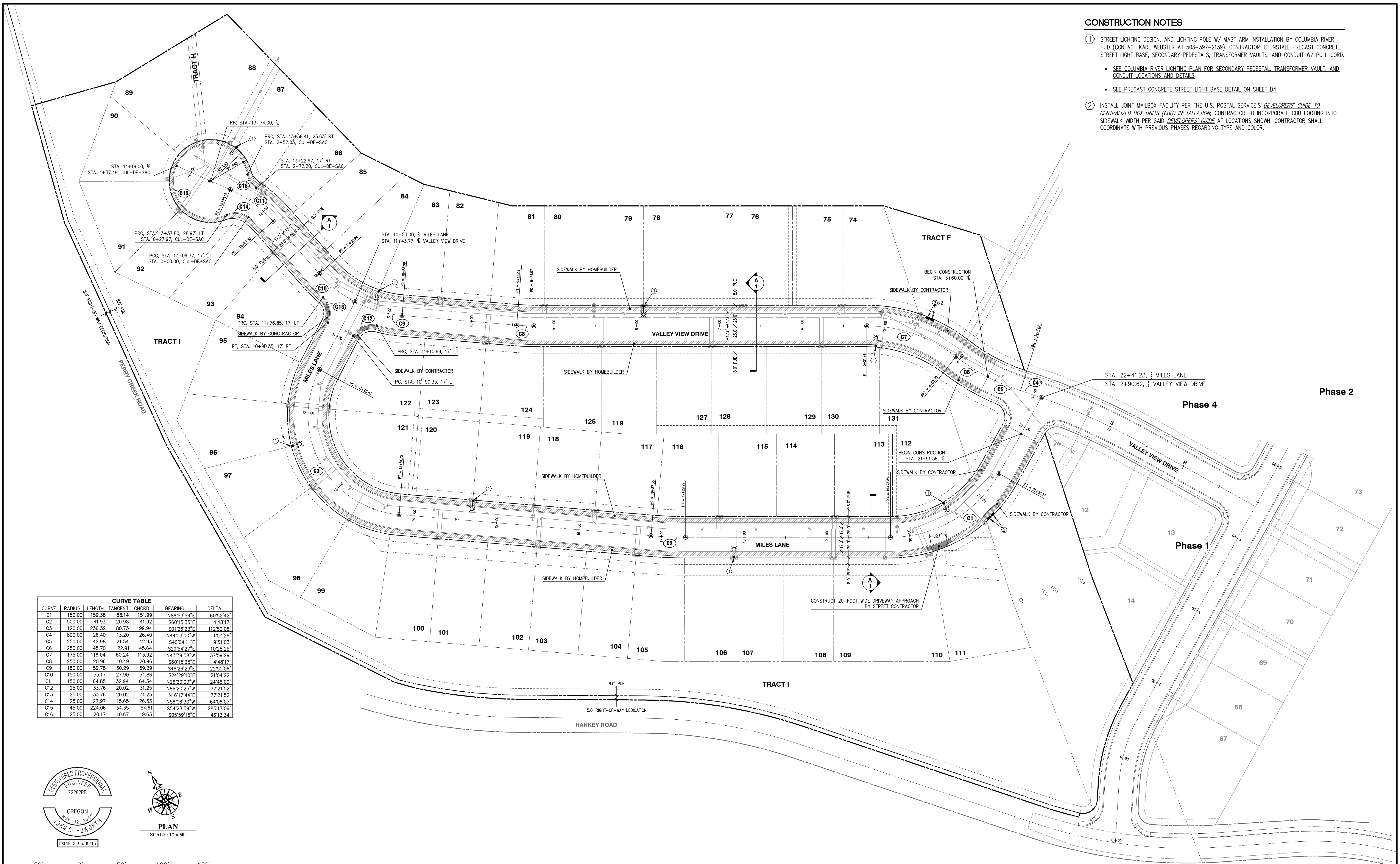
- ① STREET LIGHTING DESIGN, AND LIGHTING POLE W/ MAST ARM INSTALLATION BY COLUMBIA RIVER PUD (CONTACT KARL WEBSTER AT 503-397-2139). CONTRACTOR TO INSTALL PRECAST CONCRETE STREET LIGHT BASE, SECONDARY PEDESTALS, TRANSFORMER VAULTS, AND CONDUIT W/ PULL COIL.
 - SEE COLUMBIA RIVER LIGHTING PLAN FOR SECONDARY PEDESTAL, TRANSFORMER VAULT, AND CONDUIT LOCATIONS AND DETAILS.
 - SEE PRECAST CONCRETE STREET LIGHT BASE DETAIL ON SHEET D4.
- ② INSTALL JOINT MAILBOX FACILITY PER THE U.S. POSTAL SERVICE'S *DEVELOPERS' GUIDE TO CENTRALIZED BOX UNITS (CBU) INSTALLATION*. CONTRACTOR TO INCORPORATE CBU FOOTING INTO SIDEWALK WIDTH PER SAID *DEVELOPERS' GUIDE* AT LOCATIONS SHOWN. CONTRACTOR SHALL COORDINATE WITH PREVIOUS PHASES REGARDING TYPE AND COLOR.

CURVE	RADIUS	LENGTH	TANGENT	CHORD	BEARING	DELTA
C1	150.00	159.38	88.14	151.99	N86°33'56"E	60°52'42"
C2	500.00	41.93	20.98	41.92	S60°15'35"E	4°48'17"
C3	120.00	236.32	180.73	199.94	S01°26'23"E	112°50'06"
C4	800.00	26.40	13.20	26.40	N44°03'00"W	1°53'26"
C5	250.00	42.98	21.54	42.93	S40°04'11"E	9°51'03"
C6	250.00	45.70	22.91	45.64	S29°54'27"E	10°28'25"
C7	175.00	116.04	60.24	113.92	N43°39'58"W	37°59'29"
C8	250.00	20.96	10.49	20.96	S60°15'35"E	4°48'17"
C9	150.00	59.78	30.29	59.39	S40°28'23"E	22°50'06"
C10	150.00	55.17	27.90	54.86	S24°29'10"E	21°04'22"
C11	150.00	64.85	32.94	64.34	N26°20'03"W	24°46'09"
C12	25.00	33.76	20.02	31.25	N86°20'25"W	77°21'52"
C13	25.00	33.76	20.02	31.25	N16°17'44"E	77°21'52"
C14	25.00	27.97	15.65	26.53	N56°06'30"W	64°06'07"
C15	45.00	224.06	34.35	54.61	S54°28'59"W	285°17'06"
C16	25.00	20.17	10.67	19.63	S05°59'15"E	46°13'34"

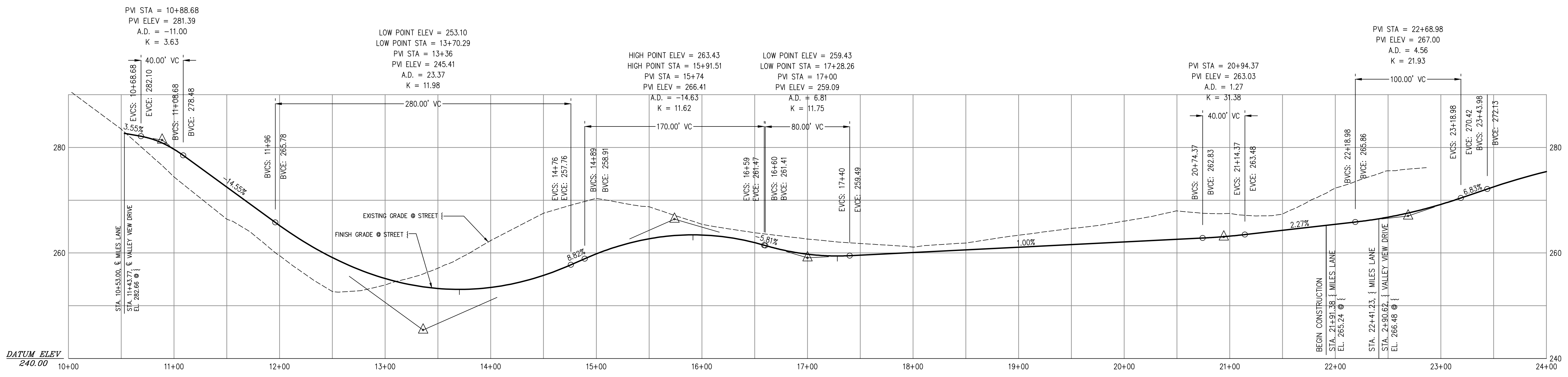
REGISTERED PROFESSIONAL ENGINEER
72282PE
OREGON
NOV. 12, 2010
JOHN D. HOWARTH
EXPIRES: 06/30/15

PLAN
SCALE: 1" = 50'

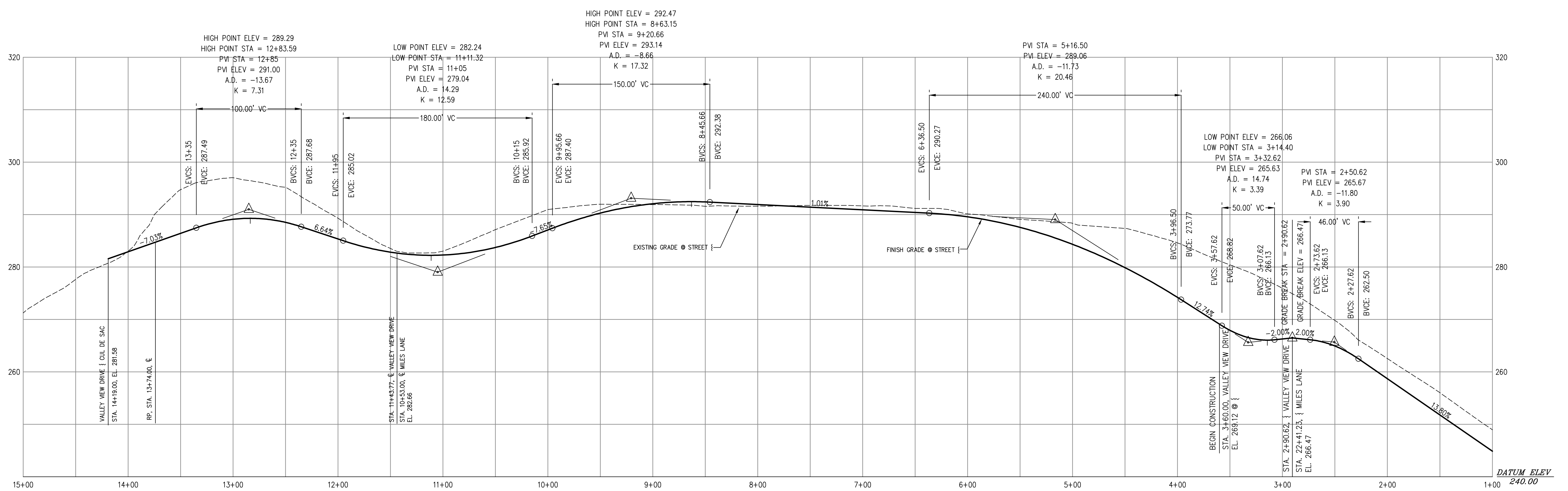
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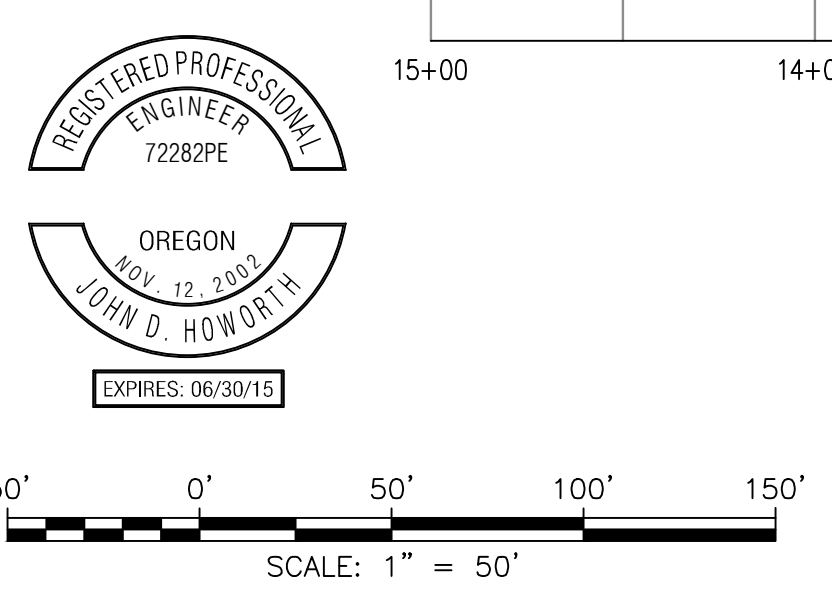
STREET PLAN



MILES LANE CENTERLINE PROFILE
 SCALE: 1" = 50' HORIZONTAL
 1" = 10' VERTICAL



VALLEY VIEW DRIVE CENTERLINE PROFILE
 SCALE: 1" = 50' HORIZONTAL
 1" = 10' VERTICAL



STREET PROFILES

DATE	NO.	REVISION

3J CONSULTING, INC.

 CIVIL ENGINEERING
 WATER RESOURCES
 LAND USE PLANNING

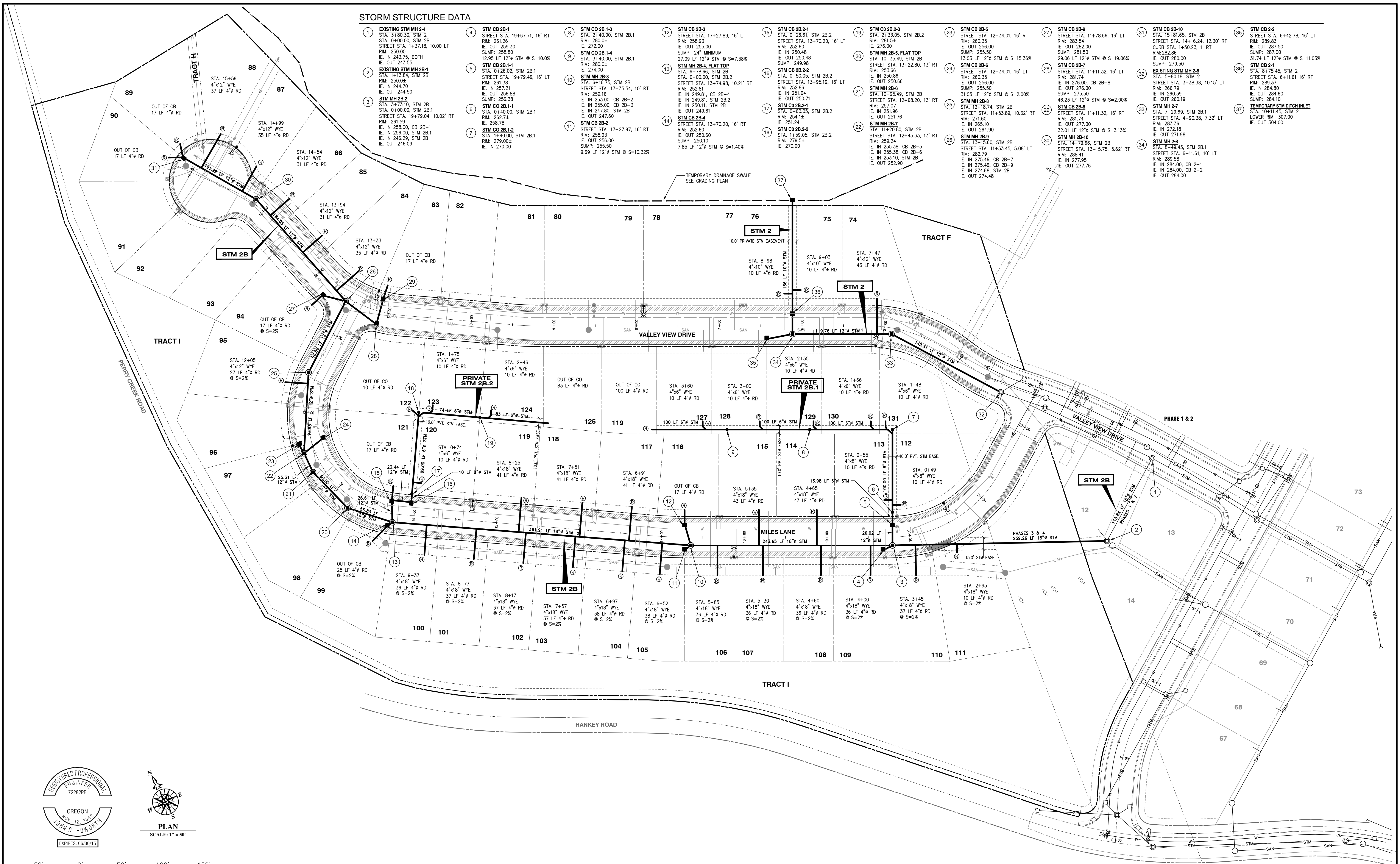
3J CONSULTING, INC.
 5075 SW GRIFFITH DRIVE, SUITE 150
 BEAVERTON, OR 97005
 PHONE & FAX: (503) 946-9365

St Helens Assets, LLC
 PO Box 288
 Washougal, WA 98671

Eik Ridge Phases 5
 Hankey Road
 St Helens, Columbia County, Oregon

STORM STRUCTURE DATA

- | | | | | | | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 1 EXISTING STM MH 2-4
STA. 3+80.30, STM 2
STA. 0+00.00, STM 2B
STREET STA. 1+37.18, 10.00 LT
RIM: 250.00
IE. IN 243.75, BOTH
IE. OUT 243.55 | 4 STM CB 2B-1
STREET STA. 19+67.71, 16' RT
RIM: 261.26
IE. OUT 258.30
SUMP: 258.80
12.95 LF 12" STM @ S=10.0% | 8 STM CO 2B-1-3
STA. 2+40.00, STM 2B.1
RIM: 280.03
IE. 272.00 | 12 STM CB 2B-3
STREET STA. 17+27.89, 16' LT
RIM: 258.33
IE. OUT 255.00
SUMP: 24' MINIMUM
27.09 LF 12" STM @ S=7.38% | 16 STM CO 2B-2-1
STA. 0+26.61, STM 2B.2
STREET STA. 13+70.20, 16' LT
RIM: 281.54
IE. 276.00 | 20 STM CO 2B-2-3
STA. 2+33.05, STM 2B.2
RIM: 281.54
IE. 276.00 | 24 STM CB 2B-5
STREET STA. 12+34.01, 16' RT
RIM: 260.35
IE. OUT 256.00
SUMP: 255.50
13.03 LF 12" STM @ S=15.36% | 28 STM CB 2B-9
STREET STA. 11+78.66, 16' LT
RIM: 283.54
IE. OUT 282.00
SUMP: 281.50
29.06 LF 12" STM @ S=19.06% | 32 EXISTING STM MH 2-6
STREET STA. 14+16.24, 12.30' RT
CURB STA. 1+50.23, 1' RT
RIM: 282.86
IE. OUT 280.00
SUMP: 279.50 | 36 STM CB 2-1
STREET STA. 6+42.78, 16' LT
RIM: 289.83
IE. OUT 287.50
SUMP: 287.00
31.74 LF 12" STM @ S=11.03% |
| 2 EXISTING STM MH 2B-1
STA. 1+13.84, STM 2B
RIM: 250.02
IE. IN 244.70
IE. OUT 244.50 | 5 STM CB 2B-1-1
STA. 0+28.02, STM 2B.1
STREET STA. 19+79.46, 16' LT
RIM: 261.38
IE. IN 257.21
IE. OUT 256.88
SUMP: 256.38 | 9 STM CO 2B-1-4
STA. 3+40.00, STM 2B.1
RIM: 280.02
IE. 274.00 | 13 STM MH 2B-4, FLAT TOP
STA. 9+78.66, STM 2B
STREET STA. 13+74.98, 10.21' RT
RIM: 252.81
IE. IN 249.81, CB 2B-4
IE. IN 249.81, STM 2B
IE. OUT 249.61 | 17 STM CO 2B-2-2
STA. 0+50.05, STM 2B.2
STREET STA. 13+95.19, 16' LT
RIM: 252.86
IE. IN 251.04
IE. OUT 250.71 | 21 STM MH 2B-6, FLAT TOP
STA. 10+35.49, STM 2B
STREET STA. 13+22.80, 13' RT
RIM: 251.66
IE. IN 250.86
IE. OUT 250.66 | 25 STM CB 2B-6
STREET STA. 12+34.01, 16' LT
RIM: 260.35
IE. OUT 256.00
SUMP: 255.50
31.05 LF 12" STM @ S=2.00% | 29 STM CB 2B-8
STREET STA. 11+31.32, 16' LT
RIM: 281.74
IE. IN 276.00, CB 2B-8
IE. OUT 276.00
SUMP: 275.50
46.23 LF 12" STM @ S=2.00% | 33 STM MH 2-7
STA. 7+29.69, STM 2B.1
STREET STA. 4+90.38, 7.32' LT
RIM: 283.36
IE. IN 272.18
IE. OUT 271.98 | 37 TEMPORARY STM DITCH INLET
STA. 10+11.45, STM 2
LOWER RIM: 307.00
IE. OUT 304.00 |
| 3 STM MH 2B-2
STA. 3+73.10, STM 2B
STA. 0+00.00, STM 2B.1
STREET STA. 19+79.04, 10.02' RT
RIM: 261.59
IE. IN 258.00, CB 2B-1
IE. IN 256.00, STM 2B.1
IE. IN 246.29, STM 2B
IE. OUT 246.09 | 6 STM CO 2B-1-1
STA. 0+40.00, STM 2B.1
RIM: 282.72
IE. 258.78 | 10 STM MH 2B-3
STA. 6+16.75, STM 2B
STREET STA. 17+35.54, 10' RT
RIM: 259.16
IE. IN 253.00, CB 2B-2
IE. IN 247.80, STM 2B
IE. OUT 247.60 | 14 STM CB 2B-4
STREET STA. 13+74.98, 16' RT
RIM: 252.60
IE. OUT 250.60
SUMP: 250.10
7.85 LF 12" STM @ S=1.40% | 18 STM CO 2B-2-2
STA. 1+59.05, STM 2B.2
RIM: 279.54
IE. 270.00 | 22 STM MH 2B-7
STA. 11+20.80, STM 2B
STREET STA. 12+45.33, 13' RT
RIM: 259.24
IE. IN 255.38, CB 2B-5
IE. IN 255.38, CB 2B-6
IE. IN 253.10, STM 2B
IE. OUT 252.80 | 26 STM MH 2B-9
STREET STA. 11+53.45, 5.08' LT
RIM: 282.79
IE. IN 275.46, CB 2B-7
IE. IN 275.46, CB 2B-9
IE. IN 274.68, STM 2B
IE. OUT 274.48 | 30 STM MH 2B-10
STREET STA. 13+15.75, 5.62' RT
RIM: 288.41
IE. IN 277.95
IE. OUT 277.76 | 34 STM MH 2-8
STA. 6+49.45, STM 2B.1
STREET STA. 6+11.61, 10' LT
RIM: 289.58
IE. IN 284.00, CB 2-1
IE. IN 284.00, CB 2-2
IE. OUT 284.00 | |



REGISTERED PROFESSIONAL ENGINEER 72282PE
OREGON NOV 12, 2003 JOHN D. HOWARTH
EXPIRES: 06/30/15

PLAN
SCALE: 1" = 50'

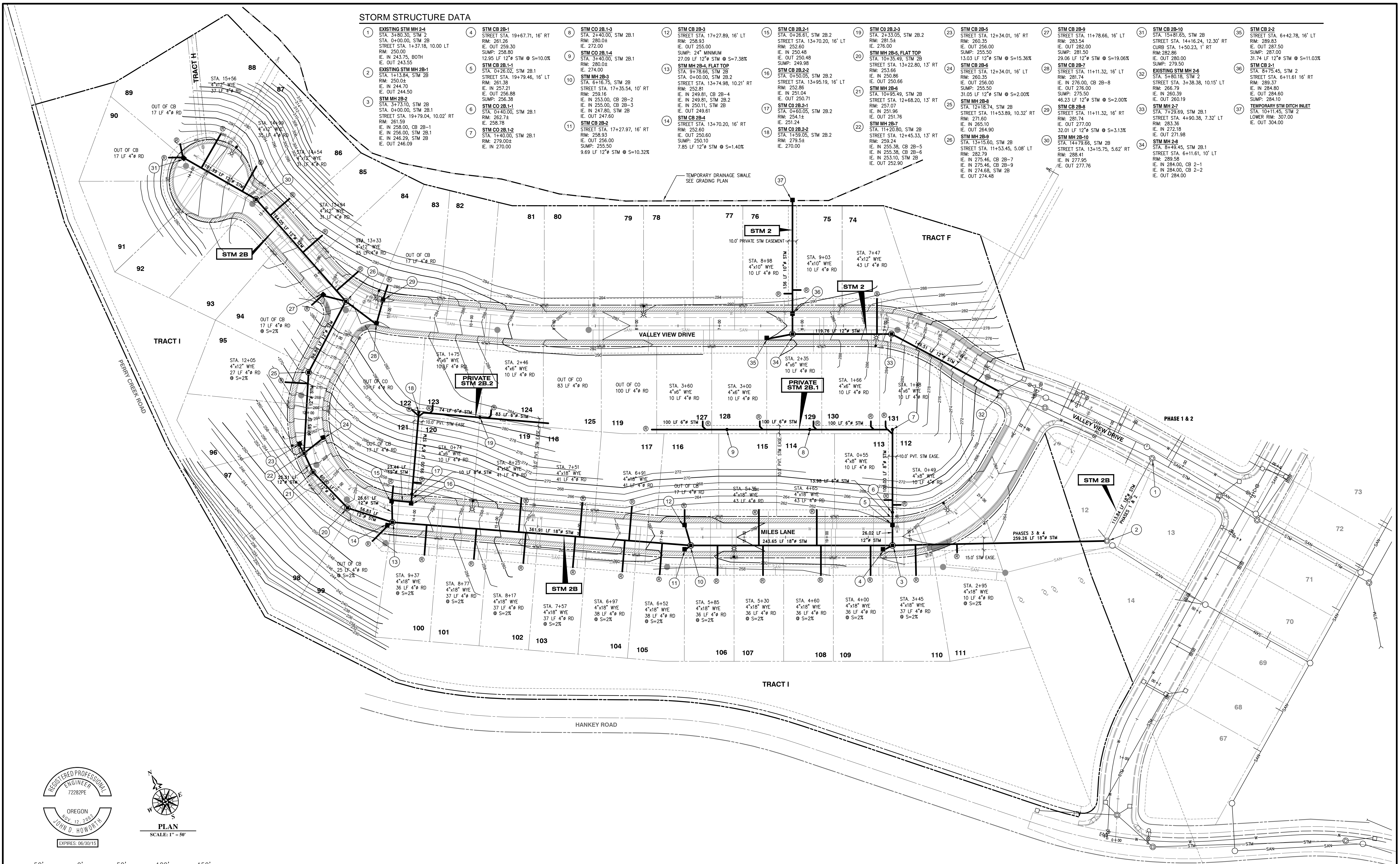
50' 0' 50' 100' 150'
SCALE: 1" = 50'

STORM DRAINAGE PLAN

DATE	NO.	REVISION	DRAWN: CLF SCALE: 1" = 50' LAND USE #: SUB.1.13	DESIGNED: CLF DATE: June 2014 DRAWING: 14188-Elk Ridge Phase 5	CHECKED: JDH	3J CONSULTING, INC. CIVIL ENGINEERING WATER RESOURCES LAND USE PLANNING	3J CONSULTING, INC. 5075 SW GRIFFITH DRIVE, SUITE 150 BEAVERTON, OR 97005 PHONE & FAX: (503) 946-9365	St Helens Assets, LLC PO Box 288 Washougal, WA 98671	Elk Ridge Phases 5 Hankey Road St Helens, Columbia County, Oregon	4 11
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STORM STRUCTURE DATA

- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| 1 EXISTING STM MH 2-4
STA. 3+80.30, STM 2
STA. 0+00.00, STM 2B
STREET STA. 1+37.18, 10.00 LT
RIM: 250.00
IE. IN 243.75, BOTH
IE. OUT 243.55 | 2 EXISTING STM MH 2B-1
STA. 1+13.84, STM 2B
RIM: 250.02
IE. IN 244.70
IE. OUT 244.50 | 3 STM MH 2B-2
STA. 3+73.10, STM 2B
STA. 0+00.00, STM 2B-1
STREET STA. 19+79.04, 10.02 RT
RIM: 261.59
IE. IN 258.00, CB 2B-1
IE. IN 256.00, STM 2B-1
IE. IN 246.29, STM 2B
IE. OUT 246.09 | 4 STM CB 2B-1
STREET STA. 19+67.71, 16' RT
RIM: 261.26
IE. OUT 255.00
SUMP: 258.80
12.95 LF 12" STM @ S=10.0% | 5 STM CO 2B-1
STA. 0+28.02, STM 2B-1
STREET STA. 19+79.46, 16' LT
RIM: 261.38
IE. IN 257.21
IE. OUT 256.88
SUMP: 256.38 | 6 STM CO 2B-1-1
STA. 0+40.00, STM 2B-1
RIM: 262.72
IE. 258.78 | 7 STM CO 2B-1-2
STA. 1+40.00, STM 2B-1
RIM: 279.00
IE. IN 270.00 | 8 STM CO 2B-1-3
STA. 2+40.00, STM 2B-1
RIM: 280.02
IE. 272.00 | 9 STM CO 2B-1-4
STA. 3+40.00, STM 2B-1
RIM: 280.02
IE. 274.00 | 10 STM MH 2B-3
STA. 6+16.75, STM 2B
STREET STA. 17+35.54, 10' RT
RIM: 259.16
IE. IN 249.81, CB 2B-4
IE. IN 253.00, CB 2B-2
IE. IN 255.00, CB 2B-3
IE. IN 247.80, STM 2B
IE. OUT 247.60 | 11 STM CB 2B-2
STREET STA. 17+27.97, 16' RT
RIM: 258.93
IE. OUT 256.00
SUMP: 255.50
9.69 LF 12" STM @ S=10.32% | 12 STM CB 2B-3
STREET STA. 17+27.89, 16' LT
RIM: 258.93
IE. OUT 255.00
SUMP: 24" MINIMUM
27.09 LF 12" STM @ S=7.38% | 13 STM MH 2B-4, FLAT TOP
STA. 9+78.66, STM 2B
STREET STA. 13+74.98, 10.21 RT
RIM: 252.81
IE. IN 249.81, CB 2B-4
IE. IN 249.81, STM 2B
IE. OUT 249.61 | 14 STM CO 2B-4
STREET STA. 13+70.20, 16' RT
RIM: 252.60
SUMP: 250.10
7.85 LF 12" STM @ S=1.40% | 15 STM CB 2B-2-1
STA. 0+26.61, STM 2B-2
STREET STA. 13+70.20, 16' LT
RIM: 256.60
IE. IN 250.48
IE. OUT 250.48
SUMP: 249.98 | 16 STM CB 2B-2-2
STA. 0+50.05, STM 2B-2
STREET STA. 13+95.19, 16' LT
RIM: 252.86
IE. IN 251.04
IE. OUT 250.71 | 17 STM CO 2B-2-1
STA. 0+60.05, STM 2B-2
RIM: 254.12
IE. 251.24 | 18 STM CO 2B-2-2
STA. 1+59.05, STM 2B-2
RIM: 279.52
IE. 270.00 | 19 STM CO 2B-2-3
STA. 2+33.05, STM 2B-2
RIM: 281.52
IE. 276.00 | 20 STM MH 2B-5, FLAT TOP
STA. 10+35.49, STM 2B
STREET STA. 13+22.80, 13' RT
RIM: 250.86
IE. IN 250.66
IE. OUT 250.66 | 21 STM MH 2B-6
STA. 10+35.49, STM 2B
STREET STA. 12+68.20, 13' RT
RIM: 257.07
IE. IN 255.38, CB 2B-5
IE. IN 255.38, CB 2B-6
IE. IN 253.10, STM 2B
IE. OUT 252.80 | 22 STM MH 2B-7
STA. 11+20.80, STM 2B
STREET STA. 12+45.33, 13' RT
RIM: 259.24
IE. IN 275.46, CB 2B-5
IE. IN 275.46, CB 2B-6
IE. IN 253.10, STM 2B
IE. OUT 274.48 | 23 STM CB 2B-5
STREET STA. 12+34.01, 16' RT
RIM: 260.35
IE. OUT 256.00
SUMP: 255.50
13.03 LF 12" STM @ S=15.36% | 24 STM CB 2B-6
STREET STA. 12+34.01, 16' LT
RIM: 260.35
IE. OUT 256.00
SUMP: 255.50
31.05 LF 12" STM @ S=2.00% | 25 STM MH 2B-8
STA. 12+18.74, STM 2B
STREET STA. 11+53.89, 10.32 RT
RIM: 271.60
IE. IN 265.10
IE. OUT 264.90 | 26 STM MH 2B-9
STA. 13+15.60, STM 2B
STREET STA. 11+53.45, 5.08 RT
RIM: 282.79
IE. IN 275.46, CB 2B-7
IE. IN 275.46, CB 2B-9
IE. IN 274.68, STM 2B
IE. OUT 277.76 | 27 STM CB 2B-9
STREET STA. 11+78.66, 16' LT
RIM: 283.54
IE. OUT 282.00
SUMP: 281.50
29.06 LF 12" STM @ S=19.06% | 28 STM CB 2B-7
STREET STA. 11+11.32, 16' LT
RIM: 281.74
IE. IN 276.00, CB 2B-8
IE. OUT 276.00
SUMP: 275.50
46.23 LF 12" STM @ S=2.00% | 29 STM CB 2B-8
STREET STA. 11+11.32, 16' RT
RIM: 281.74
IE. OUT 277.00
SUMP: 281.50
32.01 LF 12" STM @ S=3.13% | 30 STM MH 2B-10
STA. 14+79.66, STM 2B
STREET STA. 13+15.75, 5.62 RT
RIM: 288.41
IE. IN 277.95
IE. OUT 277.76 | 31 STA. 15+81.65, STM 2B
STREET STA. 14+16.24, 12.30 RT
CURB STA. 1+50.23, 1' RT
RIM: 282.86
IE. OUT 280.00
SUMP: 279.50 | 32 EXISTING STM MH 2-6
STA. 5+80.18, STM 2
STREET STA. 3+38.38, 10.15 LT
RIM: 266.79
IE. IN 260.39
IE. OUT 260.19 | 33 STM MH 2-7
STA. 7+29.69, STM 2B-1
STREET STA. 4+90.38, 7.32 LT
RIM: 283.36
IE. IN 272.18
IE. OUT 271.98 | 34 STM MH 2-8
STA. 6+49.45, STM 2B-1
STREET STA. 6+11.61, 10' LT
RIM: 289.58
IE. IN 284.00, CB 2-1
IE. IN 284.00, CB 2-2
IE. OUT 284.00 | 35 STM CB 2-2
STREET STA. 6+42.78, 16' LT
RIM: 289.83
IE. OUT 287.50
SUMP: 287.00
31.74 LF 12" STM @ S=11.03% | 36 STM CB 2-1
STA. 8+75.45, STM 2
STREET STA. 6+11.61, 16' RT
RIM: 289.37
IE. IN 284.80
IE. OUT 284.60
SUMP: 284.10 | 37 TEMPORARY STM DITCH INLET
STA. 10+11.45, STM 2
LOWER RIM: 307.00
IE. OUT 304.00 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|



STORM DRAINAGE PLAN AND CONTOURS

SCALE: 1" = 50'

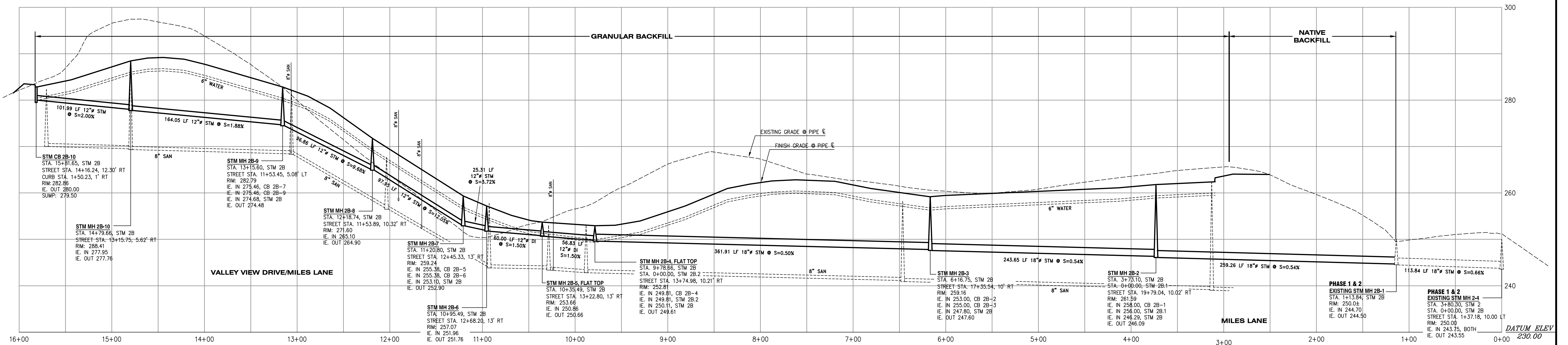
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SCALE: 1" = 50'	DATE: June 2014	
LAND USE #:	DRAWING:	
SUB. 1.13	14188-Elk Ridge Phase 5	

3J CONSULTING, INC.

 3J CONSULTING, INC.
 5075 SW GRIFFITH DRIVE, SUITE 150
 BEAVERTON, OR 97005
 PHONE & FAX: (503) 946-9365

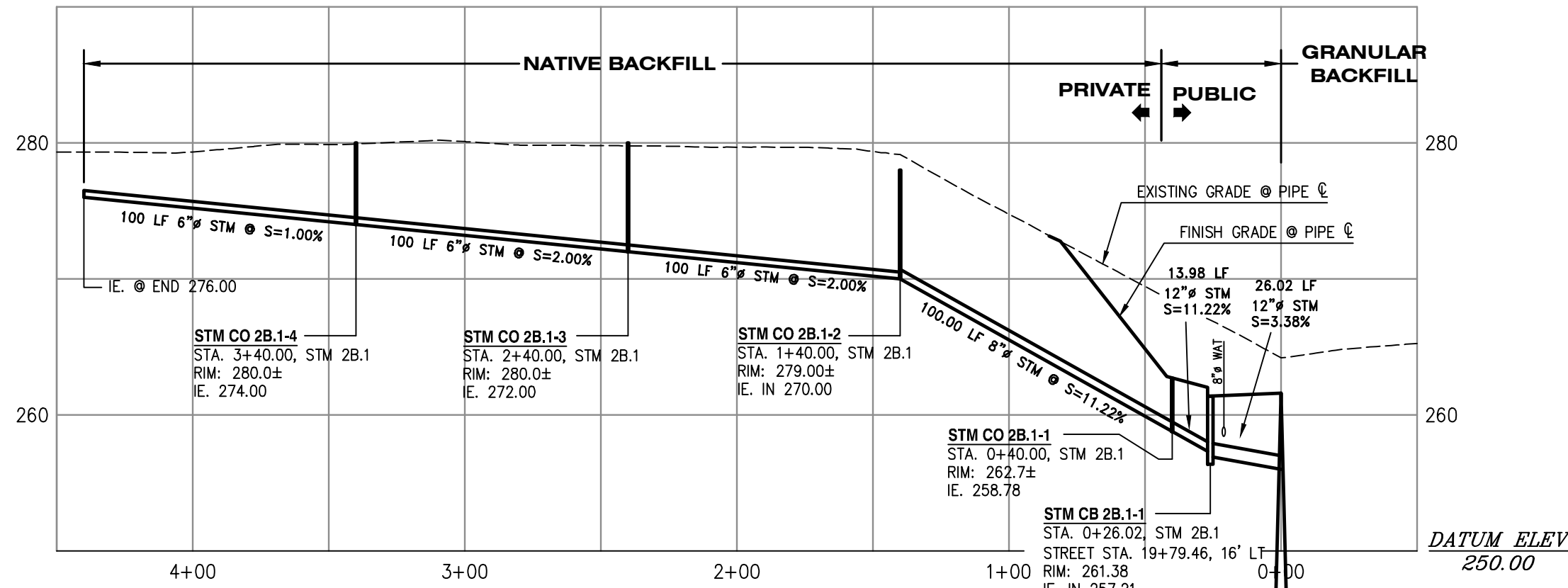
St Helens Assets, LLC
 PO Box 288
 Washougal, WA 98671

Elk Ridge Phases 5
 Hankey Road
 St Helens, Columbia County, Oregon



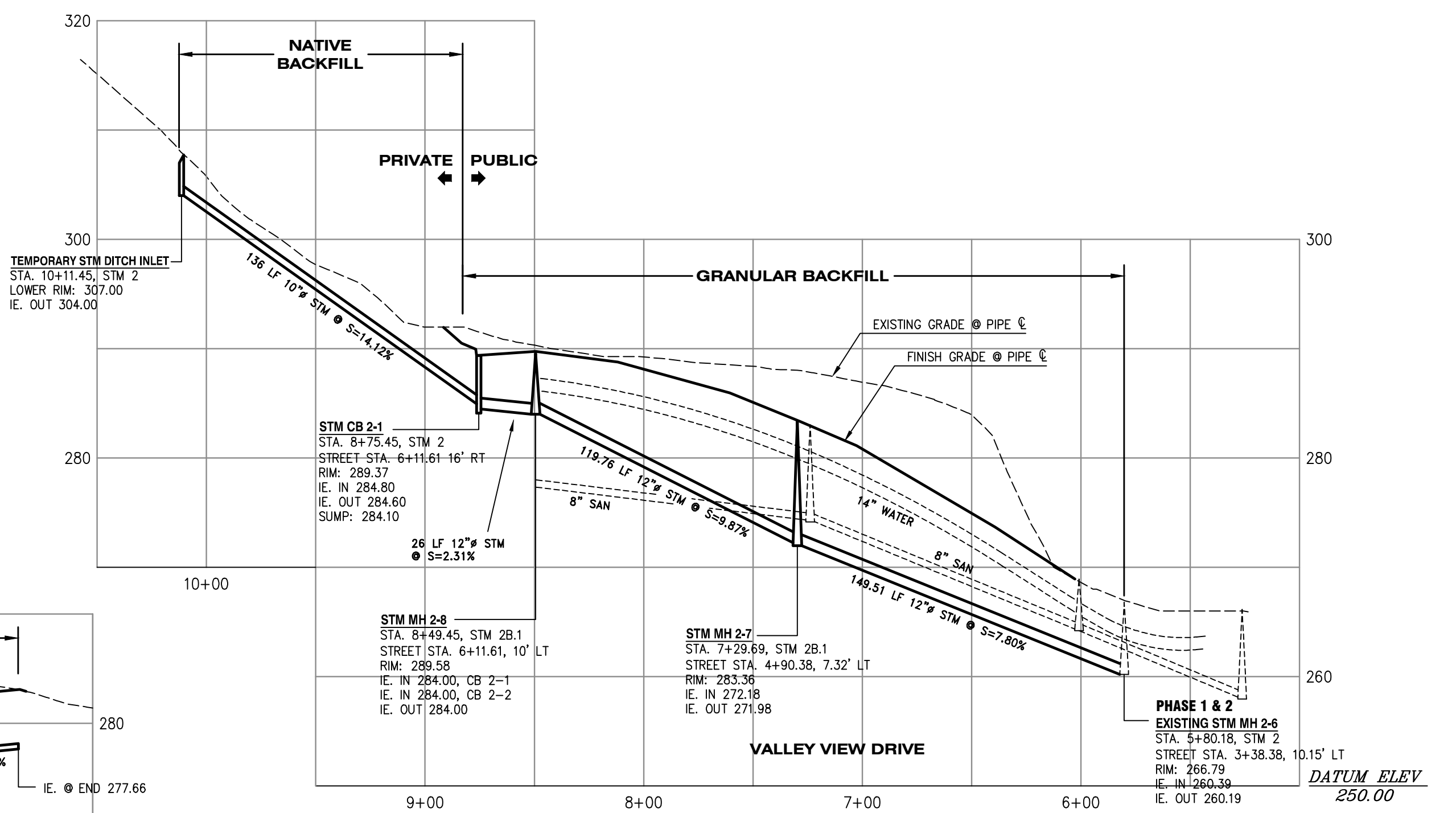
**STM 2B
STORM DRAINAGE PROFILE**
SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

1
5



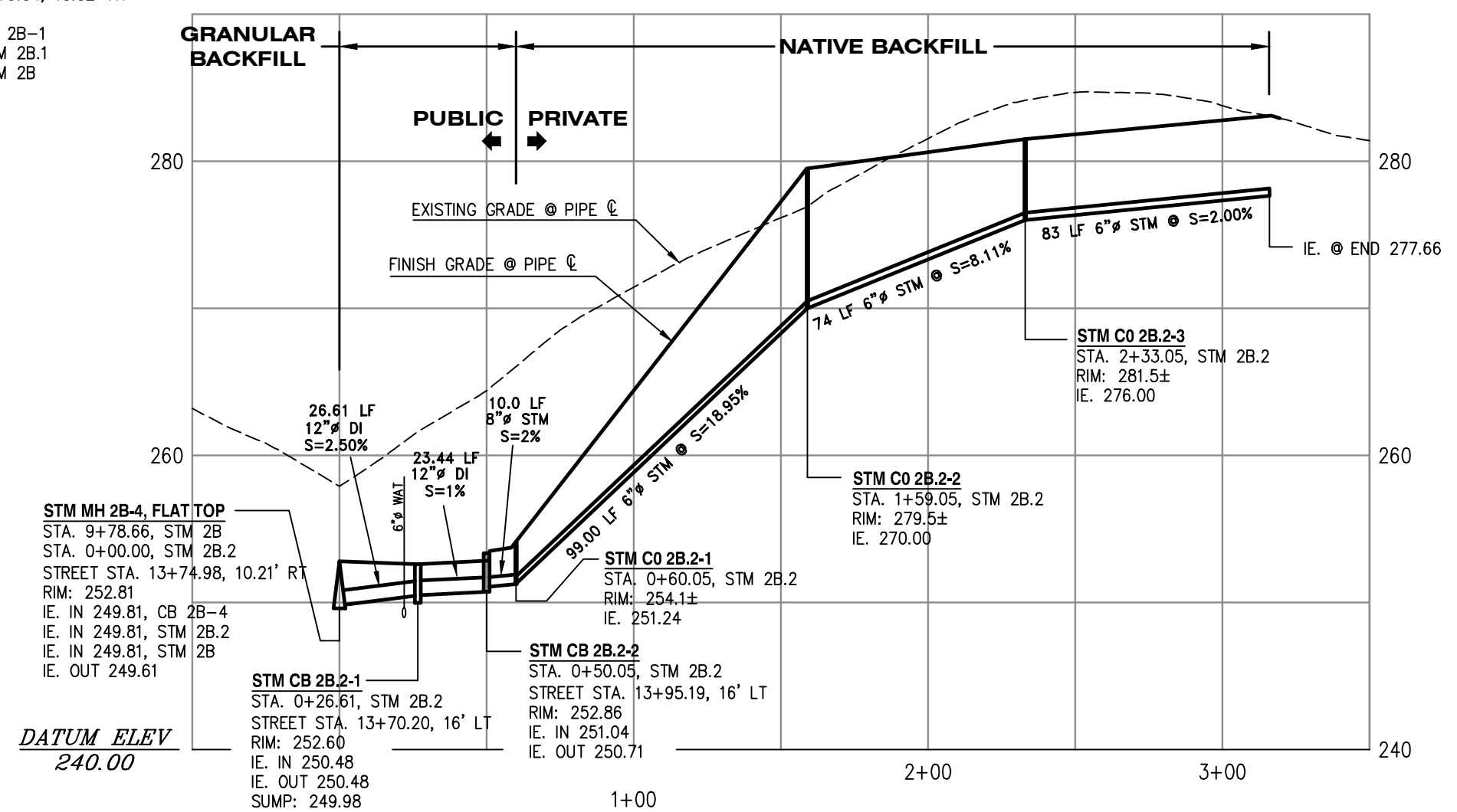
**STM 2B.1
STORM DRAINAGE PROFILE**
SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

2
5



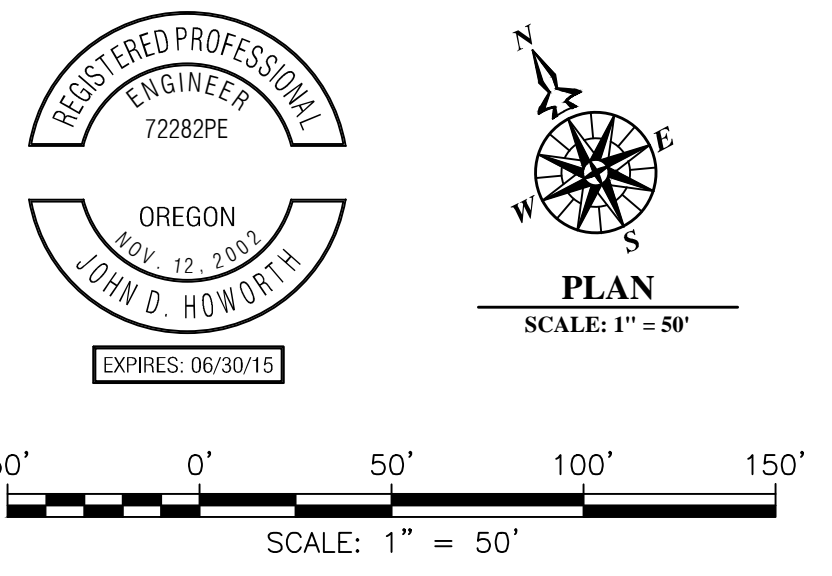
**STM 2
STORM DRAINAGE PROFILE**
SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

4
5



**STM 2B.2
STORM DRAINAGE PROFILE**
SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

3
5



STORM DRAINAGE PROFILES

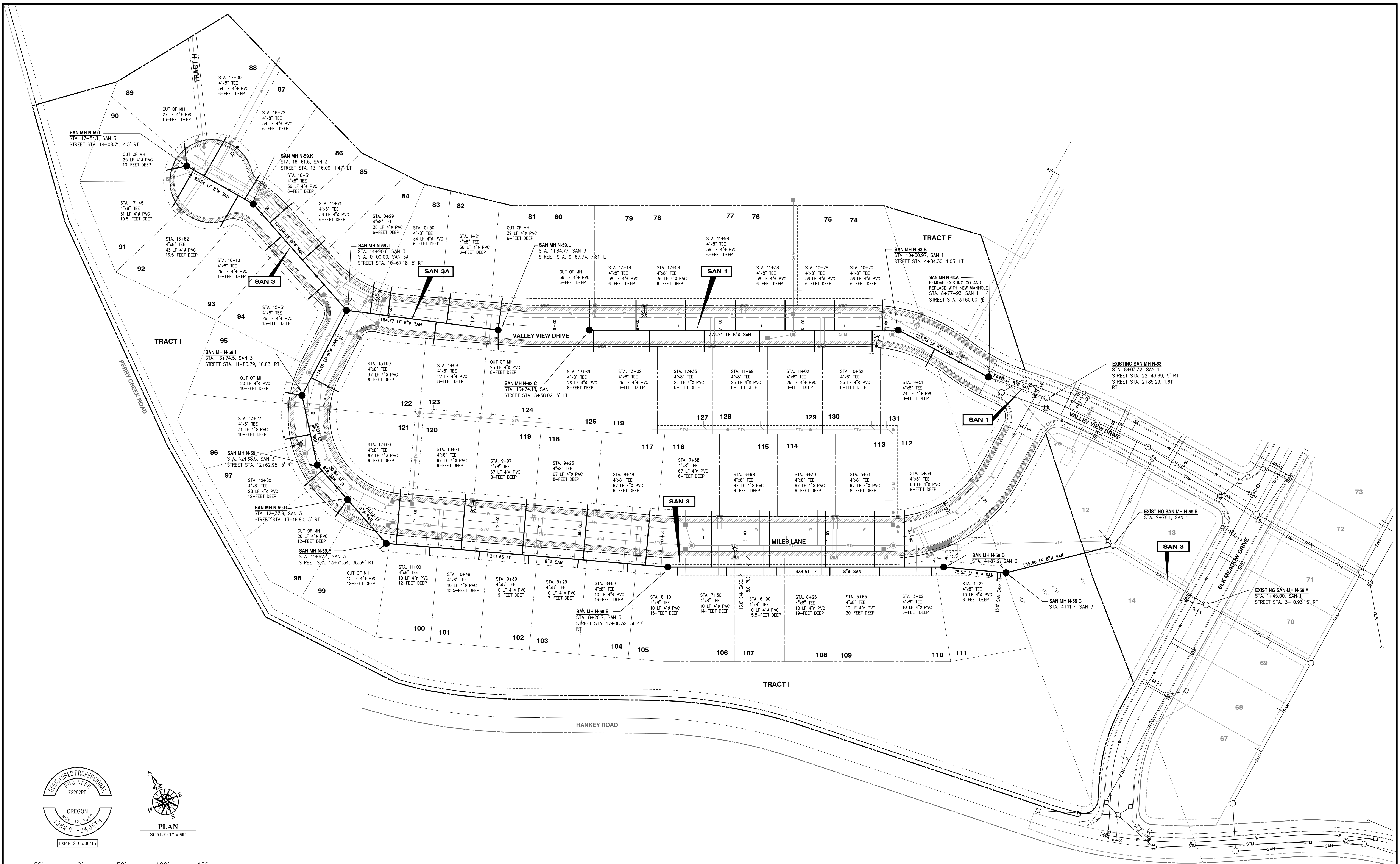
DATE	NO.	REVISION

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SCALE: 1" = 50'	DATE: June 2014	
LAND USE #:	DRAWING:	
SUB.1.13	14188-Elk Ridge Phase 5	

3J CONSULTING, INC.
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

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PO Box 288
Washougal, WA 98671

Elk Ridge Phases 5
Hankey Road
St Helens, Columbia County, Oregon



PLAN
SCALE: 1" = 50'

SANITARY SEWER PLAN

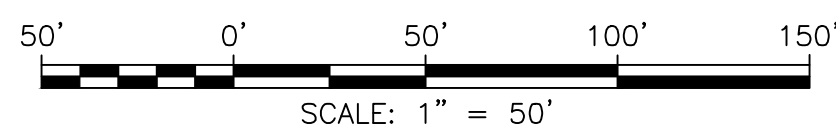
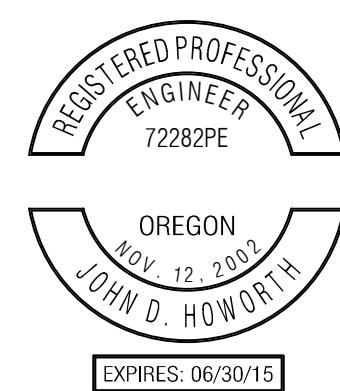
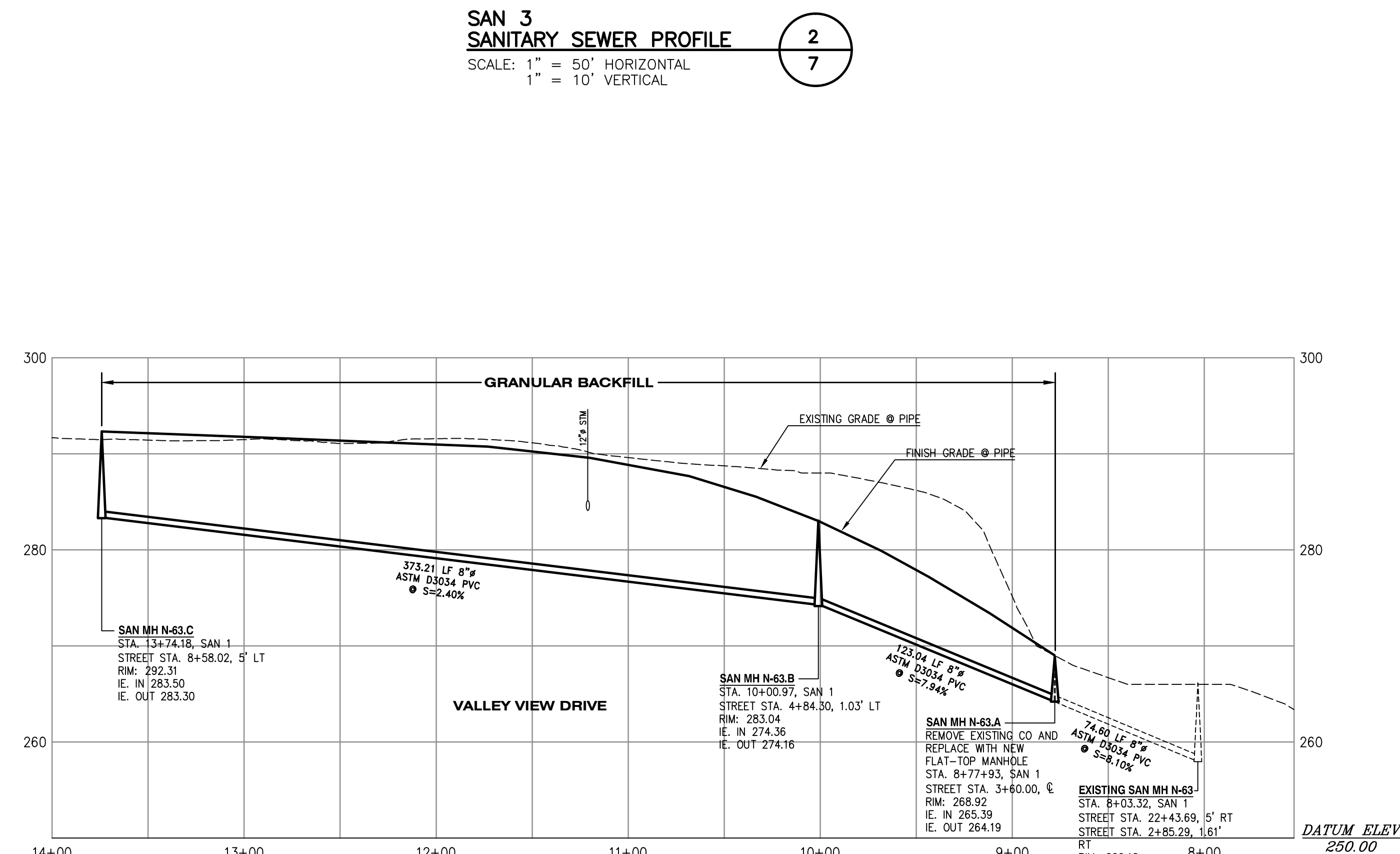
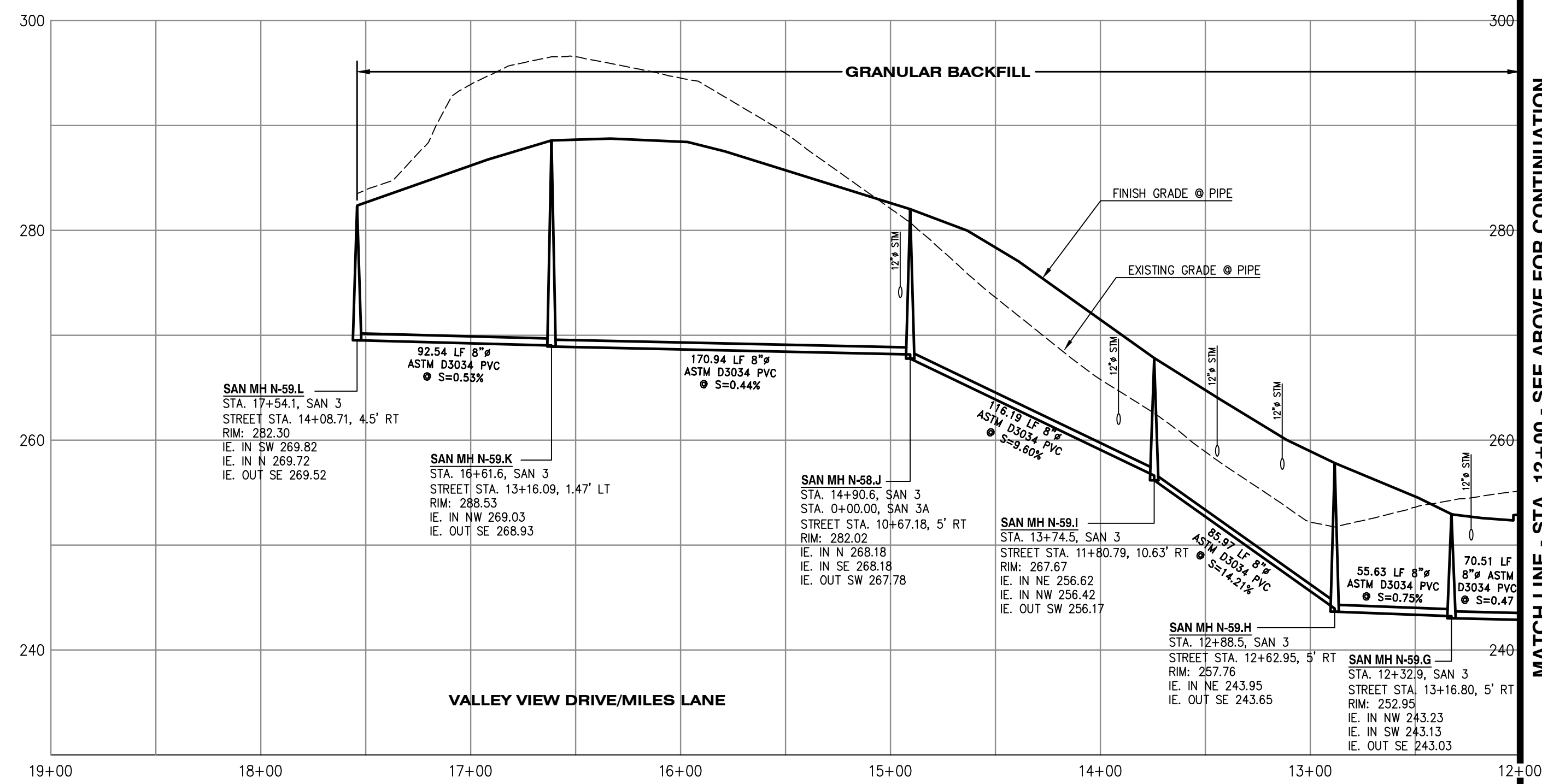
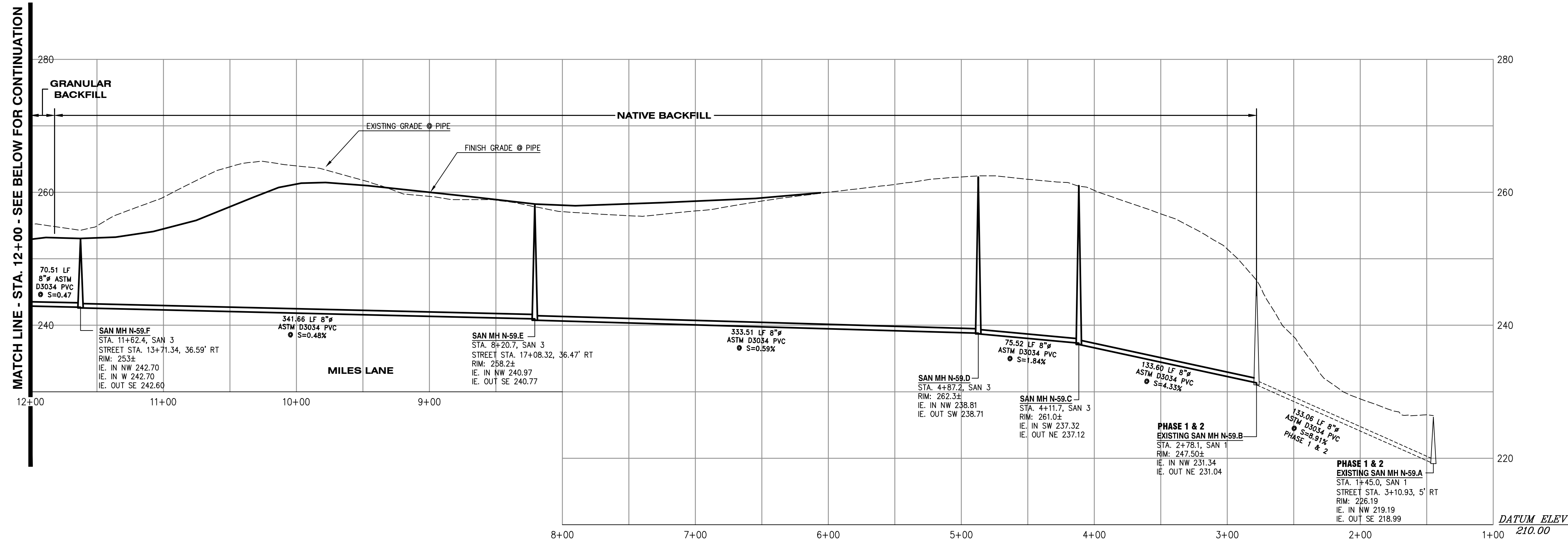
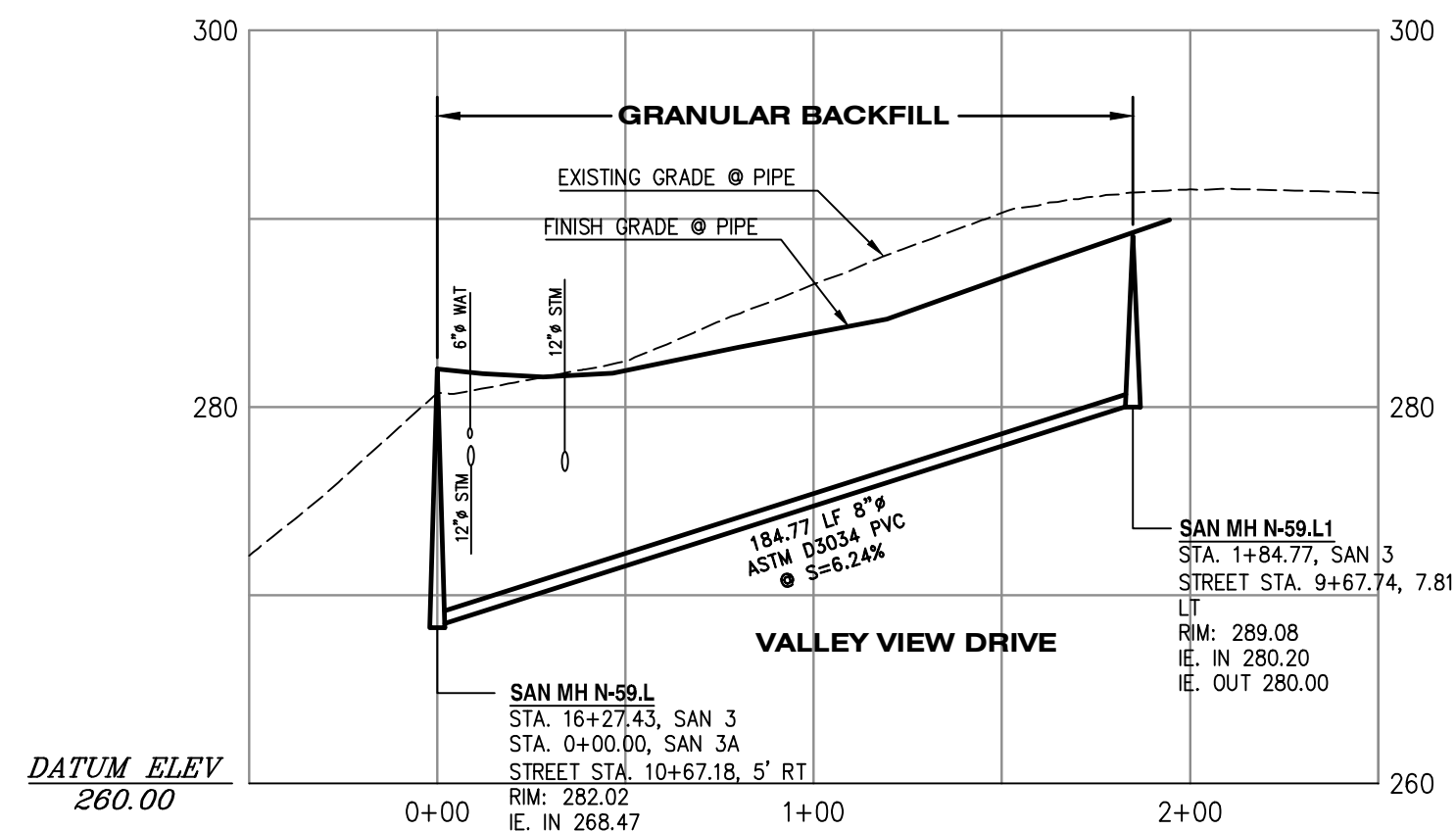
DATE	NO.	REVISION



3J CONSULTING, INC.
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
PHONE & FAX: (503) 946-9365

St Helens Assets, LLC
PO Box 288
Washougal, WA 98671

Elk Ridge Phases 5
Hankey Road
St Helens, Columbia County, Oregon



SANITARY SEWER PROFILES

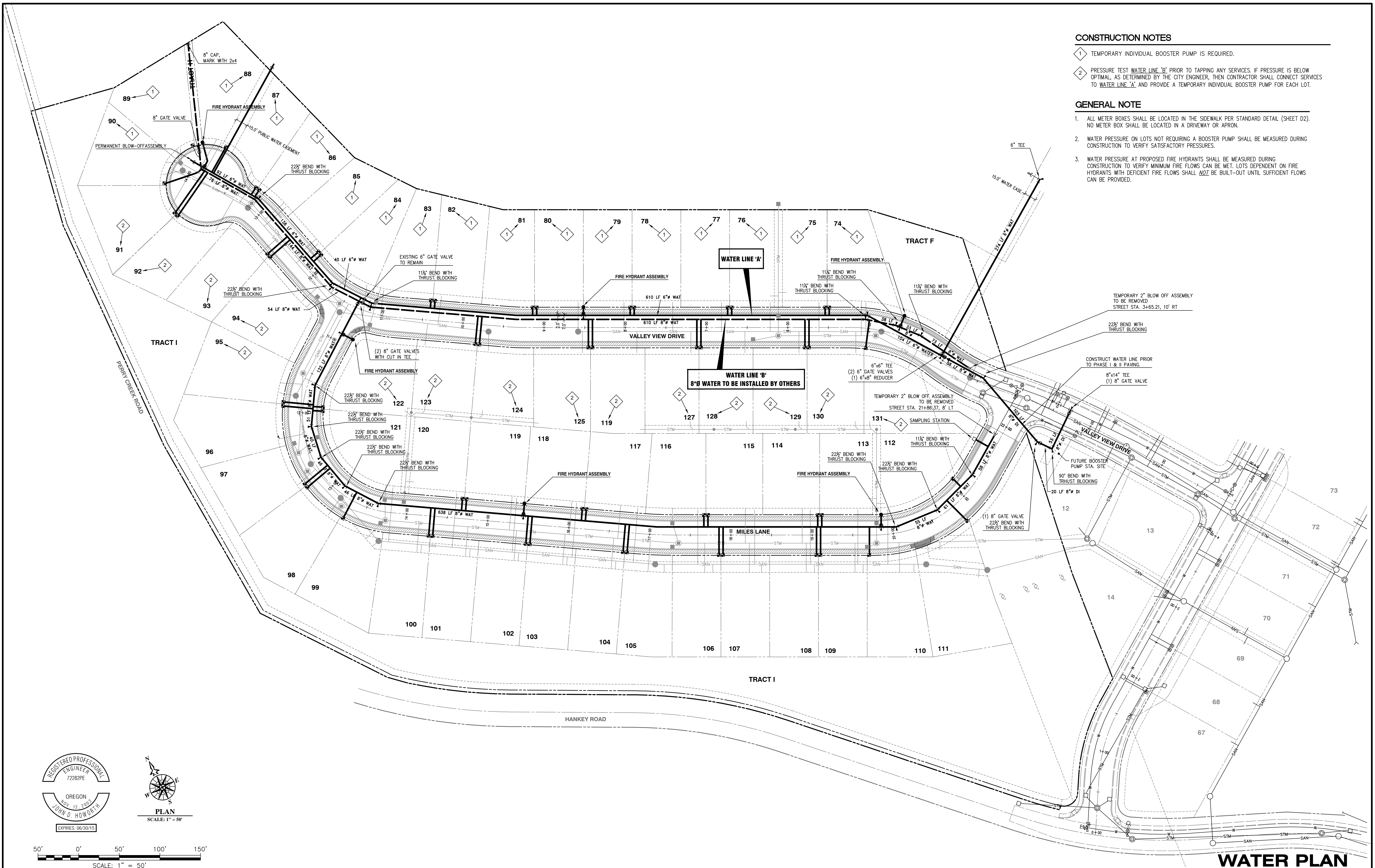
DATE	NO.	REVISION

DRAWN: CLF	DESIGNED: CLF	CHECKED: JDH
SCALE: 1" = 50'	DATE: June 2014	
LAND USE #: SUB.1.13	DRAWING: 14188-Elk Ridge Phase 5	

3J CONSULTING, INC.
 3J CONSULTING, INC.
 5075 SW GRIFFITH DRIVE, SUITE 150
 BEAVERTON, OR 97005
 PHONE & FAX: (503) 946-9365

St Helens Assets, LLC
 PO Box 288
 Washougal, WA 98671

Elk Ridge Phases 5
 Hankey Road
 St Helens, Columbia County, Oregon



- CONSTRUCTION NOTES**
1. TEMPORARY INDIVIDUAL BOOSTER PUMP IS REQUIRED.
 2. PRESSURE TEST WATER LINE 'B' PRIOR TO TAPPING ANY SERVICES. IF PRESSURE IS BELOW OPTIMAL, AS DETERMINED BY THE CITY ENGINEER, THEN CONTRACTOR SHALL CONNECT SERVICES TO WATER LINE 'A' AND PROVIDE A TEMPORARY INDIVIDUAL BOOSTER PUMP FOR EACH LOT.
- GENERAL NOTE**
1. ALL METER BOXES SHALL BE LOCATED IN THE SIDEWALK PER STANDARD DETAIL (SHEET D2). NO METER BOX SHALL BE LOCATED IN A DRIVEWAY OR APRON.
 2. WATER PRESSURE ON LOTS NOT REQUIRING A BOOSTER PUMP SHALL BE MEASURED DURING CONSTRUCTION TO VERIFY SATISFACTORY PRESSURES.
 3. WATER PRESSURE AT PROPOSED FIRE HYDRANTS SHALL BE MEASURED DURING CONSTRUCTION TO VERIFY MINIMUM FIRE FLOWS CAN BE MET. LOTS DEPENDING ON FIRE HYDRANTS WITH DEFICIENT FIRE FLOWS SHALL NOT BE BUILT-OUT UNTIL SUFFICIENT FLOWS CAN BE PROVIDED.

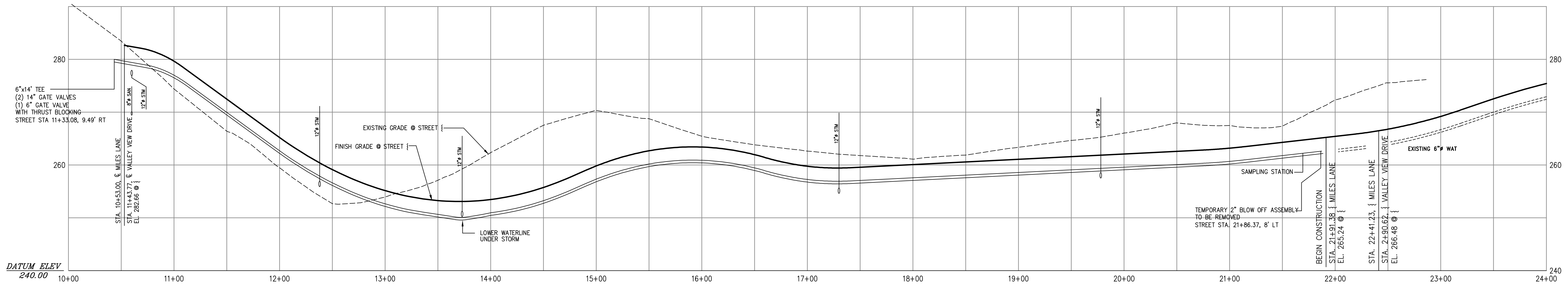
REGISTERED PROFESSIONAL ENGINEER
72282PE
OREGON
NOV. 12, 2003
JOHN D. HOWARTH
EXPIRES: 06/30/15

PLAN
SCALE: 1" = 50'

50' 0' 50' 100' 150'
SCALE: 1" = 50'

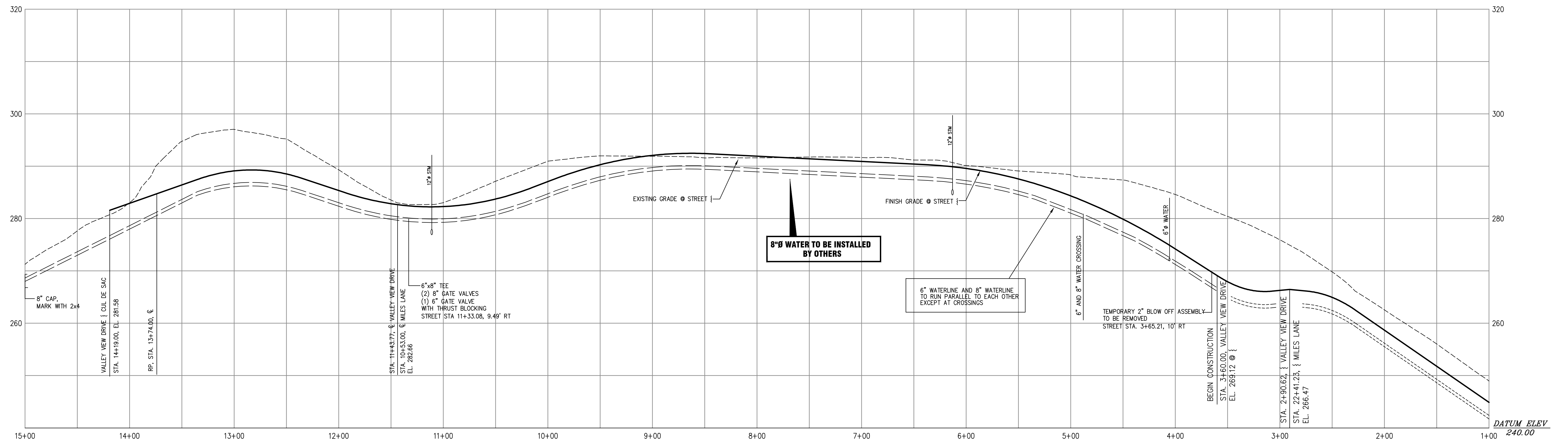
WATER PLAN

DATE	NO.	REVISION	DRAWN: CLF SCALE: 1" = 50' LAND USE #: SUB. 1.13	DESIGNED: CLF DATE: June 2014 DRAWING: 14188-Elk Ridge Phase 5	CHECKED: JDH	 3J CONSULTING, INC. 5075 SW GRIFFITH DRIVE, SUITE 150 BEAVERTON, OR 97005 PHONE & FAX: (503) 946-9365	St Helens Assets, LLC PO Box 288 Washougal, WA 98671	Elk Ridge Phases 5 Hankey Road St Helens, Columbia County, Oregon	8 11
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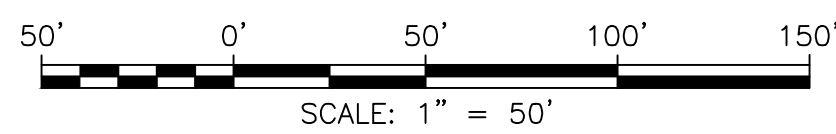
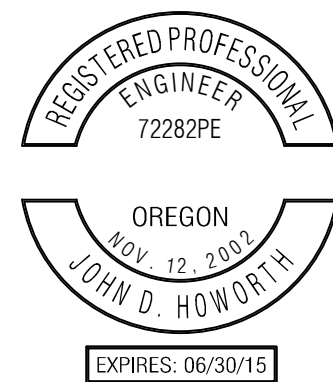
MILES LANE WATERLINE PROFILE
 SCALE: 1" = 50' HORIZONTAL
 1" = 10' VERTICAL

1
10



VALLEY VIEW DRIVE WATERLINE PROFILE
 SCALE: 1" = 50' HORIZONTAL
 1" = 10' VERTICAL

2
10



WATERLINE PROFILES

DATE	NO.	REVISION

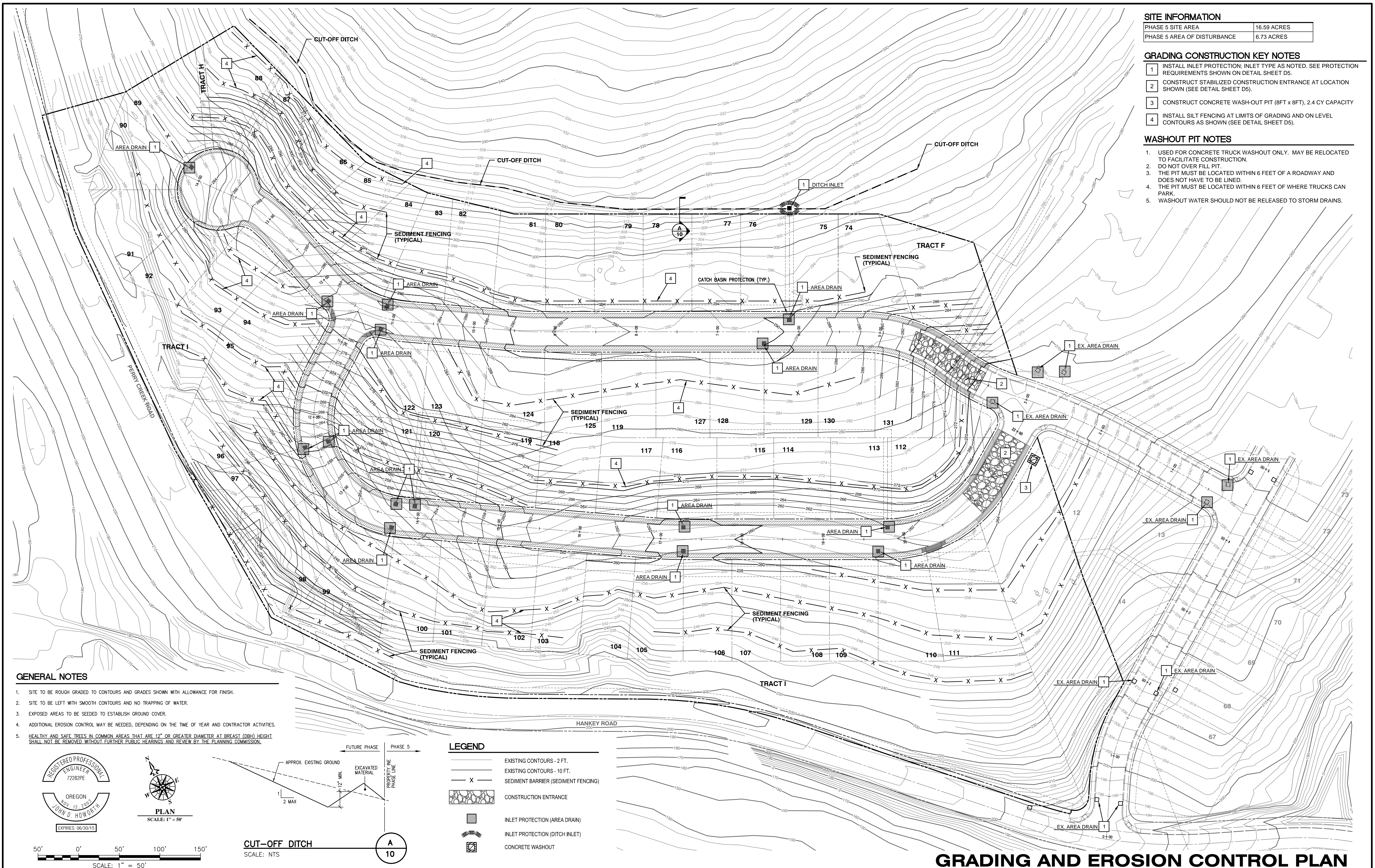
DRAWN: CLF	DESIGNED: CLF	CHECKED: JDH
SCALE: 1" = 50'	DATE: June 2014	
LAND USE #:	DRAWING: 14188-Elk Ridge Phase 5	
SUB. 1.13		



3J CONSULTING, INC.
 5075 SW GRIFFITH DRIVE, SUITE 150
 BEAVERTON, OR 97005
 PHONE & FAX: (503) 946-9365

St Helens Assets, LLC
 PO Box 288
 Washougal, WA 98671

Elk Ridge Phases 5
 Hankey Road
 St Helens, Columbia County, Oregon



SITE INFORMATION

PHASE 5 SITE AREA	16.59 ACRES
PHASE 5 AREA OF DISTURBANCE	6.73 ACRES

- GRADING CONSTRUCTION KEY NOTES**
1. INSTALL INLET PROTECTION: INLET TYPE AS NOTED. SEE PROTECTION REQUIREMENTS SHOWN ON DETAIL SHEET D5.
 2. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE AT LOCATION SHOWN (SEE DETAIL SHEET D5).
 3. CONSTRUCT CONCRETE WASH-OUT PIT (8FT x 8FT), 2.4 CY CAPACITY
 4. INSTALL SILT FENCING AT LIMITS OF GRADING AND ON LEVEL CONTOURS AS SHOWN (SEE DETAIL SHEET D5).

- WASHOUT PIT NOTES**
1. USED FOR CONCRETE TRUCK WASHOUT ONLY. MAY BE RELOCATED TO FACILITATE CONSTRUCTION.
 2. DO NOT OVER FILL PIT.
 3. THE PIT MUST BE LOCATED WITHIN 6 FEET OF A ROADWAY AND DOES NOT HAVE TO BE LINED.
 4. THE PIT MUST BE LOCATED WITHIN 6 FEET OF WHERE TRUCKS CAN PARK.
 5. WASHOUT WATER SHOULD NOT BE RELEASED TO STORM DRAINS.

GENERAL NOTES

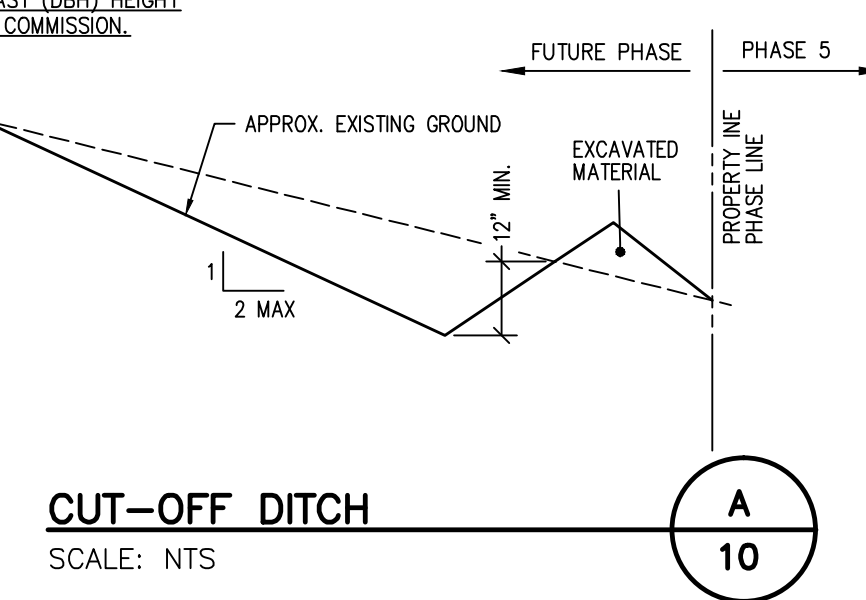
1. SITE TO BE ROUGH GRADED TO CONTOURS AND GRADES SHOWN WITH ALLOWANCE FOR FINISH.
2. SITE TO BE LEFT WITH SMOOTH CONTOURS AND NO TRAPPING OF WATER.
3. EXPOSED AREAS TO BE SEEDED TO ESTABLISH GROUND COVER.
4. ADDITIONAL EROSION CONTROL MAY BE NEEDED, DEPENDING ON THE TIME OF YEAR AND CONTRACTOR ACTIVITIES.
5. HEALTHY AND SAFE TREES IN COMMON AREAS THAT ARE 12" OR GREATER DIAMETER AT BREAST (DBH) HEIGHT SHALL NOT BE REMOVED WITHOUT FURTHER PUBLIC HEARINGS AND REVIEW BY THE PLANNING COMMISSION.

LEGEND

	EXISTING CONTOURS - 2 FT.
	EXISTING CONTOURS - 10 FT.
	SEDIMENT BARRIER (SEDIMENT FENCING)
	CONSTRUCTION ENTRANCE
	INLET PROTECTION (AREA DRAIN)
	INLET PROTECTION (DITCH INLET)
	CONCRETE WASHOUT

PLAN
 SCALE: 1" = 50'

 SCALE: 1" = 50'



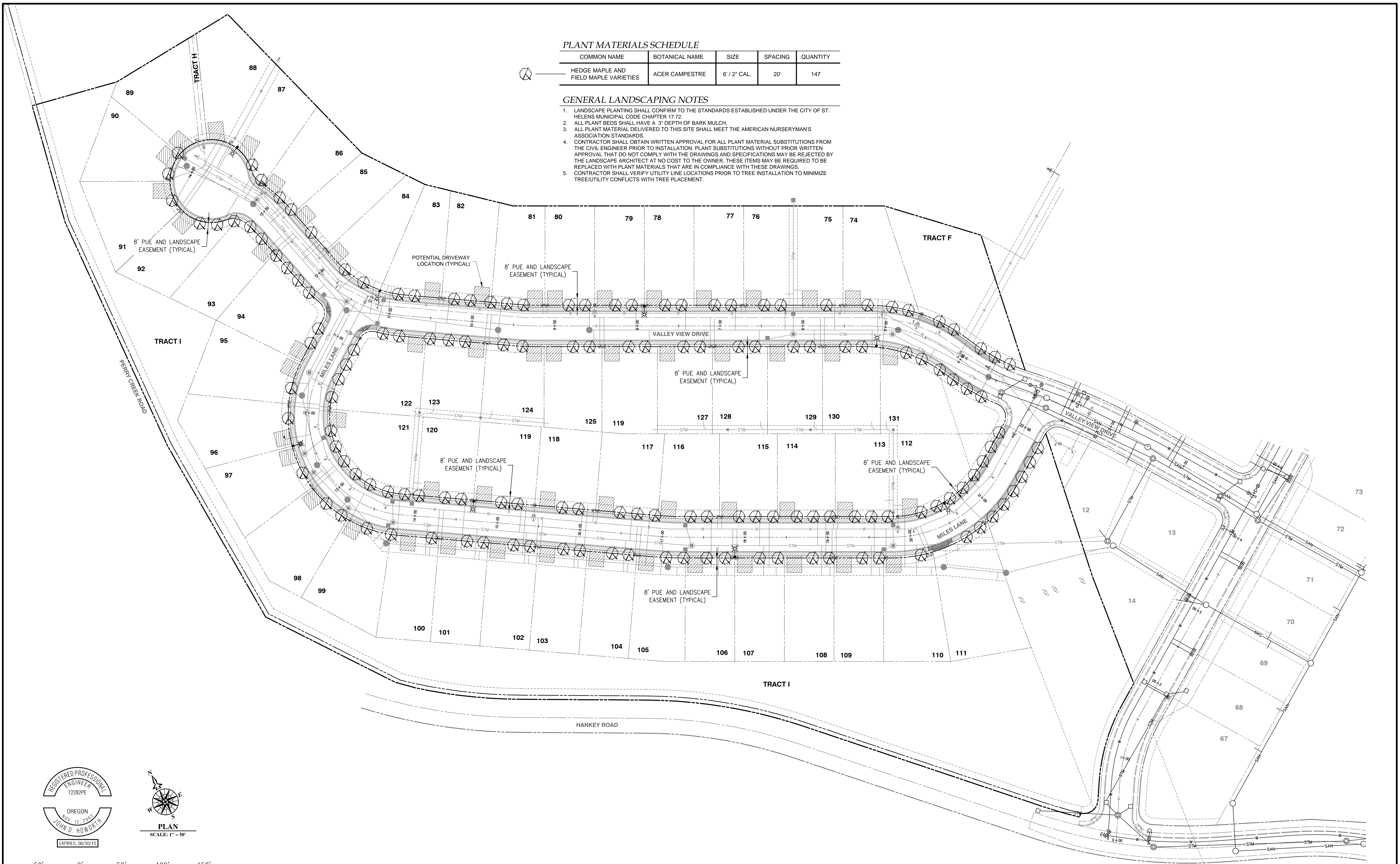
GRADING AND EROSION CONTROL PLAN

PLANT MATERIALS SCHEDULE

COMMON NAME	BOTANICAL NAME	SIZE	SPACING	QUANTITY
HEDGE MAPLE AND FIELD MAPLE VARIETIES	ACER CAMPESTRE	6' / 2" CAL.	20'	147

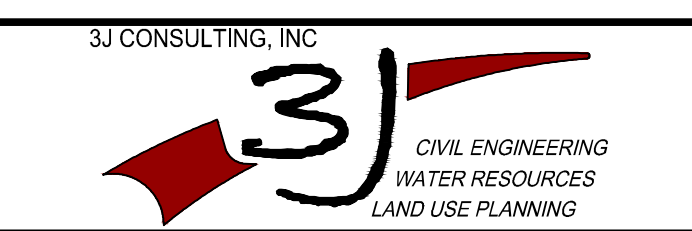
GENERAL LANDSCAPING NOTES

- LANDSCAPE PLANTING SHALL CONFIRM TO THE STANDARDS ESTABLISHED UNDER THE CITY OF ST. HELENS MUNICIPAL CODE CHAPTER 17.72.
- ALL PLANT BEDS SHALL HAVE A 3" DEPTH OF BARK MULCH.
- ALL PLANT MATERIAL DELIVERED TO THIS SITE SHALL MEET THE AMERICAN NURSERYMAN'S ASSOCIATION STANDARDS.
- CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ALL PLANT MATERIAL SUBSTITUTIONS FROM THE CIVIL ENGINEER PRIOR TO INSTALLATION. PLANT SUBSTITUTIONS WITHOUT PRIOR WRITTEN APPROVAL THAT DO NOT COMPLY WITH THE DRAWINGS AND SPECIFICATIONS MAY BE REJECTED BY THE LANDSCAPE ARCHITECT AT NO COST TO THE OWNER. THESE ITEMS MAY BE REQUIRED TO BE REPLACED WITH PLANT MATERIALS THAT ARE IN COMPLIANCE WITH THESE DRAWINGS.
- CONTRACTOR SHALL VERIFY UTILITY LINE LOCATIONS PRIOR TO TREE INSTALLATION TO MINIMIZE TREE/UTILITY CONFLICTS WITH TREE PLACEMENT.



STREET TREE PLANTING PLAN

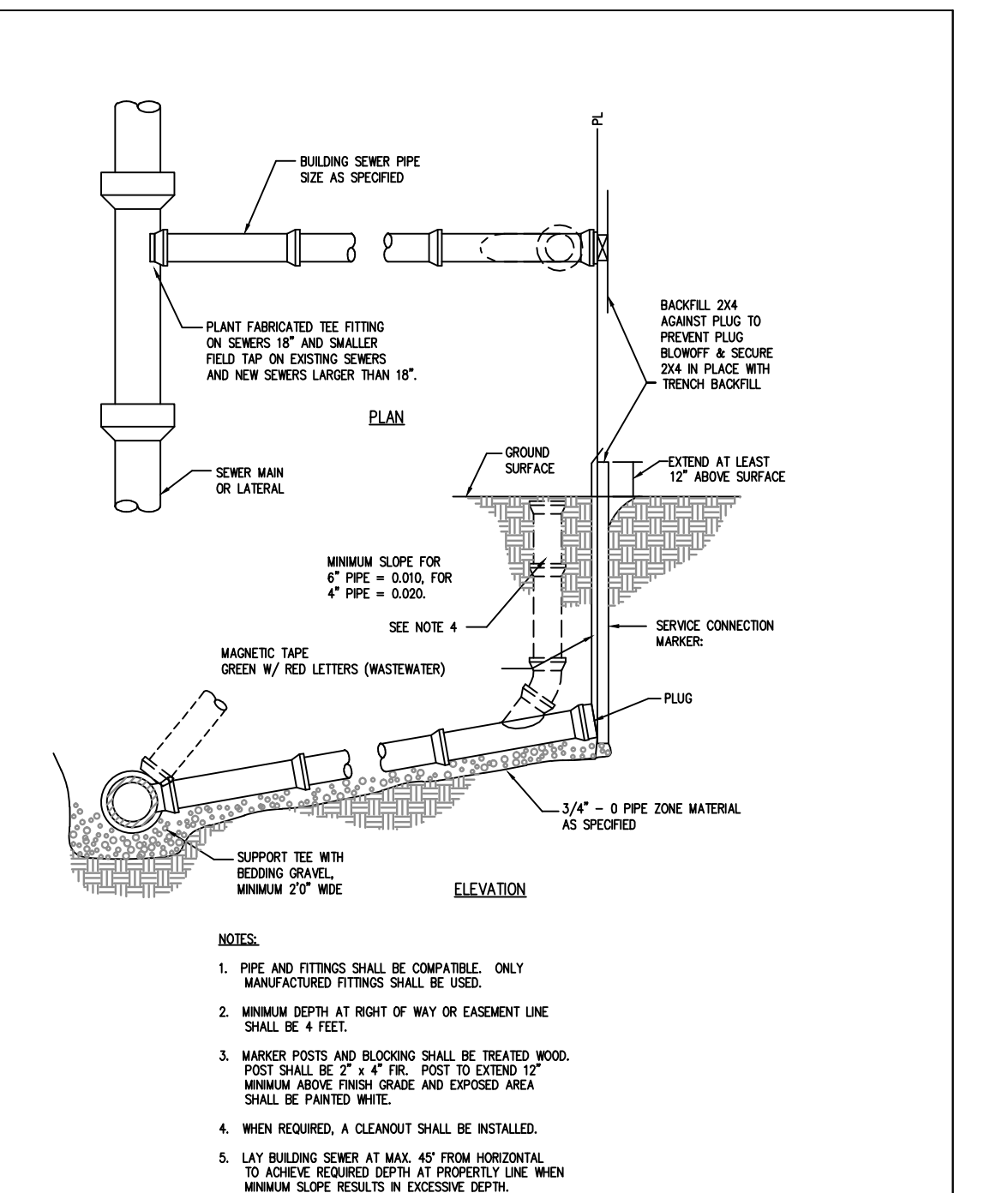
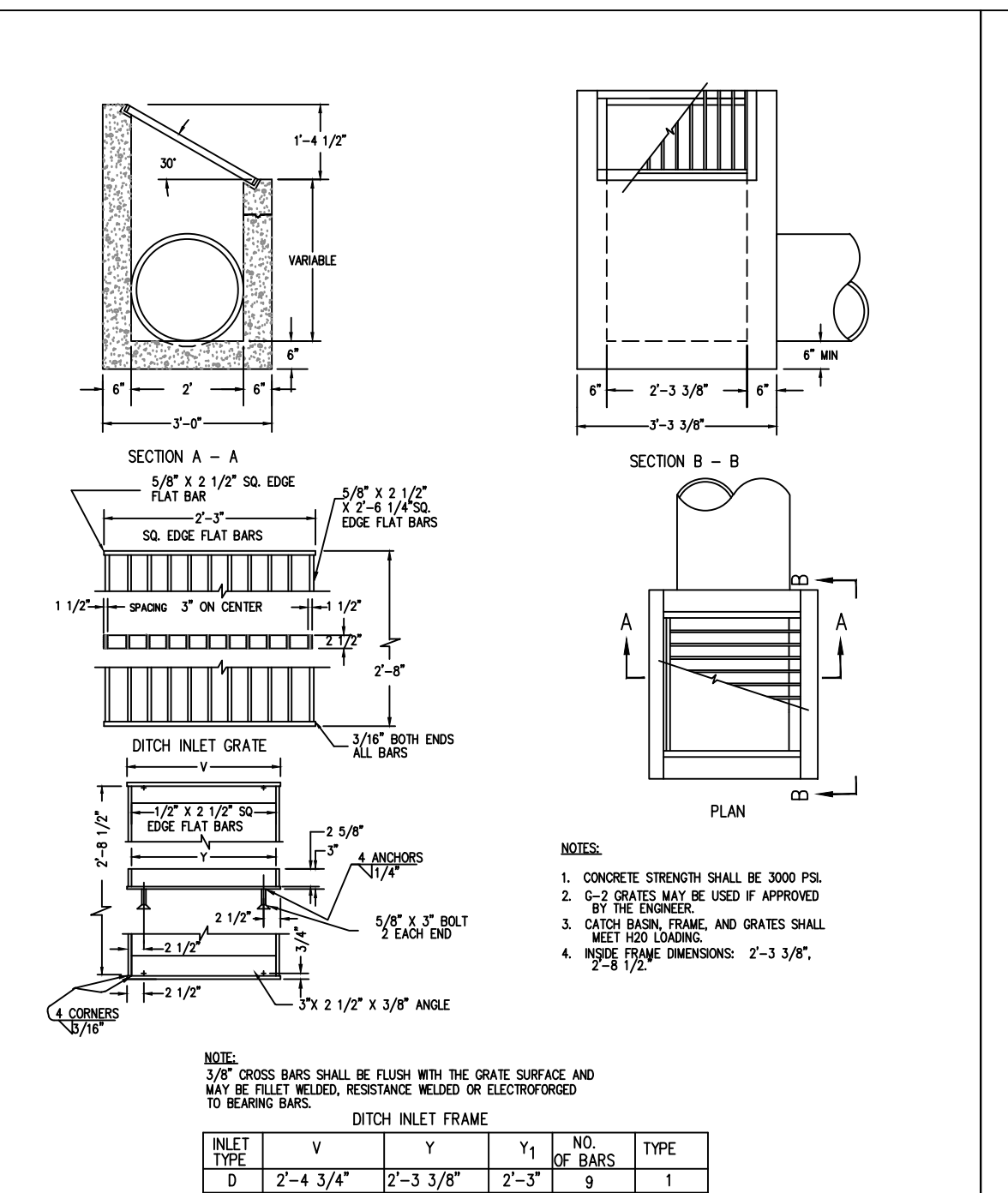
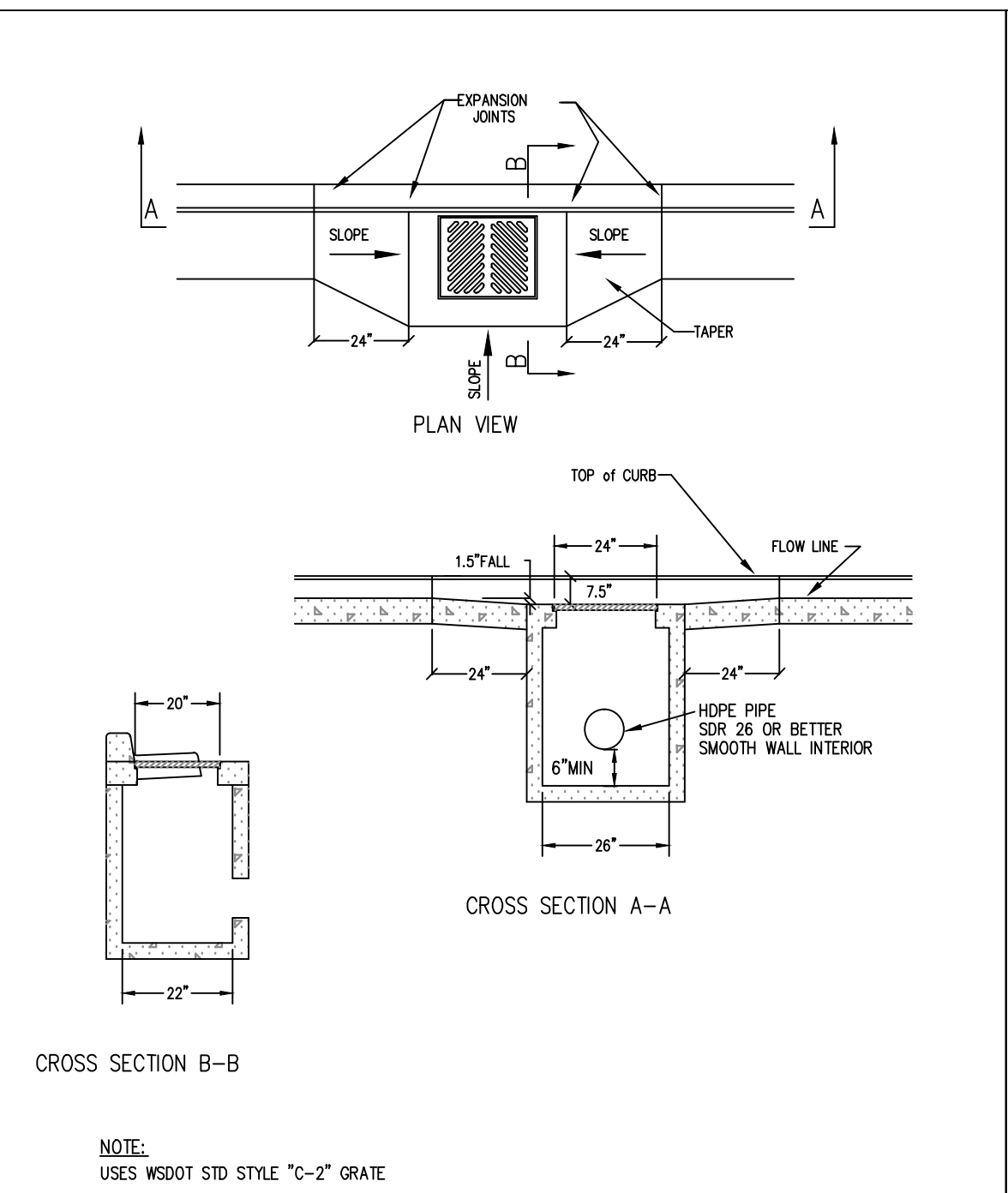
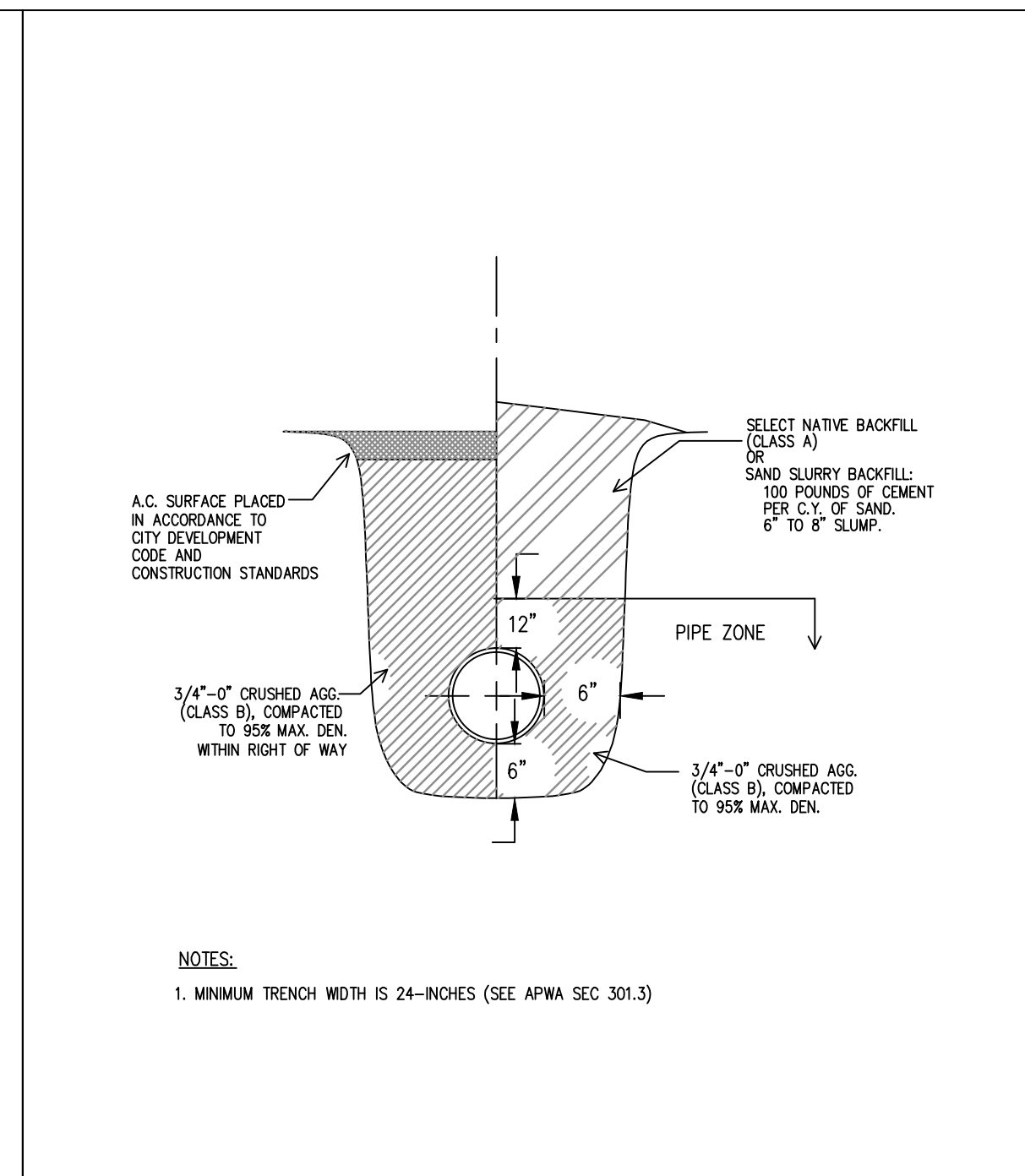
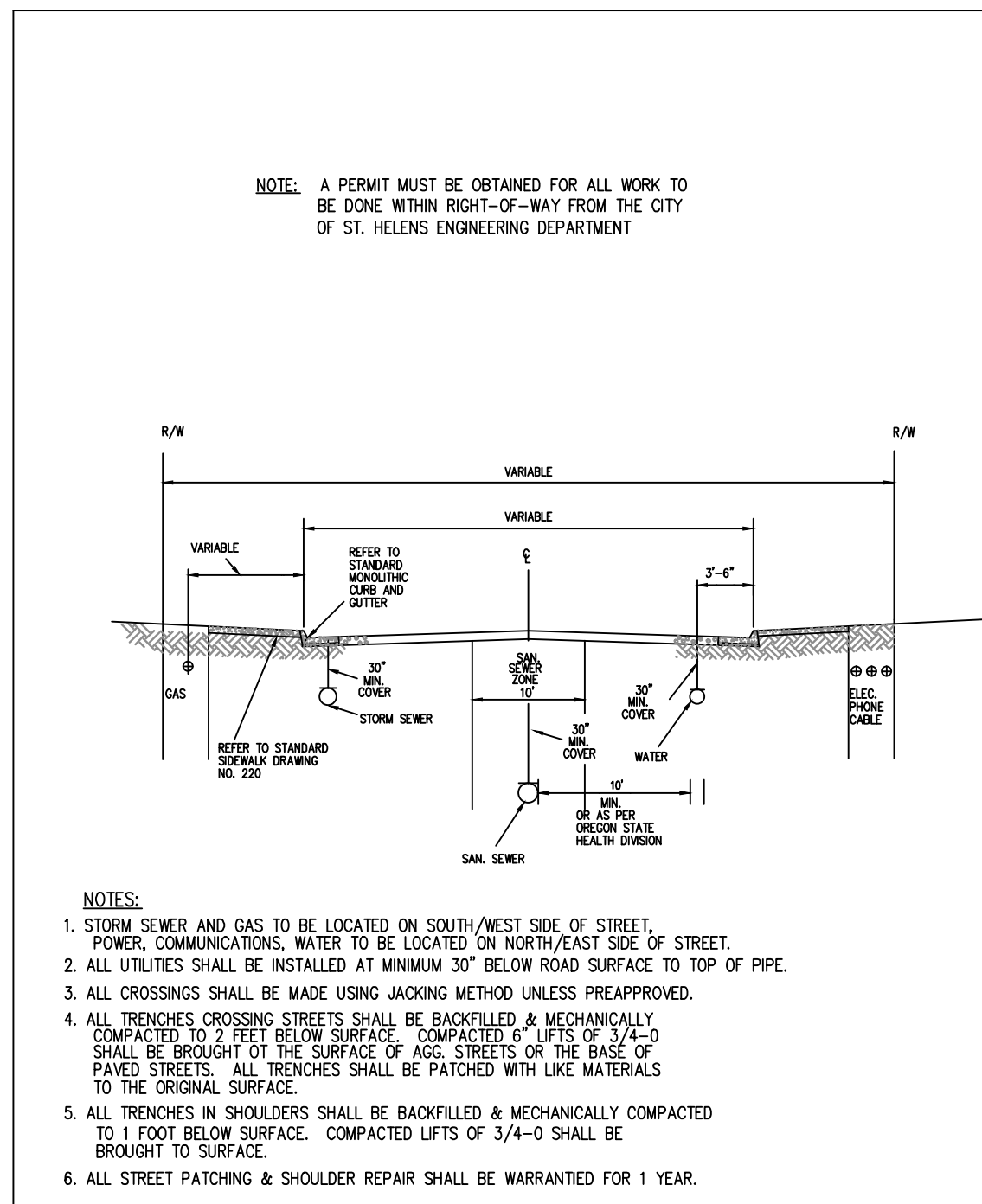
DATE	NO.	REVISION



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 BEAVERTON, OR 97005
 PHONE & FAX: (503) 946-9365

St Helens Assets, LLC
 PO Box 288
 Washougal, WA 98671

Elk Ridge Phases 5
 Hankey Road
 St Helens, Columbia County, Oregon



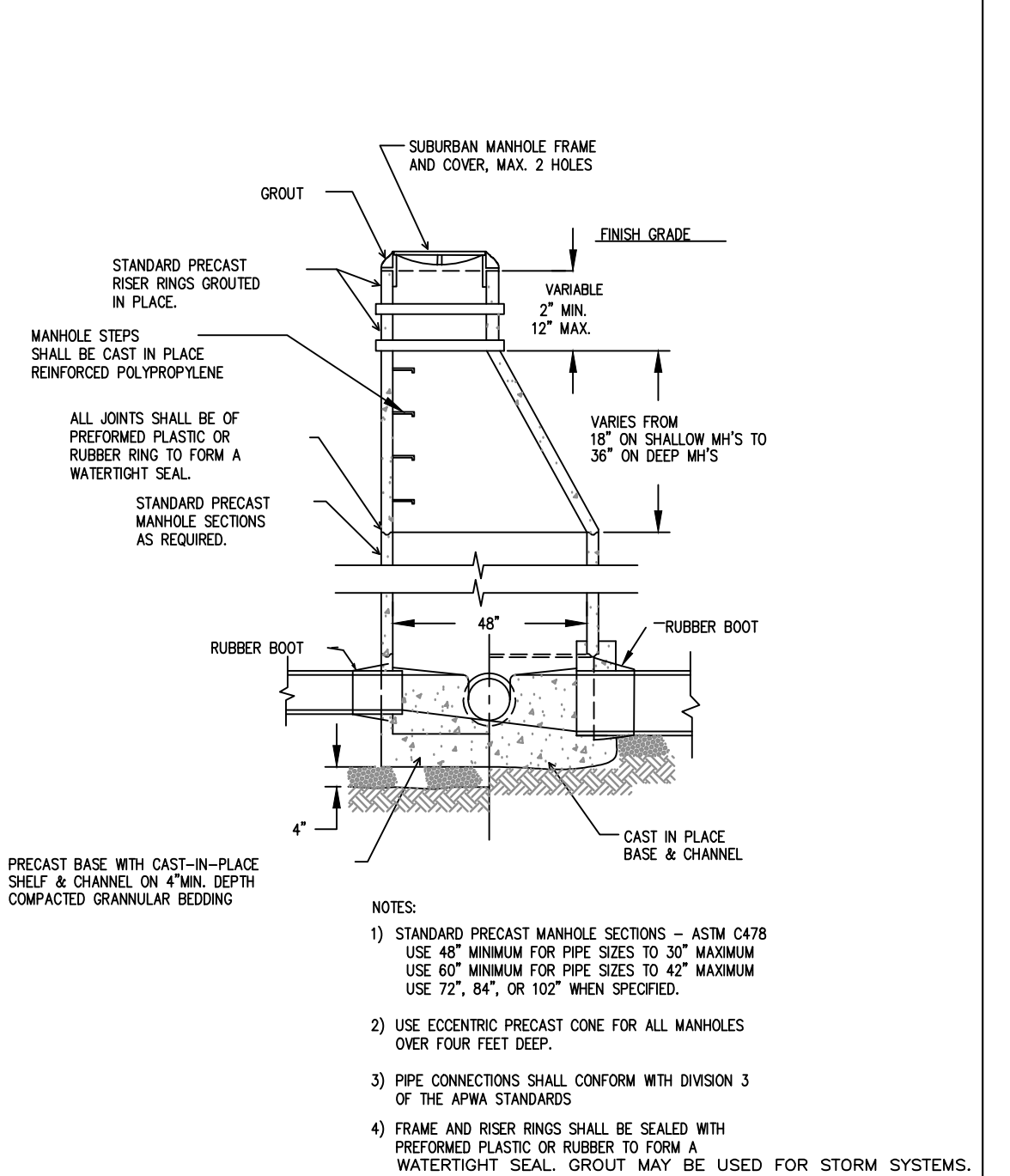
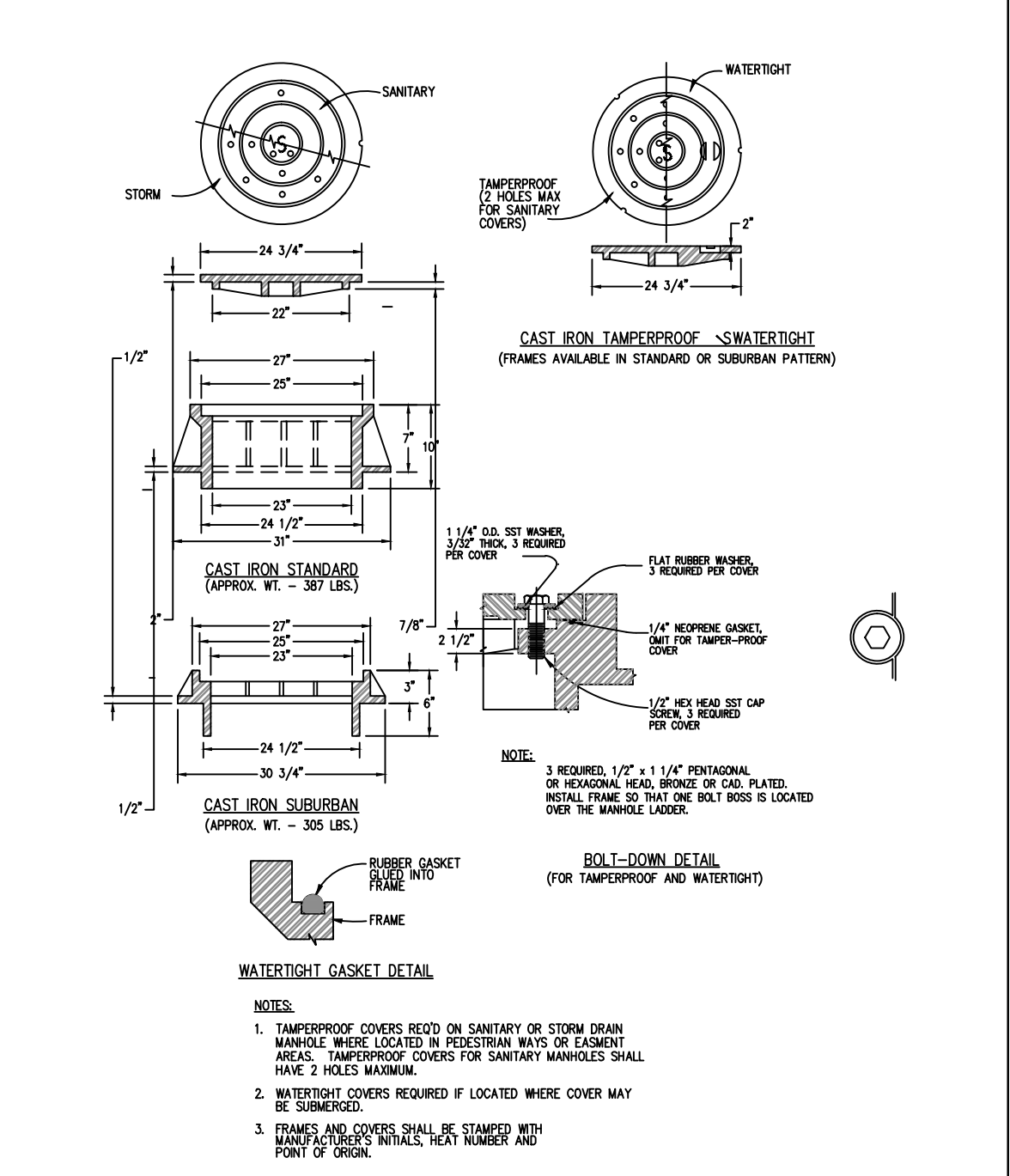
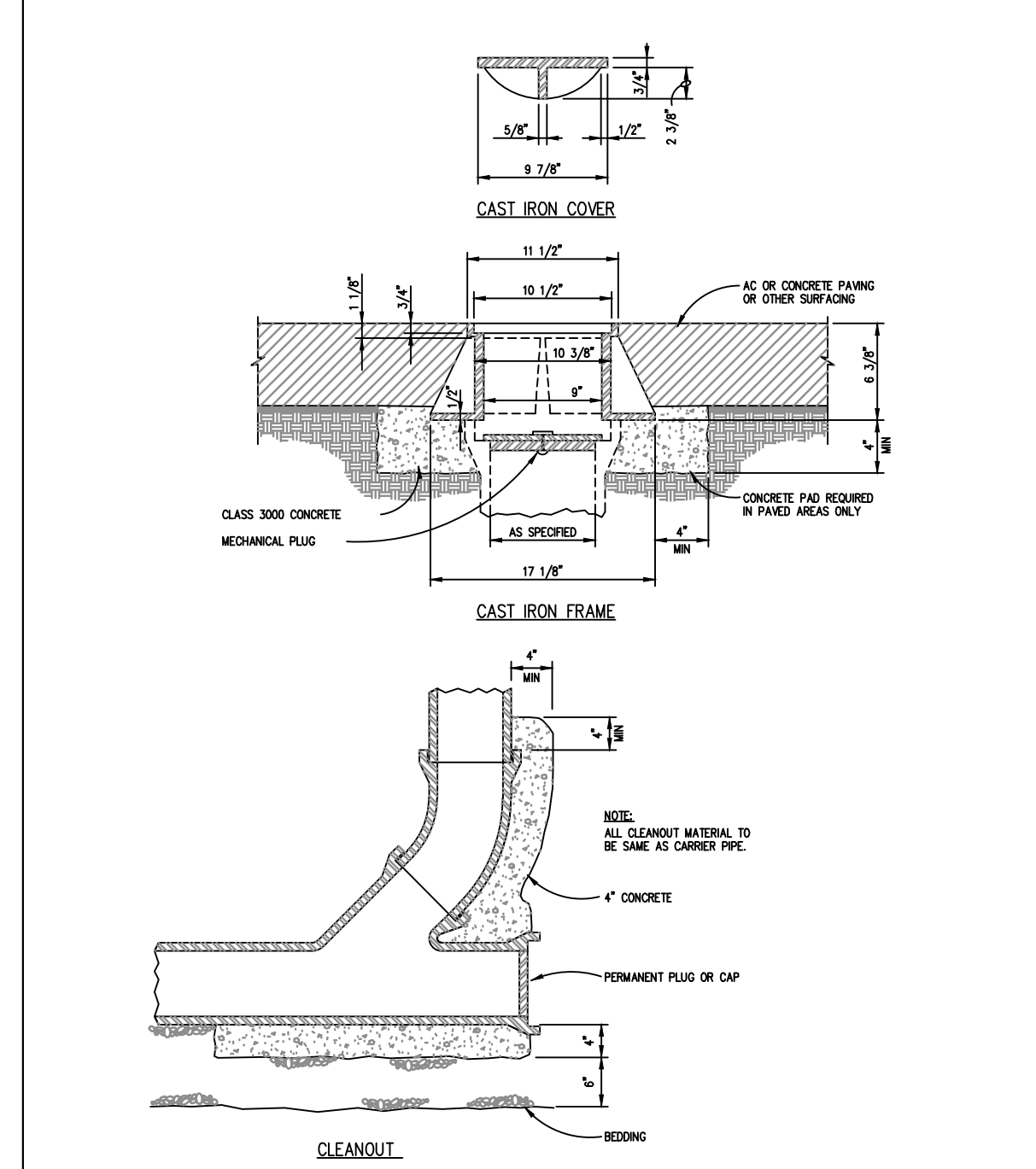
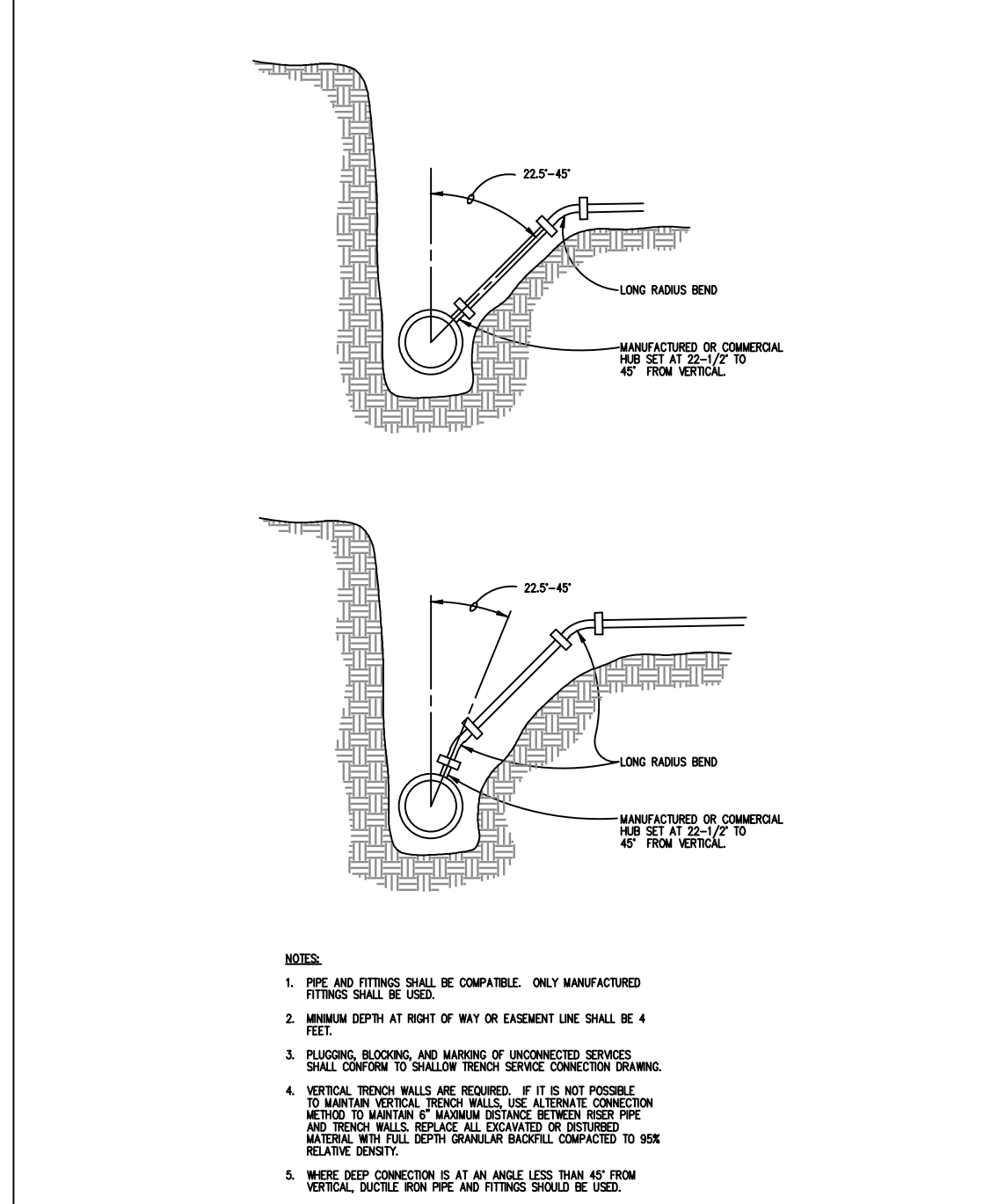
DRAWN BY: T. KOLLN	CITY OF ST. HELENS	REVISION: NC
CHECKED BY:	265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016	
DATE:	TITLE: STANDARD UTILITY LOCATIONS	DRAWING NO: 295
SCALE:		

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CHECKED BY:	265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016	
DATE:	TITLE: TYPICAL TRENCH DETAIL	DRAWING NO: 300
SCALE:		

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CHECKED BY:	265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016	
DATE:	TITLE: TYPICAL 20"x24" CATCH BASIN	DRAWING NO: 315
SCALE:		

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CHECKED BY:	265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016	
DATE:	TITLE: DITCH INLET	DRAWING NO: 325
SCALE:		

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CHECKED BY:	265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016	
DATE:	TITLE: SHALLOW TRENCH SERVICE CONNECTION, BLOCKING, & MARKING	DRAWING NO: 335
SCALE:		



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CHECKED BY:	265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016	
DATE:	TITLE: TYPICAL DEEP TRENCH SERVICE CONNECT DETAIL	DRAWING NO: 336
SCALE:		

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CHECKED BY:	265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016	
DATE:	TITLE: CLEANOUT DETAIL	DRAWING NO: 340
SCALE:		

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CHECKED BY:	265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016	
DATE:	TITLE: MANHOLE COVER & FRAME DETAILS	DRAWING NO: 346
SCALE:		

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CHECKED BY:	265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016	
DATE:	TITLE: TYPICAL MANHOLE DETAIL	DRAWING NO: 350
SCALE:		



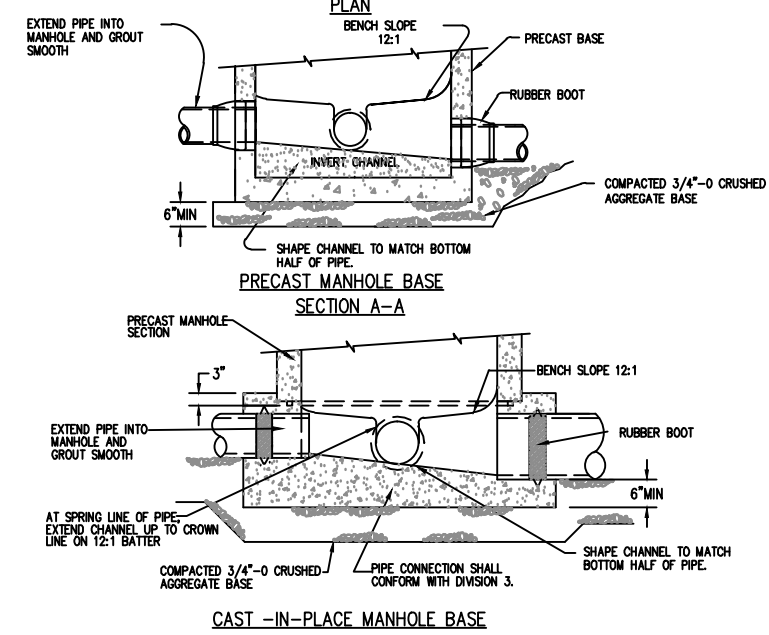
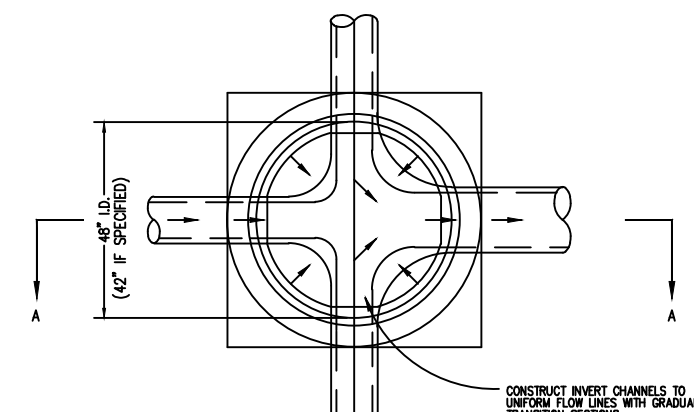
3J CONSULTING, INC.
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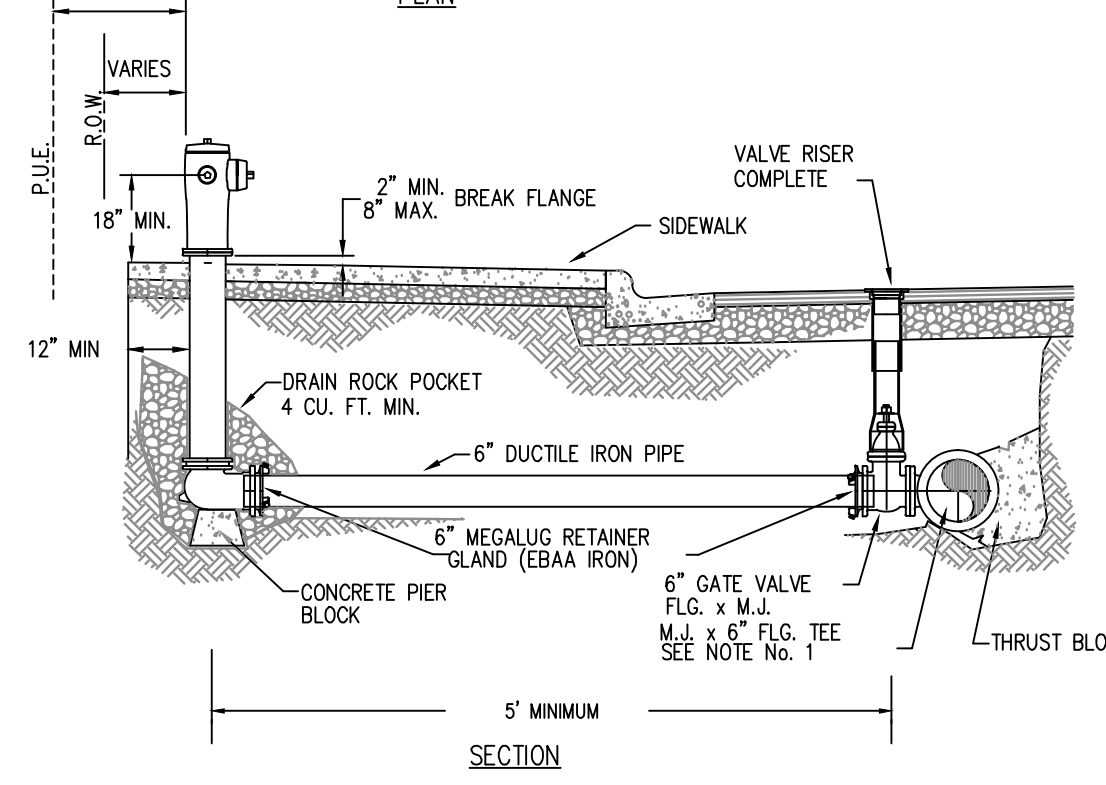
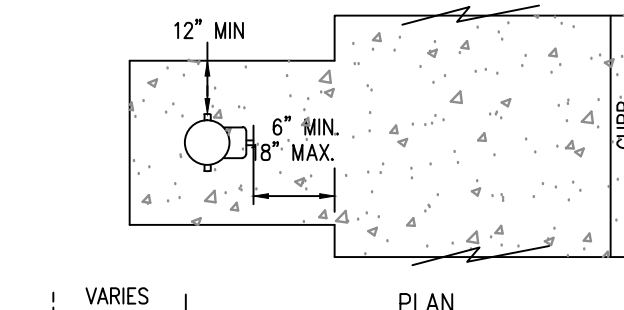
D1

STANDARD DETAILS I



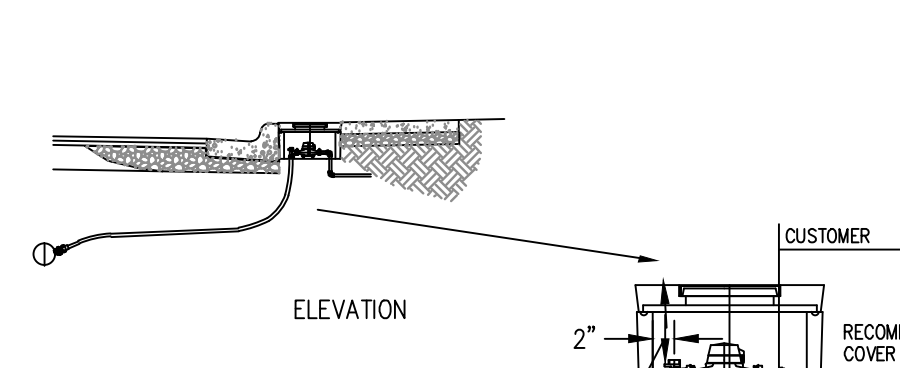
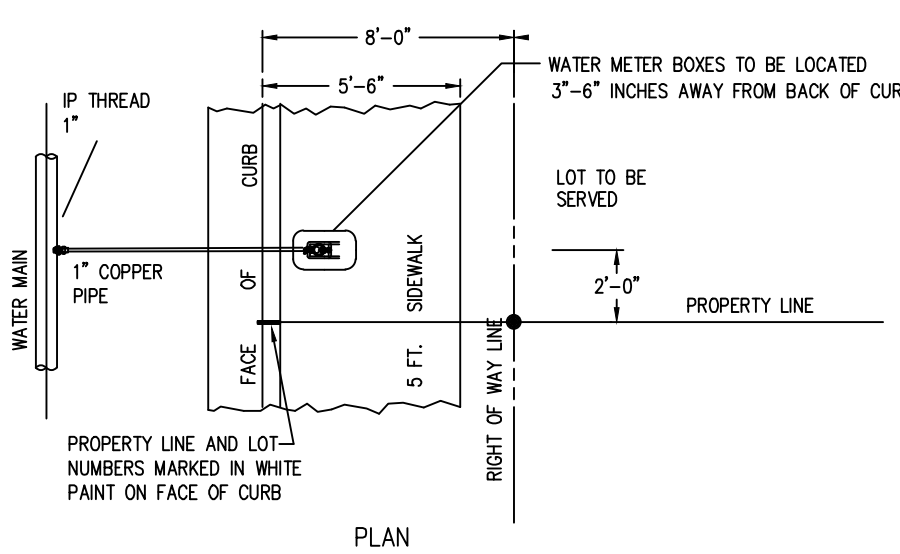
- NOTES:
- CONCRETE SHALL BE 3000 PSI AT 28 DAYS.
 - CHANNELS SHALL BE CONSTRUCTED TO PROVIDE SMOOTH EDGES AND BACK TO CURB PIPE.
 - BASES MAY BE PRECAST OR POURED IN PLACE.
 - THIS MANHOLE BASE SECTION SHALL BE USED FOR PIPE SIZES UP TO 24".
 - USE RUBBER GASKETS IF PIPE IS FLEXIBLE. GASKETS MAY BE RGR-41 SEAL OR EQUIVALENT.

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 TITLE: MANHOLE BASE SECTION
 REVISION: NC
 DRAWING NO: 360



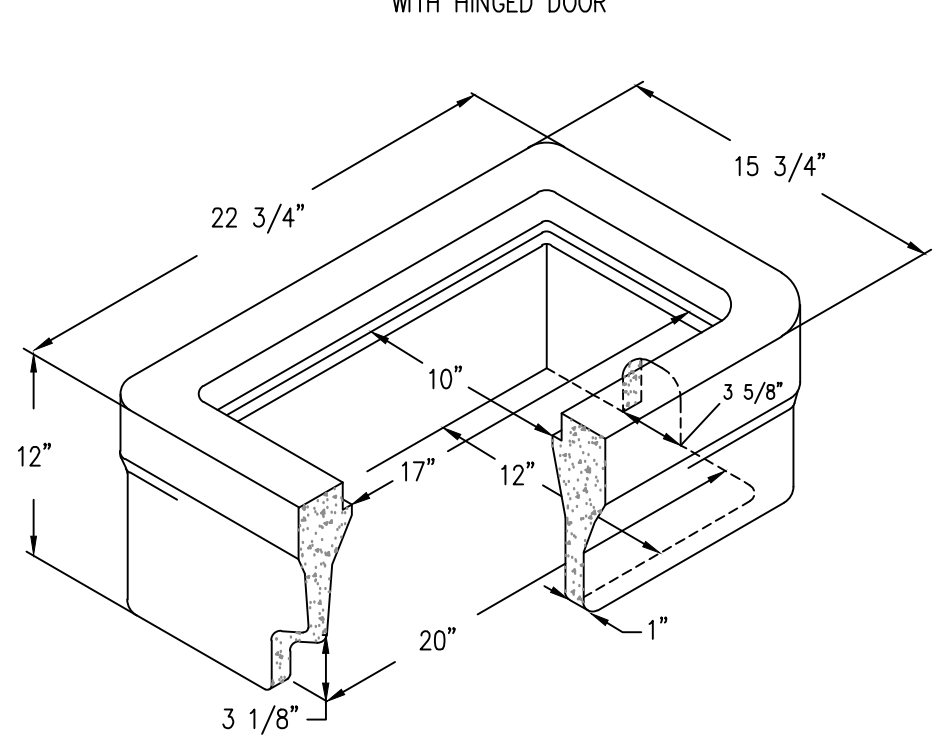
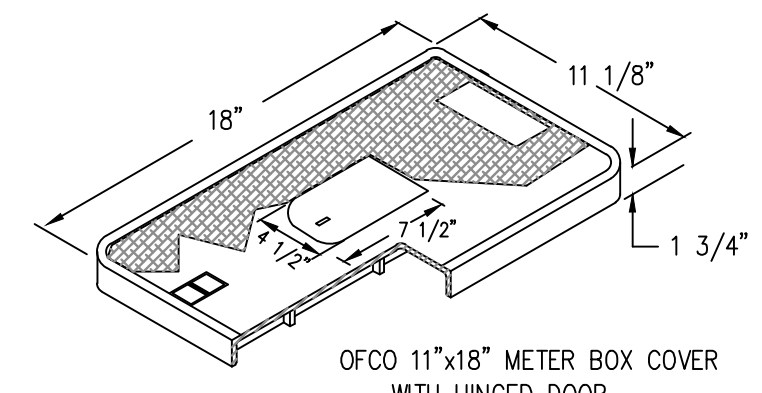
- NOTES:
- KENNEDY GUARDIAN OR OTHER APPROVED CITY HYDRANT. (VARIETY APPROVED HYDRANTS WITH CITY OF ST. HELENS MAINTENANCE DEPT. @ 503-397-3532)
 - NO OBSTRUCTIONS WITHIN 3 FT. OF FIRE HYDRANT
 - SIDEWALK SHALL BE WIDENED AROUND FIRE HYDRANT
 - INSTALL 3'-FT X 3'-FT X 8-IN PCC RESTRAINT COLLAR WHEN NOT WITHIN PCC SIDEWALK

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 PH (503)397-6272 FAX (503)397-4016
 TITLE: FIRE HYDRANT INSTALLATION
 REVISION: NC
 DRAWING NO: 400



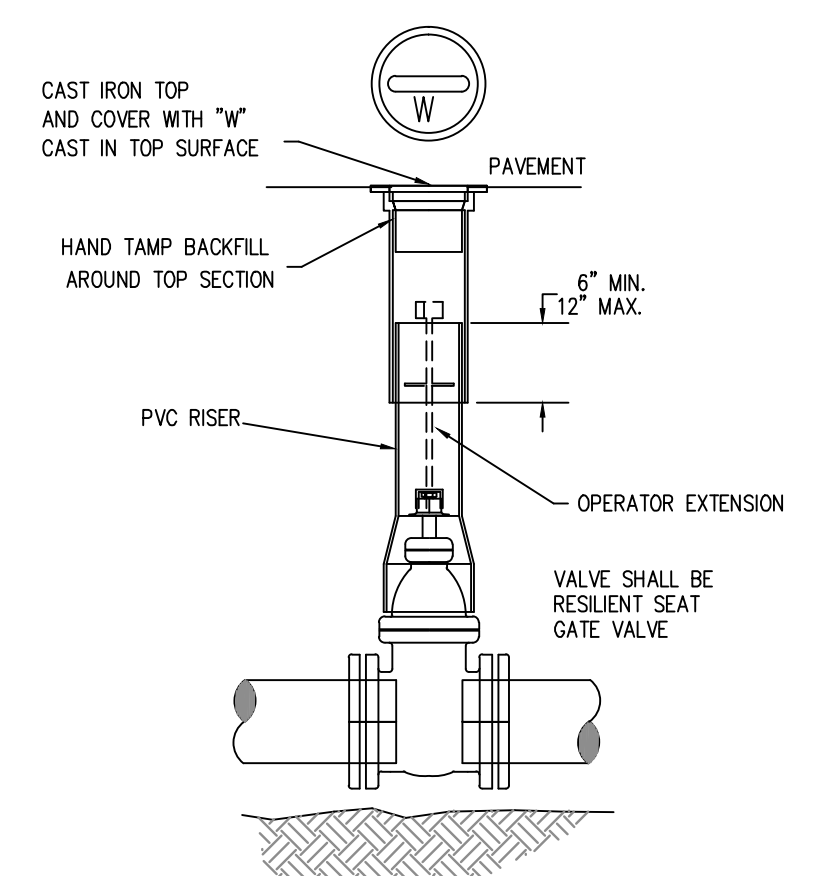
- NOTES:
- USE MSP DUCTILE IRON COVER PART NO. W520C-1118-4 AS APPROVED BY THE CITY.
 - USE ALL COMPRESSION TYPE FITTINGS
 - METERS SHALL NOT BE LOCATED IN DRIVEWAY APPROACH
 - METERS SHALL BE CENTERED IN METER BOX
 - IF COPPER PIPE IS IDENTIFIED, BENT, OR CRAMPED, THE DAMAGED SECTION SHALL BE REMOVED

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 SCALE:
CITY OF ST. HELENS
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 PH (503)397-6272 FAX (503)397-4016
 TITLE: SINGLE WATER SERVICE INSTALLATION
 REVISION: NC
 DRAWING NO: 405



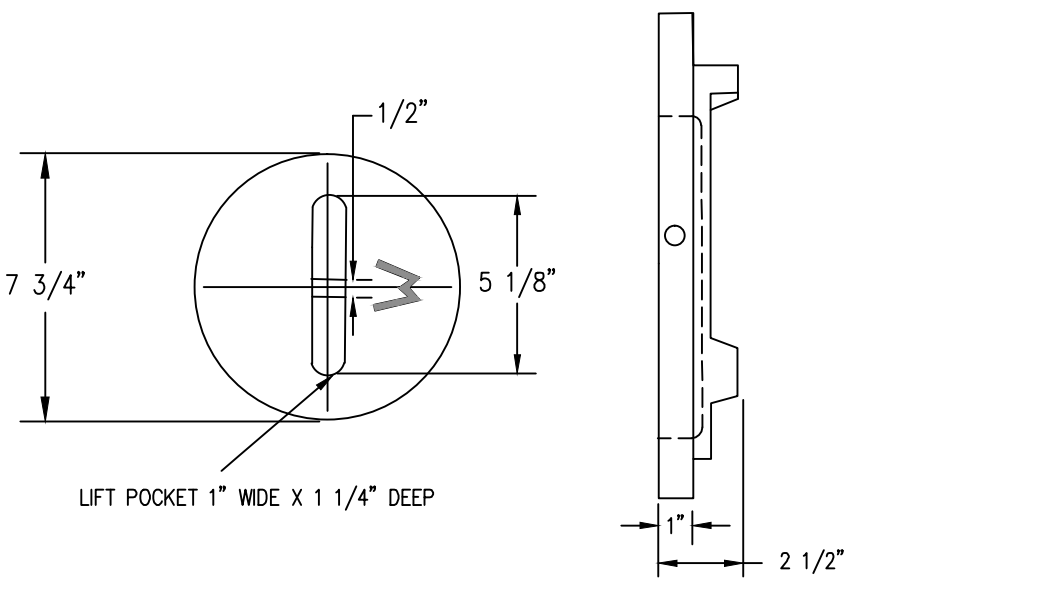
- NOTES:
- NO. 37 BODY WITH DUCTILE IRON COVER
 - LIGHTWEIGHT (LR) BOXES NOT ACCEPTABLE

DRAWN BY: SUNM
 CHECKED BY:
 DATE:
 SCALE: NOT TO SCALE
CITY OF ST. HELENS
 265 THE STRAND, ST. HELENS, OR 97051
 PH (503)397-6272 FAX (503)397-4016
 TITLE: BROOKS 12" X 20" METER BOX FOR 1" WATER METER
 REVISION: NC
 DRAWING NO: 406



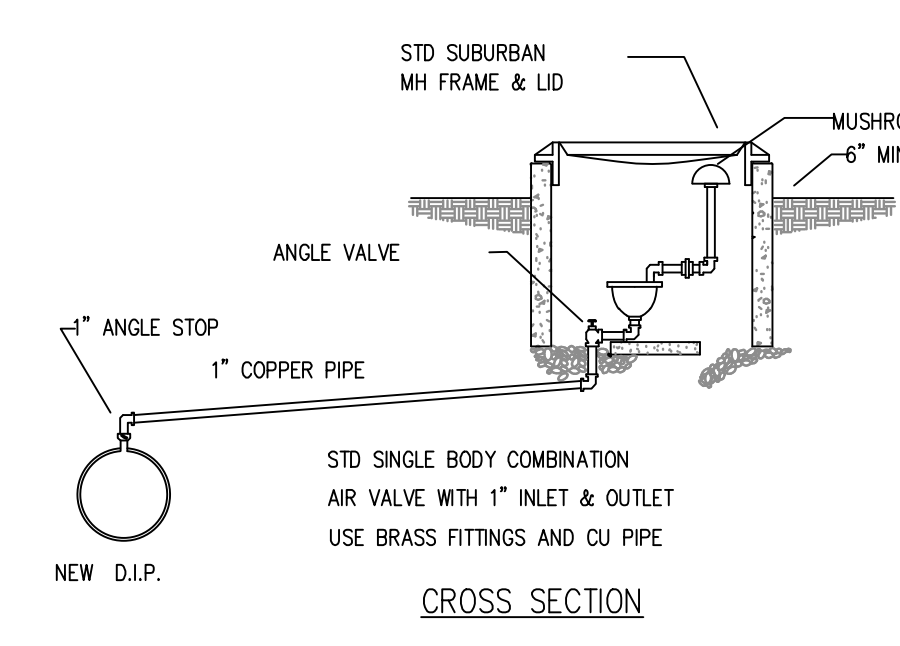
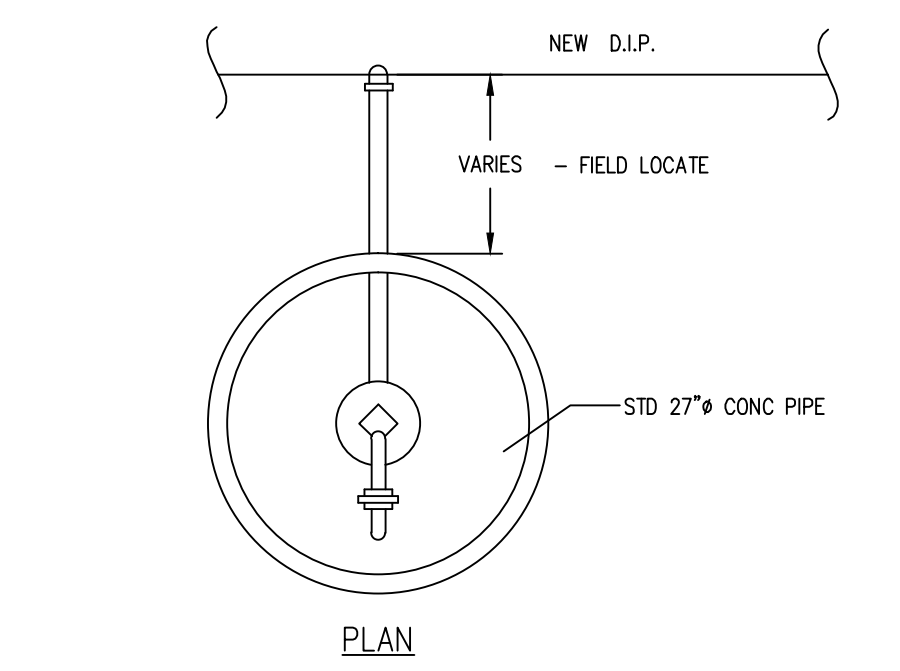
- NOTES:
- VALVE BOX NOT TO REST ON OPERATING ASSEMBLY.
 - OPERATOR EXTENSION REQUIRED WHEN VALVE NUT IS DEEPER THAN 3 FEET FROM FINISHED GRADE.
 - CENTER VALVE BOX ON AXIS OF OPERATOR NUT.
 - PROVIDE 24" SQUARE BY 4" THICK CONCRETE PAD AROUND VALVE BOX OUTSIDE OF PAVED AREAS.
 - ALL VALVES AND FITTINGS SHALL BE MECHANICAL JOINT.
 - SEE STANDARD DETAIL FOR FLANGE UP VALVE BOX AND COVER.

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 SCALE:
CITY OF ST. HELENS
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 PH (503)397-6272 FAX (503)397-4016
 TITLE: GATE VALVE SETTING DETAIL
 REVISION: NC
 DRAWING NO: 410

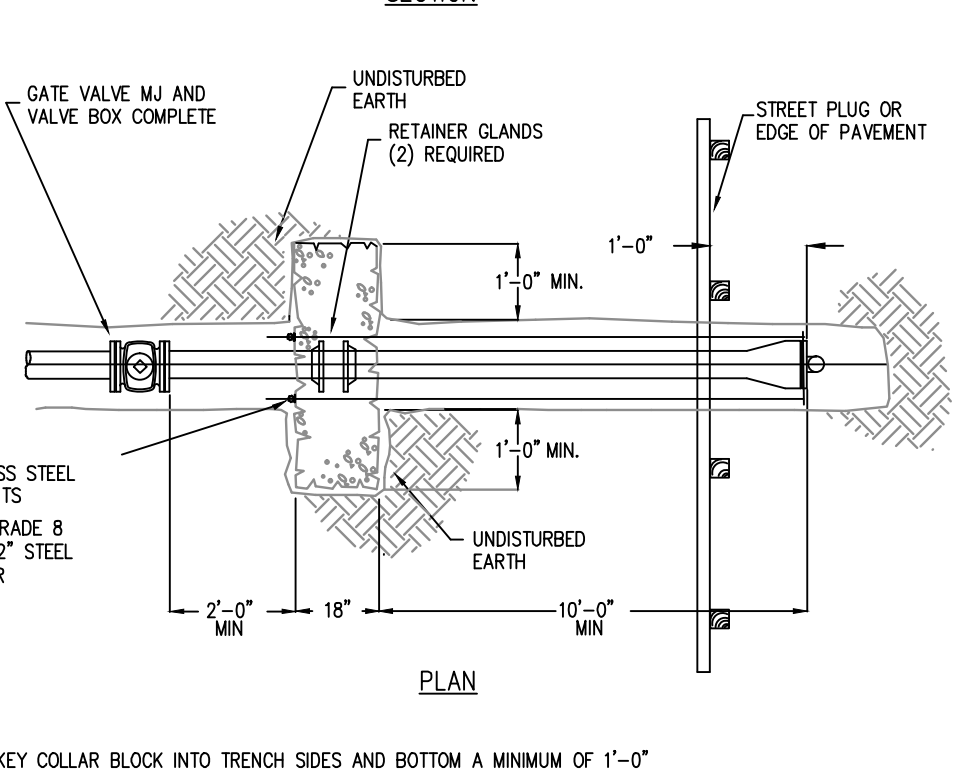
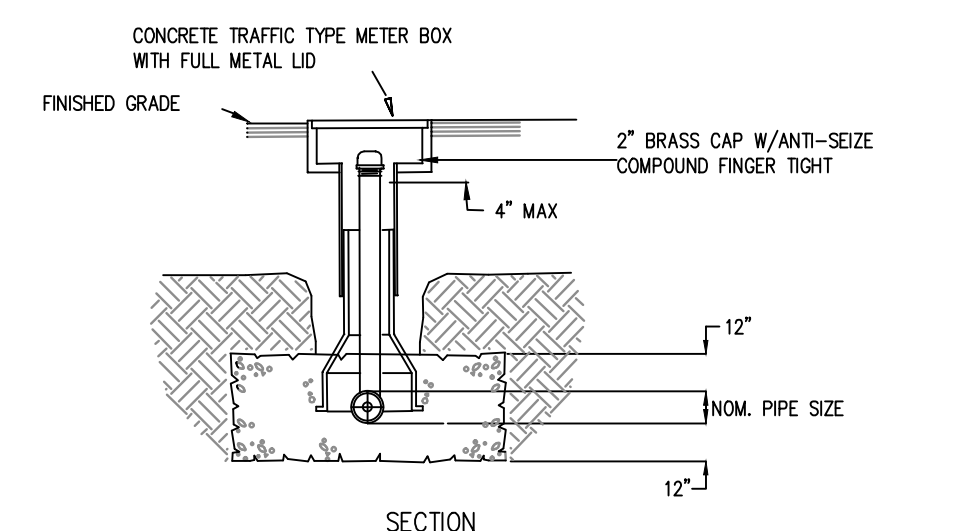


- NOTES:
- OLYMPIC FOUNDRIES PART NO. V9910 OR APPROVED EQUAL.
 - MATERIAL: CAST IRON, ASTM A-46, CL. 30
 APPROXIMATE WEIGHT:
 VALVE BOX - 42 LBS.
 COVER - 14 LBS.

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 TITLE: 18" FLANGE UP VALVE BOX AND COVER
 REVISION: NC
 DRAWING NO: 411



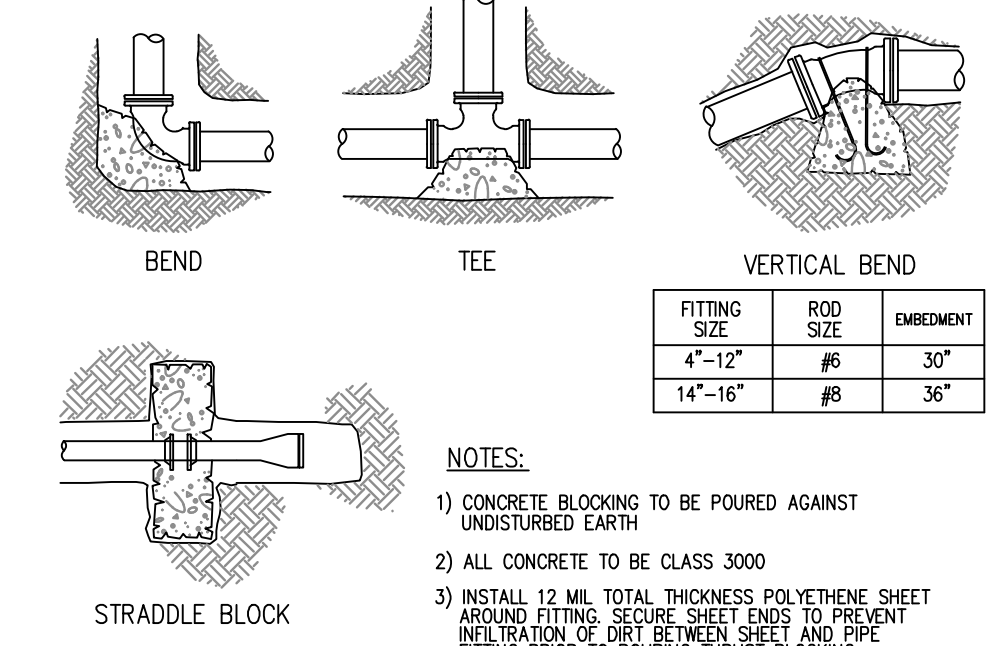
DRAWN BY: T. KOLLN
 CHECKED BY:
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 SCALE:
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 PH (503)397-6272 FAX (503)397-4016
 TITLE: AIR RELEASE VALVE
 REVISION: NC
 DRAWING NO: 415



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 SCALE:
CITY OF ST. HELENS
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 PH (503)397-6272 FAX (503)397-4016
 TITLE: TEMPORARY 2" BLOWOFF
 REVISION: NC
 DRAWING NO: 422

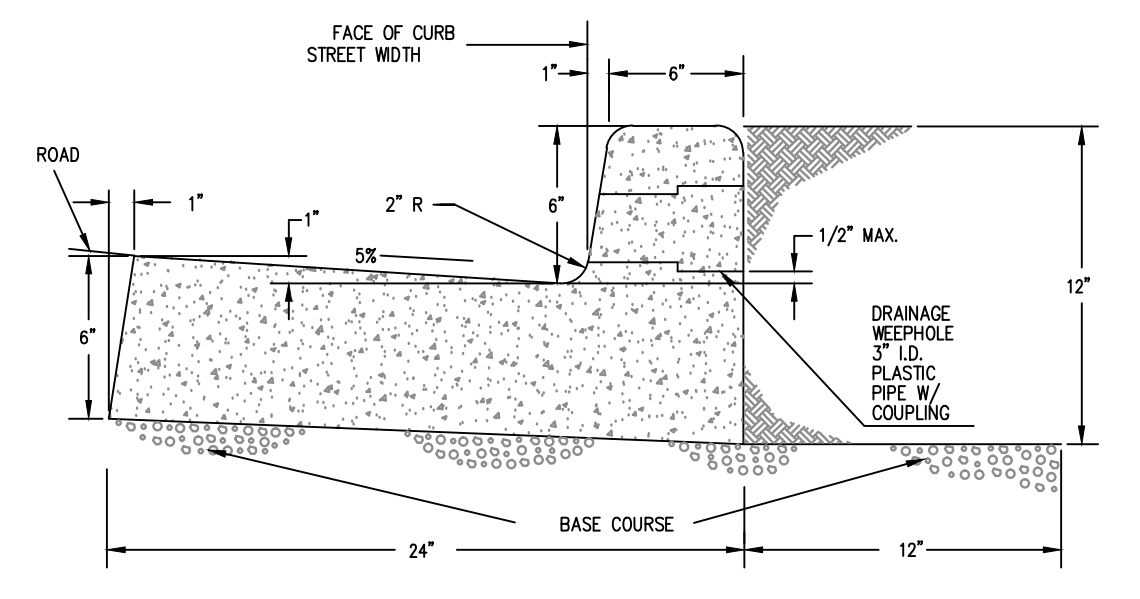
BEARING AREA OF THRUST BLOCKS IN SQ. FT.					VOLUME OF THRUST BLOCK IN CU. YDS. (VERTICAL)		
FITTING SIZE	TEE	90° BEND	45° BEND	11 1/4" BEND	FITTING SIZE	BEND ANGLE	IN CU. YDS. (VERTICAL)
4	1.3	1.9	1.3	22 1/2"	4	1.1	0.4 0.2
6	2.8	4.0	2.1	1.3	6	2.7	1.0 0.4
8	5.1	7.1	3.9	2.0	1.3	8	4.0 1.5 0.6
12	11.3	16.0	8.8	4.5	2.3	12	8.5 3.2 1.3

VALUES BASED ON 1500 PSI WATER PRESSURE AND 1500 PSF SOIL BEARING CAPACITY.



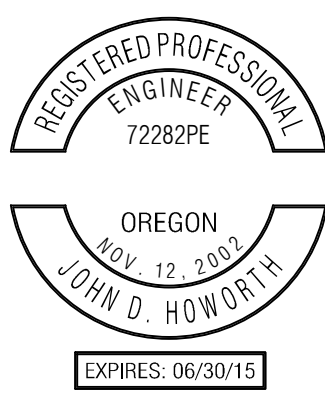
- NOTES:
- CONCRETE BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH
 - ALL CONCRETE TO BE CLASS 3000
 - INSTALL 12 MIL. TOTAL THICKNESS POLYETHYLENE SHEET AROUND FITTING. SECURE SHEET ENDS TO PREVENT INFILTRATION OF GRT BETWEEN SHEET AND PIPE FITTING PRIOR TO POURING THRUST BLOCKING
 - PROTECT MECHANICAL JOINT FOLLOWERS AND BOLTS FROM CONCRETE WITH TEMPORARY FORMS AND POLYETHYLENE SHEETING SEE NOTE NO. 3

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 TITLE: THRUST BLOCKING DETAILS
 REVISION: NC
 DRAWING NO: 430



- NOTES:
- FOR USE ALONG MEDIANS, CUTTERS MAY BE REDUCED WITH PRIOR APPROVAL FROM THE CITY ENGINEER.
 - CONCRETE TO HAVE A COMPRESSIVE STRENGTH OF 3300 P.S.I. AT 28 DAYS.
 - CONTRACTION JOINTS
 A. SPACING TO BE NOT MORE THAN 15 FEET.
 B. THE DEPTH OF THE JOINT SHALL BE AT LEAST 1-1/2 INCHES.
 C. MEPPHOLES TO BE CENTERED WITH CONTRACTION JOINTS.
 - BASE ROCK 1 1/2" - 3" OR 3/4" - 3/4" - 90% (ASTM D-1585) COMPACTED. BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4 INCHES, WHICHEVER IS GREATER, AND SHALL EXTEND 12" BEHIND THE CURB.
 - DRAINAGE WEEPHOLE - 3" DIAMETER PLASTIC PIPE
 A. 1/2" PLASTIC PIPE WITH COUPLING.
 B. DRAINAGE ACCESS THROUGH EXISTING CURBS SHALL BE CORE DRILLED.
 - ALL RADI SHALL BE 3/4" EXCEPT AS OTHERWISE SHOWN.

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 PH (503)397-6272 FAX (503)397-4016
 TITLE: STANDARD MONOLITHIC CURB AND GUTTER
 REVISION: NC
 DRAWING NO: 200



DATE	NO.	REVISION



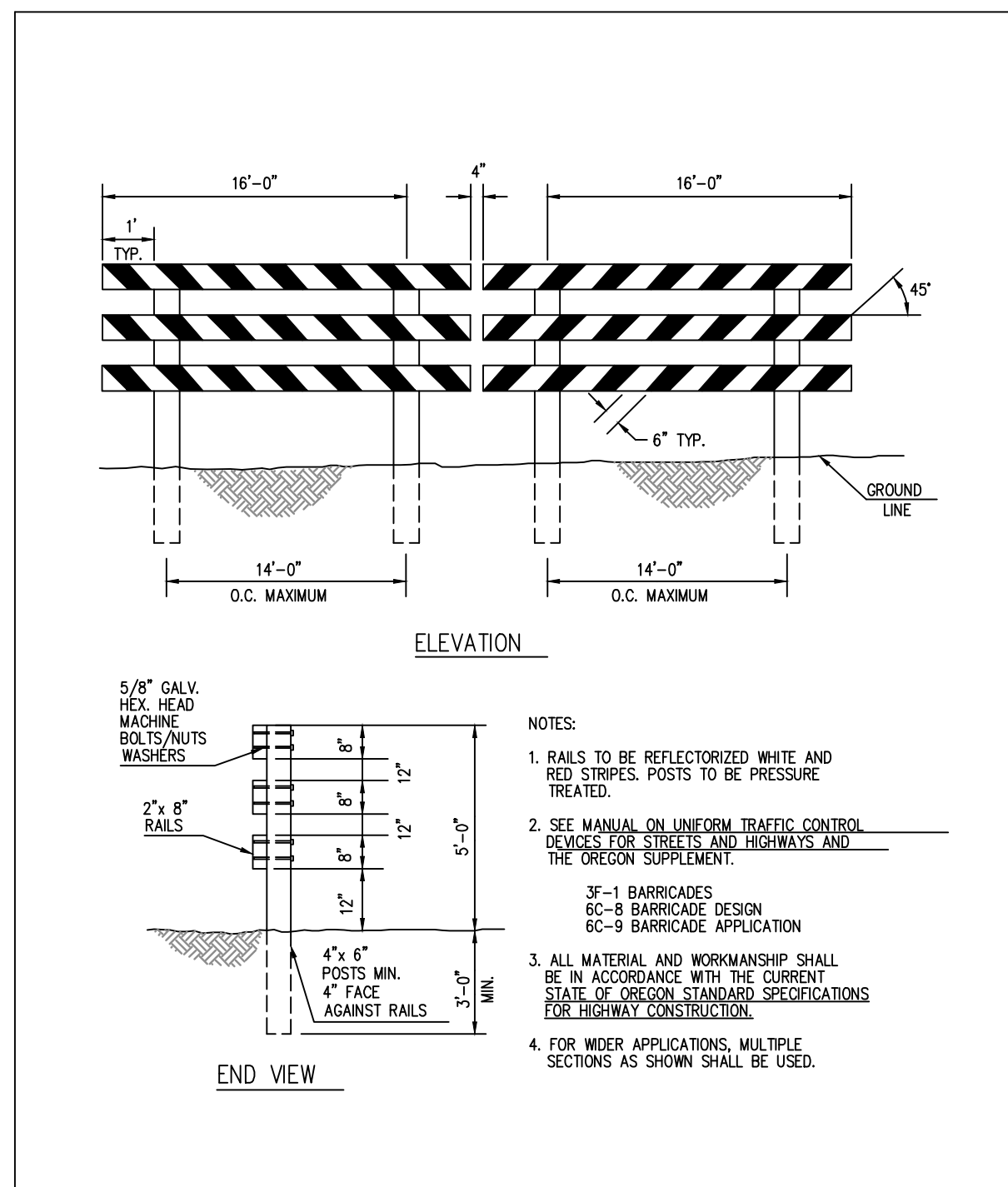
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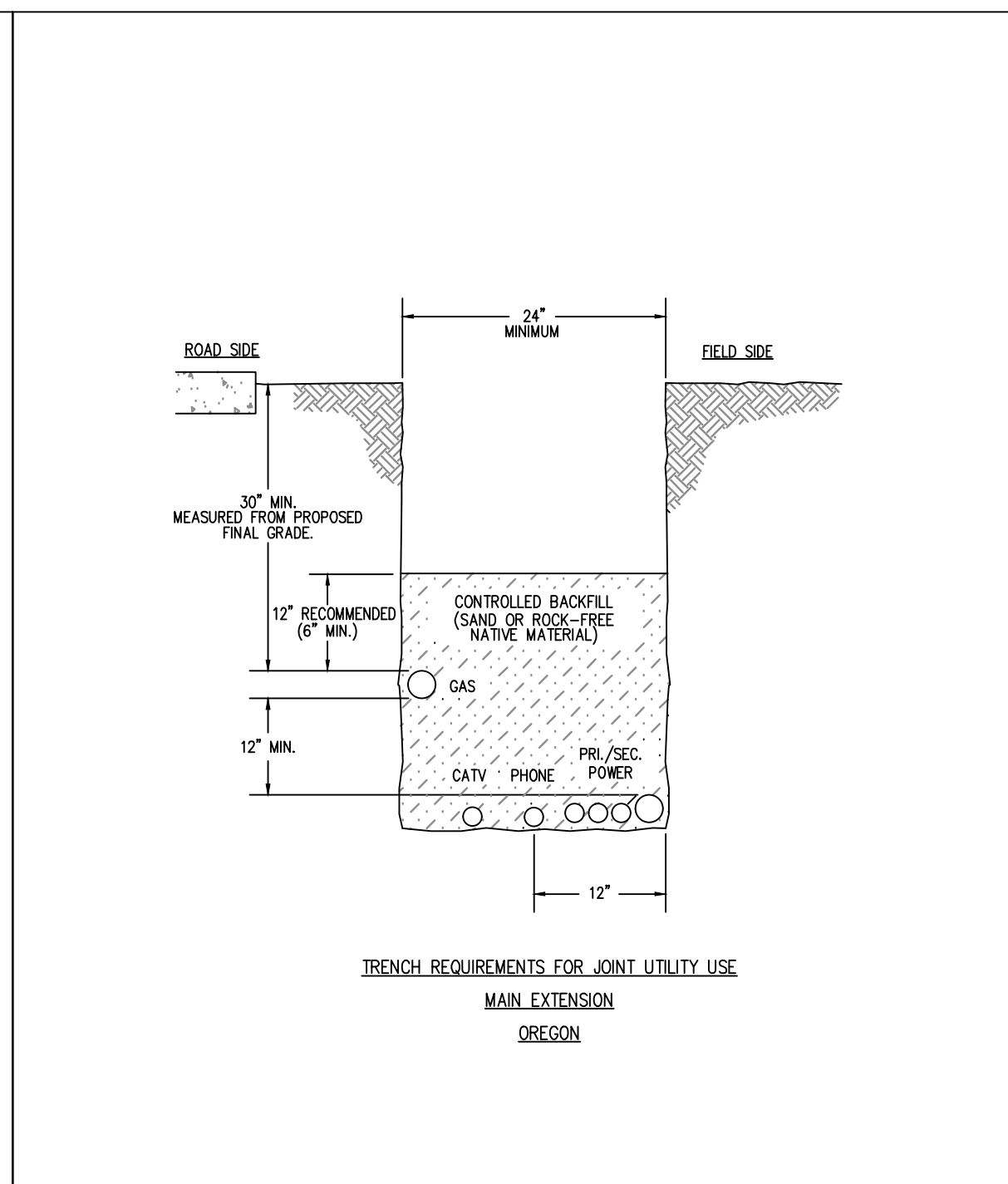
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D2

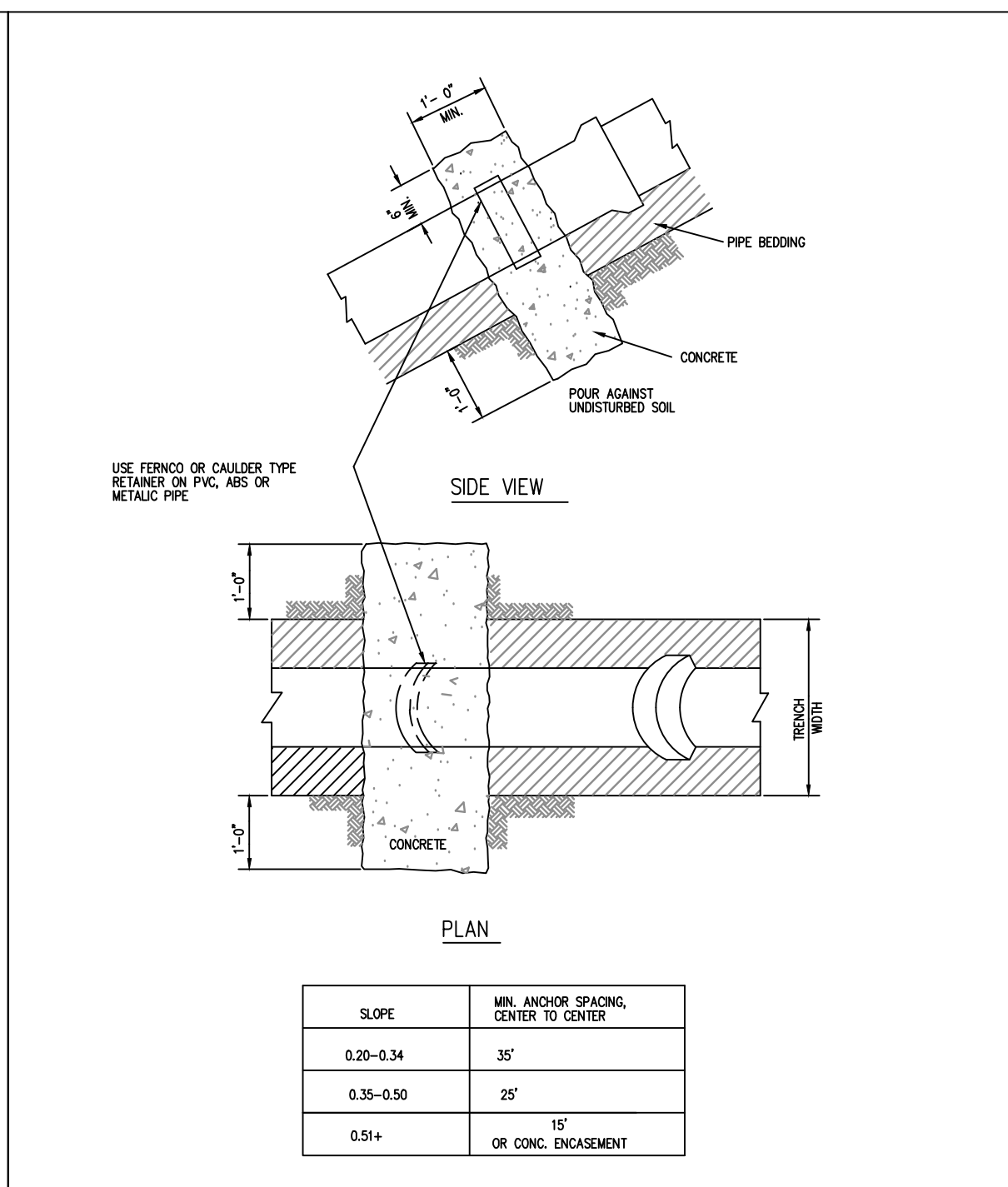
STANDARD DETAILS II



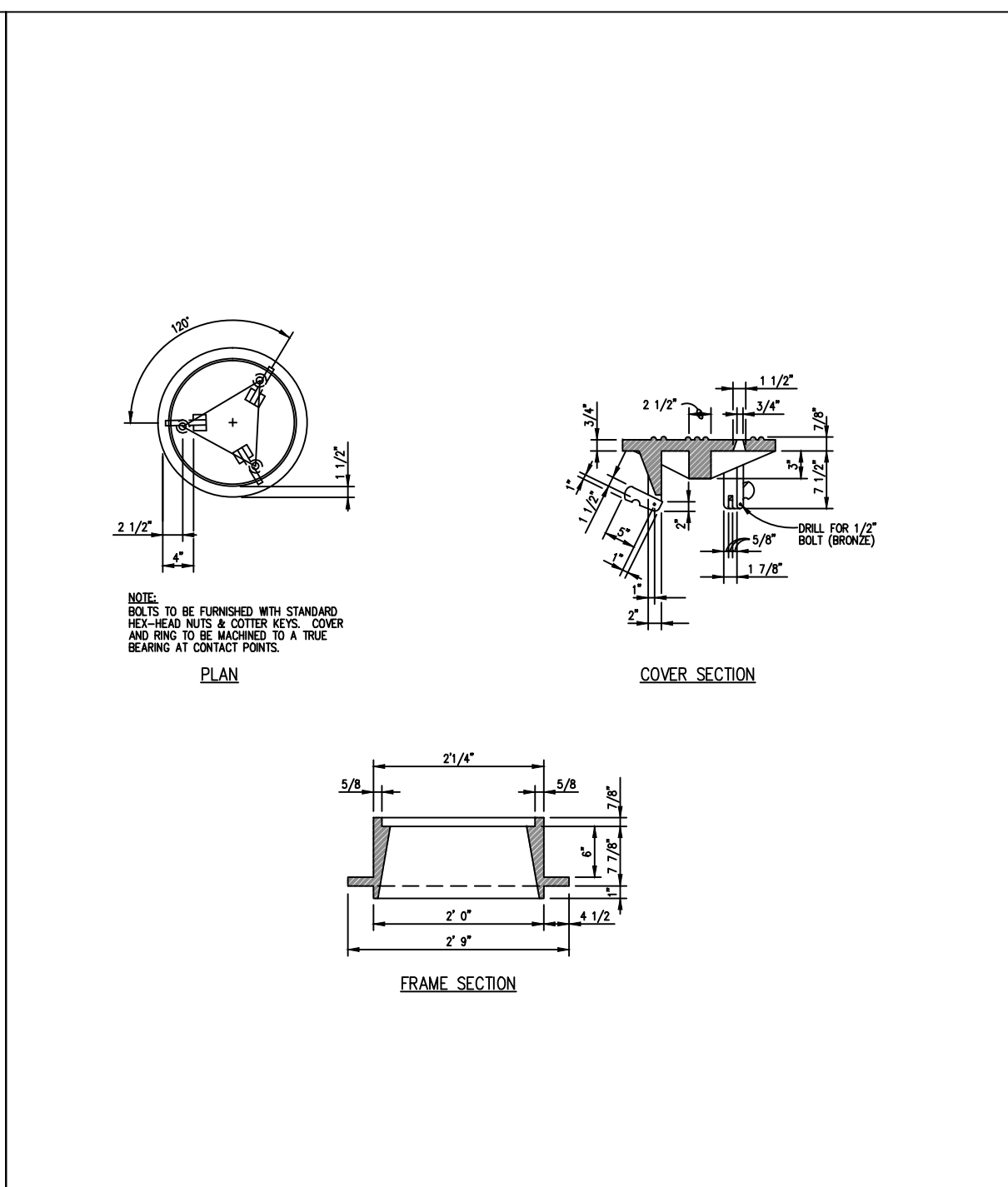
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 CHECKED BY: [Logo] 265 THE STRAND, ST. HELENS, OR 97051
 DATE: [Logo] PH (503)397-6272 FAX (503)397-4016
 SCALE: [Logo]
 TITLE: DOUBLE STREET BARRICADE - TYPE III
 DRAWING NO: 286



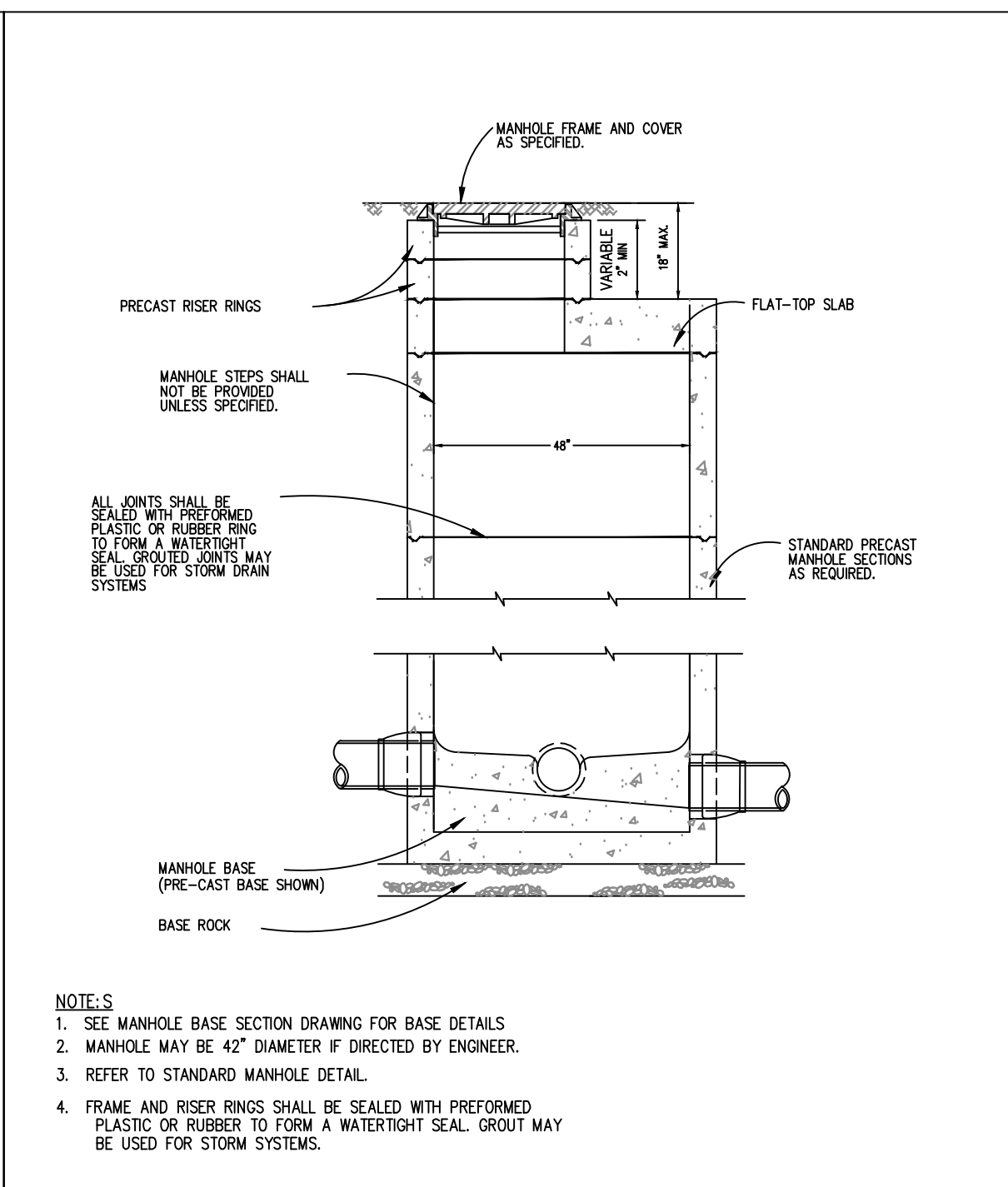
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 CHECKED BY: [Logo] 265 THE STRAND, ST. HELENS, OR 97051
 DATE: [Logo] PH (503)397-6272 FAX (503)397-4016
 SCALE: [Logo]
 TITLE: JOINT UTILITY TRENCH
 DRAWING NO: 301



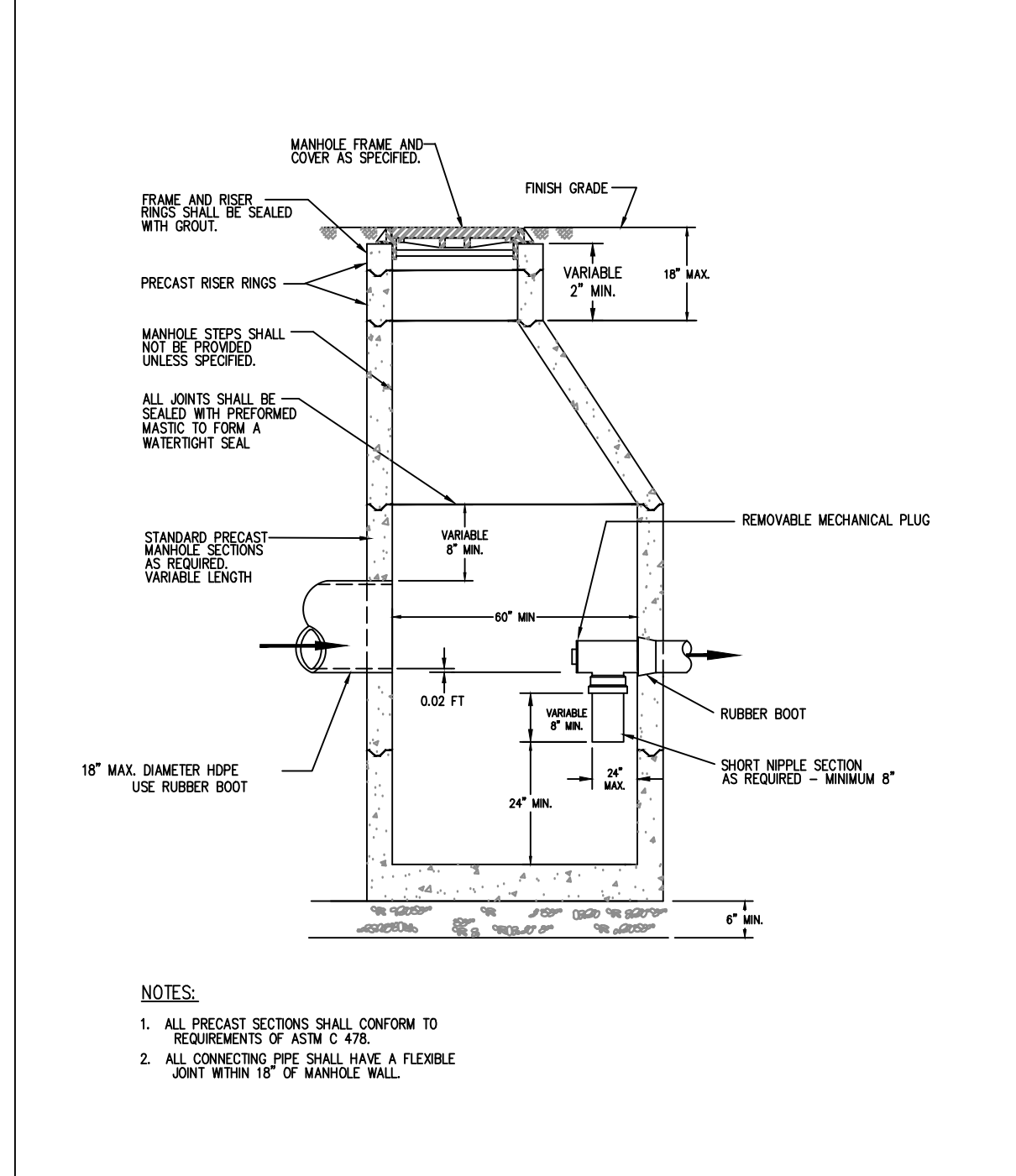
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 CHECKED BY: [Logo] 265 THE STRAND, ST. HELENS, OR 97051
 DATE: [Logo] PH (503)397-6272 FAX (503)397-4016
 SCALE: [Logo]
 TITLE: STEEP SLOPE PIPE ANCHOR WALLS
 DRAWING NO: 310



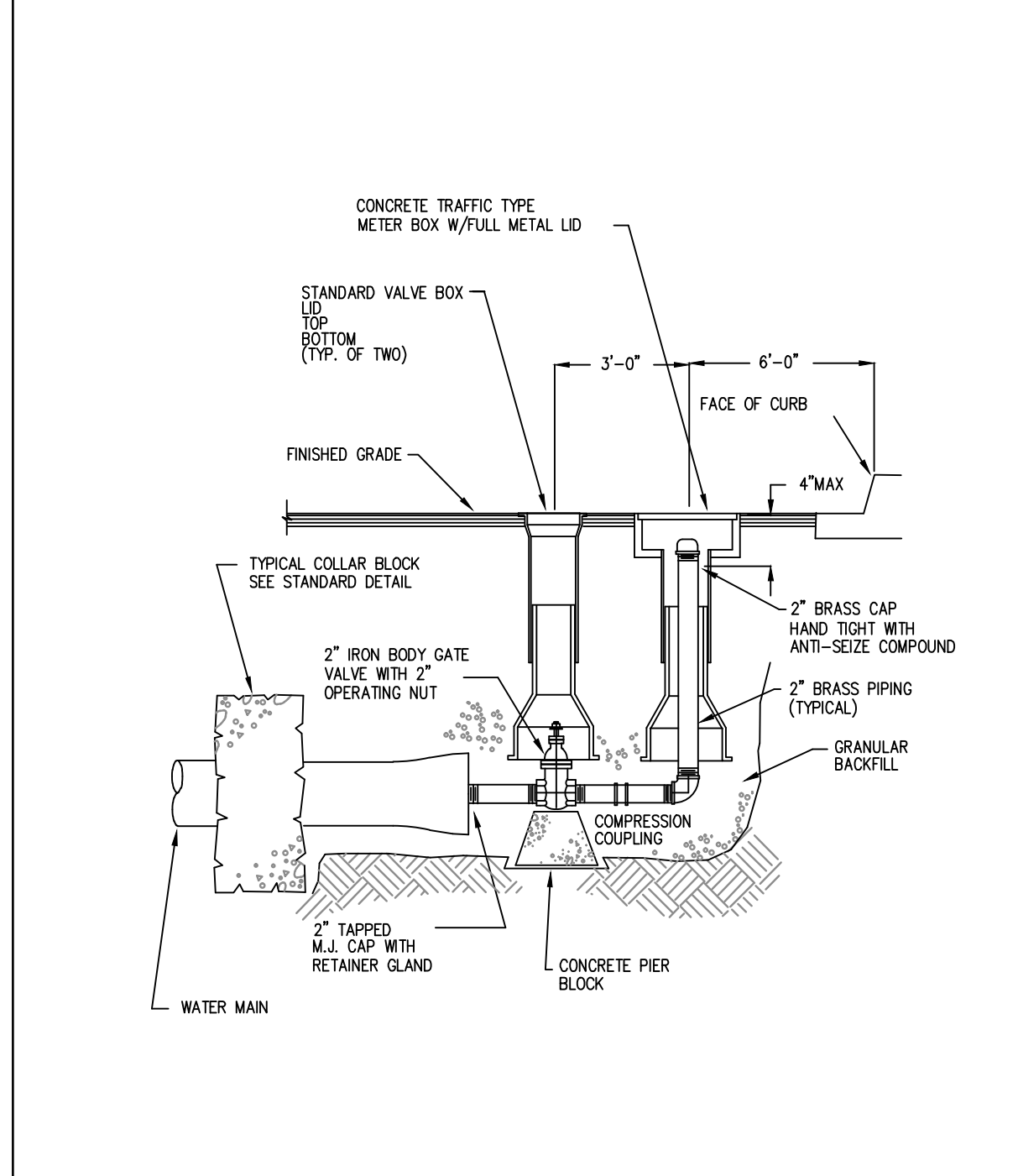
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 CHECKED BY: [Logo] 265 THE STRAND, ST. HELENS, OR 97051
 DATE: [Logo] PH (503)397-6272 FAX (503)397-4016
 SCALE: [Logo]
 TITLE: CAM-LOCK MANHOLE COVER AND FRAME
 DRAWING NO: 347



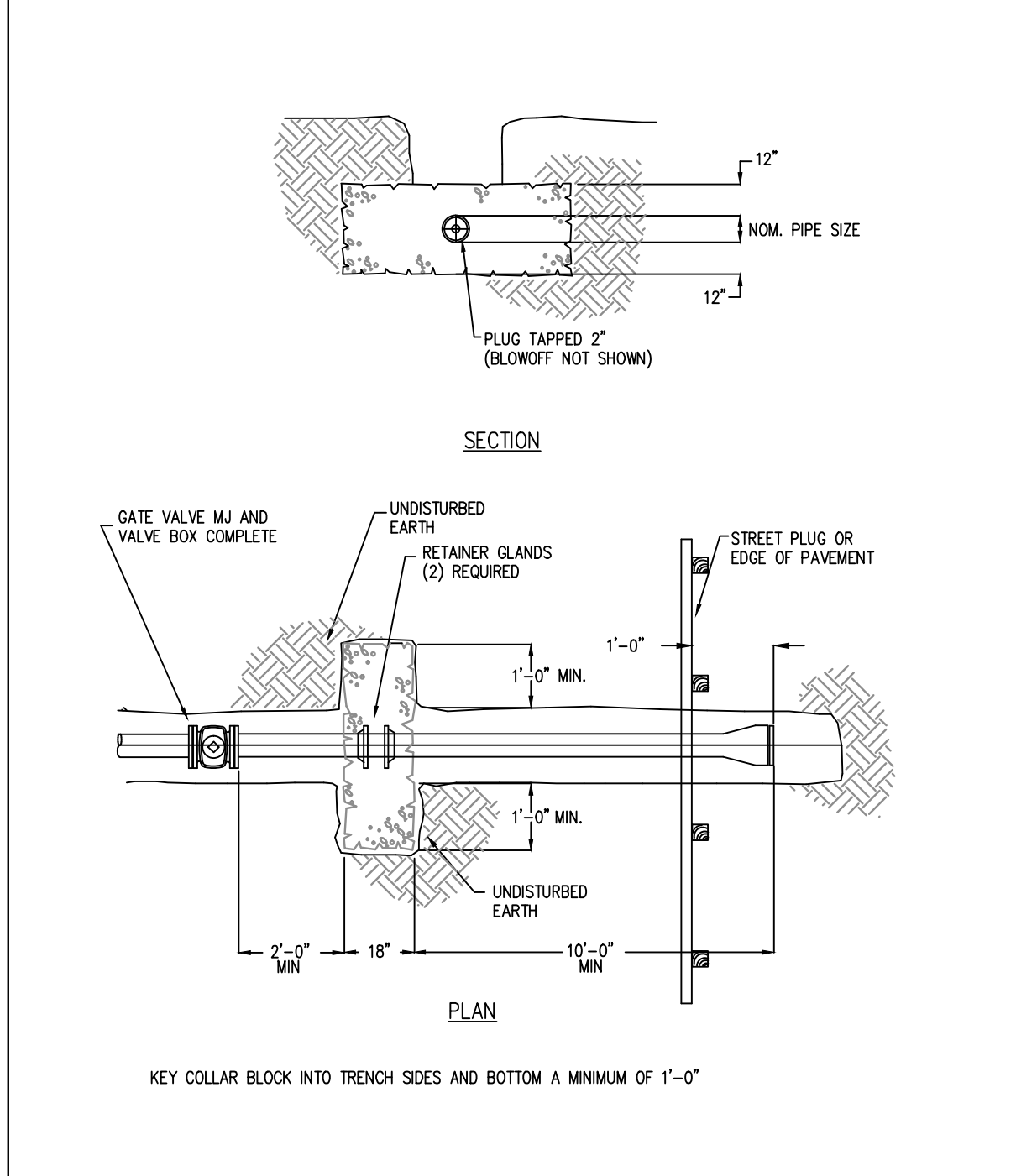
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 CHECKED BY: [Logo] 265 THE STRAND, ST. HELENS, OR 97051
 DATE: [Logo] PH (503)397-6272 FAX (503)397-4016
 SCALE: [Logo]
 TITLE: FLAT-TOP MANHOLE
 DRAWING NO: 351



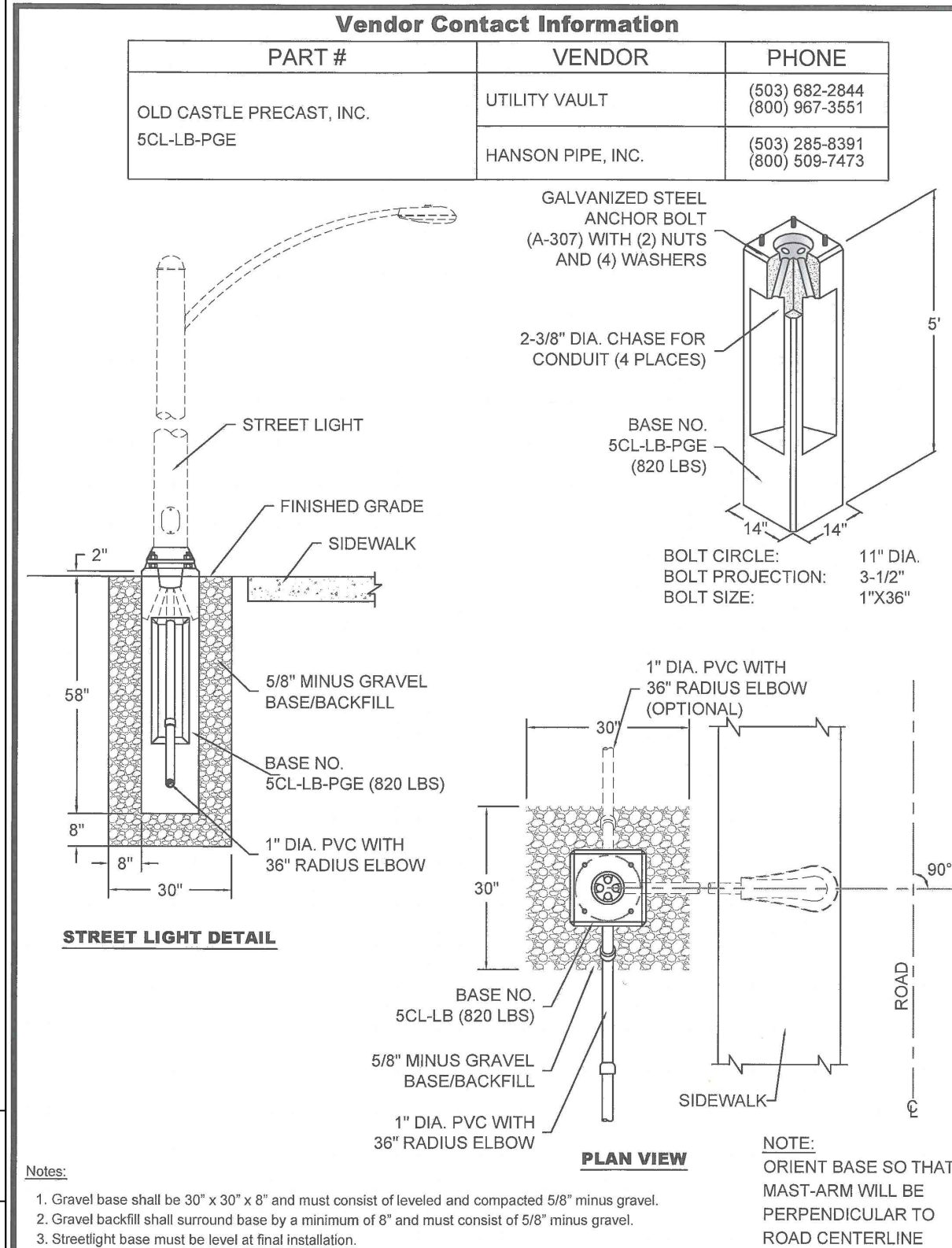
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 CHECKED BY: [Logo] 265 THE STRAND, ST. HELENS, OR 97051
 DATE: [Logo] PH (503)397-6272 FAX (503)397-4016
 SCALE: [Logo]
 TITLE: POLLUTION CONTROL MANHOLE INSIDE ELBOW
 DRAWING NO: 355



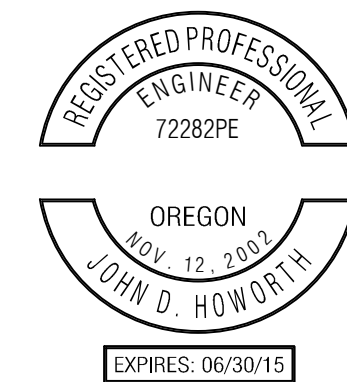
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 CHECKED BY: [Logo] 265 THE STRAND, ST. HELENS, OR 97051
 DATE: [Logo] PH (503)397-6272 FAX (503)397-4016
 SCALE: [Logo]
 TITLE: PERMANENT 2" BLOWOFF
 DRAWING NO: 420



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 DATE: [Logo] PH (503)397-6272 FAX (503)397-4016
 SCALE: [Logo]
 TITLE: COLLAR THRUST BLOCK
 DRAWING NO: 425



DRAWN BY: [Logo] CITY OF ST. HELENS
 CHECKED BY: [Logo] 265 THE STRAND, ST. HELENS, OR 97051
 DATE: [Logo] PH (503)397-6272 FAX (503)397-4016
 SCALE: [Logo]
 TITLE: COLLAR THRUST BLOCK
 DRAWING NO: 425



STANDARD DETAILS IV

DATE	NO.	REVISION

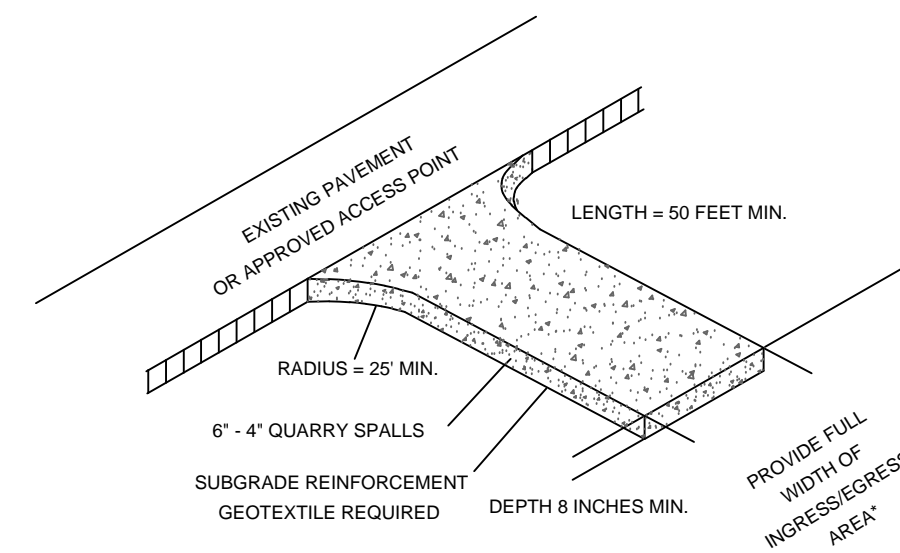
DRAWN: CLF	DESIGNED: CLF	CHECKED: JDH
SCALE: 1" = 50'	DATE: March 2014	
LAND USE #:	DRAWING: 14188-Elk Ridge Phase 5	
SUB. 1.13		

3J CONSULTING, INC.
 5075 SW GRIFFITH DRIVE, SUITE 150
 BEAVERTON, OR 97005
 PHONE & FAX: (503) 946-9365

St Helens Assets, LLC
 PO Box 288
 Washougal, WA 98671

Elk Ridge Phases 5
 Hankey Road
 St Helens, Columbia County, Oregon

D4

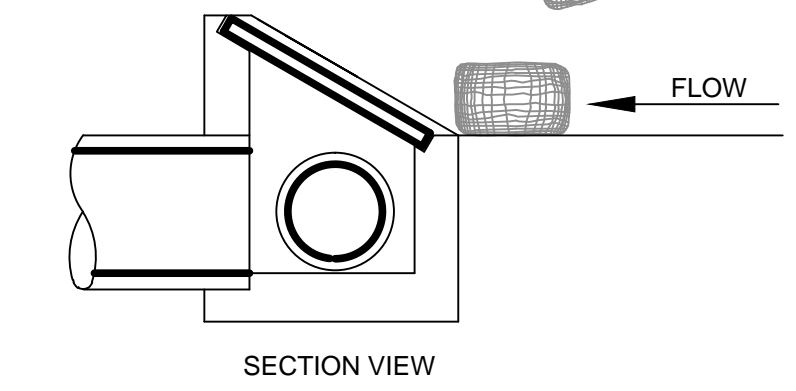
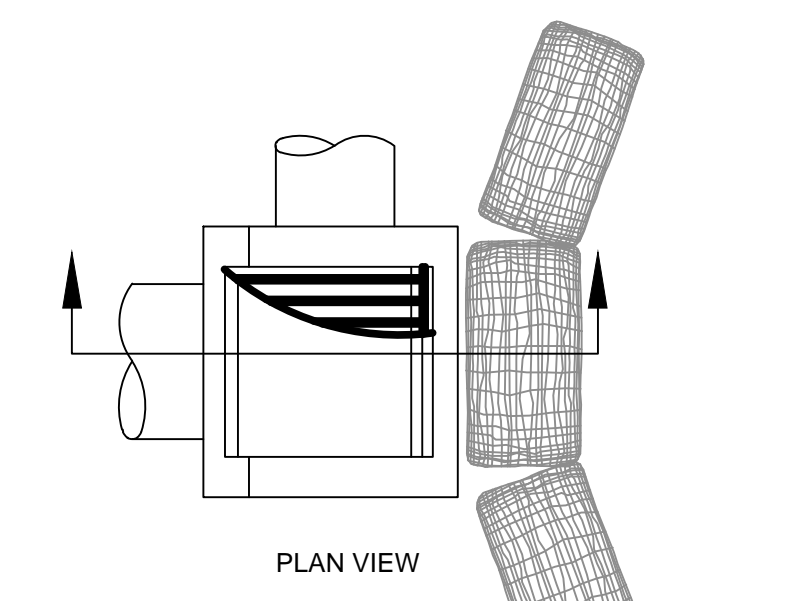


*20' MIN. FOR SINGLE FAMILY AND DUPLEX RESIDENTIAL

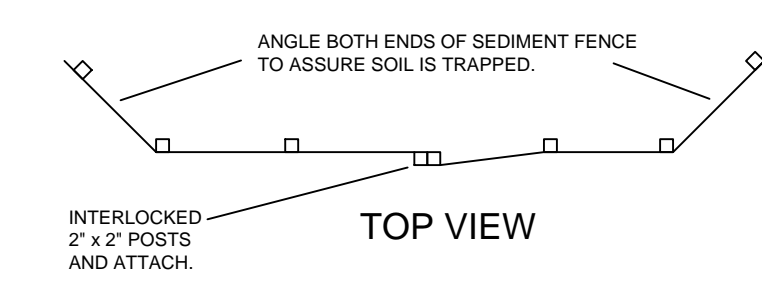
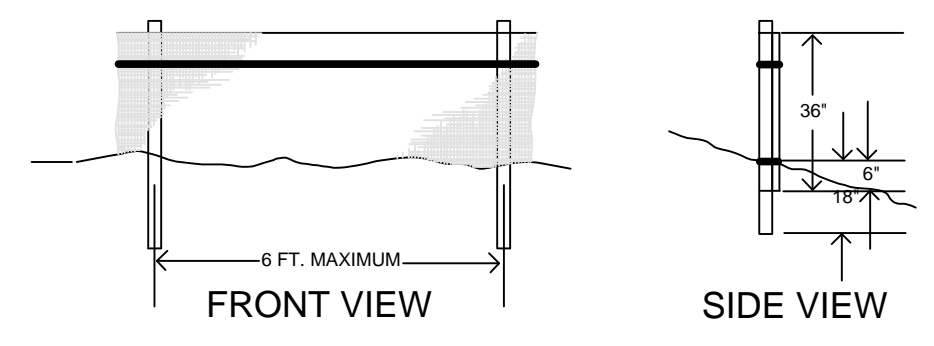
NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CURSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OF SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILETERING SYSTEM.
5. **DIMENSIONS:**
 SINGLE FAMILY: 20' LONG BY 20' WIDE 8" DEP OF 3/4" MINUS ROCK.
 COMMERCIAL: 50' LONG BY 20' WIDE 3-6" CLEAN ROCK. GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.

CONSTRUCTION ENTRANCE
NTS

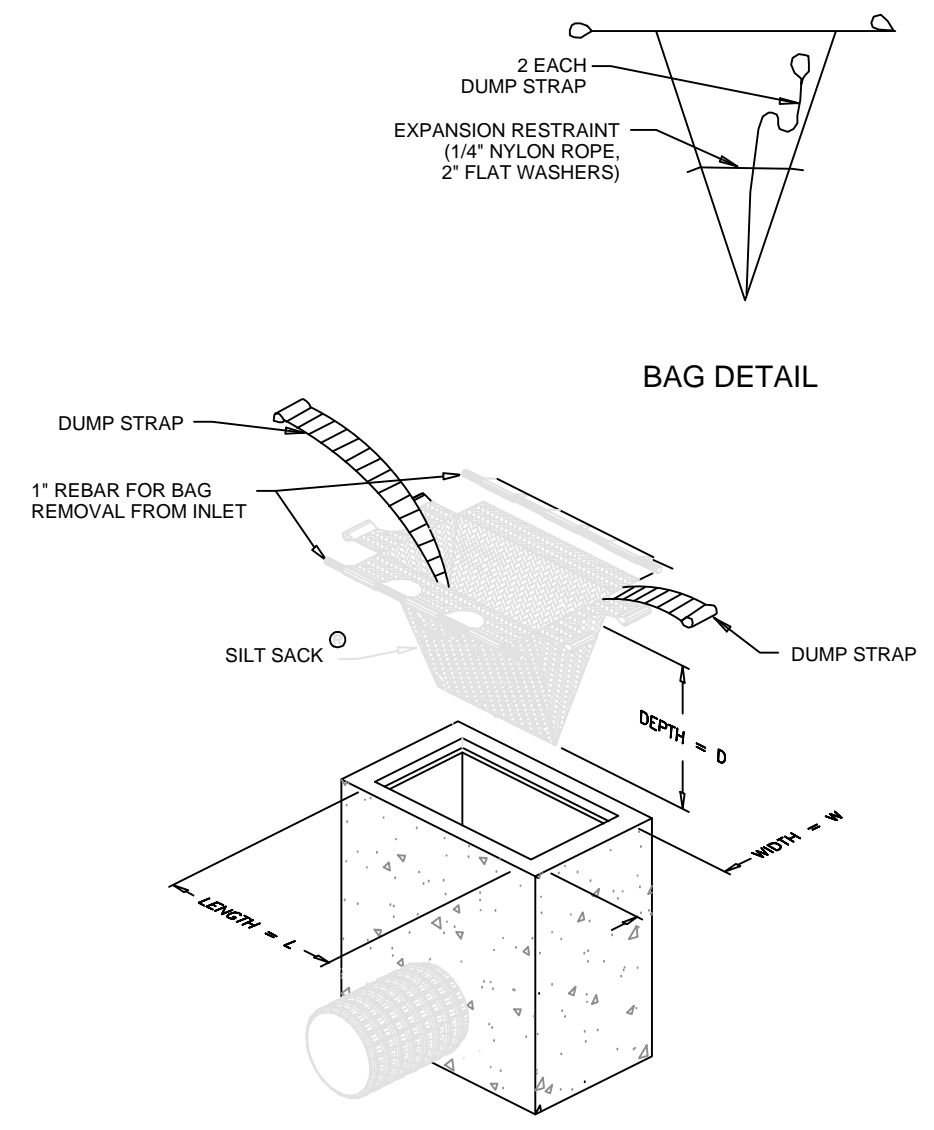


DITCH INLET - INLET PROTECTION
NTS



- NOTES:**
1. BURY BOTTOM OF FILTER FABRIC 6" MIN. VERTICALLY BELOW GRADE.
 2. 2" x 2" FR. PINE OR STEEL FENCE POSTS.
 3. STITCHED LOOPS TO BE INSTALLED UPHILL SIDE OF SLOPE.
 4. COMPACT NATIVE FILL IN ALL AREAS OF FILTER FABRIC TRENCH.

SEDIMENT FENCE
NTS



REGULAR FLOW ONLY
DO NOT USE HIGH FLOW INSERT BAGS.

AREA DRAIN - INLET PROTECTION
NTS



STANDARD DETAILS V

DATE	NO.	REVISION	DRAWN: CLF	DESIGNED: CLF	CHECKED: JDH
			SCALE: 1" = 50'	DATE: March 2014	
			LAND USE #:	DRAWING: 14188-Elk Ridge Phase 5	
			SUB. 1.13		



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St Helens Assets, LLC
PO Box 288
Washougal, WA 98671

Elk Ridge Phases 5
Hankey Road
St Helens, Columbia County, Oregon

D5

August 26, 2016

Mr. Jacob Graichen, AICP
City Planner
Planning Division
265 Strand
St. Helens, Oregon 97051

Elk Ridge Phase 6 Subdivision Application for Subdivision Approval

Dear Jacob,

3J Consulting represents St. Helens Assets, LLC regarding their property at Elk Ridge Estates within the City of St. Helens. The property is known as 5n1w32 00100 & 00200, 5n1w32db 00100, and 5n1w32dc 00900. The site is partially constructed and this application for subdivision has been requested in order to allow for construction activities to resume under an approved subdivision application.

Phase 6 of Elk Ridge Estates was most recently approved by the City in 2013 under application number SUB.1.13. The 2013 subdivision application approval expired in mid-2016, leaving the developer in construction but not far enough along to submit a final plat. It is anticipated that the developer will be ready to submit a final plat within the next twelve months.

The following details a request for preliminary plat approval for the current phase of the Elk Ridge Estates Subdivision, Phase 6. The Applicant has extracted the applicable criteria for a preliminary plat approval and has addressed each applicable criteria with a draft finding in support of the application.

Applicable Review Criteria and Draft Findings:

17.136.020 General provisions.

- (1) An application for a subdivision shall be processed through a two-step process*: the preliminary plat and the final plat:
 - (a) The preliminary plat shall be approved by the planning commission before the final plat can be submitted for approval consideration; and
 - (b) The final plat shall reflect all conditions of approval of the preliminary plat.
- (2) All subdivision proposals shall be in conformity with all state regulations set forth in ORS Chapter [92](#), Subdivisions and Partitions.*
- (3) When subdividing tracts into large lots, the planning commission shall require that the lots be of such size and shape as to facilitate future redivision in accordance with the requirements of the zoning district or comprehensive plan and this code and that a redevelopment plat be approved and used to approve building permits.
- (4) Temporary sales offices in conjunction with any subdivision may be granted as set forth in Chapter [17.116](#) SHMC.
- (5) All subdivision proposals shall be consistent with the need to minimize flood damage.
- (6) All subdivision proposals shall have underground public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.



(7) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage; and

(8) Where base flood elevation has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least 50 lots or five acres (whichever is less). (Ord. 2875 § 1.170.020, 2003)

**Applicant's
Draft Finding:**

The Applicant has submitted this application for preliminary plat approval of the Elk Ridge Phase 6 Subdivision. Upon completion of construction of the project, the Applicant will submit a final plat reflecting the preliminary site plans and the conditions which are applied to the project. The Applicant has been submitted to reflect the previously approved subdivision plans for this phase. The proposed plat contains 58 residential lots and two open space tracts. No future redivision of the property will be possible following the recordation of the final plat.

The proposed subdivision will not be located within the floodplain. Adequate facilities for the provision of drainage will be provided in order to avoid flood damage. Drainage within this phase of the subdivision will be collected within catch basins proposed within the public right-of-ways and routed to a detention and treatment facility located within the subdivision's previous phases.

17.136.030 Administration and approval process.

(1) The applicant of a preliminary plat proposal shall be the recorded owner of the property or an agent authorized in writing by the owner.

(2) A pre-application conference with city staff is required. However, failure of the director to provide any of the information required by this section shall not constitute a waiver of the standards, criteria, or requirements of the applications.

(3) Another pre-application conference is required if any preliminary plat application is submitted more than six months after the initial pre-application conference.

(4) Upon receipt of an application, the director shall review it for compliance with the requirements set forth in SHMC [17.136.060](#), Approval standards – Preliminary plat, and:

(a) If a land division application is incomplete, the director shall notify the applicant in writing of the exact information which is missing within 30 days of receipt of the application;

(b) The applicant shall be allowed to submit the missing information, and upon submission of the missing information, the application shall be deemed complete; and

(c) The applicant may refuse to submit the missing information in which case the application shall be deemed complete on the thirty-first day after the initial submittal of the application.

(5) Final action, including the resolution of all appeals and review on the land division application, shall be taken within 120 days after the application is deemed complete, and the director shall:

(a) Schedule a public hearing to be held by the planning commission within 45 days from the time the complete application is filed and shall provide a notice of the hearing in accordance with the provisions of SHMC [17.24.130](#);



- (b) Furnish one copy of the proposed preliminary plat to the city engineering division;
 - (c) Furnish one copy of the preliminary plat and supplemental material to:
 - (i) The Columbia County land development services; and
 - (ii) The Oregon Department of Transportation (ODOT), if the proposed subdivision is adjacent to a state highway and access to the state highway is desired by the applicant (these agencies will be given at least five days to review the plan, suggest revisions, and return the plans to the city);
 - (d) Incorporate all staff recommendations into a report to the planning commission.
- (6) The director shall mail notice of the preliminary plat proposal to persons who are entitled to notice in accordance with SHMC [17.24.130](#).
- (7) The planning commission shall approve, approve with conditions, or deny any application for preliminary plat per SHMC [17.136.060](#). The planning commission shall also apply the standards set forth in SHMC [17.136.070](#) when reviewing an application for a subdivision.
- (8) The decision of the planning commission may be appealed in accordance with SHMC [17.24.310](#)(2). (Ord. 2875 § 1.170.030, 2003)

Applicant's Draft Finding: The Applicant has submitted this application for preliminary plat approval of the Elk Ridge Phase 6 Subdivision. The Applicant understands that the City will review the application for completeness and determine whether additional information is required to process the application.

17.136.040 Expiration of approval – Standards for extension of time.

- (1) The preliminary plat approval by the planning commission or final approving authority shall lapse if:
- (a) A final plat (first phase in an approved phased development) has not been submitted within a one-year period; or
 - (b) The final plat does not conform to the preliminary plat as approved or approved with conditions.
- (2) The director shall, upon written request by the applicant and payment of the required fee, grant two extensions of the approval period not to exceed 12 months each; provided, that:
- (a) No changes are made on the original preliminary plat plan as approved by the planning commission;
 - (b) The applicant has expressed written intent of submitting a final plat within the extension period;
 - (c) There have been no changes to the applicable comprehensive plan policies and ordinance provisions on which the approval was based;
 - (d) An extension of time will not preclude the development of abutting properties; and
 - (e) A performance bond is provided in accordance with the city's standards. (Ord. 3105 § 2, 2009; Ord. 2875 § 1.170.040, 2003)

Applicant's Draft Finding: The Applicant notes that any preliminary approval for the proposed subdivision plat will be valid for a period of twelve months.



17.136.050 Phased development.

- (1) The planning commission may approve a time schedule for developing a subdivision in phases, but in no case shall the actual construction time period for any phase be greater than two years (unless an extension is granted) without reapplying for a preliminary plat, nor the cumulative time exceed six years (regardless of extensions) without applying for a new preliminary plat.
- (2) The criteria for approving a phased site development review proposal are:
 - (a) The public facilities shall be scheduled to be constructed in conjunction with or prior to each phase to ensure provision of public facilities prior to building occupancy;
 - (b) The development and occupancy of any phase shall not be dependent on the use of temporary public facilities:
 - (i) For purposes of this subsection, a temporary public facility is an interim facility not constructed to the applicable city or district standard;
 - (c) The phased development shall not result in requiring the city or other property owners to construct public facilities that were required as a part of the approval of the preliminary plat; and
 - (d) Public facilities approved as conditions of approval must be bonded.
- (3) The application for phased development approval shall be heard concurrently with the preliminary plat application and the decision may be appealed in the same manner as the preliminary plat. (Ord. 2875 § 1.170.050, 2003)

Applicant's Draft Finding: The Applicant notes that any preliminary approval for the proposed subdivision plat will be valid for a period of twelve months as specified by section 13.136.040. The Applicant further notes that two one-year extensions are available if additional time is required to prepare the final plat for the current subdivision phase.

17.136.060 Approval standards – Preliminary plat.

- (1) The planning commission may approve, approve with conditions or deny a preliminary plat based on the following approval criteria:
 - (a) The proposed preliminary plat complies with the city's comprehensive plan, the applicable sections of this code and other applicable ordinances and regulations;

Applicant's Draft Finding: There are no known conflicts with the City's Comprehensive Plan.
The Applicable Portions of the City's code are as follows:

Section 17.32 – Zones and Uses: The site is zoned Moderate Density Residential with a minimum lot size requirement of 7,000 sf. Proposed lot sizes within the Phase 6 plat are all at least 7,000 sf.

The minimum lot widths required within the R-7 district is 60 feet for internal lots and 85 feet for corner lots. The proposed Phase 6 plat shows lots which meet these requirements.

The minimum lot width at the street for lots in the R-7 zone is 50 feet or 30 feet if the lot is located along a cul-de-sac. The lots proposed within the Phase 6 plat meet these requirements.



The minimum required lot depth within the R-7 zone is 85 feet. The proposed lots all exceed the minimum required lot depth.

17.56 – Density Computations: The total area proposed for subdivision is approximately 16 acres. The net area for the site is approximately 9.6 acres. The maximum density permitted within the subdivision is therefore 59 units. The Applicant's proposed 58 unit plat falls within the permissible density range for the site.

17.64 – Additional Yard Setback Requirements: No additional right-of-way along the site's two existing frontage roads, Hankey Road or Perry Creek Road, is required.

17.72 – Landscaping and Screening: The City requires street trees to be planted along newly created local streets. The Applicant will submit a street tree plan for the City's review and approval prior to applying for final plat approval.

17.84 – Access, Egress, and Circulation: The Applicant proposes to create driveways in accordance with the City's standard 50 foot spacing requirement.

17.132 – Tree Removal: Much of the site has been cleared as a result of previous construction activities. The Applicant has proposed to retain trees in groves located within the areas shown on the preliminary plat. These trees have been previously evaluated at various stages within the platting process for Elk Ridge Estates. The Applicant has not proposed any changes to the plans which would necessitate removal of the tree groves shown on the preliminary plat.

17.152 – Street and Utility Improvement Standards: Subdivisions are required under this section to provide access for lots along public streets improved to City standards. Proposed local streets are required to be delineated and improved. The minimum right-of-way for local streets has been provided with 50 foot dedication for the project's two new local streets.

The Applicant has proposed to create a new looping road network with a cul-de-sac at the phase's northern boundary. The cul-de-sac and street loop connections because the grades running along the property prevent a reasonable connection to the north at this location within the plan. Additional phases of this development may be able to provide northern connections with more favorable topography. Connections to the west are prohibited due to the presence of Perry Creek Road. The Applicant's proposed street locations and improvements comply with the requirements of this section and no future street connections have been proposed within this application.

The proposed street configuration creates a block length of approximately 1844 linear feet. This proposal exceeds the 1,800 foot block perimeter required within this code however due to the



challenges presented by the site's topography and geographical limitations, the proposed block pattern is deemed to be acceptable and has been approved in this configuration through the previous land use review process.

The Applicant currently proposes two new street names for the two local street within the project, Ridge and Valley View Drive. These street names will be reviewed by Columbia County prior to the submission of a final plat.

Grading along streets has been met in that street grades are typically less than 12%. As shown within the attached engineered plan set, a portion of Miles Lane exceeds 12 percent grade in order to accommodate the proposed alignment however the roadway grade does not exceed 15 percent.

Eight (8) foot wide public utility easements will be provided along the frontage of all proposed lots. All proposed utility easements will be illustrated on the final plat. As required by this section, joint mailboxes will be located along public streets as approved by the City Engineer and the U.S. Post Office.

The Applicant has proposed a series of street improvements to include the placement of curbs, sidewalks, and gutters. The Applicant has also proposed to construct water, sanitary sewer, and stormwater systems for the proposed development. The proposed development plans have been approved by the City's engineering department and are currently under construction. Upon approval of this phase of development, the Applicant will continue to install the improvements which have been evaluated and approved by the City Engineer.

17.156 – Traffic Impact Analysis: Subdivisions generating more than 250 average daily trips are required to submit a Traffic Impact Analysis. As the overall subdivision will generate more than 250 average daily trips, a traffic impact analysis is required prior to issuing an approval for the proposed subdivision. In 2013, the Applicant's traffic engineer, Lancaster Engineering, provided a memorandum addressing levels of service at two intersections along Hankey Road at both Elk Meadows and Perry Creek Road. The analysis included within the 2013 application is also attached hereto as site conditions over the past three (3) years are similar.

The TIA analyzed both existing conditions and impacts to the intersections which would result from the construction of the proposed subdivision. All proposed surrounding intersections were deemed to be safe and capable at operating at "A" levels of service. With only minor impacts anticipated from the construction of the proposed subdivision, the Applicant's proposed development will not have a significant impact on the project's surrounding transportation network.

(b) The proposed plat name is not duplicative or otherwise satisfies the provisions of ORS Chapter 92[.090(1)];



Applicant's Draft Finding: Elk Ridge Estates is an approved plat name. The phase 6 plat is simply an additional plat under an approved plat name.

(c) The streets and roads are laid out so as to conform to the plats of subdivisions and maps of partitions already approved for adjoining property as to width, general direction and in all other respects unless the city determines it is in the public interest to modify the street or road pattern; and

Applicant's Draft Finding: The proposed subdivision layout takes into consideration previous phases of the Elk Ridge Estates Subdivision as well as existing plats and existing roadways within the site's immediate vicinity.

(d) An explanation has been provided for all common improvements.

Applicant's Draft Finding: The Applicant has proposed to create two open space tracts within this phase of the subdivision. Tract E will border the western and southern banks of lots and will provide a landscaped buffer between Hankey Road and Perry Creek Roads and the proposed residential lots. Tract D is located in an area with a Bonneville Power Administration Easement. These areas will be landscaped and will contain trees within the subdivision which are proposed for retention. The Applicant has created a Homeowners Association empowered by the project's Protective Covenants, Conditions and Restrictions which will take ownership of these two open spaces. The Homeowners Association will take on the ongoing maintenance of these areas.

(2) Lot Dimensions.

(a) Lot size, width, shape and orientation shall be appropriate for the location of the development and for the type of use contemplated, and:

- (i) No lot shall be dimensioned to contain part of an existing or proposed public right-of-way;
- (ii) The depth of all lots shall not exceed two and one-half times the average width, unless the parcel is less than one and one-half times the minimum lot size of the applicable zoning district; and
- (iii) Depth and width of properties zoned for commercial and industrial purposes shall be adequate to provide for the off-street parking and service facilities required by the type of use proposed.

Applicant's Draft Finding: All proposed lots have been designed to be exclusive of any planned or proposed right-of-way.

No proposed lot has a depth which is greater than two and one-half times the average width.

No commercial uses are proposed.

(3) Through Lots.

(a) Through lots shall be avoided except where they are essential to provide separation of residential development from major traffic arterials or to overcome specific disadvantages of topography and orientation, and:



- (i) A planting buffer at least 10 feet wide is required abutting the arterial rights-of-way; and
- (ii) All through lots shall provide the required front yard setback on each street.

Applicant's Draft Finding: No through lots have been proposed.

(4) Large Lots.

(a) In dividing tracts into large lots or parcels which at some future time are likely to be redivided, the approving authority may require that the lots be of such size and shape, and be so divided into building sites, and contain such site restrictions as will provide for the extension and opening of streets at intervals which will permit a subsequent division of any tract into lots or parcels of smaller size, and:

- (i) The land division shall be denied if the proposed large development lot does not provide for the future division of the lots and future extension of public facilities.

Applicant's Draft Finding: No lots have been proposed within this phase which will have future development potential.

(5) The planning commission may attach such conditions as are necessary to carry out the comprehensive plan and other applicable ordinances and regulations and may require:

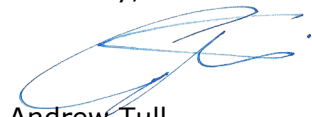
- (a) Reserve strips be granted to the city for the purpose of controlling access to adjoining undeveloped properties. (Ord. 2875 § 1.170.060, 2003)

Applicant's Draft Finding: No reserve strips are required as the property's topography and road layout will not permit the extension of access ways or roadways onto any adjoining properties.

The Applicant appreciates the planning commission's review of this application for subdivision. With the site currently under construction based upon the previously approved subdivision plat and the approved construction plans, it is the developer's intent to complete construction activities and to record a final plat within the near future.

Please feel free to give me a call if you have any questions or need any additional clarification.

Sincerely,



Andrew Tull
Principal Planner
3J Consulting, Inc.

copy: Mr. Mark Zoller, St Helens Assets, LLC.
Mr. John Howorth, PE, 3J Consulting, Inc.



Attch: Preliminary Plat
Construction Plans
Traffic Impact Analysis
Application Form



TECHNICAL MEMORANDUM

TO: Jacob Graichen & Sue Nelson
City of St. Helens

FROM: Brian Davis
Todd Mobley, PE, PTOE

DATE: April 10, 2013

SUBJECT: Elk Ridge Estates
Traffic Impact Study Addendum



**LANCASTER
ENGINEERING**

321 SW 4th Ave., Suite 400
Portland, OR 97204
phone: 503.248.0313
fax: 503.248.9251
lancasterengineering.com

At the request of the City of St. Helens, this memorandum analyzes the impacts of Elk Ridge Estates on two intersections additional to those analyzed in the original Traffic Impact Study (TIS) prepared by Lancaster Engineering on February 26, 2013. The intersections analyzed are:

- Hankey Road at Elk Meadows Drive
- Hankey Road at Perry Creek Road

The intersection of **Hankey Road at Elk Meadows Drive** will serve as the primary access point to the proposed development. This development will be the primary generator of traffic on Elk Meadows Drive. At present, the vast majority of traffic at the intersection is through-traffic on Hankey Road. Following the completion of the proposed development, it is expected that all trips generated by the development will utilize Elk Meadows Drive.

The intersection of **Hankey Road at Perry Creek Road** is adjacent to the west side of the project area. Perry Creek Road serves five residences on the hillside above the proposed development. Aside from traffic generated by these residences, all traffic at the intersection is through-traffic on Hankey Road. As described in the original traffic report, it is expected that all traffic from the proposed development will arrive from and depart toward the south. The proposed development therefore is not expected to add any additional trips to this intersection.

Traffic Volumes

This analysis utilizes traffic counts taken for the original TIS at the intersection of Hankey Road at Pittsburgh Road on Tuesday February 5, 2013. Traffic was counted from 7:00 to 9:00 AM to obtain data for the morning peak hour and from 4:00 to 6:00 PM to obtain data for the evening peak hour. The raw data is included in the technical appendix of this memorandum.

As described above, the intersection of Hankey Road at Elk Meadows Drive currently serves primarily through traffic on Hankey Road. It is assumed that only a nominal number of vehicles utilize Elk Meadows Drive absent the proposed development. Since Perry Creek Road serves five single



Jacob Graichen & Sue Nelson
April 10, 2013
Page 2 of 7

family residences, it is assumed that traffic from these residences will utilize Perry Creek Road, with the remaining traffic at this intersection consisting of through traffic along Hankey Road. As described in the original TIS, it is expected that all trips to and from these residences will arrive from and depart toward the southeast, in the direction of the town of St. Helens. The trip generation of these five residences is derived from the *Trip Generation Manual*¹; detailed calculations are provided in the appendix.

The traffic volumes for the existing conditions are shown in Figure 1 on page three.

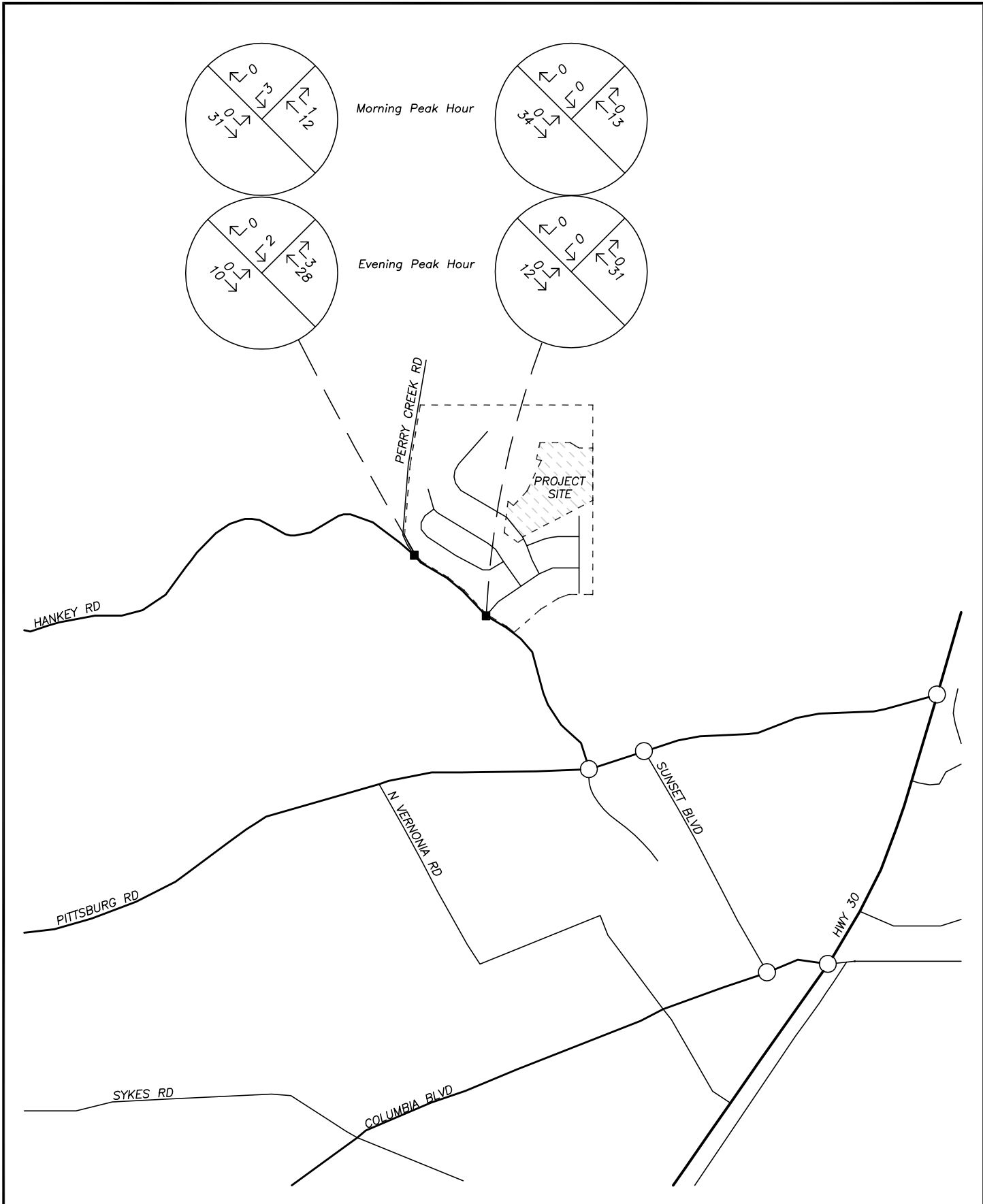
Similarly, the background conditions at the two study intersections addressed in this memorandum were analyzed using the background traffic volumes obtained for the intersection of Hankey Road at Pittsburgh Road, assuming a 1.2% annual growth rate and a build-out time of five years, as described in the original TIS. Like the existing conditions, it is assumed that aside from site-generated trips, there are a negligible number of turning movements onto Elk Meadows Drive, and all turning movements onto Perry Creek Road are generated by the five residences it serves.

The traffic volumes for the background conditions are shown in Figure 2 on page four.

Finally, conditions upon full build-out of the proposed development are analyzed utilizing the background volumes and adding in the site trips as described in the original TIS. It is assumed that all site trips will utilize Elk Meadows Drive to access the proposed development. The detailed trip generation calculations for the proposed development are provided for reference in the appendix (these are identical to those provided in the appendix of the original TIS). Again, it is assumed that all trips will arrive from and depart to the southeast along Hankey Road, so the proposed development adds no additional trips to the intersection of Hankey Road at Perry Creek Road.

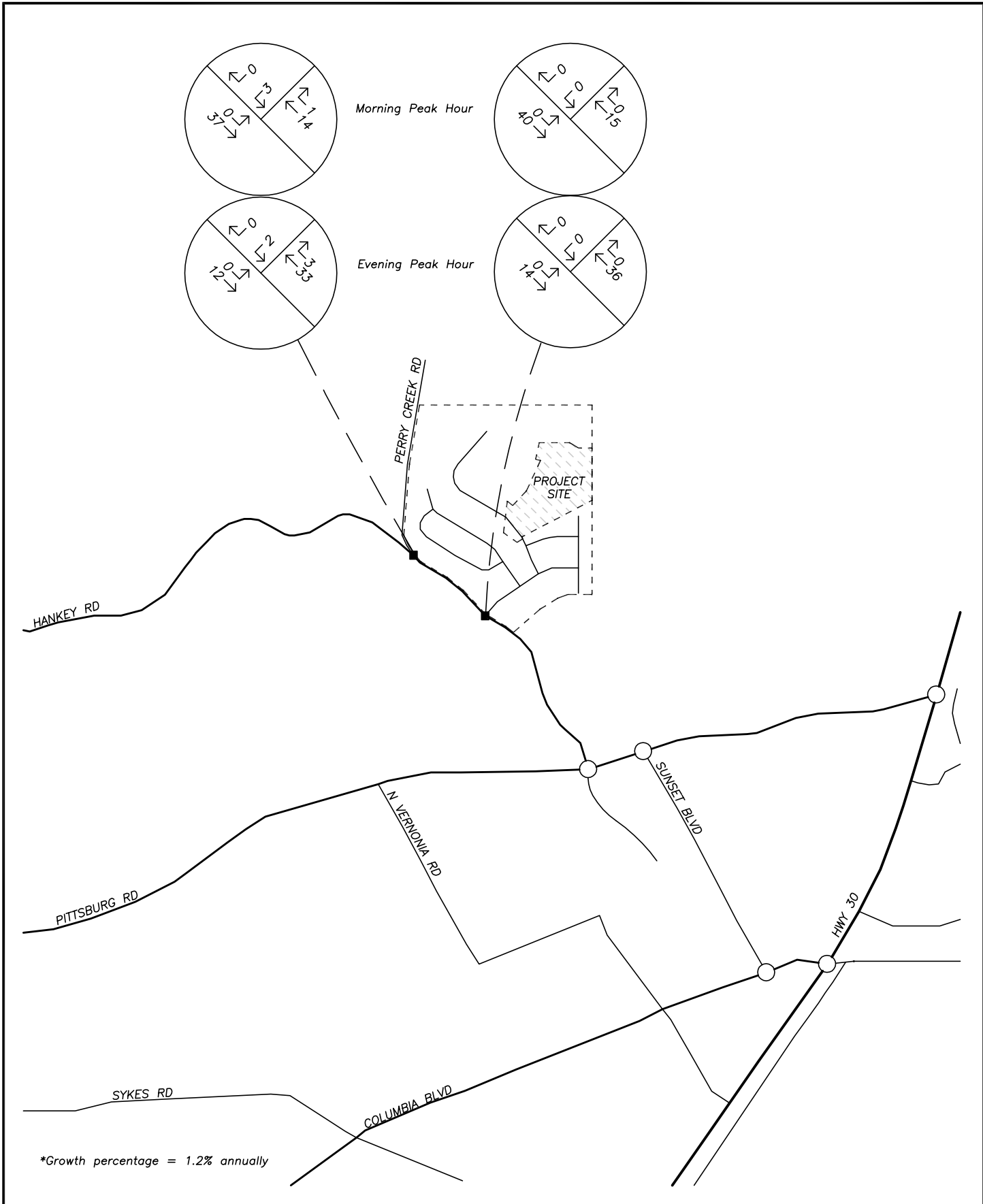
The traffic volumes for the background conditions plus site trips are shown in Figure 3 on page 5.

¹ Institute of Transportation Engineers (ITE), *Trip Generation Manual, 9th Edition*, 2012. Data cited for this study was taken from land use code #210, *Single-Family Detached Housing*.



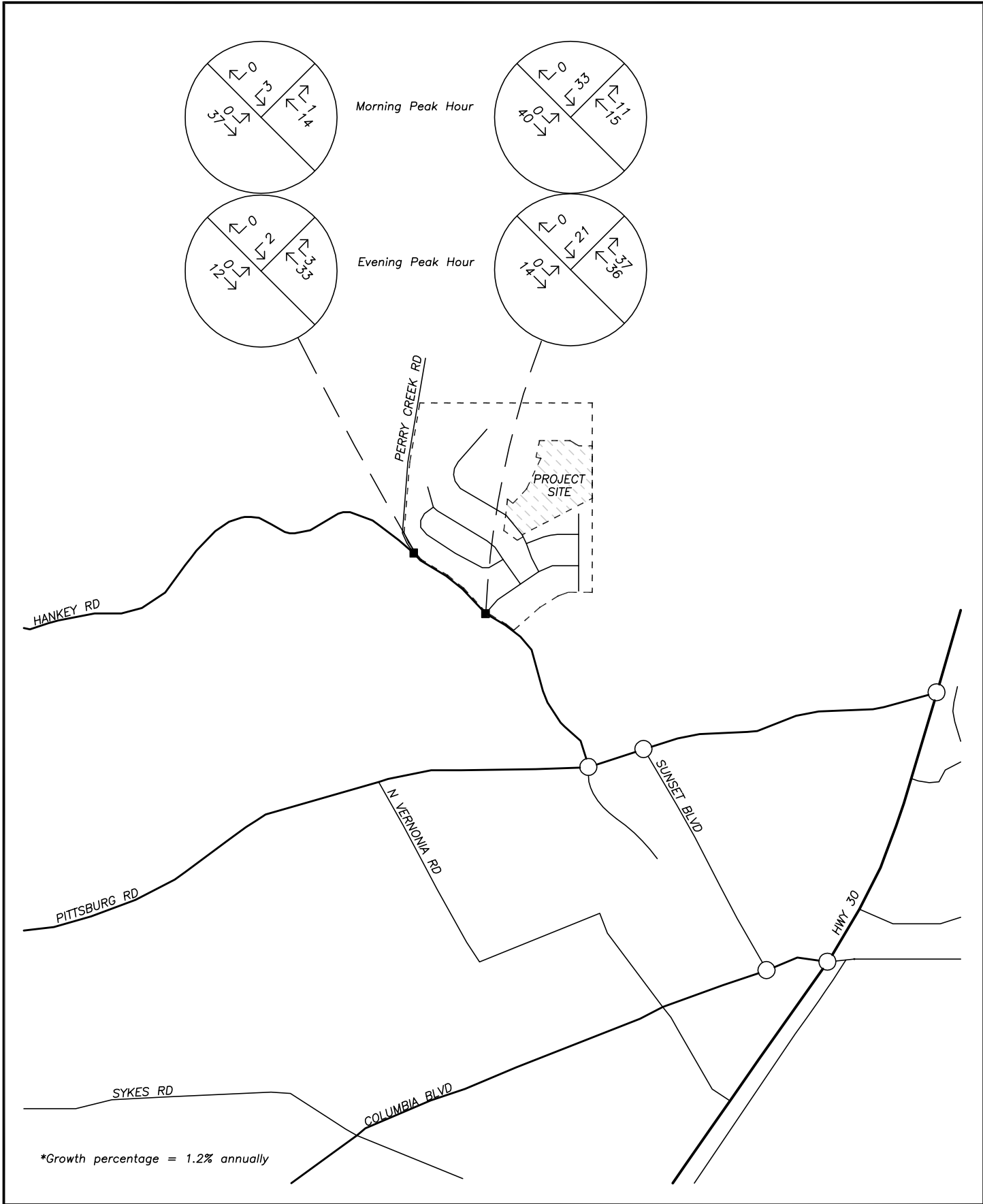
TRAFFIC VOLUMES
Existing Conditions
Morning and Afternoon Peak Hours





TRAFFIC VOLUMES
 2018 Background Conditions*
 Morning and Afternoon Peak Hours





TRAFFIC VOLUMES
 Background + Site Trips
 Morning and Afternoon Peak Hours





Operational Analysis

To determine the capacity and level-of-service at the study intersections, a capacity analysis was conducted. The analysis was conducted using the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual (HCM)*² published by the Transportation Research Board. Level-of-service (LOS) can range from A, which indicates little or no delay, to F, which indicates a significant amount of congestion and delay. The City of St. Helens operational standards are specified by section 17.156.020 of the city's municipal code, and require LOS E or better at the two intersections considered here. The volume-to-capacity ratio (v/c) and delay upon which the LOS reported is based are also reported. These results are shown in Table 1 below.

Table 1: Intersection capacity and level-of-service summary

	<i>Morning peak hour</i>				<i>Evening peak hour</i>				
	LOS	Delay (s)	V/C	Crit. Mvt.	LOS	Delay (s)	V/C	Crit. Mvt.	
Existing									
Hankey Road & Perry Creek Road	A	9	0.01	SW	A	9	0.01	SW	
Hankey Road & Elk Meadows Drive	A	0	0.01	N/A	A	0	0.01	N/A	
Background									
Hankey Road & Perry Creek Road	A	9	0.01	SW	A	9	0.01	SW	
Hankey Road & Elk Meadows Drive	A	0	0.01	N/A	A	0	0.01	N/A	
Background + Site Trips									
Hankey Road & Perry Creek Road	A	9	0.01	SW	A	9	0.01	SW	
Hankey Road & Elk Meadows Drive	A	9	0.05	SW	A	9	0.03	SW	
Delay = Average delay per vehicle in seconds									
LOS = Level of service									
V/C = Volume-to-capacity ratio									

² Transportation Research Board, *Highway Capacity Manual*, 5th Edition, 2010.



Jacob Graichen & Sue Nelson
April 10, 2013
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As shown in the table, both the intersection of Hankey Road at Perry Creek Road and the intersection of Hankey Road at Elk Meadows Drive currently operate well within the City of St. Helens' operational standards at LOS A, and both will continue to do so following the background growth in traffic. As described previously, the proposed development has no effect on the intersection of Hankey Road at Perry Creek Road. While the proposed development adds trips to the intersection of Hankey Road at Elk Meadows Drive, this intersection will continue to operate at LOS A with very low v/c ratios upon full build-out.

Safety Analysis & Right Turn Lane Warrants

Based on data obtained from ODOT's *Crash Data System*, neither the intersection of Hankey Road at Perry Creek Road nor the intersection of Hankey Road at Elk Meadows Drive had any reported crashes on record for the most recent five years (2007-2011).

To ensure that the intersection of Hankey Road at Elk Meadows Drive will continue to perform safely following full build-out of the proposed development, the warrant for a right turn lane was analyzed for northwest-bound traffic according to methodology outlined by ODOT's *Analysis Procedures Manual*³. The traffic volumes at this intersection were found to be well below those that merit consideration of a right turn lane, and neither the crash history at the intersection nor the geometry of the intersection suggest a need for a right turn lane. Accordingly, no right turn lane is needed or recommended for the northwest-bound approach of Hankey Road at Elk Meadows Drive.

Conclusion and Recommendations

Both intersections adjacent to the site of the proposed Elk Ridge Estates currently operate at LOS A, well within the City of St. Helens' operational standards, and will continue to do so following the growth of background traffic and the build-out of the proposed development. No safety issues arise at either intersection, and accordingly, no mitigations are needed or recommended to support the development.

If you have any questions or would like any additional information, please don't hesitate to call.

³ Oregon Department of Transportation (ODOT), *Analysis Procedures Manual*, 2006.

Appendix



LEVEL OF SERVICE

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

Level of service A: Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

Level of service B: Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

Level of service C: Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

Level of service D: Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

Level of service E: Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

Level of service F: Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

*LEVEL OF SERVICE CRITERIA
FOR SIGNALIZED INTERSECTIONS*

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

*LEVEL OF SERVICE CRITERIA
FOR UNSIGNALIZED INTERSECTIONS*

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50



TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Variable: Dwelling Units
Variable Value: 5

AM PEAK HOUR

Trip Rate: 0.75

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	1	3	4

PM PEAK HOUR

Trip Rate: 1

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	3	2	5

WEEKDAY

Trip Rate: 9.52

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	24	24	48

SATURDAY

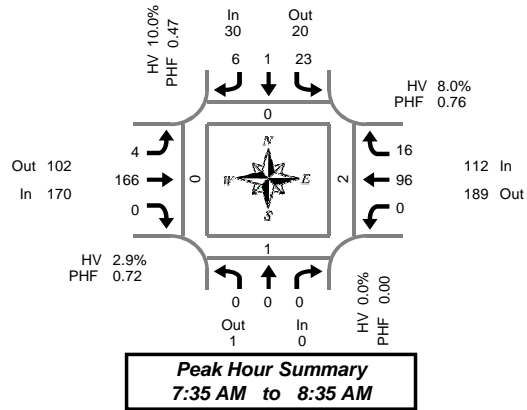
Trip Rate: 9.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	25	25	50

Total Vehicle Summary



Clay Carney
(503) 833-2740



Hankey Rd & Pittsburgh Rd

Tuesday, February 05, 2013

7:00 AM to 9:00 AM

5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	0	0	0	0	0	9	0	0	0	2	0	0	11	0	0	0	0
7:05 AM	0	0	0	0	0	0	1	0	0	10	0	0	0	4	1	0	16	0	0	0	0
7:10 AM	0	0	0	0	1	0	0	0	0	12	0	0	0	4	1	0	18	0	0	0	0
7:15 AM	0	0	0	0	2	0	2	0	1	10	0	0	0	5	1	0	21	0	0	0	0
7:20 AM	0	0	0	0	2	0	1	0	0	8	0	0	0	3	0	0	14	0	0	0	0
7:25 AM	0	0	0	0	3	0	0	0	0	11	0	0	0	7	0	0	21	0	0	0	0
7:30 AM	0	0	0	0	2	0	0	0	0	9	1	0	0	1	2	0	15	0	0	0	0
7:35 AM	0	0	0	0	3	0	0	0	0	11	0	0	0	6	0	0	20	0	0	0	0
7:40 AM	0	0	0	0	5	0	2	0	1	14	0	0	0	9	0	0	31	0	0	0	0
7:45 AM	0	0	0	0	4	0	1	0	0	15	0	0	0	8	1	0	29	0	0	0	0
7:50 AM	0	0	0	0	2	1	1	0	1	18	0	0	0	10	2	0	35	0	0	0	0
7:55 AM	0	0	0	0	1	0	0	0	0	12	0	0	0	13	0	0	26	0	0	0	0
8:00 AM	0	0	0	0	0	0	2	0	1	21	0	0	0	9	3	0	36	0	0	0	0
8:05 AM	0	0	0	0	3	0	0	0	0	21	0	0	0	10	2	0	36	0	0	0	0
8:10 AM	0	0	0	0	1	0	0	0	0	16	0	0	0	6	0	0	23	0	1	1	0
8:15 AM	0	0	0	0	2	0	0	0	0	8	0	0	0	8	0	0	18	0	0	0	0
8:20 AM	0	0	0	0	1	0	0	0	0	14	0	0	0	4	0	0	19	0	0	0	0
8:25 AM	0	0	0	0	0	0	0	0	1	6	0	0	0	8	4	0	19	0	0	0	0
8:30 AM	0	0	0	0	1	0	0	0	0	10	0	0	0	5	4	0	20	0	0	1	0
8:35 AM	0	0	0	0	1	0	0	0	0	7	0	0	0	8	2	0	18	0	0	0	0
8:40 AM	0	0	0	0	2	0	0	0	0	6	0	0	0	1	3	0	12	0	0	0	0
8:45 AM	0	0	0	0	3	0	0	0	0	4	0	0	0	3	0	0	10	0	0	0	0
8:50 AM	0	0	0	0	1	0	0	0	0	6	0	0	0	2	1	0	10	0	0	0	0
8:55 AM	0	0	0	0	2	0	0	0	0	6	0	0	0	6	2	0	16	0	0	0	0
Total Survey	0	0	0	0	42	1	10	0	5	264	1	0	0	142	29	0	494	0	1	2	0

15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	1	0	1	0	0	31	0	0	0	10	2	0	45	0	0	0	0
7:15 AM	0	0	0	0	7	0	3	0	1	29	0	0	0	15	1	0	56	0	0	0	0
7:30 AM	0	0	0	0	10	0	2	0	1	34	1	0	0	16	2	0	66	0	0	0	0
7:45 AM	0	0	0	0	7	1	2	0	1	45	0	0	0	31	3	0	90	0	0	0	0
8:00 AM	0	0	0	0	4	0	2	0	1	58	0	0	0	25	5	0	95	0	1	1	0
8:15 AM	0	0	0	0	3	0	0	0	1	28	0	0	0	20	4	0	56	0	0	0	0
8:30 AM	0	0	0	0	4	0	0	0	0	23	0	0	0	14	9	0	50	0	0	1	0
8:45 AM	0	0	0	0	6	0	0	0	0	16	0	0	0	11	3	0	36	0	0	0	0
Total Survey	0	0	0	0	42	1	10	0	5	264	1	0	0	142	29	0	494	0	1	2	0

Peak Hour Summary

7:35 AM to 8:35 AM

By Approach	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	1	1	0	30	20	50	0	170	102	272	0	112	189	301	0	312	0	1	2	0
%HV	0.0%				10.0%				2.9%				8.0%				5.4%				
PHF	0.00				0.47				0.72				0.76				0.80				

By Movement	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	23	1	6	30	4	166	0	170	0	96	16	112	312
%HV	0.0%	0.0%	0.0%	0.0%	13.0%	0.0%	0.0%	10.0%	25.0%	2.4%	0.0%	2.9%	0.0%	3.1%	37.5%	8.0%	5.4%
PHF	0.00	0.00	0.00	0.00	0.48	0.25	0.38	0.47	0.50	0.72	0.00	0.72	0.00	0.75	0.50	0.76	0.80

Rolling Hour Summary

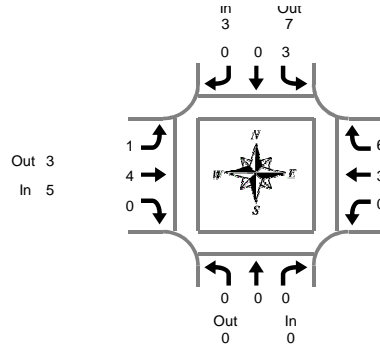
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	25	1	8	0	3	139	1	0	0	72	8	0	257	0	0	0	0
7:15 AM	0	0	0	0	28	1	9	0	4	166	1	0	0	87	11	0	307	0	1	1	0
7:30 AM	0	0	0	0	24	1	6	0	4	165	1	0	0	92	14	0	307	0	1	1	0
7:45 AM	0	0	0	0	18	1	4	0	3	154	0	0	0	90	21	0	291	0	1	2	0
8:00 AM	0	0	0	0	17	0	2	0	2	125	0	0	0	70	21	0	237	0	1	2	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Peak Hour Summary
7:35 AM to 8:35 AM

Hankey Rd & Pittsburgh Rd

Tuesday, February 05, 2013

7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
7:10 AM	0	0	0	0	1	0	0	1	0	3	0	3	0	1	0	1	5
7:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	2	3
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
7:50 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	2
7:55 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	1	2	0	3	0	0	0	0	3
8:05 AM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
8:35 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	1	2	4
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
8:45 AM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
8:50 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	2
8:55 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Survey	0	0	0	0	10	0	0	10	1	10	0	11	0	10	9	19	40

Heavy Vehicle 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	1	0	0	1	0	4	0	4	0	4	0	4	9
7:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	2	3
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
7:45 AM	0	0	0	0	1	0	0	1	0	2	0	2	0	2	1	3	6
8:00 AM	0	0	0	0	2	0	0	2	1	2	0	3	0	0	0	0	5
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
8:30 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	4	5	7
8:45 AM	0	0	0	0	4	0	0	4	0	1	0	1	0	0	0	0	5
Total Survey	0	0	0	0	10	0	0	10	1	10	0	11	0	10	9	19	40

Heavy Vehicle Peak Hour Summary

7:35 AM to 8:35 AM

By Approach	Northbound Hankey Rd			Southbound Hankey Rd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	3	7	10	5	3	8	9	7	16	17
PHF	0.00			0.38			0.31			0.45			0.71

By Movement	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	3	0	0	3	1	4	0	5	0	3	6	9	17
PHF	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.38	0.25	0.33	0.00	0.31	0.00	0.25	0.30	0.45	0.71

Heavy Vehicle Rolling Hour Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	3	0	0	3	0	6	0	6	0	9	1	10	19
7:15 AM	0	0	0	0	4	0	0	4	1	4	0	5	0	5	1	6	15
7:30 AM	0	0	0	0	3	0	0	3	1	4	0	5	0	3	5	8	16
7:45 AM	0	0	0	0	4	0	0	4	1	5	0	6	0	3	9	12	22
8:00 AM	0	0	0	0	7	0	0	7	1	4	0	5	0	1	8	9	21

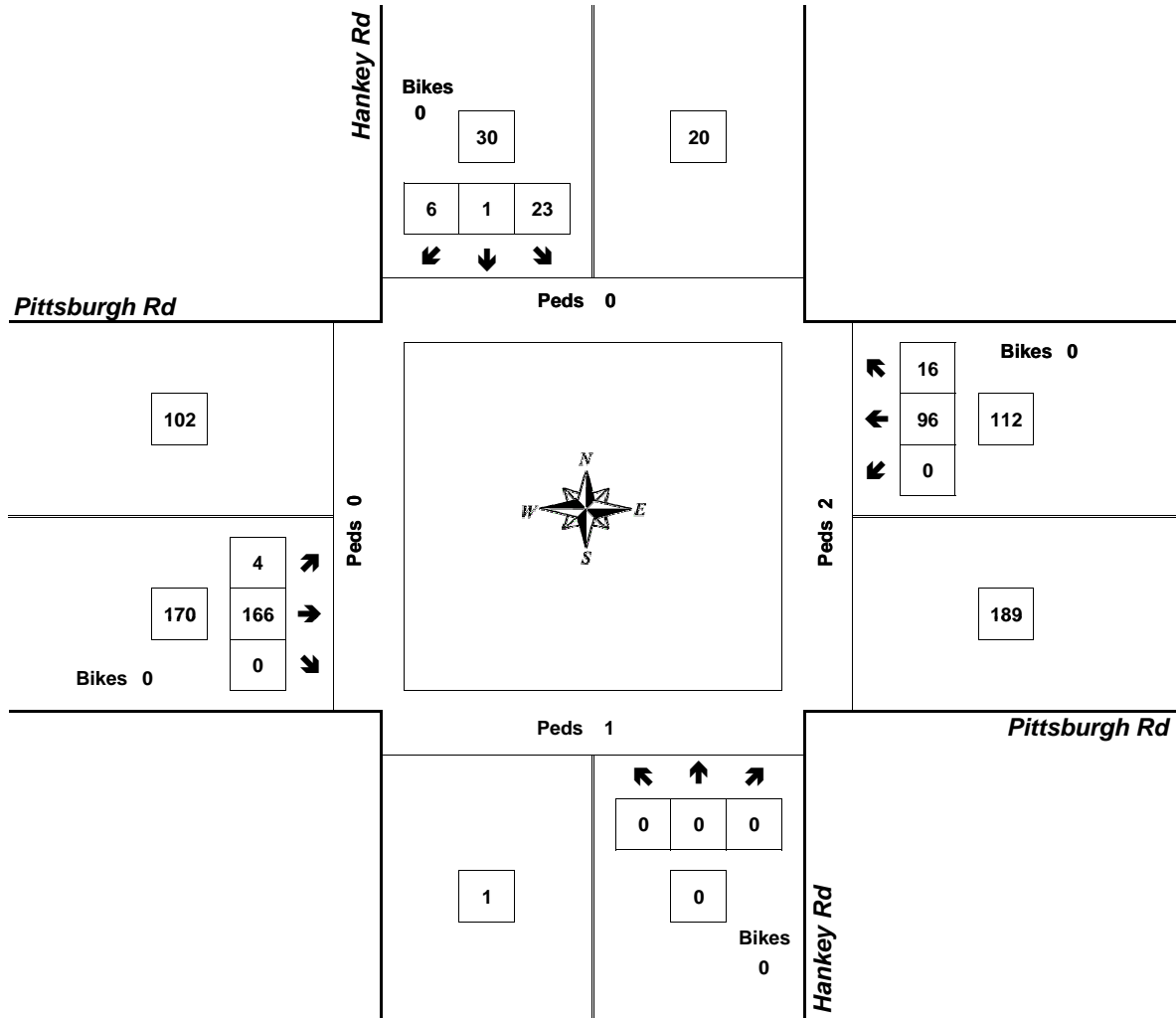
Peak Hour Summary



Clay Carney
(503) 833-2740

Hankey Rd & Pittsburgh Rd

7:35 AM to 8:35 AM
Tuesday, February 05, 2013



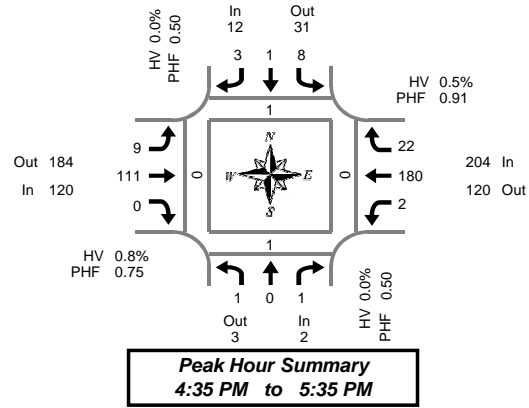
Approach	PHF	HV%	Volume
EB	0.72	2.9%	170
WB	0.76	8.0%	112
NB	0.00	0.0%	0
SB	0.47	10.0%	30
Intersection	0.80	5.4%	312

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary



Clay Carney
(503) 833-2740



Hankey Rd & Pittsburgh Rd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	2	0	1	0	0	9	0	0	0	10	0	0	22	0	0	0	0
4:05 PM	0	0	0	0	5	0	1	0	1	6	0	0	0	11	1	0	25	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	1	6	0	0	0	7	1	0	15	0	0	0	0
4:15 PM	0	0	0	0	1	0	0	0	0	16	0	0	0	4	2	0	23	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	11	0	0	0	10	0	0	21	0	0	0	0
4:25 PM	0	0	0	0	1	0	0	0	0	4	1	0	0	12	1	0	19	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	7	0	0	0	1	19	0	27	0	0	0	0
4:35 PM	0	0	0	0	0	1	0	0	1	15	0	0	1	14	1	0	33	0	0	0	0
4:40 PM	0	0	0	0	0	0	0	0	0	18	0	0	0	14	2	0	34	0	0	0	0
4:45 PM	0	0	0	0	1	0	0	0	0	6	0	0	0	14	1	0	22	0	0	0	0
4:50 PM	0	0	0	0	0	0	2	0	1	7	0	0	0	20	2	0	32	0	0	0	0
4:55 PM	0	0	1	0	2	0	0	0	2	7	0	0	1	15	2	0	30	0	0	0	0
5:00 PM	0	0	0	0	2	0	0	0	1	14	0	0	0	14	1	0	32	1	0	0	0
5:05 PM	0	0	0	0	1	0	0	0	0	6	0	0	0	18	3	0	28	0	0	0	0
5:10 PM	0	0	0	0	1	0	0	0	0	4	0	0	0	17	3	0	25	0	0	0	0
5:15 PM	1	0	0	0	0	0	0	0	2	8	0	0	0	12	3	0	26	0	0	0	0
5:20 PM	0	0	0	0	1	0	1	0	0	7	0	0	0	19	0	0	28	0	0	0	0
5:25 PM	0	0	0	0	0	0	0	0	0	7	0	0	0	10	2	0	19	0	1	0	0
5:30 PM	0	0	0	0	0	0	0	0	2	12	0	0	0	13	2	0	29	0	0	0	0
5:35 PM	0	0	0	0	1	0	1	0	1	5	0	0	0	12	2	0	22	0	0	0	0
5:40 PM	0	0	0	0	1	0	0	0	1	6	1	0	1	13	2	0	25	0	0	1	0
5:45 PM	0	0	0	0	2	0	0	0	1	6	0	0	0	11	3	0	23	0	0	0	0
5:50 PM	0	0	0	0	2	0	0	0	1	11	0	0	0	14	1	0	29	0	0	0	0
5:55 PM	1	0	0	0	1	0	2	0	0	7	0	0	0	12	2	0	25	0	1	0	0
Total Survey	2	0	1	0	24	1	8	0	15	205	2	0	4	315	37	0	614	1	2	1	0

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	7	0	2	0	2	21	0	0	0	28	2	0	62	0	0	0	0
4:15 PM	0	0	0	0	2	0	0	0	0	31	1	0	0	26	3	0	63	0	0	0	0
4:30 PM	0	0	0	0	0	1	0	0	1	40	0	0	2	47	3	0	94	0	0	0	0
4:45 PM	0	0	1	0	3	0	2	0	3	20	0	0	1	49	5	0	84	0	0	0	0
5:00 PM	0	0	0	0	4	0	0	0	1	24	0	0	0	49	7	0	85	1	0	0	0
5:15 PM	1	0	0	0	1	0	1	0	2	22	0	0	0	41	5	0	73	0	1	0	0
5:30 PM	0	0	0	0	2	0	1	0	4	23	1	0	1	38	6	0	76	0	0	1	0
5:45 PM	1	0	0	0	5	0	2	0	2	24	0	0	0	37	6	0	77	0	1	0	0
Total Survey	2	0	1	0	24	1	8	0	15	205	2	0	4	315	37	0	614	1	2	1	0

Peak Hour Summary

4:35 PM to 5:35 PM

By Approach	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	2	3	5	0	12	31	43	0	120	184	304	0	204	120	324	0	338	1	1	0	0
%HV	0.0%				0.0%				0.8%				0.5%				0.6%				
PHF	0.50				0.50				0.75				0.91				0.90				

By Movement	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	1	2	8	1	3	12	9	111	0	120	2	180	22	204	338
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.8%	0.0%	0.6%	0.0%	0.5%	0.6%
PHF	0.25	0.00	0.25	0.50	0.40	0.25	0.38	0.50	0.56	0.71	0.00	0.75	0.50	0.92	0.61	0.91	0.90

Rolling Hour Summary

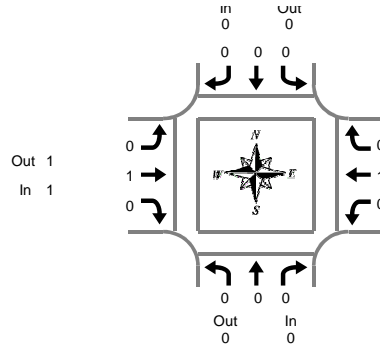
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	1	0	12	1	4	0	6	112	1	0	3	150	13	0	303	0	0	0	0
4:15 PM	0	0	1	0	9	1	2	0	5	115	1	0	3	171	18	0	326	1	0	0	0
4:30 PM	1	0	1	0	8	1	3	0	7	106	0	0	3	186	20	0	336	1	1	0	0
4:45 PM	1	0	1	0	10	0	4	0	10	89	1	0	2	177	23	0	318	1	1	1	0
5:00 PM	2	0	0	0	12	0	4	0	9	93	1	0	1	165	24	0	311	1	2	1	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Peak Hour Summary
4:35 PM to 5:35 PM

Hankey Rd & Pittsburgh Rd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	1	0	0	1	0	3	0	3	0	2	0	2	6	6

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
4:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	0	1	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	1	0	0	1	0	3	0	3	0	2	0	2	6	6

Heavy Vehicle Peak Hour Summary

4:35 PM to 5:35 PM

By Approach	Northbound Hankey Rd			Southbound Hankey Rd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	1	1	2	1	1	2	2
PHF	0.00			0.00			0.25			0.25			0.25

By Movement	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2	2
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.25	0.00	0.25	0.25	0.25

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
4:00 PM	0	0	0	0	1	0	0	1	0	2	0	2	0	1	0	1	4	4
4:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2	2
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2	2

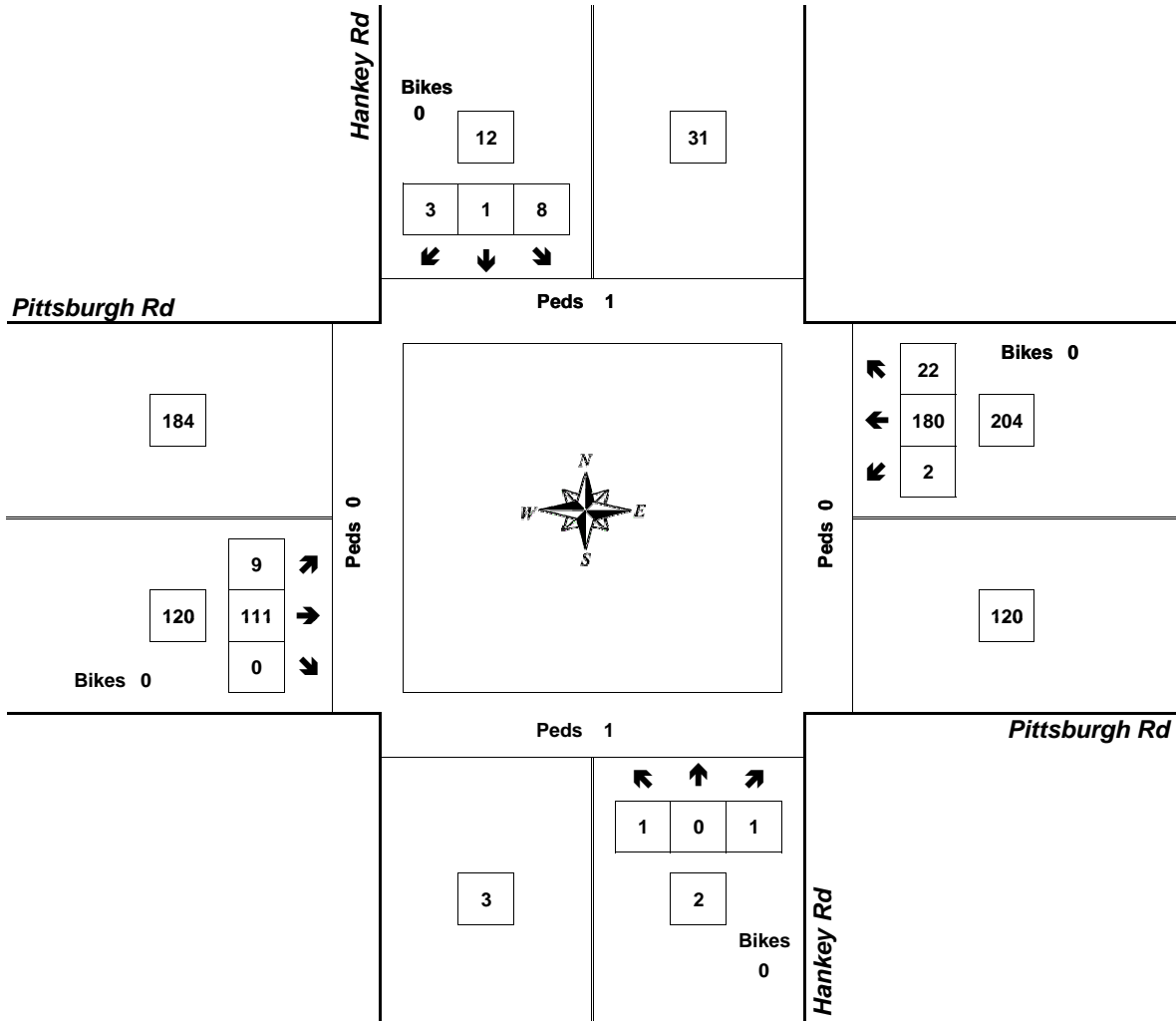
Peak Hour Summary



Clay Carney
(503) 833-2740

Hankey Rd & Pittsburgh Rd

4:35 PM to 5:35 PM
Tuesday, February 05, 2013

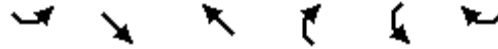


Approach	PHF	HV%	Volume
EB	0.75	0.8%	120
WB	0.91	0.5%	204
NB	0.50	0.0%	2
SB	0.50	0.0%	12
Intersection	0.90	0.6%	338

Count Period: 4:00 PM to 6:00 PM

HCM Unsignalized Intersection Capacity Analysis
 1: Hankey Road & Perry Creek Road

Existing Conditions
 Morning Peak Hour



Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	31	12	1	3	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	39	15	1	4	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	16				55	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	16				55	16
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	100
cM capacity (veh/h)	1556				935	1043

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	39	16	4
Volume Left	0	0	4
Volume Right	0	1	0
cSH	1556	1700	935
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
 2: Hankey Road & Elk Meadows Drive

Existing Conditions
 Morning Peak Hour



Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↶	↷		↶	↷
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	34	13	0	0	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	43	16	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	16				59	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	16				59	16
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	100
cM capacity (veh/h)	1556				930	1043

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	43	16	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1556	1700	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 1: Hankey Road & Perry Creek Road

Existing Conditions
 Evening Peak Hour



Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	10	28	3	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	11	31	3	2	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	34				44	33
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	34				44	33
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				100	100
cM capacity (veh/h)	1590				972	1047

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	11	34	2
Volume Left	0	0	2
Volume Right	0	3	0
cSH	1590	1700	972
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
 2: Hankey Road & Elk Meadows Drive

Existing Conditions
 Evening Peak Hour



Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↶	↷		↶	↷
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	12	31	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	13	34	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	34				48	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	34				48	34
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				100	100
cM capacity (veh/h)	1590				967	1044

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	13	34	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1590	1700	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 1: Hankey Road & Perry Creek Road

2018 Background
 Morning Peak Hour



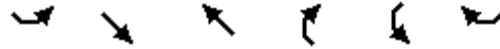
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↕	↔		↕	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	37	14	1	3	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	47	18	1	4	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	19				65	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	19				65	18
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	100
cM capacity (veh/h)	1553				923	1040

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	47	19	4
Volume Left	0	0	4
Volume Right	0	1	0
cSH	1553	1700	923
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
 2: Hankey Road & Elk Meadows Drive

2018 Background
 Morning Peak Hour



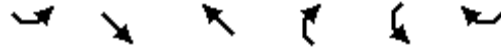
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↶	↷		↶	↷
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	40	15	0	0	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	51	19	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	19				70	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	19				70	19
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	100
cM capacity (veh/h)	1553				918	1039

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	51	19	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1553	1700	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 1: Hankey Road & Perry Creek Road

2018 Background
 Evening Peak Hour



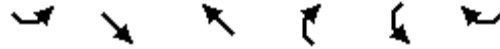
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↶	↷		↶	↷
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	12	33	3	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	13	37	3	2	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	40				52	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	40				52	38
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				100	100
cM capacity (veh/h)	1583				962	1039

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	13	40	2
Volume Left	0	0	2
Volume Right	0	3	0
cSH	1583	1700	962
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.8
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
 2: Hankey Road & Elk Meadows Drive

2018 Background
 Evening Peak Hour



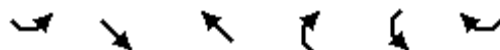
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↶	↷		↶	↷
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	14	36	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	16	40	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	40				56	40
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	40				56	40
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				100	100
cM capacity (veh/h)	1583				957	1037

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	16	40	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1583	1700	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 1: Hankey Road & Perry Creek Road

2018 Background + Site Trips
 Morning Peak Hour



Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	37	14	1	3	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	47	18	1	4	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	19				65	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	19				65	18
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	100
cM capacity (veh/h)	1553				923	1040

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	47	19	4
Volume Left	0	0	4
Volume Right	0	1	0
cSH	1553	1700	923
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



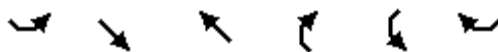
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	40	15	11	33	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	51	19	14	42	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	33				77	26
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	33				77	26
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				95	100
cM capacity (veh/h)	1535				909	1030

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	51	33	42
Volume Left	0	0	42
Volume Right	0	14	0
cSH	1535	1700	909
Volume to Capacity	0.00	0.02	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	9.1
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
 1: Hankey Road & Perry Creek Road

2018 Background + Site Trips
 Evening Peak Hour



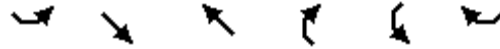
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	12	33	3	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	13	37	3	2	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	40				52	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	40				52	38
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				100	100
cM capacity (veh/h)	1583				962	1039

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	13	40	2
Volume Left	0	0	2
Volume Right	0	3	0
cSH	1583	1700	962
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.8
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
 2: Hankey Road & Elk Meadows Drive

2018 Background + Site Trips
 Evening Peak Hour



Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	14	36	37	21	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	16	40	41	23	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	81				76	61
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	81				76	61
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				97	100
cM capacity (veh/h)	1529				932	1010

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	16	81	23
Volume Left	0	0	23
Volume Right	0	41	0
cSH	1529	1700	932
Volume to Capacity	0.00	0.05	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	9.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay		1.7	
Intersection Capacity Utilization	14.2%	ICU Level of Service	A
Analysis Period (min)	15		

Elk Ridge Subdivision

Traffic Impact Study
Saint Helens, Oregon

DATE:

February 26, 2013

PREPARED FOR:

Saint Helens Assets, LLC

PREPARED BY:

Brian Davis

Todd Mobley, PE, PTOE



**LANCASTER
ENGINEERING**



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Executive Summary

1. The properties located at 34000-34807 Hankey Road in St. Helens, Oregon are proposed for a land division. The proposal would divide the land into 58 lots, with each lot to contain a single family home.
2. Trip generation estimates show that approximately 58 new trips are expected to be generated during the evening peak hour, with 37 entering the site and 21 exiting. During the morning peak hour, 44 new trips are expected to be generated, with 11 entering and 33 exiting. New trips are expected to access the site primarily via the intersection of Pittsburg Road and Hankey Road, and a majority of site trips will utilize nearby Highway 30.
3. To determine whether the local transportation system has the capacity to support the proposed development, the five intersections that will carry the bulk of the site trips were analyzed. Three of these are under the jurisdiction of the City of St. Helens. The intersections of **Pittsburgh Road at Hankey Road** and **Pittsburgh Road at Sunset Blvd** currently operate at LOS B and will continue to do so following background traffic growth and the addition of site trips. The intersection of **Columbia Blvd at Sunset Blvd** currently operates at LOS B, and will operate at LOS C following background traffic growth and the addition of site trips. These are all well within the city's performance standards, which require these intersections to operate at LOS E or better.
4. The other two most heavily impacted intersections are under the jurisdiction of ODOT. The intersection of **Pittsburgh Road at Highway 30** currently operates with v/c ratios of 0.33 and 0.36 during the morning and evening peak hours, respectively. Following the background traffic growth and the addition of site trips, the v/c ratios increase to 0.43 and 0.44. This is well within the performance standard, which requires a v/c ratio of less than 0.85 at this intersection. The intersection of **Columbia Blvd at Highway 30** currently operates with v/c ratios of 0.62 and 0.59 during the morning and evening peak hours, respectively. Following the background traffic growth and the addition of site trips, the v/c ratios increase to 0.66 and 0.63. This is also within the performance standard, which requires a v/c ratio of less than 0.80 at this intersection.
5. To determine the safety performance of intersections in the study area, the most recent available five years of crash data was analyzed for each study intersection. The intersection of Columbia Blvd at Highway 30 had ten reported crashes during this period, corresponding to a crash rate of 0.27 crashes per million entering vehicles (MEV). No other intersections had reported crashes during this period. The crash rates, patterns, and other available data do not suggest any apparent safety deficiencies in the study area.
6. No mitigations are required or recommended to support this development.



Project Description

Introduction

The property at 34000-34807 Hankey Road in Saint Helens, OR, is proposed for land division. The proposed subdivision, *Elk Ridge Estates*, will consist of 58 single family homes.

This report addresses the impacts of this subdivision on the traffic volumes and transportation conditions on the nearby street system. At the request of the City of St. Helens, the analysis includes capacity and level of service calculations for five intersections:

- 1) Pittsburgh Road at Hankey Road
- 2) Pittsburgh Road at Sunset Boulevard
- 3) Pittsburgh Road at Highway 30
- 4) Columbia Boulevard at Sunset Boulevard
- 5) Columbia Boulevard at Highway 30

Additionally, the crash history and safety performance of the study intersections are analyzed and signal warrants are examined when appropriate to determine any mitigations that are necessary to support the development.

Detailed traffic counts, trip generation calculations, and operational analysis are provided in the appendix to this report.

Location Description

The site proposed for subdivision is located on the northeast side of Hankey Road, about ½ a mile to the northwest of the intersection of Pittsburgh Road at Hankey Road. This intersection is in close proximity to Highway 30, with two access points (Pittsburgh Road at Highway 30 and Columbia Boulevard at Highway 30) to the highway within ¾ mile. It is expected that most of the site trips will utilize these access points, and travel to the site via the intersections of Columbia Boulevard at Sunset Boulevard and/or Pittsburgh Road at Sunset Boulevard. This is explained in further detail in the following section on trip generation.

The streets that will carry the bulk of new trips generated by Elk Ridge Estates are Hankey Road, Pittsburgh Road, Sunset Boulevard, Columbia Boulevard, and Highway 30.

Highway 30 is under the jurisdiction of ODOT and contains five vehicular lanes and two bicycle lanes in the study area, and the speed limit is 35mph south of St. Helens Road, 40mph between St. Helens Road and Pittsburgh Road, and 45 mph north of Pittsburgh Road. The ODOT speed zone order, which gives exact locations for the speed limit transitions, is provided in the appendix.



Pittsburgh Road and **Hankey Road** are under the jurisdiction of Columbia County. Both are two lane facilities with no median and have no posted speed limit. **Sunset Boulevard** and **Columbia Boulevard** are under the jurisdiction of the City of St. Helens. Both have a 25 mph speed limit and no median. All four roads have sidewalks and curbs in some locations though not in others.

The intersection of **Pittsburg Road at Hankey Road/Hankins Drive** is a four legged intersection, with stop control on the southbound (Hankey Road) and northbound (Hankins Drive) approaches. The northbound, eastbound, and westbound approaches each consist of a single shared lane. While the southbound approach does not have striping indicating separate lanes, the geometry of this approach provides two functional lanes, with one for right turns and another shared by through and left-turning vehicles.

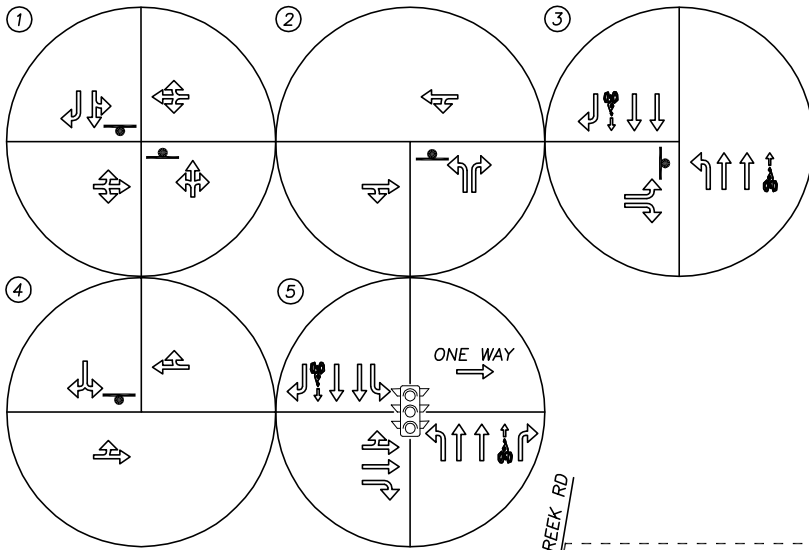
The intersection of **Pittsburg Road at Sunset Boulevard** is a three legged intersection, with stop control on the northbound approach. The eastbound and westbound approaches each consist of a single shared lane. Like the southbound approach at the intersection of Pittsburgh & Hankey, the geometry of the northbound approach of this intersection operates with two lanes, with one for right turns and another for lefts.

The intersection of **Pittsburg Road at Highway 30** is a three legged intersection, with stop control on the eastbound approach. The northbound and southbound approaches each have two through lanes and a turning lane. Like the previous two intersections, the wide corner radius on the eastbound approach allows for two functional lanes, with one for right turns and one for left turns.

The intersection of **Columbia Boulevard at Sunset Boulevard** is a three legged intersection, with stop control on the southbound approach. Each approach consists of a single shared lane.

The intersection of **Columbia Boulevard at Highway 30** is a signalized, four legged intersection. The east leg of the intersection is a one-way street heading away from the intersection, so there are only three approaches to the intersection. The northbound and southbound approaches each contain two through lanes, a right-turning lane, a left-turning lane, and two bicycle lanes. The eastbound approach contains a through-left lane, a through lane, and a right-turning lane. The signal timing is three-phased, with protected left turns on the northbound and southbound approaches, and permitted turning movements on the eastbound approach.

Figure 1 on page six shows the project study area and the location of the site within this area, as well as the lane configuration and signing at the study intersections.



LEGEND

- STUDY INTERSECTION
- STOP SIGN
- PROJECT SITE
- TRAFFIC SIGNAL
- BIKE LANE



VICINITY MAP



FIGURE 1

PAGE 6



Site Trips

Trip Generation

To estimate the trips generated by the proposed land division and subsequent construction of 58 single family dwellings, trip rates from the *Trip Generation Manual*¹ were used. The data utilized are for *Single-Family Detached Housing*, which includes, “all single family homes on individual lots.”

The trip generation calculations show that the proposed partition is projected to result in 44 additional trips during the morning peak hour and 58 additional trips during the evening peak hour. The new lots are projected to result in 574 additional trips in total each weekday, with half entering and half exiting the site. The trip generation estimates are summarized in Table 1, and detailed trip generation calculations are included in the technical appendix to this report.

Table 1: Trip generation calculations for the proposed subdivision

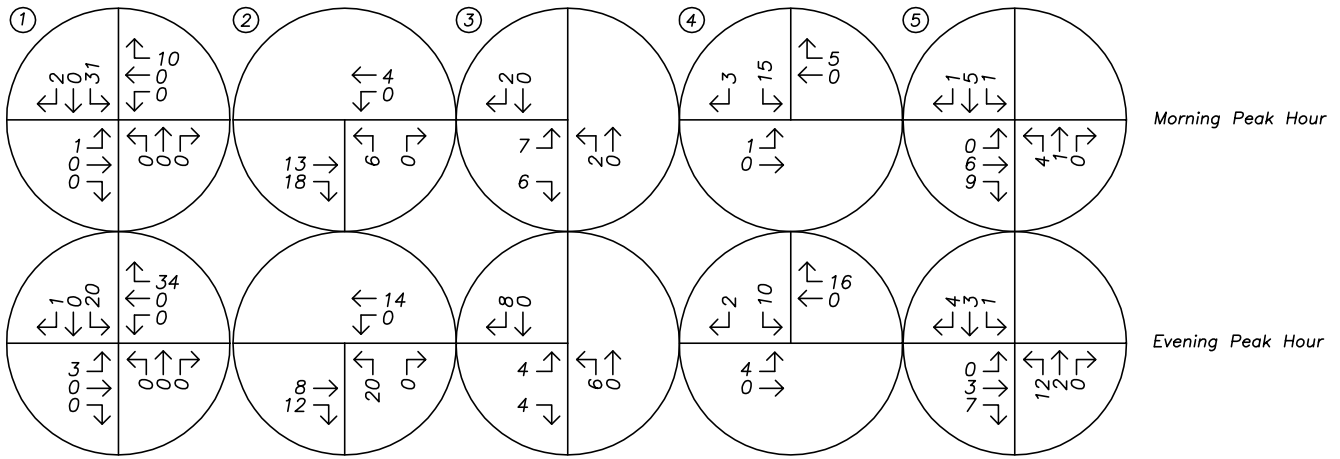
Morning Peak Hour			Evening Peak Hour			Weekday		
In	Out	Total	In	Out	Total	In	Out	Total
11	33	44	37	21	58	287	287	574

Trip Distribution & Assignment

The distribution model for new trips is based on a survey of the area surrounding the site as well as the traffic counts conducted at the study intersections. As the site is located at the northwestern edge of the City of St. Helen’s urban growth boundary, it is expected that the vast majority of trips to and from the site will arrive from and depart toward the southeast. Of these trips, 20% will arrive from and depart toward the north on Highway 30 via the intersection with Pittsburgh Road. An additional 45% will arrive from and depart toward the south on Highway 30 via the intersection with Columbia Blvd (60% of the southbound trips) and the intersection with Pittsburgh (the remaining 40% of southbound trips). The remaining trips are expected to arrive from and depart toward points within the City of Saint Helens, including 10% of trips arriving from and departing toward the west along Columbia Blvd from the intersection with Sunset Blvd, and 25% of trips arriving from and departing toward the east along Columbia Blvd from the intersection with Highway 30.

Figure 2 on page eight shows the trips generated from the proposed subdivision along with the trip distribution model used for the analysis. Since there is no transit in the vicinity of the site, and since the site is not ideally located for biking or walking trips, no deductions were taken for transit use or other non-automotive modes.

¹ Institute of Transportation Engineers (ITE), *Trip Generation Manual, 9th Edition*, 2012. Data cited for this study was taken from land use code #210, *Single-Family Detached Housing*.



TRIP DISTRIBUTION & ASSIGNMENT
 Site Generated Trips
 Morning and Afternoon Peak Hours





Operational Analysis

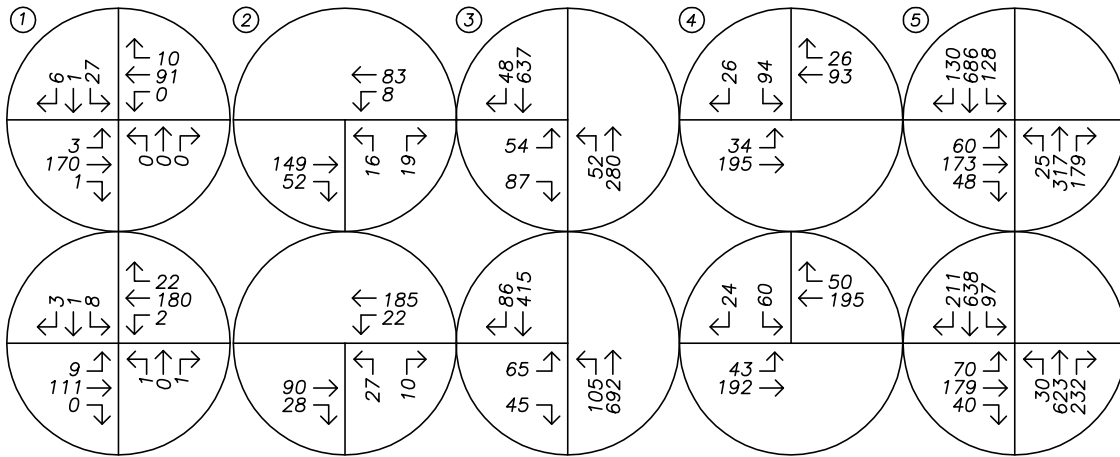
Existing and Background Traffic Volumes

To determine existing traffic volumes at the study intersections, traffic counts were conducted on Tuesday, February 5, 2013. Traffic was counted from 7:00 to 9:00 AM to obtain data for the morning peak hour and from 4:00 to 6:00 PM to obtain data for the evening peak hour. The raw data is provided in the technical appendix.

The existing traffic volumes for the five study intersections are summarized in Figure 3 on page ten. To analyze the current performance of the study intersections, the existing volumes were adjusted to design hour volumes to account for seasonal variation in traffic volumes, using methodology described in ODOT's *Analysis Procedures Manual*. The seasonal adjustment factor was determined to be 1.11, and was found using the data for "Commuter" roads provided by ODOT's *Seasonal Adjustment Table*. Note that the Seasonal Adjustment Table was utilized since there are no ATR's within the site vicinity, and no ATR's that shared the exact characteristics of Highway 30 in the study area. It is assumed that the nearby roads under city and county jurisdiction will see similar seasonal variation in traffic volumes to Highway 30, so the seasonal adjustment is used to calculate design hour volumes on all approaches to all intersections. The seasonally adjusted volumes used to analyze the current performance of the study intersections are summarized in Figure 4 on page 11.

To gauge the effect on the proposed development relative to a *no-build* scenario, background volumes were calculated according to the methodology outlined in ODOT's *Analysis Procedures Manual*. ODOT's *Future Volumes Table* was used to ascertain current and future volumes of traffic in the study area. The data used provide 2010 traffic volumes and projected 2030 volumes along Highway 30 at milepost 28.58, just to the north of the intersection with Columbia Blvd. Using these volumes, a year-over-year growth rate of 1.2% was found. Again, it is assumed that the nearby roads under city and county jurisdiction will see similar year-over-year growth in traffic volumes to the state road, so the growth rate is applied to all approaches to the study intersections to quantify background conditions. A build-out time of five years is assumed. The background traffic volumes are summarized in Figure 5 on page 12.

Finally, the trips generated by the proposed subdivision summarized in Figure 2 are added to these background volumes to compare the performance of the intersections in this scenario to the performance in the *no-build* scenario. The background + site trip volumes are summarized in Figure 6 on page 13.



Morning Peak Hour

Evening Peak Hour

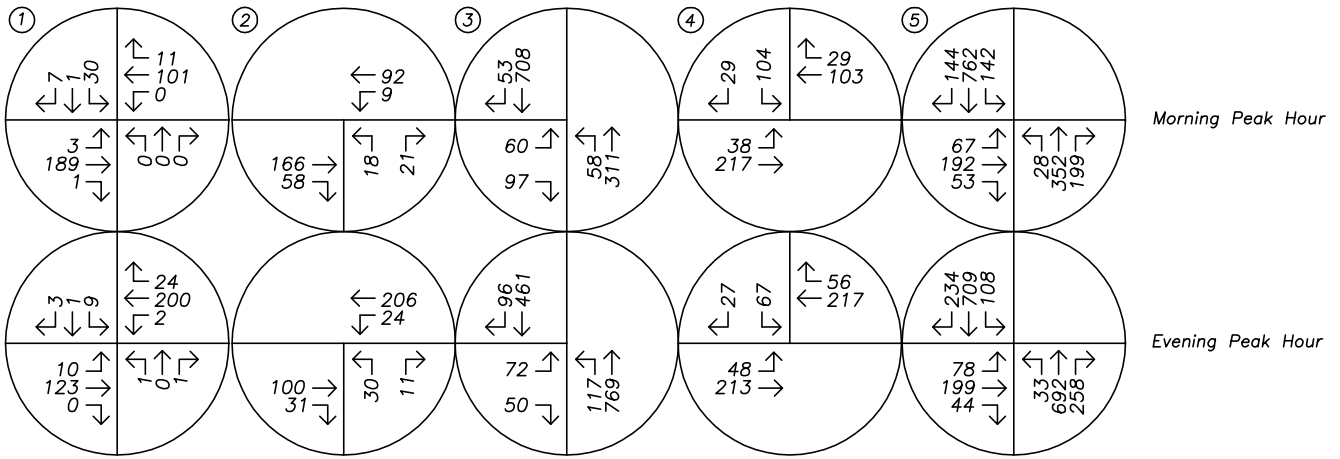


TRAFFIC VOLUMES
Existing Conditions
Morning and Afternoon Peak Hours



FIGURE 3

PAGE 10



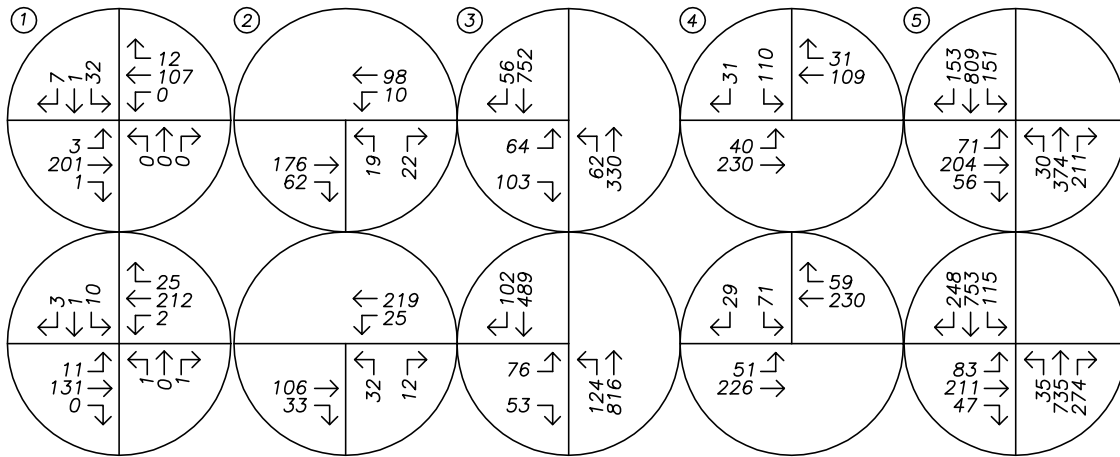
*Seasonal adjustment factor = 1.11



TRAFFIC VOLUMES
 Existing Conditions – Seasonally Adjusted*
 Morning and Afternoon Peak Hours



FIGURE
4
PAGE
11



Morning Peak Hour

Evening Peak Hour



*Growth percentage = 1.2% annually

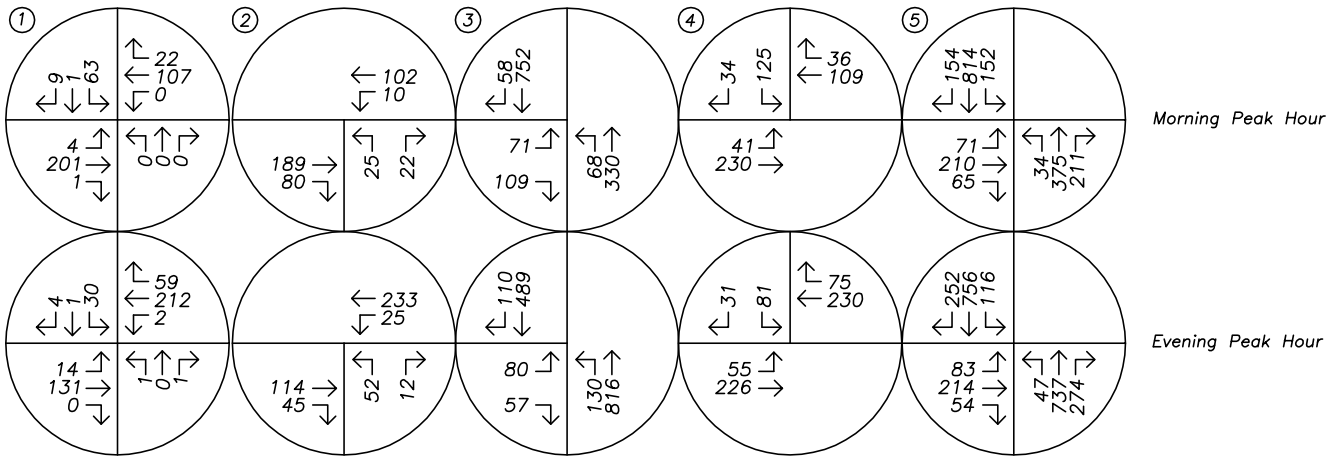


TRAFFIC VOLUMES
 2018 Background Conditions*
 Morning and Afternoon Peak Hours



FIGURE
5

PAGE
12



TRAFFIC VOLUMES
 Background + Site Trips
 Morning and Afternoon Peak Hours





Capacity & Level-of-Service

To determine the capacity and level-of-service at the study intersections, a capacity analysis was conducted. The analysis was conducted using the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual (HCM)*² published by the Transportation Research Board. Level-of-service (LOS) can range from A, which indicates little or no delay, to F, which indicates a significant amount of congestion and delay. The City of St. Helens operational standards are specified by section 17.156.020 of the city's municipal code, and require LOS E or better at the two-way stop-controlled intersections of Pittsburgh & Hankey, Pittsburgh & Sunset, and Columbia and Sunset. Detailed LOS descriptions are included in the appendix to this report.

In order to gauge the amount of capacity remaining at the intersection, the volume-to-capacity ratio (v/c) is also calculated and reported. A ratio of less than 1.0 indicates that the intersection is operating within capacity. ODOT's operational standards are based on v/c ratios. The maximum acceptable v/c ratio for the intersection of Pittsburgh Road at Highway 30 is 0.85, and the maximum acceptable v/c ratio for the intersection of Columbia Blvd at Highway 30 is 0.80.

For both level-of-service and v/c ratio, the reported result applies to the stop-controlled movements from the side streets. These movements generally experience the longest delays.

Table 2 shows a summary of the capacity and level-of-service calculations at the study intersections under the three scenarios outlined previously: 1) Seasonally adjusted existing conditions; 2) Background conditions, and; 3) Background conditions with site trips added.

The results of the capacity analysis show that the intersection of **Pittsburgh Road at Hankey Road** is currently operating at LOS B during both peak periods, with a v/c ratio of 0.07 during the morning peak and 0.02 during the evening peak. Following the background growth and the addition of new trips from the proposed subdivision, the intersection will continue to operate at LOS B during both peaks, with v/c ratios increasing to 0.15 in the morning, and to 0.07 in the evening. This is well within the city's performance standard, which requires this intersection to operate at LOS E or better.

The intersection of **Pittsburgh Road at Sunset Blvd** is currently operating at LOS B during both peak periods, with a v/c ratio of 0.04 during the morning peak and 0.05 during the evening peak. Following the background growth and the addition of new trips from the proposed subdivision, the intersection will continue to operate at LOS B during both peaks, with v/c ratios increasing to 0.05 in the morning, and to 0.10 in the evening. This is again well within the performance standard, which requires the intersection to operate at LOS E or better.

The intersection of **Pittsburgh Road at Highway 30** is currently operating at LOS D during both peak periods, with a v/c ratio of 0.33 during the morning peak and 0.36 during the evening peak. Following the background growth and the addition of new trips from the proposed subdivision, the inter-

² Transportation Research Board, *Highway Capacity Manual*, 5th Edition, 2010.



section will operate at LOS E during both peaks, with v/c ratios increasing to 0.43 in the morning, and to 0.44 in the evening. This is well within ODOT's performance standard, which requires the intersection to operate with a v/c ratio below 0.85.

The intersection of **Columbia Blvd at Sunset Blvd** is currently operating at LOS B during both peak periods, with a v/c ratio of 0.27 during the morning peak and 0.21 during the evening peak. Following the background growth and the addition of new trips from the proposed subdivision, the intersection will operate at LOS B with a v/c ratio of 0.34 during the morning peak hour, and LOS C with a v/c ratio of 0.28 during the evening peak hour. This is well within the city's performance standard, which requires the intersection to operate at LOS E or better.

The intersection of **Columbia Blvd at Highway 30** is currently operating at LOS B during both peak periods, with a v/c ratio of 0.62 during the morning peak and 0.59 during the evening peak. Following the background growth and the addition of new trips from the proposed subdivision, the intersection will operate at LOS C with a v/c ratio of 0.66 during the morning peak hour, and LOS B with a v/c ratio of 0.63 during the evening peak hour. This is well within ODOT's performance standard, which requires the intersection to operate with a v/c ratio below 0.80.

All study intersections have sufficient capacity to support the existing traffic volumes as well as additional traffic generated by the proposed improvement, and no mitigations are necessary or recommended. Detailed capacity analysis results are included in the appendix to this report.



Table 2: Intersection capacity and level-of-service summary

	<i>Morning peak hour</i>				<i>Evening peak hour</i>			
	LOS	Delay (s)	V/C	Crit. Mvt.	LOS	Delay (s)	V/C	Crit. Mvt.
Existing								
Pittsburgh Road & Hankey Road	B	12	0.07	SB	B	12	0.02	SB
Pittsburgh Road & Sunset Blvd	B	11	0.04	NB	B	11	0.05	NB
Pittsburgh Road & Highway 30	D	30	0.33	EB	D	31	0.36	EB
Columbia Blvd & Sunset Blvd	B	14	0.27	SB	B	14	0.21	SB
Columbia Blvd & Highway 30	B	20	0.62	-	B	18	0.59	-
Background								
Pittsburgh Road & Hankey Road	B	12	0.08	SB	B	12	0.02	SB
Pittsburgh Road & Sunset Blvd	B	11	0.04	NB	B	12	0.06	NB
Pittsburgh Road & Highway 30	D	34	0.38	EB	C	35	0.41	EB
Columbia Blvd & Sunset Blvd	B	14	0.30	SB	C	15	0.24	SB
Columbia Blvd & Highway 30	C	21	0.65	-	B	19	0.62	-
Background + Site Trips								
Pittsburgh Road & Hankey Road	B	13	0.15	SB	B	13	0.07	SB
Pittsburgh Road & Sunset Blvd	B	12	0.05	NB	B	12	0.10	NB
Pittsburgh Road & Highway 30	E	37	0.43	EB	E	37	0.44	EB
Columbia Blvd & Sunset Blvd	B	15	0.34	SB	C	16	0.28	SB
Columbia Blvd & Highway 30	C	21	0.66	-	B	19	0.63	-
Delay = Average delay per vehicle in seconds								
LOS = Level of service								
V/C = Volume-to-capacity ratio								



Safety Analysis

Crash History

Using data obtained from ODOT's Crash Data System, a review of the most recent available five years of crash history (2007-2011) at the study intersections was performed. Crash rates were calculated under the common assumption that traffic counted during the PM peak period represents 10% of annual average daily traffic (AADT) at the intersection.

The intersection of **Columbia Blvd at Highway 30** had ten reported crashes during the analysis period. Four of the crashes were *property damage only (PDO)* in severity, five were *Injury-C*, and one was *Injury-B*. One of the crashes involved a pedestrian and one involved a bicycle. The remaining eight were either rear-end crashes, or angle crashes, which are the most common types of crashes at signalized intersections. Neither this pattern nor the details of the individual crashes are indicative of any apparent safety issues with the intersection, and the crash rate is calculated to be 0.27 crashes per million entering vehicles (MEV).

None of the four remaining study intersections had crashes reported during the period from January 1, 2007 to December 31, 2011.

Crash rates greater than 1.0 crashes/MEV are generally indicative of a need for further investigation and possible mitigation. Since all study intersections have a crash rate well below this threshold, with four of the five study intersections having no reported crashes during the analysis period, there are no apparent safety deficiencies at any study intersection, and on-site observations and available data suggest that all intersections will continue to operate safely in the future.

Detailed information about crashes and crash reports for the study intersections are included in the appendix to this report.

Traffic Signal Warrants

Signal warrants were evaluated for the intersection of Pittsburgh Road at Highway 30 following the methodology specified in ODOT's *Analysis Procedures Manual*. Note that the 70% warrants were used in evaluating this intersection, since it is likely that the 85th percentile speed of traffic along Highway 30 in this location is greater than 40 mph.

The primary signal warrant used by ODOT in evaluating the need for signalization is Warrant #1, which is based on eight-hour vehicular volumes. Warrant 1 is not currently met at this intersection, nor will it be met following the background growth of traffic at this intersection and the addition of site trips.

Detailed information and calculations for the warrant analysis are provided in the appendix.



Conclusion

The subdivision of property located at the northern end of the City of Saint Helens has been proposed. Fifty-eight new single family homes will be created as a result of the proposed development.

The bulk of the impacts caused by trips created by this new development would occur at five intersections. Each of these intersections currently operates well within the applicable performance standards. Additionally, the crash history of these intersections is not indicative of any safety deficiencies, and no signals are warranted within the study area.

The transportation system has the necessary capacity to safely support the land division and subsequent development, and no mitigations are needed or recommended.



Appendix



LEVEL OF SERVICE

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

Level of service A: Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

Level of service B: Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

Level of service C: Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

Level of service D: Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

Level of service E: Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

Level of service F: Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

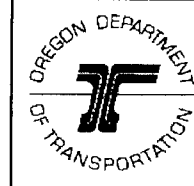
*LEVEL OF SERVICE CRITERIA
FOR SIGNALIZED INTERSECTIONS*

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

*LEVEL OF SERVICE CRITERIA
FOR UNSIGNALIZED INTERSECTIONS*

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

Whereas, the Oregon Department of Transportation, has been requested to perform an investigation pursuant to the provisions of ORS 810.180, has caused an engineering and traffic investigation to be made for the section(s) of state highway, county highway, city highway, or highway under the jurisdiction of a federal agency described below (highway means public way); and



Speed Zone Order

Whereas, the State Traffic Engineer has been authorized to act on behalf of the Oregon Transportation Commission; and

Date **April 17, 2003** Order No. **J390**

Whereas, the data, facts, and information obtained in connection with said engineering and traffic investigation are on file in the office of the Traffic Management Section of the Oregon Department of Transportation in Salem, Oregon; and

Jurisdiction(s)	
Columbia County (OTC)	Saint Helens
Columbia City	

Whereas, based upon said engineering and traffic investigation, the Traffic Engineer has found that the speed designated in ORS 811.105 or ORS 811.123 is greater than is reasonable under the conditions found to exist upon the section(s) of highway for which a lesser speed is herein designated or that the speed designated in said statute is less than is reasonable under the conditions found to exist upon the section(s) of highway for which a greater speed is herein designated; and

Whereas, the provisions of ORS 810.180 respecting notice and hearing have been complied with:

It is **Therefore Ordered** that the designated speed for the following section(s) of highway be as follows:

Name Lower Columbia River Highway

Route Number US 30

LOCATION OF TERMINI

From	MP	To	MP	Designated Speed (Miles Per Hour)
0.10 mile south of Berg Road	24.81	0.09 mile north of Achilles Road	26.45	50 ^{2/}
0.09 mile north of Achilles Road	26.45	McNulty Creek	27.53	45 ^{2/}
McNulty Creek	27.53	Firlok Park Boulevard	27.59	35 ^{2/}
Firlok Park Boulevard	27.59	0.13 mile north of St. Helens Street	28.80	35 ^{3/}
0.13 mile north of St. Helens Street	28.80	Pittsburg Road	29.10	40 ^{3/}
Pittsburg Road	29.10	0.19 mile north of Deer Island Road	29.60	45 ^{2/}
0.19 mile north of Deer Island Road	29.60	350 feet south of L Street	30.46	50 ^{2/}
350 feet south of L Street	30.46	0.38 mile north of Pacific Street	32.00	50 ^{4/}

^{1/} Except that in the following section(s), the designated speed shall be 20 mph when children are present as per provisions of Subsection 2c of ORS 811.105:

^{2/} OTC

^{3/} City of Saint Helens

^{4/} Columbia City

This rescinds OTC Speed Zone Order 958 dated November 18, 1987, OTC Order 1196 dated August 25, 1998, SZRP Order 1084D dated August 7, 1995 and SZRP Order 1306D dated August 24, 1998

Be it further ordered that the roadway authority or authorities responsible for the above section(s) of highway install appropriate signs giving notice of the designated speed(s) therefore as per ORS 810.180, Subsection 8(e).

Be it further ordered that signs installed pursuant to this order comply with the provisions of ORS 810.210 and 810.220.

Be it further ordered that any previous order made by the Department with respect to the designated speed for the above section(s) of highway which is in conflict with the provisions of this order is hereby rescinded.

Be it further ordered that the Traffic Engineer of the Oregon Department of Transportation is hereby delegated the authority to sign this order for and on behalf of the Department.

Ed Fischer, State Traffic Engineer



TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Variable: Dwelling Units
Variable Value: 58

AM PEAK HOUR

Trip Rate: 0.75

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	11	33	44

PM PEAK HOUR

Trip Rate: 1

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	37	21	58

WEEKDAY

Trip Rate: 9.52

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	276	276	552

SATURDAY

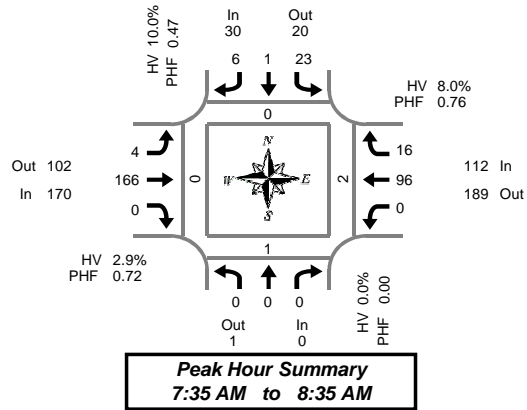
Trip Rate: 9.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	287	287	574

Total Vehicle Summary



Clay Carney
(503) 833-2740



Hankey Rd & Pittsburgh Rd

Tuesday, February 05, 2013

7:00 AM to 9:00 AM

5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	0	0	0	0	0	9	0	0	0	2	0	0	11	0	0	0	0
7:05 AM	0	0	0	0	0	0	1	0	0	10	0	0	0	4	1	0	16	0	0	0	0
7:10 AM	0	0	0	0	1	0	0	0	0	12	0	0	0	4	1	0	18	0	0	0	0
7:15 AM	0	0	0	0	2	0	2	0	1	10	0	0	0	5	1	0	21	0	0	0	0
7:20 AM	0	0	0	0	2	0	1	0	0	8	0	0	0	3	0	0	14	0	0	0	0
7:25 AM	0	0	0	0	3	0	0	0	0	11	0	0	0	7	0	0	21	0	0	0	0
7:30 AM	0	0	0	0	2	0	0	0	0	9	1	0	0	1	2	0	15	0	0	0	0
7:35 AM	0	0	0	0	3	0	0	0	0	11	0	0	0	6	0	0	20	0	0	0	0
7:40 AM	0	0	0	0	5	0	2	0	1	14	0	0	0	9	0	0	31	0	0	0	0
7:45 AM	0	0	0	0	4	0	1	0	0	15	0	0	0	8	1	0	29	0	0	0	0
7:50 AM	0	0	0	0	2	1	1	0	1	18	0	0	0	10	2	0	35	0	0	0	0
7:55 AM	0	0	0	0	1	0	0	0	0	12	0	0	0	13	0	0	26	0	0	0	0
8:00 AM	0	0	0	0	0	0	2	0	1	21	0	0	0	9	3	0	36	0	0	0	0
8:05 AM	0	0	0	0	3	0	0	0	0	21	0	0	0	10	2	0	36	0	0	0	0
8:10 AM	0	0	0	0	1	0	0	0	0	16	0	0	0	6	0	0	23	0	1	1	0
8:15 AM	0	0	0	0	2	0	0	0	0	8	0	0	0	8	0	0	18	0	0	0	0
8:20 AM	0	0	0	0	1	0	0	0	0	14	0	0	0	4	0	0	19	0	0	0	0
8:25 AM	0	0	0	0	0	0	0	0	1	6	0	0	0	8	4	0	19	0	0	0	0
8:30 AM	0	0	0	0	1	0	0	0	0	10	0	0	0	5	4	0	20	0	0	1	0
8:35 AM	0	0	0	0	1	0	0	0	0	7	0	0	0	8	2	0	18	0	0	0	0
8:40 AM	0	0	0	0	2	0	0	0	0	6	0	0	0	1	3	0	12	0	0	0	0
8:45 AM	0	0	0	0	3	0	0	0	0	4	0	0	0	3	0	0	10	0	0	0	0
8:50 AM	0	0	0	0	1	0	0	0	0	6	0	0	0	2	1	0	10	0	0	0	0
8:55 AM	0	0	0	0	2	0	0	0	0	6	0	0	0	6	2	0	16	0	0	0	0
Total Survey	0	0	0	0	42	1	10	0	5	264	1	0	0	142	29	0	494	0	1	2	0

15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	1	0	1	0	0	31	0	0	0	10	2	0	45	0	0	0	0
7:15 AM	0	0	0	0	7	0	3	0	1	29	0	0	0	15	1	0	56	0	0	0	0
7:30 AM	0	0	0	0	10	0	2	0	1	34	1	0	0	16	2	0	66	0	0	0	0
7:45 AM	0	0	0	0	7	1	2	0	1	45	0	0	0	31	3	0	90	0	0	0	0
8:00 AM	0	0	0	0	4	0	2	0	1	58	0	0	0	25	5	0	95	0	1	1	0
8:15 AM	0	0	0	0	3	0	0	0	1	28	0	0	0	20	4	0	56	0	0	0	0
8:30 AM	0	0	0	0	4	0	0	0	0	23	0	0	0	14	9	0	50	0	0	1	0
8:45 AM	0	0	0	0	6	0	0	0	0	16	0	0	0	11	3	0	36	0	0	0	0
Total Survey	0	0	0	0	42	1	10	0	5	264	1	0	0	142	29	0	494	0	1	2	0

Peak Hour Summary

7:35 AM to 8:35 AM

By Approach	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	1	1	0	30	20	50	0	170	102	272	0	112	189	301	0	312	0	1	2	0
%HV	0.0%				10.0%				2.9%				8.0%				5.4%				
PHF	0.00				0.47				0.72				0.76				0.80				

By Movement	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	23	1	6	30	4	166	0	170	0	96	16	112	312
%HV	0.0%	0.0%	0.0%	0.0%	13.0%	0.0%	0.0%	10.0%	25.0%	2.4%	0.0%	2.9%	0.0%	3.1%	37.5%	8.0%	5.4%
PHF	0.00	0.00	0.00	0.00	0.48	0.25	0.38	0.47	0.50	0.72	0.00	0.72	0.00	0.75	0.50	0.76	0.80

Rolling Hour Summary

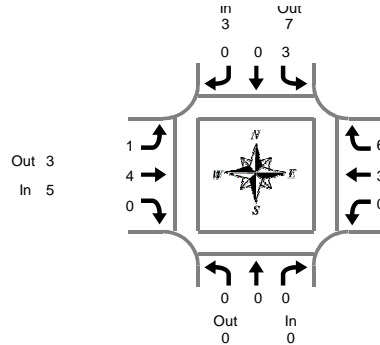
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	25	1	8	0	3	139	1	0	0	72	8	0	257	0	0	0	0
7:15 AM	0	0	0	0	28	1	9	0	4	166	1	0	0	87	11	0	307	0	1	1	0
7:30 AM	0	0	0	0	24	1	6	0	4	165	1	0	0	92	14	0	307	0	1	1	0
7:45 AM	0	0	0	0	18	1	4	0	3	154	0	0	0	90	21	0	291	0	1	2	0
8:00 AM	0	0	0	0	17	0	2	0	2	125	0	0	0	70	21	0	237	0	1	2	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Peak Hour Summary
7:35 AM to 8:35 AM

Hankey Rd & Pittsburgh Rd

Tuesday, February 05, 2013

7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
7:10 AM	0	0	0	0	1	0	0	1	0	3	0	3	0	1	0	1	5
7:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	2	3
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
7:50 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	2
7:55 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	1	2	0	3	0	0	0	0	3
8:05 AM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
8:35 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	1	2	4
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
8:45 AM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
8:50 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	2
8:55 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Survey	0	0	0	0	10	0	0	10	1	10	0	11	0	10	9	19	40

Heavy Vehicle 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	1	0	0	1	0	4	0	4	0	4	0	4	9
7:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	2	3
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
7:45 AM	0	0	0	0	1	0	0	1	0	2	0	2	0	2	1	3	6
8:00 AM	0	0	0	0	2	0	0	2	1	2	0	3	0	0	0	0	5
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
8:30 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	4	5	7
8:45 AM	0	0	0	0	4	0	0	4	0	1	0	1	0	0	0	0	5
Total Survey	0	0	0	0	10	0	0	10	1	10	0	11	0	10	9	19	40

Heavy Vehicle Peak Hour Summary

7:35 AM to 8:35 AM

By Approach	Northbound Hankey Rd			Southbound Hankey Rd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	3	7	10	5	3	8	9	7	16	17
PHF	0.00			0.38			0.31			0.45			0.71

By Movement	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	3	0	0	3	1	4	0	5	0	3	6	9	17
PHF	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.38	0.25	0.33	0.00	0.31	0.00	0.25	0.30	0.45	0.71

Heavy Vehicle Rolling Hour Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	3	0	0	3	0	6	0	6	0	9	1	10	19
7:15 AM	0	0	0	0	4	0	0	4	1	4	0	5	0	5	1	6	15
7:30 AM	0	0	0	0	3	0	0	3	1	4	0	5	0	3	5	8	16
7:45 AM	0	0	0	0	4	0	0	4	1	5	0	6	0	3	9	12	22
8:00 AM	0	0	0	0	7	0	0	7	1	4	0	5	0	1	8	9	21

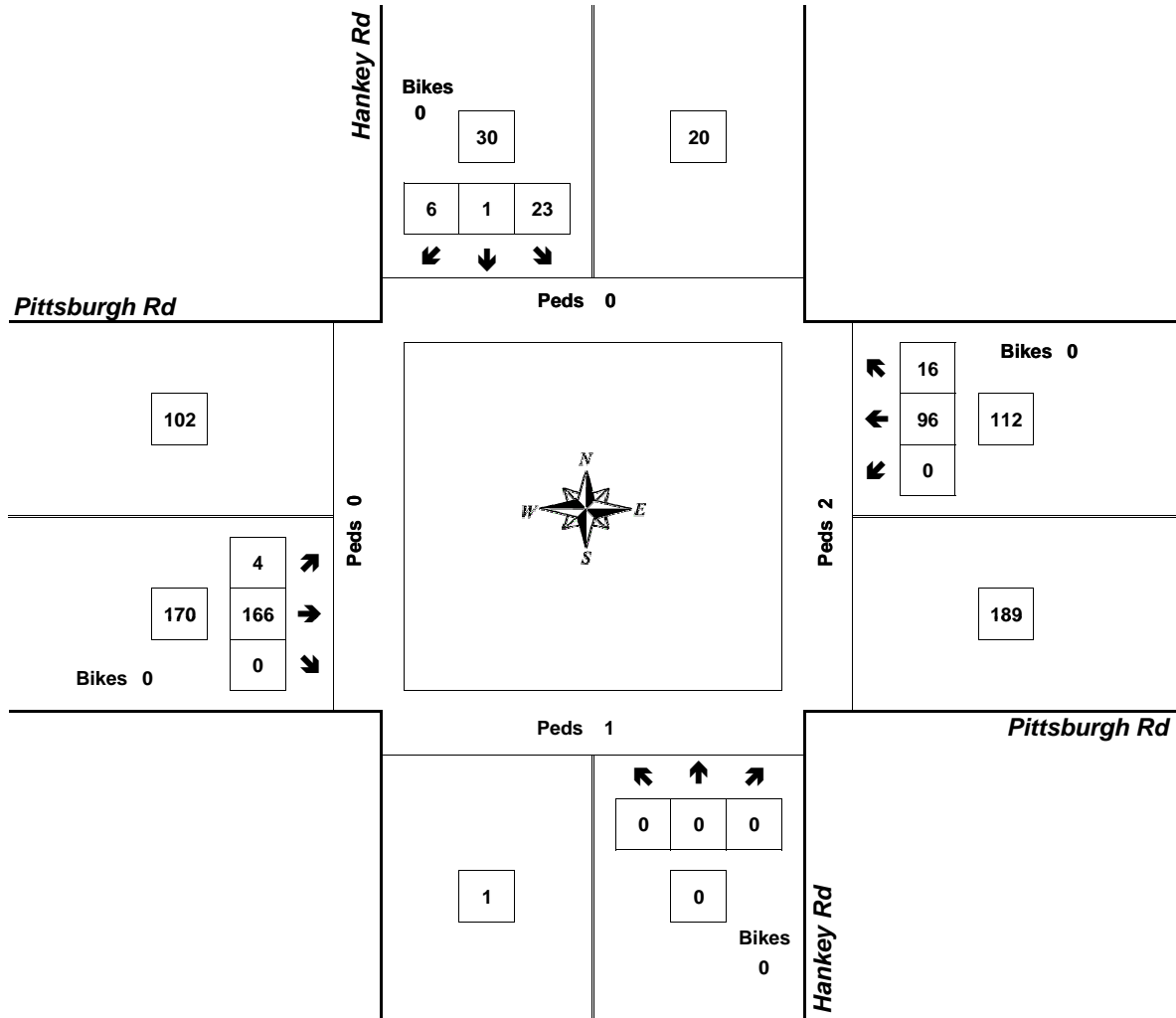
Peak Hour Summary



Clay Carney
(503) 833-2740

Hankey Rd & Pittsburgh Rd

7:35 AM to 8:35 AM
Tuesday, February 05, 2013



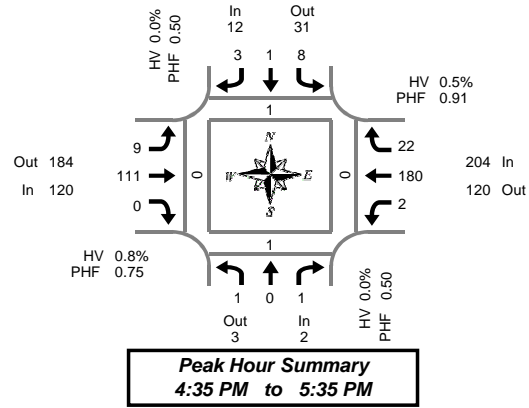
Approach	PHF	HV%	Volume
EB	0.72	2.9%	170
WB	0.76	8.0%	112
NB	0.00	0.0%	0
SB	0.47	10.0%	30
Intersection	0.80	5.4%	312

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary



Clay Carney
(503) 833-2740



Hankey Rd & Pittsburgh Rd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	2	0	1	0	0	9	0	0	0	10	0	0	22	0	0	0	0
4:05 PM	0	0	0	0	5	0	1	0	1	6	0	0	0	11	1	0	25	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	1	6	0	0	0	7	1	0	15	0	0	0	0
4:15 PM	0	0	0	0	1	0	0	0	0	16	0	0	0	4	2	0	23	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	11	0	0	0	10	0	0	21	0	0	0	0
4:25 PM	0	0	0	0	1	0	0	0	0	4	1	0	0	12	1	0	19	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	7	0	0	0	1	19	0	27	0	0	0	0
4:35 PM	0	0	0	0	0	1	0	0	1	15	0	0	1	14	1	0	33	0	0	0	0
4:40 PM	0	0	0	0	0	0	0	0	0	18	0	0	0	14	2	0	34	0	0	0	0
4:45 PM	0	0	0	0	1	0	0	0	0	6	0	0	0	14	1	0	22	0	0	0	0
4:50 PM	0	0	0	0	0	0	2	0	1	7	0	0	0	20	2	0	32	0	0	0	0
4:55 PM	0	0	1	0	2	0	0	0	2	7	0	0	1	15	2	0	30	0	0	0	0
5:00 PM	0	0	0	0	2	0	0	0	1	14	0	0	0	14	1	0	32	1	0	0	0
5:05 PM	0	0	0	0	1	0	0	0	0	6	0	0	0	18	3	0	28	0	0	0	0
5:10 PM	0	0	0	0	1	0	0	0	0	4	0	0	0	17	3	0	25	0	0	0	0
5:15 PM	1	0	0	0	0	0	0	0	2	8	0	0	0	12	3	0	26	0	0	0	0
5:20 PM	0	0	0	0	1	0	1	0	0	7	0	0	0	19	0	0	28	0	0	0	0
5:25 PM	0	0	0	0	0	0	0	0	0	7	0	0	0	10	2	0	19	0	1	0	0
5:30 PM	0	0	0	0	0	0	0	0	2	12	0	0	0	13	2	0	29	0	0	0	0
5:35 PM	0	0	0	0	1	0	1	0	1	5	0	0	0	12	2	0	22	0	0	0	0
5:40 PM	0	0	0	0	1	0	0	0	1	6	1	0	1	13	2	0	25	0	0	1	0
5:45 PM	0	0	0	0	2	0	0	0	1	6	0	0	0	11	3	0	23	0	0	0	0
5:50 PM	0	0	0	0	2	0	0	0	1	11	0	0	0	14	1	0	29	0	0	0	0
5:55 PM	1	0	0	0	1	0	2	0	0	7	0	0	0	12	2	0	25	0	1	0	0
Total Survey	2	0	1	0	24	1	8	0	15	205	2	0	4	315	37	0	614	1	2	1	0

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	7	0	2	0	2	21	0	0	0	28	2	0	62	0	0	0	0
4:15 PM	0	0	0	0	2	0	0	0	0	31	1	0	0	26	3	0	63	0	0	0	0
4:30 PM	0	0	0	0	0	1	0	0	1	40	0	0	2	47	3	0	94	0	0	0	0
4:45 PM	0	0	1	0	3	0	2	0	3	20	0	0	1	49	5	0	84	0	0	0	0
5:00 PM	0	0	0	0	4	0	0	0	1	24	0	0	0	49	7	0	85	1	0	0	0
5:15 PM	1	0	0	0	1	0	1	0	2	22	0	0	0	41	5	0	73	0	1	0	0
5:30 PM	0	0	0	0	2	0	1	0	4	23	1	0	1	38	6	0	76	0	0	1	0
5:45 PM	1	0	0	0	5	0	2	0	2	24	0	0	0	37	6	0	77	0	1	0	0
Total Survey	2	0	1	0	24	1	8	0	15	205	2	0	4	315	37	0	614	1	2	1	0

Peak Hour Summary

4:35 PM to 5:35 PM

By Approach	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	2	3	5	0	12	31	43	0	120	184	304	0	204	120	324	0	338	1	1	0	0
%HV	0.0%				0.0%				0.8%				0.5%				0.6%				
PHF	0.50				0.50				0.75				0.91				0.90				

By Movement	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	1	2	8	1	3	12	9	111	0	120	2	180	22	204	338
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.8%	0.0%	0.6%	0.0%	0.5%	0.6%
PHF	0.25	0.00	0.25	0.50	0.40	0.25	0.38	0.50	0.56	0.71	0.00	0.75	0.50	0.92	0.61	0.91	0.90

Rolling Hour Summary

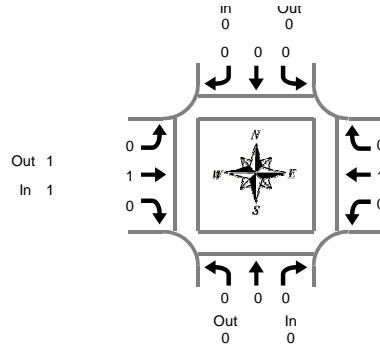
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	1	0	12	1	4	0	6	112	1	0	3	150	13	0	303	0	0	0	0
4:15 PM	0	0	1	0	9	1	2	0	5	115	1	0	3	171	18	0	326	1	0	0	0
4:30 PM	1	0	1	0	8	1	3	0	7	106	0	0	3	186	20	0	336	1	1	0	0
4:45 PM	1	0	1	0	10	0	4	0	10	89	1	0	2	177	23	0	318	1	1	1	0
5:00 PM	2	0	0	0	12	0	4	0	9	93	1	0	1	165	24	0	311	1	2	1	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Peak Hour Summary
4:35 PM to 5:35 PM

Hankey Rd & Pittsburgh Rd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2	2
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	1	0	0	1	0	3	0	3	0	2	0	2	6	6

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
4:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	1
4:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	1	0	0	1	0	3	0	3	0	2	0	2	6	6

Heavy Vehicle Peak Hour Summary

4:35 PM to 5:35 PM

By Approach	Northbound Hankey Rd			Southbound Hankey Rd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	1	1	2	1	1	2	2
PHF	0.00			0.00			0.25			0.25			0.25

By Movement	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2	2
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.25	0.00	0.25	0.25	0.25

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hankey Rd				Southbound Hankey Rd				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Interval Total	
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total		
4:00 PM	0	0	0	0	1	0	0	1	0	2	0	2	0	1	0	1	4	4
4:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1
4:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2	2
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2	2

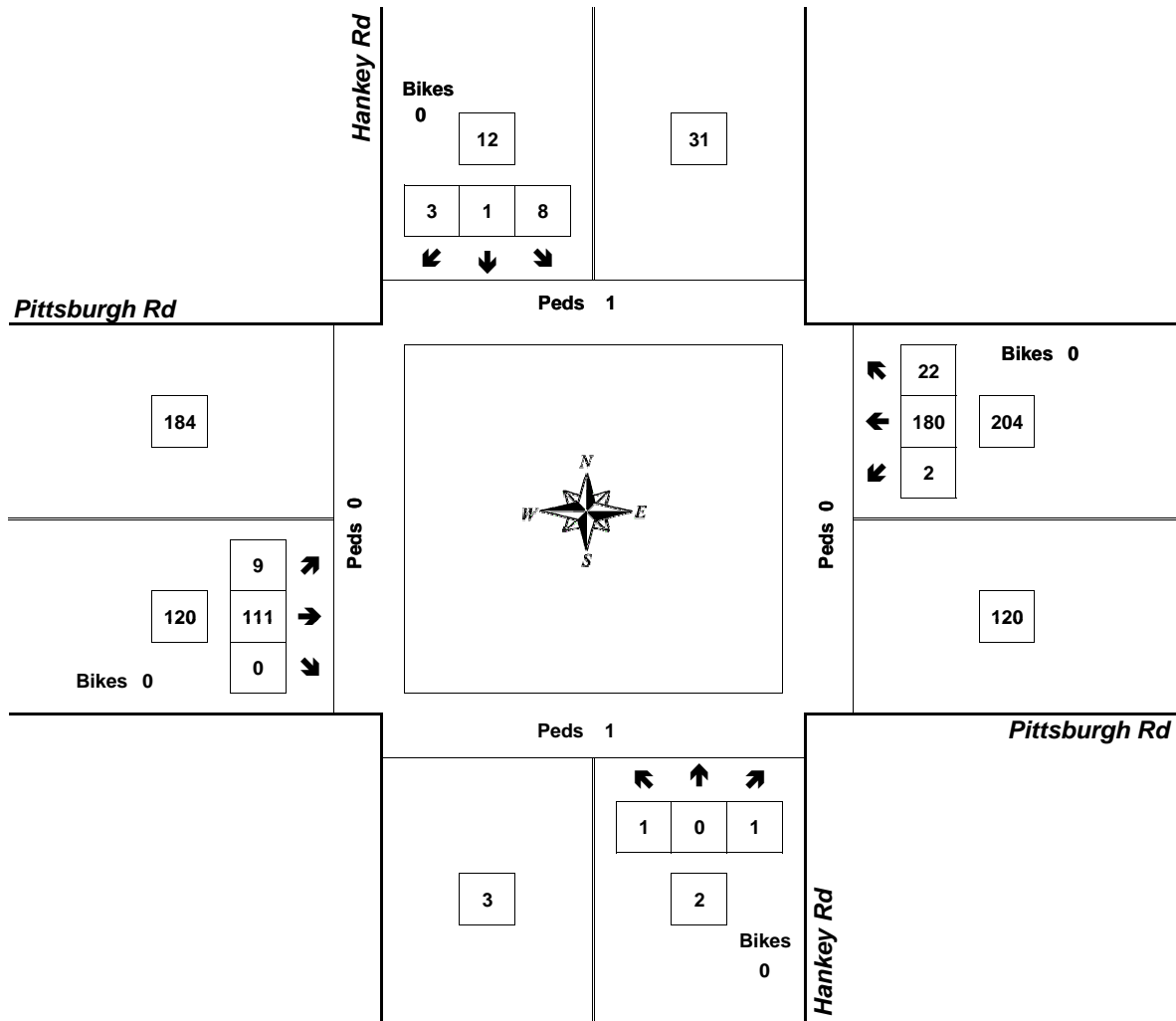
Peak Hour Summary



Clay Carney
(503) 833-2740

Hankey Rd & Pittsburgh Rd

4:35 PM to 5:35 PM
Tuesday, February 05, 2013



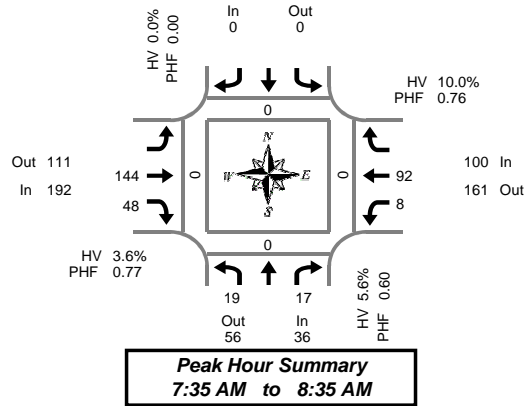
Approach	PHF	HV%	Volume
EB	0.75	0.8%	120
WB	0.91	0.5%	204
NB	0.50	0.0%	2
SB	0.50	0.0%	12
Intersection	0.90	0.6%	338

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary



Clay Carney
(503) 833-2740



Sunset Blvd & Pittsburgh Rd

Tuesday, February 05, 2013

7:00 AM to 9:00 AM

5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes			Bikes	T	R	Bikes	L	T	Bikes		North	South	East	West
7:00 AM	0	1	0			0	9	1	0	0	2	0	13	0	0	0	0
7:05 AM	0	0	0			0	9	1	0	0	5	0	15	0	0	0	0
7:10 AM	0	1	0			0	10	2	0	1	5	0	19	0	0	0	0
7:15 AM	0	1	0			0	8	1	0	0	6	0	16	0	0	0	0
7:20 AM	0	0	0			0	8	4	0	0	4	0	16	0	0	0	0
7:25 AM	0	0	0			0	11	5	0	1	7	0	24	0	0	0	0
7:30 AM	1	3	0			0	6	3	0	0	2	0	15	0	0	0	0
7:35 AM	1	1	0			0	13	3	0	2	5	0	25	0	0	0	0
7:40 AM	2	2	0			0	10	8	0	0	6	0	28	0	0	0	0
7:45 AM	4	4	0			0	13	7	0	0	5	0	33	0	0	0	0
7:50 AM	1	2	0			0	15	6	0	0	12	0	36	0	0	0	0
7:55 AM	1	0	0			0	10	2	0	0	11	0	24	0	0	0	0
8:00 AM	3	1	0			0	18	2	0	1	9	0	34	0	0	0	0
8:05 AM	2	1	0			0	20	7	0	2	10	0	42	0	0	0	0
8:10 AM	0	2	0			0	11	4	0	0	7	0	24	0	0	0	0
8:15 AM	1	2	0			0	8	4	0	1	5	0	21	0	0	0	0
8:20 AM	0	1	0			0	14	1	0	1	4	0	21	0	0	0	0
8:25 AM	2	1	0			0	4	1	0	0	10	0	18	0	0	0	0
8:30 AM	2	0	0			0	8	3	0	1	8	0	22	0	0	0	0
8:35 AM	0	3	0			0	5	2	0	2	10	0	22	0	0	0	0
8:40 AM	1	0	0			0	8	1	0	0	3	0	13	0	0	0	0
8:45 AM	1	2	0			0	5	1	0	0	2	0	11	0	0	0	0
8:50 AM	0	1	0			0	6	2	0	0	3	0	12	0	0	0	0
8:55 AM	0	0	0			0	5	3	0	1	8	0	17	0	0	0	0
Total Survey	22	29	0			0	234	74	0	13	149	0	521	0	0	0	0

15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes			Bikes	T	R	Bikes	L	T	Bikes		North	South	East	West
7:00 AM	0	2	0			0	28	4	0	1	12	0	47	0	0	0	0
7:15 AM	0	1	0			0	27	10	0	1	17	0	56	0	0	0	0
7:30 AM	4	6	0			0	29	14	0	2	13	0	68	0	0	0	0
7:45 AM	6	6	0			0	38	15	0	0	28	0	93	0	0	0	0
8:00 AM	5	4	0			0	49	13	0	3	26	0	100	0	0	0	0
8:15 AM	3	4	0			0	26	6	0	2	19	0	60	0	0	0	0
8:30 AM	3	3	0			0	21	6	0	3	21	0	57	0	0	0	0
8:45 AM	1	3	0			0	16	6	0	1	13	0	40	0	0	0	0
Total Survey	22	29	0			0	234	74	0	13	149	0	521	0	0	0	0

Peak Hour Summary

7:35 AM to 8:35 AM

By Approach	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total	Pedestrians Crosswalk					
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West		
Volume	36	56	92	0	0	0	192	111	303	0	100	161	261	0	328	0	0	0	0
%HV	5.6%			0.0%			3.6%			10.0%			5.8%						
PHF	0.60			0.00			0.77			0.76			0.82						

By Movement	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total			
	L	R	Total			Total	T	R	Total	L	T	Total				
Volume	19	17	36			0	144	48	192	8	92	100	328			
%HV	5.3%	NA	5.9%	5.6%	NA	NA	0.0%	NA	4.9%	0.0%	3.6%	12.5%	9.8%	NA	10.0%	5.8%
PHF	0.68		0.53	0.60			0.73	0.57	0.77	0.67	0.72	0.76	0.82			

Rolling Hour Summary

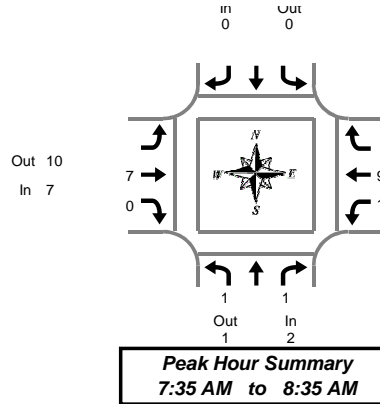
7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes			Bikes	T	R	Bikes	L	T	Bikes		North	South	East	West
7:00 AM	10	15	0			0	122	43	0	4	70	0	264	0	0	0	0
7:15 AM	15	17	0			0	143	52	0	6	84	0	317	0	0	0	0
7:30 AM	18	20	0			0	142	48	0	7	86	0	321	0	0	0	0
7:45 AM	17	17	0			0	134	40	0	8	94	0	310	0	0	0	0
8:00 AM	12	14	0			0	112	31	0	9	79	0	257	0	0	0	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Sunset Blvd & Pittsburgh Rd

Tuesday, February 05, 2013

7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	R	Total			Total	T	R	Total	L	T	Total	
7:00 AM	0	0	0			0	2	0	2	0	2	2	4
7:05 AM	0	0	0			0	0	0	0	0	1	1	1
7:10 AM	0	0	0			0	4	0	4	0	1	1	5
7:15 AM	0	0	0			0	1	0	1	0	2	2	3
7:20 AM	0	0	0			0	0	0	0	0	0	0	0
7:25 AM	0	0	0			0	0	0	0	0	0	0	0
7:30 AM	0	0	0			0	0	0	0	0	0	0	0
7:35 AM	0	0	0			0	0	0	0	1	0	1	1
7:40 AM	0	0	0			0	0	0	0	0	1	1	1
7:45 AM	1	1	2			0	1	0	1	0	1	1	4
7:50 AM	0	0	0			0	1	0	1	0	1	1	2
7:55 AM	0	0	0			0	1	0	1	0	0	0	1
8:00 AM	0	0	0			0	2	0	2	0	0	0	2
8:05 AM	0	0	0			0	2	0	2	0	0	0	2
8:10 AM	0	0	0			0	0	0	0	0	0	0	0
8:15 AM	0	0	0			0	0	0	0	0	0	0	0
8:20 AM	0	0	0			0	0	0	0	0	0	0	0
8:25 AM	0	0	0			0	0	0	0	0	5	5	5
8:30 AM	0	0	0			0	0	0	0	0	1	1	1
8:35 AM	0	0	0			0	1	0	1	0	2	2	3
8:40 AM	1	0	1			0	1	0	1	0	1	1	3
8:45 AM	0	0	0			0	2	0	2	0	0	0	2
8:50 AM	0	0	0			0	2	0	2	0	0	0	2
8:55 AM	0	0	0			0	1	0	1	0	0	0	1
Total Survey	2	1	3			0	21	0	21	1	18	19	43

Heavy Vehicle 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	R	Total			Total	T	R	Total	L	T	Total	
7:00 AM	0	0	0			0	6	0	6	0	4	4	10
7:15 AM	0	0	0			0	1	0	1	0	2	2	3
7:30 AM	0	0	0			0	0	0	0	1	1	2	2
7:45 AM	1	1	2			0	3	0	3	0	2	2	7
8:00 AM	0	0	0			0	4	0	4	0	0	0	4
8:15 AM	0	0	0			0	0	0	0	0	5	5	5
8:30 AM	1	0	1			0	2	0	2	0	4	4	7
8:45 AM	0	0	0			0	5	0	5	0	0	0	5
Total Survey	2	1	3			0	21	0	21	1	18	19	43

Heavy Vehicle Peak Hour Summary

7:35 AM to 8:35 AM

By Approach	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	1	3	0	0	0	7	10	17	10	8	18	19
PHF	0.25			0.00			0.35			0.42			0.68

By Movement	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	L	R	Total			Total	T	R	Total	L	T	Total	
Volume	1	1	2			0	7	0	7	1	9	10	19
PHF	0.25	0.25	0.25			0.00	0.35	0.00	0.35	0.25	0.38	0.42	0.68

Heavy Vehicle Rolling Hour Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	R	Total			Total	T	R	Total	L	T	Total	
7:00 AM	1	1	2			0	10	0	10	1	9	10	22
7:15 AM	1	1	2			0	8	0	8	1	5	6	16
7:30 AM	1	1	2			0	7	0	7	1	8	9	18
7:45 AM	2	1	3			0	9	0	9	0	11	11	23
8:00 AM	1	0	1			0	11	0	11	0	9	9	21

Peak Hour Summary



Clay Carney
(503) 833-2740

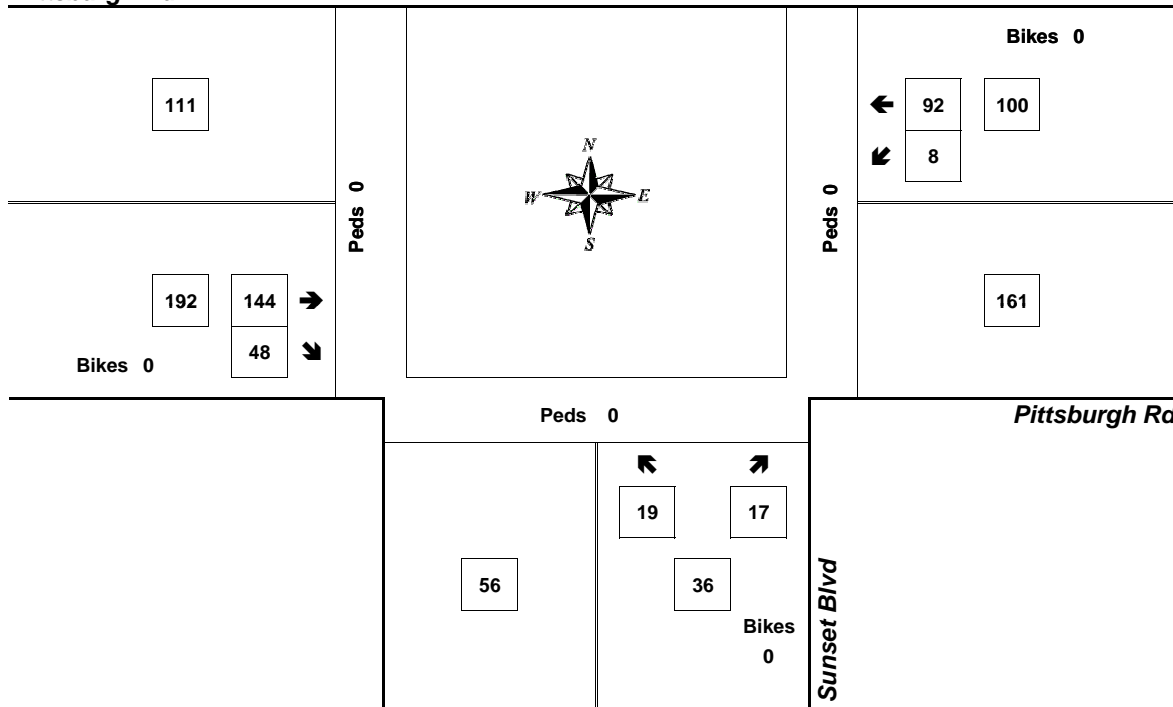
Sunset Blvd & Pittsburgh Rd

7:35 AM to 8:35 AM
Tuesday, February 05, 2013

Bikes
0

Pittsburgh Rd

Peds 0



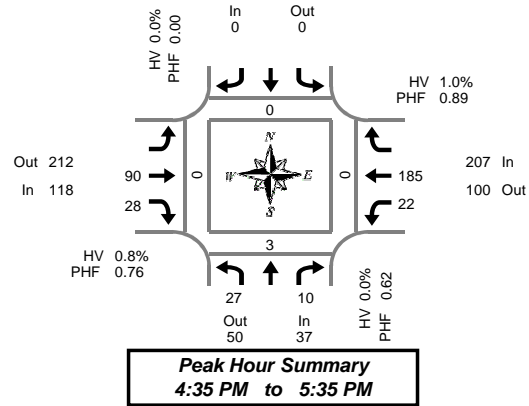
Approach	PHF	HV%	Volume
EB	0.77	3.6%	192
WB	0.76	10.0%	100
NB	0.60	5.6%	36
SB	0.00	0.0%	0
Intersection	0.82	5.8%	328

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary



Clay Carney
(503) 833-2740



Sunset Blvd & Pittsburgh Rd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes			Bikes	T	R	Bikes	L	T	Bikes		North	South	East	West
4:00 PM	3	2	0			0	9	2	0	1	8	0	25	0	0	0	0
4:05 PM	1	0	0			0	7	4	0	3	11	0	26	0	1	0	0
4:10 PM	1	0	0			0	5	1	0	0	7	0	14	0	0	0	0
4:15 PM	1	2	0			0	9	5	0	1	5	0	23	0	0	0	0
4:20 PM	1	0	0			0	8	4	0	1	10	0	24	0	0	0	0
4:25 PM	3	1	0			0	4	2	0	1	9	0	20	0	0	0	0
4:30 PM	4	1	0			0	6	2	0	3	15	0	31	0	0	0	0
4:35 PM	2	0	0			0	13	2	0	1	14	0	32	0	0	0	0
4:40 PM	3	1	0			0	16	2	0	1	14	0	37	0	1	0	0
4:45 PM	0	1	0			0	4	2	0	1	15	0	23	0	0	0	0
4:50 PM	3	0	0			0	4	3	0	2	18	0	30	0	0	0	0
4:55 PM	0	0	0			0	7	3	0	3	19	0	32	0	0	0	0
5:00 PM	2	0	0			0	15	1	0	3	13	0	34	0	0	0	0
5:05 PM	3	0	0			0	4	1	0	1	19	0	28	0	0	0	0
5:10 PM	4	0	0			0	5	2	0	2	18	0	31	0	1	0	0
5:15 PM	2	1	0			0	5	3	0	2	13	0	26	0	0	0	0
5:20 PM	3	1	0			0	3	3	0	2	17	0	29	0	0	0	0
5:25 PM	2	4	0			0	6	2	0	1	12	0	27	0	0	0	0
5:30 PM	3	2	0			0	8	4	0	3	13	0	33	0	1	0	0
5:35 PM	1	2	0			0	5	2	0	2	13	0	25	0	0	0	0
5:40 PM	2	0	0			0	4	3	0	1	15	0	25	0	1	0	0
5:45 PM	0	1	0			0	5	4	0	1	14	0	25	0	0	0	0
5:50 PM	2	0	0			0	11	3	0	1	13	0	30	0	0	0	0
5:55 PM	1	2	0			0	4	3	0	0	13	0	23	0	0	0	0
Total Survey	47	21	0			0	167	63	0	37	318	0	653	0	5	0	0

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes			Bikes	T	R	Bikes	L	T	Bikes		North	South	East	West
4:00 PM	5	2	0			0	21	7	0	4	26	0	65	0	1	0	0
4:15 PM	5	3	0			0	21	11	0	3	24	0	67	0	0	0	0
4:30 PM	9	2	0			0	35	6	0	5	43	0	100	0	1	0	0
4:45 PM	3	1	0			0	15	8	0	6	52	0	85	0	0	0	0
5:00 PM	9	0	0			0	24	4	0	6	50	0	93	0	1	0	0
5:15 PM	7	6	0			0	14	8	0	5	42	0	82	0	0	0	0
5:30 PM	6	4	0			0	17	9	0	6	41	0	83	0	2	0	0
5:45 PM	3	3	0			0	20	10	0	2	40	0	78	0	0	0	0
Total Survey	47	21	0			0	167	63	0	37	318	0	653	0	5	0	0

Peak Hour Summary

4:35 PM to 5:35 PM

By Approach	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total	Pedestrians Crosswalk					
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		Bikes	North	South	East	West	
Volume	37	50	87	0	0	0	118	212	330	0	207	100	307	0	362	0	3	0	0
%HV	0.0%			0.0%			0.8%			1.0%			0.8%						
PHF	0.62			0.00			0.76			0.89			0.94						

By Movement	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total			
	L	R	Total			Total	T	R	Total	L	T	Total				
Volume	27	10	37			0	90	28	118	22	185	207	362			
%HV	0.0%	NA	0.0%	0.0%	NA	NA	0.0%	NA	1.1%	0.0%	0.8%	0.0%	1.1%	NA	1.0%	0.8%
PHF	0.75		0.36	0.62		0.00	0.68	0.78	0.76	0.69	0.89	0.89	0.94			

Rolling Hour Summary

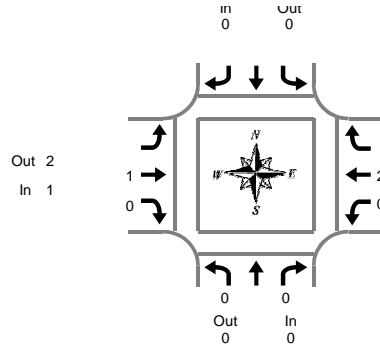
4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes			Bikes	T	R	Bikes	L	T	Bikes		North	South	East	West
4:00 PM	22	8	0			0	92	32	0	18	145	0	317	0	2	0	0
4:15 PM	26	6	0			0	95	29	0	20	169	0	345	0	2	0	0
4:30 PM	28	9	0			0	88	26	0	22	187	0	360	0	2	0	0
4:45 PM	25	11	0			0	70	29	0	23	185	0	343	0	3	0	0
5:00 PM	25	13	0			0	75	31	0	19	173	0	336	0	3	0	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Peak Hour Summary
4:35 PM to 5:35 PM

Sunset Blvd & Pittsburgh Rd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total		
	L	R	Total			Total	T	R	Total	L	T	Total			
4:00 PM	0	0	0			0			0	0	0	0	0		
4:05 PM	0	0	0			0			1	0	1	1	0	2	
4:10 PM	0	0	0			0			0	0	0	0	0	0	
4:15 PM	0	0	0			0			0	0	0	0	0	0	
4:20 PM	0	0	0			0			0	0	0	0	0	0	
4:25 PM	0	0	0			0			1	1	2	0	1	3	
4:30 PM	0	0	0			0			0	0	0	0	0	0	
4:35 PM	0	0	0			0			0	0	0	0	0	0	
4:40 PM	0	0	0			0			0	0	0	0	0	0	
4:45 PM	0	0	0			0			0	0	0	0	0	0	
4:50 PM	0	0	0			0			0	0	0	0	0	0	
4:55 PM	0	0	0			0			0	0	0	0	0	0	
5:00 PM	0	0	0			0			0	0	0	0	0	0	
5:05 PM	0	0	0			0			0	0	0	0	0	0	
5:10 PM	0	0	0			0			0	0	0	0	0	0	
5:15 PM	0	0	0			0			0	0	0	0	0	0	
5:20 PM	0	0	0			0			0	0	0	2	2	2	
5:25 PM	0	0	0			0			0	0	0	0	0	0	
5:30 PM	0	0	0			0			1	0	1	0	0	1	
5:35 PM	0	0	0			0			0	0	0	0	0	0	
5:40 PM	0	0	0			0			0	0	0	0	0	0	
5:45 PM	0	0	0			0			0	0	0	0	0	0	
5:50 PM	0	0	0			0			0	0	0	0	0	0	
5:55 PM	0	0	0			0			0	0	0	0	0	0	
Total Survey	0	0	0			0			3	1	4	1	3	4	8

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total		
	L	R	Total			Total	T	R	Total	L	T	Total			
4:00 PM	0	0	0			0			1	0	1	1	0	1	2
4:15 PM	0	0	0			0			1	1	2	0	1	1	3
4:30 PM	0	0	0			0			0	0	0	0	0	0	0
4:45 PM	0	0	0			0			0	0	0	0	0	0	0
5:00 PM	0	0	0			0			0	0	0	0	0	0	0
5:15 PM	0	0	0			0			0	0	0	0	2	2	2
5:30 PM	0	0	0			0			1	0	1	0	0	0	1
5:45 PM	0	0	0			0			0	0	0	0	0	0	0
Total Survey	0	0	0			0			3	1	4	1	3	4	8

Heavy Vehicle Peak Hour Summary

4:35 PM to 5:35 PM

By Approach	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	1	2	3	2	1	3	3
PHF	0.00			0.00			0.25			0.25			0.25

By Movement	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total	
	L	R	Total			Total	T	R	Total	L	T	Total		
Volume	0	0	0			0			1	0	1	0	2	3
PHF	0.00	0.00	0.00			0.00			0.25	0.00	0.25	0.00	0.25	0.25

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total		
	L	R	Total			Total	T	R	Total	L	T	Total			
4:00 PM	0	0	0			0			2	1	3	1	1	2	5
4:15 PM	0	0	0			0			1	1	2	0	1	1	3
4:30 PM	0	0	0			0			0	0	0	0	2	2	2
4:45 PM	0	0	0			0			1	0	1	0	2	2	3
5:00 PM	0	0	0			0			1	0	1	0	2	2	3

Peak Hour Summary



Clay Carney
(503) 833-2740

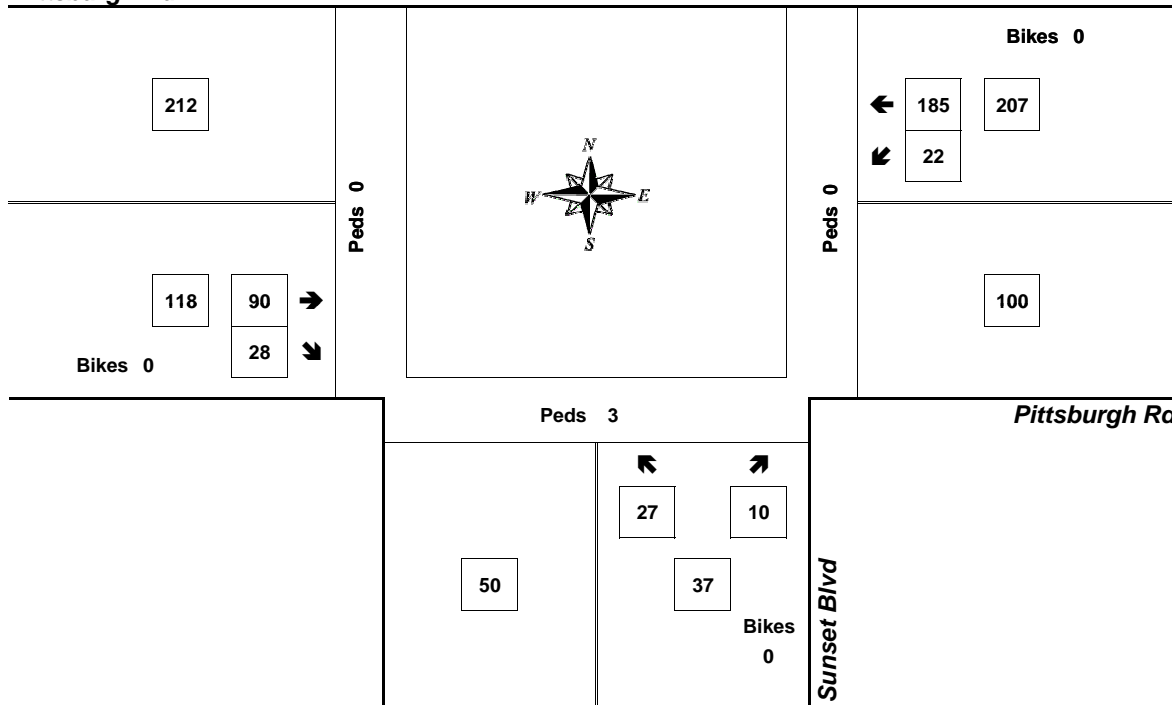
Sunset Blvd & Pittsburgh Rd

4:35 PM to 5:35 PM
Tuesday, February 05, 2013

Bikes
0

Pittsburgh Rd

Peds 0



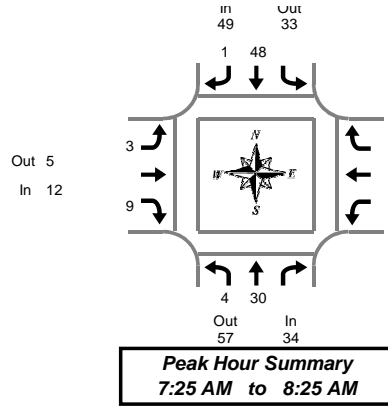
Approach	PHF	HV%	Volume
EB	0.76	0.8%	118
WB	0.89	1.0%	207
NB	0.62	0.0%	37
SB	0.00	0.0%	0
Intersection	0.94	0.8%	362

Count Period: 4:00 PM to 6:00 PM

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Hwy 30 & Pittsburgh Rd

Tuesday, February 05, 2013

7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
7:00 AM	1	3	4	4	1	5	1	0	1			0	10
7:05 AM	0	2	2	2	0	2	0	1	1			0	5
7:10 AM	1	1	2	1	0	1	0	0	0			0	3
7:15 AM	1	1	2	5	1	6	0	1	1			0	9
7:20 AM	1	5	6	6	0	6	1	2	3			0	15
7:25 AM	0	2	2	7	0	7	0	0	0			0	9
7:30 AM	0	5	5	7	1	8	0	0	0			0	13
7:35 AM	0	3	3	2	0	2	1	0	1			0	6
7:40 AM	0	4	4	0	0	0	0	1	1			0	5
7:45 AM	1	1	2	6	0	6	0	0	0			0	8
7:50 AM	0	2	2	5	0	5	1	2	3			0	10
7:55 AM	1	0	1	3	0	3	0	1	1			0	5
8:00 AM	0	3	3	4	0	4	0	1	1			0	8
8:05 AM	1	3	4	1	0	1	0	2	2			0	7
8:10 AM	0	3	3	5	0	5	0	2	2			0	10
8:15 AM	0	2	2	5	0	5	1	0	1			0	8
8:20 AM	1	2	3	3	0	3	0	0	0			0	6
8:25 AM	1	2	3	2	0	2	0	0	0			0	5
8:30 AM	0	4	4	2	3	5	0	0	0			0	9
8:35 AM	2	4	6	3	0	3	0	0	0			0	9
8:40 AM	2	1	3	5	0	5	0	1	1			0	9
8:45 AM	0	7	7	2	0	2	0	1	1			0	10
8:50 AM	0	4	4	3	0	3	1	1	2			0	9
8:55 AM	0	2	2	2	0	2	0	2	2			0	6
Total Survey	13	66	79	85	6	91	6	18	24			0	194

Heavy Vehicle 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
7:00 AM	2	6	8	7	1	8	1	1	2			0	18
7:15 AM	2	8	10	18	1	19	1	3	4			0	33
7:30 AM	0	12	12	9	1	10	1	1	2			0	24
7:45 AM	2	3	5	14	0	14	1	3	4			0	23
8:00 AM	1	9	10	10	0	10	0	5	5			0	25
8:15 AM	2	6	8	10	0	10	1	0	1			0	19
8:30 AM	4	9	13	10	3	13	0	1	1			0	27
8:45 AM	0	13	13	7	0	7	1	4	5			0	25
Total Survey	13	66	79	85	6	91	6	18	24			0	194

Heavy Vehicle Peak Hour Summary

7:25 AM to 8:25 AM

By Approach	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	34	57	91	49	33	82	12	5	17	0	0	0	95
PHF	0.71			0.72			0.60			0.00			0.85

By Movement	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	L	T	Total	T	R	Total	L	R	Total			Total	
Volume	4	30	34	48	1	49	3	9	12			0	95
PHF	0.50	0.63	0.71	0.75	0.25	0.72	0.75	0.45	0.60			0.00	0.85

Heavy Vehicle Rolling Hour Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
7:00 AM	6	29	35	48	3	51	4	8	12			0	98
7:15 AM	5	32	37	51	2	53	3	12	15			0	105
7:30 AM	5	30	35	43	1	44	3	9	12			0	91
7:45 AM	9	27	36	44	3	47	2	9	11			0	94
8:00 AM	7	37	44	37	3	40	2	10	12			0	96

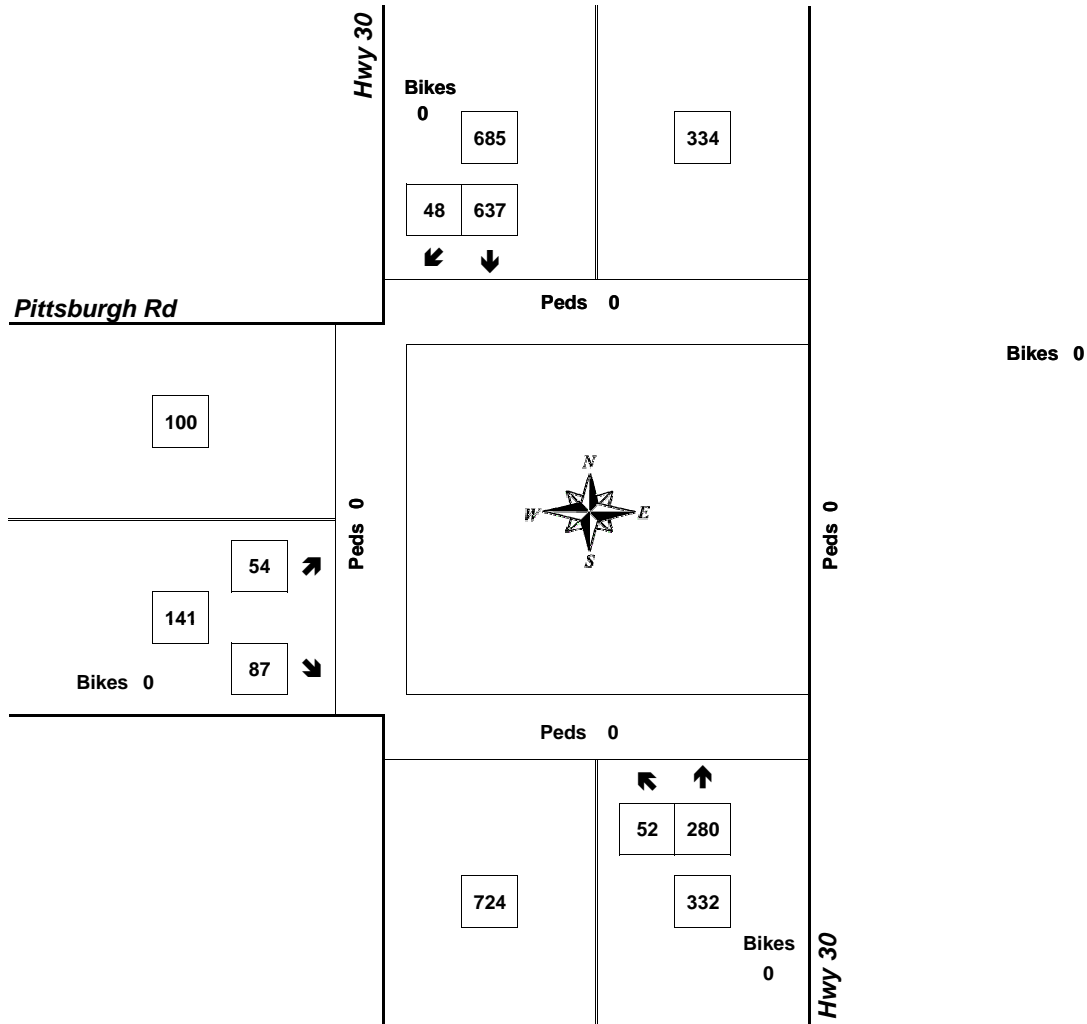
Peak Hour Summary



Clay Carney
(503) 833-2740

Hwy 30 & Pittsburgh Rd

7:25 AM to 8:25 AM
Tuesday, February 05, 2013



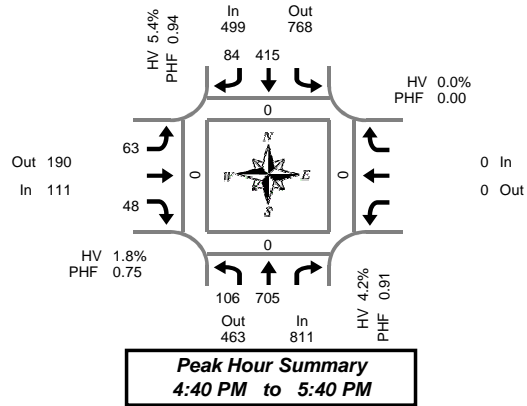
Approach	PHF	HV%	Volume
EB	0.75	8.5%	141
WB	0.00	0.0%	0
NB	0.85	10.2%	332
SB	0.80	7.2%	685
Intersection	0.86	8.2%	1,158

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary



Clay Carney
(503) 833-2740



Hwy 30 & Pittsburgh Rd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes		Bikes	North		South	East	West	
4:00 PM	5	60	0	41	4	0	4	3	0			0	0	0	0		
4:05 PM	8	63	0	36	5	0	4	8	0			0	0	0	0		
4:10 PM	5	56	0	38	6	0	3	3	0			0	0	0	0		
4:15 PM	3	46	0	26	4	0	3	3	0			0	0	0	0		
4:20 PM	8	62	0	40	5	0	11	2	0			0	0	0	0		
4:25 PM	5	56	0	21	6	0	2	6	0			0	0	0	0		
4:30 PM	3	58	0	31	10	0	1	4	0			0	0	0	0		
4:35 PM	10	47	0	30	8	0	4	4	0			0	0	0	0		
4:40 PM	8	63	0	34	5	0	11	3	0			0	0	0	0		
4:45 PM	5	56	0	37	10	0	8	9	0			0	0	0	0		
4:50 PM	11	76	0	35	6	0	3	3	0			0	0	0	0		
4:55 PM	13	61	0	35	6	0	3	4	0			0	0	0	0		
5:00 PM	4	52	0	35	3	0	6	3	0			0	0	0	0		
5:05 PM	9	66	0	37	9	0	12	4	0			0	0	0	0		
5:10 PM	10	52	0	36	11	0	3	5	0			0	0	0	0		
5:15 PM	7	54	0	31	9	0	2	3	0			0	0	0	0		
5:20 PM	9	57	0	30	10	0	1	4	0			0	0	0	0		
5:25 PM	9	55	0	42	3	0	4	1	0			0	0	0	0		
5:30 PM	10	53	0	33	6	0	8	2	0			0	0	0	0		
5:35 PM	11	60	0	30	6	0	2	7	0			0	0	0	0		
5:40 PM	4	56	0	29	10	0	7	0	0			0	0	0	0		
5:45 PM	9	46	0	27	3	0	2	2	0			0	0	0	0		
5:50 PM	7	61	0	29	3	0	3	3	0			0	0	0	0		
5:55 PM	6	52	0	30	7	0	6	5	0			0	0	0	0		
Total Survey	179	1,368	0	793	155	0	113	91	0			0	0	0	0		

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes		Bikes	North		South	East	West	
4:00 PM	18	179	0	115	15	0	11	14	0			0	0	0	0		
4:15 PM	16	164	0	87	15	0	16	11	0			0	0	0	0		
4:30 PM	21	168	0	95	23	0	16	11	0			0	0	0	0		
4:45 PM	29	193	0	107	22	0	14	16	0			0	0	0	0		
5:00 PM	23	170	0	108	23	0	21	12	0			0	0	0	0		
5:15 PM	25	166	0	103	22	0	7	8	0			0	0	0	0		
5:30 PM	25	169	0	92	22	0	17	9	0			0	0	0	0		
5:45 PM	22	159	0	86	13	0	11	10	0			0	0	0	0		
Total Survey	179	1,368	0	793	155	0	113	91	0			0	0	0	0		

Peak Hour Summary

4:40 PM to 5:40 PM

By Approach	Northbound Hwy 30				Southbound Hwy 30				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	811	463	1,274	0	499	768	1,267	0	111	190	301	0	0	0	0	0	0	0	0	0	0
%HV	4.2%				5.4%				1.8%				0.0%				4.4%				
PHF	0.91				0.94				0.75				0.00				0.93				

By Movement	Northbound Hwy 30				Southbound Hwy 30				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total
	L	T	Total	Bikes	T	R	Total	Bikes	L	R	Total	Bikes		Total	Bikes		
Volume	106	705	811	0	415	84	499	0	63	48	111	0		0	0		
%HV	0.9%	4.7%	NA	4.2%	NA	6.0%	2.4%	5.4%	1.6%	NA	2.1%	1.8%	NA	NA	NA	0.0%	4.4%
PHF	0.88	0.90	0.91		0.96	0.70	0.94		0.72	0.75	0.75			0.00	0.93		

Rolling Hour Summary

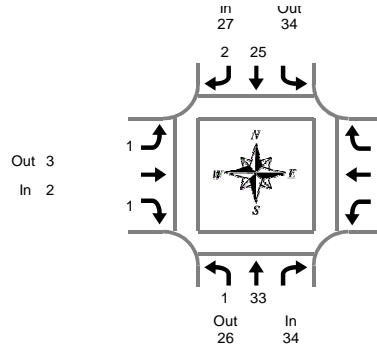
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes		Bikes	North		South	East	West	
4:00 PM	84	704	0	404	75	0	57	52	0			0	0	0	0		
4:15 PM	89	695	0	397	83	0	67	50	0			0	0	0	0		
4:30 PM	98	697	0	413	90	0	58	47	0			0	0	0	0		
4:45 PM	102	698	0	410	89	0	59	45	0			0	0	0	0		
5:00 PM	95	664	0	389	80	0	56	39	0			0	0	0	0		

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Peak Hour Summary
4:40 PM to 5:40 PM

Hwy 30 & Pittsburgh Rd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
4:00 PM	0	5	5	3	0	3	0	0	0	0	0	0	8
4:05 PM	0	2	2	2	0	2	0	0	0	0	0	0	4
4:10 PM	0	3	3	4	1	5	1	0	1	0	0	0	9
4:15 PM	0	0	0	2	0	2	0	0	0	0	0	0	2
4:20 PM	2	2	4	3	0	3	0	0	0	0	0	0	7
4:25 PM	0	5	5	0	1	1	0	0	0	0	0	0	6
4:30 PM	0	4	4	1	0	1	0	1	1	0	0	0	6
4:35 PM	0	1	1	4	0	4	0	0	0	0	0	0	5
4:40 PM	0	1	1	2	0	2	0	0	0	0	0	0	3
4:45 PM	0	3	3	3	0	3	0	0	0	0	0	0	6
4:50 PM	0	4	4	1	0	1	1	0	1	0	0	0	6
4:55 PM	0	2	2	1	1	2	0	0	0	0	0	0	4
5:00 PM	0	7	7	1	0	1	0	0	0	0	0	0	8
5:05 PM	0	2	2	5	0	5	0	0	0	0	0	0	7
5:10 PM	0	2	2	5	0	5	0	0	0	0	0	0	7
5:15 PM	0	1	1	2	0	2	0	0	0	0	0	0	3
5:20 PM	0	2	2	0	1	1	0	0	0	0	0	0	3
5:25 PM	1	1	2	4	0	4	0	0	0	0	0	0	6
5:30 PM	0	4	4	1	0	1	0	0	0	0	0	0	5
5:35 PM	0	4	4	0	0	0	0	1	1	0	0	0	5
5:40 PM	0	0	0	4	0	4	0	0	0	0	0	0	4
5:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	1
5:50 PM	0	1	1	0	0	0	0	0	0	0	0	0	1
5:55 PM	1	5	6	2	0	2	0	0	0	0	0	0	8
Total Survey	4	61	65	51	4	55	2	2	4			0	124

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
4:00 PM	0	10	10	9	1	10	1	0	1	0	0	0	21
4:15 PM	2	7	9	5	1	6	0	0	0	0	0	0	15
4:30 PM	0	6	6	7	0	7	0	1	1	0	0	0	14
4:45 PM	0	9	9	5	1	6	1	0	1	0	0	0	16
5:00 PM	0	11	11	11	0	11	0	0	0	0	0	0	22
5:15 PM	1	4	5	6	1	7	0	0	0	0	0	0	12
5:30 PM	0	8	8	5	0	5	0	1	1	0	0	0	14
5:45 PM	1	6	7	3	0	3	0	0	0	0	0	0	10
Total Survey	4	61	65	51	4	55	2	2	4			0	124

Heavy Vehicle Peak Hour Summary

4:40 PM to 5:40 PM

By Approach	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	34	26	60	27	34	61	2	3	5	0	0	0	63
PHF	0.65			0.56			0.50			0.00			0.72

By Movement	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	L	T	Total	T	R	Total	L	R	Total			Total	
Volume	1	33	34	25	2	27	1	1	2			0	63
PHF	0.25	0.63	0.65	0.52	0.50	0.56	0.25	0.25	0.50			0.00	0.72

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
4:00 PM	2	32	34	26	3	29	2	1	3			0	66
4:15 PM	2	33	35	28	2	30	1	1	2			0	67
4:30 PM	1	30	31	29	2	31	1	1	2			0	64
4:45 PM	1	32	33	27	2	29	1	1	2			0	64
5:00 PM	2	29	31	25	1	26	0	1	1			0	58

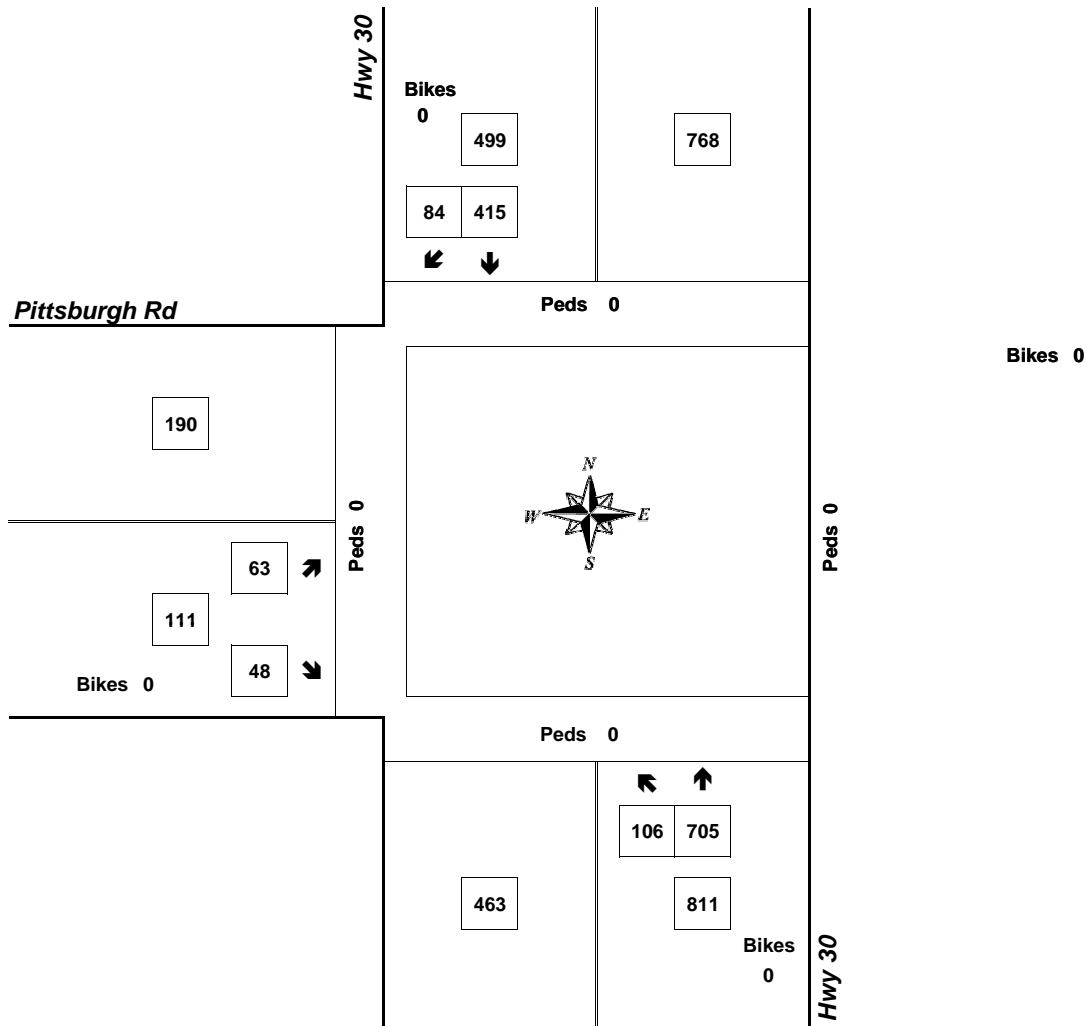
Peak Hour Summary



Clay Carney
(503) 833-2740

Hwy 30 & Pittsburgh Rd

4:40 PM to 5:40 PM
Tuesday, February 05, 2013



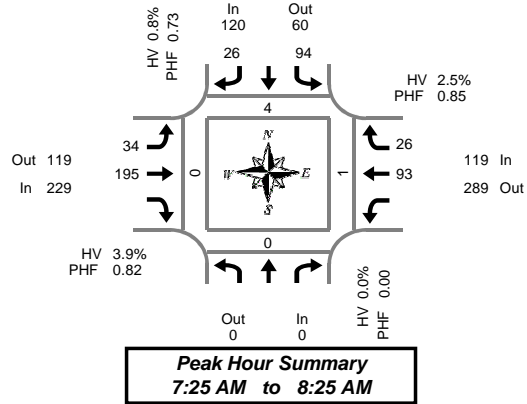
Approach	PHF	HV%	Volume
EB	0.75	1.8%	111
WB	0.00	0.0%	0
NB	0.91	4.2%	811
SB	0.94	5.4%	499
Intersection	0.93	4.4%	1,421

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary



Clay Carney
(503) 833-2740



Sunset Blvd & Columbia Blvd

Tuesday, February 05, 2013

7:00 AM to 9:00 AM

5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd				Southbound Sunset Blvd				Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	L	R	Bikes	L	T	Bikes	T	R	Bikes	North		South	East	West	
7:00 AM				0	5	0	0	0	3	0	5	0	0	0	0	0	0	0	0
7:05 AM				0	3	0	0	0	16	0	6	2	0	0	0	0	0	0	0
7:10 AM				0	3	3	0	2	8	0	3	0	0	0	0	0	0	0	0
7:15 AM				0	4	1	0	0	9	0	4	0	0	0	0	0	0	0	0
7:20 AM				0	4	4	0	1	8	0	10	0	0	0	0	0	0	0	0
7:25 AM				0	7	10	0	1	15	0	10	0	0	0	0	0	0	0	0
7:30 AM				0	4	4	0	1	11	0	7	4	0	0	0	0	0	0	0
7:35 AM				0	5	3	0	3	21	0	11	1	0	0	0	0	0	0	0
7:40 AM				0	16	2	0	8	22	0	8	2	0	0	0	0	0	0	0
7:45 AM				0	12	1	0	4	12	0	4	2	0	0	0	0	0	0	0
7:50 AM				0	10	0	0	3	19	0	7	1	1	0	0	0	0	0	0
7:55 AM				0	6	1	0	2	7	0	8	2	0	0	0	0	0	0	0
8:00 AM				0	6	1	0	2	17	0	6	2	0	0	0	0	0	0	0
8:05 AM				0	8	3	0	1	19	0	10	2	0	0	0	0	0	0	0
8:10 AM				0	6	0	0	2	12	0	12	1	0	0	0	0	0	0	0
8:15 AM				0	10	0	0	3	22	0	5	5	0	0	0	0	0	0	0
8:20 AM				0	4	1	0	4	18	0	5	4	0	0	0	0	0	0	0
8:25 AM				0	5	1	0	2	14	0	11	4	0	0	0	0	0	0	0
8:30 AM				0	8	1	0	2	14	0	7	4	0	0	0	0	0	0	0
8:35 AM				0	3	0	0	3	15	0	4	3	0	0	0	0	0	0	0
8:40 AM				0	4	1	0	0	6	0	11	1	0	0	0	0	0	0	0
8:45 AM				0	4	0	0	1	9	0	7	1	0	0	0	0	0	0	0
8:50 AM				0	4	0	0	0	10	0	7	0	0	0	0	0	0	0	0
8:55 AM				0	6	2	0	2	7	0	5	2	0	0	0	0	0	0	0
Total Survey				0	147	39	0	52	314	0	173	43	1	768	8	0	1	0	0

15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd				Southbound Sunset Blvd				Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	L	R	Bikes	L	T	Bikes	T	R	Bikes	North		South	East	West	
7:00 AM				0	11	3	0	7	27	0	14	2	0	0	0	0	0	0	0
7:15 AM				0	15	15	0	2	32	0	24	0	0	0	0	0	0	0	0
7:30 AM				0	25	9	0	12	54	0	26	7	0	0	0	0	0	0	0
7:45 AM				0	28	2	0	9	38	0	19	5	1	0	0	0	0	0	0
8:00 AM				0	20	4	0	5	48	0	28	5	0	0	0	0	0	0	0
8:15 AM				0	19	2	0	9	54	0	21	13	0	0	0	0	0	0	0
8:30 AM				0	15	2	0	5	35	0	22	8	0	0	0	0	0	0	0
8:45 AM				0	14	2	0	3	26	0	19	3	0	0	0	0	0	0	0
Total Survey				0	147	39	0	52	314	0	173	43	1	768	8	0	1	0	0

Peak Hour Summary

7:25 AM to 8:25 AM

By Approach	Northbound Sunset Blvd				Southbound Sunset Blvd				Eastbound Columbia Blvd			Westbound Columbia Blvd			Total	Pedestrians Crosswalk					
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out		Total	Bikes	North	South	East	West
Volume	0	0	0	0	120	60	180	0	229	119	348	0	119	289	408	1	468	4	0	1	0
%HV	0.0%				0.8%				3.9%			2.5%			2.8%						
PHF	0.00				0.73				0.82			0.85			0.85						

By Movement	Northbound Sunset Blvd				Southbound Sunset Blvd				Eastbound Columbia Blvd			Westbound Columbia Blvd			Total		
	Total	L	R	Total	L	T	Total	T	R	Total							
Volume	0	94	26	120	34	195	229	93	26	119	468						
%HV	NA	NA	NA	0.0%	1.1%	NA	0.0%	0.8%	5.9%	3.6%	NA	3.9%	NA	3.2%	0.0%	2.5%	2.8%
PHF		0.00	0.62	0.38	0.73	0.57	0.89	0.82	0.83	0.65	0.85	0.85					

Rolling Hour Summary

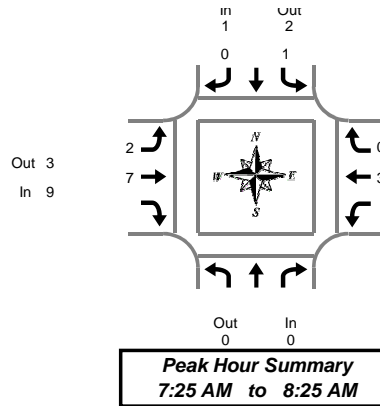
7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd				Southbound Sunset Blvd				Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	L	R	Bikes	L	T	Bikes	T	R	Bikes	North		South	East	West	
7:00 AM				0	79	29	0	30	151	0	83	14	1	386	2	0	0	0	0
7:15 AM				0	88	30	0	28	172	0	97	17	1	432	4	0	0	0	0
7:30 AM				0	92	17	0	35	194	0	94	30	1	462	4	0	1	0	0
7:45 AM				0	82	10	0	28	175	0	90	31	1	416	6	0	1	0	0
8:00 AM				0	68	10	0	22	163	0	90	29	0	382	6	0	1	0	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Sunset Blvd & Columbia Blvd

Tuesday, February 05, 2013

7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	0	0	0	0	0	0	2	2	0	1	1	3
7:10 AM	0	0	0	1	1	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:20 AM	0	0	0	0	0	0	1	1	1	0	0	0	1
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	1	0	1	0	1	1	0	0	0	2
7:35 AM	0	0	0	0	0	2	2	2	2	0	0	0	2
7:40 AM	0	0	0	0	0	2	1	3	3	0	0	0	3
7:45 AM	0	0	0	0	0	0	1	1	1	1	0	1	2
7:50 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
8:05 AM	0	0	0	0	0	0	1	1	1	0	0	0	1
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	1	1	1	0	0	0	1
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:35 AM	0	0	0	0	0	1	0	1	1	0	0	0	1
8:40 AM	0	1	0	1	0	1	0	0	0	2	0	2	3
8:45 AM	0	0	0	0	0	0	1	1	1	0	0	0	1
8:50 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
8:55 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Survey			0	2	1	3	3	11	14	7	1	8	25

Heavy Vehicle 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
7:00 AM	0	0	0	1	1	0	2	2	2	0	1	1	4
7:15 AM	0	0	0	0	0	0	1	1	1	0	0	0	1
7:30 AM	0	1	0	1	2	4	6	6	6	0	0	0	7
7:45 AM	0	0	0	0	0	0	1	1	1	2	0	2	3
8:00 AM	0	0	0	0	0	0	1	1	1	1	0	1	2
8:15 AM	0	0	0	0	0	0	1	1	1	0	0	0	1
8:30 AM	0	1	0	1	1	0	1	1	1	2	0	2	4
8:45 AM	0	0	0	0	0	0	1	1	1	2	0	2	3
Total Survey			0	2	1	3	3	11	14	7	1	8	25

Heavy Vehicle Peak Hour Summary

7:25 AM to 8:25 AM

By Approach	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Columbia Blvd			Westbound Columbia Blvd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	1	2	3	9	3	12	3	8	11	13
PHF	0.00			0.25			0.38			0.38			0.46

By Movement	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Columbia Blvd			Westbound Columbia Blvd			Total	
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total		
Volume			0	1		0	1	2	7	9	3	0	3	13
PHF			0.00	0.25		0.00	0.25	0.25	0.44	0.38	0.38	0.00	0.38	0.46

Heavy Vehicle Rolling Hour Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
7:00 AM	0	1	1	1	2	2	2	8	10	2	1	3	15
7:15 AM	0	1	0	1	2	7	9	9	9	3	0	3	13
7:30 AM	0	1	0	1	2	7	9	9	9	3	0	3	13
7:45 AM	0	1	0	1	1	3	4	4	4	5	0	5	10
8:00 AM	0	1	0	1	1	3	4	4	4	5	0	5	10

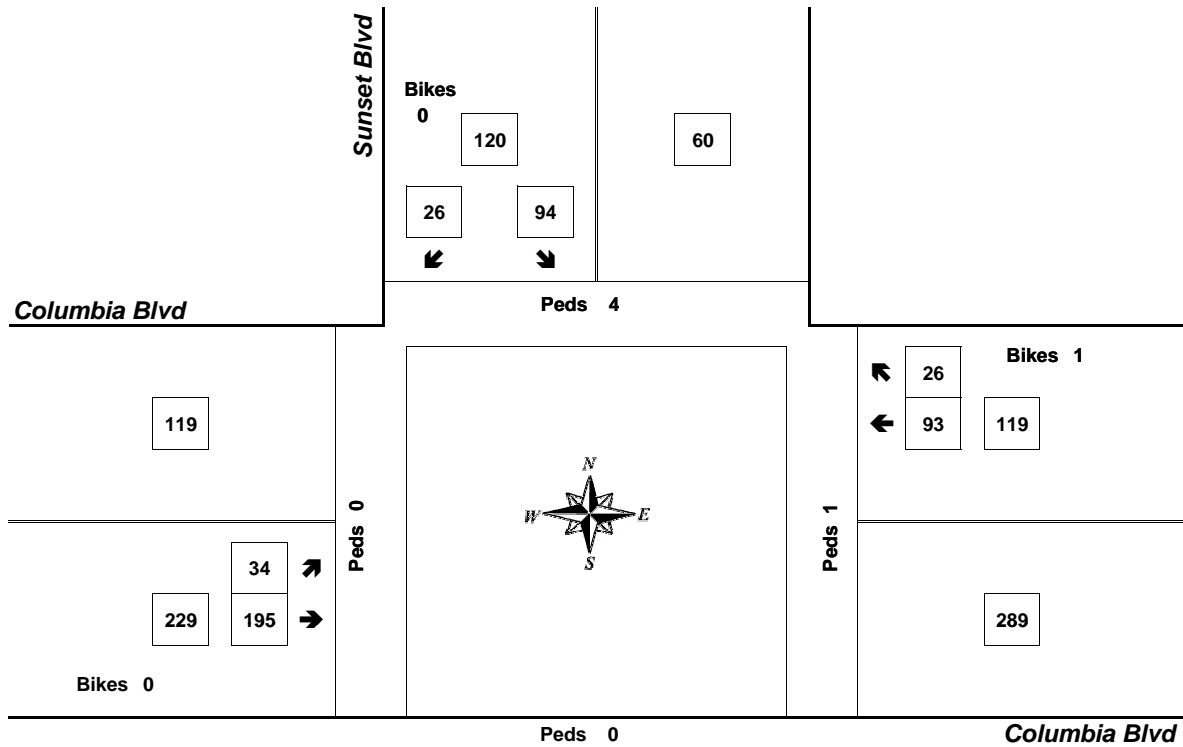
Peak Hour Summary



Clay Carney
(503) 833-2740

Sunset Blvd & Columbia Blvd

7:25 AM to 8:25 AM
Tuesday, February 05, 2013



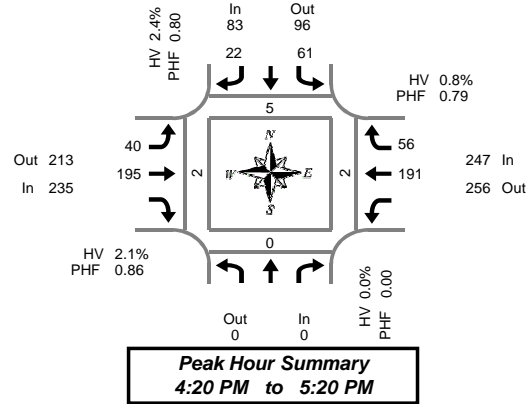
Approach	PHF	HV%	Volume
EB	0.82	3.9%	229
WB	0.85	2.5%	119
NB	0.00	0.0%	0
SB	0.73	0.8%	120
Intersection	0.85	2.8%	468

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary



Clay Carney
(503) 833-2740



Sunset Blvd & Columbia Blvd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd				Southbound Sunset Blvd				Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	L	R	Total	Bikes	L	T	Total	Bikes	T	R		Total	North	South	East
4:00 PM				0	5	2	0	3	14	0	16	3	0	43	4	0	0	0	
4:05 PM				0	7	1	0	2	23	2	17	5	0	55	2	0	0	0	
4:10 PM				0	3	4	0	5	15	0	10	4	0	41	0	0	0	0	
4:15 PM				0	5	2	0	2	27	0	10	4	0	50	0	0	0	0	
4:20 PM				0	6	1	0	4	17	0	13	6	0	47	0	0	0	0	
4:25 PM				0	5	1	0	2	11	0	9	6	0	34	0	0	0	0	
4:30 PM				0	4	2	0	4	17	0	12	4	1	43	0	0	0	0	
4:35 PM				0	7	1	0	4	18	0	14	3	0	47	0	0	0	0	
4:40 PM				0	5	1	0	1	24	0	16	4	0	51	0	0	0	0	
4:45 PM				0	5	0	0	1	19	0	8	4	0	37	0	0	1	0	
4:50 PM				0	4	5	0	4	12	0	24	3	1	52	2	0	0	0	
4:55 PM				0	5	4	0	2	13	0	16	4	0	44	0	0	0	2	
5:00 PM				0	6	2	0	3	16	0	19	5	0	51	2	0	1	0	
5:05 PM				0	4	1	0	5	19	0	20	7	0	56	0	0	0	0	
5:10 PM				0	5	3	0	3	9	0	22	5	0	47	1	0	0	0	
5:15 PM				0	5	1	0	7	20	1	18	5	0	56	0	0	0	0	
5:20 PM				0	4	1	0	4	12	0	17	3	0	41	1	0	0	0	
5:25 PM				0	3	2	0	2	15	0	11	2	0	35	4	0	0	0	
5:30 PM				0	7	3	0	7	15	0	10	5	0	47	2	0	0	0	
5:35 PM				0	3	1	0	4	8	0	9	2	0	27	0	0	0	0	
5:40 PM				0	6	2	0	1	13	0	16	5	0	43	2	0	0	0	
5:45 PM				0	7	1	0	3	12	0	22	5	0	50	0	0	0	0	
5:50 PM				0	6	0	0	6	17	0	10	5	0	44	2	0	0	0	
5:55 PM				0	6	0	0	2	19	0	17	6	0	50	0	0	0	0	
Total Survey				0	123	41	0	81	385	3	356	105	2	1,091	22	0	2	2	

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd				Southbound Sunset Blvd				Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	L	R	Total	Bikes	L	T	Total	Bikes	T	R		Total	North	South	East
4:00 PM				0	15	7	0	10	52	2	43	12	0	139	6	0	0	0	
4:15 PM				0	16	4	0	8	55	0	32	16	0	131	0	0	0	0	
4:30 PM				0	16	4	0	9	59	0	42	11	1	141	0	0	0	0	
4:45 PM				0	14	9	0	7	44	0	48	11	1	133	2	0	1	2	
5:00 PM				0	15	6	0	11	44	0	61	17	0	154	3	0	1	0	
5:15 PM				0	12	4	0	13	47	1	46	10	0	132	5	0	0	0	
5:30 PM				0	16	6	0	12	36	0	35	12	0	117	4	0	0	0	
5:45 PM				0	19	1	0	11	48	0	49	16	0	144	2	0	0	0	
Total Survey				0	123	41	0	81	385	3	356	105	2	1,091	22	0	2	2	

Peak Hour Summary

4:20 PM to 5:20 PM

By Approach	Northbound Sunset Blvd				Southbound Sunset Blvd				Eastbound Columbia Blvd			Westbound Columbia Blvd			Total	Pedestrians Crosswalk					
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out		Total	North	South	East	West	
Volume	0	0	0	0	83	96	179	0	235	213	448	1	247	256	503	2	565	5	0	2	2
%HV	0.0%				2.4%				2.1%			0.8%			1.6%						
PHF	0.00				0.80				0.86			0.79			0.89						

By Movement	Northbound Sunset Blvd				Southbound Sunset Blvd				Eastbound Columbia Blvd			Westbound Columbia Blvd			Total		
	Total	L	R	Total	L	T	Total	T	R	Total	T	R	Total				
Volume	0	61	22	83	40	195	235	191	56	247	565	565					
%HV	NA	NA	NA	0.0%	3.3%	NA	0.0%	2.4%	2.5%	2.1%	NA	2.1%	NA	1.0%	0.0%	0.8%	1.6%
PHF		0.00	0.90	0.50	0.80	0.67	0.80	0.86	0.78	0.82	0.79	0.89					

Rolling Hour Summary

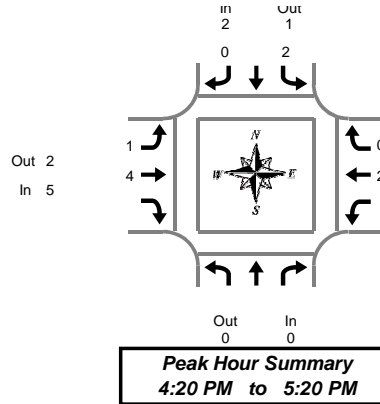
4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd				Southbound Sunset Blvd				Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	L	R	Total	Bikes	L	T	Total	Bikes	T	R		Total	North	South	East
4:00 PM				0	61	24	0	34	210	2	165	50	2	544	8	0	1	2	
4:15 PM				0	61	23	0	35	202	0	183	55	2	559	5	0	2	2	
4:30 PM				0	57	23	0	40	194	1	197	49	2	560	10	0	2	2	
4:45 PM				0	57	25	0	43	171	1	190	50	1	536	14	0	2	2	
5:00 PM				0	62	17	0	47	175	1	191	55	0	547	14	0	1	0	

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Sunset Blvd & Columbia Blvd

Tuesday, February 05, 2013
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	1	1	0	0	0	1
4:05 PM	0	1	1	0	1	1	0	0	0	1	0	1	2
4:10 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	1	1	0	1	1	0	1	1	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	1	1	0	0	0	1
4:35 PM	0	1	1	0	1	1	0	0	0	0	0	0	1
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	0	1	0	1	1	1	0	1	2
4:55 PM	0	0	0	0	0	0	0	1	1	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	1	1	1	0	1	2
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:25 PM	0	0	0	0	0	0	0	1	1	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	0	0	0	1	1	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Survey	0	3	3	0	3	3	1	7	8	5	0	5	16

Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
4:00 PM	0	1	1	0	1	1	0	1	1	2	0	2	4
4:15 PM	0	1	1	0	1	1	0	1	1	0	0	0	2
4:30 PM	0	1	1	0	1	1	0	1	1	0	0	0	2
4:45 PM	0	0	0	0	0	1	1	2	2	1	0	1	3
5:00 PM	0	0	0	0	0	0	0	1	1	1	0	1	2
5:15 PM	0	0	0	0	0	0	0	1	1	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	1	1	0	1	2
Total Survey	0	3	3	0	3	3	1	7	8	5	0	5	16

Heavy Vehicle Peak Hour Summary 4:20 PM to 5:20 PM

By Approach	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Columbia Blvd			Westbound Columbia Blvd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	2	1	3	5	2	7	2	6	8	9
PHF	0.00			0.25			0.42			0.25			0.45

By Movement	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Columbia Blvd			Westbound Columbia Blvd			Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
Volume	0	2	2	0	2	2	1	4	5	2	0	2	9
PHF	0.00	0.25		0.00	0.25		0.25	0.50	0.42	0.25	0.00	0.25	0.45

Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound Sunset Blvd			Southbound Sunset Blvd			Eastbound Columbia Blvd			Westbound Columbia Blvd			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
4:00 PM	0	3	3	0	3	3	1	4	5	3	0	3	11
4:15 PM	0	2	2	0	2	2	1	4	5	2	0	2	9
4:30 PM	0	1	1	0	1	1	1	4	5	2	0	2	8
4:45 PM	0	0	0	0	0	1	3	4	4	2	0	2	6
5:00 PM	0	0	0	0	0	0	3	3	3	2	0	2	5

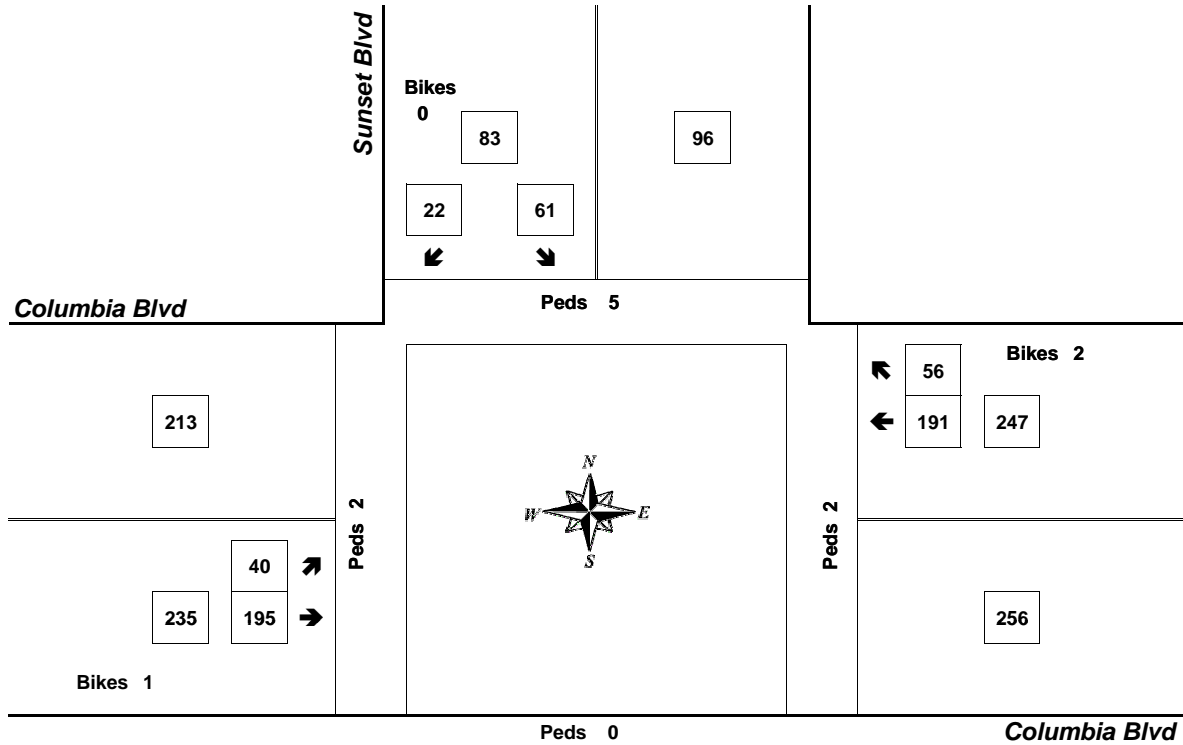
Peak Hour Summary



Clay Carney
(503) 833-2740

Sunset Blvd & Columbia Blvd

4:20 PM to 5:20 PM
Tuesday, February 05, 2013



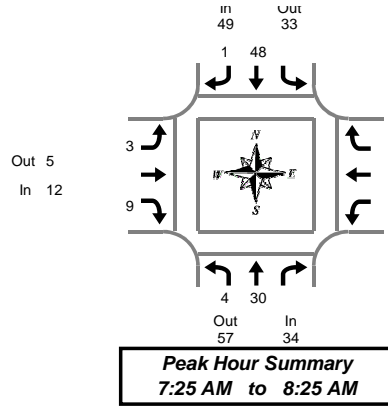
Approach	PHF	HV%	Volume
EB	0.86	2.1%	235
WB	0.79	0.8%	247
NB	0.00	0.0%	0
SB	0.80	2.4%	83
Intersection	0.89	1.6%	565

Count Period: 4:00 PM to 6:00 PM

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Hwy 30 & Pittsburgh Rd

Tuesday, February 05, 2013

7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
7:00 AM	1	3	4	4	1	5	1	0	1			0	10
7:05 AM	0	2	2	2	0	2	0	1	1			0	5
7:10 AM	1	1	2	1	0	1	0	0	0			0	3
7:15 AM	1	1	2	5	1	6	0	1	1			0	9
7:20 AM	1	5	6	6	0	6	1	2	3			0	15
7:25 AM	0	2	2	7	0	7	0	0	0			0	9
7:30 AM	0	5	5	7	1	8	0	0	0			0	13
7:35 AM	0	3	3	2	0	2	1	0	1			0	6
7:40 AM	0	4	4	0	0	0	0	1	1			0	5
7:45 AM	1	1	2	6	0	6	0	0	0			0	8
7:50 AM	0	2	2	5	0	5	1	2	3			0	10
7:55 AM	1	0	1	3	0	3	0	1	1			0	5
8:00 AM	0	3	3	4	0	4	0	1	1			0	8
8:05 AM	1	3	4	1	0	1	0	2	2			0	7
8:10 AM	0	3	3	5	0	5	0	2	2			0	10
8:15 AM	0	2	2	5	0	5	1	0	1			0	8
8:20 AM	1	2	3	3	0	3	0	0	0			0	6
8:25 AM	1	2	3	2	0	2	0	0	0			0	5
8:30 AM	0	4	4	2	3	5	0	0	0			0	9
8:35 AM	2	4	6	3	0	3	0	0	0			0	9
8:40 AM	2	1	3	5	0	5	0	1	1			0	9
8:45 AM	0	7	7	2	0	2	0	1	1			0	10
8:50 AM	0	4	4	3	0	3	1	1	2			0	9
8:55 AM	0	2	2	2	0	2	0	2	2			0	6
Total Survey	13	66	79	85	6	91	6	18	24			0	194

Heavy Vehicle 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
7:00 AM	2	6	8	7	1	8	1	1	2			0	18
7:15 AM	2	8	10	18	1	19	1	3	4			0	33
7:30 AM	0	12	12	9	1	10	1	1	2			0	24
7:45 AM	2	3	5	14	0	14	1	3	4			0	23
8:00 AM	1	9	10	10	0	10	0	5	5			0	25
8:15 AM	2	6	8	10	0	10	1	0	1			0	19
8:30 AM	4	9	13	10	3	13	0	1	1			0	27
8:45 AM	0	13	13	7	0	7	1	4	5			0	25
Total Survey	13	66	79	85	6	91	6	18	24			0	194

Heavy Vehicle Peak Hour Summary

7:25 AM to 8:25 AM

By Approach	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	34	57	91	49	33	82	12	5	17	0	0	0	95
PHF	0.71			0.72			0.60			0.00			0.85

By Movement	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	L	T	Total	T	R	Total	L	R	Total			Total	
Volume	4	30	34	48	1	49	3	9	12			0	95
PHF	0.50	0.63	0.71	0.75	0.25	0.72	0.75	0.45	0.60			0.00	0.85

Heavy Vehicle Rolling Hour Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
7:00 AM	6	29	35	48	3	51	4	8	12			0	98
7:15 AM	5	32	37	51	2	53	3	12	15			0	105
7:30 AM	5	30	35	43	1	44	3	9	12			0	91
7:45 AM	9	27	36	44	3	47	2	9	11			0	94
8:00 AM	7	37	44	37	3	40	2	10	12			0	96

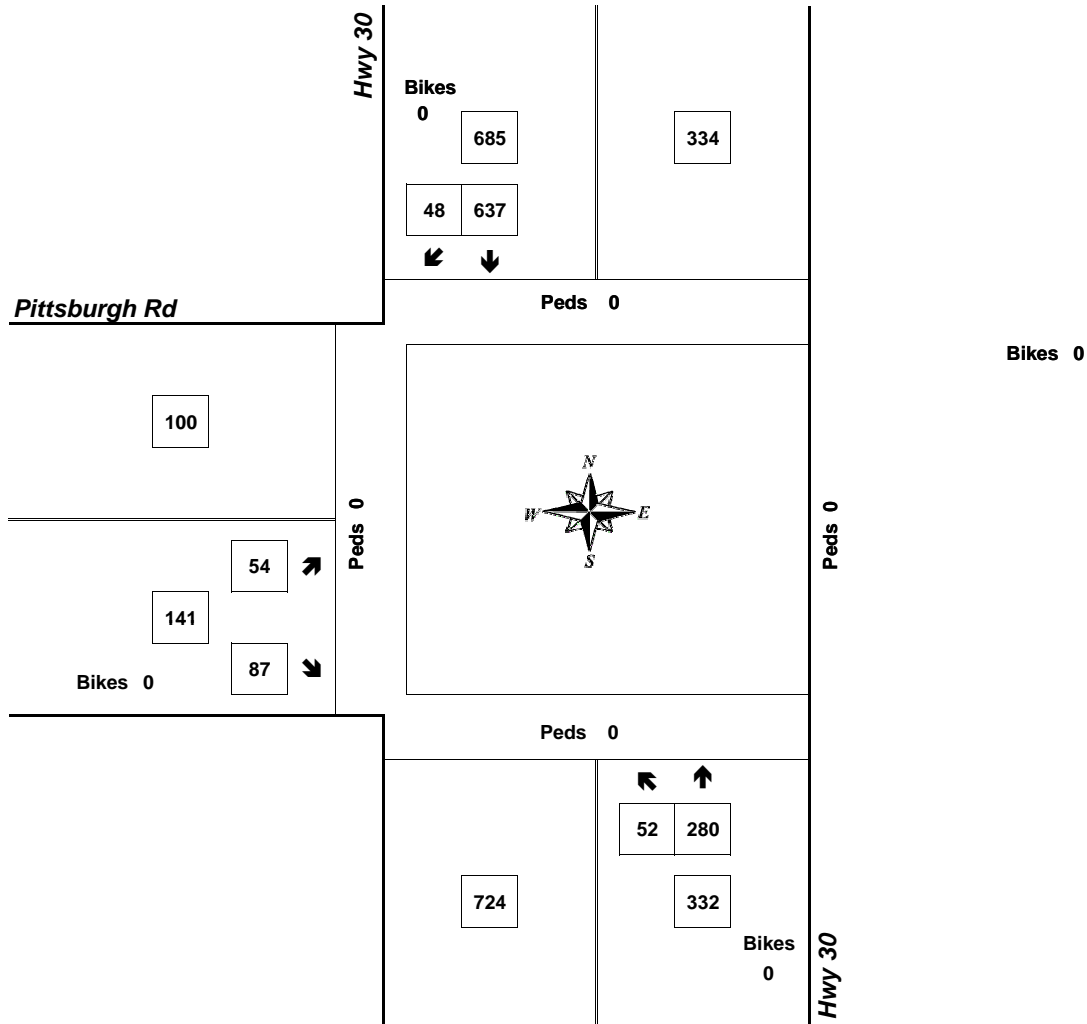
Peak Hour Summary



Clay Carney
(503) 833-2740

Hwy 30 & Pittsburgh Rd

7:25 AM to 8:25 AM
Tuesday, February 05, 2013



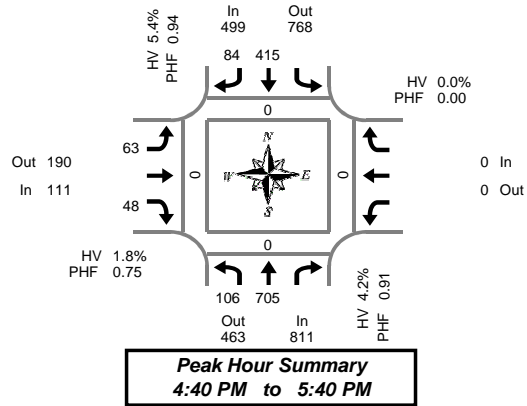
Approach	PHF	HV%	Volume
EB	0.75	8.5%	141
WB	0.00	0.0%	0
NB	0.85	10.2%	332
SB	0.80	7.2%	685
Intersection	0.86	8.2%	1,158

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary



Clay Carney
(503) 833-2740



Hwy 30 & Pittsburgh Rd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes		Bikes				North	South	East
4:00 PM	5	60	0	41	4	0	4	3	0				0	0	0	0	0
4:05 PM	8	63	0	36	5	0	4	8	0				0	0	0	0	0
4:10 PM	5	56	0	38	6	0	3	3	0				0	0	0	0	0
4:15 PM	3	46	0	26	4	0	3	3	0				0	0	0	0	0
4:20 PM	8	62	0	40	5	0	11	2	0				0	0	0	0	0
4:25 PM	5	56	0	21	6	0	2	6	0				0	0	0	0	0
4:30 PM	3	58	0	31	10	0	1	4	0				0	0	0	0	0
4:35 PM	10	47	0	30	8	0	4	4	0				0	0	0	0	0
4:40 PM	8	63	0	34	5	0	11	3	0				0	0	0	0	0
4:45 PM	5	56	0	37	10	0	8	9	0				0	0	0	0	0
4:50 PM	11	76	0	35	6	0	3	3	0				0	0	0	0	0
4:55 PM	13	61	0	35	6	0	3	4	0				0	0	0	0	0
5:00 PM	4	52	0	35	3	0	6	3	0				0	0	0	0	0
5:05 PM	9	66	0	37	9	0	12	4	0				0	0	0	0	0
5:10 PM	10	52	0	36	11	0	3	5	0				0	0	0	0	0
5:15 PM	7	54	0	31	9	0	2	3	0				0	0	0	0	0
5:20 PM	9	57	0	30	10	0	1	4	0				0	0	0	0	0
5:25 PM	9	55	0	42	3	0	4	1	0				0	0	0	0	0
5:30 PM	10	53	0	33	6	0	8	2	0				0	0	0	0	0
5:35 PM	11	60	0	30	6	0	2	7	0				0	0	0	0	0
5:40 PM	4	56	0	29	10	0	7	0	0				0	0	0	0	0
5:45 PM	9	46	0	27	3	0	2	2	0				0	0	0	0	0
5:50 PM	7	61	0	29	3	0	3	3	0				0	0	0	0	0
5:55 PM	6	52	0	30	7	0	6	5	0				0	0	0	0	0
Total Survey	179	1,368	0	793	155	0	113	91	0				0	0	0	0	0

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes		Bikes				North	South	East
4:00 PM	18	179	0	115	15	0	11	14	0				0	0	0	0	0
4:15 PM	16	164	0	87	15	0	16	11	0				0	0	0	0	0
4:30 PM	21	168	0	95	23	0	16	11	0				0	0	0	0	0
4:45 PM	29	193	0	107	22	0	14	16	0				0	0	0	0	0
5:00 PM	23	170	0	108	23	0	21	12	0				0	0	0	0	0
5:15 PM	25	166	0	103	22	0	7	8	0				0	0	0	0	0
5:30 PM	25	169	0	92	22	0	17	9	0				0	0	0	0	0
5:45 PM	22	159	0	86	13	0	11	10	0				0	0	0	0	0
Total Survey	179	1,368	0	793	155	0	113	91	0				0	0	0	0	0

Peak Hour Summary

4:40 PM to 5:40 PM

By Approach	Northbound Hwy 30				Southbound Hwy 30				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total	Pedestrians Crosswalk				
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West	
Volume	811	463	1,274	0	499	768	1,267	0	111	190	301	0	0	0	0	0	0	0	0	0	0	0
%HV	4.2%				5.4%				1.8%				0.0%				4.4%					
PHF	0.91				0.94				0.75				0.00				0.93					

By Movement	Northbound Hwy 30				Southbound Hwy 30				Eastbound Pittsburgh Rd				Westbound Pittsburgh Rd				Total			
	L	T	Total		T	R	Total		L	R	Total		Total							
Volume	106	705	811		415	84	499		63	48	111		0				1,421			
%HV	0.9%	4.7%	NA		6.0%	2.4%	5.4%		1.6%	NA	2.1%		1.8%		NA				0.0%	4.4%
PHF	0.88	0.90	0.91		0.96	0.70	0.94		0.72	0.75	0.75		0.00				0.93			

Rolling Hour Summary

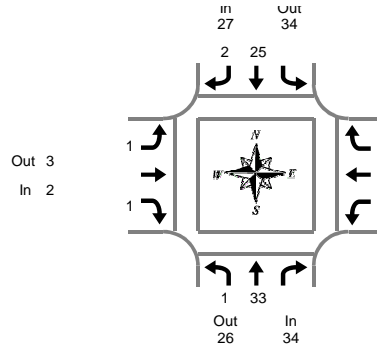
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes		Bikes				North	South	East
4:00 PM	84	704	0	404	75	0	57	52	0				0	0	0	0	0
4:15 PM	89	695	0	397	83	0	67	50	0				0	0	0	0	0
4:30 PM	98	697	0	413	90	0	58	47	0				0	0	0	0	0
4:45 PM	102	698	0	410	89	0	59	45	0				0	0	0	0	0
5:00 PM	95	664	0	389	80	0	56	39	0				0	0	0	0	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Hwy 30 & Pittsburgh Rd

Tuesday, February 05, 2013

4:00 PM to 6:00 PM

Peak Hour Summary
4:40 PM to 5:40 PM

Heavy Vehicle 5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
4:00 PM	0	5	5	3	0	3	0	0	0	0	0	0	8
4:05 PM	0	2	2	2	0	2	0	0	0	0	0	0	4
4:10 PM	0	3	3	4	1	5	1	0	1	0	0	0	9
4:15 PM	0	0	0	2	0	2	0	0	0	0	0	0	2
4:20 PM	2	2	4	3	0	3	0	0	0	0	0	0	7
4:25 PM	0	5	5	0	1	1	0	0	0	0	0	0	6
4:30 PM	0	4	4	1	0	1	0	1	1	0	0	0	6
4:35 PM	0	1	1	4	0	4	0	0	0	0	0	0	5
4:40 PM	0	1	1	2	0	2	0	0	0	0	0	0	3
4:45 PM	0	3	3	3	0	3	0	0	0	0	0	0	6
4:50 PM	0	4	4	1	0	1	1	0	1	0	0	0	6
4:55 PM	0	2	2	1	1	2	0	0	0	0	0	0	4
5:00 PM	0	7	7	1	0	1	0	0	0	0	0	0	8
5:05 PM	0	2	2	5	0	5	0	0	0	0	0	0	7
5:10 PM	0	2	2	5	0	5	0	0	0	0	0	0	7
5:15 PM	0	1	1	2	0	2	0	0	0	0	0	0	3
5:20 PM	0	2	2	0	1	1	0	0	0	0	0	0	3
5:25 PM	1	1	2	4	0	4	0	0	0	0	0	0	6
5:30 PM	0	4	4	1	0	1	0	0	0	0	0	0	5
5:35 PM	0	4	4	0	0	0	0	1	1	0	0	0	5
5:40 PM	0	0	0	4	0	4	0	0	0	0	0	0	4
5:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	1
5:50 PM	0	1	1	0	0	0	0	0	0	0	0	0	1
5:55 PM	1	5	6	2	0	2	0	0	0	0	0	0	8
Total Survey	4	61	65	51	4	55	2	2	4			0	124

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
4:00 PM	0	10	10	9	1	10	1	0	1	0	0	0	21
4:15 PM	2	7	9	5	1	6	0	0	0	0	0	0	15
4:30 PM	0	6	6	7	0	7	0	1	1	0	0	0	14
4:45 PM	0	9	9	5	1	6	1	0	1	0	0	0	16
5:00 PM	0	11	11	11	0	11	0	0	0	0	0	0	22
5:15 PM	1	4	5	6	1	7	0	0	0	0	0	0	12
5:30 PM	0	8	8	5	0	5	0	1	1	0	0	0	14
5:45 PM	1	6	7	3	0	3	0	0	0	0	0	0	10
Total Survey	4	61	65	51	4	55	2	2	4			0	124

Heavy Vehicle Peak Hour Summary

4:40 PM to 5:40 PM

By Approach	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	34	26	60	27	34	61	2	3	5	0	0	0	63
PHF	0.65			0.56			0.50			0.00			0.72

By Movement	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Total
	L	T	Total	T	R	Total	L	R	Total			Total	
Volume	1	33	34	25	2	27	1	1	2			0	63
PHF	0.25	0.63	0.65	0.52	0.50	0.56	0.25	0.25	0.50			0.00	0.72

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 30			Southbound Hwy 30			Eastbound Pittsburgh Rd			Westbound Pittsburgh Rd			Interval Total
	L	T	Total	T	R	Total	L	R	Total			Total	
4:00 PM	2	32	34	26	3	29	2	1	3			0	66
4:15 PM	2	33	35	28	2	30	1	1	2			0	67
4:30 PM	1	30	31	29	2	31	1	1	2			0	64
4:45 PM	1	32	33	27	2	29	1	1	2			0	64
5:00 PM	2	29	31	25	1	26	0	1	1			0	58

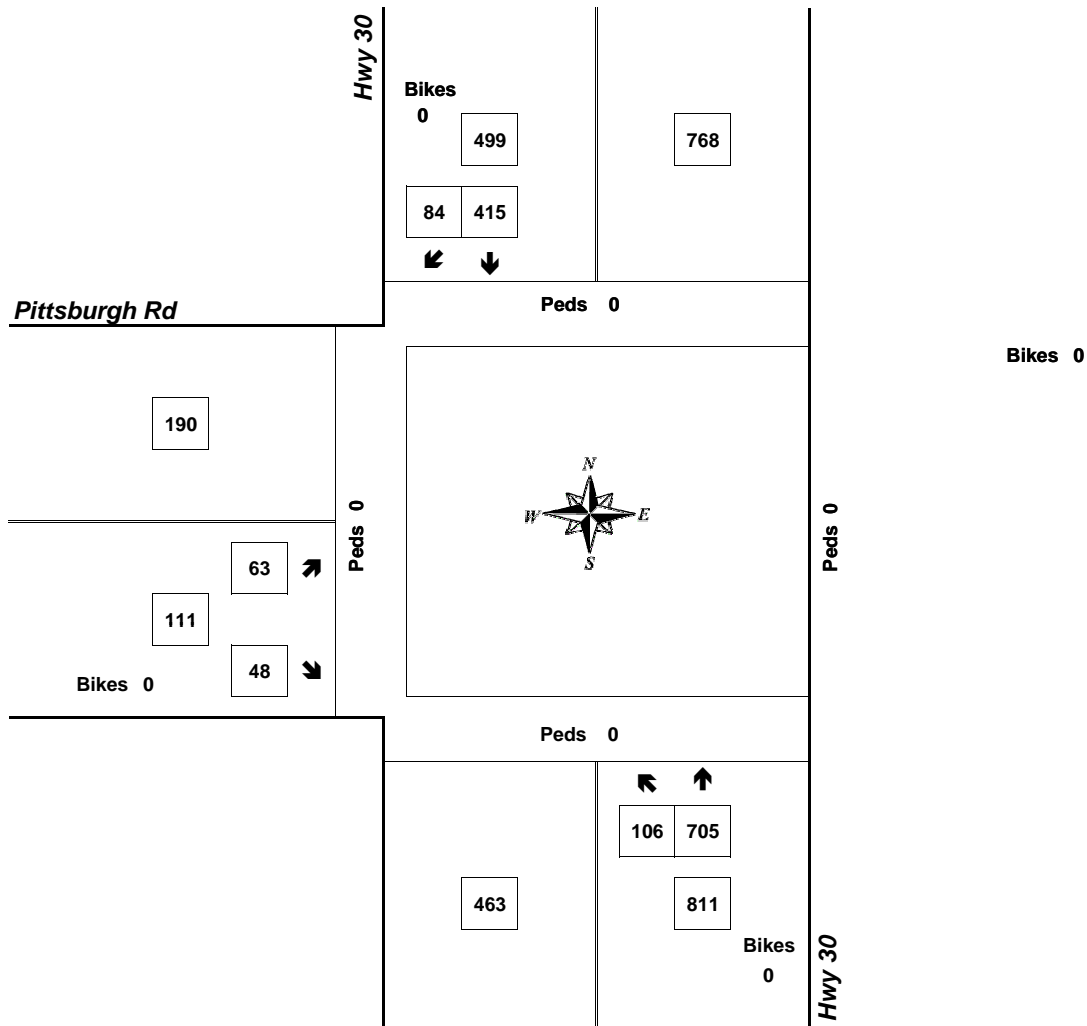
Peak Hour Summary



Clay Carney
(503) 833-2740

Hwy 30 & Pittsburgh Rd

4:40 PM to 5:40 PM
Tuesday, February 05, 2013




















Approach	PHF	HV%	Volume
EB	0.75	1.8%	111
WB	0.00	0.0%	0
NB	0.91	4.2%	811
SB	0.94	5.4%	499
Intersection	0.93	4.4%	1,421

Count Period: 4:00 PM to 6:00 PM

HCM Unsignalized Intersection Capacity Analysis
 1: Pittsburgh Rd & Hankey Rd

Existing Conditions
 Morning Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	189	1	0	101	11	0	0	0	30	1	7
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	4	239	1	0	128	14	0	0	0	38	1	9
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	142			241			392	389	240	382	383	135
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	142			241			392	389	240	382	383	135
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	100			100			100	100	100	93	100	99
cM capacity (veh/h)	1435			1314			563	548	804	562	538	896
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	244	142	0	39	9							
Volume Left	4	0	0	38	0							
Volume Right	1	14	0	0	9							
cSH	1435	1314	1700	561	896							
Volume to Capacity	0.00	0.00	0.00	0.07	0.01							
Queue Length 95th (ft)	0	0	0	6	1							
Control Delay (s)	0.1	0.0	0.0	11.9	9.1							
Lane LOS	A		A	B	A							
Approach Delay (s)	0.1	0.0	0.0	11.4								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			23.5%		ICU Level of Service					A		
Analysis Period (min)			15									













HCM Unsignalized Intersection Capacity Analysis
 2: Pittsburgh Rd & Sunset Blvd

Existing Conditions
 Morning Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	166	58	9	92	18	21
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	202	71	11	112	22	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			273		372	238
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			273		372	238
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			99		96	97
cM capacity (veh/h)			1279		616	791
Direction, Lane #	EB 1	WB 1	NB 1	NB 2		
Volume Total	273	123	22	26		
Volume Left	0	11	22	0		
Volume Right	71	0	0	26		
cSH	1700	1279	616	791		
Volume to Capacity	0.16	0.01	0.04	0.03		
Queue Length 95th (ft)	0	1	3	3		
Control Delay (s)	0.0	0.8	11.1	9.7		
Lane LOS		A	B	A		
Approach Delay (s)	0.0	0.8	10.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			23.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 3: Pittsburgh Rd & Hwy 30

Existing Conditions
 Morning Peak

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Sign Control	Stop			Free	Free			
Grade	0%			0%	0%			
Volume (veh/h)	60	97	58	311	708	53		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86		
Hourly flow rate (vph)	70	113	67	362	823	62		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type	TWLTL							
Median storage veh	0							
Upstream signal (ft)								
pX, platoon unblocked								
vC, conflicting volume	1139	412	885					
vC1, stage 1 conf vol	823							
vC2, stage 2 conf vol	316							
vCu, unblocked vol	1139	412	885					
tC, single (s)	7.0	7.1	4.3					
tC, 2 stage (s)	6.0							
tF (s)	3.6	3.4	2.3					
p0 queue free %	67	80	91					
cM capacity (veh/h)	211	570	712					
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	70	113	67	181	181	412	412	62
Volume Left	70	0	67	0	0	0	0	0
Volume Right	0	113	0	0	0	0	0	62
cSH	211	570	712	1700	1700	1700	1700	1700
Volume to Capacity	0.33	0.20	0.09	0.11	0.11	0.24	0.24	0.04
Queue Length 95th (ft)	34	18	8	0	0	0	0	0
Control Delay (s)	30.3	12.9	10.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B	B					
Approach Delay (s)	19.5		1.7			0.0		
Approach LOS	C							
Intersection Summary								
Average Delay			2.9					
Intersection Capacity Utilization			38.3%			ICU Level of Service		A
Analysis Period (min)			15					

HCM Unsignalized Intersection Capacity Analysis
4: Columbia Blvd & Sunset Blvd
























Existing Conditions
Morning Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	38	217	103	29	104	29
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	45	255	121	34	122	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)			329			
pX, platoon unblocked						
vC, conflicting volume	155				483	138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	155				483	138
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				77	96
cM capacity (veh/h)	1413				527	913
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	300	155	156			
Volume Left	45	0	122			
Volume Right	0	34	34			
cSH	1413	1700	581			
Volume to Capacity	0.03	0.09	0.27			
Queue Length 95th (ft)	2	0	27			
Control Delay (s)	1.4	0.0	13.5			
Lane LOS	A		B			
Approach Delay (s)	1.4	0.0	13.5			
Approach LOS			B			
Intersection Summary						
Average Delay			4.1			
Intersection Capacity Utilization		40.7%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
5: Columbia Blvd & Hwy 30

Existing Conditions
Morning Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 						 			 	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0				4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	1.00				1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3156	1430				1525	3050	1365	1554	3107	1390
Flt Permitted		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3156	1430				1525	3050	1365	1554	3107	1390
Volume (vph)	67	192	53	0	0	0	28	352	199	142	762	144
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	74	213	59	0	0	0	31	391	221	158	847	160
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	112	0	0	98
Lane Group Flow (vph)	0	287	10	0	0	0	31	391	109	158	847	62
Heavy Vehicles (%)	4%	4%	4%	0%	0%	0%	9%	9%	9%	7%	7%	7%
Turn Type	Perm		Perm				Prot		Perm	Prot		Perm
Protected Phases		8					1	6		5		2
Permitted Phases	8		8						6			2
Actuated Green, G (s)		11.9	11.9				20.7	36.1	36.1	12.6	28.0	28.0
Effective Green, g (s)		12.4	12.4				21.2	36.6	36.6	13.1	28.5	28.5
Actuated g/C Ratio		0.17	0.17				0.29	0.49	0.49	0.18	0.38	0.38
Clearance Time (s)		4.5	4.5				4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		528	239				436	1506	674	275	1195	535
v/s Ratio Prot							0.02	c0.13		c0.10	c0.27	
v/s Ratio Perm		0.09	0.01						0.08			0.04
v/c Ratio		0.54	0.04				0.07	0.26	0.16	0.57	0.71	0.12
Uniform Delay, d1		28.3	25.9				19.3	10.9	10.3	27.9	19.3	14.7
Progression Factor		1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.1	0.1				0.3	0.4	0.5	2.9	2.0	0.1
Delay (s)		29.4	25.9				19.6	11.3	10.8	30.8	21.2	14.8
Level of Service		C	C				B	B	B	C	C	B
Approach Delay (s)		28.8			0.0			11.5			21.7	
Approach LOS		C			A			B			C	


















Intersection Summary

HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	74.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 1: Pittsburgh Rd & Hankey Rd

Existing Conditions
 Evening Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	123	0	2	200	24	1	0	1	9	1	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	137	0	2	222	27	1	0	1	10	1	3
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	249			137			403	412	137	400	399	236
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	249			137			403	412	137	400	399	236
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	98	100	100
cM capacity (veh/h)	1323			1454			554	528	917	559	537	808
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	148	251	2	11	3							
Volume Left	11	2	1	10	0							
Volume Right	0	27	1	0	3							
cSH	1323	1454	691	557	808							
Volume to Capacity	0.01	0.00	0.00	0.02	0.00							
Queue Length 95th (ft)	1	0	0	2	0							
Control Delay (s)	0.6	0.1	10.2	11.6	9.5							
Lane LOS	A	A	B	B	A							
Approach Delay (s)	0.6	0.1	10.2	11.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			29.8%			ICU Level of Service				A		
Analysis Period (min)			15									















HCM Unsignalized Intersection Capacity Analysis
2: Pittsburgh Rd & Sunset Blvd

Existing Conditions
Evening Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	100	31	24	206	30	11
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	106	33	26	219	32	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			139		393	123
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			139		393	123
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		95	99
cM capacity (veh/h)			1450		604	934
Direction, Lane #	EB 1	WB 1	NB 1	NB 2		
Volume Total	139	245	32	12		
Volume Left	0	26	32	0		
Volume Right	33	0	0	12		
cSH	1700	1450	604	934		
Volume to Capacity	0.08	0.02	0.05	0.01		
Queue Length 95th (ft)	0	1	4	1		
Control Delay (s)	0.0	0.9	11.3	8.9		
Lane LOS		A	B	A		
Approach Delay (s)	0.0	0.9	10.6			
Approach LOS			B			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			34.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
3: Pittsburgh Rd & Hwy 30

Existing Conditions
Evening Peak

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations				 	 			
Sign Control	Stop			Free	Free			
Grade	0%			0%	0%			
Volume (veh/h)	72	50	117	769	461	96		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	78	54	127	836	501	104		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type	TWLTL							
Median storage veh	0							
Upstream signal (ft)								
pX, platoon unblocked								
vC, conflicting volume	1173	251	605					
vC1, stage 1 conf vol	501							
vC2, stage 2 conf vol	672							
vCu, unblocked vol	1173	251	605					
tC, single (s)	6.8	6.9	4.2					
tC, 2 stage (s)	5.8							
tF (s)	3.5	3.3	2.2					
p0 queue free %	64	93	87					
cM capacity (veh/h)	215	752	955					
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	78	54	127	418	418	251	251	104
Volume Left	78	0	127	0	0	0	0	0
Volume Right	0	54	0	0	0	0	0	104
cSH	215	752	955	1700	1700	1700	1700	1700
Volume to Capacity	0.36	0.07	0.13	0.25	0.25	0.15	0.15	0.06
Queue Length 95th (ft)	39	6	11	0	0	0	0	0
Control Delay (s)	31.0	10.2	9.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B	A					
Approach Delay (s)	22.4		1.2			0.0		
Approach LOS	C							
Intersection Summary								
Average Delay			2.4					
Intersection Capacity Utilization			35.2%	ICU Level of Service	A			
Analysis Period (min)			15					

HCM Unsignalized Intersection Capacity Analysis
4: Columbia Blvd & Sunset Blvd





















Existing Conditions
Evening Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	48	213	217	56	67	27
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	54	239	244	63	75	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)			329			
pX, platoon unblocked						
vC, conflicting volume	307				622	275
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	307				622	275
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				83	96
cM capacity (veh/h)	1254				432	766
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	293	307	106			
Volume Left	54	0	75			
Volume Right	0	63	30			
cSH	1254	1700	494			
Volume to Capacity	0.04	0.18	0.21			
Queue Length 95th (ft)	3	0	20			
Control Delay (s)	1.8	0.0	14.3			
Lane LOS	A		B			
Approach Delay (s)	1.8	0.0	14.3			
Approach LOS			B			
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization		47.0%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
5: Columbia Blvd & Hwy 30

Existing Conditions
Evening Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0				4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	1.00				1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3214	1458				1599	3197	1430	1599	3197	1430
Flt Permitted		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3214	1458				1599	3197	1430	1599	3197	1430
Volume (vph)	78	199	44	0	0	0	33	692	258	108	709	234
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	86	219	48	0	0	0	36	760	284	119	779	257
RTOR Reduction (vph)	0	0	40	0	0	0	0	0	139	0	0	161
Lane Group Flow (vph)	0	305	8	0	0	0	36	760	145	119	779	96
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm				Prot		Perm	Prot		Perm
Protected Phases		8					1	6		5		2
Permitted Phases	8		8						6			2
Actuated Green, G (s)		12.1	12.1				20.7	36.7	36.7	10.6	26.6	26.6
Effective Green, g (s)		12.6	12.6				21.2	37.2	37.2	11.1	27.1	27.1
Actuated g/C Ratio		0.17	0.17				0.29	0.51	0.51	0.15	0.37	0.37
Clearance Time (s)		4.5	4.5				4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		556	252				465	1631	730	243	1188	532
v/s Ratio Prot							0.02	c0.24		c0.07	c0.24	
v/s Ratio Perm		0.09	0.01						0.10			0.07
v/c Ratio		0.55	0.03				0.08	0.47	0.20	0.49	0.66	0.18
Uniform Delay, d1		27.6	25.1				18.8	11.5	9.7	28.3	19.0	15.4
Progression Factor		1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.1	0.1				0.3	1.0	0.6	1.6	1.3	0.2
Delay (s)		28.7	25.1				19.1	12.4	10.3	29.9	20.3	15.6
Level of Service		C	C				B	B	B	C	C	B
Approach Delay (s)		28.2			0.0			12.1			20.3	
Approach LOS		C			A			B			C	
Intersection Summary												
HCM Average Control Delay			17.9				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			72.9				Sum of lost time (s)		16.0			
Intersection Capacity Utilization			45.7%				ICU Level of Service		A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 1: Pittsburgh Rd & Hankey Rd

Background
 Morning Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↕
Sign Control		Free			Free			Stop			Stop	↕
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	201	1	0	107	12	0	0	0	32	1	7
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	4	254	1	0	135	15	0	0	0	41	1	9
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	151			256			415	413	255	406	406	143
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	151			256			415	413	255	406	406	143
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	100			100			100	100	100	93	100	99
cM capacity (veh/h)	1424			1298			544	531	788	542	522	886
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	259	151	0	42	9							
Volume Left	4	0	0	41	0							
Volume Right	1	15	0	0	9							
cSH	1424	1298	1700	542	886							
Volume to Capacity	0.00	0.00	0.00	0.08	0.01							
Queue Length 95th (ft)	0	0	0	6	1							
Control Delay (s)	0.1	0.0	0.0	12.2	9.1							
Lane LOS	A		A	B	A							
Approach Delay (s)	0.1	0.0	0.0	11.7								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			24.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Pittsburgh Rd & Sunset Blvd

Background
 Morning Peak



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	176	62	10	98	19	22
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	215	76	12	120	23	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			290		396	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			290		396	252
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			99		96	97
cM capacity (veh/h)			1260		595	777

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	290	132	23	27
Volume Left	0	12	23	0
Volume Right	76	0	0	27
cSH	1700	1260	595	777
Volume to Capacity	0.17	0.01	0.04	0.03
Queue Length 95th (ft)	0	1	3	3
Control Delay (s)	0.0	0.8	11.3	9.8
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.8	10.5	
Approach LOS			B	

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization	24.6%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
3: Pittsburgh Rd & Hwy 30

Background
Morning Peak



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	64	103	62	330	752	56
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	74	120	72	384	874	65
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL					
Median storage veh	0					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1210	437	940			
vC1, stage 1 conf vol	874					
vC2, stage 2 conf vol	336					
vCu, unblocked vol	1210	437	940			
tC, single (s)	7.0	7.1	4.3			
tC, 2 stage (s)	6.0					
tF (s)	3.6	3.4	2.3			
p0 queue free %	62	78	89			
cM capacity (veh/h)	196	548	678			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	74	120	72	192	192	437	437	65
Volume Left	74	0	72	0	0	0	0	0
Volume Right	0	120	0	0	0	0	0	65
cSH	196	548	678	1700	1700	1700	1700	1700
Volume to Capacity	0.38	0.22	0.11	0.11	0.11	0.26	0.26	0.04
Queue Length 95th (ft)	41	21	9	0	0	0	0	0
Control Delay (s)	34.1	13.4	10.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B	B					
Approach Delay (s)	21.3		1.7			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay		3.1	
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Columbia Blvd & Sunset Blvd





















Background
Morning Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	40	230	109	31	110	31
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	47	271	128	36	129	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)			329			
pX, platoon unblocked						
vC, conflicting volume	165				511	146
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	165				511	146
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				74	96
cM capacity (veh/h)	1402				507	903
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	318	165	166			
Volume Left	47	0	129			
Volume Right	0	36	36			
cSH	1402	1700	561			
Volume to Capacity	0.03	0.10	0.30			
Queue Length 95th (ft)	3	0	31			
Control Delay (s)	1.4	0.0	14.1			
Lane LOS	A		B			
Approach Delay (s)	1.4	0.0	14.1			
Approach LOS			B			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization		42.5%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
5: Columbia Blvd & Hwy 30


















Background
Morning Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0				4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	1.00				1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3156	1430				1525	3050	1365	1554	3107	1390
Flt Permitted		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3156	1430				1525	3050	1365	1554	3107	1390
Volume (vph)	71	204	56	0	0	0	30	374	211	151	809	153
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	227	62	0	0	0	33	416	234	168	899	170
RTOR Reduction (vph)	0	0	51	0	0	0	0	0	120	0	0	104
Lane Group Flow (vph)	0	306	11	0	0	0	33	416	114	168	899	66
Heavy Vehicles (%)	4%	4%	4%	0%	0%	0%	9%	9%	9%	7%	7%	7%
Turn Type	Perm		Perm				Prot		Perm	Prot		Perm
Protected Phases		8					1	6		5	2	
Permitted Phases	8		8						6			2
Actuated Green, G (s)		12.5	12.5				20.7	36.5	36.5	13.2	29.0	29.0
Effective Green, g (s)		13.0	13.0				21.2	37.0	37.0	13.7	29.5	29.5
Actuated g/C Ratio		0.17	0.17				0.28	0.49	0.49	0.18	0.39	0.39
Clearance Time (s)		4.5	4.5				4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		542	246				427	1491	667	281	1211	542
v/s Ratio Prot							0.02	c0.14		c0.11	c0.29	
v/s Ratio Perm		0.10	0.01						0.08			0.05
v/c Ratio		0.56	0.04				0.08	0.28	0.17	0.60	0.74	0.12
Uniform Delay, d1		28.8	26.2				20.1	11.5	10.8	28.5	19.8	14.8
Progression Factor		1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.4	0.1				0.4	0.5	0.6	3.4	2.5	0.1
Delay (s)		30.1	26.2				20.4	11.9	11.4	31.9	22.3	14.9
Level of Service		C	C				C	B	B	C	C	B
Approach Delay (s)		29.5		0.0				12.1			22.6	
Approach LOS		C		A				B			C	
Intersection Summary												
HCM Average Control Delay			20.6				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			75.7				Sum of lost time (s)		16.0			
Intersection Capacity Utilization			46.0%				ICU Level of Service		A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 1: Pittsburgh Rd & Hankey Rd

Background
 Evening Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	131	0	2	212	25	1	0	1	10	1	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	146	0	2	236	28	1	0	1	11	1	3
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	263			146			428	438	146	425	424	249
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			146			428	438	146	425	424	249
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	98	100	100
cM capacity (veh/h)	1307			1443			533	510	907	538	519	794
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	158	266	2	12	3							
Volume Left	12	2	1	11	0							
Volume Right	0	28	1	0	3							
cSH	1307	1443	672	536	794							
Volume to Capacity	0.01	0.00	0.00	0.02	0.00							
Queue Length 95th (ft)	1	0	0	2	0							
Control Delay (s)	0.7	0.1	10.4	11.9	9.6							
Lane LOS	A	A	B	B	A							
Approach Delay (s)	0.7	0.1	10.4	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			30.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Pittsburgh Rd & Sunset Blvd

Background
 Evening Peak

















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	106	33	25	219	32	12
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	113	35	27	233	34	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			148		416	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			148		416	130
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		94	99
cM capacity (veh/h)			1440		586	925

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	148	260	34	13
Volume Left	0	27	34	0
Volume Right	35	0	0	13
cSH	1700	1440	586	925
Volume to Capacity	0.09	0.02	0.06	0.01
Queue Length 95th (ft)	0	1	5	1
Control Delay (s)	0.0	0.9	11.5	8.9
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.9	10.8	
Approach LOS			B	

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Pittsburgh Rd & Hwy 30

Background
Evening Peak

											
Movement	EBL	EBR	NBL	NBT	SBT	SBR					
Lane Configurations				 	 						
Sign Control	Stop			Free		Free					
Grade	0%			0%		0%					
Volume (veh/h)	76	53	124	816	489	102					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	83	58	135	887	532	111					
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type	TWLTL										
Median storage veh)	0										
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	1245	266	642								
vC1, stage 1 conf vol	532										
vC2, stage 2 conf vol	713										
vCu, unblocked vol	1245	266	642								
tC, single (s)	6.8	6.9	4.2								
tC, 2 stage (s)	5.8										
tF (s)	3.5	3.3	2.2								
p0 queue free %	59	92	85								
cM capacity (veh/h)	201	736	925								
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3			
Volume Total	83	58	135	443	443	266	266	111			
Volume Left	83	0	135	0	0	0	0	0			
Volume Right	0	58	0	0	0	0	0	111			
cSH	201	736	925	1700	1700	1700	1700	1700			
Volume to Capacity	0.41	0.08	0.15	0.26	0.26	0.16	0.16	0.07			
Queue Length 95th (ft)	47	6	13	0	0	0	0	0			
Control Delay (s)	34.9	10.3	9.6	0.0	0.0	0.0	0.0	0.0			
Lane LOS	D	B	A								
Approach Delay (s)	24.8		1.3		0.0						
Approach LOS	C										
Intersection Summary											
Average Delay			2.6								
Intersection Capacity Utilization			36.7%		ICU Level of Service		A				
Analysis Period (min)			15								

HCM Unsignalized Intersection Capacity Analysis
4: Columbia Blvd & Sunset Blvd





















Background
Evening Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	51	226	230	59	71	29
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	57	254	258	66	80	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)			329			
pX, platoon unblocked						
vC, conflicting volume	325				660	292
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	325				660	292
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				81	96
cM capacity (veh/h)	1235				410	750
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	311	325	112			
Volume Left	57	0	80			
Volume Right	0	66	33			
cSH	1235	1700	472			
Volume to Capacity	0.05	0.19	0.24			
Queue Length 95th (ft)	4	0	23			
Control Delay (s)	1.8	0.0	15.0			
Lane LOS	A		C			
Approach Delay (s)	1.8	0.0	15.0			
Approach LOS			C			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization		49.2%		ICU Level of Service		A
Analysis Period (min)			15			


















HCM Signalized Intersection Capacity Analysis
5: Columbia Blvd & Hwy 30

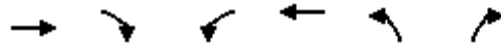
Background
Evening Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0				4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	1.00				1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3215	1458				1599	3197	1430	1599	3197	1430
Flt Permitted		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3215	1458				1599	3197	1430	1599	3197	1430
Volume (vph)	83	211	47	0	0	0	35	735	274	115	753	248
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	91	232	52	0	0	0	38	808	301	126	827	273
RTOR Reduction (vph)	0	0	43	0	0	0	0	0	149	0	0	171
Lane Group Flow (vph)	0	323	9	0	0	0	38	808	152	126	827	102
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm				Prot		Perm	Prot		Perm
Protected Phases		8					1	6		5		2
Permitted Phases	8		8						6			2
Actuated Green, G (s)		12.6	12.6				20.8	37.0	37.0	11.0	27.2	27.2
Effective Green, g (s)		13.1	13.1				21.3	37.5	37.5	11.5	27.7	27.7
Actuated g/C Ratio		0.18	0.18				0.29	0.51	0.51	0.16	0.37	0.37
Clearance Time (s)		4.5	4.5				4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		568	258				460	1618	724	248	1195	535
v/s Ratio Prot							0.02	c0.25		c0.08	c0.26	
v/s Ratio Perm		0.10	0.01						0.11			0.07
v/c Ratio		0.57	0.04				0.08	0.50	0.21	0.51	0.69	0.19
Uniform Delay, d1		27.9	25.3				19.3	12.1	10.1	28.7	19.6	15.6
Progression Factor		1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.3	0.1				0.4	1.1	0.7	1.6	1.8	0.2
Delay (s)		29.2	25.3				19.6	13.2	10.8	30.3	21.3	15.8
Level of Service		C	C				B	B	B	C	C	B
Approach Delay (s)		28.7			0.0			12.8			21.0	
Approach LOS		C			A			B			C	
Intersection Summary												
HCM Average Control Delay			18.6				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			74.1				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			47.9%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 1: Pittsburgh Rd & Hankey Rd

Background + Site Trips
 Morning Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	201	1	0	107	22	0	0	0	63	1	10
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	5	254	1	0	135	28	0	0	0	80	1	13
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	163			256			428	428	255	415	415	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	163			256			428	428	255	415	415	149
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	100			100			100	100	100	85	100	99
cM capacity (veh/h)	1409			1298			530	520	788	535	515	879
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	261	163	0	81	13							
Volume Left	5	0	0	80	0							
Volume Right	1	28	0	0	13							
cSH	1409	1298	1700	534	879							
Volume to Capacity	0.00	0.00	0.00	0.15	0.01							
Queue Length 95th (ft)	0	0	0	13	1							
Control Delay (s)	0.2	0.0	0.0	12.9	9.2							
Lane LOS	A			A	B							
Approach Delay (s)	0.2	0.0	0.0	12.4								
Approach LOS				A	B							
Intersection Summary												
Average Delay				2.3								
Intersection Capacity Utilization			25.5%			ICU Level of Service				A		
Analysis Period (min)			15									

















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	189	80	10	102	25	22
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	230	98	12	124	30	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			328		428	279
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			328		428	279
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			99		95	96
cM capacity (veh/h)			1220		570	750

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	328	137	30	27
Volume Left	0	12	30	0
Volume Right	98	0	0	27
cSH	1700	1220	570	750
Volume to Capacity	0.19	0.01	0.05	0.04
Queue Length 95th (ft)	0	1	4	3
Control Delay (s)	0.0	0.8	11.7	10.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.8	10.9	
Approach LOS			B	

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization	26.1%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
3: Pittsburgh Rd & Hwy 30

Background + Site Trips
Morning Peak

												
Movement	EBL	EBR	NBL	NBT	SBT	SBR						
Lane Configurations				 	 							
Sign Control	Stop			Free		Free						
Grade	0%			0%	0%							
Volume (veh/h)	71	109	68	330	752	58						
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86						
Hourly flow rate (vph)	83	127	79	384	874	67						
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL											
Median storage veh	0											
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1224	437	942									
vC1, stage 1 conf vol	874											
vC2, stage 2 conf vol	350											
vCu, unblocked vol	1224	437	942									
tC, single (s)	7.0	7.1	4.3									
tC, 2 stage (s)	6.0											
tF (s)	3.6	3.4	2.3									
p0 queue free %	57	77	88									
cM capacity (veh/h)	194	548	676									
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	83	127	79	192	192	437	437	67				
Volume Left	83	0	79	0	0	0	0	0				
Volume Right	0	127	0	0	0	0	0	67				
cSH	194	548	676	1700	1700	1700	1700	1700				
Volume to Capacity	0.43	0.23	0.12	0.11	0.11	0.26	0.26	0.04				
Queue Length 95th (ft)	49	22	10	0	0	0	0	0				
Control Delay (s)	36.7	13.5	11.0	0.0	0.0	0.0	0.0	0.0				
Lane LOS	E	B	B									
Approach Delay (s)	22.7		1.9				0.0					
Approach LOS	C											
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			40.9%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
4: Columbia Blvd & Sunset Blvd





















Background + Site Trips
Morning Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	41	230	109	36	125	34
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	48	271	128	42	147	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)			329			
pX, platoon unblocked						
vC, conflicting volume	171				516	149
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	171				516	149
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				71	96
cM capacity (veh/h)	1395				503	900
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	319	171	187			
Volume Left	48	0	147			
Volume Right	0	42	40			
cSH	1395	1700	555			
Volume to Capacity	0.03	0.10	0.34			
Queue Length 95th (ft)	3	0	37			
Control Delay (s)	1.4	0.0	14.7			
Lane LOS	A		B			
Approach Delay (s)	1.4	0.0	14.7			
Approach LOS			B			
Intersection Summary						
Average Delay			4.8			
Intersection Capacity Utilization		44.0%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
5: Columbia Blvd & Hwy 30


















Background + Site Trips
Morning Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0				4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	1.00				1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3157	1430				1525	3050	1365	1554	3107	1390
Flt Permitted		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3157	1430				1525	3050	1365	1554	3107	1390
Volume (vph)	71	210	65	0	0	0	34	375	211	154	814	153
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	233	72	0	0	0	38	417	234	171	904	170
RTOR Reduction (vph)	0	0	60	0	0	0	0	0	120	0	0	104
Lane Group Flow (vph)	0	312	12	0	0	0	38	417	114	171	904	66
Heavy Vehicles (%)	4%	4%	4%	0%	0%	0%	9%	9%	9%	7%	7%	7%
Turn Type	Perm		Perm				Prot		Perm	Prot		Perm
Protected Phases		8					1	6		5		2
Permitted Phases	8		8						6			2
Actuated Green, G (s)		12.6	12.6				20.7	36.5	36.5	13.4	29.2	29.2
Effective Green, g (s)		13.1	13.1				21.2	37.0	37.0	13.9	29.7	29.7
Actuated g/C Ratio		0.17	0.17				0.28	0.49	0.49	0.18	0.39	0.39
Clearance Time (s)		4.5	4.5				4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		544	246				425	1485	665	284	1214	543
v/s Ratio Prot							0.02	c0.14		c0.11	c0.29	
v/s Ratio Perm		0.10	0.01						0.08			0.05
v/c Ratio		0.57	0.05				0.09	0.28	0.17	0.60	0.74	0.12
Uniform Delay, d1		28.9	26.3				20.3	11.6	10.9	28.5	19.9	14.8
Progression Factor		1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.1				0.4	0.5	0.6	3.6	2.5	0.1
Delay (s)		30.4	26.3				20.7	12.1	11.5	32.1	22.4	14.9
Level of Service		C	C				C	B	B	C	C	B
Approach Delay (s)		29.6		0.0				12.3			22.7	
Approach LOS		C		A				B			C	
Intersection Summary												
HCM Average Control Delay			20.8				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			76.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			46.3%				ICU Level of Service			A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 1: Pittsburgh Rd & Hankey Rd

Background + Site Trips
 Evening Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	131	0	2	212	59	1	0	1	30	1	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	146	0	2	236	66	1	0	1	33	1	6
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	301			146			458	484	146	453	452	268
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	301			146			458	484	146	453	452	268
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	94	100	99
cM capacity (veh/h)	1266			1443			506	478	907	514	499	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	162	303	2	34	6							
Volume Left	17	2	1	33	0							
Volume Right	0	66	1	0	6							
cSH	1266	1443	650	514	775							
Volume to Capacity	0.01	0.00	0.00	0.07	0.01							
Queue Length 95th (ft)	1	0	0	5	1							
Control Delay (s)	0.9	0.1	10.6	12.5	9.7							
Lane LOS	A	A	B	B	A							
Approach Delay (s)	0.9	0.1	10.6	12.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			32.8%			ICU Level of Service			A			
Analysis Period (min)			15									













HCM Unsignalized Intersection Capacity Analysis
 2: Pittsburgh Rd & Sunset Blvd

Background + Site Trips
 Evening Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	114	45	25	233	52	12
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	121	48	27	248	55	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			169		446	145
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			169		446	145
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		90	99
cM capacity (veh/h)			1414		563	907
Direction, Lane #	EB 1	WB 1	NB 1	NB 2		
Volume Total	169	274	55	13		
Volume Left	0	27	55	0		
Volume Right	48	0	0	13		
cSH	1700	1414	563	907		
Volume to Capacity	0.10	0.02	0.10	0.01		
Queue Length 95th (ft)	0	1	8	1		
Control Delay (s)	0.0	0.9	12.1	9.0		
Lane LOS		A	B	A		
Approach Delay (s)	0.0	0.9	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			37.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 3: Pittsburgh Rd & Hwy 30

Background + Site Trips
 Evening Peak

											
Movement	EBL	EBR	NBL	NBT	SBT	SBR					
Lane Configurations											
Sign Control	Stop			Free		Free					
Grade	0%			0%		0%					
Volume (veh/h)	80	57	130	816	489	110					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	87	62	141	887	532	120					
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type	TWLTL										
Median storage veh)	0										
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	1258	266	651								
vC1, stage 1 conf vol	532										
vC2, stage 2 conf vol	726										
vCu, unblocked vol	1258	266	651								
tC, single (s)	6.8	6.9	4.2								
tC, 2 stage (s)	5.8										
tF (s)	3.5	3.3	2.2								
p0 queue free %	56	92	85								
cM capacity (veh/h)	197	736	918								
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3			
Volume Total	87	62	141	443	443	266	266	120			
Volume Left	87	0	141	0	0	0	0	0			
Volume Right	0	62	0	0	0	0	0	120			
cSH	197	736	918	1700	1700	1700	1700	1700			
Volume to Capacity	0.44	0.08	0.15	0.26	0.26	0.16	0.16	0.07			
Queue Length 95th (ft)	52	7	14	0	0	0	0	0			
Control Delay (s)	37.0	10.3	9.6	0.0	0.0	0.0	0.0	0.0			
Lane LOS	E	B	A								
Approach Delay (s)	25.9		1.3		0.0						
Approach LOS	D										
Intersection Summary											
Average Delay			2.9								
Intersection Capacity Utilization			37.3%		ICU Level of Service		A				
Analysis Period (min)			15								

HCM Unsignalized Intersection Capacity Analysis
4: Columbia Blvd & Sunset Blvd





















Background + Site Trips
Evening Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	55	226	230	75	81	31
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	62	254	258	84	91	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)			329			
pX, platoon unblocked						
vC, conflicting volume	343				678	301
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	343				678	301
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				77	95
cM capacity (veh/h)	1216				398	741
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	316	343	126			
Volume Left	62	0	91			
Volume Right	0	84	35			
cSH	1216	1700	456			
Volume to Capacity	0.05	0.20	0.28			
Queue Length 95th (ft)	4	0	28			
Control Delay (s)	2.0	0.0	15.9			
Lane LOS	A		C			
Approach Delay (s)	2.0	0.0	15.9			
Approach LOS			C			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization		51.2%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
5: Columbia Blvd & Hwy 30

Background + Site Trips
Evening Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0				4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	1.00				1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3215	1458				1599	3197	1430	1599	3197	1430
Flt Permitted		0.99	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3215	1458				1599	3197	1430	1599	3197	1430
Volume (vph)	83	214	54	0	0	0	47	737	274	116	756	252
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	91	235	59	0	0	0	52	810	301	127	831	277
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	149	0	0	173
Lane Group Flow (vph)	0	326	10	0	0	0	52	810	152	127	831	104
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm				Prot		Perm	Prot		Perm
Protected Phases		8					1	6		5		2
Permitted Phases	8		8						6			2
Actuated Green, G (s)		12.6	12.6				20.8	37.0	37.0	11.0	27.2	27.2
Effective Green, g (s)		13.1	13.1				21.3	37.5	37.5	11.5	27.7	27.7
Actuated g/C Ratio		0.18	0.18				0.29	0.51	0.51	0.16	0.37	0.37
Clearance Time (s)		4.5	4.5				4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		568	258				460	1618	724	248	1195	535
v/s Ratio Prot							0.03	c0.25		c0.08	c0.26	
v/s Ratio Perm		0.10	0.01						0.11			0.07
v/c Ratio		0.57	0.04				0.11	0.50	0.21	0.51	0.70	0.19
Uniform Delay, d1		27.9	25.3				19.4	12.1	10.1	28.7	19.6	15.7
Progression Factor		1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.4	0.1				0.5	1.1	0.7	1.8	1.8	0.2
Delay (s)		29.4	25.4				19.9	13.2	10.8	30.5	21.4	15.8
Level of Service		C	C				B	B	B	C	C	B
Approach Delay (s)		28.7			0.0			12.9			21.1	
Approach LOS		C			A			B			C	
Intersection Summary												
HCM Average Control Delay			18.7				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			74.1				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			48.1%				ICU Level of Service			A		
Analysis Period (min)			15									

c Critical Lane Group

TRAFFIC SIGNAL WARRANT CALCULATIONS

Major Street: Highway 30

Minor Street: Pittsburgh Road

Background Conditions (2018)

Number of Lanes for Moving Traffic on Each Approach:	ADT on Major St. (total of both approaches)	ADT on Minor St. (higher-volume approach)
------------------------------------------------------	------------------------------------------------	----------------------------------------------

WARRANT 1

CONDITION A

<u>Major St.</u>	<u>Minor St.</u>	<u>100%</u> <u>Warrants</u>	<u>70%</u> <u>Warrants</u>	<u>100%</u> <u>Warrants</u>	<u>70%</u> <u>Warrants</u>
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500

CONDITION B

1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

Warrant Used

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

	Number of Lanes	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>				
<i>Condition A: Minimum Vehicular Volume</i>				
Major Street	2	15,310	7,400	
Minor Street*	1	760	1,850	No
<i>Condition B: Interruption of Continuous Traffic</i>				
Major Street	2	15,310	11,100	
Minor Street*	1	760	950	No
<i>Combination Warrant</i>				
Major Street	2	15,310	8,880	
Minor Street*	1	760	1,480	No
<i>Warrant 3: Peak Hour Warrant - AM Peak Hour</i>				
Major Street	2	1,200		
Minor Street*	1	64	80	No
<i>Warrant 3: Peak Hour Warrant - PM Peak Hour</i>				
Major Street	2	1,531		
Minor Street*	1	76	75	Yes

* Minor street right-turning traffic volumes reduced by 25%

TRAFFIC SIGNAL WARRANT CALCULATIONS

Major Street: Highway 30

Minor Street: Pittsburgh Road

Background + Site Trips Conditions (2018)

Number of Lanes for Moving Traffic on Each Approach:	ADT on Major St. (total of both approaches)	ADT on Minor St. (higher-volume approach)
------------------------------------------------------	------------------------------------------------	----------------------------------------------

WARRANT 1

CONDITION A

<u>Major St.</u>	<u>Minor St.</u>	100% <u>Warrants</u>	70% <u>Warrants</u>	100% <u>Warrants</u>	70% <u>Warrants</u>
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500

CONDITION B

1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

Warrant Used

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

	Number of Lanes	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>				
<i>Condition A: Minimum Vehicular Volume</i>				
Major Street	2	15,450	7,400	
Minor Street*	1	800	1,850	No
<i>Condition B: Interruption of Continuous Traffic</i>				
Major Street	2	15,450	11,100	
Minor Street*	1	800	950	No
<i>Combination Warrant</i>				
Major Street	2	15,450	8,880	
Minor Street*	1	800	1,480	No
<i>Warrant 3: Peak Hour Warrant - AM Peak Hour</i>				
Major Street	2	1,208		
Minor Street*	1	71	80	No
<i>Warrant 3: Peak Hour Warrant - PM Peak Hour</i>				
Major Street	2	1,545		
Minor Street*	1	80	75	Yes

* Minor street right-turning traffic volumes reduced by 25%

CITY OF ST. HELENS PLANNING DEPARTMENT ACTIVITY REPORT



To: City Council
From: Jacob A. Graichen, AICP, City Planner

Date: 09.27.2016

This report does not indicate all *current planning* activities over the past report period. These are tasks, processing and administration of the Development Code which are a weekly if not daily responsibility. The Planning Commission agenda, available on the City's website, is a good indicator of *current planning* activities. The number of building permits issued is another good indicator as many require Development Code review prior to Building Official review.

PLANNING ADMINISTRATION

Conducted a pre-application meeting for a subdivision near the SW corner of the Pittsburg Road/N. Vernonia Road intersection. There is potential for 63 to 77 lots for single-family dwellings. This is a reboot of a subdivision that was approved before the Great Recession, but the approval lapsed.

Both the Assistant Planner and I met with ODOT's grant manager for the 2016/2017 TGM grant (Riverfront Connector corridor plan) to discuss some preliminary matters. The next step will be working on a draft Statement of Work (SOW).

Reviewed draft Framework Plan for the for Veneer Property prepared by the City's consultants. This is the initial draft of the final version. The Assistant Planner and I will meet with the consultants on September 29th to discuss and hopefully fine-tune their implementation recommendation (i.e., adoption into the Development Code).

DEVELOPMENT CODE ENFORCEMENT

Assistant Planner called a property owner about a fence being built contrary to city standards (height) on S. Vernonia Road. Based on their conversation, the issue should be resolved soon.

Sent a letter to a property between Church and S. 19th Streets for a building violation. This is a repeat from June. Code enforcement assisted.

PLANNING COMMISSION (& acting HISTORIC LANDMARKS COMMISSION)

September 13, 2016 meeting (outcome): The Commission conducted a public hearing for a zone change of approx. 12.5 acres of mostly undeveloped land at the SW corner of the Pittsburg Road/N. Vernonia Road intersection.

The Commission reviewed the finality of this cycle's CLG grant (courtesy of the Assistant Planner).

The Commission discussed the recommendation from the Council in regards to draft ORD 3209. After discussing the exact language, they agreed with the Council.

There are two Commissioner terms expiring. Both wish to continue. One hasn't served two consecutive terms and is an automatic re-up. The other has, so advertisement per the Council's rules will be necessary. Interview committee formed for this.

October 11, 2016 meeting (upcoming): The Commission will have a public hearing for Elk Ridge Phase 6, a 58 lot subdivision. They originally approved this in 2013, but construction has taken enough time that the original approval lapsed.

Some other items TBD.

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Routine data updates.

MAIN STREET PROGRAM

I attended the SHEDCO Board of Directors meeting on September 14, 2016 at the Chamber of Commerce. This is the first month for this year's Community Coordinator (#6).

I attended a Main Street program related workshop and awards ceremony in Astoria this month.

ASSISTANT PLANNER—*In addition to routine tasks, the Assistant Planner has been working on:*
See attached.

Jacob Graichen

From: Jennifer Dimsho
Sent: Friday, September 23, 2016 9:13 AM
To: Jacob Graichen
Subject: September Planning Department Report

Here are my additions to the September Planning Department Report.

GRANTS

1. McCormick Park Bridge OPRD Grant Closeout
2. CLG Historic Preservation Grant Program Grant Summary – Presentation to PC/Council. Received final reimbursement
3. OPRD McCormick Picnic Shelter Grant (16k grant, 30k project). Signed grant agreement. Met with PW/Parks to move forward with shelter purchase
4. Riverfront Connector TGM grant: Scoping meeting with ODOT grant coordinator
5. 2016 HEAL Cities Grant (Deadline: Sept. 30) – Nob Hill Nature Park improvement package. Prepared and submitted application/budget. Received 2 letters of support

EPA AWP

6. EPA AWP Advisory Committee Meeting: Sept. 12 – Scheduled meeting, reviewed meeting materials, sent out meeting materials, and provided feedback
7. Scheduled for Oct 12 Final Open House – Preparations for location, food & drink, press, outreach, reviewed materials

MISC

8. Gateway Sculpture Project Kickstarter Reward deliveries
9. Put together ACC Postcard kits. Delivered to various businesses and hotels to sell.
10. Attended ACC Meeting Sept. 27 – Update on postcard kits, Kickstarter reward deliveries, & Gateway P.2 Budget discussion
11. Attended Year of Wellness Meeting at OSU on Sept 15 – Discussed CCCO Community Grant potential
12. Created GIS Map for Spirit of Halloweentown public safety discussions
13. Worked on application for ODOT right-of-way purchase of Dalton Lake property
14. Worked with new RARE AmeriCorps Mainstreet Coordinator, Jasmine and introduced her to a few ongoing projects
15. Prepared PowerPoint slides for a League of Oregon Cities community engagement presentation
16. Answered site specific questions from CAT about a potential affordable housing grant-funded project

Jenny Dimsho

Assistant Planner
City of St. Helens
(503) 366-8207
jdimsho@ci.st-helens.or.us