VILLAGE OF OREGON

URBAN SERVICE AREA AMENDMENT REQUEST: AUTUMN RIDGE PHASE II

JUNE 7, 2021

VILLAGE OF OREGON

VANDEWALLE & ASSOCIATES

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Introduction

The Village of Oregon is requesting a 20.0-acre addition to its Urban Service Area (USA) to provide sanitary sewer, potable water, and other urban services to a site immediately south of the Village's municipal boundary on the west side of CTH MM. As depicted on Map 1 in Section 3.1, this would include 20.0 acres currently within the Town of Oregon, immediately adjacent to the Village's current USA boundary.

The unincorporated amendment area is anticipated to be annexed into the Village, with a zoning map amendment and platting to follow. The 19.5-acre parcel currently in agricultural use is presently owned by "Hofer Living Trust" on the west side of CTH MM. The remaining area (0.5 acres) is existing street right-of-way along CTH MM.

The developer, Glenn Hofer, currently owns the parcel and is proposing to develop a Planned Neighborhood residential area called "Autumn Ridge Phase II". It is likely that a portion of CTH MM will be annexed along with the subject property, and the Village is open to accepting a jurisdictional transfer of the road to the southern edge of the proposed USA amendment area.

On May 6, 2021, the Village of Oregon Plan Commission recommended a Resolution to the Village Board to initiate an Urban Service Area Amendment for the 20.0 acres and that the proposed development within the Urban Service Area Amendment is consistent with the Village Comprehensive Plan. On May 17, 2021, the Village of Oregon Village Board adopted the recommended Resolution (Attachment A).

Plan Consistency and Need

1.1. Document Consistency

With the exception of existing right-of-way on CTH MM, the bulk of the proposed USA addition is depicted as "Planned Neighborhood" on the Village's Future Land Use Map (Map 3b), which is part of the Village's Comprehensive Plan. This map was most recently amended in 2020, however the proposed USA addition area has been identified as "Planned Neighborhood" dating back to the 2004 Comprehensive Plan.

The Village's "Planned Neighborhood" land use category is described in the Comprehensive Plan as, "A carefully planned mixture of predominantly Single-Family Residential, combined with one or more of the following land use categories: Two-Family Residential, Mixed Residential, Neighborhood Office, Neighborhood Commercial, Institutional, and Parks and Open Space."

The concept plan for the amendment area (Map 1a) is consistent with this description. The site is expected to include single-family residential, a stormwater management area, and a Village park. The Comprehensive Plan also notes (p. 52) that areas were only depicted as Planned Neighborhood if they could "logically be served by current and planned sanitary sewer facilities." The Village's Future Land Use Map (Map 3b) also depicts a "Potential Urban Service Expansion Area", which includes the requested amendment area in this application.

The planned land use is also a logical continuation of the single-family residential neighborhood currently under construction in Autumn Ridge Phase I, directly north of the proposed USA Amendment area. It is also consistent with the single-family residential uses in the Town of Oregon to the south of the proposed amendment area. In total, the proposed development of Phases II serves as a form of infill development between existing Village neighborhoods and utilities, and existing Town neighborhoods.

Additionally, the Utilities and Community Facilities Map from the Village's Comprehensive Plan depicts a planned future park within the amendment area (see Attachment B). The Village's Future Facilities map from the Park and Open Space Plan (adopted in 2018) also depicts a near-term neighborhood park within the amendment area (see Attachment C).

As noted above, all of the proposed USA Amendment area is currently in the Town of Oregon. The Town of Oregon's adopted Comprehensive Plan Planned Land Use Map from 2010 (Attachment D) depicts the amendment area as "Agricultural Preservation Area", but also depicts the amendment area as "Agricultural

Transition" on the Farmland Preservation Plan Map (Attachment D). The amendment area is also within the Village's Extraterritorial Jurisdiction (Map 3b).

Finally, the preliminary plans for the amendment area are also consistent with CARPC's newest initiative, A Greater Madison Vision, which established a new shared vision and plan for growth for the future in the region. In particular, the proposed USA Amendment and conceptual plans align with CARPC's goal for increasing housing options through the development of varying sized single-family dwelling units - "obtain safe, decent, and affordable housing for all by expanding production of a broad range of housing types to match growing demand and increasing subsidies for workforce and affordable housing." Specifically, the lots and home prices in Autumn Ridge Phase II are designed to be more affordable than other currently available vacant lots in developing subdivisions on the far northwest side of the Village.

1.2. Applicable Neighborhood Plan or Studies

In 2017, the landowner and developer, Glenn Hofer, originally developed the neighborhood plan, which included Autumn Ridge Phases I, II, and III. The original plan is nearly identical to what is currently being construed in Phase I and the concept plan for Phases II, within the proposed amendment area.

The concept plan for the proposed amendment area includes mostly mid-sized single-family residential lots (Map 1a and Attachment E), consistent with the Planned Neighborhood land use category described in Section 1.1. The concept plan also includes bicycle and pedestrian accommodations throughout Phase II, in addition to a new park for increased outdoor recreational opportunities in this area of the Village.

The Concept Plan for Phase II will help complete the local road network in the area. On the south western side of Phase II, there is a planned road extension of Ridge View Lane into the planned development. Ridge View Lane is currently stubbed in the existing neighborhood to the west and stubbed to the north in the currently developing Autumn Ridge Phase I. Additionally, Foxfield Road has already been constructed as part of Phase I to the north of the proposed USA Amendment area and will connect Phases I and II together and to a main arterial roadway (CTH MM).

1.3. Need for the Addition to the USA

Historically, Oregon has grown in three directions from downtown: to the northeast between CTH MM and the USH 14 Bypass, to the west along both sides of Jefferson Street between Netherwood Road and Lincoln Road, and to the southeast along both sides of Janesville Street and Wolfe Street between Union Road and the USH 14 Bypass. The Village has a very low inventory of developable lots on its southeast side, with the remaining lots in Autumn Ridge Phase I as the only currently available supply. All other vacant lots in the community are located on either the northeast side or west side of the Village. In total, there are approximately 350 vacant platted residential parcels in the Village as of 2020. The majority of these parcels are zoned for single-family development. See Attachment H from the Village's 2020 Housing Affordability Report Map.

With the addition of new lots and homes in Autumn Ridge Phase II, some turnover in the existing housing stock could take place as existing residents move into the proposed development. While the new single-family homes will not be considered affordable housing by Village or Dane County standards, some of the existing housing stock vacated by residents moving to the new development could provide availability of more affordable housing units within the existing municipal boundaries.

Other ongoing or near-term residential infill projects in the Village include 153 new WHEDA and LIHTC affordable multi-family units along Janesville Street, a 10-unit owner-occupied duplex development on Janesville Street, and 22 new duplex units and a possible mixed-use development near Oregon Parks Avenue. In total, the Village is actively working to meet residential housing demand through a mix of housing styles, types, and affordability levels, all of which are either under construction today or ready to be constructed to meet the community's residential demand in the near future (the Village had a 4% housing vacancy rate in 2019, below a healthy community's housing vacancy rate of 5%).

In the 2013 Comprehensive Plan, it was projected that by 2030 the Village would have a total population of 13,943 residents (increase of 4,712 from 2010) and 5,530 total housing units (an increase of 1,755 from 2010). It was also projected, to support this growth, the Village would need an additional 440 acres of residential land. While the Village's Comprehensive Plan analysis is dated, the Village's actual population in 2019 (10,353 residents) was not far from the 2020 projected population total in the 2013 Plan (11,587 projected total population).

A more up to date population projection for the Village was done as part of the state-mandated Housing Affordability Report in 2019. It projected a population total of 14,730 by 2030.

The only significant recent Village annexations have been Autumn Ridge Phase I (17 acres) and the Highlands of Netherwood (75 acres). In order to support the projected population increase over the next 10 years, the addition of 20.0 acres and 31 new housing units in Autumn Ridge Phase II are needed to meet demand and continue to diversify the community's available housing stock.

Intergovernmental Cooperation

2.1. Document Notification of Adjacent Local Governmental Units

Village staff and Vandewalle & Associates attended a Town of Oregon Plan Commission meeting on December 15, 2020 where the proposed amendment, development, and eventual Village annexation was discussed. Additionally, Village staff attended a Town of Oregon Plan Commission meeting on January 19, 2021 to answer questions and provide details on the proposed development.

Following revisions to the plans for the proposed development, Village staff, Vandewalle & Associates, and the developer attended a Town of Oregon Plan Commission meeting on May 18, 2021 to present the revised plans, gather feedback, and answer questions.

Village staff contacted the Town of Rutland and provided the proposed amendment and concept plans. Meeting attendance was not requested by the Town and materials were reviewed and discussed at the Town Board meeting on January 5, 2021.

2.2. Adjacent Local Governmental Unit(s) Objections or Support

During the various Town of Oregon meetings that took place in late 2020 and early 2021, Town Plan Commission and Board members and the public were present to ask questions and provide feedback. Comments generally centered on concerns with stormwater management in and around the proposed development.

Following these meeting, the developer chose to revise the plans and only pursue Phase II at this time (parcel on western side of CTH MM) because of a number of stormwater issues that persisted with Phase III (parcel on the eastern side of CTH MM). The revised plans provide better management of stormwater coming onto the site, as well as better management of stormwater generated on-site (see Section 5.10). The revised plans were presented to the Town of Oregon on May 18, 2021. The Plan Commission and Town residents voiced similar opinions as to those expressed in the previous meetings, specially related to stormwater management and traffic impacts.

Any documented letter of support, neutrality, or opposition from this meeting will be provided to CARPC.

Land Use

3.1. Proposed USAA Boundary and Existing Rights-of-Way Map

See Map 1. The proposed addition to the USA is comprised of two existing parcels and one portion of road right-of-way.

One parcel 19.5-acre is currently being farmed. The property is owned by Hofer Living Trust, the intended developer of Phases II, Glenn Hofer. One continuous portion of road right-of-way along CTH MM constitutes the rest of the proposed amendment area. CTH MM is a collector road that links the Village to existing residential development in the Town of Oregon.

Currently, the 19.5 acres being farmed constitute the planned portion of the "Autumn Ridge Phase II" subdivision (Attachment E).

3.2. USA Amendment Area Data

	Total Acres	Existing Developed Acres On-Site	Existing Enviro Corridor Acres	Existing Housing Units
Existing Land Use				
Agriculture/Farming	19.5	0.0	0.0	0
Street Right-of-Way	0.5	0.5	0.0	0
Total	**20.0**	**0.5**	**0.0**	**0**

	Total Acres	Existing Developed Acres On-Site	Future Enviro Corridor Acres	Projected Housing Units
Planned Land Use				
Planned Neighborhood	9.2			31
Street Right-of-Way	4.0	0.5		
Park and Open Space	3.2		3.2	
Stormwater Management	3.6		3.6	
Total	**20.0**	**0.5**	**6.8**	**31**

3.3. Existing and Planned Land Use Map

Map 2 depicts Existing Land Use for the amendment area and Map 1a the conceptual parcels for planned development.

See Introduction and Section 3.1 for more information.

Map 3 and 3a depicts Planned Land Use.

Approximately 9.2 acres of the site is planned for detached single-family dwelling units on lots averaging 0.3 acres (+/- 13,000 square feet) in size.

One stormwater management area, totaling 3.6 acres, is planned for a portion of the amendment area. More detail is provided in Section 5.9.

One Neighborhood Park, totaling 3.2 acres, is also planned for a portion of the amendment area.

Finally, 2.6 acres of right-of-way are anticipated, primarily to serve the planned residential homes and park. The 0.5 acres of CTH MM right-of-way along the eastern side of Phase II will remain in right-of-way use following completion of the development and be expanded to 0.9 acres following replatting. There is a total of 4.0 acres of right-of-way planned within the proposed Urban Service Area Amendment.

Following the CARPC and WisDNR approval process, the developer will seek annexation of the existing 19.5-acre parcel into the Village. Zoning and subdivision review will occur following annexation. It is anticipated that the lots that make up Phases II will be zoned SR-3 (greater than 12,000 sf).

It is likely that a portion of CTH MM will be annexed along with the subject property, and the Village is open to accepting a jurisdictional transfer of the road to the southern edge of the proposed USA amendment area.

3.4 Proposed Quantity and Type of Housing Units

31 lots are proposed for single-family dwelling units (31 total dwelling units), located on approximately 9 acres. Lot sizes are proposed to average +/- 13,000 square feet each. Phase II will reflect the scale and type of housing currently being constructed in Autumn Ridge Phase I to the north and the existing Village neighborhood to the west. Phases II is proposed to be significantly smaller lots than the existing Town development to the south.

3.5 Land Use Phasing

The requested amendment is under 100 developable acres, and thus does not require a 10-year staging map for this application. Phase II is anticipated to begin construction immediately following CARPC and WisDNR approval and Village annexation, platting, and zoning processes. Site grading is planned for 2021, in addition to the Autumn Ridge Court and lots 38-51. In 2022, lots 58-68 and Ridge View Lane are planned.

Natural Resources:

4.1. Natural Features

See Map 4. There are no wetlands, floodplains, hydric soils, woodlands, karsts, unique flora or fauna, or surface water on the site. There are multiple areas of steep slopes above 12% running through Phase II. There are also approximately 18 acres of "Highly Erodible Soils" as defined by the USDA on the site.

Site grading during the construction process will ensure a safe transition and gentle slope between future recreational park space and stormwater management areas. Detailed site grading plans will be reviewed during the required Village Site Plan, Zoning, and Subdivision processes.

The Wisconsin DNR Bureau of Natural Heritage Conservation for Endangered Resources Review Preliminary Assessment (completed December 9, 2020) indicates that the project is covered by the Broad Incidental Take Permit/Authorization for No/low Impact Activities. Meaning that a formal Endangered Resources Review letter is not needed (Attachment F). However, the location of the proposed amendment area overlaps with the Rusty Patched Bumble Bee High Potential Zone. This means that any project within the zone should take steps to determine if suitable habitat is present for the bee. The proposed amendment area is all considered to be non-suitable habitat for the bee because it currently consists of paved areas, row crops, and a farmhouse.

It is recommended that the park and stormwater management areas include suitable active season and suitable overwintering habitat for the Rusty Patched Bumble Bee. Applicable to this site and the proposed development, this would mean the inclusion of prairies, marshes/wetlands, non-compact soils, or sandy soils. Additionally, it is recommended that the park and stormwater management areas include native trees, shrubs, and flowering plants, plants that bloom spring through fall, and the removal and control of invasive plants in any habitat used for foraging, nesting, or overwintering.

Map 4a depicts the proposed amendment area overlaid on the Natural Features Map from the Village's Comprehensive Plan. The only environmental constraints depicted within the amendment area on this map are the 12% to 20% slopes running through the parcel. It is anticipated that during the site grading process, these steep slopes will be graded to be non-steep.

4.2. Parks and Stormwater Management Facilities Map

See Map 3a. A Neighborhood Park is planned for the amendment area, totaling 3.2 acres. Park access will be provided through a parking area along Ridge View Lane with a paved path leading from the parking area to the recreational area. This paved path will connect to the new sidewalk and on-street bicycle network within Phases II, and the larger Village-wide networks as well.

Additionally, as part of Phase II, there is a planned stormwater management area. This area is 3.6 acres. The stormwater area is described in greater depth in Section 5.9.

4.3. Environmental Corridors

In total, 6.8 acres are proposed as Environmental Corridor, comprising 3.2 acres of planned Village Park space and 3.6 acres of stormwater management areas, described in Section 4.2.

The proposed corridor contains approximately 34% of the amendment area, a significant increase from nearly all existing row cropping and no protected environmental corridor areas on-site today.

4.4. Proposed Environmental Corridors Map

See Map 4.

4.5. Environmental Corridors Requirements

The proposed corridor contains both a planned Village Park and stormwater retention/groundwater recharge areas. Exact locations of stormwater areas and park land may be refined through the platting process and the corridor may need to be adjusted accordingly prior to plat approval.

The proposed corridor achieves the intended goals outlined for Environmental Corridors in the Water Quality Plan for Dane County. It protects water quality and public health by including the groundwater recharge area as part of the corridor, as well as an additional planned stormwater retention area. It also provides and encourages outdoor recreation options by including planned neighborhood park space.

Utilities and Stormwater Management

5.1. Proposed Sanitary Sewer

No new interceptor will be installed to facilitate the proposed development. Instead, wastewater will be handled by existing sanitary sewer mains along Foxfield Road in Autumn Ridge Phase I (to the north). Within Autumn Ridge Phase II, wastewater will flow from the southwestern most point of the proposed development under Ridge View Lane (8" pipe) to the east and north until it reaches the northern edge of the property (near Lot 38). Additionally, from the western most point of the cul-du-sac on Autumn Ridge Court, wastewater will flow to the east to connect to infrastructure planned under Ridge View Lane (8" pipe). A future 8" sanitary sewer pipe will be extended south from the existing manhole on Foxfield Road to the planned manhole #5 in Autumn Ridge Phase II. Assuming a 0.4% slope at 95% full, this pipe's capacity will be 372 gallons per minute. The existing sanitary sewer on Foxfield Road has 202 gallons per minute of maximum flow capacity remining without negatively affecting downstream sewers.

All existing sewer data is derived from the recently completed Southeast Side Sewer System Analysis conducted by the Village's engineering consultant, Town and County Engineering. (Appendix G)

5.2. USAA Average Daily and Peak Wastewater Flow

Per the developer's engineer, each housing unit in the proposed development is expected to contribute an additional 250 gallons per day, amounting to approximately 7,750 gallons total per day for the 31 dwelling units in the amendment area. Peak flow is estimated to be a total of 31,000 gallons per day. These values assume 2.5 persons per home and 100 gallons per person per day. A peaking factor of 4 was assumed.

Within the Village's recently completed Southeast Side Sewer System Analysis, future wastewater flow was assumed to be 130 gallons per day per single-family dwelling unit with a peaking factor of 4. This reflects the existing average wastewater flow per resident in the Village. The projected new daily flow demand in the existing Autumn Ridge Phase I pipe is estimated to be 4,323 gallons per day with the development of Autumn Ridge Phase II (a peak flow of 16.78 gallons per minute). However, this assumed 33 new dwelling units, whereas the revised plans only include 31 new dwelling units in the development.

5.3. Average Wastewater Treatment Plant Daily Flow

Per the recently approved Facilities Plan for the Village of Oregon Wastewater Treatment Plant, the average daily flow is 1.32 million gallons per day.

No new interceptor will be installed to facilitate the proposed development. Instead, wastewater will be handled by existing sanitary sewer mains on Foxfield Road in Autumn Ridge Phase I (to the north). Phase I and II will be connected through a future 8" sanitary sewer pipe extended south from the existing manhole on Foxfield Road to the planned manhole #5 in Autumn Ridge Phase II. The existing pipe on Foxfield Road currently receives 1,716 gallons per day of daily flow and a peak flow of 5 gallons per minute. There is 202 gallons per minute of remaining capacity within the existing interceptor.

5.4. Wastewater Treatment Plant Capacity

Per the Village Public Works Department, the existing Village wastewater treatment plant's rated capacity is 1.8 million gallons per day, with a reserve capacity of 0.48 million gallons per day.

As described in Section 5.2, the average daily flow expected at build-out for the amendment area is approximately 7,750 gallons per day, with a peak load of approximately 31,000 gallons per day (according to the developer's engineer) or 4,030 gallons per day with a peak load of approximately 16,120 gallons per day (according to the Village Sewer Service Analysis revised for 31 new dwelling units).

The existing interceptor on Foxfield Road has a remining available capacity of 202 gallons per minute. The future 8" sanitary main connecting existing infrastructure on Foxfield Road to planned infrastructure in Autumn Ridge Phase II has a calculated capacity of 372 gallons per minute. Both are sufficient using either the 130 gallons per day per dwelling unit figure from the Village and 250 gallons per day per dwelling unit figure from the developer's engineer. The future connection to Foxfield Road and Village's existing infrastructure and treatment plant has ample capacity to support the planned development.

5.5. Proposed USAA Public Water Supply

There is an existing 12" water main under Foxfield Road and an existing 8" water main under Ridgeview Lane. These will be connected and looped through the proposed development.

5.6. Estimated USAA Daily and Peak Hourly Water Demand

At build-out for the amendment area, the 31 anticipated housing units would be expected to use an average water total of 7,750 gallons per day, with a peak daily demand of 26,350 gallons per day. Peak hourly demand is estimated at 18.3 gallons per minute.

These totals assume 100 gallons per person per day, 2.5 persons per housing unit, 31 housing units, 15% water loss, and a peaking factor of 4 (7,750 gallons per day x 85% accounting for water loss x 4 peaking factor).

5.7. Average Daily and Peak Hourly Water Demand

Per the Village Public Works Department, the current average daily water demand is approximately 770,000 gallons, with an average demand of 535 gpm. The current average peak hourly water demand is 1,900 gpm.

5.8. Water Supply System Capacity

The Village currently operates three groundwater wells (3, 4, and 5) for water supply. Each well yields between 800 and 1,000 gallons per minute (gpm). The current well pumping capacity with all three wells operating simultaneously is 2,650 gpm. Additionally, the Village also has an existing 1.268 million gallons of water storage capacity in standpipes, ground storage reservoirs, and water towers.

This translates to a capacity of 2.38 million gallons per day and an estimated unused capacity of 1.610 million gpd with all 3 wells in operation. If one of the Village's largest wells is out of services (1,000 gpm), the firm

capacity is 1,650 gpm or 2.376 million gallons per day. The Village utilized its existing water storage capacity daily to fluctuate with demand and keep water in the storage system fresh. The additional estimated demand of 7,750 gpd, with peak demand of 26,350 gpd, for the amendment area is well within the Water System's capacity.

Within the next two years, the Village plans to dig and install a fourth well (Well #6), which will increase the Village's system capacity by 1,000 gpm (estimated).

5.9. Proposed Stormwater Management Standards

The Village of Oregon has taken a proactive approach to addressing stormwater management needs. The Village recognizes the necessity for properly managing stormwater runoff from existing and new development because of its location in an area of poorly defined stormwater flow.

In 1998-99 the Village conducted a comprehensive stormwater management study. The study divided the Village in sub-watersheds, and modeled stormwater runoff, and conveyance capacities for each system. Also, where capacity problems were identified, the study analyzed alternative management approaches, and recommendations were developed. An implementation plan prioritized the recommendations and established a schedule. At this point in time, the Village has expended over $1,000,000 in stormwater management projects.

The Village enforces a policy of stormwater management on all new development and redevelopment. The requirements of the policy addressed both stormwater quantity and quality. In 2016, the Village updated this policy, as well as other Dane County storm water and erosion control requirements, into Chapter 22 of the Oregon Municipal Code of Ordinances.

Map 3a depicts the stormwater management areas provided within the proposed development.

5.10. Stormwater Management Plan

Working with Village staff, the developer significantly revised the design of the stormwater management infrastructure from the previous USA Amendment application in January of 2020. Stormwater management for Autumn Ridge Phase II is now designed for a 1, 2, 10, and 100-year 24-hour storm event to meet a 90% stayon requirement through infiltration of predevelopment infiltration volume, which exceeds Village standards.

AUTUMN RIDGE PH 2 - 24-HR STORM EVENT (PEAK FLOW IN CFS)-PEAK FLOW COMPARISION					
	1YR	**2YR**	**10YR**	**50YR**	**100YR**
PHASE 2 DRAINAGE AREA					
Existing Flow	0.70	1.69	9.00	24.93	34.39
Proposed Total Treated Flow	0.00	0.00	0.48	1.38	6.40
Proposed Total Untreated Flow	10.33	15.21	35.77	68.54	86.10
PHASE 2 RUNOFF VOLUME (ACFT)					
Existing Runoff Volume (ACFT)	0.21	0.36	1.12	2.6	3.5
Proposed Runoff Volume Treated (ACFT)	0.0	0.0	0.7	2.6	3.6
Proposed Runoff Volume Untreated (ACFT)	0.8	1.1	2.3	4.4	5.5
PHASE 2 BASIN DESIGN					
Routed Detention Basin to Infiltration Basin	0.47	0.57	7.62	47.16	71.54
Elevation (Top = 991, Outlet = 986)	987.41	987.98	988.87	989.53	989.77
Routed Infiltration Basin to Offsite	0.00	0.00	0.48	1.38	6.40
Elevation (Top = 982, Bottom=977)	977.34	977.62	978.50	980.37	980.79

As described in Attachment E, the proposed stormwater plan includes a wet detention pond of approximately 25,000 sf with a 16" outlet pipe connecting to the southern infiltration basin system that is approximately 38,000 sf. Stormwater will naturally drain behind lot 43 and 44 to a 12" pipe behind lots 41 and 42. This will flow downhill to Autumn Ridge Court in a 12" pipe to Ridge View Lane which will carry stormwater in a 16" pipe south to the detention pond. Lots 45-57 will drain to the back of the properties in a natural recessed area connecting to a stormwater inlet that drains into the detention pond. The northern portions of Lots 58-65 will drain to Ridge View Road where a 12" storm sewer pipe will connect to the detention pond. The southern two-thirds of Lots 58-65 and a portion of the park will drain via gravity to the south and east to the planned infiltration basin. Lots 66-68 and a portion of the park will drain southeast to the detention pond via gravity. A small portion of the park and far southeastern corner of the property will drain via gravity to the drainage ditch located within the CTH MM right-of-way.

Generally, Phase II drains to the southeast where the planned stormwater detention pond and infiltration basin system is planned. The detention pond will function to hold and slow stormwater on-site.

To note, stormwater management in Autumn Ridge Phase I (to the north of the proposed amendment area) is self-contained, draining south to north into the existing stormwater detention pond in the northwest corner of the neighborhood currently under construction.

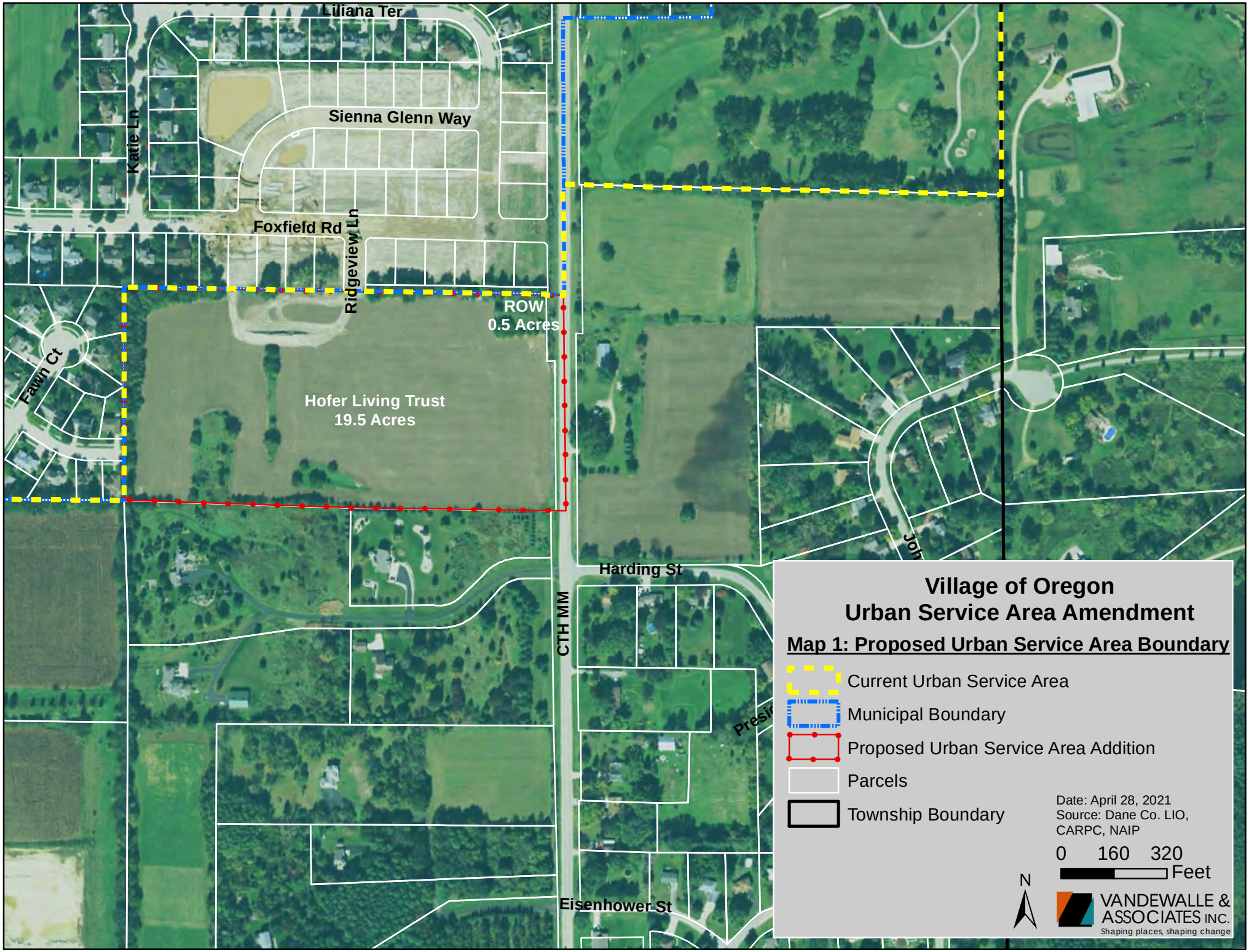
The Village ultimately assumes ownership and maintenance of stormwater detention ponds and collection systems. Prior to taking over the facilities, the developer must demonstrate that the systems are clean, built as designed, operating satisfactorily, and have full capacity for sediment retention. This typically does not occur until 80+% of homes are built in the development.

5.11. Engineering Reports

In March of 2021, the Village completed a Southeast Side Sewer Analysis to evaluate existing capacity and future needs (Attachment G). This analysis indicated sufficient capacity within the existing system to facilitate the proposed development of Autumn Ridge Phase II, in addition to other future demand from new development.

Within the Sewer Analysis Report, existing and future sewer system demand is provided in Attachment B, future flow conditions are provided in Attachment C, and maximum capacity scenarios are provided in Attachment F.

Map 1: Proposed Amendment Area


Liliana Ter
Sienna Glenn Way
Katie Ln
Foxfield Rd
Ridgeview Ln
ROW
0.5 Acres
Fawn Ct
Hofer Living Trust
19.5 Acres
Harding St
CTH MM
Eisenhower St
Village of Oregon
Urban Service Area Amendment
Map 1: Proposed Urban Service Area Boundary
Current Urban Service Area
Municipal Boundary
Proposed Urban Service Area Addition
Parcels
Township Boundary
Date: April 28, 2021
Source: Dane Co. LIO, CARPC, NAIP
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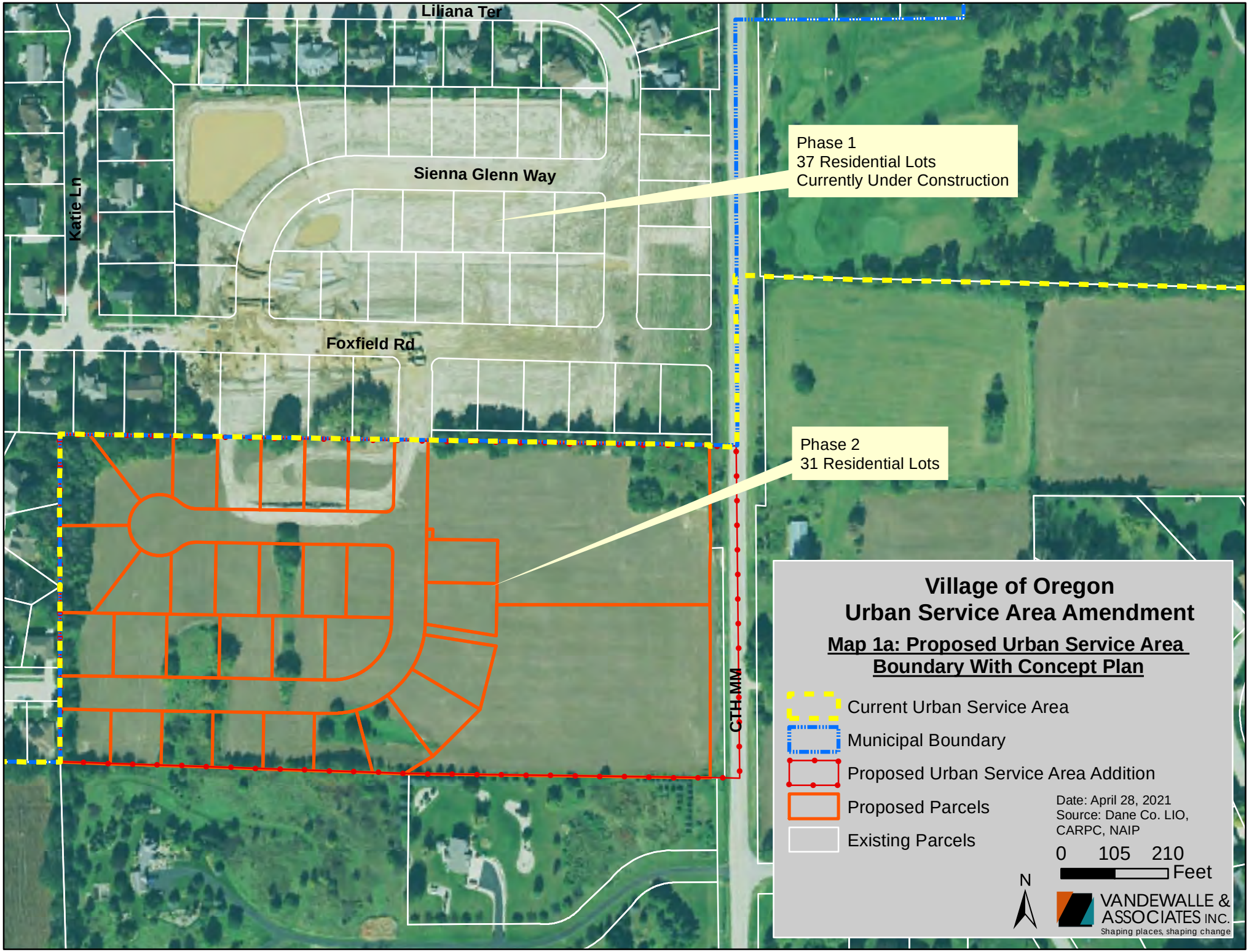
Shaping places, shaping change

Map 1a: Proposed Amendment Area Concept Plans


Liliana Ter
Sienna Glenn Way
Katie Ln
Foxfield Rd
CTH MM
Phase 1
37 Residential Lots
Currently Under Construction
Phase 2
31 Residential Lots
Village of Oregon
Urban Service Area Amendment
Map 1a: Proposed Urban Service Area Boundary With Concept Plan
Current Urban Service Area
Municipal Boundary
Proposed Urban Service Area Addition
Proposed Parcels
Existing Parcels
Date: April 28, 2021
Source: Dane Co. LIO, CARPC, NAIP
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VANDEWALLE & ASSOCIATES INC.
Shaping places, shaping change

Map 2: Existing Land Use


Liliana Ter
Sienna Glenn Way
Katie Ln
Foxfield Rd
CTH MM
Village of Oregon
Urban Service Area Amendment
Map 2: Existing Land Use
Current Urban Service Area
Municipal Boundary
Proposed Urban Service Area Addition
Existing Parcels
Existing Land Use
Agricultre/Rural
ROW
Date: April 28, 2021
Source: Dane Co. LIO, CARPC, NAIP
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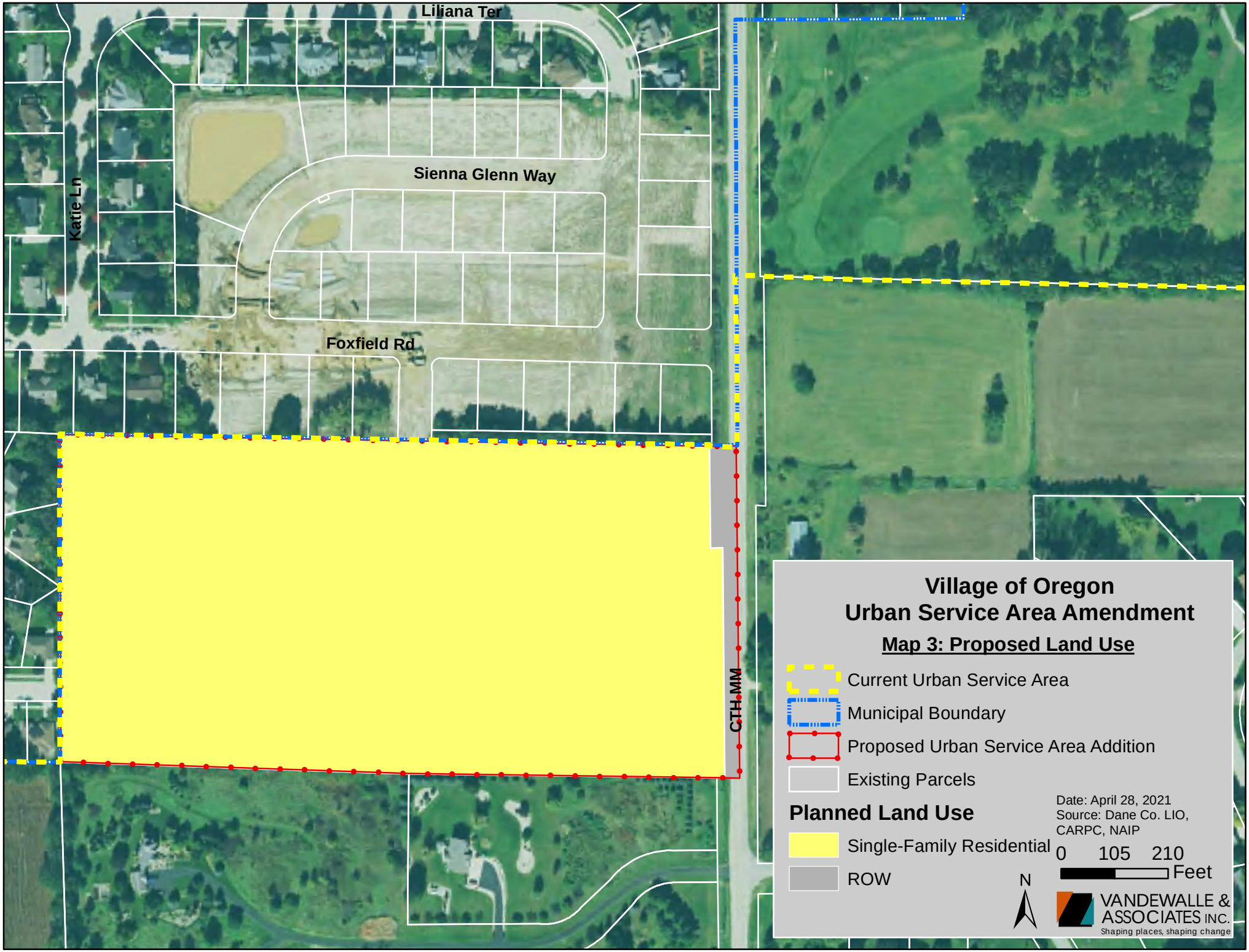
VANDEWALLE & ASSOCIATES INC.
Shaping places, shaping change

Map 3: Planned Land Use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Map 3: Proposed Land Use
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Planned Land Use
Single-Family Residential
ROW
Date: April 28, 2021
Source: Dane Co. LIO, CARPC, NAIP
0 105 210
Feet
N
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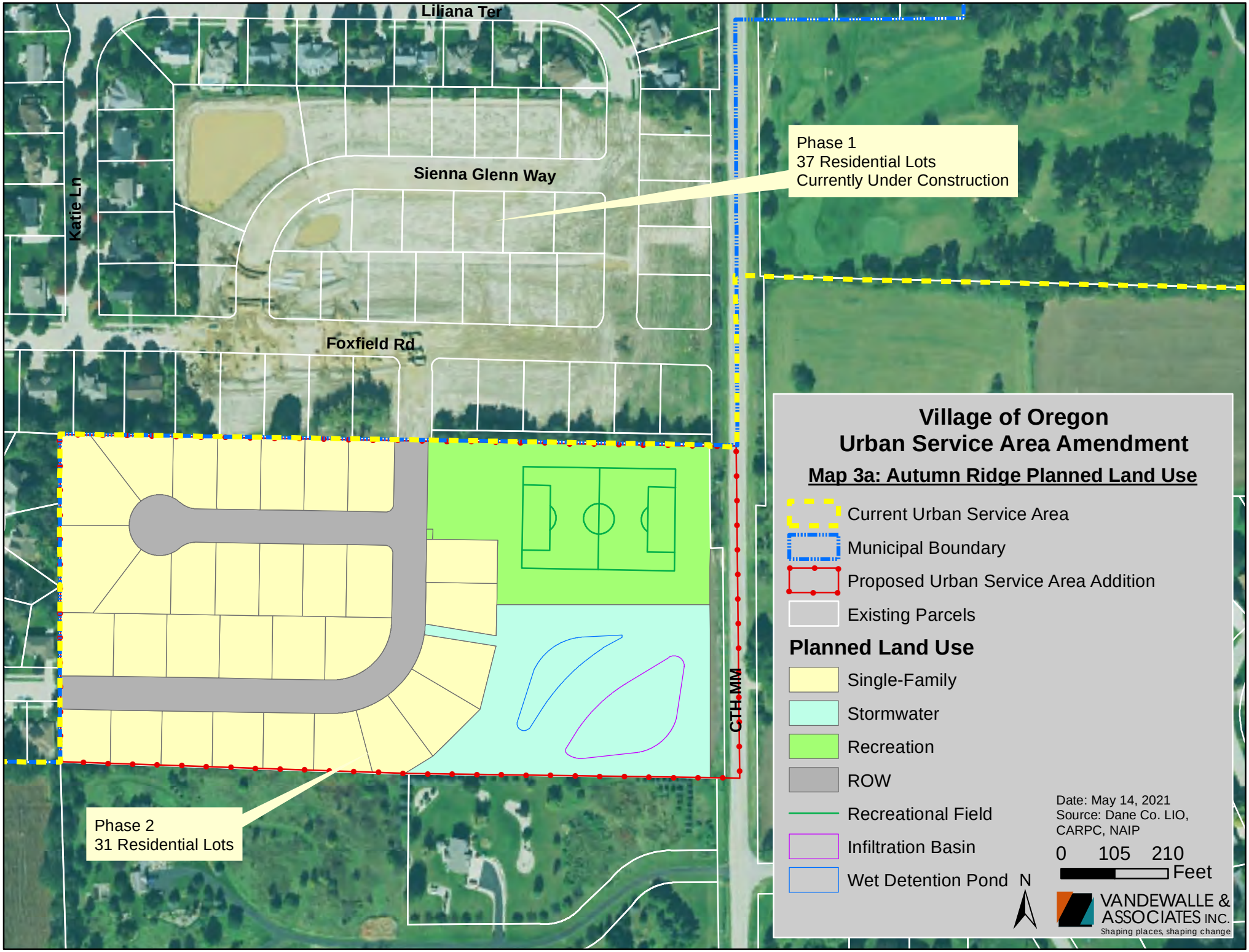
Shaping places, shaping change

Map 3a: Planned Land Use with Conceptual Plans


Liliana Ter
Sienna Glenn Way
Katie Ln
Foxfield Rd
CTH MM
Phase 1
37 Residential Lots
Currently Under Construction
Phase 2
31 Residential Lots
Village of Oregon
Urban Service Area Amendment
Map 3a: Autumn Ridge Planned Land Use
Current Urban Service Area
Municipal Boundary
Proposed Urban Service Area Addition
Existing Parcels
Planned Land Use
Single-Family
Stormwater
Recreation
ROW
Recreational Field
Infiltration Basin
Wet Detention Pond
Date: May 14, 2021
Source: Dane Co. LIO, CARPC, NAIP
0 105 210
Feet
N
VANDEWALLE & ASSOCIATES INC.
Shaping places, shaping change

Map 3b: Planned Land Use – Village ETJ Extent

Proposed USA Amendment Area

Autumn Ridge Phase II

Village of Oregon
Comprehensive Plan

Map 5b
Future Land Use - Village Extent

- Agriculture/Rural
- Exurban Residential
- Single-Family Residential
- Two-Family Residential
- Mixed Residential
- Planned Neighborhood*
- Neighborhood Office
- Planned Office
- Neighborhood Business
- Planned Business
- Central Mixed Use
- Planned Mixed Use**
- Planned Industrial
- General Industrial
- Extraction
- Institutional
- Stormwater Management
- Recreational Business
- Parks & Open Space
- Environmental Corridor
- Current Urban Service Area
- Village of Oregon
- Other Municipal Boundary
- Village of Oregon Extraterritorial Jurisdiction
- Surface Water
- Right of Way

*Each "Planned Neighborhood" may include a mix of:
1. Single-Family (predominate land use)
2. Two-Family
3. Mixed Residential
4. Institutional
5. Neighborhood Office
6. Neighborhood Business
7. Parks & Open Space

**Each "Planned Mixed Use" area may include a mix of:
1. Planned Business
2. Planned Office
3. Planned Industrial
4. Institutional
5. Mixed Residential

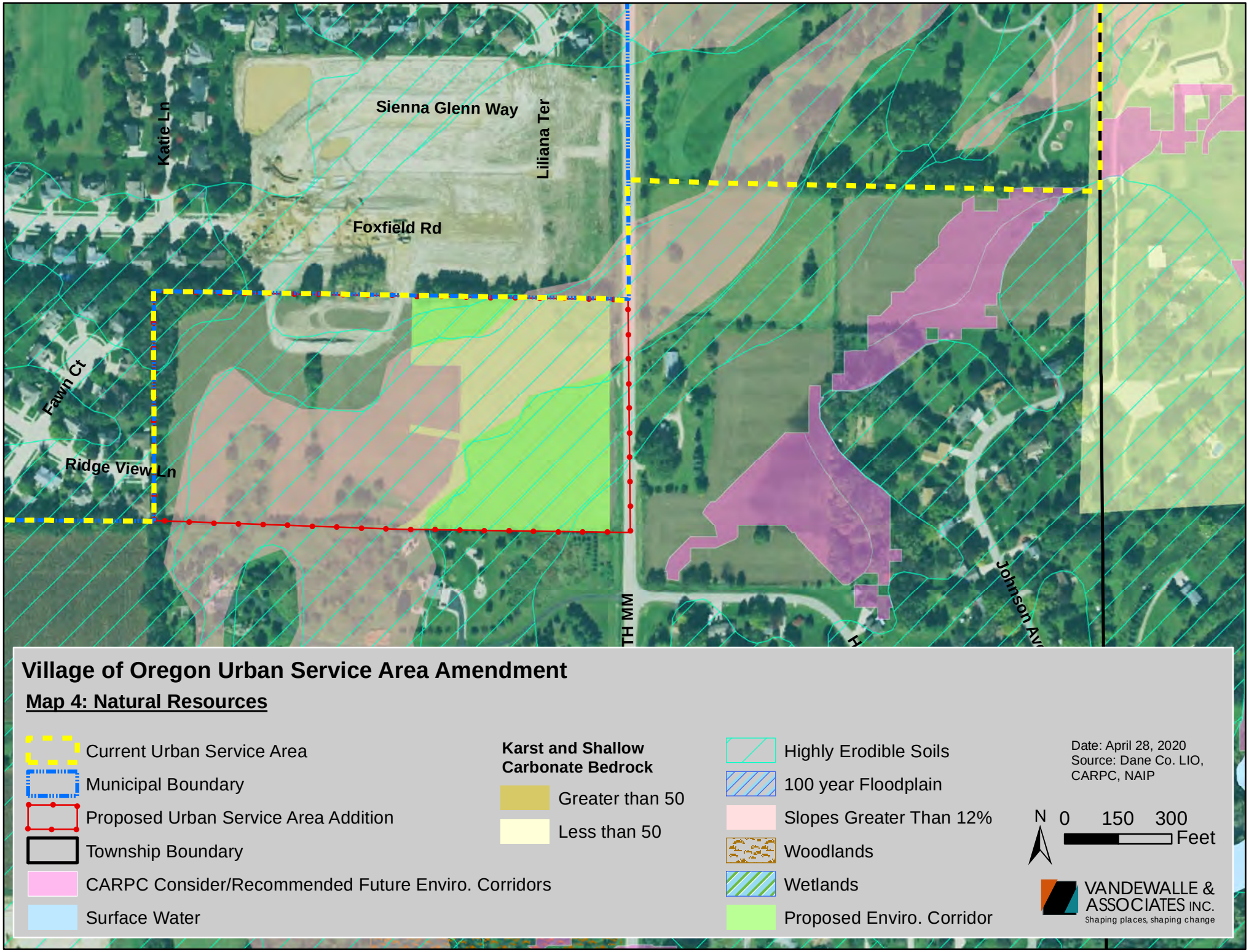
N

0 970 1,940 2,910 3,880 Feet

May 4, 2021
Source: Dane Co. LIO, 2011; WI-DNR; FEMA, 2008; V&A

VANDEWALLE & ASSOCIATES INC.
Shaping places, shaping change

Map 4: Natural Features


Sienna Glenn Way
Katie Ln
Liliana Ter
Foxfield Rd
Fawn Ct
Ridge View Ln
TH MM
Johnson Av
Village of Oregon Urban Service Area Amendment
Map 4: Natural Resources
Current Urban Service Area
Municipal Boundary
Proposed Urban Service Area Addition
Township Boundary
CARPC Consider/Recommended Future Enviro. Corridors
Surface Water
Karst and Shallow Carbonate Bedrock
Greater than 50
Less than 50
Highly Erodible Soils
100 year Floodplain
Slopes Greater Than 12%
Woodlands
Wetlands
Proposed Enviro. Corridor
Date: April 28, 2020
Source: Dane Co. LIO, CARPC, NAIP
N
0 150 300
Feet
VANDEWALLE & ASSOCIATES INC.
Shaping places, shaping change

Map 4a: Natural Features From Comprehensive Plan

Village of Oregon Comprehensive Plan

Map 3
Natural Features

- Village, Town, or County Parks and Open Space
- Private Parks, Open Space, and Golf Courses
- Other Public Open Space
- School Parkland
- Woodlands
- Watershed Boundary
- Wetlands
- Floodplain

Steep Slopes

- Greater than 20 Percent
- 12 to 20 Percent

Sections Containing Rare or Endangered Species

- Aquatic Species
- Aquatic & Terrestrial Species

- Village of Oregon
- Other Municipal Boundary
- U.S. Highway
- State Highway
- County Highway
- Local Road
- Surface Water

Proposed USA Amendment

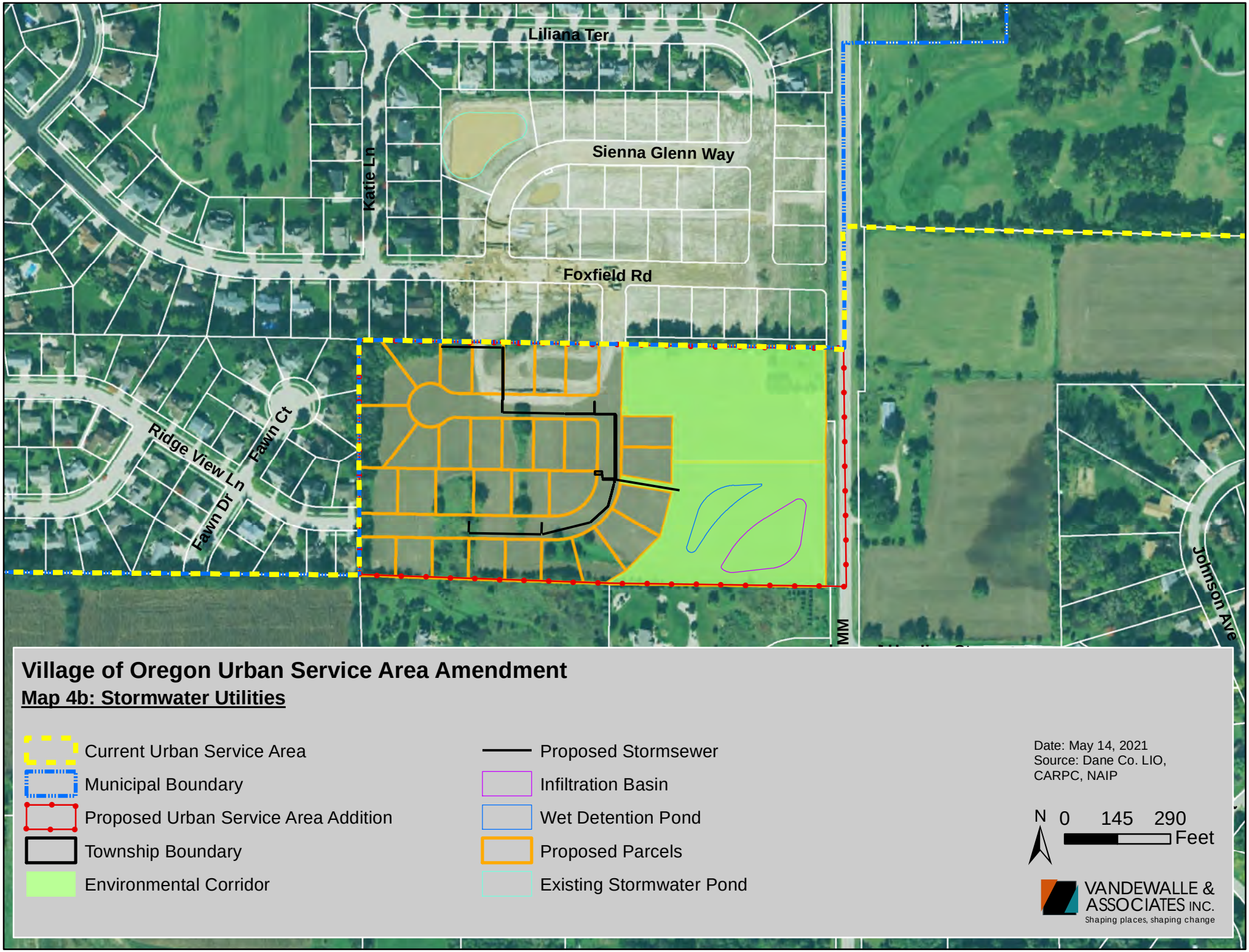
0 1,500 3,000 4,500 6,000 Feet

N

May 6, 2013
Source: Dane Co. LIO, 2011; WI-DNR; FEMA, 2008; V&A; WI State Historical Society

VANDEWALLE & ASSOCIATES INC.
Shaping places, shaping change

Map 4b: Planned Utilities



Village of Oregon Urban Service Area Amendment

Map 4b: Stormwater Utilities

- Current Urban Service Area
- Municipal Boundary
- Proposed Urban Service Area Addition
- Township Boundary
- Environmental Corridor
- Proposed Stormsewer
- Infiltration Basin
- Wet Detention Pond
- Proposed Parcels
- Existing Stormwater Pond

Date: May 14, 2021
Source: Dane Co. LIO, CARPC, NAIP

N 0 145 290 Feet

VANDEWALLE & ASSOCIATES INC.
Shaping places, shaping change

Table of Attachments

Attachment A: Plan Commission and Village Board USA Amendment Resolutions

RESOLUTION #21-28

VILLAGE OF OREGON
PLAN COMMISSION
RESOLUTION REGARDING THE RECOMMENDATION FROM THE PLAN COMMISSION TO THE VILLAGE BOARD TO INITIATE AN AMENDMENT OT THE OREGON URBAN SERVICE AREA TO INCLUDE 20 ACRES OF PROPERTY OWNED BY THE HOFER LIVING TRUST LOCATED ON THE WEST SIDE OF CTH MM (PARCEL NO. 0509-134-8500-0) TO ACCOMMODATE PHASE II OF THE AUTUMN RIDGE RESIDENTIAL SUBDIVISION

WHEREAS the Village of Oregon has been approached by the property owners to develop the existing agricultural property located on the southeast side of the Village, on full public water and sanitary sewer services to accommodate residential development; and,

WHEREAS the extension of the public water and sanitary sewer lines to serve the proposed residential development will require an amendment of the Oregon Urban Service Area to extend its boundary to include the parcel; and,

WHEREAS the proposed development of the residential subdivision is consistent with the Village of Oregon Comprehensive Plan, amended in 2020, which depicts the area in the Planned Neighborhood land use category, which allows for a mix of predominantly residential development; and,

WHEREAS the Planning Commission and Village Board passed Resolution #21-01 in January 2021 and this Resolution #21-28 replaces Resolution #21-01; and,

WHEREAS the Capital Area Regional Planning Commission (CARPC), acting as the regional agent of the Wisconsin Department of Natural Resources, requires the Village Board to pass a resolution requesting the amendment of the Oregon Urban Service Area; and,

WHEREAS the Village of Oregon Plan Commission advises the Village Board on all development-related matters, as consistent with Wisconsin Statutes;

NOW THEREFORE BE IT RESOLVED, the Village Oregon Plan Commission hereby recommends the Village Board pass the required Resolution to formally-request the Capital Area Regional Planning Commission (CARPC) consider and approve the requested amendment to the Oregon Urban Service Area to include within its boundary the parcel totaling 20 acres, located on the west side of CTH MM.

Adopted this 6th day of May, 2021.

APPROVED:

Greg Schnelle, Plan Commission Chair

ATTEST:

Candie Jones, Village Clerk

RESOLUTION #21-30

VILLAGE OF OREGON
VILLAGE BOARD
RESOLUTION REGARDING THE RECOMMENDATION FROM THE PLAN COMMISSION TO THE VILLAGE BOARD TO INITIATE AN AMENDMENT OF THE OREGON URBAN SERVICE AREA TO INCLUDE 20 ACRES OF PROPERTY OWNED BY THE HOFER LIVING TRUST LOCATED ON THE WEST SIDE OF CTH MM (PARCEL NO. 0509-134-8500-0) TO ACCOMMODATE PHASE II OF THE AUTUMN RIDGE RESIDENTIAL SUBDIVISION

WHEREAS the Village of Oregon has been approached by the property owners to develop the existing agricultural property located on the southeast side of the Village, on full public water and sanitary sewer services to accommodate residential development; and,

WHEREAS the extension of the public water and sanitary sewer lines to serve the proposed residential development will require an amendment of the Oregon Urban Service Area to extend its boundary to include the parcel; and,

WHEREAS the proposed development of the residential subdivision is consistent with the Village of Oregon Comprehensive Plan, amended in 2020, which depicts the area in the Planned Neighborhood land use category, which allows for a mix of predominantly residential development; and,

WHEREAS the Planning Commission and Village Board passed Resolution #21-01 in January 2021 and this Resolution #21-30 replaces Resolution #21-01; and,

WHEREAS the Capital Area Regional Planning Commission (CARPC), acting as the regional agent of the Wisconsin Department of Natural Resources, requires the Village Board to pass a resolution requesting the amendment of the Oregon Urban Service Area; and,

WHEREAS the Village of Oregon Plan Commission advises the Village Board on all development-related matters, as consistent with Wisconsin Statutes;

WHEREAS the Village of Oregon Plan Commission adopted Resolution #21-28 on May 6, 2021, recommending the Village Board pass the required resolution.

NOW THEREFORE BE IT RESOLVED, the Village of Oregon Village Board hereby adopts Resolution #21-30 to formally-request the Capital Area Regional Planning Commission (CARPC) consider and approve the requested amendment to the Oregon Urban Service Area to include within its boundary the parcel totaling 20 acres, located on the west side of CTH MM. SO RESOLVED by action of the Oregon Village Board on May 17, 2021.

Adopted this 17th day of May, 2021.

APPROVED:

Randy Glysch, Village President

ATTEST:

Candie Jones, Village Clerk

Attachment B: Utilities and Communities Facilities Map from Comprehensive Plan

Village of Oregon Comprehensive Plan

Map 8
Utilities and Community Facilities

Community Facilities

- Cemetary
- Fire Station
- Library
- Police Station
- Senior Center
- Village Hall
- Wastewater Treatment Plant
- Schools

Parkland

- Town/Village Park
- School Park
- Private Park
- County/State/Federal Park

Proposed Future Facilities

- Short Term Park
- Long Term Park
- Well

- Village of Oregon
- Town Boundary
- Village of Oregon Extraterritorial Jurisdiction
- Surface Water

N

0 1,000 2,000 3,000 4,000 Feet

May 6, 2013
Source: Dane Co. LIO, 2011; Vandewalle & Associates

VANDEWALLE & ASSOCIATES INC.
Shaping places, shaping change

Downtown Detail

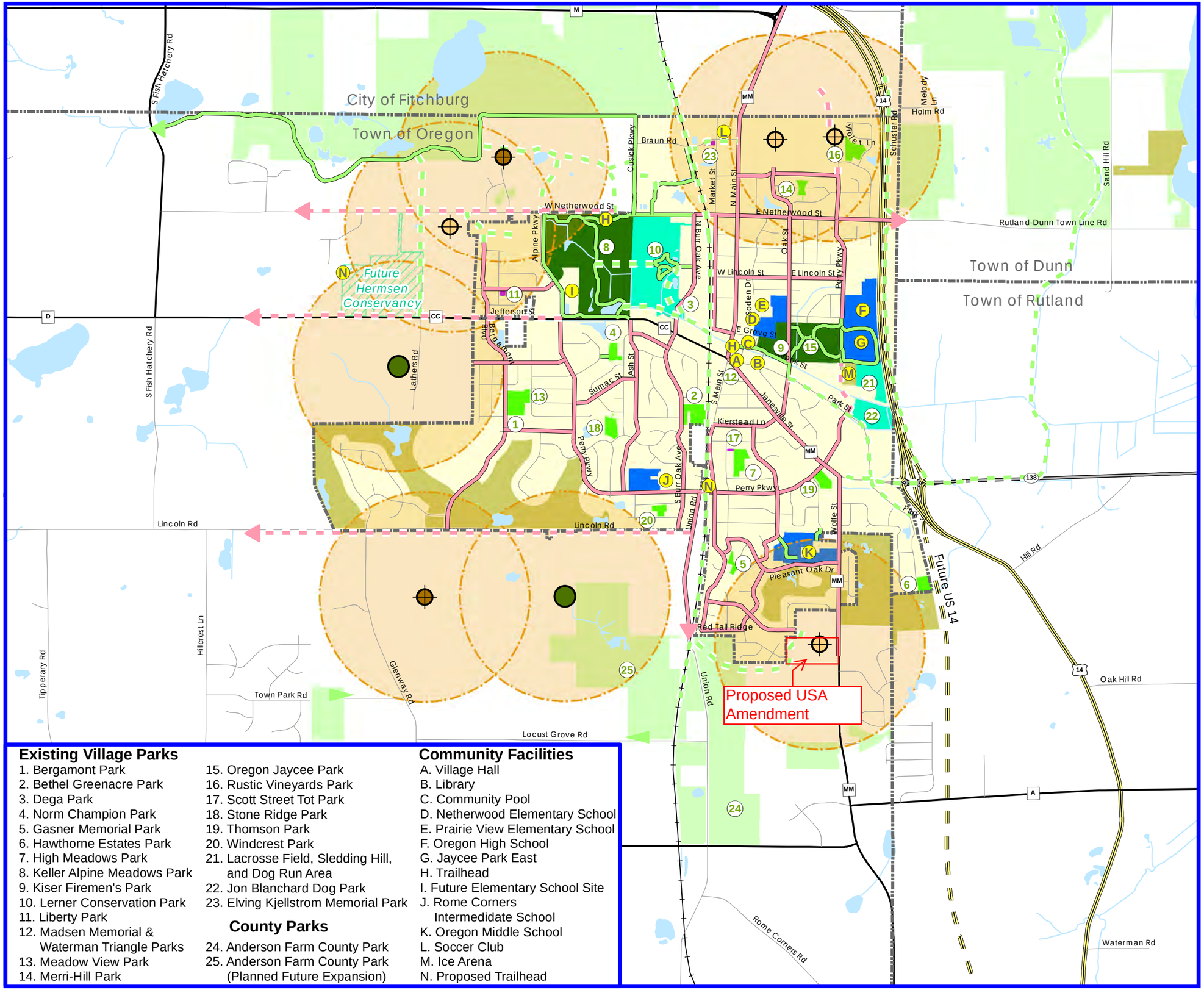
Grove Street
Main Street
Brook Street
Spring Street
Park Street
Janesville Street

Lake Barney
Wisconsin DNR
City of Fitchburg
Town of Oregon
MM
14
Braun Rd
Cusick Pkwy
Rustic Vineyards Park
Richards Rd
Merri-Hill Park
Schluster Rd
Wisconsin DNR
Rutland-Dunn Town Line Rd
Netherwood Rd
W Netherwood St
E Netherwood St
Dunn Ave
Keller Apline Meadows Park
Lerner Conservation Park
N Burr Oak Ave
Orchard Dr
E Lincoln St
Town of Dunn
Town of Rutland
Liberty Park
Dega Park
Market St
N Main St
Prairie View Elementary School
Oregon High School
CC
Jefferson St
Alpine Pkwy
Kiser Fireman's Park
Oregon Jaycee Park
Perry Pkwy
Lathers Rd
Forest View Park
Walnut St
Drumlin Dr
Oak St
Ice Arena
Park St
Janesville St
S Burr Oak Ave
S Main St
Ash St
Riviera St
Bergamont/ Meadow View Park
Sumac St
Bethel Greenacres Park
Stone Ridge Park
Augusta Dr
Sterling Dr
High Meadows Park
Thomson Park
138
Rinpoche Ln
Inverness St
Bergamont Blvd
Bergamont Golf Club
Rome Corners Intermediate School
Perry Pkwy
Windcrest Park
Leeward Ln
Lincoln Rd
Scott St
Cledell St
Union Rd
Oregon Middle School
Gasher Memorial Park
Foxboro Golf Club
Wolfe St
Concord Dr
Hawthorne Estates
Foxfield Rd
Foxboro Golf Club
Glenway Rd
Windridge Rd
MM
Anderson County Park
Harding St
Proposed USA Amendment

Attachment C: Future Park Facilities Map from Park and Open Space Plan

Village of Oregon Outdoor Recreation Plan

Map 3: Future Facilities



Existing Village Parks

1. Bergamont Park
2. Bethel Greenacre Park
3. Dega Park
4. Norm Champion Park
5. Gasner Memorial Park
6. Hawthorne Estates Park
7. High Meadows Park
8. Keller Alpine Meadows Park
9. Kiser Firemen's Park
10. Lerner Conservation Park
11. Liberty Park
12. Madsen Memorial & Waterman Triangle Parks
13. Meadow View Park
14. Merri-Hill Park
15. Oregon Jaycee Park
16. Rustic Vineyards Park
17. Scott Street Tot Park
18. Stone Ridge Park
19. Thomson Park
20. Windcrest Park
21. Lacrosse Field, Sledding Hill, and Dog Run Area
22. Jon Blanchard Dog Park
23. Elving Kjellstrom Memorial Park

County Parks

24. Anderson Farm County Park
25. Anderson Farm County Park (Planned Future Expansion)

Community Facilities

A. Village Hall
B. Library
C. Community Pool
D. Netherwood Elementary School
E. Prairie View Elementary School
F. Oregon High School
G. Jaycee Park East
H. Trailhead
I. Future Elementary School Site
J. Rome Corners Intermediate School
K. Oregon Middle School
L. Soccer Club
M. Ice Arena
N. Proposed Trailhead

- Community Parks
- Neighborhood Parks
- Mini Park / Tot Lot
- Special Use / Open Space
- School Parkland
- Private Parks, Open Space, and Golf Courses
- Other Public Open Space
- Existing Off Road Bike Trails
- Proposed Off Road Bike Trails
- Existing On Road Bike Routes
- Proposed On Road Bike Routes
- Community Facilities
- Exisiting Parks
- Proposed Short Term Neighborhood Park likely within 10 years
- Proposed Long Term Neighborhood Park likely beyond 10 years
- Proposed Community Park
- 1/2 Mile Proposed Neighborhood or Community Park Service Area
- Future Hermsen Conservancy
- Village of Oregon
- Other Municipal Boundary
- US Highway
- State Highway
- County Highway
- Local Road
- Railroads

0 1,000 2,000 4,000 Feet

Amended: January 17, 2018
Source: CARPC, V&A, Dane County LIO, Village of Oregon

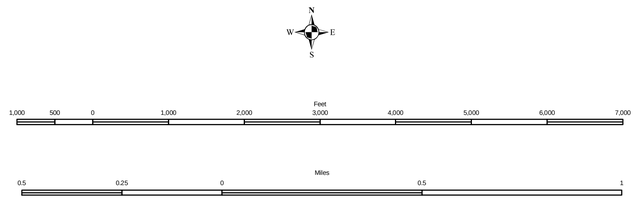
VANDEWALLE & ASSOCIATES INC.
Shaping places, shaping change

N

Attachment D: Town of Oregon Future Land Use and Farmland Preservation Maps

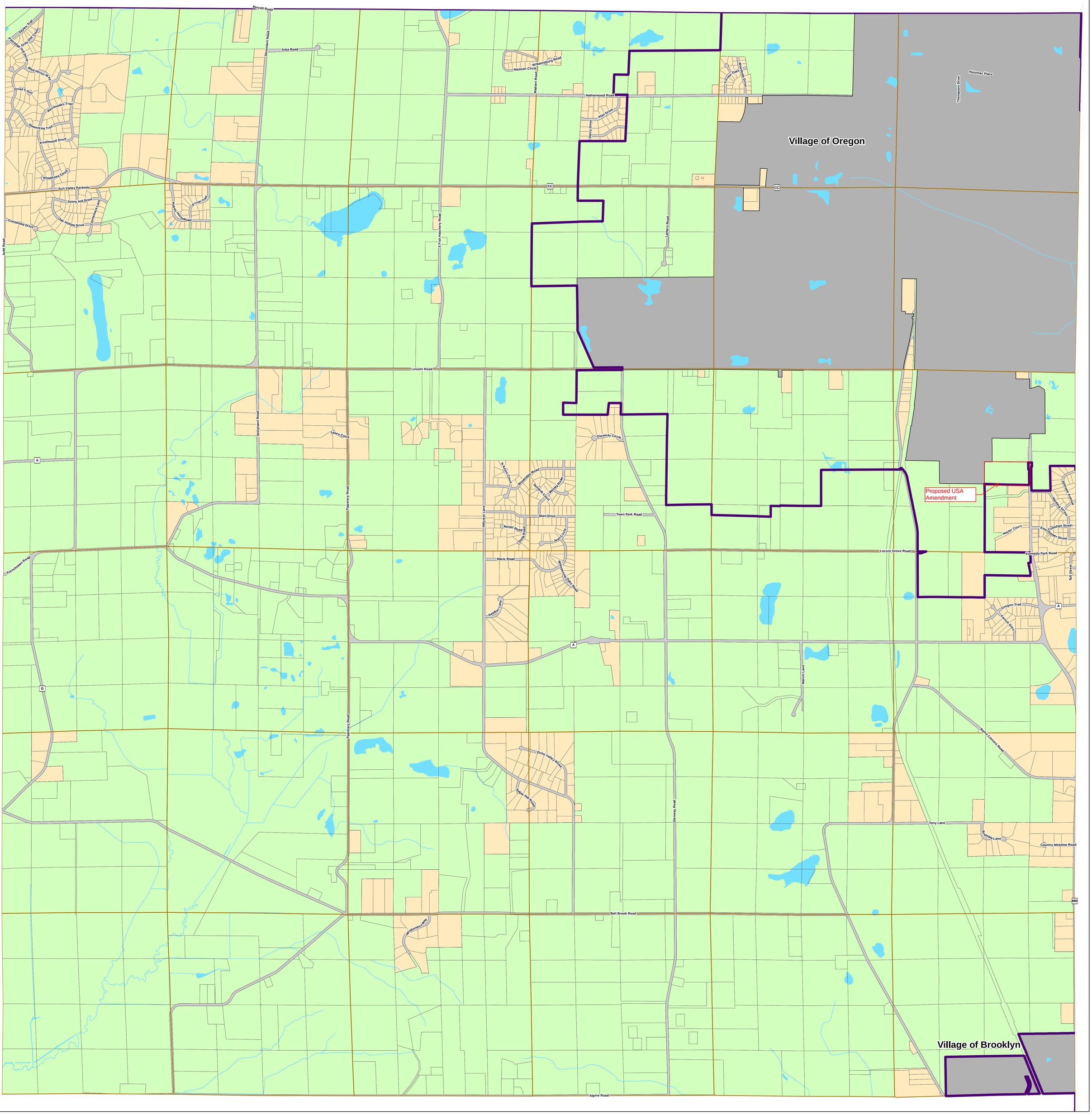
Dane County Comprehensive Plan Town of Orgeon Planned Land Use

Map created July 2010 by
Dane County Planning and Development
608-267-4115



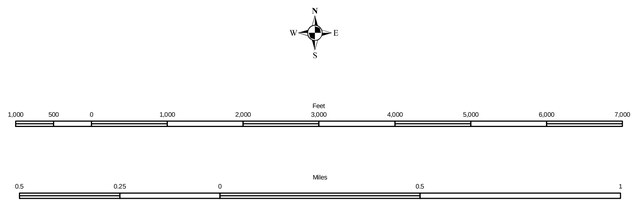
Farmland Preservation Categories

- AGRICULTURAL PRESERVATION AREAS
- RURAL DEVELOPMENT/TRANSITIONAL
- City and Village Plans
- Section Boundary
- Parcel Boundary
- Water
- Village Boundary



Farmland Preservation Plan Map for Town of Oregon, Dane County WI

Map created August 2nd 2010 by
Dane County Planning and Development
608-267-4115



Farmland Preservation Zoning Districts:
A-1Exclusive Agriculture and A-3

Farmland Preservation Categories
- AGRICULTURAL PRESERVATION
- AGRICULTURAL TRANSITION
- EXISTING NON AGRICULTURAL

- Section Boundary
- Parcel Boundary
- Water
- Village Boundary

Village of Oregon

Proposed USA Amendment

Village of Brooklyn

Attachment E: Developer Concept and Stormwater Plan

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717 • Phone: 608.833.7530 • www.donofrio.cc

April 16, 2021

Village of Oregon
Attn: Elise Cruz
117 Spring Street
Oregon, WI 53575

RE: First Addition to Autumn Ridge – Preliminary Plat

Dear Ms Cruz,

On behalf of Hofer Living Trust, please find the enclosed preliminary plat and accompanying documents for First Addition to Autumn Ridge. This is a 31-lot residential subdivision south of Autumn Ridge that includes an area dedicated for a neighborhood park. The lands will be annexed and reviewed by CARPC with the intent of amending the Urban Service Area of the Village. The applicant's intent is to develop this property in a manner consistent with the Village's land use plan.

Included in this submittal are the following documents:

a. Preliminary plat
b. Environmental Assessment checklist
c. Preliminary stormwater management plan
d. Preliminary engineering plans

Annexation petition has been submitted under a separate cover.

Your review in accordance with Town and Village standards is appreciated. Feel free to call me if you have any questions or need further clarification.

Sincerely,
D'Onofrio, Kottke & Assoc., Inc.

Bruce J. Hollar, P.E.
FN: 20-05-162

APPENDIX A
SUBDIVISION REGULATIONS
ENVIRONMENTAL ASSESSMENT CHECKLIST
FOR SUBDIVISION AND LAND DIVISION BY CERTIFIED SURVEY

All "yes" answers must be explained in detail by attaching maps and supportive documentation describing the impacts of the proposed development.

Land Resources	Yes	No
Does the project site involve (if "yes", how does the developer propose to address the matter?)		
A. Changes in relief and drainage patterns (attach a topographic map showing, at a minimum, two (2) foot contour intervals).	X	
B. A flood plain. (If "yes", attach two (2) copies of a typical stream valley cross section showing the channel of the stream, the 100-year flood plain limits and the floodway limits (if officially adopted), of each site of the channel and a cross section of area to be developed).		X
C. An area of soil instability—greater than 20% slope and/or organic soils, peats, or mucks at or near the surface.		X
D. Prime agricultural land (Class I, II or III soils).	X	
E. Wetlands and mapped environmental corridors		X
F. Unique physical features or wildlife habitat.		X
Water Resources		
Does the proposed project involve:		
A. Location within the area traversed by a navigable stream or dry run.		X
B. Lake frontage.		X

Human and Scientific Interest	Yes	No
Does the project site involve:		
A. An area or buildings of archeological or geological interest.	___	X
B. An area of historical interest.	___	X
C. An area of buildings or monuments with unique architecture.	___	X
D. Unique, uncommon, rare, plants, animal habitats, old growth, trees significant for research or preservation.	___	X
Energy, Transportation and Communications		
A. Does the development encompass any future street appearing on the Village of Oregon Official Map?	X	___
B. Is the development traversed by an existing or planned Utility corridor (gas, electricity, water, sewer interceptor, Communications, storm sewer)?	___	X
Village Planning		
A. Is the development consistent with the Village Master Plan and other adopted planning documents?	X	___

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Environmental Checklist Supplement

Land Resources:

A. Development will maintain existing drainage pattern and collect and manage stormwater runoff in a manner that exceeds the Village standards.

C. McHenry soils, Class II, comprise 20% of the development.

Energy, Transportation and Communications:

A. Existing Ridge View Lane street stubs will be connected as part of this Development.

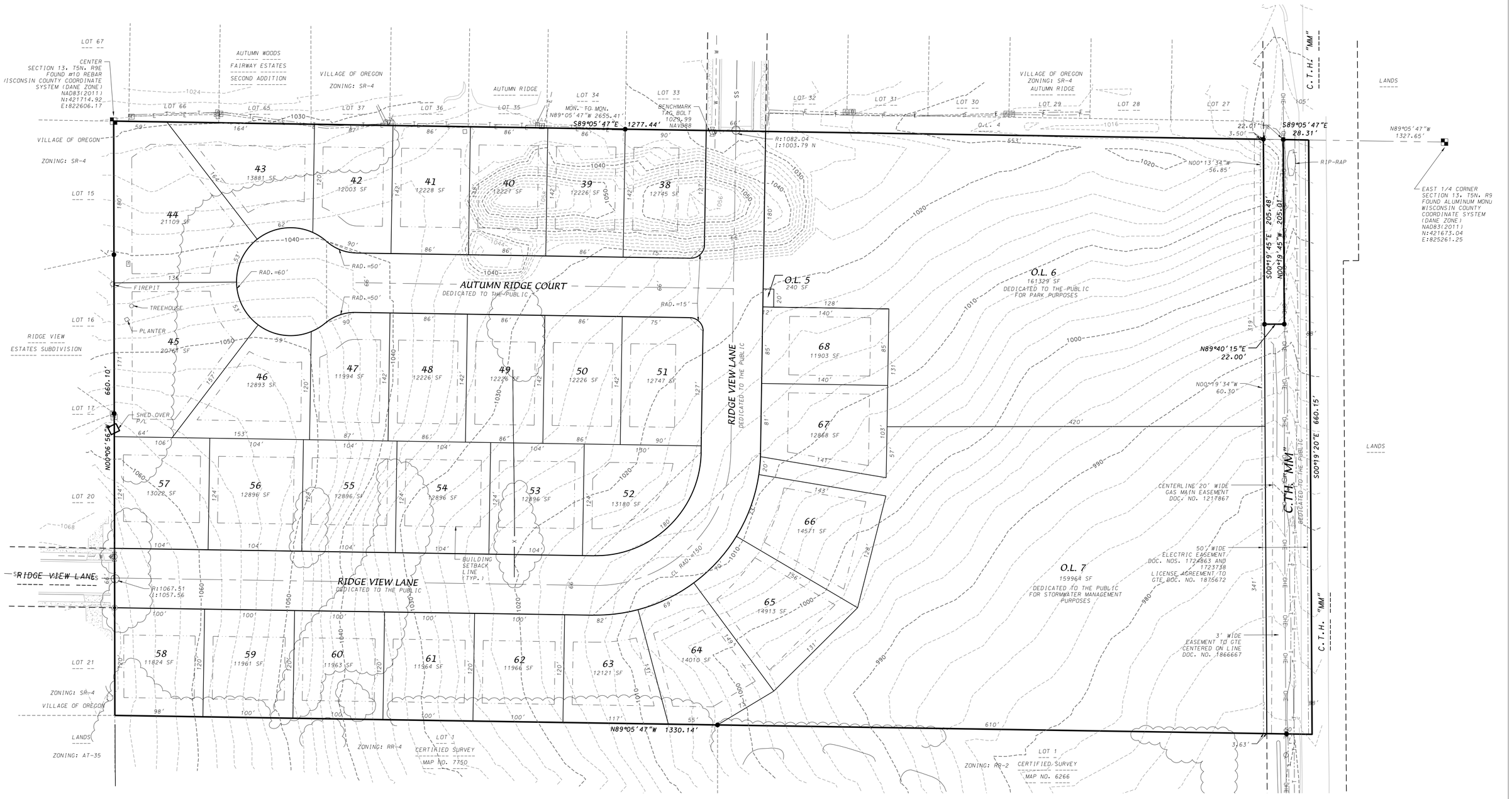
Village Planning:

A First Addition to Autumn Ridge is consistent with the Village's future land use plan for this area of the Village.

Ronald R. Klaas • Daniel N. Day • Bruce J. Hollar • Nathan G. Lockwood • Brett T. Stoffregan

FIRST ADDITION TO AUTUMN RIDGE - PRELIMINARY PLAT

LOCATED IN THE NE1/4 OF THE SE1/4 OF SECTION 13, TOWNSHIP 5 NORTH, RANGE 9 EAST, TOWN OF OREGON, DANE COUNTY, WISCONSIN



BRETT T. STOFFREGAN S-2742 MADISON, WISCONSIN — WISCONSIN LAND SURVEYOR

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.

7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

FN:20-05-162

SURVEYOR'S CERTIFICATE

I, Brett T. Stoffregan, Professional Land Surveyor, S-2742, do hereby certify that this preliminary plat is survey is a true representation of all the adjacent existing land divisions and of the boundary of the preliminary plat and features features and that I have fully complied with the Village of Oregon Subdivision Ordinance. Described as follows:

A parcel of land located of the NW1/4 of the SE1/4 of Section 13, T5N, R9E, Town of Oregon, Dane County, Wisconsin to-wit:
Commencing at the East 1/4 corner of said Section 13; thence N89°05'47"W, 1327.65 feet along the North line of said SE1/4 to the point of beginning; thence S00°19'20"E, 660.15 feet to a point on the Easterly extension of the North line of Lot 2, Certified Survey Map No. 6266; thence N89°05'47"W, 1330.14 feet along said Easterly extension, North line of said Lot 2 and the North line of Lot 1, Certified Survey Map No. 7750 to a point on the East line of Lot 21, Ridge View Estates Subdivision; thence N00°06'56"W, 660.10 feet along the East line of Lots 15, 16, 20 and 21, Ridge View Estates Subdivision and the East right-of-way line of Ridge View Lane to the Center of said Section 13; thence S89°05'47"E, 1277.44 feet along the South line of Lots 65, 66 and 67, Autumn Woods Fairway Estates Second Addition, Outlot 4 and Lots 33, 34, 35, 36 and 37, Autumn Ridge to a point on the West right-of-way line of County Highway "MM"; thence S00°19'45"E, 205.48 feet along said West right-of-way line; thence N89°40'15"E, 22.00 feet; thence N00°19'45"W, 205.01 feet to a point on the North line of said SE1/4; thence S89°05'47"E, 28.31 feet along said North line to the point of beginning.
Containing 20.032 acres.

Dated this 15th day of April, 2021.

Brett T. Stoffregan, Professional Land Surveyor, S-2742

NOTES

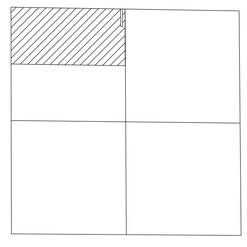
1. Elevations referenced to NAVD 88(2012).
2. Existing Zoning: AT-35
   Proposed Zoning: Lots 38-68, O.L. 5 -- SR-4
   Outlots 6 and 7 -- RH

   Setbacks: Lots 38-68 -- Front: 30'
   Side: 10'
   Rear: 20'

   Rear setback on the North lines of Lots 41-44 is 25'
3. Outlot 5 is to be owned and maintained by the Autumn Ridge Neighborhood Association and be used for group mailbox purposes.
4. Outlot 6 is dedicated to the public for park purposes
5. Outlot 7 is dedicated to the public for stormwater management purposes.
6. Owner/Land Divider: Hofer Living Trust
   610 Ondossagon Way
   Madison, WI 53719

LEGEND

- Found 1-1/4" Iron Rebar
- Found 3/4" Iron Rebar
- SS — Sanitary Sewer/Manhole
- W — Water Main
- Hydrant
- Power Pole
- OHE — OHE — Overhead Electric
- E — E — Underground Electric
- T — T — Underground Telecommunication Line
- Treeline
- Concrete
- Fence
- Concrete Curb and Gutter
- 918 — Existing Contour Line
- ( ) Recorded as information



LOCATION MAP
1"=1000'

BEARINGS REFERENCED TO THE SOUTH LINE OF THE NORTHEAST QUARTER OF SECTION 13, T5N, R9E WISCONSIN COUNTY COORDINATE SYSTEM (DANE ZONE) BEARING N89°05'47"W

1st ADDITION TO AUTUMN RIDGE
PRELIMINARY ENGINEERING

VILLAGE OF OREGON
DANE COUNTY, WISCONSIN

NOTE:
CONSTRUCTION SHALL CONFORM TO THE CURRENT CHAPTER 18 OF THE VILLAGE OF OREGON ORDINANCES.

PROJECT LOCATION

SHEET LISTING

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

FN: 20-05-162

ISSUE DATE: 04/15/2021

SHEET 1 OF 6

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

COVER SHEET

1st ADDITION TO AUTUMN RIDGE

VILLAGE OF OREGON, DANE COUNTY, WISCONSIN

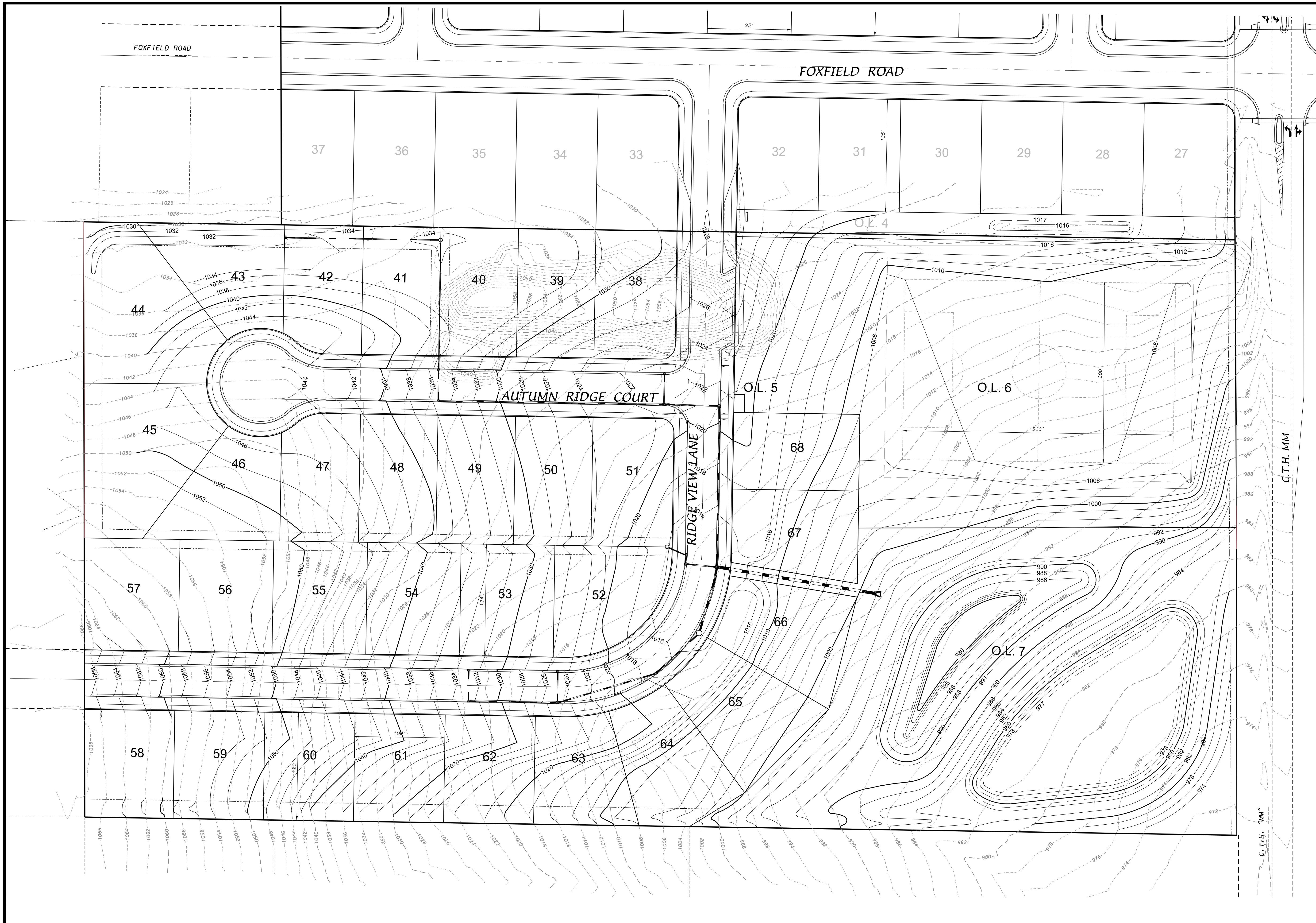
DATE: 04/15/21
REVISED:

DRAWN BY: TCF

FN: 20-05-162

Sheet Number:
1

File: U:\User\2005162\Drawings\Cover.dwg COVER OVERALL Plotted: Apr 15, 2021 - 2:27pm



D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

SITE GRADING AND EROSION CONTROL PLAN

1st ADDITION TO AUTUMN RIDGE

VILLAGE OF OREGON, DANE COUNTY, WISCONSIN

SCALE: 1"= 100'
(PAGE SIZE: 11x17)

DATE: 04/15/21
REVISED:

DRAWN BY: TCF

FN: 20-05-162

Sheet Number:

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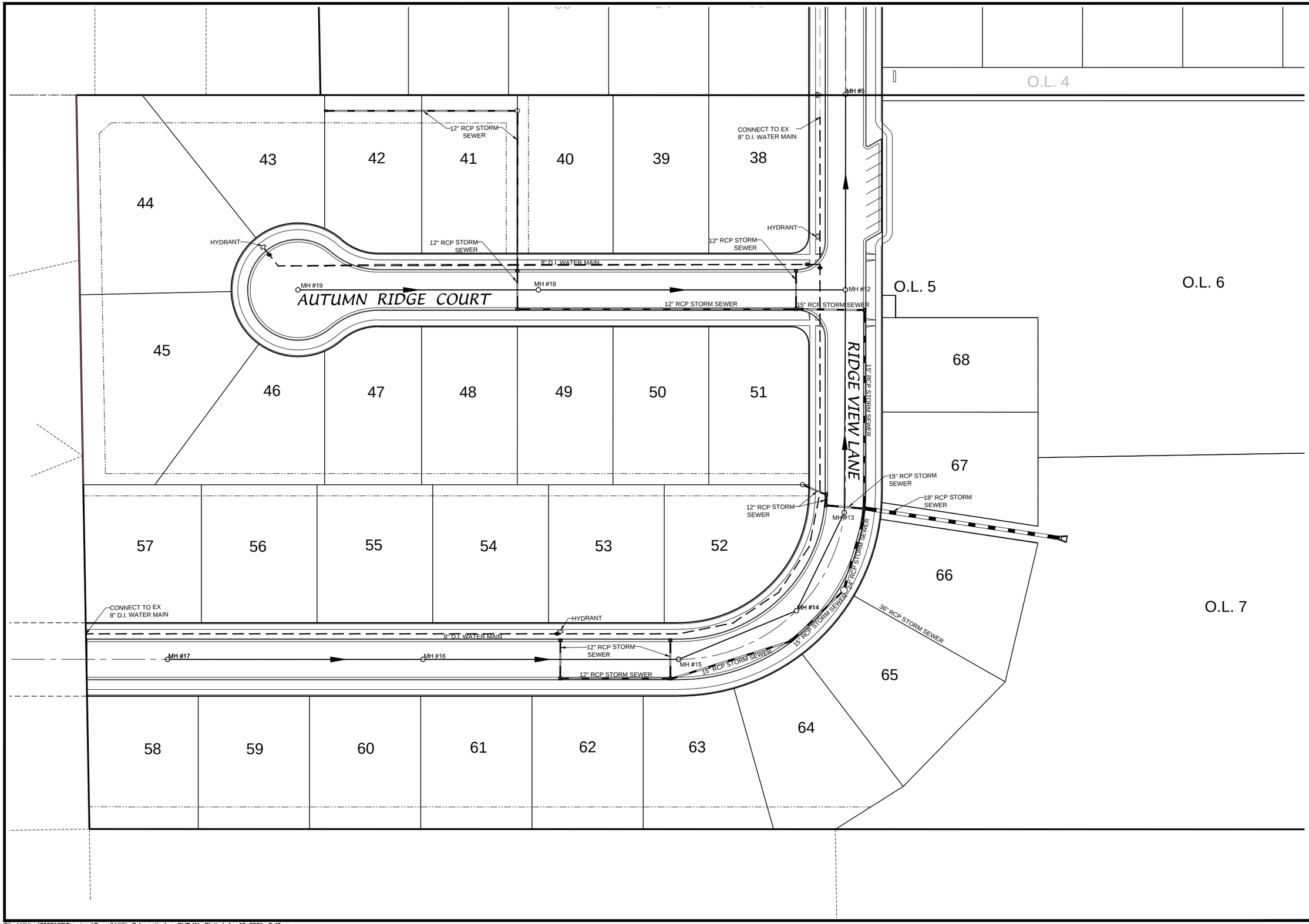

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1st ADDITION TO AUTUMN RIDGE

VILLAGE OF OREGON, DANE COUNTY, WISCONSIN

OVERALL UTILITY SCHEMATIC

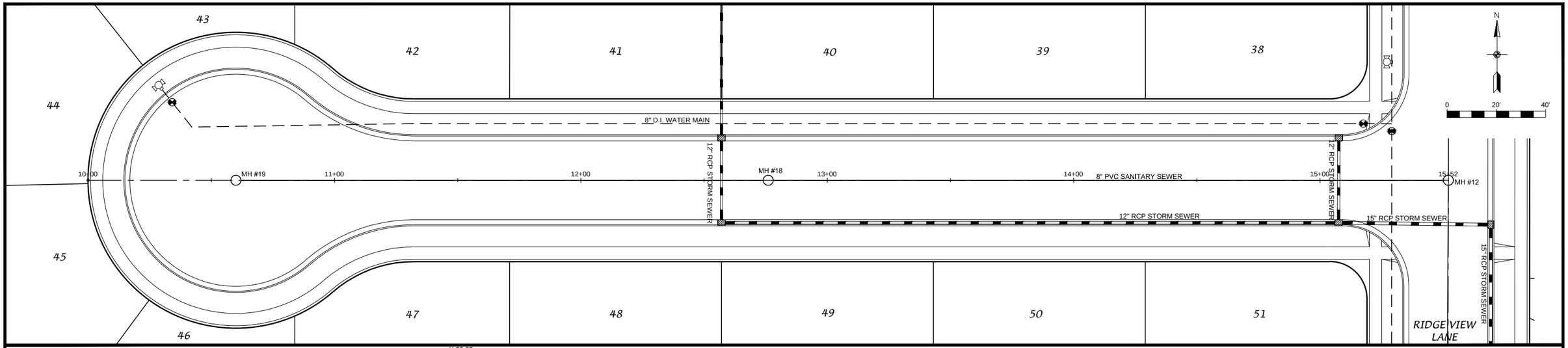
SCALE: 1"= 40'
(PAGE SIZE: 11x17)
0 20

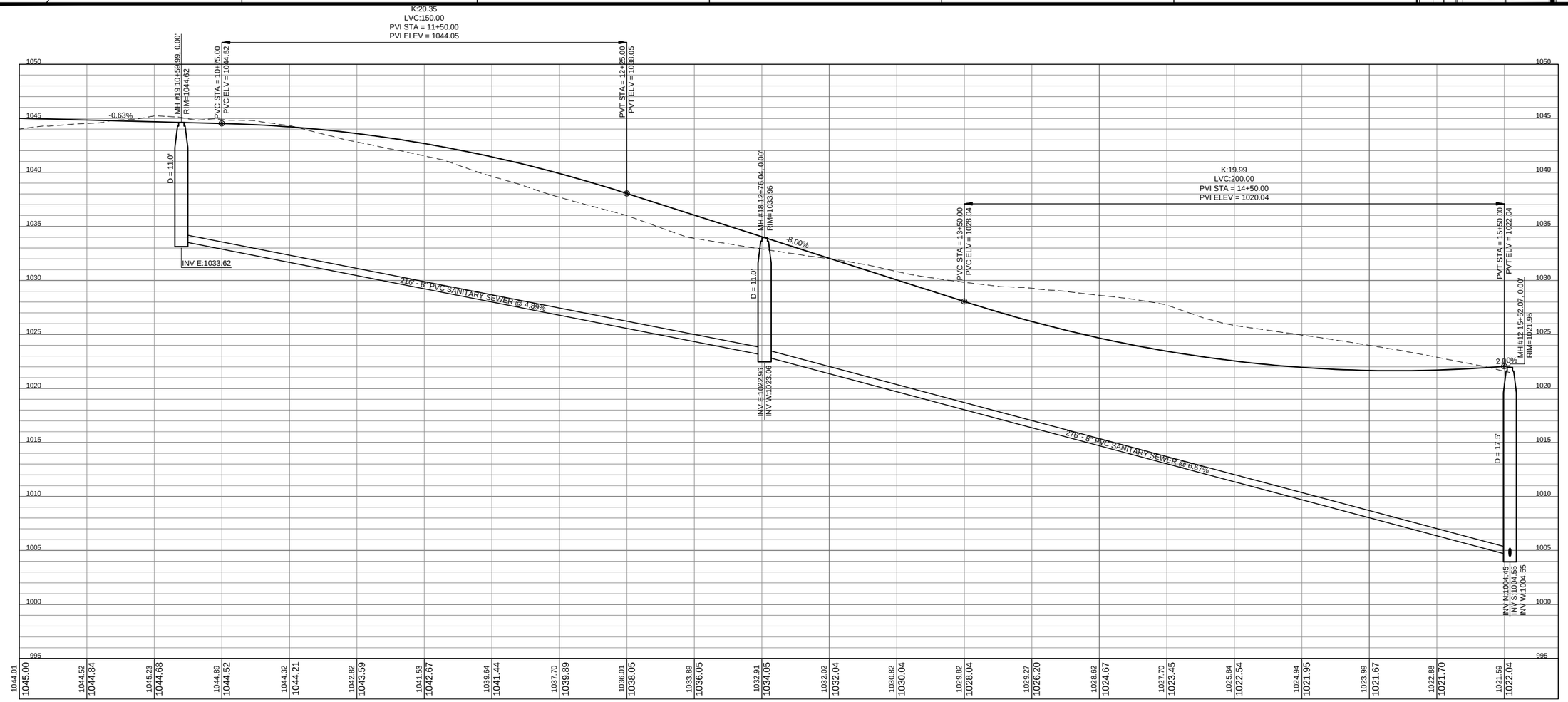
DATE: 04/15/21
REVISED:

DRAWN BY: TCF

FN: 20-05-162

Sheet Number:
3 OF 6





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FN: 20-05-162

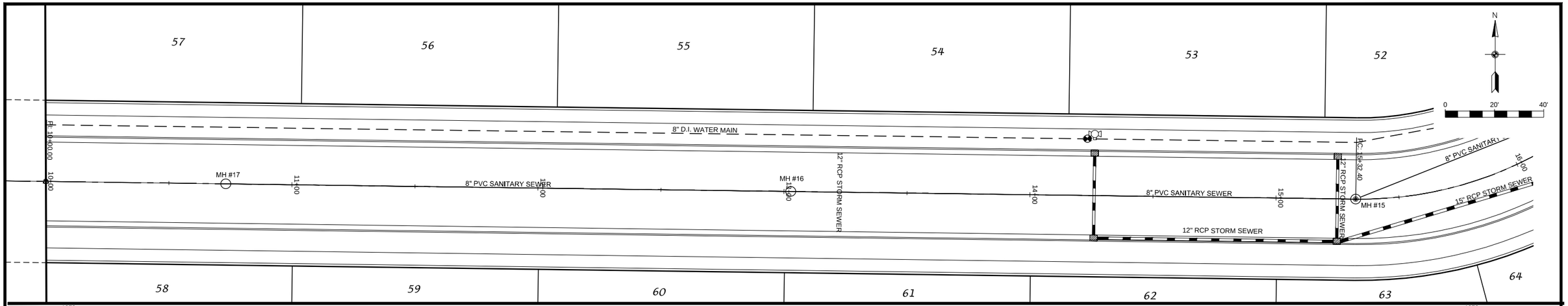
DATE: 04/15/2021

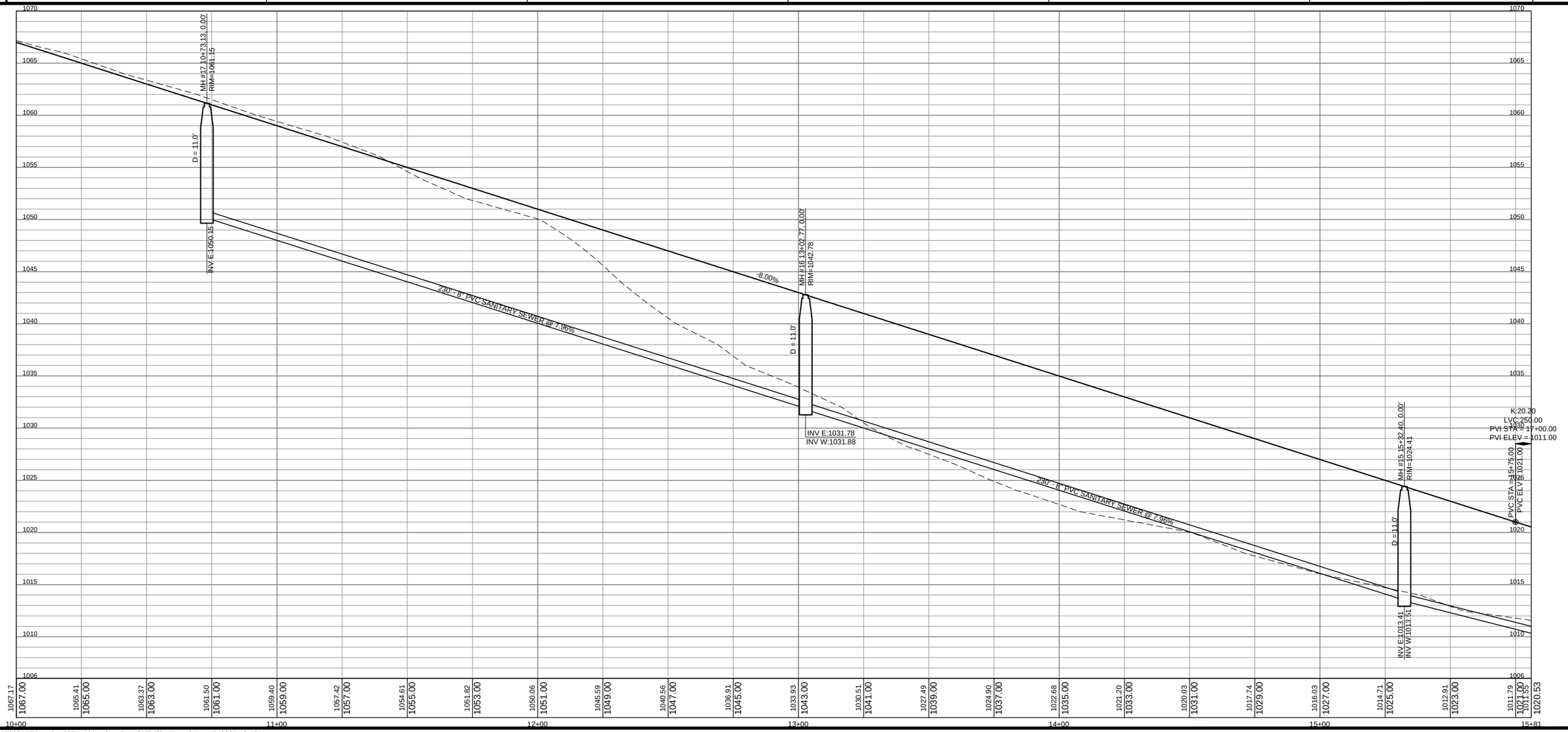
REV:

1st ADDITION TO AUTUMN RIDGE

AUTUMN RIDGE COURT

SHEET: 4 OF 6





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FN: 20-05-162

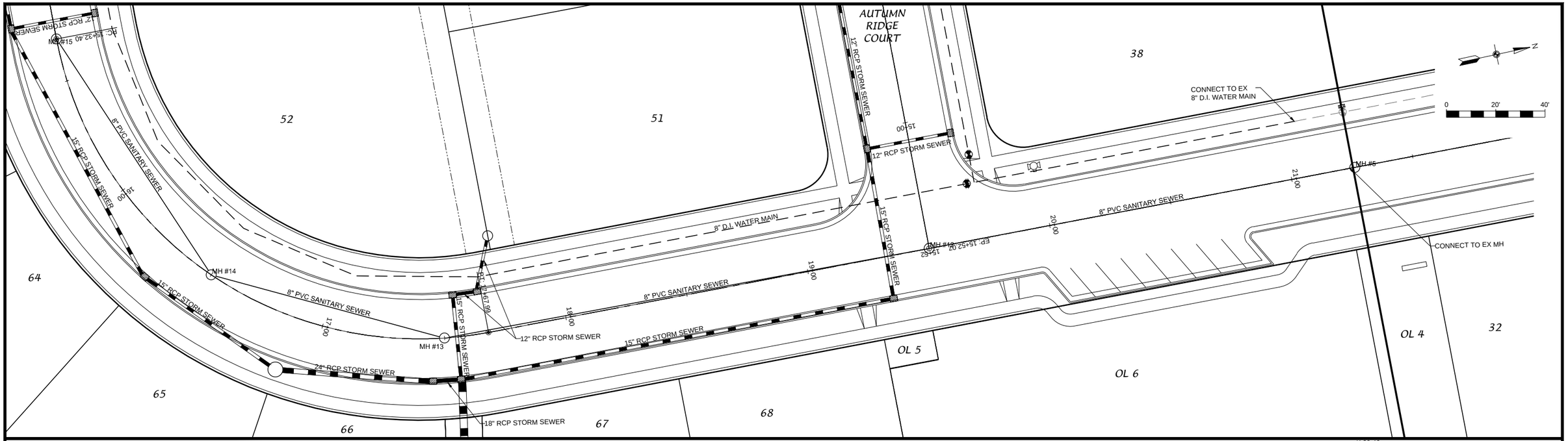
DATE: 04/15/2021

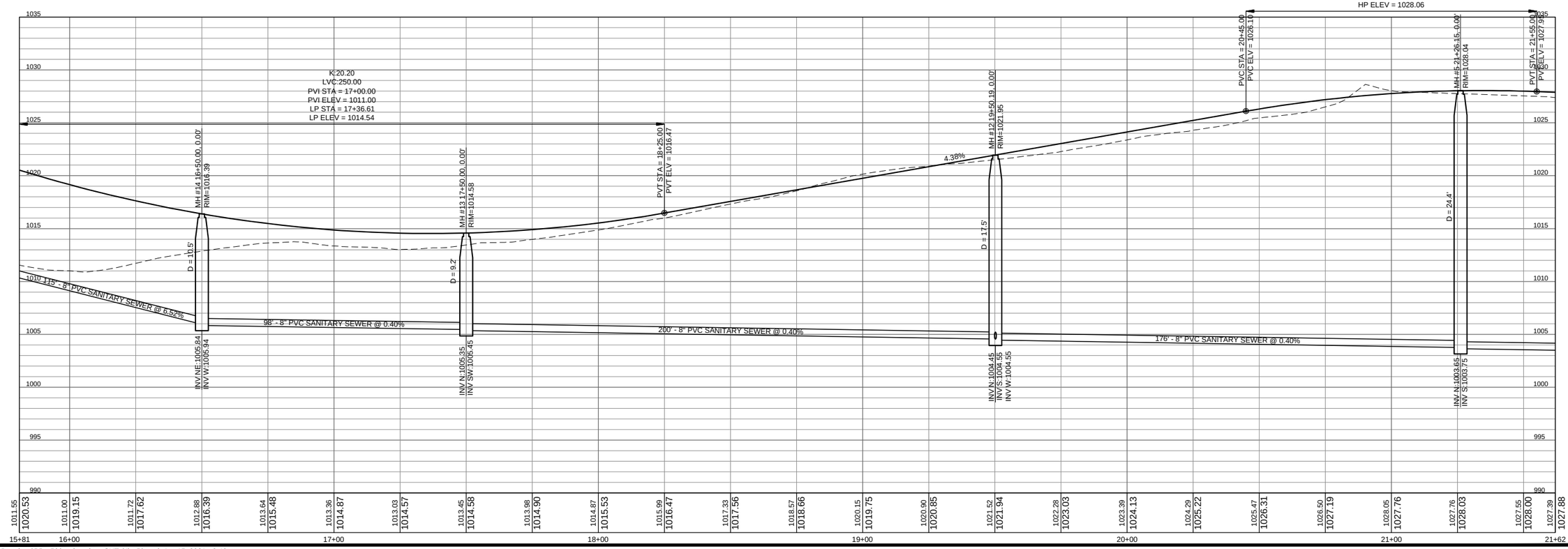
REV:

1st ADDITION TO AUTUMN RIDGE

RIDGE VIEW LANE

SHEET: 5 OF 6





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FN: 20-05-162

DATE: 04/15/2021

REV:

1st ADDITION TO AUTUMN RIDGE

RIDGE VIEW LANE

SHEET: 6 OF 6

AUTUMN RIDGE – PHASE II
VILLAGE OF OREGON – CTH MM
DANE COUNTY, WISCONSIN

STORM WATER MANAGEMENT REPORT

OWNER
Glenn & Michelle Hofer Living Trust
610 Ondossagon Way
Madison, WI 53719

April 14, 2021

PREPARED BY
D'Onofrio, Kottke & Associates, Inc.
7530 Westward Way
Madison, Wisconsin 53717
608.833.7530

FN: 20-05-162

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EXHIBITS

APPENDICES

INTRODUCTION

The intent of this report is to provide details on how the proposed "Autumn Ridge-Phase II" residential plat will be developed so that it is constructed in accordance with applicable storm water management standards.

The proposed development is approximately a 19 acre plat located in the Village of Oregon. The site is located just to the West of County Hwy MM (Wolfe St.), and South of Foxfield Road in the NW ¼ of the SE ¼, Section 13, Township 05N, Range 09E. More specifically parcel number 0509-134-8500-0 Village of Oregon, Dane County, Wisconsin. A project location map can be found in Exhibit #1.

The existing layout of the site consists of predominantly agricultural tilled land with surface water generally draining from north and west to the southeast corner of the site. The surface water eventually drains out of the southeast corner of the plat. In developed conditions the site will create approximately 31 single family lots and 2 Outlots. The residential plat area will predominantly be routed to a proposed wet detention/infiltration basin system for treatment. The soil conditions on site consist of hydrologic soil group type B soils. A site soils map can be found in Exhibit #2.

The proposed improvements for this plat requires land disturbing activity in excess of one acre and the future cumulative addition of 20,000 square feet of impervious surface area. Therefore, according to the Village of Oregon and State of Wisconsin ordinances, the site requires storm water management approvals and permits.

STANDARDS & RESULTS

The proposed development requires the following storm water management performance standards.

Sediment Control
Standard: Reduce, to the maximum extent practicable, total suspended solids load leaving the site by eighty percent (80%) based on the average annual rainfall.

Design Results: Sediment from the site will be reduced by 80% by routing the site runoff to a wet detention basin in the Southeast corner of the plat. WinSLAMM was used for modeling the sediment load reduction. See appendix B for sediment reduction calculations. Water leaving the site to the southeast will be clean runoff mostly from yards and roofs.

Temperature Control
Standard: For development of sites within thermally sensitive areas, provisions and practices to reduce the temperature of the storm water runoff shall be included.

Design Results: The proposed site does not fall within a defined thermally sensitive area.

Runoff Rate Control
Standard: For new developments, storm water management practices shall be designed and implemented to maintain post-development peak runoff discharge rates at predevelopment rates for the 1yr and 2yr-24 hour design storm event. Reduce the peak runoff rates for the 10yr-24hr storm event to the 2yr-24 hour predevelopment peak flow rate. Reduce the 100yr-24hr storm event to the 10yr-24hr predevelopment peak flow rate.

Design Results: The basin system will maintain the required peak runoff rates for the 1, 2, 10, and 100 year- 24 hour storm events. The peak flow comparison chart for site can be found in the stormwater management measures section of this report and the HydroCAD output can be found within Appendix D. The disturbed areas will be deep tilled prior to restoration to maintain existing soils classes.

Infiltration
Standard: For new developments, design practices to infiltrate sufficient runoff volume so the post-development infiltration volume shall be at least 90% of the predevelopment infiltration volume.

Design Results: The proposed development was designed to meet the 90% stayon requirement through an infiltration basin. The infiltration basin was sized using WinSLAMM modeling software. A minimum of 60% sediment reduction will occur in the proposed wet detention basin cell prior to entering the designed infiltration basin. Along with meeting the 90% stayon requirement, the basin was also designed to match the existing volume runoff for the 50 year storm event. The infiltration design calculations can be found in Appendix C.

STORM WATER MANAGEMENT MEASURES

The site generally drains to the southeast corner of the plat in existing and proposed conditions. The stormwater from the site will be treated by routing runoff to a wet detention/infiltration basin systems located at the southeast side of the plat. Peak flow, sediment reduction, and stayon requirements will be met for the entire plat within this system.

HydroCAD Stormwater Modeling software has been used to analyze the stormwater runoff characteristics for the development. HydroCAD uses the TR-55 methodology for determining peak discharge rates. The model output shows the runoff leaving the site in existing and proposed conditions. The site was designed to utilize a combination wet detention basin and infiltration basin system prior to leaving the site in proposed conditions. In this system, the wet detention chamber in will limit flow into the infiltration basin chamber for the 1yr-24hr storm event to remove sediment before entering the infiltration basin. During larger storms, the two chambers in the basin systems will act as one basin to limit peak flow from the site (see basin details in Appendix A).The detention and infiltration basins were modeled dynamically to better represent the elevations of the two chambers working together. The peak flow results from the stormwater modeling and basin design are shown in the chart on the next page. The chart shows the proposed results from the drainage area along with a comparison of the runoff volume leaving the site through the 50yr storm event. The detention basin system will maintain the peak runoff rates leaving the plat per the Village's requirements.

WinSLAMM was used to perform the sediment reduction calculations for the proposed site. Appendix B contains the calculation results. The stormwater management system will provide 80% sediment removal. The peak flow results from stormwater modeling and detention basin design are shown in the chart on the next page. This chart shows a comparison of the drainage area in existing conditions and in post construction conditions. Infiltration modeling for the site was calculated using WinSLAMM software and meets the 90% predevelopment standard per the ordinance. The infiltration basins will be implemented when at a minimum 75% of the plat area draining to the basin is complete. The infiltration calculations can be found in Appendix C.

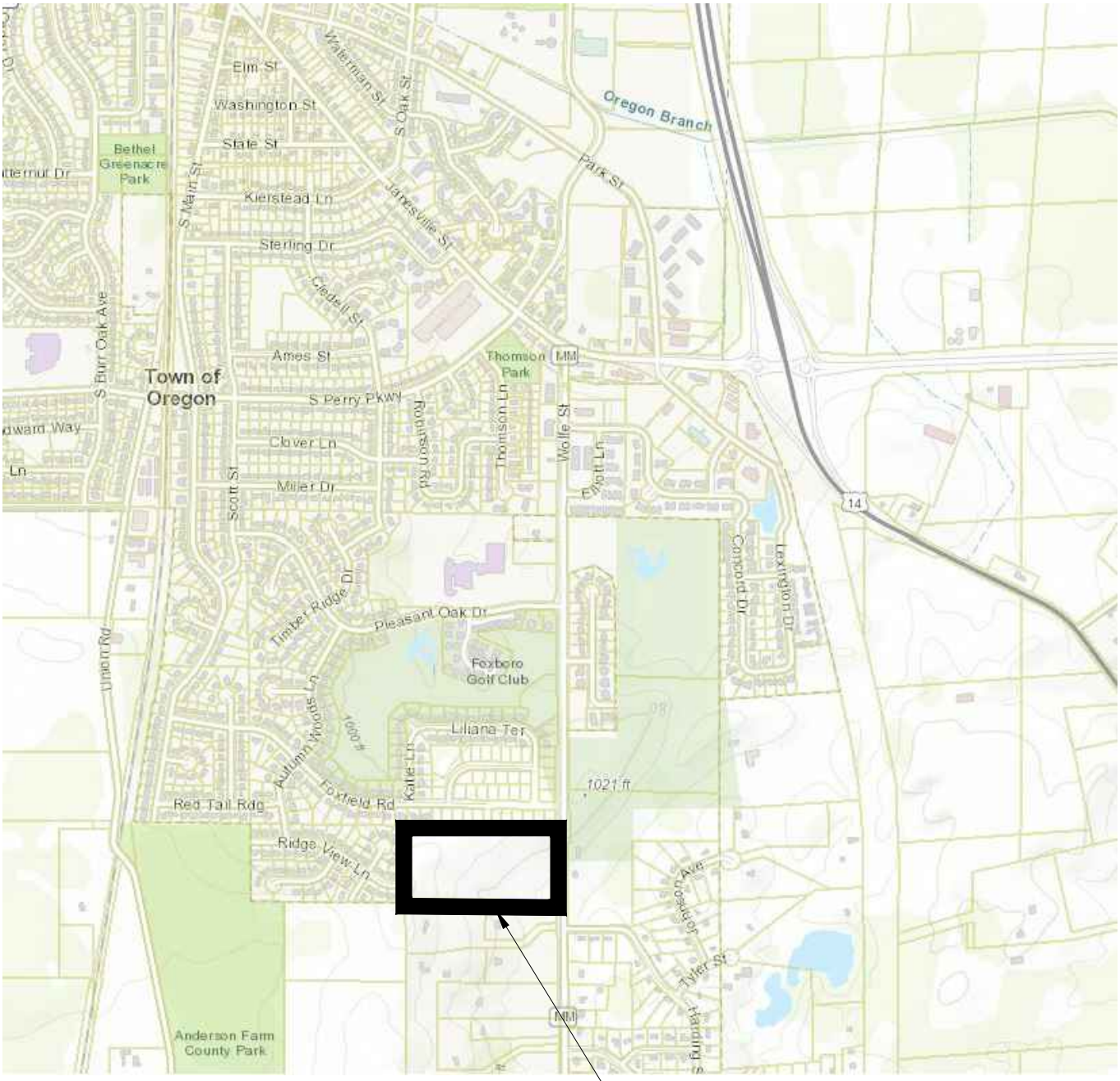
PEAK FLOW COMPARISION CHART
Autumn Ridge – Phase II

AUTUMN RIDGE PH 2 - 24-HR STORM EVENT (PEAK FLOW IN CFS)-PEAK FLOW COMPARISION					
	1YR	2YR	10YR	50YR	100YR
PHASE 2 DRAINAGE AREA					
Existing Flow	0.70	1.69	9.00	24.93	34.39
Proposed Total Treated Flow	0.00	0.00	0.48	1.38	5.47
Proposed Total Untreated Flow	10.33	15.21	35.77	68.54	56.10
PHASE 2 RUNOFF VOLUME (ACFT)					
Existing Runoff Volume (ACFT)	0.21	0.36	1.12		
Proposed Runoff Volume Treated (ACFT)	0.000	0.000	0.720		
Proposed Runoff Volume Untreated (ACFT)	0.770	1.070	2.320		
PHASE 2 BASIN DESIGN					
Routed Detention Basin to Infiltration Basin	0.47	0.57	7.62	47.16	71.54
Elevation (Top = 991, Outlet = 986)	987.41	987.98	988.87	989.53	989.77
Routed Infiltration Basin to Offsite	0.00	0.00	0.48	1.38	5.47
Elevation (Top = 982, Bottom=977)	977.34	977.62	978.50	980.37	980.82

CONCLUSIONS

As the results indicate, the storm water management system for the proposed development meets the Village of Oregon and State of Wisconsin Ordinances. The peak flow, sediment control and infiltration requirements have been addressed and met for this site.

EXHIBITS



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LOCATION MAP

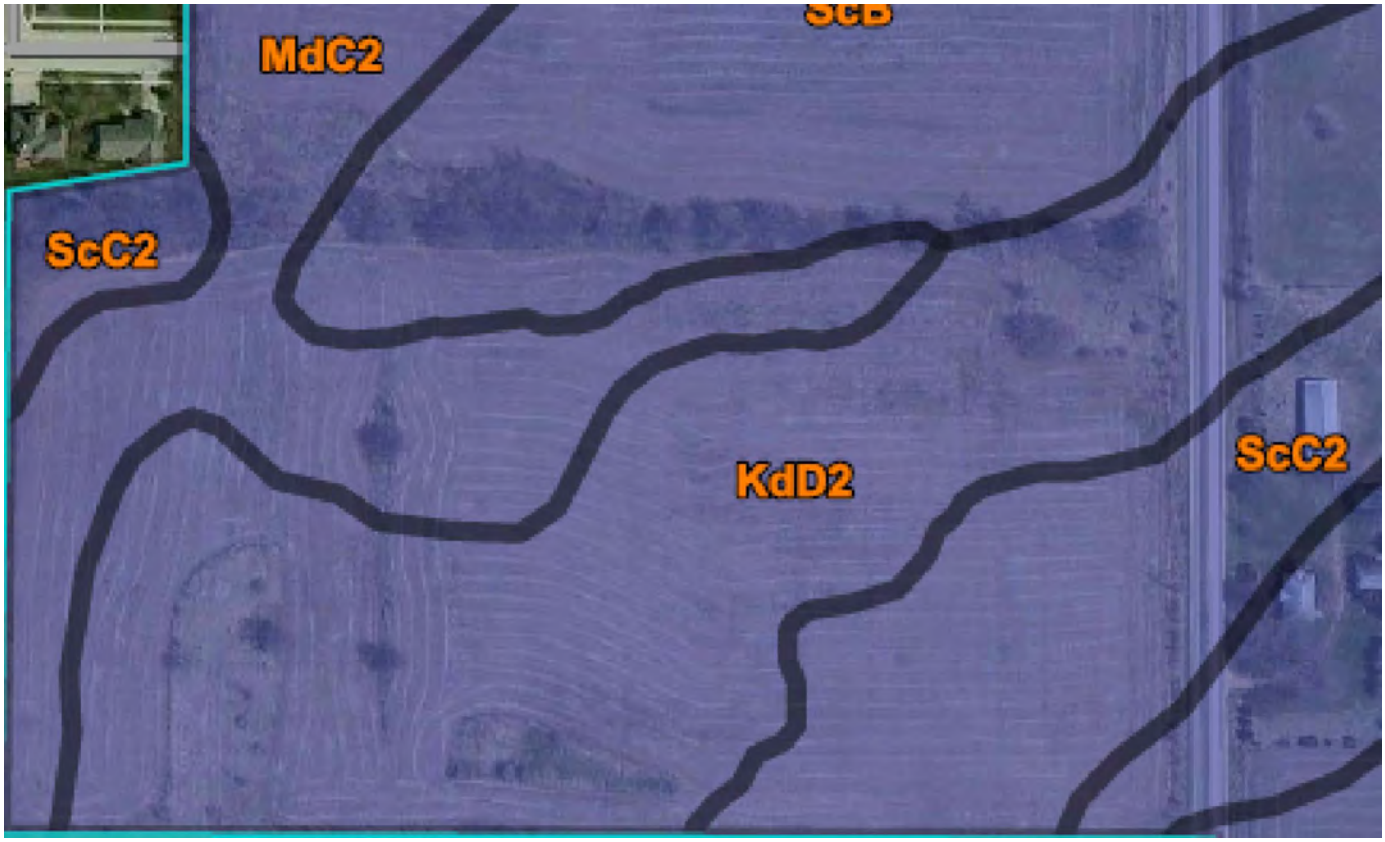
AUTUMN RIDGE - PHASE II

VILLAGE OF OREGON, DANE COUNTY, WISCONSIN

DRAWN BY:GVP

EXHIBIT 1

File: U:\User\2005162\Engineering\SWMP\Phase 2 SW Design\2005162 PH. 2 SWMP.dwg LOCATION Plotted: Apr 12, 2021 - 3:52pm



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SOILS MAP

AUTUMN RIDGE - PHASE II

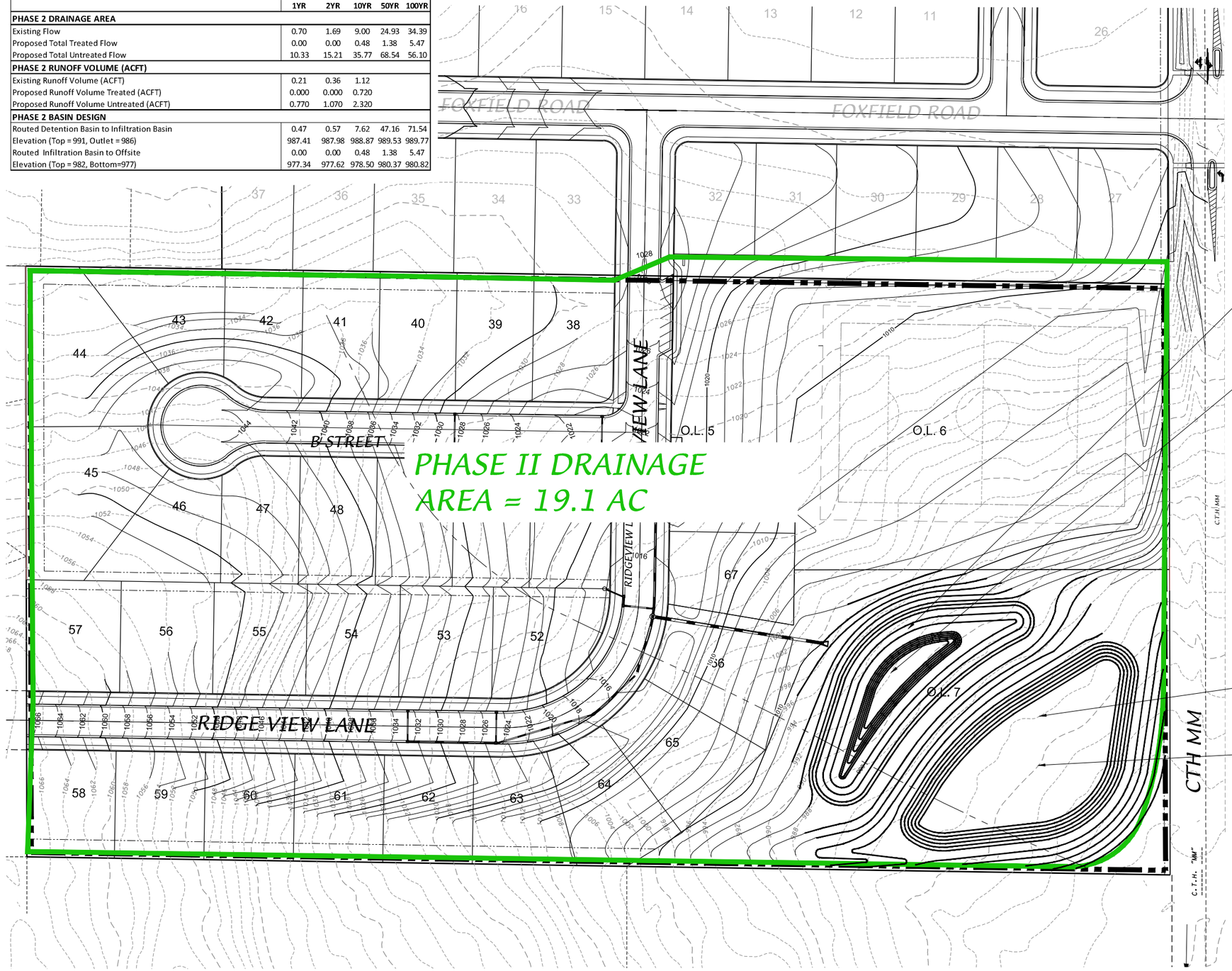
VILLAGE OF OREGON, DANE COUNTY, WISCONSIN

DRAWN BY:GVP

EXHIBIT 2

File: U:\User\2005162\Engineering\SWMP\Phase 2 SW Design\2005162 PH. 2 SWMP.dwg soils Plotted: Apr 12, 2021 - 3:52pm

AUTUMN RIDGE PH 2 - 24-HR STORM EVENT (PEAK FLOW IN CFS)-PEAK FLOW COMPARISION					
	1YR	2YR	10YR	50YR	100YR
PHASE 2 DRAINAGE AREA					
Existing Flow	0.70	1.69	9.00	24.93	34.39
Proposed Total Treated Flow	0.00	0.00	0.48	1.38	5.47
Proposed Total Untreated Flow	10.33	15.21	35.77	68.54	56.10
PHASE 2 RUNOFF VOLUME (ACFT)					
Existing Runoff Volume (ACFT)	0.21	0.36	1.12		
Proposed Runoff Volume Treated (ACFT)	0.000	0.000	0.720		
Proposed Runoff Volume Untreated (ACFT)	0.770	1.070	2.320		
PHASE 2 BASIN DESIGN					
Routed Detention Basin to Infiltration Basin	0.47	0.57	7.62	47.16	71.54
Elevation (Top = 991, Outlet = 986)	987.41	987.98	988.87	989.53	989.77
Routed Infiltration Basin to Offsite	0.00	0.00	0.48	1.38	5.47
Elevation (Top = 982, Bottom=977)	977.34	977.62	978.50	980.37	980.82



EXISTING SITE DRAINAGE BASIN INFORMATION

EXISTING SITE = 19.1AC

19.1 ACRES	TYPE B SOILS	CN 58

PROPOSED SITE DRAINAGE BASIN INFORMATION

PROPOSED SITE = 19.1 AC

12.0 ACRES	40% IMPERVIOUS	CN 74
6.3 ACRES	10% IMP PARK/OL	CN 62
0.8 ACRES	IMPERVIOUS WATER AREA	CN 98

PROPOSED WET DETENTION BASIN
TOP OF POND BERM - 991.00, AREA = 25,355 SQFT
TOP OF WET POND/OUTLET - 986.00, AREA = 11,944 SQFT
BOTTOM OF WET POND - 980.00

WET DETENTION BASIN OUTLET STRUCTURE
36" STANDPIPE W/GRATE
RIM = 988.50
W/4" ORIFICE @ 986.00
18" OUTLET PIPE @ 985.00

30' WEIR @ 989.00

PROPOSED SOUTH NFILTRATION BASIN W/ 12" DEPRESSION ZONE

23,860 SQFT @ 977.00
38,225 SQFT (TOP OF BERM) @ 982.00

INFILTRATION BASIN OUTLET STRUCTURE
36" STANDPIPE W/GRATE
RIM = 980.50
W/6" ORIFICE @ 978.00
12" OUTLET PIPE @ 978.00

30' WEIR @ 981.00

8" CAPPED EMERGENCY DRAWDOWN PIPE @ 977.00 (DAYLIGHT)

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PROPOSED PHASE 2 STORMWATER DRAINAGE PLAN

AUTUMN RIDGE - PHASE 2

VILLAGE OF OREGON, WISCONSIN

0 60'

NOT FOR CONSTRUCTION

DATE: 04/12/21
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DRAWN BY: GVP
FN: 20-05-162
Sheet Number:
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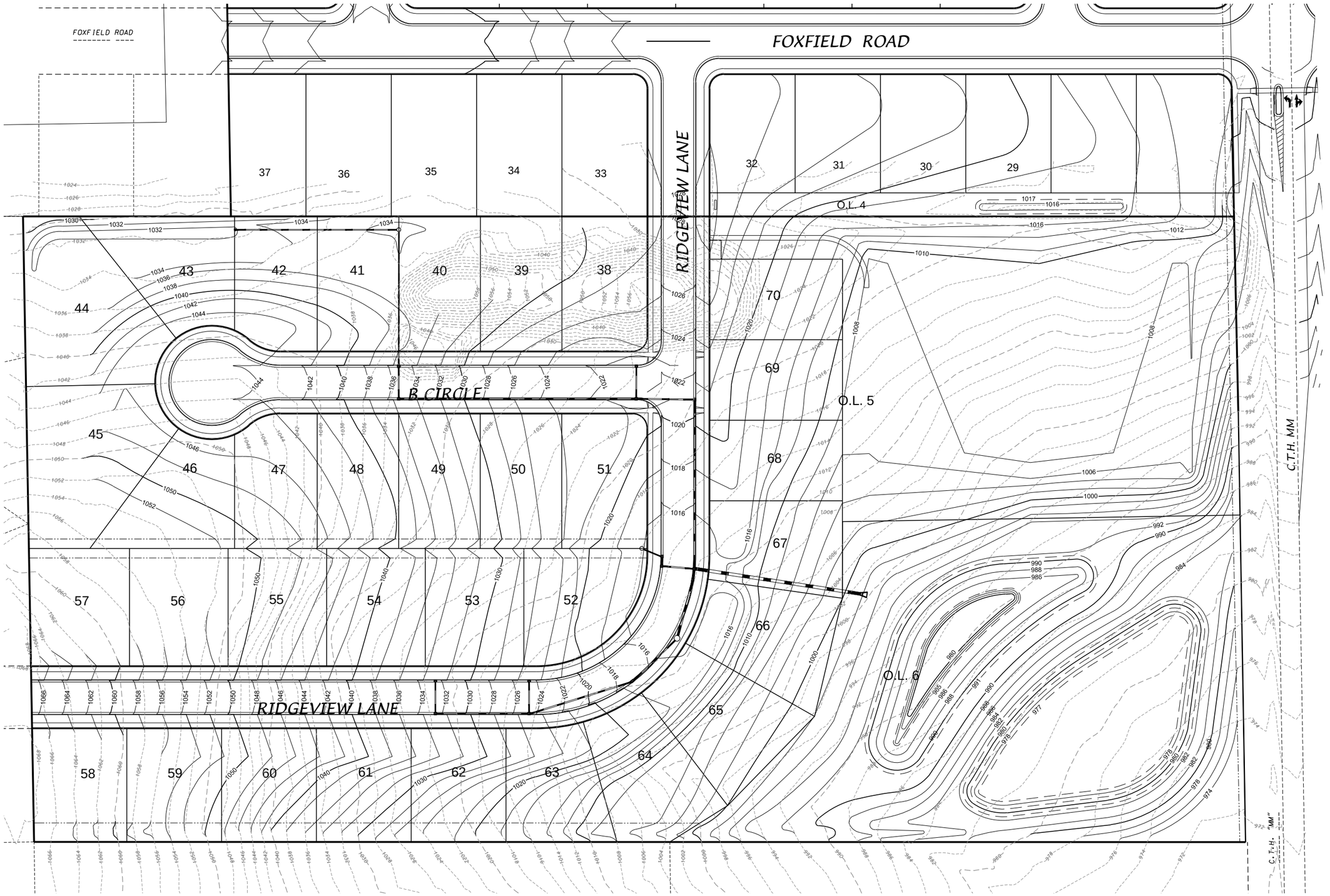

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GRADING PLAN

AUTUMN RIDGE - PHASE 2

VILLAGE OF OREGON, DANE COUNTY, WISCONSIN

SCALE: 1" = 300'
(PAGE SIZE: 11x17)
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DATE: 04-14-21
REVISED:

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FN: 20-05-162

Sheet Number:
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AERIAL MAP

AUTUMN RIDGE - PHASE II

VILLAGE OF OREGON, DANE COUNTY, WISCONSIN

DRAWN BY:GVP

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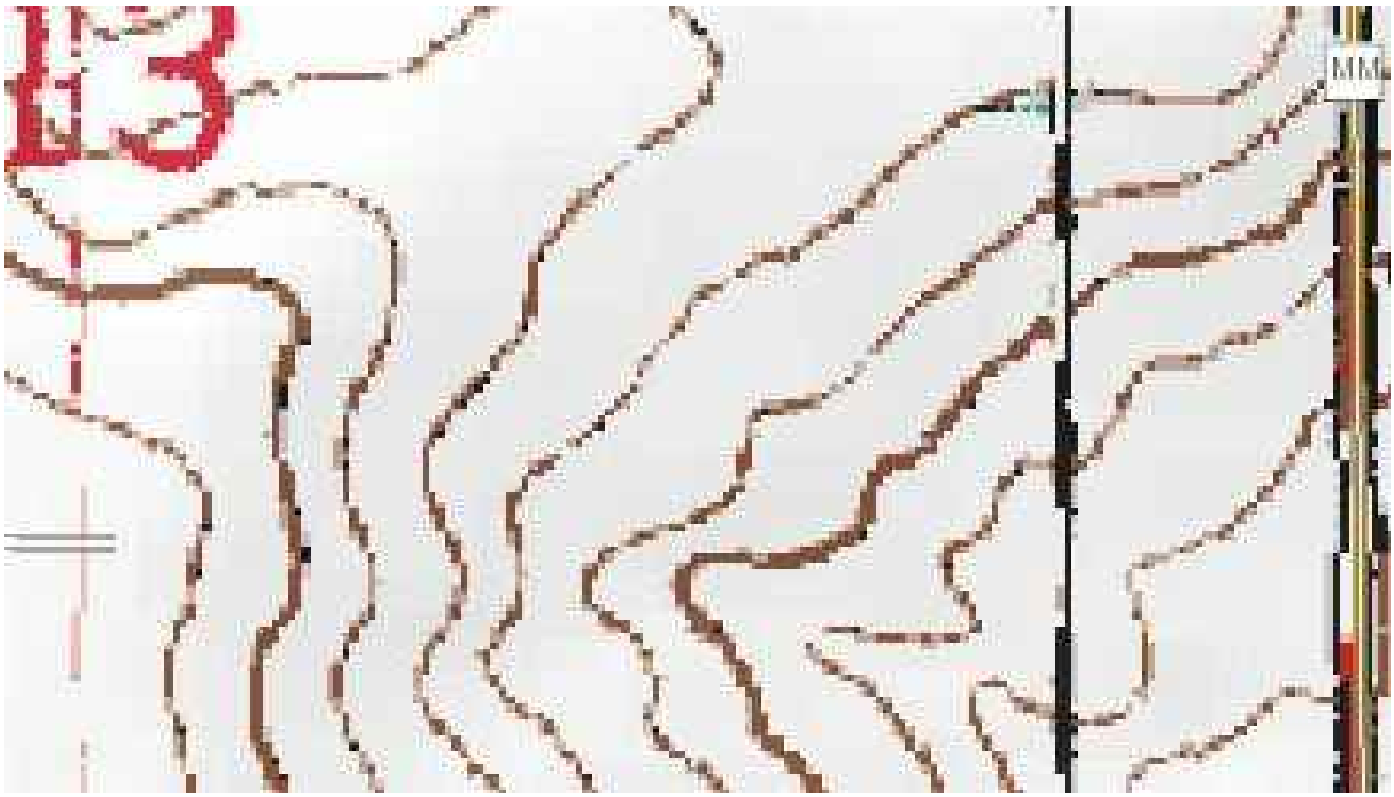

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USGS PHOTO

AUTUMN RIDGE - PHASE II

VILLAGE OF OREGON, DANE COUNTY, WISCONSIN

DRAWN BY:GVP

EXHIBIT 6

NOTE: NO WETLAND INDICATORS LOCATED ON SITE

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WETLAND INDICATOR MAP

AUTUMN RIDGE - PHASE II

VILLAGE OF OREGON, DANE COUNTY, WISCONSIN

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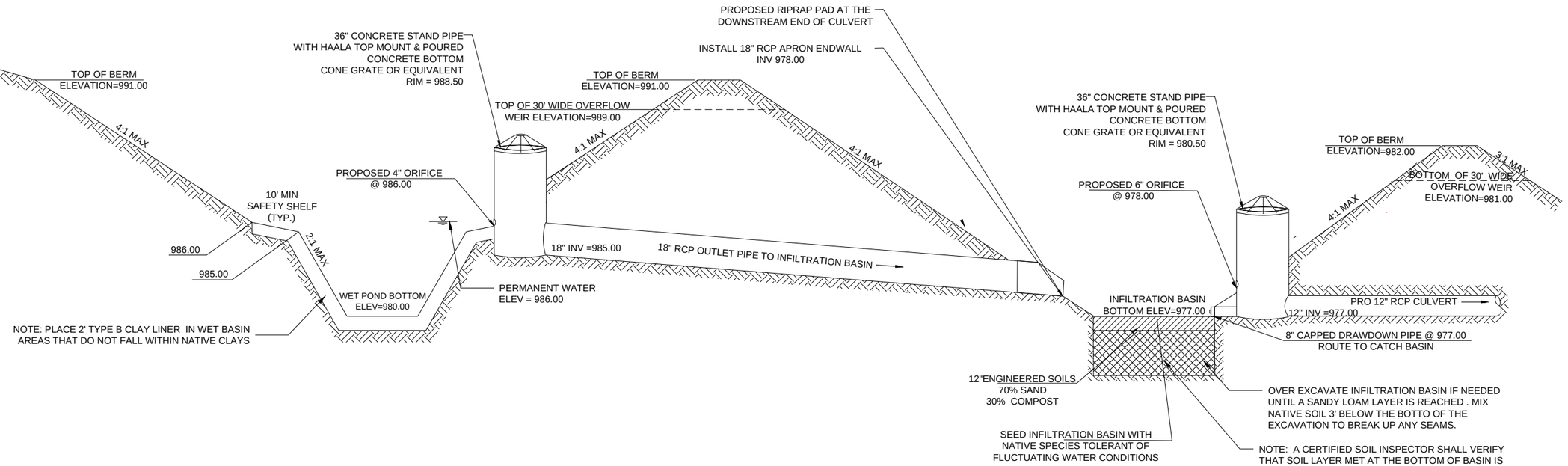
EXHIBIT 7

File: U:\User\2005162\Engineering\SWMP\Phase 2 SW Design\2005162 PH. 2 SWMP.dwg Wetland Indicator Plotted: Apr 12, 2021 - 3:53pm

APPENDIX A

DETENTION POND & INFLITRATION BASIN DETAIL



PROFILE VIEW

PROPOSED AUTUMN RIDGE - PHASE II WET DETENTION BASIN & INFILTRATION BASIN

NOT TO SCALE

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YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

WET DETENTION/INFILTRATION BASIN DETAIL

AUTUMN RIDGE - PHASE 2

VILLAGE OF OREGON, WISCONSIN

DATE: 04/12/21

REVISED:

DRAWN BY: GVP

FN: 20-05-162

Sheet Number:

APPENDIX A

APPENDIX B

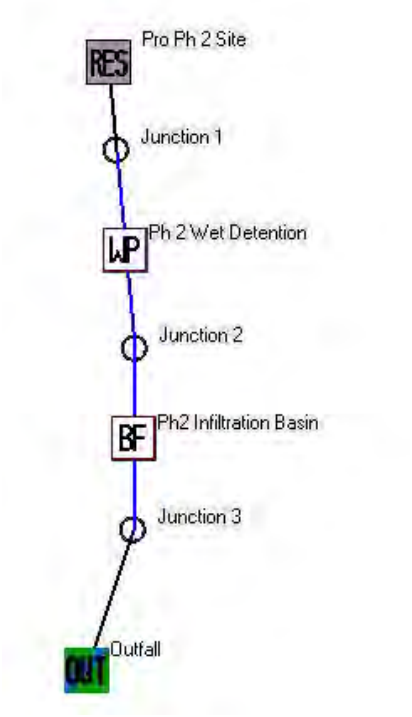
SEDIMENT REDUCTION CALCULATIONS

DETENTION BASIN
SEDIMENTATION REDUCTION CALCULATIONS (SLAMM)

WinSlamm Design

The following Slamm design shows that 80% of sediment is being removed from the proposed site

Model Schematic:



Model Input Information:

Data file name: U:\User\2005162\Engineering\SWMP\Phase 2 SW Design\pro ph2 slamm.mdb
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 04-12-2021 Time: 15:13:07
Site information:

LU# 1 - Residential: Pro Ph 2 Site Total area (ac): 19.100

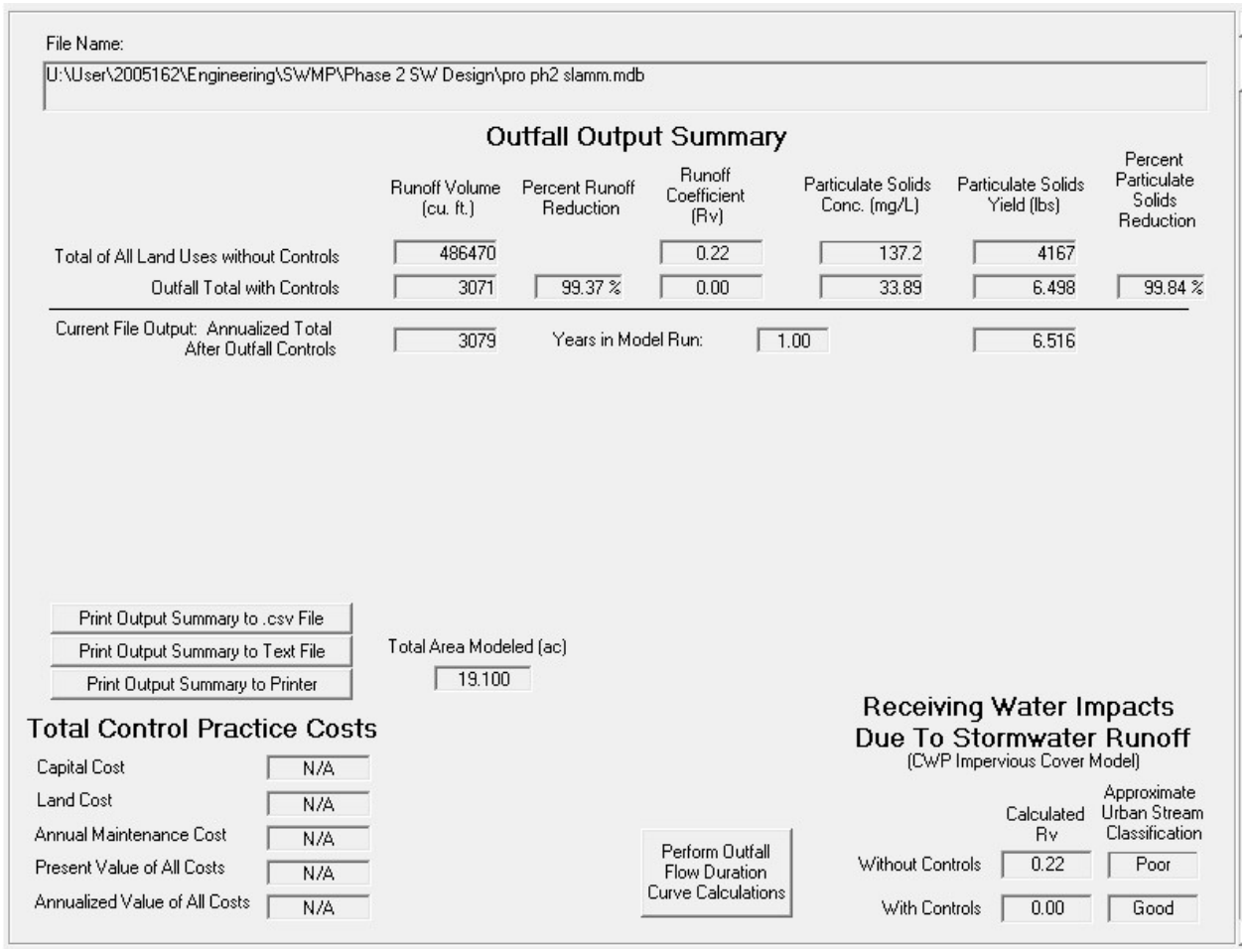
1 - Roofs 1: 1.790 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
2 - Roofs 2: 0.920 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 1.190 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 1.520 ac. Intermediate Street Length = 1.045 curb-mi Street Width (assuming two curb-mi per street mile) = 24 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 12.880 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.800 ac. Source Area PSD File:

Control Practice 1: Wet Detention Pond CP# 1 (DS) - Ph 2 Wet Detention
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 6
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:
Outlet type: Orifice 1
1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 6
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 30
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 9
Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 3
2. Stand pipe height above datum (ft): 8.5
Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.10	0.0500	0.00	0.00
2	1.00	0.0700	0.00	0.00
3	2.00	0.0800	0.00	0.00
4	3.00	0.1000	0.00	0.00
5	4.00	0.1200	0.00	0.00
6	5.00	0.1400	0.00	0.00
7	6.00	0.3300	0.00	0.00
8	7.00	0.3900	0.00	0.00
9	8.00	0.4500	0.00	0.00
10	9.00	0.5200	0.00	0.00
11	10.00	0.5800	0.00	0.00

Control Practice 2: Biofilter CP# 1 (DS) - Ph2 Infiltration Basin
1. Top area (square feet) = 38225
2. Bottom aea (square feet) = 23860
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.01
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0
Soil Data Soil Type Fraction in Eng. Soil
Biofilter Outlet/Discharge Characteristics:
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 10
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 4
Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 3
2. Stand pipe height above datum (ft): 3.5
Outlet type: Surface Discharge Pipe
1. Surface discharge pipe outlet diameter (ft): 0.5
2. Pipe invert elevation above datum (ft): 1
3. Number of surface pipe outlets: 1

Output Sediment Reduction:



File Name:

U:\User\2005162\Engineering\SWMP\Phase 2 SW Design\pro ph2 slamm.mdb

Outfall Output Summary

	Runoff Volume (cu. ft.)	Percent Runoff Reduction	Runoff Coefficient (Rv)	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of All Land Uses without Controls	486470		0.22	137.2	4167	
Outfall Total with Controls	3071	99.37 %	0.00	33.89	6.498	99.84 %
Current File Output: Annualized Total After Outfall Controls	3079	Years in Model Run:	1.00		6.516	

Print Output Summary to .csv File
Print Output Summary to Text File
Print Output Summary to Printer

Total Area Modeled (ac): 19.100

Total Control Practice Costs

Capital Cost	N/A
Land Cost	N/A
Annual Maintenance Cost	N/A
Present Value of All Costs	N/A
Annualized Value of All Costs	N/A

Perform Outfall Flow Duration Curve Calculations

Receiving Water Impacts Due To Stormwater Runoff
(CWP Impervious Cover Model)

	Calculated Rv	Approximate Urban Stream Classification
Without Controls	0.22	Poor
With Controls	0.00	Good

Total site sediment reduction in developed conditions = <u>99.84%</u>

Data File: U:\User\2005162\Engpro ph2 slamm.mdb
Rain File: WisReg - Madison WI
Date: 04-12-21 Time: 3:14:45 PM
Site Description:

Col. #:	2	4	5	6	7	8	9
Control Practice No.	Control Practice Type	Total Inflow Volume (cf)	Total Outflow Volume (cf)	Percent Volume Reduction	Total Influent Load (lbs)	Total Effluent Load (lbs)	Percent Load Reduction
1	Wet Detention Pond	486470	487742	-0.261	4167	709.5	82.97
2	Biofilter	487742	3071	99.37	709.5	6.498	99.08

The chart above shows that over 60% sediment reduction will occur prior to the infiltration basins.

APPENDIX C

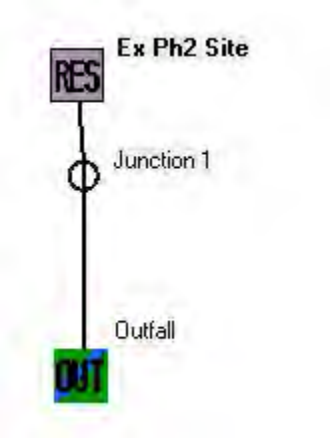
INFILTRATION DESIGN

INFILTRATION SIZING FOR THE PROPOSED PLAT

Methodology: To meet infiltration requirements, the following will show that the infiltration design will meet stayon requirements for the site. To establish the infiltration requirements, the site was modeled using WinSLAMM in existing conditions to establish an existing stayon value first. A target stayon value was established as 90% of the existing value per the ordinance. As shown in the following calculations; The site will meet the required infiltration performance standard in developed conditions

WinSLAMM Model to Establish Stayon Requirements

Model Schematic:



Model Input Information:

Data file name: U:\User\2005162\Engineering\SWMP\Phase 2 SW Design\Ph2 ex slamm.mdb
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 04-12-2021 Time: 15:17:55
Site information:

LU# 1 - Residential: Ex Ph2 Site Total area (ac): 19.100
45 - Large Landscaped Areas 1: 19.100 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Output Existing Stayon From Plat:

Data File: U:\User\2005162\Engineering\SWMP\Phase 2 SW Design\Ph2 ex slar
Rain File: WisReg - Madison WI 1981.RAN
Date: 04-12-21 Time: 3:18:47 PM
Site Description:

Runoff Volume Total (cf) at the Outfall

Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)
73	08/28/81	0.04	0	0.000	0.04
74	08/31/81	0.03	0	0.000	0.03
75	08/31/81	1.52	5662	0.054	1.44
76	09/07/81	0.89	2656	0.043	0.85
77	09/11/81	0.08	0	0.000	0.08
78	09/16/81	0.03	0	0.000	0.03
79	09/21/81	0.45	735.5	0.024	0.44
80	09/24/81	0.90	2692	0.043	0.86
81	09/26/81	0.12	0	0.000	0.12
82	09/28/81	0.10	0	0.000	0.10
83	09/29/81	0.16	0	0.000	0.16
84	09/30/81	0.36	434.4	0.017	0.35
85	10/01/81	0.01	0	0.000	0.01
86	10/04/81	0.15	0	0.000	0.15
87	10/05/81	0.04	0	0.000	0.04
88	10/05/81	0.02	0	0.000	0.02
89	10/09/81	0.14	0	0.000	0.14
90	10/13/81	1.20	4334	0.052	1.14
91	10/15/81	0.02	0	0.000	0.02
92	10/17/81	0.95	2875	0.044	0.91
93	10/18/81	0.06	0	0.000	0.06
94	10/21/81	0.06	0	0.000	0.06
95	10/21/81	0.01	0	0.000	0.01
96	10/24/81	0.01	0	0.000	0.01
97	10/31/81	0.01	0	0.000	0.01
98	11/05/81	0.04	0	0.000	0.04
99	11/15/81	0.07	0	0.000	0.07
100	11/18/81	0.05	0	0.000	0.05
101	11/19/81	0.26	121.4	0.007	0.26
102	11/23/81	0.18	0	0.000	0.18
103	11/25/81	0.89	2656	0.043	0.85
104	11/30/81	0.37	473.9	0.018	0.36
105	12/03/81	-	-	-	-
106	12/14/81	-	-	-	-
107	12/20/81	-	-	-	-
108	12/26/81	-	-	-	-
109	12/31/81	-	-	-	-
Minimum:		0.00	0	0.000	0.01
Maximum:		2.59	35914	0.200	2.07
Average:		0.26	1100	0.012	0.25
Total:		28.81	119892		27.09

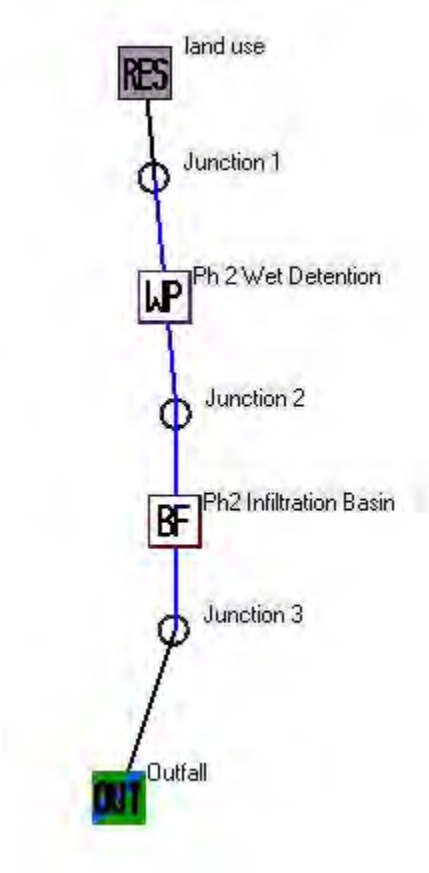
The plat has **27.09** inches of stayon in existing conditions. 90% of 27.09 inches = **24.4 inches of stayon required** to meet stayon requirements for the plat.

Proposed Infiltration Design:

Proposed Site Infiltration Design:
Stayon Required = 24.4 inches
Note: Assume 0.5 in/hr infiltration can be attained

WinSlamm Design

Model Schematic:



Model Input Information:

Data file name: U:\User\2005162\Engineering\SWMP\Phase 2 SW Design\pro ph2 slamm.mdb
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:

If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 04-12-2021 Time: 15:13:07
Site information:

LU# 1 - Residential: Pro Ph 2 Site Total area (ac): 19.100
1 - Roofs 1: 1.790 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
2 - Roofs 2: 0.920 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 1.190 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 1.520 ac. Intermediate Street Length = 1.045 curb-mi Street Width (assuming two curb-mi per street mile) = 24 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 12.880 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.800 ac. Source Area PSD File:

Control Practice 1: Wet Detention Pond CP# 1 (DS) - Ph 2 Wet Detention
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 6
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:
Outlet type: Orifice 1
1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 6
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 30
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 9
Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 3
2. Stand pipe height above datum (ft): 8.5
Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.10	0.0500	0.00	0.00
2	1.00	0.0700	0.00	0.00
3	2.00	0.0800	0.00	0.00
4	3.00	0.1000	0.00	0.00
5	4.00	0.1200	0.00	0.00
6	5.00	0.1400	0.00	0.00
7	6.00	0.3300	0.00	0.00
8	7.00	0.3900	0.00	0.00
9	8.00	0.4500	0.00	0.00
10	9.00	0.5200	0.00	0.00
11	10.00	0.5800	0.00	0.00

Control Practice 2: Biofilter CP# 1 (DS) - Ph2 Infiltration Basin
1. Top area (square feet) = 38225
2. Bottom aea (square feet) = 23860
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.01
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0
Soil Data Soil Type Fraction in Eng. Soil
Biofilter Outlet/Discharge Characteristics:
Outlet type: Broad Crested Weir

1. **Weir crest length (ft): 10**
2. **Weir crest width (ft): 10**
3. **Height of datum to bottom of weir opening: 4**

Outlet type: Vertical Stand Pipe

1. **Stand pipe diameter (ft): 3**
2. **Stand pipe height above datum (ft): 3.5**

Outlet type: Surface Discharge Pipe

1. **Surface discharge pipe outlet diameter (ft): 0.5**
2. **Pipe invert elevation above datum (ft): 1**
3. **Number of surface pipe outlets: 1**

Proposed Infiltration Design:

Data File: U:\User\2005162\Engineering\SWMP\Phase 2 SW Design\pro ph2 sla
Rain File: WisReg - Madison WI 1981.RAN
Date: 04-12-21 Time: 3:21:38 PM
Site Description:

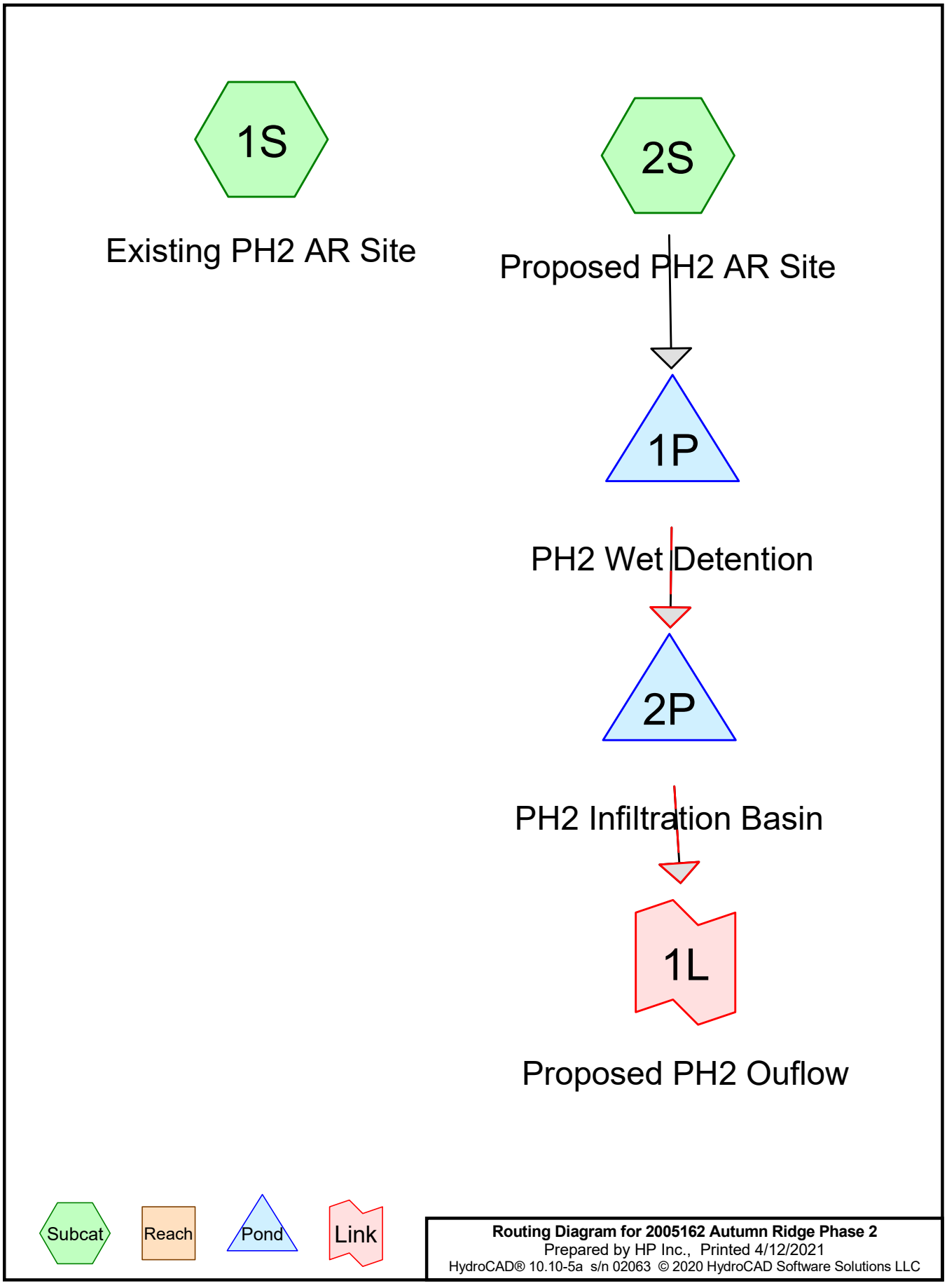
Runoff Volume Total (cf) at the Outfall

Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)
73	08/28/81	0.04	0	0.000	0.04
74	08/31/81	0.03	0	0.000	0.03
75	08/31/81	1.52	0	0.000	1.52
76	09/07/81	0.89	0	0.000	0.89
77	09/11/81	0.08	0	0.000	0.08
78	09/16/81	0.03	0	0.000	0.03
79	09/21/81	0.45	0	0.000	0.45
80	09/24/81	0.90	0	0.000	0.90
81	09/26/81	0.12	0	0.000	0.12
82	09/28/81	0.10	0	0.000	0.10
83	09/29/81	0.16	0	0.000	0.16
84	09/30/81	0.36	0	0.000	0.36
85	10/01/81	0.01	0	0.000	0.01
86	10/04/81	0.15	0	0.000	0.15
87	10/05/81	0.04	0	0.000	0.04
88	10/05/81	0.02	0	0.000	0.02
89	10/09/81	0.14	0	0.000	0.14
90	10/13/81	1.20	0	0.000	1.20
91	10/15/81	0.02	0	0.000	0.02
92	10/17/81	0.95	0	0.000	0.95
93	10/18/81	0.06	0	0.000	0.06
94	10/21/81	0.06	0	0.000	0.06
95	10/21/81	0.01	0	0.000	0.01
96	10/24/81	0.01	0	0.000	0.01
97	10/31/81	0.01	0	0.000	0.01
98	11/05/81	0.04	0	0.000	0.04
99	11/15/81	0.07	0	0.000	0.07
100	11/18/81	0.05	0	0.000	0.05
101	11/19/81	0.26	0	0.000	0.26
102	11/23/81	0.18	0	0.000	0.18
103	11/25/81	0.89	0	0.000	0.89
104	11/30/81	0.37	0	0.000	0.37
105	12/03/81	-	-	-	-
106	12/14/81	-	-	-	-
107	12/20/81	-	-	-	-
108	12/26/81	-	-	-	-
109	12/31/81	-	-	-	-
Minimum:		0.00	0	0.000	0.01
Maximum:		2.59	3071	0.017	2.55
Average:		0.26	28.17	0.000	0.26
Total:		28.81	3071		28.77

28.77 inches of stayon attained on the site in proposed conditions. This exceeds 24.4 inches required in developed conditions

APPENDIX D

HYDROCAD OUTPUT


1S
Existing PH2 AR Site
2S
Proposed PH2 AR Site
1P
PH2 Wet Detention
2P
PH2 Infiltration Basin
1L
Proposed PH2 Ouflow
Subcat
Reach
Pond
Link
Routing Diagram for 2005162 Autumn Ridge Phase 2
Prepared by HP Inc., Printed 4/12/2021
HydroCAD® 10.10-5a s/n 02063 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Existing PH2 AR Site

Runoff = 0.70 cfs @ 12.71 hrs, Volume= 0.209 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

	Area (ac)	CN	Description
*	19.100	58	Type B Soils
	19.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	300	0.0330	0.27		**Sheet Flow, Sheet** Range n= 0.130 P2= 2.84"
7.6	800	0.0625	1.75		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
25.9	1,100	Total			

Summary for Subcatchment 2S: Proposed PH2 AR Site

Runoff = 10.33 cfs @ 12.21 hrs, Volume= 0.774 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1yr 24hr Rainfall=2.49"

	Area (ac)	CN	Description
*	12.000	74	40% Imp
*	0.800	98	Water
*	6.300	62	10% Imp Park
	19.100	71	Weighted Average
	18.300		95.81% Pervious Area
	0.800		4.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0200	0.18		**Sheet Flow, Sheet** Range n= 0.130 P2= 2.84"
0.3	100	0.0800	5.74		**Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps
1.1	900	0.0367	13.80	43.34	**Pipe Channel, Channel** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
10.7	1,100	Total			

Summary for Pond 1P: PH2 Wet Detention

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth = 0.49" for 1yr 24hr event
Inflow = 10.33 cfs @ 12.21 hrs, Volume= 0.774 af
Outflow = 0.47 cfs @ 15.68 hrs, Volume= 0.750 af, Atten= 95%, Lag= 208.1 min
Primary = 0.47 cfs @ 15.68 hrs, Volume= 0.750 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 987.41' @ 15.68 hrs Surf.Area= 15,493 sf Storage= 19,375 cf

Plug-Flow detention time= 545.1 min calculated for 0.750 af (97% of inflow)
Center-of-Mass det. time= 530.3 min (1,404.3 - 874.0)

Volume	Invert	Avail.Storage	Storage Description
#1	986.00'	92,241 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
986.00	11,944	0	0
987.00	14,425	13,185	13,185
988.00	17,006	15,716	28,900
989.00	19,689	18,348	47,248
990.00	22,471	21,080	68,328
991.00	25,355	23,913	92,241

Device	Routing	Invert	Outlet Devices
#1	Primary	985.00'	**18.0" Round Culvert** L= 80.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 985.00' / 978.00' S= 0.0875 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	986.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	988.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	989.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.47 cfs @ 15.68 hrs HW=987.41' TW=977.08' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.47 cfs of 10.98 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.47 cfs @ 5.38 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=986.00' TW=977.00' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: PH2 Infiltration Basin

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth > 0.47" for 1yr 24hr event
Inflow = 0.47 cfs @ 15.68 hrs, Volume= 0.750 af
Outflow = 0.29 cfs @ 29.40 hrs, Volume= 0.751 af, Atten= 39%, Lag= 823.5 min
Discarded = 0.29 cfs @ 29.40 hrs, Volume= 0.751 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 977.34' @ 29.40 hrs Surf.Area= 24,756 sf Storage= 8,160 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 293.2 min (1,697.4 - 1,404.3)

Volume	Invert	Avail.Storage	Storage Description
#1	977.00'	154,205 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
977.00	23,860	0	0
978.00	26,530	25,195	25,195
979.00	29,304	27,917	53,112
980.00	32,177	30,741	83,853
981.00	35,151	33,664	117,517
982.00	38,225	36,688	154,205

Device	Routing	Invert	Outlet Devices
#1	Discarded	977.00'	**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = -7.00'
#2	Primary	977.00'	**12.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 977.00' / 974.00' S= 0.0600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	978.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	980.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	981.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.29 cfs @ 29.40 hrs HW=977.34' (Free Discharge)
└**1=Exfiltration** (Controls 0.29 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=977.00' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=977.00' TW=0.00' (Dynamic Tailwater)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Proposed PH2 Ouflow

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth = 0.00" for 1yr 24hr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Existing PH2 AR Site

Runoff = 1.69 cfs @ 12.58 hrs, Volume= 0.357 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

	Area (ac)	CN	Description
*	19.100	58	Type B Soils
	19.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	300	0.0330	0.27		**Sheet Flow, Sheet** Range n= 0.130 P2= 2.84"
7.6	800	0.0625	1.75		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
25.9	1,100	Total			

Summary for Subcatchment 2S: Proposed PH2 AR Site

Runoff = 15.21 cfs @ 12.20 hrs, Volume= 1.067 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

	Area (ac)	CN	Description
*	12.000	74	40% Imp
*	0.800	98	Water
*	6.300	62	10% Imp Park
	19.100	71	Weighted Average
	18.300		95.81% Pervious Area
	0.800		4.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0200	0.18		**Sheet Flow, Sheet** Range n= 0.130 P2= 2.84"
0.3	100	0.0800	5.74		**Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps
1.1	900	0.0367	13.80	43.34	**Pipe Channel, Channel** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
10.7	1,100	Total			

Summary for Pond 1P: PH2 Wet Detention

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth = 0.67" for 2yr 24hr event
Inflow = 15.21 cfs @ 12.20 hrs, Volume= 1.067 af
Outflow = 0.57 cfs @ 16.51 hrs, Volume= 1.033 af, Atten= 96%, Lag= 258.4 min
Primary = 0.57 cfs @ 16.51 hrs, Volume= 1.033 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 987.98' @ 16.51 hrs Surf.Area= 16,944 sf Storage= 28,489 cf

Plug-Flow detention time= 640.6 min calculated for 1.033 af (97% of inflow)
Center-of-Mass det. time= 623.9 min (1,487.8 - 863.9)

Volume	Invert	Avail.Storage	Storage Description
#1	986.00'	92,241 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
986.00	11,944	0	0
987.00	14,425	13,185	13,185
988.00	17,006	15,716	28,900
989.00	19,689	18,348	47,248
990.00	22,471	21,080	68,328
991.00	25,355	23,913	92,241

Device	Routing	Invert	Outlet Devices
#1	Primary	985.00'	**18.0" Round Culvert** L= 80.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 985.00' / 978.00' S= 0.0875 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	986.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	988.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	989.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.57 cfs @ 16.51 hrs HW=987.98' TW=977.16' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.57 cfs of 12.69 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.57 cfs @ 6.48 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=986.00' TW=977.00' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: PH2 Infiltration Basin

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth > 0.65" for 2yr 24hr event
Inflow = 0.57 cfs @ 16.51 hrs, Volume= 1.033 af
Outflow = 0.30 cfs @ 34.15 hrs, Volume= 0.859 af, Atten= 48%, Lag= 1,058.7 min
Discarded = 0.30 cfs @ 34.15 hrs, Volume= 0.859 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 977.62' @ 34.15 hrs Surf.Area= 25,502 sf Storage= 15,181 cf

Plug-Flow detention time= 488.6 min calculated for 0.859 af (83% of inflow)
Center-of-Mass det. time= 323.9 min (1,811.7 - 1,487.8)

Volume	Invert	Avail.Storage	Storage Description
#1	977.00'	154,205 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
977.00	23,860	0	0
978.00	26,530	25,195	25,195
979.00	29,304	27,917	53,112
980.00	32,177	30,741	83,853
981.00	35,151	33,664	117,517
982.00	38,225	36,688	154,205

Device	Routing	Invert	Outlet Devices
#1	Discarded	977.00'	**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = -7.00'
#2	Primary	977.00'	**12.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 977.00' / 974.00' S= 0.0600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	978.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	980.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	981.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.30 cfs @ 34.15 hrs HW=977.62' (Free Discharge)
└**1=Exfiltration** (Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=977.00' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=977.00' TW=0.00' (Dynamic Tailwater)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Proposed PH2 Ouflow

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth = 0.00" for 2yr 24hr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Existing PH2 AR Site

Runoff = 9.00 cfs @ 12.45 hrs, Volume= 1.124 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

	Area (ac)	CN	Description
*	19.100	58	Type B Soils
	19.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	300	0.0330	0.27		**Sheet Flow, Sheet** Range n= 0.130 P2= 2.84"
7.6	800	0.0625	1.75		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
25.9	1,100	Total			

Summary for Subcatchment 2S: Proposed PH2 AR Site

Runoff = 35.77 cfs @ 12.19 hrs, Volume= 2.318 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

	Area (ac)	CN	Description
*	12.000	74	40% Imp
*	0.800	98	Water
*	6.300	62	10% Imp Park
	19.100	71	Weighted Average
	18.300		95.81% Pervious Area
	0.800		4.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0200	0.18		**Sheet Flow, Sheet** Range n= 0.130 P2= 2.84"
0.3	100	0.0800	5.74		**Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps
1.1	900	0.0367	13.80	43.34	**Pipe Channel, Channel** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
10.7	1,100	Total			

Summary for Pond 1P: PH2 Wet Detention

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth = 1.46" for 10yr 24hr event
Inflow = 35.77 cfs @ 12.19 hrs, Volume= 2.318 af
Outflow = 7.62 cfs @ 12.64 hrs, Volume= 2.255 af, Atten= 79%, Lag= 26.6 min
Primary = 7.62 cfs @ 12.64 hrs, Volume= 2.255 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 988.87' @ 12.64 hrs Surf.Area= 19,339 sf Storage= 44,703 cf

Plug-Flow detention time= 464.5 min calculated for 2.255 af (97% of inflow)
Center-of-Mass det. time= 449.8 min (1,292.3 - 842.5)

Volume	Invert	Avail.Storage	Storage Description
#1	986.00'	92,241 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
986.00	11,944	0	0
987.00	14,425	13,185	13,185
988.00	17,006	15,716	28,900
989.00	19,689	18,348	47,248
990.00	22,471	21,080	68,328
991.00	25,355	23,913	92,241

Device	Routing	Invert	Outlet Devices
#1	Primary	985.00'	**18.0" Round Culvert** L= 80.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 985.00' / 978.00' S= 0.0875 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	986.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	988.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	989.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.59 cfs @ 12.64 hrs HW=988.87' TW=977.22' (Dynamic Tailwater)
└─**1=Culvert** (Passes 7.59 cfs of 15.03 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.69 cfs @ 7.91 fps)
  └─**3=Orifice/Grate** (Weir Controls 6.90 cfs @ 1.99 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=986.00' TW=977.00' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: PH2 Infiltration Basin

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth > 1.42" for 10yr 24hr event
Inflow = 7.62 cfs @ 12.64 hrs, Volume= 2.255 af
Outflow = 0.80 cfs @ 19.49 hrs, Volume= 1.660 af, Atten= 90%, Lag= 411.3 min
Discarded = 0.32 cfs @ 19.49 hrs, Volume= 0.945 af
Primary = 0.48 cfs @ 19.49 hrs, Volume= 0.715 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 978.50' @ 19.49 hrs Surf.Area= 27,925 sf Storage= 38,889 cf

Plug-Flow detention time= 693.5 min calculated for 1.658 af (74% of inflow)
Center-of-Mass det. time= 399.2 min (1,691.5 - 1,292.3)

Volume	Invert	Avail.Storage	Storage Description
#1	977.00'	154,205 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
977.00	23,860	0	0
978.00	26,530	25,195	25,195
979.00	29,304	27,917	53,112
980.00	32,177	30,741	83,853
981.00	35,151	33,664	117,517
982.00	38,225	36,688	154,205

Device	Routing	Invert	Outlet Devices
#1	Discarded	977.00'	**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = -7.00'
#2	Primary	977.00'	**12.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 977.00' / 974.00' S= 0.0600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	978.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	980.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	981.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.32 cfs @ 19.49 hrs HW=978.50' (Free Discharge)
└**1=Exfiltration** (Controls 0.32 cfs)

Primary OutFlow Max=0.48 cfs @ 19.49 hrs HW=978.50' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.48 cfs of 3.79 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.48 cfs @ 2.42 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=977.00' TW=0.00' (Dynamic Tailwater)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Proposed PH2 Ouflow

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth > 0.45" for 10yr 24hr event
Inflow = 0.48 cfs @ 19.49 hrs, Volume= 0.715 af
Primary = 0.48 cfs @ 19.49 hrs, Volume= 0.715 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Existing PH2 AR Site

Runoff = 24.93 cfs @ 12.41 hrs, Volume= 2.600 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 50yr 24hr Rainfall=5.80"

	Area (ac)	CN	Description
*	19.100	58	Type B Soils
	19.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	300	0.0330	0.27		**Sheet Flow, Sheet** Range n= 0.130 P2= 2.84"
7.6	800	0.0625	1.75		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
25.9	1,100	Total			

Summary for Subcatchment 2S: Proposed PH2 AR Site

Runoff = 68.54 cfs @ 12.19 hrs, Volume= 4.359 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 50yr 24hr Rainfall=5.80"

	Area (ac)	CN	Description
*	12.000	74	40% Imp
*	0.800	98	Water
*	6.300	62	10% Imp Park
	19.100	71	Weighted Average
	18.300		95.81% Pervious Area
	0.800		4.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0200	0.18		**Sheet Flow, Sheet** Range n= 0.130 P2= 2.84"
0.3	100	0.0800	5.74		**Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps
1.1	900	0.0367	13.80	43.34	**Pipe Channel, Channel** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
10.7	1,100	Total			

Summary for Pond 1P: PH2 Wet Detention

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth = 2.74" for 50yr 24hr event
Inflow = 68.54 cfs @ 12.19 hrs, Volume= 4.359 af
Outflow = 47.16 cfs @ 12.30 hrs, Volume= 4.288 af, Atten= 31%, Lag= 6.6 min
Primary = 16.54 cfs @ 12.30 hrs, Volume= 3.649 af
Secondary = 30.62 cfs @ 12.30 hrs, Volume= 0.639 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 989.53' @ 12.30 hrs Surf.Area= 21,162 sf Storage= 58,059 cf

Plug-Flow detention time= 261.6 min calculated for 4.288 af (98% of inflow)
Center-of-Mass det. time= 252.3 min (1,079.1 - 826.8)

Volume	Invert	Avail.Storage	Storage Description
#1	986.00'	92,241 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
986.00	11,944	0	0
987.00	14,425	13,185	13,185
988.00	17,006	15,716	28,900
989.00	19,689	18,348	47,248
990.00	22,471	21,080	68,328
991.00	25,355	23,913	92,241

Device	Routing	Invert	Outlet Devices
#1	Primary	985.00'	**18.0" Round Culvert** L= 80.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 985.00' / 978.00' S= 0.0875 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	986.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	988.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	989.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=16.54 cfs @ 12.30 hrs HW=989.53' TW=977.69' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 16.54 cfs @ 9.36 fps)
  ├─**2=Orifice/Grate** (Passes < 0.77 cfs potential flow)
  └─**3=Orifice/Grate** (Passes < 32.17 cfs potential flow)

Secondary OutFlow Max=30.59 cfs @ 12.30 hrs HW=989.53' TW=977.69' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Weir Controls 30.59 cfs @ 1.93 fps)

Summary for Pond 2P: PH2 Infiltration Basin

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth > 2.69" for 50yr 24hr event
Inflow = 47.16 cfs @ 12.30 hrs, Volume= 4.288 af
Outflow = 1.76 cfs @ 16.73 hrs, Volume= 3.617 af, Atten= 96%, Lag= 265.9 min
Discarded = 0.39 cfs @ 16.73 hrs, Volume= 1.057 af
Primary = 1.38 cfs @ 16.73 hrs, Volume= 2.560 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 980.37' @ 16.73 hrs Surf.Area= 33,282 sf Storage= 96,009 cf

Plug-Flow detention time= 702.0 min calculated for 3.614 af (84% of inflow)
Center-of-Mass det. time= 514.7 min (1,593.8 - 1,079.1)

Volume	Invert	Avail.Storage	Storage Description
#1	977.00'	154,205 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
977.00	23,860	0	0
978.00	26,530	25,195	25,195
979.00	29,304	27,917	53,112
980.00	32,177	30,741	83,853
981.00	35,151	33,664	117,517
982.00	38,225	36,688	154,205

Device	Routing	Invert	Outlet Devices
#1	Discarded	977.00'	**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = -7.00'
#2	Primary	977.00'	**12.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 977.00' / 974.00' S= 0.0600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	978.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	980.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	981.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.39 cfs @ 16.73 hrs HW=980.37' (Free Discharge)
└**1=Exfiltration** (Controls 0.39 cfs)

Primary OutFlow Max=1.38 cfs @ 16.73 hrs HW=980.37' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 1.38 cfs of 6.41 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.38 cfs @ 7.01 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=977.00' TW=0.00' (Dynamic Tailwater)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Proposed PH2 Ouflow

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth > 1.61" for 50yr 24hr event
Inflow = 1.38 cfs @ 16.73 hrs, Volume= 2.560 af
Primary = 1.38 cfs @ 16.73 hrs, Volume= 2.560 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: Existing PH2 AR Site

Runoff = 34.39 cfs @ 12.40 hrs, Volume= 3.472 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

	Area (ac)	CN	Description
*	19.100	58	Type B Soils
	19.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	300	0.0330	0.27		**Sheet Flow, Sheet** Range n= 0.130 P2= 2.84"
7.6	800	0.0625	1.75		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
25.9	1,100	Total			

Summary for Subcatchment 2S: Proposed PH2 AR Site

Runoff = 86.10 cfs @ 12.19 hrs, Volume= 5.474 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100yr 24hr Rainfall=6.66"

	Area (ac)	CN	Description
*	12.000	74	40% Imp
*	0.800	98	Water
*	6.300	62	10% Imp Park
	19.100	71	Weighted Average
	18.300		95.81% Pervious Area
	0.800		4.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0200	0.18		**Sheet Flow, Sheet** Range n= 0.130 P2= 2.84"
0.3	100	0.0800	5.74		**Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps
1.1	900	0.0367	13.80	43.34	**Pipe Channel, Channel** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
10.7	1,100	Total			

Summary for Pond 1P: PH2 Wet Detention

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth = 3.44" for 100yr 24hr event
Inflow = 86.10 cfs @ 12.19 hrs, Volume= 5.474 af
Outflow = 71.54 cfs @ 12.26 hrs, Volume= 5.401 af, Atten= 17%, Lag= 4.3 min
Primary = 17.06 cfs @ 12.26 hrs, Volume= 4.155 af
Secondary = 54.49 cfs @ 12.26 hrs, Volume= 1.246 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 989.77' @ 12.26 hrs Surf.Area= 21,830 sf Storage= 63,222 cf

Plug-Flow detention time= 212.6 min calculated for 5.401 af (99% of inflow)
Center-of-Mass det. time= 204.8 min (1,026.2 - 821.4)

Volume	Invert	Avail.Storage	Storage Description
#1	986.00'	92,241 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
986.00	11,944	0	0
987.00	14,425	13,185	13,185
988.00	17,006	15,716	28,900
989.00	19,689	18,348	47,248
990.00	22,471	21,080	68,328
991.00	25,355	23,913	92,241

Device	Routing	Invert	Outlet Devices
#1	Primary	985.00'	**18.0" Round Culvert** L= 80.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 985.00' / 978.00' S= 0.0875 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	986.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	988.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	989.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=17.03 cfs @ 12.26 hrs HW=989.76' TW=978.06' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 17.03 cfs @ 9.64 fps)
  ├─**2=Orifice/Grate** (Passes < 0.80 cfs potential flow)
  └─**3=Orifice/Grate** (Passes < 38.18 cfs potential flow)

Secondary OutFlow Max=53.33 cfs @ 12.26 hrs HW=989.76' TW=978.06' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Weir Controls 53.33 cfs @ 2.34 fps)

Summary for Pond 2P: PH2 Infiltration Basin

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth > 3.39" for 100yr 24hr event
Inflow = 71.54 cfs @ 12.26 hrs, Volume= 5.401 af
Outflow = 6.80 cfs @ 13.67 hrs, Volume= 4.710 af, Atten= 91%, Lag= 84.8 min
Discarded = 0.40 cfs @ 13.67 hrs, Volume= 1.086 af
Primary = 6.40 cfs @ 13.67 hrs, Volume= 3.624 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 980.79' @ 13.67 hrs Surf.Area= 34,535 sf Storage= 110,303 cf

Plug-Flow detention time= 602.1 min calculated for 4.705 af (87% of inflow)
Center-of-Mass det. time= 447.5 min (1,473.7 - 1,026.2)

Volume	Invert	Avail.Storage	Storage Description
#1	977.00'	154,205 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
977.00	23,860	0	0
978.00	26,530	25,195	25,195
979.00	29,304	27,917	53,112
980.00	32,177	30,741	83,853
981.00	35,151	33,664	117,517
982.00	38,225	36,688	154,205

Device	Routing	Invert	Outlet Devices
#1	Discarded	977.00'	**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = -7.00'
#2	Primary	977.00'	**12.0" Round Culvert** L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 977.00' / 974.00' S= 0.0600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	978.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	980.50'	**36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	981.00'	**30.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.40 cfs @ 13.67 hrs HW=980.79' (Free Discharge)
└**1=Exfiltration** (Controls 0.40 cfs)

Primary OutFlow Max=6.39 cfs @ 13.67 hrs HW=980.79' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 6.39 cfs of 6.86 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 1.51 cfs @ 7.68 fps)
  └**4=Orifice/Grate** (Weir Controls 4.88 cfs @ 1.77 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=977.00' TW=0.00' (Dynamic Tailwater)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Proposed PH2 Ouflow

Inflow Area = 19.100 ac, 4.19% Impervious, Inflow Depth > 2.28" for 100yr 24hr event
Inflow = 6.40 cfs @ 13.67 hrs, Volume= 3.624 af
Primary = 6.40 cfs @ 13.67 hrs, Volume= 3.624 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

APPENDIX E

SOILS INFORMATION

Division of Industry Services
P.O. Box 2658
Madison, Wisconsin 53701
Scott Walker, Governor
Laura Gutierrez, Secretary

Attachment 2:

SOIL AND SITE EVALUATION - STORM

In accordance with SPS 382.365, 385, Wis. Adm. Code, and WDNR Standard 1002

Attach a complete site plan on paper not less than 8 ½ x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent of slope, scale or dimensions, north arrow, and BM referenced to nearest road

Please print all information

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1)(m)]

County: *Dane*

Parcel I.D.: *042/0509-134-8500-0*

Reviewed by:

Date:

Property Owner: *Hofer Living Trust, Glenn & Michelle*

Property Location
Govt. Lot *NW ¼ SE ¼* S *13* T *5* N R *9* E

Property Owner's Mail Address: *610 Ondossagon Way*

Lot # | Block# | Subd. Name or CSM #

City: *Madison* State: *WI* Zip Code: *53719* Phone Number

[ ] City [ ] Village [X] Town: *Oregon*

Nearest Road: *CTH MM*

Drainage area _____ [ ] sq ft [ ] acres

Test site suitable for (check all that apply): [ ] Site not suitable;
[ ] Bioretention; [ ] Subsurface Disperal System;
[ ] Reuse; [ ] Irrigation; [ ] Other _____

Hydraulic Application Test Method
[X] Morphological Evaluation
[ ] Double Ring Infiltrometer
[ ] Other: (specify) _____

Soil Moisture
Date of soil borings: _____
USDA-NRCS WETS Value:
[ ] Dry = 1;
[ ] Normal = 2;
[ ] Wet = 3.

SP1 #OBS. [X] Pit [ ] Boring Ground surface elevation 982.4 ft. Elevation of limiting factor < 968.4 ft.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate Inches/Hr
1	0-7	10YR 4/2	None	SIL	1msbk	mvfi	gw	< 5		0.13
2	7-48	10YR 5/4	None	SICL	1msbk	mvfi	gw	< 5		0.04
3	48-58	10YR 4/6	None	SCL	1fsbk	mfi	gw	< 5		0.11
4	58-72	10YR 5/4	None	FS	0sg	ml	gw	< 5		0.5
5	72-108	10YR 6/4; 6/6	None	GRSL/FS/SIL	0sg	ml	gw	10-20		0.13-0.5(1)
6	108-168	10YR 7/8	None	FS	0sg	ml		10-20	5.9	0.5

Comments: Groundwater was not encountered during or upon completion of excavation. Extensive sloughing/caving of sidewalls experienced, limiting the depth of test pit. (1)Presence of silt loam seams will limit infiltration potential within horizon, unless removed or properly deep-tilled to break-up the lower permeability seams.

SP2 #OBS. [X] Pit [ ] Boring Ground surface elevation 980.8 ft. Elevation of limiting factor < 965.8 ft.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate Inches/Hr
1	0-9	10YR 4/2	None	SIL	1fsbk	mvfi	gw	< 5		0.13
2	9-42	10YR 5/4	None	SICL	1mabk	mvfi	gw	< 5		0.04
3	42-62	10YR 5/6	None	SL	0sg	ml	gw	< 5		0.5
4	62-100	10YR 6/4	None	LFS/SIL	0sg	ml	gw	5-15	39.6(2)	0.13-0.5(1)
5	100-180	10YR 6/6	None	FS/SIL	0sg	ml		5-15		0.13-0.5(1)

Comments: Stratigraphy of test pit was extremely variable in all directions. Above profile obtained from south sidewall of excavation. Groundwater was not encountered during or upon completion of excavation. (1)Presence of silt loam seams will limit infiltration potential within horizon, unless removed or properly deep-tilled to break-up the lower permeability seams. Thicker deposits of silt loam (> 2 in.) will require removal. (2)Results from mixed representative sample of horizon.

Name (Please Print)	Signature	Credential Number
Ryan J. Portman		**1201636**
Address	**Date Evaluation Conducted**	**Telephone Number**
201 N. Mallard Dr., Sun Prairie, WI 53590	**4/8/2021**	608-288-4100

SP3 #OBS. [X] Pit [ ] Boring Ground surface elevation 976.3 ft. Elevation of limiting factor < 961.3 ft. Page **2** of **2**

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate Inches/Hr
1	0-30	10YR 4/2	None	SIL	1fsbk	mvfi	gw	< 5		0.13
2	30-82	10YR 5/4	None	SICL	1mabk	mvfi	gw	< 5		0.04
3	82-96	10YR 5/4	None	L	0sg	ml	gw	< 5		0.24
4	96-132	10YR 5/6; 5/8	None	LFS/SIL	0sg	ml		5-15	17.3(2)	0.13-0.5(1)

Comments: Groundwater was not encountered during or upon completion of excavation. Extensive sloughing/caving of sidewalls experienced, limiting the depth of test pit. (1)Presence of silt loam seams will limit infiltration potential within horizon, unless removed or properly deep-tilled to break-up the lower permeability seams. (2)Results from mixed representative sample of horizon.

[ ] #OBS. [ ] Pit [ ] Boring Ground surface elevation _____ ft. Elevation of limiting factor _____ ft.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate Inches/Hr

Comments:

[ ] #OBS. [ ] Pit [ ] Boring Ground surface elevation _____ ft. Elevation of limiting factor _____ ft.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate Inches/Hr

Comments:

Overall Site Comments: See text in related report.

APPENDIX F

STORMWATER OPINON OF PROBABLE COST

STORM WATER OPINION OF PROBABLE COST

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	AMOUNT
1.	Unclassified Excavation (Detention)	8,525	CY	$2.00	$17,050.00
5.	Infiltration Basin	23,860	SQFT	$10.00	$230,860.00
1.	Outlet Structure	2	EA	$2000.00	$4,000.00
			TOTAL		**$251,910.00**

In providing Opinions of Probable Costs, it is understood that the Consultant has no control over the cost or availability of labor, equipment or materials, or over conditions or the Contractor's method of pricing, and that the Consultant's Opinions of Probable Construction Costs are made on the basis of the Consultant's professional judgment and experience. The Consultant makes no warranty, expressed or implied, that bids, quantities, or negotiated costs of the Work will not vary from the Consultant's Opinion of Probable Construction

APPENDIX G

DRAFT MAINTENANCE AGREEMENT

Maintenance provisions:

Detention Basin

Visual inspection of the detention basin and outlet structure shall be performed, at a minimum annually. The inspections shall include checking for potential problems such as: subsidence, erosion, tree growth in and around the embankment and outfall structure, sediment accumulation, clogging of outfall structure, and damage to the emergency spillway. Problems identified by the inspections shall be repaired as soon as practicable.

Sediment accumulations shall be removed by dredging when two (2) foot of siltation has occurred or as directed by the Village of Waunakee. The dredged material shall be removed and disposed of in accordance with NR 347.

The detention basin shall be mowed a minimum of twice per year. Mowing shall maintain a minimum grass height of 6 to 8 inches. Areas of sparse vegetation shall be reseeded. Additional fertilizer shall be applied as needed, per the results of a soil test.

Separate and distinct records shall be maintained by the owner to record the specific activities and costs thereof for the maintenance plan implementation. The records shall include the dates of maintenance visits and the specific work performed. Records shall be kept as required by local, state or federal law.

Infiltration Basin

Visual Inspection of the Infiltration Basin shall be performed, at a minimum, annually.

Maintenance shall be required when system shows standing water beyond 24 hours of rain event. Cleaning shall consist of removal of sediment, two (2) foot undercut, undercut replacement with material consisting of 15-30% compost and 70-85% sand and restoration in-kind.

Restoration of plant material shall be with native plugs or seed mixture tolerant of fluctuating water conditions. If a seed mixture is used steps shall be taken to assure vegetation establishes

Attachment F: Wisconsin DNR Bureau of Natural Heritage Conservation for Endangered Resources Review Preliminary Assessment

Endangered Resources Preliminary Assessment

Created on **12/9/2020**. This report is good for one year after the created date.

DNR staff will be reviewing the ER Preliminary Assessments to verify the results provided by the Public Portal. ER Preliminary Assessments are only valid if the project habitat and waterway-related questions are answered accurately based on current site conditions. If an assessment is deemed invalid, a full ER review may be required even if the assessment indicated otherwise.

Results

A search was conducted of the NHI Portal within a 1-mile buffer (for terrestrial and wetland species) and a 2-mile buffer (for aquatic species) of the project area. Based on these search results, below are your follow-up actions.

Actions required to comply with state and/or federal endangered species laws:

The project overlaps the Rusty Patched Bumble Bee High Potential Zone. The USFWS has created a Rusty Patched Bumble Bee High Potential Zone to show where there is a high likelihood for the species to be present. If a project overlaps with this zone then steps should be taken to determine if suitable habitat is present for the bee. Shapefiles and an interactive map of the zone can be found on the USFWS rusty patched bumble bee guidance page: (https://www.fws.gov/midwest/endangered/insects/rpbb/rpbbmap.html)

- Suitable active season habitat includes, but is not limited to: prairies, woodlands, marshes/wetlands, agricultural landscapes and residential parks and gardens. The RPBB relies on diverse and abundant flowering plant species in proximity to suitable overwintering sites for hibernating queens.
- Suitable overwintering habitat includes, but is not limited, to: non-compacted soils, sandy soils, or woodlands. Overwintering habitat does not include wetlands.
- Non-suitable habitat includes, but is not limited to: permanently flooded areas/open water, paved areas, areas planted to annual row crops, forest where invasive shrubs are dominant and spring ephemeral flowers are absent, and areas mowed too frequently to allow development of diverse wildflower resources (e.g., road shoulders, medians, lawns).

If your project is 100% within non-suitable habitat then no further actions are necessary. However, if suitable habitat is present within the project site, assume presence and follow one or more the USFWS' recommended conservation measures (https://www.fws.gov/midwest/endangered/insects/rpbb/index.html) below:

For prescribed fire, mowing/haying, grazing, pesticide use and tree clearing/thinning, follow the voluntary conservation measures outlined in the Conservation Management Guidelines for the Rusty Patched Bumble Bee (*Bombus affinis*)] document: (https://www.fws.gov/midwest/endangered/insects/rpbb/pdf/ConservationGuidanceRPBBv1_27Feb2018.pdf)

For all other projects:

- use native trees, shrubs and flowering plants in landscaping,
- provide plants that bloom from spring through fall (refer to the USFWS RPBB Midwest Plant Guide: (https://www.fws.gov/midwest/endangered/insects/rpbb/pdf/MidwestPlantGuideRPBB.pdf),
- remove and control invasive plants in any habitat used for foraging, nesting, or overwintering

If **none** of the above conservation measures can be followed or for more information on implementing the above conservation measures, contact the USFWS Bloomington Field Office at (952) 252-0092 or TwinCities@fws.gov for further consultation.

For more information, refer to the **Screening Guidance for the Rusty Patched Bumble Bee (RPBB):** (https://dnr.wi.gov/topic/endangeredresources/documents/NHIbeescreening.pdf).

A copy of this document can be kept on file and submitted with any other necessary DNR permit applications to show that the need for an ER Review has been met. This notice only addresses endangered resources issues. This notice does not constitute DNR authorization of the proposed project and does not exempt the project from securing necessary permits and approvals from the DNR and/or other permitting authorities.

Project Information

Landowner name	**Hoefer Living Trust**
Project address	**958 COUNTY HIGHWAY MM** **Oregon, Wisconsin** **53575**
Project description	**Proposed residential subdivision.**

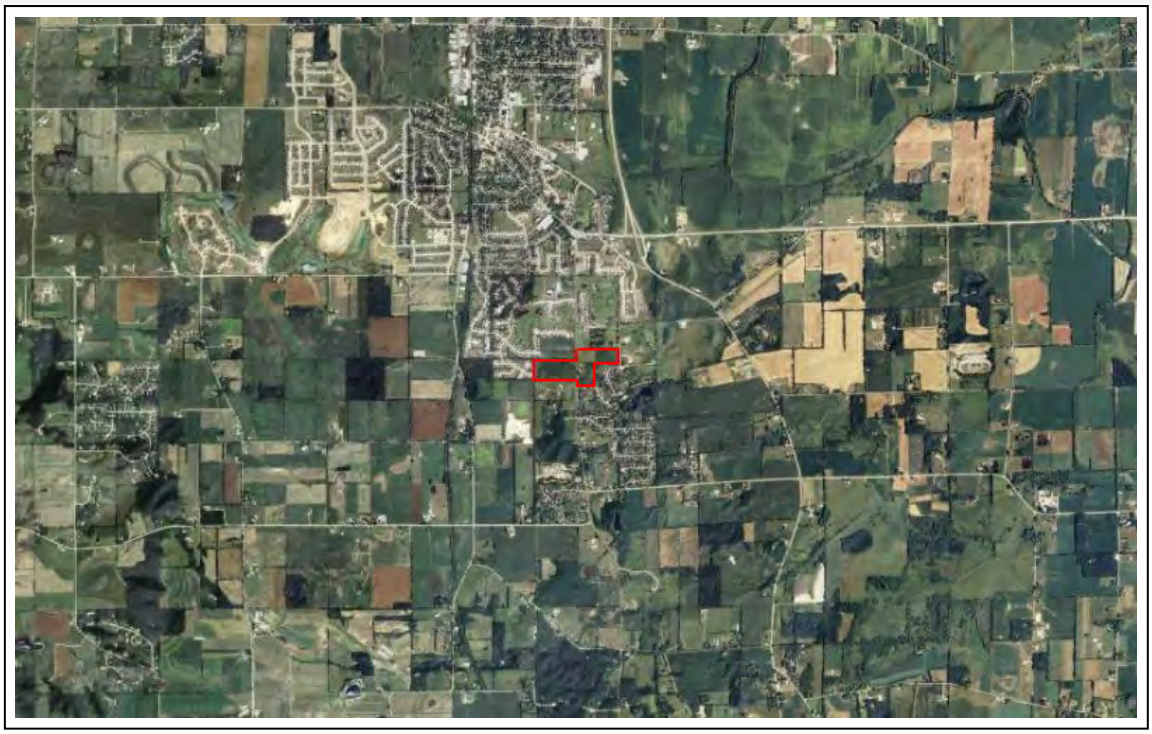
Project Questions

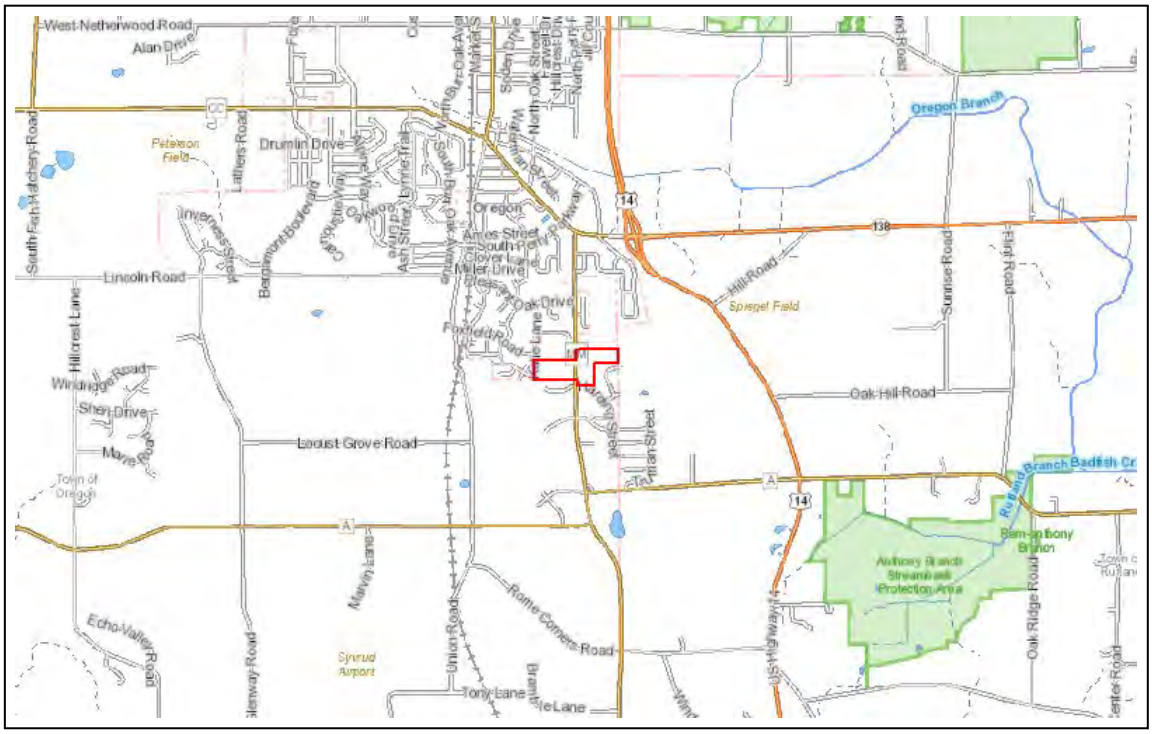
Does the project involve a public property?	**Yes**
Is there any federal involvement with the project?	**No**
Is the project a utility, agricultural, forestry or bulk sampling (associated with mining) project?	**No**
Is the project property in Managed Forest Law or Managed Forest Tax Law?	**No**
Project involves tree removal?	**Yes**
Is project near (within 300 ft) a waterbody or a shoreline?	**No**
Is project within a waterbody or along the shoreline?	**No**

Does the project area (including access routes, staging areas, laydown yards, select sites, source/fill sites, etc.) occur **entirely within** one or more of the following habitats?

Urban/residential	**No**
Manicured lawn	**Yes**
Artificial/paved surface	**No**
Agricultural land	**Yes**
Areas covered in crushed stone or gravel	**No**

Project Area Maps





Attachment G: Southeast Side Sewer Service Analysis

SCOPE OF SERVICES
MEMORANDUM

Date: March 31, 2021

To: Jeff Rau, Director of Public Works – Village of Oregon

From: Ben Heidemann, P.E., Vice President – Town and Country Engineering

Subject: Sewer System Analysis Results for Park Street and South Perry Parkway Interceptors

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The Village of Oregon has three planned developments on the southeast side of the Village; Autumn's Ridge Phase 2 and 3, Lakestone Development at Wolfe St and Janesville St, and Park Street redevelopment. In order to ensure the existing sanitary sewer had adequate capacity, a sanitary sewer analysis was conducted.

Sewer Area

Collector and interceptor sewers for the South Perry Parkway and Park Street interceptors were modeled to confirm adequate capacity exists for the planned developments. The South Perry Parkway interceptor will be experiencing additional flows from Autumn's Ridge Phase 2 and 3, as well as the Lakestone Development, and a portion of the Park Street redevelopment. The Park Street interceptor will be experiencing additional flow from the remaining portion of the Park Street redevelopment, which includes residential sewer flows and discharge from a future carwash. Sewer flows from these areas travel both the Park Street and South Perry Parkway interceptors prior to being discharged into the pumping station at the WWTP. A map of the Sewer Area being analyzed in included as Attachment A.

Sewersheds

A key step in modeling and analyzing the existing sewer system is quantifying the flowrate being conveyed to each manhole. This was accomplished by creating a "sewershed" for each manhole. A sewershed is an area of land where all the sewers flow to a single endpoint, or in this case, a manhole. Once the sewershed was determined, the number of homes, businesses, etc. was totaled so that a total flow for this area could be calculated.

Sewer Drainage Information

In order to properly analyze the sanitary sewer that will be affected by the planned developments, the manhole elevations and pipe inverts had to be determined. The Village of Oregon currently has manhole rim and invert elevations for the majority of the sewer system location in their GIS mapping system, obtained by using a handheld GPS device. As the vertical accuracy of the GPS unit can vary by up to 3 feet, it was necessary that the accurate manhole rim and pipe inverts were collected. GIS elevations were compared with existing sewer plans, and in-field data collected by the Village staff. Any manholes that had a horizontal GPS accuracy range of greater than 1 foot, or lacked invert elevations, were surveyed by Town and Country with precise survey equipment, with an accuracy of 0.02 ft. A total of 21 manholes in the sewer area were surveyed by Town and Country, 11 of which were out of the 1 foot accuracy range.

Existing Flow

To quantify the existing sanitary flows in the sewer, sewer sales records were obtained from the Village and broken down by billing category (Residential, Commercial, Industrial, and Public Authority.) The residential flows were summarized for an annual daily usage, per meter. For 2018-2020, the annual daily flow rate per residential meter was 130 gallons per day. For multi-family and larger commercial lots, individual sewer bills were requested and summarized separately. In addition, individual sewer bills from the Oregon Middle School were obtained, as they also are a

contributor to the sanitary system being analyzed. To calculate peak flows, a peaking factor of 4 was applied to the average daily flows, in accordance with NR 110.

Flow data for the furthest downstream manhole (MH 83) was obtained through the previous I/I studies. The highest liquid level recorded during the I/I study for MH 83 was 10 inches. This level reading was under normal conditions and does not represent the backup and flooding situation that occurred in 2018 resulting in basement backups. The Park Street and South Perry Parkway interceptors were not documented to have been negatively affected by the 2018 backups, so it was not deemed necessary to try and duplicate that event. Based on existing information, the peak flow rate at Manhole 83 is estimated to be approximately 380 gpm.

Future Flows

Future flows for the planned developments were determined by taking the number of residential housing units, and applying the average daily flow rate of 130 gpm per unit. For the multi-family developments, an average daily usage of 80 gallons per day was applied to each unit. The multi-family usage is on average less than the residential to reflect the variety of unit sizes (i.e. studio, 3-bedroom.) Additionally, Phase 3 of Autumn's Ridge will be serviced by an assumed 80 gpm pumping station, so this flow was used for future modeling in lieu of residential flows. When the future flows were added to the existing flows, Manhole 83 had a peak flow rate of approximately 515 gpm. A table of existing and future flows in included as Attachment B.

Modeling

Once the flows and sewer information was obtained and verified, a model of the existing system was creating using AutoCAD Storm and Sanitary Analysis. GIS data, as well as CAD survey information was imported into the program to model the existing system. Flows were added at each manhole to represent the sewersheds contributing to each manhole. At the furthest downstream manhole (MH 83), a surcharge depth of 10 inches was applied to model the water depth from the contribution of the Oak Street interceptor.

Results

Modeling of the sanitary system indicated that the sanitary sewer interceptors do have adequate capacity for the planned developments and associated flows. The sewer capacity was compared to a "full pipe" condition, the level of water equal to, but not exceeding, the diameter of the pipe. A full pipe is considered to be at 100% capacity. Actual capacity varies from segment to segment based upon pipe diameter and slope.

The anticipated capacity utilized ratios varied in the system from 11% to 78%, and can be viewed in the sanitary sewer analysis results, located in Attachment C. A map of the Park Street and South Perry Parkways sewers was created to graphically display the various flows through the system, and is included as Attachment D. Profile sections of the sanitary model are included as Attachment E.

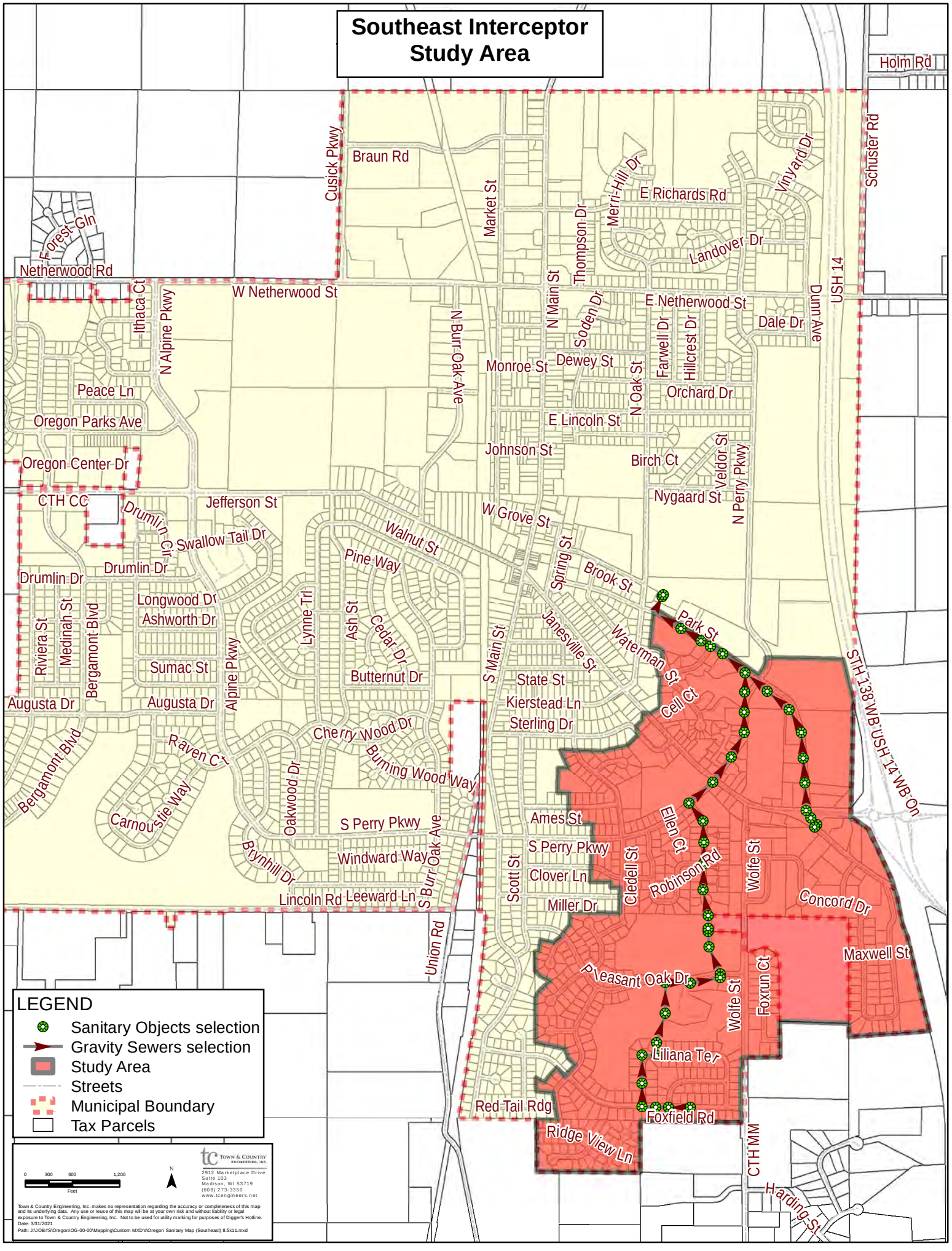
In addition to the pipe capacity, the manholes were also analyzed to determine if they would experience surcharging during peak flows. Surcharging occurs in a manhole when the rate of water entering is greater that the capacity of the outlet pipe. A manhole is determined to be surcharged when the water level in the manhole rises about the top of the outlet pipe. Based on the model, the only surcharged manhole was Manhole 83, with a max water depth of 1.42 feet during peak flows, and was caused by contributing sewersheds. This water level does not have a significant impact on the upstream system and was not deemed an item of concern.

Additional Capacity

As part of the sanitary sewer analysis, additional capacity for both Park and Perry Street was calculated in order to give the Village direction for future planning and development in these areas. A maximum capacity scenario was generated to see how much additional flow could be added at

the start of each of the interceptors, while still keeping the peak flow rate to 95% of the max design flow capacity. The South Perry Street Interceptor has an available capacity of approximately 105 gpm of peak flow. This amounts to a residential increase of approximately 290 homes. The Park Street Interceptor has an available capacity of approximately 115 gpm, resulting in an additional 315 homes that could be added. Additional flows for South Perry and Park Street interceptors were modeled to occur simultaneously, to reflect development on both interceptors. The piping which dictates the additional flow allowable for the Park Street Interceptor is located downstream of where the two interceptors join. Results of the max capacity scenario are included as Attachment F.

Attachment A



Village of Oregon
Sanitary Sewer System Analysis
OG 48

Existing Sewershed										Future Sewershed						
MH ID	Residential homes (#)	Residential Daily Flow (gal/day)	Multi-family Daily Flow (gal/day)	Industrial Daily Flow (gal/day)	Commercial Daily Flow (gal/day)	Public Authority Daily Flow (gal/day)	Total Daily Flow (gal/day)	Total Cumulative Flow (gpm)	Peak Flow (gpm)	Residential homes (#)	Residential Daily Flow (gal/day)	Commercial Daily Flow (gpd)	Total Daily Flow (gpd)	Future Peak Flow (gpm)	Future Cumulative Flow (gpm)	Future Peak Cumulative Flow (gpm)
111							0	38	150					0.00	44	174
112							0	38	150					0.00	44	174
113	12	1,572	3,765				5,349	38	150					14.86	44	174
114	12	1,572	1,970				3,554	34	136					9.87	40	159
115	9	1,179					1,188	31	126					3.30	37	149
116	83	10,873	1,975		2,650		15,581	31	122	41	3,239	875	4,114	54.71	37	146
117							0	20	79					0.00	23	91
289	146	19,126	5,202	3,065	964		28,503	20	79	56	4,424		4,424	91.46	23	91
118							0	0	0			6,550		0.00	0	0
83							0	96	383					0.00	189	517
698							0	96	383					0.00	189	517
106							0	96	383					0.00	189	517
107						642	642	96	383					1.78	189	517
108							0	95	381					0.00	189	515
502	74	9,694					9,768	95	381					27.13	189	515
109	1	131					132	88	354					0.37	182	488
110							0	88	354					0.00	182	487
273							0	51	203					0.00	138	313
274					2,050		2,050	51	203					5.69	138	313
275			3,124				3,124	49	197	82	6,478		6,478	26.67	137	307
276			3,319				3,319	47	189					9.22	130	281
277							0	45	180					0.00	128	272
278	204	26,724		2,542			29,470	45	180					81.86	128	272
546	2	262					264	24	98					0.73	107	190
547	7	917					924	24	97					2.57	107	189
548	47	6,157					6,204	24	94					17.23	107	186
549	8	1,048					1,056	19	77					2.93	102	169
550	6	786					792	19	74					2.20	102	166
1152						1,764	1,764	18	72					4.90	101	164
551							0	17	67					0.00	100	159
552							0	17	67					0.00	100	159
553							0	17	67					0.00	100	159
554	35	4,585					4,620	17	67					12.83	100	159
568	8	1,048					1,056	14	54					2.93	97	146
569							0	13	51					0.00	96	143
570	7	917					924	13	51					2.57	96	143
571							0	12	49					0.00	95	141
572	33	4,323					4,356	12	49					12.10	95	141
577	3	393					396	9	37					1.10	92	129
578	7	917					924	9	36					2.57	92	128
579	65	8,515					8,580	8	33					23.83	91	125
580	2	262					264	2	9					0.73	85	101
1123	10	1,310					1,320	2	8					3.67	85	100
1124	13	1,703					1,716	1	5	33	4,323		4,323	16.78	84	97
														80	80	

Oregon Sanitary Sewer Analysis
Village of Oregon
5/11/2021

Future Flow Conditions

Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Total Drop (ft)	Average Slope (%)	Pipe Diameter (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)
Pipe 01	MH1124	MH1123	277.04	1,015.38	1,006.16	9.22	3.3300	8.040	97	4.25	1,072	0.09	0.20	0.14
Pipe 02	MH1123	MH580	162.43	1,006.00	1,004.83	1.17	0.7200	8.040	100	2.42	479	0.21	0.31	0.21
Pipe 03	MH580	MH579	171.58	1,004.92	1,002.53	2.39	1.3900	8.040	101	3.16	694	0.15	0.26	0.17
Pipe 04	MH579	MH578	299.91	1,001.98	985.45	16.53	5.5100	8.040	125	5.48	1,379	0.09	0.20	0.14
Pipe 05	MH578	MH577	355.99	985.27	975.38	9.89	2.7800	8.040	128	4.32	979	0.13	0.24	0.16
Pipe 06	MH577	MH572	183.31	975.25	974.34	0.91	0.5000	8.040	129	2.33	414	0.31	0.38	0.26
Pipe 07	MH572	MH571	164.03	974.34	973.86	0.48	0.2900	8.040	141	1.97	318	0.44	0.47	0.31
Pipe 08	MH571	MH570	383.90	974.05	970.76	3.29	0.8600	8.040	141	2.91	544	0.26	0.35	0.23
Pipe 09	MH570	MH569	393.56	970.76	970.00	0.76	0.1900	8.040	143	1.71	263	0.55	0.53	0.35
Pipe 10	MH569	MH568	318.20	970.54	966.89	3.65	1.1500	8.040	143	3.25	629	0.23	0.32	0.22
Pipe 11	MH568	MH554	386.79	966.69	957.10	9.59	2.4800	8.040	146	4.31	925	0.16	0.27	0.18
Pipe 12	MH554	MH553	44.74	956.85	956.60	0.25	0.5600	9.960	159	2.54	796	0.20	0.30	0.25
Pipe 13	MH553	MH552	373.22	956.64	952.73	3.91	1.0500	9.960	159	3.18	1,090	0.15	0.26	0.22
Pipe 14	MH552	MH551	197.17	952.70	948.94	3.76	1.9100	9.960	159	3.93	1,471	0.11	0.22	0.19
Pipe 15	MH551	MH1152	39.57	948.97	948.55	0.42	1.0600	9.960	159	3.19	1,098	0.14	0.26	0.21
Pipe 16	MH1152	MH550	167.81	948.45	946.80	1.65	0.9800	9.960	164	3.13	1,056	0.16	0.27	0.22
Pipe 17	MH550	MH549	334.39	946.74	942.68	4.06	1.2100	9.960	166	3.39	1,174	0.14	0.25	0.21
Pipe 18	MH549	MH548	322.76	942.56	941.18	1.38	0.4300	9.960	169	2.34	696	0.24	0.34	0.28
Pipe 19	MH548	MH547	274.09	941.07	939.81	1.27	0.4600	9.960	186	2.48	724	0.26	0.35	0.29
Pipe 20	MH547	MH546	270.65	939.59	936.50	3.09	1.1400	9.960	189	3.44	1,138	0.17	0.28	0.23
Pipe 21	MH546	MH278	291.98	936.51	935.62	0.89	0.3000	9.960	190	2.14	588	0.32	0.39	0.33
Pipe 22	MH278	MH277	403.51	935.74	932.42	3.32	0.8200	9.960	272	3.39	966	0.28	0.36	0.30
Pipe 23	MH277	MH276	402.89	932.30	929.28	3.02	0.7500	9.960	272	3.28	922	0.29	0.37	0.31
Pipe 24	MH276	MH275	350.16	929.37	922.06	7.31	2.0900	9.960	281	4.77	1,539	0.18	0.29	0.24
Pipe 25	MH275	MH274	255.69	922.06	921.16	0.90	0.3500	9.960	307	2.56	632	0.49	0.49	0.41
Pipe 26	MH274	MH273	256.51	921.16	920.67	0.49	0.1900	9.960	313	2.08	476	0.66	0.59	0.49
Pipe 27	MH273	MH110	244.27	920.61	919.97	0.64	0.2600	9.960	313	2.29	541	0.58	0.55	0.46
Pipe 28	MH118	MH289	88.09	927.21	926.43	0.78	0.8900	9.960	0	0.00	1,002	0.00	0.00	0.00
Pipe 29	MH289	MH117	114.80	926.43	925.43	1.00	0.8700	9.960	91	2.54	994	0.09	0.20	0.17
Pipe 30	MH117	MH116	116.10	925.40	925.40	0.00	0.0000	9.960	91	1.50	476	0.19	0.30	0.25
Pipe 31	MH116	MH115	344.44	925.38	924.44	0.94	0.2700	9.960	146	1.93	562	0.26	0.35	0.29
Pipe 32	MH115	MH114	316.60	924.44	923.56	0.88	0.2800	9.960	149	1.94	562	0.27	0.35	0.29
Pipe 33	MH114	MH113	322.63	923.55	922.47	1.08	0.3300	9.960	159	2.11	616	0.26	0.35	0.29
Pipe 34	MH113	MH112	333.42	922.45	921.80	0.65	0.1900	9.960	174	1.79	476	0.37	0.42	0.35
Pipe 35	MH112	MH111	362.57	921.74	921.00	0.74	0.2000	9.960	174	1.79	476	0.37	0.42	0.35
Pipe 36	MH111	MH110	369.46	920.90	919.98	0.92	0.2500	12.000	174	2.19	1,043	0.17	0.28	0.28
Pipe 37	MH110	MH109	371.72	919.94	918.61	1.33	0.3600	12.000	487	2.93	1,052	0.46	0.48	0.48
Pipe 38	MH109	MH502	180.94	918.61	918.18	0.43	0.2400	12.000	488	2.48	845	0.58	0.55	0.55
Pipe 39	MH502	MH108	141.88	918.18	917.96	0.22	0.1600	12.000	515	2.35	775	0.66	0.60	0.60
Pipe 40	MH108	MH107	298.41	917.96	917.21	0.75	0.2500	12.000	515	2.57	868	0.59	0.55	0.55
Pipe 41	MH107	MH106	399.62	917.21	915.99	1.21	0.3000	12.000	517	2.76	955	0.54	0.52	0.52
Pipe 42	MH106	MH698	220.98	915.99	915.98	0.01	0.0100	12.000	517	2.35	775	0.67	0.60	0.60
Pipe 43	MH698	MH83	28.72	915.97	915.79	0.18	0.6300	12.000	517	3.69	1,409	0.37	0.42	0.42
Pipe 44	MH83	Out-1Pipe - (9)	11.07	914.79	914.50	0.29	2.6200	12.000	517	6.06	2,804	0.18	0.29	0.29

Highlighted pipes are above 50% of full capacity during peak flow.

Attachment D

Park and Perry Sewer Analysis
Village of Oregon

Brook St
N Oak St
N Perry P
Waterman St
S Oak St
Park St
State St
Meadow Ln
Kierstead Ln
Janesville St
Cell Ct
Waterman Ln
Sterling Dr
Chelsea Ct
Ames St
Ellen Ct
Thomson Ln
Wolfe St
S Perry Pkwy
Cledell St
Robinson Rd
Clover Ln
Miller Dr
Shady Oaks Ln
Elliott Ln
Rosewood Ave
CTH MM
Pleasant Oak Dr
Charles Ct
Foxrun Ct
Foxboro Dr
Club House Dr
Concord Dr
Lexington Dr
Maxwell St
Liliana Ter
Katie Ln
Sienna Glenn Way
Foxfield Rd
Fawn Ct
Johnson Ave
USH 14 EB STH 138 WB Off
STH 138 WB USH 14 WB On
USH 14
STH 138
STH 138 EB USH 14 On

698 83 107 108 502 109 110 273 274 275 276 277 278 546 547 548 549 550 1152 551 552 553 554 569 568 570 571 577 572 578 579 580 1123 1124 111 112 113 114 115 116 117 289

LEGEND

- Sanitary Manholes

Sanitary Pipes FlowRate

- 0-25%
- 25-50%
- 50-75%
- 75-100%
- Tax Parcels
- Municipal Boundary

N

0 112.5 225 450

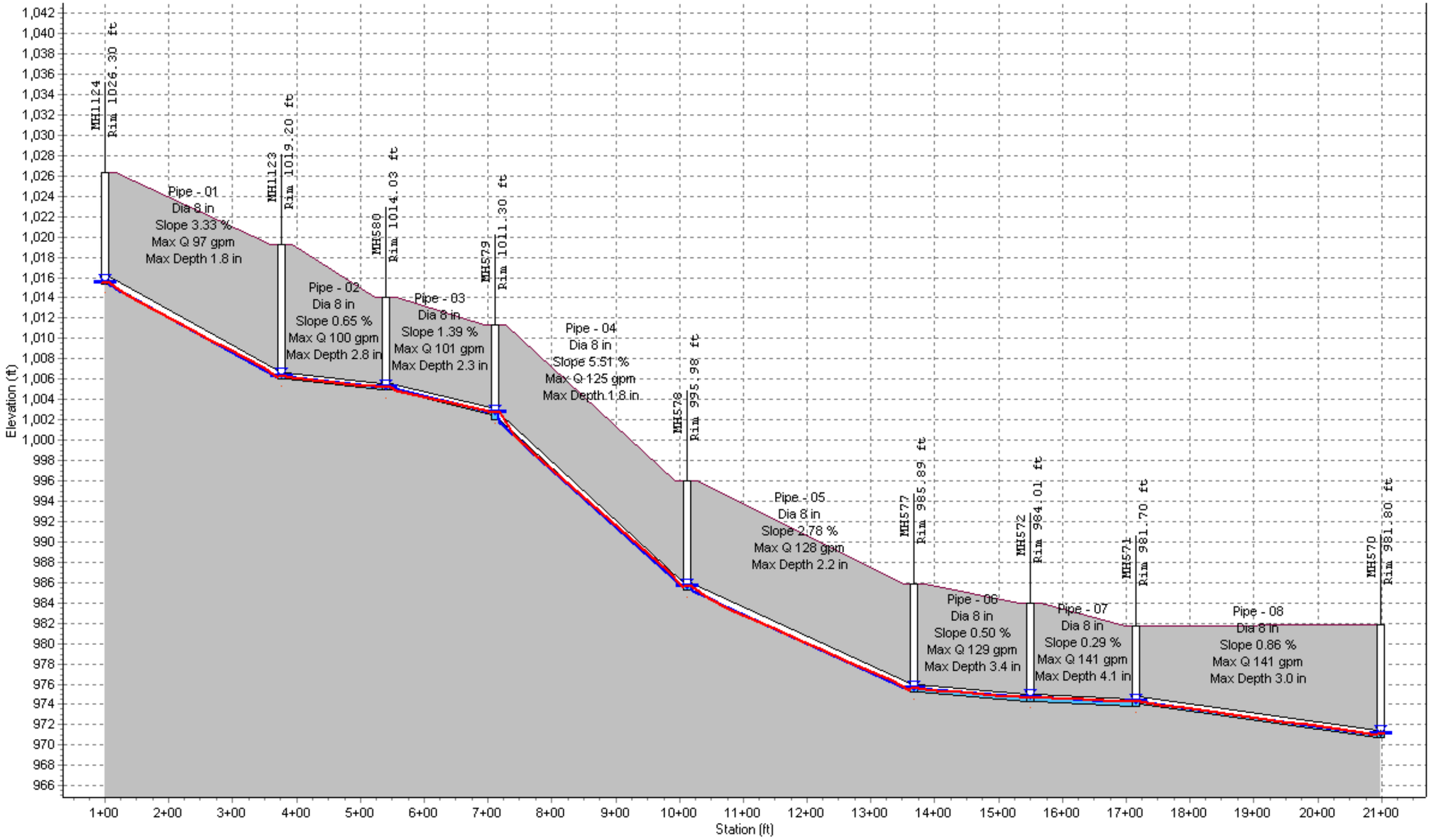
Feet

TOWN & COUNTRY ENGINEERING, INC.
2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net

Date: 3/23/2021
Path: J:\JOB#S\Oregon\OG-00-00\Mapping\Oregon Mapping.mxd

Attachment E

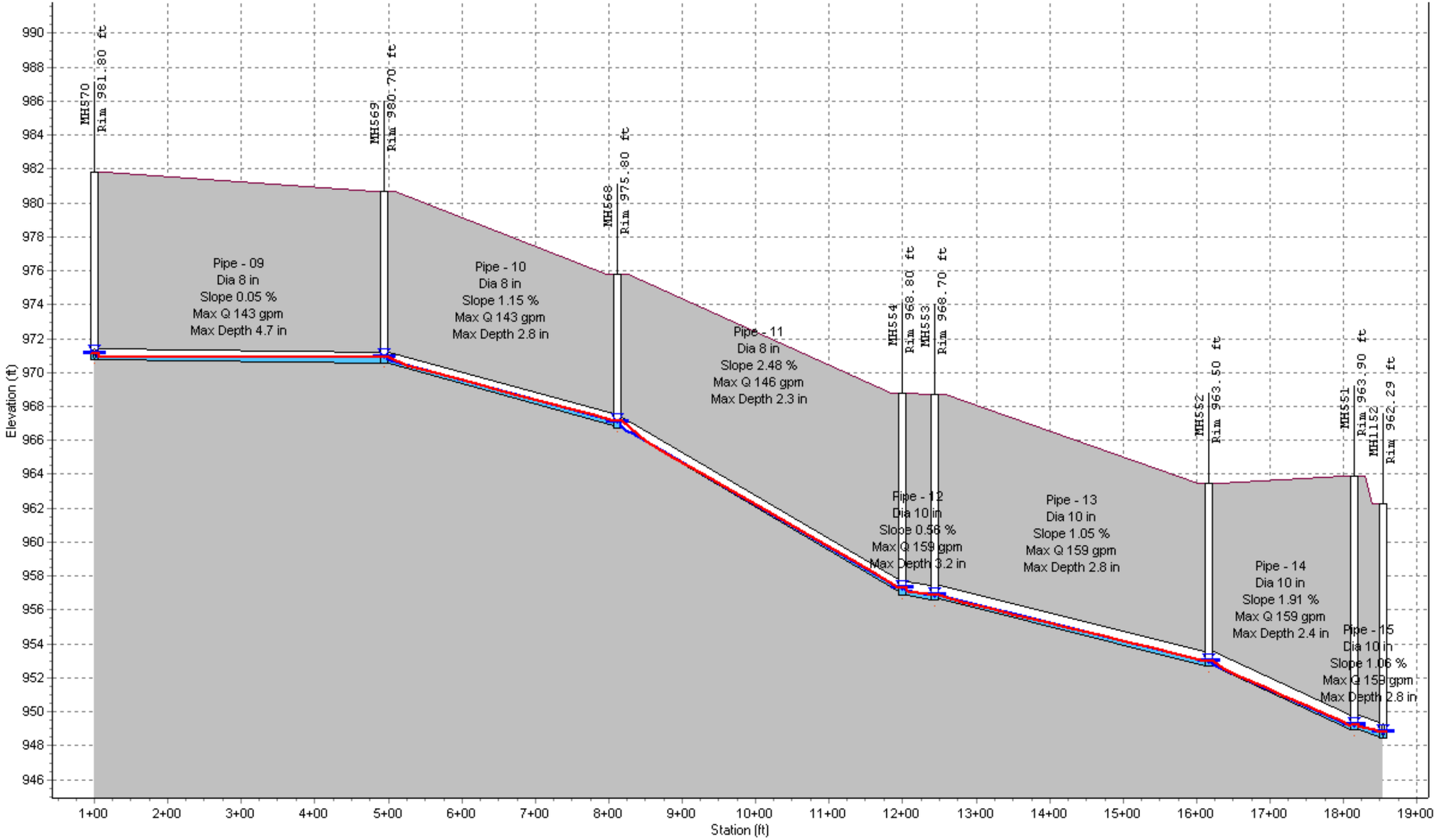
Oregon Sanitary Sewer



:	MH1124	MH1123	MH580	MH579	MH578	MH577	MH572	MH571	MH570
Rim (ft):	1026.30	1019.20	1014.03	1011.30	995.98	985.89	984.01	981.70	981.80
Invert (ft):	1015.38	1006.00	1004.92	1001.98	985.27	975.25	974.34	973.86	970.76
Min Pipe Cover (ft):	10.25	12.37	8.43	8.10	9.86	9.84	9.01	6.98	10.37
Max HGL (ft):	1015.53	1006.31	1005.17	1002.72	985.60	975.56	974.68	974.30	971.15

:	Pipe - 01	Pipe - 02	Pipe - 03	Pipe - 04	Pipe - 05	Pipe - 06	Pipe - 07	Pipe - 08
Length (ft):	277.04	162.43	171.58	299.91	355.99	183.31	164.03	383.90
Dia (in):	8	8	8	8	8	8	8	8
Slope (%):	3.33	0.65	1.39	5.51	2.78	0.50	0.29	0.86
Up Invert (ft):	1015.38	1006.00	1004.92	1001.98	985.27	975.25	974.34	974.05
Dn Invert (ft):	1006.16	1004.94	1002.53	985.45	975.38	974.34	973.86	970.76
Max Q (gpm):	97	100	101	125	128	129	141	141
Max Vel (ft/s):	3.81	2.15	2.83	4.91	3.87	2.08	1.75	2.60
Max Depth (in):	1.8	2.8	2.3	1.8	2.2	3.4	4.1	3.0

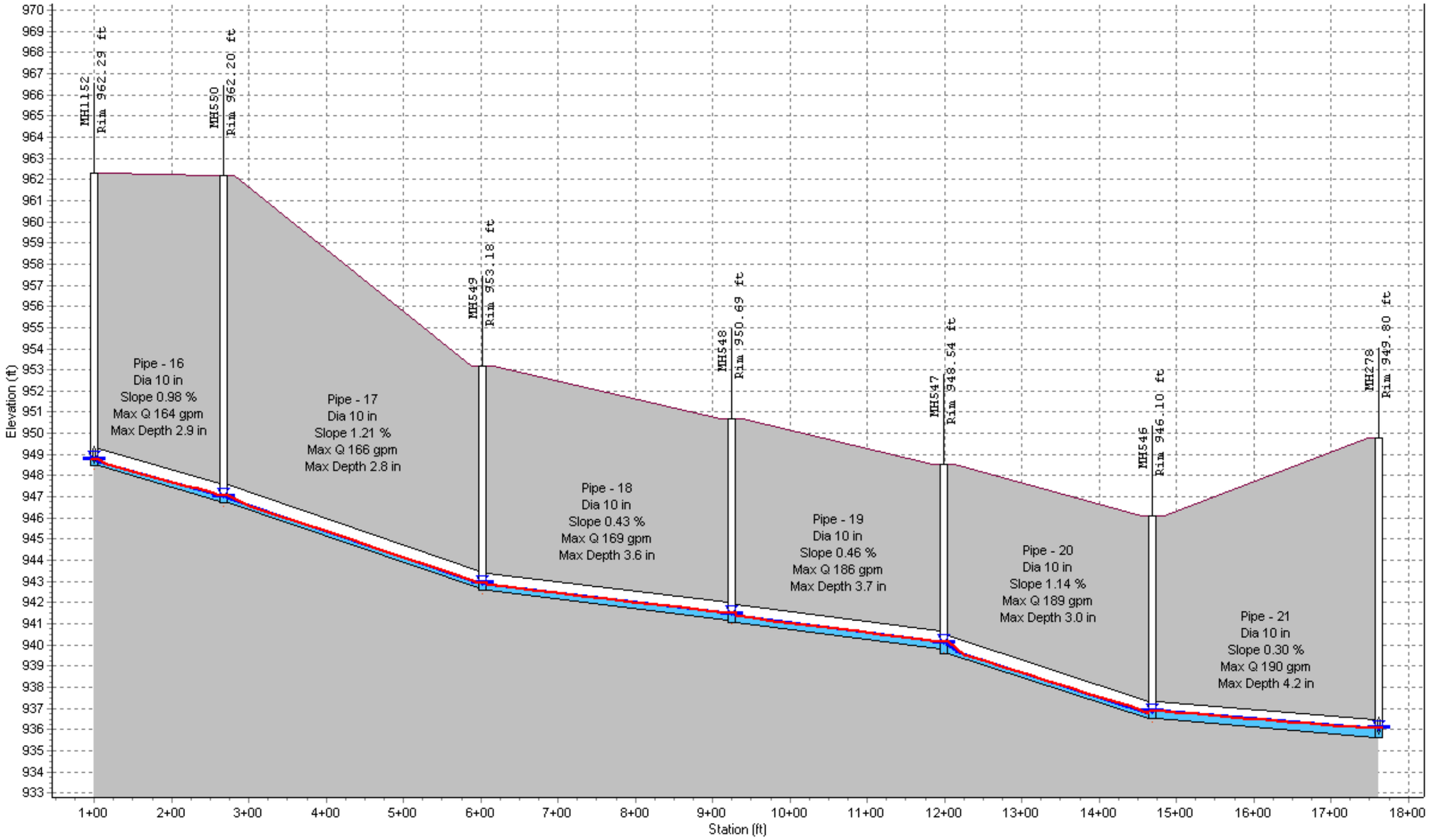
Oregon Sanitary Sewer



:	MH570	MH569	MH568	MH554	MH553	MH552	MH551	MH1152
Rim (ft):	981.80	980.70	975.80	968.80	968.70	963.50	963.90	962.29
Invert (ft):	970.76	970.54	966.69	956.85	956.60	952.70	948.39	948.45
Min Pipe Cover (ft):	10.37	9.48	8.24	11.03	11.23	9.94	14.10	12.91
Max HGL (ft):	971.15	970.94	967.12	957.29	956.87	952.96	949.29	948.78

:	Pipe - 09	Pipe - 10	Pipe - 11	Pipe - 12	Pipe - 13	Pipe - 14	Pipe - 15
Length (ft):	393.56	318.20	386.79	44.74	373.22	197.17	39.57
Dia (in):	8	8	8	10	10	10	10
Slope (%):	0.05	1.15	2.48	0.56	1.05	1.91	1.06
Up Invert (ft):	970.76	970.54	966.69	956.85	956.64	952.70	948.97
Dn Invert (ft):	970.55	966.89	957.10	956.60	952.73	948.94	948.55
Max Q (gpm):	143	143	146	159	159	159	159
Max Vel (ft/s):	1.52	2.91	3.86	2.27	2.85	3.53	2.86
Max Depth (in):	4.7	2.8	2.3	3.2	2.8	2.4	2.8

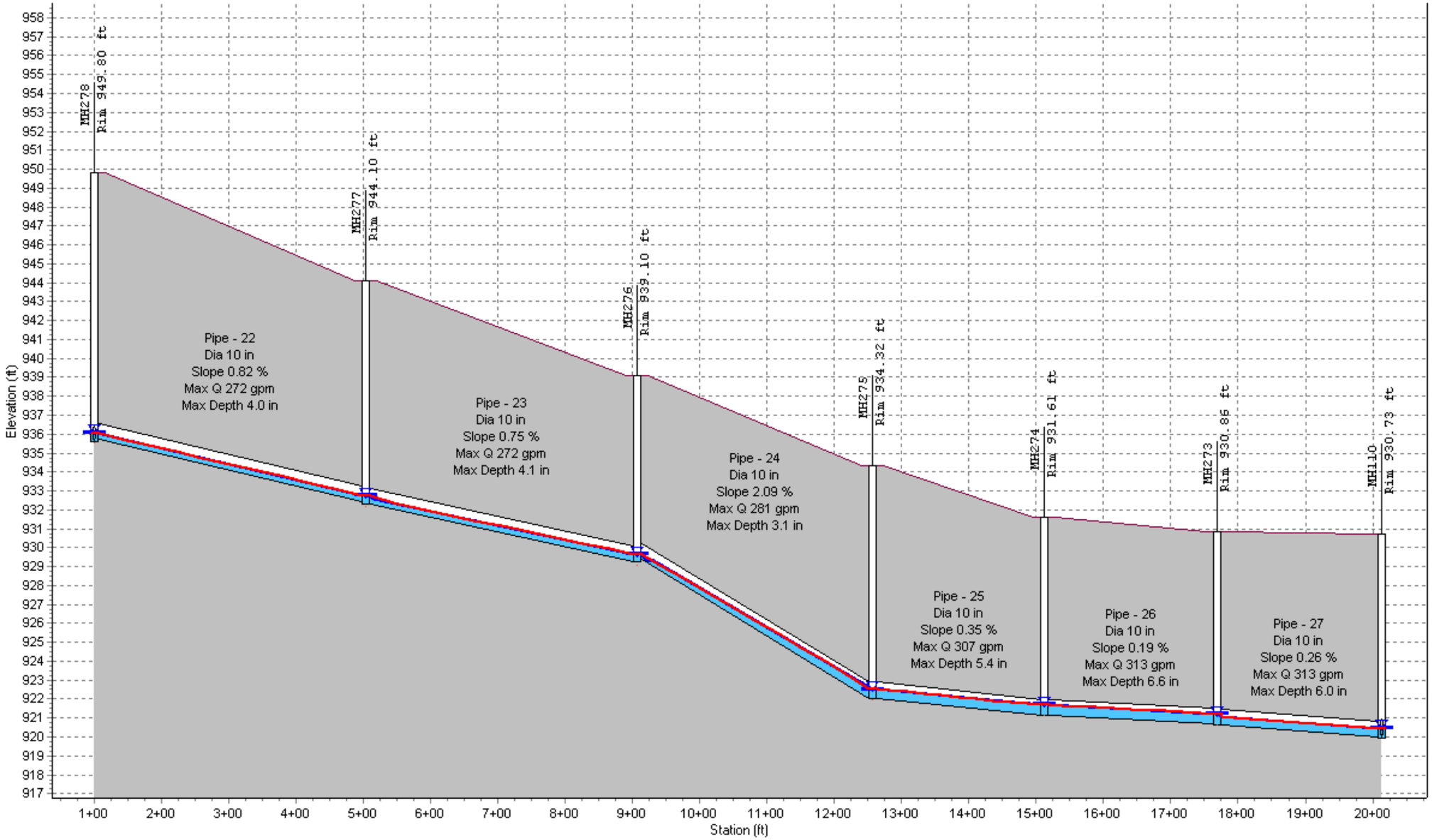
Oregon Sanitary Sewer



:	MH1152	MH550	MH549	MH548	MH547	MH546	MH278
Rim (ft):	962.29	962.20	953.18	950.69	948.54	946.10	949.80
Invert (ft):	948.45	946.74	942.56	941.07	939.59	936.50	935.62
Min Pipe Cover (ft):	12.91	14.57	9.67	8.68	7.90	8.76	13.23
Max HGL (ft):	948.78	947.04	942.91	941.49	940.12	936.86	936.07

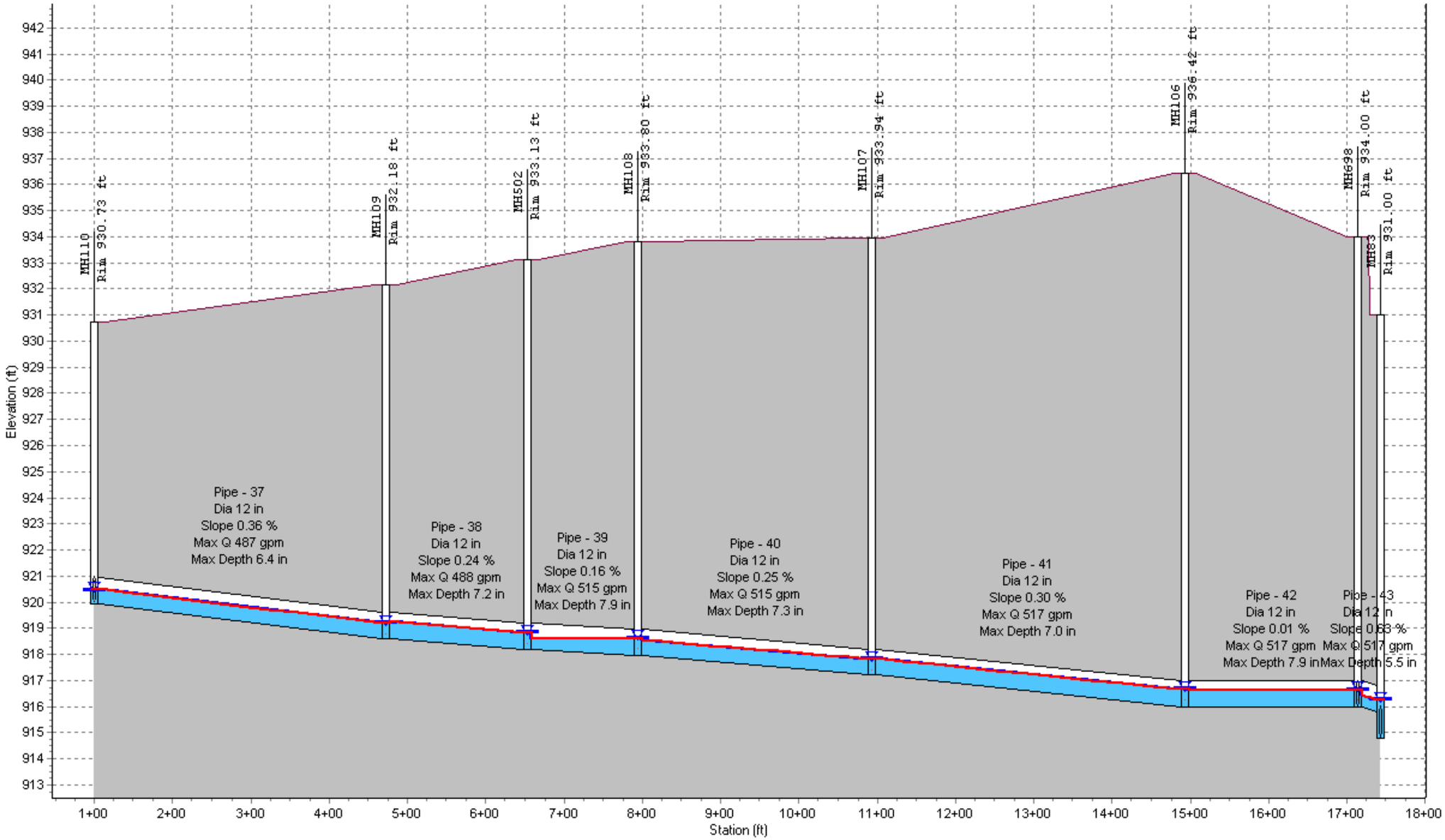
:	Pipe - 16	Pipe - 17	Pipe - 18	Pipe - 19	Pipe - 20	Pipe - 21
Length (ft):	167.81	334.39	322.76	274.09	270.65	291.98
Dia (in):	10	10	10	10	10	10
Slope (%):	0.98	1.21	0.43	0.46	1.14	0.30
Up Invert (ft):	948.45	946.74	942.56	941.07	939.59	936.51
Dn Invert (ft):	946.80	942.68	941.18	939.81	936.50	935.62
Max Q (gpm):	164	166	169	186	189	190
Max Velocity (ft/s):	2.80	3.04	2.10	2.22	3.08	1.91
Max Depth (in):	2.9	2.8	3.6	3.7	3.0	4.2

Oregon Sanitary Sewer



:	MH278	MH277	MH276	MH275	MH274	MH273	MH110
Rim (ft):	949.80	944.10	939.10	934.32	931.61	930.86	930.73
Invert (ft):	935.62	932.30	929.28	922.06	921.16	920.61	919.94
Min Pipe Cover (ft):	13.23	10.85	8.90	11.43	9.61	9.36	9.76
Max HGL (ft):	936.07	932.75	929.63	922.51	921.71	921.22	920.47

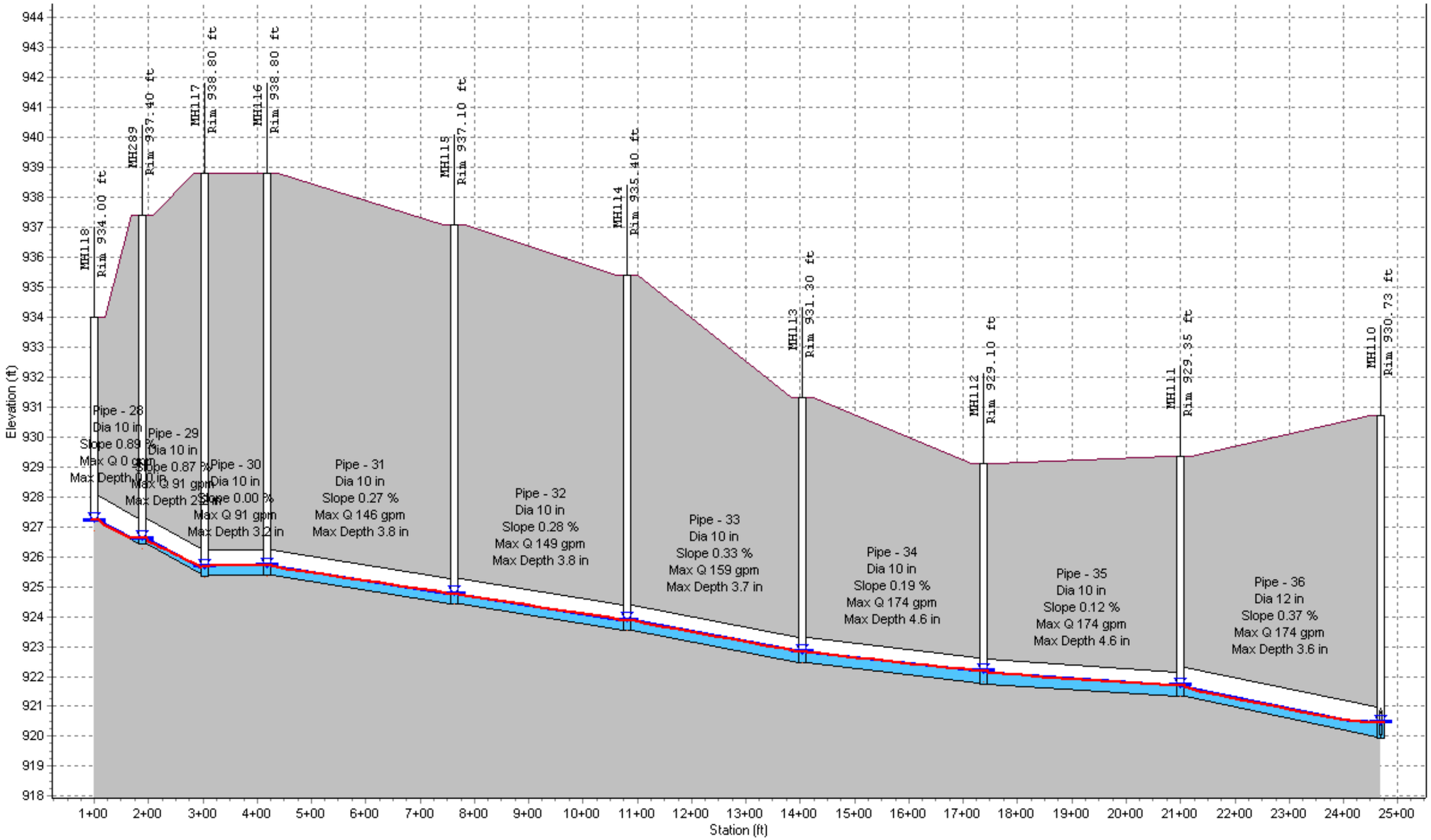
:	Pipe - 22	Pipe - 23	Pipe - 24	Pipe - 25	Pipe - 26	Pipe - 27
Length (ft):	403.51	402.89	350.16	255.69	256.51	244.27
Dia (in):	10	10	10	10	10	10
Slope (%):	0.82	0.75	2.09	0.35	0.19	0.26
Up Invert (ft):	935.74	932.30	929.37	922.06	921.16	920.61
Dn Invert (ft):	932.42	929.28	922.06	921.16	920.67	919.97
Max Q (gpm):	272	272	281	307	313	313
[illegible]	3.03	2.93	4.28	2.28	1.84	2.04
Max Depth (in):	4.0	4.1	3.1	5.4	6.6	6.0



:	MH110	MH109	MH502	MH108	MH107	MH106	MH698	MH83
Rim (ft):	930.73	932.18	933.13	933.80	933.94	936.42	934.00	931.00
Invert (ft):	919.94	918.61	918.18	917.96	917.21	915.99	915.98	914.79
Min Pipe Cover (ft):	9.76	12.57	13.95	14.84	15.73	19.43	17.01	14.21
Max HGL (ft):	920.47	919.21	918.84	918.62	917.82	916.66	916.99	916.25

:	Pipe - 37	Pipe - 38	Pipe - 39	Pipe - 40	Pipe - 41	Pipe - 42	Pipe - 43
Length (ft):	371.72	180.94	141.88	298.41	399.62	220.98	28.72
Dia (in):	12	12	12	12	12	12	12
Slope (%):	0.36	0.24	0.16	0.25	0.30	0.01	0.63
Up Invert (ft):	919.94	918.61	918.18	917.96	917.21	915.99	915.97
Dn Invert (ft):	918.61	918.18	917.96	917.21	915.99	915.98	915.79
Max Q (gpm):	487	488	515	515	517	517	517
Max Vel (ft/s):	2.58	2.20	2.08	2.28	2.45	2.08	3.23
Max Depth (in):	6.4	7.2	7.9	7.3	7.0	7.9	5.5

Oregon Sanitary Sewer



:	MH118	MH289	MH117	MH116	MH115	MH114	MH113	MH112	MH111	MH110
Rim (ft):	934.00	937.40	938.80	938.80	937.10	935.40	931.30	929.10	929.35	930.73
Invert (ft):	927.21	926.43	925.34	925.38	924.44	923.55	922.45	921.74	921.32	919.94
Min Pipe Cover (ft):	5.96	10.14	12.54	12.57	11.83	11.01	8.00	6.47	7.03	9.76
Max HGL (ft):	927.21	926.61	925.67	925.70	924.76	923.88	922.83	922.18	921.70	920.47

:	Pipe - 28	Pipe - 29	Pipe - 30	Pipe - 31	Pipe - 32	Pipe - 33	Pipe - 34	Pipe - 35	Pipe - 36
Length (ft):	88.09	114.80	116.10	344.44	316.60	322.63	333.42	362.57	369.46
Dia (in):	10	10	10	10	10	10	10	10	12
Slope (%):	0.89	0.87	0.00	0.27	0.28	0.33	0.19	0.12	0.37
Up Invert (ft):	927.21	926.43	925.40	925.38	924.44	923.55	922.45	921.74	921.32
Dn Invert (ft):	926.43	925.43	925.40	924.44	923.56	922.47	921.80	921.32	919.97
Max Q (gpm):	0	91	91	146	149	159	174	174	174
[illegible]	0.00	2.27	1.34	1.71	1.73	1.89	1.60	1.60	1.97
Max Depth (in):	0.0	2.2	3.2	3.8	3.8	3.7	4.6	4.6	3.6

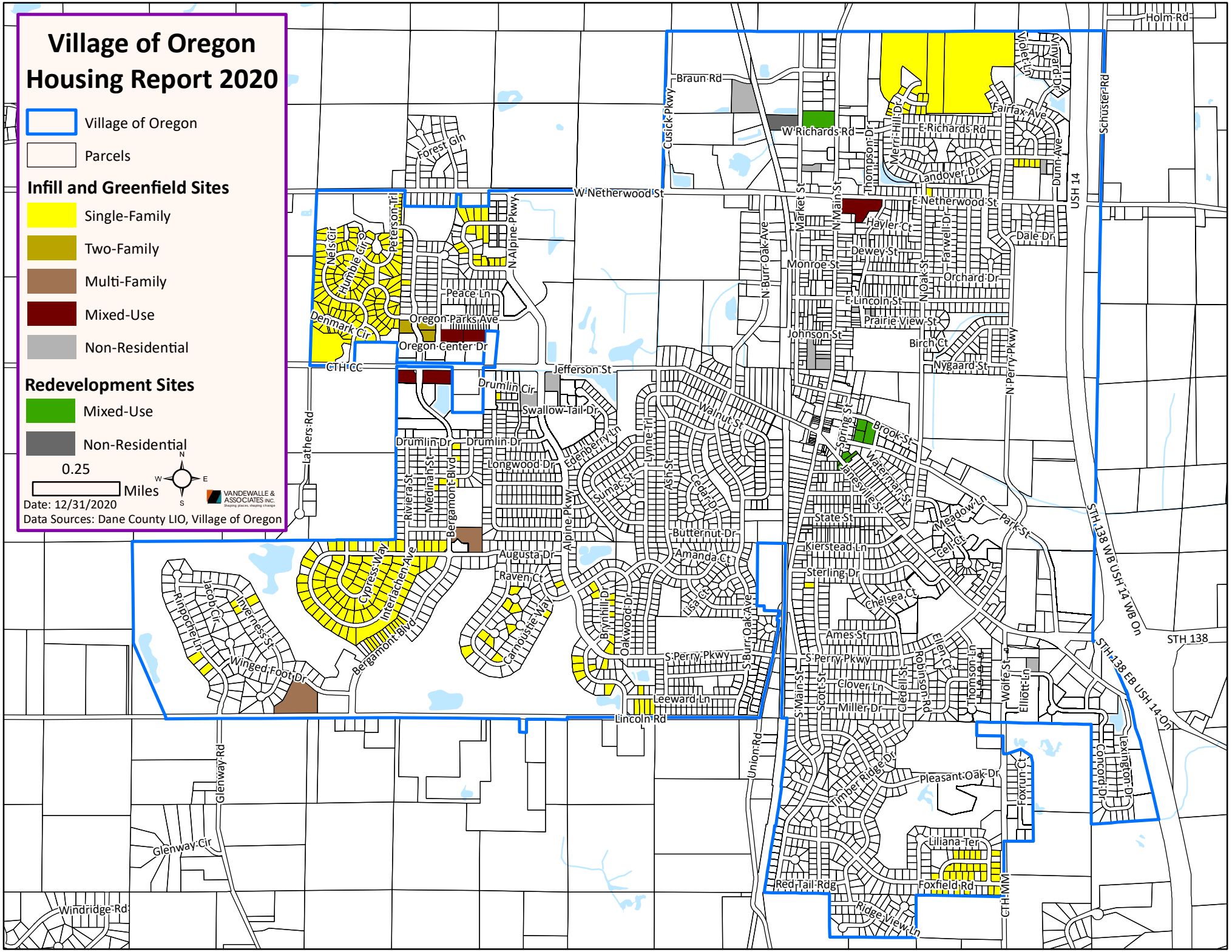
Oregon Sanitary Sewer Analysis
Village of Oregon
3/23/2021

Maximum Capacity Scenario

Element ID	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Total Drop (ft)	Average Slope (%)	Pipe Diameter (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)
Pipe 01	MH1124	MH1123	277.04	1,015.38	1,006.16	9.22	3.33	8	202	5.25	1,072	0.19	0.29	0.20
Pipe 02	MH1123	MH580	162.43	1,006.00	1,004.83	1.17	0.72	8	205	2.94	479	0.43	0.46	0.31
Pipe 03	MH580	MH579	171.58	1,004.92	1,002.53	2.39	1.39	8	206	3.86	694	0.30	0.37	0.25
Pipe 04	MH579	MH578	299.91	1,001.98	985.45	16.53	5.51	8	230	6.52	1,379	0.17	0.28	0.18
Pipe 05	MH578	MH577	355.99	985.27	975.38	9.89	2.78	8	233	5.12	979	0.24	0.33	0.22
Pipe 06	MH577	MH572	183.31	975.25	974.34	0.91	0.50	8	234	2.72	414	0.56	0.54	0.36
Pipe 07	MH572	MH571	164.03	974.34	973.86	0.48	0.29	8	246	2.24	318	0.77	0.66	0.44
Pipe 08	MH571	MH570	383.90	974.05	970.76	3.29	0.86	8	246	3.38	544	0.45	0.47	0.31
Pipe 09	MH570	MH569	393.56	970.76	970.00	0.76	0.19	8	248	1.91	263	0.95	0.77	0.52
Pipe 10	MH569	MH568	318.20	970.54	966.89	3.65	1.15	8	248	3.78	629	0.39	0.44	0.29
Pipe 11	MH568	MH554	386.79	966.69	957.10	9.59	2.48	8	251	5.02	925	0.27	0.36	0.24
Pipe 12	MH554	MH553	44.74	956.85	956.60	0.25	0.56	10	264	2.92	796	0.33	0.40	0.33
Pipe 13	MH553	MH552	373.22	956.64	952.73	3.91	1.05	10	264	3.67	1,090	0.24	0.34	0.28
Pipe 14	MH552	MH551	197.17	952.70	948.94	3.76	1.91	10	264	4.54	1,471	0.18	0.29	0.24
Pipe 15	MH551	MH1152	39.57	948.97	948.55	0.42	1.06	10	264	3.69	1,098	0.24	0.33	0.28
Pipe 16	MH1152	MH550	167.81	948.45	946.80	1.65	0.98	10	269	3.61	1,056	0.25	0.34	0.29
Pipe 17	MH550	MH549	334.39	946.74	942.68	4.06	1.21	10	271	3.90	1,174	0.23	0.33	0.27
Pipe 18	MH549	MH548	322.76	942.56	941.18	1.38	0.43	10	274	2.67	696	0.39	0.44	0.36
Pipe 19	MH548	MH547	274.09	941.07	939.81	1.27	0.46	10	291	2.80	724	0.40	0.44	0.37
Pipe 20	MH547	MH546	270.65	939.59	936.50	3.09	1.14	10	294	3.90	1,138	0.26	0.35	0.29
Pipe 21	MH546	MH278	291.98	936.51	935.62	0.89	0.30	10	295	2.40	588	0.50	0.50	0.42
Pipe 22	MH278	MH277	403.51	935.74	932.42	3.32	0.82	10	377	3.70	966	0.39	0.43	0.36
Pipe 23	MH277	MH276	402.89	932.30	929.28	3.02	0.75	10	377	3.58	922	0.41	0.44	0.37
Pipe 24	MH276	MH275	350.16	929.37	922.06	7.31	2.09	10	386	5.23	1,539	0.25	0.34	0.28
Pipe 25	MH275	MH274	255.69	922.06	921.16	0.90	0.35	10	412	2.75	632	0.65	0.59	0.49
Pipe 26	MH274	MH273	256.51	921.16	920.67	0.49	0.19	10	418	2.19	476	0.88	0.73	0.61
Pipe 27	MH273	MH110	244.27	920.61	919.97	0.64	0.26	10	418	2.44	541	0.77	0.66	0.55
Pipe 28	MH118	MH289	88.09	927.21	926.43	0.78	0.89	10	0	0.00	1,002	0.00	0.00	0.00
Pipe 29	MH289	MH117	114.80	926.43	925.43	1.00	0.87	10	206	3.20	994	0.21	0.31	0.26
Pipe 30	MH117	MH116	116.10	925.40	925.40	0.00	0.00	10	206	1.88	476	0.43	0.46	0.38
Pipe 31	MH116	MH115	344.44	925.38	924.44	0.94	0.27	10	261	2.25	562	0.46	0.48	0.40
Pipe 32	MH115	MH114	316.60	924.44	923.56	0.88	0.28	10	264	2.26	562	0.47	0.48	0.40
Pipe 33	MH114	MH113	322.63	923.55	922.47	1.08	0.33	10	274	2.44	616	0.45	0.47	0.39
Pipe 34	MH113	MH112	333.42	922.45	921.80	0.65	0.19	10	289	2.04	476	0.61	0.56	0.47
Pipe 35	MH112	MH111	362.57	921.74	921.00	0.74	0.20	10	289	2.04	476	0.61	0.56	0.47
Pipe 36	MH111	MH110	369.46	920.90	919.98	0.92	0.25	12	289	2.53	1,043	0.28	0.36	0.36
Pipe 37	MH110	MH109	371.72	919.94	918.61	1.33	0.36	12	707	3.20	1,052	0.67	0.60	0.60
Pipe 38	MH109	MH502	180.94	918.61	918.18	0.43	0.24	12	708	2.68	845	0.84	0.70	0.70
Pipe 39	MH502	MH108	141.88	918.18	917.96	0.22	0.16	12	735	2.50	775	0.95	0.78	0.78
Pipe 40	MH108	MH107	298.41	917.96	917.21	0.75	0.25	12	735	2.76	868	0.85	0.71	0.71
Pipe 41	MH107	MH106	399.62	917.21	915.99	1.21	0.30	12	737	2.99	955	0.77	0.66	0.66
Pipe 42	MH106	MH698	220.98	915.99	915.98	0.01	0.01	12	737	2.50	775	0.95	0.78	0.78
Pipe 43	MH698	MH83	28.72	915.97	915.79	0.18	0.63	12	737	4.04	1,409	0.52	0.51	0.51
Pipe 44	MH83	Out-Pipe	11.07	914.79	914.50	0.29	2.62	12	737	6.70	2,804	0.26	0.35	0.35

Highlighted pipes are above 50% of full capacity during peak flow

Attachment H: 2020 Village of Oregon Housing Affordability Map


Village of Oregon Housing Report 2020
Village of Oregon
Parcels
Infill and Greenfield Sites
Single-Family
Two-Family
Multi-Family
Mixed-Use
Non-Residential
Redevelopment Sites
Mixed-Use
Non-Residential
0.25
Miles
N
W
E
S
VANDEWALLE & ASSOCIATES INC.
Shaping places, shaping change
Date: 12/31/2020
Data Sources: Dane County LIO, Village of Oregon
Holm Rd
Braun Rd
Cusick Pkwy
W Richards Rd
E Richards Rd
Fairfax Ave
Violet Ln
Vinward Dr
Schuster Rd
Merri-Hill Dr
Thompson Dr
Landover Dr
Dunn Ave
USH 14
Forest Gln
W Netherwood St
E Netherwood St
Market St
N Main St
Hayler Ct
Farwell Dr
Dale Dr
Dewey St
Monroe St
N Burr Oak Ave
N Oak St
Orchard Dr
E Lincoln St
Prairie View St
Johnson St
Birch Ct
Nygaard St
N Perry Pkwy
Nels Cir
Humble Cir
Peterson Trl
N Alpine Pkwy
Peace Ln
Oregon Parks Ave
Denmark Cir
Oregon Center Dr
CTH CC
Jefferson St
Drumlin Cir
Swallow Tail Dr
Lathers Rd
Drumlin Dr
Longwood Dr
Edenberry Ln
Lynne Trl
Walnut St
Spring St
Brook St
Waterman St
Fairview St
Rivera St
Medinah St
Bergamont Blvd
Alpine Pkwy
Sumac St
Ash St
Cedar Dr
State St
Meadow Ln
Park St
Gell Ct
Butternut Dr
Amanda Ct
Kierstead Ln
Sterling Dr
Chelsea Ct
Augusta Dr
Raven Ct
Cypress Way
Interlachen Ave
Jacob Cir
Rinpoche Ln
Inverness St
Winged Foot Dr
Bergamont Blvd
Carnoustie Way
Brynhill Dr
Oakwood Dr
Lisa Ct
S Burr Oak Ave
Ames St
S Perry Pkwy
Ellen Ct
Robinson Rd
Thomson Ln
Wolfe St
Elliott Ln
Scott St
S Main St
Clover Ln
Miller Dr
Cledell St
Leeward Ln
Lincoln Rd
STH 138 WB USH 14 WB On
STH 138
STH 138 EB USH 14 On
Lexington Dr
Concord Dr
Union Rd
Timber Ridge Dr
Pleasant Oak Dr
Foxrun Ct
Glenway Rd
Glenway Cir
Liliana Ter
Red Tail Rdg
Foxfield Rd
CTH MM
Ridge View Ln
Windridge Rd

Attachment I: Dane County Groundwater Recharge Map

as daily minimum, maximum, and average temperatures and daily precipitation observations. The model was used to simulate two years of recharge, with the first year used to develop antecedent conditions for the second year. Output was reported as total annual recharge in inches per year. Unrealistic high values (specifically, recharge greater than 50 inches, or 127 cm, per year) were converted to 50 inches, with the remainder likely representing additional runoff to surface water features. Extractive (such as quarries), wetland, and water land-use categories were removed from further processing and labeled as undefined. These land-use types are hydrologically complex and cannot be accurately represented in the SWB recharge model. The model output was then smoothed using a focal median method with a 19-cell area (approximately 80 acres).

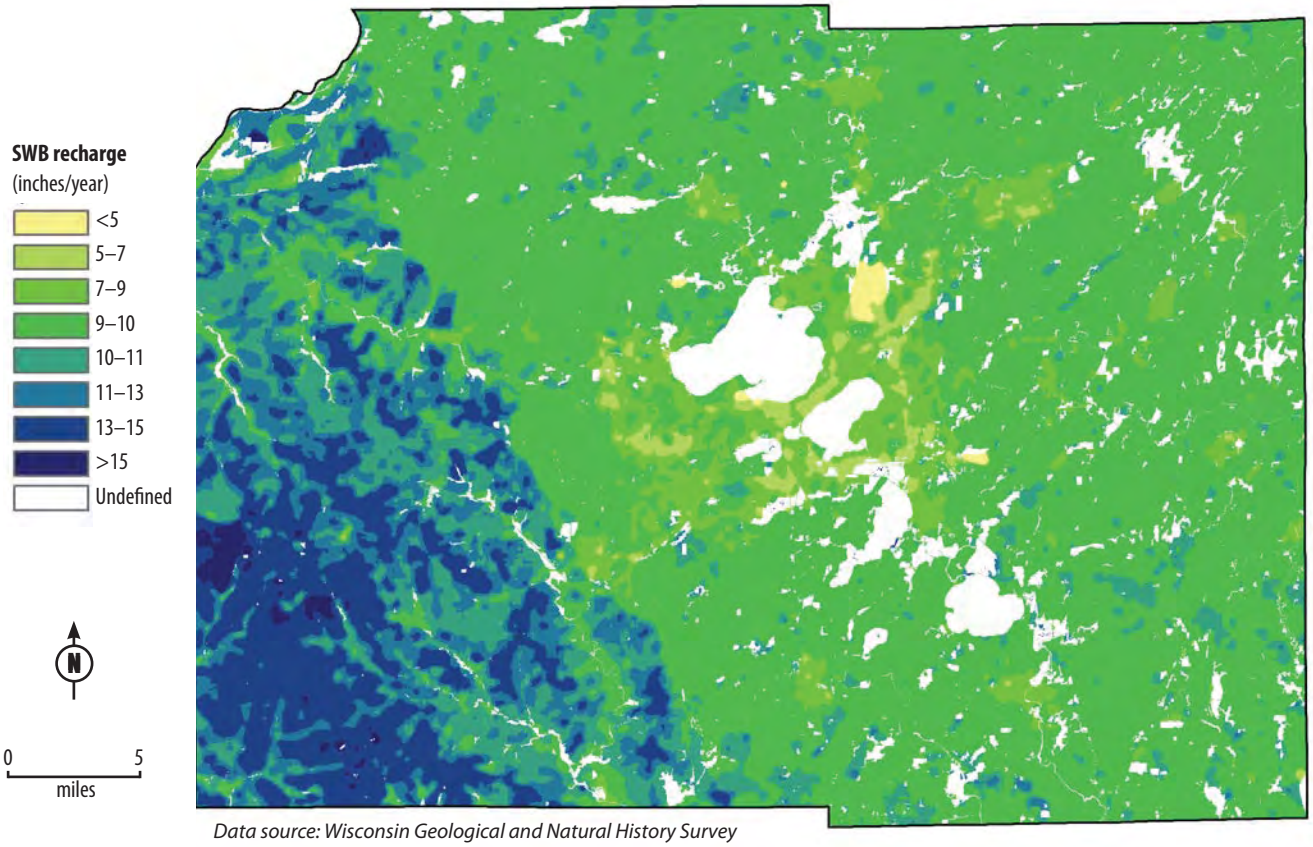
Results and applications

Regional recharge

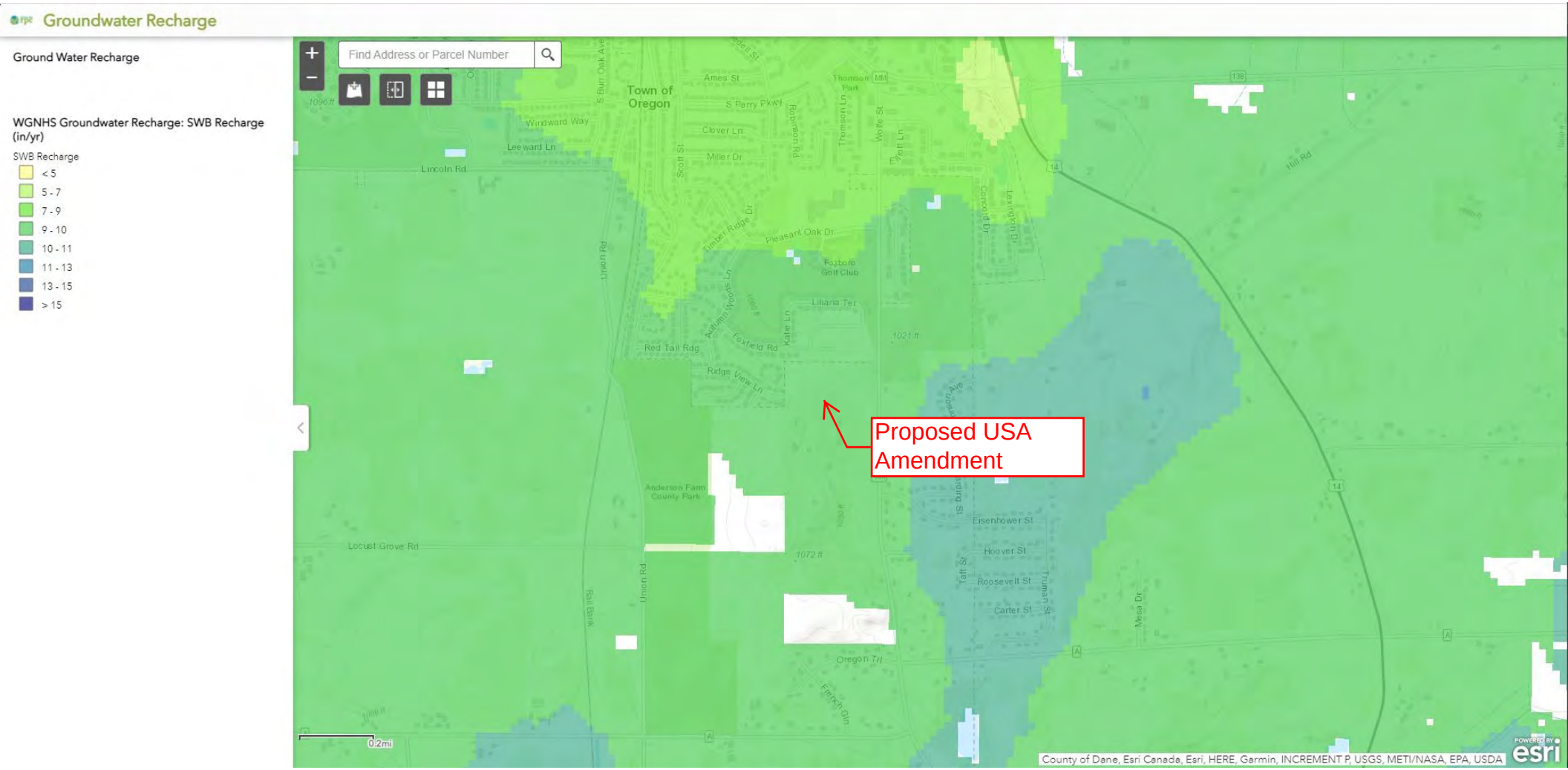
The recharge map (shown categorized at a reduced scale in figure 5) was prepared as a raster data set in Environmental Systems Research Institute grid format, suitable for overlay and analysis with other GIS data layers. The map was prepared using existing land use as of 2005 and a typical climate year, 1981. For this model year, recharge varies by more than 10 inches (25 cm) per year across the county. Using other years with different precipitation patterns and antecedent moisture conditions will result in different recharge estimates. In general, the pattern of recharge will remain constant, but the overall average will vary with the precipitation and antecedent soil moisture.

Some general trends, correlating with surficial geology and land-use patterns, are evident in the recharge map. The greatest spatial control on recharge in Dane County is surficial geology. The unglaciated western and southwestern part of the county (Clayton and Attig, 1997) has the highest recharge, shown in dark green and blue. Recharge is high here because thin soils with low storage capacity occur over carbonate and sandstone bedrock. In contrast, the eastern two-thirds of the county, the glaciated area, has moderate recharge with little variation. In this area, the moderate hydraulic conductivity and higher storage capacity of the glacial tills reduce recharge rates. The lower recharge values in the central part of the county are due primarily to urban development in the Madison

Figure 5. Recharge map for Dane County.



Data source: Wisconsin Geological and Natural History Survey


Groundwater Recharge
Ground Water Recharge
WGNHS Groundwater Recharge: SWB Recharge (in/yr)
SWB Recharge
< 5
5 - 7
7 - 9
9 - 10
10 - 11
11 - 13
13 - 15
> 15
Find Address or Parcel Number
Town of Oregon
Proposed USA Amendment
Anderson Farm County Park
Fitzboro Golf Club
Thomson Park
Ames St
S Perry Pkwy
Clover Ln
Miller Dr
Windward Way
Leeward Ln
Lincoln Rd
Union Rd
Pleasant Oak Dr
Liliana Ter
Red Tail Rdg
Foxfield Rd
Ridge View Ln
Eisenhower St
Hoover St
Roosevelt St
Carter St
Oregon Trl
Locust Grove Rd
Hill Rd
0.2mi
County of Dane, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA
esri

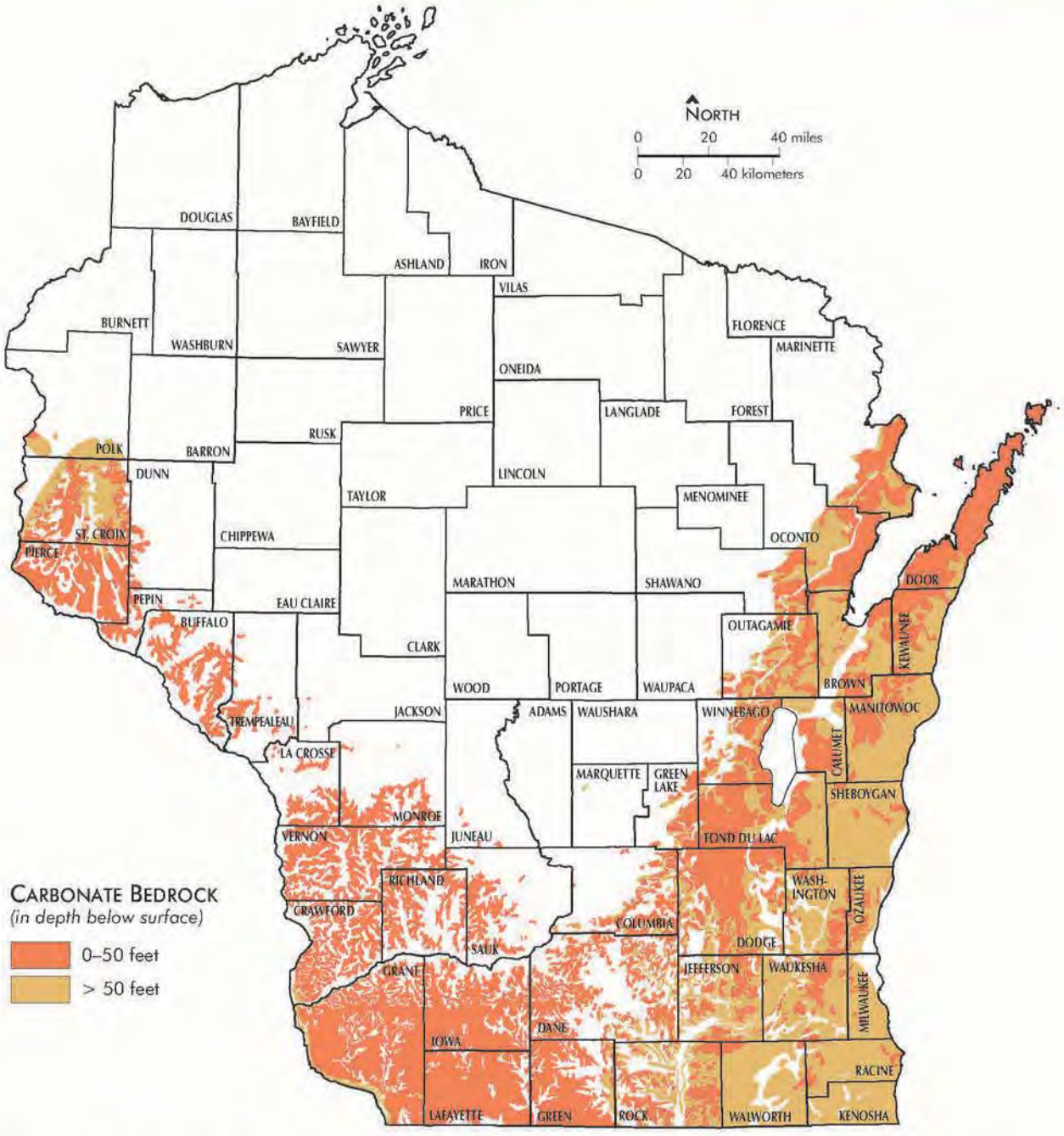
Attachment J: UW-Extension Wisconsin Geological and Natural History Survey – Karst and Shallow Bedrock

Karst and shallow carbonate bedrock in Wisconsin

Wisconsin Geological and Natural History Survey

Factsheet 02 | 2009

Areas with carbonate bedrock within 50 feet of the land surface are particularly vulnerable to groundwater contamination.



UW Extension
University of Wisconsin-Extension

Wisconsin Geological and Natural History Survey 3817 Mineral Point Road • Madison, Wisconsin 53705-5100
Tel 608.263.7389 • Fax 608.262.8086 • WisconsinGeologicalSurvey.org
Director and State Geologist: James M. Robertson