MASTER DEVELOPMENT DRAINAGE PLAN FOR AUTUMN HILLS (NE4 SEC 36-12-65) SKETCH PLAN EL PASO COUNTY, COLORADO

Due to the review comments provided, additional new comments may be generated on the subsequent submittal

AUGUST 2022

Prepared For:

MERIDIAN HILLS LLC
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716.473.0599
Contact: Kevin Donovan

Prepared By:

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add PCD file No. SKP231

TNE Job No. 2199.13
County Job No. ####

MASTER DEVELOPMENT DRAINAGE PLAN FOR AUTUMN HILLS (NE4 SEC 36-12-65) SKETCH PLAN EL PASO COUNTY, COLORADO

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MASTER DEVELOPMENT DRAINAGE PLAN FOR AUTUMN HILLS (NE4 SEC 36-12-65) SKETCH PLAN EL PASO COUNTY, COLORADO

CERTIFICATION STATEMENT:

Engineers Statement

This 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 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.

_____

Dane Frank, P.E. 50207 Seal

Developers Statements

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

MERIDIAN HILLS LLC_____

Business Name

By:_____

Title:_____

Address:_____

_____

El Paso County Approval:

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

_____ _____

Jennifer Irvine, Date

County Engineer / ECM Administrator

Conditions:

Please revise to Joshua Palmer, P.E.

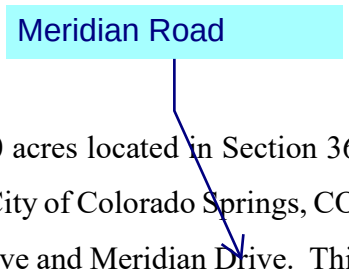
MASTER DEVELOPMENT DRAINAGE PLAN FOR AUTUMN HILLS (NE4 SEC 36-12-65) SKETCH PLAN EL PASO COUNTY, COLORADO

PURPOSE

The purpose of this Master Development Drainage Plan (MDDP) is to identify major drainageways; ponding/detention areas; locations of culverts, bridges, and open channels; and drainage areas which are tributary to the proposed development.

DBPS

The site lies within the Falcon Drainage Basin and is covered by the Final Falcon Drainage Basin Planning Study, dated 2015.



GENERAL DESCRIPTION

This MDDP for "Autumn Hills" is an analysis of approximately 160 acres located in Section 36, Township 12 South, Range 64 West of the Sixth Principal Meridian, City of Colorado Springs, CO. The site is at the southwest corner of the intersection of Stapleton Drive and Meridian Drive. This property is planned for mixed use development (commercial/residential).

The site is bounded on the north by Stapleton Drive, on the east be Meridian Road, on south by lots from Woodmen Hills Filing #2 and #4 (residential), and on the west by lots from The Meadows Filing Three (residential).

The site has not been previously studied.

Soils in the study area are shown as mapped by the S.C.S. in the "Soils Survey of El Paso County Area" (see appendix). Soils for this project are 52.6% Pring coarse sandy loam 71 (HSG B) and 47.4% Stapleton sandy loam 83 (HSG B).

The site lies within the Falcon Drainage Basin and runoff ultimately flows into the Black Squirrel Creek.

The study area consists of undeveloped land that has existing vegetation consisting of established native grasses. The site drains from northwest to southeast overland, with existing drainageways on the east and south sides. Once leaving the site, the majority of runoff continues south in the Meridian Road roadside swale.

Please clarify as the drainage map does not depict the Bennett Ranch drainageway along the east side of the site. Additionally it is stated above and below that there is just a roadside swale along Meridian road which is on the east side of the site

EXISTING DRAINAGE CONDITIONS

There are two existing offsite basins that surface drain onto the site, and the site itself is composed of six basins that drain southwest, south, or southeast. There is an existing offsite swale along the south side of the site that drains east, and an existing onsite swale along Meridian Road on the east side of the site. The Bennett Ranch Drainageway runs along the east side of the site, and a swale runs along the west and south sides of the site. Around 80% of the runoff from the site leaves the site in the swales at the southeast corner of the site.

identify were the other 20% leaves the site

Offsite Basin OS-Z's 2.42 acres consists of part of Meridian Road (asphalt and native grasses) that flows onto the site. Runoff (Q_5 = 2.7 cfs, Q_{100} = 5.9 cfs) surface flows west into the roadside swale in Basin EX-B, then flows south.

Offsite Basin OS-Y's 2.39 acres consists of half of Stapleton Drive (asphalt and native grasses) that flows onto the site. Runoff (Q_5 = 5.9 cfs, Q_{100} = 14.3 cfs) surface flows southwest into Basin EX-B.

Runoff (Q_5 = 0.9 cfs, Q_{100} = 5.3 cfs) from Basin EX-A's 2.17 acres sheet flows southwest and off the site. Design Point A is located near the northwest corner of the site.

Runoff (Q_5 = 22.1 cfs, Q_{100} = 104.4 cfs) from Basin EX-B's 84.8 acres sheet flows southeast across undeveloped land and into the swale along Meridian Road. Design Point B is located in the southeast corner of the basin.

Runoff (Q_5 = 13.9 cfs, Q_{100} = 81.1 cfs) from Basin EX-C's 44.7 acres sheet flows southeast across undeveloped land and into the offsite swale south of the site. Design Point C is located near the southeast corner of the site.

Runoff (Q_5 = 1.0 cfs, Q_{100} = 5.9 cfs) from Basin EX-D's 2.79 acres sheet flows southeast across

undeveloped land and into the offsite swale south of the site. Design Point D is located near the south-center of the site.

Runoff (Q_5 = 2.1 cfs, Q_{100} = 12.4 cfs) from Basin EX-E's 6.25 acres sheet flows southeast across undeveloped land and into the offsite swale south of the site. Design Point E is located near the south-centerof the site.

Runoff (Q_5 = 5.9 cfs, Q_{100} = 34.7 cfs) from Basin EX-F's 19.1 acres sheet flows southwest across undeveloped land and off the site near the southwest corner. Design Point F is located near the southwest corner of the site.

The Falcon DBPS doesn't show any existing or proposed drainage improvements on the site. It does show a drainageway that starts at the southwest corner of the site that is labeled as Protect In Place. The subbasins shown in the DBPS loosely match the existing drainage basins on the site.

Provide excerpts of all DBPS sections referenced within the report.

Adjust the Offsite Basin boundary for Meridian Road to include the full road section per the Meridian (North) Access Control Plan. The Control Plan shows runoff from the eastern half of Meridian will be collected by inlets and routed into the ditch on the west side.

CONDITIONS

d residential/commercial development. In the proposed condition the Road will remain largely unchanged and the majority of the site runoff e in the swale at the southeast corner. There are currently no specific lan showing commercial development along e site, and stormwater treatment structures on possible layout for interior roads has been shown on the proposed for a visual aid of how the site could be developed. It is expected that for the developed site will continue to direct runoff to the southeast corner of the site.

Basin and roadside ditch assumption needs to account for the ultimate condition of Meridian Road. Narrative should state as such.

Offsite Basin OS-Z's 2.42 acres consists of part of Meridian Road (asphalt and native grasses) that flows onto the site. Runoff (Q_5 = 2.7 cfs, Q_{100} = 5.9 cfs) surface flows west into the roadside swale in Basin EX-B, then flows south.

This should be proposed basin PR-1 per the drainage map

Offsite Basin OS-Y's 2.39 acres consists of half of Stapleton Drive (asphalt and native grasses) that flows onto the site. Runoff (Q_5 = 5.9 cfs, Q_{100} = 14.3 cfs) surface flows southwest into Basin EX-B.

This should be PR-2 per the drainage map

Update PR-1 flow and impervious assumption to account for the widening of Meridian Road to it's ultimate cross section.

Revise to one

Basin PR-1's 3.65 acres consists of the existing swale along Meridian Road. A percent impervious of 2% was assumed for this basin in the developed condition. Runoff (Q_5 = 0.9 cfs, Q_{100} = 5.0 cfs) is expected to flow south to Design Point 1. It is likely the existing swale will need re[illegible] to accommodate landscaping and current standards. Two new roads are shown connecting t[illegible] Road and will presumably require new culverts at the crossing locations.

Identify the anticipated culvert size and the road side ditch.

Elaborate on the assumption. The hydrology needs to account for the Stapleton Drive widening.

[illegible]t of the site and drains to a stormwater treatment structure in [illegible]cent impervious of 80% was assumed for this basin in the developed condition. Runoff (Q_5 = 346.5 cfs, Q_{100} = 676.2 cfs) is expected to flo[illegible] Design Point 2. This basin would ultimately discharge into the existing swale at the so[illegible] of the site.

Please clarify that you are referring to DP1 and not the offsite swale south of the pond.

State whether or not the proposed ponds will mitigate the increase in flow caused by the development. Provide a comparison of the historic flows leaving the site and the developed flows that will need to be mitigated.

The southeast corner of the site is the low point for most the site, so it's the most like[illegible] an onsite stormwater treatment facility. Based on basin PR-2 runoff a stormwater por[illegible] sized to have a footprint of 330,000 square feet. This assumes the entire basin will [illegible] single location.

Please state what the ponds will be designed to release at. Will it be historic rates?

Basin PR-3's 29.4 acres consists of the southwest section of the site and drains to a stormwater treatment structure in the southwest corner of the site. A percent impervious of 50% was assumed for this basin in the developed condition. Runoff (Q_5 = 47.8 cfs, Q_{100} = 107.4 cfs) is expected to flow south to Design Point 3. This basin would ultimately discharge into the existing offsite swale south of the site.

identify where the flow from this offsite swale is conveyed to. Are improvements needed to this swale? what are the existing conditions? Is the existing swale contained within a drainage easement as it appears to be within residential lots? Please address.

The southwest section of the site doesn[illegible] own onsite stormwater treatment facility. Based on basin PR-3 runoff a stormwater pond was roughly sized to have a footprint of 41,000 square feet. This assumes the entire basin will be treated at a single location.

It is not clear what those problems are from the text above. Please elaborate and clearly state the anticipated problems and solutions.

No drainage problems are anticipated for the proposed development, other than those discussed above.

Please identify where the developments flow will be conveyed to once leaving the site. Provide analysis & discussion of the downstream (refer to DCMV1 chapter4.2) and identify whether it appears adequate or if it is anticipated to require improvements. Identify the suitable outfall per ECM 3.2.4

provide

Please elaborate. How does the proposed impervious compare with the impervious identified in the DBPS for this area.

The Falcon DBPS appears to assume a future land use for the site area of Single Family Urban (Figure 3-6), which would have a similar density to mixed use residential/commercial shown on the sketch plan.

It is understood that full details of the development is not known. Please provide general examples of how these items may be accomplished by this development.

In an effort to protect receiving water and as part of the "four-step process to minimize adverse impacts of urbanization" this site was analyzed in the following manner:

1. Reduce Runoff- As no details of the proposed development have been provided and the sketch plan has only possible development features shown, it is not known if/how runoff would be reduced.
2. Stabilize Drainageways- As no details of the proposed development have been provided and hydraulic calculations are not part of this MDDP, it is not currently known if drainageway stabilization will be necessary for this development.
3. Provide Water Quality Capture Volume (WQCV)- Possible locations for two extended detention basins have been shown on the proposed drainage map, that could provide WQCV. As no details of the proposed development have been provided, it is not currently known if these locations will be used or what form of water quality treatment will be used.
4. Consider Need for Industrial and Commercial BMPs- The proposed development is for residential/commercial land. As no details of the proposed development have been provided, it is not currently known if commercial BMPs will be warranted, or what form they could take.

Please remove the highlighted sentence. The intent of the MDDP is to set the stage for the future drainage reports in the development process. Identifying that 2 EDB's where located can provide the detention and water quality for the site will suffice.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the El Paso County Storm Drainage Design Criteria Manual - Volumes 1 & 2, latest editions. The Rational Method was used to estimate storm water runoff anticipated from design storms with 5-year and 100-year recurrence intervals.

FLOODPLAIN STATEMENT

No portion of this site is within a designated F.E.M.A. floodplain, as determined by Flood Insurance Rate Map No. 08041C0553 G and 08041C0551 G dated December 7, 2018 (see appendix). The floodplain is shown on the drainage maps.

DRAINAGE FEES

It is expected that the County will require drainage fees be paid when this site is platted for residential/commercial use.

SUMMARY

The site is planned for residen ent. Runoff mostly flows to the southeast. The concepts presented in this MDDP are preliminary in nature and will need to be refined in the future final drainage report(s).

Revise to ...future preliminary and final drainage report(s).

identify who will own/maintain the two detention ponds.

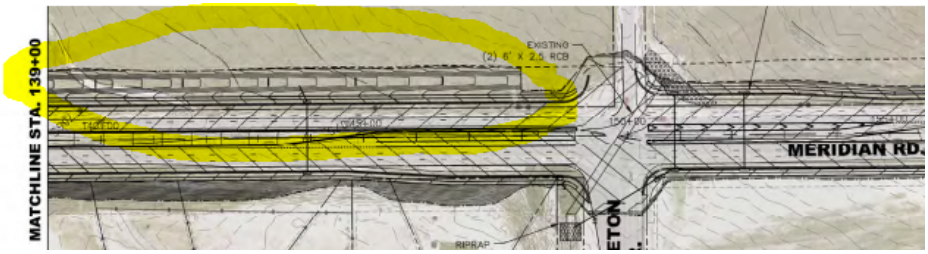
Discuss the phasing plan of the two detention ponds. The submitted phasing plan shows both ponds are part of Phase 1. however, phase 1 improvements only drains toward the eastern pond. Why is the western pond included with Phase 1.

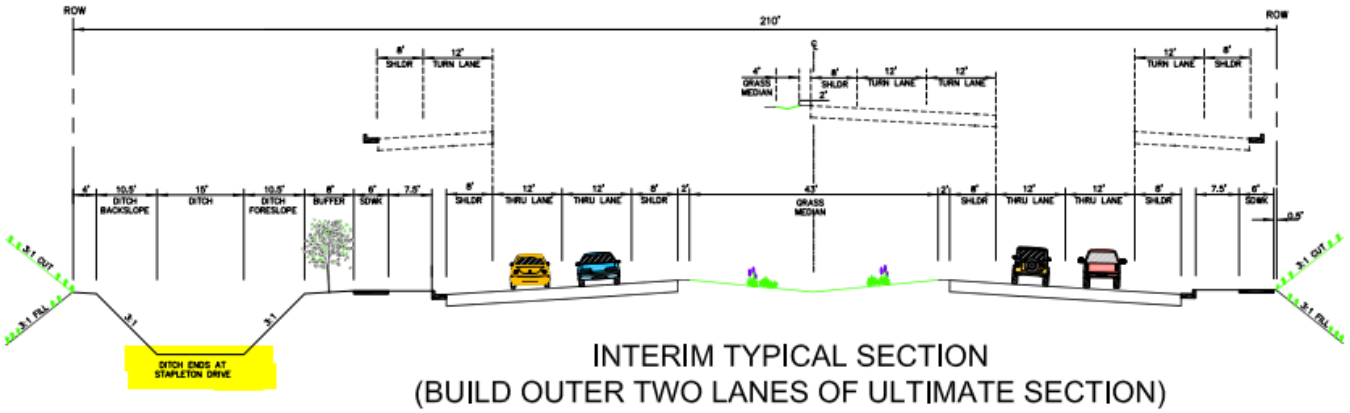
PREPARED BY:
TERRA NOVA ENGINEERING, I

Dane Frank, P.E.
Project Engineer
Jobs/2199.130/Drainage/2199130 MDDP.doc

The Meridian Corridor Plan (see link and snippet below) identifies a 15' bottom wide trapezoidal channel along Meridian road that is to convey 167cfs. Please provide analysis/discussion regarding this and indicate whether this channel will still be required. If not required, provide solutions to where Meridian Road runoff will be conveyed to as the corridor plan currently indicates inlets that will convey runoff from the road into the ditch.

https://assets-publicworks.elpasoco.com/wp-content/uploads/Documents/MeridianNorthCorridorPlan_Part2.pdf





INTERIM TYPICAL SECTION
(BUILD OUTER TWO LANES OF ULTIMATE SECTION)
WOODMEN HILLS DRIVE TO REX ROAD

BIBLIOGRAPHY

"El Paso County Drainage Criteria Manual-Volumes 1 & 2", latest edition

"El Paso County Board Resolution No 15-042" (Adoption of Chapter 6 and Section 3.2.1 Chapter 13 of the City of Colorado Springs Drainage Criteria Manual dated May 2014, Hydrology and Full Spectrum Detention)

"Final Falcon Drainage Basin Planning Study", by Matrix Design Group, dated September, 2015

SCS Soils Map for El Paso County

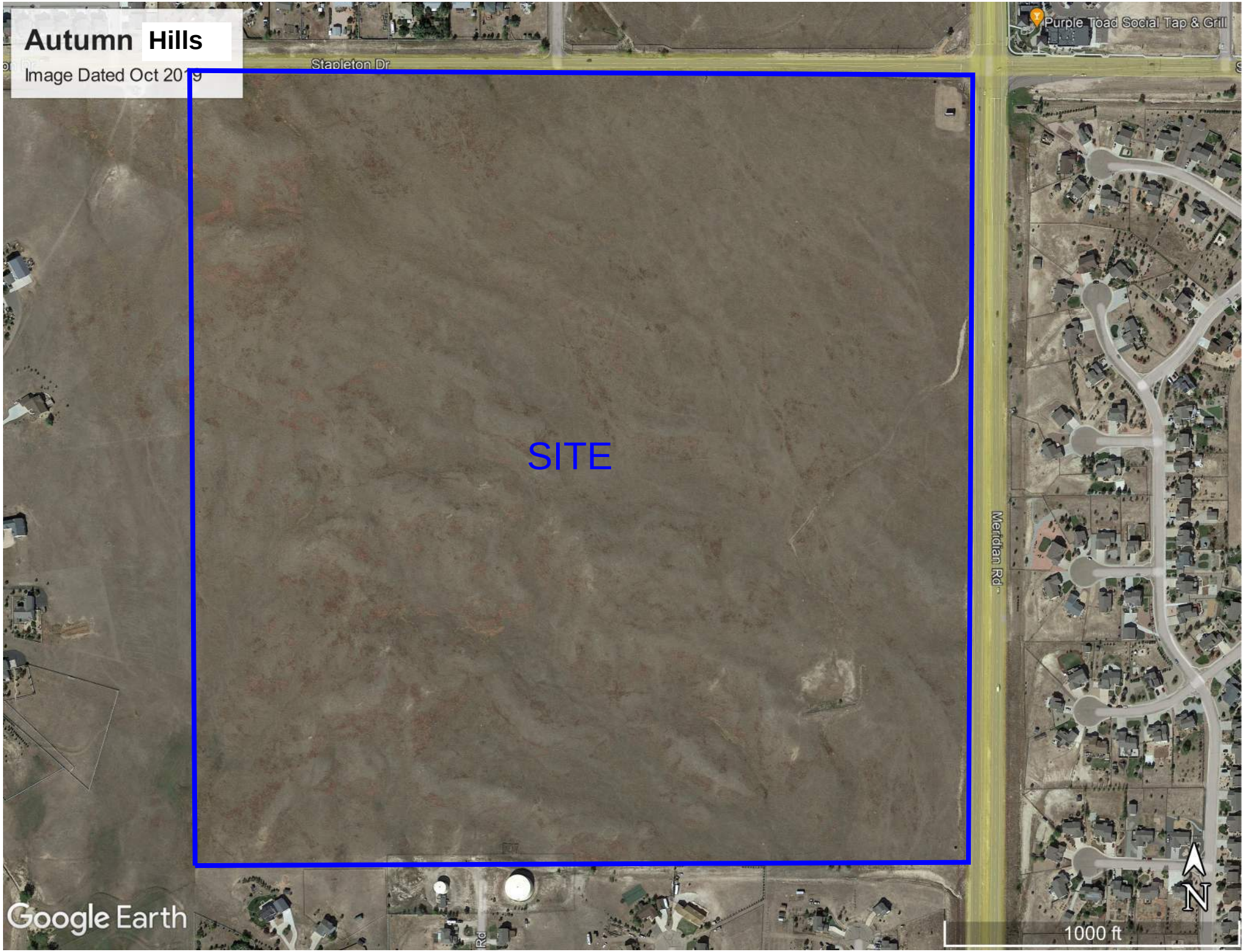
FEMA Floodplain Map

VICINITY MAP

El Paso County - Community: Property Search

Schedule Number: 5200000016

Autumn Hills
Vicinity Map


Autumn Hills
Image Dated Oct 2019
Stapleton Dr
Purple Toad Social Tap & Grill
SITE
Meridian Rd
Google Earth
1000 ft
N

S.C.S. SOILS MAP

Soil Map—El Paso County Area, Colorado

Autumn Hills

Map Scale: 1:6,240 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

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

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	0.0	0.0%
71	Pring coarse sandy loam, 3 to 8 percent slopes	85.1	52.6%
83	Stapleton sandy loam, 3 to 8 percent slopes	76.5	47.4%
Totals for Area of Interest		**161.6**	**100.0%**

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Flood plains, fan terraces, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent

Landform: Swales
Hydric soil rating: Yes

Other soils
Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

El Paso County Area, Colorado

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R048AY222CO - Loamy Park
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

El Paso County Area, Colorado

83—Stapleton sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369z
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Stapleton and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stapleton

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

A - 0 to 11 inches: sandy loam
Bw - 11 to 17 inches: gravelly sandy loam
C - 17 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls
Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Other soils
Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

FEMA FIRM MAP

This panel not printed by FEMA

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, City of Fountain, Bureau of Land Management, National Oceanic and Atmospheric Administration, United States Geological Survey, and Anderson Consulting Engineers, Inc. These data are current as of 2006.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

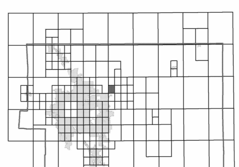
Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

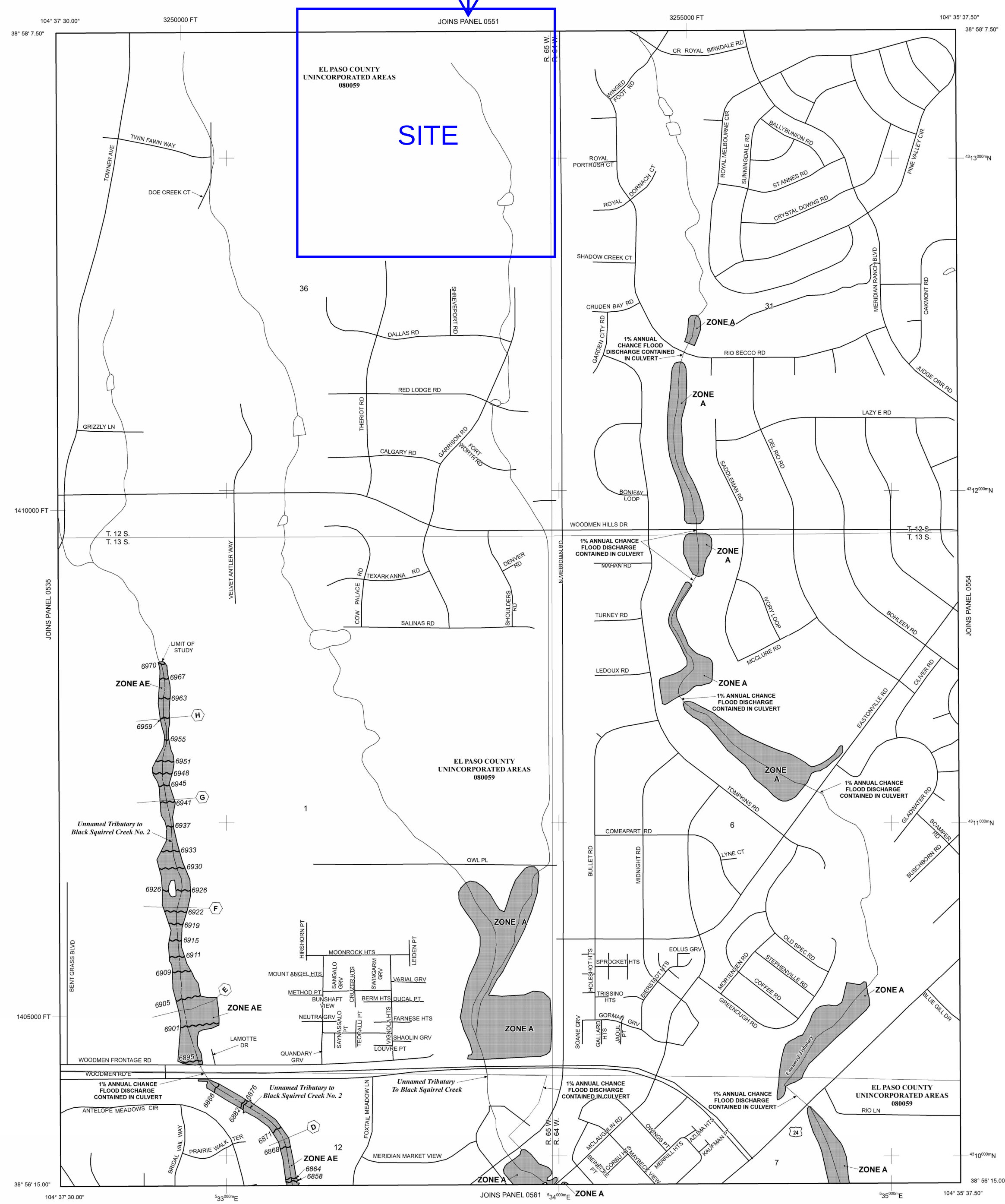
Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION	

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary
Floodway boundary
Zone D Boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
~~ 513 ~~ Base Flood Elevation line and value; elevation in feet*
(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

(A)——(A) Cross section line
(23)--------(23) Transect line
97° 07' 30.00", 32° 22' 30.00" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN 1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

PANEL 0553G

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 553 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY	080059	0553	G

Notice: This map was reissued on 05/15/2020 to make a correction.This version replaces any previous versions. See the Notice-to-User Letter that accompanied this correction for details.

Notice to User: The **Map Number** shown below should be used when placing map orders: the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 08041C0553G

MAP REVISED DECEMBER 7, 2018

Federal Emergency Management Agency

HYDROLOGIC CALCULATIONS

AUTUMN HILLS
AREA RUNOFF COEFFICIENT (C) SUMMARY

EXISTING

		DEVELOPED / IMPERVIOUS			*UNDEVELOPED / NON-IMPERVIOUS*			*WEIGHTED*		*WEIGHTED CA*	
BASIN	**TOTAL AREA**	**AREA**	**C5**	**C100**	**AREA**	**C5**	**C100**	**C5**	**C100**	**CA5**	**CA100**
	(Acres)	***(Acres)***			***(Acres)***						
OS-Z	2.42	1.21	0.90	0.96	1.21	0.09	0.36	0.50	0.66	1.20	1.60
OS-Y	2.39	1.20	0.90	0.96	1.19	0.09	0.36	0.50	0.66	1.19	1.58
EX-A	2.17	0.04	0.90	0.96	2.13	0.09	0.36	0.10	0.37	0.23	0.81
EX-B	84.8	1.70	0.90	0.96	83.1	0.09	0.36	0.11	0.37	9.01	31.55
EX-C	44.7	0.89	0.90	0.96	43.8	0.09	0.36	0.11	0.37	4.74	16.63
EX-D	2.79	0.06	0.90	0.96	2.73	0.09	0.36	0.11	0.37	0.30	1.04
EX-E	6.25	0.13	0.90	0.96	6.12	0.09	0.36	0.11	0.37	0.67	2.33
EX-F	19.1	0.38	0.90	0.96	18.7	0.09	0.36	0.11	0.37	2.03	7.10

DEVELOPED

		DEVELOPED / IMPERVIOUS			*UNDEVELOPED / NON-IMPERVIOUS*			*WEIGHTED*		*WEIGHTED CA*	
BASIN	**TOTAL AREA**	**AREA**	**C5**	**C100**	**AREA**	**C5**	**C100**	**C5**	**C100**	**CA5**	**CA100**
	(Acres)	***(Acres)***			***(Acres)***						
OS-Z	2.42	1.21	0.90	0.96	1.21	0.09	0.36	0.50	0.66	1.20	1.60
OS-Y	2.39	1.20	0.90	0.96	1.19	0.09	0.36	0.50	0.66	1.19	1.58
PR-1	3.65	0.07	0.90	0.96	3.58	0.09	0.36	0.11	0.37	0.39	1.36
PR-2	126	101	0.90	0.96	25.0	0.09	0.36	0.74	0.84	93.15	105.96
PR-3	29.4	14.7	0.90	0.96	14.7	0.09	0.36	0.50	0.66	14.55	19.40

Calculated by: DLF
Date: 7/29/2022
Checked by:

Provide the composite %impervious calculation for the sub-basins.

AUTUMN HILLS
RUNOFF SUMMARY

EXISTING

		WEIGHTED		*OVERLAND*				*STREET / CHANNEL FLOW*				T_C	*INTENSITY*		*TOTAL FLOWS*	
BASIN	**AREA TOTAL** *(Acres)*	C_5	C_{100}	C_5	**Length** *(ft)*	**Slope** *(ft/ft)*	T_t *(min)*	**Length** *(ft)*	**Slope** *(%)*	**Velocity** *(fps)*	T_t *(min)*	**TOTAL** *(min)*	I_5 *(in/hr)*	I_{100} *(in/hr)*	Q_5 *(c.f.s.)*	Q_{100} *(c.f.s.)*
		** For Calcs See Runoff Summary*														
OS-Z	2.42	0.50	0.66	0.50	40	0.04	4.4	1300	2.0%	0.7	30.6	35.0	2.3	3.7	2.7	5.9
OS-Y	2.39	0.50	0.66	0.50	40	0.04	4.4	0	4.0%	1.0	0.0	5.0	5.0	9.1	5.9	14.3
EX-A	2.17	0.10	0.37	0.10	200	0.10	11.9	0	10.0%	1.6	0.0	11.9	3.8	6.6	0.9	5.3
EX-B	84.8	0.11	0.37	0.11	300	0.03	21.6	1300	2.0%	0.7	30.6	52.3	1.8	2.9	16.2	90.1
EX-C	44.7	0.11	0.37	0.11	300	0.03	21.6	0	3.0%	0.9	0.0	21.6	2.9	4.9	13.9	81.1
EX-D	2.79	0.11	0.37	0.11	300	0.07	16.3	0	7.0%	1.3	0.0	16.3	3.3	5.7	1.0	5.9
EX-E	6.25	0.11	0.37	0.11	300	0.05	18.3	0	5.0%	1.1	0.0	18.3	3.2	5.3	2.1	12.4
EX-F	19.1	0.11	0.37	0.11	300	0.03	21.6	0	3.0%	0.9	0.0	21.6	2.9	4.9	5.9	34.7

DEVELOPED

		WEIGHTED		*OVERLAND*				*STREET / CHANNEL FLOW*				T_C	*INTENSITY*		*TOTAL FLOWS*	
BASIN	**AREA TOTAL** *(Acres)*	C_5	C_{100}	C_5	**Length** *(ft)*	**Slope** *(ft/ft)*	T_t *(min)*	**Length** *(ft)*	**Slope** *(%)*	**Velocity** *(fps)*	T_t *(min)*	**TOTAL** *(min)*	I_5 *(in/hr)*	I_{100} *(in/hr)*	Q_5 *(c.f.s.)*	Q_{100} *(c.f.s.)*
		** For Calcs See Runoff Summary*														
OS-Z	2.42	0.50	0.66	0.50	40	0.04	4.4	1300	2.0%	0.7	30.6	35.0	2.3	3.7	2.7	5.9
OS-Y	2.39	0.50	0.66	0.50	40	0.04	4.4	0	4.0%	1.0	0.0	5.0	5.0	9.1	5.9	14.3
PR-1	3.65	0.11	0.37	0.11	30	0.10	4.6	1300	2.0%	0.7	30.6	35.2	2.3	3.7	0.9	5.0
PR-2	126	0.74	0.84	0.74	300	0.03	7.9	1000	3.0%	3.5	4.8	12.7	3.7	6.4	346.5	676.2
PR-3	29.4	0.50	0.66	0.50	300	0.03	13.2	800	3.0%	3.5	3.8	17.0	3.3	5.5	47.8	107.4

Calculated by: DLF

Date: 7/29/2022

Checked by: _____

AUTUMN HILLS
SURFACE ROUTING SUMMARY

Design Point(s)	*Contributing Basins*	*Area (ac)*	*Flow (cfs)*	
			Q_5	Q_{100}
Z	**OS-Z**	2.42	2.7	5.9
Y	**OS-Y**	2.39	5.9	14.3
A	**EX-A**	2.17	0.9	5.3
B	**EX-B, OS-Y**	87.2	22.1	104.4
C	**EX-C**	44.7	13.9	81.1
D	**EX-D**	2.8	1.0	5.9
E	**EX-E**	6.3	2.1	12.4
F	**EX-F**	19.1	5.9	34.7
α	**OS-Z,OS-Y,EX-B,EX-C,EX-D,EX-E**	143.4	41.9	209.7
1	**PR-1, OS-Z**	6.1	3.6	10.9
2	**PR-2, OS-Y**	128.4	352.4	690.5
3	**PR-3**	29.40	47.8	107.4

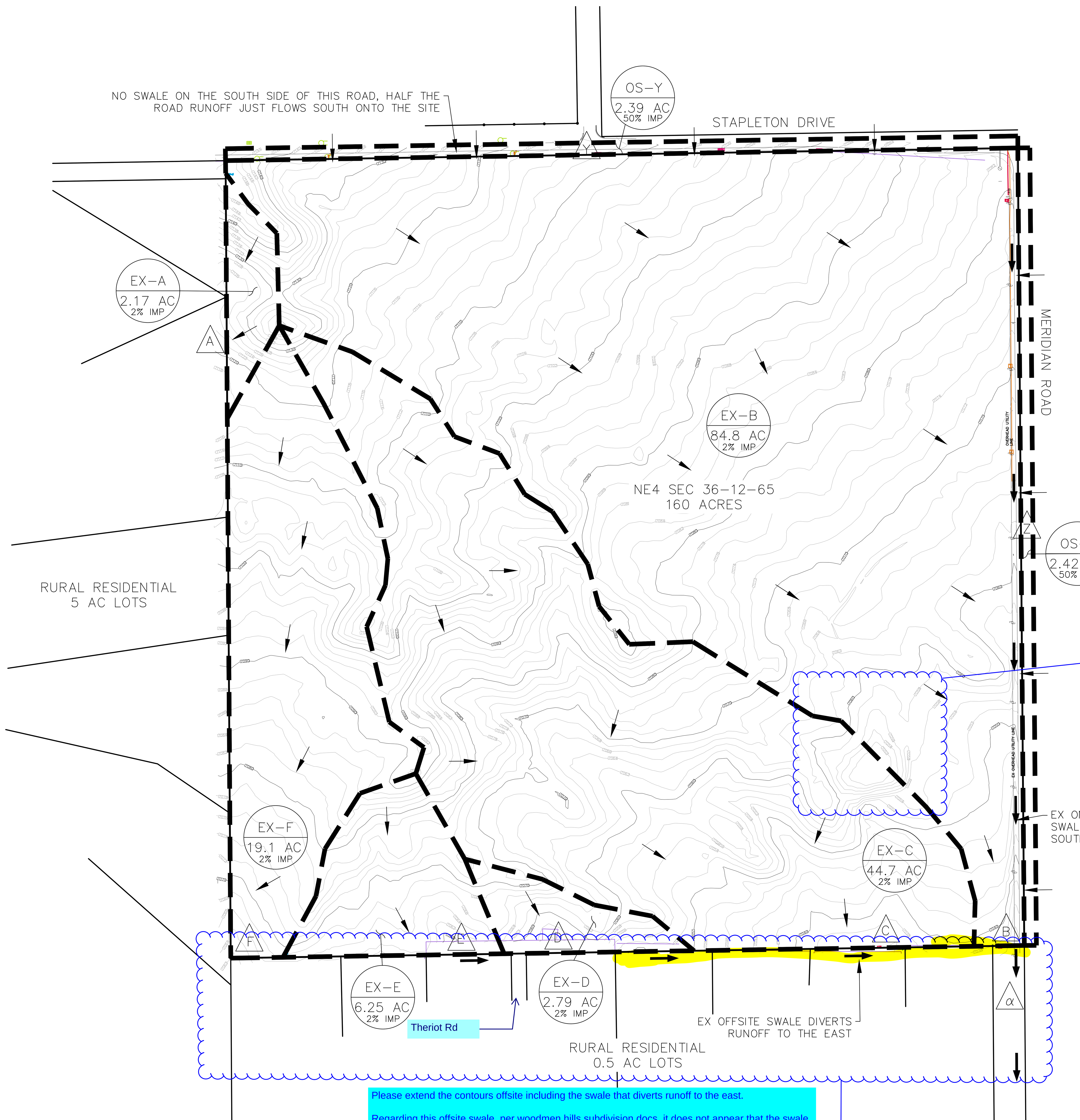
Calculated by: DLF

Date: 7/29/2022

Checked by: _____

DRAINAGE MAPS

AUTUMN ACRES
EL PASO COUNTY
EXISTING DRAINAGE MAP
AUGUST 2022



Label and describe in the narrative.
Is this a stock pond, detention, or water quality pond.

Please extend the contours offsite including the swale that diverts runoff to the east.

Regarding this offsite swale, per woodmen hills subdivision docs, it does not appear that the swale extends to the west past the tank sites on each side of Theriot Rd, therefore DP E may not be conveyed to the east as shown. The easement that contains the swale indicated in Woodmen Hills Filing 4 (PCD File SF97030) only extends along the highlighted residential lots. Woodmen Hills Filing 2 (SF97004) to the west of the highlighted area does not show an easement nor do the CD's show a swale at DP E. Please verify and revise the design as necessary.

NOTES

1. NO PORTION OF THE SITE IS WITHIN A 100 YEAR FEMA FLOOD PLAIN.
2. THE ROADS TO THE NORTH AND EAST ARE CROWNED, SO LIMIT OFFSITE RUNOFF FROM THOSE DIRECTIONS TO HALF OF THOSE ROADS. THERE IS NO CURB AND GUTTER ON THESE ROADS.

LEGEND

- P-7 / 12.22 / #% IMP — BASIN DESIGNATION / AREA IN BASIN (AC) / PERCENT IMPERVIOUS
- D — DESIGN POINT
- BASIN BOUNDARY
- ROAD AND DITCH FLOW DIRECTION
- GROUND SURFACE FLOW DIRECTION
- 6132 — EXISTING CONTOURS – MINOR
- 6130 — EXISTING CONTOURS – MAJOR
- PR — PROPOSED
- EX — EXISTING

DRAINAGE SUMMARY

BASIN	AREA TOTAL (Acres)	TOTAL FLOWS Q5 (c.f.s.)	Q100 (c.f.s.)
OS-Z	2.42	2.7	5.9
OS-Y	2.39	5.9	14.3
EX-A	2.17	0.9	5.3
EX-B	84.80	16.2	90.1
EX-C	44.70	13.9	81.1
EX-D	2.79	1.0	5.9
EX-E	6.25	2.1	12.4
EX-F	19.10	5.9	34.7

DESIGN POINT SUMMARY

Design Point(s)	Contributing Basins	Area (ac)	Flow (cfs) Q 5	Q 100
Z	OS-Z	2.42	2.7	5.9
Y	OS-Y	2.39	5.9	14.3
A	EX-A	2.17	0.9	5.3
B	EX-B, OS-Y	87.2	22.1	104.4
C	EX-C	44.7	13.9	81.1
D	EX-D	2.8	1.0	5.9
E	EX-E	6.3	2.1	12.4
F	EX-F	19.1	5.9	34.7
α	OS-Z,OS-Y,EX-B,EX-C,EX-D,EX-E	143.4	41.9	209.7

N

200' 0 200' 400'

SCALE: 1"=200'

REVISIONS

NO.	DESCRIPTION	DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, TERRA NOVA ENGINEERING, INC. APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR:
MERIDIAN HILLS LLC
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106 CERRITO PT
COLORADO SPRINGS, CO 80905
719.473.0599

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721 S. 23RD STREET
COLORADO SPRINGS, CO 80904
OFFICE: 719-635-6422
FAX: 719-635-6426
www.tnesinc.com

AUTUMN ACRES
EXISTING DRAINAGE MAP

DESIGNED BY DLF
DRAWN BY DLF
CHECKED BY LD
H-SCALE AS NOTED
V-SCALE AS NOTED
JOB NO. 2199.13
DATE ISSUED 08/01/22
SHEET NO. 1 OF 2

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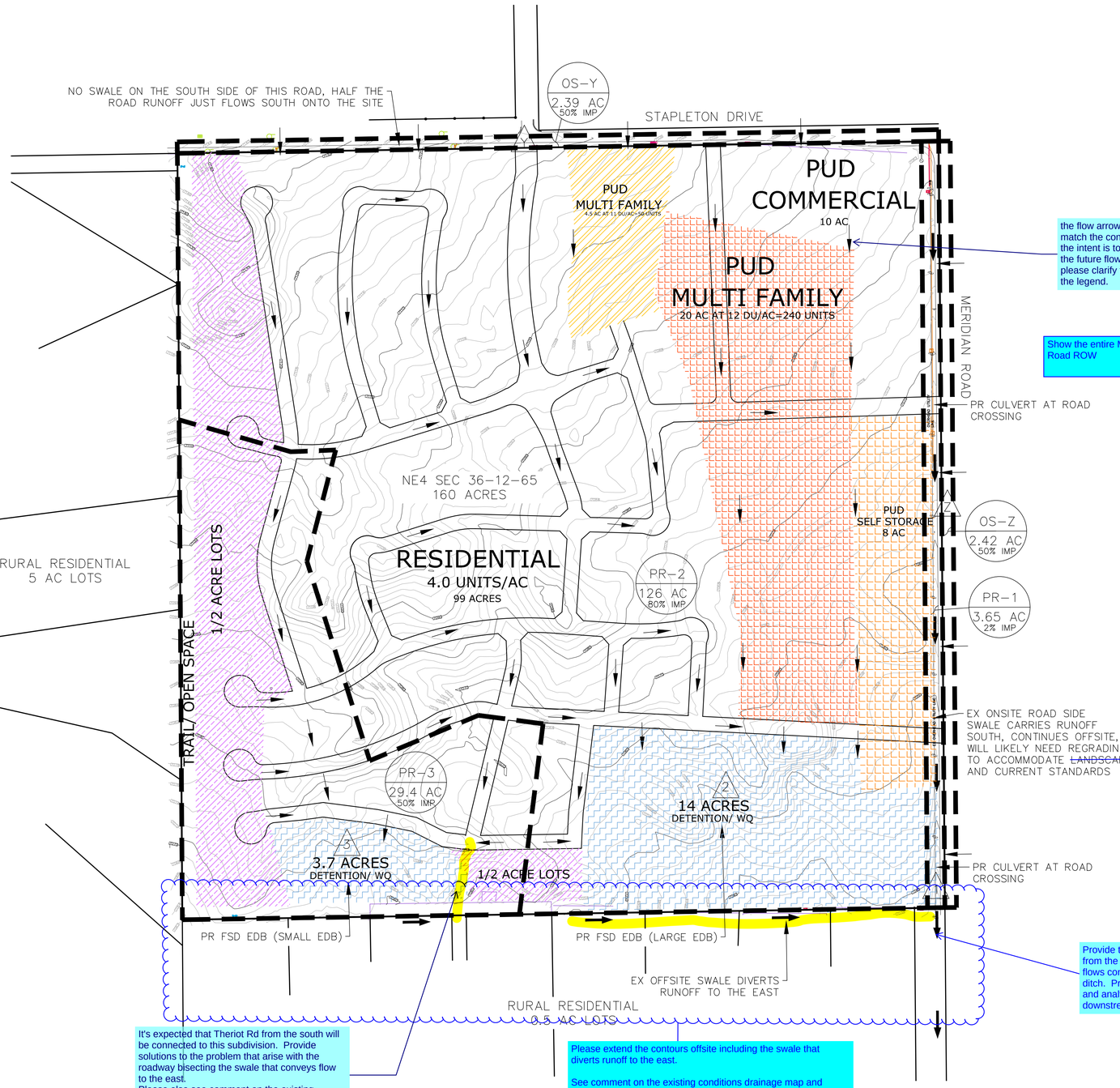
AUTUMN ACRES
EL PASO COUNTY
PROPOSED DRAINAGE MAP
AUGUST 2022



NOTES

1. NO PORTION OF THE SITE IS WITHIN A 100 YEAR FEMA FLOOD PLAIN.
2. THE ROADS TO THE NORTH AND EAST ARE CROWNED, SO LIMIT OFFSITE RUNOFF FROM THOSE DIRECTIONS TO HALF OF THOSE ROADS. THERE IS NO CURB AND GUTTER ON THESE ROADS.

LEGEND

P-7 / 12.22 AC / 25 IMP	BASIN DESIGNATION / AREA IN BASIN (AC) / PERCENT IMPERVIOUS
D	DESIGN POINT
	BASIN BOUNDARY
	ROAD AND DITCH FLOW DIRECTION
	GROUND SURFACE FLOW DIRECTION
6132	EXISTING CONTOURS – MINOR
6130	EXISTING CONTOURS – MAJOR
PR	PROPOSED
EX	EXISTING

the flow arrows do not match the contours. If the intent is to show the future flow then please clarify that on the legend.

Show the entire Meridian Road ROW

DRAINAGE SUMMARY

BASIN	AREA TOTAL (Acres)	TOTAL FLOWS Q_5 (c.f.s.)	TOTAL FLOWS Q_{100} (c.f.s.)
OS-Z	2.42	2.7	5.9
OS-Y	2.39	5.9	14.3
PR-1	3.65	0.9	5.0
PR-2	126.00	346.5	676.2
PR-3	29.40	47.8	107.4

DESIGN POINT SUMMARY

Design Point(s)	*Contributing Basins*	*Area (ac)*	*Flow (cfs)* Q_5	*Flow (cfs)* Q_{100}
1	**PR-1, OS-Z**	6.1	3.6	10.9
2	**PR-2, OS-Y**	128.4	352.4	690.5
3	**PR-3**	29.40	47.8	107.4

Remove landscaping. Additional ROW will be required for the roadside ditch. Landscaping is not permitted within the ROW & swale.

Provide the ultimate flow rate from the pond and offsite flows conveyed by roadside ditch. Provide discussion and analysis of the downstream ditch.

It's expected that Theriot Rd from the south will be connected to this subdivision. Provide solutions to the problem that arise with the roadway bisecting the swale that conveys flow to the east.
Please also see comment on the existing drainage map and address the above comment accordingly per the outfall of this small EDB

Please extend the contours offsite including the swale that diverts runoff to the east.

See comment on the existing conditions drainage map and revise accordingly.

REVISIONS NO	DESCRIPTION	DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, TERRA NOVA ENGINEERING, INC. APPROVES THEIR USE FOR ANY PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

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OFFICE: 719-635-6422
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www.tnesinc.com

AUTUMN ACRES

PROPOSED DRAINAGE MAP

DESIGNED BY	DLF
DRAWN BY	DLF
CHECKED BY	LD
H-SCALE	AS NOTED
V-SCALE	AS NOTED
JOB NO.	2199.13
DATE ISSUED	08/01/22
SHEET NO.	2 OF 2

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