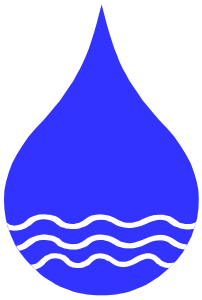
THE RESERVE

TOWN OF LOOMIS, CA

PRELIMINARY HYDROLOGIC AND HYDRAULIC STUDY

VERTICAL DATUM: NGVD29



Original Submittal: September 27, 2024
Revised Submittal: April 7, 2025

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Prepared By:

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TABLE OF CONTENTS

I. INTRODUCTION

This report presents hydrologic and hydraulic analyses for The Reserve Subdivision (Project) by Premier 40, LLC, located in the Town of Loomis, Placer County, California (See Appendix A – Vicinity Map). This report estimates storm flow hydrology and hydraulics as outlined in the *Town of Loomis Land Development Manual* (Reference 1, hereinafter referred to as the *Manual*) and the *Placer County Stormwater Management Manual* (Reference 2, hereinafter referred to as the *SWMM*). Additionally, this report presents Low Impact Development (LID) Storm Water Quality calculations as outlined in the *West Placer – Storm Water Quality Design Manual* (Reference 3, hereinafter referred to as the *LID Manual*).

II. PROJECT LOCATION AND DESCRIPTION

The Project is proposed as a residential subdivision development located on 26.29± acres of currently undeveloped land in the Town of Loomis, Placer County. The site is located in the southwest corner of Rocklin Road and Barton Road (5780 Rocklin Road). Existing roadway improvements (Rocklin Road) border the Project to the north. Existing roadway improvements (Barton Road) border the Project east. Existing developed single-family large-lot parcels border the Project to the south and west. A large parcel (Parcel 2 – APN: 045-161-034) is situated between the Project site and the actual southwest corner of Rocklin and Barton Roads. This parcel (13.78± acres) is mostly undeveloped, with exception to agricultural fields and a small fruit stand structure.

See Vicinity Map – Appendix A

The development is proposed as a 20-lot residential subdivision and public right-of-way dedications along Rocklin and Barton Roads. The Project will construct roadway improvements, underground utilities and buildable areas on the proposed residential lots (see Tentative Subdivision Map – Appendix C). The Project's proposed improvements generally consist of the following:

- 20 Single-Family Residential Lots (Average Lot Size – 54,628 SF);
- 1.21± acres of Public Right-of-Way;
- A paved single cul-de-sac to serve the subdivision (Private)
    - Concrete curb, gutter & sidewalk (one side of road only)
- Offsite (Frontage Widening) Improvements along Rocklin Road
    - Pavement widening
    - Concrete curb, gutter & sidewalk
    - Frontage Soundwall (or Fence)
- Offsite (Frontage Widening) Improvements along Barton Road
    - Pavement Widening + Entrance Tapers
    - 3-FT Bike Lane
    - Roadway Shoulder Grading & AC Curb
- Onsite & Offsite underground utilities;
- Water Quality (Vegetated) Swales, Preservation of Existing Tree Canopy and Preservation of Naturally Vegetated Areas (Buffers)

III. HYDROLOGY

METHODS

The methodology contained in this preliminary study is in compliance with the procedures presented in the *Manual and SWMM*. A hydrologic analysis was completed to estimate storm runoff from the proposed project. The drainage sheds and flow patterns for the undeveloped and developed conditions were determined from existing topography and the proposed preliminary grading plan. Both the Existing Shed Maps and Preliminary Developed Shed Maps can be seen in Appendix – D.

The *SWMM's – Peak Flows from Small Watersheds* was used to determine both the 10-year storm (for analysis of the local onsite storm drain system) and 100-year storm (for analysis of the overland flow routes). The associated detailed analysis, calculations, and estimates can be seen in Appendices – E & F.

EXISTING SITE CONDITIONS AND HYDROLOGY

Previously stated, the Project site encompasses 26.29± acres of undeveloped land and adjacent existing roadway improvements on Rocklin Road and Barton Road (See Appendix D – Existing Shed Maps). The property is located within the Town of Loomis and the County of Placer. Existing Conditions FEMA designation and Soil Group Classification are identified, as follows:

- FEMA National Flood Hazard Layer FIRMette Map, included in Appendix B, shows *The Project* is located within Non-Shaded Flood Zone "X" (Areas of Minimal Flood Hazard). There are no proposed building sites within a FEMA-designated Flood Zone or Special Flood Hazard Area (see Appendix B – FEMA Map).

- Onsite soils belong to the Hydrologic Soil Group "B" (Reference 4, Soil Survey of Placer County, California – Western Part). An infiltration rate of 0.18 inches per hour for Natural Covers – Woodland, Grass – Fair Quality (per Table 5-3 of the *SWMM*) has been assumed for the site under existing conditions and underlying soils.

Native grasses, and heavily wooded rolling terrain comprise the majority of the site's ground cover. The existing drainage patterns are shown on the Existing Shed Maps (Appendix – D). The majority of the existing Project site, including adjacent Parcel 2, drain from the northeast to the southwest corner (denoted as Sheds X1 – X11). The southeast corner of the Project site (Shed X13) drains from northwest to southeast and discharges offsite to the south along Barton Road. Additionally, (6) six offsite drainage sheds (denoted as Sheds O1 – O2, O4 – O7) contribute runoff to and through the Project site to the southwest corner. The southwest corner of the site (shown as Shed X1) is a large pond, containing water year round, receiving runoff from the Project site and adjacent properties to the south and west. Sheds X1 – X13 and O1 – O7 are more specifically described as follows:

SHED X1	The southwest corner of the Project site at 4.42± acres. Shed X1 is most defined as a year round pond, receiving runoff from the site and adjacent properties to the south and west. Stormwater collected in Shed X1 eventually discharges westerly (offsite) to natural conveyances of the Dry Creek watershed.
SHEDS X2 –X9 & X11	The majority of the Project site and adjacent Parcel 2 (APN: 045-161-034) totaling 33.87± acres. Generated runoff flows from the northeast to the southwest via natural drainage swales, entering the existing pond (Shed X1) in several locations.
SHEDS X8 & X10	Drainage sheds within the limits of the Project boundary and Parcel 2; however, located on the north side of Rocklin Road totaling 1.10± acres. Sheds X8 & X10 are characterized mostly by existing roadway runoff. Generated runoff is conveyed by existing roadside ditches to (2) two separate cross-culverts on Rocklin Road. Stormwater is then conveyed across Rocklin Road to the Project site and Parcel 2, combining with Sheds X2 –X9 & X11.
SHED X12	A small portion of Rocklin Road (north side) at 0.06± acres (2,500± SF) draining to an existing roadside ditch. Although technically within the Project's boundary, runoff from this small roadway shed, drain westerly down Rocklin Road to existing offsite drainage conveyances.
SHED X13	The southeast corner of the Project site at 0.99± acres. Shed X13 sheet flows east towards Barton Road and combines with offsite runoff from Shed O3. Runoff is conveyed south via existing AC curb along the west side of the road and discharges south along Barton Road.
SHEDS O1 & O2	Existing offsite drainage sheds contributing runoff to the Project site at 3.51± acres (See Offsite Existing Shed Map – EXH 2 – Appendix D). Existing Sheds O1 & O2 are comprised of large-lot single family properties. Runoff from these sheds combines with Onsite Sheds X2 & X3, respectively, prior to discharging the existing pond.
SHEDS O3 – O5	Existing offsite drainage sheds along Barton Road totaling 0.28± acres. Sheds O3 – O5 are the remainder area between the Project's boundary and roadway crown along Barton Road. Generated runoff from Sheds O3 – O5 sheet flows from the roadway crown to the west where it either continues to sheet flow to the Project site and Parcel 2 or is conveyed by AC curb along the west side of Barton Road. Runoff eventually combines with existing onsite Sheds.
SHEDS O6 & O7	Existing offsite drainage sheds on the north side of Rocklin Road totaling 11.60± acres. Sheds O6 & O7 generate runoff to the existing roadside ditches along the north side of Rocklin Road.

Runoff estimates for the Project's On-Site existing conditions and Offsite run-on were determined utilizing the *SWMM – Peak Flows from Small Watersheds.* Response times and associated runoff for the 10-year and 100-year event peak flows and supporting calculations are included in Appendix E - Table E1.

Table 1 below summarizes estimates for specific individual & cumulative shed storm runoff under existing conditions. Please refer to the detailed analysis performed in Appendix – E for supporting calculations.

	TABLE 1 **EXISTING PEAK FLOW CHARACTERISTICS** **(10 & 100-YEAR)**	
Location	Q_{10} (cfs)	Q_{100} (cfs)
Design Point #1 [SHED X1]	10.07	20.90
Design Point #2 [SHEDS X2 + O1]	6.01	10.98
Design Point #3 [SHED X13 + O3]	2.70	5.39
Design Point #5 [SHEDS X3-X4, O2]	15.18	27.93
Design Point #7 [SHEDS X5 + O4]	14.44	26.47
Design Point #8 [SHED X6]	4.23	8.21
Design Point #15 [SHEDS X7-X11, O5-O7]	53.72	96.80
Design Point #16 [SHED X12]	0.15	0.30

With respect to the existing peak flow runoff rates, shown in Table 1, above, please note the following:

1. Attenuation of existing runoff from Offsite Sheds O6 & O7 and Onsite Sheds X8 & X10, due to the existing culverts in Rocklin Road is not accounted for at this time. Hydraulically, roadway cross-culverts will develop a certain amount of headwater on their upstream end to convey flow. This developed headwater condition will attenuate peak flows from the contributing sheds.
2. Attenuation of existing runoff from Onsite Sheds X2 – X9 & X11, due to localized ponding is not accounted for at this time. Further evaluation of existing topography to determine localized low-points and/or depressions (if any) will be addressed at final design.

DEVELOPED SITE CONDITIONS & HYDROLOGY

The *SWMM – Peak Flows from Small Watersheds* was used to determine the 10-year developed storm flows for the analysis of proposed storm drains and drainage swales. The same methodology was also utilized for the 100-year storm and used to evaluate overland release patterns. The proposed single-family subdivision portion of the Project site has been divided into several drainage sub-sheds shown on the Preliminary Developed Shed Maps (See Appendix – D) as Shed's A1 – A6, Shed B1 – B5 and Sheds C1 – C6. Existing Onsite Sheds (X1 – X12) were either replaced, modified or unchanged under proposed Developed Conditions.

The proposed sub-sheds, together, encompass the same total area of existing drainage Sheds X1 – X13 shown on the Existing Shed Maps (See Appendix – D). The smaller sub-sheds, under developed conditions, are used to determine 10-year peak flows rates to specific points of concentration (i.e. – drainage swales, vegetated swales, cross culverts, etc.). Sub-shed flows will be used in the hydraulic analysis of the proposed storm drain system under final design.

Similar to existing conditions, the proposed drainage patterns will drain from the northeast to southwest to Shed X1 (Existing Pond). However, in the developed condition the majority of the site that is composed of impervious surfaces will be conveyed to proposed roadside water quality swales (See Section V & Appendix - G). Additionally, developed runoff from impervious surfaces will be disconnected and flow across naturally and/or proposed landscape areas, prior to discharging to the Existing Pond. Runoff will be conveyed via paved surfaces, drainage swales, vegetated (water quality) swales and underground storm drain to the existing pond within the southwest corner of the Project site. The developed sub-sheds of Sheds A1 – A6, B1 – B5 and Sheds C1 – C6 are more specifically described, as follows:

SHEDS A1 – A6	Onsite developed Sheds totaling 9.27± acres located on the southwest side of the proposed cul-de-sac. These Sheds are comprised primarily of residential homes construction and areas intentionally left undisturbed. Shed A1 – A6 drain directly to the existing pond (Shed X1). Prior to discharging to the pond, developed runoff will drain over/through natural vegetation providing water quality treatment.
SHEDS B1 – B5	Onsite Developed Sheds adjacent to the proposed cul-de-sac (3.43± acres), uphill from Sheds A1 – A6. These sheds are comprised primarily of roadway surfaces and vegetated roadside swales. One exception is Shed B5 which includes (2) two proposed residential lots and future home construction. Sheds B1 – B5 drain to the proposed water quality (vegetated) swales along the southwest side of the cul-de-sac. The proposed swales provide water quality and convey stormwater to downstream drainage swales, eventually discharging to the existing pond (Shed X1).
SHEDS C1 – C6	Onsite Developed Sheds adjacent to and uphill of the proposed cul-de-sac, totaling 8.04± acres. These Sheds are comprised primarily of residential home construction and areas intentionally left undisturbed. Sheds C1 – C6 also include portions of the proposed cul-de-sac and vegetated roadside swales.

	One exception is Shed C6 which is comprised primarily of the required roadway widening improvements (i.e. – AC pavement, Concrete Curb, Gutter & Sidewalk, etc.) on Rocklin Road. Sheds C1 – C5 drain to the proposed water quality (vegetated) swales along the northeast side of the cul-de-sac. The proposed swales provide water quality and convey stormwater to downstream drainage swales, eventually discharging to the existing pond (Shed X1).

It should be noted that specific shed descriptions for Sheds X1, X5, X7 – X10, X11-A, X11-B, X12 and Sheds O1 – O7 have not been provided above, for the proposed Developed Condition. These sheds are similar in nature (if not exactly the same) as Existing Conditions. Sheds X2 – X4 and X13 are replaced by the proposed developed Sheds. Shed X5 is reduced under developed conditions. Sheds X11-A & X11-B are a result of the proposed development. These existing sheds drain through the proposed residential subdivision and discharge to the existing pond, similar to existing conditions.

Response times and associated runoff for the 10-year and 100-year event peak flow and supporting calculations are included in Appendix E - Tables E2 – E5. Table 2 below summarizes estimates for specific individual & cumulative shed storm runoff under developed conditions.

	TABLE 2 **PROPOSED PEAK FLOW CHARACTERISTICS** **(10 & 100-YEAR)**	
Location	Q_{10} (cfs)	Q_{100} (cfs)
Design Point #1 [SHED X1]	10.07	20.90
Design Point #2 [SHED A1-A2, O1-O2]	15.34	28.54
Design Point #3 [SHED O3 + O3-A]	1.62	3.25
Design Point #7 [SHEDS A3, B1-B3, C1-C3, X5 + O4]	18.86	35.45
Design Point #8 [SHED A4]	3.19	6.29
Design Point #15 [SHEDS A5, B4-B5, C4-C6, X7-X11, O5-O7]	51.08	92.88
Design Point #15A [SHED A6]	2.72	5.05
Design Point #16 [SHED X12]	0.15	0.30

IV. HYDRAULICS

STORM DRAIN SYSTEM

The proposed site layout and grading were used in determining the drainage swale locations, cross-culvert size, location, slopes, and inverts in accordance with the *Manual*. Stormwater flows from the sub-shed areas described above will be evaluated using Bentley StormCAD software, under final project design and analyzed for swale & culvert capacity and hydraulic grade line (10-Year Storm Event).

Based on the estimated Design Runoff (10-yr) and the associated hydraulic characteristics within the proposed drainage system, the analysis will verify that the swales and cross-culverts have adequate capacity to convey Design Runoff (10-yr). During final design the StormCAD Hydraulic Reports (Appendix – F) will show that HGL's within the onsite drainage system will maintain freeboard requirements of *Manual* – Section 11.

DETENTION SYSTEM

Under preliminary design, no detention or retention of storm water flows is proposed for this site. This report did however analyze the pre- and post-developed condition volumetric runoff to confirm the existing pond can adequately accommodate the developed stormwater. The Pond Volume Calculations are provided in Appendix E. The volumetric runoff is summarized in Table 3 below:

TABLE 3

VOLUMETRIC RUNOFF SUMMARY

Existing Condition, CF	Developed Condition, CF
205,927	243,252

Based on the analysis, there is an increase of 37,325 CF of runoff volume in the developed condition. This increase in volume equates to an increase of 1.57 inches in depth when spread over the surface area of the existing pond. As the increase in pond depth is minimal, it is determined that the basin can accommodate the developed condition runoff.

V. STORM WATER QUALITY

The Project is required to implement Low Impact Development (LID) standards designed to reduce runoff, treat stormwater, and provide baseline hydromodification management (if required) per the *Manual* and *LID Manual*. "LID is a design strategy where storm water runoff is treated as a valuable resource that can recharge groundwater supplies, protect and enhance natural habitat and biodiversity, and add value to new development or redevelopment projects" *LID Manual.*

The Project design includes the use of seven (7) Water Quality Swales (*Swales)* as Site Design Measures to treat and effectively reduce runoff from the impervious surfaces within DMA's 1 - 7 (See Preliminary Developed DMA SWQ Map – Appendix G). Naturally and/or Developed vegetated areas (Rooftop and Impervious Area Disconnection) and Existing Tree Canopy Preservation are proposed to treat and effectively reduce runoff from the impervious surfaces of DMA's 8 - 13. The *LID Manual's* template for Post-Construction Storm Water Quality Plans was utilized to determine the effectiveness for water quality treatment and runoff reduction of the proposed *Swales, Rooftop & Impervious Area Disconnection and Existing Tree Canopy Preservation*. (See Appendix G – LID Storm Water Quality). The Project's proposed drainage sheds were analyzed through the template for their impervious and pervious compositions (Each DMA's Surface Data is also provided on Preliminary Developed DMA SWQ Map – Appendix G). Within the template, drainage sheds are identified as Drainage Management Areas (DMA's) and are designated accordingly in the Preliminary Developed DMA SWQ Map (See Appendix – G). LID measures as outlined in the *LID Manual* were applied to the proposed drainage sheds or DMA's where appropriate. The Project utilizes Site Design Measures as Existing Tree Canopy Preservation, Rooftop and Impervious Area Disconnection and Vegetated Swales within individual drainage sheds (DMA's) prior to reaching the existing pond in the southwest corner of the Project site.

Runoff is treated/reduced from DMA's 1 - 7 via Existing Tree Canopy Preservation and Vegetated Swales. Per template Forms 3-4 & 3-5 each DMA's impervious surfaces are treated by Site Design Measures. Vegetated swale calculations are provided in Appendix G verifying minimum retention time (10 minutes) and maximum velocity (1 ft/s) requirements are met. Stormwater flow rates above the 2-year, 24-hour storm event are designed to flow through the *Swales* and eventually to the existing pond.

Runoff from rooftops and impervious surfaces within DMA's 8 - 13 is proposed to be disconnected. To achieve this, naturally and/or proposed vegetated areas will be utilized to capture the runoff volume from the 85th percentile, 24-hour storm event. Per the template's Form 3-4 the required runoff volume to be captured (after taking into consideration Existing Tree Canopy Preservation) is:

- DMA 8 = 603-cubic feet
- DMA 9 = 0-cubic feet
- DMA 10 = 377-cubic feet
- DMA 11 = 417-cubic feet
- DMA 12 = 465-cubic feet
- DMA 13 = 187-cubic feet

Per the *LID Manual*, disconnected rooftops and impervious surfaces should be directed to established vegetated areas via splash pads, bubble-up emitters and/or sheet flow. Landscaped and/or naturally vegetated areas receiving runoff from rooftops and imperious surfaces should be sized on an impervious:pervious ratio of 2:1. Under final design, this area ratio will be verified for DMA's 8 – 13 to effectively treat the runoff volumes listed above.

Results of the *LID Manual's* template are provided in Appendix G.

VI. CONCLUSIONS

1. The methods used to calculate storm runoff for this project are in compliance with the *Manual and SWMM*.

2. The proposed Project lies outside of a FEMA-designated Flood Zone or Special Flood Hazard Area.

3. 10-Year storm flows generated from the site are conveyed through onsite swales, vegetated swales and underground roadway cross-culverts.

4. Onsite storm runoff from impervious surfaces is reduced through proposed Site Design Measures consisting of Existing Tree Canopy Preservation, Disconnection and Vegetated Swales, providing permanent BMP facilities and LID measures.

5. The proposed Site Design Measures will provide the required water quality treatment and runoff reduction needed for the proposed Reserve Residential subdivision.

VII. REFERENCES

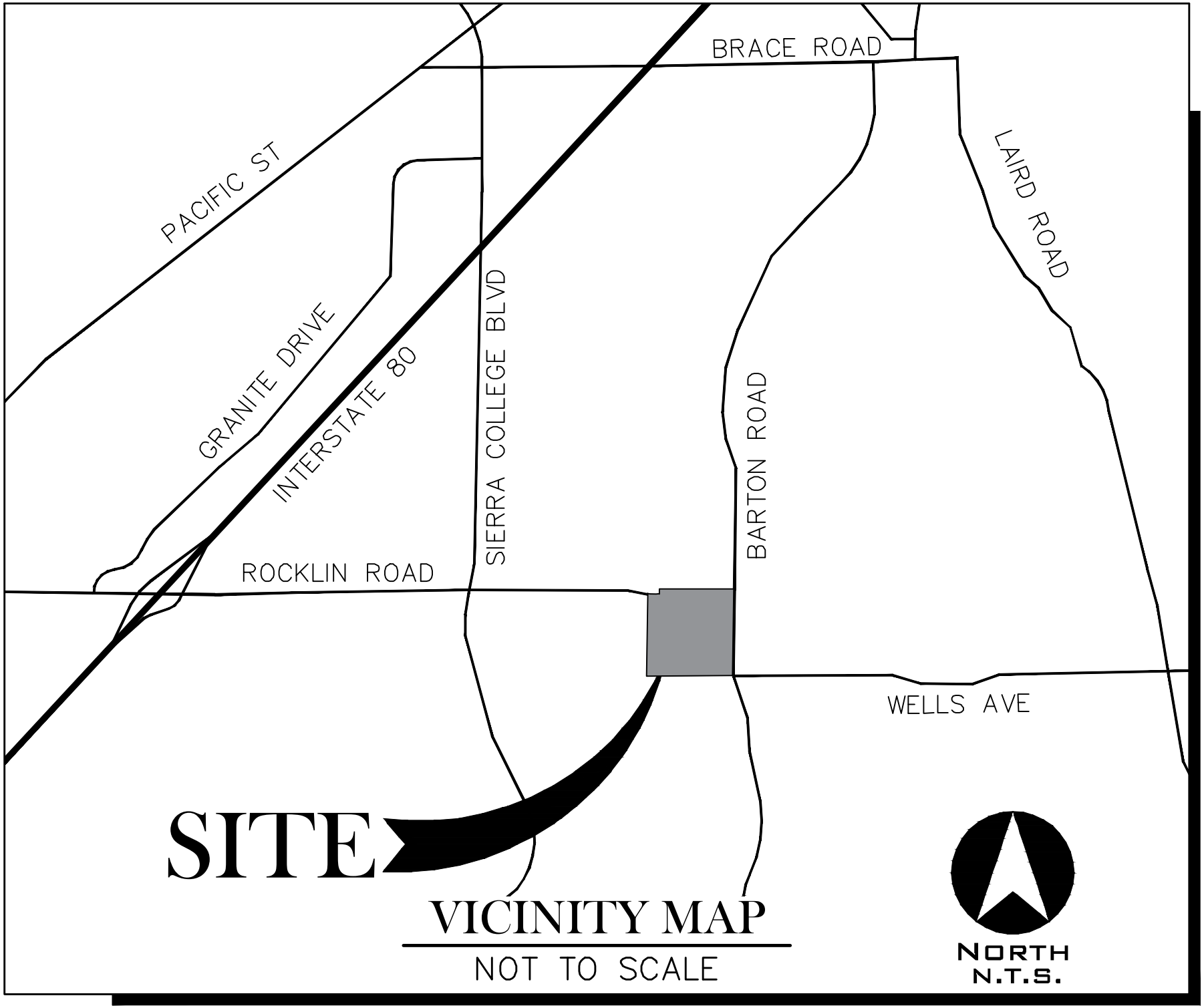
1. Town of Loomis. *Town of Loomis Land Development Manual*. March, 2004
2. Placer County Flood Control and Water Conservation District. *Stormwater Management Manual*. September 1, 1990.

3. West Placer. *Storm Water Quality Design Manual*. April 2016.

4. Natural Resources Conservation Service. *Soil Survey of Placer County, California – Western Part*. Survey Area Data: Version 15, August 31, 2023.

APPENDIX A – VICINITY MAP

Vicinity Map



VICINITY MAP

NOT TO SCALE

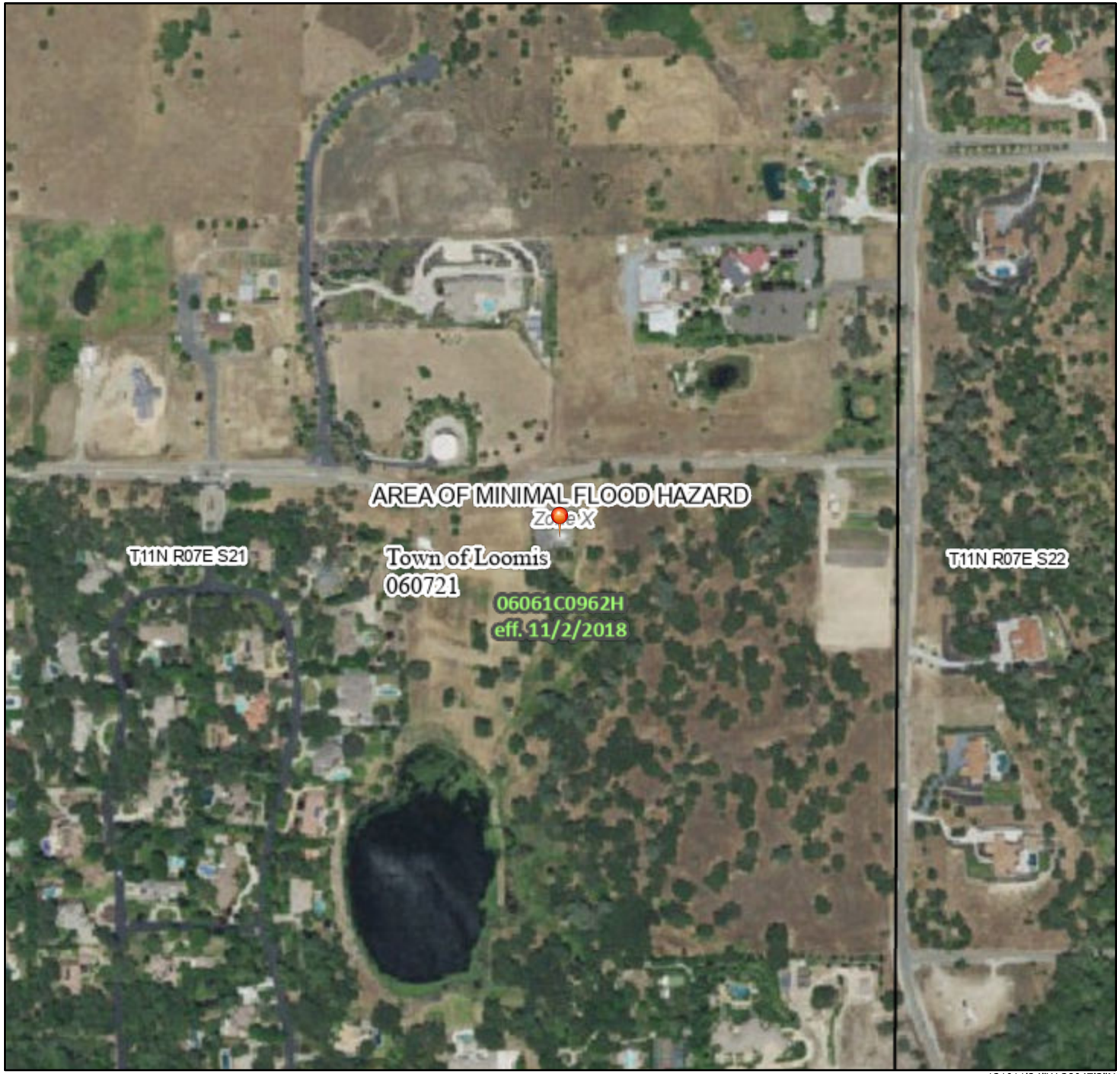
APPENDIX B - FEMA MAP

FEMA Map

National Flood Hazard Layer FIRMette

FEMA

121°12'2"W 38°47'31"N



121°11'24"W 38°47'3"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 — Cross Sections with 1% Annual Chance
- 17.5 — Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/10/2024 at 3:30 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

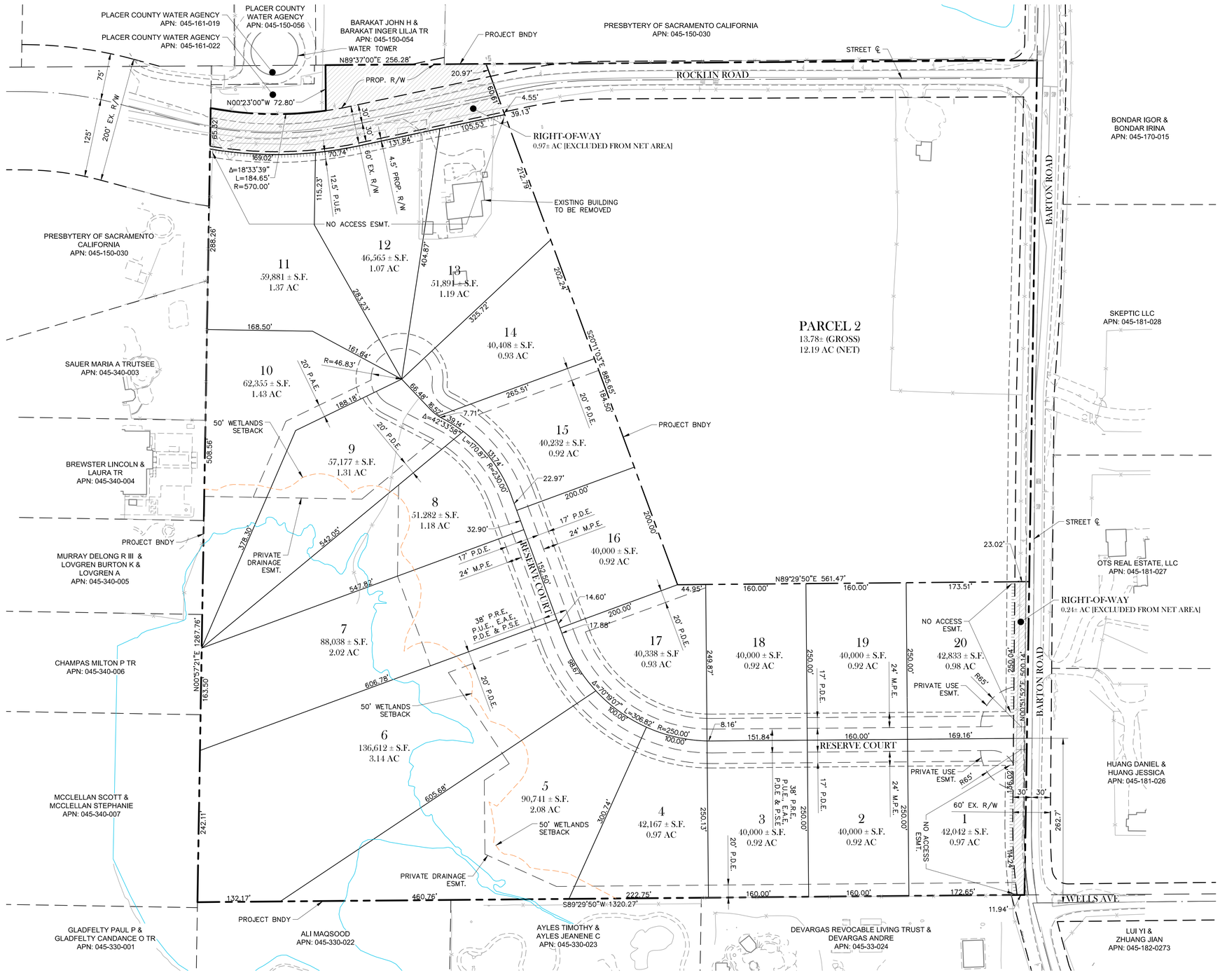
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX C – TSM & WEB SOIL SURVEY

Tentative Subdivision Map

Web Soil Survey Data

TENTATIVE SUBDIVISION MAP



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ENGINEER

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FOLSOM, CA 95630
ATTN: CASEY FEICKERT
EMAIL: cfeickert@tsdeng.com
PHONE: (916) 608-0707

DISTRICT ZONES

SANITARY SEWER
SOUTH PLACER MUNICIPAL UTILITY DISTRICT (SPMUD)

STORM DRAIN
TOWN OF LOOMIS

WATER
PLACER COUNTY WATER AGENCY (PCWA)

FIRE
SOUTH PLACER FIRE DISTRICT

GAS
PACIFIC GAS & ELECTRIC COMPANY (PG&E)

ELECTRIC
PACIFIC GAS & ELECTRIC COMPANY (PG&E)

PARK DISTRICT
TOWN OF LOOMIS

ELEM. SCHOOL DISTRICT
LOOMIS UNION SCHOOL DISTRICT

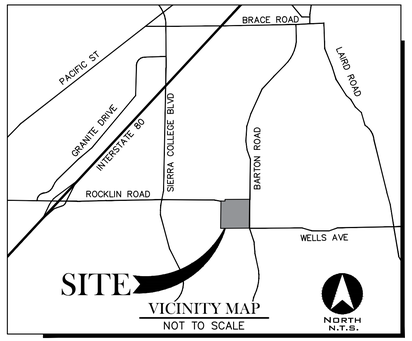
HIGH SCHOOL DISTRICT
PLACER UNION HIGH SCHOOL DISTRICT

FLOOD ZONE

ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) PER THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP, MAP NO. 06061C0962H, DATED NOVEMBER 2, 2018.

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS MAP IS THE NORTHERLY LINE OF LOTS 43, 44, & 45, AS SAID LOTS ARE SHOWN ON THE AMENDED PLAT OF "ST. FRANCIS WOODS", FILED ON AUGUST 14, 1991, IN BOOK R OF MAPS, AT PAGE 60, PLACER COUNTY RECORDS.



INDEX OF DRAWINGS

PROJECT SUMMARY

ASSESSOR S PARCEL NO.
045-161-033

ADDRESS
5780 ROCKLIN RD

EXISTING USE
SINGLE FAMILY, AGRICULTURAL

PROPOSED USE
SINGLE FAMILY RESIDENTIAL, 20 LOTS

GENERAL PLAN
RR - RURAL RESIDENTIAL

EXISTING ZONING
RR - RURAL RESIDENTIAL

PROPOSED ZONING
RR - RURAL RESIDENTIAL

LOT SIZE
RESIDENTIAL LOTS - 20 LOTS
MINIMUM: 40,000 SF
MAXIMUM: 136,612 SF
AVERAGE: 54,628 SF

PROJECT AREA
GROSS: 26.29± AC (1,145,269 SF)
R/W: 1.21± AC (52,702 SF)
NET: 25.08± AC (1,092,567 SF)

DEVELOPMENT STANDARDS (RR)

CRITERIA	STANDARD
NET LOT AREA (SF)	40,000
MIN. LOT DEPTH (FT)	100
MIN. LOT WIDTH (FT)	135
MAX LOT COVERAGE (%)	20
FRONT SETBACK (FT)	75 AVG. (50 MIN.)
SIDE SETBACK (FT)	20
REAR SETBACK (FT)	20
MAX HEIGHT (FT)	35

FRONT SETBACK VARIANCE

THE COMBINED FRONT SETBACK FOR LOTS WITHIN THE COMMUNITY SHALL BE AN AVERAGE OF 75' OR MORE FROM THE CENTERLINE OF THE ROADWAY. IN NO EVENT SHALL THE FRONT SETBACK OF A LOT BE LESS THAN 50' FROM THE CENTERLINE OF THE ROADWAY. FRONT SETBACKS OF LESS THAN 75' SHALL BE GRANTED WHERE BENEFICIAL FOR THE PROTECTION OF NATURAL RESOURCES LIKE WETLANDS, TREES, ROCK OUTCROPPINGS AND OTHER DESIRABLE NATURAL FEATURES CURRENTLY EXISTING ON THE PROPERTY.

SW Corner of Rocklin Road and Barton Road
Loomis, California

Proposed By:
PREMIER HOMES
8483 Douglas Plaza Dr
Granite Bay, CA 95746

APRIL 1, 2025
2ND SUBMITTAL

TSD ENGINEERING, INC.
expect more.
785 Orchard Drive, Suite #110
Folsom, CA 95630
Phone: (916) 608-0707
Fax: (916) 608-0701

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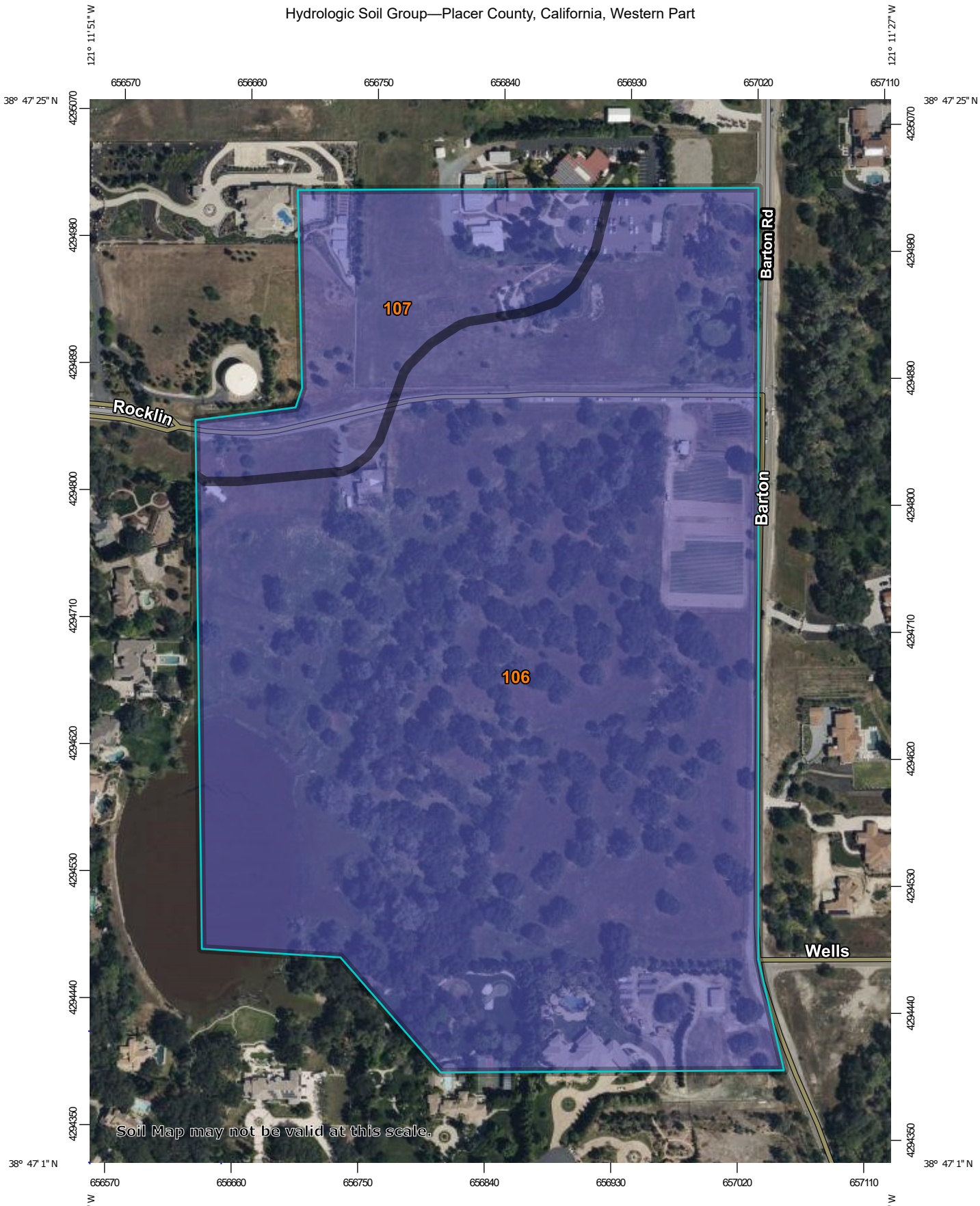


Map Scale: 1:3,670 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Placer County, California, Western Part
Survey Area Data: Version 15, Aug 31, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 23, 2022—Apr 24, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
106	Andregg coarse sandy loam, 2 to 9 percent slopes	B	48.9	86.9%
107	Andregg coarse sandy loam, 9 to 15 percent slopes	B	7.4	13.1%
Totals for Area of Interest			**56.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX D – SHED MAPS

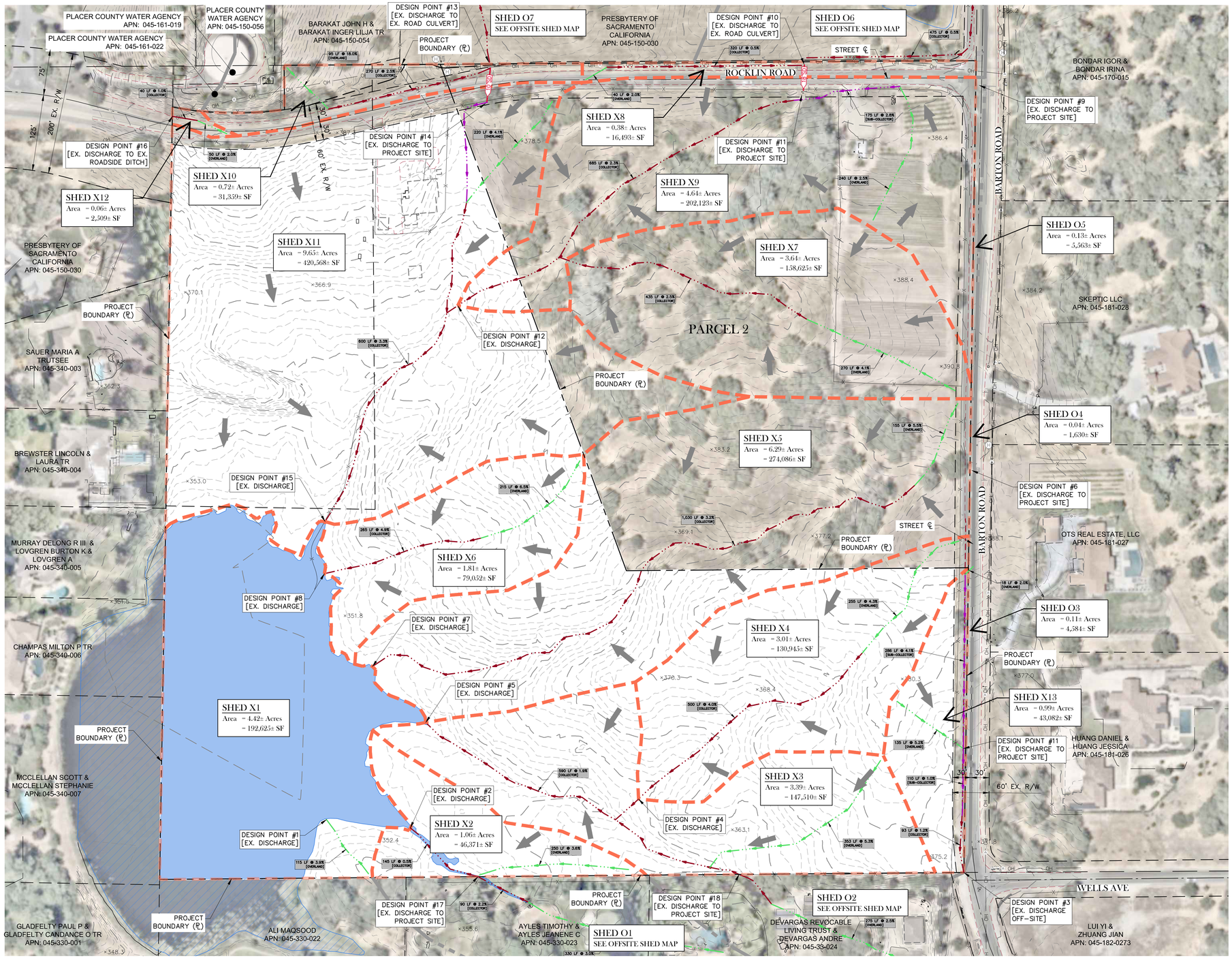
EXH 1 – Existing Shed Map (Onsite)

EXH 2 – Existing Shed Map (Offsite)

EXH 3 – Developed Shed Map (Onsite)

EXH 4 – Developed Shed Map (Offsite)

Existing Shed Map (Onsite)



KEY FEATURES LEGEND:

- EXISTING SHED BOUNDARY
- EXISTING SHED BOUNDARY [ON PL]
- EXISTING SHED BOUNDARY [OFFSITE]
- COLLECTOR FLOW PATH
- SUB-COLLECTOR FLOW PATH
- OVERLAND FLOW PATH
- EXISTING CONTOUR (MAJOR) [SEE NOTE 1]
- EXISTING CONTOUR (MINOR) [SEE NOTE 1]
- EXISTING OFFSITE CONTOUR (20-FT) [SEE NOTE 2]
- EXISTING POND - APPROX. HIGH WATER EDGE [ONSITE – WITHIN PROJECT BOUNDARY]
- EXISTING POND - APPROX. HIGH WATER EDGE [OFFSITE – OUTSIDE PROJECT BOUNDARY]
- EXISTING STORM DRAIN
- EXISTING STORM DRAIN MANHOLE
- EXISTING DRAIN INLET
- DESIGN POINT I.D. [DESIGN POINT #X / EX. DRAIN]
- SURFACE FLOW DIRECTION

GENERAL NOTES:

1. EXISTING GROUND CONTOURS (5–FT MAJOR & 1–FT MINOR) BASED AERIAL TOPOGRAPHIC SURVEY PREPARED BY TSD ENGINEERING, INC. – DATE OF SURVEY: APRIL 2024.
2. EXISTING GROUND CONTOURS (20–FT) BASED ON PLACER COUNTY OPEN DATA (GIS CONTOUR DATA) – UPDATED APRIL 18, 2023.

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scale: 1"=80'

80 0 40 80 160

THE RESERVE - TOWN OF LOOMIS EXH-I

SW Corner of Rocklin Road and Barton Road
Loomis, California

Proposed By:

PREMIER HOMES
8483 Douglas Plaza Dr
Granite Bay, CA 95746

APRIL 1, 2025
2ND SUBMITTAL

TSD ENGINEERING, INC.
expect more.
785 Orchard Drive, Suite #110
Folsom, CA 95630
Phone: (916) 608-0707
Fax: (916) 608-0701

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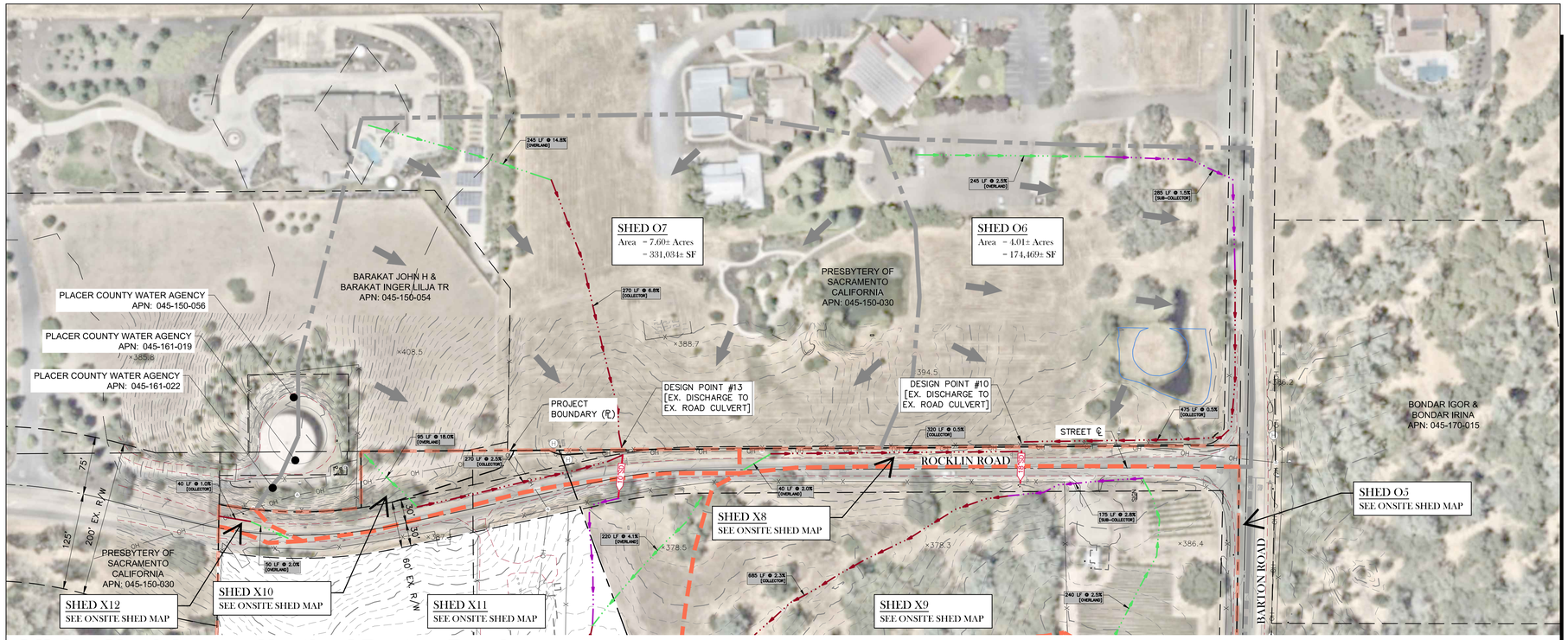
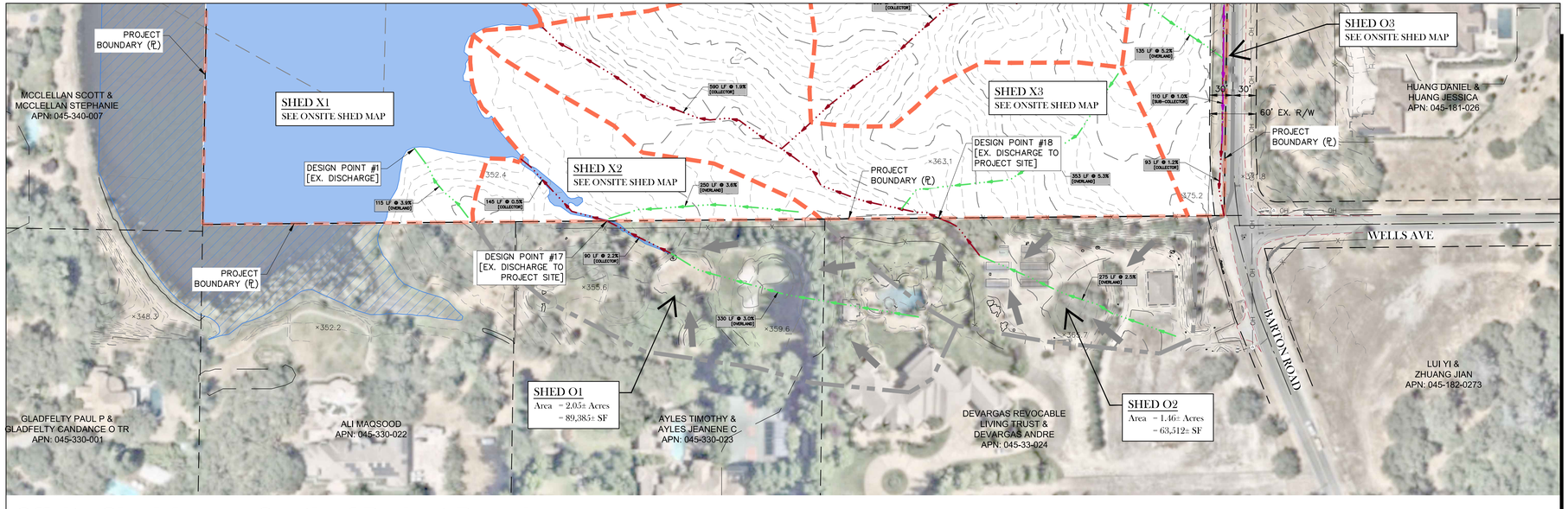
Existing Shed Map (Offsite)



Offsite Shed Areas - North of Barton Road



Offsite Shed Areas - South of Project Boundary

KEY FEATURES LEGEND:

- EXISTING SHED BOUNDARY
- EXISTING SHED BOUNDARY [ON PL]
- EXISTING SHED BOUNDARY [OFFSITE]
- COLLECTOR FLOW PATH
- SUB-COLLECTOR FLOW PATH
- OVERLAND FLOW PATH
- EXISTING CONTOUR (MAJOR) [SEE NOTE 1]
- EXISTING CONTOUR (MINOR) [SEE NOTE 1]
- EXISTING OFFSITE CONTOUR (20-FT) [SEE NOTE 2]
- EXISTING POND - APPROX. HIGH WATER EDGE [ONSITE – WITHIN PROJECT BOUNDARY]
- EXISTING POND - APPROX. HIGH WATER EDGE [OFFSITE – OUTSIDE PROJECT BOUNDARY]
- EXISTING STORM DRAIN
- EXISTING STORM DRAIN MANHOLE
- EXISTING DRAIN INLET
- DESIGN POINT #X [EX. DRAIN] — DESIGN POINT I.D.
- SURFACE FLOW DIRECTION

GENERAL NOTES:

1. EXISTING GROUND CONTOURS (5–FT MAJOR & 1–FT MINOR) BASED AERIAL TOPOGRAPHIC SURVEY PREPARED BY TSD ENGINEERING, INC. – DATE OF SURVEY: APRIL 2024.
2. EXISTING GROUND CONTOURS (20–FT) BASED ON PLACER COUNTY OPEN DATA (GIS CONTOUR DATA) – UPDATED APRIL 18, 2023.

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scale: 1"=80'

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THE RESERVE - TOWN OF LOOMIS EXH-2

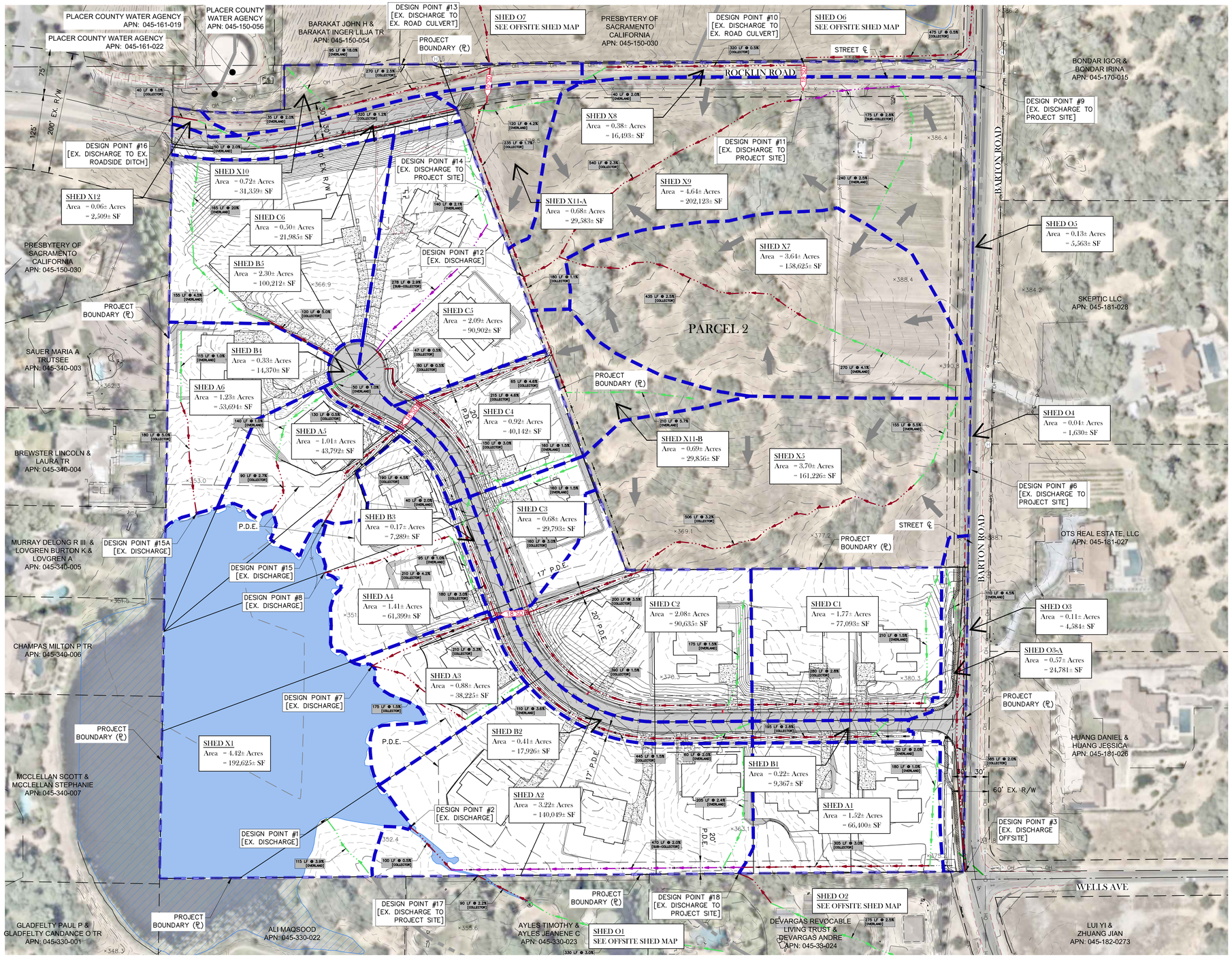
SW Corner of Rocklin Road and Barton Road
Loomis, California

Proposed By:
PREMIER HOMES
8483 Douglas Plaza Dr
Granite Bay, CA 95746

APRIL 1, 2025
2ND SUBMITTAL

TSD ENGINEERING, INC.
expect more.
785 Orchard Drive, Suite #110
Folsom, CA 95630
Phone: (916) 608-0707
Fax: (916) 608-0701

Developed Shed Map (Onsite)



KEY FEATURES LEGEND:

- DEVELOPED SHED BOUNDARY
- DEVELOPED SHED BOUNDARY [ON PL]
- EXISTING SHED BOUNDARY [OFFSITE]
- COLLECTOR FLOW PATH
- SUB-COLLECTOR FLOW PATH
- OVERLAND FLOW PATH
- EXISTING CONTOUR (MAJOR) [SEE NOTE 1]
- EXISTING CONTOUR (MINOR) [SEE NOTE 1]
- EXISTING OFFSITE CONTOUR (20-FT) [SEE NOTE 2]
- EXISTING POND - APPROX. HIGH WATER EDGE [ONSITE – WITHIN PROJECT BOUNDARY]
- EXISTING POND - APPROX. HIGH WATER EDGE [OFFSITE – OUTSIDE PROJECT BOUNDARY]
- EXISTING STORM DRAIN
- EXISTING STORM DRAIN MANHOLE
- EXISTING DRAIN INLET
- PROPOSED STORM DRAIN
- DESIGN POINT #X [EX. DISCHARGE]
- SURFACE FLOW DIRECTION

GENERAL NOTES:

1. EXISTING GROUND CONTOURS (5–FT MAJOR & 1–FT MINOR) BASED AERIAL TOPOGRAPHIC SURVEY PREPARED BY TSD ENGINEERING, INC. – DATE OF SURVEY: APRIL 2024.
2. EXISTING GROUND CONTOURS (20–FT) BASED ON PLACER COUNTY OPEN DATA (GIS CONTOUR DATA) – UPDATED APRIL 18, 2023.

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THE RESERVE - TOWN OF LOOMIS EXH-3

SW Corner of Rocklin Road and Barton Road
Loomis, California

Proposed By:
PREMIER HOMES
8483 Douglas Plaza Dr
Granite Bay, CA 95746

APRIL 1, 2025
2ND SUBMITTAL

TSD ENGINEERING, INC.
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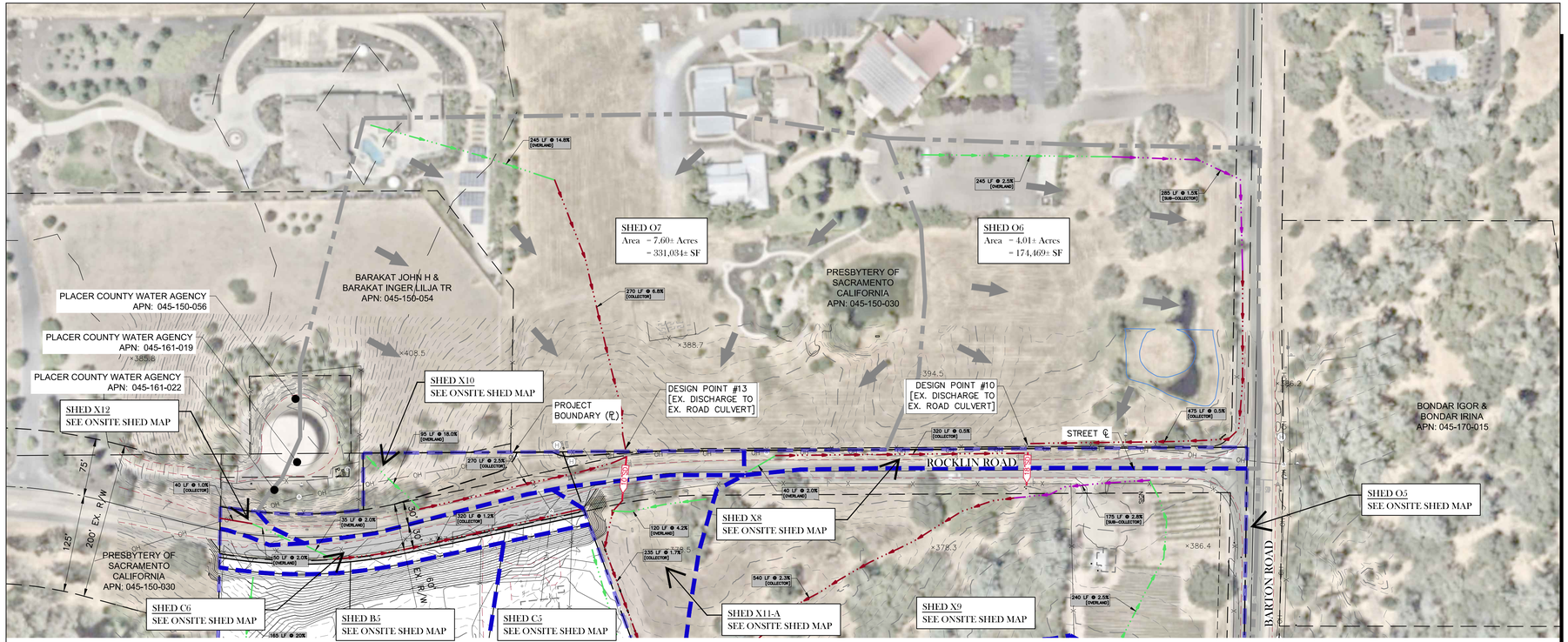
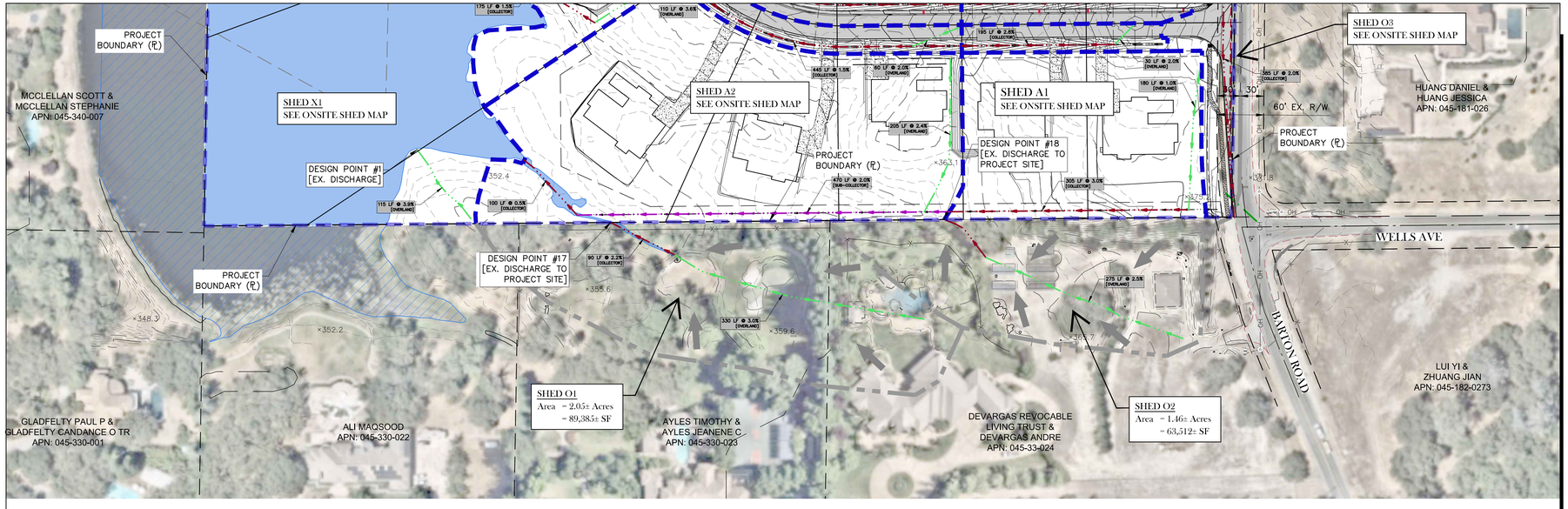
Developed Shed Map (Offsite)



Offsite Shed Areas - North of Barton Road



Offsite Shed Areas - South of Project Boundary

KEY FEATURES LEGEND:

- DEVELOPED SHED BOUNDARY
- DEVELOPED SHED BOUNDARY [ON PL]
- EXISTING SHED BOUNDARY [OFFSITE]
- COLLECTOR FLOW PATH
- SUB-COLLECTOR FLOW PATH
- OVERLAND FLOW PATH
- EXISTING CONTOUR (MAJOR) [SEE NOTE 1]
- EXISTING CONTOUR (MINOR) [SEE NOTE 1]
- EXISTING OFFSITE CONTOUR (20-FT) [SEE NOTE 2]
- EXISTING POND - APPROX. HIGH WATER EDGE [ONSITE – WITHIN PROJECT BOUNDARY]
- EXISTING POND - APPROX. HIGH WATER EDGE [OFFSITE – OUTSIDE PROJECT BOUNDARY]
- EXISTING STORM DRAIN
- EXISTING STORM DRAIN MANHOLE
- EXISTING DRAIN INLET
- PROPOSED STORM DRAIN
- DESIGN POINT #X [EX. DISCHARGE]
- SURFACE FLOW DIRECTION

GENERAL NOTES:

1. EXISTING GROUND CONTOURS (5–FT MAJOR & 1–FT MINOR) BASED AERIAL TOPOGRAPHIC SURVEY PREPARED BY TSD ENGINEERING, INC. – DATE OF SURVEY: APRIL 2024.
2. EXISTING GROUND CONTOURS (20–FT) BASED ON PLACER COUNTY OPEN DATA (GIS CONTOUR DATA) – UPDATED APRIL 18, 2023.

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scale: 1"=80'

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THE RESERVE - TOWN OF LOOMIS EXH-4

SW Corner of Rocklin Road and Barton Road
Loomis, California

Proposed By: **PREMIER HOMES**
8483 Douglas Plaza Dr
Granite Bay, CA 95746

APRIL 1, 2025
2ND SUBMITTAL

TSD ENGINEERING, INC.
expect more.
785 Orchard Drive, Suite #110
Folsom, CA 95630
Phone: (916) 608-0707
Fax: (916) 608-0701

APPENDIX E - HYDROLOGY

Table E1 – Existing Conditions – Shed Data

Table E2 – Proposed Conditions – Shed "A" Data

Table E3 – Proposed Conditions – Shed "B" Data

Table E4 – Proposed Conditions – Shed "C" Data

Table E5 – Proposed Conditions – Shed "X" + Cumulative Shed Data

THE RESERVE

TABLE E1 - EXISTING CONDITIONS - SHED DATA

Date: 27-Sep-24 By: TNJ Revised: 2-Apr-25 By: JM

	SHED CHARACTERISTICS											RESPONSE TIME				DISCHARGE RATE					
Drainage Shed I.D. [Design Point #]	Shed Area (acres)	Flow Type	Soil Type	Ground Cover	Cover Condition	Constant Loss Rate (in/hr)	Impervious %	Slope (Ft/Ft)	Travel Length (ft)	Manning's n	Side Slope (Z) (ft/ft)	Overland Flow Response Time (minutes)	Collector Response Time (minutes)	Collector Tributary Area (acres)	Total Response Time[1] (minutes)	Elevation (ft)	Unit Peak Discharge q10 (cfs/ac)	Unit Peak Discharge q100 (cfs/ac)	Infiltration Factor Fi (cfs/ac)	Peak Flow Q_{10} (cfs)	Peak Flow Q_{100} (cfs)
SHED X1	**4.42**	Overland	B	Woodland,Grass	Fair	0.18	90	0.039	115	0.150		5.19			**5**	370	2.55	5.00	0.30	**10.07**	**20.90**
				Graded Swale				0.000	0	0.000	0.00		0.00	0.00							
[EXISTING POND]												**5.19**	**0.00**								
SHED X2	**1.06**	Overland	B	Woodland,Grass	Fair	0.18	5	0.036	250	0.150		8.47			**10**	370	2.10	3.85	0.30	**2.21**	**4.07**
		Collector		Natural Swale				0.005	145	0.040	5.00		1.03	1.06							
[DESIGN POINT #2]												**8.47**	**1.03**								
SHED O1	**2.05**	Overland	B	Woodland,Grass	Fair	0.18	6	0.030	330	0.150		10.56			**11**	370	2.00	3.80	0.30	**4.06**	**7.75**
		Collector		Natural Swale				0.022	90	0.035	5.00		0.28	2.05							
[DESIGN POINT #17]												**10.56**	**0.28**								
SHEDS X2 + O1	**3.11**	Overland	B	Woodland,Grass	Fair	0.18	6	0.030	330	0.150		10.56			**12**	370	1.95	3.55	0.30	**6.01**	**10.98**
		Collector		Natural Swale				0.022	90	0.035	5.00		0.28	2.05							
		Collector		Natural Swale				0.005	145	0.040	5.00		0.79	3.11							
[DESIGN POINT #2]												**10.56**	**1.07**								
SHED X3	**3.39**	Overland	B	Woodland,Grass	Fair	0.18	5	0.053	353	0.150		9.27			**11**	370	2.30	4.20	0.30	**7.75**	**14.19**
		Collector		Natural Swale				0.019	590	0.035	5.00		1.73	3.39							
[DESIGN POINT #5]												**9.27**	**1.73**								
SHED X4	**3.01**	Overland	B	Woodland,Grass	Fair	0.18	5	0.043	255	0.150		8.12			**9**	370	2.20	3.90	0.30	**6.58**	**11.69**
		Collector		Natural Swale				0.040	500	0.035	5.00		1.14	3.01							
[DESIGN POINT #4]												**8.12**	**1.14**								
SHED O2	**1.46**	Overland	B	Woodland,Grass	Fair	0.18	10	0.025	275	0.150		10.00			**10**	370	2.10	3.85	0.30	**3.02**	**5.58**
		Collector		Natural Swale				0.019	90	0.035	10.00		0.38	1.46							
[DESIGN POINT #18]												**10.00**	**0.38**								
SHEDS X3-X4 + O2	**7.97**	Overland	B	Woodland,Grass	Fair	0.18	15	0.025	275	0.150		10.00			**12**	370	1.95	3.55	0.30	**15.18**	**27.93**
		Collector		Natural Swale				0.019	90	0.035	10.00		0.38	1.46							
		Collector		Natural Swale				0.019	590	0.035	5.00		1.39	7.97							
[DESIGN POINT #5]												**10.00**	**1.78**								
SHED O3	**0.11**	Overland	B	AC Pavement	Fair	0.06	98	0.020	18	0.110		1.73			**3**	370	2.55	5.00	0.10	**0.27**	**0.54**
		Sub-Collector		AC Curb				0.041	286	0.015	50.00		1.38	0.11							
[DESIGN POINT #11]												**1.73**	**1.38**								
SHED X13	**0.99**	Overland	B	Woodland,Grass	Fair	0.18	5	0.052	135	0.150		5.24			**5**	370	2.55	5.00	0.30	**2.51**	**4.94**
				AC Curb				0.000	0	0.000	0.00		0.00	0.00							
[DESIGN POINT #11]												**5.24**	**0.00**								
SHED X13 + O3	**1.10**	Overland	B	AC Pavement	Fair	0.06	98	0.020	18	0.110		1.73			**2**	370	2.55	5.00	0.10	**2.70**	**5.39**
		Sub-Collector		AC Curb				0.041	286	0.015	50.00		1.38	0.11							
		Sub-Collector		AC Curb				0.010	110	0.015	50.00		0.51	1.10							
		Collector		Natural Swale				0.012	93	0.035	5.00			1.10							
[DESIGN POINT #3]												**1.73**	**0.51**								
SHED X5	**6.29**	Overland	B	Woodland,Grass	Fair	0.18	5	0.055	155	0.150		5.60			**8**	370	2.30	4.20	0.30	**14.37**	**26.32**
		Collector		Natural Swale				0.032	1030	0.035	5.00		2.12	6.29							
[DESIGN POINT #7]												**5.60**	**2.12**								
SHED O4	**0.04**	Overland	B	AC Pavement	Fair	0.06	98	0.020	18	0.110		1.73			**3**	370	2.55	5.00	0.10	**0.10**	**0.20**
		Collector		AC Curb				0.030	120	0.015	50.00		0.84	0.04							
[DESIGN POINT #6]												**1.73**	**0.84**								
SHEDS X5 + O4	**6.33**	Overland	B	Woodland,Grass	Fair	0.18	6	0.055	155	0.150		5.60			**8**	370	2.30	4.20	0.30	**14.44**	**26.47**
		Collector		Natural Swale				0.032	1030	0.035	5.00		2.12	6.33							
[DESIGN POINT #7]												**5.60**	**2.12**								

THE RESERVE

TABLE E1 - EXISTING CONDITIONS - SHED DATA

Date: 27-Sep-24 By: TNJ Revised: 2-Apr-25 By: JM

	SHED CHARACTERISTICS											RESPONSE TIME				DISCHARGE RATE					
Drainage Shed I.D. [Design Point #]	**Shed Area (acres)**	**Flow Type**	**Soil Type**	**Ground Cover**	**Cover Condition**	**Constant Loss Rate** (in/hr)	**Impervious %**	**Slope** (Ft/Ft)	**Travel Length** (ft)	**Manning's n**	**Side Slope (Z)** (ft/ft)	**Overland Flow Response Time** (minutes)	**Collector Response Time** (minutes)	**Collector Tributary Area** (acres)	**Total Response Time[1]** (minutes)	**Elevation** (ft)	**Unit Peak Discharge q10** (cfs/ac)	**Unit Peak Discharge q100** (cfs/ac)	**Infiltration Factor Fi** (cfs/ac)	**Peak Flow Q_{10}** (cfs)	**Peak Flow Q_{100}** (cfs)
SHED X6	**1.81**	Overland	B	Woodland,Grass	Fair	0.18	5	0.065	215	0.150		6.48			**7**	370	2.35	4.55	0.30	**4.23**	**8.21**
		Collector		Natural Swale				0.049	265	0.035	5.00		0.64	1.81							
[DESIGN POINT #8]												**6.48**	**0.64**								
SHED X7	**3.64**	Overland	B	Woodland,Grass	Fair	0.18	5	0.041	270	0.150		8.53			**10**	370	2.10	3.85	0.30	**7.59**	**13.96**
		Collector		Natural Swale				0.025	435	0.035	5.00		1.13	3.64							
[DESIGN POINT #__]												**8.53**	**1.13**								
SHED X8	**0.38**	Overland	B	AC Pavement	Fair	0.06	50	0.020	40	0.110		2.79			**5**	370	2.55	5.00	0.10	**0.95**	**1.88**
		Collector		Graded Swale				0.005	320	0.030	3.00		2.13	0.38							
[DESIGN POINT #10]												**2.79**	**2.13**								
SHED X9	**4.64**	Overland	B	Woodland,Grass	Fair	0.18	5	0.025	240	0.150		9.22			**11**	370	2.00	3.80	0.30	**9.21**	**17.56**
		Sub-Collector		Graded Swale				0.028	175	0.030	3.00		0.43	1.50							
		Collector		Natural Swale				0.023	685	0.035	5.00		1.72	4.64							
[DESIGN POINT #12]												**9.22**	**2.16**								
SHED X10	**0.72**	Overland	B	Woodland,Grass	Fair	0.18	45	0.180	95	0.150		2.92			**4**	370	2.55	5.00	0.30	**1.74**	**3.50**
		Collector		Graded Swale				0.025	270	0.030	3.00		0.84	0.72							
[DESIGN POINT #13]												**2.92**	**0.84**								
SHED X11	**9.65**	Overland	B	Woodland,Grass	Fair	0.18	5	0.041	220	0.150		7.54			**9**	370	2.20	3.90	0.30	**21.08**	**37.49**
		Collector		Natural Swale				0.033	600	0.035	5.00		1.10	9.65							
[DESIGN POINT #15]												**7.54**	**1.10**								
SHED X12	**0.06**	Overland	B	AC Pavement	Fair	0.06	60	0.020	50	0.110		3.19			**4**	370	2.55	5.00	0.10	**0.15**	**0.30**
		Collector		Graded Swale				0.010	40	0.030	3.00		0.33	0.06							
[DESIGN POINT #16]												**3.19**	**0.33**								
SHED O5	**0.13**	Overland	B	AC Pavement	Fair	0.06	98	0.020	18	0.110		1.73			**5**	370	2.55	5.00	0.10	**0.32**	**0.64**
		Collector		AC Curb				0.012	490	0.015	50.00		3.59	0.13							
[DESIGN POINT #9]												**1.73**	**3.59**								
SHED O6	**4.01**	Overland	B	Woodland,Grass	Fair	0.18	15	0.025	245	0.150		9.33			**12**	370	1.95	3.55	0.30	**7.64**	**14.05**
		Sub-Collector		Graded Swale				0.015	285	0.030	10.00		1.30	1.00							
		Collector		Graded Swale				0.005	475	0.030	3.00		1.75	4.01							
[DESIGN POINT #10]												**9.33**	**3.05**								
SHED O7	**7.60**	Overland	B	Woodland,Grass	Fair	0.18	15	0.148	245	0.150		5.47			**6**	370	2.40	4.80	0.30	**17.90**	**36.14**
		Collector		Natural Swale				0.068	270	0.030	10.00		0.42	7.60							
[DESIGN POINT #13]												**5.47**	**0.42**								
SHEDS X7-X9 + O5-O6	**12.80**	Overland	B	Woodland,Grass	Fair	0.18	18	0.025	245	0.150		9.33			**14**	370	1.80	3.20	0.30	**22.35**	**40.27**
		Sub-Collector		Graded Swale				0.015	285	0.030	10.00		1.30	1.00							
		Collector		Graded Swale				0.005	475	0.030	3.00		1.75	4.01							
		Collector		Natural Swale				0.023	685	0.035	5.00		1.34	12.80							
[DESIGN POINT #12]												**9.33**	**4.39**								
SHEDS X7-X11 + O5-O7	**30.77**	Overland	B	Woodland,Grass	Fair	0.18	18	0.025	245	0.150		9.33			**14**	370	1.80	3.20	0.30	**53.72**	**96.80**
		Sub-Collector		Graded Swale				0.015	285	0.030	10.00		1.30	1.00							
		Collector		Graded Swale				0.005	475	0.030	3.00		1.75	4.01							
		Collector		Natural Swale				0.023	685	0.035	5.00		1.34	12.80							
		Collector		Natural Swale				0.033	415	0.035	5.00		0.57	30.77							
[DESIGN POINT #15]												**9.33**	**4.96**								

Notes:

1. Minimum response time of 5 minutes is used for all response times calculated to be less than 5 minutes.

THE RESERVE

TABLE E2 - PROPOSED CONDITIONS - SHED "A" DATA

Date: 27-Sep-24 **By:** TNJ **Revised:** 2-Apr-25 **By:** JM

	SHED CHARACTERISTICS											RESPONSE TIME				DISCHARGE RATE					
Drainage Shed I.D. [Design Point #]	**Shed Area (acres)**	**Flow Type**	**Soil Type**	**Ground Cover**	**Cover Condition**	**Constant Loss Rate** (in/hr)	**Impervious %**	**Slope** (Ft/Ft)	**Travel Length** (ft)	**Manning's n**	**Side Slope (Z)** (ft/ft)	**Overland Flow Response Time** (minutes)	**Collector Response Time** (minutes)	**Collector Tributary Area** (acres)	**Total Response Time[1]** (minutes)	**Elevation** (ft)	**Unit Peak Discharge q10** (cfs/ac)	**Unit Peak Discharge q100** (cfs/ac)	**Infiltration Factor Fi** (cfs/ac)	**Peak Flow Q_{10}** (cfs)	**Peak Flow Q_{100}** (cfs)
SHED A1	**1.52**	Overland	B	Residential	Fair	0.18	30	0.010	180	0.150		10.21			**11**	370	2.00	3.80	0.30	**2.90**	**5.64**
		Collector		Drainage Swale				0.030	305	0.020	3.00		0.54	1.54							
[DESIGN POINT #18]												**10.21**	**0.54**								
SHED O2	**1.46**	Overland	B	Woodland,Grass	Fair	0.18	10	0.025	275	0.150		10.00			**10**	370	2.10	3.85	0.30	**3.02**	**5.58**
		Collector		Natural Swale				0.019	90	0.035	10.00		0.38	1.46							
[DESIGN POINT #18]												**10.00**	**0.38**								
SHEDS A1 + O2	**2.98**	Overland	B	Residential	Fair	0.18	30	0.010	180	0.150		10.21			**11**	370	2.00	3.80	0.30	**5.69**	**11.05**
		Collector		Drainage Swale				0.030	305	0.020	3.00		0.54	1.55							
[DESIGN POINT #18]												**10.21**	**0.54**								
SHED A2	**3.22**	Overland	B	Residential	Fair	0.18	30	0.024	205	0.150		8.49			**10**	370	2.10	3.85	0.30	**6.47**	**12.11**
		Sub-Collector		Drainage Swale				0.020	470	0.020	3.00		0.94	1.75							
		Collector		Natural Swale				0.005	100	0.040	5.00		0.54	3.22							
[DESIGN POINT #2]												**8.49**	**1.48**								
SHED O1	**2.05**	Overland	B	Woodland,Grass	Fair	0.18	6	0.030	330	0.150		10.56			**11**	370	2.00	3.80	0.30	**4.06**	**7.75**
		Collector		Natural Swale				0.022	90	0.035	5.00		0.28	2.05							
[DESIGN POINT #17]												**10.56**	**0.28**								
SHEDS A1-A2 + O1-O2	**8.25**	Overland	B	Residential	Fair	0.18	30	0.010	180	0.150		10.21			**12**	370	1.95	3.55	0.30	**15.34**	**28.54**
		Collector		Drainage Swale				0.030	305	0.020	3.00		0.54	1.55							
		Collector		Drainage Swale				0.020	470	0.020	3.00		0.73	4.76							
		Collector		Natural Swale				0.005	100	0.040	5.00		0.43	8.28							
[DESIGN POINT #2]												**10.21**	**1.69**								
SHED A3	**0.88**	Overland	B	Residential	Fair	0.18	30	0.036	110	0.150		5.17			**6**	370	2.40	4.80	0.30	**2.03**	**4.14**
		Collector		Drainage Swale				0.015	175	0.020	3.00		0.46	0.88							
[DESIGN POINT #7]												**5.17**	**0.46**								
SHED A4	**1.41**	Overland	B	Residential	Fair	0.18	30	0.010	95	0.150		6.96			**7**	370	2.35	4.55	0.30	**3.19**	**6.29**
		Collector		Drainage Swale				0.042	210	0.020	3.00		0.33	1.41							
[DESIGN POINT #8]												**6.96**	**0.33**								
SHED A5	**1.01**	Overland	B	Residential	Fair	0.18	30	0.010	140	0.150		8.78			**9**	370	2.20	3.90	0.30	**2.13**	**3.85**
		Collector		Drainage Swale				0.027	90	0.020	3.00		0.18	1.01							
[DESIGN POINT #___]												**8.78**	**0.18**								
SHED A6	**1.23**	Overland	B	Residential	Fair	0.18	30	0.010	115	0.150		7.80			**8**	370	2.30	4.20	0.30	**2.72**	**5.05**
		Collector		Drainage Swale				0.050	180	0.020	3.00		0.28	1.23							
[DESIGN POINT #15A]												**7.80**	**0.28**								

Notes:

1. Minimum response time of 5 minutes is used for all response times calculated to be less than 5 minutes.

THE RESERVE

TABLE E3 - PROPOSED CONDITIONS - SHED "B" DATA

Date: 27-Sep-24 Revised: 2-Apr-25

By: TNJ By: JM

	SHED CHARACTERISTICS											RESPONSE TIME				DISCHARGE RATE					
Drainage Shed I.D. [Design Point #]	**Shed Area (acres)**	**Flow Type**	**Soil Type**	**Ground Cover**	**Cover Condition**	**Constant Loss Rate** (in/hr)	**Impervious %**	**Slope** (Ft/Ft)	**Travel Length** (ft)	**Manning's n**	**Side Slope (Z)** (ft/ft)	**Overland Flow Response Time** (minutes)	**Collector Response Time** (minutes)	**Collector Tributary Area** (acres)	**Total Response Time[1]** (minutes)	**Elevation** (ft)	**Unit Peak Discharge q10** (cfs/ac)	**Unit Peak Discharge q100** (cfs/ac)	**Infiltration Factor Fi** (cfs/ac)	**Peak Flow Q_{10}** (cfs)	**Peak Flow Q_{100}** (cfs)
SHED B1	**0.22**	Overland	B	AC Pavement	Fair	0.18	50	0.020	30	0.110		2.35			**3**	166	2.55	5.00	0.31	**0.53**	**1.07**
		Collector		Vegetated Swale				0.028	195	0.045	3.00		1.03	0.24							
[DESIGN POINT #__]												**2.35**	**1.03**								
SHED B2	**0.41**	Overland	B	AC Pavement	Fair	0.18	50	0.020	60	0.110		3.56			**6**	166	2.40	4.80	0.31	**0.92**	**1.90**
		Collector		Vegetated Swale				0.015	445	0.045	3.00		2.61	0.41							
[DESIGN POINT #__]												**3.56**	**2.61**								
SHEDS B1 + B2	**0.63**	Overland	B	AC Pavement	Fair	0.18	50	0.020	30	0.110		2.35			**7**	166	2.35	4.55	0.31	**1.38**	**2.77**
		Collector		Vegetated Swale				0.028	195	0.045	3.00		1.03	0.24							
		Collector		Vegetated Swale				0.015	640	0.045	3.00		3.34	0.65							
[DESIGN POINT #__]												**2.35**	**4.37**								
SHED B3	**0.17**	Overland	B	AC Pavement	Fair	0.18	50	0.020	40	0.110		2.79			**4**	166	2.55	5.00	0.31	**0.41**	**0.82**
		Collector		Vegetated Swale				0.030	180	0.045	3.00		1.01	0.17							
[DESIGN POINT #__]												**2.79**	**1.01**								
SHED B4	**0.33**	Overland	B	AC Pavement	Fair	0.18	50	0.020	50	0.110		3.19			**4**	166	2.55	5.00	0.31	**0.79**	**1.60**
		Collector		Vegetated Swale				0.005	130	0.045	3.00		1.21	0.33							
[DESIGN POINT #__]												**3.19**	**1.21**								
SHED B5	**2.30**	Overland	B	Residential	Fair	0.18	30	0.200	165	0.150		3.95			**10**	166	2.10	3.85	0.31	**4.62**	**8.64**
		Overland		Residential				0.045	155	0.150		5.94									
		Collector		Drainage Swale				0.050	120	0.020	3.00		0.16	2.30							
[DESIGN POINT #__]												**9.89**	**0.16**								
SHEDS B4 + B5	**2.63**	Overland	B	Residential	Fair	0.18	40	0.200	165	0.150		3.95			**11**	166	2.00	3.80	0.31	**4.93**	**9.67**
		Overland		Residential				0.045	155	0.150		5.94									
		Collector		Drainage Swale				0.050	120	0.020	3.00		0.16	2.30							
		Collector		Vegetated Swale				0.005	130	0.045	3.00		0.72	2.63							
[DESIGN POINT #__]												**9.89**	**0.88**								

Notes:

1. Minimum response time of 5 minutes is used for all response times calculated to be less than 5 minutes.

THE RESERVE

TABLE E4 - PROPOSED CONDITIONS - SHED "C" DATA

Date: 27-Sep-24 By: TNJ Revised: 2-Apr-25 By: JM

	SHED CHARACTERISTICS											RESPONSE TIME				DISCHARGE RATE					
Drainage Shed I.D. [Design Point #]	Shed Area (acres)	Flow Type	Soil Type	Ground Cover	Cover Condition	Constant Loss Rate (in/hr)	Impervious %	Slope (Ft/Ft)	Travel Length (ft)	Manning's n	Side Slope (Z) (ft/ft)	Overland Flow Response Time (minutes)	Collector Response Time (minutes)	Collector Tributary Area (acres)	Total Response Time[1] (minutes)	Elevation (ft)	Unit Peak Discharge q10 (cfs/ac)	Unit Peak Discharge q100 (cfs/ac)	Infiltration Factor Fi (cfs/ac)	Peak Flow Q_{10} (cfs)	Peak Flow Q_{100} (cfs)
SHED C1	**1.77**	Overland	B	Residential	Fair	0.18	35	0.015	210	0.150		9.92			**11**	370	2.00	3.80	0.30	**3.35**	**6.54**
		Collector		Vegetated Swale				0.028	280	0.045	3.00		0.90	1.80							
[DESIGN POINT #__]												**9.92**	**0.90**								
SHED C2	**2.08**	Overland	B	Residential	Fair	0.18	35	0.015	175	0.150		8.89			**10**	370	2.10	3.85	0.30	**4.15**	**7.79**
		Collector		Vegetated Swale				0.015	390	0.045	3.00		1.41	2.80							
[DESIGN POINT #__]												**8.89**	**1.41**								
SHEDS C1 + C2	**3.85**	Overland	B	Residential	Fair	0.18	35	0.015	210	0.150		9.92			**12**	370	1.95	3.55	0.30	**7.10**	**13.26**
		Collector		Vegetated Swale				0.028	280	0.045	3.00		0.90	1.80							
		Collector		Vegetated Swale				0.015	390	0.045	3.00		1.25	4.60							
[DESIGN POINT #__]												**9.92**	**2.14**								
SHED C3	**0.68**	Overland	B	Residential	Fair	0.18	35	0.015	160	0.150		8.42			**9**	370	2.20	3.90	0.30	**1.42**	**2.58**
		Collector		Vegetated Swale				0.030	160	0.045	3.00		0.64	0.68							
[DESIGN POINT #__]												**8.42**	**0.64**								
SHED C4	**0.92**	Overland	B	Residential	Fair	0.18	35	0.015	160	0.150		8.42			**9**	370	2.20	3.90	0.30	**1.93**	**3.49**
		Collector		Vegetated Swale				0.030	150	0.045	3.00		0.55	0.92							
[DESIGN POINT #__]												**8.42**	**0.55**								
SHED C5	**2.09**	Overland	B	Residential	Fair	0.18	32	0.021	140	0.150		7.03			**10**	370	2.10	3.85	0.30	**4.19**	**7.85**
		Sub-Collector		Drainage Swale				0.029	278	0.020		2.87									
		Collector		PCC Curb & Gutter				0.005	47	0.015	50.00										
		Collector		Vegetated Swale				0.005	80	0.045	3.00		0.47	2.09							
[DESIGN POINT #__]												**9.90**	**0.47**								
SHED C6	**0.50**	Overland	B	AC Pavement	Fair	0.18	50	0.020	35	0.110		2.58			**4**	370	2.55	5.00	0.30	**1.20**	**2.42**
		Collector		PCC Curb & Gutter				0.012	320	0.015	50.00		1.67	0.50							
[DESIGN POINT #__]												**2.58**	**1.67**								

Notes:

1. Minimum response time of 5 minutes is used for all response times calculated to be less than 5 minutes.

THE RESERVE

Date: 27-Sep-24 **Revised: 2-Apr-25**

TABLE E5 - PROPOSED CONDITIONS - SHED "X" + CUMMULATIVE SHED DATA

By: TNJ **By: JM**

	SHED CHARACTERISTICS											RESPONSE TIME				DISCHARGE RATE					
Drainage Shed I.D. [Design Point #]	**Shed Area (acres)**	**Flow Type**	**Soil Type**	**Ground Cover**	**Cover Condition**	**Constant Loss Rate** (in/hr)	**Impervious %**	**Slope** (Ft/Ft)	**Travel Length** (ft)	**Manning's n**	**Side Slope (Z)** (ft/ft)	**Overland Flow Response Time** (minutes)	**Collector Response Time** (minutes)	**Collector Tributary Area** (acres)	**Total Response Time[1]** (minutes)	**Elevation** (ft)	**Unit Peak Discharge q10** (cfs/ac)	**Unit Peak Discharge q100** (cfs/ac)	**Infiltration Factor Fi** (cfs/ac)	**Peak Flow Q_{10}** (cfs)	**Peak Flow Q_{100}** (cfs)
SHED X5	**3.70**	Overland	B	Woodland,Grass	Fair	0.18	5	0.055	155	0.150		5.60			**7**	370	2.35	4.55	0.30	**8.64**	**16.78**
		Collector		Natural Swale				0.032	506	0.035	5.00		1.19	3.70							
[DESIGN POINT #__]												**5.60**	**1.19**								
SHED X11-A	**0.68**	Overland	B	Woodland,Grass	Fair	0.18	5	0.042	120	0.150		5.20			**6**	370	2.40	4.80	0.30	**1.62**	**3.25**
		Collector		Drainage Swale				0.017	235	0.020	3.00		0.63	0.68							
[DESIGN POINT #__]												**5.20**	**0.63**								
SHED X11-B	**0.69**	Overland	B	Woodland,Grass	Fair	0.18	5	0.057	210	0.150		6.64			**7**	370	2.35	4.55	0.30	**1.61**	**3.13**
		Collector		Drainage Swale				0.046	65	0.020	3.00		0.12	0.69							
[DESIGN POINT #__]												**6.64**	**0.12**								
SHED O3-A	**0.57**	Overland	B	Woodland,Grass	Fair	0.18	5	0.045	110	0.150		4.84			**5**	370	2.55	5.00	0.30	**1.44**	**2.84**
		Collector		Natural Swale				0.000	0	0.000	0.00		0.00	0.00							
[DESIGN POINT #__]												**4.84**	**0.00**								
SHED O3 + O3-A	**0.68**	Overland	B	Woodland,Grass	Fair	0.18	5	0.045	110	0.150		4.84			**6**	370	2.40	4.80	0.30	**1.62**	**3.25**
		Collector		AC Curb				0.020	385	0.015	50.00		1.54	0.68							
[DESIGN POINT #3]												**4.84**	**1.54**								
SHEDS X5 + C1-C3	**8.23**	Overland	B	Residential	Fair	0.18	25	0.015	210	0.150		9.92			**12**	370	1.95	3.55	0.30	**15.43**	**28.60**
		Collector		Vegetated Swale				0.028	280	0.045	3.00		0.90	1.77							
		Collector		Vegetated Swale				0.015	390	0.045	3.00		1.08	8.23							
[DESIGN POINT #__]												**9.92**	**1.98**								
SHEDS X5 + C1-C3 + B1-B3	**9.03**	Overland	B	Residential	Fair	0.18	30	0.015	210	0.150		9.92			**12**	370	1.95	3.55	0.30	**16.79**	**31.24**
		Collector		Vegetated Swale				0.028	280	0.045	3.00		0.90	1.77							
		Collector		Vegetated Swale				0.015	390	0.045	3.00		1.08	8.23							
		Collector		Circular Pipe				0.005	48	0.015	1.00		0.08	9.03							
[DESIGN POINT #__]												**9.92**	**2.06**								
SHEDS X10 + X11-A + C6 + O7	**9.50**	Overland	B	Woodland,Grass	Fair	0.18	30	0.148	245	0.150		5.47			**6**	370	2.40	4.80	0.30	**21.94**	**44.74**
		Collector		Natural Swale				0.068	270	0.030	10.00		0.42	7.60							
		Collector		Circular Pipe				0.005	55	0.015	1.00		0.09	8.32							
		Collector		Drainage Swale				0.017	235	0.020	3.00		0.33	9.50							
[DESIGN POINT #__]												**5.47**	**0.84**								
SHEDS X7-X10 + X11-A + C6 + O5-O7	**22.30**	Overland	B	Woodland,Grass	Fair	0.18	30	0.025	245	0.150		9.33			**14**	370	1.80	3.20	0.30	**38.12**	**69.34**
		Sub-Collector		Graded Swale				0.015	285	0.030	10.00		1.30	1.00							
		Collector		Graded Swale				0.005	475	0.030	3.00		1.75	4.01							
		Collector		Circular Pipe				0.005	40	0.015	1.00		0.08	4.39							
		Collector		Natural Swale				0.023	540	0.035	5.00		1.15	9.16							
		Collector		Drainage Swale				0.011	180	0.020	3.00		0.24	22.30							
[DESIGN POINT #__]												**9.33**	**4.51**								
SHEDS X7-X10 + X11-A + X11-B + C6 + O5-O7	**22.99**	Overland	B	Woodland,Grass	Fair	0.18	30	0.025	245	0.150		9.33			**14**	370	1.80	3.20	0.30	**39.30**	**71.49**
		Sub-Collector		Graded Swale				0.015	285	0.030	10.00		1.30	1.00							
		Collector		Graded Swale				0.005	475	0.030	3.00		1.75	4.01							
		Collector		Circular Pipe				0.005	40	0.015	1.00		0.08	4.39							
		Collector		Natural Swale				0.023	540	0.035	5.00		1.15	9.16							
		Collector		Drainage Swale				0.011	180	0.020	3.00		0.24	22.99							
[DESIGN POINT #__]												**9.33**	**4.51**								

THE RESERVE

TABLE E5 - PROPOSED CONDITIONS - SHED "X" + CUMMULATIVE SHED DATA

Date: 27-Sep-24 By: TNJ Revised: 2-Apr-25 By: JM

	SHED CHARACTERISTICS											RESPONSE TIME				DISCHARGE RATE					
Drainage Shed I.D. [Design Point #]	**Shed Area (acres)**	**Flow Type**	**Soil Type**	**Ground Cover**	**Cover Condition**	**Constant Loss Rate** (in/hr)	**Impervious %**	**Slope** (Ft/Ft)	**Travel Length** (ft)	**Manning's n**	**Side Slope (Z)** (ft/ft)	**Overland Flow Response Time** (minutes)	**Collector Response Time** (minutes)	**Collector Tributary Area** (acres)	**Total Response Time[1]** (minutes)	**Elevation** (ft)	**Unit Peak Discharge q10** (cfs/ac)	**Unit Peak Discharge q100** (cfs/ac)	**Infiltration Factor Fi** (cfs/ac)	**Peak Flow Q_{10}** (cfs)	**Peak Flow Q_{100}** (cfs)
SHEDS X7-X10 + X11-A + X11-B + C6 + O5-O7 + C4-C5	**26.00**	Overland	B	Woodland,Grass	Fair	0.18	30	0.025	245	0.150		9.33			**14**	370	1.80	3.20	0.30	**44.45**	**80.85**
		Sub-Collector		Graded Swale				0.015	285	0.030	10.00		1.30	1.00							
		Collector		Graded Swale				0.005	475	0.030	3.00		1.75	4.01							
		Collector		Circular Pipe				0.005	40	0.015	1.00		0.08	4.39							
		Collector		Natural Swale				0.023	540	0.035	5.00		1.15	9.16							
		Collector		Drainage Swale				0.011	180	0.020	3.00		0.24	22.99							
		Collector		Drainage Swale				0.046	215	0.020	3.00		0.15	30.53							
[DESIGN POINT #__]												**9.33**	**4.66**								
	28.63	Overland	B	Woodland,Grass	Fair	0.18	30	0.025	245	0.150		9.33			**14**	370	1.80	3.20	0.30	**48.95**	**89.03**
SHEDS X7-X10 + X11-A + X11-B + C6 + O5-O7 + C4-C5 + B4-B5		Sub-Collector		Graded Swale				0.015	285	0.030	10.00		1.30	1.00							
		Collector		Graded Swale				0.005	475	0.030	3.00		1.75	4.01							
		Collector		Circular Pipe				0.005	40	0.015	1.00		0.08	4.39							
		Collector		Natural Swale				0.023	540	0.035	5.00		1.15	9.16							
		Collector		Drainage Swale				0.011	180	0.020	3.00		0.24	22.99							
		Collector		Drainage Swale				0.046	215	0.020	3.00		0.15	30.53							
		Collector		Circular Pipe				0.005	45	0.015	1.00		0.05	33.16							
[DESIGN POINT #__]												**9.33**	**4.72**								

Notes:

1. Minimum response time of 5 minutes is used for all response times calculated to be less than 5 minutes.

By: JM

The Reserve
Pond Volume Calculations

Date: 4/7/2025
Revised:

[1]Equations:

Volume = (Q)(Watershed Area)

$Q = [(P - 0.2S)^2] / (P + 0.8S)$

$S = (1000 / CN) - 10$

where:

Q = Direct Runoff (excess rainfall) in inches
S = Potential Abstraction
P = Rainfall Depth, inches
CN = Curve Number

Existing Condition

CN = 61 — [1,3]Curve Number for Pasture or range, good condition & Hydrologic Soil Group B

CN = (61)(1.30 - ((1.30 - 1.21) / (70 - 60))(61 - 60)
= 78.8 — [1]AMC III Curve Number, interpolated for worst case scenario

S = (1000 / 78.8) - 10
= 2.70 — Existing Condition, potential abstraction

P = 4.65 + [(4.84 - 4.65) / (400 - 300)](370 - 300)
= 4.78 — [2]Rainfall Depth for 100-yr Storm Event, interpolated for Elevation of 370-ft

$Q = [(4.78 - (0.2)(2.70))^2] / (4.78 + (0.8)(2.70))$
= 2.59 — Existing Condition runoff, inches

Volume = (2.59 in)(26.29 ac - 4.42 ac)(43,560 ft^2 / ac)(1 ft / 12 in)
= 205,927 — Existing Condition volume (site area excluding pond area), ft^3

By: JM

The Reserve
Pond Volume Calculations

Date: 4/7/2025
Revised:

Developed Condition

CN = 70 - ((70 - 66) / (2 - 0.5))(1 - 0.5)
= 68.7

[1,3]Curve Number for Residential 1-acre lot, good condition (interpolated) & Hydrologic Soil Group B

CN = (68.7)(1.30 - ((1.30 - 1.21) / (70 - 60))(68.7 - 60)
= 83.9

[1]AMC III Curve Number, interpolated for worst case scenario

S = (1000 / 83.9) - 10
= 1.92

Developed Condition, potential abstraction

P = 4.65 + [(4.84 - 4.65) / (400 - 300)](370 - 300)
= 4.78

[2]Rainfall Depth for 100-yr Storm Event, interpolated for Elevation of 370-ft

Q = $[(4.78 - (0.2)(1.92))^2] / (4.78 + (0.8)(1.92))$
= 3.06

Developed Condition runoff, inches

Volume = (3.06 in)(26.29 ac - 4.42ac)(43,560 ft^2 / ac)(1 ft / 12 in)
= 243,252

Developed Condition volume (site area excluding pond area), ft^3

Change in Volume = Dev. Condition Vol. - Ex. Condition Vol.
= 243,252 - 205,927
= 37,325

Increase in Runoff Volume, ft^3

Change in Pond Depth = Change in Vol. / Pond Surface Area
= (44,869 ft^3 / 284,460 ft^2)(12 in / ft)
= 1.57

Increase in Pond Depth, inches

References

1. State Water Resources Control Boad. *The Clean Water Team Guidance Compendium for Watershed Monitoring and Assessment*.
2. Placer County Flood Control and Water Conservation District. *Stormwater Management Manual*. September 1, 1990.
3. Natural Resources Conservation Service. *Soil Survey of Placer County, California - Western Part*. Survey Area Data: Version 15, August 31, 2023.

APPENDIX F - HYDRAULICS

Reserved for Final Design

APPENDIX G – STORM WATER QUALITY

Post Construction Storm Water Quality Plan

Preliminary Developed DMA SWQ Map

Water Quality – Vegetated Swale Calculations

Flowmaster Worksheets – Vegetated Swale Calculations

Post-Construction
Storm Water Quality Plan

For:

THE RESERVE
TOWN OF LOOMIS, CALIFORNIA

APN: 045-161-033

Prepared for:

Stefan Horstschraer
Owner/Developer
Premier 40, LLC
8483 Douglas Plaza Dr, Suite 110
Granite Bay, CA 95746
(916) 773-0207

Prepared by:

TSD Engineering, Inc.
785 Orchard Dr., Suite 110
Folsom, CA 95630
(916) 607-0707

Preparation Date: 04/02/2024

PLACER COUNTY Approval Date:_____

Section 1 General Project Information

The undersigned owner of the subject property, is responsible for the implementation of the provisions of this Storm Water Quality Plan (SWQP), including ongoing operations and maintenance (O&M), consistent with the requirements of the West Placer Storm Water Quality Design Manual and the State of California Phase II Small MS4 General Permit (Order No: 2013-0001-DWQ). If the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement the SWQP.

For all Regulated Projects (As identified in Form 1-2 below), the undersigned owner hereby grants access to all representatives of the Jurisdictional Agency for the sole purpose of performing O&M inspections of the installed treatment system(s) and hydromodification control(s) if any.

A copy of the final signed and fully approved SWQP shall be available on the subject site for the duration of construction and then stored with the project approval documentation and improvement plans in perpetuity.

Form 1-1 Project Identification and Owner's Certification

Project Site Address:	Located in the intersection of Wells Ave and Barton Road	
Owner Name:	Stefan Horstschraer	
Title	Owner/Devloper	
Company	Premier 40, LLC	
Address	8483 Douglas Plaza Dr, Suite 110	
City, State, Zip Code	Granite Bay, CA 95746	
Email	stefan@premierhomesca.com	
Telephone #	(916) 773-0207	
Signature	Date	
Engineer:*	Tom Jones	PE Stamp* (Required for all Regulated Projects)
Title	Project Engineer	
Company	TSD Engineering, Inc.	
Address	785 Orchard Dr., Suite 110	
City, State, Zip Code	Folsom, CA 95630	
Email	tjones@tsdeng.com	
Telephone #	(916) 607-0707	
Signature		
Brief Description of Project: (Attach additional sheets as necessary)	The Reserve subdivision proposes 20 residential lots that surround a cul-de-sac accessed from the Reserve Court.	

* Not required for Small Projects as determined in Form 1-2 below. Project owners are responsible for ensuring that all storm water facilities are designed by an appropriately licensed and qualified professional.

Form 1-2 Project Category	
Development Category (Select all that apply)	
[1]**Small Project** – All projects, except LUPs, that create and/or replace between 2,500-5,000 ft^2 of impervious surface or detached single family homes that create and/or replace 2,500 ft^2 or more of impervious surface and are not part of a larger plan of development.	
[2]Enter total new and/or replaced impervious surface (ft^2)	
[3]**Regulated Project** – All projects that create and/or replace 5,000 ft^2 or more of impervious surface.	
[4]**Regulated Redevelopment Project** with equal to, or greater than 50 percent increase in impervious area	
[5]**Regulated Redevelopment Project** with less than 50 percent increase in impervious area	
[6]Enter total pre-project impervious surface (ft^2)	
[7]Enter total new and/or replaced impervious surface (ft^2)	
[8]**Regulated Road or linear underground/overhead project (LUP)** creating 5,000 ft^2 or more of newly constructed contiguous impervious surface.	
[9]Enter total new and/or replaced impervious surface (ft^2)	
[10]**Regulated Hydromodification Management Project** – Regulated projects that create and/or replace 1 acre or more of impervious surface. A project that does not increase impervious surface area over the pre-project condition is not a hydromodification management project.	X
[11]Enter total new and/or replaced impervious surface (ft^2)	637,594

Section 3 Regulated Projects

Section 3 forms are to be completed for all Regulated Projects.

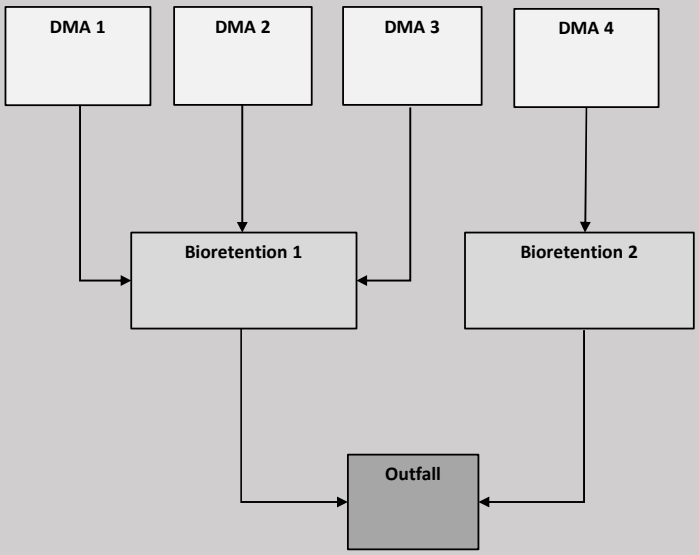
Form 3-1 Site Location and Hydrologic Features

Site coordinates: *Take GPS measurement at approximate center of site*	[1] Latitude	[2] Longitude	[3] Elevation (ft. above sea level)	[4] 85th Percentile, 24 Hour Design Storm Depth (in):
	38.78631	-121.19472	370	0.9

[5] Receiving waters *Name of stream, lake or other downstream waterbody to which the site runoff eventually drains*	Dry Creek
[6] 303(d) listed pollutants of concern *Refer to State Water Resources Control Board website* www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired	Sediment, oils, fuel, mercury and debris
[7] Is Project going to be phased? *If yes, ensure that the SWQP evaluates each phase with distinct DMAs, requiring LID BMPs to address runoff at time of completion*	No

[8] *Use this form to show a conceptual schematic depicting DMAs and conveyance features connecting DMAs to the site outlet(s). An example is provided below that can be modified for the proposed project or a drawing clearly showing DMAs and flow routing may be attached.*

See Attached Stormwater Quality Schematic & Developed DMA SWQ Map



Form 3-2 Site Assessment and Layout Documentation

	Has this Item been considered in the Site Layout and depicted in the Site Plan?	
	Yes	**Not Applicable (Include brief explanation)**
Define the development envelope and protected areas, identifying areas that are most suitable for development and areas to be landscaped, or left undisturbed, and used for infiltration.	X	
Concentrate development on portions of the site with less permeable soils and preserve areas that can promote infiltration.		N/A Infiltration Rate is the same (Soil Type B)
Limit overall impervious coverage of the site with paving and roofs.	X	
Set back development from creeks, wetlands, and riparian habitats.	X	
Preserve significant trees.	X	
Conform site layout along natural landforms.	X	
Avoid excessive grading and disturbance of vegetation and soils.	X	
Replicate the site's natural drainage patterns.	X	
Detain and retain runoff throughout the site.	X	

Attach a Site Plan that incorporates the applicable considerations above. Ensure that the following items are included in the Site Plan:

Site Boundary
Soil types and areal extents, test pit and infiltration test locations
Topographic data with 1 ft. contours
Existing natural hydrologic features (depressions, watercourses, wetlands, riparian corridors)
Environmentally sensitive areas and areas to be preserved.
Proposed locations and footprints of improvements creating new, or replaced, impervious surfaces
Potential pollutant sources and locations
Entire site divided into separate DMAs with unique identifiers
Existing and proposed site drainage network with flow directions and site run-on and discharge locations
Proposed design features and surface treatments used to minimize imperviousness and reduce runoff
Proposed locations and footprints of treatment and hydromodification management facilities
Design features for managing authorized non-stormwater discharges
Areas of soil and/or groundwater contamination
Existing utilities and easements
Maintenance areas

Form 3-3 Source Control Measures			
Potential Pollutant Generating Activity or Source	Check One		Describe the source control measures to be implemented for each potential pollutant generating activity or source present on the project as listed in Appendix C and in the CASQA Fact Sheets. Include any special features, materials, or methods of construction that will be used.
	Present	Not Applicable	
Accidental spills or leaks	☑	☐	Materials will be stored indoors aways from storm drains or sensitive areas. (CASQA SC-11)
Interior floor drains	☐	☑	
Parking/storage areas and maintenance	☑	☐	Parking/Driveway areas drain to vegetated swales.
Indoor and structural pest control	☑	☐	Fed., State and local laws and regulatons for the use, storage and disposal of pesticides shall be followed. (CASQA SC-41)
Pools, spas, ponds, decorative fountains, and other water features	☑	☐	Never discharge wash water or wastewater to the driveway, street, gutter, or near a storm drain (use local regulation for storm drain discharge)
Landscape/outdoor pesticide use	☑	☐	Fed., State, and local laws and regulations for the use, storage, and disposal of pesticides shall be followed. (CASQA SC-41)
Restaurants, grocery stores, and other food service operations	☐	☑	
Refuse areas	☑	☐	Utilize Good Housekeeping measures and prevent runon and runoff from refuse toter storage areas. (CASQA SC-34)
Industrial Processes	☐	☑	
Outdoor storage of equipment or materials	☑	☐	Limit exposure of rainfall whenever possible. (CASQA SC-30, SC-31, SC-32)
Vehicle and equipment cleaning	☑	☐	If you choose to wash your car at home, wash it on a lawn or other unpaved surface to reduce the amount of car wash water runoff.
Vehicle and equipment repair and maintenance	☐	☑	
Fuel dispensing areas	☐	☑	
Loading docks	☐	☑	
Fire sprinkler test water	☐	☑	
Drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources	☐	☑	
Unauthorized non-storm water discharges	☐	☑	
Building and grounds maintenance	☑	☐	Switch to non-toxic chemical, encourage proper lawn management and native vegetation, integrated pest management, proper yard trimming recycling, and recycle residual paint, solvents, lumber, and other materials.

The source control measures identified in this table shall be designed consistent with recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment[1], or from another equivalent manual.

[1] California Stormwater BMP Handbook New Development and Redevelopment. California Stormwater Quality Association (CASQA). January 2003.

Form 3-4 Runoff Reduction Calculator for Site Design Measures on Regulated Projects

[1]DMA ID No.			1		2		3		4	
Site Design Measure	**Runoff Reduction Parameters**			**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**
[2] Adjacent/On-Site Stream Setbacks and Buffers	A_{imp} (ft^2)	*impervious drainage area*		0		0		0		0
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8		0.8	
[3] Soil Quality Improvement and Maintenance	A_{pond} (ft^2)	*ponding area*		0		0		0		0
	D_{pond} (ft)	*ponding depth*								
	A_{sa} (ft^2)	*soil amendment area*								
	D_{sa} (ft)	*depth of amended soil*								
	n	*porosity of amended soil*								
[4] Tree Planting and Preservation	n_e	*number of new evergreen trees*		2056		402		377		1619
	n_d	*number of new deciduous trees*								
	A_{tc} (ft^2)	*canopy area of existing trees to remain on the property*	30458		5960		5581		23992	
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8		0.8	
[5] Rooftop and Impervious Area Disconnection	A_{imp} (ft^2)	*impervious drainage area*		0		0		0		0
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8		0.8	
[6] Porous Pavement	A_{res} (ft^2)	*area of gravel storage layer*		0		0		0		0
	D_{res} (ft)	*depth of gravel storage layer*								
	n_{agg}	*porosity of aggregate*								
	C	*efficiency factor*								
[7] Vegetated Swales	A_{imp} (ft^2)	*impervious drainage area*	19450	1313	6827	461	7103	479	25	2
	V_{85} (in)	*runoff volume from 85th percentile, 24-hour storm*	0.8		0.8		0.8		0.8	
[8] Rain Barrels and Cisterns	N	*number of rain barrels and/or cisterns*		0		0		0		0
	V_a (ft^3)	*volume of each rain barrel and/or cistern*								
[9] Do all Site Design Measures meet the design requirements outlined in the Fact Sheets?					**Yes**	**X**	**No**			
[10] Total Volume Reduction (ft^3)			**3369**		**863**		**856**		**1621**	
[11] Effective Treated Impervious Area (ft^2)			**49908**		**12787**		**12684**		**24017**	

Form 3-4 Runoff Reduction Calculator for Site Design Measures on Regulated Projects

DMA ID No.	5		6		7		8		9		10		11		12	
Runoff Reduction Parameters		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**
impervious drainage area		0		0		0		0		0		0		0		0
runoff volume from 85th percentile, 24-hour storm	0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8	
ponding area		0		0		0		0		0		0		0		0
ponding depth																
soil amendment area																
depth of amended soil																
porosity of amended soil																
number of new evergreen trees		123		0		61		580		3218		190		696		120
number of new deciduous trees																
canopy area of existing trees to remain on the property	1829		0		898		8586		47679		2811		10308		1772	
runoff volume from 85th percentile, 24-hour storm	0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8	
impervious drainage area		0		0		0	8929	603	0	0	5579	377	6173	417	6891	465
runoff volume from 85th percentile, 24-hour storm	0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8	
area of gravel storage layer		0		0		0		0		0		0		0		0
depth of gravel storage layer																
porosity of aggregate																
efficiency factor																
impervious drainage area	29099	1964	3731	252	13448	908		0		0		0		0		0
runoff volume from 85th percentile, 24-hour storm	0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8	
number of rain barrels and/or cisterns		0		0		0		0		0		0		0		0
volume of each rain barrel and/or cistern																
Total Volume Reduction	**2088**		**252**		**968**		**1182**		**3218**		**566**		**1112**		**585**	
Effective Treated Impervious Area	**30928**		**3731**		**14346**		**17515**		**47679**		**8390**		**16481**		**8663**	

Form 3-4 Runoff Reduction Calculator for Site Design Measures on Regulated Projects

DMA ID No.	13		14		15		16		17		18		19		20	
Runoff Reduction Parameters		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**		**Runoff Reduction (ft^3)**
impervious drainage area		0		0		0		0		0		0		0		0
runoff volume from 85th percentile, 24-hour storm	0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8	
ponding area		0		0		0		0		0		0		0		0
ponding depth																
soil amendment area																
depth of amended soil																
porosity of amended soil																
number of new evergreen trees		587		0		0		0		0		0		0		0
number of new deciduous trees																
canopy area of existing trees to remain on the property	8700															
runoff volume from 85th percentile, 24-hour storm	0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8	
impervious drainage area	2772	187		0		0		0		0		0		0		0
runoff volume from 85th percentile, 24-hour storm	0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8	
area of gravel storage layer		0		0		0		0		0		0		0		0
depth of gravel storage layer																
porosity of aggregate																
efficiency factor																
impervious drainage area		0		0		0		0		0		0		0		0
runoff volume from 85th percentile, 24-hour storm	0.8		0.8		0.8		0.8		0.8		0.8		0.8		0.8	
number of rain barrels and/or cisterns		0		0		0		0		0		0		0		0
volume of each rain barrel and/or cistern																
Total Volume Reduction	**774**		**0**		**0**		**0**		**0**		**0**		**0**		**0**	
Effective Treated Impervious Area	**11472**		**0**		**0**		**0**		**0**		**0**		**0**		**0**	

Form 3-5 Computation of Water Quality Design Criteria for Stormwater Treatment and Baseline Hydromodification Measures																						
DMA ID No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
[1]Total impervious area requiring treatment	49,908	12,787	12,684	24,017	30,928	3,731	14,346	17,515	27,853	8,390	16,481	8,663	11,472									
[2] Impervious area untreated by Site Design Measures (ft^2) *Item 1 – Form 3-4 Item 11*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[3]Additional pervious area draining to BMP (ft^2)	117,819	17,006	27,458	66,885	83,654	3,558	12,946	48,885	112,196	29,835	44,918	35,129	42,222									
[4] Composite DMA Runoff Coefficient (Rc) *Enter area weighted composite runoff coefficient representing entire DMA*	0.42	0.52	0.44	0.40	0.40	0.58	0.59	0.40	0.35	0.36	0.40	0.35	0.36									
[5] Water Quality Volume (WQV) (ft^3) *WQV = 1/12 * [Item 2 + Item 3) *Item 4] * Unit WQV*	2701	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[6] Water Quality Flow (WQF) (cfs) *WQF = 1/43,200 * [0.2* (Item 2 + Item 3) * Item4]*	0.231	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

[5, 6] Values will equal zero if all impervious area has been treated by Site Design Measures.

DMA ID No.	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**
[1]Total impervious area requiring treatment																						
[2] Impervious area untreated by Site Design Measures (ft^2) *Item 1 – Form 3-4 Item 11*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[3]Additional pervious area draining to BMP (ft^2)																						
[4] Composite DMA Runoff Coefficient (Rc) *Enter area weighted composite runoff coefficient representing entire DMA*																						
[5] Water Quality Volume (WQV) (ft^3) *WQV = 1/12 * [Item 2 + Item 3) *Item 4] * Unit WQV*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[6] Water Quality Flow (WQF) (cfs) *WQF = 1/43,200 * [0.2* (Item 2 + Item 3) * Item4]*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

[5, 6] Values will equal zero if all impervious area has been treated by Site Design Measures.

Form 5-1 BMP Inspection and Maintenance

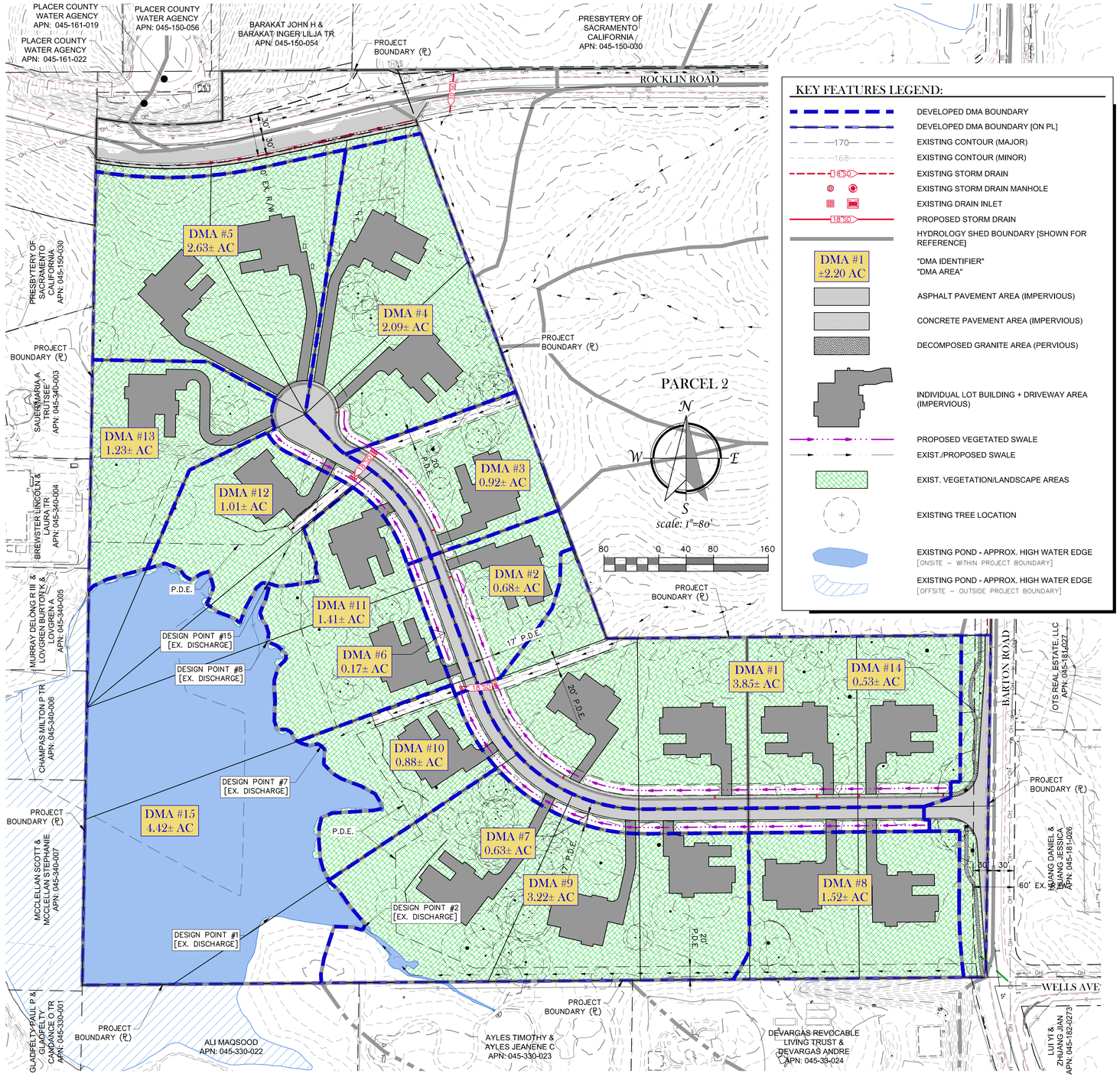
BMP	Inspection Point and Frequency	Maintenance Activity Required
SWQ SWALES	Inlet/Outlet Structures (Bi-annually)	Ensure stable conveyance into facility, remove debris, repair any erosion
	Vegetation (on-going)	Prune and weed to keep water quality swales neat and orderly
	Irrigation (on-going)	Irrigate as required to establish and/or maintain vegetation
	Trash (Monthy, or as needed after storm events)	Remove obstructions, debris and trash from swales and dispose of properly.
EXISITNG TREE CANOPY (SITE)	Irrigation (on-going)	Irrigate as required to establish and/or maintain trees
	Pruning (on-going)	Prune dead vegetation from trees on a regular basis
	Planting Areas (annually)	Remove fallen leaves and debris that could enter stormwater runoff
	Treating (on-going)	Minimize the use of chemical fertilizers & pesticides
NATURAL AND/OR DEVELOPED VEGETATED AREAS (Individual Lots)	Trash & Sediment (on-going)	Remove accumulated sediment, trash debris, leaves and grass clippings. Remove tree seedlings.

Form 6-1 Post-Construction Stormwater BMPs

Following is a summary of all BMPs included in the Project design. This checklist must be included on the cover sheet of the Improvement Plans for all Regulated Projects.

BMP		Plan Sheet Number(s)
Structural Source Controls (list BMPs)		
Site Design Measures	Stream Setbacks and Buffers	**C-7.0**
	Soil Quality Improvement and Maintenance	**N/A**
	Tree Planting and Preservation	**C3.0 & C5.0**
	Rooftop and Impervious Area Disconnection	**C7.0**
	Porous Pavement	**N/A**
	Vegetated Swales	**SWQP EXHIBIT**
	Rain Barrels and Cisterns	**N/A**
Stormwater Treatment and Baseline Hydromodification Measures	Bioretention with Infiltration	**N/A**
	Flow-Through Planters, Tree Box Filters and Media Filters	**N/A**
Hydromodification Management Measures	Supplemental Detention	**N/A**

Preliminary Developed DMA SWQ Map



KEY FEATURES LEGEND:

- DEVELOPED DMA BOUNDARY
- DEVELOPED DMA BOUNDARY [ON PL]
- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- EXISTING STORM DRAIN
- EXISTING STORM DRAIN MANHOLE
- EXISTING DRAIN INLET
- PROPOSED STORM DRAIN
- HYDROLOGY SHED BOUNDARY [SHOWN FOR REFERENCE]
- "DMA IDENTIFIER" "DMA AREA"
- ASPHALT PAVEMENT AREA (IMPERVIOUS)
- CONCRETE PAVEMENT AREA (IMPERVIOUS)
- DECOMPOSED GRANITE AREA (PERVIOUS)
- INDIVIDUAL LOT BUILDING + DRIVEWAY AREA (IMPERVIOUS)
- PROPOSED VEGETATED SWALE
- EXIST./PROPOSED SWALE
- EXIST. VEGETATION/LANDSCAPE AREAS
- EXISTING TREE LOCATION
- EXISTING POND - APPROX. HIGH WATER EDGE [ONSITE – WITHIN PROJECT BOUNDARY]
- EXISTING POND - APPROX. HIGH WATER EDGE [OFFSITE – OUTSIDE PROJECT BOUNDARY]

DMA SURFACE DATA:

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #1 AREA =	**167,727**	**3.85**
PERVIOUS		
LANDSCAPE AREAS[1]	117,819	2.70
PERVIOUS AREA TOTAL[2] =	**117,819**	**2.70**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	29,714	0.68
ASSUMED FUTURE CONCRETE FLATWORK[4]	6,000	0.14
AC & PCC PAVEMENT AREAS (ROADWAY)[5]	14,194	0.33
IMPERVIOUS AREA TOTAL[6] =	**49,908**	**1.15**
TOTAL AREA (CHECK) =	167,727	3.85

Notes:
1. Total = DMA #1 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #1 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC & PCC pavement within Reserve Court for DMA #1.
6. Total impervious area for DMA #1 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #2 AREA =	**29,793**	**0.68**
PERVIOUS		
LANDSCAPE AREAS[1]	17,006	0.39
PERVIOUS AREA TOTAL[2] =	**17,006**	**0.39**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	7,443	0.17
ASSUMED FUTURE CONCRETE FLATWORK[4]	1,500	0.03
AC & PCC PAVEMENT AREAS (ROADWAY)[5]	3,844	0.09
IMPERVIOUS AREA TOTAL[6] =	**12,787**	**0.29**
TOTAL AREA (CHECK) =	29,793	0.68

Notes:
1. Total = DMA #2 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #2 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC & PCC pavement within Reserve Court for DMA #2.
6. Total impervious area for DMA #2 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #3 AREA =	**40,142**	**0.92**
PERVIOUS		
LANDSCAPE AREAS[1]	27,458	0.63
PERVIOUS AREA TOTAL[2] =	**27,458**	**0.63**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	7,414	0.17
ASSUMED FUTURE CONCRETE FLATWORK[4]	1,500	0.03
AC & PCC PAVEMENT AREAS (ROADWAY)[5]	3,770	0.09
IMPERVIOUS AREA TOTAL[6] =	**12,684**	**0.29**
TOTAL AREA (CHECK) =	40,142	0.92

Notes:
1. Total = DMA #3 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #3 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC & PCC pavement within Reserve Court for DMA #3.
6. Total impervious area for DMA #3 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #4 AREA =	**90,902**	**2.09**
PERVIOUS		
LANDSCAPE AREAS[1]	66,885	1.54
PERVIOUS AREA TOTAL[2] =	**66,885**	**1.54**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	17,545	0.40
ASSUMED FUTURE CONCRETE FLATWORK[4]	3,000	0.07
AC & PCC PAVEMENT AREAS (ROADWAY)[5]	3,472	0.08
IMPERVIOUS AREA TOTAL[6] =	**24,017**	**0.55**
TOTAL AREA (CHECK) =	90,902	2.09

Notes:
1. Total = DMA #4 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #4 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC & PCC pavement within Reserve Court for DMA #4.
6. Total impervious area for DMA #4 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #5 AREA =	**114,582**	**2.63**
PERVIOUS		
LANDSCAPE AREAS[1]	83,654	1.92
PERVIOUS AREA TOTAL[2] =	**83,654**	**1.92**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	19,120	0.44
ASSUMED FUTURE CONCRETE FLATWORK[4]	3,000	0.07
AC & PCC PAVEMENT AREAS (ROADWAY)[5]	8,808	0.20
IMPERVIOUS AREA TOTAL[6] =	**30,928**	**0.71**
TOTAL AREA (CHECK) =	114,582	2.63

Notes:
1. Total = DMA #5 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #5 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC & PCC pavement within Reserve Court for DMA #5.
6. Total impervious area for DMA #5 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #6 AREA =	**7,289**	**0.17**
PERVIOUS		
LANDSCAPE AREAS[1]	3,558	0.08
PERVIOUS AREA TOTAL[2] =	**3,558**	**0.08**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	290	0.01
ASSUMED FUTURE CONCRETE FLATWORK[4]	0	0.00
AC PAVEMENT AREAS (ROADWAY)[5]	3,441	0.08
IMPERVIOUS AREA TOTAL[6] =	**3,731**	**0.09**
TOTAL AREA (CHECK) =	7,289	0.17

Notes:
1. Total = DMA #6 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #6 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC pavement within Reserve Court for DMA #6.
6. Total impervious area for DMA #6 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #7 AREA =	**27,292**	**0.63**
PERVIOUS		
LANDSCAPE AREAS[1]	12,946	0.30
PERVIOUS AREA TOTAL[2] =	**12,946**	**0.30**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	1,717	0.04
ASSUMED FUTURE CONCRETE FLATWORK[4]	0	0.00
AC PAVEMENT AREAS (ROADWAY)[5]	12,629	0.29
IMPERVIOUS AREA TOTAL[6] =	**14,346**	**0.33**
TOTAL AREA (CHECK) =	27,292	0.63

Notes:
1. Total = DMA #7 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #7 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC pavement within Reserve Court for DMA #7.
6. Total impervious area for DMA #7 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #8 AREA =	**66,400**	**1.52**
PERVIOUS		
LANDSCAPE AREAS[1]	48,885	1.12
PERVIOUS AREA TOTAL[2] =	**48,885**	**1.12**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	14,515	0.33
ASSUMED FUTURE CONCRETE FLATWORK[4]	3,000	0.07
AC PAVEMENT AREAS (ROADWAY)[5]	0	0.00
IMPERVIOUS AREA TOTAL[6] =	**17,515**	**0.40**
TOTAL AREA (CHECK) =	66,400	1.52

Notes:
1. Total = DMA #8 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #8 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC pavement within Reserve Court for DMA #8.
6. Total impervious area for DMA #8 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #9 AREA =	**140,049**	**3.22**
PERVIOUS		
LANDSCAPE AREAS[1]	112,196	2.58
PERVIOUS AREA TOTAL[2] =	**112,196**	**2.58**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	23,353	0.54
ASSUMED FUTURE CONCRETE FLATWORK[4]	4,500	0.10
AC PAVEMENT AREAS (ROADWAY)[5]	0	0.00
IMPERVIOUS AREA TOTAL[6] =	**27,853**	**0.64**
TOTAL AREA (CHECK) =	140,049	3.22

Notes:
1. Total = DMA #9 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #9 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC pavement within Reserve Court for DMA #9.
6. Total impervious area for DMA #9 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #10 AREA =	**38,225**	**0.88**
PERVIOUS		
LANDSCAPE AREAS[1]	29,835	0.68
PERVIOUS AREA TOTAL[2] =	**29,835**	**0.68**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	6,890	0.16
ASSUMED FUTURE CONCRETE FLATWORK[4]	1,500	0.03
AC PAVEMENT AREAS (ROADWAY)[5]	0	0.00
IMPERVIOUS AREA TOTAL[6] =	**8,390**	**0.19**
TOTAL AREA (CHECK) =	38,225	0.88

Notes:
1. Total = DMA #10 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #10 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC pavement within Reserve Court for DMA #10.
6. Total impervious area for DMA #10 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #11 AREA =	**61,399**	**1.41**
PERVIOUS		
LANDSCAPE AREAS[1]	44,918	1.03
PERVIOUS AREA TOTAL[2] =	**44,918**	**1.03**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	13,481	0.31
ASSUMED FUTURE CONCRETE FLATWORK[4]	3,000	0.07
AC PAVEMENT AREAS (ROADWAY)[5]	0	0.00
IMPERVIOUS AREA TOTAL[6] =	**16,481**	**0.38**
TOTAL AREA (CHECK) =	61,399	1.41

Notes:
1. Total = DMA #11 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #11 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC pavement within Reserve Court for DMA #11.
6. Total impervious area for DMA #11 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #12 AREA =	**43,792**	**1.01**
PERVIOUS		
LANDSCAPE AREAS[1]	35,129	0.81
PERVIOUS AREA TOTAL[2] =	**35,129**	**0.81**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	7,163	0.16
ASSUMED FUTURE CONCRETE FLATWORK[4]	1,500	0.03
AC PAVEMENT AREAS (ROADWAY)[5]	0	0.00
IMPERVIOUS AREA TOTAL[6] =	**8,663**	**0.20**
TOTAL AREA (CHECK) =	43,792	1.01

Notes:
1. Total = DMA #12 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #12 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC pavement within Reserve Court for DMA #12.
6. Total impervious area for DMA #12 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #13 AREA =	**53,694**	**1.23**
PERVIOUS		
LANDSCAPE AREAS[1]	42,222	0.97
PERVIOUS AREA TOTAL[2] =	**42,222**	**0.97**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	9,972	0.23
ASSUMED FUTURE CONCRETE FLATWORK[4]	1,500	0.03
AC PAVEMENT AREAS (ROADWAY)[5]	0	0.00
IMPERVIOUS AREA TOTAL[6] =	**11,472**	**0.26**
TOTAL AREA (CHECK) =	53,694	1.23

Notes:
1. Total = DMA #13 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #13 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC pavement within Reserve Court for DMA #13.
6. Total impervious area for DMA #13 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #14 AREA =	**22,902**	**0.53**
PERVIOUS		
LANDSCAPE AREAS[1]	14,456	0.33
PERVIOUS AREA TOTAL[2] =	**14,456**	**0.33**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	0	0.00
ASSUMED FUTURE CONCRETE FLATWORK[4]	0	0.00
AC PAVEMENT AREAS (ROADWAY)[5]	8,446	0.19
IMPERVIOUS AREA TOTAL[6] =	**8,446**	**0.19**
TOTAL AREA (CHECK) =	22,902	0.53

Notes:
1. Total = DMA #14 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #14 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC pavement within Reserve Court for Barton Road for DMA #14.
6. Total impervious area for DMA #14 used in SWQP - Form 3-5, Item 1.

SURFACE DESCRIPTION	AREA SF	AREA AC
TOTAL DMA #15 AREA =	**192,625**	**4.42**
PERVIOUS		
LANDSCAPE AREAS[1]	192,625	4.42
PERVIOUS AREA TOTAL[2] =	**192,625**	**4.42**
IMPERVIOUS		
BUILDING AREAS + DRIVEWAY[3]	0	0.00
ASSUMED FUTURE CONCRETE FLATWORK[4]	0	0.00
AC PAVEMENT AREAS (ROADWAY)[5]	0	0.00
IMPERVIOUS AREA TOTAL[6] =	**0**	**0.00**
TOTAL AREA (CHECK) =	192,625	4.42

Notes:
1. Total = DMA #15 Area Less Bldg + Driveway + Patios & Walkways.
2. Total pervious area for DMA #15 used in SWQP - Form 3-5, Item 3.
3. Based on Lot Fit Analysis and assumed driveway configurations.
4. Based on 1,500 SF of future flatwork per lot for patios & walkways in back & side yards.
5. AC pavement within Reserve Court for DMA #15.
6. Total impervious area for DMA #15 used in SWQP - Form 3-5, Item 1.

THE RESERVE - TOWN OF LOOMIS

EXH-5

SW Corner of Rocklin Road and Barton Road
Loomis, California

Proposed By:
PREMIER HOMES
8483 Douglas Plaza Dr
Granite Bay, CA 95746

APRIL 1, 2025
2ND SUBMITTAL

TSD ENGINEERING, INC.
expect more.
785 Orchard Drive, Suite #110
Folsom, CA 95630
Phone: (916) 608-0707
Fax: (916) 608-0701

P:\Projects\506-001\03 REPORTS\HYDROLOGY AND HYDRAULICS_Entitlements\Appendix G – LID & SWQ\506-001 – Developed DMA SWQ Map.dwg, Johnathon Medina, 10:28:29, 04-02-25

The Reserve
PLACER COUNTY, CA
WATER QUALITY - VEGETATED SWALE CALCULATIONS

Original Date: 9/30/2024 Checked By: CSF

Revised Date: 4/2/2025 Prepared By: TNJ, JM

			WATER QUALITY FLOW - HYDRAULICS							
SWALE I.D.	DMA I.D.	DMA AREA$_1$	C Value$_2$	INTENSITY$_3$	Q_4	DEPTH IN SWALE$_5$		VELOCITY$_6$	LENGTH OF SWALE	SWALE RETENTION TIME$_7$
		acres		in/hr	cfs	ft	in	ft/s	ft	min
WQ Swale #1	1	3.85	0.42	0.20	0.32	0.325	4	0.33	670	34
WQ Swale #2	2	0.68	0.52	0.20	0.07	0.125	1 1/2	0.23	160	12
WQ Swale #3	3	0.92	0.44	0.20	0.08	0.133	1 1/2	0.24	150	10
WQ Swale #4	4	2.09	0.40	0.20	0.17	0.333	4	0.17	100	10
WQ Swale #5	5	2.63	0.40	0.20	0.21	0.333	4	0.21	130	10
WQ Swale #6	6	0.17	0.60	0.20	0.02	0.058	1/2	0.15	180	20
WQ Swale #7	7	0.63	0.59	0.20	0.07	0.15	2	0.18	640	59

NOTES:

1. DMA Area requiring treatment via vegetated swale BMP.
2. Composite Runoff Coefficient for subject DMA (See Calulations Pages 2 & 3).
3. Water Quality Flow-Based Intensity per Stormwater Quality Design Manual for Sacramento and South Placer Regions (Roseville), May 2007
4. Water Quality Flow Rate → Q = CiA
5. Water Quality Flow Depth (Reference FlowMaster® Worksheets - Appendix G)
6. Water Quality Flow Velocity (Reference FlowMaster® Worksheets - Appendix G). Velocity ≤ Per Placer County SQDM SDM-6.
7. Treatment Contact Time within Swale (Time = Swale Length ÷ Velocity). Time ≥ 10 minutes Per Placer County SQDM SMD-6.

COMPOSITE RUNOFF COEFFICIENT CALCULATIONS

DMA 1

$$\text{Comp C} = \frac{(C1*A1) + (C2*A2)}{A1 + A2}$$

Where:

C1 =	0.2	→	Runoff Coefficient for Landscaped Areas (Pervious)
A1 =	2.7	→	Pervious Area for DMA 1 (acres) per Developed DMA SWQ Map - Appendix G
C2 =	0.95	→	Runoff Coefficient for Impervious Areas
A2 =	1.15	→	Impervious Area for DMA 1 (acres) per Developed DMA SWQ Map - Appendix G

$$\text{Comp C} = \frac{(0.2*2.7) + (0.95*1.15)}{2.7+1.15} \rightarrow 0.424026$$

DMA 2

$$\text{Comp C} = \frac{(C1*A1) + (C2*A2)}{A1 + A2}$$

Where:

C1 =	0.2	→	Runoff Coefficient for Landscaped Areas (Pervious)
A1 =	0.39	→	Pervious Area for DMA 2 (acres) per Developed DMA SWQ Map - Appendix G
C2 =	0.95	→	Runoff Coefficient for Impervious Areas
A2 =	0.29	→	Impervious Area for DMA 2 (acres) per Developed DMA SWQ Map - Appendix G

$$\text{Comp C} = \frac{(0.2*0.39) + (0.95*0.29)}{0.39+0.29} \rightarrow 0.5198529$$

DMA 3

$$\text{Comp C} = \frac{(C1*A1) + (C2*A2)}{A1 + A2}$$

Where:

C1 =	0.2	→	Runoff Coefficient for Landscaped Areas (Pervious)
A1 =	0.63	→	Pervious Area for DMA 3 (acres) per Developed DMA SWQ Map - Appendix G
C2 =	0.95	→	Runoff Coefficient for Impervious Areas
A2 =	0.29	→	Impervious Area for DMA 3 (acres) per Developed DMA SWQ Map - Appendix G

$$\text{Comp C} = \frac{(0.2*0.63) + (0.95*0.29)}{0.63+0.29} \rightarrow 0.436413$$

DMA 4

$$\text{Comp C} = \frac{(C1*A1) + (C2*A2)}{A1 + A2}$$

Where:

C1 =	0.2	→	Runoff Coefficient for Landscaped Areas (Pervious)
A1 =	1.54	→	Pervious Area for DMA 4 (acres) per Developed DMA SWQ Map - Appendix G
C2 =	0.95	→	Runoff Coefficient for Impervious Areas
A2 =	0.55	→	Impervious Area for DMA 4 (acres) per Developed DMA SWQ Map - Appendix G

$$\text{Comp C} = \frac{(0.2*1.54) + (0.95*0.55)}{1.54+0.55} \rightarrow 0.3973684$$

DMA 5

$$\text{Comp C} = \frac{(C1*A1) + (C2*A2)}{A1 + A2}$$

Where:

C1 =	0.2	→	Runoff Coefficient for Landscaped Areas (Pervious)
A1 =	1.92	→	Pervious Area for DMA 5 (acres) per Developed DMA SWQ Map - Appendix G
C2 =	0.95	→	Runoff Coefficient for Impervious Areas
A2 =	0.71	→	Impervious Area for DMA 5 (acres) per Developed DMA SWQ Map - Appendix G

$$\text{Comp C} = \frac{(0.2*1.92) + (0.95*0.71)}{1.92+0.71} \rightarrow 0.4024715$$

DMA 6

$$\text{Comp C} = \frac{(C1*A1) + (C2*A2)}{A1 + A2}$$

Where:

C1 =	0.2	→	Runoff Coefficient for Landscaped Areas (Pervious)
A1 =	0.08	→	Pervious Area for DMA 6 (acres) per Developed DMA SWQ Map - Appendix G
C2 =	0.95	→	Runoff Coefficient for Impervious Areas
A2 =	0.09	→	Impervious Area for DMA 6 (acres) per Developed DMA SWQ Map - Appendix G

$$\text{Comp C} = \frac{(0.2*0.08) + (0.95*0.09)}{0.08+0.09} \rightarrow 0.5970588$$

DMA 7

$$\text{Comp C} = \frac{(C1*A1) + (C2*A2)}{A1 + A2}$$

Where:

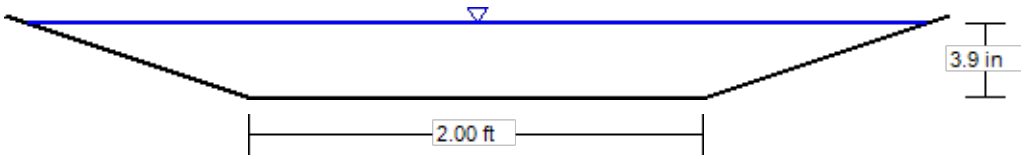
C1 =	0.2	→	Runoff Coefficient for Landscaped Areas (Pervious)
A1 =	0.3	→	Pervious Area for DMA 7 (acres) per Developed DMA SWQ Map - Appendix G
C2 =	0.95	→	Runoff Coefficient for Impervious Areas
A2 =	0.33	→	Impervious Area for DMA 7 (acres) per Developed DMA SWQ Map - Appendix G

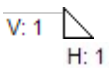
$$\text{Comp C} = \frac{(0.2*0.3) + (0.95*0.33)}{0.3+0.33} \rightarrow 0.5928571$$

Cross Section for Water Quality Swale #1 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.020 ft/ft
Normal Depth	3.9 in
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.32 cfs





Worksheet for Water Quality Swale #1 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.020 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.32 cfs

Results	
Normal Depth	3.9 in
Flow Area	1.0 ft²
Wetted Perimeter	4.1 ft
Hydraulic Radius	2.9 in
Top Width	3.97 ft
Critical Depth	1.1 in
Critical Slope	2.153 ft/ft
Velocity	0.33 ft/s
Velocity Head	0.00 ft
Specific Energy	0.33 ft
Froude Number	0.115
Flow Type	Subcritical

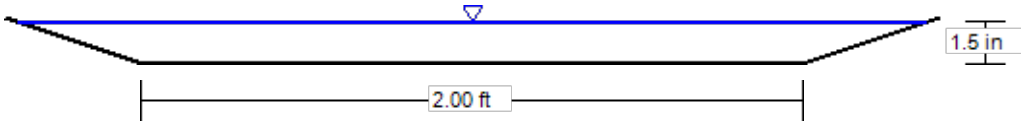
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

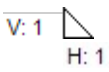
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.9 in
Critical Depth	1.1 in
Channel Slope	0.020 ft/ft
Critical Slope	2.153 ft/ft

Cross Section for Water Quality Swale #2 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.030 ft/ft
Normal Depth	1.5 in
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.07 cfs





Worksheet for Water Quality Swale #2 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.030 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.07 cfs

Results	
Normal Depth	1.5 in
Flow Area	0.3 ft²
Wetted Perimeter	2.8 ft
Hydraulic Radius	1.3 in
Top Width	2.76 ft
Critical Depth	0.4 in
Critical Slope	2.901 ft/ft
Velocity	0.23 ft/s
Velocity Head	0.00 ft
Specific Energy	0.13 ft
Froude Number	0.124
Flow Type	Subcritical

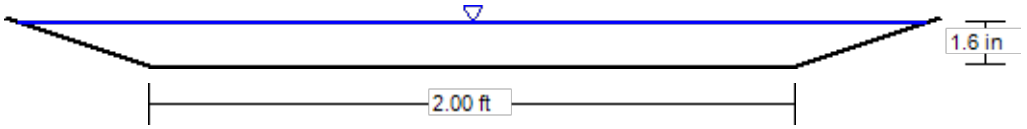
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

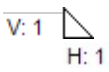
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.5 in
Critical Depth	0.4 in
Channel Slope	0.030 ft/ft
Critical Slope	2.901 ft/ft

Cross Section for Water Quality Swale #3 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.030 ft/ft
Normal Depth	1.6 in
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.08 cfs





Worksheet for Water Quality Swale #3 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.030 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.08 cfs

Results	
Normal Depth	1.6 in
Flow Area	0.3 ft²
Wetted Perimeter	2.9 ft
Hydraulic Radius	1.4 in
Top Width	2.82 ft
Critical Depth	0.4 in
Critical Slope	2.822 ft/ft
Velocity	0.24 ft/s
Velocity Head	0.00 ft
Specific Energy	0.14 ft
Froude Number	0.126
Flow Type	Subcritical

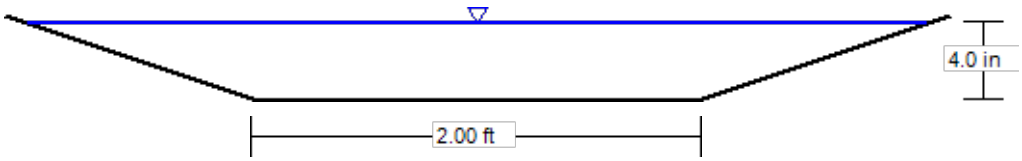
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

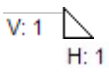
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.6 in
Critical Depth	0.4 in
Channel Slope	0.030 ft/ft
Critical Slope	2.822 ft/ft

Cross Section for Water Quality Swale #4 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.005 ft/ft
Normal Depth	4.0 in
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.17 cfs





Worksheet for Water Quality Swale #4 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.005 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.17 cfs

Results	
Normal Depth	4.0 in
Flow Area	1.0 ft²
Wetted Perimeter	4.1 ft
Hydraulic Radius	2.9 in
Top Width	4.02 ft
Critical Depth	0.7 in
Critical Slope	2.429 ft/ft
Velocity	0.17 ft/s
Velocity Head	0.00 ft
Specific Energy	0.34 ft
Froude Number	0.059
Flow Type	Subcritical

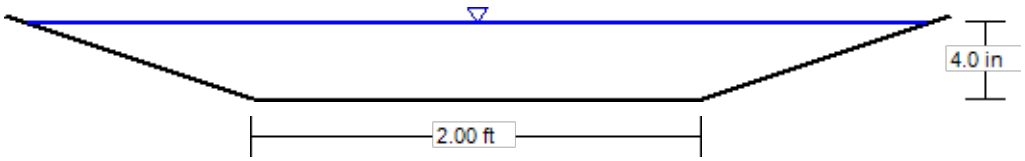
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

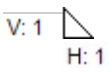
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	4.0 in
Critical Depth	0.7 in
Channel Slope	0.005 ft/ft
Critical Slope	2.429 ft/ft

Cross Section for Water Quality Swale #5 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.008 ft/ft
Normal Depth	4.0 in
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.21 cfs





Worksheet for Water Quality Swale #5 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.008 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.21 cfs

Results	
Normal Depth	4.0 in
Flow Area	1.0 ft²
Wetted Perimeter	4.1 ft
Hydraulic Radius	2.9 in
Top Width	4.01 ft
Critical Depth	0.8 in
Critical Slope	2.329 ft/ft
Velocity	0.21 ft/s
Velocity Head	0.00 ft
Specific Energy	0.34 ft
Froude Number	0.073
Flow Type	Subcritical

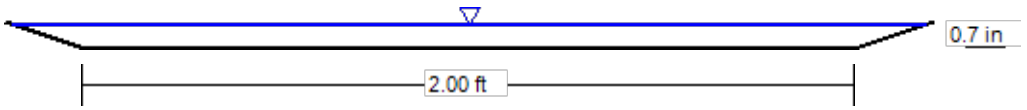
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

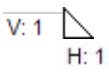
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	4.0 in
Critical Depth	0.8 in
Channel Slope	0.008 ft/ft
Critical Slope	2.329 ft/ft

Cross Section for Water Quality Swale #6 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.030 ft/ft
Normal Depth	0.7 in
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.02 cfs





Worksheet for Water Quality Swale #6 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.030 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.02 cfs

Results	
Normal Depth	0.7 in
Flow Area	0.1 ft²
Wetted Perimeter	2.4 ft
Hydraulic Radius	0.7 in
Top Width	2.37 ft
Critical Depth	0.2 in
Critical Slope	3.773 ft/ft
Velocity	0.15 ft/s
Velocity Head	0.00 ft
Specific Energy	0.06 ft
Froude Number	0.112
Flow Type	Subcritical

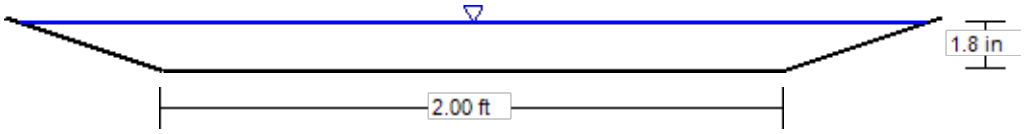
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

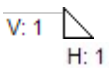
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.7 in
Critical Depth	0.2 in
Channel Slope	0.030 ft/ft
Critical Slope	3.773 ft/ft

Cross Section for Water Quality Swale #7 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.015 ft/ft
Normal Depth	1.8 in
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.07 cfs





Worksheet for Water Quality Swale #7 - WQF

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.250
Channel Slope	0.015 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	2.00 ft
Discharge	0.07 cfs

Results	
Normal Depth	1.8 in
Flow Area	0.4 ft²
Wetted Perimeter	3.0 ft
Hydraulic Radius	1.5 in
Top Width	2.92 ft
Critical Depth	0.4 in
Critical Slope	2.901 ft/ft
Velocity	0.18 ft/s
Velocity Head	0.00 ft
Specific Energy	0.15 ft
Froude Number	0.090
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.8 in
Critical Depth	0.4 in
Channel Slope	0.015 ft/ft
Critical Slope	2.901 ft/ft