

ENVIRONMENTAL ASSESSMENT WORKSHEET

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at:

<http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm>. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item, or can be addresses collectively under EAW Item 19.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. Project title: [Kayak Bay Village Development](#)

2. Proposer:

[Spirit Valley Land Company, LLC](#)
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3. RGU:

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[City of Duluth Planning](#)
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Consultant for RGU:

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4. Reason for EAW Preparation: (check one)

Required:
EIS Scoping
Mandatory EAW

Discretionary:
 Citizen petition
RGU discretion
Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

5. Project Location:

County: [St. Louis County](#)

City/Township: [Duluth](#)

PLS Location (1/4, 1/4, Section, Township, Range): [S23, T49N, R15W](#)

Watershed (81 major watershed scale): [3, St. Louis River Watershed](#)

GPS Coordinates: [46.71426, 92.20361](#)

Tax Parcel Number: [010-2520-03540, 010-2520-03680, 010-2520-02080, 010-2520-02170, 010-2520-02180, 010-2520-02181, 010-2520-02190, 010-2520-02230, 010-2520-02250, 010-2520-02280, 010-2520-01720, 010-2520-01840, 010-2520-11790, 010-2520-11980, 010-2520-12580, 010-2520-12740, 010-2520-11560, 010-2520-12090, 010-2520-12350, 010-2520-12830, 010-2520-11400, 010-2520-12250, 010-2520-13000, and 010-2746-00247](#)

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project;
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.

List of Attachments:

Figure 1: [County Map](#)

Figure 2: [Project Area](#)

Figure 3: [USGS Topographic Map](#)

Figure 4: [Map of Historic Properties](#)

Figure 5: [Existing Drainage](#)

Figure 6: [City of Duluth Zoning](#)

Figure 7: [Future Land Use](#)

Appendix A: [Proposed Development Plan Set](#)

Appendix B: [Natural Heritage Letter](#)

Appendix C: [State Historic Preservation Office Letter](#)

Appendix D: [Traffic Impact Study](#)

6. Project Description:

- a. Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

[Spirit Valley Land Company, LLC](#) is proposing a development called [Kayak Bay Village](#), that will include adding parking areas, residential buildings (multi-family and townhomes),

commercial buildings, and office buildings in the St. Louis River Corridor (Figure 1). A citizen petition is the reason for this EAW being conducted.

- b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

The Kayak Bay Village Development (Project), will be a mixed use, planned development and is located adjacent to the St. Louis River (Figures 1 and 2). A total of 9 development parcels (not to be confused with legal parcels like those identified by St. Louis County Parcel ID Numbers) are proposed: two parcels for open space (F, H), two parcels for residential development only (E, G), two parcels for commercial development only (A, I), and three parcels that may be used for either residential or commercial development (B, C, D). The potential maximum density, if all parcels were developed to the approved maximum density, could be a total of 105,000 square feet of retail space, 175,000 square feet of office space, 540 units of attached dwellings, or 65 units of unattached dwellings (townhomes). A map of proposed locations of structures is in Appendix A. Preliminary Development Plans referenced in this EAW were completed by Westwood Professional Services (Westwood) consulting engineers representing the proposer, Spirit Valley Land Company.

The developer, Spirit Valley Land Company, LLC, will be working with the City of Duluth to develop portions of the 27.13-acre Project located across Grand Avenue from the Warwick Street entrance to the lower Spirit Mountain Chalet.

The Project proposes to add residential buildings, retail space, commercial buildings, office buildings, and to construct Kayak Bay Drive, a road continuing south from Warwick Street. This road will provide access to the St. Louis River and the proposed amenities. Natural resource assets in the area include the Willard Munger State Trail, Superior Hiking Trail, Western Waterfront Trail, St. Louis River State Water Trail, and Lake Superior State Water Trail. The Project intends to take advantage of these resources and connect the Cross City, Munger, Western Waterfront, Duluth Traverse, and Superior Hiking Trails. Beyond being a connection to natural areas, the Project may offer amenities for users of the nearby Spirit Mountain.

Land disturbances will occur as a result of filling for roadways, structural support for buildings, and sidewalks resulting in an increase of approximately 12.8 acres of impervious surface. Approximately 0.5 acres of wetlands are proposed to be filled and mitigated to allow for road placement. An area at the end of the new ¼-mile, 28-foot wide, bituminous Kayak Bay Drive will be owned and operated by the City of Duluth. Kayak Bay Drive will be used to access improvements cited in this EAW. A little under half of the Project will remain as green/open space, keep mature trees, and preserve the streams.

1) Construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes

Land in the Project area is currently vacant. Features whose construction will require physical manipulation of the environment include: parking lots, commercial space, office space, Kayak Bay Drive, a private road, and residential buildings. The physical manipulation of the environment will include disturbance of soil to construct foundations and proper structural support of features.

Infrastructure needs include addition of public roadways with a current total land area of 1.40 acres for Kayak Bay Drive towards the northeast and an approximately equal-sized private street towards the southwest.

The Munger trail may be rerouted to avoid crossing new road construction. However, if the Munger Trail is not rerouted, there will have to be construction of pedestrian crossings of Kayak Bay Drive and any other roadway that crosses the Munger Trail. According to a Pedestrian Crosswalk presentation by St. Louis County and a crossing study (Westwood, 2017), pedestrian crossings for Kayak Bay Drive are likely to be marked crosswalks, advanced warning signs on Kayak Bay Drive, flashing beacons, a refuge median, and road crossing warnings painted on the Munger Trail. It is uncertain as of the time of this EAW who would own and be responsible for maintenance of the pedestrian crossing.

2) Modifications to existing equipment or industrial processes

There are no existing equipment or industrial processes. Therefore, modifications will not be conducted.

3) Significant demolition, removal or remodeling of existing structures

There are no existing structures. Therefore, demolition or remodeling will not be conducted.

4) Timing and duration of construction activities

The schedule for the project is to begin construction as soon as possible after approval and will span over a five-year time period. Construction of Kayak Bay Drive is anticipated to be started in 2018. Construction for future commercial buildings, office buildings retail, and housing units will follow.

c. Project magnitude:

Total Project Acreage	27.13 acres (including roads) (~10.16 acres D/U Easement Acres) (16.97 developed acres)
Linear project length	Approximately 2,000 feet
Number and type of residential units	540 attached dwellings 65 (unattached dwellings) townhomes
Commercial building area (in square feet)	105,000 sf (retail) 175,000 sf (office)

Industrial building area (in square feet)	0 sf
Institutional building area (in square feet)	0 sf
Other uses – specify (in square feet)	148,104 sf (open space or parking lot)
Structure height(s)	<u>Development parcels B, C, D:</u> <ul style="list-style-type: none"> max. height 72 feet (retail/office) <u>Development parcels A, I:</u> <ul style="list-style-type: none"> max height 20 feet (retail) max. height 35 feet (office) <u>Development parcels E, G:</u> <ul style="list-style-type: none"> max height 60 feet (dwellings: multi-family and townhomes) <u>Development parcels F, H:</u> <ul style="list-style-type: none"> No structures: open space/parking lot

- d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The Project will be carried out by Spirit Valley Land Company, LLC, a private company, with collaboration from the City of Duluth. Amenities added to the Project may possibly benefit users of the Spirit Mountain recreation area, which is directly across the road from the Project.

- e. Are future stages of this development including development on any other property planned or likely to happen? Yes No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

The schedule for the Project is to begin construction as soon as possible after approval and will span over a five-year time period. Construction of Kayak Bay Drive is anticipated to be started in 2018. Construction for future hotel, retail, and housing units will follow.

- f. Is this project a subsequent stage of an earlier project? Yes No

If yes, briefly describe the past development, timeline and any past environmental review.

Not applicable.

7. **Cover types:** Estimate the acreage of the site with each of the following cover types before and after development:

	Before	After		Before	After
Wetlands	1.4	0.9	Lawn/landscaping	0.3	5.2
Deep water/streams	-	-	Impervious surface	0	12.8
Wooded/forest	18.1	6.1	Stormwater Pond	0	1.0

Brush/Grassland	7.3	1.1	Other (describe)	-	-
Cropland	-	-			
			TOTAL	27.1	27.1

- 8. Permits and approvals required:** List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Permits to be applied for are listed below in the table below. Further permits may be deemed necessary upon approval of final development designs.

Unit of Government	Type of Application	Status
City of Duluth	Wetland Conservation Act Replacement Plan	Pending EAW
	Filing and Grading Permit	To be submitted
	Erosion Control Permit	To be submitted
	Shoreland Application	To be submitted
	Excavation Permit	To be submitted
	Final Plat	To be submitted
	Planned Development Regulating Plan	To be submitted
WLSSD	Sanitary Sewer Extension Application Form	To be submitted
USACE	Joint Application	To be submitted
MN/DNR	Joint Application	To be submitted
	Water Appropriations Permit	To be submitted, if required
MPCA	Stormwater Discharge Permit	To be submitted
St. Louis County	Funding of Kayak Bay Drive	Pending

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 19

9. Land use:

- a. Describe:
 - i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

Previously, the Riverside Golf Club operated from 1919 to 1945 in the Project area. The Project area (Figures 2 and 3) is currently open space (woods, grasslands, streams, and wetlands). Located just south of Grand Avenue, and north of the Lake Superior and Mississippi Railroad, St. Louis River Estuary and Tallas Island, the Project is located along the St. Louis River Corridor. Three public trails run east and west on and near the site, through the site is the Willard Munger State Trail, to the north is the Superior Hiking Trail, and to the south is the Western Waterfront Trail. Spirit Mountain Recreational Area is located just north of Grand Avenue. Immediately adjacent to the southwest is the residential community of Riverside and Riverside Park. Farther southwest and along the St. Louis River are the Tate & Lyle industrial plant and Spirit Lake Marina.

- ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

The 2006 City of Duluth Comprehensive Plan and the Riverside Small Area Plan propose the Project land to be used for preservation, urban residential, general mixed use, and neighborhood commercial purposes (Figure 7). Areas planned for preservation border the Willard Munger State Trail and the St. Louis River Estuary. Parts of these areas and those bordering the 84th Avenue West Creek, 85th Avenue West Creek, and Knowlton Creek are included in the sensitive lands overlay.

More specifically, Spirit Valley Land Company, LLC, in cooperation with the City of Duluth Planning Commission plans a mixed-use development in the Project area. A total of 9 development parcels are proposed: two parcels for open space, two parcels for residential development only, two parcels for commercial development only, and three parcels that may be used for either residential or commercial development.

- iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

Current zoning in the Project area consists mostly of Mixed Use Planned (MU-P) with a small section in the southwestern corner for Residential Traditional (R-1) (Figure 6). The northeast section of the Project also is part of the Cold Water Shoreland Management Zone, and the southwest half of the Project is part of the General Development Shoreland Management Zone. The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Number 2704210045C, designates the Project area as Zone C, an area of minimal flooding.

Adjacent areas are zoned as Industrial General (I-G) bordering the St. Louis River Estuary, R-1 throughout the Riverside community, Mixed Use Neighborhood (MU-N) along northern Project border of Grand Avenue, and Residential Urban (R-2) along the southern Project border of Grand Avenue.

- b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The City of Duluth developed and passed the Riverside Small Area Plan to provide guidance for the area that will influence future developments through an assessment of current demographics, land use, zoning, transportation, development opportunities, and environmental characteristics for the area. The proposed mixed-use development is compatible with the zoning and future plans of the Project detailed in the Riverside Small Area Plan and the City of Duluth Comprehensive Plan. Nearby land uses are also compatible with the proposed development as the Project aims to provide a variety of commercial and residential opportunities. Installing two roads onto the property is intended to provide access to the development and both navigable waters and public trails.

- c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

The proposed development maintains a buffer with the St. Louis River Estuary and the two creeks on site. Stormwater control measures will be incorporated in the construction and final grading plans. A tree survey has been conducted and a plan has been developed to preserve existing trees where possible. The proposed development intends to avoid and minimize any wetland area impacts, and mitigate any impacts that are unavoidable. The Project will provide roads and public parking areas for access to the proposed amenities and enhance the use of trails and the St. Louis River. Therefore, the proposed development is compatible with the plans set forth by the City of Duluth, as it aims to revitalize the St. Louis River Corridor.

Land Use Cumulative Effects: The Project, the City of Duluth Comprehensive Plan, and the Riverside Small Area Plan aim to provide better recreational, residential, and commercial services to the community of Duluth. As a result of these plans, open natural areas will be developed in accordance to zoning and future plans by the City of Duluth. As the zoning includes preservation and sensitive areas surrounding at-risk natural features, environmental impacts will be minimized.

10. Geology, soils and topography/land forms:

- a. Geology - Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

Bedrock underlying the Project is reported as being gabbro, sandstone, and siltstone. Due to the varying topography, depth to groundwater is expected to vary over much of the Project area. With wetlands and surface water bodies (streams) immediately adjacent to or in the Project area, unconfined, shallow aquifers are expected to exist. The estimated depth to groundwater ranges from 0 feet to approximately 20 feet.

Though bedrock can be shallow in the general area of Duluth, Minnesota, bedrock geology is not expected to be affected by the Project. Depth to bedrock is expected to range between 60 and 160 feet below current ground surface (Minnesota Department of Natural Resources, 2017). Even if basements are installed in buildings, it is not expected disturbance will reach the minimum expected depth to bedrock of 60 feet.

Cumulative effects: Because bedrock is not expected to be encountered, cumulative effects on bedrock are not anticipated.

- b. Soils and topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 11 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 10.

Soils in the Project area are described in the table below (US Department of Agriculture, 2017). This is not intended to be a detailed soil survey or replace a soil investigation.

NRCS Soil Type	Map Unit Name	Approximate Acres in Project Area	Approximate Percent of Total Acres
1020A	Bowstring and Fluvaquents, loamy, 0 to 2 percent slopes, frequently flooded	0.6	2.4%
E9E	Miskoaki-Fluvaquents, frequently flooded, complex, 0 to 45 percent slopes	6.4	23.9%
E18B	Urban land-Cuttre-Rock outcrop complex, 0 to 8 percent slopes	10.6	39.5%
E25D	Urban land-Amnicon-Rock outcrop complex, 0 to 18 percent slopes	8.6	32.2%

In the Project land's current state, erosion potential is expected to be low. Based on a site walk by AMI on August 11, 2017, there were no obvious erosional surfaces. The estimated volume of soil excavation is unknown since future development is not set, but the estimated area of land disturbance is estimated to be 17 acres. Impacts of Project activities from construction include grading for road, parking lot, and building construction. Impacts from operation with appropriate best management practices (BMPs) are expected to be low.

Cumulative effects: During the construction phase, significant filling, grading, and sloping will occur. Effects beyond the initial land restructuring is not expected.

11. Water resources:

- a. Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.
 - i. Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

The Project is located within the St. Louis River Watershed. Two creeks, 84th Avenue West Creek and 85th Avenue West Creek, run through the northeast and southwest sections of the property. Eleven wetlands exist throughout the Project area. Two trout streams are located near the Project: Stewart Creek to the south and Knowlton Creek to the north. To the south of the Project is St. Louis River Bay and to the north is Kingsbury Creek. As shown below in the Minnesota Pollution Control Agency (MPCA) 303d Impaired Waters List, Stewart Creek, Kingsbury Creek, and the St. Louis River are all listed by the MPCA as impaired waters and are located within one mile of the Project. Various pollutants have contributed to impaired aquatic life, recreation, and consumption. No impaired waters exist within Project boundaries and effects on impaired waters by this development are not expected.

Water body	Year Listed	Stream/River Segment ID	Affected Designated Use	Pollutant or Stressor
Stewart Creek	2012	04010201-884	Aquatic Recreation	Escherichia coli
Kingsbury Creek	2012	04010201-626	Aquatic Life	Aquatic macroinvertebrate bioassessments Fish bioassessments
St. Louis River (St. Louis Bay)	1998	04010201-501	Aquatic Consumption	Mercury in fish tissue and water column PCB in fish tissue and water column
St. Louis River (St. Louis Bay)	2002	04010201-501	Aquatic Consumption	DDT Dieldrin Dioxin (including 2,3,7,8-TCDD) Toxaphene

- ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

The depth to groundwater is estimated to range from 0 to 20 feet. The Project is not located within a MDH wellhead protection area. According to Minnesota Department of Health's (MDH) Minnesota Well Index, there are two unverified monitoring wells (552017 and 552018) at a depth of 10 feet to the northwest of the Project. Southwest of the Riverside neighborhood are two monitoring wells (559198 and 559200) at a depth of 14 feet.

- b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

- i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.
 - 1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.
 - 2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.
 - 3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.

Wastewater systems will be installed during the construction as shown on Westwood's preliminary plans (Appendix A). Sanitary sewer will be connected at two locations to existing sewer lines that run underground along the southeast side of the Project to the Western Lake Superior Sanitary District (WLSSD) for treatment. Communications with the WLSSD indicated that there appears to be sufficient treatment capacity and that they would do calculations at a future date in the project schedule. City of Duluth Public Works & Utilities Department- Engineering Division indicated that there are no issues in having adequate pipe capacity and collection capabilities to handle the wastewater.

- ii. Stormwater - Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

Stormwater from the Project flows into adjacent wetlands and 84th Ave. Creek and 85th Ave. Creek, which flow east-southeast into St. Louis River that leads to Lake Superior. Westwood developed preliminary grading and drainage plans for the (Appendix A). The approximately 27-acre Project is planned to have 17 net development acres with 12.8 acres of impervious surfaces. Stormwater will be collected and conveyed in stormwater sewers and directed to permanent stormwater filtration basins as shown on the plan map. The Project will require application for a National Pollutant Discharge Elimination System (NPDES) construction stormwater permit and develop a Stormwater Pollution Prevention Plan (SWPPP) using BMPs. Sediment and erosion control measures will be installed prior to and during construction activities to limit the potential for stormwater impacts. The Project will be in compliance with the City of Duluth's MPCA MS4 stormwater program. The pollutants specifically identified in the MS4 permit are total stormwater Volume (TVOL), total suspended solids (TSS), total phosphorus (TP) and temperature (T). The developer will restrict stormwater discharges to the maximum extent possible (MEP). The Westwood preliminary plans (Appendix A) on sheet number 7 depict the Project stormwater management plans with eight drainage boundaries and proposed filtration basins. Before infiltration basins are designed/constructed, soil testing at the actual location of the BMP will be performed to determine if the soils are conducive to infiltration per MPCA guidelines.

Construction plans for curb and gutters include road drains with "WIMCO" curb inlet protection, storm drain sediment control inlet hats to control stormwater sediment discharges, and City of Duluth gutter stamps warning against dumping.

Westwood's preliminary plan identifies silt fence and other erosion control features to be installed prior to any excavation and construction activity. Stormwater control BMPs will include:

- Site perimeter silt fencing or similar sediment control
- Slope stabilization with erosion control blankets
- Stormwater catch basins
- Inlet protection at catch basins
- Silt fencing or similar sediment control surrounding all temporary inactive stockpiles
- Construction work phasing to minimize the duration that any disturbed soil is exposed
- Rock construction entrances at access points
- Temporary protection or permanent cover over exposed soil areas if not being actively graded or at permanent grades within seven days of disturbance activity temporarily or permanently ceasing

The SWPPP preliminary plan will be updated as necessary to be in compliance with the City of Duluth's MPCA MS4 stormwater program to restrict discharges to the maximum extent possible (MEP). This is an approval for the stormwater management facilities, that they are appropriate for the site, and meet the requirements of the Unified Development Code (UDC). These requirements include rate/flood control, water quality controls, volume controls and areas that discharge to Knowlton Creek will require temperature

controls due to the cold-water trout stream regulations and control stormwater discharges leading to the St. Louis River.

- iii. Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

The Project does not intend to appropriate surface or groundwater. The Project will be connected to the City of Duluth public water system for potable water. Well installations are not planned. Construction dewatering is not anticipated to be more than 10,000 gallons of water per day or 1 million gallons per year.

- iv. Surface Waters

- a) Wetlands - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.

A wetland delineation was completed at the Project site by LHB, Inc in 2015. Eleven wetlands were delineated on the Project site totaling 1.37 acres. Kayak Bay Drive, approximately a quarter mile long and 28 feet wide including the curb, will be installed directly across from Warwick Street and leading into the development. A total of 0.25 acres of wetlands will be filled through the Right of Way available for road construction. Grading modifications for the proposed development of private amenities will also require 0.23 acres of wetlands to be filled. Eight of the eleven wetlands, Type 7 Wooded Swamp and Type 2 Wet Meadow, totaling 0.48 of the 1.37 acres of wetlands on site, will be permanently impacted. According to the wetland permit application submitted to the City of Duluth, temporary impacts will also occur for a maximum of 120 days during construction of the road.

In the proposed design, filling wetlands was avoided to the greatest extent possible. Wetlands near streams and ravines were avoided due to an anticipated larger impact compared to that of more isolated wetlands. Site development was minimized to maintain open green space and the road was designed with multiple limiting factors in mind. Limitations to roadway design include the available Right of Way for road construction, the street grade required by the City, the possible road crossing of the Willard Munger State Trail, the railroad crossing, proximity to Grand Avenue, surface

waters requiring shoreline setbacks, the water utility line running from the pump house up to Spirit Mountain, and State Aid Design Standards to be eligible for county funding of the road.

Development alternatives to minimize wetland impacts were considered. A do-nothing approach would not satisfy the need for residential and recreational development along the St. Louis River Corridor. Other road designs were also considered. However, due to safety and other environmental impacts, the current design was chosen. Open coniferous bog wetland credits will be purchased from the Mississippi and Superior Wetland Mitigation Bank to mitigate permanent impacts. This wetland bank is in St. Louis County and within the St. Louis River Watershed.

- b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

Surface water features beyond wetlands are not anticipated to be impacted. Designs will ensure that the onsite streams and the St. Louis River will not be altered. Work will not occur in the water and the buffer zones. BMPs will be installed and maintained surrounding the streams to reduce sediment input from construction activities.

Water Resources Cumulative Effects: This Project includes temporary and permanent disturbances to wetlands. For the proposed permanent effects, mitigation will be required. Measures will be taken to avoid disturbance of the St. Louis River and the streams on and near the site. As the City of Duluth works to revitalize the St. Louis River Corridor, further developments will require filling and grading of previously undeveloped lands. An increase of impervious surfaces will affect the watershed and water infiltration on site therefore decreasing groundwater recharge, as well as lead to greater susceptibility to flooding and erosion. Open space will be preserved to the greatest extent possible to allow for infiltration of water. Water bodies listed as sensitive areas, as well as preservation zones will help to ensure the protection of natural resources.

Cumulative Stormwater Effects: The Project will have an increase of 12.8 acres of impervious surfaces. This increase will be offset by installation of stormwater management BMPs. Stormwater will be collected and conveyed in stormwater sewers and directed to permanent sediment and filtration basins as shown on the plan. Sediment and erosion control measures will be installed to manage stormwater during construction activities. Permanent sediment filtration basins and curb and gutter stormwater controls are included in the design to contain and manage stormwater. The Project will be required to be in compliance with the City of Duluth's MPCA

MS4 stormwater program to restrict discharges to the maximum extent possible (MEP). City approval for stormwater management facilities will not be granted until the building plans have been submitted for review with full construction plans and a detail drainage report discussing the site, analysis and hydrologic and hydraulic modeling. The review will be completed by a licensed Civil Engineer with review and approval by the City Engineering department.

Cumulative Wastewater Effects: The wastewater will be directed to the sanitary district for treatment. The sanitary district has indicated that it has sufficient capacity to convey and treat the increase in wastewater and will confirm this with calculations.

12. Contamination/Hazardous Materials/Wastes:

- a. Pre-project site conditions - Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

The Project area is not listed on the MPCA database for contaminated sites (MPCA, 2017).

Within an approximate search distance of 0.25 mile (“close proximity”) around the Project area, there are no known sources of contamination (MPCA, 2017, NETROnline, 2017). There is one petroleum leak site located across Grand Avenue (hydraulically upgradient) that is just beyond a quarter-mile from the Project. If contamination did exist at a hydraulically upgradient location, there is potential for contamination to flow onto the Project area. This leak site, the “Spirit Mountain Maintenance Bldg” with leak site number LS0006604, was discovered in 1993 and received site closure from the MPCA on April 9, 1997. The term “site closure” does not necessarily mean that all petroleum contamination has been removed but “site closure” means that the MPCA believed that contamination had been cleaned up satisfactorily.

The pre-Project, historic golf course operations on portions of the Project are not likely to have contributed to historic sources of contamination. Therefore, Project construction and operation are not likely to exacerbate potentially existing contamination.

In summary, there does not appear to be significant risk of contamination existing for the Project.

Cumulative effects: Cumulative effects are not anticipated for contamination because no known sources of contamination exist.

- b. Project related generation/storage of solid wastes - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

Waste anticipated to be generated during construction consists of fairly benign objects such as used construction/snow fencing, various packaging wraps, boxes, etc. These objects are

anticipated to be stored in containers and removed from the Project, such as during a weekly trash pickup. There is some potential for on-site storage of fuel tanks for construction vehicles, leaks from hydraulic lines, and leaks of other fluids from construction equipment. As long as construction workers follow proper procedure for cleaning up spills (such as in a Spill Prevention Control and Countermeasure plan), there are not anticipated to be effects from contaminated construction equipment fluid leaks.

Solid waste that is anticipated to be generated during operation include standard household and commercial business type waste that should be disposed of in accordance with applicable laws.

Cumulative effects: Potential cumulative effects from generation of anticipated waste include various litter being blown around and accumulating against vertical objects such as buildings, fences, and vegetation. This could be avoided by having trash receptacles at various locations across the Project, properly closing lids of trash receptacles and dumpsters, regular trash pickups of dumpsters, and fences around dumpsters to limit the spread of trash being blown out of the dumpster should the lid be left open.

- c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

Use and storage of hazardous materials during construction will be limited to fuel and lubricants used for various construction equipment. Any on-site storage of fuel tanks for equipment must be properly protected from spills, such as in a spill prevention control and countermeasure (SPCC) plan and stormwater management plan (SWPPP).

As of September 2017, it is believed that use and storage of hazardous materials during operation will be limited to items associated with maintenance equipment: small fuel cans, small containers of engine oil, minor amounts of grease, etc. Use and storage during operation and construction shall follow applicable regulations.

Cumulative effects: There will likely be hazardous substances on site during construction and operation, but current plans make it sound as if the likelihood of these materials being released into the soil or groundwater are minimal.

- d. Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

Hazardous waste is not anticipated to be generated during the Project.

Cumulative effects: Cumulative effects are not anticipated.

13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features):

- a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

The proposed Kayak Bay Village Department is located within the Northshore Highlands Subsection of the Laurentian Mixed Forest, as classified by the MNDNR. Pre-settlement vegetation was forest including white pine, red pine, jack pine, balsam fir, white spruce, aspen-birch, and conifer swamps. Following the logging industry in the 20th century, much of the pine was logged and replaced with northern hardwoods.

Two trout streams are located within the vicinity of the Project and are regularly stocked with trout by the Duluth Area Fisheries Office, according to the MNDNR website. Stewart Creek is stocked with rainbow trout and Kingsbury Creek with brook trout. The St. Louis River, located south of the Project is home to many fish species including the lake sturgeon, a special concern species, as well as walleye, northern pike, smallmouth bass and largemouth bass. Many bird, mammal, reptile and amphibian species frequent the area including cedar waxwings, chickadees, black bear, whitetail deer, beaver, red fox, chipmunks, squirrels, turtles, and frogs.

- b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (ERDB _____) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

A Natural Heritage Information System data request was made to the MNDNR on September 1, 2017 to identify any rare species that may exist on site. As per correspondence # ERDB 20180157, three species were identified within the area: two endangered plant species, the eastern hemlock and the pale sedge, as well as a special concern fish species, the lake sturgeon. MNDNR has the authority to prohibit the taking of any species listed as endangered or threatened. Additional information obtained from the MNDNR website regarding these species is found below.

Eastern Hemlock (*Tsuga canadensis*): This coniferous evergreen tree is one of Minnesota's most rare trees even before the era of logging and slash fires. It was first listed as a special concern in 1984, and elevated to endangered in 2013 to allow for legal protection. The eastern hemlock can be found in well-drained, sheltered valleys and ravines and is usually scattered within mixed hardwood-conifer forests. This species is vulnerable to land clearing activities, drought, and whitetail deer predation. Taking of this species, including its seeds, is prohibited without a take permit. Therefore, unless deemed unavoidable, a buffer zone of one tree length around the perimeter will be established as per recommendations by the MNDNR. A tree survey was conducted on site and while eastern hemlocks were noted as a special tree within the area, none were documented within the Project borders.

Pale Sedge (*Carex pallescens var. neogaea*): This primarily eastern plant species has rare occurrences in the moist, grassy or rocky habitats along the margin of fire-dependent forests that border Lake Superior. The pale sedge is commonly mistaken for the Torrey's sedge, a much more

common species within the area. This species is vulnerable to habitat loss caused by developments and certain high intensity recreational activities.

Lake Sturgeon (*Acipenser fulvescens*): This primitive migratory fish species is commonly found in moderately clear large rivers, littoral zone of lakes, as well as deep water zones of lakes. Once common throughout the state, population have declined due to overfishing and pollution. Lake sturgeon are also vulnerable to altered stream hydrology, and decreases in water quality caused by sedimentation. This project proposes to use effective erosion control BMPs and buffer zones to avoid sedimentation of the nearby streams and the St. Louis River.

- c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

Lake Sturgeon are not expected to be affected by the proposed development. Buffer zones will be acknowledged surrounding all water features. Both the eastern hemlock and pale sedge are plant species found within the vicinity of the proposed development. A tree survey was conducted and did not document any eastern hemlock trees on the property. Therefore, effects to this endangered species is not expected. As the pale sedge may exist on site, disturbance will be minimized to the greatest extent possible and a take permit will be applied for is disturbances to this endangered species is unavoidable.

To avoid the introduction and spread of invasive species, all equipment will be inspected, cleaned and dried before entering or leaving the Project site. Land disturbance and disturbance to any native vegetation will be minimized to the greatest extent possible. Any material that is moved will remain onsite, as well as be transferred back to its original location of removal.

- d. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

Proper stormwater and erosion control BMPs will be utilized to minimize impact to nearby waters and sensitive ecological features. Land disturbance and vehicle traffic will be minimized to the greatest extent possible during the construction phase. Native vegetation will also be preserved when possible, as well as native seeds will be used for any revegetation of the area. A take permit will be pursued if disturbances to endangered species is deemed unavoidable.

Cumulative Effects: As the area continues to develop, habitat suitable for rare and endangered species may continue to decline. Construction activity will also temporarily disturb the surrounding wildlife habitat and plant communities. The pale sedge is most vulnerable to growth and development in the area. This proposed development is not expected to affect the lake sturgeon, as special precautions will be taken to avoid disturbance of the water features nearby. Although the eastern hemlock has been identified in the area, none were documented on site during the tree survey completed by LHB.

14. Historic properties:

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

A literature search has been conducted to identify historic or archeological sites that may potentially be affected by the proposed development. Both the National and State Register of Historic Places have been examined, as well as a Project review by the State Historic Preservation Office (Appendix C). A Phase I archeological survey was recommended to be completed and may be pursued in the future. Three historic properties were identified north and south of the site, with no properties existing within the Project (Figure 4). Skyline Parkway (SL-XXX-003) and Spirit Mountain are located north of the Project, and the Lake Superior and Mississippi Railroad is located immediately south. Details of these properties and their significance are discussed below.

Skyline Parkway: Skyline Parkway, located north of the Project, is a historic property deemed eligible for listing in the National Register of Historic Places through a previous federal Section 106 review. Construction of Skyline Parkway began along the ancient gravel shoreline of glacial Lake Nemadji in 1889 and continued in multiple phases until 1929 when seven separate sections combined to become Skyline Parkway (City of Duluth Parks & Recreation, 2017). This scenic route runs 46 miles following the entire length of the City of Duluth from semi-wilderness to urban areas, with numerous scenic outlook points (City of Duluth, 2015).

Spirit Mountain: Spirit Mountain, located north of the Project, has been identified as a significant site to Native American Tribes in An Ethnographic Study of Indigenous Contributions to the City of Duluth. Called Manitouahgebik (Spirit Mountain) by the Ojibwe people, the forest at the top was believed to host the Great Spirit in the forest at the top of Spirit Mountain. In the 1860's much of the hillside was used by the Ojibwe for maple sugar camps (City of Duluth, 2015). It is believed the unusually shaped large mounds that exist on Spirit Mountain are burial grounds. In 1974, Spirit Mountain Recreation Area was developed by the City of Duluth covering 1,123 acres of hillside (City of Duluth, 2003).

Lake Superior and Mississippi Railroad: The Lake Superior and Mississippi Railroad, located immediately south of the Project, is a historic railroad line determined eligible for listing in the National Register of Historic Places through a previous federal Section 106 review. This was the first railroad line in Duluth. The first train traveled from St. Paul to Duluth on the night of August 1, 1870 (Lake Superior & Mississippi Railroad, 2017). Through the years the railway traded names and owners, eventually returning to its original name in 1980 as the Lake Superior and Mississippi Railroad. A portion of the original road-bed is used for tourist excursions (Lake Superior & Mississippi Railroad, 2017).

Historic Properties Cumulative Effects: Adverse effects to these historic sites are not likely to occur with this proposed development. However, potential effects may include interference with scenic and natural views.

15. Visual:

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

The Project itself is not believed to contribute to scenic views from the surrounding area. Upon initial inspection of maps of developments in the surrounding area, there appears to be potential for the elevation of buildings on the Project to block views of the St. Louis River from homes on Bessemer Street and from the Spirit Mountain Chalet across Grand Avenue. However, based on a drive-through on Bessemer Street, there is not currently a view of the St. Louis River from homes on Bessemer Street. It is unclear whether or not there is currently a view of the St. Louis River from the Spirit Mountain Chalet. Windows on the Chalet are facing essentially straight east and straight south. Development parcels A, B, G, and I, have a higher likelihood of impacting potential scenic views of the St. Louis River from the Chalet. The elevation of the windows is not clear but the ground elevation around the Chalet is approximately 700 feet and the windows of the Chalet appear to be approximately 15 feet above ground, which puts views from the windows at approximately 715 feet elevation. The Chalet view of the river would be going downhill. To obstruct a view of a downhill location from an uphill location, elevations of tops of buildings in the Project could be slightly less than the 700 feet of ground. Estimated maximum elevations of buildings range from 705 feet to 738 feet in development parcels A, B, G, and I. Consequently, there is some potential for the views from the Chalet to be affected by the proposed development.

From the Project area, there is a scenic view of the St. Louis River from some raised portions of the where tree cover is sparse. Visual effects from the Project may include obstruction of the scenic view of the St. Louis River.

Visual Cumulative Effects: There is potential for the buildings to block the view from surrounding areas. Without a detailed look at views from surrounding land relative to the Project, the full effect cannot be known. It is suggested that investigation of current status of views from the Chalet and a maximum elevation of the top of a building be determined prior to making final development plans.

16. Air:

- a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

The Project includes the development of a road, residential properties, retail, lodging, outfitting, and mixed-use development (retail and multi-family housing). Stationary emission sources are not included in the development plans.

- b. Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic

operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

Westwood conducted a traffic study of the proposed development, the results of which were summarized in an April 29, 2014 memo that concluded that the full build-out with mixed uses would generate 9,500 vehicle-trips per day. Westwood's 2-13-2017 preliminary plans show less than 400 parking spaces. Vehicle air emissions include carbon monoxide and volatile organic compounds (a primary ingredient of ozone) and nitrogen oxides. Control of these air pollution sources must rely on the federal government to set fuel-efficiency and fuel type standards. Vehicle-related emissions from the development can be reduced by encouraging residents to drive less and operate more efficient vehicles. The Project offers transportation alternatives including access to established bus routes and shelters along Grand Avenue. In addition, options to use biking and hiking trails, that run adjacent to the development, can reduce congestion and improve air quality.

Cumulative effect: There will be some increase in vehicle emissions associated with the Project, but not considered a significant air quality impact.

- c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

Dust emissions will temporarily increase during construction due to site grading and construction activities. Dust generated during construction will be minimized through standard construction management practices with dust control measures such as application of water to haul routes and stabilization of areas with temporary seeding and mulching. In addition, combustion exhaust from construction equipment will emit odors in the direct vicinity of the construction activities. However, the work will be temporary in nature and typical of this type of construction project; adverse impacts to receptors are not anticipated. The closest residential receptors to the construction activities will be approximately 200 feet to the southwest. Upon completion of the Project, no emissions of dust or odors are anticipated.

Cumulative effect: There will be some increase in dust and odor emissions during the construction phase of the Project. They are temporary and not a significant air quality impact.

17. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

During construction, noise will be generated from construction equipment and Project construction activities. Noise levels in the Project will vary depending on the type of equipment in use, the operating mode, and the location of the equipment on the construction site. Working equipment may

be concentrated in a specific area or spread out over a larger area of the Project. For these reasons, the construction equipment noise effects on a single receiver point will vary both day-to-day and hour-to-hour. Construction activities should be completed during normal working hours. Project construction activities will also lead to temporarily increased traffic along Grand Avenue. After completion of the construction activities, noise levels will be typical of a mixed-use development (retail and multi-family housing).

Cumulative effect: There will be some increase in noise during the construction phase of the Project. They are temporary and not considered a significant environmental impact.

18. Transportation

- a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

A Traffic Impact Study was prepared by Westwood in April of 2014 (Appendix D). The proposed development is located along Grand Avenue, a main arterial roadway for West Duluth. No parking spaces currently exist onsite and approximately 400 parking spaces are proposed to be installed to accommodate for residential, retail, and recreational purposes. A new road, Kayak Bay Drive, is proposed to continue south from Warwick Street and through the development. Average weekday daily traffic is estimated to raise approximately an additional 9,544 from the existing 11,040 to 20,600 vehicle trips a day.

There is both a morning and evening peak hour of traffic. The current weekday peak morning hour traffic rate is 716 trips per day. This development is expected to generate an additional 719 trips per day for a total of 1,435 trips in the peak morning hour. The current weekday peak evening hour traffic rate is 1,075 trips. This development will add 715 trips for a total of 1,790 trips in the peak evening hour. The trip generation was determined using the standard trip generation rates included in Trip Generation, 9th Edition (Institute of Transportation Engineers, 2012). Alternative methods of transportation are limited to the Duluth Transit bus lines and sidewalks along Grand Avenue. Multiple bus stops are located along Grand Avenue.

- b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. *If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.* Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: <http://www.dot.state.mn.us/accessmanagement/resources.html>) or a similar local guidance.

Traffic congestion along Grand Avenue due to developments have been previously reported, however, traffic improvements have not been made. This development is expected to further increase traffic and therefore a traffic signal is suggested (Westwood, 2014). Furthermore, due to the close proximity to many public trails and recreational areas, pedestrian high visibility

crosswalks are recommended, as well as push buttons at signalized intersections to accommodate for non-motorized traffic (Westwood, 2014).

- c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

Installing Kayak Bay Drive will allow for more streamlined access to the proposed development. The approximately 400 proposed parking spaces will also allow for parking off main roadways. It was suggested by Westwood (2014) that traffic signals be installed to better control the increased traffic flow.

Transportation Cumulative Effects: This traffic data was collected during Spirit Mountain's off-season; therefore, the traffic can be expected to increase in the winter. With the increase in traffic, as well as an increase of traffic expected with other developments, a traffic signal was suggested Westwood (2014). An installed traffic signal will better control the influx of traffic during peak hours.

- 19. Cumulative potential effects:** (Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

All necessary cumulative potential effects analysis information has been presented item by item.

- a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.
- b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.
- c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

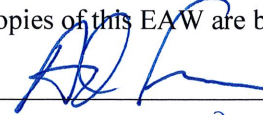
- 20. Other potential environmental effects:** If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

Other potential environmental effects are not anticipated.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature 

Date 10/23/2017

Title Community Planning Manager

REFERENCES

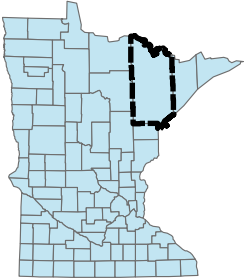
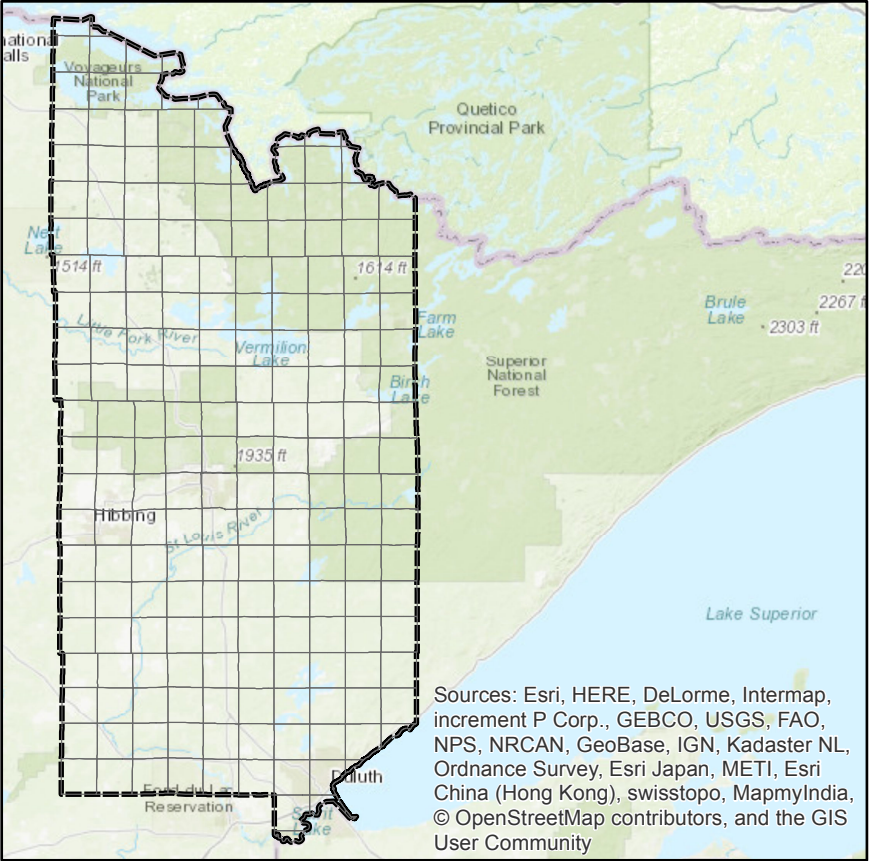
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Figures

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St. Louis County, Minnesota



Legend

-  County Boundary, St. Louis County, MN
-  Townships, St. Louis County, MN

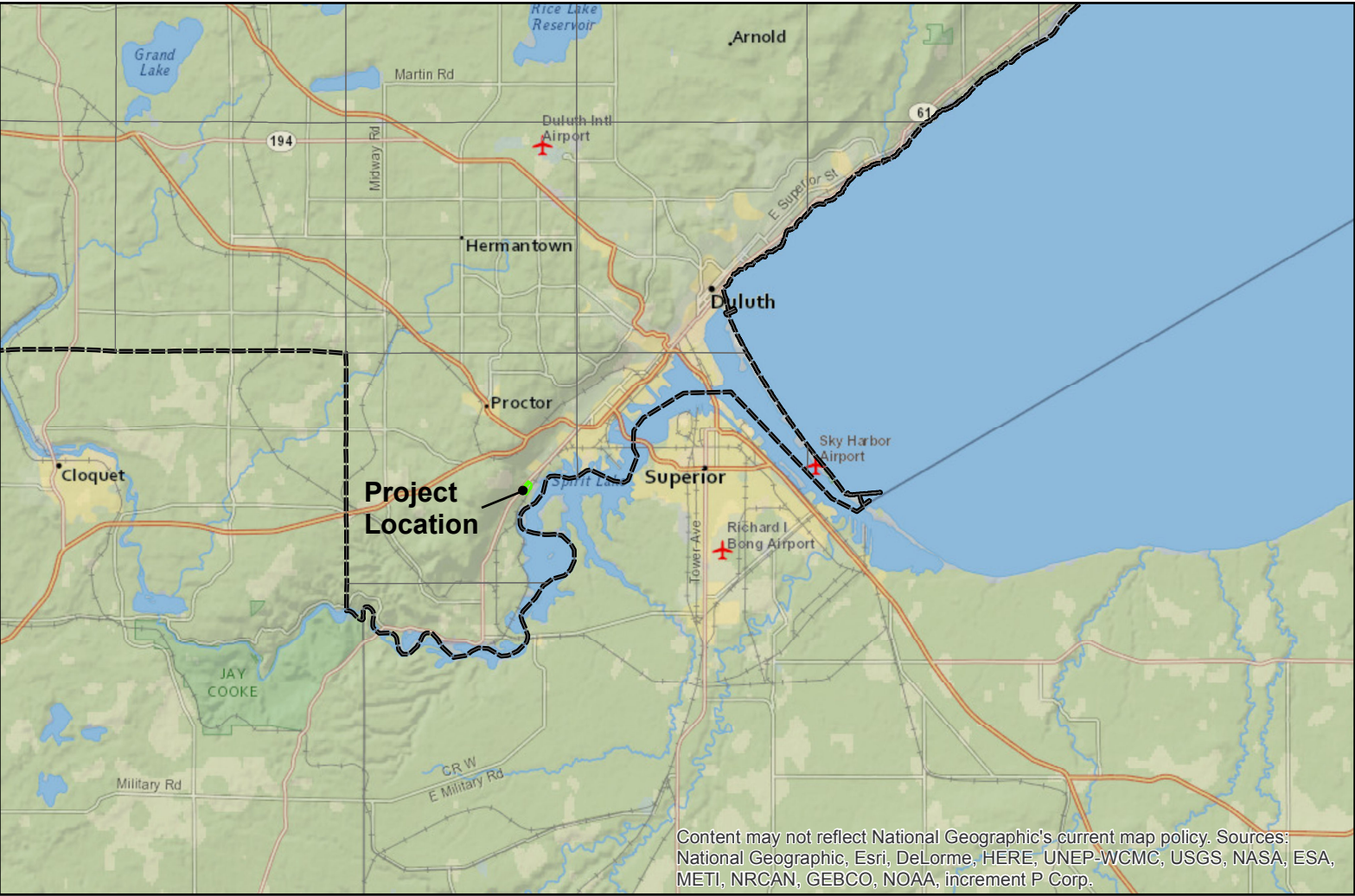


Figure 1: County Map

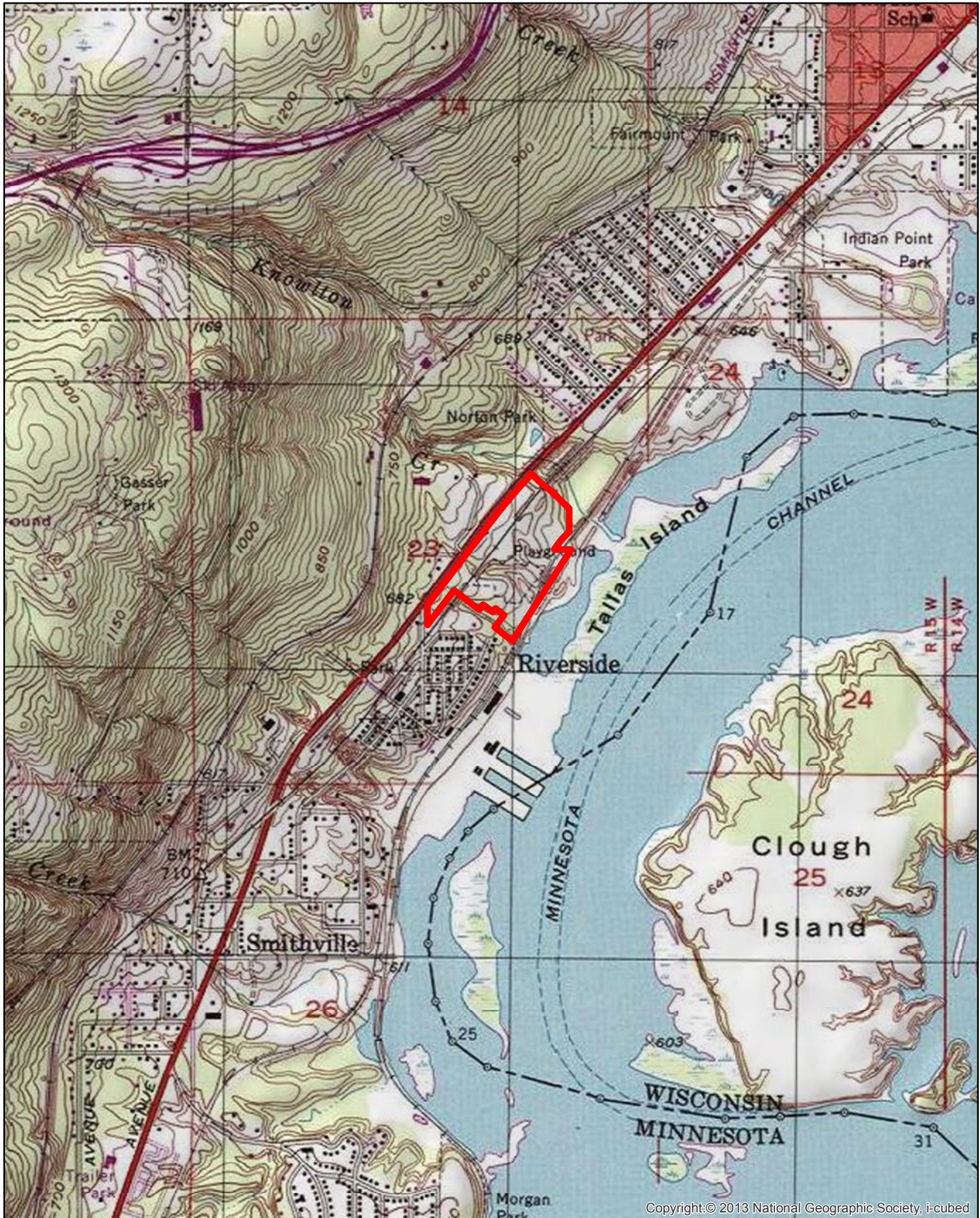
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Figure 2: Project Area



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Figure 3: USGS Topographic Map




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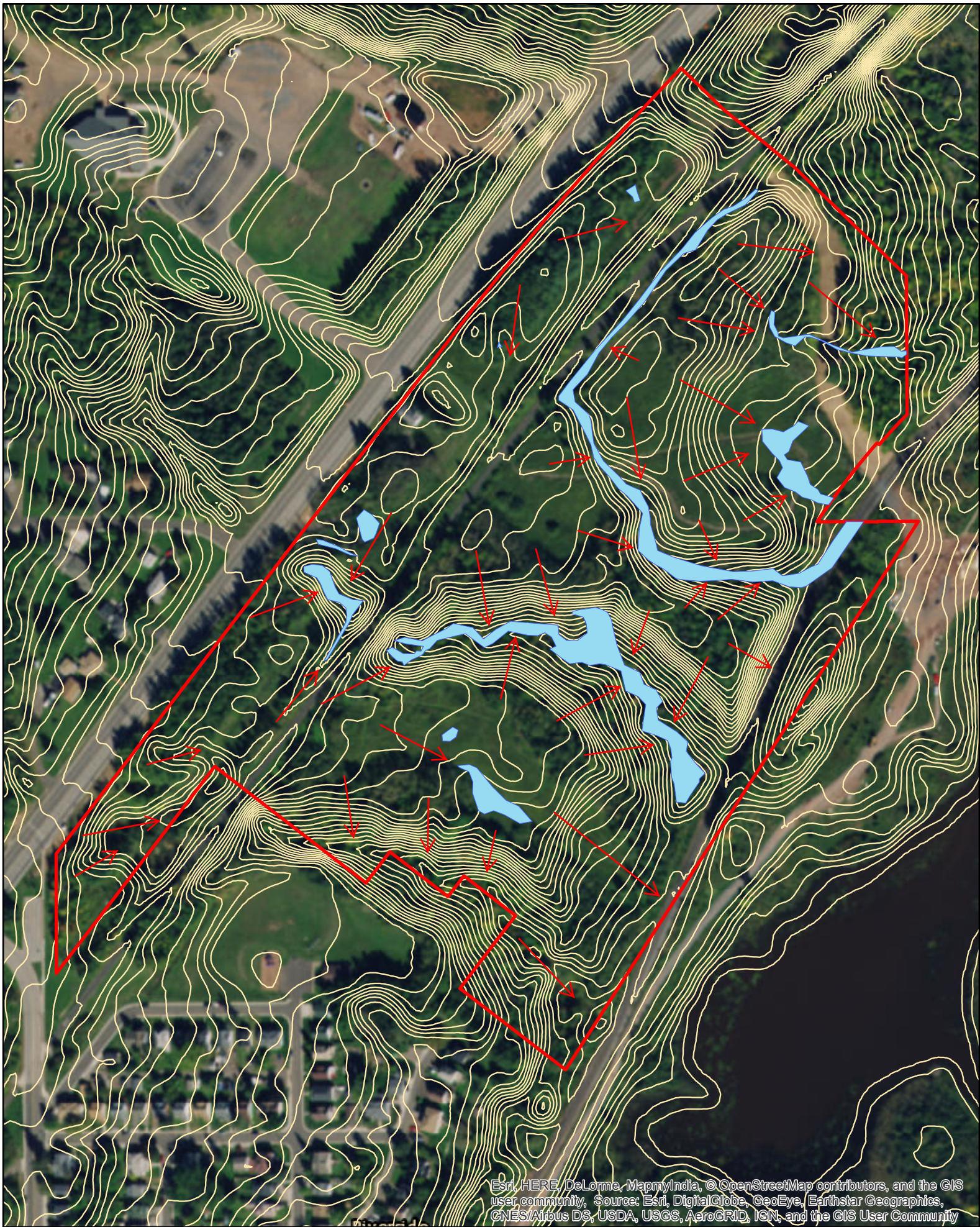
Figure 4: Map of Historic Properties



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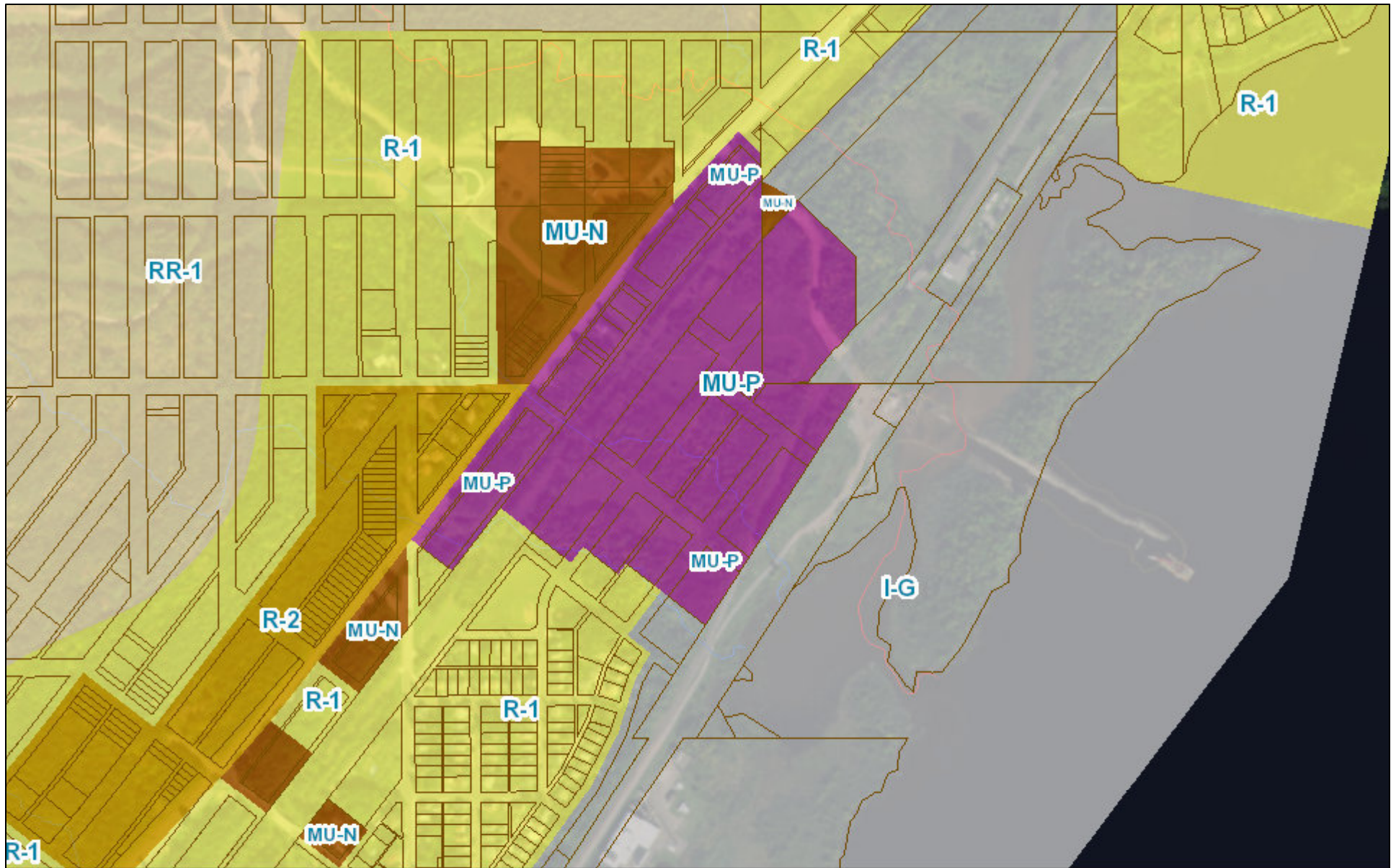
Figure 5: Existing Drainage

Flow Direction 



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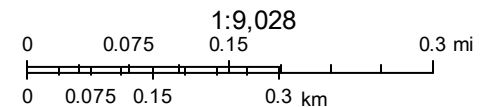
Figure 6: City of Duluth Zoning



October 19, 2017

Zoning

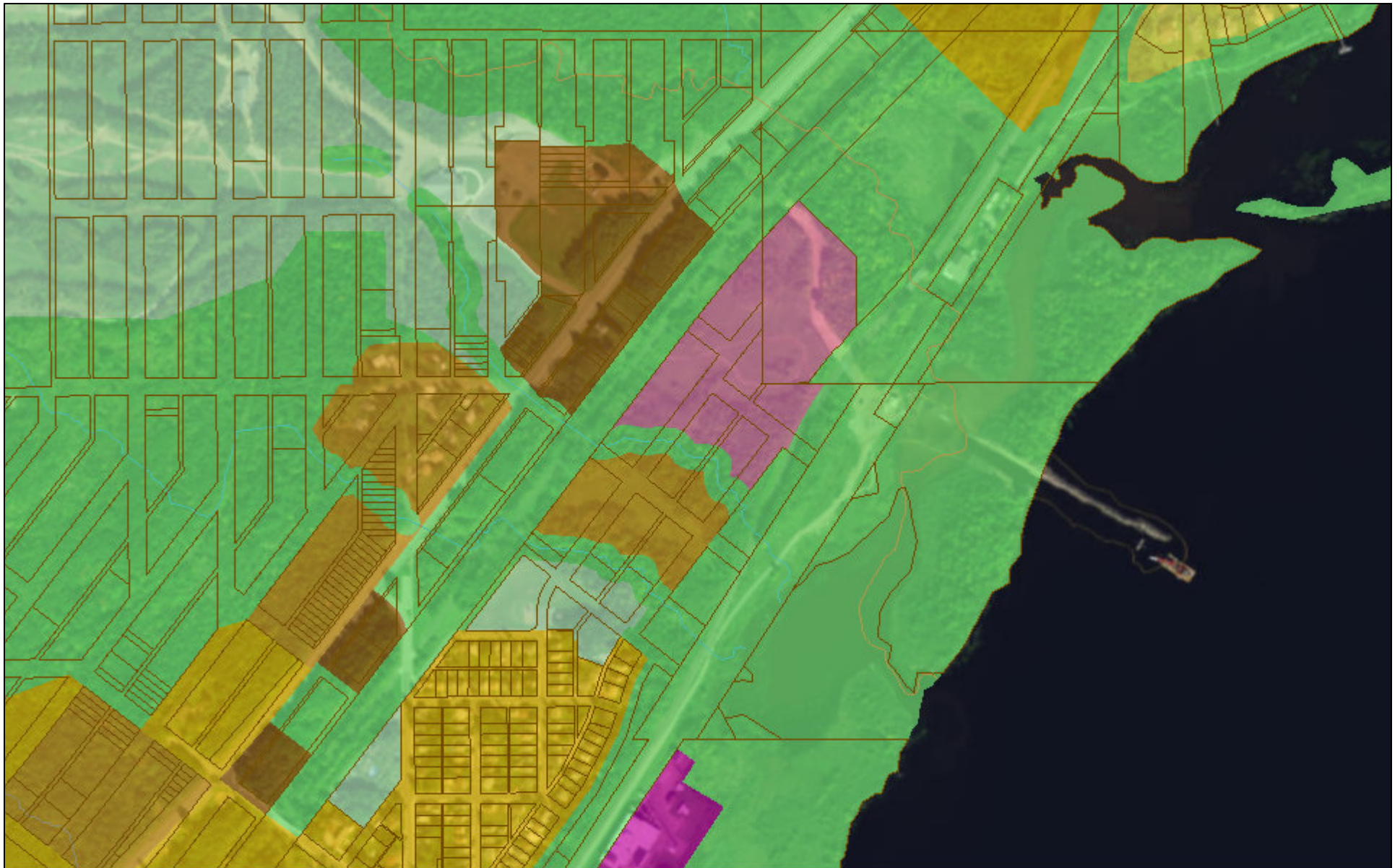
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| <ul style="list-style-type: none"> ■ F-1 (Low-Rise Neighborhood Shopping) ■ F-2 (Low-Rise Neighborhood Mix) ■ F-3 (Mid-Rise Community Shopping) ■ F-4 (Mid-Rise Community Mix) | <ul style="list-style-type: none"> ■ F-5 (Mid-Rise Community Shopping and Office) ■ F-6 (Mid-Rise Neighborhood Shopping) ■ F-7 (Downtown Shopping) ■ F-8 (Downtown Mix) ■ F-9 (Canal Park Lakefront) | <ul style="list-style-type: none"> ■ RR-1 (Rural Residential 1) ■ RR-2 (Rural Residential 2) ■ R-1 (Residential Traditional) ■ R-2 (Residential Urban) ■ R-P (Residential Planned) ■ MU-B (Mixed Use Business Park) | <ul style="list-style-type: none"> ■ MU-N (Mixed Use Neighborhood) ■ MU-P (Mixed Use Planned) ■ MU-W (Mixed Use Waterfront) ■ I-G (Industrial General) ■ I-W (Industrial Waterfront) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



City of Duluth, MN Office of GIS
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus

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Figure 7: Future Land Use



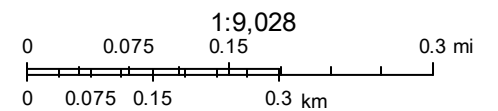
October 19, 2017

Future Land Use

- Preservation
- Preservation/Outside Duluth
- Recreation
- Recreation/Outside Duluth
- Rural Residential

- Low-density Neighborhood
- Traditional Neighborhood
- Urban Residential
- Neighborhood Commercial
- Auto Oriented Commercial

- Commercial Waterfront
- General Mixed Use
- Neighborhood Mixed Use
- Light Industrial
- General Industrial
- Industrial Waterfront
- Business Park



City of Duluth, MN Office of GIS
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus

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Figure 8: Shoreland Management Zones



October 19, 2017

Duluth Streets

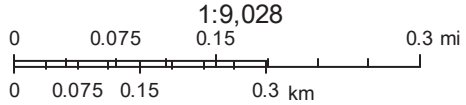
- Interstate
- US Highway

- MN Highway
- CSAH; County Rds
- Local Roads

Shoreland Management Zones

- ▣ Cold Water
- ▣ Natural Environment

- ▣ General Development



City of Duluth, MN Office of GIS
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus

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Appendix A
Proposed Development Plan Set

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Preliminary Plans

for

Site, Grading, Erosion Control, Utilities and Tree Preservation

for

Kayak Bay Duluth, Minnesota

Prepared for:

Spirit Valley Land Company, LLC

P.O. Box 235

Chanhassen, Minnesota 55317

Contact: Brad Johnson

Phone: 612-369-4364

Fax: 952-937-3506

Prepared by:

Westwood

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Toll Free (888) 937-5150 westwoodps.com

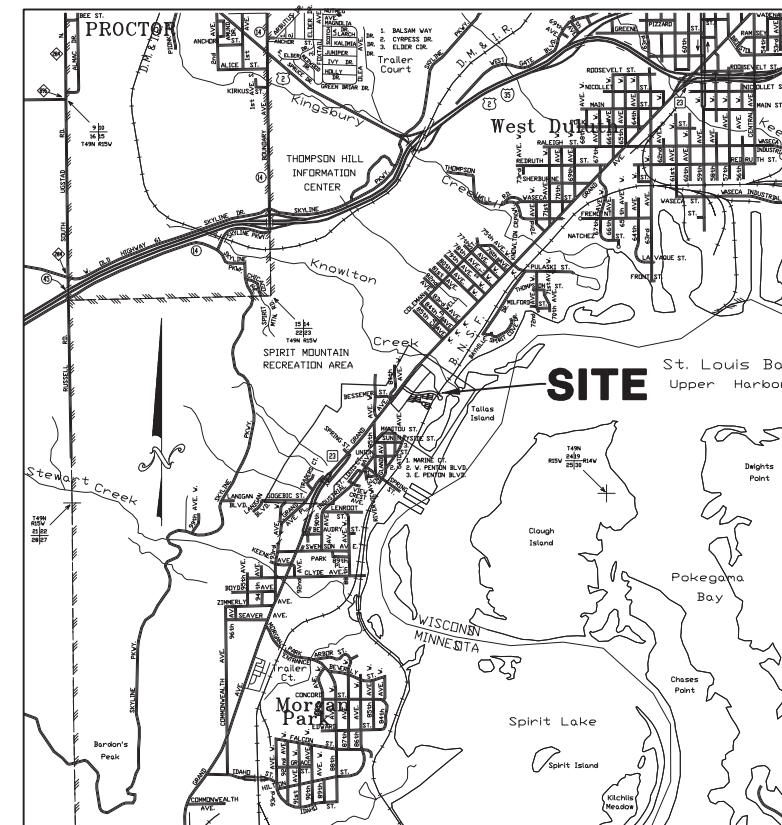
Westwood Professional Services, Inc.

Project number: 0002483.00

Contact: Cory Meyer

Sheet List Table	
Sheet Number	Sheet Title
1	COVER
2	EXISTING CONDITIONS
3	PRELIMINARY PLAT
4	SITE PLAN
5	CONCEPT GRADING PLAN
6	CONCEPT UTILITY PLAN
7	STORMWATER MANAGEMENT PLAN
8	PRELIMINARY LANDSCAPE & TREE PRESERVATION PLAN
9	PRELIMINARY LANDSCAPE & TREE PRESERVATION PLAN
10	DETAILS
11	DETAILS

Vicinity Map



(Not to Scale)

NO.	DATE	REVISION	SHEETS

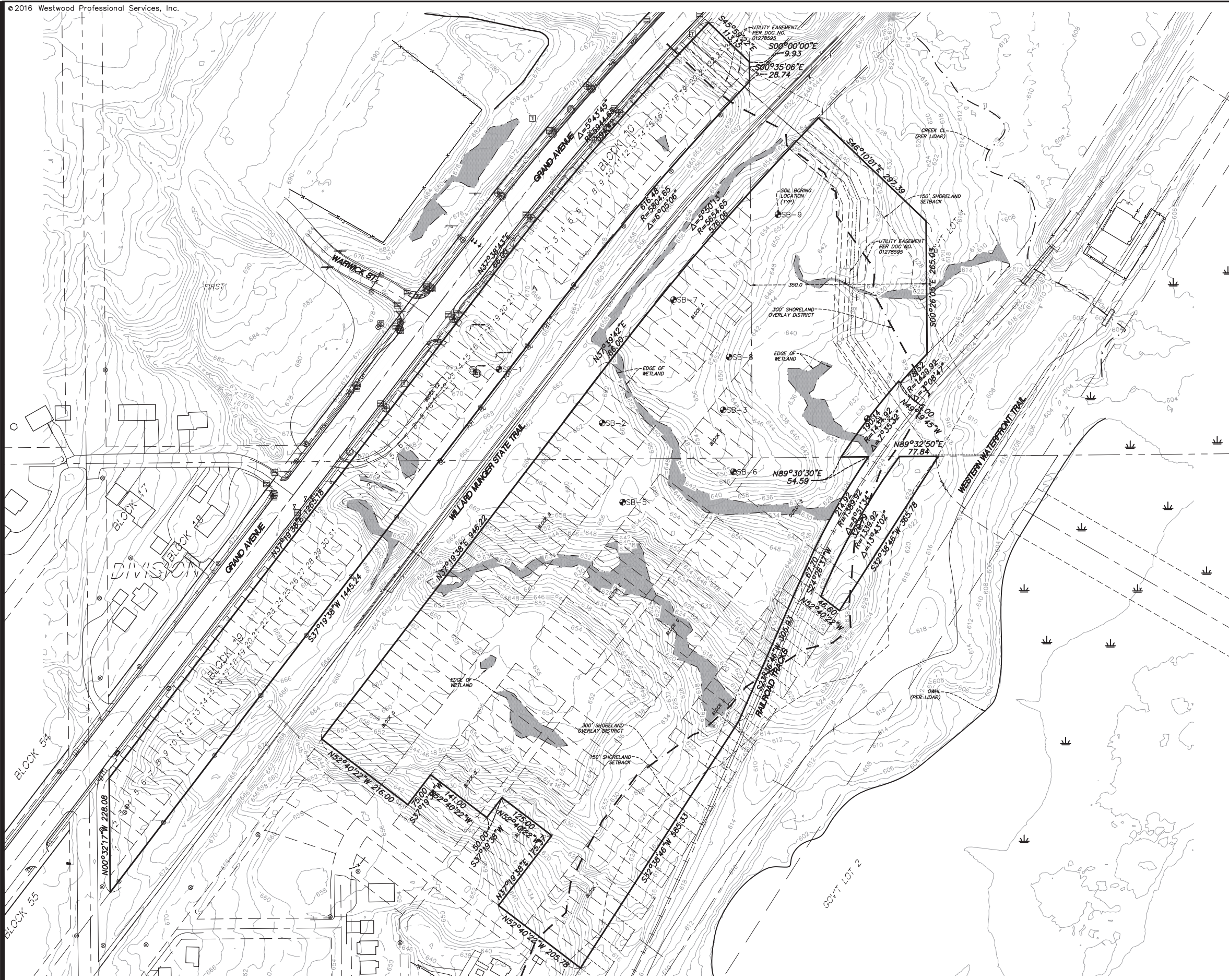
Preliminary Plans

for

**Site, Grading, Erosion Control,
Utilities and Landscape**

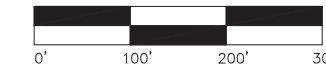
for

**Kayak Bay
Duluth, Minnesota**



LEGEND

⊙	SANITARY MANHOLE	☐	TELEPHONE BOX
⊙	SEWER CLEANOUT	⊙	TELEPHONE MANHOLE
⊙	STORM MANHOLE	☐	CABLE TV BOX
☐	CATCH BASIN	☐	TRAFFIC CONTROL BOX
⊙	BEEHIVE CATCH BASIN	⊙	HAND HOLE
⊙	FLARED END SECTION	⊙	TRAFFIC LIGHT
⊙	POWER POLE	⊙	STREET LITE
⊙	GUY WIRE	⊙	BUSH/SHRUB
☐	ELECTRIC BOX	⊙	CONIFEROUS TREE
⊙	ELECTRIC METER	⊙	DECIDUOUS TREE
⊙	ELECTRIC MANHOLE	⊙	WETLAND
⊙	ELECTRIC TOWER	⊙	TREE LINE
⊙	GATE VALVE	—CIV—	CABLE TV
⊙	HYDRANT	—GAS—	GAS LINE
⊙	WATER METER	—POH—	POWER OVERHEAD
☐	CURB STOP BOX	—PUG—	POWER UNDERGROUND
⊙	WATER MANHOLE	—SAN—	SANITARY SEWER
⊙	WELL	—STO—	STORM SEWER
⊙	GAS METER	—TOL—	TELEPHONE OVERHEAD
⊙	STEEL/WOOD POST	—TUG—	TELEPHONE UNDERGROUND
⊙	SIGN-TRAFFIC/OTHER	—WAT—	WATERMAIN
⊙	SIGN-TRAFFIC/OTHER	—X—	FENCE LINE
☐	MAIL BOX	—	CURB & GUTTER
⊙	HANDICAPPED STALL	—△—	ACCESS CONTROL
⊙	PERC TEST	☐	CONCRETE SURFACE
⊙	MONITORING WELL	☐	BITUMINOUS SURFACE
⊙	FIRE HOSE CONNECTION	☐	GRAVEL SURFACE



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Date: 2/13/2017 Sheet: 2 OF 11

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Westwood Professional Services, Inc.

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly licensed LAND SURVEYOR under the laws of the State of Minnesota.

Craig W. Morse, RLS
Date: 2/13/2017 License No. 23021

Revisions:

Designed:

Checked: CWM
Drawn: SRS
Record Drawing by/date:

Prepared for:

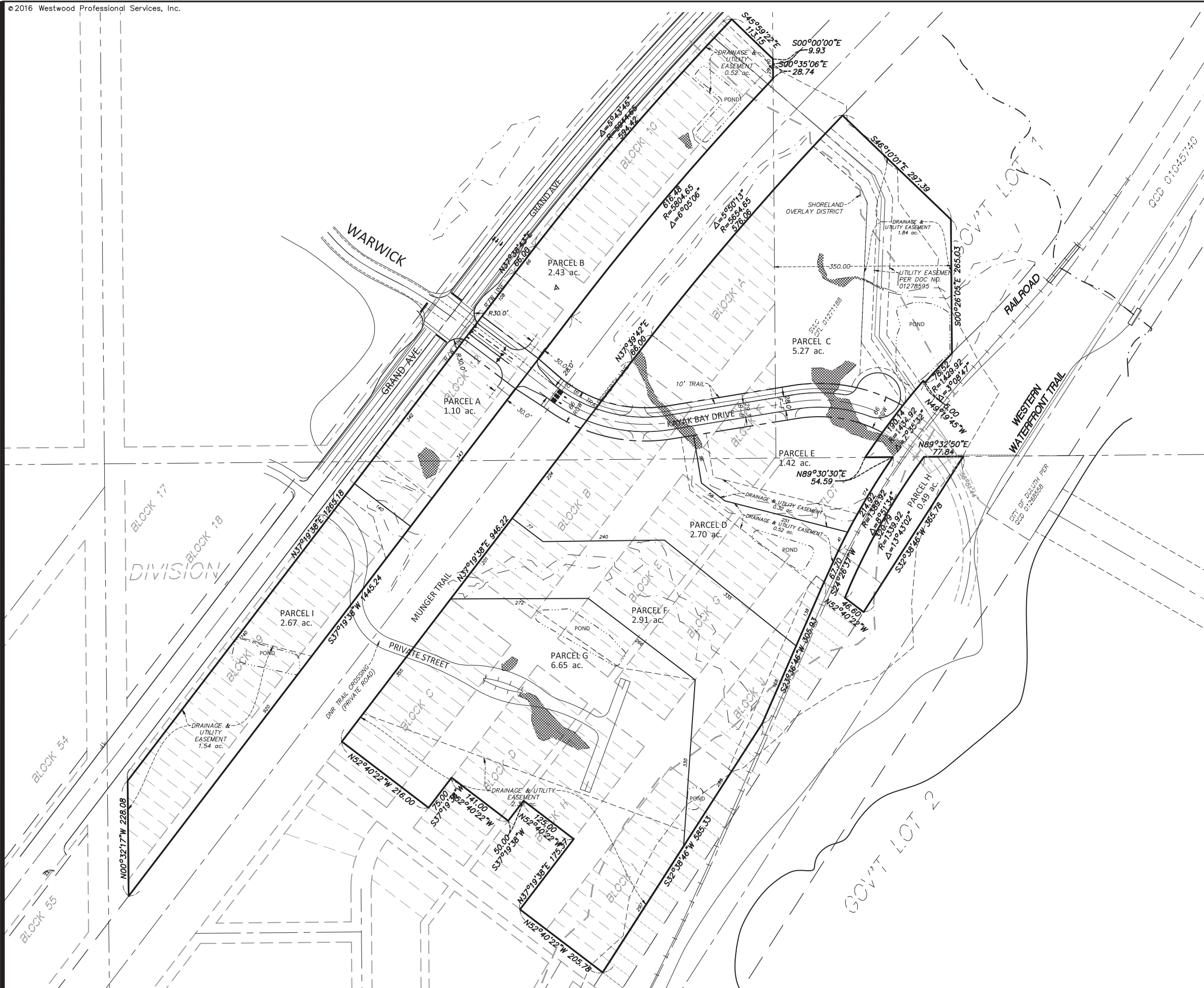
Spirit Valley Land Company, LLC

P.O. Box 235
Chanhassen, Minnesota 55317

Kayak Bay

Duluth, Minnesota

Existing Conditions



Property Description

See Attached Legals

Parcel Data

Kayak Bay Village Regulating Plan

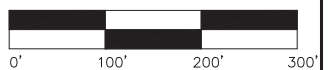
12/28/16

Parcel	Gross Acres	D/U Easement Acres		Maximum Density	Max. Height	Notes
A	1.10 ac	0.22 ac.	0.88 ac.	Mixed Use (see detail)	10,000 sf Retail / 20,000 sf Office	20' Rtl / 35' Off.
B	2.43 ac.	0.52 ac.	1.91 ac.	Mixed Use (see detail)	25,000 sf Retail / 40,000 sf Office / 100 units	72'
C	5.27 ac.	1.84 ac.	3.43 ac.	Mixed Use (see detail)	35,000 sf Retail / 50,000 sf Office / 150 units	72'
D	2.70 ac	0.52 ac	2.18 ac.	Mixed Use (see detail)	15,000 sf Retail / 30,000 sf Office / 100 units	72'
E	1.42 ac.	0.32 ac.	1.10 ac.	Mixed use (see detail)	40 MF units / 15 Res Townhomes	60'
F	2.91 ac.	2.91 ac.	0.0 ac.	Open Space	n/a	
G	6.65 ac.	2.75 ac.	3.90 ac.	Mixed Use (see detail)	150 MF units / 50 Res Townhomes	60'
H	0.49 ac.	0.49 ac.	0.0 ac.	Open Space/Parking	n/a	
I	2.67 ac.	1.68 ac.	0.99 ac.	Mixed Use (see detail)	20,000 sf Retail / 35,000 sf Office	20' Rtl / 35' Off.
R/W	1.16 ac.	n/a	1.16 ac.	Public Street	n/a	n/a
Total	26.80 ac.	10.16 ac.	16.64 ac.			

Permitted Uses in Mixed Use District:

- Parcels B, C & D**
 - Retail store Less Than 15,000sqft
 - Bank
 - Office
 - Medical or Dental Clinic
 - Lodging (Hotel or Motel)
 - Multifamily Rental
 - Multi-family Condos
 - Restaurant up to 5,000 sqft or more
 - Garden Material Sales
 - Personal Service or Repair
 - Dwelling, one or two Family, Townhomes
 - Convention or Event Center
- Parcels A & I**
 - Retail Store Less Than 15,000sqft
 - Office
 - Bank
 - Medical or Dental Clinic
 - Restaurant less than 5,000sqft
 - Garden Material Sales
 - Personal service or repair
- Parcels G & E**
 - Dwelling, one-two family
 - Dwelling, townhouse
 - Dwelling, Multifamily, Rental or Condos

ALL PARCELS TO BE OWNED BY SVLC



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 Date: 2/13/2017 License No. 23021

Revisions:

No.	Description

Designed: CLM
 Checked: CLM
 Drawn: SRS
 Record Drawing by/date:

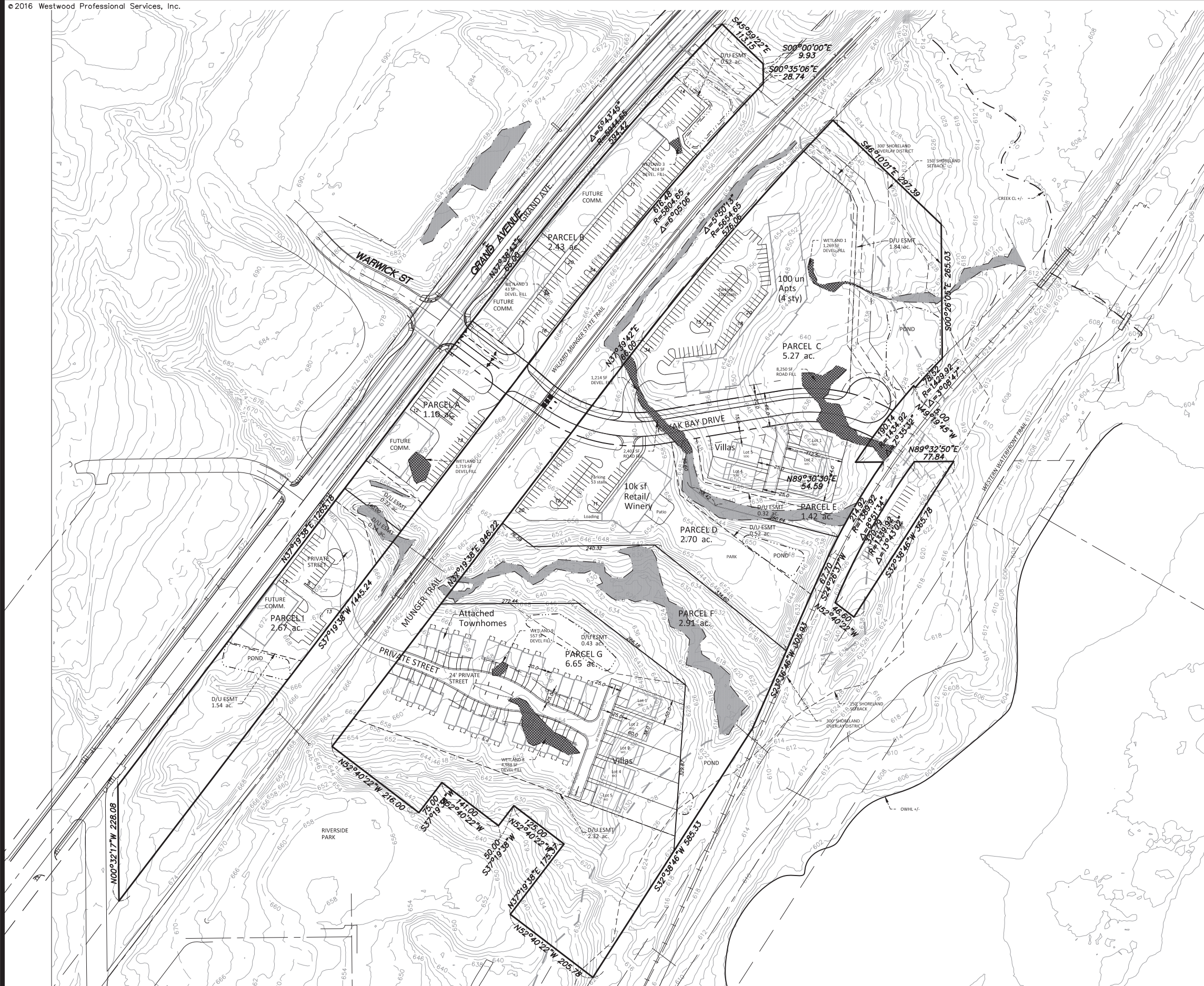
Prepared for:
Spirit Valley Land Company, LLC

P.O. Box 235
 Chanhassen, Minnesota 55317

Kayak Bay

Duluth, Minnesota

Preliminary Plat



Parcel Data

Kayak Bay Village Regulating Plan

12/28/16

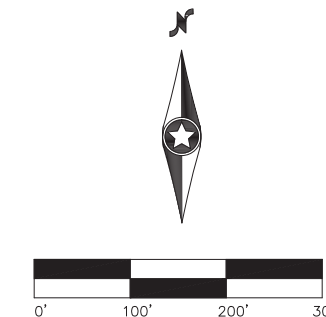
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F	2.91 ac.	2.91 ac.	0.0 ac.	Open Space	n/a	
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R/W	1.16 ac.	n/a	1.16 ac.	Public Street	n/a	
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Permitted Uses in Mixed Use District:

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Parcels B, C & D</p> <ul style="list-style-type: none"> • Retail store Less Than 15,000sqft • Bank • Office • Medical or Dental Clinic • Lodging (Hotel or Motel) • Multifamily Rental • Multi-family Condos • Restaurant up to 5,000 sqft or more • Garden Material Sales • Personal Service or Repair • Dwelling, one or two family, Townhomes • Convention or Event Center | <p>Parcels A & I</p> <ul style="list-style-type: none"> • Retail Store Less Than 15,000sqft • Office • Bank • Medical or Dental Clinic • Restaurant less than 5,000sqft • Garden Material Sales • Personal service or repair |
| <p>Parcels G & E</p> <ul style="list-style-type: none"> • Dwelling, one-two family • Dwelling, townhouse • Dwelling, Multifamily, Rental or Condos | |

Site Plan Notes:

Site Plan uses and configurations are CONCEPTUAL and provided for illustrative purposes only. Specific development plans and applications will be provided under separate Site Plan review process with the City as uses/parcels are developed.



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 Checked: CLM
 Drawn: SRS
 Record Drawing by/date: _____

Prepared for:
Spirit Valley Land Company, LLC
 P.O. Box 235
 Chanhassen, Minnesota 55317

Kayak Bay

Duluth, Minnesota

Site Plan



GENERAL GRADING & DRAINAGE NOTES:

- ALL CONTOURS AND SPOT ELEVATIONS ARE SHOWN TO FINISHED SURFACE/GUTTER GRADES UNLESS OTHERWISE NOTED.
- REFER TO THE SITE PLAN/RECORD PLAT FOR MOST CURRENT HORIZONTAL SITE DIMENSIONS AND LAYOUT.
- THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING UTILITIES AND TOPOGRAPHICAL FEATURES WITH THE OWNERS AND FIELD-VERIFY PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM PLAN.
- ALL RCP FOR STORM SEWER SHALL BE CLASS III UNLESS OTHERWISE NOTED
- ALL CATCH BASINS AND MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.10 FEET. RIM ELEVATIONS ON PLANS REFLECT THE SUMPED ELEVATIONS.
- ALL CONSTRUCTION SHALL CONFORM TO LOCAL RULES.
- POSITIVE DRAINAGE FROM THE SITE MUST BE PROVIDED AT ALL TIMES.

EROSION CONTROL NOTES:

- ALL SILT FENCE AND OTHER EROSION CONTROL FEATURES SHALL BE IN-PLACE PRIOR TO ANY EXCAVATION/CONSTRUCTION AND SHALL BE MAINTAINED UNTIL Viable TURF OR GROUND COVER HAS BEEN ESTABLISHED. EXISTING SILT FENCE ON-SITE SHALL BE MAINTAINED AND OR REMOVED AND SHALL BE CONSIDERED INCIDENTAL TO THE GRADING CONTRACT. IT IS OF EXTREME IMPORTANCE TO BE AWARE OF CURRENT FIELD CONDITIONS WITH RESPECT TO EROSION CONTROL. TEMPORARY PONDING, DIKES, HAY BALES, ETC., REQUIRED BY THE CITY SHALL BE INCIDENTAL TO THE GRADING CONTRACT.
- ALL STREETS DISTURBED DURING WORKING HOURS MUST BE CLEANED AT THE END OF EACH WORKING DAY. A ROCK ENTRANCE TO THE SITE MUST BE PROVIDED ACCORDING TO DETAILS TO REDUCE TRACKING OF DIRT ONTO PUBLIC STREETS.

LEGEND:

- DENOTES SOIL BORING
- DENOTES SILT FENCE
- DENOTES HEAVY DUTY SILT FENCE
- DENOTES EXISTING CONTOURS
- DENOTES PROPOSED CONTOURS
- DENOTES EXISTING STORM SEWER
- DENOTES PROPOSED STORM SEWER
- DENOTES EXISTING TREE LINE
- DENOTES APPROXIMATE TREE REMOVAL LIMITS
- DENOTES EXISTING SPOT ELEVATION
- DENOTES PROPOSED SPOT ELEVATION
- DENOTES BIO-ROLL EROSION CHECKS
- DENOTES EMERGENCY OVERFLOW ELEVATION
- DENOTES EXISTING WETLAND
- DENOTES WETLAND FILL



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Date: 2/13/2017 Sheet: 5 OF 11

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I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly licensed PROFESSIONAL ENGINEER under the laws of the State of Minnesota.

Ryan M. Bluhm
 Date: 2/13/2017 License No. 41257

Revisions:

No.	Description	Date

Designed: CLJ
 Checked: RMB
 Drawn: HW
 Record Drawing by/date:

Prepared for:
Spirit Valley Land Company, LLC

P.O. Box 235
 Chanhassen, Minnesota 55317

Kayak Bay

Duluth, Minnesota

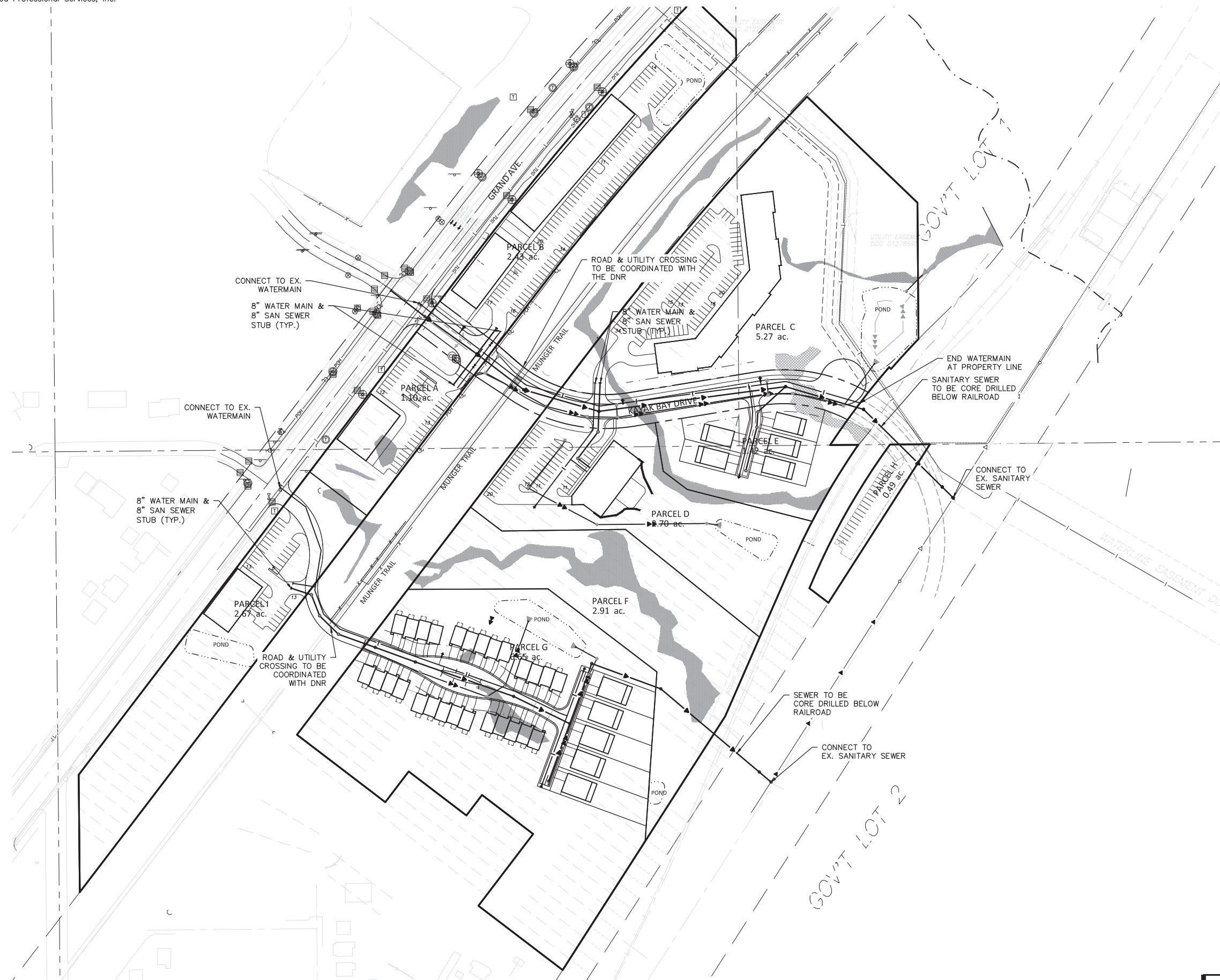
Concept Grading Plan

GENERAL UTILITY NOTES:

- THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY THE OWNER OF ANY DIFFERENCES.
- UNLESS OTHERWISE NOTED, ALL MATERIALS, CONST. TECHNIQUES AND TESTING SHALL CONFORM TO THE 1999 ED. OF THE "STANDARD UTILITIES SPECIFICATIONS FOR WATER MAIN AND SERVICE LINE INSTALLATION AND SANITARY SEWER AND STORM SEWER INSTALLATION BY THE CITY ENGINEERING ASSOCIATION OF MINN." AND TO THE "STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION" MINN. DEPT. OF TRANS. AUGUST 31,2005 INCLUDING THE CURRENT ADDENDUM. THE CONTRACTOR SHALL BE REQUIRED TO FOLLOW ALL PROCEDURES AS OUTLINED BY THE LOCAL AGENCY.
- THE CONTRACTOR SHALL RECEIVE THE NECESSARY PERMITS FOR ALL WORK OUTSIDE OF THE PROPERTY LIMITS.
- SEE ARCH. PLAN FOR EXACT BLDG. LOCATION. SEE SITE PLAN FOR LAYOUT DIMENSIONS. SERVICE ENTRY LOCATIONS TO BE COORDINATED WITH THE ARCHITECT.
- VERIFY EXISTING INVERT LOC. & ELEV. PRIOR TO BEGINNING CONSTRUCTION.
- THE WATER SERVICE SHALL BE INSTALLED WITH A MIN. OF 7.5 FT. OF COVER. THE CONTRACTOR SHALL VERIFY THE CITY AS-BUILT CONSTRUCTION PLANS TO CHECK LOCATION AND MATERIAL TYPE.
- ALL STORM SEWER PIPE SHALL BE CLASS 5 UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL CONTACT "GOPHER STATE ONE CALL" FOR FOR UTILITY LOCATIONS PRIOR TO UTILITY INSTALLATION.

LEGEND

EXISTING	
Sanitary Sewer	—◁
Water	—
Hyd. w\Valve	— ⇄
Storm Sewer	—▷
PROPOSED	
Sanitary Sewer	—◁
Water	—
Hyd. w\Valve	— ⇄
Storm Sewer	—▷
FUTURE	
Sanitary Sewer	—◁
Water	—
Hyd. w\Valve	— ⇄
Storm Sewer	—▷



0002483UTP02.dwg

Date: 2/13/2017 Sheet: 6 OF 11

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 Date: 2/13/2017 License No. 41257

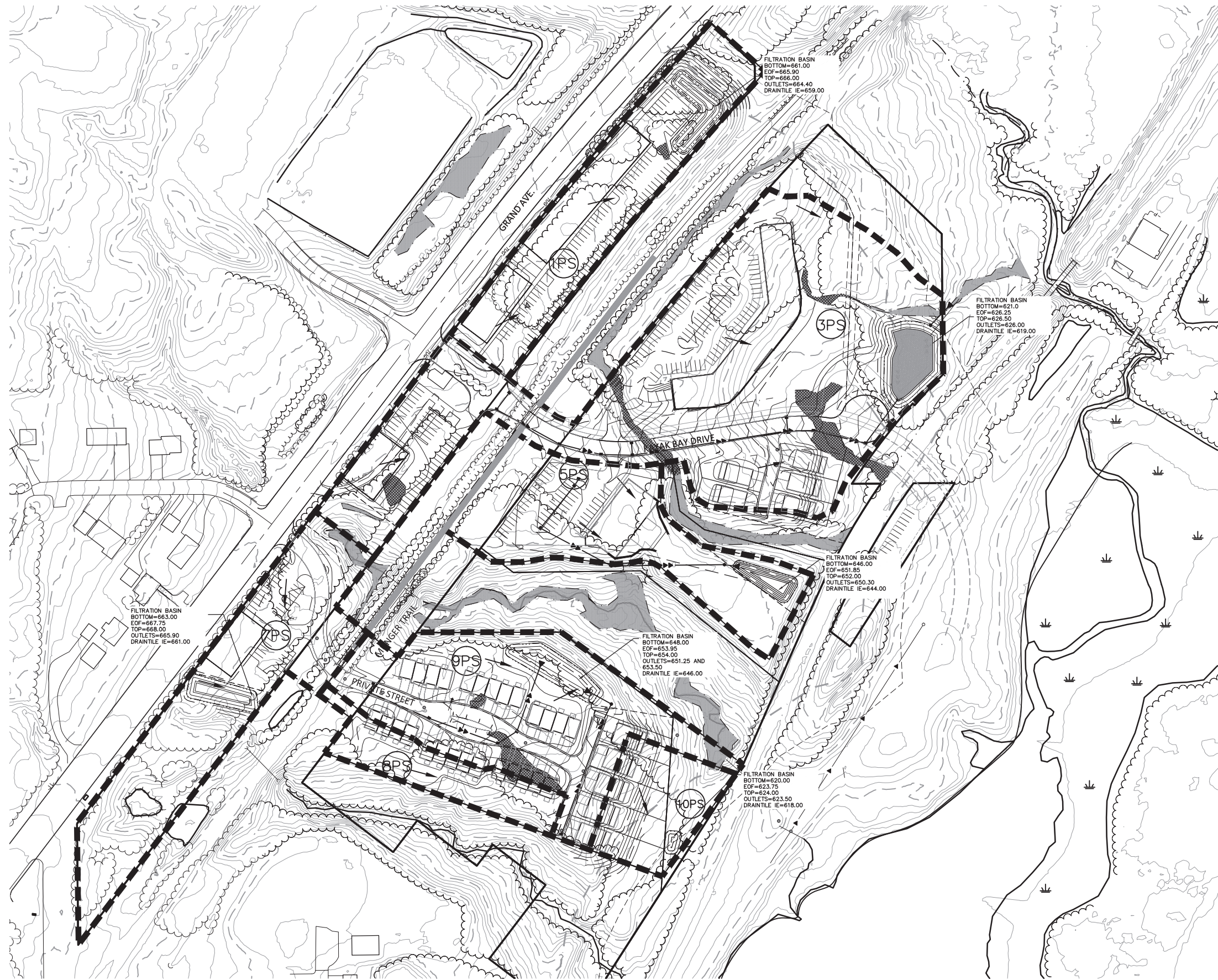
Revisions:

Designed: CLJ
 Checked: RMB
 Drawn: HW
 Record Drawing by/date:

Prepared for:
Spirit Valley Land Company, LLC
 P.O. Box 235
 Chanhassen, Minnesota 55317

Kayak Bay
 Duluth, Minnesota

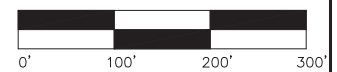
Concept Utility Plan



Legend

EXISTING	PROPOSED	FUTURE	
---	---	---	PROPERTY LINE
980	980	980	INDEX CONTOUR
982	982	982	INTERVAL CONTOUR
---	---	---	STORM SEWER
---	---	---	FLARED END SECTION (WITH RIPRAP)
---	---	---	DRAIN TILE
---	---	---	SAND
---	---	---	WETLAND
---	---	---	WETLAND REMOVAL
---	---	---	TREE LINE
---	---	---	DRAINAGE BOUNDARY
---	---	---	FLOW

NOTE: SITE PLAN AND GRADING SHOWN ARE CONCEPT LEVEL AND SUBJECT TO CHANGE IN PRELIMINARY AND FINAL DESIGN. STORMWATER MANAGEMENT WILL BE UPDATED AS NEEDED WITH CHANGES.



00024835WMP.dwg

Date: 2/13/2017 Sheet: 7 OF 11

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Kayak Bay

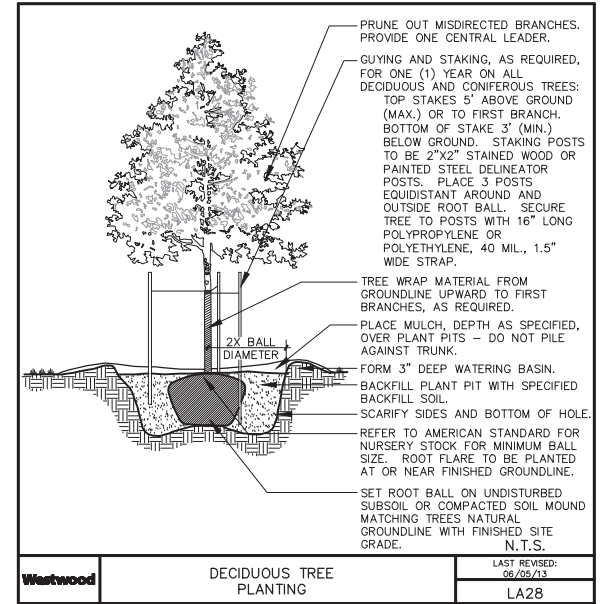
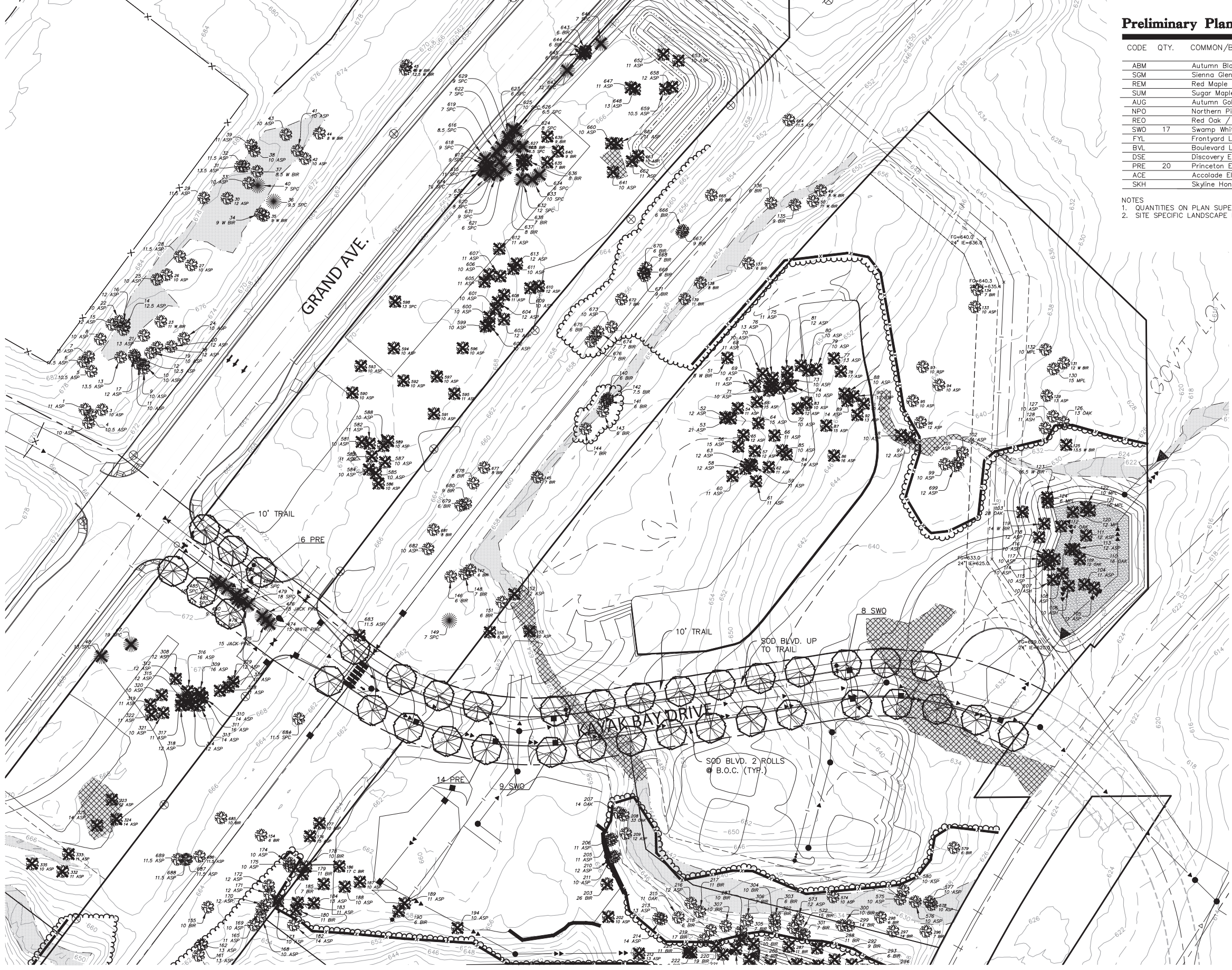
Duluth, Minnesota

Stormwater Management Plan

Preliminary Plant Schedule

CODE	QTY.	COMMON/BOTANICAL NAME	SIZE	SPACING O.C.
ABM		Autumn Blaze Maple / <i>Acer x freemanii</i> 'Jeffersred'	2.5" BB	AS SHOWN
SGM		Sienna Glen Maple / <i>Acer x freemanii</i> 'Sienna'	2.5" BB	AS SHOWN
REM		Red Maple / <i>Acer rubrum</i>	2.5" BB	AS SHOWN
SUM		Sugar Maple / <i>Acer saccharum</i>	2.5" BB	AS SHOWN
AUG		Autumn Gold Ginkgo / <i>Ginkgo biloba</i> 'Autumn Gold'	2.5" BB	AS SHOWN
NPO		Northern Pin Oak / <i>Quercus ellipsoidalis</i>	2.5" BB	AS SHOWN
REO		Red Oak / <i>Quercus rubra</i>	2.5" BB	AS SHOWN
SWO	17	Swamp White Oak / <i>Quercus bicolor</i>	2.5" BB	AS SHOWN
FYL		Frontyard Linden / <i>Tilia americana</i> 'Frontyard'	2.5" BB	AS SHOWN
BVL		Boulevard Linden / <i>Tilia americana</i> 'Boulevard'	2.5" BB	AS SHOWN
DSE		Discovery Elm / <i>Ulmus davidiana</i> var. <i>japonica</i> 'Discovery'	2.5" BB	AS SHOWN
PRE	20	Princeton Elm / <i>Ulmus americana</i> 'Princeton'	2.5" BB	AS SHOWN
ACE		Accolade Elm / <i>Ulmus japonica</i> x <i>wilsoniana</i> 'Morton'	2.5" BB	AS SHOWN
SKH		Skyline Honeylocust / <i>Gleditsia tricanthos</i> var. <i>inermis</i> 'Skycole'	2.5" BB	AS SHOWN

- NOTES
 1. QUANTITIES ON PLAN SUPERSEDE LIST QUANTITIES IN THE EVENT OF A DISCREPANCY.
 2. SITE SPECIFIC LANDSCAPE PLANS TO BE DEVELOPED AS FUTURE PARCELS ARE BROUGHT FORWARD UNDER SITE PLAN REVIEW.



Legend

- DENOTES PROPOSED OVERSTORY TREE
 - SAVED TREE CANOPY LINE
 - DENOTES TREE PROTECTION FENCE
 - DENOTES EXISTING CONIFEROUS TREE TO REMAIN
 - DENOTES EXISTING DECIDUOUS TREE TO REMAIN
 - DENOTES EXISTING CONIFEROUS TREE TO BE REMOVED
 - DENOTES EXISTING DECIDUOUS TREE TO BE REMOVED
- 0' 50' 100' 150'

Kayak Bay
 Duluth, Minnesota

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 Toll Free (888) 937-5150 westwoodps.com
 Westwood Professional Services, Inc.

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly licensed LANDSCAPE ARCHITECT under the laws of the State of Minnesota.
 Cory Meyer
 Date: 2/13/2017 License No. 26971

Revisions:

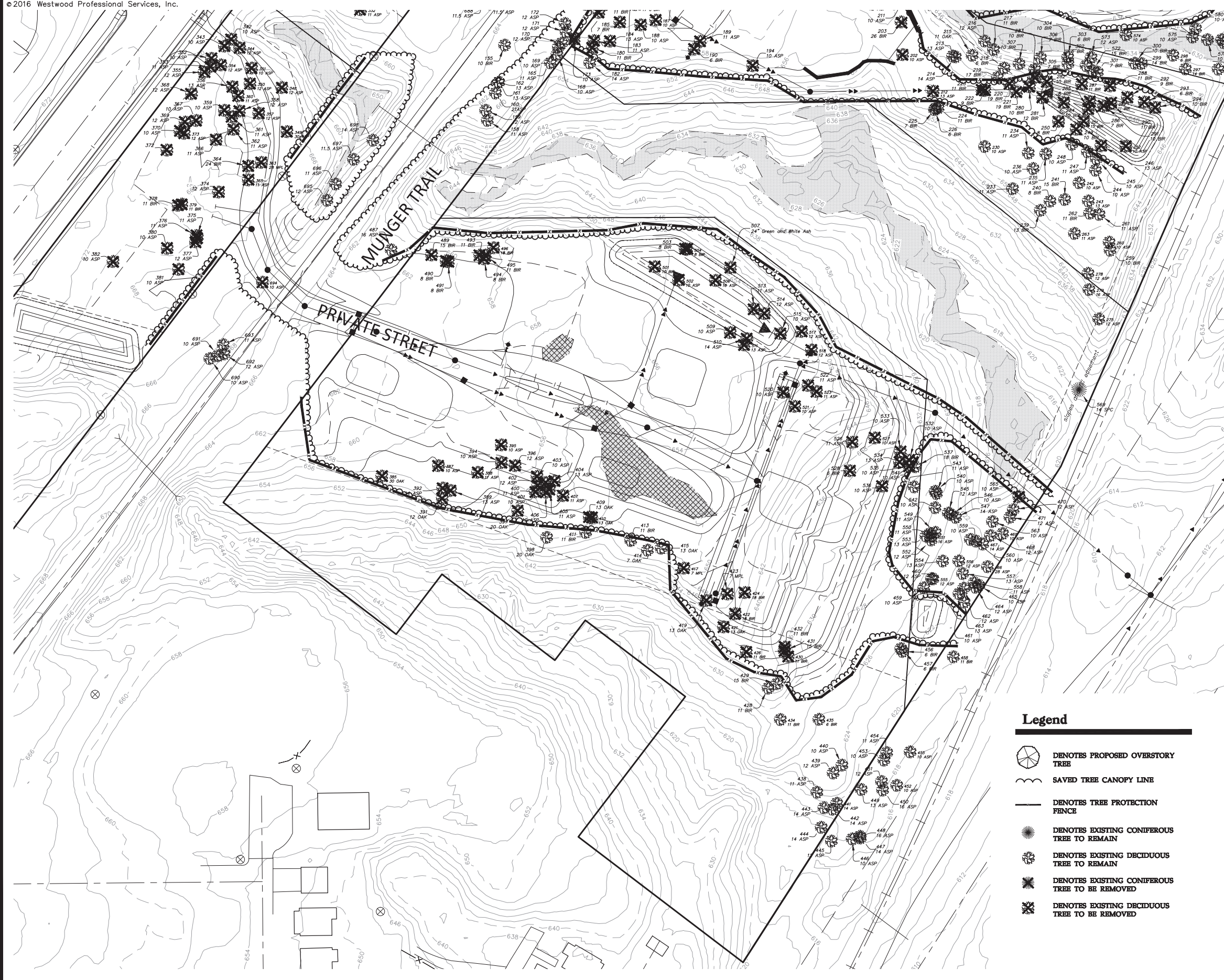
Designed: CLM
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 Drawn: NTM
 Record Drawing by/date: _____

Prepared for:
Spirit Valley Land Company, LLC
 P.O. Box 235
 Chanhassen, Minnesota 55317

Preliminary Landscape & Tree Preservation Plan

Planting Notes

- CONTRACTOR SHALL CONTACT COMMON GROUND ALLIANCE AT 811 OR CALL811.COM TO VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY PLANTS OR LANDSCAPE MATERIAL.
- ACTUAL LOCATION OF PLANT MATERIAL IS SUBJECT TO FIELD AND SITE CONDITIONS.
- NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
- ALL SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO SUBMISSION OF ANY BID AND/OR QUOTE BY THE LANDSCAPE CONTRACTOR.
- CONTRACTOR SHALL PROVIDE ONE YEAR GUARANTEE OF ALL PLANT MATERIALS. THE GUARANTEE BEGINS ON THE DATE OF THE LANDSCAPE ARCHITECT'S OR OWNER'S WRITTEN ACCEPTANCE OF THE INITIAL PLANTING. REPLACEMENT PLANT MATERIAL SHALL HAVE A ONE YEAR GUARANTEE COMMENCING UPON PLANTING.
- ALL PLANTS TO BE SPECIMEN GRADE, MINNESOTA-GROWN AND/OR HARDY. SPECIMEN GRADE SHALL ADHERE TO, BUT IS NOT LIMITED BY, THE FOLLOWING STANDARDS:
ALL PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, SCARS, ETC.
ALL PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES.
ALL PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES.
ALL PLANTS SHALL HAVE HEAVY, HEALTHY BRANCHING AND LEAFING.
CONIFEROUS TREES SHALL HAVE AN ESTABLISHED MAIN LEADER AND A HEIGHT TO WIDTH RATIO OF NO LESS THAN 5:3.
- PLANTS TO MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014 OR MOST CURRENT VERSION) REQUIREMENTS FOR SIZE AND TYPE SPECIFIED.
- PLANTS TO BE INSTALLED AS PER MNLA & ANSI STANDARD PLANTING PRACTICES.
- PLANTS SHALL BE IMMEDIATELY PLANTED UPON ARRIVAL AT SITE. PROPERLY HEEL-IN MATERIALS IF NECESSARY; TEMPORARY ONLY.
- PRIOR TO PLANTING, FIELD VERIFY THAT THE ROOT COLLAR/ROOT FLAIR IS LOCATED AT THE TOP OF THE BALLED & BURLAP TREE. IF THIS IS NOT THE CASE, SOIL SHALL BE REMOVED DOWN TO THE ROOT COLLAR/ROOT FLAIR. WHEN THE BALLED & BURLAP TREE IS PLANTED, THE ROOT COLLAR/ROOT FLAIR SHALL BE EVEN OR SLIGHTLY ABOVE FINISHED GRADE.
- OPEN TOP OF BURLAP ON BB MATERIALS; REMOVE POT ON POTTED PLANTS; SPLIT AND BREAK APART PEAT POTS.
- PRUNE PLANTS AS NECESSARY - PER STANDARD NURSERY PRACTICE AND TO CORRECT POOR BRANCHING OF EXISTING AND PROPOSED TREES.
- WRAP ALL SMOOTH-BARKED TREES - FASTEN TOP AND BOTTOM. REMOVE BY APRIL 1ST.
- STAKING OF TREES AS REQUIRED; REPOSITION, PLUMB AND STAKE IF NOT PLUMB AFTER ONE YEAR.
- THE NEED FOR SOIL AMENDMENTS SHALL BE DETERMINED UPON SITE SOIL CONDITIONS PRIOR TO PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT FOR THE NEED OF ANY SOIL AMENDMENTS.
- BACKFILL SOIL AND TOPSOIL TO ADHERE TO MN/DOT STANDARD SPECIFICATION 3877 (COMMON TOPSOIL BORROW) AND TO BE EXISTING TOP SOIL FROM SITE FREE OF ROOTS, ROCKS LARGER THAN ONE INCH, SUBSOIL DEBRIS, AND LARGE WEEDS UNLESS SPECIFIED OTHERWISE. MINIMUM 4" DEPTH TOPSOIL FOR ALL LAWN GRASS AREAS AND 12" DEPTH TOPSOIL FOR TREE, SHRUBS, AND PERENNIALS.
- MULCH TO BE AT ALL TREE, SHRUB, PERENNIAL, AND MAINTENANCE AREAS. TREE AND SHRUB PLANTING BEDS SHALL HAVE 4" DEPTH OF SHREDDED HARDWOOD MULCH. SHREDDED HARDWOOD MULCH TO BE USED AROUND ALL PLANTS WITHIN TURF AREAS. PERENNIAL AND ORNAMENTAL GRASS BEDS SHALL HAVE 2" DEPTH SHREDDED HARDWOOD MULCH. MULCH TO BE FREE OF DELETERIOUS MATERIAL AND COLORED BROWN, OR APPROVED EQUAL. MULCH AND FABRIC TO BE APPROVED BY OWNER PRIOR TO INSTALLATION. MULCH TO MATCH EXISTING CONDITIONS (WHERE APPLICABLE).
- SPADED EDGE TO PROVIDE V-SHAPED DEPTH AND WIDTH TO CREATE SEPARATION BETWEEN MULCH AND GRASS. INDIVIDUAL TREE, SHRUB, OR RAIN-GARDEN BEDS TO BE SPADED EDGE, UNLESS NOTED OTHERWISE. EDGING TO MATCH EXISTING CONDITIONS (WHERE APPLICABLE).
- ALL DISTURBED AREAS TO BE SODDED OR SEEDED, UNLESS OTHERWISE NOTED. PARKING LOT ISLANDS TO BE SODDED WITH SHREDDED HARDWOOD MULCH AROUND ALL TREES AND SHRUBS. SOD TO BE STANDARD MINNESOTA GROWN AND HARDY BLUEGRASS MIX, FREE OF LAWN WEEDS. ALL TOPSOIL AREAS TO BE RAKED TO REMOVE DEBRIS AND ENSURE DRAINAGE. SLOPES OF 3:1 OR GREATER SHALL BE STAKED. SEED AS SPECIFIED AND PER MN/DOT SPECIFICATIONS. IF NOT INDICATED ON LANDSCAPE PLAN, SEE EROSION CONTROL PLAN.
- CONTRACTOR SHALL PROVIDE NECESSARY WATERING OF PLANT MATERIALS UNTIL THE PLANT IS FULLY ESTABLISHED. OWNER WILL NOT PROVIDE WATER FOR CONTRACTOR.
- REPAIR, REPLACE, OR PROVIDE SOD/SEED AS REQUIRED FOR ANY ROADWAY BOULEVARD AREAS ADJACENT TO THE SITE DISTURBED DURING CONSTRUCTION.
- REPAIR ALL DAMAGE TO PROPERTY FROM PLANTING OPERATIONS AT NO COST TO OWNER.



Legend

- DENOTES PROPOSED OVERSTORY TREE
- SAVED TREE CANOPY LINE
- DENOTES TREE PROTECTION FENCE
- DENOTES EXISTING CONIFEROUS TREE TO REMAIN
- DENOTES EXISTING DECIDUOUS TREE TO REMAIN
- DENOTES EXISTING CONIFEROUS TREE TO BE REMOVED
- DENOTES EXISTING DECIDUOUS TREE TO BE REMOVED

Westwood

Phone (952) 937-5150 7699 Anagram Drive
 Fax (952) 937-5822 Eden Prairie, MN 55344
 Toll Free (888) 937-5150 westwoodps.com
 Westwood Professional Services, Inc.

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly licensed LANDSCAPE ARCHITECT under the laws of the State of Minnesota.

Cory Meyer
 Date: 2/13/2017 License No. 26971

Revisions:

No.	Description	Date

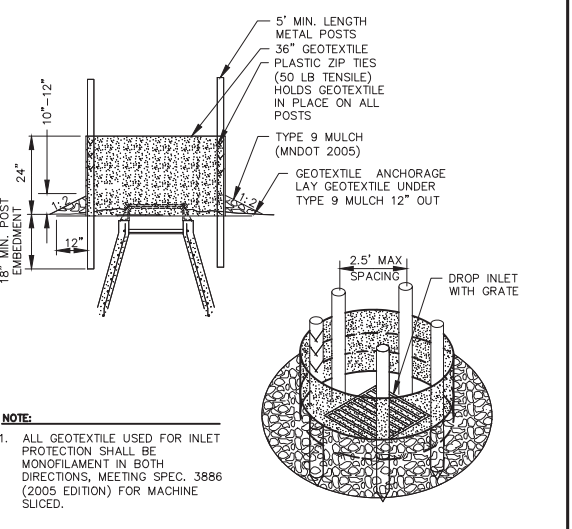
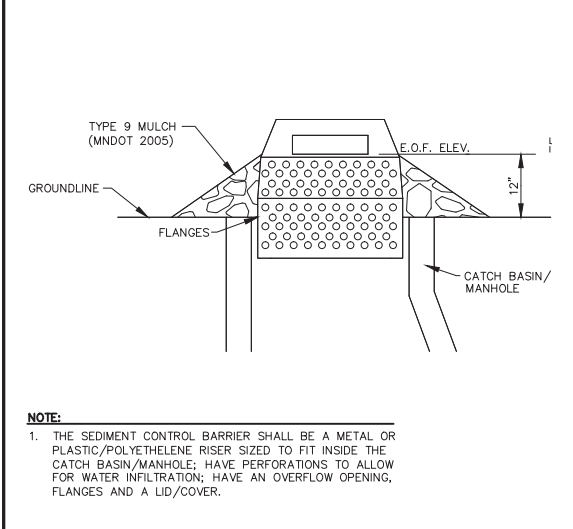
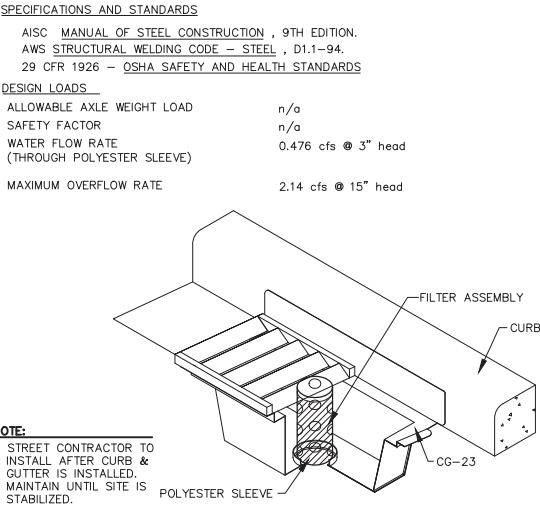
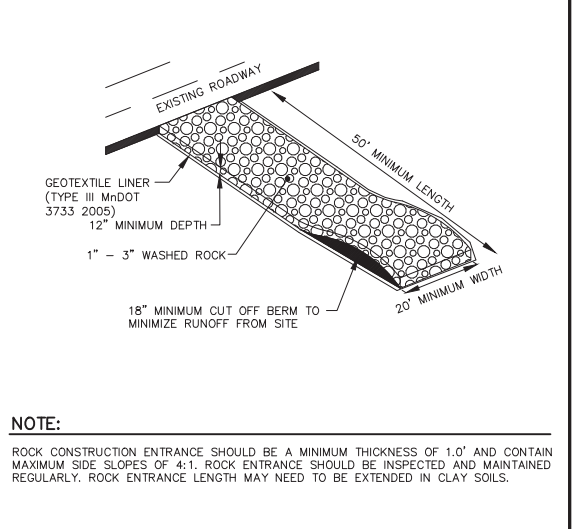
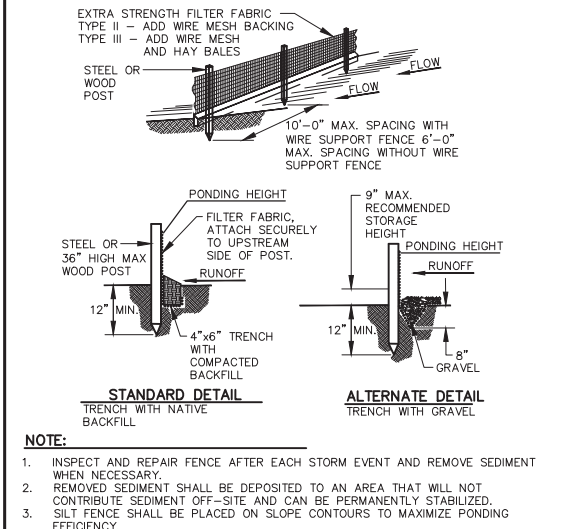
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 Checked: CLM
 Drawn: NTM
 Record Drawing by/date:

Prepared for:
Spirit Valley Land Company, LLC
 P.O. Box 235
 Chanhassen, Minnesota 55317

Kayak Bay

Duluth, Minnesota

Preliminary Landscape &
 Tree Preservation Plan



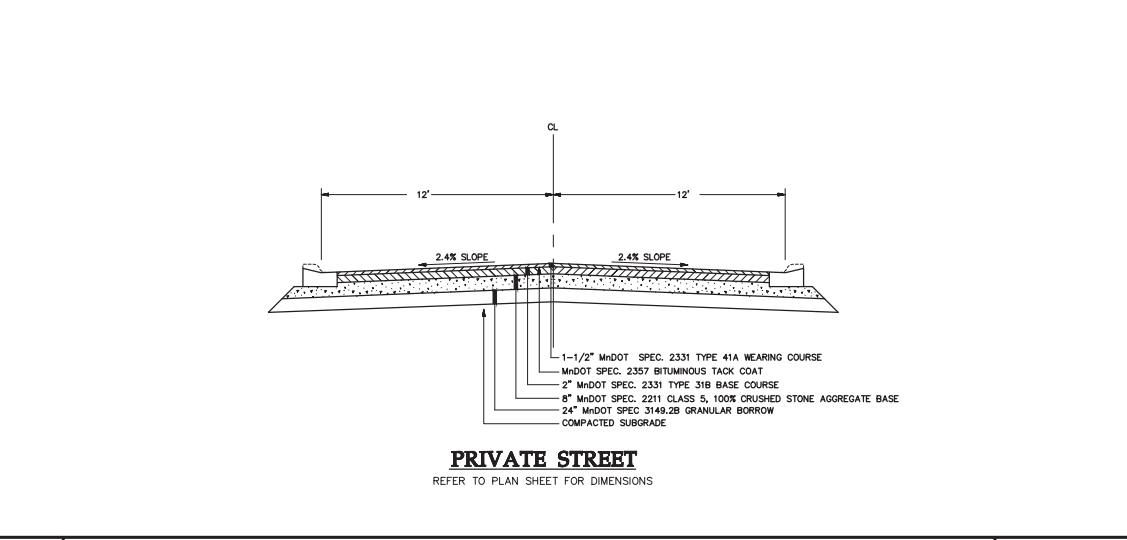
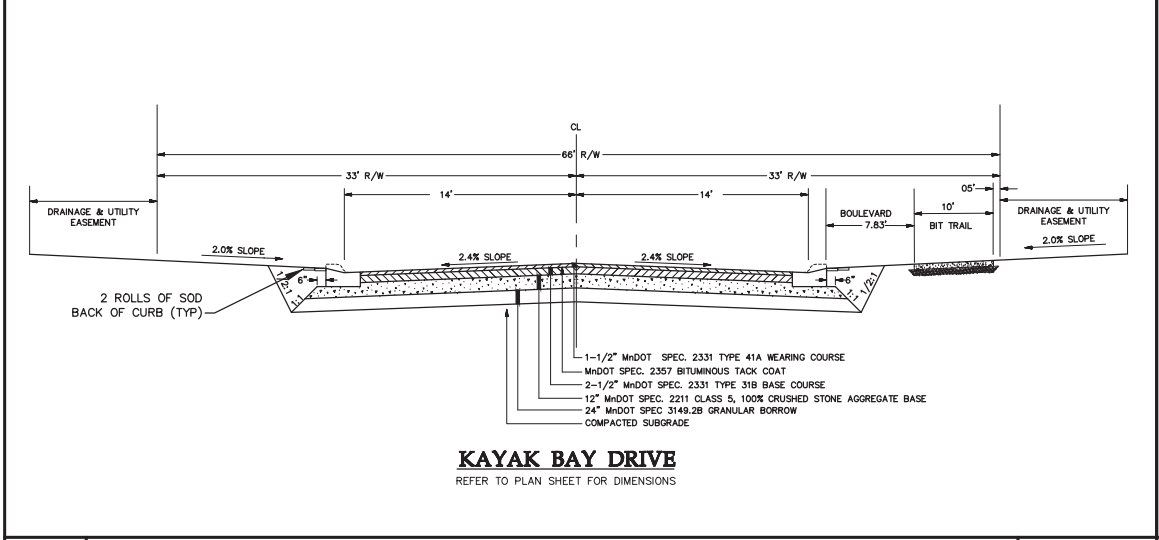
Westwood	SILT FENCE	LAST REVISED: 03/03/08 GD02
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Westwood	ROCK CONSTRUCTION ENTRANCE	LAST REVISED: 03/03/08 GD05
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Westwood	ROAD DRAIN CG-23 "WIMCO" CURB INLET PROTECTION	LAST REVISED: 03/03/08 GD12
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Westwood	STORM DRAIN (SEDIMENT CONTROL INLET HAT)	LAST REVISED: 03/03/08 GD14
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Westwood	SILT FENCE RING ROCK BARRIER COMBINATION	LAST REVISED: 03/03/08 GD15
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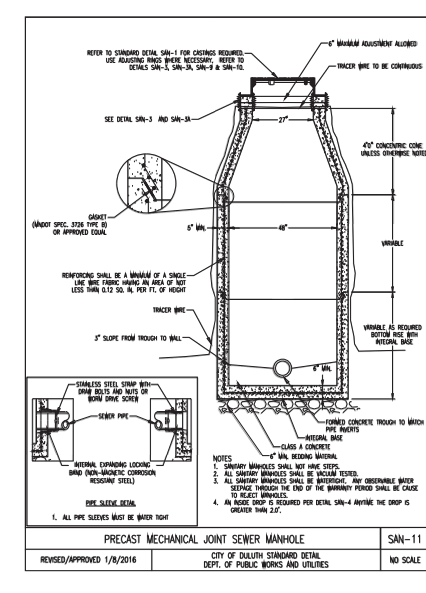
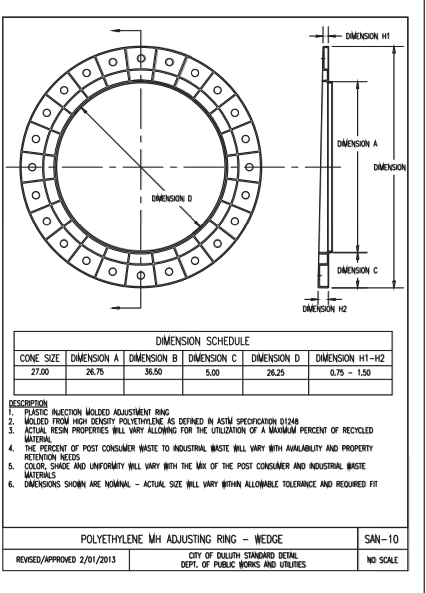
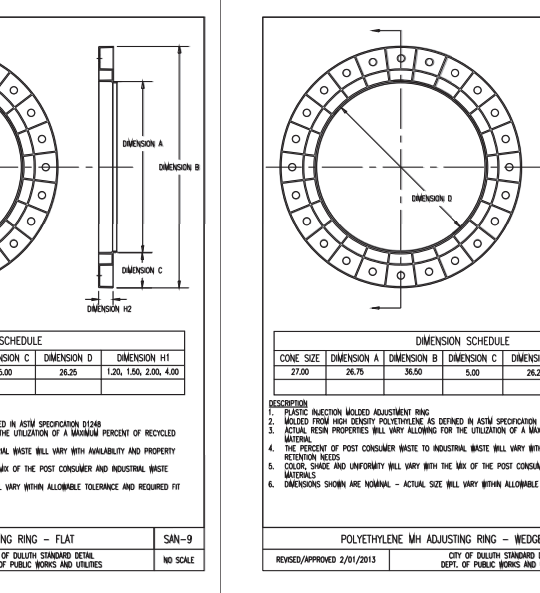
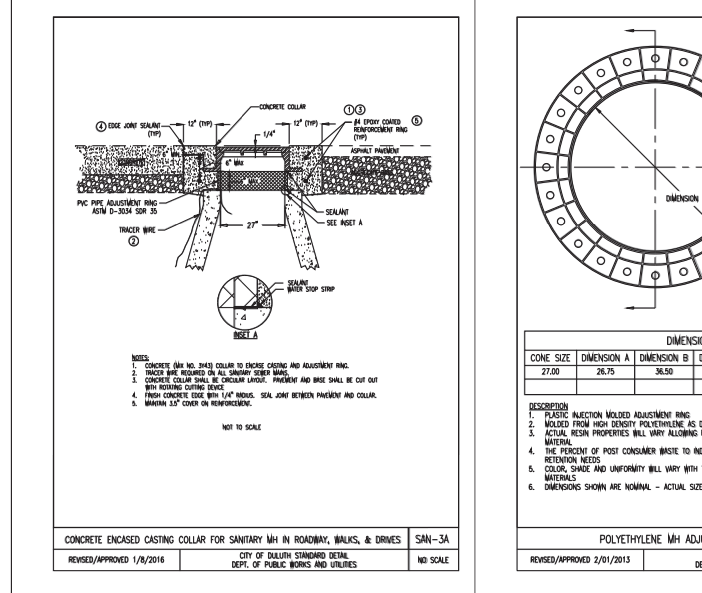
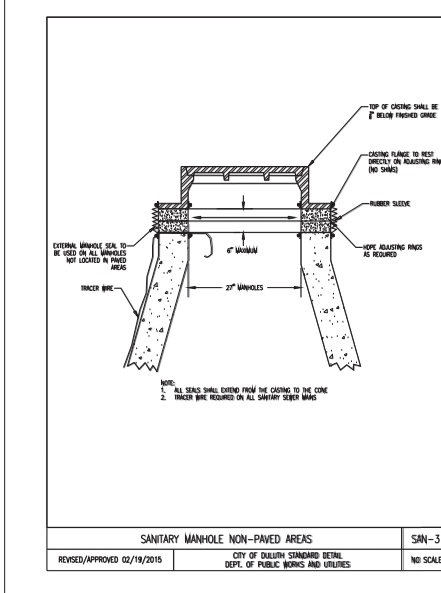
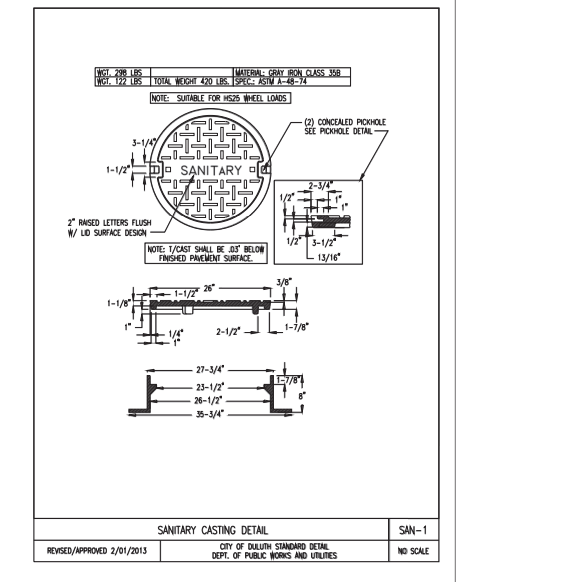


Westwood		LAST REVISED: 06/11/08 SI26
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Westwood		LAST REVISED: 06/11/08 SI26
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Westwood		LAST REVISED: 06/11/08 SI26
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Kayak Bay
 Details
 Duluth, Minnesota

STORM MANHOLE NON-PAVED AREAS STRM-5
 REVISION/APPROVED 02/18/2015 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

CONCRETE ENCASED CASING COLLAR FOR STORM MH IN ROADWAY, WALKS, & DRIVES STRM-5A
 REVISION/APPROVED 1/8/2016 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

FIRE HYDRANT SETTING DETAIL - HDPE W-4A
 REVISION/APPROVED 1/8/2016 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

STRAPPING WATERMAIN VERTICAL OFFSETS W-6
 REVISION/APPROVED 2/01/2013 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

PIPE SIZE	A	B	C	D
16"	6'-0"	2'-0"	5'-0"	0'-1"
20"	8'-0"	3'-0"	5'-0"	0'-1 1/4"
24"	8'-0"	3'-0"	5'-0"	0'-1 1/2"
30"	8'-0"	3'-0"	5'-0"	0'-2"

WATER VALVE BOX - HDPE MAIN W-17A
 REVISION/APPROVED 1/8/2016 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

STORM MANHOLE CASTING STRM-1
 REVISION/APPROVED 2/01/2013 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

CATCH BASIN/CURB BOX CASTINGS STRM-2
 REVISION/APPROVED 2/01/2013 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

CATCH BASIN CASTINGS STRM-3
 REVISION/APPROVED 1/8/2016 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

DUCTILE IRON, PE WATERMAIN, PRESSURE SEWER, & FORCEMAIN BEDDING EX-1
 REVISION/APPROVED 1/8/2016 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

PVC AND CORRUGATED POLYETHYLENE SEWER PIPE BEDDING DETAIL EX-3
 REVISION/APPROVED 1/8/2016 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

CONCRETE STORM SEWER BEDDING EX-4
 REVISION/APPROVED 1/8/2016 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

PERFORATED PIPE DETAIL STR-1
 REVISION/APPROVED 2/01/2013 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

**4\"/>
 REVISION/APPROVED 02/18/2015 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE**

DRIVEWAY & ALLEY ENTRANCES STR-5
 REVISION/APPROVED 1/8/2016 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

STREET RESTORATION OVER TRENCH STR-8
 REVISION/APPROVED 1/8/2016 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

PLUG BLOCKING FOR WATERMAIN W-2
 REVISION/APPROVED 2/01/2013 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

PLUG SIZE	B	D
6"	12"	12"
8"	24"	15"
10"	30"	20"
12"	36"	25"
16"	48"	30"
20"	60"	34"
24"	60"	40"
30"	80"	40"

THRUST BLOCKING FOR WATERMAIN W-3
 REVISION/APPROVED 2/01/2013 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE

BEND OR BRANCH SIZE	B	D	B	D	B	D
6"	12"	12"	12"	12"	12"	12"
8"	12"	12"	12"	12"	12"	12"
10"	12"	12"	12"	12"	12"	12"
12"	12"	12"	12"	12"	12"	12"
16"	12"	12"	12"	12"	12"	12"
20"	12"	12"	12"	12"	12"	12"
24"	12"	12"	12"	12"	12"	12"
30"	12"	12"	12"	12"	12"	12"

GUTTER STAMP STRM-7
 REVISION/APPROVED 2/01/2013 CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES NO SCALE



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Appendix B

Natural Heritage Information System Letter

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**Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025**

October 16, 2017

Correspondence # ERDB 20180157

Mr. Karl Everett
AMI Consulting Engineers
91 Main Street
Superior, WI 54880

RE: Natural Heritage Review of the proposed Kayak Bay Village Development,
T49N R15W Section 23; St. Louis County

Dear Mr. Everett,

As requested, the Minnesota Natural Heritage Information System has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project. Based on this query, rare features have been documented within the search area (for details, please visit the Rare Species Guide at <http://www.dnr.state.mn.us/rsg/index.html> for more information on the biology, habitat use, and conservation measures of these rare species). Please note that the following rare features may be adversely affected by the proposed project:

- Eastern hemlock (*Tsuga canadensis*), a state-listed endangered plant species, has been documented in the vicinity of the proposed project. Eastern hemlock usually occurs in well-drained, sheltered valleys and ravines. Protecting all surviving stands from any land clearing activities is a major conservation need for this species. Establishing a minimum one tree length buffer around the perimeter of any populations is recommended. Please note that Minnesota's endangered species law (MS 84.0895) and associated rules (Chapter 6212.1800 - 6212.2300 and 6134) prohibit the taking of endangered or threatened species, including their parts or seeds, without a permit. If there is suitable habitat within the project area and there will be any tree removal, we recommend that a qualified surveyor (please see enclosed list) conduct a botanical survey to ensure the protection of this rare species. For plants, taking includes picking, digging, or destroying. I have attached information regarding surveying, including a list of surveyors. **Please contact the Endangered Species Environmental Review Coordinator, Lisa Joyal at lisa.joyal@state.mn.us or 651-259-5901 before any survey work is initiated**, as you will need to discuss potential surveyors, survey protocol, and other requirements.
- Pale sedge (*Carex pallescens var. neogaea*), a state endangered plant species, has been documented in the vicinity of the project. This species is found in moist, grassy or rocky habitats on the margin of fire-dependent forests adjacent to the Lake Superior shore. This species is mainly impacted by the loss of habitat from development, road building & maintenance, and certain high-intensity recreational activities. If there is suitable habitat within the project area, we recommend that a qualified surveyor (please see

enclosed list) conduct a botanical survey to ensure the protection of this rare species. **Please contact Lisa Joyal before any survey work is initiated.**

- The lake sturgeon (*Acipenser fulvescens*), a state-listed special concern species, has been documented in Lake Superior in the vicinity of the proposed project. This species can be adversely impacted by actions which alter stream hydrology or decrease water quality, including sedimentation, dredging and filling, stream dewatering, impoundment, eutrophication, channelization, and pollution/contamination. Therefore, it is important that effective erosion and sediment control practices be implemented and maintained during construction and be incorporated into any stormwater management plan.
- The Environmental Assessment Worksheet should address whether the proposed project has the potential to adversely affect the above rare features and, if so, it should identify specific measures that will be taken to avoid or minimize disturbance.
- Please include a copy of this letter in any state or local license or permit application. Please note that measures to avoid or minimize disturbance to the above rare features may be included as restrictions or conditions in any required permits or licenses.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location (noted above) and the project description provided on the NHIS Data Request Form. Please contact me if project details change or for an updated review if construction has not occurred within one year.

The Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. If you have not done so already, please contact your DNR Regional Environmental Assessment Ecologist to determine whether there are other natural resource concerns associated with the proposed project (contact information available at http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html). Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,

A handwritten signature in black ink that reads "Samantha Bump". The signature is written in a cursive style with a large, prominent "S" and "B".

Samantha Bump
Natural Heritage Review Specialist
Samantha.Bump@state.mn.us

Enc. Rare Species Survey Process

Cc: Margi Coyle

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Appendix C

State Historic Preservation Office Letter

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STATE HISTORIC PRESERVATION OFFICE

October 6, 2017

Karl Everett
AMI Consulting Engineers P.A.
91 Main Street
Superior WI 54880RE: Proposed Kayak Bay Village Development
Duluth, Saint Louis County
SHPO Number: 2017-3016

Dear Mr. Everett,

Thank you for consulting with our office during the preparation of an Environmental Assessment Worksheet (EAW) for the above-referenced project.

Based on our review of the project information submitted by your office on 1 September 2017, our records indicate the following historic/architectural and archaeological properties are located within or directly adjacent to the project area:

- **Skyline Parkway (SL-XXX-003)** – a historic property determined to be eligible for listing in the National Register of Historic Places through previous federal Section 106 review;
- **Lake Superior and Mississippi Railroad: St. Paul to Duluth Mainline** – a historic property determined to be eligible for listing in the NRHP through previous federal Section 106 review; and
- **Spirit Mountain** – as cited in the recently completed report by the City of Duluth entitled *An Ethnographic Study of Indigenous Contributions to the City of Duluth*, this geographic feature has been identified as a property significant to Native American tribes.

Regarding historic/architectural properties, we recommend that the City continue to consult with our office as project plans are developed in an effort to avoid direct or indirect effects to Skyline Parkway or the Lake Superior and Mississippi Railroad properties. We have not been provided sufficient information as it pertains to the current status of the proposed development parcel in order to determine potential effects to historic properties, if any. Information and documentation pertaining to any extant buildings, structures, park features, or historic landscapes 45 years old or older should be submitted to our office for review and consideration.

Regarding archaeology, due to the nature and location of the proposed project, we recommend that a Phase I archaeological survey be completed. The survey must meet the requirements of the Secretary of the Interior's *Standards for Identification* and should include an evaluation of National Register eligibility for any properties that are identified. For a list of consultants who have expressed an interest in undertaking such surveys, please visit the website preservationdirectory.mnhs.org, and select "Archaeologists" in the "Search by Specialties" box.

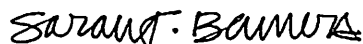
We will reconsider the need for survey if the project area can be documented as previously surveyed or disturbed. Any previous survey work must meet contemporary standards. **Note:** plowed areas and right-of-way are not automatically considered disturbed. Archaeological sites can remain intact beneath the plow zone and in undisturbed portions of the right-of-way.

Regarding properties of significance to Native American tribes, we recommend that the City consult with appropriate tribal communities in an effort to identify significant properties, consider potential effect that the proposed development project may have on these properties, and resolve adverse effects, if any, through avoidance, minimization, or mitigation.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36CFR800, procedures of the Advisory Council on Historic Preservation for the protection of historic properties. If this project is considered for federal assistance, or requires a federal license or permit, it should be submitted to our office by the responsible federal agency.

Please contact me at sarah.beimers@mnhs.org or 651-259-3456 if you have any questions regarding our comment letter.

Sincerely,



Sarah J. Beimers, Manager
Government Programs and Compliance

Cc via email only:

Bethany Rosemore, AMI Engineers

Appendix D
Traffic Impact Study

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7699 Anagram Drive
Eden Prairie, MN 55344

PHONE 952-937-5150
FAX 952-937-5822
TOLL FREE 888-937-5150

www.westwoodps.com

MEMORANDUM

Date: April 29, 2014

Re: **Riverside Development – Traffic Impact Study Memo**
File R0003622

To: Brad Johnson, Spirit Valley Land Company

From: Steve Manhart, P.E., PTOE, PTP

Westwood Professional Services has reviewed the traffic impacts of the proposed Riverside Development in Duluth, MN. The mixed use development is proposed to for the parcels southeast of Grand Avenue (MN TH 23) and across from the Spirit Mountain Ski Area.

The intent of this study is to define the existing traffic conditions, to determine the site trip generation, to summarize the impacts of the site trips on the intersection of TH 23 and Warwick Street (the name of the ski area drive). This memo will show the number of AM, PM Peak Hour and Saturday midday trips generated by the site, the number of daily trips generated and the resulting levels of service during each peak hour if this intersection were to be retained as a side-street stop condition with free-flow along MN 23.

Further, Westwood will utilize the assumptions and procedures outlined in the Minnesota Manual on Uniform Traffic Control Devices (MnMUTCD) to determine whether warrants will exist for side-street stop, all-way stop, signalization or roundabout control. Based on warrants met and levels of service projected, traffic control will be recommended for the resulting intersection.

BACKGROUND

Westwood is aware that the Duluth-Superior Metropolitan Interstate Council (MIC) had prepared the Highway 23/Grand Avenue Corridor Study in October 2013. In that document, Grand Avenue is identified as a principal arterial serving West Duluth. This study presented a series of short- and mid-term options for recommended improvements that "...could improve the existing corridor for both motorized and



non-motorized users”, and that could be “...implemented within the existing public right-of-way and with moderate levels of investment.”¹

The document has categorized the Riverside Development area as being in Zone 3: Grand Avenue Place to 85th Avenue West. The document also recognizes the development impacts that have already begun in this area. The document states:

“In February 2013, Spirit Mountain opened a new ski chalet with a restaurant, bar, and event space at Warwick Street. Significant increases in traffic are already being reported by the Duluth Police Department, DTA, and other stakeholders, and there is some community interest in seeing a traffic signal installed at this location. A 12-hour count conducted by MnDOT after the chalet’s opening, however, indicate that the increased traffic still does not meet the traffic warrants to allow for a signal. With that said, the types of development that are being proposed in Zone 3 would likely increase the levels of traffic that would require signalization.”²

EXISTING CONDITON

The Riverside Development area will be served by an intersection with MN TH 23 across from the entrance to Spirit Mountain Ski Area (See Figures 1 and 2). Currently, the intersection of TH 23 and Warwick Street (the ski area entrance) exists as a T-intersection with side-street stop control. TH 23 is a 46-foot wide four-lane undivided highway with 5-foot shoulders on each side and curb & gutter. Warwick Street is a 36-foot wide unmarked street with curb & gutter.

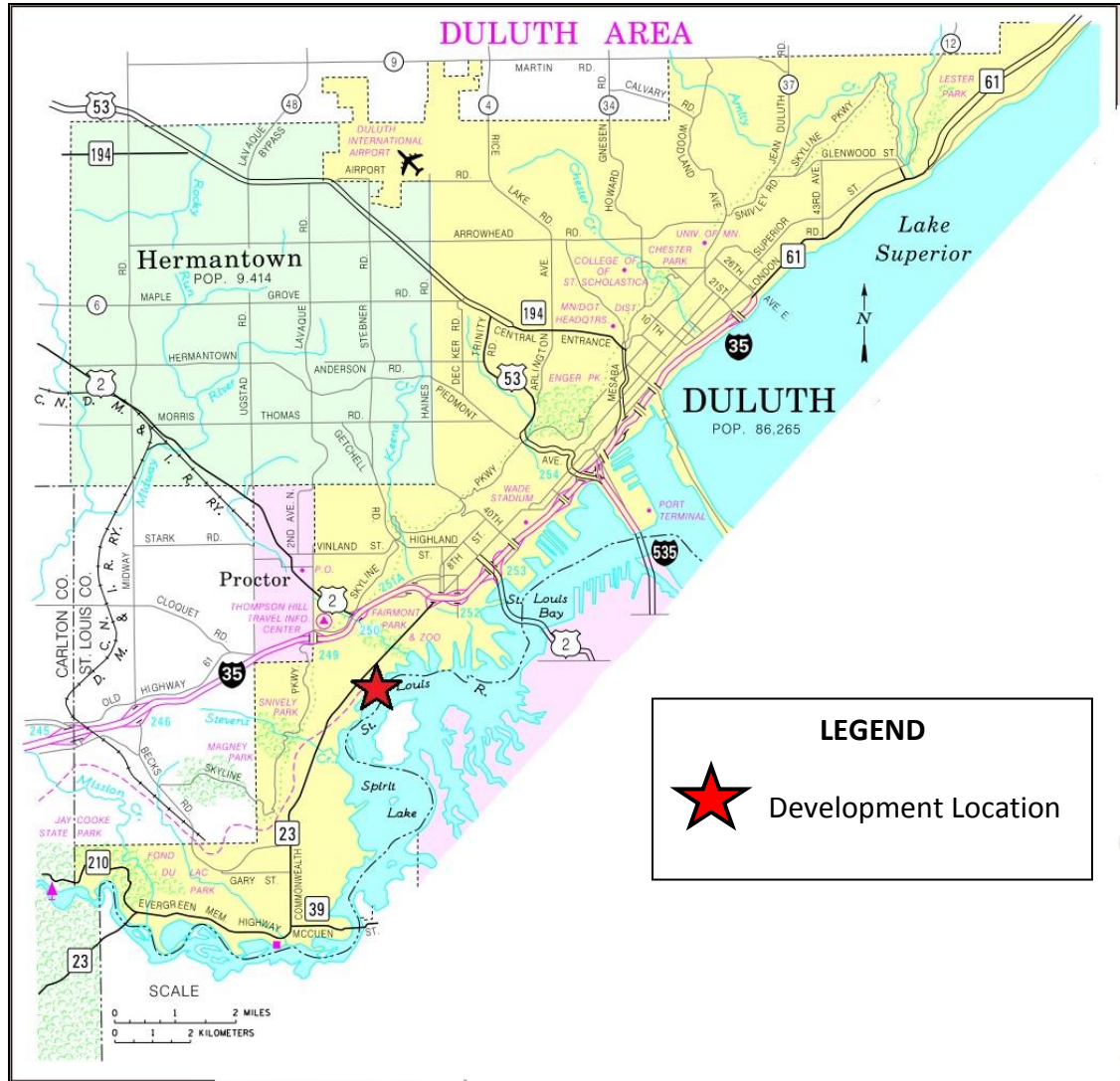
The speed limit on this segment of TH 23 is 45 mph, with a transition to 35 mph occurring just to the northeast of this intersection. The speed limit for Warwick Street is unposted, which defaults to the statutory speed limit of 30 mph.

Currently, TH 23 is generally level, but Warwick Street slopes downward toward TH 23 and suggests sight distance limitations due to trees and brush especially looking toward the northeast from a stop position.

¹ Highway 23/Grand Avenue Corridor Study, prepared by the Duluth-Superior Metropolitan Interstate Council, Duluth, MN, October, 2013.

² Ibid., page 47.

FIGURE 1 – PROJECT LOCATION



Source: MnDOT Roadway Map, 2012.

There are no sidewalks along either TH 23 or Warwick Street. Nevertheless, the Willard Munger State Trail parallels TH 23 just 235 feet to the east. The Western Waterfront Trail lies approximately 800 feet to the east of the Munger Trail. To the west of the intersection, the Superior Hiking Trail and the DWP trail bisect the Spirit Mountain property.

This intersection is served by bus service from Duluth Transit. Routes 2, 2F and 2X serve designated bus stops along northbound and southbound TH 23 near this intersection (as shown on Figure 2).

FIGURE 2 – AERIAL VIEW OF DEVELOPMENT AREA

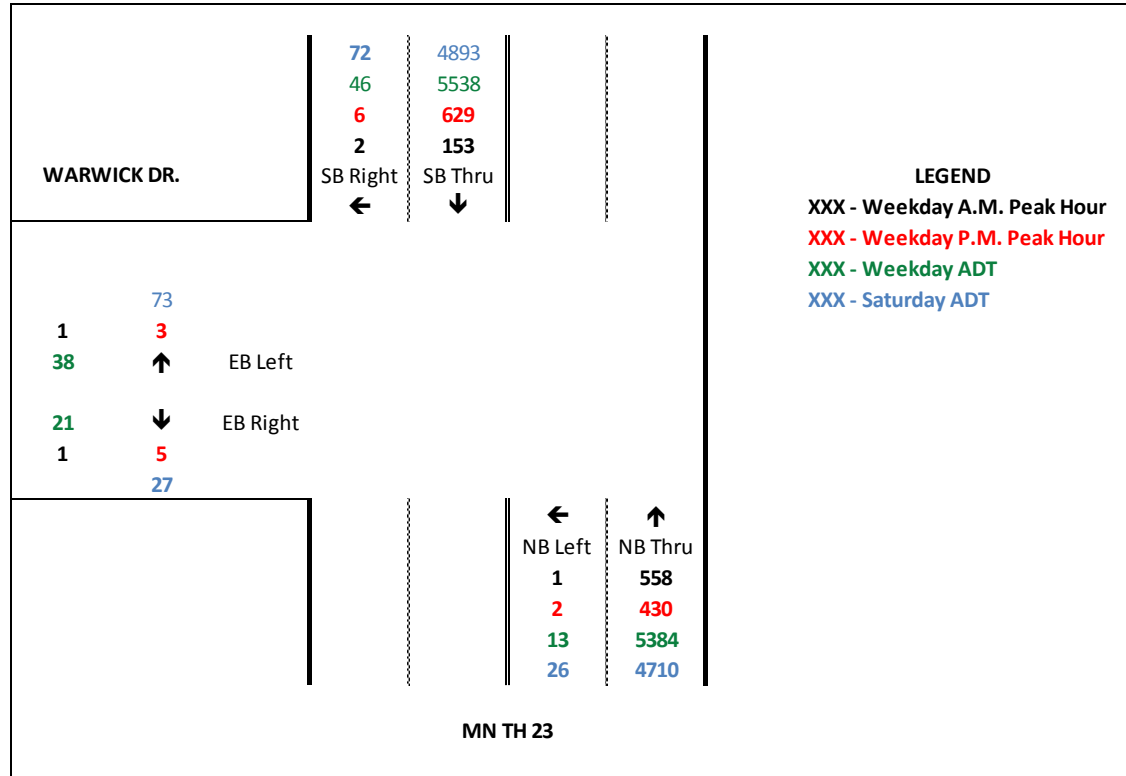


Source: Google Maps.

DATA COLLECTION

In April 2014, Westwood Professional Services deployed video cameras at the intersection to capture turning movements at the intersection. The cameras captured both weekday peak hour and Saturday midday turning movements at the intersection. Results of this data collection appear in Figure 3 below.

FIGURE 3 -- EXISTING TURNING MOVEMENT COUNTS



Source: Westwood Professional Services, April 11-13, 2014

It is important to note that the counts above do not reflect the full impact of the ski area traffic. When these counts were conducted, the ski area was closed for the season. Although some traffic is generated by the ski area's Adventure Park, the traffic recorded is far less than what would be anticipated in the height of the ski season.

CRASH HISTORY

Westwood analyzed crash history within the area for the three most recent years (2011, 2012 and 2013). No crashes were reported directly at the intersection of TH 23 and Warwick Street. Three non-injury crashes occurred to the southwest of the intersection during this period. Two of the three were snow related, one crash involved hitting a deer, and each of the three occurred in the dark.

PROPOSED DEVELOPMENT

SITE TRAFFIC GENERATION

The proposed development will consist of a variety of mixed uses:

- a fast food establishment
- a gas & convenience store
- a 100-room hotel
- a three-story office building with a 33,000 sq. ft. ground-floor clinic
- a senior housing facility
- a mixed-use development with fitness center & sit-down restaurant
- twenty single-family residential units
- 80-acre park with beach, boat piers, seasonal restaurant and overflow parking area with shuttle for the ski area.

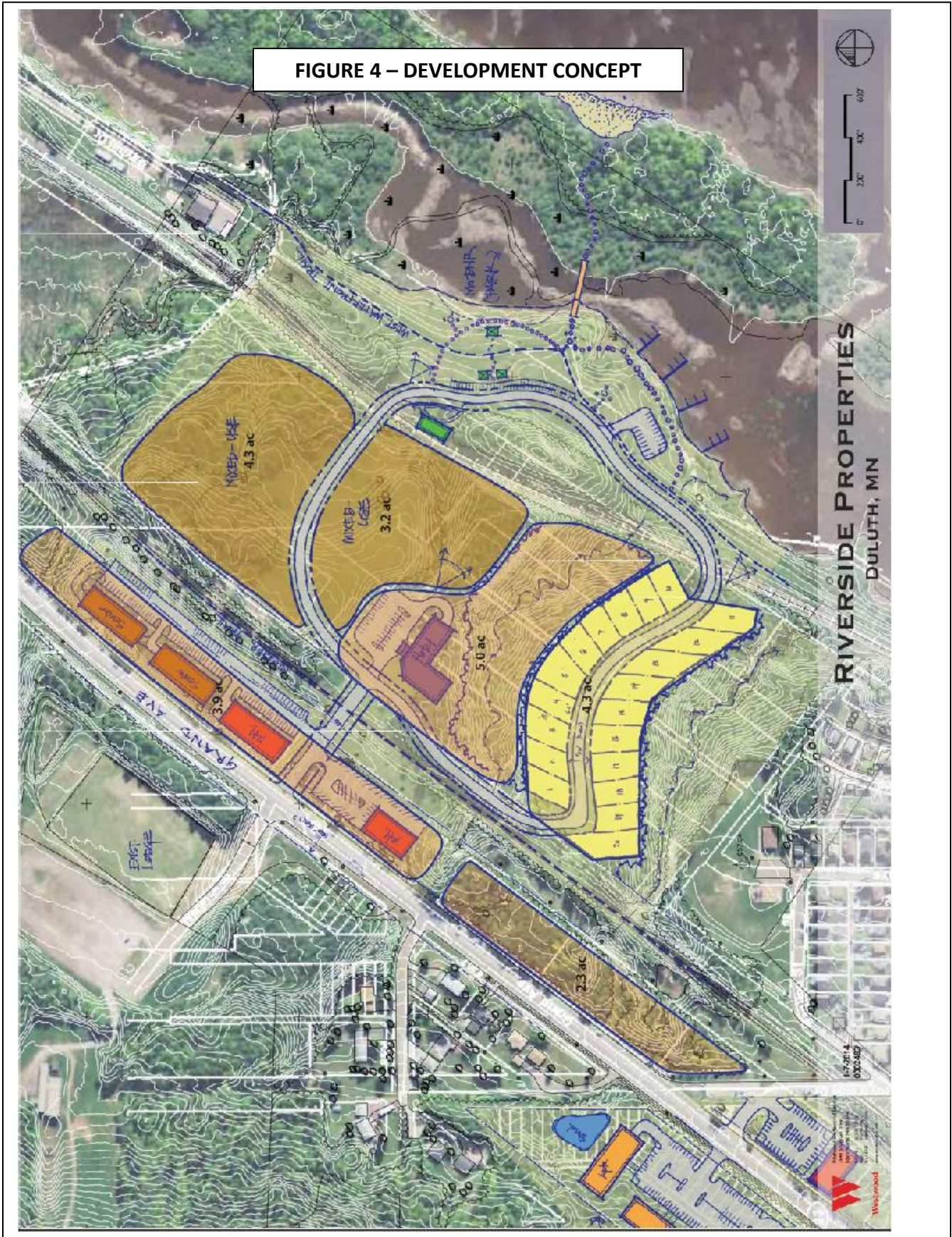
Phasing of the development will be varied, but it is known that the gas & convenience store will open first.

Table 1 illustrates the trip generation potential for the full development. Figure 4 shows the proposed layout of the development.

TABLE 1 – PROPOSED TRIP GENERATION

Group No.	Type	Land Use	ITE Code	Size	Weekday		AM peak		PM Peak	
					Enter	Exit	Enter	Exit	Enter	Exit
1	Retail	Fast Food - w/Drive Thru	934	5 k.s.f.	1,194	1,194	116	111	70	65
1	Retail	Gas/Service w/ Conv & Wash	946	16 fuel pos.	1,178	1,178	88	85	93	93
2	Lodging	Hotel	310	100 rooms	394	394	31	20	25	22
2	Office	Medical-Dental Office Bldg.	720	33 k.s.f.	574	574	57	16	26	68
2	Office	General Office Building	710.2	66 k.s.f.	350	350	83	11	14	66
3	Residential	Elderly Housing - Attached	252	100 units	166	166	6	12	11	10
4	Recreational	Health/Fitness Club	492	45 k.s.f.	713	713	29	29	73	54
5	Residential	Single Family Housing	210	20 units	115	115	6	17	13	7
6	Recreational	County Park	412	80 acres	88	88	1	1	3	2
					4,772	4,772	417	302	328	387
					9,544		719		715	

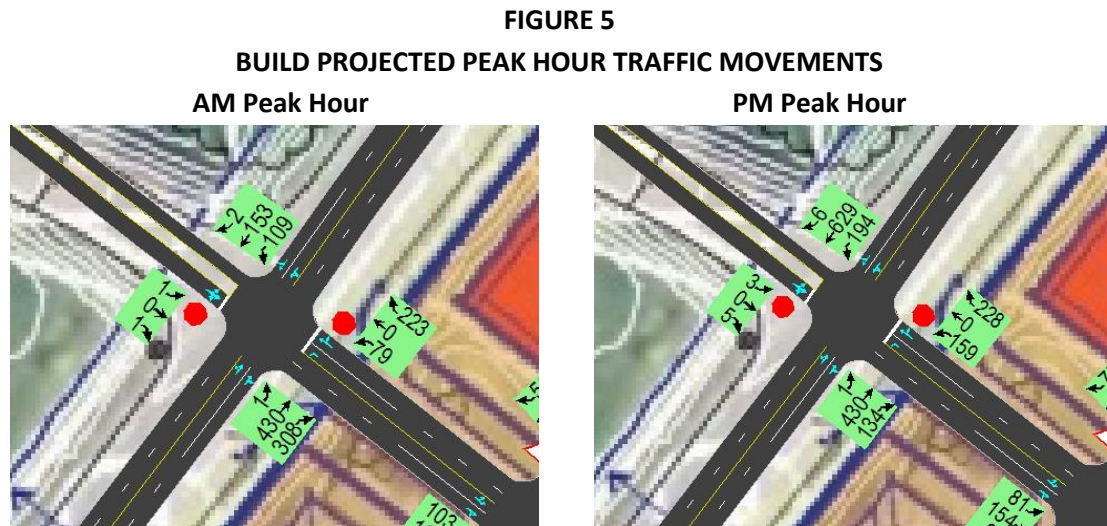
Source: Trip Generation, Ninth Edition, Institute of Transportation Engineers, Washington, DC, 2012.



ASSIGNMENT

Westwood has directionally distributed the trips defined above by assigning in-bound and outbound trips (enter and exit respectively) based on the hourly volumes along northbound and southbound MN 23 recorded over a 24-hour period. The trips have then been proportioned and assigned to the inbound movements (southbound left turns and northbound right turns) and the outbound movements (westbound left turns and right turns). Thus, a model of the development's 24-hour movements has been achieved.

Figure 5 below illustrates the trips generated by the Riverside development and assigned at the intersection.



TRAFFIC OPERATION

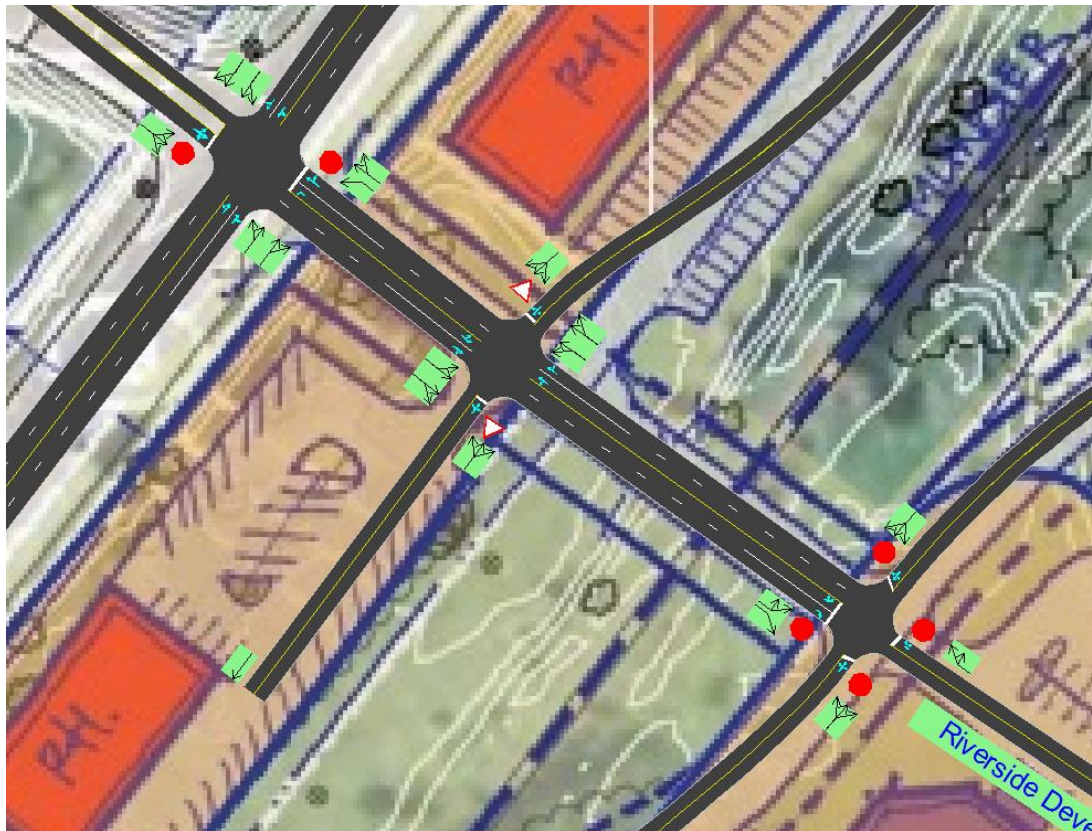
The development will be served by a main roadway that will intersect with MN TH 23 across from Warwick Street. Westwood has tested a variety of traffic control options to determine whether warrants exist for traffic control will exist beyond the rudimentary side street stop control. An Intersection Control Evaluation (ICE Report) of this intersection has been included in the Appendix of this report. The ICE Report has concluded that signalization will be warranted, and is the recommended control option, upon completion of various stages of the Riverside Development.

It is recommended that the MN TH 23 (Grand Avenue) and Warwick Street/Riverside Development Drive intersection be controlled by a traffic signal installation. While

each traffic control scenario yielded overall LOS-A or –B operation, the traffic signal control option allows for acceptable overall intersection operation and manageable queue lengths.

Signalization is better at accommodating changes in traffic conditions and can be coordinated with other area interconnected signal systems for optimized flow along MN 23. Further, pedestrian and bicycle crossings to the Willard Munger State Trail, the Western Waterfront Trail, the Superior Hiking Trail and the DWP Trail can be accommodated by incorporating pedestrian crossing indications and push buttons at the signalized intersection. In addition, the added traffic generated by the Spirit Mountain Ski Area during winter months will create greater traffic volumes and demand on the intersection that can be better accommodated by signalization than other traffic control devices and mitigation strategies.

FIGURE 6
RECOMMENDED LANE ARRANGEMENT AND TRAFFIC CONTROL



NON-MOTORIZED TRAFFIC OPERATION

This area of Duluth offers several trails for bicyclists, hikers and pedestrians. The Willard Munger Trail, the Western Waterfront Trail and the Saint Louis River are within close proximity to the east of this intersection, which provide numerous opportunities for non-motorized activity. To the west of this intersection lies Spirit Mountain ski area, the Superior Hiking Trail and the DWP Trail.

MnDOT is planning a Hwy 23 Rehabilitation Project that will include plans to narrow the travel lanes of MN 23 to accommodate bicyclists. Further, MnDOT will improve and extend sidewalks on both sides of MN 23 from I-35 to the end of the urban section (which includes this intersection area). Pedestrian activated high-visibility crosswalks and ADA improvements will be added at locations along the project section. Additional trail connections will be made from MN 23 to the adjacent bike trail.

These improvements will emphasize the need for safe and efficient crossings of MN 23 for bicyclists and pedestrians. Only the all-way stop control and the signalized intersection control provide safe and efficient traffic control for pedestrians and bicyclists at the intersection of MN 23 and Warwick Street/Riverside Development Drive. Two-way stop control provides no safe crossing control of MN 23. Roundabouts are not designed for crossings at the rotary itself, but must rely on pedestrian and bicycle crossings in advance or beyond the rotary area, and these crossings are often at uncontrolled crosswalk locations.

Within the Riverside Development, trail crossings will be marked and signed for the safety of bicyclists, pedestrians and motorists.

CONCLUSION

The Riverside Development will provide a variety of mixed uses for the area. The intersection with MN TH 23 will impact the most traffic, and can be controlled safely and effectively through signalization. The attached Intersection Control Evaluation details the resulting serviceability of each traffic control type tested.

At full build-out, the mixed uses will generate 9,500 vehicle-trips per day. This analysis tested these trips as vehicular trips, but due to the presence of numerous trails and other travel modes, many of these trips may not be by single-occupant vehicle. Nevertheless, this magnitude of trips can be accommodated by the proposed lane arrangements and traffic control.