



HEARING EXAMINER EXHIBIT LIST

PROJECT:	Public Hearing for Preliminary Plat for Main Brook Townhomes Preliminary Plat
FILE NUMBER(S):	PL2017-02
APPLICANT:	Hanson Homes @ Main Brook – Rick Hanson
HEARING DATE AND LOCATION:	February 22, 2018 at 10:00 AM Monroe City Hall Council Chambers 806 West Main Street, Monroe, WA 98272

EXHIBITS

1. Staff Analysis
2. Vicinity Map
3. Preliminary Plat Map
4. Preliminary Plat Application
5. Letter of complete application
6. Notice of Application
 - 6- A Affidavit of Publication
 - 6- B Affidavit of Posting (On Site)
 - 6- C Affidavit of Posting (CH_Library)
 - 6- D Affidavit of Mailing
 - 6- E Email to Public Agencies (NOA)
7. Public Comments
 - A. Letter from Puget Sound Energy
 - B. Letter from Public Utility District #1
8. Notice of Public Hearing
 - 8- A Affidavit of Publication NOPH
 - 8- B Affidavit of Mailing
 - 8- C Affidavit of Posting (On Site)
 - 8- D Affidavit of Posting CH)

9. SEPA - Determination of Non Significance (DNS)

9- A Affidavit of Publication

9- B Affidavit of Mailing

9- C Affidavit of Posting (CH_Library)

9- D Affidavit of Posting (On Site)

9- E Email to Public Agencies (DNS)

10. Conceptual Utility Plan

11. Stormwater Drainage Report

12. Geotechnical Report

13. Traffic Impact Analysis

14. Conceptual Landscape Plans

	STAFF REPORT AND RECOMMENDATION Main Brook Townhomes Public Hearing for Main Brook Townhomes Preliminary Plat
HEARING EXAMINER:	Mr. Phil Obrechts, City of Monroe Hearing Examiner
DATE:	February 15, 2018
FILE NUMBERS:	PL2017-02
DESCRIPTION:	Public Hearing for Main Brook Townhomes Preliminary Plat to subdivide approximately 1.42 acres into 19 lots containing eighteen (18) zero lot-line townhome lots and one (1) commercial lot in the Mixed-Use Commercial (MUC) zoning district.
APPLICANT:	Rick Hanson Hanson Homes at Main Brook, LLC PO Box 2289 Snohomish, WA 98291
PROJECT LOCATION:	Section 1 Township 27 Range 6 Quarter SW LOT 4 OF CITY OF MON SP 199008 REC AFN 199912215006 BEING A PTN OF SW1/4 SW1/4; otherwise known as XXXX W. Main Street, Monroe, Washington, 98272. Snohomish County Tax Parcel Number(s): 27060100310200, 27060100310300, and 27060100310400.
HEARING DATE:	February 22, 2018 at 10:00 AM
HEARING LOCATION:	Monroe City Hall Council Chambers 806 West Main Street Monroe, WA 98272
STAFF CONTACT:	Anita Marrero, Senior Planner, City of Monroe

A. PROJECT DESCRIPTION

The applicant, Hanson Homes at Main Brook, LLC, has submitted an application for preliminary plat approval of a 19 lot subdivision containing eighteen (18) zero lot-line townhome lots and one (1) commercial lot on approximately 1.42 acres (approximately 61,885 square feet). The subject project is zoned Mixed Use Commercial (MUC). The project site is addressed as XXXX West Main Street, Monroe, WA 98272; and is identified by Snohomish County Tax Parcel Numbers 27060100310200, 27060100310300, and 27060100310400. The subject site is vacant and contains a parking lot. Conceptual street improvements, clearing and grading, and installation of all utilities (sewer, water, storm, power, gas, telephone, cable and telecommunications, etc.) have been reviewed for compliance with the development standards in the applicable sections of the Monroe Municipal Code, as well as other pertinent documents adopted by reference in the code.

B. GENERAL INFORMATION

1. Applicant and Owner:
Rick Hanson
Hanson Homes at Main Brook, LLC
PO Box 2289
Snohomish, WA 98291
2. Contact Person:
Ry McDuffy

Orca Land Surveying
 3605 Colby Avenue
 Everett, WA 98201

3. General Location:

The site is located at Section 1 Township 27 Range 6 Quarter SW LOT 4 OF CITY OF MON SP 199008 REC AFN 199912215006 BEING A PTN OF SW1/4 SW1/4; otherwise known as XXXX W. Main Street, Monroe, Washington, 98272. Snohomish County Tax Parcel Number(s): 27060100310200, 27060100310300, and 27060100310400. (Exhibit 2).

4. Site Address:

XXXX W. Main Street, Monroe, WA 98272

5. Description of Proposal:

The applicant, Hanson Homes, is requesting preliminary plat approval for a 19-lot subdivision containing eighteen (18) zero lot-line townhome lots and one (1) commercial lot to be developed in two (2) phases on approximately 1.42 acres in the Mixed Use Commercial (MUC) zoning district. The site currently does not contain any structures.

6. Critical Areas:

The City's critical areas map does not indicate critical areas on the subject site.

7. Comprehensive Plan Land Use Designations, Zoning Designations, and Existing Land Uses of the Project Site and Surrounding Area:

AREA	EXISTING LAND USE DESIGNATION	ZONING	EXISTING USE
Project Site	Mixed Use	Mixed Use Commercial (MUC)	Vacant, parking lot
North of Site	High Density SFR	Urban Residential (UR6000)	Single-family residential
South of Site (across West Main Street)	General Commercial & Mixed Use	Mixed Use Commercial (MUC)	Single-family residential
East of Site	Mixed Use	Mixed Use Commercial (MUC)	Single-family residential, Multi-family residential, Commercial
West of Site	Mixed Use	Mixed Use Commercial (MUC)	Nursing Home

8. Public Utilities and Services Provided by:

Water:	City of Monroe	Gas:	Puget Sound Energy
Sewer:	City of Monroe	Cable TV:	Comcast
Garbage:	Republic Services	Police:	City of Monroe
Storm Water:	City of Monroe	Fire:	Snohomish County Fire District No. 7
Telephone:	Verizon	School:	Monroe Public Schools
Electricity:	Snohomish County PUD No. 1	Hospital:	Evergreen Health

C. APPLICATION REVIEW PROCESS

1. Regulatory Requirements for Review of Quasi-Judicial Actions:

Pursuant to Monroe Municipal Code (MMC) Sections 21.20.050(F) and 21.50.120, preliminary plats are quasi-judicial actions subject to a public hearing with the Hearing Examiner as the final decision body for the application.

The decision of the Hearing Examiner shall be final and conclusive, unless appealed as provided by law, in accordance with MMC Chapter 21.60. Appeals of final decisions on preliminary plats may be appealed to Snohomish County Superior Court (MMC 21.50.120).

2. Application Submittal and Completeness:

The Main Brook Townhomes Preliminary Plat application was received by the City of Monroe on September 29, 2017 (Exhibit 4). The application was deemed complete and vested on October 17, 2017 (Exhibit 5).

3. Public Notification and Comments:

Public notice for the application was provided in accordance with the requirements of MMC section 21.40.010. A Notice of Application was published, mailed, and posted on October 20, 2017 (Exhibit 6 - 6E). A public comment period was provided from October 20, 2017 through 5:00 PM on November 3, 2017. No public comments were received and two (2) agency comments from PSE and PUD were received. (Exhibits 7A – 7B).

A Notice of Public Hearing was published, mailed, and posted on February 12, 2018 (Exhibit 8 – 8D). The date of the open record public hearing with the Hearing Examiner is set for February 22, 2018 at 10:00 AM. Public testimony may be provided during the public hearing pursuant to MMC 21.50.060(C).

4. Environmental Review:

A Determination of Non-Significance (DNS) was issued, published, posted, and mailed on December 15, 2017 (Exhibit 9 - 9E). The DNS provided a comment and appeal period ending at 5:00 PM on January 2, 2018. No appeals regarding the SEPA threshold determination were received by the City during the specified appeal period.

D. FINDINGS OF FACT

1. Application Submittal and Completeness:

The application was submitted on September 29, 2017 and determined to be complete on October 17, 2017.

2. Environmental Review:

A SEPA Determination of Non-Significance (DNS) was issued on December 15, 2017. No comments or appeals on the SEPA threshold determination were received.

3. Bulk Requirements and Dimensional Standards:

Per MMC section 18.10.050 Zoning Land Use Matrix, and MMC section 18.10.140 Bulk Requirements and Table A, the development shall comply with the following standards for the Mixed Use Commercial (MUC) zone for townhome residential development:

Table B
– Mixed Use Zoning District Bulk Development Requirements

	Mixed Use	
	MUNC	MUC
Minimum Lot Size, in sq. ft.	NA	NA
Minimum Lot Width¹	NA	NA
Maximum Lot Coverage	75%	NA ²
Maximum Building Height³	35 – 45	35 – 55
Minimum First Story Height (mixed use buildings)	15	15
Front Yard Setback^{4,5}	5/20	5/20
Side Yard Setback^{6,7,8}	5 – 10	10
Rear Yard Setback⁹	10 – 20	10 – 20
Landscape Buffer¹⁰	5	5

Notes:

1. When townhomes or other attached housing units are built on separate lots, the lot width-to-depth ratio will be approximately 1:4.
2. Except as required by the landscape and parking district requirements.
3. The maximum height along street frontages is limited to thirty-five feet (three stories); in the MUNC zone height can be increased to forty-five feet when the fourth floor is stepped back and in the MUC zone height can be increased to fifty-five feet when the fourth and fifth floors are stepped back.
4. The minimum required setback is five feet; the maximum allowed setback is twenty feet.
5. Porches, covered entries, or pedestrian-oriented spaces may project up to five feet into front yard setbacks.
6. When townhomes or other attached housing units are built on separate lots, a zero setback between units is permitted in allowed zones. The outside setback for attached housing units abutting a ROW, separate detached unit(s), or different zone will be ten feet.
7. Side yard setbacks for single-family residences will be five feet minimum; all other mixed use, commercial and multifamily structures will be ten feet minimum.
8. Side yard setbacks for fourth and fifth floors require an additional five feet per floor. That is, the fourth floor must be set back at least five feet from the building's edge and the fifth floor must be set back at least ten feet from the building's edge.
9. The rear setback can be reduced to ten feet if parking is underground or underneath the unit for multifamily developments or parking is accessed off an alley/private drive to the rear and provides a minimum backup area of twenty feet including the alley or private lane.
10. Landscape buffers will be five feet along property lines; however, the city may waive the five-foot perimeter landscape buffer for internal property lines when the adjacent properties share parking, access, or other common features that will make intensive landscaping impractical.

4. Density Calculations:

Section 18.10.020(B) of the MMC delineate how an applicant can determine the maximum allowed residential density for mixed use zoning districts.

To calculate the maximum allowed base density for a site in the MUC zone (12-20 dwelling units per acre), multiply the gross site area, in acres, by the units allowed per acre. The base density for the proposed site, with a gross site area of 1.42 acres, would be calculated as follows.

Step 1. Gross site area (in acres) * 12 (12 dwelling units per acre in the MUC zone):

$$1.42 \text{ acres} * 12 = \underline{17.04 \text{ dwelling units}}$$

Step 2. Gross site area (in acres) * 20 (20 dwelling units per acre in the MUC zone):

$$1.42 \text{ acres} * 20 = \underline{28.4 \text{ dwelling units}}$$

Step 3. MMC 18.10.020(B)(1) requires that “when calculating the maximum residential density, any resulting fraction 0.50 or over shall be rounded up to the next whole number and any fraction 0.49 or under shall be rounded down to the preceding whole number:”

*A maximum of **17-28 units** are allowed in the Main Brook Townhome preliminary plat.*

The applicant is proposing 18 dwelling units, which is within the maximum density allowed in the MUC zoning district. Thus, the density is consistent with that allowed by the zoning code.

5. MMC Title 17 Subdivision(s):

Pursuant to MMC 17.12.030(E), the City Planner, City Engineer, Fire Marshal, and Building Official have all reviewed and commented on the proposed project. Their comments are included in the body of this report and in the project permit conditions of approval.

6. MMC Title 17 Preliminary Plat Decision Criteria:

Pursuant to MMC 17.12.030(H)(1-3) the applicant shall comply with the following:

The hearing authority shall consider if the proposed subdivision conforms to the comprehensive plan and the Shoreline Master Program;

The City of Monroe’s 2015-2035 Comprehensive Plan Future Land Use Map designates the project site as “Mixed Use.” The proposed preliminary plat, under MUC zoning, which provides for 12-20 dwelling units per acre, conforms to the City of Monroe’s 2015-2035 Comprehensive Plan “Mixed Use” designation for density. The City of Monroe 2015-2035 Comprehensive Plan Table 3.07 provides the following description of the “Mixed Use” land use plan designation:

Mixed-Use. Mixed-Use areas should be concentrated in areas of the city characterized by a diverse fine-grained mix of land uses; where there is the ability to develop land efficiently through the consolidation and infill of under-utilized parcels; and where infrastructure, transit and other public services / facilities are available or where the city or proponent can provide public services. Mixed-use areas encourage office, retail, and light-industrial uses; compatible high-technology manufacturing; institutional and educational facilities; public and private parks and other public

gathering places; entertainment and cultural uses; and attached residential units up to 25 dwelling units per acre integrated throughout the district, within the same property, or inside a single building.

Design standards will increase compatibility among the mixed-uses on both the site and structures. Standards to integrate development may include but not be limited to coordinated building design, signage, landscaping, and access configuration. The city will implement this designation by more than one zoning classification. Individual development proposals will take into account the density of adjacent existing development and the capacities of existing and planned public facilities.

The site is not located within the shoreline jurisdiction for the City. Therefore, this provision does not apply.

The hearing authority shall consider the physical characteristics of a proposed subdivision site and may recommend disapproval of a proposed plat because of improper protection from floods, inundation or wetland conditions;

The site is not located within a floodplain. As described above, there are no wetlands on site. This provision does not apply.

All identified direct impacts must be mitigated or meet concurrency as set forth in MMC Title 20.

All direct impacts of the proposal have been or will be mitigated through municipal code requirements and the conditions of preliminary plat approval.

Per MMC section 20.06.030(D), strategies and financial commitments are in place to complete necessary improvements or strategies within six years of time of development as set forth in the Comprehensive Plan. This includes the payment of mitigation and/or impact fees for water, wastewater, parks, transportation, and schools. Stormwater is mitigated on site by the applicant during subdivision improvement construction. The City of Monroe Police Department and Fire District #7 did not raise any concerns regarding level of service standards when provided the opportunity to comment on the proposed preliminary plat.

According to the information presented in the development application as well as the analysis completed by City staff, the development does not lower the level of service on the following public facilities and services below the minimum standards established within the City of Monroe Comprehensive Plan:

- a. Potable water;
- b. Wastewater;
- c. Storm water drainage;
- d. Police and fire protection;
- e. Parks and recreation;
- f. Arterial roadways; and
- g. Public schools.

7. RCW 58.17.110 - Approval or disapproval of subdivision and dedication-factors to be considered-Conditions of approval-Finding-Release from damages:

1) The city, town, or county legislative body shall inquire into the public use and interest proposed to be served by the establishment of the subdivision and dedication. It shall determine:

(a) If appropriate provisions are made for, but not limited to, the public health, safety, and general welfare, for open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds, and shall consider all other relevant facts, including sidewalks and other planning features that assure safe walking conditions for students who only walk to and from school; and

The preliminary plat map (Exhibit 3) confirms that the preliminary plat application includes provisions for the public health, safety, and general welfare including open spaces, drainage ways, streets or roads, potable water, sanitary wastes, parks and recreation, playgrounds, schools and school grounds, and sidewalks that assure safe walking conditions for students who only walk to and from school. The Monroe School District was notified of the development application. No comments were received from the Monroe School District on the proposal.

(b) Whether the public interest will be served by the subdivision and dedication.

The public interest would be served by the subdivision and dedication, provided that the subdivision and dedication were developed under the current zoning district (MUC). Under this scenario, an existing parcel in the City would be developed allowing for efficient provision of public services, consistent with densities identified in the Monroe 2015-2035 Comprehensive Plan.

(2) A proposed subdivision and dedication shall not be approved unless the city, town, or county legislative body makes written findings that:

(a) Appropriate provisions are made for the public health, safety, and general welfare and for such open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds and all other relevant facts, including sidewalks and other planning features that assure safe walking conditions for students who only walk to and from school; and

The preliminary plat map (Exhibit 3) confirms that the preliminary plat application includes provisions for the public health. The Staff Analysis addresses the provisions made for safety and general welfare, including open spaces, drainage ways, streets or roads, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds, and sidewalks that assure safe walking conditions for students who only walk to and from school.

(b) The public use and interest will be served by the platting of such subdivision and dedication. If it finds that the proposed subdivision

and dedication make such appropriate provisions and that the public use and interest will be served, then the legislative body shall approve the proposed subdivision and dedication. Dedication of land to any public body, provision of public improvements to serve the subdivision, and/or impact fees imposed under RCW 82.02.050 through 82.02.090 may be required as a condition of subdivision approval. Dedications shall be clearly shown on the final plat. No dedication, provision of public improvements, or impact fees imposed under RCW 82.02.050 through 82.02.090 shall be allowed that constitutes an unconstitutional taking of private property. The legislative body shall not as a condition to the approval of any subdivision require a release from damages to be procured from other property owners.

The proposed preliminary plat includes provisions for the public health, safety, and general welfare including open spaces, drainage ways, streets or roads, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds, and sidewalks that assure safe walking conditions for students who walk to and from Frank Wagner Elementary School and Park Place Middle School and the residents of the City of Monroe. The subject proposal does not include dedication of a public park. Private recreation space has been provided in Tract 999. Required site improvements and impact fees will be required as conditions of plat approval. The Washington State Growth Management Act requires that jurisdictions that plan shall have sufficient housing capacity to meet projected growth targets. The proposed plat increases the residential density of the City by creating lots to accommodate future population growth, which increases the City's housing capacity.

8. Critical Areas:

There are no known critical areas on this site.

9. Utilities:

There is sufficient capacity available in the City's public water and sanitary sewer system to serve the proposed subdivision. All lots will connect to the City's water and sewer system. Sanitary sewer and water lines will be constructed across West Main Street and in the proposed private road in accordance with the current City's Public Works Design and Construction Standards. The conceptual utilities plan is attached (Exhibit 10).

As part of the civil plan review process, the applicant will install improvements to the stormwater system. Stormwater management will be designed to meet the requirements of the 2014 Department of Ecology Storm Water Management Manual for Western Washington as administered by the City Engineer. Any future permitted activities, such as building permits, will also have to comply with the provisions of the Storm Water Management Manual in effect at the time of the vesting of the permit application.

10. Streets and Traffic:

Access to the subdivision is proposed via West Main Street. Internal access to individual lots will be provided through a private road 'A' and 'B' (Tract 997). Road 'A' is 30', 2-10' travel lanes and a 5' sidewalk on one side. Road 'B' is 20', 2-10' travel lanes. The proposed private road design was approved by the Public Works

Director. Frontage improvements along West Main Street are already installed which includes curb and gutter, and a five foot wide sidewalk along the entire length of the site frontage. An ADA ramp and new driveway approach will be installed at the entrance of West Main Street.

Traffic control devices and street signs shall be installed prior to final plat approval, and all private roads within the subdivision shall be constructed in accordance with the City's Public Works Design and Construction Standards and installed by the developer to the satisfaction of the City Engineer prior to final plat approval.

Based on the Traffic Impact Study dated September 2017 (Exhibit 13), the development is anticipated to generate approximately 23.44 AM peak-hour trips and 32.85 PM peak-hour trips. The level of service analysis shows that all of the study intersections in the TIA are anticipated to operate within acceptable level of service thresholds.

Impacts to the City's transportation system are mitigated through the collection of traffic mitigation fees. In accordance with the City's traffic impact fee program under MMC Chapter 20.12, impact fees require a standard fee amount per dwelling unit as a condition of residential development within the City. Traffic impact fees shall be paid in accordance with MMC Chapter 20.12 and shall be based on the amount in effect at the time of payment. Frontage improvements and paving, including curb, gutter, sidewalk, and street trees shall be installed along all private streets within the subdivision in accordance with the City's Public Works Design and Construction Standards.

11. Park and Recreation Usable Open Space:

Per MMC 18.78.080, for each proposed dwelling unit in a multifamily structure, complex or development, recreational space shall be provided per the following table:

Type of dwelling unit	Open space
Studio and one bedroom	90 square feet per unit
Two bedrooms	130 square feet per unit
Three or more bedrooms	170 square feet per unit

The proposed subdivision provides a private neighborhood park within the development. Tract 998 (749 sq. ft.) is open space and Tract 999 (2,417 sq. ft.) will contain a play structure, bench, landscaping, and fencing (Exhibit 14). The development is required to provide 3,060 square feet of recreation space. The total recreation space provided is 3,166 square feet. Maintenance of the park and recreation tract shall be the responsibility of the homeowner's association.

Impacts to the City park and recreation system from the anticipated additional public park users will be mitigated. In accordance with the City's park impact mitigation fees established under MMC Chapter 20.10, impact fees require a standard fee amount per dwelling unit as a condition of residential development within the city. Park impact fees shall be paid in accordance with MMC 20.10. Park impact fees shall be based on the fee amount in effect at the time of payment.

12. Schools:

Impacts to the Monroe Public Schools and the Snohomish School District in the form of additional students are addressed through mitigation programs. The City of Monroe has adopted the Monroe and Snohomish School District 2016 - 2021 Capital Facilities Plan, and imposes impact fees for schools in accordance with the plan and MMC Chapter 20.07. School mitigation fees require a standard fee amount per dwelling unit as a condition of residential development within the city. School impact fees are based on the amount in effect at the time of payment.

RCW 58.17.110(2) requires the City to make a finding that the proposed subdivision assures "safe walking conditions for students who only walk to and from school." Students will walk from the development to Frank Wagner Elementary School and Park Place Middle School. Students will be bussed from the development to Monroe High School by the Monroe School District. Sidewalks will be installed on one side of Road 'A' and will extend to West Main Street providing safe walking conditions. The public streets fronting on and/or adjacent to the subdivision include sidewalks on all sides of the street as well as sidewalk along the property frontage along West Main Street.

13. Impact Fees and Capital Improvements:

Development shall be subject to all applicable MMC requirements specifically including and without limitations, all applicable impact fees, and capital improvement charges pursuant to MMC section or chapter 13.04.025, 13.08.272, 20.07, 20.10, and 20.12.

14. Preliminary Plat Expiration:

Per MMC section 17.12.020(A), preliminary approval of a proposed plat shall be effective for a period not to exceed five years from the date of Hearing Examiner approval, or concurrently with the expiration of the preliminary plat, whichever occurs earlier.

E. CONCLUSIONS OF LAW

1. The City of Monroe 2015-2035 Comprehensive Plan Future Plan Map designation for the site is "Mixed Use," which assumes an overall density of up to 25 dwelling units per acre. The site's present zoning designation of Mixed Use Commercial is in compliance with the future land use designation adopted in the current Comprehensive Plan.
2. The proposed subdivision, as conditioned herein, will be consistent with the pertinent development goals and policies outlined in the Monroe 2015-2035 Comprehensive Plan.
3. The proposed subdivision, as conditioned herein, will be consistent with the applicable land division requirements outlined in MMC Title 17, Subdivisions.
4. The proposed subdivision, as conditioned herein, will be consistent with the pertinent development standards outlined in MMC Title 18, Planning and Zoning.
5. The proposed subdivision, as conditioned herein, will make appropriate provisions for public use and interest, health, safety, and general welfare.
6. The proposed preliminary plat as conditioned meets all MMC requirements for a subdivision.

7. The preliminary plat should be approved subject to the conditions noted below.
8. The preliminary plat approval shall expire five years from the date of Hearing Examiner approval.

F. STAFF RECOMMENDATION

Based on the Findings of Fact and Conclusions of Law detailed in the staff report, staff recommends that the Hearing Examiner **APPROVE** the Main Brook Townhomes Preliminary Plat (project number PL2017-02), subject to the following conditions of preliminary approval:

1. All improvements shall be constructed in accordance with the approved preliminary plat map with the date stamp of January 17, 2018. Minor modifications of the plans submitted, as described in MMC 18.84.210 (e.g. BLA or reduction in total number of lots), may be approved by the Community Development Director or his/her designee if the modifications do not change the Findings of Fact or the Conditions of Approval.
2. Final engineering drawings depicting the street improvements, water and sewer improvements, and drainage design shall be submitted to the City's Public Works Director for final review and approval before issuance of any grading permits. The street, water and sewer, and drainage improvements shall be designed in accordance with the City's most current Public Works Design and Construction Standards.
3. The project shall implement all of the applicable recommendations contained in the following technical reports submitted to the City:
 - a) Storm Drainage Report, prepared by Joseph M. Smeby, PE, dated September 2017 (Exhibit 11).
 - b) Geotechnical Report, prepared by Liu & Associates, dated March 31, 2017 (Exhibit 12).
 - c) Traffic Report, prepared by GTC, dated September 2017 (Exhibit 13).

CLEARING AND GRADING

4. A comprehensive erosion and sedimentation control plan to ensure appropriate on-site and off-site water quality control shall be developed and implemented for all construction activities. The Best Management Practices outlined in the 2014 DOE Stormwater Management Manual for Western Washington shall be incorporated into the design. At a minimum, the plan shall include the following elements:
 - a) Exposed soils shall be stabilized and protected with straw, hydro-seeding or other appropriate materials to limit the extent and duration of exposure;
 - b) Disturbed areas shall be protected from storm water runoff impacts through the use of silt fence. Other means of filtration of storm water runoff and for limiting erosion/sedimentation such as check dams, and sediment traps may be required and are recommended.
 - c) Clearing and grading activities shall not be performed in the winter-wet season when soils are unstable.

STORM DRAINAGE IMPROVEMENTS

5. The stormwater system design and stormwater discharge shall utilize the Best Management Practices of the 2014 DOE Stormwater Management Manual for Western Washington.

6. Stormwater pollution prevention measures shall be employed per the approved Stormwater Pollution Prevention Plan and as necessary to ensure appropriate on-site and off-site water quality control. Site runoff during construction shall be handled and treated as to quantity and quality impacts by utilizing Best Management Practices, as defined in the 2014 DOE Stormwater Management Manual for Western Washington.
7. The developer shall obtain a General Construction Stormwater NPDES Permit from the WA Department of Ecology (DOE) prior to beginning construction.

ROAD IMPROVEMENTS

8. Frontage improvements, including curb, gutter, sidewalk, street trees, and traffic control devices shall be provided for all streets within the subdivision; shall be constructed in accordance with the City's most current Public Works Design and Construction Standards; and are to be installed by the developer to the satisfaction of the City Engineer prior to final plat application.

LANDSCAPING

9. Street trees shall be included in the street planter strips per the approved landscape plan. Street trees shall be planted when a street frontage is fully owner occupied and as directed by the City of Monroe Planning Department. The City will coordinate tree plantings to the most favorable time of the year for plant survival. All street frontage landscaping/irrigation improvements shall be bonded until such time that housing construction is completed and bonded work may be completed without risk of construction damage.
10. Irrigation is required for all street trees and newly planted vegetation within the right-of-way and within Tracts (where applicable and required by the City). The applicant shall submit an irrigation plan prior to construction for review and approval by the City.

FIRE

11. The following requirements shall be adhered to during construction and completed before occupancy of any structure in accordance with the 2015 International Fire Code:
 - Fire hydrants shall be provided in accordance with city standards and the direction of the Fire Marshal
 - Fire Hydrants shall be installed as per fire flow and spacing requirements specified for the type of development with regards to distances to structures;
 - Fire hydrants shall be equipped with four (4) inch quarter-turn Storz adapters;
 - An access route, for fire fighting apparatus, must be provided at the start of construction. Minimum access route requirements include a 20' width, 13'6" vertical height clearance, and the ability to support a load up to 75,000 pounds;
 - All buildings must be addressed visibly and legibly from the road. When buildings are not visible from the street, appropriate provisions must be made to identify clearly which road or drive serves the appropriate address including private roads.
 - Fire sprinklers are required for all residential units and future development.
 - No parking signs are required as directed by the Fire Marshal for all streets with a width less than 32' and within turnaround areas.

FEES

12. Prior to approval of the final plat, all landscaping associated with the plat shall require the submittal of an acceptable warranty surety to warrant all required landscaping improvements against defects in labor materials for a period of 24 months after

acceptance of those improvements by the City. The warranty amount shall be equal to fifteen (15) percent of the costs of the improvements, as determined by the Community Development Director.

13. Prior to approval of the final plat, the developer shall submit an acceptable warranty surety to warrant all required public improvements, installed, against defects in labor and materials for a period of 24 months after acceptance of those improvements by the City. The warranty amount shall be equal to ten (10) percent of the costs of the improvements, as determined by the Public Works Director. The surety shall be submitted to and approved by the City of Monroe and executed prior to final plat approval.
14. Park, Traffic and School impact fees assessed in accordance with MMC Chapters 20.07, 20.10 and 20.12 shall be required and paid at the rate in effect at the time of building permit issuance.
15. The water system capital improvement charge, in accordance with MMC Section 13.04.025, shall be required and paid prior to building permit issuance.
16. The wastewater system capital improvement charge, in accordance with MMC Section 13.08.270, shall be required and paid prior to building permit issuance.

FINAL PLAT

17. Prior to Final Plat submittal, all improvements shall be installed, inspected, and approved by the City Engineer per the approved plans. All improvements shall be constructed in accordance with the approved engineering plans and preliminary plat map. Minor modifications of the plans submitted may be approved by the Community Development Director or Public Works Director if the modifications do not change the Preliminary Plat Findings of Fact or Conditions of Approval.
18. All lot corners shall be installed with rod and cap or other City-approved survey method prior to Final Plat approval.
19. All existing and proposed easements and maintenance agreements shall be clearly shown and labeled on the final plat.
20. The following note shall appear on the face of the Final Plat Map: "The Homeowners Association is responsible for maintaining, in a uniform manner, all landscaping and irrigation within all commonly owned Tracts and easements."
21. The following Waiver of Claims for Damages Statement shall appear on the face of the Final Plat Map: "This dedication includes conveyance of roads, tracts, utility and storm drainage infrastructure, and other areas of right-of-way intended for public use and/or ownership as shown on or otherwise referenced by the plat. The [insert name here] hereby waives all claims against the City of Monroe and/or any other governmental authority for damages which may occur to the adjacent land as a result of the construction, drainage and maintenance of such facilities and improvements."
22. If the final plat contains dedication of land for public purposes, it shall contain the following statement:

"Know all men by these presents that (name of developer) do hereby declare this plat and dedicate to the public forever all roads and ways and other public property shown hereon, and the use thereof for any and all public purposes, with the right to make all necessary slopes for cuts and fills, and the right to continue to drain the roads and ways over and across any lot or lots, where water might take a natural course, in the original reasonable grading of the roads and ways shown hereon.

Following original reasonable grading of roads and ways hereon, no drainage waters on any lot or lots shall be diverted or blocked from their natural course so as to discharge upon any public road rights-of-way, or to hamper proper road drainage. Any enclosing of drainage waters in culverts or drains or rerouting thereof across any lot as may be undertaken by or for the owner of such lot shall be done by and at the expense of such owner, but only after approval by the city engineer.”

23. The following shall be shown on the recording block section of the plat map: “Refer to Auditor Recording Number.”
24. The final plat shall provide space for the approving signatures of the community development director, city engineer and the mayor, and the city clerk shall attest the signatures.
25. The title block on the final plat map shall have the names of all the legal owners of the property named on the plat and the name of the surveyor/engineering firm which prepared the final plat map.
26. An Auditor’s Certificate shall be shown on the final plat map.
27. The following are required to be shown on the face of the final plat map:
 - Surveyor Certificate;
 - Correct legal description of all lots as set out in Chapter 58.17 RCW;
 - Owners Statement;
 - All new easement(s) over the property, their legal description(s) and associated dedication block(s);
 - Recording block/Certification blocks for City approval;
 - North arrow;
 - Certification of Payment of Taxes and Assessments;
 - Auditor’s Certificate; and
 - The survey control scheme, monumentation, basis of bearing and references.

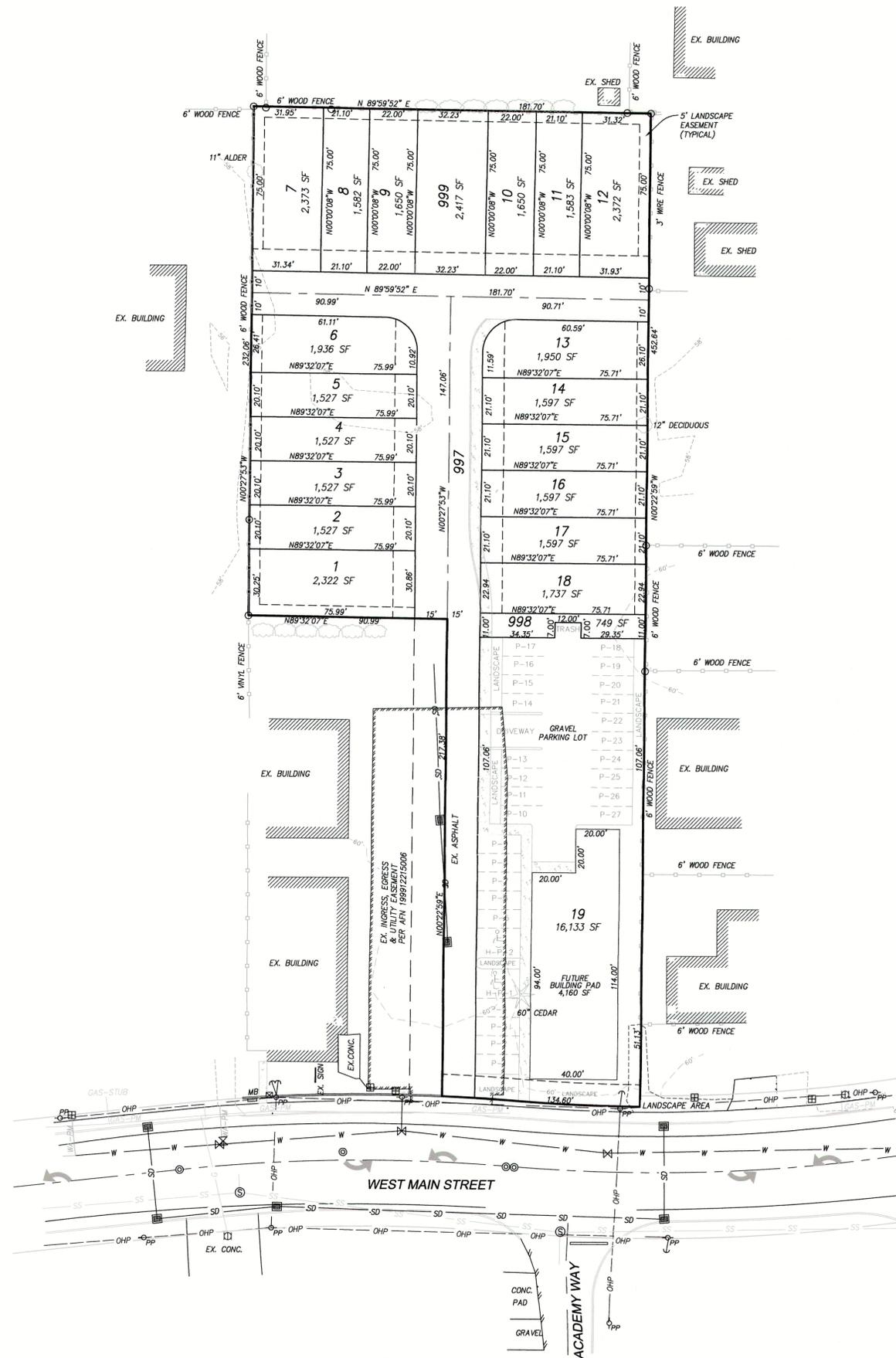
MISCELLANEOUS

28. The 30’ existing ingress, egress, and utility easement (AFN 199912215006) to the site shall be revised to include access to the proposed new lots before final plat approval.
29. Preliminary plat approval shall be effective for a maximum time period of five years upon which a final plat that meets all conditions of the preliminary plat approval must be submitted, in accordance with MMC 17.12.020(A).
30. All development within the mixed use commercial zone shall comply with the Infill, Multifamily, and Mixed Use Design Standards, subject to the requirements of MMC 18.10.132.
31. The developer shall apply to the Snohomish County Auditor at 3000 Rockefeller Avenue, Everett, WA 98201-4060 for a plat name reservation certificate and furnish the City with a copy of the approved reservation certificate at the time of final plat submittal.
32. If applicable, at the time of final plat submittal the developer shall submit a group mailbox plan, approved by the U.S. Post Office, to the Planning Department for final addressing.

33. Mail routes, including mailbox types and locations, shall be approved by the Postmaster prior to construction.
34. The developer shall submit a paper copy of the final plat to the Snohomish County Assessor's at 3000 Rockefeller Avenue, Everett, WA 98201-4060 with a segregation letter for land segregation and property tax review.
35. All construction equipment, building materials, and debris shall be stored on the applicant's property, out of the public right-of-way. In no case shall the access to any private or public property be blocked or impinged upon without prior consent from the affected property owners and the City of Monroe.
36. If at any time during clearing, grading and construction the streets are not kept clean and clear, all work will stop until the streets are cleaned and maintained in a manner acceptable to the Public Works Director.
37. Construction noise is not allowed between the hours of ten (10) p.m. and seven (7) a.m.
38. All signs shown on the approved plans for the subdivision are for illustrative purposes only. Pursuant to Monroe Municipal Code 18.80, a sign permit must be obtained for the placement of any non-exempt signage. Application for that sign permit shall include an approved site plan specifying the location of all signs.
39. The developer and contractor shall attend a pre-construction meeting with City staff to discuss expectations and limitations of the project permit before starting construction.

MAIN BROOK TOWNHOMES
 IN THE WW 1/4 OF THE SW 1/4 OF
 SECTION 1, TOWNSHIP 27 NORTH, RANGE 6 EAST, W.M.
 CITY OF MONROE, SNOHOMISH COUNTY, WASHINGTON

EXHIBIT 3



- EXISTING LEGEND**
- ⊙ EX. 4" SQUARE CONCRETE MONUMENT
 - EX. REBAR W/CAP (R&C) OR AS NOTED
 - ⊕ TEMPORARY BENCH MARK
 - ⊖ POWER POLE (PP)
 - ⊙ GUY ANCHOR
 - ⊕ FIRE HYDRANT
 - ⊖ WATER METER
 - ⊖ WATER VALVE
 - ⊖ GAS VALVE
 - ⊖ POWER VAULT
 - ⊖ UTILITY VAULT
 - ⊖ CATCH BASIN
 - ⊖ SANITARY SEWER MANHOLE
 - ⊖ MAIL BOX
 - EDGE OF ASPHALT
 - EX. BUILDING WALL
 - DECIDUOUS TREE
 - CONIFER TREE
 - HEDGE

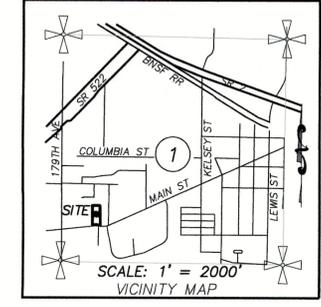
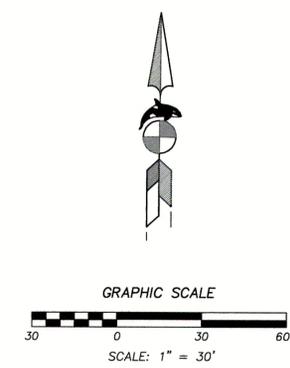
TITLE 18.10.140(B)
 USING 675 SQUARE FEET OF PARK AND RECREATIONAL USABLE OPEN SPACE PER BASE DWELLING UNIT AS FOUND IN TABLE 1
 18 LOTS X 170 SQUARE FEET = 3,060 SQUARE FEET OF USABLE OPEN SPACE REQUIRED
 USABLE OPEN SPACE PROVIDED IN THIS SUBDIVISION IS 3,166 SQUARE FEET.

LOTS AND TRACTS AREAS

LOTS 1-19	47,784 SF	1.10 ACRES
TRACTS 998 & 999 (PARK AND RECREATIONAL USABLE OPEN SPACE)	3,163 SF	0.07 ACRES

EQUIPMENT AND PROCEDURES:
 INSTRUMENTATION: LEICA TCR1205 TOTAL STATION
 METHOD OF SURVEY: FIELD TRAVERSE OF EXISTING MONUMENTATION
 PRECISION: MEETS OR EXCEEDS W.A.C. 332-130-090 REQUIREMENTS
 BASIS OF BEARING: PER THE UNDERLYING CITY OF MONROE SHORT PLAT NO. 1999008, APN 199912215006.
 REFERENCES:
 R1) CITY OF MONROE SHORT PLAT NO. 1999008, APN 199912215006
 R2) RECORD OF SURVEY, APN 200102285002
 R3) RECORD OF SURVEY, APN 9708145002
 BENCHMARK: WSDOT BRASS DISK CEMENTED INTO A DRILL HOLE AND SET LEVEL WITH THE CONCRETE SURFACE, NOTED ON WSDOT SURVEY INFORMATION SYSTEM, DESIGNATION GPS31522-154, MONUMENT ID 3244, ELEVATION = 71.699'
 DATUM: NAVD 88

- NOTES:**
- THIS SURVEY WAS PERFORMED WITH THE BENEFIT OF A TITLE REPORT, BUT DOES NOT PURPORT TO SHOW ALL EASEMENTS, RESTRICTIONS, RESERVATIONS AND/OR OCCUPATION WHICH MAY ENCUMBER TITLE TO OR USE OF THIS PROPERTY.
 - THIS SURVEY HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF PARTIES WHOSE NAMES APPEAR HEREON ONLY, AND DOES NOT EXTEND TO ANY UNNAMED THIRD PARTIES WITHOUT THE EXPRESS RECERTIFICATION BY THE LAND SURVEYOR.
 - BOUNDARY LINES SHOWN AND CORNERS SET REPRESENT DEED LOCATIONS; OWNERSHIP LINES MAY VARY. NO GUARANTEE OF OWNERSHIP IS EXPRESSED OR IMPLIED.
- PROJECT NOTES:**
- NO DUPLEX STRUCTURES PROPOSED WITHIN THIS SUBDIVISION.
 - ENTIRE SITE LIES OUTSIDE OF FLOOD HAZARD AREA AND LANDSLIDE HAZARD AREA.
 - ALL LOT AREAS ARE GROSS AREAS UNLESS OTHERWISE NOTED.
 - NEAREST FIRE HYDRANT IS LOCATED ON MAIN STREET +/- 10' WEST OF SITE.
 - FIRE HYDRANT(S) TO BE INSTALLED WITHIN THE SUBDIVISION AS DIRECTED BY THE FIRE MARSHAL.
 - 10' UTILITIES EASEMENT ABUTTING ROAD FRONTAGE ON ALL LOTS AND TRACTS AT TIME OF RECORDING.
 - ADJOINING LOT DATA INFORMATION TAKEN FROM THE PROPERTY AND TAX DATA PREPARED BY THE SNOHOMISH COUNTY ASSESSOR.
 - LINE OF DEVELOPMENT ACTIVITY AND PROJECT CLEARING LIMITS SHALL BE THE PROJECT BOUNDARY.
 - PROJECT SHALL BE CONSTRUCTED IN TWO PHASES.
 - HOA IS RESPONSIBLE FOR STORM WATER SYSTEM MAINTENANCE
 - DWELLING UNITS WITH ANY FIRST FLOOR EXTERIOR SURFACE IN EXCESS OF 150' FROM A FIRE APPARATUS ACCESS ROAD HAVING A MINIMUM OF 20' WIDTH SHALL BE PROTECTED WITH RESIDENTIAL FIRE SPRINKLERS.
 - MAX BUILDING HEIGHT 35'-55', FRONT & REAR YARD SETBACK 10', SIDE YARD SETBACK 0'.
 - CROSS EASEMENT FOR LOT 19 AT FINAL PAT APPROVAL.



PROJECT DESIGN TEAM

PLANNER / CONTACT LAND RESOLUTIONS 3605 COLBY AVE EVERETT, WA 98201 PHONE: (425) 258-4438 ATTN: RICK HANSON EMAIL: JEN@ORCALSI.COM	OWNER / APPLICANT HANSON HOMES 3605 COLBY AVE SNOHOMISH, WA 98291 PHONE: (425) 258-4438 ATTN: RICK HANSON EMAIL: 2011HANSONHOMES@GMAIL.COM	SURVEYOR ORCA LAND SURVEYING 3605 COLBY AVE EVERETT, WA 98201 PHONE: (425) 258-3400 ATTN: JOANNE M. SWANSON, PLS EMAIL: JOANNE@ORCALSI.COM
ENGINEER OMEGA ENGINEERING, INC 2707 WETMORE AVE EVERETT, WA 98201 PHONE: (425) 387-3820 ATTN: JOSEPH SNEYD EMAIL: JOE@OMEGA-ENG.COM	LANDSCAPE ARCHITECT ORION DESIGN GROUP 1031 - 185TH AVE NE SNOHOMISH, WA 98290 PHONE: (425) 346-1905 ATTN: KRISTAL LOWE EMAIL: ORIGIND@GMAIL.COM	TRAFFIC GIBSON TRAFFIC CONSULTANTS 2802 WETMORE AVENUE #220 EVERETT, WASHINGTON 98201 PHONE: (425) 338-8266 ATTN: EDWARD KOLTONOWSKI EMAIL: EDWARDK@GIBSONTRAFFIC.COM

LEGAL DESCRIPTION:
 LOTS 2, 3 AND 4 OF CITY OF MONROE SHORT PLAT NO. 199008, RECORDED UNDER RECORDING NUMBER 199912215006, BEING A PORTION OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST, W.M., SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON.

PROJECT INFORMATION

TAX NUMBER	27060100310200, 27060100310300 & 27060100310400
SITE ADDRESS	XXXX WEST MAIN STREET, MONROE, WA 98272
WITHIN UGA BOUNDARY	CITY OF MONROE
COMPREHENSIVE PLAN	MIXED USE
PROPOSED LAND USE	SINGLE FAMILY RESIDENTIAL
EXISTING ZONING	MIXED USE COMMERCIAL
PROPOSED ZONING	MIXED USE COMMERCIAL
CITY OF MONROE SEWER DEPARTMENT	SEWAGE DISPOSAL
CITY OF MONROE WATER DEPARTMENT	WATER SUPPLY
MONROE SCHOOL DISTRICT NO. 103	SCHOOL DISTRICT
SNOHOMISH COUNTY E.P.D. # 7	FIRE DISTRICT
CITY OF MONROE	PARK DISTRICT
SNOHOMISH COUNTY PUD	POWER COMPANY
YTIWITY	CABLE COMPANY
REPUBLIC SERVICES	TRASH COMPANY
PSE	GAS COMPANY
VERIZON COMMUNICATIONS	TELEPHONE COMPANY

GROSS SITE AREA	62,059 SF	1.42 ACRES
NET SITE AREA	47,790 SF	1.10 ACRES
TOTAL LOTS PROPOSED	19 - 18 SINGLE FAMILY LOTS, 1 COMMERCIAL LOT	

GROSS DENSITY (18/1.42)	12.67 D.U. PER ACRE	
NET DENSITY (18/1.10)	16.36 D.U. PER ACRE	
AVERAGE LOT SIZE	2,276 SF	0.05 ACRES
SMALLEST LOT SIZE	1,527 SF	0.03 ACRES

PARK AND RECREATIONAL / USEABLE OPEN SPACE PROVIDED		
TRACTS 998 & 999	3,163 SF	0.07 ACRES
PERCENT OF GROSS SITE AREA	5.10	PERCENT OF SITE
TOTAL ROADS TRACT 997	11,106 SF	0.25 ACRES
TOTAL ROAD LENGTH	546 LF	
PERCENT OF TOTAL SITE AREA	17.89	PERCENT OF SITE



ORCA Land Surveying
 3605 COLBY AVENUE, EVERETT, WA 98201
 425-258-3400 FAX: 425-258-1616

LAND RESOLUTIONS
 DESIGN • PLANNING • MANAGEMENT

PRELIMINARY SUBDIVISION
 OF
MAIN BROOK TOWNHOMES

IN THE SW 1/4 OF THE SW 1/4 OF
 SECTION 1, TWP. 27 N., RGE. 6 E., W.M.
 CITY OF MONROE
 SNOHOMISH COUNTY, WASHINGTON

FILE NO. 2017-028 DWG BY: JLH DATE: 1/15/2018 REV:

SHEET 1 OF 1



COMMUNITY DEVELOPMENT

806 West Main Street, Monroe, WA 98272
Phone (360) 794-7400 Fax (360) 794-4007
www.monroewa.gov

FOR OFFICE USE ONLY
PERMIT #(s) App # 4391
SEPA 2017-12
PL 2017-02

RECEIVED
SEP 29 2017
COMMUNITY DEVELOPMENT

COMBINED PERMIT APPLICATION

PERMIT SUBMITTAL HOURS

MONDAY – FRIDAY 8:00 – 12:00 / 1:00 – 5:00

<u>Building</u>	<u>Operations</u>	<u>Fire</u>	<u>Land Use</u>
<input type="checkbox"/> Commercial T/I	<input type="checkbox"/> Engineering Review	<input type="checkbox"/> Fire Alarm	<input type="checkbox"/> Accessory Dwelling Unit
<input type="checkbox"/> Demolition	<input type="checkbox"/> Fencing	<input type="checkbox"/> Fire Sprinkler	<input type="checkbox"/> Boundary Line Adjustment /Lot Consolidation
<input type="checkbox"/> Garage/Carport	<input type="checkbox"/> Grading	<input type="checkbox"/> High Piled Storage	<input type="checkbox"/> Conditional/Special Use
<input type="checkbox"/> Mechanical	<input type="checkbox"/> Retaining wall	<input type="checkbox"/> Hood Suppression	<input type="checkbox"/> Land Clearing/Forest Practices
<input type="checkbox"/> New Construction (Commercial/Residential)	<input type="checkbox"/> Rockery	<input type="checkbox"/> Operational	<input type="checkbox"/> Planned Residential Development
<input type="checkbox"/> Plumbing	<input type="checkbox"/> Right-of-Way Disturbance	<input type="checkbox"/> Spray Booth	<input type="checkbox"/> Shoreline Permit
<input type="checkbox"/> Racking	<input type="checkbox"/> Special Flood Hazard Area	<input type="checkbox"/> Tents & Canopies	<input type="checkbox"/> Short Plat
<input type="checkbox"/> Residential Remodel	<input type="checkbox"/> Utility Service	<input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Subdivision/Plat
<input type="checkbox"/> Sign	<input type="checkbox"/> Other _____		<input type="checkbox"/> Variance
<input type="checkbox"/> Other _____			<input type="checkbox"/> Other _____

NOTE: All required Electrical Permits will be issued by the Dept. of Labor & Industries.

THIS APPLICATION WILL NOT BE ACCEPTED WITHOUT COMPLETED SUBMITTAL REQUIREMENTS

Site Address or Property Location: XXXX West Main Street

Size of site (acre/square feet): 1.42 Acres

Assessor's Tax Parcel Number (14 digits): 27060100310200, 27060100310300 & 27060100310400

Applicant: Hanson Homes AT MAIN BROOK LLC Phone # (425) 328-5202

*Signature: [Signature] Printed Name: Rick Hanson

Mailing Address: PO Box 2289 Fax # () _____

City Snohomish State WA Zip 98291 E-mail 2011hansonhomes@gmail.com

Property Owner: Hanson Homes AT MAIN BROOK LLC Phone # (425) 328-5202

**Signature: [Signature] Printed Name: Rick Hanson

Mailing Address: PO Box 2289 Fax # () _____

City Snohomish State WA Zip 98291 E-mail 2011hansonhomes@gmail.com

Attach a separate sheet for additional property owners/additional addresses

*Applicant: By your signature above, you hereby certify that the information submitted is true and correct and that you are authorized by the property owner(s) to act on their behalf.

**Property Owners: by your signature above, you hereby certify that you have authorized the above applicant to make application on your behalf for this application.

**City of Monroe
Land Use Permit Application- Page 2**



Give a detailed description below of the proposal / work. Provide details specific to your application e.g., current and proposed lot sizes, number of lots, description of driveway, description of proposed business including hours of operation, number of employees, existing and proposed parking spaces.

Forest Tax Reporting Account Number (if harvesting timber call the Department of Revenue at (800) 548-8829 for tax reporting information or to receive a tax number):

Detailed Description of work:

See attached narrative.

FOR OFFICE USE ONLY

Planning Application Fee: <u>\$2750.00</u>	Publication Fee: <u>\$200.00 + \$25.00(sign)</u>
Fire Plan Check Fee: <u>\$175.00</u>	Mailing Fee: <u>\$150.00</u>
SEPA Fee: <u>\$550.00</u>	Technology Fee: <u>\$236.75</u>
TOTAL FEES: <u>\$5346.75</u>	
Per Lot fee = \$1260.00	

LAND RESOLUTIONS

LAND USE CONSULTANTS
Design • Planning • Management
3605 Colby Avenue - Everett, WA 98201
tele (425) 258-4438 - fax (425) 258-1616
landuse@nwlinc.com

RECEIVED
SEP 29 2017
COMMUNITY DEVELOPMENT

September 29, 2017

City of Monroe
Attn: Shana Restall
806 West Main Street
Monroe, Washington 98272

Re: **Main Brook Townhomes** ~ Project Narrative

Project Design Team

Joseph Smeby ~ Omega Engineering (425) 387-3820 joe@omega-eng.com
Rick Hanson ~ Hanson Homes (425) 328-5202 hansonhomes2011@gmail.com
Krystal Lowe ~ Origin Design Group (425) 346-1905 origindg@gmail.com
Edward Koltonowski ~ Gibson Traffic (425) 339-8266 edwardk@gibsontraffic.com

Project Contact

Jen Haugen ~ Land Resolutions (425) 258-4438 jen@orcalsi.com
Joanne Swanson ~ Orca Land Surveying (425) 259-3400 joanne@orcalsi.com

Dear Ms. Restall,

All of the information within this narrative will also be found on the preliminary plat map Sheet 1 of 1 and other reports or maps in the application presented to the city for review and approval.

The current owner of this property is Hanson Homes. On behalf of our client, Rick Hanson, whose mailing address is PO Box 2289, Snohomish, Washington 98291, and is the primary contact who may be reached at (425) 328-5202, we would like to submit the following project narrative.

The project consists of the following tax parcel numbers: 27060100310300, 27060100310200 & 27060100310400.

The site addresses for the existing parcel is unknown.

This property within this application contains 62,059 square feet or 1.42 acres.

The current zoning of the property is Mixed Use Commercial.

The average lot size in this development is 2,276 SF. Smallest lot is 1,527 SF.

Main Brook Townhomes is being proposed as a 21-lot subdivision containing 18 zero lot-line townhomes and 3 commercial lots, to be called **Main Brook Station**, using the City Of Monroe's MUC codes. The project will be developed in up to two phases.

There are no critical areas on site.

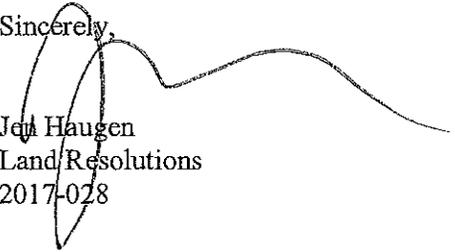
Tracts 998 and 999, which encompass 3,166 square feet, shall be utilized for the required useable open space for the residents in the development.

All existing trees and brush shall be removed within the proposed lots, and Tracts 997-999. All other trees shall be preserved and protected within this subdivision except for any tree that is determined to be dead, diseased or a hazard tree.

This development shall have house styles that comply with MMC 18.10.035(A)(3), and 18.10.065(A)(1), those together with the fact that there shall be less infrastructure for the city to maintain in the future and Tracts 998 & 999 to be used by the residents as recreational areas, shall be an enhancement to the area and the community.

Thank you in advance for reviewing this project with us and we look forward to working with you to complete this application and project. If you have any questions or comments concerning this application or project feel free to contact me at (425) 258-4438 office, or via email jen@orcalsi.com.

Sincerely,



Jen Haugen
Land Resolutions
2017-028



October 17, 2017

Hanson Homes at Main Brook, LLC
ATTN: Rick Hanson
PO Box 2289
Snohomish, WA 98291

RE: Notice of Complete Application for Main Brook Townhomes Preliminary Plat

File No. PL2017-02

Dear Mr. Hanson,

Your land use permit application which was submitted to the City of Monroe on September 29, 2017 for preliminary plat approval has been determined **COMPLETE** as of **September 29, 2017**. A complete application is not an approved application. A permit application is complete when it meets the submission requirements outlined in the Monroe Municipal Code. The City's determination of completeness does not preclude the City from requesting revisions, additional information or studies if new information is required, corrections are needed, or where there are substantial changes in the proposed action.

A decision will be made within 120 days of the date of the letter of completeness excluding time periods as described in MMC 21.50.110. If you have any questions and/or wish to discuss any portion of the enclosure of your application, please feel free to contact me at (360) 863-4513 or amarrero@monroewa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Anita Marrero".

Anita Marrero
Senior Planner

Cc: File



City of Monroe
806 West Main Street, Monroe, WA 98272
Phone (360) 794-7400 Fax (360) 794-4007
www.monroewa.gov

NOTICE OF LAND USE APPLICATION

NOTICE IS HEREBY GIVEN that the City of Monroe has received an application for a Preliminary Plat as described below:

PROJECT NAME: Main Brook Townhomes Preliminary Plat

PROJECT FILE#: PL2017-02

APPLICANT/OWNER: Hanson Homes at Main Brook, LLC, PO Box 2289 Snohomish, WA 98291

PROJECT LOCATION: The site is located at Section 1 Township 27 Range 6 Quarter SW LOT 4 OF CITY OF MON SP 199008 REC AFN 199912215006 BEING A PTN OF SW1/4 SW1/4; otherwise known as XXXX W. Main Street, Monroe, Washington, 98272. Snohomish County Tax Parcel Number(s): 27060100310200, 27060100310300, and 27060100310400.

PROJECT DESCRIPTION: The applicant, Hanson Homes, is requesting preliminary plat approval for a 21-lot subdivision containing eighteen (18) zero lot-line townhome lots and three (3) commercial lots to be developed in two (2) phases on approximately 1.42 acres in the Mixed-Use Commercial (MUC) zoning district.

APPROVALS REQUIRED: Preliminary Subdivision and SEPA Environmental Review.

STUDIES REQUIRED: Traffic Study, Drainage Report, Geotechnical Report, and Environmental Checklist.

APPLICATION PROCESS: A preliminary plat is a public hearing review process per City of Monroe Municipal Code (MMC) Chapter 21.20.050(F). It requires a public hearing, which will be noticed separately, and decision before the Hearing Examiner.

APPLICATION DATE: September 29, 2017

NOTICE OF COMPLETE APPLICATION: October 17, 2017

DATE OF NOTICE OF APPLICATION: October 20, 2017

COMMENT PERIOD: Submit written comments on or before **5 p.m., November 3, 2017**. Comments should address completeness of the application, quality or quantity of information presented, and the project's conformance to applicable plans or code.

STAFF CONTACT: Anita Marrero, Senior Planner @ (360) 863-4513 or amarrero@monroewa.gov

All documents are available for review Monday-Friday, 8:00-5:00p.m., excluding holidays, at Monroe City Hall, 806 West Main St Monroe, WA 98272 and online at www.monroewa.gov/mainbrook

A decision on the application will be made within one hundred twenty (120) days of the date of the letter of completeness.

Everett Daily Herald

Affidavit of Publication

State of Washington }
County of Snohomish } ss

Deb Grigg being first duly sworn, upon oath deposes and says: that he/she is the legal representative of the Everett Daily Herald a daily newspaper. The said newspaper is a legal newspaper by order of the superior court in the county in which it is published and is now and has been for more than six months prior to the date of the first publication of the Notice hereinafter referred to, published in the English language continually as a daily newspaper in Snohomish County, Washington and is and always has been printed in whole or part in the Everett Daily Herald and is of general circulation in said County, and is a legal newspaper, in accordance with the Chapter 99 of the Laws of 1921, as amended by Chapter 213, Laws of 1941, and approved as a legal newspaper by order of the Superior Court of Snohomish County, State of Washington, by order dated June 16, 1941, and that the annexed is a true copy of EDH782189 PL2017-02 as it was published in the regular and entire issue of said paper and not as a supplement form thereof for a period of 1 issue(s), such publication commencing on 10/20/2017 and ending on 10/20/2017 and that said newspaper was regularly distributed to its subscribers during all of said period.

The amount of the fee for such publication is \$53.82.

Deb Grigg

Subscribed and sworn before me on this 20 day of October, 2017.

Aubrey Knapp

AUBREY KNAPP
Notary Public
State of Washington
My Commission Expires
July 30, 2018

CITY OF MONROE, WASHINGTON
NOTICE OF LAND USE APPLICATION

NOTICE IS HEREBY GIVEN that the City of Monroe has received an application for a Preliminary Plat per the following: **PROJECT NAME:** Main Brook Townhomes Preliminary Plat **PROJECT FILE#:** PL2017-02 **APPLICANT/OWNER:** Hanson Homes at Main Brook, LLC, PO Box 2289 Snohomish, WA 98291 **PROJECT LOCATION:** The site is located at Section 1 Township 27 Range 6 Quarter SW LOT 4 OF CITY OF MON SP 199008 REC AFN 199912215006 BEING A PTN OF SW1/4 SW1/4; otherwise known as XXXX W. Main Street, Monroe, Washington, 98272. Snohomish County Tax Parcel Number(s): 27060100310200, 27060100310300, and 27060100310400. **PROJECT DESCRIPTION:** The applicant, Hanson Homes, is requesting preliminary plat approval for a 21-lot subdivision containing eighteen (18) zero lot-line townhome lots and three (3) commercial lots to be developed in two (2) phases on approximately 1.42 acres in the Mixed-Use Commercial (MUC) zoning district. **APPROVALS REQUIRED:** Preliminary Subdivision and SEPA Environmental Review. **STUDIES REQUIRED:** Traffic Study, Drainage Report, Geotechnical Report, and Environmental Checklist. **APPLICATION PROCESS:** A preliminary plat is a public hearing review process per City of Monroe Municipal Code (MMC) Chapter 21.20.050(F). It requires a public hearing, which will be noticed separately, and decision before the Hearing Examiner. **APPLICATION DATE:** September 29, 2017 **NOTICE OF COMPLETE APPLICATION:** October 17, 2017 **DATE OF NOTICE OF APPLICATION:** October 20, 2017 **COMMENT PERIOD:** Submit written comments on or before 5 p.m., November 3, 2017. Comments should address completeness of the application, quality or quantity of information presented, and the project's conformance to applicable plans or code. **STAFF CONTACT:** Anita Marrero, Senior Planner @ (360) 863-4513 or amarrero@monroewa.gov. All documents are available for review Monday-Friday, 8:00-5:00p.m., excluding holidays, at Monroe City Hall, 806 West Main St Monroe, WA 98272 and online at www.monroewa.gov/mainbrook. A decision on the application will be made within one hundred twenty (120) days of the date of the letter of completeness.

Published: October 20, 2017.

EDH782189

85

AFFIDAVIT OF POSTING NOTICE OF LAND USE APPLICATION

STATE OF WASHINGTON)

XXXX W. Main St., Monroe WA. 98272 (tax
parcel #'s 27060100310200 / 27060100310300
/ 27060100310400
Project location

COUNTY OF SNOHOMISH)

Main Brook Townhomes - Preliminary Plat
PL2017-02
Application Name and File Number

I, Ron Paynter (print name) being first duly sworn on oath, depose and say: That I am a citizen of the United States of America; That I am competent to be witness herein; That on the 20th day of October 2017, that I posted one sign for the Main Brook Townhomes Preliminary Plat PL2017-02 on or near the property concerned, in a conspicuous place; and the correct date of posting of said notice, to wit:

XXXX W Main St. Monroe WA. 98272 (see above for tax parcel #'s)
LOCATION OF NOTICE


Signed

Subscribed and sworn to me this 20th day of October, 20 17

NOTARY SEAL



Kim M. Shaw
NOTARY PUBLIC in and for the State of
Washington, residing at:

Snohomish County

Printed Name: Kim Shaw

My commission expires: 6/3/2020

AFFIDAVIT OF POSTING NOTICE OF LAND USE APPLICATION

STATE OF WASHINGTON) XXXX W Main St., Monroe, WA 98272
Project location

COUNTY OF SNOHOMISH) PL2017-02 - Main Brook Townhomes
Preliminary Plat
File Number and Application Name

I, Kim Shaw being first duly sworn on oath, depose and say: That I am a citizen of the United States of America; That I am competent to be witness herein; That on the 20th day of October, 2017, that I posted (1) Notice of Application for the Main Brook Townhomes Preliminary Plat at Monroe City Hall lobby.

806 West Main Street, Monroe, WA 98272 Monroe, WA 98272
Location of notice

Kim Shaw
Signed

Subscribed and sworn to me this 23rd day of October, 2017

NOTARY SEAL



Vicki L. Thayer
NOTARY PUBLIC in and for the State of Washington, residing at:

Snohomish County

Printed Name: Vicki Thayer

My commission expires: 5/9/2020

AFFIDAVIT OF POSTING NOTICE OF LAND USE APPLICATION

STATE OF WASHINGTON)

XXXX W Main St., Monroe, WA 98272
Project location

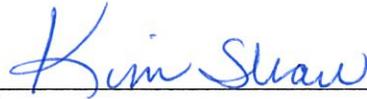
PL2017-02 - Main Brook Townhomes
Preliminary Plat

COUNTY OF SNOHOMISH)

File Number and Application Name

I, Kim Shaw being first duly sworn on oath, depose and say: That I am a citizen of the United States of America; That I am competent to be witness herein; That on the 20th day of October, 2017, that I posted (1) Notice of Application for the Main Brook Townhomes Preliminary Plat at Monroe City Hall lobby.

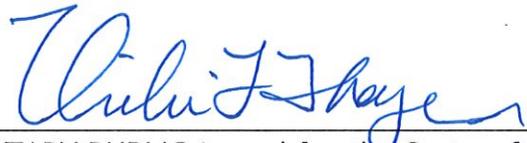
806 West Main Street, Monroe, WA 98272 Monroe, WA 98272
Location of notice



Signed

Subscribed and sworn to me this 23rd day of October, 2017

NOTARY SEAL



NOTARY PUBLIC in and for the State of Washington, residing at:

Snohomish County

Printed Name: Vicki Thayer

My commission expires: 5/9/2020

From: [Kim Shaw](#)
To: [Kim Shaw](#)
Cc: [Ben Swanson](#); [Anita Marrero](#); [Leigh Anne Barr](#)
Subject: Notice of Land Use Application - City of Monroe
Date: Friday, October 20, 2017 4:39:56 PM
Attachments: [image001.png](#)
[Vicinity map.pdf](#)
[NOA Main Brook Townhomes.pdf](#)

Good Afternoon,

Please see the attached Notice of Application for a proposed 21-lot Preliminary Plat in the City of Monroe. For questions on this application, please contact Anita Marrero, Senior Planner, at (360) 863-4513 or amarrero@monroewa.gov.

Thank you,
Kim

Kim Shaw, CPT
Land Use Permit Supervisor
806 West Main Street | Monroe, WA 98272
(360) 863-4532 (Ph) | (360) 794-4007 (F)
<http://www.monroewa.gov>



Still valid: separegister@ecy.wa.gov; pspirito@sno-isle.org; lanthony@sno-isle.org;
Justin.fontes@ftr.com; david.matulich@pse.com; john_warrick@comcast.com;
crenderlein@snopud.com; Kate.Tourtellot@commtrans.org; Neilwheeler@comcast.net;
Eileen.lefebvre@providence.org; piplicd@monroe.wednet.edu; Gretchen.Kaehler@DAHP.wa.gov;
sharon.swan@snoco.org; Diane.Rolph@co.snohomish.wa.us; equestions@shd.snohomish.wa.gov;
mfitzgerald@monroefire.org; k.kerwin@snoco.org; SEPA@psccleanair.org; stevev@psccleanair.org;
marsha.engel@psp.wa.gov; eip@parks.wa.gov; sposner@utc.wa.gov; kmclain@agr.wa.gov;
ike.nwankwo@commerce.wa.gov; anthony.boscolo@commerce.wa.gov;
reviewteam@commerce.wa.gov; sepadesk@dfw.wa.gov; robert.zeigler@dfw.wa.gov;
efheinitz@doc1.wa.gov; marksoltman@doh.wa.gov; Terri.Sinclair-Olson@dshs.wa.gov;
sepacenter@dnr.wa.gov; ramin.pazooki@wsdot.wa.gov; randy.kline@parks.wa.gov;
somers.elaine@epa.gov; epa-seattle@epa.gov; kate.hawe@noaa.gov; Stan.Allison@faa.gov;
Karen.Wood-McGuinness@fema.dhs.gov; kjoseph@sauk-suiattle.com; njoseph@sauk-suiattle.com;
jjoseph@sauk-suiattle.com; ryoung@tulaliptribes-nsn.gov; klyste@stillaguamish.com;
pstevenson@stillaguamish.com; sposner@utc.wa.gov; richard.wagner@bnsf.com;
newstips@heraldnet.com; mmuscari@esassoc.com; info@PPTValley.org;
tom.laufmann@sno.wednet.edu; lpelly@tu.org; rooseveltwater@frontier.com;
staff@highlandwaterdistrict.com; bewood@snopud.com; faye.ryan@pse.com;
dan.o.olson@williams.com; shannon.fleming@snoco.org; zlamebull@tulaliptribes-nsn.gov;
wrightp@wsdot.wa.gov; mrobenland@doc1.wa.gov; piplicd@monroe.wednet.edu

From: [Ryan Faye](#)
To: [Kim Shaw](#)
Subject: RE: Notice of Land Use Application - City of Monroe
Date: Monday, October 23, 2017 11:51:49 AM
Attachments: [image001.png](#)

Hi, Kim and Anita.
PSE has no gas or electric easements or facilities on these properties.
Thank you for allowing us to review.

Faye Ryan, SR/WA
Senior Real Estate Representative
Northern Region

Puget Sound Energy
Right-of-Way Department
1660 Park Lane
Burlington, WA 98233

Easement ?s

http://pse.com/accountsandservices/YourProperty/Documents/6105_NCC_Brochure.pdf

faye.ryan@pse.com
360-766-5455 (ofc)
360-628-2864 (cell)

From: Kim Shaw [mailto:KShaw@monroewa.gov]
Sent: Friday, October 20, 2017 4:40 PM
To: Kim Shaw
Cc: Ben Swanson; Anita Marrero; Leigh Anne Barr
Subject: Notice of Land Use Application - City of Monroe

Good Afternoon,

Please see the attached Notice of Application for a proposed 21-lot Preliminary Plat in the City of Monroe. For questions on this application, please contact Anita Marrero, Senior Planner, at (360) 863-4513 or amarrero@monroewa.gov.

Thank you,
Kim

Kim Shaw, CPT
Land Use Permit Supervisor
806 West Main Street | Monroe, WA 98272
(360) 863-4532 (Ph) | (360) 794-4007 (F)
<http://www.monroewa.gov>





Providing quality water, power and service at a competitive price that our customers value

November 1, 2017

Anita Marrero
City of Monroe
806 West Main Street
Monroe, WA 98272

Dear Ms. Marrero:

Reference No.: PL2017 02 Main Brook Townhomes Preliminary Plat

District DR Number: 17-222

The District presently has sufficient electric system capacity to serve the proposed development. However, the existing District facilities in the local area may require upgrading. Existing PUD facilities and easements may need modifications or relocations at the developer's expense. Any relocation, alteration or removal of District facilities to accommodate this project shall be at the expense of the project developer, and must be coordinated with the PUD in advance of final design. Please include any utility work in all applicable permits.

Cost of any work, new or upgrade, to existing facilities that is required to connect this proposed development to the District electric system shall be in accordance with the applicable District policy. The developer will be required to supply the District with suitable locations/easements upon its property for any electrical facilities that must be installed to serve the proposed development.

Please contact the District prior to design of the proposed project. For information about specific electric service requirements, please call the District's Monroe office at 360-794-3903 to contact a Customer Engineer.

Sincerely,

A handwritten signature in blue ink that reads "Jason Zyskowski".

Jason Zyskowski
Senior Manager
Planning, Engineering, & Technical Services



City of Monroe
806 West Main Street, Monroe, WA 98272
Phone (360) 794-7400 Fax (360) 794-4007
www.monroewa.gov

NOTICE OF PUBLIC HEARING

NOTICE is hereby given that a **PUBLIC HEARING** is scheduled to be held on the proposed **MAIN BROOK TOWNHOMES PRELIMINARY PLAT** on **THURSDAY, FEBRUARY 22, 2017 AT 10:00 A.M.** by the City of Monroe Hearing Examiner in the Council Chambers at City Hall, located at 806 West Main Street, Monroe, WA.

PROJECT NAME: Main Brook Townhomes Preliminary Plat

PROJECT FILE #: PL2017-02/SEPA2017-14

APPLICANT: Hanson Homes @ Main Brook, LLC

CONTACT: Rick Hanson, PO Box 2289, Snohomish WA. 98291

PROJECT DESCRIPTION: The applicant, Hanson Homes, is requesting preliminary plat approval for a 19-lot subdivision containing eighteen (18) zero lot-line townhome lots and one (1) commercial lot to be developed in two (2) phases on approximately 1.42 acres in the Mixed-Use Commercial (MUC) zoning district.

PROJECT LOCATION: The site is located at Section 1 Township 27 Range 6 Quarter SW LOT 4 OF CITY OF MON SP 199008 REC AFN 199912215006 BEING A PTN OF SW1/4 SW1/4; otherwise known as XXXX W. Main Street, Monroe, Washington, 98272. Snohomish County Tax Parcel Number(s): 27060100310200, 27060100310300, and 27060100310400.

PUBLIC COMMENTS: Anyone wishing to comment on the above items or to provide other relevant information may do so in writing or appear in person before the Hearing Examiner at the time and place of said public hearing. The Hearing Examiner is required to issue a final decision on this project pursuant to MMC 21.50.030(D). The Hearing Examiner's decision will be final and issued within 10 days of the public hearing.

PUBLIC REVIEW OF DOCUMENTS: The file is available for review during regular business hours, 8:00 a.m. - 5:00 p.m., Monday - Friday at Monroe City Hall, 806 West Main Street, Monroe WA. For more information, please contact Kim Shaw at (360) 863-4532 or kshaw@monroewa.gov. Project information is also available on the city's website at: www.monroewa.gov/mainbrook.

STAFF CONTACT: Anita Marrero, Senior Planner, at (360) 863-4513 or amarrero@monroewa.gov.

NOTICE OF PUBLIC HEARING POSTED/MAILED: 2/12/2018

Everett Daily Herald

Affidavit of Publication

State of Washington }
County of Snohomish } ss

Dicy Sheppard being first duly sworn, upon oath deposes and says: that he/she is the legal representative of the Everett Daily Herald a daily newspaper. The said newspaper is a legal newspaper by order of the superior court in the county in which it is published and is now and has been for more than six months prior to the date of the first publication of the Notice hereinafter referred to, published in the English language continually as a daily newspaper in Snohomish County, Washington and is and always has been printed in whole or part in the Everett Daily Herald and is of general circulation in said County, and is a legal newspaper, in accordance with the Chapter 99 of the Laws of 1921, as amended by Chapter 213, Laws of 1941, and approved as a legal newspaper by order of the Superior Court of Snohomish County, State of Washington, by order dated June 16, 1941, and that the annexed is a true copy of EDH795777 PUBLIC HEARING as it was published in the regular and entire issue of said paper and not as a supplement form thereof for a period of 1 issue(s), such publication commencing on 02/09/2018 and ending on 02/09/2018 and that said newspaper was regularly distributed to its subscribers during all of said period.

The amount of the fee for such publication is \$53.65.

Dicy Sheppard

Subscribed and sworn before me on this 9th day of February, 2018.



Linda Phillips

Notary Public in and for the State of Washington.
City Of Monroe | 14103247
KIM SHAW

CLASSIFIED ADVERTISING

PROOF/RECEIPT

CITY OF MONROE, WASHINGTON

NOTICE OF PUBLIC HEARING

NOTICE is hereby given that a PUBLIC HEARING is scheduled to be held on the proposed **MAIN BROOK TOWNHOMES PRELIMINARY PLAT** on **THURSDAY, FEBRUARY 22, 2018 AT 10:00 A.M.** by the City of Monroe Hearing Examiner in the Council Chambers at City Hall, located at 806 West Main Street, Monroe, WA. **PROJECT NAME:** Main Brook Townhomes Preliminary Plat **PROJECT FILE #:** PL2017-02/SEPA2017-14 **APPLICANT:** Hanson Homes @ Main Brook, LLC **CONTACT:** Rick Hanson, PO Box 2289, Snohomish WA, 98291 **PROJECT DESCRIPTION:** The applicant, Hanson Homes, is requesting preliminary plat approval for a 19-lot subdivision containing eighteen (18) zero lot-line townhome lots and one (1) commercial lot to be developed in two (2) phases on approximately 1.42 acres in the Mixed-Use Commercial (MUC) zoning district. **PROJECT LOCATION:** The site is located at Section 1 Township 27 Range 6 Quarter SW LOT 4 OF CITY OF MON SP 199008 REC AFN 199912215006 BEING A PTN OF SW1/4 SW1/4; otherwise known as XXXX W. Main Street, Monroe, Washington, 98272 Snohomish County Tax Parcel Number(s): 27060100310200, 27060100310300, and 27060100310400. **PUBLIC COMMENTS:** Anyone wishing to comment on the above items or to provide other relevant information may do so in writing or appear in person before the Hearing Examiner at the time and place of said public hearing. The Hearing Examiner is required to issue a final decision on this project pursuant to MMC 21.50.030(D). The Hearing Examiner's decision will be final and issued within 10 days of the public hearing. **PUBLIC REVIEW OF DOCUMENTS:** The file is available for review during regular business hours, 8:00 a.m. - 5:00 p.m., Monday - Friday at Monroe City Hall, 806 West Main Street, Monroe WA. For more information, please contact Kim Shaw at (360) 863-4532 or kshaw@monroewa.gov. Project information is also available on the city's website at: www.monroewa.gov/mainbrook. **STAFF CONTACT:** Anita Marrero, Senior Planner, at (360) 863-4513 or amarrero@monroewa.gov.
Published: February 9, 2018. EDH795777

AFFIDAVIT OF MAILING
NOTICE OF PUBLIC HEARING

STATE OF WASHINGTON)

Main Brook Townhomes - Preliminary Plat
PL2017-02

Application Name & File #

COUNTY OF SNOHOMISH)

Hanson Homes @ Main Brook

Applicant

I, Kim Shaw, being first duly sworn on oath depose and say that on the 5th day of February, 2017, made application with Click 2 Mail to mail on February 7, 2018, a copy with prepaid postage of the Notice of Public Hearing for the Main Brook Townhome Preliminary Plat PL2017-02. Attached is a list of names and addresses to whom this information was mailed.

Kim Shaw

Signed

Subscribed and sworn to me this 6th day of February, 2018

NOTARY SEAL



Vicki L. Thayer

NOTARY PUBLIC in and for the State of Washington, residing at:

Snohomish County

Printed Name: Vicki L. Thayer

My commission expires: 5/9/2020



City of Monroe
806 West Main Street, Monroe, WA 98272
Phone (360) 794-7400 Fax (360) 794-4007
www.monroewa.gov

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STAFF CONTACT: Anita Marrero, Senior Planner, at (360) 863-4513 or amarrero@monroewa.gov.

NOTICE OF PUBLIC HEARING POSTED/MAILED: 2/12/2018

OwnerNmFirst	OwnerNmLast	OwnerAddr	OwnerCityNm	OwnerState	OwnerZIP
Arnie & Maria	Meza	1152 Johnson St SE	Monroe	WA	98272
Arthur & Denise	Gulas	184 Academy Way	Monroe	WA	98272
Barbara	McLaren	338 Dennis Way	Monroe	WA	98272
Bd Monroe Properties LLC		970 5th Ave NW	Issaquah	WA	98027
Best Life Properties LLC		31115 Cherry Valley Rd	Duvall	WA	98019
Carolyn	Lunn	18106 159th St SE	Monroe	WA	98272
Charles Edward & Andrea Jhonne	Swanson	705 Alden St	Monroe	WA	98272
Christian Reformed Church-Monroe		1012 W Main St	Monroe	WA	98272
Christopher & Camren	Vivolo	280 Dennis Way	Monroe	WA	98272
Compass Health-Monroe		PO Box 3810	Everett	WA	98213
Michael & Sandra	Condo	16014 Dennis Wy	Monroe	WA	98272
Daniel & Rhonda	Williams	704 Lawrence St	Monroe	WA	98272
Darlene	Helm	22207 Dubuque Rd	Snohomish	WA	98290
David	Glenn	1118 Johnson St SE	Monroe	WA	98272
David	Rintala	314 Dennis Way	Monroe	WA	98272
David & Cindy	Lang	297 Dennis Way	Monroe	WA	98272
David & Winifred	McCune	283 Dennis Way	Monroe	WA	98272
Delana	Reeves	253 Dennis Way	Monroe	WA	98272
Denis	Porter	148 Academy Way	Monroe	WA	98272
Donald	White Jr	715 Lawrence St	Monroe	WA	98272
Donald	Wiens	719 Lawrence St	Monroe	WA	98272
Donald & Shirley	Thayer	241 Dennis Way	Monroe	WA	98272
Dorothy	Clark	13309 208th Ave SE	Monroe	WA	98272
Double Down Holding Company LLC		P O Box 1001	Clinton	WA	98236
Dwight	Pruitt	722 Lawrence St	Monroe	WA	98272
Eric	Harting	181 Academy Way	Monroe	WA	98272
Eutiquio Martinez	Garcia	26702 Ben Howard Rd	Monroe	WA	98272
Gail & Jeffrey	Jones	270 Dennis Way	Monroe	WA	98272
Gary & Jodi	Hazen	284 Dennis Way	Monroe	WA	98272
Greg	Hetland	166 Academy Way	Monroe	WA	98272
Harmony House East Association		PO Box 419	Everett	WA	98206
Harriet	Ferguson	329 Dennis Way	Monroe	WA	98272
Heather Holmes & Aaron Joseph	Goldstein	2207 W Lake Sammamish Pkwy SE	Bellevue	WA	98008
Howard Kenneth	Shelton	1136 159th St SE	Monroe	WA	98272

Irene	Slagle	2232 12th St Apt 223	Everett	WA	98201
J Michael	Gallagher	1203 W Main St	Monroe	WA	98272
Jayce	Sanders	1118 156th Pl SE Apt D40	Mill Creek	WA	98272
Jessie	Barraza	316 S Kelsey St Apt 1	Monroe	WA	98272
John	Harris	310 Orr St	Monroe	WA	98272
John & Nancy	Wolf	328 Dennis Way	Monroe	WA	98272
Joseph	Moore	1017 W Main St Apt D101	Monroe	WA	98272
Judith	Carberry	18042 159th St SE	Monroe	WA	98272
Kelli	Campbell	18054 159th St SE Unit B	Monroe	WA	98272
Keven & Gayle	McGinnis	315 Dennis Way	Monroe	WA	98272
Kimberly	Kussman	709 Lawrence St	Monroe	WA	98272
Kurt	Nowadnick	703 Alden Ave	Monroe	WA	98272
Lagniappe Investments LLC		12821 NE 36th St	Bellevue	WA	98005
Larry & Marjorie	McKay	P O Box 880	Monroe	WA	98272
Lawrence & Kimberlea	Green	258 Dennis Way	Monroe	WA	98272
Leanna	Patridge	504 S 20th St D	Mount Vernon	WA	98274
Leonard	Rich	1103 W Main St	Monroe	WA	98272
Linda & Boyd	Hill Sr	287 Dennis Way	Monroe	WA	98272
Lourdes	Hernandez-Salazar	1113 W Main St	Monroe	WA	98272
Lowell & Kathleen	Braaten	325 Dennis Way	Monroe	WA	98272
Lucy & Bert	Spada	15925 179th Ave SE	Monroe	WA	98272
Mary	Ottini	1102 W Main St	Monroe	WA	98272
Michael	Hollack	1060 Johnson St SE	Monroe	WA	98272
Monroe Christian School		1009 W Main St	Monroe	WA	98272
Monroe Professional Center LLC	Attn: Dr. Irene V Chasen, Manager	16784 NE 86th Crt	Redmond	WA	98052
Monroe School Dist 103		200 E Fremont St.	Monroe	WA	98272
Monroe Valley Church Of Christ		15915 179th Ave SE	Monroe	WA	98272
Ngy Chhe	Chhour	14911 Chain Lake Rd Apt M387	Monroe	WA	98272
Norma	Marshall	324 Dennis Way	Monroe	WA	98272
Nusreta	Aksamovic-Madesko	837 Pine St	Everett	WA	98201
Donald & Jean Trust	O'Connor	18088 159th St SE	Monroe	WA	98272
Rachel	Moser	339 Dennis Way	Monroe	WA	98272
Raymond & Elizabeth	Neibert	PO Box 1567	Monroe	WA	98272
Richard	Fredlund	12303 NE 147th Ct	Kirkland	WA	98034
Richard & Mary	White	177 Academy Way	Monroe	WA	98272

Robert & Janet	Russell	294 Dennis Way	Monroe	WA	98272
Robert Michael	Berg	717 Lawrence Ave	Monroe	WA	98272
Rutledge-Monroe 1 LLC		12509 130th Ln NE	Kirkland	WA	98034
Ryan	Dilsaver	18463 Blueberry Ln No H303	Monroe	WA	98272
Sahar	Siddiq	11013 Meridian Dr SE	Everett	WA	98208
Sharon	Morency	16005 Dennis Way	Monroe	WA	98272
Smiley	Creswell	1 Academy Way	Monroe	WA	98272
Sorn	Sutter	15919 179th Ave SE	Monroe	WA	98272
Steven & Chaiyapathna Darawan	Morrison	15921 179th Ave SE	Monroe	WA	98272
The Downie Family LLC		1188 Village Way	Monroe	WA	98272
Tibltres	Bereket	16605 6th Ave W Unit K201	Lynnwood	WA	98037
Timothy & Joette	Cochran	273 Dennis Way	Monroe	WA	98272
Tracey	Wagner	1230 W Main St	Monroe	WA	98272
Triple Down LLC		2302 2nd Ave N	Seattle	WA	98109
Triple Down LLC		12821 NE 36th St	Bellevue	WA	98005
Victoria & Hilliard Paul	Smith	246 Dennis Way	Monroe	WA	98272
Wade	Brickman	8002 156th St SE	Snohomish	WA	98296
Western Wash Seventh-Day Adventists		32229 Weyerhaeuser Way S	Federal Way	WA	98001
William & Mary	Clark	PO Box 165	Monroe	WA	98272
William & Valeria	Barschaw	1087 Hidden Valley Rd	Cle Elum	WA	98922
Blick Shirley R Trust		707 Alden Ave	Monroe	WA	98272
Hanson Homes @ Main Brook, LLC		PO Box 2289	Snohomish	WA	98291
Land Resolutions	Attn: Ry McDuffy/Jen Haugen	3605 Colby Ave	Everett	WA	98206

AFFIDAVIT OF POSTING NOTICE OF PUBLIC HEARING

STATE OF WASHINGTON)

XXXX W. Main St., Monroe WA. 98272 (tax
parcel #'s 27060100310200 / 27060100310300
/ 27060100310400
Project location

Main Brook Townhomes - Preliminary Plat
PL2017-02

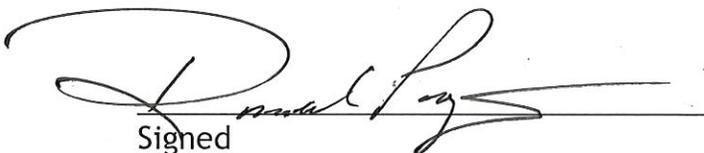
COUNTY OF SNOHOMISH)

Application Name and File Number

I, Ron Payne (print name) being first duly sworn on oath, depose and say: That I am a citizen of the United States of America; That I am competent to be witness herein; That on the 13th day of February 2018, that I posted one sign for the Main Brook Townhomes Preliminary Plat PL2017-02 on or near the property concerned, in a conspicuous place; and the correct date of posting of said notice, to wit:

XXXX W Main St. Monroe WA. 98272 (see above for tax parcel #'s)

LOCATION OF NOTICE


Signed

Subscribed and sworn to me this 13th day of February, 2018

NOTARY SEAL



Kim M. Shaw

NOTARY PUBLIC in and for the State of Washington, residing at:

Snohomish County

Printed Name: Kim Shaw

My commission expires: 6/3/2020

AFFIDAVIT OF POSTING NOTICE OF PUBLIC HEARING

STATE OF WASHINGTON)

XXXX W Main St., Monroe, WA 98272
Project location

PL2017-02 - Main Brook Townhomes
Preliminary Plat

COUNTY OF SNOHOMISH)

File Number and Application Name

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806 West Main Street, Monroe, WA 98272 Monroe, WA 98272
Location of notice

Kim Shaw

Signed

Subscribed and sworn to me this 13th day of February, 2018

NOTARY SEAL



Vicki L Thayer

NOTARY PUBLIC in and for the State of Washington, residing at:

Snohomish County

Printed Name: Vicki Thayer

My commission expires: 5/9/2020



City of Monroe
806 West Main Street, Monroe, WA 98272
Phone (360) 794-7400 Fax (360) 794-4007
www.monroewa.gov

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PROJECT NAME: Main Brook Townhomes Preliminary Plat .

PROJECT FILE #: PL2017-02/SEPA2017-14

APPLICANT: Hanson Homes @ Main Brook, LLC

CONTACT: Rick Hanson, PO Box 2289, Snohomish WA. 98291

PROJECT DESCRIPTION: The applicant, Hanson Homes, is requesting preliminary plat approval for a 19-lot subdivision containing eighteen (18) zero lot-line townhome lots and one (1) commercial lot to be developed in two (2) phases on approximately 1.42 acres in the Mixed-Use Commercial (MUC) zoning district.

PROJECT LOCATION: The site is located at Section 1 Township 27 Range 6 Quarter SW LOT 4 OF CITY OF MON SP 199008 REC AFN 199912215006 BEING A PTN OF SW1/4 SW1/4; otherwise known as XXXX W. Main Street, Monroe, Washington, 98272. Snohomish County Tax Parcel Number(s): 27060100310200, 27060100310300, and 27060100310400.

PUBLIC COMMENTS: Anyone wishing to comment on the above items or to provide other relevant information may do so in writing or appear in person before the Hearing Examiner at the time and place of said public hearing. The Hearing Examiner is required to issue a final decision on this project pursuant to MMC 21.50.030(D). The Hearing Examiner's decision will be final and issued within 10 days of the public hearing.

PUBLIC REVIEW OF DOCUMENTS: The file is available for review during regular business hours, 8:00 a.m. - 5:00 p.m., Monday - Friday at Monroe City Hall, 806 West Main Street, Monroe WA. For more information, please contact Kim Shaw at (360) 863-4532 or kshaw@monroewa.gov. Project information is also available on the city's website at: www.monroewa.gov/mainbrook.

STAFF CONTACT: Anita Marrero, Senior Planner, at (360) 863-4513 or amarrero@monroewa.gov.

NOTICE OF PUBLIC HEARING POSTED/MAILED: 2/12/2018



DETERMINATION OF NON-SIGNIFICANCE (DNS)

File Number: SEPA 2017-14

Name of Proposal: Main Brook Townhomes Preliminary Plat

Description of Proposal: The applicant, Hanson Homes, is requesting preliminary plat approval for a 21-lot subdivision containing eighteen (18) zero lot-line townhome lots and three (3) commercial lots to be developed in two (2) phases on approximately 1.42 acres in the Mixed-Use Commercial (MUC) zoning district.

Proponents: Rick Hanson
Hanson Homes
PO Box 2289
Snohomish, WA 98291

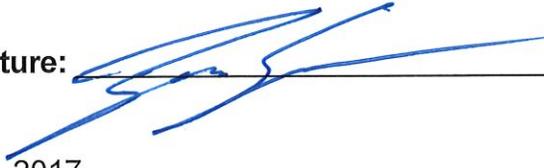
Location of Proposal: The site is located at Section 1 Township 27 Range 6 Quarter SW LOT 4 OF CITY OF MON SP 199008 REC AFN 199912215006 BEING A PTN OF SW1/4 SW1/4; otherwise known as XXXX W. Main Street, Monroe, Washington, 98272. Snohomish County Tax Parcel Number(s): 27060100310200, 27060100310300, and 27060100310400.

Lead Agency: City of Monroe

Threshold Determination: The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) IS NOT required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public for review upon request at Monroe City Hall, 806 West Main Street, Monroe, WA 98272 between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays. The information is also available for view online at www.monroewa.gov/mainbrook.

- There is no comment period for this DNS.
- This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.
- This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by **January 2, 2018**.

Responsible Official: Ben Swanson, Community Development Director
SEPA Responsible Official
(360) 863-4554
Monroe City Hall
806 West Main Street
Monroe, WA 98272
bswanson@monroewa.gov

Date: 12/12/17 **Signature:**  _____

Date of Issuance: December 15, 2017

Deadline for Submitting Comments/Appeals: No later than 5:00 p.m. on January 2, 2018

Appeals: You may appeal this determination to the City of Monroe Hearing Examiner at Monroe City Hall, which is located at 806 West Main Street, Monroe, WA 98272, no later than **5:00 p.m. on January 2, 2018**. You should be prepared to make specific factual objections; and you shall set forth the specific reason, rationale, and/or basis for the appeal. Appeals must be made in person on City appeal forms, which are available through the Community Development Department at Monroe City Hall. Appeals must be filed in original form in accordance with MMC Chapter 21.60. Payment of the appeal fee, as specified in the city's fee resolution, shall occur at the time the appeal is filed. Please contact Kim Shaw, Land Use Permit Supervisor, by email at kshaw@monroewa.gov or by phone at (360) 863-4532 to read or ask about the procedures for SEPA appeals.

Staff Contact: Questions about the proposal may be directed to Anita Marrero, Senior Planner, at amarrero@monroewa.gov or (360) 863-4513.

Everett Daily Herald

Affidavit of Publication

State of Washington }
County of Snohomish } ss

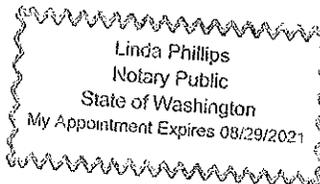
Dicy Sheppard being first duly sworn, upon oath deposes and says: that he/she is the legal representative of the Everett Daily Herald a daily newspaper. The said newspaper is a legal newspaper by order of the superior court in the county in which it is published and is now and has been for more than six months prior to the date of the first publication of the Notice hereinafter referred to, published in the English language continually as a daily newspaper in Snohomish County, Washington and is and always has been printed in whole or part in the Everett Daily Herald and is of general circulation in said County, and is a legal newspaper, in accordance with the Chapter 99 of the Laws of 1921, as amended by Chapter 213, Laws of 1941, and approved as a legal newspaper by order of the Superior Court of Snohomish County, State of Washington, by order dated June 16, 1941, and that the annexed is a true copy of EDH789310 SEPA 2017-14, DNS as it was published in the regular and entire issue of said paper and not as a supplement form thereof for a period of 1 issue(s), such publication commencing on 12/15/2017 and ending on 12/15/2017 and that said newspaper was regularly distributed to its subscribers during all of said period.

The amount of the fee for such publication is \$71.76.

Dicy Sheppard

Subscribed and sworn before me on this 15th day of December, 2017.

Linda Phillips



Notary Public in and for the State of Washington.
City Of Monroe | 14103247
KIM SHAW

CLASSIFIED ADVERTISING

PROOF/RECEIPT

CITY OF MONROE, WASHINGTON
DETERMINATION OF NON-SIGNIFICANCE (DNS)

File Number: SEPA 2017-14 **Name of Proposal:** Main Brook Townhomes Preliminary Plat **Description of Proposal:** The applicant, Hanson Homes, is requesting preliminary plat approval for a 21-lot subdivision containing eighteen (18) zero lot-line townhome lots and three (3) commercial lots to be developed in two (2) phases on approximately 1.42 acres in the Mixed-Use Commercial (MUC) zoning district. **Proponents:** Rick Hanson, Hanson Homes PO Box 2289, Snohomish, WA 98291 **Location of Proposal:** The site is located at Section 1 Township 27 Range 6 Quarter SW LOT 4 OF CITY OF MON SP 199008 REC AFN 199912215006 BEING A PTN OF SW1/4 SW1/4; otherwise known as XXXX W, Main Street, Monroe, Washington, 98272. Snohomish County Tax Parcel Number(s): 27060100310200, 27060100310300, and 27060100310400. **Lead Agency:** City of Monroe **Threshold Determination:** The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) IS NOT required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public for review upon request at Monroe City Hall, 806 West Main Street, Monroe, WA 98272 between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays. The information is also available for view online at www.monroewa.gov/mainbrook. This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by **January 2, 2018**. **Responsible Official:** Ben Swanson, Community Development Director, SEPA Responsible Official, (360) 863-4554, 806 W. Main Street Monroe, WA 98272 or bswanson@monroewa.gov **Date of Issuance:** December 15, 2017 **Deadline for Submitting Comments/Appeals:** No later than 5:00 p.m. on **January 2, 2018** **Appeals:** You may appeal this determination to the City of Monroe Hearing Examiner at Monroe City Hall, which is located at 806 West Main Street, Monroe, WA 98272, no later than 5:00 p.m. on **January 2, 2018**. You should be prepared to make specific factual objections; and you shall set forth the specific reason, rationale, and/or basis for the appeal. Appeals must be made in person on City appeal forms, which are available through the Community Development Department at Monroe City Hall. Appeals must be filed in original form in accordance with MMC Chapter 21.60. Payment of the appeal fee, as specified in the city's fee resolution, shall occur at the time the appeal is filed. Please contact Kim Shaw, Land Use Permit Supervisor, by email at kshaw@monroewa.gov or by phone at (360) 863-4532 to read or ask about the procedures for SEPA appeals. **Staff Contact:** Questions about the proposal may be directed to Anita Marrero, Senior Planner, at amarrero@monroewa.gov or (360) 863-4513.

Published: December 15, 2017.

EDH789310

AFFIDAVIT OF MAILING
NOTICE OF SEPA DETERMINATION

STATE OF WASHINGTON)

Main Brook Townhomes - Preliminary Plat
PL2017-02 / SEPA2017-14
Application Name & File #

COUNTY OF SNOHOMISH)

Hanson Homes @ Main Brook
Applicant

I, Kim Shaw, being first duly sworn on oath depose and say that on the 13th
day of December, 2017, made application with Click 2 Mail to mail on
December 14th, 2017, a copy with prepaid postage of the Notice of SEPA
Determination for MainBrook Townhomes SEPA2017-14. Attached is a list of
names and addresses to whom this information was mailed.

Kim Shaw

Signed

Subscribed and sworn to me this 18th day of December, 2017

NOTARY SEAL



Vicki L. Thayer

NOTARY PUBLIC in and for the State of
Washington, residing at:

Snohomish County

Printed Name: Vicki L. Thayer

My commission expires: 5/9/2020

Kim Shaw

From: Click2Mail Customer Support <support@click2mail.com>
Sent: Wednesday, December 13, 2017 4:25 PM
To: Kim Shaw
Subject: click2mail.com: New Order # 102324214

Dear Kim Shaw,

Thank you for your order from click2mail.com. Below is a copy of your invoice. You can check the status of your order at any time by logging in to your account. If you have any questions about your order, please feel free to contact us at support@click2mail.com or by phone at (866) 665-2787. Customer Support is available Monday – Friday from 9am – 8pm EST. Thank you again for your business.



Order #102324214

Order Date: December 13, 2017

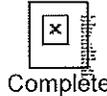
Account: CityofMonroe

Order Total: \$77.62

Billing Address

Payment

Finance Department
City of Monroe
806 W Main St
Monroe WA 98272-2125
United States



Complete



In progress

Job ID: 1824284

Requested Fulfillment Date: 12/14/2017

Product Information	Actual Fulfillment Date	Quantity	Subtotal
Postcard - 5 x 8 - SpaceSaver Format Product SKU: PC41-P <i>Product type: Postcard 5 x 8</i> <i>Paper type: White Matte</i> <i>Print color: Full Color</i> <i>Print options: Printing both sides</i> <i>Mail class: First Class</i> <i>Production time: Next Day</i> <i>Base Document Name: MainBrook SEPA postcard</i> <i>12_13_2017</i> <i>Job Address List Name: MainBrook mailing 12_2017</i> Production Costs for 91 Pieces:\$39.13 First Class Automation Letter Postage for 91 Pieces: \$38.49 Postage for 0 Pieces: \$0.00 Postage for 0 Pieces: \$0.00		91	\$77.62
Order Sub Total:			\$77.62
Invoice Subtotal:			\$77.62

OwnerNmFirst	OwnerNmLast	OwnerAddr	OwnerCityNm	OwnerState	OwnerZIP
Arnie & Maria	Meza	1152 Johnson St SE	Monroe	WA	98272
Arthur & Denise	Gulas	184 Academy Way	Monroe	WA	98272
Barbara	McLaren	338 Dennis Way	Monroe	WA	98272
Bd Monroe Properties LLC		970 5th Ave NW	Issaquah	WA	98027
Best Life Properties LLC		31115 Cherry Valley Rd	Duvall	WA	98019
Carolyn	Lunn	18106 159th St SE	Monroe	WA	98272
Charles Edward & Andrea Jhonne	Swanson	705 Alden St	Monroe	WA	98272
Christian Reformed Church-Monroe		1012 W Main St	Monroe	WA	98272
Christopher & Camren	Vivolo	280 Dennis Way	Monroe	WA	98272
Compass Health-Monroe		PO Box 3810	Everett	WA	98213
Michael & Sandra	Condo	16014 Dennis Wy	Monroe	WA	98272
Daniel & Rhonda	Williams	704 Lawrence St	Monroe	WA	98272
Darlene	Helm	22207 Dubuque Rd	Snohomish	WA	98290
David	Glenn	1118 Johnson St SE	Monroe	WA	98272
David	Rintala	314 Dennis Way	Monroe	WA	98272
David & Cindy	Lang	297 Dennis Way	Monroe	WA	98272
David & Winifred	McCune	283 Dennis Way	Monroe	WA	98272
Delana	Reeves	253 Dennis Way	Monroe	WA	98272
Denis	Porter	148 Academy Way	Monroe	WA	98272
Donald	White Jr	715 Lawrence St	Monroe	WA	98272
Donald	Wiens	719 Lawrence St	Monroe	WA	98272
Donald & Shirley	Thayer	241 Dennis Way	Monroe	WA	98272
Dorothy	Clark	13309 208th Ave SE	Monroe	WA	98272
Double Down Holding Company LLC		P O Box 1001	Clinton	WA	98236
Dwight	Pruitt	722 Lawrence St	Monroe	WA	98272
Eric	Harting	181 Academy Way	Monroe	WA	98272
Eutiquio Martinez	Garcia	26702 Ben Howard Rd	Monroe	WA	98272
Gail & Jeffrey	Jones	270 Dennis Way	Monroe	WA	98272
Gary & Jodi	Hazen	284 Dennis Way	Monroe	WA	98272
Greg	Hetland	166 Academy Way	Monroe	WA	98272
Harmony House East Association		PO Box 419	Everett	WA	98206
Harriet	Ferguson	329 Dennis Way	Monroe	WA	98272
Heather Holmes & Aaron Joseph	Goldstein	2207 W Lake Sammamish Pkwy SE	Bellevue	WA	98008
Howard Kenneth	Shelton	1136 159th St SE	Monroe	WA	98272

Irene	Slagle	2232 12th St Apt 223	Everett	WA	98201
J Michael	Gallagher	1203 W Main St	Monroe	WA	98272
Jayce	Sanders	1118 156th Pl SE Apt D40	Mill Creek	WA	98272
Jessie	Barraza	316 S Kelsey St Apt 1	Monroe	WA	98272
John	Harris	310 Orr St	Monroe	WA	98272
John & Nancy	Wolf	328 Dennis Way	Monroe	WA	98272
Joseph	Moore	1017 W Main St Apt D101	Monroe	WA	98272
Judith	Carberry	18042 159th St SE	Monroe	WA	98272
Kelli	Campbell	18054 159th St SE Unit B	Monroe	WA	98272
Keven & Gayle	McGinnis	315 Dennis Way	Monroe	WA	98272
Kimberly	Kussman	709 Lawrence St	Monroe	WA	98272
Kurt	Nowadnick	703 Alden Ave	Monroe	WA	98272
Lagniappe Investments LLC		12821 NE 36th St	Bellevue	WA	98005
Larry & Marjorie	McKay	P O Box 880	Monroe	WA	98272
Lawrence & Kimberlea	Green	258 Dennis Way	Monroe	WA	98272
Leanna	Patridge	504 S 20th St D	Mount Vernon	WA	98274
Leonard	Rich	1103 W Main St	Monroe	WA	98272
Linda & Boyd	Hill Sr	287 Dennis Way	Monroe	WA	98272
Lourdes	Hernandez-Salazar	1113 W Main St	Monroe	WA	98272
Lowell & Kathleen	Braaten	325 Dennis Way	Monroe	WA	98272
Lucy & Bert	Spada	15925 179th Ave SE	Monroe	WA	98272
Mary	Ottini	1102 W Main St	Monroe	WA	98272
Michael	Hollack	1060 Johnson St SE	Monroe	WA	98272
Monroe Christian School		1009 W Main St	Monroe	WA	98272
Monroe Professional Center LLC	Attn: Dr. Irene V Chasen, Manager	16784 NE 86th Crt	Redmond	WA	98052
Monroe School Dist 103		200 E Fremont St.	Monroe	WA	98272
Monroe Valley Church Of Christ		15915 179th Ave SE	Monroe	WA	98272
Ngy Chhe	Chhour	14911 Chain Lake Rd Apt M387	Monroe	WA	98272
Norma	Marshall	324 Dennis Way	Monroe	WA	98272
Nusreta	Aksamovic-Madesko	837 Pine St	Everett	WA	98201
Donald & Jean Trust	O'Connor	18088 159th St SE	Monroe	WA	98272
Rachel	Moser	339 Dennis Way	Monroe	WA	98272
Raymond & Elizabeth	Neibert	PO Box 1567	Monroe	WA	98272
Richard	Fredlund	12303 NE 147th Ct	Kirkland	WA	98034
Richard & Mary	White	177 Academy Way	Monroe	WA	98272

Robert & Janet	Russell	294 Dennis Way	Monroe	WA	98272
Robert Michael	Berg	717 Lawrence Ave	Monroe	WA	98272
Rutledge-Monroe 1 LLC		12509 130th Ln NE	Kirkland	WA	98034
Ryan	Dilsaver	18463 Blueberry Ln No H303	Monroe	WA	98272
Sahar	Siddiq	11013 Meridian Dr SE	Everett	WA	98208
Sharon	Morency	16005 Dennis Way	Monroe	WA	98272
Smiley	Creswell	1 Academy Way	Monroe	WA	98272
Sorn	Sutter	15919 179th Ave SE	Monroe	WA	98272
Steven & Chaiyapathna Darawan	Morrison	15921 179th Ave SE	Monroe	WA	98272
The Downie Family LLC		1188 Village Way	Monroe	WA	98272
Tibltres	Bereket	16605 6th Ave W Unit K201	Lynnwood	WA	98037
Timothy & Joette	Cochran	273 Dennis Way	Monroe	WA	98272
Tracey	Wagner	1230 W Main St	Monroe	WA	98272
Triple Down LLC		2302 2nd Ave N	Seattle	WA	98109
Triple Down LLC		12821 NE 36th St	Bellevue	WA	98005
Victoria & Hilliard Paul	Smith	246 Dennis Way	Monroe	WA	98272
Wade	Brickman	8002 156th St SE	Snohomish	WA	98296
Western Wash Seventh-Day Adventists		32229 Weyerhaeuser Way S	Federal Way	WA	98001
William & Mary	Clark	PO Box 165	Monroe	WA	98272
William & Valeria	Barschaw	1087 Hidden Valley Rd	Cle Elum	WA	98922
Blick Shirley R Trust		707 Alden Ave	Monroe	WA	98272
Hanson Homes @ Main Brook, LLC		PO Box 2289	Snohomish	WA	98291

AFFIDAVIT OF POSTING NOTICE OF SEPA DETERMINATION

STATE OF WASHINGTON)

XXXX W Main St., Monroe, WA 98272
Project location

COUNTY OF SNOHOMISH)

SEPA2017-14 - Main Brook Townhomes SEPA
Determination
File Number and Application Name

I, Kim Shaw being first duly sworn on oath, depose and say: That I am a citizen of the United States of America; That I am competent to be witness herein; That on the 15th day of December, 2017, that I posted (1) Notice of SEPA Determination SEPA2017-14 for the Main Brook Townhomes Preliminary Plat at Monroe City Hall lobby and Monroe Library.

806 West Main Street, Monroe, WA 98272/1070 Village Way, Monroe, WA 98272
Location of notice

Kim Shaw

Signed

Subscribed and sworn to me this 18th day of December, 2017

NOTARY SEAL



Vicki L. Thayer

NOTARY PUBLIC in and for the State of Washington, residing at:

Snohomish County

Printed Name: Vicki Thayer

My commission expires: 5/9/2020



DETERMINATION OF NON-SIGNIFICANCE (DNS)

File Number: SEPA 2017-14

Name of Proposal: Main Brook Townhomes Preliminary Plat

Description of Proposal: The applicant, Hanson Homes, is requesting preliminary plat approval for a 21-lot subdivision containing eighteen (18) zero lot-line townhome lots and three (3) commercial lots to be developed in two (2) phases on approximately 1.42 acres in the Mixed-Use Commercial (MUC) zoning district.

Proponents: Rick Hanson
Hanson Homes
PO Box 2289
Snohomish, WA 98291

Location of Proposal: The site is located at Section 1 Township 27 Range 6 Quarter SW LOT 4 OF CITY OF MON SP 199008 REC AFN 199912215006 BEING A PTN OF SW1/4 SW1/4; otherwise known as XXXX W. Main Street, Monroe, Washington, 98272. Snohomish County Tax Parcel Number(s): 27060100310200, 27060100310300, and 27060100310400.

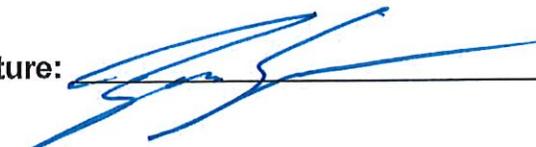
Lead Agency: City of Monroe

Threshold Determination: The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) IS NOT required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public for review upon request at Monroe City Hall, 806 West Main Street, Monroe, WA 98272 between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays. The information is also available for view online at www.monroewa.gov/mainbrook.

- There is no comment period for this DNS.
- This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.
- This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by **January 2, 2018**.

Responsible Official: Ben Swanson, Community Development Director
SEPA Responsible Official
(360) 863-4554
Monroe City Hall
806 West Main Street
Monroe, WA 98272
bswanson@monroewa.gov

Date: 12/12/17

Signature:  _____

Date of Issuance: December 15, 2017

Deadline for Submitting Comments/Appeals: No later than 5:00 p.m. on January 2, 2018

Appeals: You may appeal this determination to the City of Monroe Hearing Examiner at Monroe City Hall, which is located at 806 West Main Street, Monroe, WA 98272, no later than **5:00 p.m. on January 2, 2018**. You should be prepared to make specific factual objections; and you shall set forth the specific reason, rationale, and/or basis for the appeal. Appeals must be made in person on City appeal forms, which are available through the Community Development Department at Monroe City Hall. Appeals must be filed in original form in accordance with MMC Chapter 21.60. Payment of the appeal fee, as specified in the city's fee resolution, shall occur at the time the appeal is filed. Please contact Kim Shaw, Land Use Permit Supervisor, by email at kshaw@monroewa.gov or by phone at (360) 863-4532 to read or ask about the procedures for SEPA appeals.

Staff Contact: Questions about the proposal may be directed to Anita Marrero, Senior Planner, at amarrero@monroewa.gov or (360) 863-4513.

AFFIDAVIT OF POSTING NOTICE OF SEPA DETERMINATION

STATE OF WASHINGTON) XXXX W. Main St., Monroe WA. 98272
Project location

COUNTY OF SNOHOMISH) Main Brook Townhomes - SEPA2017-14
Application Name and File Number

I, Jamie Woolwalk (print name) being first duly sworn on oath, depose and say: That I am a citizen of the United States of America; That I am competent to be witness herein; That on the 15th day of December 2017, that I posted one sign for the Main Brook Townhomes SEPA Determination SEPA2017-14 on or near the property concerned, in a conspicuous place; and the correct date of posting of said notice, to wit:

XXXX W Main St. Monroe WA. 98272
LOCATION OF NOTICE

Jamie Woolwalk
Signed

Subscribed and sworn to me this 15th day of December, 2017

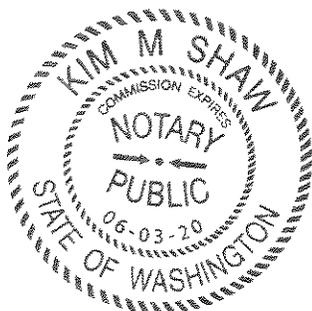
NOTARY SEAL

Kim M. Shaw
NOTARY PUBLIC in and for the State of Washington, residing at:

Snohomish County

Printed Name: Kim Shaw

My commission expires: 6/3/2020



Kim Shaw

From: Kim Shaw
Sent: Friday, December 15, 2017 3:25 PM
To: Kim Shaw
Cc: Kim Shaw
Subject: Notice of Determination of Non-Significance
Attachments: Signed DNS MainBrook 12_15_2017.pdf; Environmental Checklist.pdf; Vicinity map.pdf

Good Afternoon,

Please see the attached Determination of Non-Significance for the Preliminary Plat of Main Brook Townhomes. If you have specific project questions, please contact Anita Marrero, Senior Planner, at (360) 863-4513 or amarrero@monroewa.gov.

You can also find the project documents on the city's web site at:
www.monroewa.gov/mainbrook

Thank you,
Kim

Kim Shaw, C.P.T

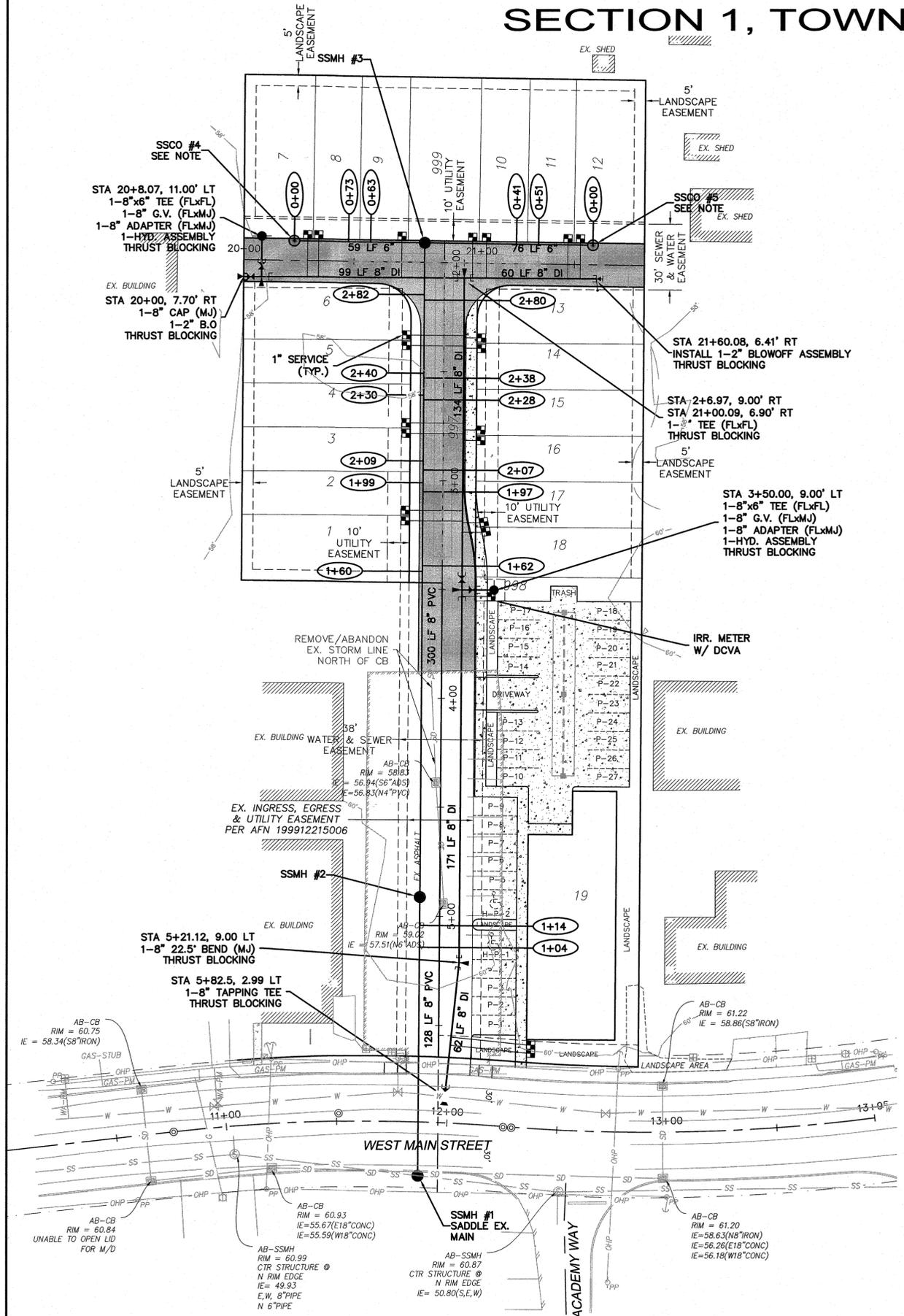
Land Use Permit Supervisor
806 West Main Street | Monroe, WA 98272
Direct Line: 360-863-4532 | Fax: 360-794-4007
<http://www.monroewa.gov>



Still valid: separegister@ecy.wa.gov; pspirito@sno-isle.org; lanthony@sno-isle.org;
Justin.fontes@ftr.com; david.matulich@pse.com; john_warrick@comcast.com;
crenderlein@snopud.com; Kate.Tourtellot@commtrans.org; Neilwheeler@comcast.net;
Eileen.lefebvre@providence.org; piplicd@monroe.wednet.edu; Gretchen.Kaehler@DAHP.wa.gov;
sharon.swan@snoco.org; Diane.Rolph@co.snohomish.wa.us; equestions@shd.snohomish.wa.gov;
mfitzgerald@monroefire.org; k.kerwin@snoco.org; SEPA@psc Cleanair.org; stevev@psc Cleanair.org;
marsha.engel@psp.wa.gov; eip@parks.wa.gov; sposner@utc.wa.gov; kmclain@agr.wa.gov;
ike.nwankwo@commerce.wa.gov; anthony.boscolo@commerce.wa.gov;
reviewteam@commerce.wa.gov; sepadesk@dfw.wa.gov; robert.zeigler@dfw.wa.gov;
efheinitz@doc1.wa.gov; marksoltman@doh.wa.gov; Terri.Sinclair-Olson@dshs.wa.gov;
sepacenter@dnr.wa.gov; ramin.pazooki@wsdot.wa.gov; randy.kline@parks.wa.gov;
somers.elaine@epa.gov; epa-seattle@epa.gov; kate.hawe@noaa.gov; Stan.Allison@faa.gov;
Karen.Wood-McGuinness@fema.dhs.gov; kjoseph@sauk-suiattle.com; njoseph@sauk-suiattle.com;
jjoseph@sauk-suiattle.com; ryoung@tulaliptribes-nsn.gov; klyste@stillaguamish.com;
pstevenson@stillaguamish.com; sposner@utc.wa.gov; richard.wagner@bnsf.com;
newstips@heraldnet.com; mmuscari@esassoc.com; info@PPTValley.org;
tom.laufmann@sno.wednet.edu; lpelly@tu.org; rooseveltwater@frontier.com;
staff@highlandwaterdistrict.com; bewood@snopud.com; faye.ryan@pse.com;
dan.o.olson@williams.com; shannon.fleming@snoco.org; zlamebull@tulaliptribes-nsn.gov;
wrightp@wsdot.wa.gov; mrobenland@doc1.wa.gov; piplicd@monroe.wednet.edu

MAIN BROOK TOWNHOMES

SECTION 1, TOWNSHIP 21N, RANGE 6E, W.M.



SSCO NOTE:
NEW 6" PVC MAIN SHALL TERM. AT A CLEANOUT. THE SSCO LID SHALL BE CAST IRON PER CITY STANDARD PLAN SS2.

EX. UTILITY NOTE:

CONTRACTOR TO VERIFY WATER AND SEWER MAIN SIZE AND TYPE PRIOR TO CONNECTION TO EXISTING PIPES.

FIRE SPRINKLER NOTE:

ANY DWELLING UNITS WITH ANY FIRST FLOOR EXTERIOR SURFACE IN EXCESS OF 150 FEET FROM A FIRE APPARATUS ACCESS ROAD HAVING A MINIMUM 20 FOOT WIDTH SHALL BE PROTECTED WITH RESIDENTIAL FIRE SPRINKLERS. ANY UNIT THAT REQUIRES A FIRE SPRINKLER SYSTEM SHALL ALSO REQUIRE DCVA.

WATER METER BOX NOTES:

METER BOX SHALL BE CARLSON 1419 PLASTIC METER BOX OR EQUAL. IN TRAFFIC AREAS FOGTITE B9T OR EQUAL.

APPROVED SEWER PIPE MATERIAL:

PVC SEWER PIPE, ASTM D3034 SDR35
REINFORCED CONCRETE PIPE, ASTM C76
PLAIN CONCRETE SEWER PIPE, ASTM C14 CLASS 3
DUCTILE IRON SEWER PIPE, ANSI A 21.51 OR AWWA C151 CLASS 52

UTILITY CROSSING NOTE:

ALL PIPE CROSSINGS WITH LESS THAN 1' VERTICAL SEPARATION SHALL USE SAND BED BETWEEN PIPES AT CROSSING POINT.



SEWER & WATER PLAN

2707 WETMORE AVE.
EVERETT, WA 98201
1.425.903.4852
f 425.259.1956



MAIN BROOK TOWNHOMES
CITY OF MONROE, Washington
PORTION OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST, W.M.

CALL 48 HOURS BEFORE YOU DIG
811

PROJ. NO.	17-0807	DSN. BY:	RAW
DATE:	2/9/18		
SCALE:	1" = 30'		
DRAWING NO.	8	OF	9

FILE NO.:

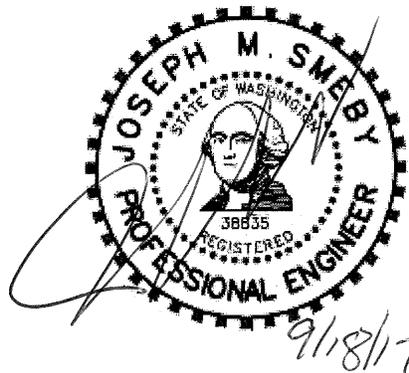
REV. PER COMMENT LETTER 12/5/17
12/14/17

**Drainage Report
Mainbrook Townhomes
PFN: M2017-**

for

**Rick Hansen
P.O. Box 2289
Snohomish, WA 98291**

**SITE LOCATION:
1237 West Main St.
Monroe, WA 98272**



Prepared by:
Joseph M. Smeby, P.E.

Job No: 17-0807
September 2017

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1. INTRODUCTION

This document is intended to provide engineering information necessary to support the preliminary plat application to the City of Monroe for an 18-unit townhome project with future commercial building(s) and parking proposed on this site. The site covers 1.42 acres, all of which is proposed to be disturbed as a result of this project. The site will take access from an existing road/drive isle which will be improved on the east side and extended to the north to serve this project.

This project proposes to construct improvements to the existing private access. Some work within West Main St will be required to extend sewer and water services onto this property. This project will require the construction of driveways for each future townhome, parking for the future commercial building, stormwater facilities and other utilities. The existing on-site soils are highly permeable at a depth of 5-6' below existing grade. Therefore, infiltration will be viable for this project. Refer to the geotechnical report prepared by Liu and Associates.

2. DRAINAGE INFORMATION SUMMARY FORM

Project: **Mainbrook Townhomes**
 PFN: **M2017-**
 Engineer: **Omega Engineering, Inc.**
 2707 Wetmore Ave
 Everett, WA 98201
 Attention: Joseph Smeby, P.E.

Total site area: **1.42 acres**
 Offsite area: **0.00 acres**
 Disturbed area: **1.38 acres**

Applicant: **Hanson Homes**
 P.O. Box 2289
 Snohomish, WA 98291

Number of lots/Bldg: **5**

Drainage Basin Information	East Basin
On-site Developed Area	1.42 acres
Off-site Improved Area	0.00 acres
Types of storage proposed	Infiltration Trenches
Approximate total storage volume	Varies
Soil Types	Type A/B
Basin Data	
Pre-developed run-off rates: 2-year	0.002 cfs
50-year	0.014 cfs
Post-developed run-off rates: 2-year	0.00 cfs
50-year	0.00 cfs

3. EXISTING SITE CHARACTERISTICS and ASSUMPTIONS

The site is located north of West Main St. taking access off of an existing private access within an easement just west of Academy Way. The project is located in Section 1, Township 21N, Range 6E, Willamette Meridian. See Figure 1 - Vicinity Map. The entire property consists of a single lot totaling 1.42 acres.

Land use around the site is single-family residential to the north and east and commercial to the west and south. This site is currently vacant covered in grasses, brush and some trees. Frontage improvements will not be required West Main St but some utility work will occur within the R/W.

The existing site is irregular in shape approximately 450-feet long running north-south and 180-feet running east-west. The grades on the site are flat. The vegetation found on the existing property is a mixture of landscaping including grasses and shrubs and native vegetation.

Grades on the site generally run from south to north. The existing soils on this site are silty fine sand to a depth of 4-6' over gravelly fine to coarse sand to 9'+. Please refer to the attached geotechnical report in Appendix C for further discussion of the existing on-site soils. A site visit was conducted on August 8, 2017. The weather was clear with temperatures in the 70's. No surface water was observed on this site.

The soil hydrologic types for this site have been identified as Type C for the upper soil stratum and A/B for the lower stratum. The soil type mapped for this site is Sultan Silt Loam. However, soil tests on this site found permeable soils at 4-6'. Refer to Geotechnical Report in Appendix C. The project Geotech therefore has recommended that infiltration be used for this project.

4. NARRATIVE OF DEVELOPED SITE CHARACTERISTICS

This development proposes to create 5 new buildings totaling 18-units for this project. The infiltration systems will be designed to mitigate for all of the future hard surfaces and landscaping proposed for this project. The systems have been sized to meet the 2012 DOE stormwater flow control and water quality standards.

The new on-site access, parking, roof and landscaping areas will be collected in the on-site conveyance system and directed infiltration trenches spread around the site. The storm drainage system for this project has been designed to collect, treat and infiltrate all of the new landscaping and impervious areas on this site. The off-site impervious areas disturbed for the utility construction will not be accounted for since the land cover will not change as a result of this project.

The infiltration and water quality system has been designed using the WWHM2012 software which meets the City standards.

4A. DOE MINIMUM REQUIREMENTS

MINIMUM REQUIREMENT #1: PREPARATION OF STORMWATER SITE PLANS

This project proposes to construct new impervious surfaces in excess of the minimum threshold so a final storm water site plan is being prepared with the full engineering plans for this project.

MINIMUM REQUIREMENT #2: CONSTRUCTION STORMWATER POLLUTION PREVENTION (SWPPP)

1: Mark Clearing Limits

One of the first steps in the "Construction Sequence" included on the clearing and grading plan sheets is for a surveyor to stake the limits of clearing and to have construction or silt fencing placed along the limits prior to any other construction activity.

2: Establish Construction Access

The SWPPP calls for the proposed construction entrance to be installed as the second step after the staking of clearing limits. A detail is provided on the plans.

3: Control Flow Rates

This project will construct an interceptor swale system to capture site runoff and allow the water to infiltrate on-site in areas not proposed for future/permanent infiltration systems.

4: Install Sediment Controls

This site and SWPPP proposes to construct a construction entrance to collect and contain the sediment on this site. In addition, inlet filters will be installed in the existing catch basins adjacent to the site, and check dams will be installed in the on-site interceptor swales. The proposed on-site CBs will be installed with inlet filters but the outlet pipes connecting to infiltration trenches will be plugged until the site has been stabilized and the conveyance system flushed and cleaned. These features are intended to minimize the opportunity for sediment to leave the site via stormwater or on vehicles. The construction of these features is one of the first items required in the "Construction Sequence".

5: Stabilize Soils

The "Construction Sequence" and "TESC Notes" call for the stabilization of soils that remain unworked for certain lengths of time based on the time of year. Stabilization techniques may include but not limited to mulching, plastic sheeting or hydroseeding, notes have been added to the plan regarding protection for the stock pile area if necessary.

6: Protect Slopes

No slopes are expected on this site; however, any stockpile area will be protected as noted above.

7: Protect Drain Inlets

All existing & proposed catch basins and area drains will have inlet filters installed to protect the conveyance system.

8: Stabilize Channels and Outlets

Check dams will be used in any existing/proposed ditch on-site or adjacent to the site. Also, interceptor swales with check dams. These features will protect the existing and proposed channels from erosion.

9: Control Pollutants

No outside chemicals are expected to be necessary for the construction of this project. All vehicles working on and around the site would need to meet the State requirements for emissions.

10: Control DeWatering

Dewatering runoff will be infiltrated on-site. The contractor shall monitor the temporary system to ensure no erosion or excessive sedimentation occurs in the disposal areas.

11: Maintain BMPs

The construction supervisor will be responsible for maintaining all BMPs during construction and working with the City to relocate or add BMPs as necessary as site conditions change.

12: Manage the Project

It will be the responsibility of the Contractor and Developer to manage this project and coordinate with the City Inspector and Engineer.

Inspection and Monitoring:

Site inspections shall be done by a person who is knowledgeable in the principles and practices of erosion and sediment control. The person must have skills to first assess the site conditions and construction activities that could impact the quality of stormwater, and second assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

Whenever inspection and/or monitoring reveals that the BMPs identified in the Construction SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, appropriate BMPs or design changes shall be implemented as soon as possible.

Maintaining an Updated Construction SWPPP:

The construction SWPPP shall be retained on-site or within reasonable access to the site.

The SWPPP shall be modified whenever there is a change in the design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the state.

The SWPPP shall be modified if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within seven days following inspection.

MINIMUM REQUIREMENT #3: SOURCE CONTROL OF POLLUTANTS

The improvements proposed on this site will create 5 buildings with 18 unites and new private access, parking and driveways. Office buildings and Residential townhomes do not require additional source control BMPS, but basic water quality is proposed on this site.

MINIMUM REQUIREMENT #4: PRESERVATION OF NATURAL DRAINAGE SYSTEMS AND OUTFALLS

The runoff generated from the finished project will be fully infiltrated up to the 100-year storm event.

MINIMUM REQUIREMENT #5: ON-SITE STORMWATER MANAGEMENT

Runoff from the new private access, parking lot, roofs and landscaping will be collected in CBs or yard drains and conveyed to different infiltration trenches spread around the site.

MINIMUM REQUIREMENT #6: RUNOFF TREATMENT

A soil treatment layer will be provided in the bottom of all infiltration trenches receiving runoff from PGHS. This design meets the basic water quality treatment requirement for residential projects.

MINIMUM REQUIREMENT #7: FLOW CONTROL

The design and analysis for this project requires the construction of an infiltration system which was sized using the WWHM2012 software.

MINIMUM REQUIREMENT #8: WETLAND PROTECTION

Full infiltration will recharge the groundwater and protect downstream critical areas.

MINIMUM REQUIREMENT #9: BASIN/WATERSHED PLANNING

The scope of this project is too small to justify a Watershed Plan.

MINIMUM REQUIREMENT #10: OPERATION AND MAINTENANCE

A complete O&M manual will be provided with the full drainage report.

5. DESCRIPTION OF PROPOSED EROSION CONTROL BMP's

Clearing, grading, and temporary erosion and sediment control plans have been prepared for this project. However, since a construction site is dynamic it will be necessary to re-assess the erosion control BMP's during construction and install additional measures when and if necessary.

Proposed temporary measures for this project will include the following BMP's:

- Installation of stabilized rock construction entrance(s).
- Interceptor swales
- Rip-Rap check dams
- Straw mulch, hydroseed or other mulching and planting method to stabilize unworked areas.
- Silt Fencing

Permanent measures to reduce or eliminate erosion or water quality degradation will include the following BMP's: (Under Future Phase/Permit)

- Paving all traffic areas
- Drainage collection system, including catch basins and floatable material separators
- Permanent landscaping in pervious areas.
- Limiting cut and fill slopes to 2:1 maximum
- Routine maintenance and inspection of the grounds and response to developing problems.

These proposed erosion control BMP's have been engineered for anticipated conditions in compliance with DOE guidelines. With proper installation, maintenance and inspection the proposed BMP's should result in minimal impact to the surrounding environment. The City retains the authority by code to require additional measures should the existing measures prove insufficient.

A. SITE GRADING/EROSION CONTROL RISK ASSESSMENT

SLOPE: Existing grades onsite slope down from north to south to northwest to southeast ranging from 0% to approximately 3.0%. The proposed internal access grades will be no greater than 2%.

CRITICAL AREAS: None on or adjacent to the site.

SOILS: In the development area of the site soils are hydrologic group C but underlain with group A/B, (from Geotechnical Report).

GROUND MOVEMENT POTENTIAL: N/A

SOURCES OF WATER FOR EROSION: Rainfall will be the only significant source of onsite runoff.

MEASURES PROPOSED TO PREVENT/MINIMIZE EROSION:

TEMPORARY MEASURES: Mulch cover, rock construction entrance(s), diversion swales, silt fencing are all proposed to be used to prevent or minimize erosion and siltation during construction.

PERMANENT MEASURES: Future measures will include permanent vegetative cover in pervious areas, limiting permanent cut and fill slopes to 2:1 maximum unless protected with a rockery face, asphalt pavement to stabilize all vehicle traffic areas and a piped conveyance system to control the location of runoff release. Routine maintenance of the grounds and response to developing problems will be a function of the property owner.

CONCLUSION: Proposed erosion control BMP's in compliance with DOE guidelines have been engineered for anticipated conditions. Civil construction plans include a detailed ESC plan that provides details and notes for the proposed BMP's. With proper installation, maintenance and inspection, the proposed BMP's should result in minimal impact to the surrounding environment. Based on the above information the Erosion Risk for this site is Low to Moderate. Reports, studies and designs for this site include:

SEPA Checklist, by Others

Geotechnical Report, by Liu & Associates, Inc.

B. Minimum Elements

1: Mark Clearing Limits

One of the first steps in the "Construction Sequence" included on the clearing and grading plan sheets is for a surveyor to stake the limits of clearing and to have construction or silt fencing placed along the limits prior to any other construction activity.

2: Establish Construction Access

The SWPPP calls for the proposed construction entrance to be installed as the second step after the staking of clearing limits. A detail is provided on the plans.

3: Control Flow Rates

This project will construct an interceptor swale system to capture site runoff and allow the water to infiltrate on-site in areas not proposed for future/permanent infiltration systems.

4: Install Sediment Controls

This site and SWPPP proposes to construct a construction entrance to collect and contain the sediment on this site. In addition, inlet filters will be installed in the existing catch basins adjacent to the site, and check dams will be installed in the on-site interceptor swales. The proposed on-site CBs will be installed with inlet filters but the outlet pipes connecting to infiltration trenches will be plugged until the site has been stabilized and the conveyance system flushed and cleaned. These features are intended to minimize the opportunity for sediment to leave the site via stormwater or on vehicles. The construction of these features is one of the first items required in the "Construction Sequence".

5: Stabilize Soils

The "Construction Sequence" and "TESC Notes" call for the stabilization of soils that remain unworked for certain lengths of time based on the time of year. Stabilization techniques may include but not limited to mulching, plastic sheeting or hydroseeding, notes have been added to the plan regarding protection for the stock pile area if necessary.

6: Protect Slopes

No slopes are expected on this site; however, any stockpile area will be protected as noted above.

7: Protect Drain Inlets

All existing & proposed catch basins and area drains will have inlet filters installed to protect the conveyance system.

8: Stabilize Channels and Outlets

Check dams will be used in any existing/proposed ditch on-site or adjacent to the site. Also, interceptor swales with check dams. These features will protect the existing and proposed channels from erosion.

9: Control Pollutants

No outside chemicals are expected to be necessary for the construction of this project. All vehicles working on and around the site would need to meet the State requirements for emissions.

10: Control DeWatering

Dewatering runoff will be infiltrated on-site. The contractor shall monitor the temporary system to ensure no erosion or excessive sedimentation occurs in the disposal areas.

11: Maintain BMPs

The construction supervisor will be responsible for maintaining all BMPs during construction and working with the City to relocate or add BMPs as necessary as site conditions change.

12: Manage the Project

It will be the responsibility of the Contractor and Developer to manage this project and coordinate with the City Inspector and Engineer.

Inspection and Monitoring:

Site inspections shall be done by a person who is knowledgeable in the principles and practices of erosion and sediment control. The person must have skills to first assess the site conditions and construction activities that could impact the quality of stormwater, and second assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

Whenever inspection and/or monitoring reveals that the BMPs identified in the Construction SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, appropriate BMPs or design changes shall be implemented as soon as possible.

Maintaining an Updated Construction SWPPP:

The construction SWPPP shall be retained on-site or within reasonable access to the site.

The SWPPP shall be modified whenever there is a change in the design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the state.

The SWPPP shall be modified if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within seven days following inspection.

6. OFFSITE DRAINAGE ANALYSIS - UPSTREAM

From field observation and review of the available topography, it appears that some small areas to the south of this project will drain onto the site but this is limited to only the private access. These flows are negligible in the existing condition and will be collected on-site and infiltrated with the other areas in the developed condition.

7. OFFSITE DRAINAGE ANALYSIS - DOWNSTREAM

The project is bordered to the north, south, east and west by developed properties. Since the proposed project will account for the upstream offsite flows this project will fully infiltrate all runoff generated on-site and tributary to the site.

8. DETENTION STORAGE CALCULATIONS

Current City code requires this site be analyzed using the 2012 DOE manual. The WWHM2012 has been selected to size the appropriate drainage mitigation system for this project. The 2012 drainage manual calls for the use of an approved continuous runoff hydrology model and the WWHM2012 stormwater software meets this requirement.

Since this site proposes using multiple infiltration systems to fully infiltrate the runoff from the developed site infiltration trenches have been sized to accommodate the developed conditions for this project up to the 100-year condition.

Refer to appendix 'A' for the full output from the WWHM2012 software.

9. WATER QUALITY DESIGN

Water quality for this project will be provided in the form of a soil treatment layer in the bottom of any infiltration trench receiving runoff from PGHS. This meets the basic water quality requirements.

10. CONVEYANCE CALCULATIONS

All of the proposed pipes designed for this project will receive much less than 2.5 cfs peak flows from the 100-year storm event. These pipes are designed as 12" pipes (S=0.5%, min.) with a peak flowing full capacity of over 2.7 cfs and therefore are then adequate capacity to handle the expected flows.

Therefore, all pipes designed for this project have more capacity than required based on the expected flow to each leg of the pipe system.

11. OPERATIONS AND MAINTENANCE MANUAL

The Property Owners and HOA will be responsible for maintaining the stormwater and landscaping facilities within this development. Included in this manual are checklists for each feature specific to this project. Copies should be made of the checklists as necessary during routine inspections and required maintenance. Specific problems can be recorded along with the appropriate action taken.

These checklists are a guide for inspections and maintenance. The frequency of the inspections/maintenance is identified in the left hand column with the following abbreviations:

A = Annual (March or April preferred)

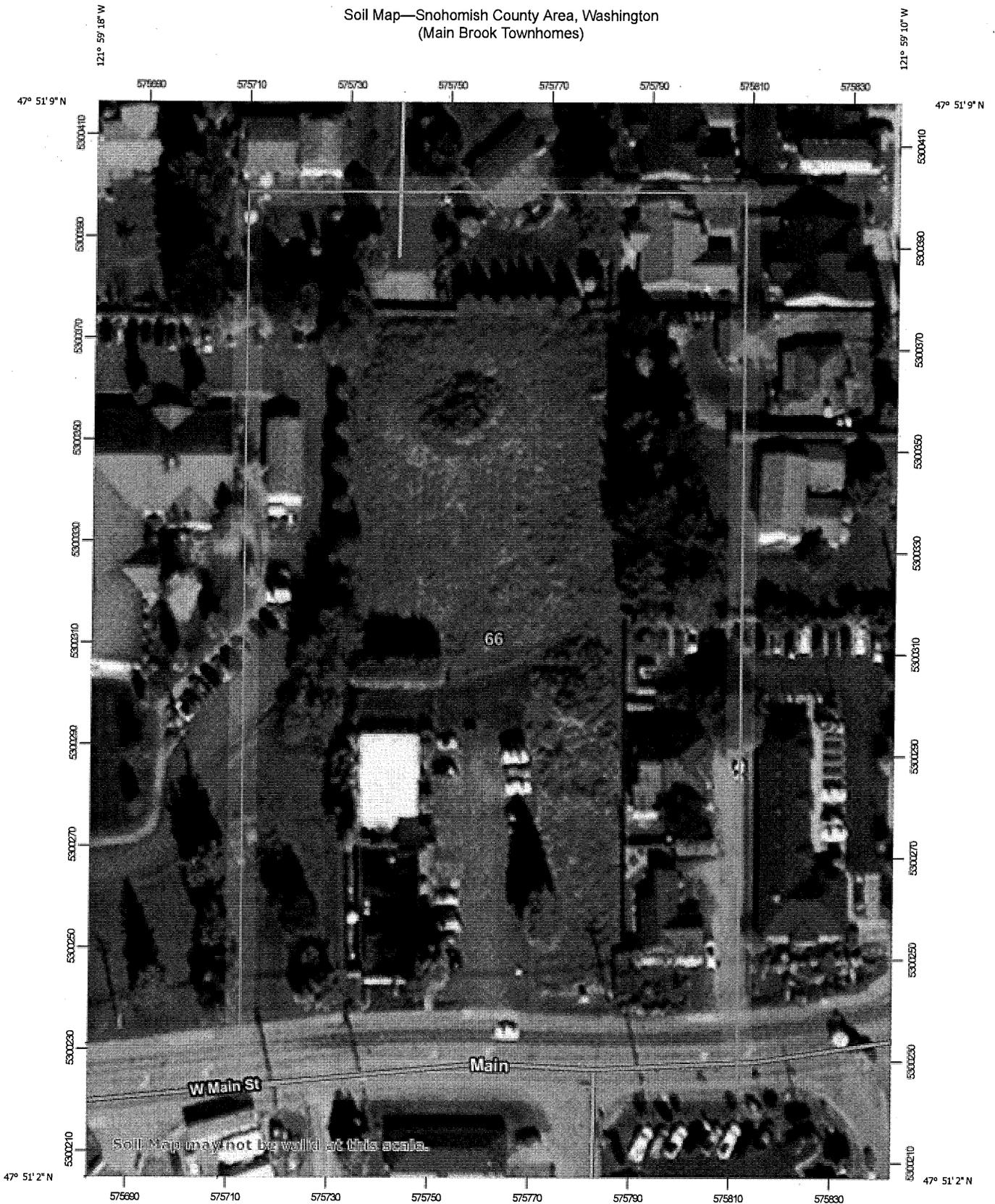
M = Monthly

S = After Major Storms (Use 1-inch in 24 hours as a guideline)

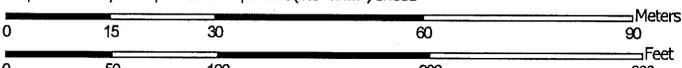
Routine inspections and maintenance will improve the long-term performance of the stormwater facilities. If at any time you are unsure if a problem exists or how to address a specific problem, contact a Professional Engineer.

Refer to Appendix B for a list of each facility to be maintained and the appropriate maintenance checklist.

Soil Map—Snohomish County Area, Washington
(Main Brook Townhomes)



Map Scale: 1:1,030 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84



APPENDIX A
STORMWATER CALCULATIONS

WWHM2012
PROJECT REPORT

General Model Information

Project Name: 17-0807 - infil
Site Name: MAINBROOK
Site Address: MAIN STREET
City: MONROE
Report Date: 9/14/2017
Gage: Everett
Data Start: 1948/10/01
Data End: 2009/09/30
Timestep: 15 Minute
Precip Scale: 1.20
Version Date: 2016/02/25
Version: 4.2.12

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass: No

GroundWater: No

Pervious Land Use acre
A B, Forest, Flat 1.38

Pervious Total 1.38

Impervious Land Use acre

Impervious Total 0

Basin Total 1.38

Element Flows To:

Surface

Interflow

Groundwater

Mitigated Land Use

LOTS 19-21

Bypass: No

GroundWater: No

Pervious Land Use acre
A B, Lawn, Flat 0.09

Pervious Total 0.09

Impervious Land Use acre
ROOF TOPS FLAT 0.1
PARKING FLAT 0.2

Impervious Total 0.3

Basin Total 0.39

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 1	Gravel Trench Bed 1	

LOTS 1-19, TRACT 997

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Flat	0.26
Pervious Total	0.26
Impervious Land Use	acre
ROADS FLAT	0.17
ROOF TOPS FLAT	0.37
DRIVEWAYS FLAT	0.17
SIDEWALKS FLAT	0.02
Impervious Total	0.73
Basin Total	0.99

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 2	Gravel Trench Bed 2	

Routing Elements
Predeveloped Routing

Mitigated Routing

Gravel Trench Bed 1

Bottom Length:	75.00 ft.
Bottom Width:	10.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	4
Pour Space of material for first layer:	0.35
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	4
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	58.067
Total Volume Through Riser (ac-ft.):	0.001
Total Volume Through Facility (ac-ft.):	58.068
Percent Infiltrated:	100
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	4 ft.
Riser Diameter:	8 in.
Element Flows To:	
Outlet 1	Outlet 2
Channel 1	

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.017	0.000	0.000	0.000
0.0556	0.017	0.000	0.000	0.069
0.1111	0.017	0.000	0.000	0.069
0.1667	0.017	0.001	0.000	0.069
0.2222	0.017	0.001	0.000	0.069
0.2778	0.017	0.001	0.000	0.069
0.3333	0.017	0.002	0.000	0.069
0.3889	0.017	0.002	0.000	0.069
0.4444	0.017	0.002	0.000	0.069
0.5000	0.017	0.003	0.000	0.069
0.5556	0.017	0.003	0.000	0.069
0.6111	0.017	0.003	0.000	0.069
0.6667	0.017	0.004	0.000	0.069
0.7222	0.017	0.004	0.000	0.069
0.7778	0.017	0.004	0.000	0.069
0.8333	0.017	0.005	0.000	0.069
0.8889	0.017	0.005	0.000	0.069
0.9444	0.017	0.005	0.000	0.069
1.0000	0.017	0.006	0.000	0.069
1.0556	0.017	0.006	0.000	0.069
1.1111	0.017	0.006	0.000	0.069
1.1667	0.017	0.007	0.000	0.069
1.2222	0.017	0.007	0.000	0.069
1.2778	0.017	0.007	0.000	0.069

1.3333	0.017	0.008	0.000	0.069
1.3889	0.017	0.008	0.000	0.069
1.4444	0.017	0.008	0.000	0.069
1.5000	0.017	0.009	0.000	0.069
1.5556	0.017	0.009	0.000	0.069
1.6111	0.017	0.009	0.000	0.069
1.6667	0.017	0.010	0.000	0.069
1.7222	0.017	0.010	0.000	0.069
1.7778	0.017	0.010	0.000	0.069
1.8333	0.017	0.011	0.000	0.069
1.8889	0.017	0.011	0.000	0.069
1.9444	0.017	0.011	0.000	0.069
2.0000	0.017	0.012	0.000	0.069
2.0556	0.017	0.012	0.000	0.069
2.1111	0.017	0.012	0.000	0.069
2.1667	0.017	0.013	0.000	0.069
2.2222	0.017	0.013	0.000	0.069
2.2778	0.017	0.013	0.000	0.069
2.3333	0.017	0.014	0.000	0.069
2.3889	0.017	0.014	0.000	0.069
2.4444	0.017	0.014	0.000	0.069
2.5000	0.017	0.015	0.000	0.069
2.5556	0.017	0.015	0.000	0.069
2.6111	0.017	0.015	0.000	0.069
2.6667	0.017	0.016	0.000	0.069
2.7222	0.017	0.016	0.000	0.069
2.7778	0.017	0.016	0.000	0.069
2.8333	0.017	0.017	0.000	0.069
2.8889	0.017	0.017	0.000	0.069
2.9444	0.017	0.017	0.000	0.069
3.0000	0.017	0.018	0.000	0.069
3.0556	0.017	0.018	0.000	0.069
3.1111	0.017	0.018	0.000	0.069
3.1667	0.017	0.019	0.000	0.069
3.2222	0.017	0.019	0.000	0.069
3.2778	0.017	0.019	0.000	0.069
3.3333	0.017	0.020	0.000	0.069
3.3889	0.017	0.020	0.000	0.069
3.4444	0.017	0.020	0.000	0.069
3.5000	0.017	0.021	0.000	0.069
3.5556	0.017	0.021	0.000	0.069
3.6111	0.017	0.021	0.000	0.069
3.6667	0.017	0.022	0.000	0.069
3.7222	0.017	0.022	0.000	0.069
3.7778	0.017	0.022	0.000	0.069
3.8333	0.017	0.023	0.000	0.069
3.8889	0.017	0.023	0.000	0.069
3.9444	0.017	0.023	0.000	0.069
4.0000	0.017	0.024	0.000	0.069
4.0556	0.017	0.025	0.092	0.069
4.1111	0.017	0.026	0.255	0.069
4.1667	0.017	0.027	0.441	0.069
4.2222	0.017	0.027	0.610	0.069
4.2778	0.017	0.028	0.730	0.069
4.3333	0.017	0.029	0.799	0.069
4.3889	0.017	0.030	0.873	0.069
4.4444	0.017	0.031	0.933	0.069
4.5000	0.017	0.032	0.989	0.069

4.5556	0.017	0.033	1.043	0.069
4.6111	0.017	0.034	1.094	0.069
4.6667	0.017	0.035	1.143	0.069
4.7222	0.017	0.036	1.189	0.069
4.7778	0.017	0.037	1.234	0.069
4.8333	0.017	0.038	1.277	0.069
4.8889	0.017	0.039	1.319	0.069
4.9444	0.017	0.040	1.360	0.069
5.0000	0.017	0.041	1.399	0.069

Gravel Trench Bed 2

Bottom Length: 220.00 ft.
 Bottom Width: 8.00 ft.
 Trench bottom slope 1: 0 To 1
 Trench Left side slope 0: 0 To 1
 Trench right side slope 2: 0 To 1
 Material thickness of first layer: 4
 Pour Space of material for first layer: 0.35
 Material thickness of second layer: 0
 Pour Space of material for second layer: 0
 Material thickness of third layer: 0
 Pour Space of material for third layer: 0
 Infiltration On
 Infiltration rate: 4
 Infiltration safety factor: 1
 Total Volume Infiltrated (ac-ft.): 141.532
 Total Volume Through Riser (ac-ft.): 0.005
 Total Volume Through Facility (ac-ft.): 141.537
 Percent Infiltrated: 100
 Total Precip Applied to Facility: 0
 Total Evap From Facility: 0
 Discharge Structure
 Riser Height: 4 ft.
 Riser Diameter: 8 in.
 Element Flows To:
 Outlet 1 Outlet 2
 Channel 1

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infil(cfs)
0.0000	0.040	0.000	0.000	0.000
0.0556	0.040	0.000	0.000	0.163
0.1111	0.040	0.001	0.000	0.163
0.1667	0.040	0.002	0.000	0.163
0.2222	0.040	0.003	0.000	0.163
0.2778	0.040	0.003	0.000	0.163
0.3333	0.040	0.004	0.000	0.163
0.3889	0.040	0.005	0.000	0.163
0.4444	0.040	0.006	0.000	0.163
0.5000	0.040	0.007	0.000	0.163
0.5556	0.040	0.007	0.000	0.163
0.6111	0.040	0.008	0.000	0.163
0.6667	0.040	0.009	0.000	0.163
0.7222	0.040	0.010	0.000	0.163
0.7778	0.040	0.011	0.000	0.163
0.8333	0.040	0.011	0.000	0.163
0.8889	0.040	0.012	0.000	0.163
0.9444	0.040	0.013	0.000	0.163
1.0000	0.040	0.014	0.000	0.163
1.0556	0.040	0.014	0.000	0.163
1.1111	0.040	0.015	0.000	0.163
1.1667	0.040	0.016	0.000	0.163
1.2222	0.040	0.017	0.000	0.163
1.2778	0.040	0.018	0.000	0.163
1.3333	0.040	0.018	0.000	0.163
1.3889	0.040	0.019	0.000	0.163

1.4444	0.040	0.020	0.000	0.163
1.5000	0.040	0.021	0.000	0.163
1.5556	0.040	0.022	0.000	0.163
1.6111	0.040	0.022	0.000	0.163
1.6667	0.040	0.023	0.000	0.163
1.7222	0.040	0.024	0.000	0.163
1.7778	0.040	0.025	0.000	0.163
1.8333	0.040	0.025	0.000	0.163
1.8889	0.040	0.026	0.000	0.163
1.9444	0.040	0.027	0.000	0.163
2.0000	0.040	0.028	0.000	0.163
2.0556	0.040	0.029	0.000	0.163
2.1111	0.040	0.029	0.000	0.163
2.1667	0.040	0.030	0.000	0.163
2.2222	0.040	0.031	0.000	0.163
2.2778	0.040	0.032	0.000	0.163
2.3333	0.040	0.033	0.000	0.163
2.3889	0.040	0.033	0.000	0.163
2.4444	0.040	0.034	0.000	0.163
2.5000	0.040	0.035	0.000	0.163
2.5556	0.040	0.036	0.000	0.163
2.6111	0.040	0.036	0.000	0.163
2.6667	0.040	0.037	0.000	0.163
2.7222	0.040	0.038	0.000	0.163
2.7778	0.040	0.039	0.000	0.163
2.8333	0.040	0.040	0.000	0.163
2.8889	0.040	0.040	0.000	0.163
2.9444	0.040	0.041	0.000	0.163
3.0000	0.040	0.042	0.000	0.163
3.0556	0.040	0.043	0.000	0.163
3.1111	0.040	0.044	0.000	0.163
3.1667	0.040	0.044	0.000	0.163
3.2222	0.040	0.045	0.000	0.163
3.2778	0.040	0.046	0.000	0.163
3.3333	0.040	0.047	0.000	0.163
3.3889	0.040	0.047	0.000	0.163
3.4444	0.040	0.048	0.000	0.163
3.5000	0.040	0.049	0.000	0.163
3.5556	0.040	0.050	0.000	0.163
3.6111	0.040	0.051	0.000	0.163
3.6667	0.040	0.051	0.000	0.163
3.7222	0.040	0.052	0.000	0.163
3.7778	0.040	0.053	0.000	0.163
3.8333	0.040	0.054	0.000	0.163
3.8889	0.040	0.055	0.000	0.163
3.9444	0.040	0.055	0.000	0.163
4.0000	0.040	0.056	0.000	0.163
4.0556	0.040	0.058	0.092	0.163
4.1111	0.040	0.061	0.255	0.163
4.1667	0.040	0.063	0.441	0.163
4.2222	0.040	0.065	0.610	0.163
4.2778	0.040	0.067	0.730	0.163
4.3333	0.040	0.070	0.799	0.163
4.3889	0.040	0.072	0.873	0.163
4.4444	0.040	0.074	0.933	0.163
4.5000	0.040	0.076	0.989	0.163
4.5556	0.040	0.079	1.043	0.163
4.6111	0.040	0.081	1.094	0.163

4.6667	0.040	0.083	1.143	0.163
4.7222	0.040	0.085	1.189	0.163
4.7778	0.040	0.088	1.234	0.163
4.8333	0.040	0.090	1.277	0.163
4.8889	0.040	0.092	1.319	0.163
4.9444	0.040	0.094	1.360	0.163
5.0000	0.040	0.097	1.399	0.163

Channel 1

Bottom Length: 100.00 ft.
 Bottom Width: 10.00 ft.
 Manning's n: 0.03
 Channel bottom slope 1: 1 To 1
 Channel Left side slope 0: 0.1 To 1
 Channel right side slope 2: 0.1 To 1
 Discharge Structure
 Riser Height: 0 ft.
 Riser Diameter: 0 in.
 Element Flows To:
 Outlet 1 Outlet 2

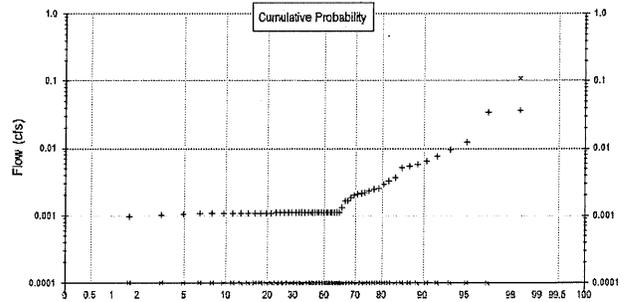
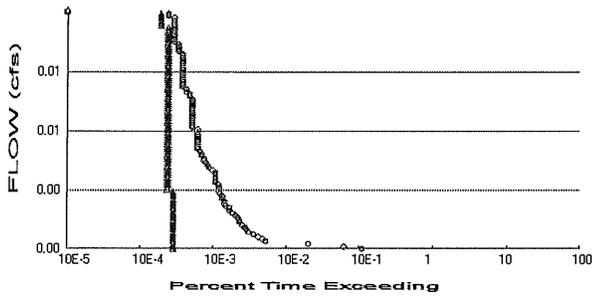
Channel Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.023	0.000	0.000	0.000
0.0222	0.023	0.000	0.870	0.000
0.0444	0.023	0.001	2.755	0.000
0.0667	0.023	0.001	5.401	0.000
0.0889	0.023	0.002	8.702	0.000
0.1111	0.023	0.002	12.59	0.000
0.1333	0.023	0.003	17.01	0.000
0.1556	0.023	0.003	21.94	0.000
0.1778	0.023	0.004	27.35	0.000
0.2000	0.023	0.004	33.20	0.000
0.2222	0.023	0.005	39.47	0.000
0.2444	0.023	0.005	46.15	0.000
0.2667	0.023	0.006	53.23	0.000
0.2889	0.023	0.006	60.67	0.000
0.3111	0.023	0.007	68.48	0.000
0.3333	0.023	0.007	76.64	0.000
0.3556	0.023	0.008	85.14	0.000
0.3778	0.023	0.008	93.97	0.000
0.4000	0.023	0.009	103.1	0.000
0.4222	0.023	0.009	112.5	0.000
0.4444	0.023	0.010	122.3	0.000
0.4667	0.023	0.010	132.3	0.000
0.4889	0.023	0.011	142.7	0.000
0.5111	0.023	0.011	153.3	0.000
0.5333	0.023	0.012	164.2	0.000
0.5556	0.023	0.012	175.3	0.000
0.5778	0.023	0.013	186.7	0.000
0.6000	0.023	0.013	198.4	0.000
0.6222	0.023	0.014	210.3	0.000
0.6444	0.023	0.015	222.5	0.000
0.6667	0.023	0.015	234.9	0.000
0.6889	0.023	0.016	247.5	0.000
0.7111	0.023	0.016	260.4	0.000
0.7333	0.023	0.017	273.5	0.000
0.7556	0.023	0.017	286.8	0.000
0.7778	0.023	0.018	300.4	0.000
0.8000	0.023	0.018	314.1	0.000
0.8222	0.023	0.019	328.1	0.000
0.8444	0.023	0.019	342.2	0.000
0.8667	0.023	0.020	356.6	0.000

0.8889	0.023	0.020	371.2	0.000
0.9111	0.023	0.021	385.9	0.000
0.9333	0.023	0.021	400.9	0.000
0.9556	0.023	0.022	416.0	0.000
0.9778	0.023	0.022	431.4	0.000
1.0000	0.023	0.023	446.9	0.000
1.0222	0.023	0.024	462.6	0.000
1.0444	0.023	0.024	478.5	0.000
1.0667	0.023	0.025	494.5	0.000
1.0889	0.024	0.025	510.7	0.000
1.1111	0.024	0.026	527.1	0.000
1.1333	0.024	0.026	543.7	0.000
1.1556	0.024	0.027	560.4	0.000
1.1778	0.024	0.027	577.3	0.000
1.2000	0.024	0.028	594.4	0.000
1.2222	0.024	0.028	611.6	0.000
1.2444	0.024	0.029	629.0	0.000
1.2667	0.024	0.029	646.5	0.000
1.2889	0.024	0.030	664.2	0.000
1.3111	0.024	0.030	682.0	0.000
1.3333	0.024	0.031	700.0	0.000
1.3556	0.024	0.032	718.2	0.000
1.3778	0.024	0.032	736.4	0.000
1.4000	0.024	0.033	754.8	0.000
1.4222	0.024	0.033	773.4	0.000
1.4444	0.024	0.034	792.1	0.000
1.4667	0.024	0.034	811.0	0.000
1.4889	0.024	0.035	829.9	0.000
1.5111	0.024	0.035	849.1	0.000
1.5333	0.024	0.036	868.3	0.000
1.5556	0.024	0.036	887.7	0.000
1.5778	0.024	0.037	907.2	0.000
1.6000	0.024	0.037	926.8	0.000
1.6222	0.024	0.038	946.6	0.000
1.6444	0.024	0.039	966.5	0.000
1.6667	0.024	0.039	986.5	0.000
1.6889	0.024	0.040	1006.	0.000
1.7111	0.024	0.040	1026.	0.000
1.7333	0.024	0.041	1047.	0.000
1.7556	0.024	0.041	1067.	0.000
1.7778	0.024	0.042	1088.	0.000
1.8000	0.024	0.042	1109.	0.000
1.8222	0.024	0.043	1130.	0.000
1.8444	0.024	0.043	1151.	0.000
1.8667	0.024	0.044	1172.	0.000
1.8889	0.024	0.045	1193.	0.000
1.9111	0.024	0.045	1214.	0.000
1.9333	0.024	0.046	1236.	0.000
1.9556	0.024	0.046	1257.	0.000
1.9778	0.024	0.047	1279.	0.000
2.0000	0.024	0.047	1301.	0.000
2.0222	0.024	0.048	1322.	0.000

Analysis Results

POC 1



+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1

Total Pervious Area: 1.38
 Total Impervious Area: 0

Mitigated Landuse Totals for POC #1

Total Pervious Area: 0.35
 Total Impervious Area: 1.03

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.001584
5 year	0.003435
10 year	0.005511
25 year	0.009625
50 year	0.014222
100 year	0.02063

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.001	0.000
1950	0.003	0.000
1951	0.002	0.000
1952	0.001	0.000
1953	0.001	0.000
1954	0.008	0.000
1955	0.006	0.000
1956	0.001	0.000
1957	0.001	0.000
1958	0.001	0.000

1959	0.002	0.000
1960	0.002	0.000
1961	0.005	0.112
1962	0.001	0.000
1963	0.001	0.000
1964	0.004	0.000
1965	0.001	0.000
1966	0.001	0.000
1967	0.002	0.000
1968	0.001	0.000
1969	0.001	0.000
1970	0.001	0.000
1971	0.005	0.000
1972	0.001	0.000
1973	0.001	0.000
1974	0.003	0.000
1975	0.001	0.000
1976	0.003	0.000
1977	0.001	0.000
1978	0.001	0.000
1979	0.002	0.000
1980	0.001	0.000
1981	0.001	0.000
1982	0.002	0.000
1983	0.001	0.000
1984	0.001	0.000
1985	0.002	0.000
1986	0.010	0.000
1987	0.006	0.000
1988	0.001	0.000
1989	0.001	0.000
1990	0.001	0.000
1991	0.001	0.000
1992	0.001	0.000
1993	0.001	0.000
1994	0.001	0.000
1995	0.001	0.000
1996	0.012	0.000
1997	0.034	0.000
1998	0.001	0.000
1999	0.001	0.000
2000	0.002	0.000
2001	0.001	0.000
2002	0.001	0.000
2003	0.001	0.000
2004	0.001	0.000
2005	0.001	0.000
2006	0.037	0.000
2007	0.001	0.000
2008	0.002	0.000
2009	0.001	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0367	0.1116
2	0.0342	0.0000
3	0.0125	0.0000

4	0.0097	0.0000
5	0.0076	0.0000
6	0.0064	0.0000
7	0.0058	0.0000
8	0.0054	0.0000
9	0.0052	0.0000
10	0.0036	0.0000
11	0.0032	0.0000
12	0.0029	0.0000
13	0.0025	0.0000
14	0.0025	0.0000
15	0.0023	0.0000
16	0.0022	0.0000
17	0.0022	0.0000
18	0.0021	0.0000
19	0.0020	0.0000
20	0.0019	0.0000
21	0.0017	0.0000
22	0.0016	0.0000
23	0.0013	0.0000
24	0.0011	0.0000
25	0.0011	0.0000
26	0.0011	0.0000
27	0.0011	0.0000
28	0.0011	0.0000
29	0.0011	0.0000
30	0.0011	0.0000
31	0.0011	0.0000
32	0.0011	0.0000
33	0.0011	0.0000
34	0.0011	0.0000
35	0.0011	0.0000
36	0.0011	0.0000
37	0.0011	0.0000
38	0.0011	0.0000
39	0.0011	0.0000
40	0.0011	0.0000
41	0.0011	0.0000
42	0.0011	0.0000
43	0.0011	0.0000
44	0.0011	0.0000
45	0.0011	0.0000
46	0.0011	0.0000
47	0.0011	0.0000
48	0.0011	0.0000
49	0.0011	0.0000
50	0.0011	0.0000
51	0.0011	0.0000
52	0.0011	0.0000
53	0.0011	0.0000
54	0.0011	0.0000
55	0.0011	0.0000
56	0.0011	0.0000
57	0.0011	0.0000
58	0.0011	0.0000
59	0.0010	0.0000
60	0.0010	0.0000
61	0.0008	0.0000

Duration Flows
The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0008	2355	6	0	Pass
0.0009	1329	6	0	Pass
0.0011	434	6	1	Pass
0.0012	112	6	5	Pass
0.0013	103	6	5	Pass
0.0015	89	6	6	Pass
0.0016	77	6	7	Pass
0.0017	66	6	9	Pass
0.0019	61	6	9	Pass
0.0020	58	6	10	Pass
0.0021	54	6	11	Pass
0.0023	50	6	12	Pass
0.0024	49	6	12	Pass
0.0026	47	6	12	Pass
0.0027	43	6	13	Pass
0.0028	40	6	15	Pass
0.0030	36	6	16	Pass
0.0031	36	6	16	Pass
0.0032	32	6	18	Pass
0.0034	31	6	19	Pass
0.0035	31	6	19	Pass
0.0036	29	6	20	Pass
0.0038	29	6	20	Pass
0.0039	27	6	22	Pass
0.0040	26	6	23	Pass
0.0042	26	5	19	Pass
0.0043	26	5	19	Pass
0.0045	25	5	20	Pass
0.0046	23	5	21	Pass
0.0047	23	5	21	Pass
0.0049	23	5	21	Pass
0.0050	23	5	21	Pass
0.0051	23	5	21	Pass
0.0053	21	5	23	Pass
0.0054	19	5	26	Pass
0.0055	18	5	27	Pass
0.0057	17	5	29	Pass
0.0058	16	5	31	Pass
0.0059	16	5	31	Pass
0.0061	15	5	33	Pass
0.0062	15	5	33	Pass
0.0064	14	5	35	Pass
0.0065	13	5	38	Pass
0.0066	13	5	38	Pass
0.0068	13	5	38	Pass
0.0069	13	5	38	Pass
0.0070	13	5	38	Pass
0.0072	13	5	38	Pass
0.0073	13	5	38	Pass
0.0074	13	5	38	Pass
0.0076	13	5	38	Pass
0.0077	11	5	45	Pass
0.0078	11	5	45	Pass

0.0080	11	5	45	Pass
0.0081	11	5	45	Pass
0.0083	11	5	45	Pass
0.0084	11	5	45	Pass
0.0085	11	5	45	Pass
0.0087	11	5	45	Pass
0.0088	11	5	45	Pass
0.0089	11	5	45	Pass
0.0091	11	5	45	Pass
0.0092	11	5	45	Pass
0.0093	11	5	45	Pass
0.0095	10	5	50	Pass
0.0096	10	5	50	Pass
0.0097	9	5	55	Pass
0.0099	9	5	55	Pass
0.0100	8	5	62	Pass
0.0102	8	5	62	Pass
0.0103	8	5	62	Pass
0.0104	8	5	62	Pass
0.0106	8	5	62	Pass
0.0107	8	5	62	Pass
0.0108	8	5	62	Pass
0.0110	8	5	62	Pass
0.0111	8	5	62	Pass
0.0112	8	5	62	Pass
0.0114	8	5	62	Pass
0.0115	8	5	62	Pass
0.0116	8	5	62	Pass
0.0118	8	5	62	Pass
0.0119	8	5	62	Pass
0.0121	7	5	71	Pass
0.0122	7	5	71	Pass
0.0123	7	5	71	Pass
0.0125	7	5	71	Pass
0.0126	6	5	83	Pass
0.0127	6	5	83	Pass
0.0129	6	5	83	Pass
0.0130	6	5	83	Pass
0.0131	6	5	83	Pass
0.0133	6	5	83	Pass
0.0134	6	5	83	Pass
0.0135	6	4	66	Pass
0.0137	6	4	66	Pass
0.0138	6	4	66	Pass
0.0140	6	4	66	Pass
0.0141	5	4	80	Pass
0.0142	5	4	80	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume: 0 acre-feet

On-line facility target flow: 0 cfs.

Adjusted for 15 min: 0 cfs.

Off-line facility target flow: 0 cfs.

Adjusted for 15 min: 0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Channel 1 POC	<input type="checkbox"/>	0.01			<input type="checkbox"/>	0.00			
Gravel Trench Bed 1	<input type="checkbox"/>	52.97			<input type="checkbox"/>	99.76			
Gravel Trench Bed 2	<input type="checkbox"/>	128.94			<input type="checkbox"/>	99.89			
Total Volume Infiltrated		181.91	0.00	0.00		99.85	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

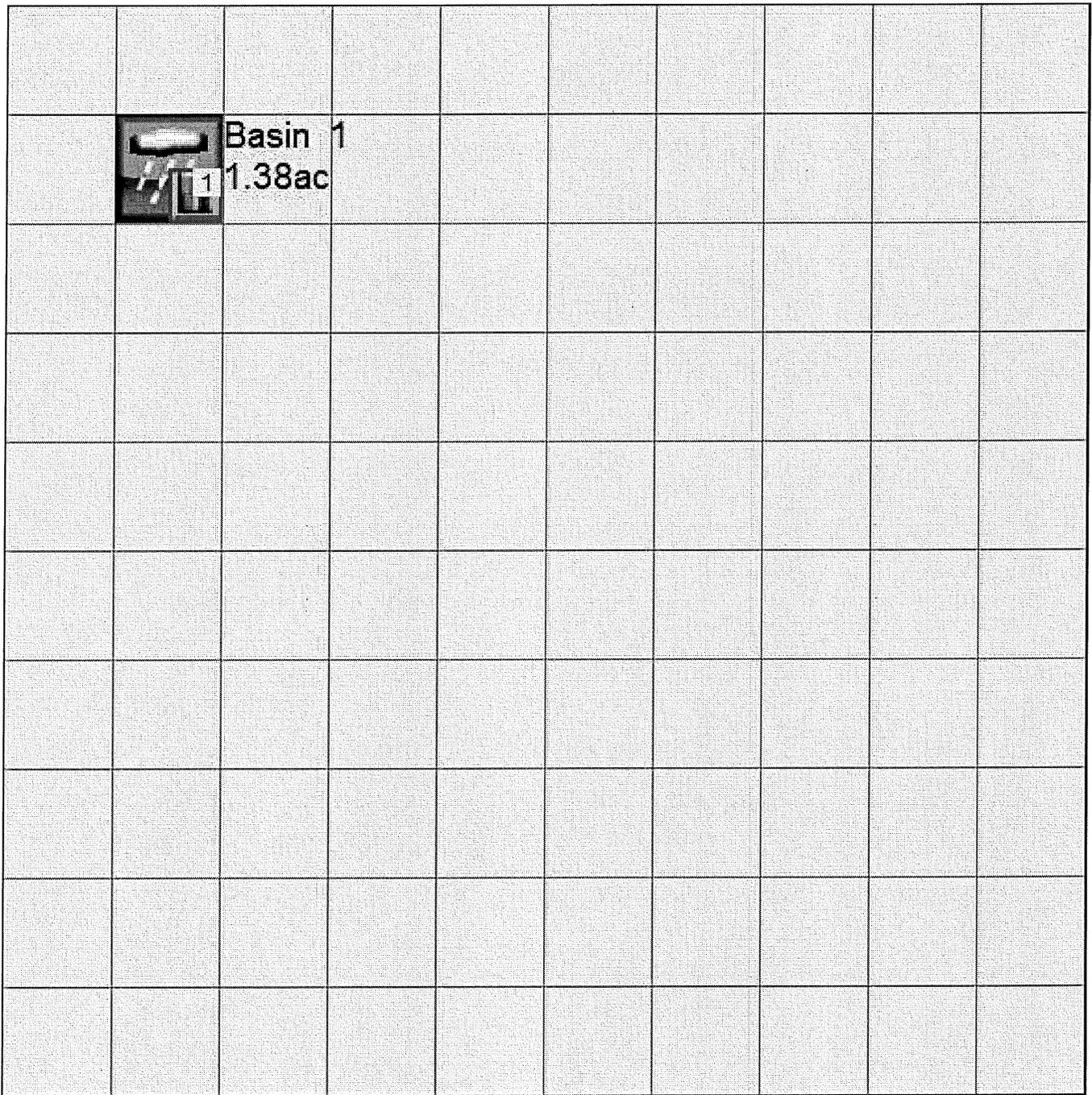
PERLND Changes

No PERLND changes have been made.

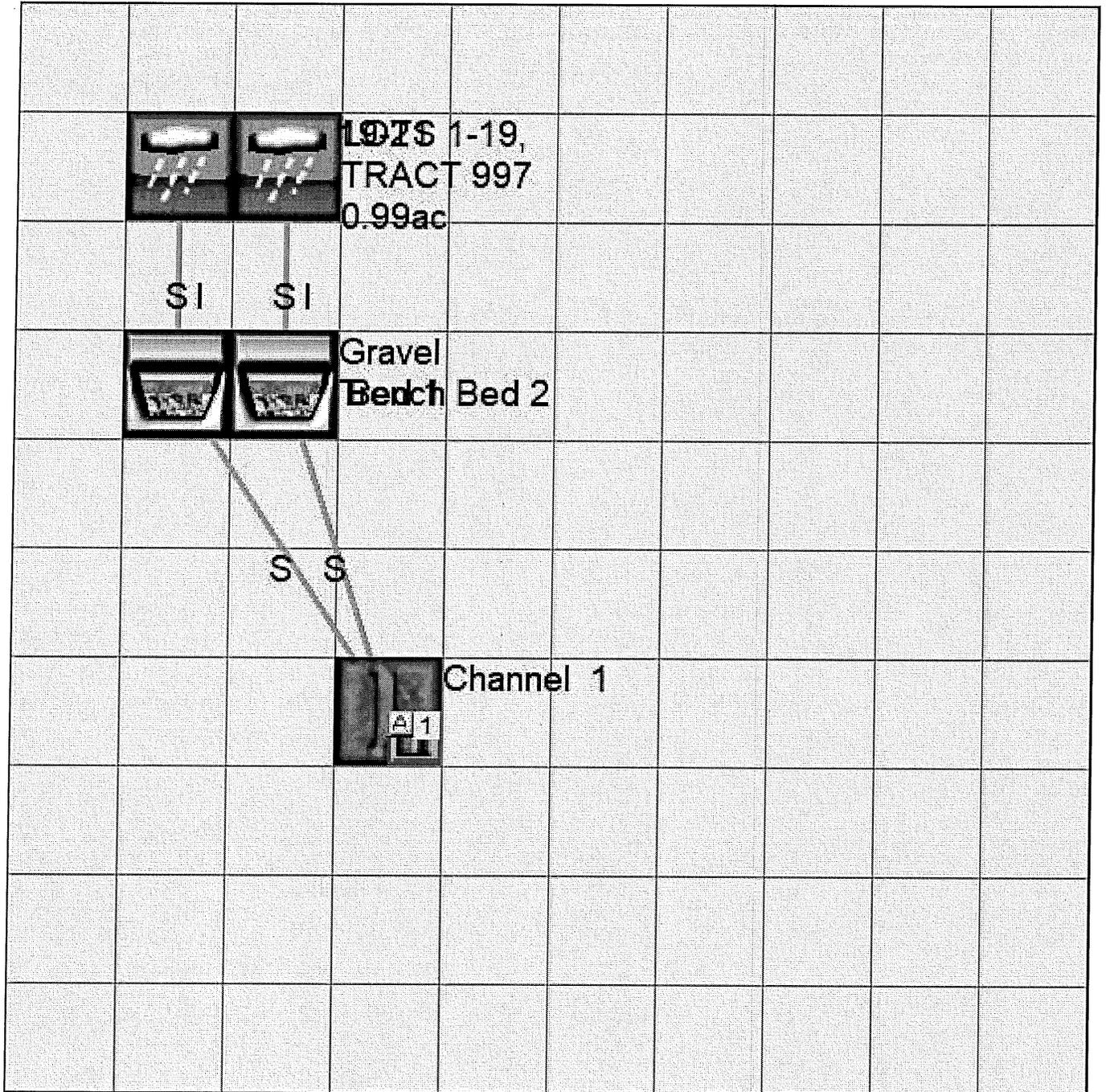
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

RUN

GLOBAL

WVHM4 model simulation
START 1948 10 01 END 2009 09 30
RUN INTERP OUTPUT LEVEL 3 0
RESUME 0 RUN 1 UNIT SYSTEM 1

END GLOBAL

FILES

<File>	<Un#>	<-----File Name----->	***
<-ID->			***
WDM	26	17-0807 - infil.wdm	
MESSU	25	Pre17-0807 - infil.MES	
	27	Pre17-0807 - infil.L61	
	28	Pre17-0807 - infil.L62	
	30	POC17-0807 - infil1.dat	

END FILES

OPN SEQUENCE

INGRP INDELT 00:15
PERLND 1
COPY 501
DISPLY 1

END INGRP

END OPN SEQUENCE

DISPLY

DISPLY-INFO1

#	-	#	<-----Title----->	***	TRAN	PIVL	DIG1	FIL1	PYR	DIG2	FIL2	YRND
1			Basin 1		MAX				1	2	30	9

END DISPLY-INFO1

END DISPLY

COPY

TIMESERIES

#	-	#	NPT	NMN	***
1			1	1	
501			1	1	

END TIMESERIES

END COPY

GENER

OPCODE

#	#	OPCD	***

END OPCODE

PARM

#	#	K	***

END PARM

END GENER

PERLND

GEN-INFO

<PLS >	<-----Name----->	NBLKS	Unit-systems	Printer	***		
#	-	#	User	t-series	Engl Metr	***	
			in	out		***	
1	A/B, Forest, Flat	1	1	1	1	27	0

END GEN-INFO

*** Section PWATER***

ACTIVITY

<PLS >	***** Active Sections *****														
#	-	#	ATMP	SNOW	PWAT	SED	PST	PWG	PQAL	MSTL	PEST	NITR	PHOS	TRAC	***
1			0	0	1	0	0	0	0	0	0	0	0	0	

END ACTIVITY

PRINT-INFO

<PLS >	***** Print-flags *****													PIVL	PYR		
#	-	#	ATMP	SNOW	PWAT	SED	PST	PWG	PQAL	MSTL	PEST	NITR	PHOS	TRAC	*****		
1			0	0	4	0	0	0	0	0	0	0	0	0		1	9

END PRINT-INFO

```

PWAT-PARM1
<PLS > PWATER variable monthly parameter value flags ***
# - # CSNO RTOP UZFG VCS VUZ VNN VIFW VIRC VLE INFC HWT ***
1 0 0 0 0 0 0 0 0 0 0 0
END PWAT-PARM1

```

```

PWAT-PARM2
<PLS > PWATER input info: Part 2 ***
# - # ***FOREST LZSN INFILT LSUR SLSUR KVARY AGWRC
1 0 5 2 400 0.05 0.3 0.996
END PWAT-PARM2

```

```

PWAT-PARM3
<PLS > PWATER input info: Part 3 ***
# - # ***PETMAX PETMIN INFEXP INFILD DEEPFR BASETP AGWETP
1 0 0 2 2 0 0 0
END PWAT-PARM3

```

```

PWAT-PARM4
<PLS > PWATER input info: Part 4 ***
# - # CEPSC UZSN NSUR INTFW IRC LZETP ***
1 0.2 0.5 0.35 0 0.7 0.7
END PWAT-PARM4

```

```

PWAT-STATE1
<PLS > *** Initial conditions at start of simulation
ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
# - # *** CEPS SURS UZS IFWS LZS AGWS GWVS
1 0 0 0 0 3 1 0
END PWAT-STATE1

```

END PERLND

IMPLND

```

GEN-INFO
<PLS ><-----Name-----> Unit-systems Printer ***
# - # User t-series Engl Metr ***
in out ***

```

```

END GEN-INFO
*** Section IWATER***

```

```

ACTIVITY
<PLS > ***** Active Sections *****
# - # ATMP SNOW IWAT SLD IWG IQAL ***
END ACTIVITY

```

```

PRINT-INFO
<ILS > ***** Print-flags ***** PIVL PYR
# - # ATMP SNOW IWAT SLD IWG IQAL *****
END PRINT-INFO

```

```

IWAT-PARM1
<PLS > IWATER variable monthly parameter value flags ***
# - # CSNO RTOP VRS VNN RTLI ***
END IWAT-PARM1

```

```

IWAT-PARM2
<PLS > IWATER input info: Part 2 ***
# - # *** LSUR SLSUR NSUR RETSC
END IWAT-PARM2

```

```

IWAT-PARM3
<PLS > IWATER input info: Part 3 ***
# - # ***PETMAX PETMIN
END IWAT-PARM3

```

```

IWAT-STATE1
<PLS > *** Initial conditions at start of simulation
# - # *** RETS SURS
END IWAT-STATE1

```



```

WDM      1 EVAP      ENGL      0.76          PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP      ENGL      0.76          IMPLND   1 999 EXTNL  PETINP

```

END EXT SOURCES

EXT TARGETS

```

<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name> # <Name> # #<-factor->strg <Name> # <Name> tem strg strg***
COPY 501 OUTPUT MEAN 1 1 48.4 WDM 501 FLOW ENGL REPL
END EXT TARGETS

```

MASS-LINK

```

<Volume> <-Grp> <-Member-><--Mult--> <Target> <-Grp> <-Member->***
<Name> # <Name> # #<-factor-> <Name> <Name> # #***
MASS-LINK 12
PERLND PWATER SURO 0.083333 COPY INPUT MEAN
END MASS-LINK 12

```

```

MASS-LINK 13
PERLND PWATER IFWO 0.083333 COPY INPUT MEAN
END MASS-LINK 13

```

END MASS-LINK

END RUN

Mitigated UCI File

RUN

GLOBAL

WVHM4 model simulation
START 1948 10 01 END 2009 09 30
RUN INTERP OUTPUT LEVEL 3 0
RESUME 0 RUN 1 UNIT SYSTEM 1

END GLOBAL

FILES

```
<File> <Un#> <-----File Name----->***  
<-ID-> ***  
WDM 26 17-0807 - infil.wdm  
MESSU 25 Mit17-0807 - infil.MES  
27 Mit17-0807 - infil.L61  
28 Mit17-0807 - infil.L62  
30 POC17-0807 - infil1.dat
```

END FILES

OPN SEQUENCE

INGRP INDELT 00:15

PERLND 7
IMPLND 4
IMPLND 11
IMPLND 1
IMPLND 5
IMPLND 8
RCHRES 1
RCHRES 2
RCHRES 3
COPY 1
COPY 501
DISPLY 1

END INGRP

END OPN SEQUENCE

DISPLY

DISPLY-INFO1

```
# - #<-----Title----->***TRAN PIVL DIG1 FIL1 PYR DIG2 FIL2 YRND  
1 Channel 1 MAX 1 2 30 9
```

END DISPLY-INFO1

END DISPLY

COPY

TIMESERIES

```
# - # NPT NMN ***  
1 1 1  
501 1 1
```

END TIMESERIES

END COPY

GENER

OPCODE

```
# # OPCODE ***
```

END OPCODE

PARM

```
# # K ***
```

END PARM

END GENER

PERLND

GEN-INFO

```
<PLS ><-----Name----->NBLKS Unit-systems Printer ***  
# - # User t-series Engl Metr ***  
in out ***  
7 A/B, Lawn, Flat 1 1 1 1 27 0
```

END GEN-INFO

*** Section PWATER***

ACTIVITY

```
<PLS > ***** Active Sections *****  
# - # ATMP SNOW PWAT SED PST PWG PQAL MSTL PEST NITR PHOS TRAC ***
```

7 0 0 1 0 0 0 0 0 0 0 0 0 0
END ACTIVITY

PRINT-INFO

<PLS > ***** Print-flags ***** PIVL PYR
- # ATMP SNOW PWAT SED PST PWG PQAL MSTL PEST NITR PHOS TRAC *****
7 0 0 4 0 0 0 0 0 0 0 0 0 0 1 9
END PRINT-INFO

PWAT-PARM1

<PLS > PWATER variable monthly parameter value flags ***
- # CSNO RTOP UZFG VCS VUZ VNN VIFW VIRC VLE INFC HWT ***
7 0 0 0 0 0 0 0 0 0 0 0
END PWAT-PARM1

PWAT-PARM2

<PLS > PWATER input info: Part 2 ***
- # ***FOREST LZSN INFILT LSUR SLSUR KVARY AGWRC
7 0 5 0.8 400 0.05 0.3 0.996
END PWAT-PARM2

PWAT-PARM3

<PLS > PWATER input info: Part 3 ***
- # ***PETMAX PETMIN INFEXP INFILD DEEPFR BASETP AGWETP
7 0 0 2 2 0 0 0
END PWAT-PARM3

PWAT-PARM4

<PLS > PWATER input info: Part 4 ***
- # CEPSC UZSN NSUR INTFW IRC LZETP ***
7 0.1 0.5 0.25 0 0.7 0.25
END PWAT-PARM4

PWAT-STATE1

<PLS > *** Initial conditions at start of simulation
ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
- # *** CEPS SURS UZS IFWS LZS AGWS GWVS
7 0 0 0 0 3 1 0
END PWAT-STATE1

END PERLND

IMPLND

GEN-INFO

<PLS ><-----Name-----> Unit-systems Printer ***
- # User t-series Engr Metr ***
in out ***
4 ROOF TOPS/FLAT 1 1 1 27 0
11 PARKING/FLAT 1 1 1 27 0
1 ROADS/FLAT 1 1 1 27 0
5 DRIVEWAYS/FLAT 1 1 1 27 0
8 SIDEWALKS/FLAT 1 1 1 27 0
END GEN-INFO

*** Section IWATER***

ACTIVITY

<PLS > ***** Active Sections *****
- # ATMP SNOW IWAT SLD IWG IQAL ***
4 0 0 1 0 0 0
11 0 0 1 0 0 0
1 0 0 1 0 0 0
5 0 0 1 0 0 0
8 0 0 1 0 0 0
END ACTIVITY

PRINT-INFO

<ILS > ***** Print-flags ***** PIVL PYR
- # ATMP SNOW IWAT SLD IWG IQAL *****
4 0 0 4 0 0 0 1 9
11 0 0 4 0 0 0 1 9
1 0 0 4 0 0 0 1 9

```

5      0      0      4      0      0      0      1      9
8      0      0      4      0      0      0      1      9
END PRINT-INFO

```

```

IWAT-PARM1
<PLS > IWATER variable monthly parameter value flags ***
# - # CSNO RTOP VRS VNN RTLI      ***
4      0      0      0      0      0
11     0      0      0      0      0
1      0      0      0      0      0
5      0      0      0      0      0
8      0      0      0      0      0
END IWAT-PARM1

```

```

IWAT-PARM2
<PLS > IWATER input info: Part 2      ***
# - # *** LSUR      SLSUR      NSUR      RETSC
4      400      0.01      0.1      0.1
11     400      0.01      0.1      0.1
1      400      0.01      0.1      0.1
5      400      0.01      0.1      0.1
8      400      0.01      0.1      0.1
END IWAT-PARM2

```

```

IWAT-PARM3
<PLS > IWATER input info: Part 3      ***
# - # ***PETMAX      PETMIN
4      0      0
11     0      0
1      0      0
5      0      0
8      0      0
END IWAT-PARM3

```

```

IWAT-STATE1
<PLS > *** Initial conditions at start of simulation
# - # *** RETS      SURS
4      0      0
11     0      0
1      0      0
5      0      0
8      0      0
END IWAT-STATE1

```

END IMPLND

```

SCHEMATIC
<-Source->          <--Area-->          <-Target->          MBLK      ***
<Name> #           <-factor->          <Name> #          Tbl#      ***
LOTS 19-21***
PERLND 7           0.09           RCHRES 1          2
PERLND 7           0.09           RCHRES 1          3
IMPLND 4           0.1            RCHRES 1          5
IMPLND 11          0.2            RCHRES 1          5
LOTS 1-19, TRACT 997***
PERLND 7           0.26           RCHRES 2          2
PERLND 7           0.26           RCHRES 2          3
IMPLND 1           0.17           RCHRES 2          5
IMPLND 4           0.37           RCHRES 2          5
IMPLND 5           0.17           RCHRES 2          5
IMPLND 8           0.02           RCHRES 2          5

*****Routing*****
RCHRES 1           1            RCHRES 3          7
RCHRES 1           1            COPY 1           17
RCHRES 2           1            RCHRES 3          7
RCHRES 2           1            COPY 1           17
RCHRES 3           1            COPY 501         16
END SCHEMATIC

```


Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.017218	0.000000	0.000000	0.000000		
0.055556	0.017218	0.000335	0.000000	0.069444		
0.111111	0.017218	0.000670	0.000000	0.069444		
0.166667	0.017218	0.001004	0.000000	0.069444		
0.222222	0.017218	0.001339	0.000000	0.069444		
0.277778	0.017218	0.001674	0.000000	0.069444		
0.333333	0.017218	0.002009	0.000000	0.069444		
0.388889	0.017218	0.002344	0.000000	0.069444		
0.444444	0.017218	0.002678	0.000000	0.069444		
0.500000	0.017218	0.003013	0.000000	0.069444		
0.555556	0.017218	0.003348	0.000000	0.069444		
0.611111	0.017218	0.003683	0.000000	0.069444		
0.666667	0.017218	0.004017	0.000000	0.069444		
0.722222	0.017218	0.004352	0.000000	0.069444		
0.777778	0.017218	0.004687	0.000000	0.069444		
0.833333	0.017218	0.005022	0.000000	0.069444		
0.888889	0.017218	0.005357	0.000000	0.069444		
0.944444	0.017218	0.005691	0.000000	0.069444		
1.000000	0.017218	0.006026	0.000000	0.069444		
1.055556	0.017218	0.006361	0.000000	0.069444		
1.111111	0.017218	0.006696	0.000000	0.069444		
1.166667	0.017218	0.007031	0.000000	0.069444		
1.222222	0.017218	0.007365	0.000000	0.069444		
1.277778	0.017218	0.007700	0.000000	0.069444		
1.333333	0.017218	0.008035	0.000000	0.069444		
1.388889	0.017218	0.008370	0.000000	0.069444		
1.444444	0.017218	0.008704	0.000000	0.069444		
1.500000	0.017218	0.009039	0.000000	0.069444		
1.555556	0.017218	0.009374	0.000000	0.069444		
1.611111	0.017218	0.009709	0.000000	0.069444		
1.666667	0.017218	0.010044	0.000000	0.069444		
1.722222	0.017218	0.010378	0.000000	0.069444		
1.777778	0.017218	0.010713	0.000000	0.069444		
1.833333	0.017218	0.011048	0.000000	0.069444		
1.888889	0.017218	0.011383	0.000000	0.069444		
1.944444	0.017218	0.011718	0.000000	0.069444		
2.000000	0.017218	0.012052	0.000000	0.069444		
2.055556	0.017218	0.012387	0.000000	0.069444		
2.111111	0.017218	0.012722	0.000000	0.069444		
2.166667	0.017218	0.013057	0.000000	0.069444		
2.222222	0.017218	0.013391	0.000000	0.069444		
2.277778	0.017218	0.013726	0.000000	0.069444		
2.333333	0.017218	0.014061	0.000000	0.069444		
2.388889	0.017218	0.014396	0.000000	0.069444		
2.444444	0.017218	0.014731	0.000000	0.069444		
2.500000	0.017218	0.015065	0.000000	0.069444		
2.555556	0.017218	0.015400	0.000000	0.069444		
2.611111	0.017218	0.015735	0.000000	0.069444		
2.666667	0.017218	0.016070	0.000000	0.069444		
2.722222	0.017218	0.016405	0.000000	0.069444		
2.777778	0.017218	0.016739	0.000000	0.069444		
2.833333	0.017218	0.017074	0.000000	0.069444		
2.888889	0.017218	0.017409	0.000000	0.069444		
2.944444	0.017218	0.017744	0.000000	0.069444		
3.000000	0.017218	0.018079	0.000000	0.069444		
3.055556	0.017218	0.018413	0.000000	0.069444		
3.111111	0.017218	0.018748	0.000000	0.069444		
3.166667	0.017218	0.019083	0.000000	0.069444		
3.222222	0.017218	0.019418	0.000000	0.069444		
3.277778	0.017218	0.019752	0.000000	0.069444		
3.333333	0.017218	0.020087	0.000000	0.069444		
3.388889	0.017218	0.020422	0.000000	0.069444		
3.444444	0.017218	0.020757	0.000000	0.069444		
3.500000	0.017218	0.021092	0.000000	0.069444		
3.555556	0.017218	0.021426	0.000000	0.069444		
3.611111	0.017218	0.021761	0.000000	0.069444		
3.666667	0.017218	0.022096	0.000000	0.069444		

3.722222	0.017218	0.022431	0.000000	0.069444
3.777778	0.017218	0.022766	0.000000	0.069444
3.833333	0.017218	0.023100	0.000000	0.069444
3.888889	0.017218	0.023435	0.000000	0.069444
3.944444	0.017218	0.023770	0.000000	0.069444
4.000000	0.017218	0.024105	0.000000	0.069444
4.055556	0.017218	0.025061	0.092279	0.069444
4.111111	0.017218	0.026018	0.255267	0.069444
4.166667	0.017218	0.026974	0.441835	0.069444
4.222222	0.017218	0.027931	0.610909	0.069444
4.277778	0.017218	0.028887	0.730523	0.069444
4.333333	0.017218	0.029844	0.799562	0.069444
4.388889	0.017218	0.030800	0.872951	0.069444
4.444444	0.017218	0.031757	0.933224	0.069444
4.500000	0.017218	0.032713	0.989833	0.069444
4.555556	0.017218	0.033670	1.043376	0.069444
4.611111	0.017218	0.034627	1.094302	0.069444
4.666667	0.017218	0.035583	1.142961	0.069444
4.722222	0.017218	0.036540	1.189631	0.069444
4.777778	0.017218	0.037496	1.234539	0.069444
4.833333	0.017218	0.038453	1.277869	0.069444
4.888889	0.017218	0.039409	1.319778	0.069444
4.944444	0.017218	0.040366	1.360396	0.069444
5.000000	0.017218	0.041322	1.399836	0.069444
5.055556	0.017218	0.042279	1.438194	0.069444

END FTABLE 1

FTABLE 2

92 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.040404	0.000000	0.000000	0.000000		
0.055556	0.040404	0.000786	0.000000	0.162963		
0.111111	0.040404	0.001571	0.000000	0.162963		
0.166667	0.040404	0.002357	0.000000	0.162963		
0.222222	0.040404	0.003143	0.000000	0.162963		
0.277778	0.040404	0.003928	0.000000	0.162963		
0.333333	0.040404	0.004714	0.000000	0.162963		
0.388889	0.040404	0.005499	0.000000	0.162963		
0.444444	0.040404	0.006285	0.000000	0.162963		
0.500000	0.040404	0.007071	0.000000	0.162963		
0.555556	0.040404	0.007856	0.000000	0.162963		
0.611111	0.040404	0.008642	0.000000	0.162963		
0.666667	0.040404	0.009428	0.000000	0.162963		
0.722222	0.040404	0.010213	0.000000	0.162963		
0.777778	0.040404	0.010999	0.000000	0.162963		
0.833333	0.040404	0.011785	0.000000	0.162963		
0.888889	0.040404	0.012570	0.000000	0.162963		
0.944444	0.040404	0.013356	0.000000	0.162963		
1.000000	0.040404	0.014141	0.000000	0.162963		
1.055556	0.040404	0.014927	0.000000	0.162963		
1.111111	0.040404	0.015713	0.000000	0.162963		
1.166667	0.040404	0.016498	0.000000	0.162963		
1.222222	0.040404	0.017284	0.000000	0.162963		
1.277778	0.040404	0.018070	0.000000	0.162963		
1.333333	0.040404	0.018855	0.000000	0.162963		
1.388889	0.040404	0.019641	0.000000	0.162963		
1.444444	0.040404	0.020426	0.000000	0.162963		
1.500000	0.040404	0.021212	0.000000	0.162963		
1.555556	0.040404	0.021998	0.000000	0.162963		
1.611111	0.040404	0.022783	0.000000	0.162963		
1.666667	0.040404	0.023569	0.000000	0.162963		
1.722222	0.040404	0.024355	0.000000	0.162963		
1.777778	0.040404	0.025140	0.000000	0.162963		
1.833333	0.040404	0.025926	0.000000	0.162963		
1.888889	0.040404	0.026712	0.000000	0.162963		
1.944444	0.040404	0.027497	0.000000	0.162963		
2.000000	0.040404	0.028283	0.000000	0.162963		
2.055556	0.040404	0.029068	0.000000	0.162963		
2.111111	0.040404	0.029854	0.000000	0.162963		
2.166667	0.040404	0.030640	0.000000	0.162963		

2.222222	0.040404	0.031425	0.000000	0.162963
2.277778	0.040404	0.032211	0.000000	0.162963
2.333333	0.040404	0.032997	0.000000	0.162963
2.388889	0.040404	0.033782	0.000000	0.162963
2.444444	0.040404	0.034568	0.000000	0.162963
2.500000	0.040404	0.035354	0.000000	0.162963
2.555556	0.040404	0.036139	0.000000	0.162963
2.611111	0.040404	0.036925	0.000000	0.162963
2.666667	0.040404	0.037710	0.000000	0.162963
2.722222	0.040404	0.038496	0.000000	0.162963
2.777778	0.040404	0.039282	0.000000	0.162963
2.833333	0.040404	0.040067	0.000000	0.162963
2.888889	0.040404	0.040853	0.000000	0.162963
2.944444	0.040404	0.041639	0.000000	0.162963
3.000000	0.040404	0.042424	0.000000	0.162963
3.055556	0.040404	0.043210	0.000000	0.162963
3.111111	0.040404	0.043996	0.000000	0.162963
3.166667	0.040404	0.044781	0.000000	0.162963
3.222222	0.040404	0.045567	0.000000	0.162963
3.277778	0.040404	0.046352	0.000000	0.162963
3.333333	0.040404	0.047138	0.000000	0.162963
3.388889	0.040404	0.047924	0.000000	0.162963
3.444444	0.040404	0.048709	0.000000	0.162963
3.500000	0.040404	0.049495	0.000000	0.162963
3.555556	0.040404	0.050281	0.000000	0.162963
3.611111	0.040404	0.051066	0.000000	0.162963
3.666667	0.040404	0.051852	0.000000	0.162963
3.722222	0.040404	0.052637	0.000000	0.162963
3.777778	0.040404	0.053423	0.000000	0.162963
3.833333	0.040404	0.054209	0.000000	0.162963
3.888889	0.040404	0.054994	0.000000	0.162963
3.944444	0.040404	0.055780	0.000000	0.162963
4.000000	0.040404	0.056566	0.000000	0.162963
4.055556	0.040404	0.058810	0.092279	0.162963
4.111111	0.040404	0.061055	0.255267	0.162963
4.166667	0.040404	0.063300	0.441835	0.162963
4.222222	0.040404	0.065544	0.610909	0.162963
4.277778	0.040404	0.067789	0.730523	0.162963
4.333333	0.040404	0.070034	0.799562	0.162963
4.388889	0.040404	0.072278	0.872951	0.162963
4.444444	0.040404	0.074523	0.933224	0.162963
4.500000	0.040404	0.076768	0.989833	0.162963
4.555556	0.040404	0.079012	1.043376	0.162963
4.611111	0.040404	0.081257	1.094302	0.162963
4.666667	0.040404	0.083502	1.142961	0.162963
4.722222	0.040404	0.085746	1.189631	0.162963
4.777778	0.040404	0.087991	1.234539	0.162963
4.833333	0.040404	0.090236	1.277869	0.162963
4.888889	0.040404	0.092480	1.319778	0.162963
4.944444	0.040404	0.094725	1.360396	0.162963
5.000000	0.040404	0.096970	1.399836	0.162963
5.055556	0.040404	0.099214	1.438194	0.162963

END FTABLE 2

FTABLE 3

91 4

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.022957	0.000000	0.000000		
0.022222	0.022977	0.000510	0.870124		
0.044444	0.022998	0.001021	2.755333		
0.066667	0.023018	0.001532	5.401836		
0.088889	0.023039	0.002044	8.702821		
0.111111	0.023059	0.002556	12.59127		
0.133333	0.023079	0.003069	17.01911		
0.155556	0.023100	0.003582	21.94920		
0.177778	0.023120	0.004096	27.35151		
0.200000	0.023141	0.004610	33.20092		
0.222222	0.023161	0.005124	39.47594		
0.244444	0.023182	0.005639	46.15785		
0.266667	0.023202	0.006155	53.23005		

0.288889	0.023223	0.006670	60.67772
0.311111	0.023243	0.007187	68.48747
0.333333	0.023264	0.007703	76.64708
0.355556	0.023284	0.008221	85.14535
0.377778	0.023305	0.008738	93.97197
0.400000	0.023326	0.009256	103.1173
0.422222	0.023346	0.009775	112.5726
0.444444	0.023367	0.010294	122.3293
0.466667	0.023387	0.010813	132.3797
0.488889	0.023408	0.011333	142.7164
0.511111	0.023429	0.011854	153.3324
0.533333	0.023449	0.012375	164.2212
0.555556	0.023470	0.012896	175.3766
0.577778	0.023490	0.013418	186.7925
0.600000	0.023511	0.013940	198.4634
0.622222	0.023532	0.014463	210.3838
0.644444	0.023552	0.014986	222.5486
0.666667	0.023573	0.015510	234.9529
0.688889	0.023594	0.016034	247.5919
0.711111	0.023614	0.016558	260.4611
0.733333	0.023635	0.017083	273.5562
0.755556	0.023656	0.017609	286.8730
0.777778	0.023677	0.018135	300.4074
0.800000	0.023697	0.018661	314.1556
0.822222	0.023718	0.019188	328.1138
0.844444	0.023739	0.019715	342.2783
0.866667	0.023760	0.020243	356.6458
0.888889	0.023780	0.020771	371.2128
0.911111	0.023801	0.021300	385.9760
0.933333	0.023822	0.021829	400.9324
0.955556	0.023843	0.022358	416.0787
0.977778	0.023863	0.022889	431.4121
1.000000	0.023884	0.023419	446.9297
1.022222	0.023905	0.023950	462.6287
1.044444	0.023926	0.024481	478.5063
1.066667	0.023947	0.025013	494.5599
1.088889	0.023968	0.025546	510.7870
1.111111	0.023988	0.026079	527.1850
1.133333	0.024009	0.026612	543.7516
1.155556	0.024030	0.027146	560.4844
1.177778	0.024051	0.027680	577.3810
1.200000	0.024072	0.028215	594.4392
1.222222	0.024093	0.028750	611.6569
1.244444	0.024114	0.029285	629.0319
1.266667	0.024135	0.029822	646.5622
1.288889	0.024156	0.030358	664.2457
1.311111	0.024177	0.030895	682.0804
1.333333	0.024198	0.031433	700.0645
1.355556	0.024218	0.031971	718.1960
1.377778	0.024239	0.032509	736.4731
1.400000	0.024260	0.033048	754.8940
1.422222	0.024281	0.033587	773.4570
1.444444	0.024302	0.034127	792.1603
1.466667	0.024323	0.034667	811.0023
1.488889	0.024344	0.035208	829.9813
1.511111	0.024365	0.035749	849.0957
1.533333	0.024386	0.036291	868.3440
1.555556	0.024407	0.036833	887.7246
1.577778	0.024429	0.037376	907.2360
1.600000	0.024450	0.037919	926.8768
1.622222	0.024471	0.038462	946.6455
1.644444	0.024492	0.039006	966.5407
1.666667	0.024513	0.039551	986.5610
1.688889	0.024534	0.040096	1006.705
1.711111	0.024555	0.040641	1026.972
1.733333	0.024576	0.041187	1047.359
1.755556	0.024597	0.041734	1067.867
1.777778	0.024618	0.042280	1088.493
1.800000	0.024639	0.042828	1109.237
1.822222	0.024661	0.043376	1130.096

```

1.844444 0.024682 0.043924 1151.071
1.866667 0.024703 0.044473 1172.160
1.888889 0.024724 0.045022 1193.361
1.911111 0.024745 0.045571 1214.674
1.933333 0.024766 0.046121 1236.098
1.955556 0.024788 0.046672 1257.631
1.977778 0.024809 0.047223 1279.272
2.000000 0.024830 0.047775 1301.021

```

END FTABLE 3

END FTABLES

EXT SOURCES

```

<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member-> ***
<Name> # <Name> # tem strg<-factor->strg <Name> # # <Name> # # ***
WDM 2 PREC ENGL 1.2 PERLND 1 999 EXTNL PREC
WDM 2 PREC ENGL 1.2 IMPLND 1 999 EXTNL PREC
WDM 1 EVAP ENGL 0.76 PERLND 1 999 EXTNL PETINP
WDM 1 EVAP ENGL 0.76 IMPLND 1 999 EXTNL PETINP

```

END EXT SOURCES

EXT TARGETS

```

<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name> # <Name> # #<-factor->strg <Name> # <Name> tem strg strg***
RCHRES 3 HYDR RO 1 1 1 WDM 1000 FLOW ENGL REPL
RCHRES 3 HYDR STAGE 1 1 1 WDM 1001 STAG ENGL REPL
COPY 1 OUTPUT MEAN 1 1 48.4 WDM 701 FLOW ENGL REPL
COPY 501 OUTPUT MEAN 1 1 48.4 WDM 801 FLOW ENGL REPL

```

END EXT TARGETS

MASS-LINK

```

<Volume> <-Grp> <-Member-><--Mult--> <Target> <-Grp> <-Member->***
<Name> # <Name> # #<-factor-> <Name> <Name> # #***
MASS-LINK 2
PERLND PWATER SURO 0.083333 RCHRES INFLOW IVOL
END MASS-LINK 2

MASS-LINK 3
PERLND PWATER IFWO 0.083333 RCHRES INFLOW IVOL
END MASS-LINK 3

MASS-LINK 5
IMPLND IWATER SURO 0.083333 RCHRES INFLOW IVOL
END MASS-LINK 5

MASS-LINK 7
RCHRES OFLOW OVOL 1 RCHRES INFLOW IVOL
END MASS-LINK 7

MASS-LINK 16
RCHRES ROFLOW COPY INPUT MEAN
END MASS-LINK 16

MASS-LINK 17
RCHRES OFLOW OVOL 1 COPY INPUT MEAN
END MASS-LINK 17

```

END MASS-LINK

END RUN

APPENDIX B

MAINTENANCE & OPERATIONS MANUAL

No. 2 – Infiltration

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	Trash & Debris	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Poisonous/Noxious Vegetation	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Contaminants and Pollution	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Rodent Holes	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
Storage Area	Sediment	Water ponding in infiltration pond after rainfall ceases and appropriate time allowed for infiltration. Treatment basins should infiltrate Water Quality Design Storm Volume within 48 hours, and empty within 24 hours after cessation of most rain events. (A percolation test pit or test of facility indicates facility is only working at 90% of its designed capabilities. Test every 2 to 5 years. If two inches or more sediment is present, remove).	Sediment is removed and/or facility is cleaned so that infiltration system works according to design.
Filter Bags (if applicable)	Filled with Sediment and Debris	Sediment and debris fill bag more than 1/2 full.	Filter bag is replaced or system is redesigned.
Rock Filters	Sediment and Debris	By visual inspection, little or no water flows through filter during heavy rain storms.	Gravel in rock filter is replaced.
Side Slopes of Pond	Erosion	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
Emergency Overflow Spillway and Berms over 4 feet in height.	Tree Growth	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Piping	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
Emergency Overflow Spillway	Rock Missing	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Erosion	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
Pre-settling Ponds and Vaults	Facility or sump filled with Sediment and/or debris	6" or designed sediment trap depth of sediment.	Sediment is removed.

No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
General	Trash & Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%.	No Trash or debris located immediately in front of catch basin or on grate opening.
		Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe.	No trash or debris in the catch basin.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Inlet and outlet pipes free of trash or debris.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the catch basin.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the catch basin
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch (Intent is to make sure no material is running into basin).	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Frame is sitting flush on the riser rings or top slab and firmly attached.
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound.	Basin replaced or repaired to design standards.
		Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Pipe is regouted and secure at basin wall.
	Settlement/ Misalignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the basin opening.	No vegetation blocking opening to basin.
		Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation or root growth present.
		Contamination and Pollution	See "Detention Ponds" (No. 1).

No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Catch basin cover is closed
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. (Intent is keep cover from sealing off access to maintenance.)	Cover can be removed by one maintenance person.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
Metal Grates (If Applicable)	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

No. 6 – Debris Barriers (e.g., Trash Racks)

Maintenance Components	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Trash and Debris	Trash or debris that is plugging more than 20% of the openings in the barrier.	Barrier cleared to design flow capacity.
Metal	Damaged/ Missing Bars.	Bars are bent out of shape more than 3 inches.	Bars in place with no bends more than 3/4 inch.
		Bars are missing or entire barrier missing.	Bars in place according to design.
		Bars are loose and rust is causing 50% deterioration to any part of barrier.	Barrier replaced or repaired to design standards.
	Inlet/Outlet Pipe	Debris barrier missing or not attached to pipe	Barrier firmly attached to pipe

APPENDIX C
GEOTECHNICAL REPORT

LIU & ASSOCIATES, INC.

Geotechnical Engineering

Engineering Geology

Earth Science

March 31, 2017

Mr. Rick Hanson
Hanson Homes
P. O. Box 2289
Snohomish, WA 98291

Dear Mr. Hanson:

Subject: Geotechnical Investigation
Main Street Townhomes
1237 West Main Street
Monroe, Washington
L&A Job No. 17-038

INTRODUCTION

We understand the development of a townhome project is proposed for the subject property, located at the above address in Monroe, Washington. The project site is a flag-stone shaped parcel. The proposed development is to build four townhome buildings in the "flag" portion of the site initially, with the two north buildings each containing four townhome units and the two south buildings each containing 6 units. Two more buildings are to be constructed in the "handle bar" portion of the site in the future. We also understand that onsite stormwater disposal by infiltration is being considered for the development. At your request, we have completed a geotechnical investigation for the proposed development project.

The purpose of this investigation is to explore and characterize subsurface conditions of the project site, evaluate feasibility of onsite stormwater disposal by infiltration, and

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provide geotechnical recommendations on grading, onsite stormwater disposal, erosion mitigation, surface and ground water drainage control, and foundation support to buildings for the proposed development. Presented in this report are our findings of the site conditions, conclusion, and geotechnical recommendations.

PROJECT DESCRIPTION

The proposed townhome buildings are to be three-story, above-grade, wood-framed structures supported on perimeter concrete foundation walls and interior load-bearing walls, beams, and columns. The site is to be accessed from West Main Street via a paved driveway along the west side of the "handle bar" portion and extending northward into the middle of the "flag" portion of the site. Due to the nearly flat terrain of the site, grading and construction of the residences will require minimal cut and fill.

SCOPE OF SERVICES

Our scope of services for this study comprises specifically the following:

1. Review the geologic and soil conditions at the site based on a published geologic map.
2. Explore the site for subsurface conditions with backhoe test pits to depth where a firm bearing soil stratum or a soil layer suitable for disposing stormwater by infiltration is encountered, or to the maximum depth (about 10 feet) capable by the backhoe used in excavating the test pits, whichever occurs first.
3. Perform geotechnical analyses and provide geotechnical recommendations on onsite stormwater disposal, erosion mitigation, surface and ground water drainage

control, and foundation support to buildings for the proposed development based on subsurface conditions encountered by the test pits and results of our geotechnical analyses and laboratory tests on soil samples.

4. Prepare a written report to present our findings, conclusions, and recommendations.

SITE CONDITIONS

SURFACE CONDITION

The general location of the project site is shown on Plate 1 – Vicinity Map. The site is situated in a flood plain of the nearby Skykomish River and its tributary creeks. For our use in this investigation, you provided us with a site and layout plan of the proposed development. The project site is bounded by West Main Street to the south, and adjoined a mixture of commercial and residential development to the east and west and by residential development to the north. The project site is nearly level with a shallow mound along the south side of the "flag" portion of the site, possibly formed by stockpiled soils excavated previously out of the "handle bar" portion of the site.

The terrain within the project site is nearly flat. The site is currently undeveloped and is covered by lawn grass.

GEOLOGIC SETTING

The Surficial Geologic Map of the Skykomish and Snoqualmie Rivers Area, Snohomish and King Counties, Washington, by Derek B Booth, published by U. S. Geological Survey in 1990, was referenced for the geologic condition of the project site. According

to this publication, the surficial soil unit at and in the vicinity of the project site is mapped as Alluvium Deposits (Q_a).

The alluvium deposits were geologically recent sediment transported and deposited by flooding water of the nearby Skykomish River and its tributary creeks, following the retreat of the last glaciation, the Vashon Stade of the Fraser Glaciation, which occurred during the later stages of the Pleistocene Epoch and retreated from the region some 12,500 years ago. The coarser materials of the alluvium deposits, such as coarse sand, gravel, cobble and boulder, were deposited closer to the river and tributary creek channels and are highly permeable, while the finer materials of the alluvium deposits, such as clay, silt and fine sand, were laid down farther away from the river/tributary creek channels and are less permeable. The younger alluvium deposits had not been over-ridden by glacier and are generally loose to medium-dense in their natural, undisturbed state.

SOIL CONDITION

Subsurface conditions of the project site were explored with six test pits. The test pits were excavated on March 22, 2017, with a rubber-tired backhoe to depths from 8.0 to 9.0. The approximate locations of the test pits are shown on Plate 2 - Site and Exploration Location Plan. The test pits were located with either a tape measure or by visual reference to existing topographic features in the field and on the site survey map, and their locations should be considered as only accurate to the measuring method used.

A geotechnical engineer from our office was present during subsurface exploration, examined the soil and geologic conditions encountered, and completed logs of the test

pits. Soil samples obtained from each soil layer in the test pits were visually classified in general accordance with United Soil Classification System, a copy of which is presented on Plate 3. Detailed descriptions of soils encountered during site exploration are presented in test pit logs on Plates 4 through 6.

Test Pit 5, located in the northwest quadrant of the "handle bar" portion of the site, encountered fill with concrete rubble and chunks of asphalt pavement, glass bottles, plastic sheets, metal parts, fuel cans, etc., mixed in loose dark-brown, organic, soils down to and beyond the excavated depth of 8.5 feet. The remaining five test pits all encountered a layer of loose organic topsoil, about 12 to 16 inches thick, mantling the site. Under the topsoil are layers of weathered soil of brown, loose, silty fine sand and light-gray, medium-dense, silty fine sand, totaling from 3.6 to 5.3 feet thick. The weathered soils are underlain to the depths explored by a alluvium deposit of light-gray, medium-dense, gravelly, cobbly, fine to coarse sand.

GROUNDWATER CONDITION

Groundwater was not encountered by any of the six test pits excavated on the project site. The topsoil and weathered soils are of moderately-high permeability and would allow some storm runoff to infiltrate into the ground, while the underlying alluvium deposit is of very-high permeability and would allow water to seep through very easily. The test pits were excavated in early spring following a very wet winter. Therefore, the winter high groundwater table under the site should be at the site that it would have little or no impact on the proposed development.

GEOLOGIC HAZARDS AND MITIGATION

Erosion and Landslide Hazard

The site is nearly flat and is underlain at shallow depth by an alluvium deposit of medium-dense, gravelly and cobbly sand deposit of moderately high shear strength. Therefore, there should be little or no hazard for soil erosion and landslide to occur on the project site. To further minimize erosion hazard of the site, vegetation cover outside of construction areas should be protected and maintained. Concentrated stormwater should not be discharged uncontrolled onto the ground within the site. Stormwater over impervious surfaces, such as roofs and paved roadway, driveways and parking areas, should be captured by underground drain line systems connected to roof downspouts and catch basins installed in paved areas. Water collected into these drain line systems should be tightlined to discharge into a storm sewer or suitable stormwater disposal facilities.

Seismic Hazard

The Puget Sound region is in an active seismic zone. The project site is underlain at shallow depth by medium-dense, gravelly, cobbly sand soil of very-high permeability. Also, the site is nearly level. Therefore, the potential for seismic hazards, such as landslides, liquefaction, lateral soil spreading, to occur on the site should be minimal. The proposed townhome buildings, however, should be designed for seismic forces induced by strong earthquakes. Based on the soil conditions encountered by the test pits, it is our opinion that Seismic Use Group I and Site Class D should be used in the seismic design of the proposed residences in accordance with the 2012 International Building Code (IBC).

DISCUSSION AND RECOMMENDATIONS

GENERAL

Based on the soil conditions encountered by test pits excavated on the project site, it is our opinion that the project site is suitable for the proposed development from the geotechnical engineering viewpoint, provided that the recommendations in this report are fully implemented and observed during and following completion of construction. Conventional footing foundations constructed on or into the underlying medium-dense to dense alluvium deposit of gravelly sand deposit underlying the site at shallow depth may be used to support proposed residences. Unsuitable surficial topsoil and weak surficial weathered soil should be stripped within footprint of roadway, driveways, parking areas, and areas of structural fill. The fill in the "handle bar" portion of the site should be thoroughly removed down to firm alluvium soil for the development of the future buildings.

The surficial topsoil and weathered soils contain a high percentage of fines and can be easily disturbed when saturated. Grading work in wet winter months may cause significant complications and difficulties. Therefore, earth work should be scheduled and completed from April 1 and October 31, if possible. Otherwise, erosion protection and drainage control measures recommended in this report should be implemented for site stabilization and to facilitate earthwork if it is to be carried out beyond the above dry period.

TEMPORARY DRAINAGE AND EROSION CONTROL

The onsite surficial weak soils are sensitive to moisture and can be easily disturbed by construction traffic. A layer of clean, 2-to-4-inch quarry spalls should be placed over areas of frequent traffic, such as the entrances to and exit from the site, as required, to protect the subgrade soils from disturbance by construction traffic.

A silt fence should be installed along the downhill sides of construction areas to minimize transport of sediment by storm runoff onto neighboring properties or streets. The bottom of the filter cloth of the silt fences should be anchored in a trench filled with onsite soil.

Intercepting ditches or trench drains should be installed around construction areas, as required, to intercept and drain away storm runoff and near-surface groundwater seepage. Water captured by such ditches or trench drains should be stored in temporary holding and settling ponds onsite. Only clear and clean water may be discharged into the alluvium deposit under the site or into a nearby storm inlet. The storm inlet into which collected stormwater is to be discharged should be covered with a non-woven filter fabric sock to prevent sediment from entering the storm sewer system. The filter sock should be cleaned frequently during construction to prevent clogging, and should be removed after completion of construction.

Spoil soils should be hauled off of the site as soon as possible. Spoil soils and imported structural fill material to be stored onsite should be securely covered with plastic tarps, as required, for protection against erosion.

SITE PREPARATION AND GENERAL GRADING

Vegetation within construction limits should be cleared and grubbed. Loose topsoil and unsuitable surficial soils should be completely stripped down to the medium-dense to dense alluvium deposit of gravelly sand soil within building pads of residences and within paved roadway, driveways, and parking areas. Exposed soils after stripping should be compacted to a non-yielding state with a vibratory mechanical compactor and proof-rolled with a piece of heavy earthwork equipment prior to roadway, driveway, and parking area construction.

EXCAVATION AND FILL SLOPES

Under no circumstance should excavation slopes be steeper than the limits specified by local, state and federal safety regulations if workers have to perform construction work in excavated areas. Unsupported temporary cuts greater than 4 feet in height should be no steeper than 1H:1V. Permanent cut banks should be no steeper than 2-1/4H:1V. Soil condition encountered by cuts and stability of cut slopes should be observed and verified by a geotechnical engineer during excavation.

Permanent fill embankments required to support structural or traffic load should be constructed with compacted structural fill placed over undisturbed, proof-rolled, firm, alluvium soils after the surficial unsuitable soils are completely stripped. The slope of permanent fill embankments should be no steeper than 2-1/4H:1V. Upon completion, the sloping face of permanent fill embankments should be thoroughly compacted to a non-yielding state with a hoe-pack. Permanent fill embankments constructed over ground of 20% or more should be structurally supported laterally.

The above recommended cut slopes and fill embankments are under the assumption that groundwater seepage would not be encountered during construction. If groundwater is encountered, the grading work should be immediately halted and the slope stability re-evaluated. The slopes may have to be flattened and other measures taken to stabilize the slopes. Stormwater should not be allowed to flow uncontrolled over cut slopes and fill embankments. Permanent cut slopes or fill embankments should be seeded and vegetated as soon as possible for erosion protection and long-term stability, and should be securely covered with clear plastic sheets, as required, to protect them from erosion until the vegetation is fully established.

STRUCTURAL FILL

Structural fill is the fill that supports structural or traffic load. Structural fill should consist of clean granular soils free of organic, debris and other deleterious substances and with particles not larger than three inches. Structural fill should have a moisture content within one percent of its optimum moisture content at the time of placement. The optimum moisture content is the water content in the soils that enable the soils to be compacted to the highest dry density for a given compaction effort. Onsite soils meeting the above requirements may be used as structural fill. Imported material to be used as structural fill should be clean, free-draining, granular soils containing no more than 7.5 percent by weight finer than the No. 200 sieve based on the fraction of the material passing No. 4 sieve, and should have individual particles not larger than three inches.

The ground over which structural fill is to be placed should be prepared in accordance with recommendations in the SITE PREPARATION AND GENERAL GRADING and

EXCAVATION AND FILL SLOPES sections of this report. Structural fill should be placed in lifts no more than 10 inches thick in its loose state, with each lift compacted to a minimum percentage of the maximum dry density determined by ASTM D1557 (Modified Proctor Method) as follows:

<u>Application</u>	<u>% of Maximum Dry Density</u>
Within building pads and under foundations	95%
Roadway/driveway subgrade	95% for top 3 feet and 90% below
Retaining/foundation wall backfill	92%
Utility trench backfill	95% for top 4 feet and 90% below

In-situ density of structural fill should be tested with a nuclear densometer by a testing agency specialized in fill placement and construction work. Testing frequency should be one test per every 250 square feet per lift of fill.

ONSITE STORMWATER DISPOSAL

General

The alluvium soil deposit of gravelly, cobbly sand deposit underlying the site at the depth of about 5.0 to 6.0 feet below existing ground surface is of very-high permeability and would be able to support onsite stormwater disposal by infiltration easily.

Design Infiltration Rate

The alluvium deposit of gravelly cobbly sand underlying the project site is of such high permeability that it will allow water to seep through very quick. In-situ infiltration test in

this soil deposit would not be possible as water will not accumulate in test pits excavated into this deposit to allow for infiltration test. This type of alluvium deposit would have a in-situ infiltration rate of 40 iph or more. We recommend a design infiltration rate of 4.0 iph (inches per hour) with a factor of safety of 10 be used for sizing infiltration trenches.

Design Infiltration Rate

The alluvium deposit of gravelly cobbly sand underlying the project site is of such high permeability that it will allow water to seep through very quick. In-situ infiltration test in this soil deposit would not be possible as water will not accumulate in test pits excavated into this deposit to allow for infiltration test. This type of alluvium deposit would have a in-situ infiltration rate of 40 iph or more. We recommend a design infiltration rate of 4.0 iph (inches per hour) with a factor of safety of at least 10.0 be used for sizing infiltration trenches.

Infiltration Trench Construction

Infiltration trenches should be cut at least 12 inches into the alluvium deposit of gravelly sand soil. To reach this target soil stratum the trenches would have to be excavated to depths of about 6.0 to 7.0 feet or more. The condition of the soil unit at bottom of trenches should be verified by a geotechnical engineer. The stability of the trench cut banks should also be checked out by a geotechnical engineer during excavation.

The trenches should be at least 24 inches wide. The side walls (but not the bottom) of the trenches should be lined with a layer of non-woven filter fabric (MIRAFI 140NS). The

trenches are then to be filled with clean washed 3/4 to 1-1/2 inch gravel to within about 12 inches of finish grade. The dispersion pipes should be constructed of 4-inch rigid PVC pipes and laid level in the gravel or crushed rock filled trenches at about 24 inches below the top of trenches. The dispersion pipes should be spaced at no more than 4 feet apart if multiple dispersion pipes are used. The top of the gravel or crushed rock fill should also be covered with the filter fabric liner. The remaining trenches should then be backfilled in lifts with compacted onsite clean sandy soils. The gravel or crushed rock fill should be placed in lifts no more than 10 inches thick in loose state, with each lift compacted to a non-yielding state with a vibratory mechanical compactor. The compaction and densification of trench fill is critical if it is to support roadway or driveways or parking areas. Stormwater captured over paved roadway, driveways, or parking areas should be routed into a catch basin equipped with an oil-water separator before being released into the infiltration trenches.

If maintaining groundwater quality is critical, the bottom of trenches should be filled with a minimum 12-inch layer of uncompacted amended soil for filtering out pollutants. The amended soil should contain 40 percent (by volume) of compost, mixed with clean, medium to coarse, sand, to achieve an organic content of at least 10% by dry weight.

BUILDING FOUNDATIONS

Conventional footing foundations may be used to support the proposed residences. The footing foundations should be constructed on or into the medium-dense silty fine underlying weathered soil of light-gray, medium-dense, silty fine sand soil. Water should

not be allowed to accumulate in excavated footing trenches. Disturbed soils in footing trenches should be completely removed down to above competent deposit in their native, undisturbed state and footing bearing soils should be thoroughly compacted to a non-yielding state with a vibratory mechanical compactor prior to pouring concrete for footings.

If the above recommendations are followed, our recommended design criteria for footing foundations are as follows:

- The allowable soil bearing pressure for design of footing foundations, including dead and live loads, should be no greater than 2,500 psf. The footing bearing soils should be verified by a geotechnical engineer after the footing trenches are excavated and before the footings poured.
- The minimum depth to bottom of perimeter footings below adjacent final exterior grade should be no less than 18 inches. The minimum depth to bottom of the interior footings below top of floor slab should be no less than 12 inches.
- The minimum width should be no less than 18 inches for continuous footings, and no less than 24 inches for individual footings, except those footings supporting light-weight decks or porches.

A one-third increase in the above recommended allowable soil bearing pressure may be used when considering short-term, transitory, wind or seismic loads. For footing foundations designed and constructed per recommendations above, we estimate that the maximum total post-construction settlement of the buildings should be 3/4 inch or less and the differential settlement across building width should be 1/2 inch or less.

Lateral loads on the proposed residences may be resisted by the friction force between the foundations and the subgrade soils or the passive earth pressure acting on the below-grade portion of the foundations. For the latter, the foundations must be poured “neat” against undisturbed soils or backfilled with a clean, free-draining, compacted structural fill. We recommend that an equivalent fluid density (EFD) of 275 pcf (pounds per cubic foot) for the passive earth pressure be used for lateral resistance. The above passive pressure assumes that the backfill is level or inclines upward away from the foundations for a horizontal distance at least twice the depth of the foundations below the final grade. A coefficient of friction of 0.55 between the foundations and the subgrade soils may be used. The above soil parameters are unfactored values, and a proper factor of safety should be used in calculating the resisting forces against lateral loads on the buildings.

SLAB-ON-GRADE FLOORS

Slab-on-grade floors, if used for the proposed townhome buildings, should be placed on firm subgrade soil prepared as outlined in the SITE PREPARATION AND GENERAL EARTHWORK and the STRUCTURAL FILL sections of this report. Where moisture control is critical, the slab-on-grade floors should be placed on a capillary break which is in turn placed on the compacted subgrade. The capillary break should consist of a minimum four-inch-thick layer of clean, free-draining, 7/8-inch crushed rock, containing no more than 5 percent by weight passing the No. 4 sieve. A vapor barrier, such as a 6-mil plastic membrane, may be placed over the capillary break, as required, to keep moisture from migrating upwards.

PAVED ROADWAY/DRIVEWAYS AND PARKING AREAS

Performance of roadway, driveways, and parking area pavement is critically related to the conditions of the underlying subgrade soils. We recommend that the subgrade soils under the roadways, driveways and parking areas be treated and prepared as described in the SITE PREPARATION AND GENERAL EARTHWORK section of this report. Prior to placing base material, the subgrade soils should be compacted to a non-yielding state with a vibratory roller compactor and proof-rolled with a piece of heavy construction equipment, such as a fully-loaded dump truck. Any areas with excessive flexing or pumping should be over-excavated and re-compacted or replaced with a structural fill or crushed rock placed and compacted in accordance with the recommendations provided in the STRUCTURAL FILL section of this report.

We recommend that a layer of compacted, 7/8-inch crushed rock base (CRB), be placed for the roadways, driveways, and parking areas. This crushed rock base should be at least 6 inches for the public roadways and 4 inches for the private driveways and parking areas. This crushed rock base should be overlain with a 3-inch asphalt treated base (ATB) topped by a 2-inch-thick Class B asphalt concrete (AC) surficial course for the public roads and overlain by a 3-inch-thick Class B asphalt concrete (AC) surficial course for private driveways and parking areas.

DRAINAGE CONTROL

Building Footprint Excavation

Footprint excavation for the proposed townhome buildings, if encountering groundwater seepage, should have bottom of excavation sloped slightly and ditches excavated along

bases of the cut banks to direct collected groundwater into sump pits from which water can be pumped out. A layer of 2-inch crushed rock should be placed over footing bearing subgrade soils, as required, to protect the soils from disturbance by construction traffic. This crushed rock base should be built to a few inches above groundwater level, but not less than 6 inches thick. The crush rock base should be compacted in 12-inch lifts to a non-yielding state with a vibratory mechanical compactor.

Runoff over Impervious Surfaces

Storm runoff over impervious surfaces, such as roofs, paved roadway, driveways and parking areas, should be collected by underground drain line systems connected to downspouts and by catch basins installed in paved roadways, driveways and parking areas. Stormwater thus collected should be tightlined to discharge into a storm sewer or suitable stormwater disposal facilities.

Building Footing Drains

A footing subdrain should be installed around the perimeter footing foundations of each townhome building. The subdrains should consist of a 4-inch-minimum-diameter, perforated, rigid, drain pipe, laid a few inches below bottom of the perimeter footings of the buildings. The trenches and the drain lines should have a sufficient gradient (0.5% minimum) to generate flow by gravity. The drain lines should be wrapped in a non-woven filter fabric sock and completely enclosed in clean washed gravel. The remaining trenches may be backfilled with clean onsite soils. Water collected by the perimeter footing subdrain systems should be tightlined, separately from the roof and surface

stormwater drain lines, to discharge into a storm sewer or suitable stormwater disposal facilities.

Surface Drainage

Water should not be allowed to stand in any areas where footings, on-grade slabs, or pavement is to be constructed. Finish ground surface should be graded to direct surface runoff away from the adjacent buildings. We recommend the finish ground be sloped at a gradient of 3 percent minimum for a distance of at least 10 feet away from buildings, except in the areas to be paved.

Cleanouts

Sufficient number of cleanouts at strategic locations should be provided for underground drain lines. The underground drain lines should be cleaned and maintained periodically to prevent clogging.

RISK EVALUATION STATEMENT

The subject site is underlain at shallow depth by an alluvium deposit of medium-dense, gravelly, cobbly sand. This deposit is of moderately-high shear strength and the site is nearly level. Therefore, the site should be quite stable. It is our opinion that if the recommendations in this report are fully implemented and observed during and following completion of construction, the areas disturbed by construction will be stabilized and will remain stable, and will not increase potential for soil movement. In our opinion, the risk for damages to the proposed development and from the development to adjacent properties due to soil movement should be minimal.

LIMITATIONS

This report has been prepared for the specific application to this project for the exclusive use by Hanson Homes and its associates, representatives, consultants and contractors. We recommend that this report, in its entirety, be included in the project contract documents for the information of prospective contractors for their estimating and bidding purposes and for compliance with the recommendations in this report during construction. The conclusions and interpretations in this report, however, should not be construed as a warranty of the subsurface conditions. The scope of this study does not include services related to construction safety precautions and our recommendations are not intended to direct the contractor's methods, techniques, sequences or procedures, except as specifically described in this report for design considerations. All geotechnical construction work should be monitored and inspected by a geotechnical engineer during construction.

Our recommendations and conclusions are based on the geologic and soil conditions encountered in the test pits excavated on the site, and our experience and engineering judgment. The conclusions and recommendations are professional opinions derived in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area. No warranty, expressed or implied, is made.

The actual subsurface conditions of the site may vary from those encountered by the test pits excavated on the site. The nature and extent of such variations may not become evident until construction starts. If variations appear then, we should be retained to re-

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March 31, 2017
Main Street Townhomes
L&A Job No. 17-038
Page 20

evaluate the recommendations of this report, and to verify or modify them in writing prior to proceeding further with the construction of the proposed development of the site.

CLOSURE

We are pleased to be of service to you on this project. Please feel free to contact us if you have questions regarding this report or need further consultation.



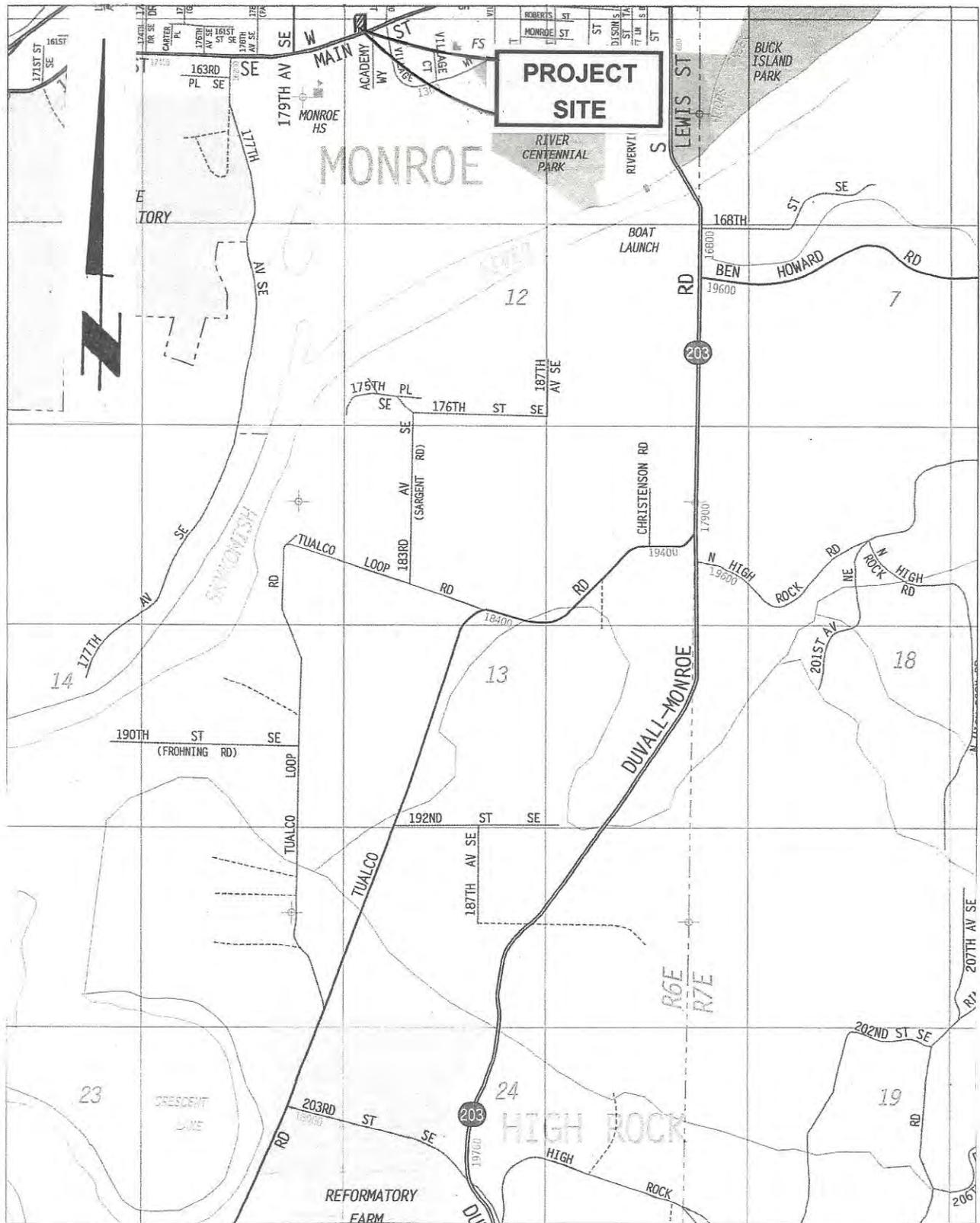
Yours very truly,
LIU & ASSOCIATES, INC.

A handwritten signature in blue ink, appearing to read "J. S. Liu".

J. S. (Julian) Liu, Ph.D., P.E.
Principal

Attached: Six Plates and Appendix

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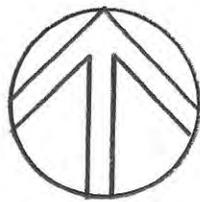
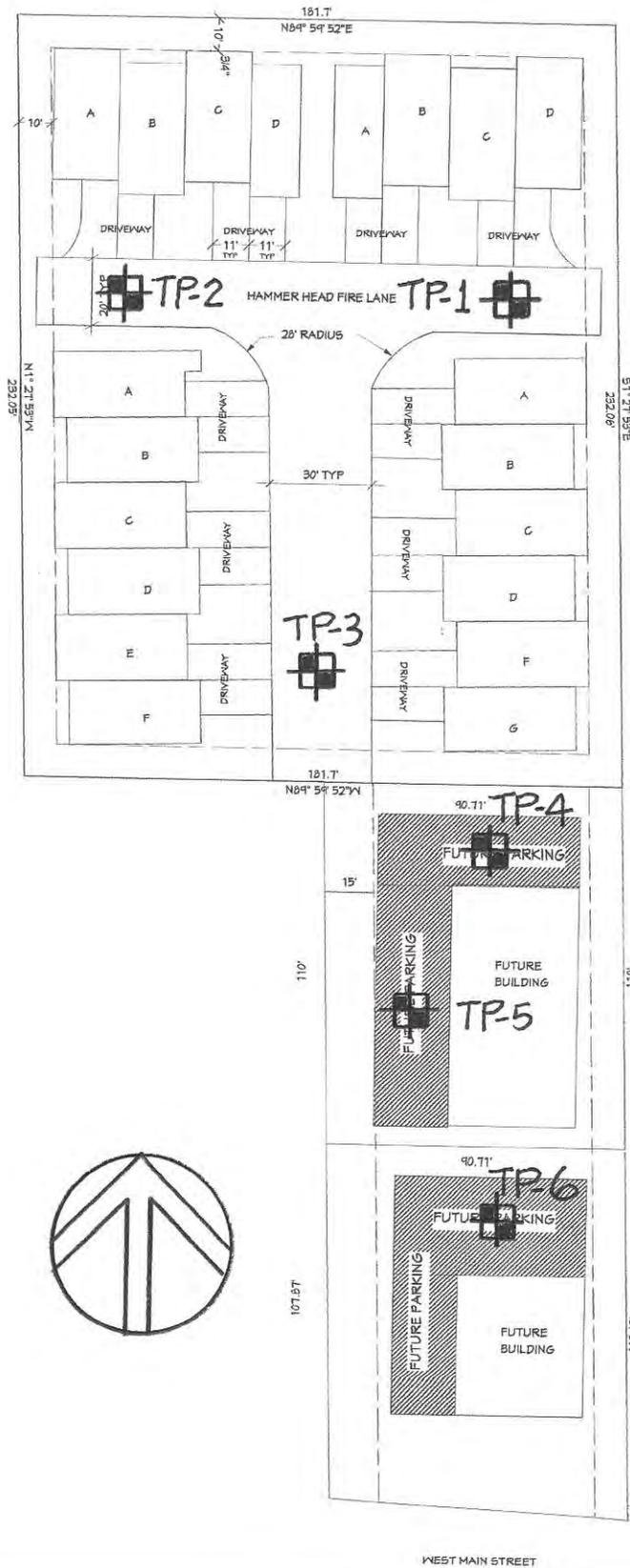


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**VICINITY MAP
 MAIN STREET TOWNHOMES
 1237 W MAIN STREET
 MONROE, WASHINGTON**

JOB NO. 17-038 DATE 3/30/2017 PLATE 1



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**SITE AND EXPLORATION LOCATION PLAN
MAIN STREET TOWNHOMES
1237 W MAIN STREET
MONROE, WASHINGTON**

JOB NO. 17-038 | DATE 3/30/2017 | PLATE 2

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOILS MORE THAN 50% RETAINED ON THE NO. 200 SIEVE	GRAVEL MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
		GRAVEL WITH FINES	GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
		GRAVEL WITH FINES	GC	CLAYEY GRAVEL
	SAND MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
		SAND WITH FINES	SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
		SAND WITH FINES	SC	CLAYEY SAND
FINE-GRAINED SOILS MORE THAN 50% PASSING ON THE NO. 200 SIEVE	SILT AND CLAY LIQUID LIMIT LESS THAN 50%	INORGANIC	ML	SILT
		INORGANIC	CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILTY AND CLAY LIQUID LIMIT 50% OR MORE	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
		INORGANIC	CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC SILT, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

NOTES:

1. FIELD CLASSIFICATION IS BASED ON VISUAL EXAMINATION OF SOIL IN GENERAL ACCORDANCE WITH ASTM D2488-83.
2. SOIL CLASSIFICATION USING LABORATORY TESTS IS BASED ON ASTM D2487-83.
3. DESCRIPTIONS OF SOIL DENSITY OR CONSISTENCY ARE BASED ON INTERPRETATION OF BLOW-COUNT DATA, VISUAL APPEARANCE OF SOILS, AND/OR TEST DATA.

SOIL MOISTURE MODIFIERS:

- DRY - ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH
- SLIGHTLY MOIST - TRACE MOISTURE, NOT DUSTY
- MOIST - DAMP, BUT NO VISIBLE WATER
- VERY MOIST - VERY DAMP, MOISTURE FELT TO THE TOUCH
- WET - VISIBLE FREE WATER OR SATURATED, USUALLY SOIL IS OBTAINED FROM BELOW WATER TABLE

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UNIFIED SOIL CLASSIFICATION SYSTEM

TEST PIT NO. 1

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2	SM	Light-brown, loose, silty fine SAND, moist			
3					
4	SM	Light-gray, medium-dense, silty fine sand, slightly-moist			
5					
6					
7	SW	Light-gray, medium-dense, gravelly, cobbly, fine to coarse sand, slightly-moist (ALLUVIUM DEPOSIT)			
8					
9					
10		Test pit terminated at 9.0 ft; groundwater not encountered,			

TEST PIT NO. 2

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2	SM	Light-brown, loose, silty fine SAND, moist			
3	SM	Light-gray, medium-dense, silty fine sand, slightly-moist			
4					
5					
6	SW	Light-gray, medium-dense, gravelly, cobbly, fine to coarse sand, slightly-moist (ALLUVIUM DEPOSIT)			
7					
8					
9		Test pit terminated at 8.0 ft; groundwater not encountered,			
10					

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**TEST PIT LOGS
MAIN STREET TOWNHOMES
1237 W MAIN STREET
MONROE, WASHINGTON**

JOB NO. 17-143 DATE 3/22/2017 PLATE 4

TEST PIT NO. 3

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2	SM	Brown to light-brown, loose, silty fine SAND, moist			
3					
4					
5	SM	Light-gray, medium-dense, silty fine sand, slightly-moist			
6					
7	SW	Light-gray, medium-dense, gravelly, cobbly, fine to coarse sand, slightly-moist (ALLUVIUM DEPOSIT)			
8					
9					
10		Test pit terminated at 9.0 ft; groundwater not encountered,			

TEST PIT NO. 4

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2	SM	Brown to light-brown, loose, silty fine SAND, moist			
3					
4	SM	Light-gray, medium-dense, silty fine sand, slightly-moist			
5					
6	SW	Light-gray, medium-dense, gravelly, cobbly, fine to coarse sand, slightly-moist (ALLUVIUM DEPOSIT)			
7					
8					
9		Test pit terminated at 8.0 ft; groundwater not encountered,			
10					

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TEST PIT LOGS
 MAIN STREET TOWNHOMES
 1237 W MAIN STREET
 MONROE, WASHINGTON

JOB NO. 17-038 DATE 3/22/2017 PLATE 5

TEST PIT NO. 5

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, with concrete rubble, asphalt fragments, glass bottles, plastic sheets, metal parts, fuel cans, etc. mixed in, moist			
2					
3					
4					
5					
6					
7					
8					
9					
10		Test pit terminated at 8.5 ft; groundwater not encountered,			

TEST PIT NO. 6

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2	SM	Brown, loose, silty fine SAND, moist			
3	SM	Light-gray, medium-dense, silty fine sand, slightly-moist			
4					
5					
6	SW	Light-gray, medium-dense, gravelly, cobbly, fine to coarse sand, slightly-moist (ALLUVIUM DEPOSIT)			
7					
8					
9		Test pit terminated at 8.0 ft; groundwater not encountered,			
10					

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Geotechnical Engineering · Engineering Geology · Earth Science

TEST PIT LOGS
 MAIN STREET TOWNHOMES
 1237 W MAIN STREET
 MONROE, WASHINGTON

JOB NO. 17-038 DATE 3/22/2017 PLATE 6

LIU & ASSOCIATES, INC.

Geotechnical Engineering

Engineering Geology

Earth Science

March 31, 2017

Mr. Rick Hanson
Hanson Homes
P. O. Box 2289
Snohomish, WA 98291

Dear Mr. Hanson:

Subject: Geotechnical Investigation
Main Street Townhomes
1237 West Main Street
Monroe, Washington
L&A Job No. 17-038

INTRODUCTION

We understand the development of a townhome project is proposed for the subject property, located at the above address in Monroe, Washington. The project site is a flag-stone shaped parcel. The proposed development is to build four townhome buildings in the "flag" portion of the site initially, with the two north buildings each containing four townhome units and the two south buildings each containing 6 units. Two more buildings are to be constructed in the "handle bar" portion of the site in the future. We also understand that onsite stormwater disposal by infiltration is being considered for the development. At your request, we have completed a geotechnical investigation for the proposed development project.

The purpose of this investigation is to explore and characterize subsurface conditions of the project site, evaluate feasibility of onsite stormwater disposal by infiltration, and

19213 Kenlake Place NE · Kenmore, Washington 98028
Phone (425) 483-9134 · Fax (425) 486-2746

provide geotechnical recommendations on grading, onsite stormwater disposal, erosion mitigation, surface and ground water drainage control, and foundation support to buildings for the proposed development. Presented in this report are our findings of the site conditions, conclusion, and geotechnical recommendations.

PROJECT DESCRIPTION

The proposed townhome buildings are to be three-story, above-grade, wood-framed structures supported on perimeter concrete foundation walls and interior load-bearing walls, beams, and columns. The site is to be accessed from West Main Street via a paved driveway along the west side of the "handle bar" portion and extending northward into the middle of the "flag" portion of the site. Due to the nearly flat terrain of the site, grading and construction of the residences will require minimal cut and fill.

SCOPE OF SERVICES

Our scope of services for this study comprises specifically the following:

1. Review the geologic and soil conditions at the site based on a published geologic map.
2. Explore the site for subsurface conditions with backhoe test pits to depth where a firm bearing soil stratum or a soil layer suitable for disposing stormwater by infiltration is encountered, or to the maximum depth (about 10 feet) capable by the backhoe used in excavating the test pits, whichever occurs first.
3. Perform geotechnical analyses and provide geotechnical recommendations on onsite stormwater disposal, erosion mitigation, surface and ground water drainage

control, and foundation support to buildings for the proposed development based on subsurface conditions encountered by the test pits and results of our geotechnical analyses and laboratory tests on soil samples.

4. Prepare a written report to present our findings, conclusions, and recommendations.

SITE CONDITIONS

SURFACE CONDITION

The general location of the project site is shown on Plate 1 – Vicinity Map. The site is situated in a flood plain of the nearby Skykomish River and its tributary creeks. For our use in this investigation, you provided us with a site and layout plan of the proposed development. The project site is bounded by West Main Street to the south, and adjoined a mixture of commercial and residential development to the east and west and by residential development to the north. The project site is nearly level with a shallow mound along the south side of the "flag" portion of the site, possibly formed by stockpiled soils excavated previously out of the "handle bar" portion of the site.

The terrain within the project site is nearly flat. The site is currently undeveloped and is covered by lawn grass.

GEOLOGIC SETTING

The Surficial Geologic Map of the Skykomish and Snoqualmie Rivers Area, Snohomish and King Counties, Washington, by Derek B Booth, published by U. S. Geological Survey in 1990, was referenced for the geologic condition of the project site. According

to this publication, the surficial soil unit at and in the vicinity of the project site is mapped as Alluvium Deposits (Q_a).

The alluvium deposits were geologically recent sediment transported and deposited by flooding water of the nearby Skykomish River and its tributary creeks, following the retreat of the last glaciation, the Vashon Stade of the Fraser Glaciation, which occurred during the later stages of the Pleistocene Epoch and retreated from the region some 12,500 years ago. The coarser materials of the alluvium deposits, such as coarse sand, gravel, cobble and boulder, were deposited closer to the river and tributary creek channels and are highly permeable, while the finer materials of the alluvium deposits, such as clay, silt and fine sand, were laid down farther away from the river/tributary creek channels and are less permeable. The younger alluvium deposits had not been over-ridden by glacier and are generally loose to medium-dense in their natural, undisturbed state.

SOIL CONDITION

Subsurface conditions of the project site were explored with six test pits. The test pits were excavated on March 22, 2017, with a rubber-tired backhoe to depths from 8.0 to 9.0. The approximate locations of the test pits are shown on Plate 2 - Site and Exploration Location Plan. The test pits were located with either a tape measure or by visual reference to existing topographic features in the field and on the site survey map, and their locations should be considered as only accurate to the measuring method used.

A geotechnical engineer from our office was present during subsurface exploration, examined the soil and geologic conditions encountered, and completed logs of the test

pits. Soil samples obtained from each soil layer in the test pits were visually classified in general accordance with United Soil Classification System, a copy of which is presented on Plate 3. Detailed descriptions of soils encountered during site exploration are presented in test pit logs on Plates 4 through 6.

Test Pit 5, located in the northwest quadrant of the "handle bar" portion of the site, encountered fill with concrete rubble and chunks of asphalt pavement, glass bottles, plastic sheets, metal parts, fuel cans, etc., mixed in loose dark-brown, organic, soils down to and beyond the excavated depth of 8.5 feet. The remaining five test pits all encountered a layer of loose organic topsoil, about 12 to 16 inches thick, mantling the site. Under the topsoil are layers of weathered soil of brown, loose, silty fine sand and light-gray, medium-dense, silty fine sand, totaling from 3.6 to 5.3 feet thick. The weathered soils are underlain to the depths explored by a alluvium deposit of light-gray, medium-dense, gravelly, cobbly, fine to coarse sand.

GROUNDWATER CONDITION

Groundwater was not encountered by any of the six test pits excavated on the project site. The topsoil and weathered soils are of moderately-high permeability and would allow some storm runoff to infiltrate into the ground, while the underlying alluvium deposit is of very-high permeability and would allow water to seep through very easily. The test pits were excavated in early spring following a very wet winter. Therefore, the winter high groundwater table under the site should be at the site that it would have little or no impact on the proposed development.

GEOLOGIC HAZARDS AND MITIGATION

Erosion and Landslide Hazard

The site is nearly flat and is underlain at shallow depth by an alluvium deposit of medium-dense, gravelly and cobbly sand deposit of moderately high shear strength. Therefore, there should be little or no hazard for soil erosion and landslide to occur on the project site. To further minimize erosion hazard of the site, vegetation cover outside of construction areas should be protected and maintained. Concentrated stormwater should not be discharged uncontrolled onto the ground within the site. Stormwater over impervious surfaces, such as roofs and paved roadway, driveways and parking areas, should be captured by underground drain line systems connected to roof downspouts and catch basins installed in paved areas. Water collected into these drain line systems should be tightlined to discharge into a storm sewer or suitable stormwater disposal facilities.

Seismic Hazard

The Puget Sound region is in an active seismic zone. The project site is underlain at shallow depth by medium-dense, gravelly, cobbly sand soil of very-high permeability. Also, the site is nearly level. Therefore, the potential for seismic hazards, such as landslides, liquefaction, lateral soil spreading, to occur on the site should be minimal. The proposed townhome buildings, however, should be designed for seismic forces induced by strong earthquakes. Based on the soil conditions encountered by the test pits, it is our opinion that Seismic Use Group I and Site Class D should be used in the seismic design of the proposed residences in accordance with the 2012 International Building Code (IBC).

DISCUSSION AND RECOMMENDATIONS

GENERAL

Based on the soil conditions encountered by test pits excavated on the project site, it is our opinion that the project site is suitable for the proposed development from the geotechnical engineering viewpoint, provided that the recommendations in this report are fully implemented and observed during and following completion of construction. Conventional footing foundations constructed on or into the underlying medium-dense to dense alluvium deposit of gravelly sand deposit underlying the site at shallow depth may be used to support proposed residences. Unsuitable surficial topsoil and weak surficial weathered soil should be stripped within footprint of roadway, driveways, parking areas, and areas of structural fill. The fill in the "handle bar" portion of the site should be thoroughly removed down to firm alluvium soil for the development of the future buildings.

The surficial topsoil and weathered soils contain a high percentage of fines and can be easily disturbed when saturated. Grading work in wet winter months may cause significant complications and difficulties. Therefore, earth work should be scheduled and completed from April 1 and October 31, if possible. Otherwise, erosion protection and drainage control measures recommended in this report should be implemented for site stabilization and to facilitate earthwork if it is to be carried out beyond the above dryer period.

TEMPORARY DRAINAGE AND EROSION CONTROL

The onsite surficial weak soils are sensitive to moisture and can be easily disturbed by construction traffic. A layer of clean, 2-to-4-inch quarry spalls should be placed over areas of frequent traffic, such as the entrances to and exit from the site, as required, to protect the subgrade soils from disturbance by construction traffic.

A silt fence should be installed along the downhill sides of construction areas to minimize transport of sediment by storm runoff onto neighboring properties or streets. The bottom of the filter cloth of the silt fences should be anchored in a trench filled with onsite soil.

Intercepting ditches or trench drains should be installed around construction areas, as required, to intercept and drain away storm runoff and near-surface groundwater seepage. Water captured by such ditches or trench drains should be stored in temporary holding and settling ponds onsite. Only clear and clean water may be discharged into the alluvium deposit under the site or into a nearby storm inlet. The storm inlet into which collected stormwater is to be discharged should be covered with a non-woven filter fabric sock to prevent sediment from entering the storm sewer system. The filter sock should be cleaned frequently during construction to prevent clogging, and should be removed after completion of construction.

Spoil soils should be hauled off of the site as soon as possible. Spoil soils and imported structural fill material to be stored onsite should be securely covered with plastic tarps, as required, for protection against erosion.

SITE PREPARATION AND GENERAL GRADING

Vegetation within construction limits should be cleared and grubbed. Loose topsoil and unsuitable surficial soils should be completely stripped down to the medium-dense to dense alluvium deposit of gravelly sand soil within building pads of residences and within paved roadway, driveways, and parking areas. Exposed soils after stripping should be compacted to a non-yielding state with a vibratory mechanical compactor and proof-rolled with a piece of heavy earthwork equipment prior to roadway, driveway, and parking area construction.

EXCAVATION AND FILL SLOPES

Under no circumstance should excavation slopes be steeper than the limits specified by local, state and federal safety regulations if workers have to perform construction work in excavated areas. Unsupported temporary cuts greater than 4 feet in height should be no steeper than 1H:1V. Permanent cut banks should be no steeper than 2-1/4H:1V. Soil condition encountered by cuts and stability of cut slopes should be observed and verified by a geotechnical engineer during excavation.

Permanent fill embankments required to support structural or traffic load should be constructed with compacted structural fill placed over undisturbed, proof-rolled, firm, alluvium soils after the surficial unsuitable soils are completely stripped. The slope of permanent fill embankments should be no steeper than 2-1/4H:1V. Upon completion, the sloping face of permanent fill embankments should be thoroughly compacted to a non-yielding state with a hoe-pack. Permanent fill embankments constructed over ground of 20% or more should be structurally supported laterally.

The above recommended cut slopes and fill embankments are under the assumption that groundwater seepage would not be encountered during construction. If groundwater is encountered, the grading work should be immediately halted and the slope stability re-evaluated. The slopes may have to be flattened and other measures taken to stabilize the slopes. Stormwater should not allowed to flow uncontrolled over cut slopes and fill embankments. Permanent cut slopes or fill embankments should be seeded and vegetated as soon as possible for erosion protection and long-term stability, and should be securely covered with clear plastic sheets, as required, to protect them from erosion until the vegetation is fully established.

STRUCTURAL FILL

Structural fill is the fill that supports structural or traffic load. Structural fill should consist of clean granular soils free of organic, debris and other deleterious substances and with particles not larger than three inches. Structural fill should have a moisture content within one percent of its optimum moisture content at the time of placement. The optimum moisture content is the water content in the soils that enable the soils to be compacted to the highest dry density for a given compaction effort. Onsite soils meeting the above requirements may be used as structural fill. Imported material to be used as structural fill should be clean, free-draining, granular soils containing no more than 7.5 percent by weight finer than the No. 200 sieve based on the fraction of the material passing No. 4 sieve, and should have individual particles not larger than three inches.

The ground over which structural fill is to be placed should be prepared in accordance with recommendations in the SITE PREPARATION AND GENERAL GRADING and

EXCAVATION AND FILL SLOPES sections of this report. Structural fill should be placed in lifts no more than 10 inches thick in its loose state, with each lift compacted to a minimum percentage of the maximum dry density determined by ASTM D1557 (Modified Proctor Method) as follows:

<u>Application</u>	<u>% of Maximum Dry Density</u>
Within building pads and under foundations	95%
Roadway/driveway subgrade	95% for top 3 feet and 90% below
Retaining/foundation wall backfill	92%
Utility trench backfill	95% for top 4 feet and 90% below

In-situ density of structural fill should be tested with a nuclear densometer by a testing agency specialized in fill placement and construction work. Testing frequency should be one test per every 250 square feet per lift of fill.

ONSITE STORMWATER DISPOSAL

General

The alluvium soil deposit of gravelly, cobbly sand deposit underlying the site at the depth of about 5.0 to 6.0 feet below existing ground surface is of very-high permeability and would be able to support onsite stormwater disposal by infiltration easily.

Design Infiltration Rate

The alluvium deposit of gravelly cobbly sand underlying the project site is of such high permeability that it will allow water to seep through very quick. In-situ infiltration test in

this soil deposit would not be possible as water will not accumulate in test pits excavated into this deposit to allow for infiltration test. This type of alluvium deposit would have a in-situ infiltration rate of 40 iph or more. We recommend a design infiltration rate of 4.0 iph (inches per hour) with a factor of safety of 10 be used for sizing infiltration trenches.

Design Infiltration Rate

The alluvium deposit of gravelly cobbly sand underlying the project site is of such high permeability that it will allow water to seep through very quick. In-situ infiltration test in this soil deposit would not be possible as water will not accumulate in test pits excavated into this deposit to allow for infiltration test. This type of alluvium deposit would have a in-situ infiltration rate of 40 iph or more. We recommend a design infiltration rate of 4.0 iph (inches per hour) with a factor of safety of at least 10.0 be used for sizing infiltration trenches.

Infiltration Trench Construction

Infiltration trenches should be cut at least 12 inches into the alluvium deposit of gravelly sand soil. To reach this target soil stratum the trenches would have to be excavated to depths of about 6.0 to 7.0 feet or more. The condition of the soil unit at bottom of trenches should be verified by a geotechnical engineer. The stability of the trench cut banks should also be checked out by a geotechnical engineer during excavation.

The trenches should be at least 24 inches wide. The side walls (but not the bottom) of the trenches should be lined with a layer of non-woven filter fabric (MIRAFI 140NS). The

trenches are then to be filled with clean washed 3/4 to 1-1/2 inch gravel to within about 12 inches of finish grade. The dispersion pipes should be constructed of 4-inch rigid PVC pipes and laid level in the gravel or crushed rock filled trenches at about 24 inches below the top of trenches. The dispersion pipes should be spaced at no more than 4 feet apart if multiple dispersion pipes are used. The top of the gravel or crushed rock fill should also be covered with the filter fabric liner. The remaining trenches should then be backfilled in lifts with compacted onsite clean sandy soils. The gravel or crushed rock fill should be placed in lifts no more than 10 inches thick in loose state, with each lift compacted to a non-yielding state with a vibratory mechanical compactor. The compaction and densification of trench fill is critical if it is to support roadway or driveways or parking areas. Stormwater captured over paved roadway, driveways, or parking areas should be routed into a catch basin equipped with an oil-water separator before being released into the infiltration trenches.

If maintaining groundwater quality is critical, the bottom of trenches should be filled with a minimum 12-inch layer of uncompacted amended soil for filtering out pollutants. The amended soil should contain 40 percent (by volume) of compost, mixed with clean, medium to coarse, sand, to achieve an organic content of at least 10% by dry weight.

BUILDING FOUNDATIONS

Conventional footing foundations may be used to support the proposed residences. The footing foundations should be constructed on or into the medium-dense silty fine underlying weathered soil of light-gray, medium-dense, silty fine sand soil. Water should

not be allowed to accumulate in excavated footing trenches. Disturbed soils in footing trenches should be completely removed down to above competent deposit in their native, undisturbed state and footing bearing soils should be thoroughly compacted to a non-yielding state with a vibratory mechanical compactor prior to pouring concrete for footings.

If the above recommendations are followed, our recommended design criteria for footing foundations are as follows:

- The allowable soil bearing pressure for design of footing foundations, including dead and live loads, should be no greater than 2,500 psf. The footing bearing soils should be verified by a geotechnical engineer after the footing trenches are excavated and before the footings poured.
- The minimum depth to bottom of perimeter footings below adjacent final exterior grade should be no less than 18 inches. The minimum depth to bottom of the interior footings below top of floor slab should be no less than 12 inches.
- The minimum width should be no less than 18 inches for continuous footings, and no less than 24 inches for individual footings, except those footings supporting light-weight decks or porches.

A one-third increase in the above recommended allowable soil bearing pressure may be used when considering short-term, transitory, wind or seismic loads. For footing foundations designed and constructed per recommendations above, we estimate that the maximum total post-construction settlement of the buildings should be 3/4 inch or less and the differential settlement across building width should be 1/2 inch or less.

Lateral loads on the proposed residences may be resisted by the friction force between the foundations and the subgrade soils or the passive earth pressure acting on the below-grade portion of the foundations. For the latter, the foundations must be poured “neat” against undisturbed soils or backfilled with a clean, free-draining, compacted structural fill. We recommend that an equivalent fluid density (EFD) of 275 pcf (pounds per cubic foot) for the passive earth pressure be used for lateral resistance. The above passive pressure assumes that the backfill is level or inclines upward away from the foundations for a horizontal distance at least twice the depth of the foundations below the final grade. A coefficient of friction of 0.55 between the foundations and the subgrade soils may be used. The above soil parameters are unfactored values, and a proper factor of safety should be used in calculating the resisting forces against lateral loads on the buildings.

SLAB-ON-GRADE FLOORS

Slab-on-grade floors, if used for the proposed townhome buildings, should be placed on firm subgrade soil prepared as outlined in the SITE PREPARATION AND GENERAL EARTHWORK and the STRUCTURAL FILL sections of this report. Where moisture control is critical, the slab-on-grade floors should be placed on a capillary break which is in turn placed on the compacted subgrade. The capillary break should consist of a minimum four-inch-thick layer of clean, free-draining, 7/8-inch crushed rock, containing no more than 5 percent by weight passing the No. 4 sieve. A vapor barrier, such as a 6-mil plastic membrane, may be placed over the capillary break, as required, to keep moisture from migrating upwards.

PAVED ROADWAY/DRIVEWAYS AND PARKING AREAS

Performance of roadway, driveways, and parking area pavement is critically related to the conditions of the underlying subgrade soils. We recommend that the subgrade soils under the roadways, driveways and parking areas be treated and prepared as described in the SITE PREPARATION AND GENERAL EARTHWORK section of this report. Prior to placing base material, the subgrade soils should be compacted to a non-yielding state with a vibratory roller compactor and proof-rolled with a piece of heavy construction equipment, such as a fully-loaded dump truck. Any areas with excessive flexing or pumping should be over-excavated and re-compacted or replaced with a structural fill or crushed rock placed and compacted in accordance with the recommendations provided in the STRUCTURAL FILL section of this report.

We recommend that a layer of compacted, 7/8-inch crushed rock base (CRB), be placed for the roadways, driveways, and parking areas. This crushed rock base should be at least 6 inches for the public roadways and 4 inches for the private driveways and parking areas. This crushed rock base should be overlain with a 3-inch asphalt treated base (ATB) topped by a 2-inch-thick Class B asphalt concrete (AC) surficial course for the public roads and overlain by a 3-inch-thick Class B asphalt concrete (AC) surficial course for private driveways and parking areas.

DRAINAGE CONTROL

Building Footprint Excavation

Footprint excavation for the proposed townhome buildings, if encountering groundwater seepage, should have bottom of excavation sloped slightly and ditches excavated along

bases of the cut banks to direct collected groundwater into sump pits from which water can be pumped out. A layer of 2-inch crushed rock should be placed over footing bearing subgrade soils, as required, to protect the soils from disturbance by construction traffic. This crushed rock base should be built to a few inches above groundwater level, but not less than 6 inches thick. The crush rock base should be compacted in 12-inch lifts to a non-yielding state with a vibratory mechanical compactor.

Runoff over Impervious Surfaces

Storm runoff over impervious surfaces, such as roofs, paved roadway, driveways and parking areas, should be collected by underground drain line systems connected to downspouts and by catch basins installed in paved roadways, driveways and parking areas. Stormwater thus collected should be tightlined to discharge into a storm sewer or suitable stormwater disposal facilities.

Building Footing Drains

A footing subdrain should be installed around the perimeter footing foundations of each townhome building. The subdrains should consist of a 4-inch-minimum-diameter, perforated, rigid, drain pipe, laid a few inches below bottom of the perimeter footings of the buildings. The trenches and the drain lines should have a sufficient gradient (0.5% minimum) to generate flow by gravity. The drain lines should be wrapped in a non-woven filter fabric sock and completely enclosed in clean washed gravel. The remaining trenches may be backfilled with clean onsite soils. Water collected by the perimeter footing subdrain systems should be tightlined, separately from the roof and surface

stormwater drain lines, to discharge into a storm sewer or suitable stormwater disposal facilities.

Surface Drainage

Water should not be allowed to stand in any areas where footings, on-grade slabs, or pavement is to be constructed. Finish ground surface should be graded to direct surface runoff away from the adjacent buildings. We recommend the finish ground be sloped at a gradient of 3 percent minimum for a distance of at least 10 feet away from buildings, except in the areas to be paved.

Cleanouts

Sufficient number of cleanouts at strategic locations should be provided for underground drain lines. The underground drain lines should be cleaned and maintained periodically to prevent clogging.

RISK EVALUATION STATEMENT

The subject site is underlain at shallow depth by an alluvium deposit of medium-dense, gravelly, cobbly sand. This deposit is of moderately-high shear strength and the site is nearly level. Therefore, the site should be quite stable. It is our opinion that if the recommendations in this report are fully implemented and observed during and following completion of construction, the areas disturbed by construction will be stabilized and will remain stable, and will not increase potential for soil movement. In our opinion, the risk for damages to the proposed development and from the development to adjacent properties due to soil movement should be minimal.

LIU & ASSOCIATES, INC.

LIMITATIONS

This report has been prepared for the specific application to this project for the exclusive use by Hanson Homes and its associates, representatives, consultants and contractors. We recommend that this report, in its entirety, be included in the project contract documents for the information of prospective contractors for their estimating and bidding purposes and for compliance with the recommendations in this report during construction. The conclusions and interpretations in this report, however, should not be construed as a warranty of the subsurface conditions. The scope of this study does not include services related to construction safety precautions and our recommendations are not intended to direct the contractor's methods, techniques, sequences or procedures, except as specifically described in this report for design considerations. All geotechnical construction work should be monitored and inspected by a geotechnical engineer during construction.

Our recommendations and conclusions are based on the geologic and soil conditions encountered in the test pits excavated on the site, and our experience and engineering judgment. The conclusions and recommendations are professional opinions derived in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area. No warranty, expressed or implied, is made.

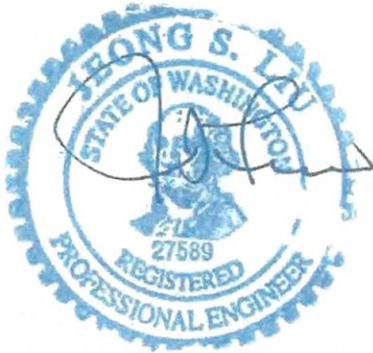
The actual subsurface conditions of the site may vary from those encountered by the test pits excavated on the site. The nature and extent of such variations may not become evident until construction starts. If variations appear then, we should be retained to re-

March 31, 2017
Main Street Townhomes
L&A Job No. 17-038
Page 20

evaluate the recommendations of this report, and to verify or modify them in writing prior to proceeding further with the construction of the proposed development of the site.

CLOSURE

We are pleased to be of service to you on this project. Please feel free to contact us if you have questions regarding this report or need further consultation.



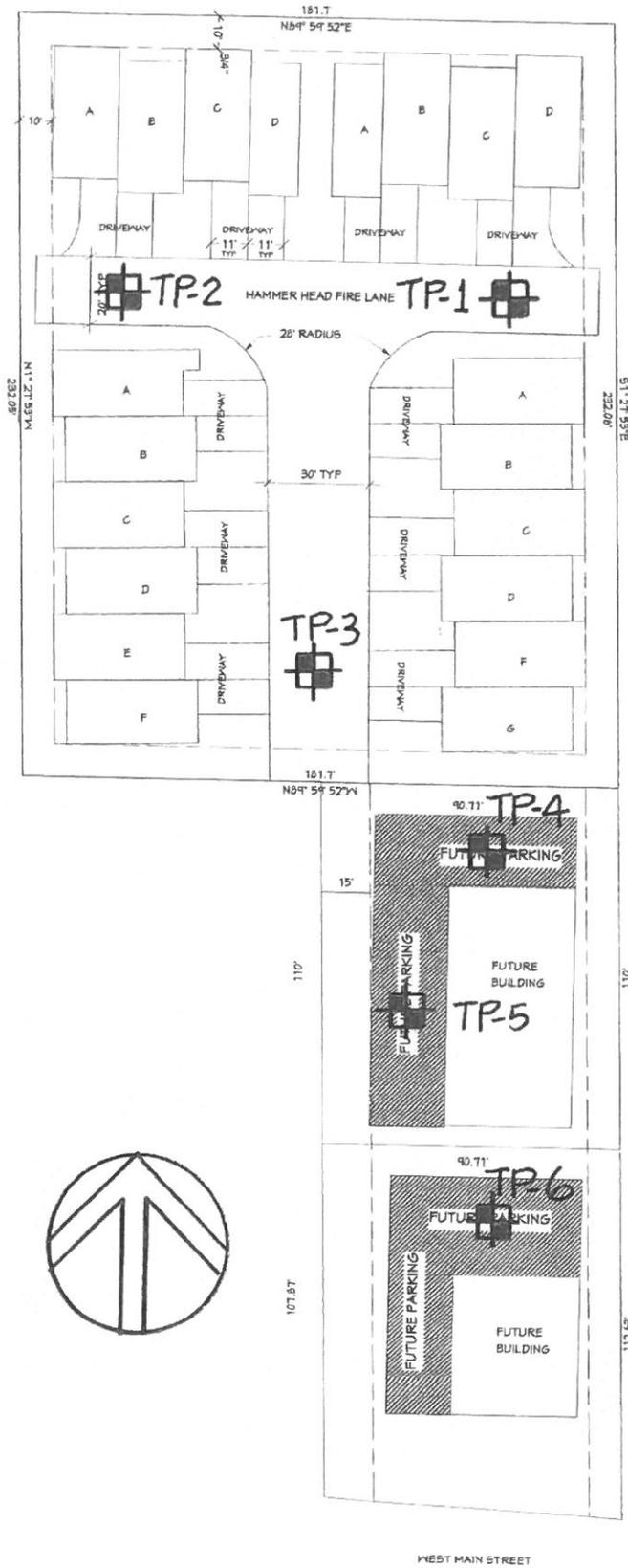
Yours very truly,
LIU & ASSOCIATES, INC.

A handwritten signature in blue ink, appearing to read "J. S. Liu".

J. S. (Julian) Liu, Ph.D., P.E.
Principal

Attached: Six Plates and Appendix

LIU & ASSOCIATES, INC.



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**SITE AND EXPLORATION LOCATION PLAN
 MAIN STREET TOWNHOMES
 1237 W MAIN STREET
 MONROE, WASHINGTON**

JOB NO. 17-038 DATE 3/30/2017 PLATE 2

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME	
COARSE-GRAINED SOILS MORE THAN 50% RETAINED ON THE NO. 200 SIEVE	GRAVEL MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL	
		GRAVEL WITH FINES	GP	POORLY-GRADED GRAVEL	
		SAND MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SAND WITH FINES	SP	POORLY-GRADED SAND
	FINE-GRAINED SOILS MORE THAN 50% PASSING ON THE NO. 200 SIEVE	SILT AND CLAY LIQUID LIMIT LESS THAN 50%	INORGANIC	ML	SILT
			ORGANIC	CL	CLAY
			INORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
		SILTY AND CLAY LIQUID LIMIT 50% OR MORE	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
ORGANIC			CH	CLAY OF HIGH PLASTICITY, FAT CLAY	
ORGANIC			OH	ORGANIC SILT, ORGANIC SILT	
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	

NOTES:

1. FIELD CLASSIFICATION IS BASED ON VISUAL EXAMINATION OF SOIL IN GENERAL ACCORDANCE WITH ASTM D2488-83.
2. SOIL CLASSIFICATION USING LABORATORY TESTS IS BASED ON ASTM D2487-83.
3. DESCRIPTIONS OF SOIL DENSITY OR CONSISTENCY ARE BASED ON INTERPRETATION OF BLOW-COUNT DATA, VISUAL APPEARANCE OF SOILS, AND/OR TEST DATA.

SOIL MOISTURE MODIFIERS:

- DRY - ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH
- SLIGHTLY MOIST - TRACE MOISTURE, NOT DUSTY
- MOIST - DAMP, BUT NO VISIBLE WATER
- VERY MOIST - VERY DAMP, MOISTURE FELT TO THE TOUCH
- WET - VISIBLE FREE WATER OR SATURATED, USUALLY SOIL IS OBTAINED FROM BELOW WATER TABLE

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UNIFIED SOIL CLASSIFICATION SYSTEM

TEST PIT NO. 1

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2	SM	Light-brown, loose, silty fine SAND, moist			
3					
4	SM	Light-gray, medium-dense, silty fine sand, slightly-moist			
5					
6					
7	SW	Light-gray, medium-dense, gravelly, cobbly, fine to coarse sand, slightly-moist (ALLUVIUM DEPOSIT)			
8					
9					
10		Test pit terminated at 9.0 ft; groundwater not encountered,			

TEST PIT NO. 2

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2	SM	Light-brown, loose, silty fine SAND, moist			
3	SM	Light-gray, medium-dense, silty fine sand, slightly-moist			
4					
5					
6	SW	Light-gray, medium-dense, gravelly, cobbly, fine to coarse sand, slightly-moist (ALLUVIUM DEPOSIT)			
7					
8					
9		Test pit terminated at 8.0 ft; groundwater not encountered,			
10					

LIU & ASSOCIATES, INC.

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TEST PIT LOGS
 MAIN STREET TOWNHOMES
 1237 W MAIN STREET
 MONROE, WASHINGTON

JOB NO. 17-143 DATE 3/22/2017 PLATE 4

TEST PIT NO. 3

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2	SM	Brown to light-brown, loose, silty fine SAND, moist			
3					
4					
5					
6	SM	Light-gray, medium-dense, silty fine sand, slightly-moist			
7	SW	Light-gray, medium-dense, gravelly, cobbly, fine to coarse sand, slightly-moist (ALLUVIUM DEPOSIT)			
8					
9					
10		Test pit terminated at 9.0 ft; groundwater not encountered,			

TEST PIT NO. 4

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2	SM	Brown to light-brown, loose, silty fine SAND, moist			
3					
4	SM	Light-gray, medium-dense, silty fine sand, slightly-moist			
5					
6	SW	Light-gray, medium-dense, gravelly, cobbly, fine to coarse sand, slightly-moist (ALLUVIUM DEPOSIT)			
7					
8					
9		Test pit terminated at 8.0 ft; groundwater not encountered,			
10					

LIU & ASSOCIATES, INC.

Geotechnical Engineering · Engineering Geology · Earth Science

TEST PIT LOGS
 MAIN STREET TOWNHOMES
 1237 W MAIN STREET
 MONROE, WASHINGTON

JOB NO. 17-038 DATE 3/22/2017 PLATE 5

TEST PIT NO. 5

Logged By: JSL

Date: 3/22/2017

Ground El. ±

Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, with concrete rubble, asphalt fragments, glass bottles, plastic sheets, metal parts, fuel cans, etc. mixed in, moist			
2					
3					
4					
5					
6					
7					
8					
9		Test pit terminated at 8.5 ft; groundwater not encountered,			
10					

TEST PIT NO. 6

Logged By: JSL

Date: 3/22/2017

Ground El. ±

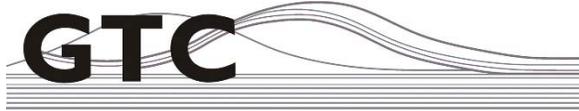
Depth ft.	USCS CLASS.	Soil Description	Sample No.	W %	Other Test
1	OL	Dark-brown, loose, organic, silty fine SAND, moist (TOPSOIL)			
2	SM	Brown, loose, silty fine SAND, moist			
3	SM	Light-gray, medium-dense, silty fine sand, slightly-moist			
4					
5					
6	SW	Light-gray, medium-dense, gravelly, cobbly, fine to coarse sand, slightly-moist (ALLUVIUM DEPOSIT)			
7					
8		Test pit terminated at 8.0 ft; groundwater not encountered,			
9					
10					

LIU & ASSOCIATES, INC.

Geotechnical Engineering · Engineering Geology · Earth Science

TEST PIT LOGS
 MAIN STREET TOWNHOMES
 1237 W MAIN STREET
 MONROE, WASHINGTON

JOB NO. 17-038 DATE 3/22/2017 PLATE 6

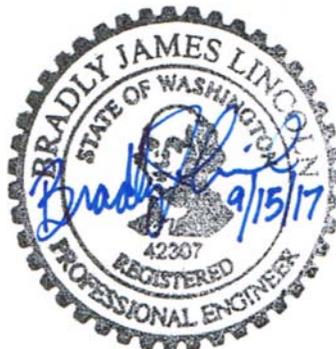


Gibson Traffic Consultants
2813 Rockefeller Avenue
Suite B
Everett, WA 98201
425.339.8266

Main Brook Townhomes Traffic Impact Analysis

Jurisdiction: City of Monroe

September 2017



GTC #17-194

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1. DEVELOPMENT IDENTIFICATION

Gibson Traffic Consultants, Inc. (GTC) has been retained to provide a traffic impact analysis for the proposed Main Brook Townhomes development to address the City of Monroe, Snohomish County and Washington State Department of Transportation (WSDOT) traffic impacts. Brad Lincoln, responsible for this report and traffic analysis, is a licensed professional engineer (Civil) in the State of Washington and member of the Washington State section of ITE.

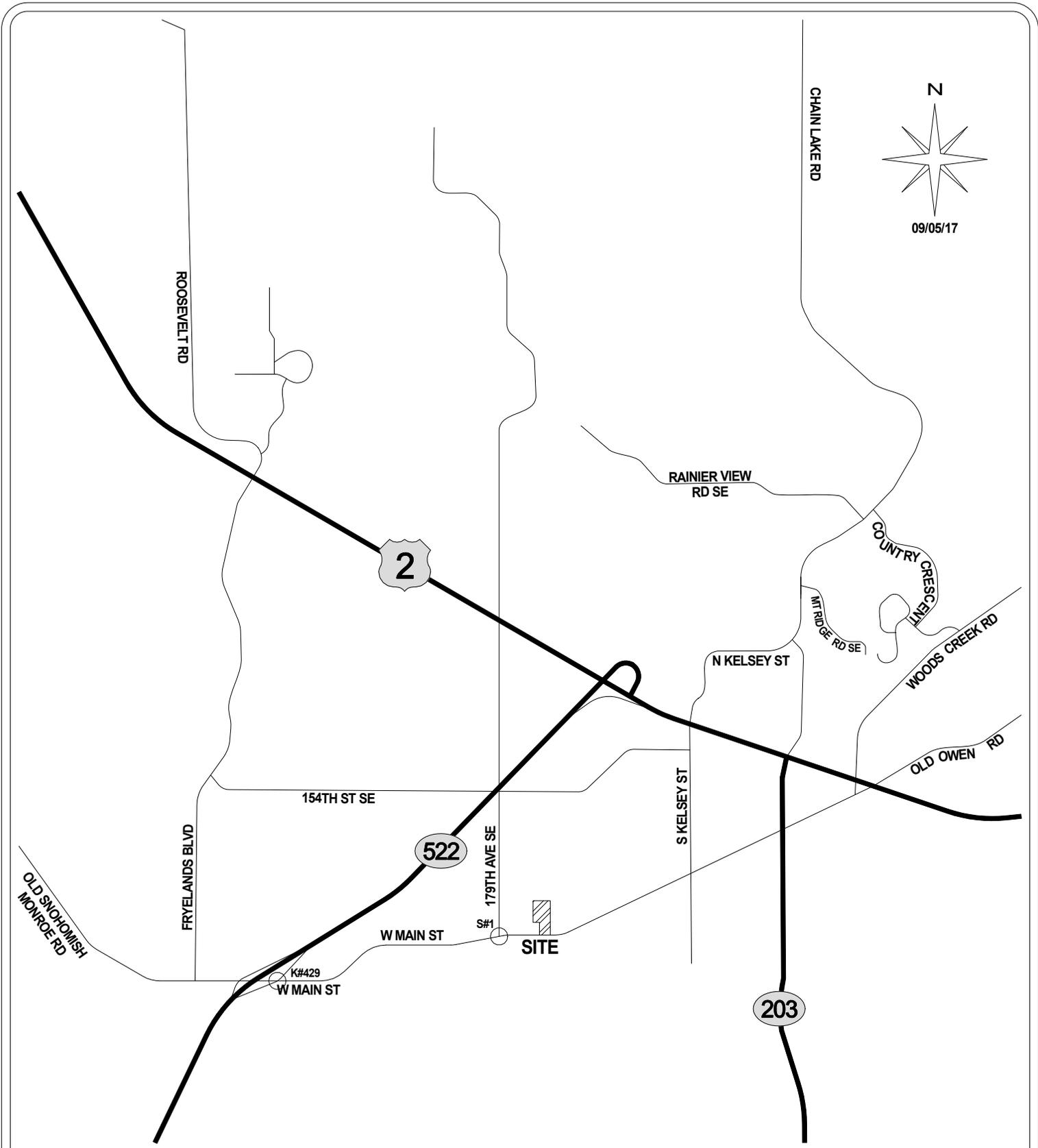
The Main Brook Townhomes development is proposed to consist of a total of 18 standalone residential townhouse units and 4,160 square feet (SF) of medical office. The development site is located on the north side of W Main Street, west of Dennis Way. The development is proposing to utilize an existing access onto W Main Street. site vicinity map has been included in Figure 1.

2. METHODOLOGY

Trip generation calculations for the Main Brook Townhomes development have been performed utilizing average trip generation data contained in the Institute of Transportation Engineers' (ITE) *Trip Generation, 9th Edition (2012)*. The distribution of trips generated by the site is based on approved distributions for similar developments in the site vicinity.

Intersection level of service analysis has been performed based on typical analysis requirements of the City of Monroe and analysis performed for similar developments in the site vicinity. Level of service analysis has been performed for the intersection of W Main Street at 179th Avenue SE.

Congestion at intersections is generally measured in terms of level of service (LOS). In accordance with *Highway Capacity Manual: 2010 Edition (HCM)* by the Transportation Research Board, road facilities and intersections are rated between LOS A and LOS F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. The level of service at signalized, roundabout and all-way stop-controlled intersections is based on the average delay of all approaches. The level of service for two-way stop-controlled intersections is based on average delays for the stopped approach with the highest delay. Geometric characteristics and conflicting traffic movements are taken into consideration when determining level of service values. A summary of the intersection level of service criteria is included in Table 1.



GIBSON TRAFFIC CONSULTANTS

**TRAFFIC IMPACT STUDY
GTC #17-194**

**MAIN BROOK TOWNHOMES
18 TOWNHOUSE UNITS
4,160 SF OF MEDICAL OFFICE**

CITY OF MONROE

LEGEND



DEVELOPMENT SITE



STUDY INTERSECTION



KEY INTERSECTION

**FIGURE 1
SITE VICINITY
MAP**

Table 1: Level of Service Criteria for Intersections

Level of ¹ Service	Expected Delay	Intersection Control Delay (Seconds per Vehicle)	
		Unsignalized Intersections	Signalized Intersections
A	Little/No Delay	≤10	≤10
B	Short Delays	>10 and ≤15	>10 and ≤20
C	Average Delays	>15 and ≤25	>20 and ≤35
D	Long Delays	>25 and ≤35	>35 and ≤55
E	Very Long Delays	>35 and ≤50	>55 and ≤80
F	Extreme Delays ²	>50	>80

The City of Monroe has a level of service threshold of LOS C for collector road intersections and LOS D for arterial road intersections. The level of service analysis has been performed utilizing the *Synchro 9.1, Build 912* software.

The City of Monroe also has an interlocal agreement with Snohomish County to provide turning movements at Snohomish County key intersections impacted with 3 or more directional peak-hour trips on an approach or departure and for traffic mitigation fees.

¹ **Source:** *Highway Capacity Manual 2010*.

LOS A: Free-flow traffic conditions, with minimal delay to stopped vehicles (no vehicle is delayed longer than one cycle at signalized intersection).

LOS B: Generally stable traffic flow conditions.

LOS C: Occasional back-ups may develop, but delay to vehicles is short term and still tolerable.

LOS D: During short periods of the peak hour, delays to approaching vehicles may be substantial but are tolerable during times of less demand (i.e. vehicles delayed one cycle or less at signal).

LOS E: Intersections operate at or near capacity, with long queues developing on all approaches and long delays.

LOS F: Jammed conditions on all approaches with excessively long delays and vehicles unable to move at times.

² When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection.

3. TRIP GENERATION

The trip generation calculations for the Main Brook Townhomes development are based on the average trip generation rates for ITE Land Use Code (LUC) 210, Single-Family Detached Housing and LUC 720, Medical/Dental Office. The trip generation for the Main Brook Townhomes development is summarized in Table 2.

Table 2: Trip Generation Summary

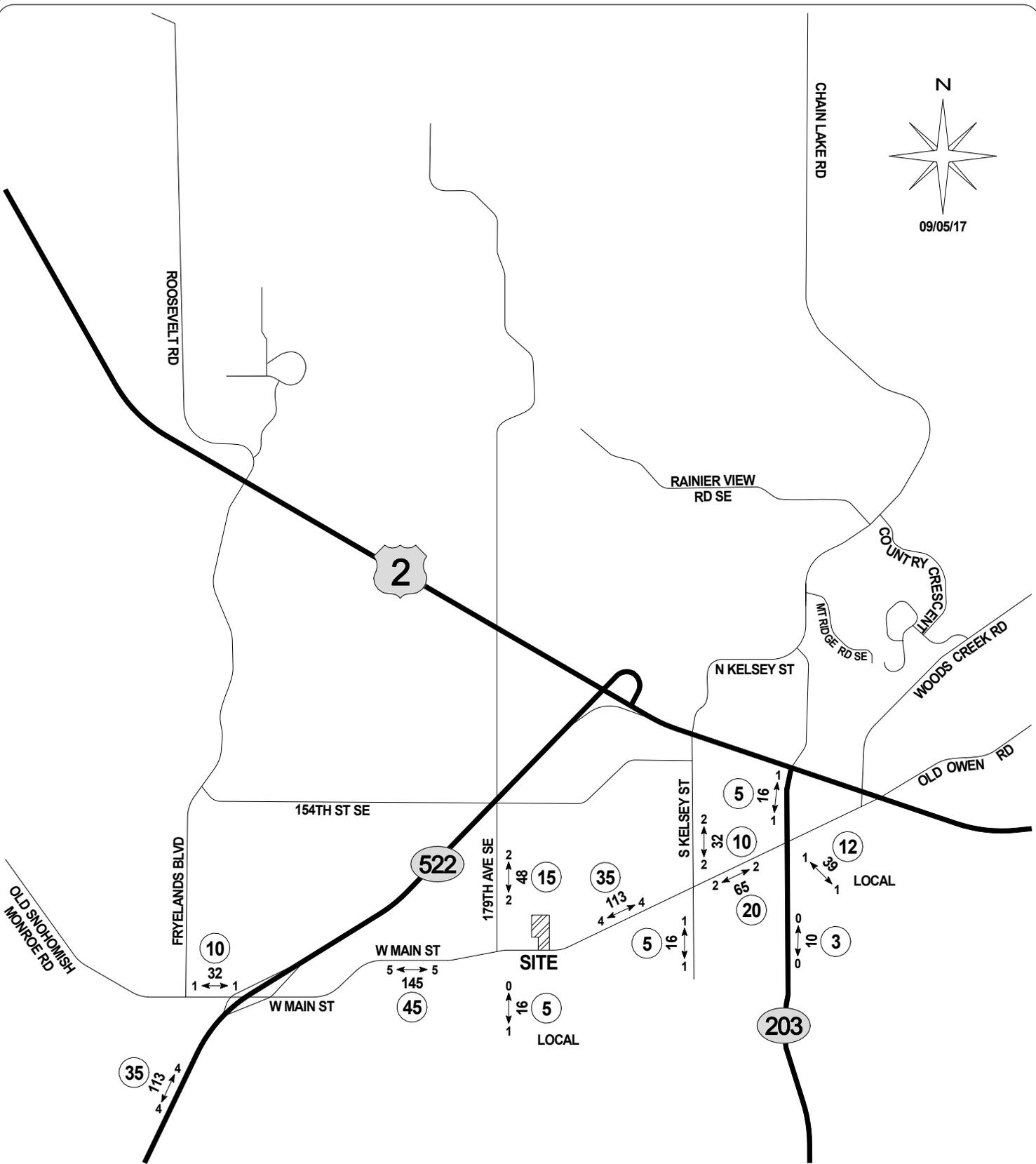
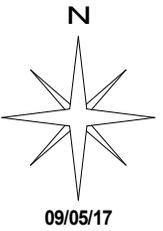
ITE Land Use Code Use Size	Average Daily Trips	AM Peak-Hour Trips			PM Peak-Hour Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
LUC 210 Single-Family Detached 18 Units	171.36	3.38	10.12	13.50	11.34	6.66	18.00
LUC 720 Medical/Dental Office 4,160 SF	150.30	7.85	2.09	9.94	4.16	10.69	14.85
NEW TRIPS	321.66	11.23	12.21	23.44	15.50	17.35	32.85

The Main Brook Townhomes development is anticipated to generate 321.66 average daily trips with 23.44 AM peak-hour trips and 32.85 PM peak-hour trips. Trip generation calculations are included in the attachments.

4. TRIP DISTRIBUTION

The distribution of trips generated by the Main Brook Townhomes development is based on previously approved traffic studies for developments conducted in the site vicinity. It is anticipated that 45% of the development's trips will travel to and from the west along W Main Street. Approximately 35% of the development's trips will travel to and from the east along W Main Street. It is estimated that 15% of the development's trips will travel to and from the north along 179th Avenue SE. The remaining 5% of the development's trips will be local trips. Detailed distributions are included in Figure 2 for the AM peak-hour and Figure 3 for the PM peak-hour.

The interlocal agreement with Snohomish County requires key intersections impacted with 3 or more directional peak-hour trips on any approach or departure to be shown. The Main Brook Townhomes development will impact 1 Snohomish County key intersection during the AM and PM peak-hours. The key intersection impacts are shown in detail in the attachments of this report. Snohomish County's trip distribution policies state that trips along US-2 do not need to be distributed west of 88th Street SE. Development trips on US-2 are expected to be through-trips at 88th Street SE. Development trips traveling to and from the south along SR-522 are anticipated to travel to and from King County.



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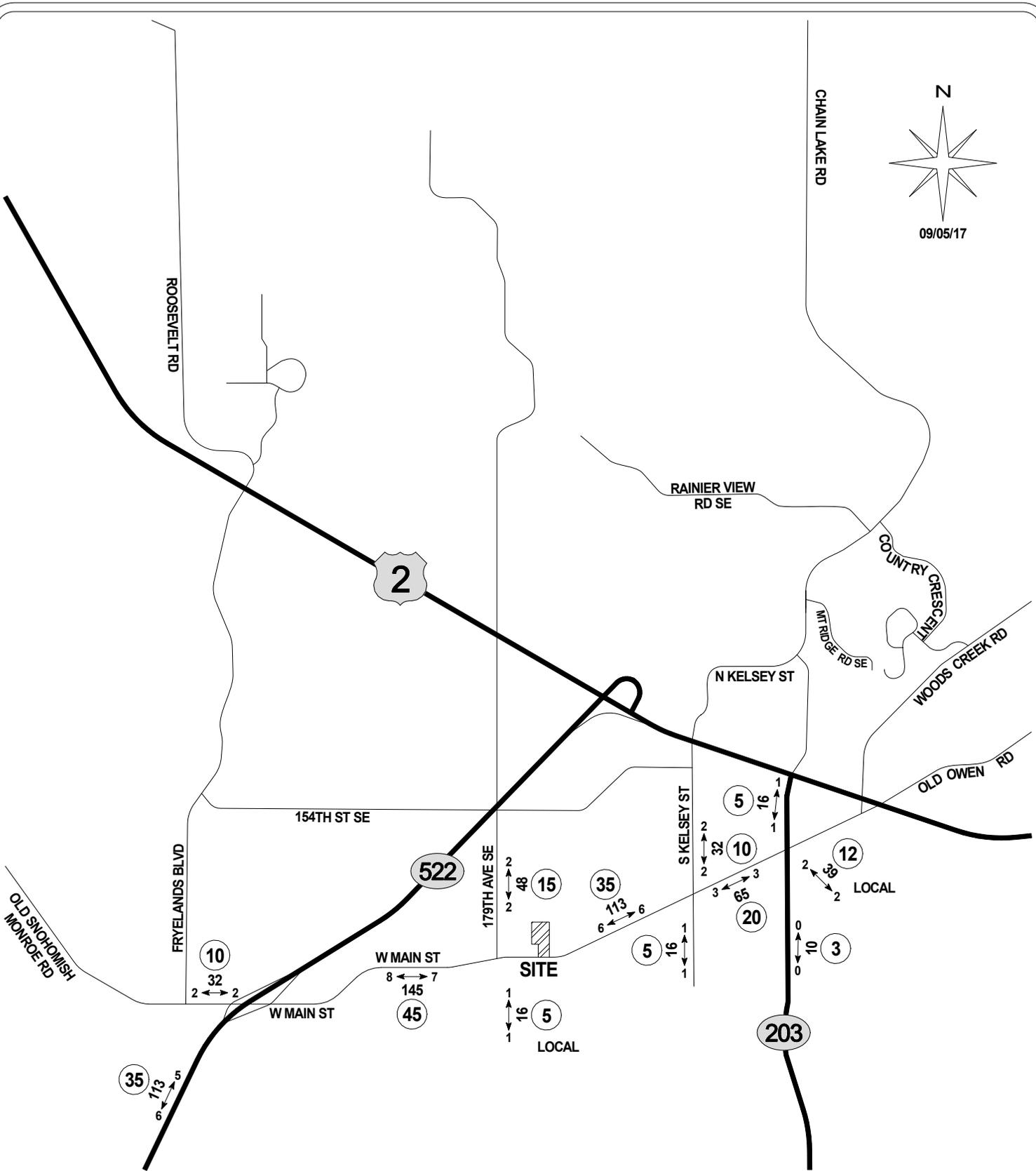
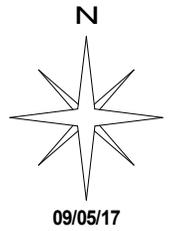
TRAFFIC IMPACT STUDY
GTC #17-194

MAIN BROOK TOWNHOMES
18 TOWNHOUSE UNITS
4,160 SF OF MEDICAL OFFICE

LEGEND
AWDT
AM ↔ PEAK
XX
NEW SITE TRAFFIC
(DAILY/PEAK-HOUR)
TRIP DISTRIBUTION %

FIGURE 2
DEVELOPMENT
TRIP DISTRIBUTION
AM PEAK-HOUR

CITY OF MONROE



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**TRAFFIC IMPACT STUDY
GTC #17-194**

MAIN BROOK TOWNHOMES
18 TOWNHOUSE UNITS
4,160 SF OF MEDICAL OFFICE

LEGEND
AWDT
PM ↔ PEAK
XX
NEW SITE TRAFFIC
(DAILY/PEAK-HOUR)
TRIP DISTRIBUTION %

**FIGURE 3
DEVELOPMENT
TRIP DISTRIBUTION
PM PEAK-HOUR**

CITY OF MONROE

5. INTERSECTION LEVEL OF SERVICE ANALYSIS

The intersection of W Main Street at 179th Avenue SE has been analyzed as part of this report based on typical requirements of the City of Monroe. This is the only major intersection impacted with 10 or more development PM peak-hour trips. There are no WSDOT intersections that are anticipated to be impacted with 25 PM peak-hour trips, which is the WSDOT threshold for intersections that do not have fee-based improvements.

5.1 Turning Movement Volumes

The existing turning movements at the study intersections were counted by the independent count firm of Traffic Data Gathering (TDG). The counts were performed between 4:00 PM and 6:00 PM, the typical PM peak-period. The turning movement counts were collected on August 29, 2017. The 2017 existing turning movements at the study intersections are shown in Figure 4.

The future volumes have been calculated for the year 2027, a 10-year horizon period. The 2027 baseline turning movements have been calculated by applying a 2% annually compounding growth rate. The 2027 baseline turning movements at the study intersections are shown in Figure 5.

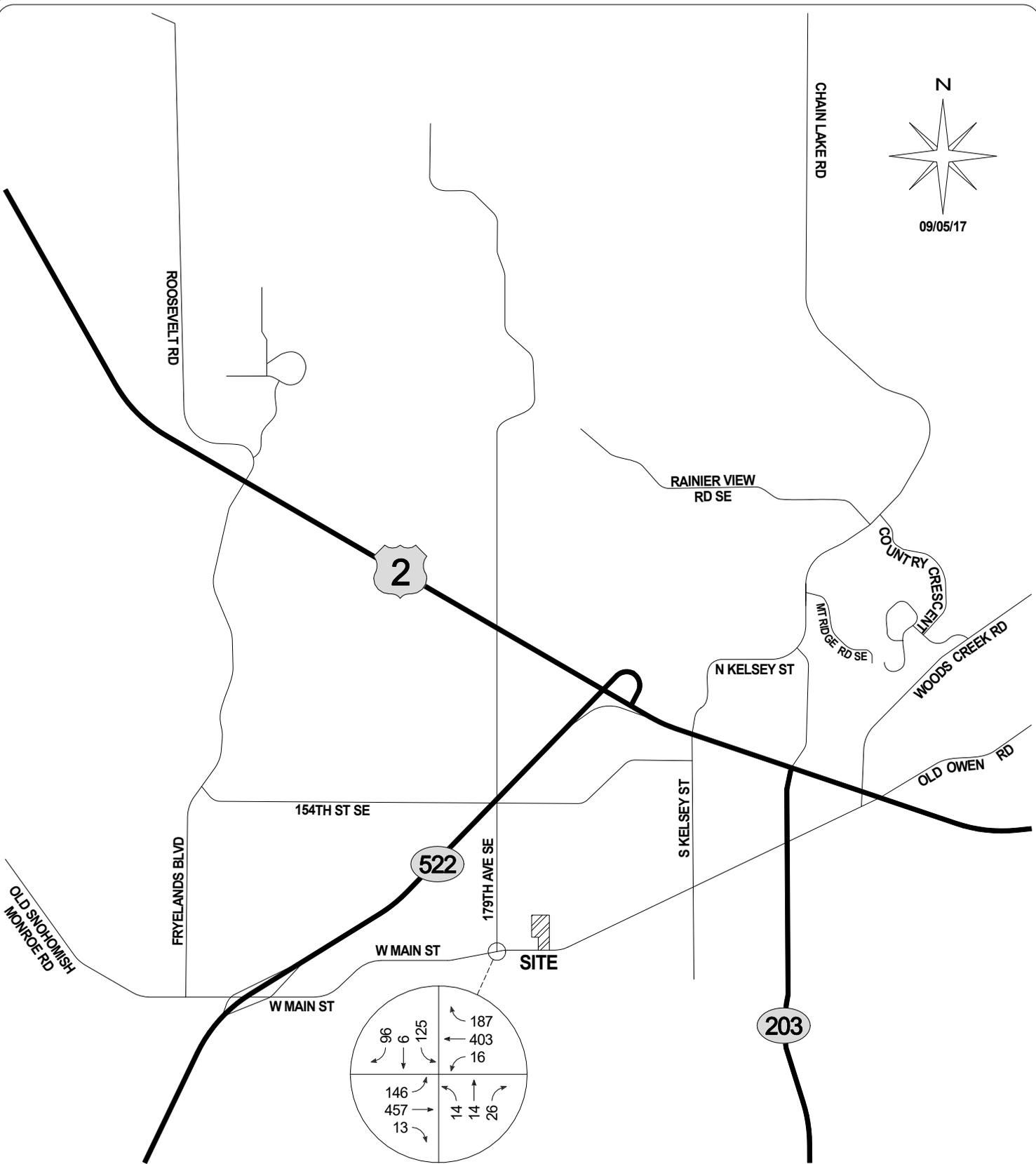
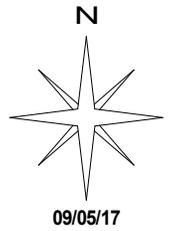
The 2027 future with development turning movements were calculated by adding the development's turning movements to the 2027 baseline turning movements. The 2027 future with development turning movements are shown in Figure 6.

The existing turning movement counts and turning movement calculations are included in the attachments.

5.2 Intersection Level of Service Results

The level of service analysis has been performed utilizing the existing control, channelization, peak-hour factors and heavy-vehicle factors. The signal timing was optimized in the 2027 baseline conditions and then utilized for the 2027 future with development conditions. The study intersection is located along W Main Street which is classified as a minor arterial and therefore has a level of service threshold of LOS D.

The level of service analysis shows that the study intersection will operate at acceptable LOS B under the existing conditions and the 2027 baseline conditions; and will operate at acceptable LOS C with the addition of the Main Brook Townhomes Development. The level of service results for the study intersections are summarized in Table 3.



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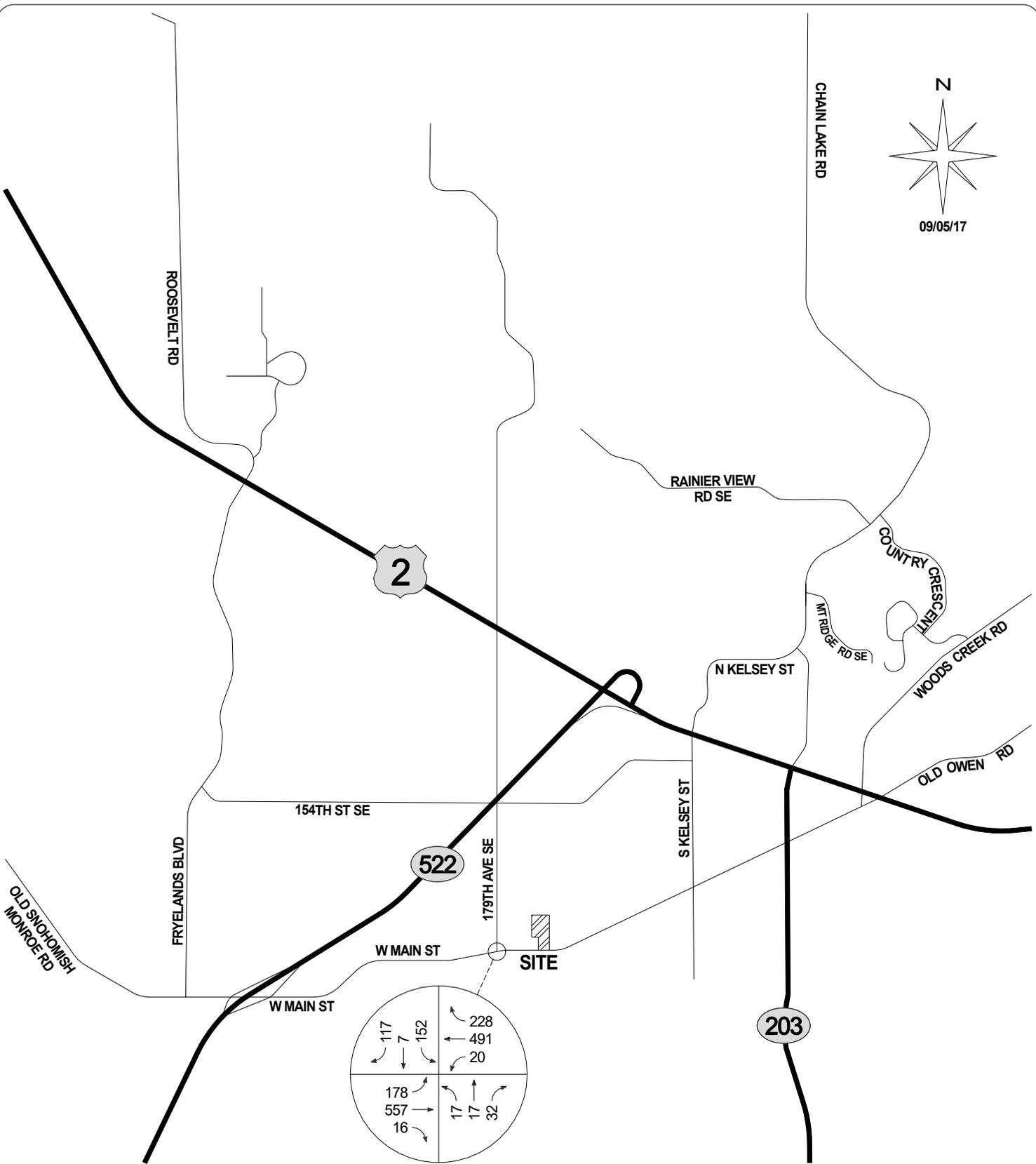
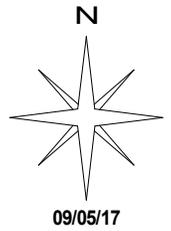
**TRAFFIC IMPACT STUDY
GTC #17-194**

MAIN BROOK TOWNHOMES
18 TOWNHOUSE UNITS
4,160 SF OF MEDICAL OFFICE

LEGEND
xxx → PM PEAK-HOUR
TURNING MOVEMENT VOLUMES

**FIGURE 4
2017 EXISTING
TURNING MOVEMENTS**

CITY OF MONROE



GIBSON TRAFFIC CONSULTANTS

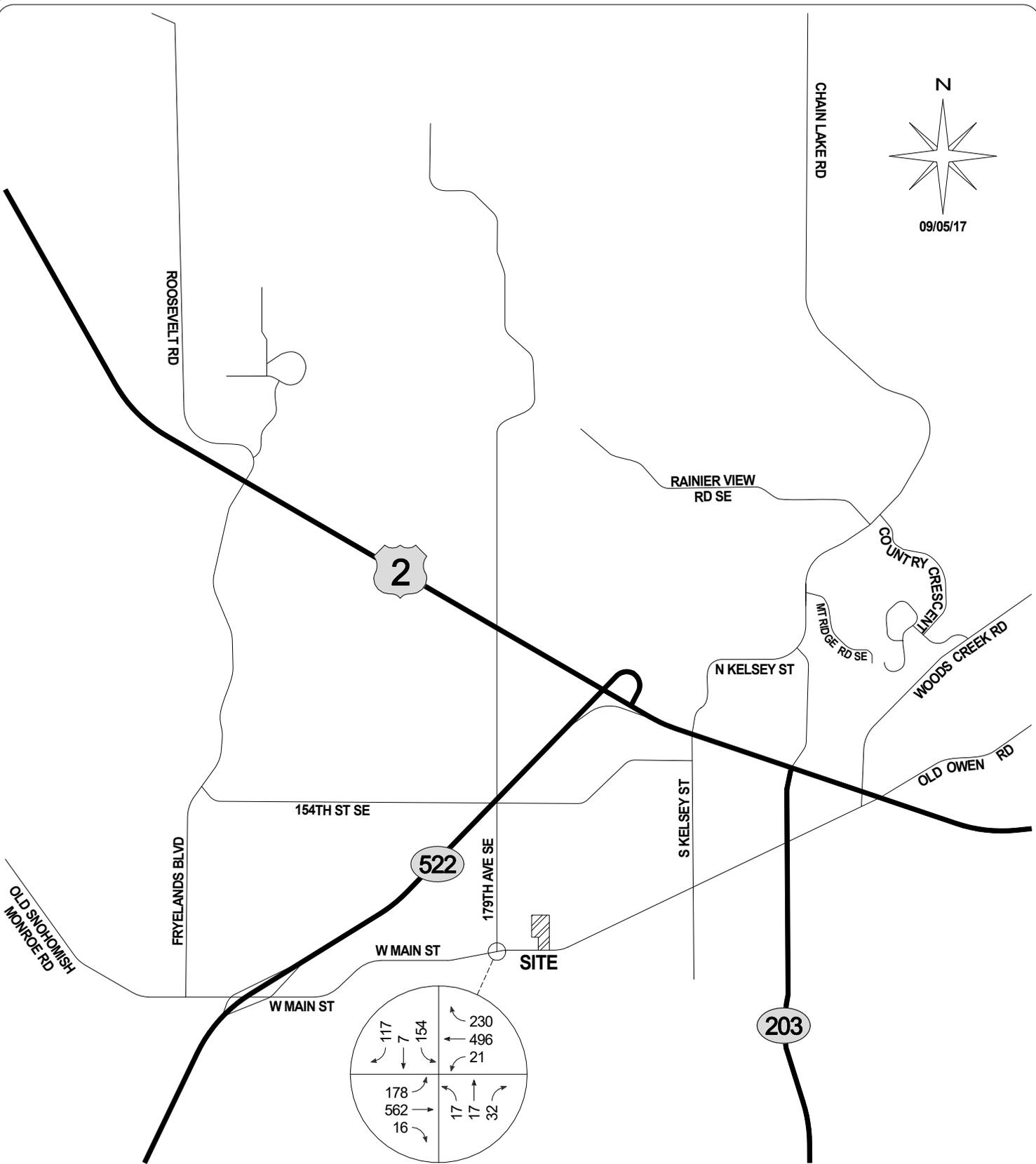
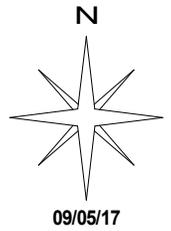
**TRAFFIC IMPACT STUDY
GTC #17-194**

**MAIN BROOK TOWNHOMES
18 TOWNHOUSE UNITS
4,160 SF OF MEDICAL OFFICE**

LEGEND
xxx → PM PEAK-HOUR
TURNING MOVEMENT VOLUMES

**FIGURE 5
2027 BASELINE
TURNING MOVEMENTS**

CITY OF MONROE



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**TRAFFIC IMPACT STUDY
GTC #17-194**

**MAIN BROOK TOWNHOMES
18 TOWNHOUSE UNITS
4,160 SF OF MEDICAL OFFICE**

LEGEND
xxx → PM PEAK-HOUR
TURNING MOVEMENT VOLUMES

**FIGURE 6
2027 FUTURE WITH
DEVELOPMENT
TURNING MOVEMENTS**

CITY OF MONROE

Table 3: Intersection Level of Service Summary

Intersection	Control	Existing Conditions		2027 Baseline Conditions		2027 Future Conditions with Development	
		LOS	Delay	LOS	Delay	LOS	Delay
1. W Main Street at 179 th Avenue SE	Signalized	B	14.7 sec	C	21.4 sec	C	21.7 sec

The level of service calculations are included in the attachments.

6. COLLISION HISTORY

Collision data was provided by WSDOT for the 5-year period from January 1, 2012 through December 31, 2016 at the study intersection. There were 5 collisions at the study intersection, with two rear-end collisions, two at-angle and one opposite direction collision. With a PM peak-hour volume of 1,503 vehicles and assuming a standard k-factor of 10, the study intersection has a collision rate per million entering vehicles of approximately 0.18. Collision rates below 1.0 are typically considered normal to low rates and therefore the intersection should not be considered to have a significant collision history.

7. TRAFFIC MITIGATION FEES

The Washington Growth Management Act and Revised Code of Washington 82.02.050(2) authorize local jurisdictions to establish proportionate share traffic mitigation fees in order to fund capital facilities, such as roads and intersections. The Main Brook Townhomes development is located within the City of Monroe, which has established traffic mitigation fees. The City of Monroe also has interlocal agreements with Snohomish County and WSDOT for traffic mitigation fees.

7.1 City of Monroe

The City of Monroe has established a traffic mitigation fee schedule. The fee for single-family residential units is \$3,459.00 per unit and the fee for medical office is \$12.35 per gross square foot. The 18 new units and 4,160 SF of the Main Brook Townhomes development will have City of Monroe traffic mitigation fees of \$62,262.00 for the residential units and \$51,376.00 for the medical office. The Main Brook Townhomes development will have a total City of Monroe mitigation fee of \$113,638.00. It should be noted that these fees may not vest and may be higher when the building applications are pulled.

7.2 Snohomish County

The City of Monroe and Snohomish County have an interlocal agreement that provides for the payment of traffic mitigation for impacts to Snohomish County roadways by City of Monroe developments. Traffic mitigation fees are based on predetermined area impacts or impacts to actual improvement projects. The trip distribution shows that the Main Brook Townhomes development will not impact any Snohomish County improvement projects in the Transportation Needs Report with three directional PM peak-hour trips. According to Section 3(a)2 of the *Snohomish County Traffic Worksheet and Traffic Study Requirements for Developments in the City of Monroe*, City of Monroe developments are only required to pay traffic mitigation fees for improvements in the Transportation Needs Report impacted with three directional peak-hour trips. The Main Brook Townhomes development is therefore not required to pay traffic mitigation fees to Snohomish County.

7.3 WSDOT

The City of Monroe and WSDOT have an interlocal agreement that provides for the payment of traffic mitigation fees. The interlocal agreement states that development only has a “significant adverse impact” if the development contributes 25 or more trips to a WSDOT intersection. The Main Brook Townhomes development will not impact any WSDOT intersections with 25 peak-hour trips during the AM or PM peak-hours. The Main Brook Townhomes development is therefore not required to pay traffic mitigation fees to WSDOT.

8. CONCLUSIONS

The Main Brook Townhomes development is proposed to consist of 18 new single-family residential units and 4,160 SF of medical office. The development is anticipated to generate 321.66 new average daily trips with 23.44 new AM peak-hour trips and 32.85 new PM peak-hour trips. The level of service analysis shows that the study intersection is anticipated to operate at an acceptable level of service. Additionally, the study intersection has a collision rate per million entering vehicles of less than 1.0. The Main Brook Townhomes development will have City of Monroe traffic mitigation fees of \$113,638.00. The development will not meet the thresholds for paying traffic mitigation fees to Snohomish County or WSDOT.

Trip Generation Calculations

Main Brook Townhomes
 GTC #17-194

Trip Generation for: **Weekday**
 (a.k.a.): **Average Weekday Daily Trips (AWDT)**

LAND USES	VARIABLE	ITE LU code	Gross Trips				Internal Crossover				NET EXTERNAL TRIPS BY TYPE					
			Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	IN BOTH DIRECTIONS		DIRECTIONAL ASSIGNMENTS					
									TOTAL	NEW	PASS-BY	DIVERTED LINK	PASS-BY	DIVERTED LINK	NEW	
			% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	% of Ext. Trips	In+Out (Total)	In	Out	In	Out	In	Out	
Single-Family Detached	18 units	210	50%	50%	171.36	0%	0.00	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	85.68
Medical/ Dental Offices	4.160 KSF	720	50%	50%	150.30	0%	0.00	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.15
Totals					321.66		0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	160.83

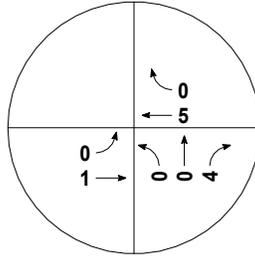
Main Brook Townhomes
 GTC #17-194

**Trip Generation for: Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM
 (a.k.a.): Weekday PM Peak Hour**

LAND USES		NET EXTERNAL TRIPS BY TYPE																
		Gross Trips						IN BOTH DIRECTIONS				DIRECTIONAL ASSIGNMENTS						
		ITE LU code	VARIABLE	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Internal Crossover	TOTAL In+Out (Total)	% of Ext. Trips	In+Out (Total)	PASS-BY In	PASS-BY Out	NEW In+Out (Total)	DIVERTED LINK In	DIVERTED LINK Out	NEW In
Single-Family Detached	18 units	210	1.00	63%	37%	18.00	0%	0.00	18.00	0%	0.00	0.00	0.00	18.00	0.00	0.00	11.34	6.66
Medical/ Dental Offices	4,160 KSF	720	3.57	28%	72%	14.85	0%	0.00	14.85	0%	0.00	0.00	0.00	14.85	0.00	0.00	4.16	10.69
Totals						32.85		0.00	32.85		0.00	0.00	0.00	32.85	0.00	0.00	15.50	17.35

Snohomish County Key Intersection Impacts

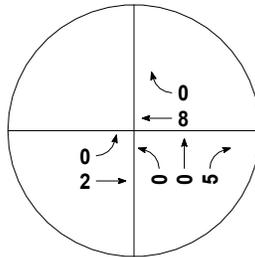
#429 SR-522 EB RAMPS @
OLD SNOHOMISH RD



AM PEAK-HOUR

PM PEAK-HOUR

#429 SR-522 EB RAMPS @
W MAIN STREET



09/05/17

GIBSON TRAFFIC CONSULTANTS

**TRAFFIC IMPACT STUDY
GTC #17-194**

**MAIN BROOK TOWNHOMES
18 TOWNHOUSE UNITS
4,160 SF OF MEDICAL OFFICE**

LEGEND

XXX →

PEAK-HOUR
TURNING MOVEMENT VOLUMES

**FIGURE B1
DEVELOPMENT
KEY INTERSECTION VOLUMES
AM & PM PEAK-HOURS**

CITY OF MONROE

AM Peak-Hour Key Intersection Volumes

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#429: W Main St at SR-522 NB Ramps	0	1	N/A	N/A	5	0	0	0	4	N/A	N/A	N/A

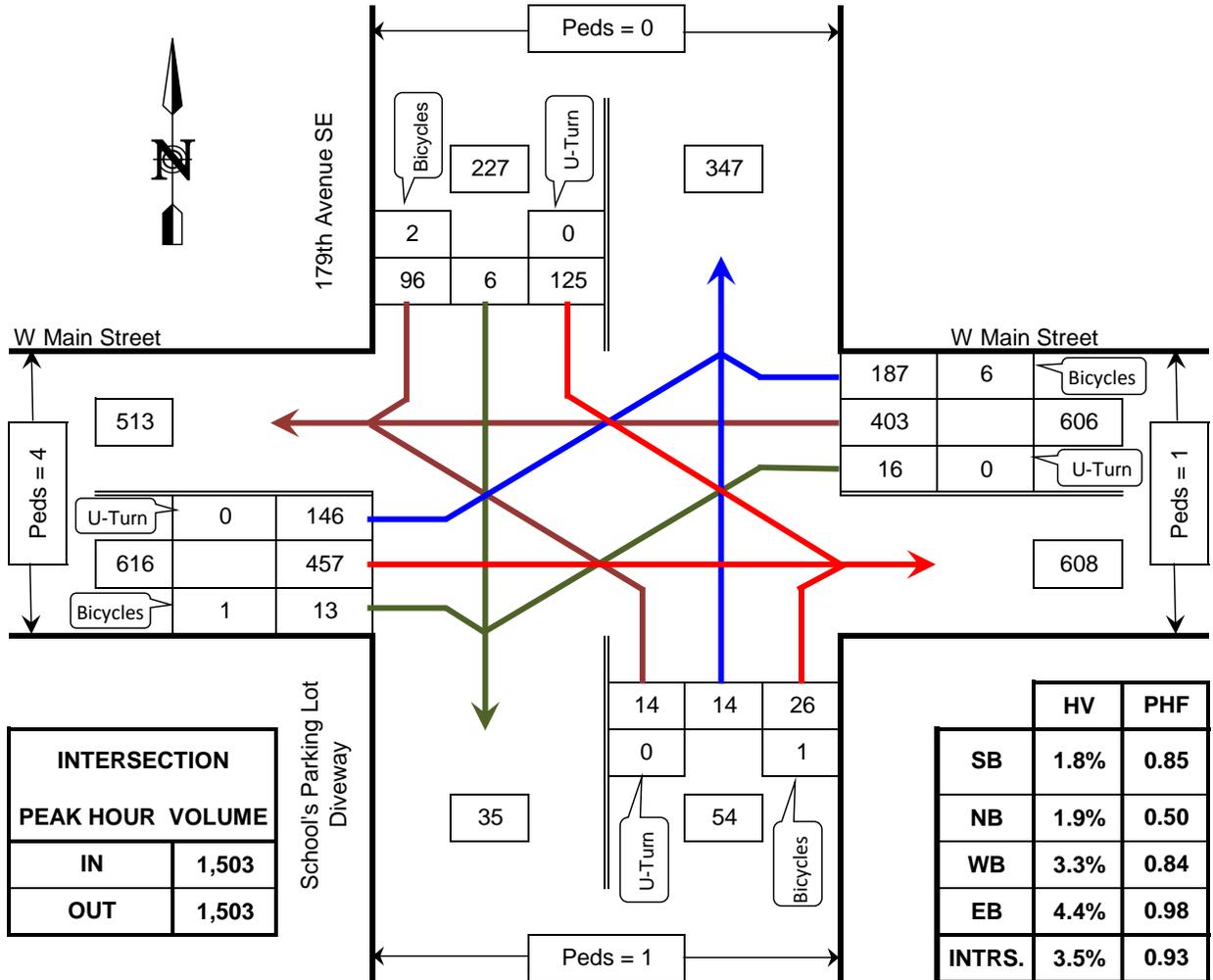
PM Peak-Hour Key Intersection Volumes

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#429: W Main St at SR-522 NB Ramps	0	2	N/A	N/A	8	0	0	0	5	N/A	N/A	N/A

Counts and Turning Movement Volumes

TURNING MOVEMENTS DIAGRAM

4:00 PM - 6:00 PM PEAK HOUR: 4:15 PM TO 5:15 PM



179th Avenue SE @ W Main Street

Monroe, WA

COUNTED BY: VT/CN

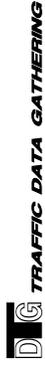
DATE OF COUNT: Tue. 8/29/17

REDUCED BY: CN

TIME OF COUNT: 4:00 PM - 6:00 PM

REDUCTION DATE: Wed. 8/30/17

WEATHER: Sunny



INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: 179th Avenue SE @ W Main Street, Monroe, WA DATE OF COUNT: Tue, 8/29/17, 4:00 PM - 6:00 PM COUNTED BY: VT/CN WEATHER: Sunny

TIME INTERVAL ENDING AT	FROM NORTH ON 179th Avenue SE						FROM SOUTH ON School's Parking Lot Diverway						FROM EAST ON W Main Street						FROM WEST ON W Main Street						INTERVAL TOTALS					
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV		U-Turn	Left	Thru	Right	
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
04:15 PM	0	0	1	0	27	0	14	1	0	0	1	2	0	2	4	0	2	108	45	1	0	8	0	44	101	3	348			
04:30 PM	0	0	1	0	33	1	33	0	0	0	0	1	0	0	0	2	104	39	0	1	8	0	36	108	4	361				
04:45 PM	0	2	1	0	27	1	21	0	0	4	1	3	0	0	7	89	34	0	0	7	0	35	118	2	342					
05:00 PM	0	0	2	0	36	3	24	0	0	0	6	9	12	1	1	5	0	3	90	57	1	0	4	33	119	5	397			
05:15 PM	0	0	0	0	29	1	18	1	1	1	0	4	3	11	0	5	5	0	4	120	57	3	0	42	112	2	403			
05:30 PM	0	0	2	0	27	0	19	0	0	4	1	2	1	0	1	0	1	11	31	0	1	7	0	34	92	0	321			
05:45 PM	0	0	0	0	24	0	22	0	0	0	0	2	1	0	0	9	0	122	36	1	1	7	0	28	101	0	336			
06:00 PM	0	1	4	0	25	0	27	0	0	0	1	1	2	0	2	4	0	1	95	39	1	0	2	0	41	98	0	330		
PEAK HOUR TOTALS	0	2	4	0	125	6	96	1	1	1	1	14	14	26	1	6	20	0	16	403	187	4	1	27	0	146	457	13	1503	
ALL MOVEMENTS	1.8%						1.9%						3.3%						4.4%						616	0.88	3.5%	0.93		
PEAK HOUR FACTOR	0.85						0.50						0.84						0.88											

HV = Heavy Vehicle
PHF = Peak Hour Factor

REDUCED BY: CN DATE OF REDUCTION: 8/30/2017

ROLLING HOUR COUNT

TIME INTERVAL	FROM NORTH ON 179th Avenue SE						FROM SOUTH ON School's Parking Lot Diverway						FROM EAST ON W Main Street						FROM WEST ON W Main Street						INTERVAL TOTALS				
	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV	U-Turn	Left	Thru	Right	Peds	Bicycle	HV		U-Turn	Left	Thru	Right
2:00 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:15 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:30 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:15 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:30 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:45 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:00 PM - 5:00 PM	0	2	5	0	123	5	92	1	0	0	11	12	17	1	3	19	0	14	391	175	2	1	27	0	148	446	14	1448	
4:15 PM - 5:15 PM	0	2	4	0	125	6	96	1	1	1	0	14	14	26	1	6	20	0	16	403	187	4	1	27	0	146	457	13	1503
4:30 PM - 5:30 PM	0	2	5	0	119	5	82	1	1	1	0	18	14	28	2	6	13	0	14	410	179	4	1	26	0	144	441	9	1463
4:45 PM - 5:45 PM	0	0	4	0	116	4	83	1	1	1	0	14	15	26	2	6	20	0	7	443	181	5	2	26	0	137	424	7	1457
5:00 PM - 6:00 PM	0	1	6	0	105	1	86	1	1	1	0	9	7	16	1	7	19	0	5	448	163	5	2	24	0	145	403	2	1390
4:00 PM - 6:00 PM Total:	0	3	11	0	228	6	178	2	1	1	0	20	19	33	2	10	38	0	19	839	338	7	3	51	0	293	849	16	2838

1 179th St SE at W Main St

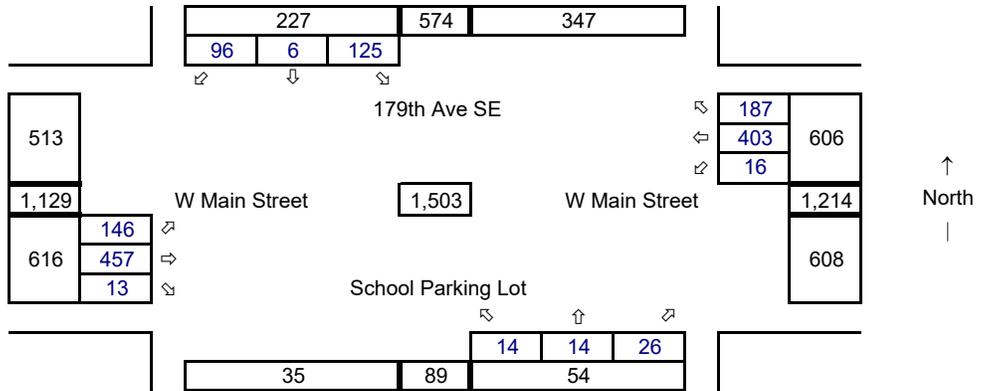
Synchro ID: 1

Existing

Average Weekday
PM Peak Hour

Year: 8/29/17

Data Source: TDG



Future without Project

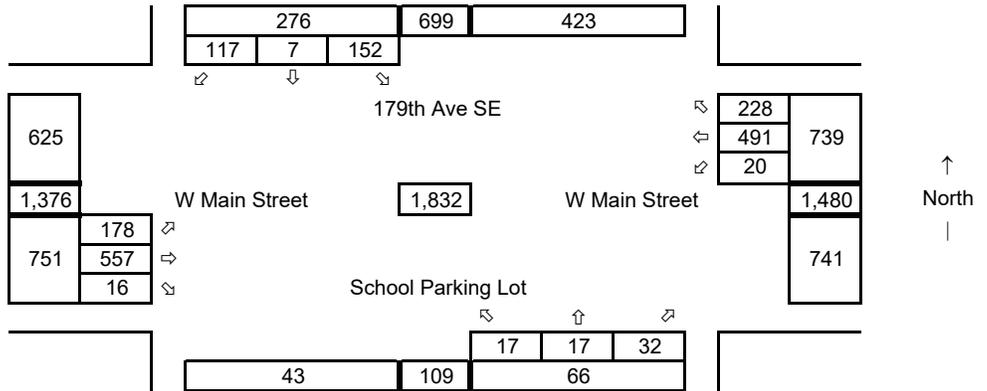
Average Weekday
PM Peak Hour

Year: 2027

Growth Rate = 2.0%

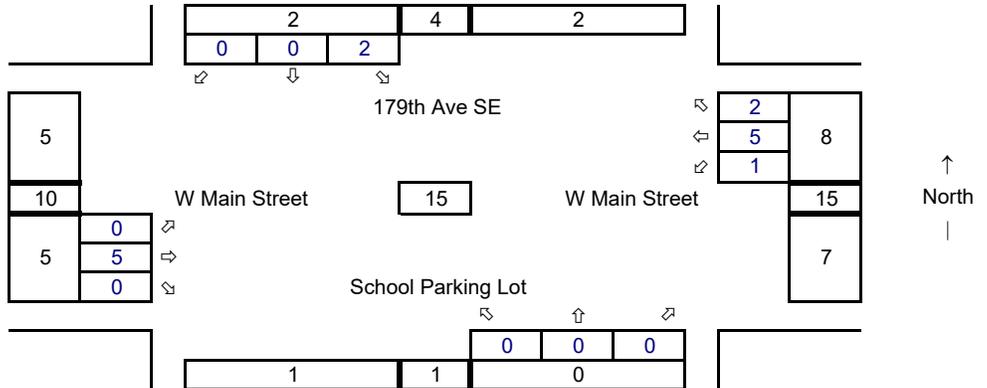
Years of Growth = 10

Total Growth = 1.2190



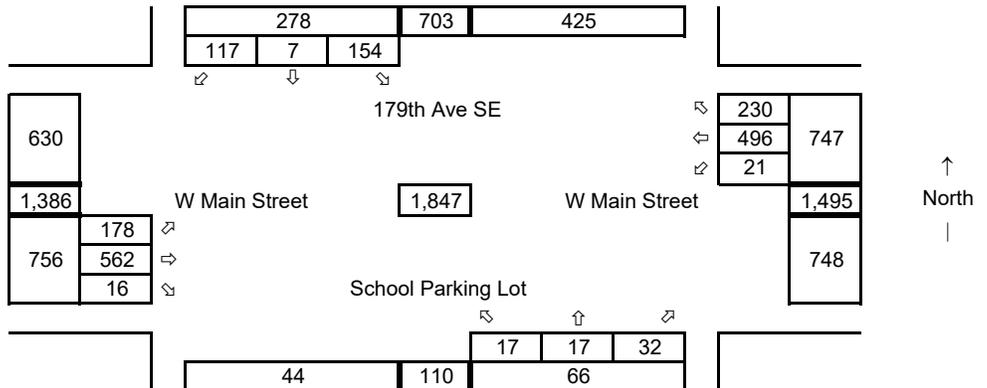
Total Project Trips

Average Weekday
PM Peak Hour



Future with Project

Average Weekday
PM Peak Hour



Level of Service Calculations

2017 Existing Conditions.syn
1: School Driveway/179th Ave SE & W Main St

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	146	457	13	16	403	187	14	14	26	125	6	96
Traffic Volume (vph)	146	457	13	16	403	187	14	14	26	125	6	96
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	100	100	0	100	0	0	0	0	0	50	0	0
Storage Length (ft)	1	1	0	1	0	0	0	0	0	1	0	0
Taper Length (ft)	25	1.00	1.00	25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Ped Bike Factor	0.996	0.952	0.935	0.987	0.935	0.952	0.935	0.987	0.935	0.858	0.858	0.858
Flt Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1736	1818	0	1736	1725	0	1667	0	1736	1521	0	0
Flt Permitted	0.234	0.464	0.847	0.1725	0.1725	0	0.914	0	1540	0	1311	1521
Satd. Flow (perm)	427	1818	0	847	1725	0	1540	0	1311	1521	0	0
Right Turn on Red			Yes		Yes	Yes		Yes		Yes	Yes	Yes
Satd. Flow (RTOR)	2	30	30	30	30	30	28	30	28	103	30	30
Link Speed (mph)	30	30	30	30	30	30	30	30	30	366	366	366
Link Distance (ft)	560	560	425	425	425	425	524	425	524	366	366	366
Travel Time (s)	12.7	12.7	9.7	9.7	9.7	9.7	11.9	9.7	11.9	8.3	8.3	8.3
Confl. Peds. (#/hr)			1	1	1	4	4	1	1	1	4	4
Confl. Bikes (#/hr)			1	1	1	6	6	1	1	1	2	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	157	505	0	17	634	0	0	58	0	134	109	0
Turn Type	pm+pl	NA	NA	pm+pl	NA	NA	Perm	NA	NA	Perm	NA	0
Protected Phases	7	4	3	8	8	2	2	2	2	6	6	6
Permitted Phases	4	8	8	8	8	2	2	2	2	6	6	6
Detector Phase	7	4	3	8	8	2	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	39.4	9.6	39.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0
Total Split (%)	11.1%	43.8%	10.7%	43.3%	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	38.6	37.6	34.2	29.0	34.2	29.0	34.2	29.0	34.2	29.0	34.2	29.0
Actuated g/C Ratio	0.64	0.62	0.57	0.48	0.57	0.48	0.57	0.48	0.57	0.48	0.57	0.48
v/c Ratio	0.40	0.44	0.03	0.75	0.03	0.75	0.18	0.03	0.75	0.53	0.29	0.83
Control Delay	0.0	0.0	4.8	19.0	4.8	19.0	14.9	4.8	19.0	0.0	0.0	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	8.9	4.8	19.0	4.8	19.0	14.9	4.8	19.0	31.2	8.3	8.3
LOS	A	A	A	B	A	B	B	A	B	C	A	A
Approach Delay	8.6	18.7	14.9	18.7	14.9	18.7	14.9	18.7	14.9	20.9	14.9	20.9

Gibson Traffic Consultants, Inc. [SF] 2017 Existing Conditions PM Peak Hour

2017 Existing Conditions.syn
1: School Driveway/179th Ave SE & W Main St

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	18	71	2	163	2	163	9	9	46	2	2	2
Queue Length 50th (ft)	46	230	9	326	9	326	37	37	98	38	38	38
Queue Length 95th (ft)	100	480	100	345	100	345	444	444	50	286	286	286
Internal Link Dist (ft)	396	1179	558	1026	558	1026	967	967	814	984	984	984
Turn Bay Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.43	0.03	0.62	0.03	0.62	0.06	0.06	0.16	0.11	0.11	0.11
Intersection Summary	Other											
Area Type:	Other											
Cycle Length:	90											
Actuated Cycle Length:	60.2											
Natural Cycle:	65											
Control Type:	Actuated-Uncoordinated											
Maximum v/c Ratio:	0.75											
Intersection Signal Delay:	14.7											
Intersection LOS:	B											
Intersection Capacity Utilization:	65.7%											
Analysis Period (min):	15											
ICU Level of Service:	C											

Gibson Traffic Consultants, Inc. [SF] 2017 Existing Conditions PM Peak Hour

2027 Baseline Conditions.syn
1: School DriveWAY/179th Ave SE & W Main St

2027 Baseline Conditions.syn
1: School DriveWAY/179th Ave SE & W Main St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS												
Queue Length 50th (ft)	27	114		3	295			15		73		3
Queue Length 95th (ft)	82	313		11	#589			51		145		49
Internal Link Dist (ft)	100	480		100	345			444		50		286
Turn Bay Length (ft)	379	1320		486	1140			454		407		517
Base Capacity (vph)	0	0		0	0			0		0		0
Starvation Cap Reductn	0	0		0	0			0		0		0
Spillback Cap Reductn	0	0		0	0			0		0		0
Storage Cap Reductn	0	0		0	0			0		0		0
Reduced v/c Ratio	0.50	0.47		0.05	0.68			0.15		0.40		0.26

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	557	16	20	491	228	17	17	32	152	7	117
Future Volume (vph)	178	557	16	20	491	228	17	17	32	152	7	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100	100	0	100	0	0	0	0	0	50	0	0
Storage Lanes	1	1	0	1	0	0	0	0	0	25	0	0
Taper Length (ft)	25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	0.99	0.99	0.934	0.987	0.950	0.950	0.859	0.859
Ped Bike Factor	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996
Flt Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1736	1818	0	1736	1726	0	0	1664	0	1736	1520	0
Flt Permitted	0.136	0.136	0.403	0.403	0.909	0.909	0.909	0.909	0.796	0.796	1520	0
Satd. Flow (perm)	248	1818	0	736	1726	0	0	1530	0	1451	1520	0
Right Turn on Red			Yes		Yes							
Satd. Flow (RTOR)	3	30	38	30	30	30	34	30	30	30	126	0
Link Speed (mph)	30	30	30	30	30	30	30	30	30	30	30	30
Link Distance (ft)	560	560	425	425	425	524	524	524	366	366	8.3	4
Travel Time (s)	12.7	12.7	9.7	9.7	9.7	11.9	11.9	11.9	8.3	8.3	1	4
Confl. Peds. (#/hr)			1	1	1	4	4	4	1	1	1	4
Confl. Bikes (#/hr)			1	1	1	6	6	6	1	1	1	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	191	616	0	22	773	0	0	70	0	163	134	0
Turn Type	pm-plt	NA	NA	pm+pt	NA	NA	Perm	NA	NA	Perm	INA	0
Protected Phases	7	4	3	8	8	2	2	2	2	6	6	6
Permitted Phases	4	4	8	8	8	2	2	2	2	6	6	6
Detector Phase	7	4	3	8	8	2	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	14.5	55.9	9.6	51.0	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (%)	16.1%	62.1%	10.7%	56.7%	27.2%	27.2%	27.2%	27.2%	27.2%	27.2%	27.2%	27.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	51.2	48.0	42.0	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7
Actuated g/C Ratio	0.69	0.64	0.56	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
v/c Ratio	0.52	0.53	0.05	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Control Delay	12.0	10.9	5.1	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	10.9	5.1	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8
LOS	B	B	A	C	C	C	C	C	C	C	C	C
Approach Delay	11.1	11.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 74.6
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Capacity Delay: 21.4
Analysis Period (min): 15
ICU Level of Service: D
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Spills and Phases: 1: School DriveWAY/179th Ave SE & W Main St

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2027 Baseline Conditions
PM Peak Hour

2027 Baseline Conditions
PM Peak Hour

2027 Future with Development Conditions.syn
1: School Driveway/179th Ave SE & W Main St

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	178	562	16	21	496	230	17	17	32	154	7	117
Traffic Volume (vph)	178	562	16	21	496	230	17	17	32	154	7	117
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphft)	100	100	0	100	0	0	0	0	0	50	0	0
Storage Length (ft)	1	0	0	1	0	0	0	0	0	0	0	0
Taper Length (ft)	25	1.00	1.00	25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	0.99	1.00	0.99	0.99	1.00	0.97	0.859	0.859
Ped Bike Factor	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996
Flt Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1736	1818	0	1736	1726	0	0	1664	0	1736	1520	0
Flt Permitted	0.134	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399	0.399
Satd. Flow (perm)	245	1818	0	728	1726	0	0	1530	0	1446	1520	0
Right Turn on Red			Yes		Yes							
Satd. Flow (RTOR)	3	30	30	38	30	30	34	30	30	30	30	30
Link Speed (mph)	560	12.7	1.1	9.7	4	4	4	4	4	1	1	4
Travel Time (s)	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Conf. Peds. (#/hr)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Conf. Bikes (#/hr)	191	621	0	23	780	0	0	70	0	166	134	0
Peak Hour Factor	pm-plt	NA	NA	pm-plt	NA	NA	NA	NA	NA	Perm	INA	INA
Heavy Vehicles (%)	7	4	3	8	8	8	8	8	8	6	6	6
Shared Lane Traffic (%)	7	4	3	8	8	8	8	8	8	6	6	6
Lane Group Flow (vph)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Turn Type	Minimum	Initial										
Protected Phases	9.5	22.5	9.5	22.5	9.5	22.5	9.5	22.5	9.5	22.5	9.5	22.5
Permitted Phases	14.5	55.9	9.6	51.0	14.5	55.9	9.6	51.0	14.5	55.9	9.6	51.0
Detector Phase	16.1%	62.1%	10.7%	56.7%	16.1%	62.1%	10.7%	56.7%	16.1%	62.1%	10.7%	56.7%
Switch Phase	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Minimum Initial (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Minimum Split (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Split (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Yellow Time (s)	Lead	Lag										
All-Red Time (s)	Yes											
Lost Time Adjust (s)	None											
Total Lost Time (s)	51.8	48.5	51.8	48.5	51.8	48.5	51.8	48.5	51.8	48.5	51.8	48.5
Lead/Lag	0.69	0.64	0.56	0.49	0.69	0.64	0.56	0.49	0.69	0.64	0.56	0.49
Lead-Lag Optimize?	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
Recall Mode	12.3	11.0	12.3	11.0	12.3	11.0	12.3	11.0	12.3	11.0	12.3	11.0
Act Effct Green (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Red (s)	12.3	11.0	12.3	11.0	12.3	11.0	12.3	11.0	12.3	11.0	12.3	11.0
Actuated g/C Ratio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
v/c Ratio	12.3	11.0	12.3	11.0	12.3	11.0	12.3	11.0	12.3	11.0	12.3	11.0
Control Delay	B	B	B	A	C	C	B	B	B	D	A	A
Queue Delay	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
Total Delay	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
LOS	B	B	B	A	C	C	B	B	B	D	A	A
Approach Delay	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3

Gibson Traffic Consultants, Inc. [SF] 2027 Future with Development Conditions PM Peak Hour

2027 Future with Development Conditions.syn
1: School Driveway/179th Ave SE & W Main St

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	27	118	3	304	3	304	15	15	15	77	3	3
Queue Length 50th (ft)	83	316	11	#598	11	#598	51	51	51	148	49	49
Queue Length 95th (ft)	100	480	100	345	100	345	444	444	444	286	286	286
Internal Link Dist (ft)	375	1317	483	1127	483	1127	449	449	449	401	512	512
Turn Bay Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.47	0.05	0.69	0.05	0.69	0.16	0.16	0.16	0.41	0.26	0.26
Intersection Summary	Other											
Area Type:	Other											
Cycle Length:	90											
Actuated Cycle Length:	75.4											
Natural Cycle:	80											
Control Type:	Actuated-Uncoordinated											
Maximum v/c Ratio:	0.89											
Intersection LOS:	C											
ICU Level of Service:	D											
Intersection Capacity Delay:	21.7											
Analysis Period (min):	15											
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												
Spills and Phases:	1: School Driveway/179th Ave SE & W Main St											
	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø11	Ø12	Ø13
	24.5 s	9.6 s	55.9 s	15.5 s								

Gibson Traffic Consultants, Inc. [SF] 2027 Future with Development Conditions PM Peak Hour

Collision Data

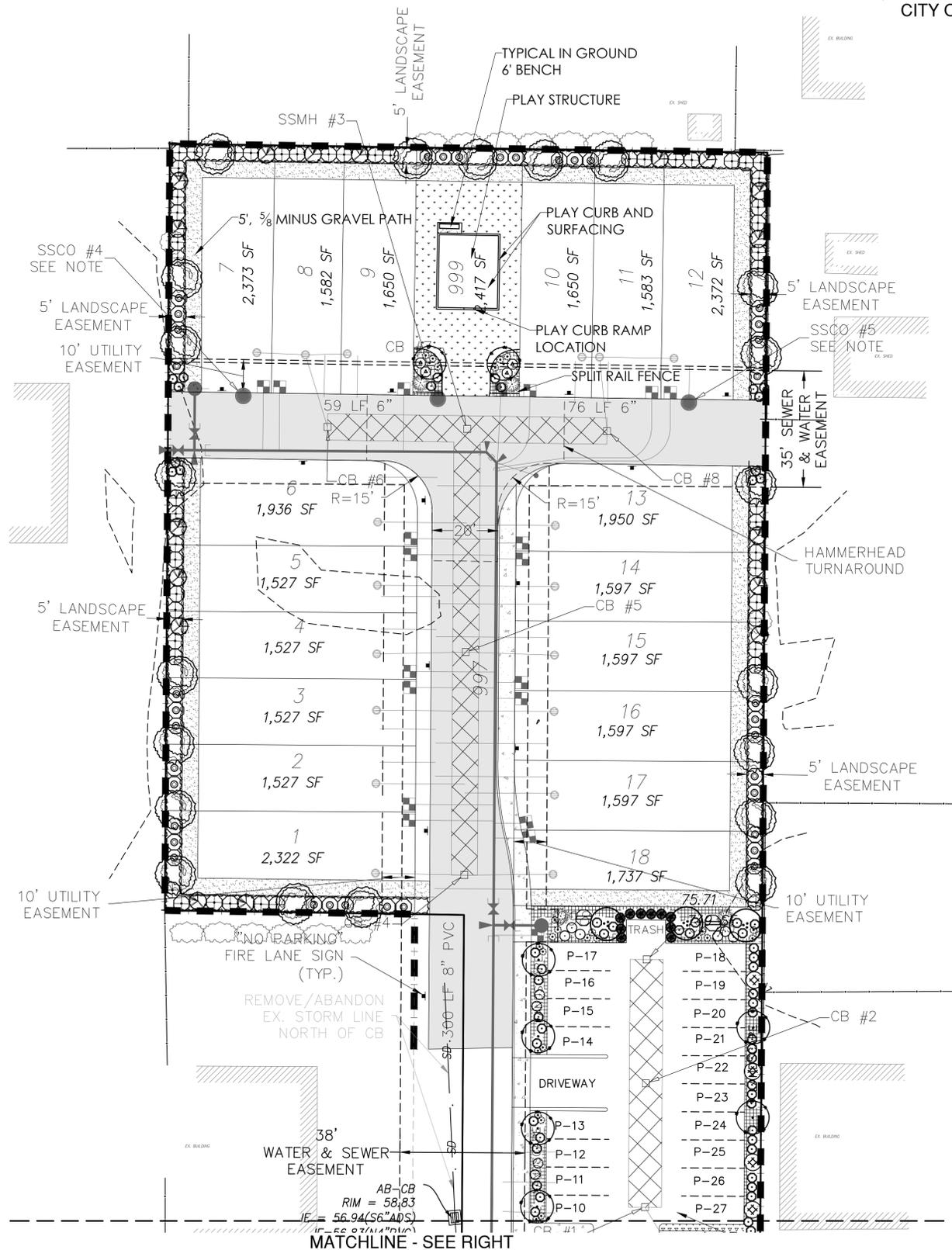
OFFICER REPORTED CRASHES THAT OCCURRED ON ALL ROADS IN THE CITY OF MONROE

01/01/2012 - 12/31/2016

Under 23 U.S. Code § 409 and 23 U.S. Code § 148, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	A / B	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# I N J U R Y	# F V E K	# # P I # B	FIRST COLLISION TYPE / OBJECT STRUCK	
W MAIN ST		179TH AVE SE		E160334	02/23/2012	10:42	Possible Injury	1	0	2	0	Entering at angle
W MAIN ST	17900	179TH AVE SE		E368142	10/19/2014	10:20	No Injury	0	0	2	0	From opposite direction - one left turn - one straight
W MAIN ST	17900	179TH AVE SE		E476532	10/01/2015	14:25	No Injury	0	0	2	0	Entering at angle
W MAIN ST	17900	179TH AVE SE		E503321	01/07/2016	16:14	Possible Injury	1	0	2	0	From same direction - both going straight - one stopped - rear-end
W MAIN ST	17900	179TH AVE SE		E577186	08/22/2016	14:53	Possible Injury	1	0	2	0	From same direction - both going straight - one stopped - rear-end

SECTION 1, TOWNSHIP 21N, RANGE 6E, WM.
CITY OF MONROE



LANDSCAPE PLANTING SCHEDULE

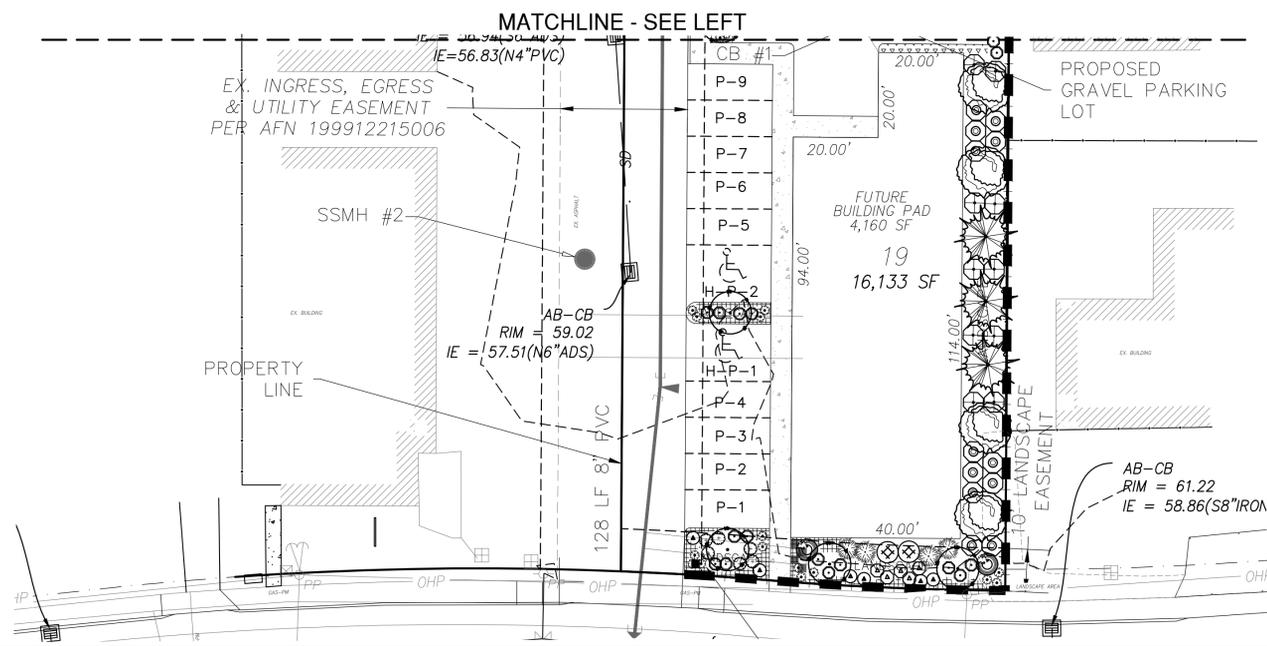
EVERGREEN TREES			SIZE	CONDITION
SYMBOL	QTY	BOTANICAL / COMMON NAME		
	17	<i>Chamaecyparis nootkatensis</i> Pendula / WEEPING ALASKA CEDAR	6' MIN. HT.	B&B., SPACING AS SHOWN
	10	<i>Thuja occidentalis</i> 'Emerald Green' / EMERALD GREEN ARBORVITAE	6' MIN. HT.	B&B., SPACING AS SHOWN
	3	<i>Thuja plicata</i> 'Excelsa' / EXCELSA WESTERN RED CEDAR	6' MIN. HT.	B&B., SPACING AS SHOWN

DECIDUOUS TREES			SIZE	CONDITION
SYMBOL	QTY	BOTANICAL / COMMON NAME		
	25	<i>Acer rubrum</i> 'Bowhall' / BOWHALL RED MAPLE	2" CAL.	B&B., 20' O.C. BRANCHED @ 8' HT
	3	<i>Amelanchier grandiflora</i> 'Autumn Brilliance' / SERVICEBERRY	1 3/4" CAL.	B&B., SPACING AS SHOWN
	12	<i>Pyrus calleryana</i> 'Capital' / CAPITAL PEAR	1.5" CAL.	B&B., SPACING AS SHOWN

SHRUBS			SIZE	CONDITION
SYMBOL	QTY	BOTANICAL / COMMON NAME		
	41	<i>Berberis thunbergii</i> var. <i>atropurpurea</i> 'Crimson Pygmy' / PYGMY BARBERRY	2 GAL. MIN.	CON. GRWN. 3' O.C.
	6	<i>Cornus alba</i> 'Elegantissima' / VARIEGATED RED TWIG DOGWOOD	2 GAL. MIN.	CON. GRWN. 5' O.C.
	2	<i>Ilex crenata</i> / JAPANESE HOLLY	21" MIN. HT.	CON. GRWN. 4' O.C.
	2	<i>Hydrangea quercifolia</i> 'Snow Queen' / OAKLEAF HYDRANGEA	18" MIN. HT.	CON. GRWN. 5' O.C.
	6	<i>Lavandula angustifolia</i> 'Munstead' / MUNSTEAD LAVENDER	2 GAL. MIN.	CON. GRWN. 3' O.C.
	8	<i>Miscanthus sinensis</i> 'Morning Light' / SILVER MAIDEN GRASS	18" MIN. HT.	CON. GRWN. 5' O.C.
	71	<i>Nandina domestica</i> 'Gulf Stream' / DWARF HEAVENLY BAMBOO	18" MIN. HT.	CON. GRWN. 3' O.C.
	60	<i>Pieris</i> 'Forest Flame' / MOUNTAIN PIERIS	21" MIN. HT.	CON. GRWN. 5' O.C.
	10	<i>Pinus mugo</i> 'Mops' / MOPS MUGO PINE	18" MIN. HT.	CON. GRWN. 4' O.C.
	49	<i>Prunus laurocerasus</i> 'Otto Luyken' / DWARF ENGLISH LAUREL	21" MIN. HT.	CON. GRWN. 4' O.C.
	6	<i>Spiraea x bumalda</i> 'Goldflame' / GOLDFLAME SPIREA	2 GAL. MIN.	CON. GRWN. 3' O.C.

GROUND COVER			SIZE	CONDITION
SYMBOL	QTY	BOTANICAL / COMMON NAME		
	*	<i>Arctostaphylos uva-ursi</i> / KINNICKINICK	4" POTS	CON. GRWN., 12" O.C.
	*	<i>Gaultheria shallon</i> / SALAL	1 GAL. MIN.	CON. GRWN. 12" O.C.
	*	<i>Nassella tenuissima</i> / MEXICAN FEATHER GRASS	1 GALLON	CON. GRWN., 24" O.C.
	*	HYDROSEED LAWN		

* CONTRACTOR TO CALCULATE QUANTITIES TO PROVIDE FULL COVERAGE



NOTE:
STREET TREES, PLANTER STRIP AND LANDSCAPE BUFFER TRACTS ADJACENT LOTS SHALL BE MAINTAINED BY THE HOMEOWNER. MAINTENANCE RESPONSIBILITIES FOR ALL LANDSCAPE AND IRRIGATION IMPROVEMENTS FALLS UPON THE HOA.
HYDROSEEDING APPLICATION WILL ONLY BE ALLOWED BETWEEN MARCH 1 AND OCTOBER 15.
SIX-INCH PROTECTIVE CURBS OR WHEEL STOP TO PROTECT LANDSCAPED AREAS SHALL BE PROVIDED.



ORIGIN
DESIGN GROUP

1031 185TH AVE NE
SNOHOMISH, WA 98290
TEL: 425.346.1905



STATE OF WASHINGTON
LICENSED
LANDSCAPE ARCHITECT
KRISTAL LOWE
LICENCE NO. 1206

#	DESCRIPTION	DATE
1	LANDSCAPE EASEMENT	11-10-17
2	SITE PLAN UPDATE	1-9-18

MAINBROOK TOWNHOMES

DRAWING TITLE:
LANDSCAPE PLAN

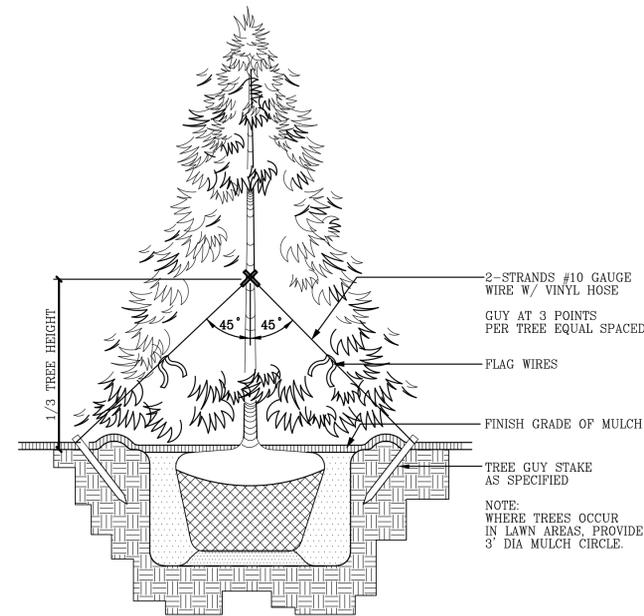
APPLICANT:
HANSON HOMES
P.O. BOX 2289
SNOHOMISH, WA 98291
CONTACT: RICK HANSON
2011HANSONHOMES@GMAIL.COM
(425) 328-5202

DRAWING INFORMATION
ODG PROJECT #: 17-165
DRAWN BY: KL
CHECKED BY: KL

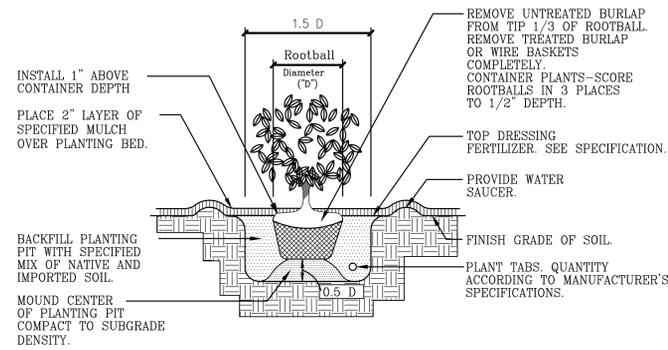
DATE:
SEPTEMBER 22, 2017

SHEET NO:
L-2
OF 4

SECTION 1, TOWNSHIP 21N, RANGE 6E, WM.
CITY OF MONROE



1 TREE GUYING
4 SCALE: NTS



NOTE: DETAIL APPLIES TO TREES, SHRUBS AND GROUNDCOVER PLANTINGS.

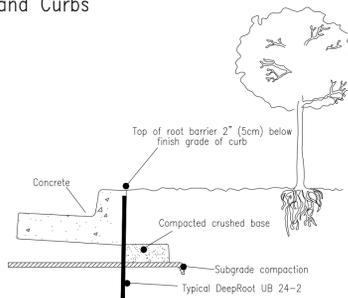
2 SHRUB PLANTING
4 SCALE: NTS

Linear Application of DeepRoot Tree Root Barriers at Time of Installing Concrete Sidewalks and Curbs

TYPICAL SECTION OF CURB AND GUTTER WITH DEEPROOT TREE ROOT BARRIER INSET INTO CONCRETE. BARRIER INSTALLED IN A TRENCH IN SUBGRADE WHICH IS THEN COMPACTED. BARRIER IS SET SO THAT TOP EDGE WILL BE 2" (5CM) BELOW FINISH GRADE OF CURB, AND SET FLUSH WITH EDGE OF CURB. BARRIER RIBS FACE TOWARD TREE ROOTS.

INSTALLATION SEQUENCE:

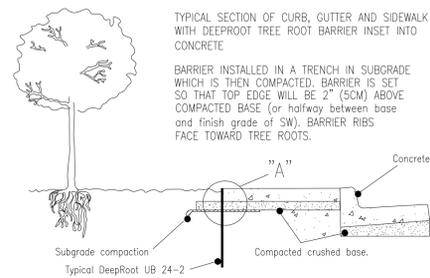
1. Prepare base and subgrade
2. Trench to appropriate depth for installation of root barrier so that top of barrier is 2" (5cm) below finish grade of top of curb.
3. Place root barrier in trench, vertical ribs must face toward tree roots.
4. Backfill and compact to requirements.
5. Place form material against barrier (it may be nailed from the outside of the form)



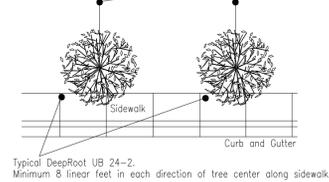
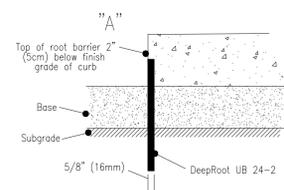
TYPICAL SECTION OF CURB, GUTTER AND SIDEWALK WITH DEEPROOT TREE ROOT BARRIER INSET INTO CONCRETE. BARRIER INSTALLED IN A TRENCH IN SUBGRADE WHICH IS THEN COMPACTED. BARRIER IS SET SO THAT TOP EDGE WILL BE 2" (5CM) ABOVE COMPACTED BASE (OR HALFWAY BETWEEN BASE AND FINISH GRADE OF SW). BARRIER RIBS FACE TOWARD TREE ROOTS.

INSTALLATION SEQUENCE:

1. Prepare base and subgrade
2. Trench to appropriate depth for installation of root barrier so that top of barrier is 2" (5cm) below finish grade of top of sidewalk (or halfway between top of compacted base and finish grade of SW)
3. Place root barrier in trench, vertical ribs must face toward tree roots.
4. Backfill and compact to requirements.
5. Place form material against barrier (it may be nailed from the outside of the form)

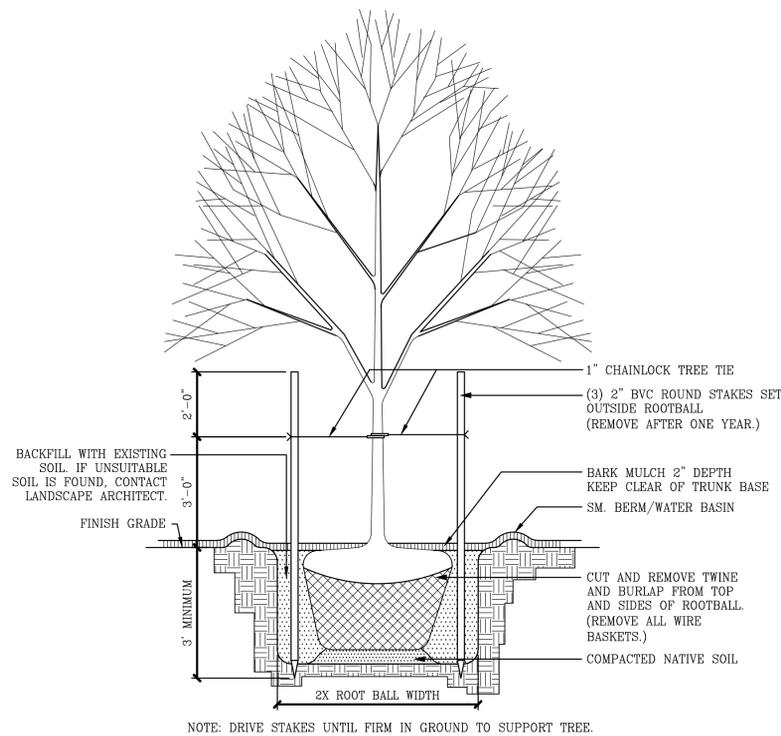


IMPORTANT NOTE: Tree location must align with "as-built" center of barrier.



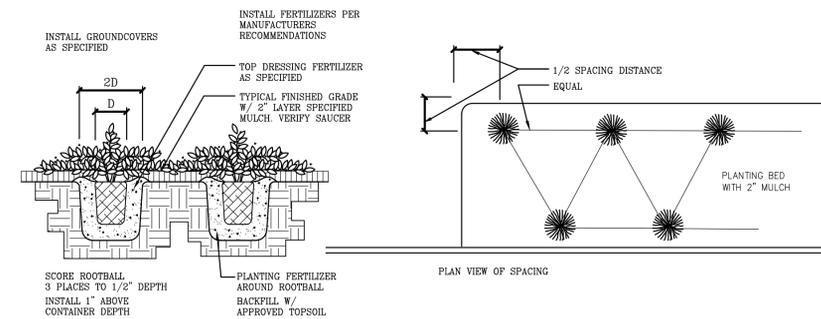
NOTE: ALL STREET TREES SHALL HAVE ROOT BARRIERS. ROOT BARRIERS REQUIRED ADJACENT TO CURB AND GUTTER AND BACK OF SIDEWALK.

4 ROOT BARRIER
4



NOTE: DRIVE STAKES UNTIL FIRM IN GROUND TO SUPPORT TREE.

3 TREE PLANTING / STAKING
4



5 GROUNDCOVER PLANTING
4



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LICENCE NO. 1206

#	DESCRIPTION	DATE
1	LANDSCAPE EASEMENT	11-10-17

MAINBROOK TOWNHOMES

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OF 4