9/13/2024

Town of Castle Rock | Development Services Department
Town Hall, 100 N. Wilcox St.,
Castle Rock, CO 80104
P: (720) 733-3513

RE: Taft House - Drainage Conformance Letter

Introduction:
The Taft House design team would like to present this letter to outline the drainage and flooding issues currently impacting Taft House and the pool and to describe the proposed drainage improvements intended to correct these issues.

This Drainage Conformance Letter will outline the proposed changes to the existing site drainage infrastructure and site drainage patterns, while demonstrating conformance to the overall approved side drainage concept. A summary of the proposed improvements are as follows:

- Construction of a landscape berm and 6" pedestrian curb at the back of the existing curb ramp at the NE corner of Low Meadows Blvd. & Meadows Pkwy.
- Re-grade the low point in the elevated field west of Taft House back to its intended location per the original approved design, and add a Type C inlet, spillway, riprap rundown, a chase drain, and cross pan within the exiting parking lot.
- Re-grade the landscape areas immediately west and south of Taft House with landscape berms and construction of additional area drains and underground pipes to tie into the existing storm sewer system.
- Evaluation of the capacity and functionality of the existing 12" and 18" PVC storm drain mainline system that runs along the south and east sides of the existing pool area, and repairs as necessary.

Existing Conditions:

An Engineer's Opinion Report on the Site Drainage for Taft House was completed by Engineering Analytics (EA) in January, 2023, and is included in the appendix. This letter will focus on those findings as it relates to the areas south and west of Taft House only.

The historic basin of concern from the EA report is Basin EA-1. This basin consists of the elevated field to the west of Taft House, and the lower landscaped areas immediately west and south of Taft House. The design point for this basin is the existing area drain directly southeast of Taft House and is identified on the Existing Basin Map as Drain Inlet ID-1.

Basin EA-1 has an area of 1.56-AC and generates 0.24-CFS in the 5-yr storm, and 4.24-CFS in the 100-yr storm. Concerns noted in the EA report state that the storm sewer system that this basin outfalls into does not provide sufficient capacity to convey the flows adequately.

It is also important to note that these flows do not appear to account for the excess runoff during documented major storm events over the last few years that have jumped the curb ramp at the intersection of Low Meadow Blvd. & Meadows Pkwy., flooded the elevated field, and overflowed into the landscaped areas immediately west and south of Taft House, overwhelming the existing storm sewer system and flooding the structure and pool.

Proposed Conditions:

With this SDP amendment and subsequent Construction Documents, the proposed improvements will consist of the following:

- Construction of a landscape berm and 6" pedestrian curb at the back of the existing curb ramp at the NE corner of Low Meadows Blvd. & Meadows Pkwy.
    - The purpose of the berm and pedestrian curb will be to intercept the flows coming down Low Meadows Blvd. that historically have overtopped the curb and curb ramp in that location and flowed into the field towards Taft House and redirect it back into the Low Meadows Blvd. curb and gutter system per the original design intents for this intersection.
- Re-grade the low point in the elevated field west of Taft House back to its intended location per the original approved design, and add a Type C inlet, riprap rundown, a chase drain, and cross pan within the exiting parking lot.
    - The purpose of the regrading and new inlet will be to collect the storm runoff from the field, prevent it from overtopping and flowing towards Taft House, and convey it out to Celestial Ave. via underground pipe, riprap rundown, sidewalk chase and cross pan. Major flows that exceed the capacity of the conveyance infrastructure will flow through the spillway and be directed north towards the parking lot and away from Taft House via a riprap rundown.
- Re-grade the landscape areas immediately west and south of Taft House with landscape berms and construction of additional area drains and underground pipes to tie into the existing storm sewer system.
    - The purpose of these improvements will be to prevent runoff from both minor and major storm events from flooding Taft House and the pool. Proposed infrastructure for these improvements will include small area drains, underground 4" and 12" PVC storm pipe to tie into the existing storm sewer system, and grading to form a landscape berm between the proposed area drains and Taft House.
- Evaluation of the capacity and functionality of the existing 12" and 18" PVC storm drain mainline system that runs along the south and east sides of the existing pool area, and repairs as necessary.
    - The purpose of this evaluation will be to ensure the capacity of the system will be able to convey the anticipated proposed conditions storm runoff from the new area drain infrastructure on the west side of Taft House, and to correct as-built discrepancies as found in the EA report and current surveyed conditions of the system.

Basin Analysis:

Historic basin EA-1 will be broken into two smaller basins:

- Basin PR-1 will be 1.06-AC in size with a design point at the proposed Type C inlet at the northern corner of the field. Basin PR-1 is anticipated to generate 0.12-CFS during the 5-yr storm and 2.88-CFS during the 100-yr storm.
- Basin PR-2 will be 0.50-AC in size with a design point at the existing area drain identified in the EA report as Drain Inlet ID-1. Basin PR-2 is anticipated to generate 0.08-CFS during the 5-yr storm and 1.36-CFS during the 100-yr storm.

- By splitting the historic basin into two smaller basins and directing approx. 2/3 of the historic flows out into the parking lot and ultimately the Celestial Ave. curb & gutter system, the flows generated by Basin PR-2 that will be tributary to the existing storm system on the south and east side of Taft House and the pool will be significantly reduced and well within the capacity of the existing pipe sizes.
- Full Rational hydraulic calculations will be provided in the final drainage letter to be included with the Construction Documents submittal package after approval of the SDP Amendment.

Summary:

By constructing the berm & pedestrian curb at the intersection of Low Meadow Blvd. & Meadows Pkwy., flows through that intersection will remain in the street curb & gutter system and will be prevented from flowing into the field, down the hill and impacting Taft House and the pool. This, of all the proposed improvements, is anticipated to have the biggest impact in improving the flooding issues that Taft House has been experiencing over the last few years.

The re-grading of the low point in the field and construction of the Type C inlet, spillway, riprap rundown, chase drain, and cross pan will act as a secondary means of preventing stormwater flows from impacting Taft House and the pool. Additionally, these measures will reduce the tributary area to the existing storm sewer system along the south and east sides of Taft House and the pool, thus improving the functionality of that system without requiring a major removal and upsizing of that system.

The area drains and landscape berms immediately south and west of Taft House will act as a final measure of prevention from stormwater flows from impacting Taft House and the pool.

Opinion:

It is the opinion of PES, LLC that the improvements described herein will significantly reduce, if not completely eliminate, the flooding issues that have been impacting Taft House for the last few years. The improvements maintain general conformance of the original drainage design, and will have no negative impact to the site nor the surrounding and downstream properties.

If you have any questions regarding this letter, please feel free to call me at 720-388-8126.

Sincerely,
Personalized Engineering Solutions, LLC

Stephen Douglas, P.E.
Owner

APPENDIX A

Engineering Analytics Engineer's Opinion Report – January 23, 2023
(Submitted as a separate document due to file size)

APPENDIX B

Drainage Basin Maps

MEADOWS FILING NO. 20, PHASE 1, AMENDMENT NO. 6. LOT 1A
SITE DEVELOPMENT PLAN

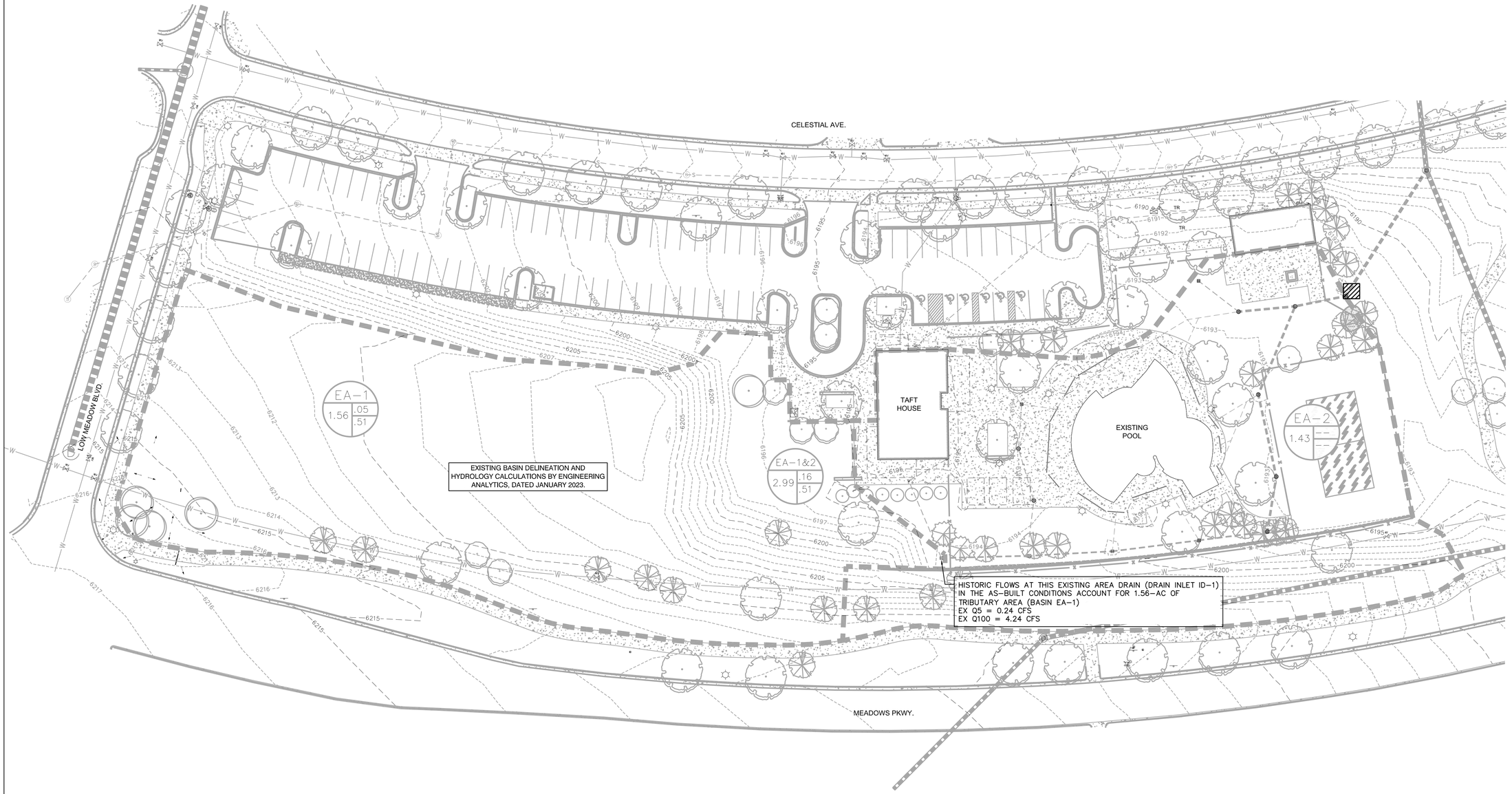
LOT 1A, BLOCK 6, THE MEADOWS FILING NO. 20, PHASE 1, AMENDMENT NO. 6
TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO

LEGEND

- EA EXISTING BASIN LINE
- 5300 PROPOSED MAJOR CONTOUR
- 5300 PROPOSED MINOR CONTOUR
- 5300 EXISTING MAJOR CONTOUR
- 5300 EXISTING MINOR CONTOUR
- DRAINAGE SWALES
- DRAINAGE FLOW ARROWS

EA–1 BASIN DESIGNATION
AREA (AC.) 1.56 | .05 MINOR RUNOFF COEF. | .51 MAJOR RUNOFF COEF.

ENGINEERING ANALYTICS ORIGINAL BASIN BLOCK



39.38"
NORTH

0 15 30 60
1 inch = 30 ft. Horizontal

ISSUE DATE:	09.13.2024
REVISION 1:	
REVISION 2:	
REVISION 3:	
REVISION 4:	

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Highlands Ranch, CO 80129 720.388.8126
www.pengsolutions.com
Construction Management Civil Engineering Land Planning

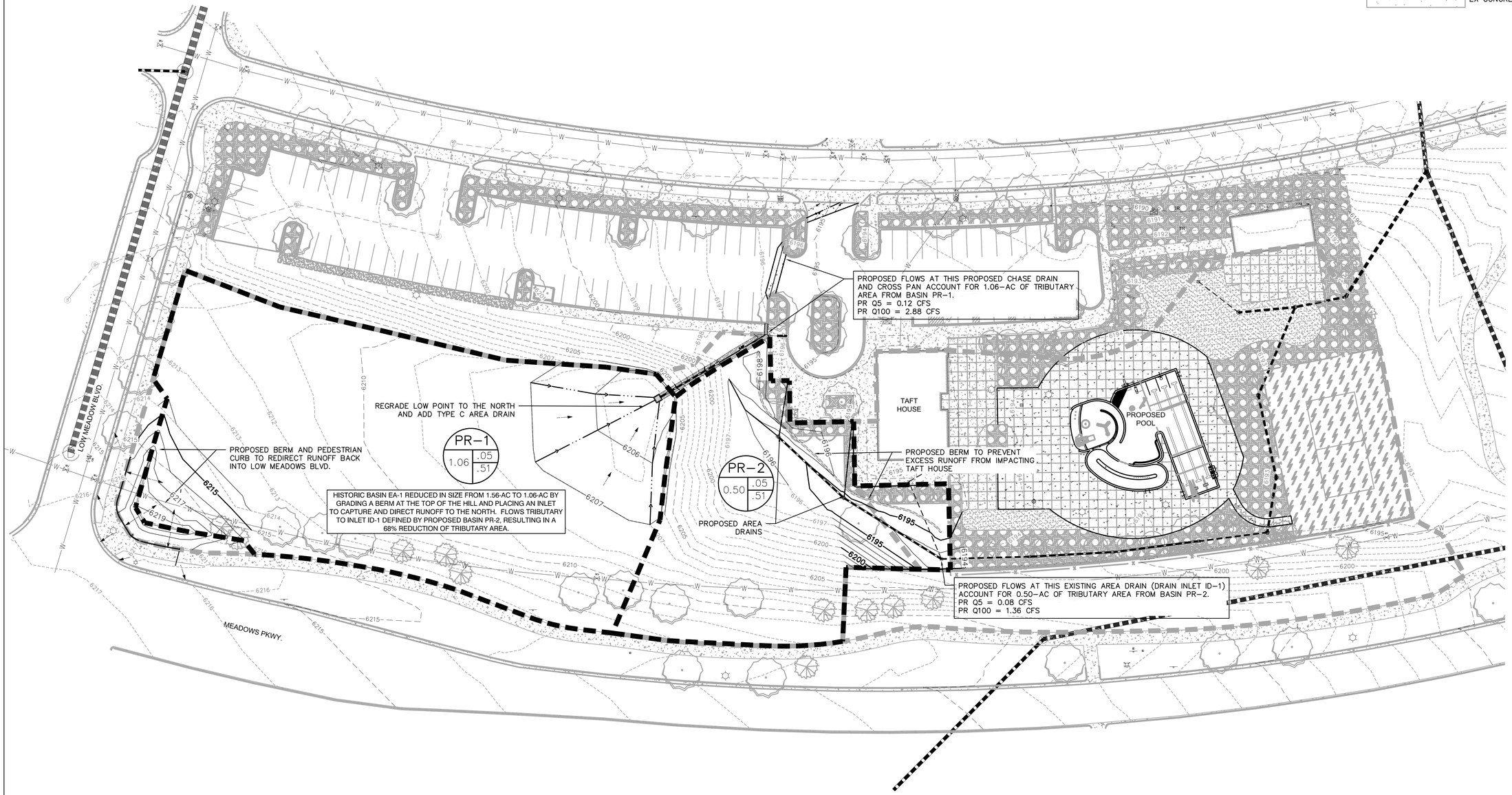
EXISTING BASIN MAP
01 OF 02

MEADOWS FILING NO. 20, PHASE 1, AMENDMENT NO. 6. LOT 1A
SITE DEVELOPMENT PLAN

LOT 1A, BLOCK 6, THE MEADOWS FILING NO. 20, PHASE 1, AMENDMENT NO. 6
TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO

LEGEND

- EA EXISTING BASIN LINE
- PES PROPOSED BASIN LINE
- 5300 PROPOSED MAJOR CONTOUR
- 5300 PROPOSED MINOR CONTOUR
- 5300 EXISTING MAJOR CONTOUR
- 5300 EXISTING MINOR CONTOUR
- TOP OF BERM
- DRAINAGE SWALES
- DRAINAGE FLOW ARROWS
- PR-1 BASIN DESIGNATION; AREA (AC.) 0.48; .16 MINOR RUNOFF COEF.; .51 MAJOR RUNOFF COEF. — PES REVISED BASIN BLOCK
- EX CONCRETE SIDEWALK



39.38"

NORTH

0 15 30 60
1 inch = 30 ft. Horizontal

THE FULL RATIONAL CALCULATIONS WILL BE PROVIDED IN THE FINAL DRAINAGE LETTER SUBMITTED WITH THE CONSTRUCTION DOCUMENTS

ISSUE DATE:	09.13.2024
REVISION 1:	
REVISION 2:	
REVISION 3:	
REVISION 4:	

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PROPOSED BASIN MAP
02 OF 02