

EPC STORMWATER REVIEW COMMENTS
IN ORANGE BOXES WITH BLACK TEXT

The title of the report has been revised as requested.



~~Master Development Drainage Plan and
Final Drainage Report~~

Peerless Farms
16975 Falcon Hwy
Peyton, CO 80831

Prepared for (Owner):
Robert S Williams
4075 Golf Club Dr.
Colorado Springs CO, 80922
Contact: Robert S Williams
(460) 438-1874

Prepared by:
Kimley-Horn and Associates, Inc.
2 North Nevada Avenue, Suite 900
Colorado Springs, Colorado 80903
Contact: Mitchell Hess, P.E.
(719) 453-0180

Project #: 19611400

PCD File No. SF242

Prepared: June 26, 2024

Kimley»Horn



The title of the report has been revised as requested.

CERTIFICATION

ENGINEERS STATEMENT

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

SIGNATURE (Affix Seal): _____
Mitchell Hess, Colorado P.E. No. 53916 Date

DEVELOPER’S STATEMENT

I, the owner/developer have read and will comply with all of the requirements specified in this drainage report and plan.

Name of Developer

Authorized Signature Date

Printed Name

Title

Address:

EL PASO COUNTY

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

Joshua Palmer, P.E. Date
County Engineer / ECM Administrator

Conditions:

found to be 570 cfs. Stormwater runoff within Sub-Basin T4 will continue to follow its historical path.

Sagecreek South Drainage

As part of the Project drainage design, the Sagecreek South Drainage Final Drainage Report was reviewed and an onsite field visit was conducted. To the best of our knowledge, it appears that when the Sagecreek South Subdivision was constructed, final grading restrict stormwater flows from draining from the Sagecreek South Subdivision lots to the Peerless Farms lot.

PUBLIC ROADWAY AND PRIVATE DRIVEWAY DITCHES

Ditches have been proposed adjacent to the proposed public roadway and the proposed private gravel driveways. Ditches will be constructed to meet the requirements of El Paso County Standard Detail SD_2-11. Ditches are considered roadside ditches and per Section 3.3.4 of the ECM, are not considered drainage ditches and therefore are not required to meet open channel standards. Ditch calculations for each applicable Sub-Basin have been included in Appendix D. Based on ditch slopes between 0.5% and 6.65% as well as mean ditch velocities varying between 2.87 and 4.48 ft/s, ditches will be seeded/lined with either Bermudagrass, Reed Canary Grass or Tall Fescue Grass.

Unresolved:
Per ECM section 3.3.4.B.1 minimum ditch slope is 2.0% or min velocity of 6 fps. This criteria is for "right of way" ditches, which are roadside ditches.

Unresolved:
Per ECM section 3.3.4.B.2, ditch should have freeboard of 0.5'. This criteria is for "right of way" ditches, which are roadside ditches.

We have discussed this with county staff. Please refer to the item directly above ECM Section 3.3.4.B.2. Right-of-way ditches are not roadside ditches. This section clearly excludes roadside ditches. As a side note, roadside ditches need to follow the slope of the road. Applying Section 3.3.4.B.2 criteria to roadside ditches would cause drainage issues as the ditches cannot slope at 2% if the road only slopes at 1%.

We have discussed this with county staff. Please refer to the item directly above ECM Section 3.3.4.B.2. Right-of-way ditches are not roadside ditches. This section clearly excludes roadside ditches. As a side note, roadside ditches need to follow the slope of the road. Applying Section 3.3.4.B.2 criteria to roadside ditches would cause drainage issues as the ditches cannot slope at 2% if the road only slopes at 1%.

PUBLIC ROADWAY AND PRIVATE DRIVEWAY DITCHES
... Pipes (RCP) and Concrete ...
... proposed public roadway or ...
... calculations have been include ...
... RCP depending on the propo ...
... culvert in the 100-year storm event. Riprap will be provided at both ends of culverts. Riprap has ...
... the highest flow ...
... " thick Type L F ...
... standard culve ...
... plans.
THE DBPS
... single-family lo ...
... for the Project ...
... up to 10% impe ...
... direct runoff for the site will be 16.08 and 63.49 cfs respectively. The proposed development is in general conformance with the DBPS and will not negatively affect downstream drainage.

EMERGENCY OVERFLOW ROUTING

All overflow routing will be directed to the existing unnamed drainageway that is located on the western side of the site. This flow path matches the historical stormwater runoff path.

HYDRAULIC ANALYSIS METHODOLOGY

The proposed drainage facilities were designed in accordance with the CRITERIA and MANUAL. Floodplain identification was determined using a custom FIRMette map by FEMA and information provided in the CRITERIA. Apart from road culverts, no underground storm drain pipes as proposed for the development. Culvert sizing calculations were computed using Flow master and are included in Appendix D. There are no proposed variances from the City of Colorado Springs/El Paso County Criteria for the proposed development.

No inlets have been proposed as part of the Project. Stormwater runoff will be routed above

The proposed Project involves construction of roadside ditches which will discharge into the unnamed drainageway. To reduce the opportunity for erosion where the ditches outfall, riprap will be added to dissipate energy from stormwater runoff.

Step 3: Provide Water Quality Capture Volume (WQCV)

The proposed Project development includes large-lot single-family lots which include minimal impervious areas. The single-family lots will be restricted to a maximum impervious value of 10% per lot. Lots 2, 6 and 7 include private/shared gravel driveways which will count towards the 10% maximum impervious allotment of those lots. As all of the lots are built out with future impervious coverings such as houses, out-buildings, driveways, sidewalks and patios, impervious values for each lot will be considered up to a maximum of 10% for each lot. As discussed above in Step 1, the residential lots are exempt from WQCV requirements and the Public ROW will meet County MS4 requirements by using runoff reduction methods which will meet the 60% runoff reduction standard.

Step 4: Consider Need for Industrial and Commercial BMPs

The proposed Project consists of a single-family subdivision. No industrial and commercial uses or developments are anticipated as part of the proposed development.

WATER QUALITY AND DETENTION REQUIREMENTS

The proposed Project development includes large-lot single-family lots which include minimal impervious areas. As discussed above in Step 1 of the Four-Step Process, the residential lots are exempt from WQCV requirements and the Public ROW will meet County MS4 requirements by using runoff reduction methods which will meet the 60% runoff reduction standard.

The Project does not include a proposed detention pond for this development. Large-Lot Residential Developments, especially those in excess of 5-acre lots, do not increase post-development stormwater flows as substantially as smaller-lot residential and non-residential developments. Stormwater flows collected from this development will drain to the existing unnamed drainageway. As documented in the DBPS, the unnamed drainageway is made up of the combination of the T3-02 and T4 Tributaries which both cross Falcon Highway using corrugated metal pipes known as Facility Numbers 609 and 610. The proposed 100-year flows for these tributaries at these locations are 460 cfs and 570 cfs respectively. Therefore, the unnamed drainageway is expected to have proposed 100-year storm event flows of 1,030 cfs.

The Project currently contributes 7.02 cfs and 45.01 cfs to the unnamed drainageway during the 5-year and 100-year storm events respectively, and it is proposed that 16.08 cfs and 63.49 cfs will discharge to the unnamed drainageway in the redeveloped condition and during the 5-year and 100-year storm events respectively. During a 100-year storm event, the existing stormwater flows for the Site account for 4.37% of the total flows in the unnamed drainageway (1,030 cfs). During a 100-year storm event, the proposed Project will contribute 6.16% of the total flows in the unnamed drainageway (1,030 cfs). This represents an increase of 18.48 cfs, or 1.79% of the total flows. The future flows of 1,030 cfs within the channel according to the developed conditions of the upstream basin, including the proposed Project, are shown in the calculations showing these flows contained within the channel. The channel near the southwest corner of the site is included in the

Because the unnamed drainageway flows directly through the Project, the Project stormwater peak flows can enter the unnamed drainageway. The peak flows from the off-site upstream drainage basins can arrive at this area of the drainage

We discussed this with county staff and have added two sentences that discuss the path of the flows that flow off-site and then west to the unnamed channel. We aren't changing the discharge location. The historical path of stormwater is being maintained. We are actually improving things here by allowing less stormwater to discharge off-site. Based on our follow-up call with the county this comment should be addressed. Thank you!

All flows do not flow directly through the site, some flow directly to the low spot along Falcon Highway.

Unresolved from Submittal 1: The last section of the public road does not flow directly to the unnamed drainageway but rather flow to a low spot along Falcon Highway. Discuss any increase in flows/suitable outfall for that basin because it has a different discharge location. It is understood that the roadside ditch will flow, but when discussing the potential downstream impacts both discharge points, the unnamed tributary and the roadside ditch, need to be discussed for the suitability of the outfalls.

basin. There are five upstream drainage sub-basins identified in the DBPS. They are identified as HR0260, HR0270, HR0280, HR0290 and HR0300, with the lower numbered sub-basins located further from the Site. The lag times associated with each of these sub-basins are 11, 23, 42, 17 and 31 minutes respectively. The three proposed sub-basins for the Project which contribute the largest peak flows are also the three sub-basins with the longest time of concentrations. Each of these sub-basins, 1, 6 and 8 also drain directly into the unnamed drainageway. Their time of concentrations are 39.28, 29.41 and 33.25 minutes respectively. Based on these time of concentrations being less than the longest lag time identified for the upstream DBPS sub-basins and the fact that the lag times identified above do not account for channel flow times for the stormwater to arrive at the Site, it has been concluded that not detaining stormwater flows for this Project will allow the peak stormwater flows to beat the peak stormwater flows from the overall drainage basin. Conversely, detaining stormwater flows on-site in a private extended detention basin, would negatively impact the channel as peak flows would be delayed and could coincide with the peak flows in the channel, allowing higher peak flows in the unnamed drainageway.

We have added a flowmaster calculation (starts at pdf page 102). We have coordinated on this with county staff.

Due to the minimal increase of stormwater flows caused by the redeveloped 18.48 cfs, or a 1.79% increase within the existing unnamed drainageway, larger residential lot configuration, the recommendations of the DBPS as opposed to private onsite detention, the negligible impact to the unnamed drainageway and the ability of the peak stormwater flows to pass through the unnamed drainageway, no stormwater detention has been recommended.

Unresolved:
Provide a channel calculation (Flowmaster, AutoCAD hydrology, etc) showing increased flows in major channel, does not have any adverse effects. A full model is not needed, just a simple single channel analysis showing what depth, velocities, etc will be.

EROSION CONTROL PLAN

Erosion Control Plans will be submitted separately as a standalone construction document. During construction temporary control measures will be installed to reduce erosion onsite. The temporary controls are anticipated to consist, at a minimum, of silt fencing, vehicle tracking control, ditches, check dams, culvert protection, erosion control blankets, seeding and mulching and temporary sediment basins.

As part of the construction associated with this subdivision, two temporary sediment basins will be constructed to meet County MS4 and State requirements. Although the sediment basins will be temporary erosion controls, permanent ditches will be constructed which will route stormwater to the temporary sediment basins during construction and to the unnamed drainageway post-construction. The temporary sediment basins will be sized according to El Paso County Standard Detail 900-TSB-2. This standard detail has been included in Appendix E. Final sizing for the temporary sediment basins will be included in the Grading and Erosion Control Plans and Stormwater Management Plan.

FLOODPLAIN STATEMENT

The western portion of the Site is within Area AE, special flood hazard areas with base flood elevations and Zone X, 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.

The remaining portion of the Site is located outside of the 100-year floodplain as determined by the custom FIRMetMap created on April 20, 2021 and contained with Appendix B.

FEES DEVELOPMENT

APPLICABLE FEES

Drainage and Bridge Fees are required to be paid at the time of Final Plat recording for the Project. The Site is within the Haegler Ranch Drainage Basin. Drainage Fees are based on the number of impervious acres for the development. The 2024 Drainage and Bridge Fees are \$13,971 and \$2,062, respectively, per impervious acre. Fee calculation is provided below:

Total Acreage (40-acres) x Total Development (inclusive of Prop. Public ROW) Impervious Value (12%) = Impervious Acres (4.8)

| | | |
|--------------------------------------|--------------------------------|------------------------|
| 2024 Drainage Basins Fees | = 4.8-acres x (\$ 13,971) | = \$ 67,060.80 |
| 2024 Bridge Fees | = 4.8-acres x (\$ 2,062) | = \$ 9,897.60 |
| Subtotal | | = \$ 76,958.40 |
| <i>25% Reduction for 5-acre lots</i> | <i>= 0.25 * (\$ 76,958.40)</i> | <i>= (\$19,239.60)</i> |

25% Reduction is only for Drainage Fees. Bridge Fees are not reduced.

Final Fee **= \$57,718.80**

The 25% reduction has been revised to only be for the drainage fees.

CONSTRUCTION COST OPINION

An opinion of probable construction cost for the construction of the private drainage facilities for the Project has been included in Appendix E. There are no public drainage ponds or permanent control measures proposed as part of the Project.

MAINTENANCE AND OPERATIONS

No detention has been proposed as part of this Project. The public roadside ditches and culverts within the proposed Public ROW which provide water quality treatment will be maintained by El Paso County, upon acceptance. Other proposed ditches, swales and culverts located outside of the proposed Public ROW will be maintained by property owners of the development. Easements will be provided over the shared driveways and ditches to allow all property owners the ability to access and maintain ditches and culverts as needed.

GROUNDWATER CONSIDERATIONS

A Geotechnical Evaluation by RMG and dated 4/14/2021 was performed for the Site. According to the Geotechnical Evaluation, "Groundwater was encountered in all three test borings at depths ranging from between 11.0 feet to 18.0 feet below the existing ground surface at the time of boring. When checked five days subsequent to drilling, groundwater was encountered at depths ranging between 4.0 feet to 18.6 feet. Groundwater levels are anticipated to have sufficient separation from the bottom of proposed crawlspace and basement foundation components on Lots 2, 4, 6 and 7. Due to the shallow groundwater conditions encountered near the unnamed intermittent creek, the use of basements on Lots 1 and 5 may be limited. Groundwater conditions should be considered in the site-specific soils investigations and OWTS designs."

SUMMARY

COMPLIANCE WITH STANDARDS

The drainage design presented within this report for the Peerless Farms Large-Lot Single-Family Development conforms to the City of Colorado Springs/El Paso County Storm Drainage Criteria and the Urban Drainage and Flood Control District Manual. Additionally, the Site runoff and private storm sewer facilities will not adversely affect the downstream and surrounding developments or

PROJECT NAME: Peerless Farms
 PROJECT NUMBER: 1.96E+08
 CALCULATED BY: MOH
 CHECKED BY: MOH

DATE: 6/26/2024

P₁ (1-Hour Rainfall) = **1.5**

| STORM LINE | DESIGN POINT | DIRECT RUNOFF | | | | | | | TOTAL RUNOFF | | | | STREET | | PIPE | | | TRAVEL TIME | | | REMARKS |
|------------------------|--------------|---------------|-----------|--------------|----------------------|---------|-----------|---------|------------------------|-----------------------|------------------------|----------|---------|---------|---------|-------------------|-------------------|-------------|----------------|-------------|---------|
| | | DESIGN BASIN | AREA (AC) | RUNOFF COEFF | t _c (min) | C*A(ac) | I (in/hr) | Q (cfs) | Q ₁₀₀ (cfs) | Q ₁₀₀ (mm) | Q ₁₀₀ (max) | C*A (ac) | I (/hr) | Q (cfs) | OPE (%) | STREET FLOW (cfs) | DESIGN FLOW (cfs) | SLOPE (%) | PIPE SIZE (in) | LENGTH (ft) | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) |
| On-Site Basins | | | | | | | | | | | | | | | | | | | | | |
| | EX1 | EX1 | 35.36 | 0.09 | 45.23 | 3.28 | 1.83 | | | | | | | | | | | | | | |
| | EX2 | EX2 | 4.64 | 0.10 | 35.66 | 0.48 | 2.12 | 1.03 | 3.16 | | | | | | | | | | | | |
| Off-Site Basins | | | | | | | | | | | | | | | | | | | | | |
| | EX3 | EX3 | 2.63 | 0.25 | 15.93 | 0.66 | 3.31 | 2.18 | 5.34 | | | | | | | | | | | | |
| | EX3B | EX3B | 5.97 | 0.10 | 13.19 | 0.59 | 3.61 | 2.14 | 2.14 | | | | | | | | | | | | |
| | T3 | T3-02 | 289 | - | - | - | - | - | - | | | | | | | | | | | | |
| | T4 | T4 | 350 | - | - | - | - | - | - | | | | | | | | | | | | |

Unresolved: DP EX1 is total of all basins. Please provide separate line for this DP

As discussed in a call with county staff, no additional rows or sub-basins are required. Notes just need to be added in the "Remarks" Section which explains which Sub-Basins contribute to the cumulative flows. This information is redundant because it is already found within the FDR narrative, but we have added it at the request of the county.

*Acreages and Q100 values for T3-02 and T4 were taken from the DBPS. Other values are not available.
 **Refer to Drainage Map for cummulative flows accumulation paths

Unresolved: DP EX3 is combined flows of Basins EX3, EX3B & EX2. Please provide separate line for DP

As discussed in a call with county staff, no additional rows or sub-basins are required. Notes just need to be added in the "Remarks" Section which explains which Sub-Basins contribute to the cumulative flows. This information is redundant because it is already found within the FDR narrative, but we have added it at the request of the county.



**PROPOSED
STORM DRAINAGE DESIGN - RATIONAL METHOD 5 YEAR EVENT**

PROJECT NAME: Peerless Farms
 PROJECT NUMBER: 1.96E+08
 CALCULATED BY: MOH
 CHECKED BY: MOH

DATE: 6/26/2024

P₁ (1-Hour Rainfall) = **1.5**

| STORM LINE | DESIGN POINT | DIRECT RUNOFF | | | | | | | | | TOTAL RUNOFF | | | | STREET | | PIPE | | | TRAVEL TIME | | | REMARKS |
|------------------------|--------------|---------------|-----------|--------------|----------------------|---------|-----------|---------|-------------------|----------------------|--------------|-----------|---------|-----------|------------------|------------------|-----------|----------------|-------------|----------------|----------------------|------|---------|
| | | DESIGN BASIN | AREA (AC) | RUNOFF COEFF | t _c (min) | C*A(ac) | I (in/hr) | Q (cfs) | Q** (Cummm) (cfs) | t _c (max) | S(C*A) (ac) | I (in/hr) | Q (cfs) | SLOPE (%) | STREET FLOW(cfs) | DESIGN FLOW(cfs) | SLOPE (%) | PIPE SIZE (in) | LENGTH (ft) | VELOCITY (fps) | t _t (min) | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (9B) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | |
| On-Site Basins | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 1 | 19.97 | 0.16 | 39.28 | 3.11 | 2.00 | 6.21 | 20.40 | | | | | | | | | | | | | | |
| | 2 | 2 | 1.78 | 0.20 | 26.92 | 0.35 | 2.51 | 0.87 | 11.05 | | | | | | | | | | | | | | |
| | 3 | 3 | 0.78 | 0.29 | 11.60 | 0.23 | 3.82 | 0.86 | 0.86 | | | | | | | | | | | | | | |
| | 4 | 4 | 0.42 | 0.55 | 7.69 | 0.23 | 4.47 | 1.03 | 1.03 | | | | | | | | | | | | | | |
| | 5 | 5 | 0.85 | 0.37 | 13.32 | 0.31 | 3.60 | 1.12 | 1.12 | | | | | | | | | | | | | | |
| | 6 | 6 | 5.55 | 0.18 | 29.41 | 0.97 | 2.38 | 2.32 | 9.32 | | | | | | | | | | | | | | |
| | 7 | 7 | 1.57 | 0.13 | 22.96 | 0.20 | 2.74 | 0.54 | 3.71 | | | | | | | | | | | | | | |
| | 8 | 8 | 9.09 | 0.16 | 33.25 | 1.42 | 2.21 | 3.14 | 14.19 | | | | | | | | | | | | | | |
| Off-Site Basins | | | | | | | | | | | | | | | | | | | | | | | |
| | EX3 | EX3 | 2.63 | 0.25 | 15.93 | 0.66 | 3.31 | 2.18 | 5.89 | | | | | | | | | | | | | | |
| | EX3B | EX3B | 5.97 | 0.10 | 13.19 | 0.59 | 3.61 | 2.14 | 2.14 | | | | | | | | | | | | | | |
| | T3 | T3-02 | 289 | - | - | - | - | - | - | | | | | | | | | | | | | | |
| | T4 | T4 | 350 | - | - | - | - | - | - | | | | | | | | | | | | | | |

*Acreages and C₁₀₀ values for T3-02 and T4 were taken from the DBPS. Other values are not available.

**Refer to Drainage Map for cummulative flows accumulation paths

Unresolved:
 Please provide individual design point calculation for each of those listed which combine flows from multiple basins. See comment to the left

DP1 is the total of all basins
 DP2 Basins 2 & 3 combined
 DP6 is Basins 4,5 &6 combined
 DPEX3 is basins EX3, 7 & EX3B combined

As discussed in a call with county staff, no additional rows or sub-basins are required. Notes just need to be added in the "Remarks" Section which explains which Sub-Basins contribute to the cumulative flows. This information is redundant because it is already found within the FDR narrative, but we have added it at the request of the county.

As discussed in a call with county staff, no additional rows or sub-basins are required. Notes just need to be added in the "Remarks" Section which explains which Sub-Basins contribute to the cumulative flows. This information is redundant because it is already found within the FDR narrative, but we have added it at the request of the county.



**PROPOSED
STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT**

PROJECT NAME: Peerless Farms
 PROJECT NUMBER: 1.96E+08
 CALCULATED BY: MOH
 CHECKED BY: MOH

DATE: 6/26/2024

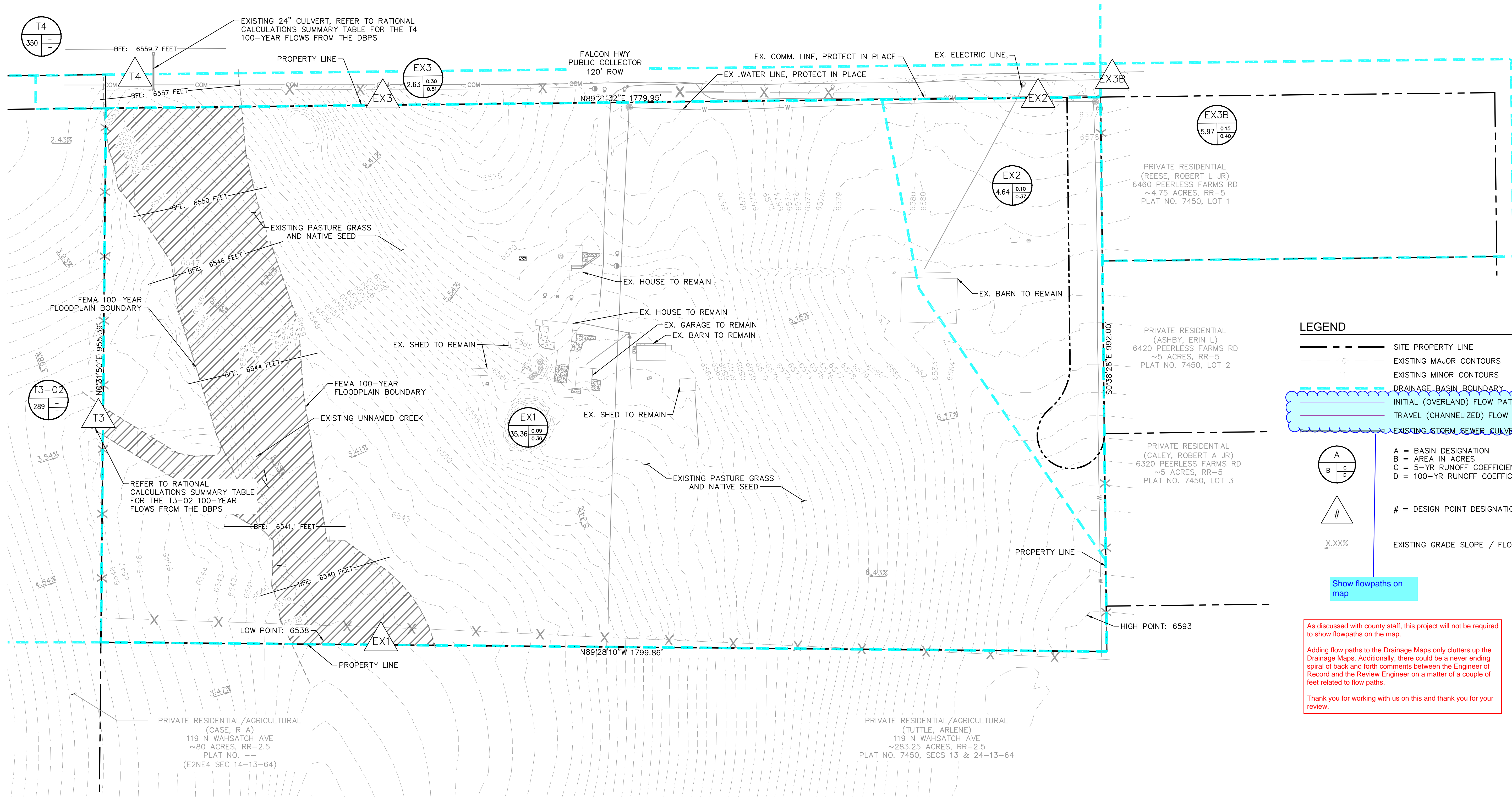
P₁ (1-Hour Rainfall) = **2.52**

| STORM LINE | DESIGN POINT | DIRECT RUNOFF | | | | | | | | | TOTAL RUNOFF | | | | STREET | | PIPE | | TRAVEL TIME | | | REMARKS |
|------------------------|--------------|---------------|-----------|--------------|----------------------|---------|-----------|---------|-------------------|----------------------|--------------|-----------|---------|-----------|------------------|------------------|-----------|----------------|-------------|----------------|----------------------|---------|
| | | DESIGN BASIN | AREA (AC) | RUNOFF COEFF | t _c (min) | C*A(ac) | I (in/hr) | Q (cfs) | Q** (Cummm) (cfs) | t _c (max) | S(C*A) (ac) | I (in/hr) | Q (cfs) | SLOPE (%) | STREET FLOW(cfs) | DESIGN FLOW(cfs) | SLOPE (%) | PIPE SIZE (in) | LENGTH (ft) | VELOCITY (fps) | t _t (min) | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (9B) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) |
| On-Site Basins | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 1 | 19.97 | 0.40 | 39.28 | 8.06 | 3.36 | 27.04 | 85.63 | | | | | | | | | | | | | |
| | 2 | 2 | 1.78 | 0.43 | 26.92 | 0.77 | 4.21 | 3.24 | 44.94 | | | | | | | | | | | | | |
| | 3 | 3 | 0.78 | 0.50 | 11.60 | 0.39 | 6.42 | 2.48 | 2.48 | | | | | | | | | | | | | |
| | 4 | 4 | 0.42 | 0.70 | 7.69 | 0.29 | 7.51 | 2.21 | 2.21 | | | | | | | | | | | | | |
| | 5 | 5 | 0.85 | 0.56 | 13.32 | 0.47 | 6.04 | 2.84 | 2.84 | | | | | | | | | | | | | |
| | 6 | 6 | 5.55 | 0.42 | 29.41 | 2.32 | 4.00 | 9.26 | 39.22 | | | | | | | | | | | | | |
| | 7 | 7 | 1.57 | 0.38 | 22.96 | 0.60 | 4.60 | 2.77 | 19.65 | | | | | | | | | | | | | |
| | 8 | 8 | 9.09 | 0.40 | 33.25 | 3.67 | 3.72 | 13.65 | 58.59 | | | | | | | | | | | | | |
| Off-Site Basins | | | | | | | | | | | | | | | | | | | | | | |
| | EX3 | EX3 | 2.63 | 0.51 | 15.93 | 1.34 | 5.56 | 7.47 | 27.12 | | | | | | | | | | | | | |
| | EX3B | EX3B | 5.97 | 0.40 | 13.19 | 2.42 | 6.07 | 14.67 | 14.67 | | | | | | | | | | | | | |
| | T3 | T3-02 | 289 | - | - | - | - | - | - | | | | | | | | | | | | | |
| | T4 | T4 | 350 | - | - | - | - | - | - | | | | | | | | | | | | | |

*Acreages and Q100 values for T3-02 and T4 were taken from the DBPS. Other values are not available.

Unresolved:
See comments on previous sheet

As discussed in a call with county staff, no additional rows or sub-basins are required. Notes just need to be added in the "Remarks" Section which explains which Sub-Basins contribute to the cumulative flows. This information is redundant because it is already found within the FDR narrative, but we have added it at the request of the county.



NOTES:
1. OFF-SITE SUB-BASINS T3-02 AND T4 ARE TRIBUTARY AREAS TO THE UNNAMED DRAINAGEWAY WHICH ARE DOCUMENTED IN THE HAEGLER RANCH DBPS. 5 AND 100-YR RUNOFF COEFFICIENTS ARE UNKNOWN FOR THESE AREAS, BUT 100-YEAR FLOWS FOR T3-02 AND T4 AFTER FULL BUILD-OUT OF THE DRAINAGE BASIN ARE EXPECTED TO BE 460 CFS AND 570 CFS, RESPECTIVELY (REFER TO TABLE 6-7 FROM THE DBPS).
2. Offsite areas not included in survey, but estimated based on aerial imagery for drainage calculations.

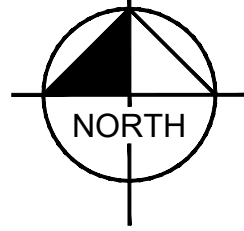
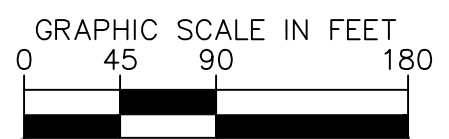
| LEGEND | |
|--------|--|
| | SITE PROPERTY LINE |
| | EXISTING MAJOR CONTOURS |
| | EXISTING MINOR CONTOURS |
| | DRAINAGE BASIN BOUNDARY |
| | INITIAL (OVERLAND) FLOW PATH |
| | TRAVEL (CHANNELIZED) FLOW PATH |
| | EXISTING STORM SEWER CULVERT |
| | A = BASIN DESIGNATION B = AREA IN ACRES C = 5-YR RUNOFF COEFFICIENT D = 100-YR RUNOFF COEFFICIENT |
| | # = DESIGN POINT DESIGNATION |
| | EXISTING GRADE SLOPE / FLOW DIRECTION |

Show flowpaths on map

As discussed with county staff, this project will not be required to show flowpaths on the map.

Adding flow paths to the Drainage Maps only clutters up the Drainage Maps. Additionally, there could be a never ending spiral of back and forth comments between the Engineer of Record and the Review Engineer on a matter of a couple of feet related to flow paths.

Thank you for working with us on this and thank you for your review.

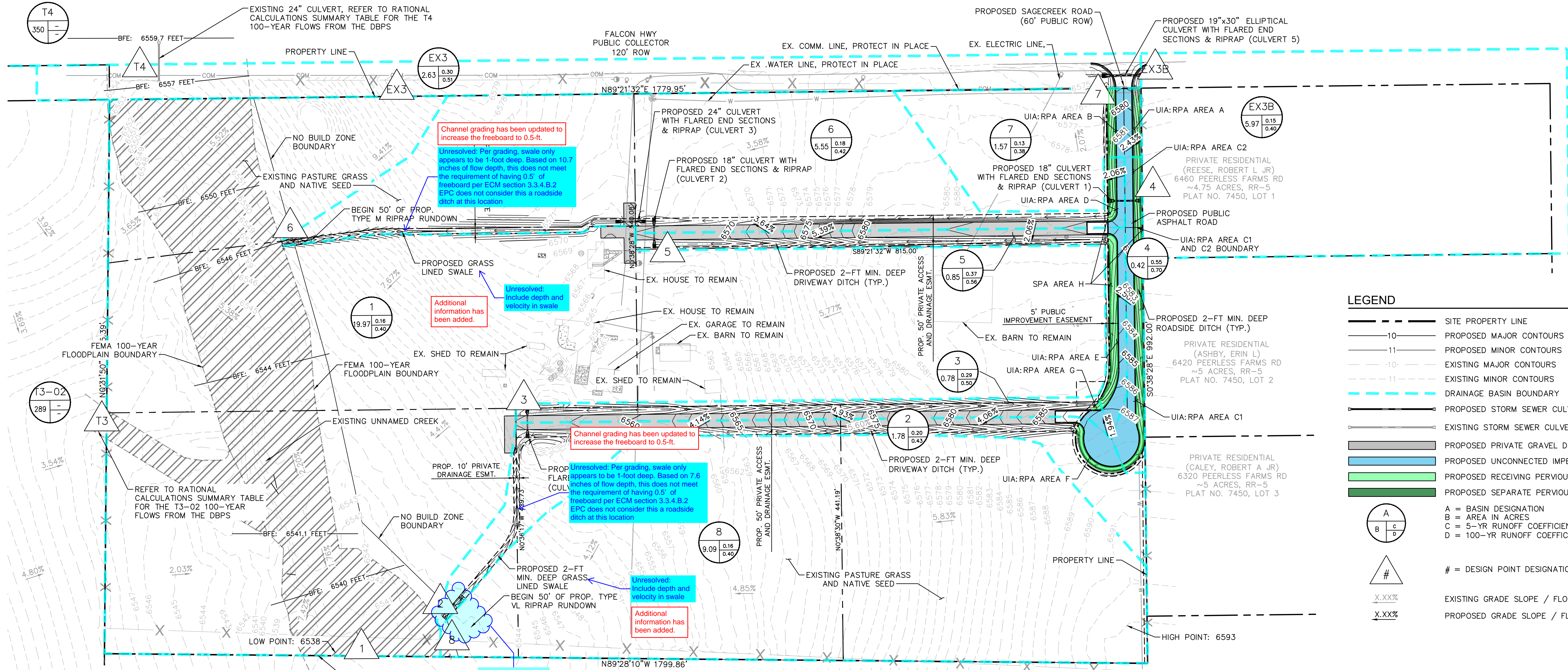


EXISTING DRAINAGE MAP
PEERLESS FARMS
06/24/2024



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2 N NEVADA AVE., SUITE 900, COLORADO SPRINGS, 80903
PHONE: 719-453-0180

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LEGEND

- SITE PROPERTY LINE
- 10- PROPOSED MAJOR CONTOURS
- 11- PROPOSED MINOR CONTOURS
- 10- EXISTING MAJOR CONTOURS
- 11- EXISTING MINOR CONTOURS
- - - DRAINAGE BASIN BOUNDARY
- PROPOSED STORM SEWER CULVERT
- EXISTING STORM SEWER CULVERT
- PROPOSED PRIVATE GRAVEL DRIVEWAY
- PROPOSED UNCONNECTED IMPERVIOUS AREA
- PROPOSED RECEIVING PERVIOUS AREA
- PROPOSED SEPARATE PERVIOUS AREA

| | | | |
|---|---|---|---|
| A | B | C | D |
|---|---|---|---|

- A = BASIN DESIGNATION
- B = AREA IN ACRES
- C = 5-YR RUNOFF COEFFICIENT
- D = 100-YR RUNOFF COEFFICIENT

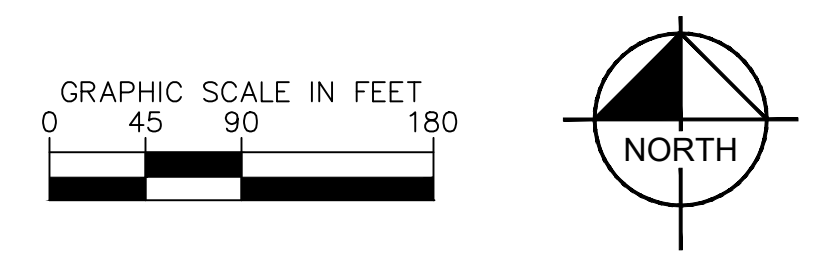
= DESIGN POINT DESIGNATION

X.XX% EXISTING GRADE SLOPE / FLOW DIRECTION

X.XX% PROPOSED GRADE SLOPE / FLOW DIRECTION

NOTES:

- OFF-SITE SUB-BASINS T3-02 AND T4 ARE TRIBUTARY AREAS TO THE UNNAMED DRAINAGEWAY WHICH ARE DOCUMENTED IN THE HAEGLER RANCH DBPS. 5 AND 100-YR RUNOFF COEFFICIENTS ARE UNKNOWN FOR THESE AREAS, BUT 100-YEAR FLOWS FOR T3-02 AND T4 AFTER FULL BUILD-OUT OF THE DRAINAGE BASIN ARE EXPECTED TO BE 460 CFS AND 570 CFS, RESPECTIVELY (REFER TO TABLE 6-7 FROM THE DBPS).
- REFERENCE GRADING AND EROSION CONTROL PLANS FOR RIPRAP PLACEMENT AND SIZING DETAIL (SHEET C2.2)



PROPOSED DRAINAGE MAP
PEERLESS FARMS
06/24/2024

Kimley»Horn

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PHONE: 719-453-0180