



# City of Stanwood

## Public Works

10220 270<sup>th</sup> Street NW, Stanwood, WA 98292  
(360) 629-9781 | Fax: (360) 629-0867

June 20th, 2022

To: Residential Treatment Facility North

Subject: Water Availability

The City of Stanwood has the capacity to serve your site with water with the upgrades described in the RH2 analysis letter dated June 10<sup>th</sup>, 2022. The new water main shall match the description in the RH2 letter, and comply with the City of Stanwood Street and Utility Standards.

If you have any questions, feel free to contact me at 360-454-5230 or at [kevin.hushagen@ci.stanwood.wa.us](mailto:kevin.hushagen@ci.stanwood.wa.us).

Sincerely,

A handwritten signature in blue ink that reads "Kevin Hushagen".

Kevin Hushagen  
Public Works Director



**June 10, 2022**

Mr. Alan Lytton  
Engineering Technician  
City of Stanwood  
10220 270<sup>th</sup> Street NW  
Stanwood, WA 98292

*Sent via:* Email

**Subject: Residential Treatment Facility Property - 22 102230 CUP  
Water Availability Evaluation**

Dear Mr. Lytton:

RH2 Engineering, Inc., (RH2) received a request from the City of Stanwood (City) to review water availability for the proposed Residential Treatment Facility property development near the intersection of 80<sup>th</sup> Avenue NW and 300<sup>th</sup> Street NW (Development). The proposed Development, located on tax parcel no. 32041800100100 (total area of approximately 15.56 acres), consists of approximately 5 acres upon which a treatment facility with 16 beds is proposed for construction. A preliminary water utility plan developed by BCRA was provided (**Attachment 1**).

In accordance with Stanwood Municipal Code (SMC) 17.148.080, certificates of capacity for water facilities are granted upon the approval of a preliminary development permit or at the time of the final development permit issuance.

The City is currently in the process of updating its Water System Plan. As the plans have not yet been finalized, the existing 2015 *Comprehensive Water System Plan* (WSP) and associated hydraulic model was utilized as a basis for the water availability evaluation.

## Water Availability Evaluation

### Projected Demand and System Capacity

The projected water demand for the proposed Development is based on the proposed number of equivalent residential units (ERUs). One ERU is equivalent to the amount of water used by one single-family residence. The proposed Development is estimated to consist of approximately 33 total ERUs, as shown in **Table 1**. The proposed Development demands are estimated based on unit demands of 400 gallons per day (gpd) per bed for a hospital, as identified

#### WASHINGTON LOCATIONS

Bellingham  
Bothell (Corporate)  
East Wenatchee  
Issaquah  
Richland  
Tacoma

#### OREGON LOCATIONS

Medford  
Portland

#### IDAHO LOCATIONS

Meridian

in Table 3-2 of the Washington State Department of Health *Water System Design Manual* (2020), and unit demands of 192 gpd per ERU, as identified in Table 4-13 of the City's 2015 WSP. The average day (ADD), maximum day (MDD), and peak hour demands (PHD) of the proposed Development are shown in **Table 1**.

**Table 1**  
**Proposed Development Water Demand Data**

Projected Development ERUs	
Projected Development ERUs	33
ADD per ERU (gpd per ERU)	192
Projected Development Average Day Demand	
Total Projected Demand (gpd)	6,400
Total Projected Demand (gpm)	4.4
Projected Development Maximum Day Demand	
Maximum Day / Average Day Peaking Factor	1.69
Total Projected Demand (gpd)	10,829
Total Projected Demand (gpm)	7.5
Projected Development Peak Hour Demand	
Peak Hour / Average Day Peaking Factor	2.45
Total Projected Demand (gpd)	15,652
Total Projected Demand (gpm)	10.9

The City's water system capacity evaluation included a review of the City's sources of supply, water rights, storage facilities, and transmission main capacities. The evaluation concluded that the City's facilities are sufficient to support the 33 ERUs for the proposed Development in addition to the existing customers and developments that have been constructed or approved for water availability. **Table 2** shows the supply evaluation for the 365 Zone, within which the proposed Development would be located and connected. **Table 3** shows the supply evaluation for the 297 Zone, which serves the 365 Zone via the Knittle and Cedarhome Booster Pump Stations. **Table 4** shows the evaluation for the remainder of the City's sources of supply, water rights, storage facilities, and transmission main capacities. This analysis was based on the updated storage operational levels provided by the City in September 2018. Flows and ERUs for the reviewed developments were based on the flows used to review those developments: an ADD of 192 gpd per ERU (per the City's 2015 WSP) and the same peaking factors shown in **Table 1**.



**Table 2**  
**365 Zone Supply Capacity Evaluation**

<b>365 Zone Supply Evaluation</b>	
365 Zone Supply Capacity (gpm)	2,360.0
Reserved Fire Flow Supply (gpm)	1,000.0
2013 Estimated 365 Zone MDD (gpm)	71.1
Sundance Estates MDD (gpm)	2.0
Jasper Junction MDD (gpm)	8.3
BYK Short Plat (4 West Lots) MDD (gpm)	0.9
Schmitt Development MDD (gpm)	21.4
Skyline Development MDD (gpm)	2.0
JBS Holdings Short Plat MDD (gpm)	0.9
Kottsick Plat MDD (gpm)	21.6
Lindberg Development MDD (gpm)	25.7
Estimated Reviewed Development MDD (gpm)	82.9
Projected Development MDD (gpm)	7.5
<b>Remaining 365 Zone Supply Capacity (gpm)</b>	<b>1,198.5</b>



**Table 3**  
**297 Zone Supply Capacity Evaluation**

<b>297 Zone Supply Evaluation</b>	
297 Zone Supply Capacity (gpm)	1,950.0
2013 Estimated 297 Zone MDD (gpm) <sup>1</sup>	973.7
Maple Court Apartments MDD (gpm)	10.8
Mineral Point MDD (gpm)	15.6
Jasper Junction MDD (gpm)	0.9
BYK Short Plat (5 East Lots) MDD (gpm)	1.1
Landed Gentry Development MDD (gpm)	28.2
Lindstrom Apartments MDD (gpm)	15.7
Pence Short Plat MDD (gpm)	0.7
Brandt Short Plat MDD (gpm)	0.7
Decker Short Plat MDD (gpm)	2.0
August's Landing MDD (gpm)	2.0
Madison Place MDD (gpm)	18.3
Cambridge Place MDD (gpm)	10.1
Upper Left Apts MDD (gpm)	7.0
Creekside Apts Phase 3 MDD (gpm)	13.5
Vet Clinic MDD (gpm)	1.8
Wolfkill Construction MDD (gpm)	1.7
North Star MDD (gpm)	1.6
Chandler's Reserve MDD (gpm)	20.5
Kottsick Plat MDD (gpm)	9.0
Grandview Apartments MDD (gpm)	10.8
Cedarside Commons MDD (gpm)	79.3
Estimated Reviewed Development MDD - 297 Zone (gpm)	251.3
Estimated Reviewed Development MDD - Other Zones (gpm)	97.8
Projected Development MDD (gpm)	7.5
<b>Remaining 297 Zone Supply Capacity (gpm)</b>	<b>619.8</b>



**Table 4**  
**System Capacity Analysis**

System Capacity (ERUs)	
Well and Spring Supply Source	8,673
Annual Water Rights Source	24,677
Instantaneous Water Rights Source	17,222
Storage <sup>1</sup>	10,262
Transmission Capacity	11,324
ERUs	
2013 ERUs	4,331
Grocery Outlet ERUs	1.3
Petco ERUs	10.4
Carlson ERUs	0.4
Maple Court Apartments ERUs	48
Mineral Point ERUs	69
Jasper Junction ERUs	41
Sundance ERUs	9
BYK Short Plat ERUs	9
Landed Gentry Development ERUs	125
Robinett Development ERUs	15
Schmitt Development ERUs	95
Skyline Development ERUs	9
Lindstrom Apartments ERUs	70
Pence Short Plat ERUs	3
Brandt Short Plat ERUs	3
JBS Holdings Short Plat ERUs	4
Decker Short Plat ERUs	9
August's Landing ERUs	9
Madison Place - MF ERUs	81
Cambridge Place - MF ERUs	45
Upper Left Apts ERUs	31
Brunner Townhome Project ERUs	6
Creskide Apts Phase 3 ERUs	60
Vet Clinic ERUs	8
Wolfkill Construction ERUs	8
North Star ERUs	7
Chandler's Reserve ERUs	91
Kottsieck Plat ERUs	136
Grandview Apartments ERUs	48
Josephine Expansion ERUs	33
Lindberg ERUs	114
Cedarside Commons ERUs	352
Reviewed Development ERUs	1,549
Projected Development ERUs	33
Remaining System Capacity Available (ERUs)	
Well and Spring Supply Source	2,760
Annual Water Rights Source	18,764
Instantaneous Water Rights Source	11,309
Storage	4,349
Transmission	5,411

1: Storage capacity based on current operational levels.

## Hydraulic Analyses Results

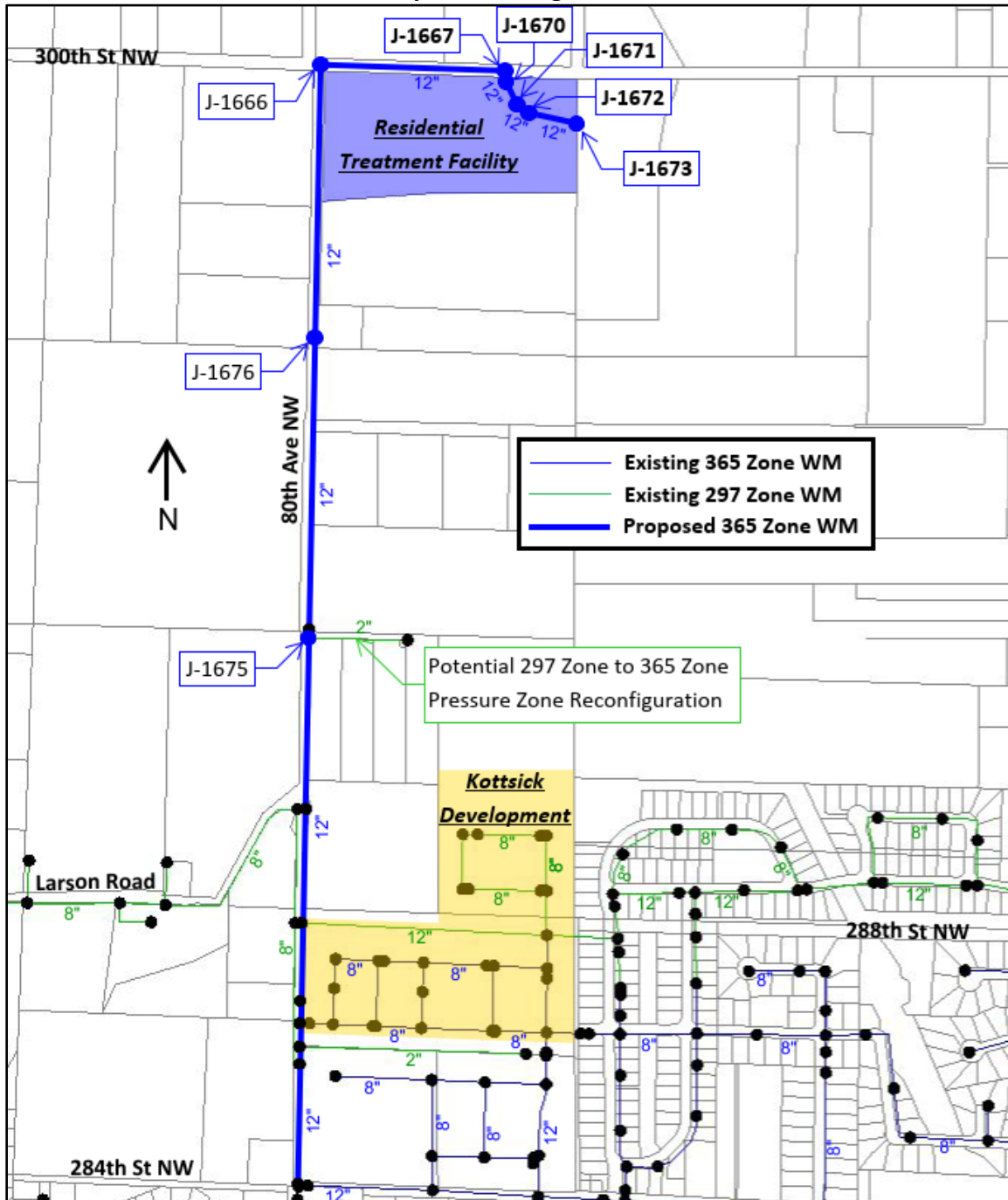
Hydraulic analyses were performed using the City's existing hydraulic model to determine pressure and fire flow availability to the proposed Development. The model included the proposed Development and other reviewed development demands added to the 2013 system demands based on the 2015 WSP. The WSP projected demands can be found in Table 4-12 of the City's WSP.

The proposed Development's location and assumed connection point to existing water main are shown on **Figure 1**. The Development is assumed to connect to the existing 12-inch-diameter water main at the intersection of 284<sup>th</sup> Street NW and 80<sup>th</sup> Avenue NW. As shown in **Figure 1**, the water main associated with the proposed Kottsick Development (approximately located north of 286<sup>th</sup> Place NW, between 80<sup>th</sup> Avenue NW and 75<sup>th</sup> Drive NW) was included in the model but has not yet been constructed. However, this water main was not modeled as connected to the proposed new water main at the intersection of 286<sup>th</sup> Street NW and 80<sup>th</sup> Avenue NW for the purposes of these analyses because the Kottsick Development has not been constructed.

The provided fire flow requirement for the proposed Development is 1,219 gallons per minute (gpm) for 2 hours. Hydraulic analyses were performed to evaluate the water system based on the configuration proposed by the developer.

**Figure 1** depicts the layout of the Development's proposed 12-inch-diameter water main, and **Table 5** presents the results of the pressure and fire flow availability analyses.

**Figure 1**  
**Proposed Configuration**





**Table 5**  
**Hydraulic Analyses Results**

Junction	Zone	PHD Pressure (psi)	Available Derated Fire Flow (gpm)
J-1666	365	50	1,960
<b>J-1667</b>	365	57	1,960
<b>J-1670</b>	365	57	1,950
<b>J-1671</b>	365	57	1,930
<b>J-1672</b>	365	56	1,920
<b>J-1673</b>	365	53	1,890
J-1675	365	76	2,490
J-1676	365	47	2,090

Note: Bolded junctions are those that directly serve the proposed Development.

Fire flow analyses were performed under MDD conditions, and water system pressure analyses were performed under PHD conditions, both with the City's facilities operating at the settings specified in the City's 2015 WSP, with the exception of the reservoirs. The reservoirs were modeled with current operational levels. The settings used in the modeling are detailed later in this letter.

The analyses indicate that the Development will have a range of approximately 1,890 gpm to 1,960 gpm of fire flow available, as shown in **Table 5**, which meets the minimum provided fire flow requirement for this Development. The calculated fire flow rates are based on a residual pressure of 20 pounds per square inch (psi) in the water main adjacent to the hydrant and water velocities in the distribution system of 8 feet per second (fps) or less.

Pressure analyses indicate that the proposed Development will experience pressures of approximately 53 to 57 psi during PHD conditions, as shown in **Table 5**, which meets the minimum pressure requirements.

Another consideration for this Development is to reconnect the 2-inch water main that connects to an existing 6-inch-diameter 297 Zone water main along 80<sup>th</sup> Avenue NW, north of Larson Road, to the proposed 12-inch-diameter 365 Zone water main. This location is called out on **Figure 1**. Performing this pressure zone conversion would allow the City to abandon approximately 800 feet of parallel 6-inch main. Under existing conditions, with service provided from the 297 Zone, pressures at the termination of the 2-inch water main are approximately 48 psi during PHD conditions. Reconnecting this main to the 365 Zone would cause pressures to increase to approximately 79 psi during PHD conditions. If the City desires to perform this pressure zone reconfiguration, it may need to consider individual pressure reducing valves to maintain service pressures under 80 psi. The City also should consider water quality concerns associated with dead-end water main should it choose to connect the 2-inch main to the proposed 12-inch main.

The following is a summary of the hydraulic model's operational conditions used in the analyses:

- The City's water system was experiencing estimated 2013 MDD plus the proposed Development and other reviewed developments MDD for the fire flow analyses and estimated 2013 PHD plus the proposed Development and other reviewed developments PHD for the pressure analyses.
- The Bailey Reservoirs were drawn down 3.7 feet, resulting in a hydraulic elevation of 121.3 feet for the pressure and fire flow analyses.
- The Knittle Reservoirs were drawn down 8.0 feet for the pressure analyses, resulting in a hydraulic elevation of 289.0 feet. The Knittle Reservoirs were drawn down 16.2 feet for the fire flow analyses, resulting in a hydraulic elevation of 280.8 feet.
- The Cedarhome Reservoir was drawn down 7.5 feet for the pressure analyses, resulting in a hydraulic elevation of 357.5 feet. The Cedarhome Reservoir was drawn down 18.3 feet for the fire flow analyses, resulting in a hydraulic elevation of 346.7 feet.
- The Bailey Booster Pump Station was not operating during the pressure or fire flow analyses.
- The Knittle Booster Pump Station was not operating during the pressure or fire flow analyses.
- The Cedarhome Booster Pump Station was operating at approximately 500 gpm for the pressure analyses and at its normal setpoint for the fire flow analyses.
- Bryant Well No. 1 was supplying approximately 1,350 gpm for the pressure and fire flow analyses.
- Bryant Well No. 2 has been taken offline and as such was not operating during the pressure or fire flow analyses.
- Bryant Well No. 3 was not operating during the pressure or fire flow analyses.
- The Cedarhome Well was supplying approximately 600 gpm for the pressure and fire flow analyses.
- Hatt Slough Springs has been taken offline and as such was not operating during the pressure or fire flow analyses.
- All pressure reducing stations were operating at their normal setpoints.

## Conclusion

Water system capacity was evaluated for the proposed Development. The City's existing water system has **sufficient supply, water rights, storage, and transmission capacity for the proposed Development demand, and sufficient distribution system capacity for the proposed Development fire flow.** The water main configuration and diameters identified will provide a minimum available fire flow of approximately 1,890 gpm to the Development. It should be noted that the Development's water main plan indicates approximately 6,600 feet of dead-end water main. The City should consider water quality concerns associated with dead-end water main should this Development be constructed.



If you have any questions regarding the information within, please contact me at (425) 951-5319 or Michele Campbell at (425) 951-5394.

Sincerely,

*Zachary W. Schrempp*

**Zach Schrempp, PE**

Project Engineer

MRC/ZWS/LJM/sp

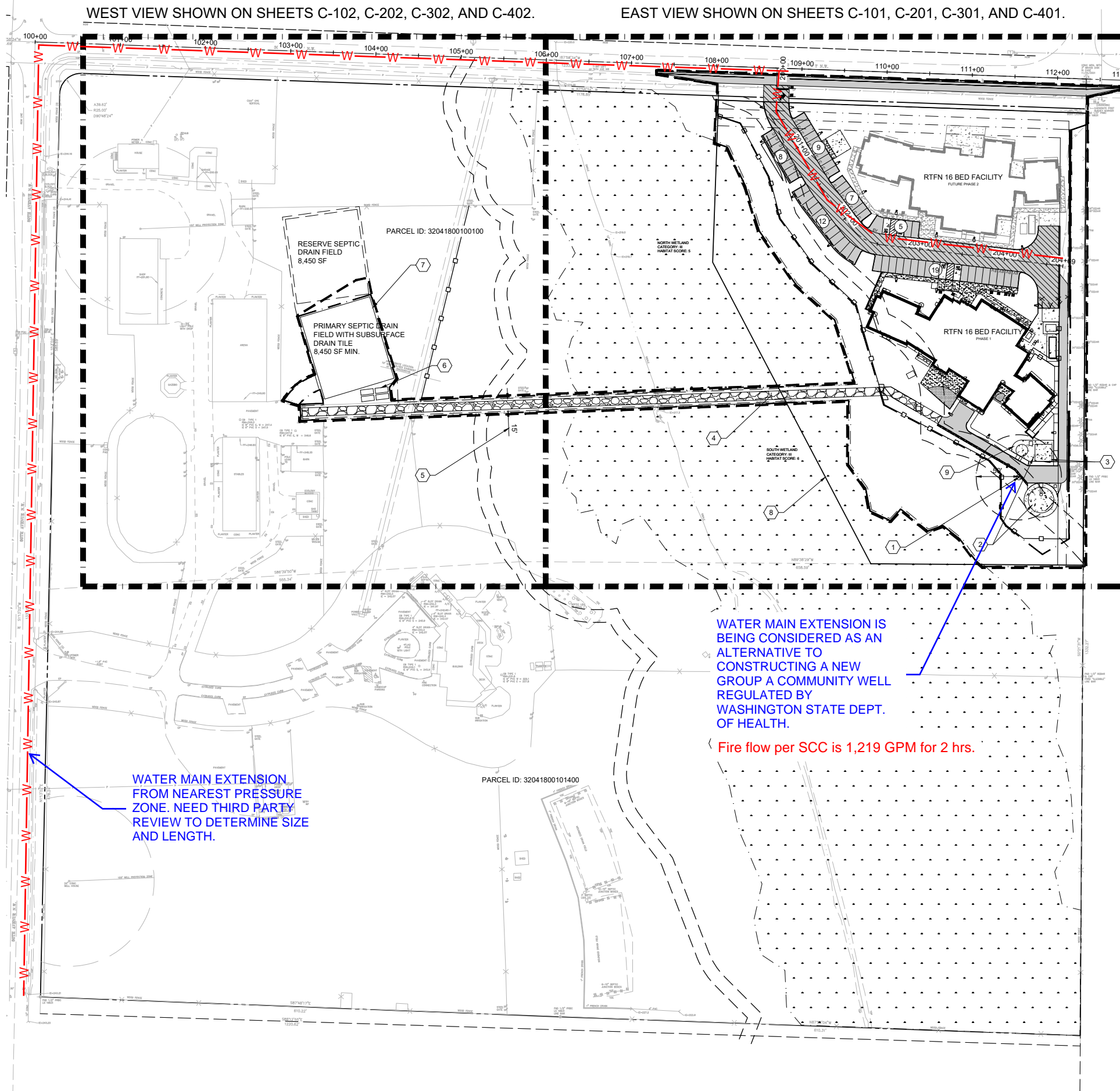


Signed:  
6/10/22

Attachments: Attachment 1 – Preliminary Utility Plan

cc: Mr. Kevin Hushagen, Public Works Director, City of Stanwood  
Mr. Shawn Smith, PE, Interim City Administrator, City of Stanwood

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## SITE AND SURFACING LEGEND

	PROPERTY/BOUNDARY LINE
	PROPOSED PROPERTY LINE ADJUSTMENT
	RIGHT-OF-WAY LINE
	SETBACK LINE
	ACCESS EASEMENT
	ROAD CENTERLINE
	WETLAND BUFFER LINE
	WETLAND DELINEATION LINE
	BUILDING FOOTPRINT
	ASPHALT PAVEMENT
	ASPHALT PAVEMENT - HEAVY DUTY
	CEMENT CONCRETE SIDEWALK
	CEMENT CONCRETE PAVEMENT
	GRAVEL SURFACING
	CEDAR SPLIT RAIL FENCE
	LIMITS OF GRADING
	NUMBER OF PARKING STALLS PER ROW
	SIGN
	PRECAST CONCRETE WHEELSTOP
	LIMITS OF WORK

## SHEET NOTES

- GROUP A PUBLIC WATER WELL
- WATER STORAGE TANKS
- PUMP AND DECHLORINATION FACILITY ENCLOSURE PADS
- GRAVEL MAINTENANCE ROAD
- ACCESS AND UTILITY EASEMENT
- SEPTIC TANKS
- SEPTIC DRAIN FIELD EASEMENT
- PROPOSED BOUNDARY LINE ADJUSTMENT
- CHLORINATION FACILITY

## SITE INFORMATION

- SITE AND ALL ADJACENT SITES ARE DESIGNATED FEMA FLOOD HAZARD ZONE X.
- NOT A CRITICAL AREA SITE PLAN.
- NOT LOCATED WITHIN A CRITICAL AQUIFER RECHARGE AREA.
- PARKING REQUIREMENTS DETERMINED BY THE DEPARTMENT BASED ON COMPARABLE USES.
- ZONING: R-5

**PROJECT PARKING REQUIREMENTS:**  
STANDARD STALLS: 28 PER BUILDING  
ADA STALLS: 2 PER BUILDING  
TOTAL: 60 STALLS

SITE AREAS SUMMARY		
TOTAL SITE AREA	221,509 SF	5.09 AC
BUILDING FOOTPRINT AREAS	34,734 SF	0.80 AC
EXISTING IMPERVIOUS SURFACE	658 SF	0.02 AC
PROPOSED NEW PLUS REPLACED IMPERVIOUS SURFACE	86,500 SF	1.99 AC

