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City of Lynden
Public Works
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Lynden, WA 98264

**Subject: Lionsgate Plat
 Preliminary Stormwater Design Letter
 F&A Project No. 21098**

This letter serves as a preliminary stormwater design narrative for the proposed Lionsgate Plat project at 1986 Main Street Lynden, Washington. The project site is bounded by Guide Meridian Road to the west and Main Street to the south. Figures 1 and 2 provide a vicinity map and an aerial photo of recent ground cover conditions on site. The southern end of the site is currently developed with the Lynden Academy building and associated parking, stormwater pond, and play fields. The remainder of the site is undeveloped pasture with a row of trees bisecting the property into north and south halves. Proposed improvements will develop the pasture and portions of the parking lot with a mixture of multi- and single-family housing and associated streets and utilities.

Existing topography on site appears to slope at gentle grades from north to south, however a topographical survey is not available at this time. Stormwater runoff from the Lynden Academy developments appears to be conveyed to a stormwater pond in the southwest corner of the site, which outfalls directly to municipal storm drains in adjacent streets. Any runoff that may occur from the northern portion of the site is either collected in this pond or in the existing drainage ditch along Guide Meridian Road.

Regional soil mapping from Natural Resources Conservation Service (NRCS) indicates that soils on site are classified as Edmonds-Woodlyn loam, hydrologic group B/D. Our experience with similar soils in the vicinity indicates that stormwater infiltration systems will likely be rendered infeasible. In addition, Sound Geology, LLC (Sound Geology) performed a preliminary geotechnical study on site. Groundwater levels were monitored and found to be present at or near the ground surface during the peak of the wet season.

Based on the soils encountered and seasonal high groundwater, Sound Geology does not recommend on-site stormwater management using infiltration methods or permeable pavement.

Proposed improvements will create 108 lots which will consist of a mix of multi- and single-family housing, as well as associated public streets, private alleys, and open spaces for recreation. Access will be provided from Main Street and Pine Street.

Minimum stormwater management requirements for this project have been determined using the 2014 Department of Ecology Stormwater Management Manual for Western Washington (2014 DOE SWMM or DOE Manual). Proposed improvements will exceed 10,000 square feet of new hard surfacing and 5,000 square feet of pollution-generating hard surfacing. As such, the project will be subject to all 9 Minimum Requirements in the DOE Manual. On-site stormwater management BMPs, such as infiltration systems or dispersion systems, are expected to be infeasible due to soil/groundwater conditions and due to the lack of native vegetation on site. Therefore, stormwater will be managed with conventional flow control and treatment strategies. Minimum Requirements #1 through #9 are expected to be addressed as follows:

Minimum Requirement #1 Preparation of Stormwater Site Plans

This letter serves as a preliminary Stormwater Site Plan (SSP). All final stormwater management systems will be designed according to City of Lynden Development Standards and Department of Ecology (DOE) standards. A construction Stormwater Pollution Prevention Plan (SWPPP) will also be prepared and incorporated in the construction documents.

Minimum Requirement #2 Construction Stormwater Pollution Prevention (SWPPP)

A construction SWPPP will be prepared as part of the permitting documents and will address each of the 13 Elements identified in the DOE Manual. Since this project will exceed one acre of soil disturbance and all stormwater will discharge to waters of the state, an NPDES permit from Washington Department of Ecology will be required. The contractor will be required to provide a Certified Erosion and Sedimentation Control Lead (CESCL) to routinely monitor and inspect the temporary erosion controls that will be used during construction.

Minimum Requirement #3 Source Control of Pollutants

Pollutant sources for residential development include vehicular traffic, fertilizers, and other detergents or chemicals typical to building maintenance activities. Pollution will be controlled at the source to the maximum extent possible. All known, available and reasonable source control BMPs will be applied to the design and layout of the site and stormwater plans. Per the DOE Manual, land use controls that emphasize prevention of water quality impacts are preferred over treatment strategies. Therefore, clearing areas will be limited to the minimum areas necessary for construction. No vehicle or machinery repair or maintenance will be performed on site unless the maintenance area is contained and protected in such a way as to prevent any contact with stormwater. Maintenance

activities such as oil changes or fluid replacements should be performed off site to the maximum extent practicable.

Minimum Requirement #4 Preservation of Natural Drainage Systems and Outfalls

Currently, the entire project site is contained within a single regional basin and stormwater appears to drain to municipal conveyance systems near the site. No significant stormwater diversions are proposed as a part of this project. Natural drainage patterns will be maintained by discharging stormwater to the existing municipal stormwater conveyance systems.

Minimum Requirement #5 On-Site Stormwater Management

As a project that is expected to trigger Minimum Requirements #1 through #9, this project will be required to demonstrate compliance with the LID Performance Standard or shall use BMPs from List #2 in the 2014 DOE Manual. This project is expected to comply with List #2.

Projects choosing to utilize List #2 of the 2014 DOE Manual to meet the requirements of Minimum Requirement #5 – On-site Stormwater Management must consider the BMPs in the order listed for each type of surface. The first BMP that is considered feasible must be used on the site. No other On-site Stormwater Management BMPs are necessary for that surface. The following table identifies all of the required BMPs in List #2 and if they are feasible or infeasible.

TABLE 1 - MINIMUM REQUIREMENT #5 LIST #2				
Minimum Requirement		Feasible	Infeasible	Criteria Comments
#	Lawn & Landscaped Area			
1	Post-Construction Soil Quality and Depth - BMP T5.13	✓		This BMP will be applied to all areas outside of roofs or hard surfaces disturbed during construction.
#	Roofs			
1	Full Dispersion - BMP T5.30 Full Infiltration - BMP T5.10A		✓	Likely infeasible due to poor soil conditions and lack of suitable flow path onsite.
2	Bioretention – BMP T7.30		✓	Likely infeasible for infiltration due to poor soil conditions.
3	Downspout Dispersion BMP T5.10B		✓	Infeasible due to lack of vegetation area downstream from new buildings.
4	Perforated Stub-out Connection BMP T5.10C		✓	Likely infeasible due to groundwater elevations and poor soil conditions.
#	Other Hard Surfaces			
1	Full Dispersion BMP T5.30		✓	Infeasible due to impervious surface limits, lot size, and the lack of suitable vegetated areas downstream from the proposed improvements.
2	Permeable Pavement - BMP T5.15		✓	Likely infeasible due to existing soil types.
3	Bioretention – BMP T7.30		✓	Likely infeasible for infiltration due to poor soil conditions.
4	Sheet Flow Dispersion BMP T5.12 Concentrated Flow Dispersion BMP T5.11		✓	Infeasible due to lack of vegetation area downstream from new improvements.

As shown in Table 1, on-site stormwater management BMPs are expected to be deemed infeasible and cannot be reasonably implemented within the site. Stormwater runoff from the project will be managed on site with conventional flow control and treatment facilities. In addition, post-construction topsoil quality and depth will comply with BMP T5.13 for all disturbed areas that will be stabilized with vegetation.

Minimum Requirement #6 Runoff Treatment

New pollution-generating hard surface areas include the new road surfaces. These surfaces will exceed 5,000 square feet, and as such, are subject to runoff treatment. Less than 50% of the project runoff is expected to come from multi-family areas, therefore, this project is subject to basic treatment requirements in the 2014 DOE Manual.

Basic treatment will be achieved with filtration vaults, such as BioClean Modular Wetland Systems, prior to discharging to public storm drains. One filter vault is anticipated downstream from the stormwater detention system (see Minimum Requirement #7 below. These filtration systems are selected from Department of Ecology's Emerging Stormwater Treatment Technologies list and have achieved a General Use Level Designation (GULD).

Minimum Requirement #7 Flow Control

Since the site cannot reasonably accommodate full dispersion or infiltration systems, conventional stormwater detention systems will be used for flow control. As currently envisioned, a series of large-diameter pipes will be installed beneath sidewalks, alleys, and open spaces. A control structure will attenuate peak flows rates and durations from this facility in accordance with the DOE Manual. Downstream from the control structure, detained stormwater will outfall to the public storm drain system in Main Street.

Minimum Requirement #8 Wetlands Protection

No existing wetlands have been identified on site or in the immediate vicinity. If wetlands become identified during the design or permitting process, a biologist will be employed to determine impacts and mitigations, if any, that may be needed for compliance with city codes.

Minimum Requirement #9 Operation and Maintenance

As required by the DOE Manual, a separate operations and maintenance manual will be prepared for the proposed stormwater management facilities. The manual will contain a description of the facilities that were installed, what the facilities do, and how they work. The manual will also identify and describe maintenance tasks for each component of the facilities and the required frequency of each task.

As shown above, this project can comply with current stormwater management requirements in place for the City of Lynden. Please contact us with any questions or concerns regarding these observations.

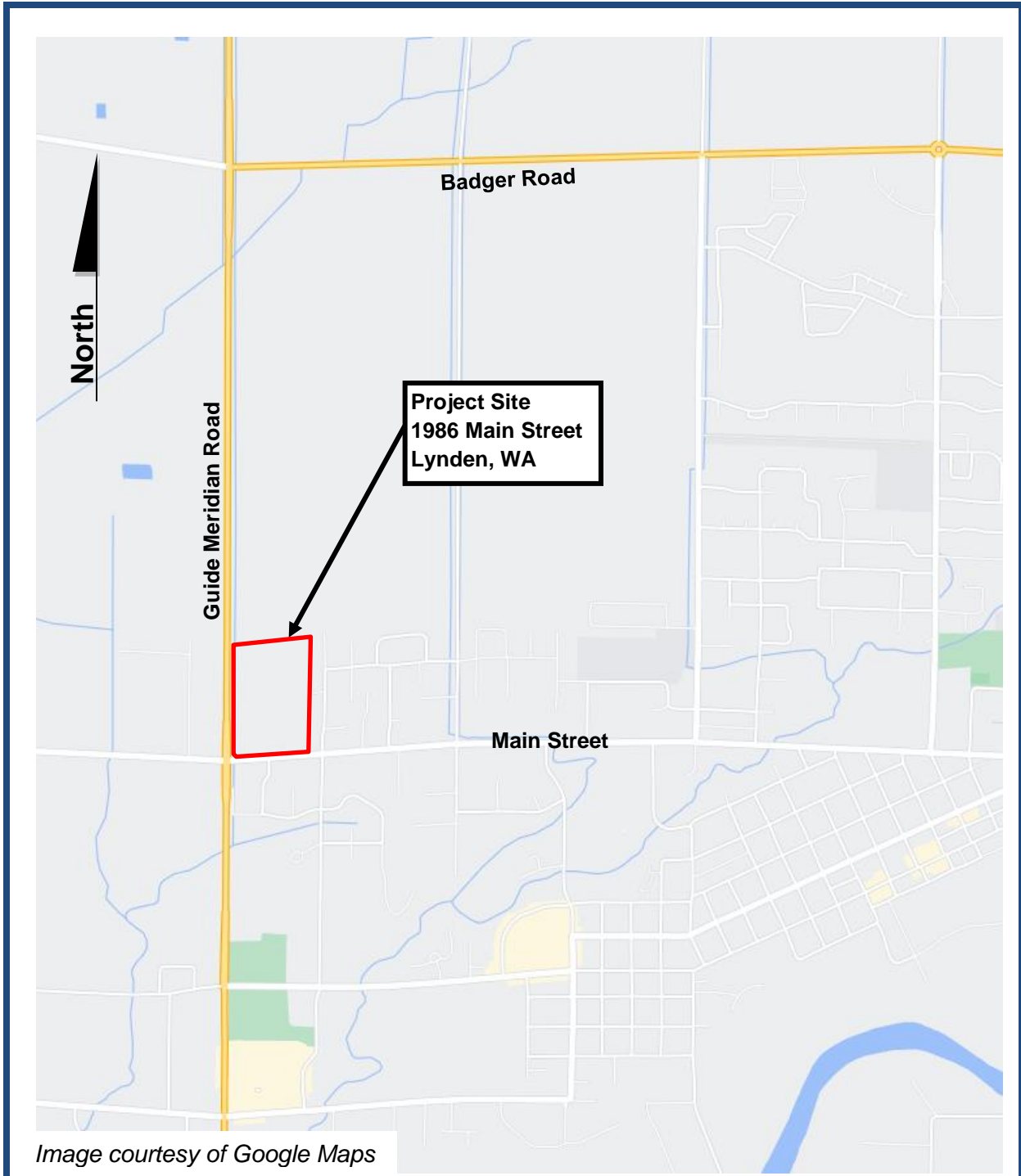
Sincerely,
Freeland and Associates, Inc.



Michael Bratt, PE
Associate Engineer

Attachments

Vicinity Map
Aerial Photograph of Site



Vicinity Map

Figure 1



Aerial Photograph of Site

Figure 2