

# Bowman

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## Drainage Report

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### Manor Downs Industrial

**Bowman**

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*Project No. 070422-01-002*

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## 1.0 INTRODUCTION

The proposed project is located at Hill Lane, Manor, TX, 78653. It is located within the City of Manor City Limits, in Travis County. The total project area is approximately 146.92 acres. The proposed development includes six IN-2 Heavy Industrial zoned lots and one lot to be dedicated to the City of Manor as parkland. There is public right of way dedication to the City of Manor for the Murray Dalfen Drive roadway that bisects the site. There is also public right of way dedication along the southern property line to Travis County. Associated water, wastewater, grading and drainage improvements are proposed with this project to service the development. A site Location Map is included in the appendix of this report as **Exhibit 1**.

The proposed improvements for Manor Downs Industrial are shown in the Overall Site & Dimension Plan in **Exhibit 2**.

### 1.1 ZONING

This site is located within the City of Manor City Limits and is zoned as IN-2 Heavy Industrial. This zoning allows for a maximum impervious cover of 85% and requires at least 15% of each lot to be landscaped. Six out of the seven proposed lots will have industrial buildings with the seventh lot being parkland dedication to the City of Manor.

### 1.2 EXISTING CONDITIONS

The existing tract is predominantly open grass area with some tree coverage. The site drains to the south towards Hill Lane with three distinct point of analysis, which include culverts under Hill Lane. The site contains two existing drainage easements to be released by the City of Manor with document numbers, 2000100887 and 20004163233.

## 2.0 HYDROLOGY AND HYDRAULICS

### 2.1 WATERSHED

The site is located within the Gilleland Creek Watershed and is classified as a Suburban Watershed in the ETJ. See **Exhibit 3** for the City of Austin Watershed Map. The subject site is not located within the Edwards Aquifer Recharge Zone, or the Recharge Transition Zone as defined by TCEQ or the City of Austin. Refer to **Exhibit 4** for Edwards Aquifer Map.

### 2.2 FLOOD PLAIN

No portion of the subject tract is located within a 100-year FEMA designated flood plain as shown on FEMA Map Panel No. 48453C0290J effective August 18, 2014. A copy of the FEMA Floodplain Map has been included in the Appendix of this report as **Exhibit 5**.

### 2.3 TOPOGRAPHY AND SOILS

The entire site drains to the south towards three different points of analysis, which include proposed culverts with the Hill Lane Roadway Project, COA #SP-2023-0488D. The soil on-site consists of mostly



clay soils, which correlate to Group D Hydrologic Soils. This group of soils has slow infiltration rates during storm events. See **Exhibit 6** for the soil map and soil descriptions from Natural Resources Conservation Service.

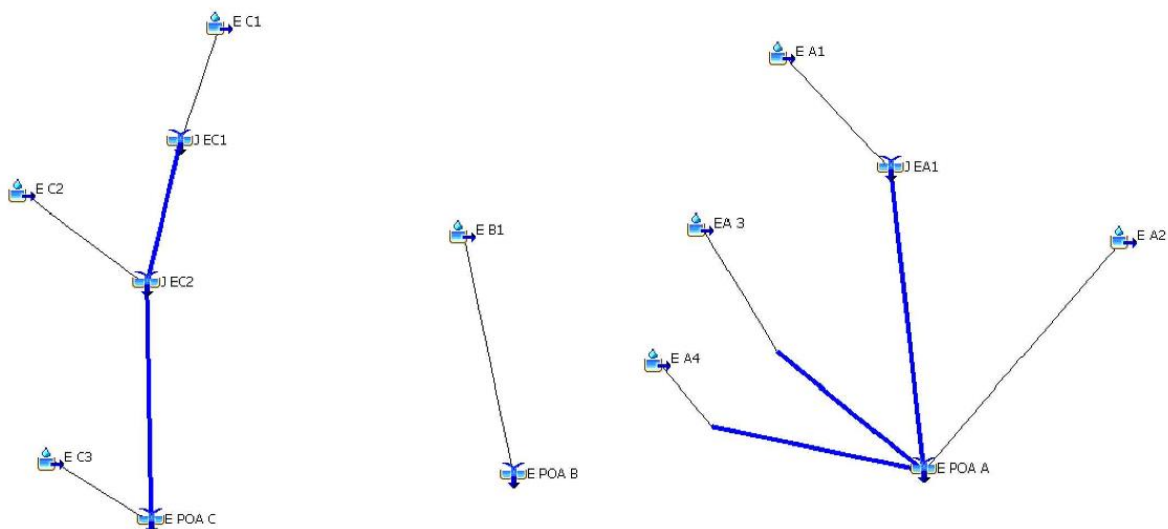
## 2.4 EXISTING DRAINAGE AREA MAP

The Manor Downs Industrial project is proposed in two phases. Phase 1 includes the subdivision construction plans for the public roadway and public Manville waterline as well as Site Plan A, which contains proposed industrial buildings 3-6. Phase 2 includes Site Plan B, which includes Industrial Buildings 1 and 2. Therefore, there are two different proposed drainage conditions for this project: intermediate conditions for the Subdivision and Site Plan A and ultimate conditions which include the Subdivision, Site Plan A, and Site Plan B.

The following rainfall data from the City of Austin Drainage Criteria Manual was used for HEC-HMS.

The site resides North of the Colorado River, which is in Zone 2, according to the City of Austin Study Area Map. The precipitation factor in Zone 2 for the 24-hr duration is 4.06 inches with a curve number of 84 for fair condition (grass cover 50% to 75%). Upstream, offsite areas are considered to be fully developed per COA DCM 25-7-8. See **Exhibit 7** for the existing drainage area map for the ultimate conditions. The intermediate conditions existing drainage area map contains the same delineations without POA C since no improvements are proposed that affect that POA. The pre-development conditions consist of eight basins that total 355.2 acres, which drain to three different POA's. POA C is an 18" and 24" corrugated metal pipe, CMP, POA B is a 36" and 42" CMP, and POA C is two 30" CMP. CMPs drain under the existing Hill Lane Roadway towards the south. The table below shows the existing flows at each points of analysis.

Existing Conditions - HEC-HMS Model & Results:



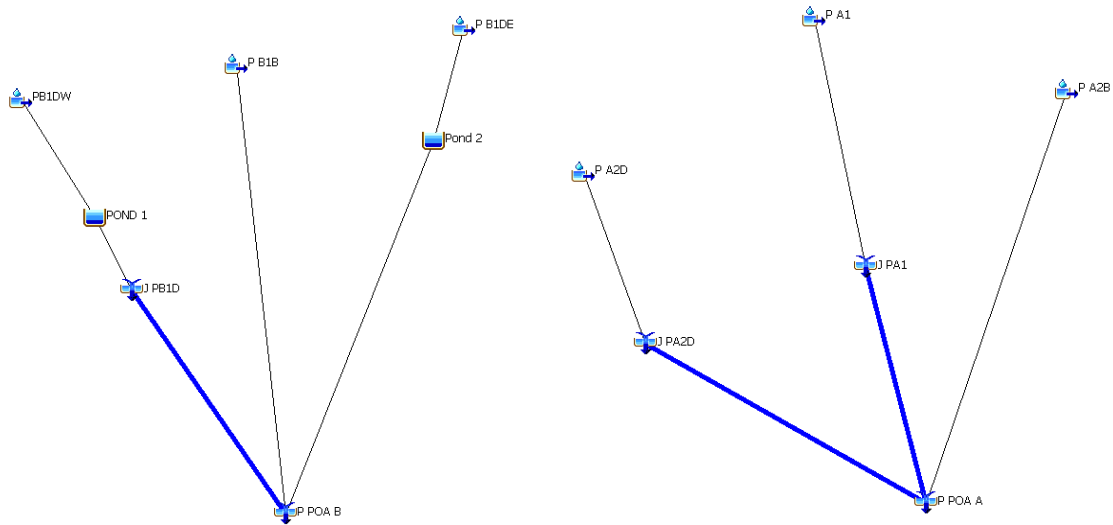
| Existing Development Conditions - SCS Method - Via HEC-HMS |             |       |        |    |                  |       |            |         |       |       |       |        |
|------------------------------------------------------------|-------------|-------|--------|----|------------------|-------|------------|---------|-------|-------|-------|--------|
| BASIN                                                      | AREA        |       |        | CN | IMPERVIOUS COVER |       | LAG<br>min | Q (CFS) |       |       |       |        |
|                                                            | sf          | ac    | sq mi  |    | sf               | %     |            | 2-yr    | 5-yr  | 10-yr | 25-yr | 100-yr |
| EA1                                                        | 2,283,711   | 52.4  | 0.0819 | 84 | 1,428,166        | 62.5% | 27.1       | 98.8    | 130.0 | 157.9 | 198.7 | 267.6  |
| EA2                                                        | 4,696,199   | 107.8 | 0.1685 | 84 | 2,456,560        | 52.3% | 40.4       | 159.2   | 212.7 | 260.8 | 331.8 | 452.9  |
| EA3                                                        | 1,761,118   | 40.4  | 0.0632 | 84 | 7,433            |       | 15.2       | 71.1    | 99.7  | 125.2 | 161.9 | 224.0  |
| EA4                                                        | 703,689     | 16.2  | 0.0252 | 84 | 6,356            | 0.9%  | 66.7       | 14.2    | 20.5  | 26.4  | 35.1  | 50.3   |
| Reach EA1                                                  |             |       |        |    |                  |       | 6.6        | 93.4    | 122.7 | 149.0 | 187.5 | 252.7  |
| Reach EA3                                                  |             |       |        |    |                  |       | 1.0        | 70.9    | 99.5  | 125.0 | 161.8 | 222.7  |
| Reach EA4                                                  |             |       |        |    |                  |       |            | 14.1    | 20.4  | 26.3  | 35.0  | 50.1   |
| Junction EA1                                               |             |       |        |    |                  |       |            | 98.8    | 130.0 | 157.9 | 198.7 | 267.6  |
| E-POA A                                                    | 9,444,717   | 216.8 | 0.3388 |    |                  |       |            | 305.0   | 410.0 | 504.8 | 644.5 | 883.3  |
| EB1                                                        | 1,146,885   | 26.3  | 0.0124 | 84 | 85,459           | 7.5%  | 13.6       | 49.3    | 69.6  | 87.9  | 114.3 | 158.1  |
| E-POA B                                                    | 1,146,885   | 26.3  | 0.0124 |    |                  |       |            | 49.3    | 69.6  | 87.9  | 114.3 | 158.1  |
| EC1                                                        | 2,787,609   | 64.0  | 0.1000 | 84 | 1,811,946        | 65.0% | 28.6       | 116.9   | 153.6 | 186.4 | 234.5 | 315.9  |
| EC2                                                        | 403,953     | 9.3   | 0.0145 | 84 | 196,647          | 48.7% | 13.5       | 20.7    | 27.6  | 33.8  | 42.8  | 57.8   |
| EC3                                                        | 1,689,471   | 38.8  | 0.0606 | 84 | 84,323           | 5.0%  | 17.3       | 69.8    | 97.5  | 122.3 | 158.0 | 217.2  |
| Reach EC1                                                  |             |       |        |    |                  |       | 0.8        | 116.9   | 153.6 | 186.4 | 234.5 | 315.9  |
| Reach EC2                                                  |             |       |        |    |                  |       | 5.7        | 125.7   | 165.1 | 200.5 | 252.4 | 340.4  |
| Junction EC1                                               |             |       |        |    |                  |       |            | 116.9   | 153.6 | 186.4 | 234.5 | 315.9  |
| Junction EC2                                               |             |       |        |    |                  |       |            | 135.7   | 178.5 | 216.6 | 272.6 | 366.9  |
| E-POA C                                                    | 4,881,033.1 | 112.1 | 0.2    |    |                  |       |            | 191.4   | 258.1 | 317.7 | 404.8 | 551.0  |

## 2.5 PROPOSED DRAINAGE AREA MAP

The precipitation factor in Zone 2 for the 24-hr duration is 4.06 inches with a curve number of 84 for fair condition (grass cover 50% to 75%). Upstream, offsite areas are considered to be fully developed per COA DCM 25-7-8 for both the intermediate and ultimate conditions. It is also assumed that Hill Lane Roadway has been improved by others and the new improved culverts exist at each POA.

The proposed drainage area map for the intermediate conditions was designed for the fully developed Subdivision and Site plan A. The post-development conditions consist of 6 basins totaling about 243.15 acres. Due to the complexity of the site's drainage patterns, storm drains, culverts, channels, and ponds were used to divert flow to ensure that existing flows were matched and/or decreased. See **Exhibit 8** for the proposed drainage area map that shows the intermediate proposed drainage routing for the site. The table below shows the discharge of the proposed points of analysis with a decrease in flows at POA A and B.

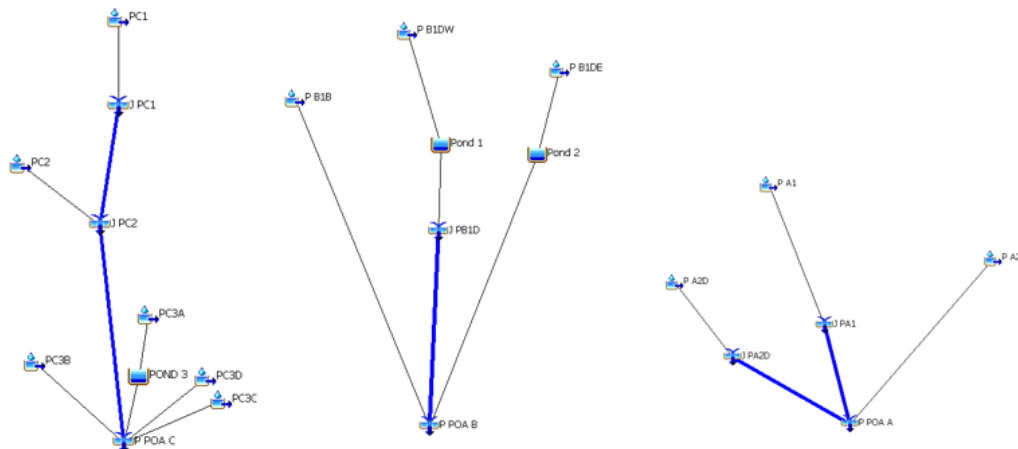
## Proposed Intermediate Conditions - HEC-HMS Model & Results:



| Proposed Intermediate Conditions - SCS Method - Via HEC-HMS |           |       |        |    |                  |       |         |              |              |              |               |               |
|-------------------------------------------------------------|-----------|-------|--------|----|------------------|-------|---------|--------------|--------------|--------------|---------------|---------------|
| BASIN                                                       | AREA      |       |        | CN | IMPERVIOUS COVER |       | LAG min | Q (CFS)      |              |              |               |               |
|                                                             | sf        | ac    | sq mi  |    | sf               | %     |         | 2-yr         | 5-yr         | 10-yr        | 25-yr         | 100-yr        |
| PA1                                                         | 2249743   | 51.6  | 0.0807 | 84 | 1,431,765        | 63.6% | 26.75   | 98.5         | 129.5        | 157.2        | 197.6         | 265.9         |
| PA2B                                                        | 4,252,218 | 97.6  | 0.1525 | 84 | 2,376,513        | 55.9% | 39.94   | 147.2        | 195.8        | 239.5        | 304.0         | 413.9         |
| PA2D                                                        | 1,845,372 | 42.4  | 0.0662 | 84 | 1,209,351        | 65.5% | 12.42   | 106.3        | 139.0        | 168.2        | 210.4         | 281.1         |
| REACH PA1                                                   |           |       |        |    |                  |       | 5.49    | 91.9         | 120.7        | 146.4        | 184.1         | 247.9         |
| REACH PA2D                                                  |           |       |        |    |                  |       | 1.47    | 102.2        | 133.6        | 161.7        | 202.5         | 270.8         |
| <b>PPOA A</b>                                               |           |       |        |    |                  |       |         | <b>296.5</b> | <b>392.6</b> | <b>478.6</b> | <b>605.7</b>  | <b>821.9</b>  |
| PB1B                                                        | 977613    | 22.44 | 0.0351 | 84 | 355563           | 36%   | 13.86   | 46.9         | 63.5         | 78.4         | 100.0         | 136.1         |
| PB1DW                                                       | 360395    | 8.27  | 0.0129 | 84 | 8314             | 2%    | 7.63    | 20.2         | 28.4         | 35.8         | 46.2          | 63.6          |
| PB1DE                                                       | 906385    | 20.81 | 0.0325 | 84 | 553976           | 61%   | 8.62    | 62.7         | 81.8         | 99.3         | 124.0         | 165.5         |
| POND 1                                                      |           |       |        |    |                  |       |         | 0.2          | 0.8          | 4.3          | 13.6          | 34.8          |
| POND 2                                                      |           |       |        |    |                  |       |         | 0.3          | 0.3          | 0.3          | 3.5           | 45.3          |
| REACH PB1D                                                  |           |       |        |    |                  |       | 1.35    | 0.20         | 0.80         | 4.30         | 13.30         | 33.60         |
| <b>PPOAB</b>                                                |           |       |        |    |                  |       |         | <b>47.20</b> | <b>63.90</b> | <b>78.90</b> | <b>100.50</b> | <b>157.70</b> |

The proposed drainage area map for the ultimate conditions was designed for the fully developed industrial site with six industrial buildings. The post-development conditions consist of 12 basins totaling about 355.2 acres. Due to the complexity of the site's drainage patterns, storm drains, culverts, channels, and ponds were used to divert flow to ensure that existing flows were matched and/or decreased. See **Exhibit 9** for the proposed drainage area map that shows the ultimate proposed drainage routing for the fully developed site conditions. The table below shows the discharge of the proposed points of analysis with a decrease in flows at POA A, B, and C.

## Proposed Ultimate Conditions - HEC-HMS Model & Results:



| Proposed Development Conditions - SCS Method - Via HEC-HMS |           |       |        |    |                  |       |            |         |       |       |       |        |
|------------------------------------------------------------|-----------|-------|--------|----|------------------|-------|------------|---------|-------|-------|-------|--------|
| BASIN                                                      | AREA      |       |        | CN | IMPERVIOUS COVER |       | LAG<br>min | Q (CFS) |       |       |       |        |
|                                                            | sf        | ac    | sq mi  |    | sf               | %     |            | 2-yr    | 5-yr  | 10-yr | 25-yr | 100-yr |
| PA1                                                        | 2,244,375 | 51.5  | 0.0805 | 84 | 1,428,275        | 63.6% | 26.75      | 98.3    | 129.2 | 156.8 | 197.1 | 265.2  |
| PA2B                                                       | 4,252,218 | 97.6  | 0.1525 | 84 | 2,376,513        | 55.9% | 39.94      | 147.2   | 195.8 | 239.5 | 304.0 | 413.9  |
| PA2D                                                       | 1,845,372 | 42.4  | 0.0662 | 84 | 1,209,351        | 65.5% | 12.42      | 106.3   | 139.0 | 168.2 | 210.4 | 281.1  |
|                                                            |           |       |        |    |                  |       |            |         |       |       |       |        |
| REACH PA1                                                  |           |       |        |    |                  |       | 5.49       | 91.7    | 120.4 | 146.0 | 183.6 | 247.3  |
| REACH PA2D                                                 |           |       |        |    |                  |       | 1.47       | 102.2   | 133.6 | 161.7 | 202.5 | 270.8  |
|                                                            |           |       |        |    |                  |       |            |         |       |       |       |        |
| P POA A                                                    | 8,341,964 | 191.5 | 0.2992 |    | 5,014,139        | 60.1% |            | 296.3   | 392.3 | 478.2 | 605.2 | 821.3  |
|                                                            |           |       |        |    |                  |       |            |         |       |       |       |        |
| PB1B                                                       | 892568    | 20.5  | 0.0320 | 84 | 390015           | 43.7% | 11.95      | 48.8    | 65.3  | 80.2  | 101.5 | 137.2  |
| PB1DW                                                      | 148014    | 3.4   | 0.0053 | 84 | 89891            | 60.7% | 3.00       | 10.7    | 14.0  | 16.9  | 21.1  | 28.2   |
| PB1DE                                                      | 938133    | 21.5  | 0.0337 | 84 | 553976           | 59.1% | 8.62       | 64.5    | 84.5  | 102.6 | 128.3 | 171.3  |
|                                                            |           |       |        |    |                  |       |            |         |       |       |       |        |
| REACH PB1D                                                 |           |       |        |    |                  |       | 1.41       | 0.2     | 0.2   | 0.2   | 0.2   | 0.2    |
|                                                            |           |       |        |    |                  |       |            |         |       |       |       |        |
| P POA B                                                    | 1,978,715 | 45    | 0.0710 |    | 1,033,881        | 52.3% |            | 49.2    | 65.7  | 80.6  | 102.0 | 137.7  |
|                                                            |           |       |        |    |                  |       |            |         |       |       |       |        |
| PC 1                                                       | 2,787,609 | 64.0  | 0.1000 | 84 | 1,811,946        | 65.0% | 28.64      | 116.9   | 153.6 | 186.4 | 234.5 | 315.9  |
| PC 2                                                       | 332,575   | 7.6   | 0.0119 | 84 | 196,639          | 59.1% | 12.94      | 18.2    | 23.9  | 29.1  | 36.5  | 49.0   |
| PC3A                                                       | 619,735   | 14.2  | 0.0222 | 84 | 355,885          | 57.4% | 13.88      | 32.1    | 42.4  | 51.6  | 65.0  | 87.4   |
| PC3B                                                       | 431,604   | 9.9   | 0.0155 | 84 | 30,972           | 7.2%  | 7.72       | 25.7    | 35.7  | 44.8  | 57.6  | 79.0   |
| PC3C                                                       | 107,012   | 2.5   | 0.0038 | 84 | 94,453           | 88.3% | 8.43       | 8.0     | 10.2  | 12.2  | 15.1  | 19.8   |
| PC3D                                                       | 873,264   | 20.0  | 0.0313 | 84 | 643,781          | 73.7% | 12.72      | 50.9    | 66.0  | 79.4  | 99.0  | 131.7  |
|                                                            |           |       |        |    |                  |       |            |         |       |       |       |        |
| REACH PC1                                                  |           |       |        |    |                  |       | 2.40       | 111.6   | 146.3 | 177.4 | 223.6 | 301.8  |
| REACH PC2                                                  |           |       |        |    |                  |       | 4.47       | 121.6   | 159.6 | 193.8 | 243.9 | 329.1  |
|                                                            |           |       |        |    |                  |       |            |         |       |       |       |        |
| P POA C                                                    | 5,151,800 | 118.3 | 0.1848 |    | 3,133,677        | 61%   |            | 189.9   | 247.8 | 299.0 | 374.3 | 550.7  |
|                                                            |           |       |        |    |                  |       |            |         |       |       |       |        |

## 2.6 STORMWATER DETENTION

Based on the existing and proposed HEC-HMS Results, storm water detention is required due to the increase of area and impervious cover being routed to POA B and C. There are two ponds proposed at POA B, named Pond 1 and Pond 2, and one pond proposed at POA C, named Pond 3. Each pond was designed using the City of Austin Drainage Criteria Manual as guide for side slopes, berm width, bottom slopes, and spillway/outlet calculations. Pond 2 is greater than six feet in height and therefore has associated probable maximum flood calculations with the pond.

For the intermediate conditions, Pond 1 is proposed to ensure that flows do not increase at POA B for proposed conditions. The pond footprint, bottom and side slopes, and outlet structure remain the same from intermediate to proposed conditions. The difference between intermediate and ultimate conditions for Pond 1 is the contributing drainage area, inlet structure, and temporary channel. In the intermediate conditions, there are 8.27 acres routed to Pond 1 with 2.31% impervious cover while in the ultimate conditions, there is 3.28 acres with 62.86% impervious cover. In the intermediate conditions, there is a temporary channel constructed to ensure water is routed into the pond. Similarly, there is a temporary entrance headwall provided to the pond from the temporary channel. This headwall is to be demoed and replaced with the storm drain infrastructure proposed in Site Plan B. Refer to **Exhibit 10** for the proposed detention Pond 1 sheets that further detail the pond for intermediate conditions. Refer to **Exhibit 11** for the proposed detention pond sheets that further detail each pond for the ultimate conditions. Note that Pond 2 remains the same from the intermediate conditions to the ultimate conditions and can be found in Exhibit 11.

The proposed channels for Manor Downs Industrial were also analyzed. **Exhibit 12** shows the cross sections for Channel East for the 2 yr, 25 yr, and 100 yr storm events as well as the internal cross sections near Murray-Dalfen Drive for the same storm events. For Channels A-C on the interior of the site near Murray Dalfen Drive, the flows through the channel were taken from Storm CAD headwall results. For Channel D, the flow in the cross section was determined using the HEC HMS results for Pond 1. For Channel E, a combination of StormCAD headwall results and Pond 2 HEC HMS results were utilized to determine the total flow through the cross section. The table below shows the difference in flows from existing to proposed conditions at each POA.

Existing vs. Proposed Flow (CFS) - HEC-HMS Results:

| EXISTING VS PROPOSED FLOWS |       |       |       |       |        |
|----------------------------|-------|-------|-------|-------|--------|
|                            | 2YR   | 5 YR  | 10 YR | 25 YR | 100 YR |
| EXISTING POA A             | 305.0 | 410.0 | 504.8 | 644.5 | 883.3  |
| PROPOSED POA A             | 296.3 | 392.3 | 478.2 | 605.2 | 821.3  |
| Δ                          | -8.7  | -17.7 | -26.6 | -39.3 | -62.0  |
| EXISTING POA B             | 49.3  | 69.6  | 87.9  | 114.3 | 158.1  |
| PROPOSED POA B             | 49.2  | 65.7  | 80.6  | 102.0 | 137.7  |
| Δ                          | -0.1  | -3.9  | -7.3  | -12.3 | -20.4  |
| EXISTING POA C             | 191.4 | 258.1 | 317.7 | 404.8 | 551.0  |
| PROPOSED POA C             | 189.9 | 247.8 | 299.0 | 374.3 | 550.7  |
| Δ                          | -1.5  | -10.3 | -18.7 | -30.5 | -0.3   |

## 2.7 DRAINAGE EASEMENTS

There are two existing drainage easements on site that are to be vacated by the City of Manor with document numbers 2000100887 and 2004163233. There are four proposed drainage easements to be dedicated via plat in order to convey offsite drainage through the site. The drainage easements cover the proposed ponds and channels throughout the site.

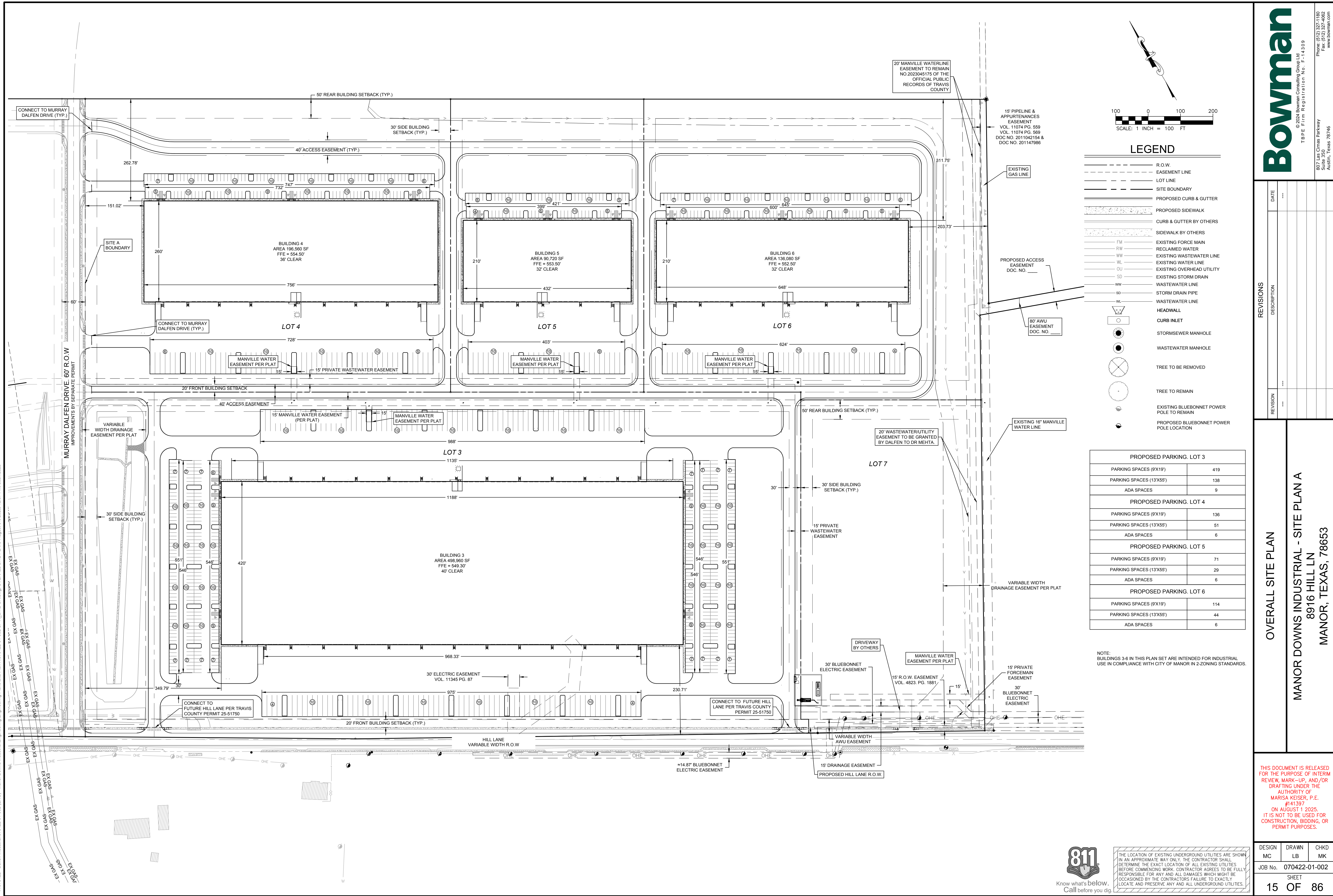
## EXHIBIT 1 – LOCATION MAP





## EXHIBIT 2 – OVERALL SITE & DIMENSION PLAN





| REVISIONS |                |            |
|-----------|----------------|------------|
| REVISION  | DESCRIPTION    | DATE       |
| 1         | Initial design | 10/10/2023 |
| 2         | Revised design | 11/10/2023 |
| 3         | Final design   | 12/10/2023 |
| 4         | Revised design | 13/10/2023 |
| 5         | Final design   | 14/10/2023 |
| 6         | Revised design | 15/10/2023 |
| 7         | Final design   | 16/10/2023 |
| 8         | Revised design | 17/10/2023 |
| 9         | Final design   | 18/10/2023 |
| 10        | Revised design | 19/10/2023 |
| 11        | Final design   | 20/10/2023 |
| 12        | Revised design | 21/10/2023 |
| 13        | Final design   | 22/10/2023 |
| 14        | Revised design | 23/10/2023 |
| 15        | Final design   | 24/10/2023 |
| 16        | Revised design | 25/10/2023 |
| 17        | Final design   | 26/10/2023 |
| 18        | Revised design | 27/10/2023 |
| 19        | Final design   | 28/10/2023 |
| 20        | Revised design | 29/10/2023 |
| 21        | Final design   | 30/10/2023 |
| 22        | Revised design | 31/10/2023 |
| 23        | Final design   | 01/11/2023 |
| 24        | Revised design | 02/11/2023 |
| 25        | Final design   | 03/11/2023 |
| 26        | Revised design | 04/11/2023 |
| 27        | Final design   | 05/11/2023 |
| 28        | Revised design | 06/11/2023 |
| 29        | Final design   | 07/11/2023 |
| 30        | Revised design | 08/11/2023 |
| 31        | Final design   | 09/11/2023 |
| 32        | Revised design | 10/11/2023 |
| 33        | Final design   | 11/11/2023 |
| 34        | Revised design | 12/11/2023 |
| 35        | Final design   | 13/11/2023 |
| 36        | Revised design | 14/11/2023 |
| 37        | Final design   | 15/11/2023 |
| 38        | Revised design | 16/11/2023 |
| 39        | Final design   | 17/11/2023 |
| 40        | Revised design | 18/11/2023 |
| 41        | Final design   | 19/11/2023 |
| 42        | Revised design | 20/11/2023 |
| 43        | Final design   | 21/11/2023 |
| 44        | Revised design | 22/11/2023 |
| 45        | Final design   | 23/11/2023 |
| 46        | Revised design | 24/11/2023 |
| 47        | Final design   | 25/11/2023 |
| 48        | Revised design | 26/11/2023 |
| 49        | Final design   | 27/11/2023 |
| 50        | Revised design | 28/11/2023 |
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## OVERALL SITE PLAN

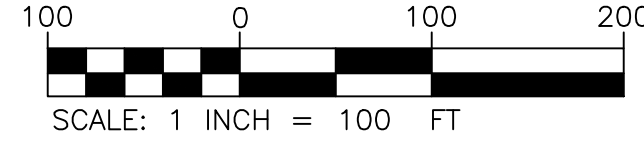
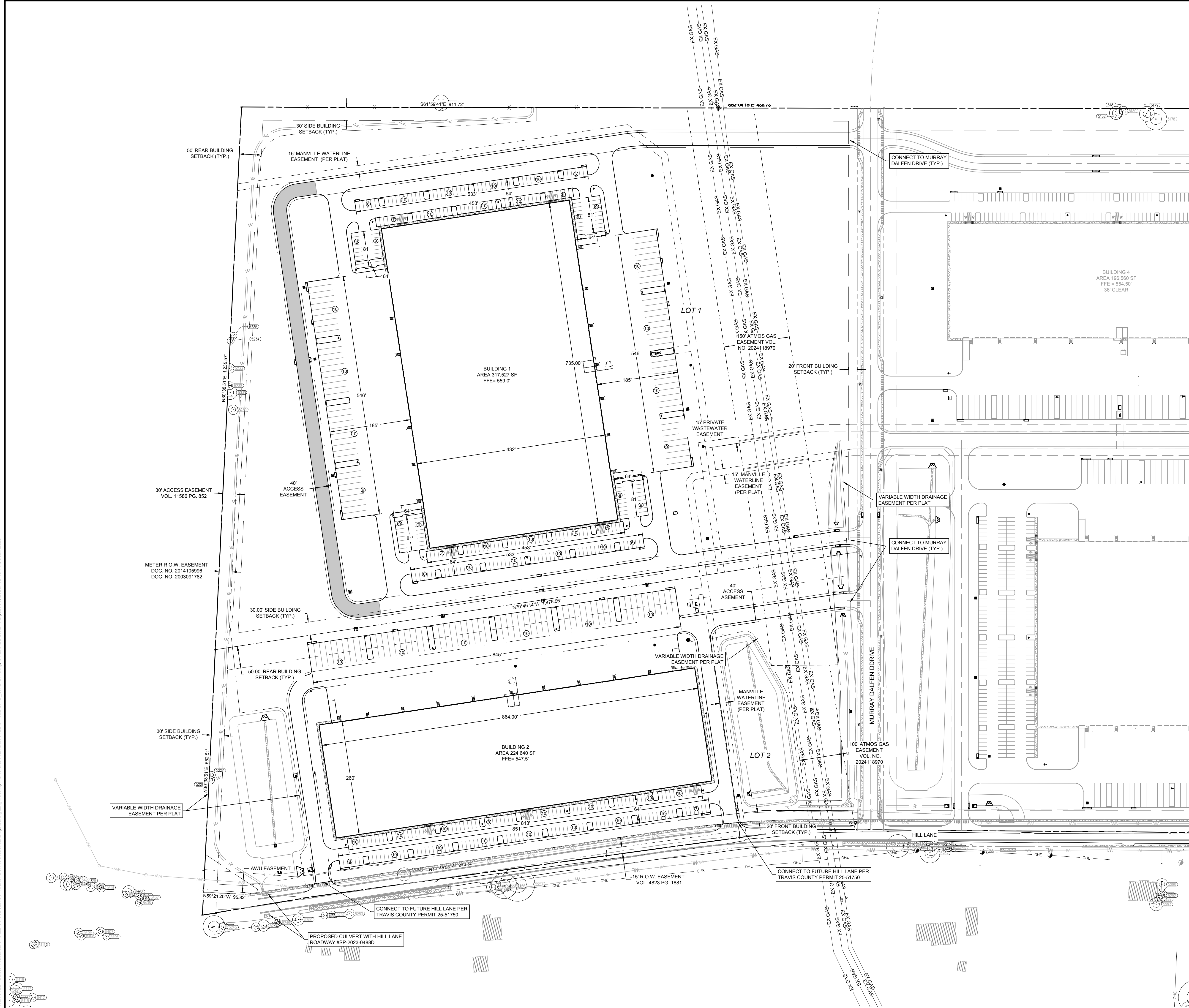
MANOR DOWNS INDUSTRIAL - SITE PLAN A  
8916 HILL LN  
MANOR, TEXAS, 78653

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FOR THE PURPOSE OF INTERIM  
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MARISA KEISER, P.E.  
#141397  
ON AUGUST 1 2025.  
IT IS NOT TO BE USED FOR  
CONSTRUCTION, BIDDING, OR  
PERMIT PURPOSES.

|                       |             |            |
|-----------------------|-------------|------------|
| DESIGN<br>MC          | DRAWN<br>LB | CHKD<br>MK |
| JOB No. 070422-01-002 |             |            |
| SHEET                 |             |            |
| 15                    | OF          | 86         |



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### LEGEND

- PROPERTY BOUNDARY LINE
- R.O.W.
- EASEMENT LINE
- CREEK CENTERLINE
- FIRE LANE
- WATER LINE
- FORCE MAIN LINE
- CURB AND GUTTER
- CURB INLET
- GRATE INLET
- MANHOLE
- WATER METER
- WATER VALVE
- FIRE HYDRANT
- BACKFLOW PREVENTER
- PAD MOUNTED TRANSFORMER
- EXISTING TREE
- EXISTING TREE TO BE REMOVED
- LOC
- LIMITS OF CONSTRUCTION
- PROPOSED SIDEWALK

#### PROPOSED PARKING, LOT 1

|                          |     |
|--------------------------|-----|
| PARKING SPACES (9'X19')  | 254 |
| PARKING SPACES (13'X55') | 78  |
| ADA SPACES               | 8   |

#### PROPOSED PARKING, LOT 2

|                          |     |
|--------------------------|-----|
| PARKING SPACES (9'X19')  | 155 |
| PARKING SPACES (13'X55') | 60  |
| ADA SPACES               | 6   |



Know what's below.  
Call before you dig.

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

# Bowman

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T8 PE Firm Registration No. F-14309  
8071 Las Comas Parkway  
Suite 350  
Austin, Texas 78746  
Phone: (512) 327-1800  
Fax: (512) 327-4062  
www.bowman.com

#### REVISIONS

| REVISION | DESCRIPTION | DATE |
|----------|-------------|------|
|          |             |      |
|          |             |      |
|          |             |      |
|          |             |      |
|          |             |      |
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#### OVERALL SITE PLAN

MANOR DOWNS INDUSTRIAL - SITE PLAN B  
8500 HILL LN  
MANOR, TEXAS, 78653

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|         |               |      |
|---------|---------------|------|
| DESIGN  | DRAWN         | CHKD |
| MC      | MG            | MK   |
| JOB No. | 070422-01-002 |      |

SHEET  
07 OF 43

PRELIMINARY NOT FOR CONSTRUCTION

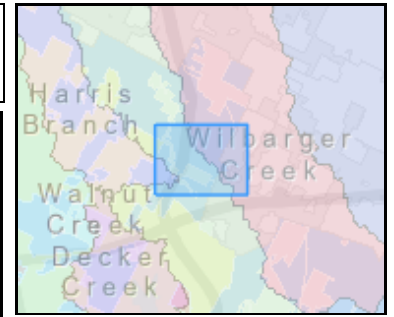
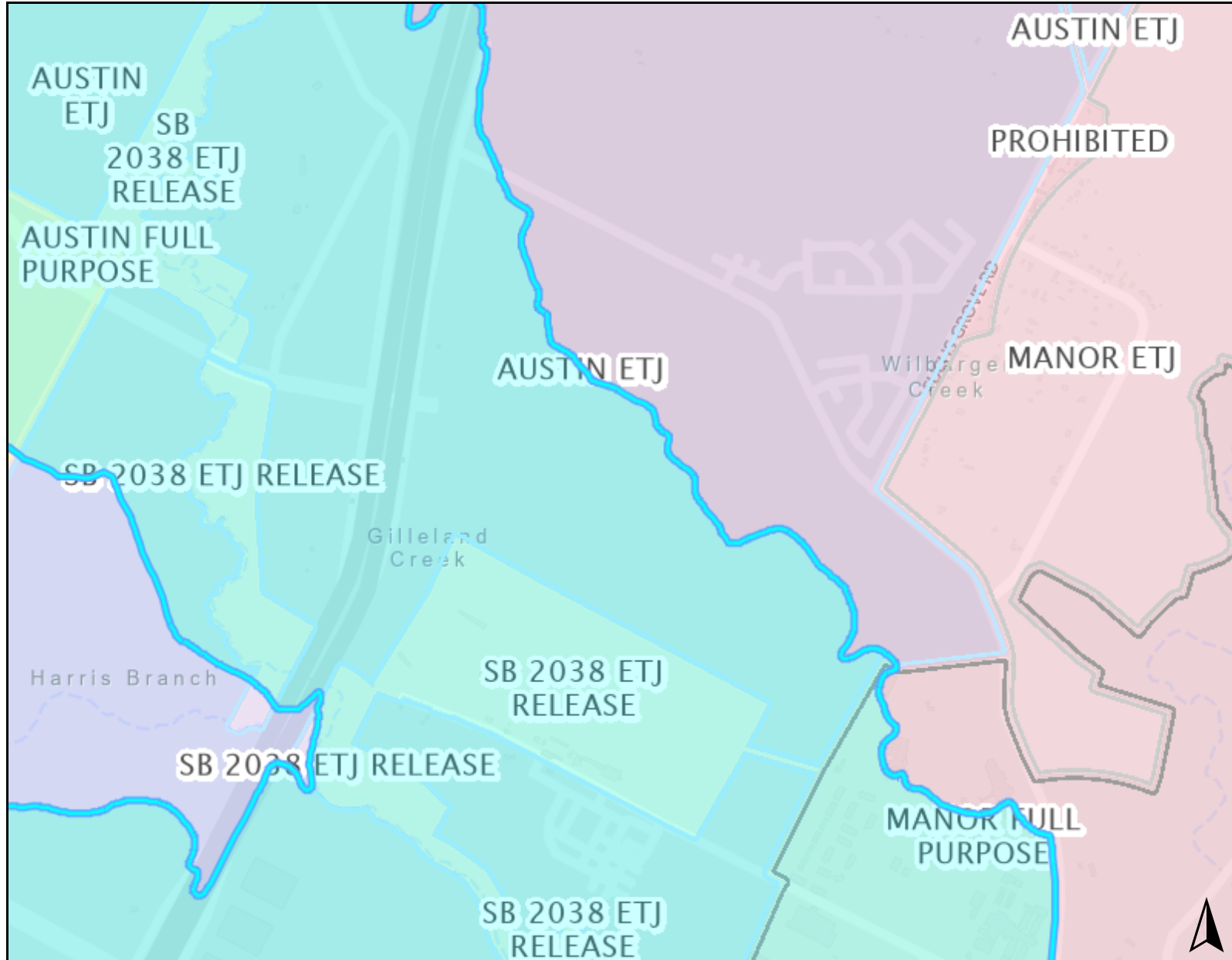




## EXHIBIT 3 – WATERSHED MAP



# Property Profile



## Legend

### Property

#### Jurisdiction

- FULL PURPOSE
- EXTRATERRITORIAL JURISDICTION
- EXTRATERRITORIAL JURISDICTION
- OTHER CITY LIMITS
- OTHER CITIES ETJ

### Jurisdictions Fill

#### Jurisdiction

- FULL PURPOSE
- EXTRATERRITORIAL JURISDICTION
- EXTRATERRITORIAL JURISDICTION
- OTHER CITY LIMITS
- OTHER CITIES ETJ

### Environmental 3

#### Watershed

- Gilleland Creek
- Harris Branch
- Wilbarger Creek

## Notes

0 0.5 1 mi

5/6/2025

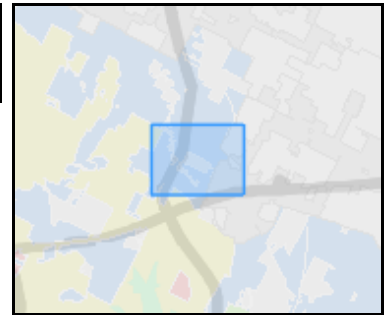
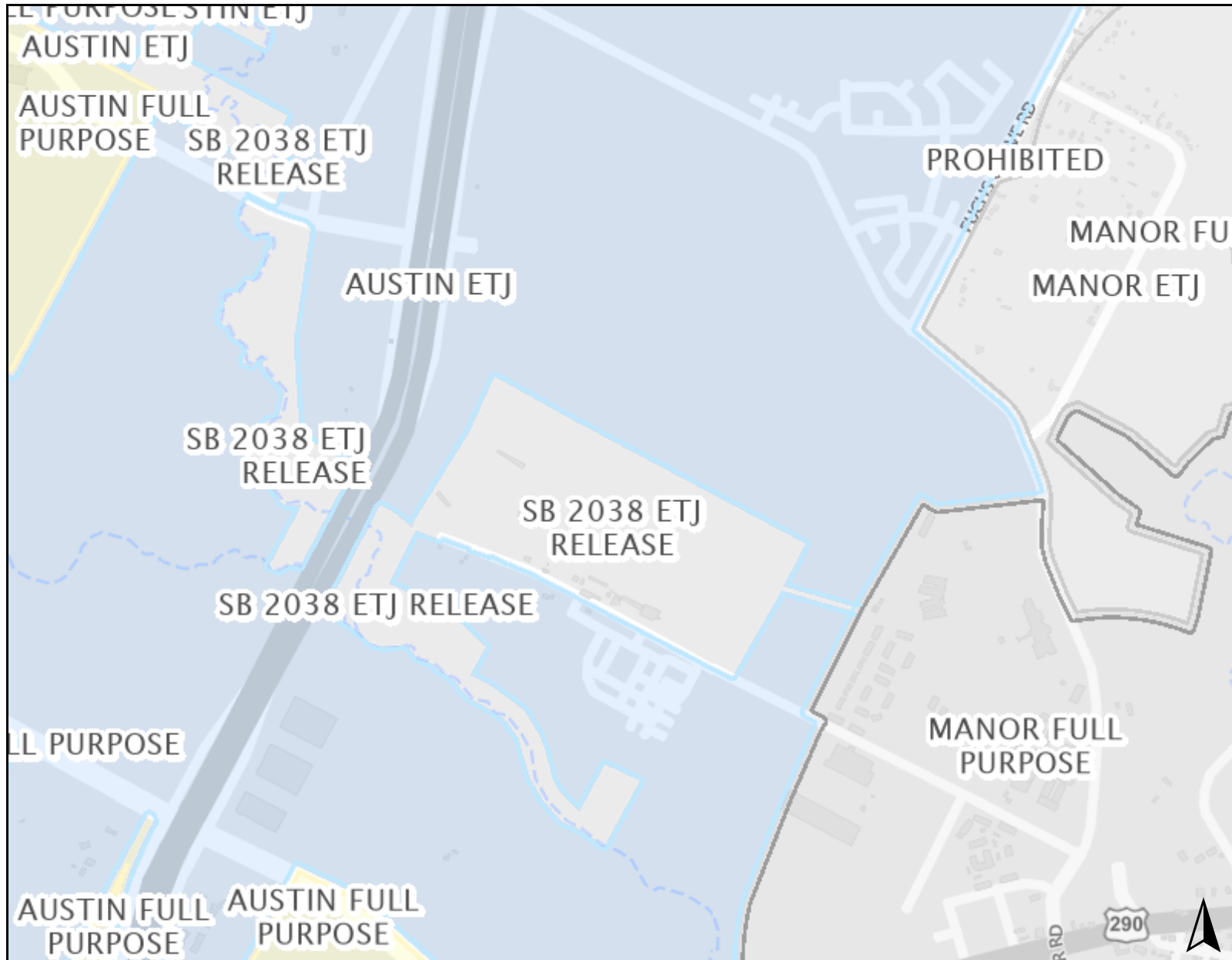
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## EXHIBIT 4 – EDWARDS AQUIFER MAP





# Property Profile



## Legend

### Property

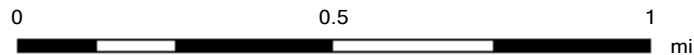
#### Jurisdiction

- FULL PURPOSE
- EXTRATERRITORIAL JURISDICTION
- OTHER CITY LIMITS
- OTHER CITIES ETJ

### Jurisdictions Fill

#### Jurisdiction

- FULL PURPOSE
- EXTRATERRITORIAL JURISDICTION
- OTHER CITY LIMITS
- OTHER CITIES ETJ



5/6/2025

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## Notes

## EXHIBIT 5 – FEMA FLOODPLAIN MAP



## 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 **Floodway** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevation Tables contained within the Flood Insurance Study (FIS) report that accompanies the 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 0.7 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevation Tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevation Tables 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 Texas State Plane Central Zone (FIPSZONE 4203). The horizontal datum was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in production of FIRM for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. 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, NIMS12  
National Geodetic Survey  
SSM-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 the City of Austin and CAPCOG. The projection used in the preparation of the FIRM was Texas State Plane Central Zone (FIPSZONE 4203) and the horizontal datum was NAD83, GRS1980 spheroid.

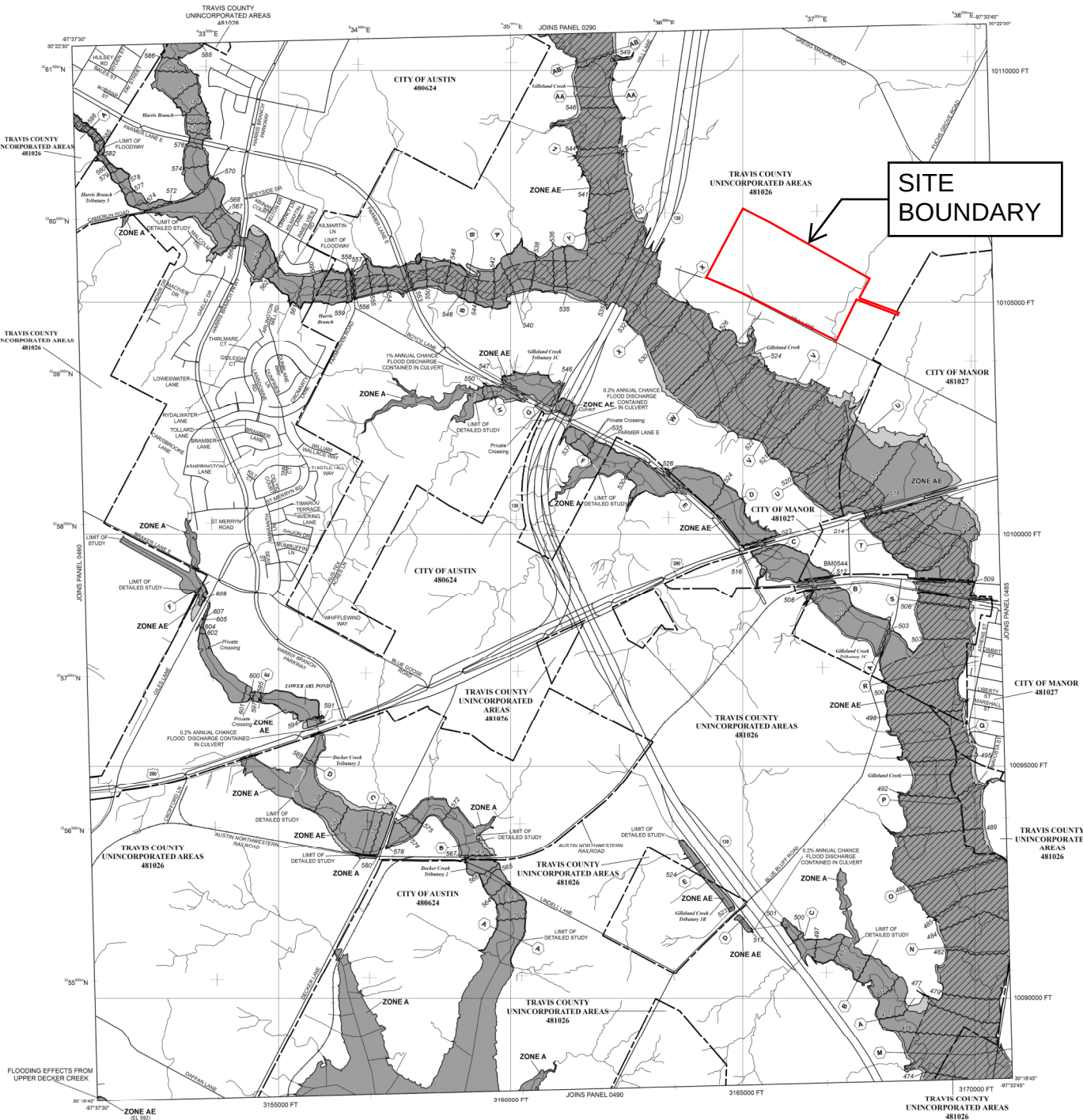
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydrologic data) may reflect stream channel details that differ from what is shown on this map.

**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.

For information on available products associated with this FIRM, visit the Map Service Center (MSC) website at <http://www.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital version of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have questions about this map, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-336-3827 or visit the FEMA website at <http://www.fema.gov>.



## LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual 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, AO, AR, AV, VE, V, and X. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.
- ZONE A**  
No Base Flood Elevations determined.  
Base Flood Elevations determined.  
Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AE**  
Flood depths of 1 to 3 feet (usually sheet flow on dipping terrain); average depths determined.  
Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently dismantled. Zone AE indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE AO**  
Area to be protected from 1% annual chance flood by a Federal Flood protection system under construction; no Base Flood Elevations determined.
- ZONE AR**  
Coastal Flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE AV**  
Coastal Flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- ZONE VE**  
Floodway Areas in Zone AE
- 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 D**  
Areas determined to be outside the 0.2% annual chance floodplain. 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.
- Floodway boundary**
- Zone D boundary**
- CBRS and OPA boundary**
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Area Zones of different Base Flood Elevations, flood depths or flood velocities.**
- Limit of Moderate Wave Action**
- Base Flood Elevation line and water elevation in feet**
- Base Flood Elevation value where uniform within zone; elevation in feet**
- \* Referenced to the North American Vertical Datum of 1988**
- Cross section line**
- Transect line**
- Canal, Flume, Periodic or Aqueduct**
- Road or Railroad Bridge**
- Floodgate**
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere**
- 3000-meter Universal Transverse Mercator grid values, zone 14**
- 5000-foot grid values, Texas State Plane coordinate system, Central zone (FIPSZONE 4203), Lambert Conformal Conic projection**
- Bench mark (see explanation in Notes to Users section of this FIS report)**
- Blue Mile**
- MAP REPOSITORY**
- Refer to listing of Map Repositories on Map Index
- EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP**
- June 16, 1993
- EFFECTIVE DATES OF REVISIONS TO THIS PANEL**
- June 5, 1987 January 19, 2000 April 15, 2002 September 20, 2008
- August 18, 2014 - In change Base Flood Elevations and Special Flood Hazard Areas and to incorporate previously issued Letters of Map Amendment
- 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 1-800-638-6635.

**NFIP**

**PANEL 480J**

**FIRM**

**FLOOD INSURANCE RATE MAP**

**TRAVIS COUNTY, TEXAS AND INCORPORATED AREAS**

**PANEL 480 OF 730**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

| COMMUNITY       | NUMBER | PANEL | SUFFIX |
|-----------------|--------|-------|--------|
| AUSTIN, CITY OF | 48107  | 048J  | J      |
| MANOR, CITY OF  | 48108  | 048J  | J      |
| TRAVIS COUNTY   | 48108  | 048J  | J      |

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**  
48453C0480J

**MAP REVISED**  
AUGUST 18, 2014

**Federal Emergency Management Agency**

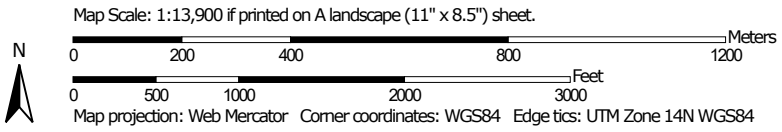
## EXHIBIT 6 – NRCS SOILS MAP



Soil Map—Travis County, Texas  
(MANOR DOWNS INDUSTRIAL)



Soil Map may not be valid at this scale.



Soil Map—Travis County, Texas  
(MANOR DOWNS INDUSTRIAL)

## 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: Travis County, Texas

Survey Area Data: Version 26, Aug 30, 2024

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

Date(s) aerial images were photographed: Data not available.

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 |
|------------------------------------|----------------------------------------------------------------|--------------|----------------|
| FhF3                               | Ferris-Heiden complex, 8 to 20 percent slopes, severely eroded | 46.6         | 4.9%           |
| HeC2                               | Heiden clay, 3 to 5 percent slopes, eroded                     | 373.5        | 39.4%          |
| HeD2                               | Heiden clay, 5 to 8 percent slopes, eroded                     | 10.4         | 1.1%           |
| HnA                                | Houston Black clay, 0 to 1 percent slopes                      | 25.2         | 2.7%           |
| HnB                                | Houston Black clay, 1 to 3 percent slopes                      | 423.3        | 44.6%          |
| HnC2                               | Houston Black clay, 3 to 5 percent slopes, moderately eroded   | 10.0         | 1.1%           |
| Tv                                 | Tinn clay, 0 to 1 percent slopes, occasionally flooded         | 3.1          | 0.3%           |
| Tw                                 | Tinn clay, 0 to 1 percent slopes, frequently flooded           | 56.5         | 6.0%           |
| <b>Totals for Area of Interest</b> |                                                                | <b>948.7</b> | <b>100.0%</b>  |

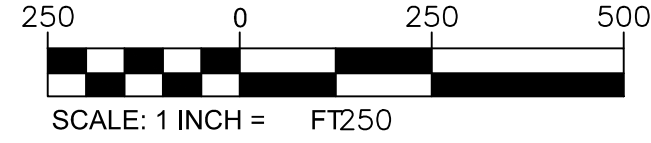
## EXHIBIT 7 – EXISTING DRAINAGE AREA MAP



V:\070422 - Dallas Industrial\070422-01-002 (ENG) - Manor Downs Industrial\Engineering\Plans\Subdivision Plan\070422-01-002 SUB\_EDM.dwg EXISTING DRAINAGE AREA MAP, July 15, 2025, 3:05 PM, rjgaurra



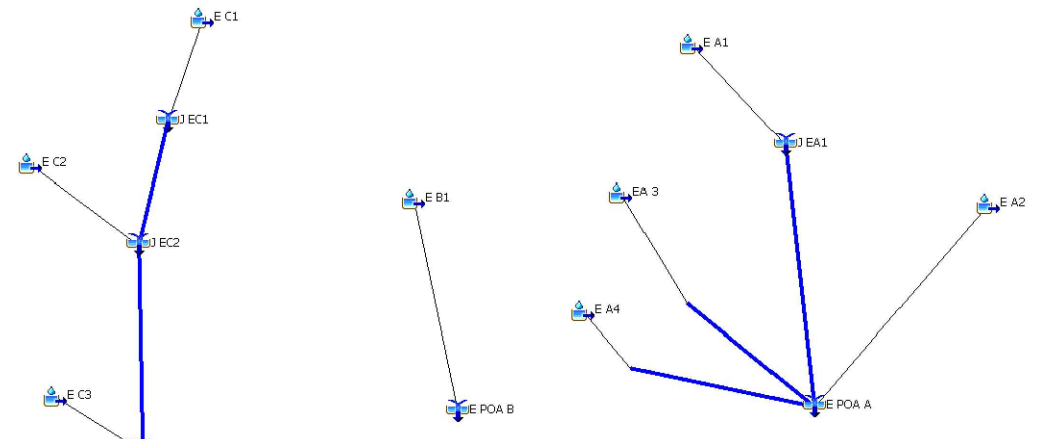
| HEC-HMS INPUT- EXISTING TIME OF CONCENTRATION CALCULATIONS - MANOR DOWNS INDUSTRIAL |            |       |        |                  |        |            |       |       |      |          |                           |       |         |        |           |              |       |       |      |      |           |   |   |    |      |    |     |   |    |   |    |  |    |     |   |   |    |   |    |   |    |   |      |    |     |           |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
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| BASIN                                                                               | AREA       |       |        | IMPERVIOUS COVER |        | SHEET FLOW |       |       |      |          | SHALLOW CONCENTRATED FLOW |       |         |        |           | CHANNEL FLOW |       |       |      |      | Pipe Flow |   |   |    |      |    |     |   |    |   | TC |  | CN | IC% |   |   |    |   |    |   |    |   |      |    |     |           |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|                                                                                     |            |       |        |                  |        | L          | ft    | n     | S    | 2yr-24hr | Tc                        | ft    | n       | S      | Flow Type | Table 15-3   | Tc    | min   | L    | ft   | n         | S | R | V* | ft/s | Tc | min | L | ft | n |    |  |    |     | S | D | in | A | sf | P | in | V | ft/s | Tc | min | Total min | Lag min |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|                                                                                     |            |       |        |                  |        |            |       |       |      |          |                           |       |         |        |           |              |       |       |      |      |           |   |   |    |      |    |     |   |    |   |    |  |    |     |   |   |    |   |    |   |    |   |      |    |     |           |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
| EA1                                                                                 | 2283711.08 | 52.43 | 0.0819 | 1,428,166        | 62.54% | 100        | 0.240 | 0.50% | 4.06 | 22.1     | 2693                      | 1.60% | Unpaved | 16.135 | 22.0      | 304          | 0.045 | 1.90% | 1.00 | 4.56 | 1.1       |   |   |    |      |    |     |   |    |   |    |  |    |     |   |   |    |   |    |   |    |   |      |    |     |           |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |



#### LEGEND

- PROPERTY BOUNDARY
- EXISTING R.O.W.
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING DRAINAGE AREA
- TIME OF CONCENTRATION
- REACH
- DRAINAGE AREA IDENTIFIER
- FLOW ARROW

| Existing Development Conditions - SCS Method - Via HEC-HMS |             |       |        |    |                  |       |            |        |       |       |       |        |  |
|------------------------------------------------------------|-------------|-------|--------|----|------------------|-------|------------|--------|-------|-------|-------|--------|--|
| BASIN                                                      | AREA        |       |        | CN | IMPERVIOUS COVER |       | LAG<br>min | Q(CFS) |       |       |       |        |  |
|                                                            | sf          | ac    | sq mi  |    | sf               | %     |            | 2-yr   | 5-yr  | 10-yr | 25-yr | 100-yr |  |
| EA1                                                        | 2,283,711   | 52.4  | 0.0819 | 84 | 1,428,166        | 62.5% | 27.1       | 98.8   | 130.0 | 157.9 | 198.7 | 267.6  |  |
| EA2                                                        | 4,696,199   | 107.8 | 0.1685 | 84 | 2,456,560        | 52.3% | 40.4       | 159.2  | 212.7 | 260.8 | 331.8 | 452.9  |  |
| EA3                                                        | 1,761,118   | 40.4  | 0.0632 | 84 | 7,433            |       | 15.2       | 71.1   | 99.7  | 125.2 | 161.9 | 224.0  |  |
| EA4                                                        | 703,689     | 16.2  | 0.0252 | 84 | 6,356            | 0.9%  | 66.7       | 14.2   | 20.5  | 26.4  | 35.1  | 50.3   |  |
| Reach EA1                                                  |             |       |        |    |                  |       | 6.6        | 93.4   | 122.7 | 149.0 | 187.5 | 252.7  |  |
| Reach EA3                                                  |             |       |        |    |                  |       | 1.0        | 70.9   | 99.5  | 125.0 | 161.8 | 222.7  |  |
| Reach EA4                                                  |             |       |        |    |                  |       |            | 14.1   | 20.4  | 26.3  | 35.0  | 50.1   |  |
| Junction EA1                                               |             |       |        |    |                  |       |            | 98.8   | 130.0 | 157.9 | 198.7 | 267.6  |  |
| E-POA A                                                    | 9,444,717   | 216.8 | 0.3388 |    |                  |       |            | 305.0  | 410.0 | 504.8 | 644.5 | 883.3  |  |
| EB1                                                        | 1,146,885   | 26.3  | 0.0124 | 84 | 85,459           | 7.5%  | 13.6       | 49.3   | 69.6  | 87.9  | 114.3 | 158.1  |  |
| E-POA B                                                    | 1,146,885   | 26.3  | 0.0124 |    |                  |       |            | 49.3   | 69.6  | 87.9  | 114.3 | 158.1  |  |
| EC1                                                        | 2,787,609   | 64.0  | 0.1000 | 84 | 1,811,946        | 65.0% | 28.6       | 116.9  | 153.6 | 196.4 | 234.5 | 315.9  |  |
| EC2                                                        | 403,953     | 9.3   | 0.0145 | 84 | 196,647          | 48.7% | 13.5       | 20.7   | 27.6  | 33.8  | 42.8  | 57.8   |  |
| EC3                                                        | 1,689,471   | 38.8  | 0.0606 | 84 | 84,323           | 5.0%  | 17.3       | 69.8   | 97.5  | 122.3 | 158.0 | 217.2  |  |
| Reach EC1                                                  |             |       |        |    |                  |       | 0.8        | 116.9  | 153.6 | 196.4 | 234.5 | 315.9  |  |
| Reach EC2                                                  |             |       |        |    |                  |       | 5.7        | 125.7  | 165.1 | 200.5 | 252.4 | 340.4  |  |
| Junction EC1                                               |             |       |        |    |                  |       |            | 116.9  | 153.6 | 196.4 | 234.5 | 315.9  |  |
| Junction EC2                                               |             |       |        |    |                  |       |            | 135.7  | 178.5 | 216.6 | 272.6 | 366.9  |  |
| E-POA C                                                    | 4,881,033.1 | 112.1 | 0.2    |    |                  |       |            | 191.4  | 258.1 | 317.7 | 404.8 | 551.0  |  |



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**Bowman**

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T8PE Firm Registration No. F-14309  
8071 Las Cimas Parkway  
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Austin, Texas 78746  
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Fax: (512) 327-4062  
www.bowman.com

| REVISIONS |  | DATE | DESCRIPTION |
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| REVISION  |  |      |             |

#### EXISTING DRAINAGE AREA MAP

MANOR DOWNS INDUSTRIAL  
8916 HILL LN  
MANOR, TEXAS, 78653

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|        |       |      |
|--------|-------|------|
| DESIGN | DRAWN | CHKD |
| MC     | MG    | MK   |

JOB No. 070422-01-002

SHEET  
17 OF 33

PRELIMINARY NOT FOR CONSTRUCTION



## EXHIBIT 8 – PROPOSED DRAINAGE AREA MAP: INTERMEDIATE CONDITIONS

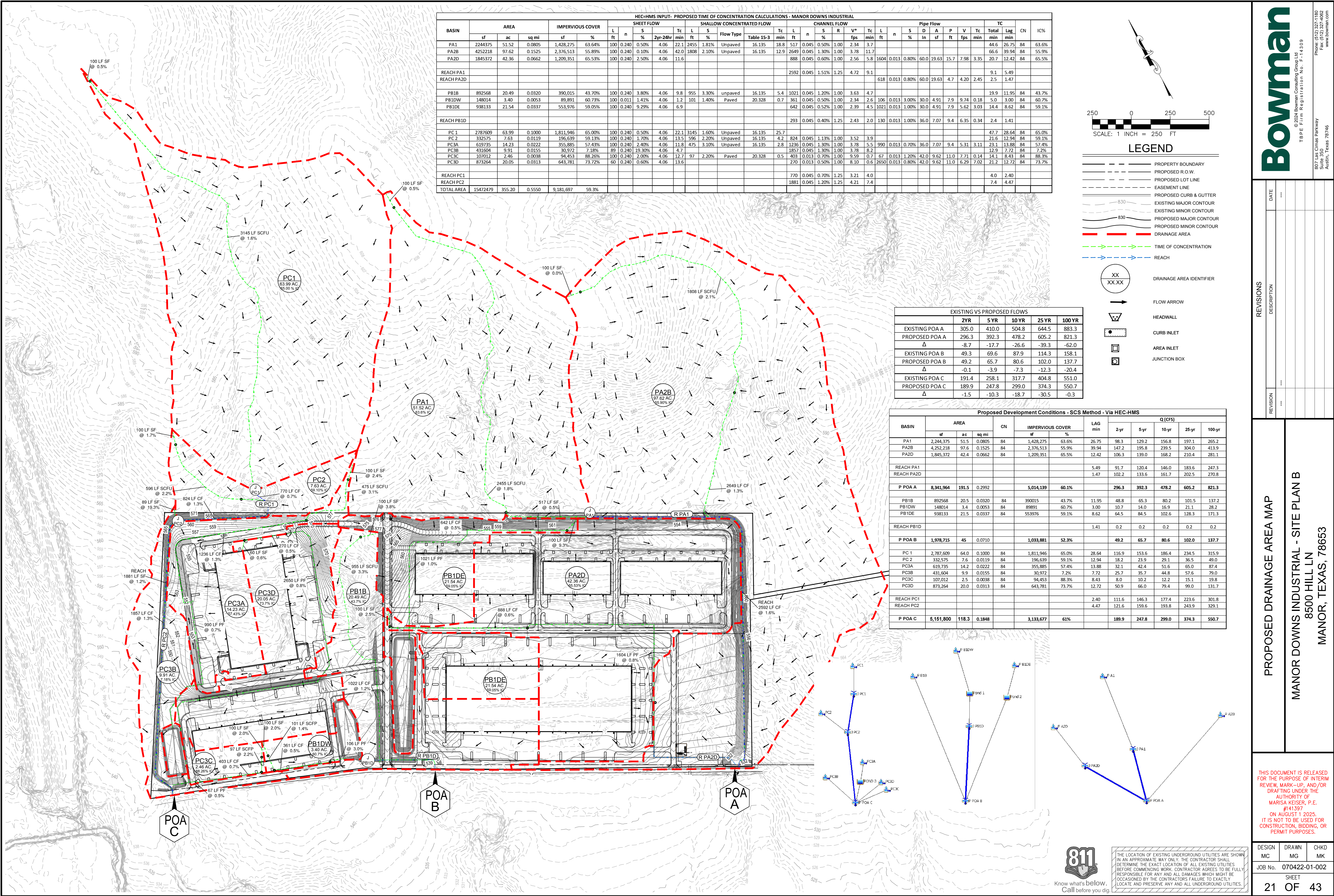






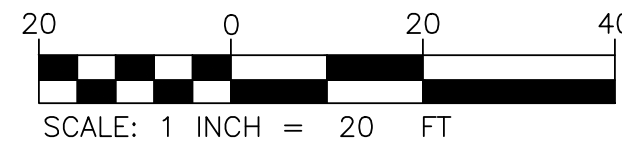
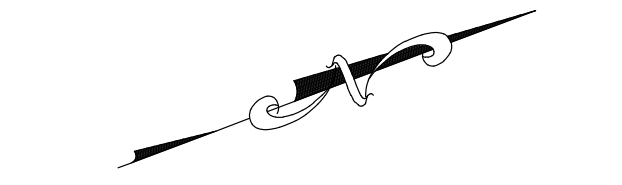
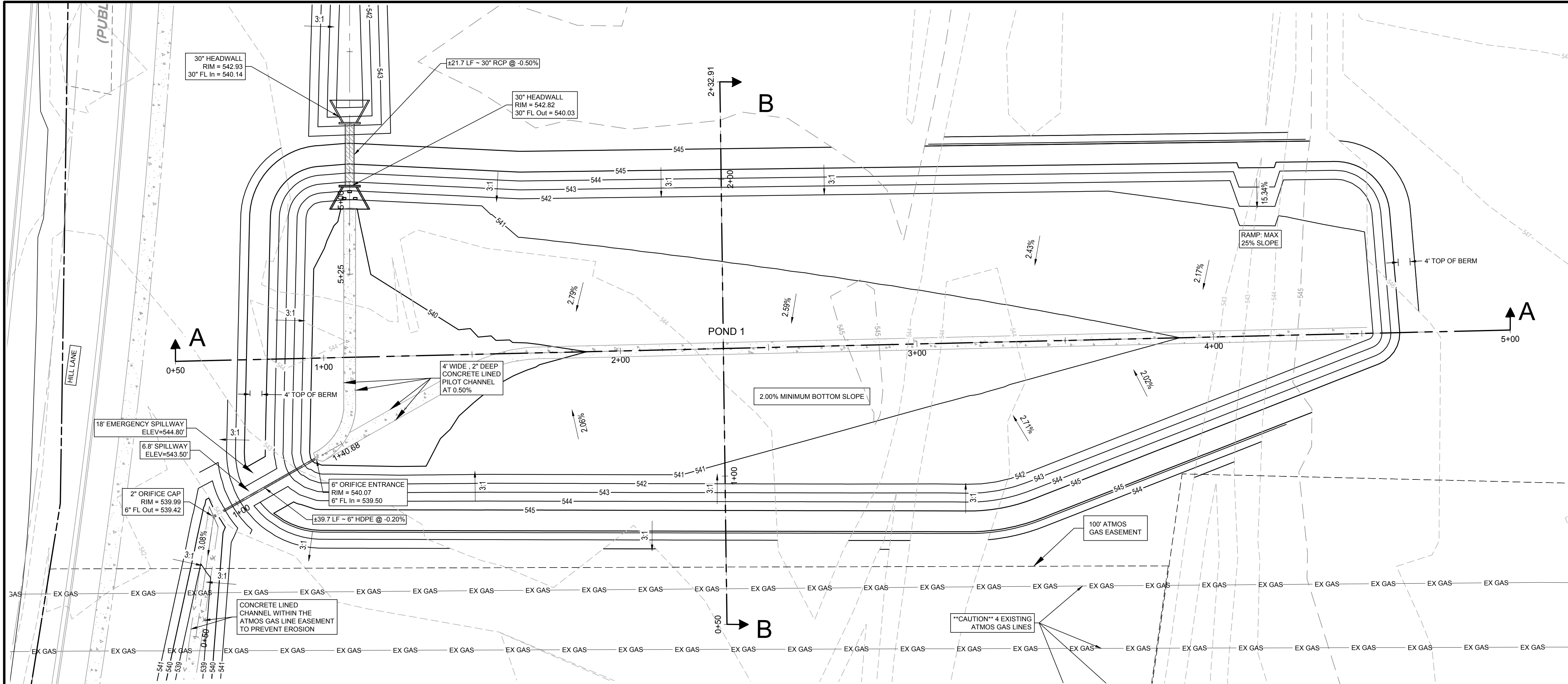
## EXHIBIT 9 – PROPOSED DRAINAGE AREA MAP: ULTIMATE CONDITIONS







## EXHIBIT 10 – DETENTION POND 1: INTERMEDIATE CONDITIONS

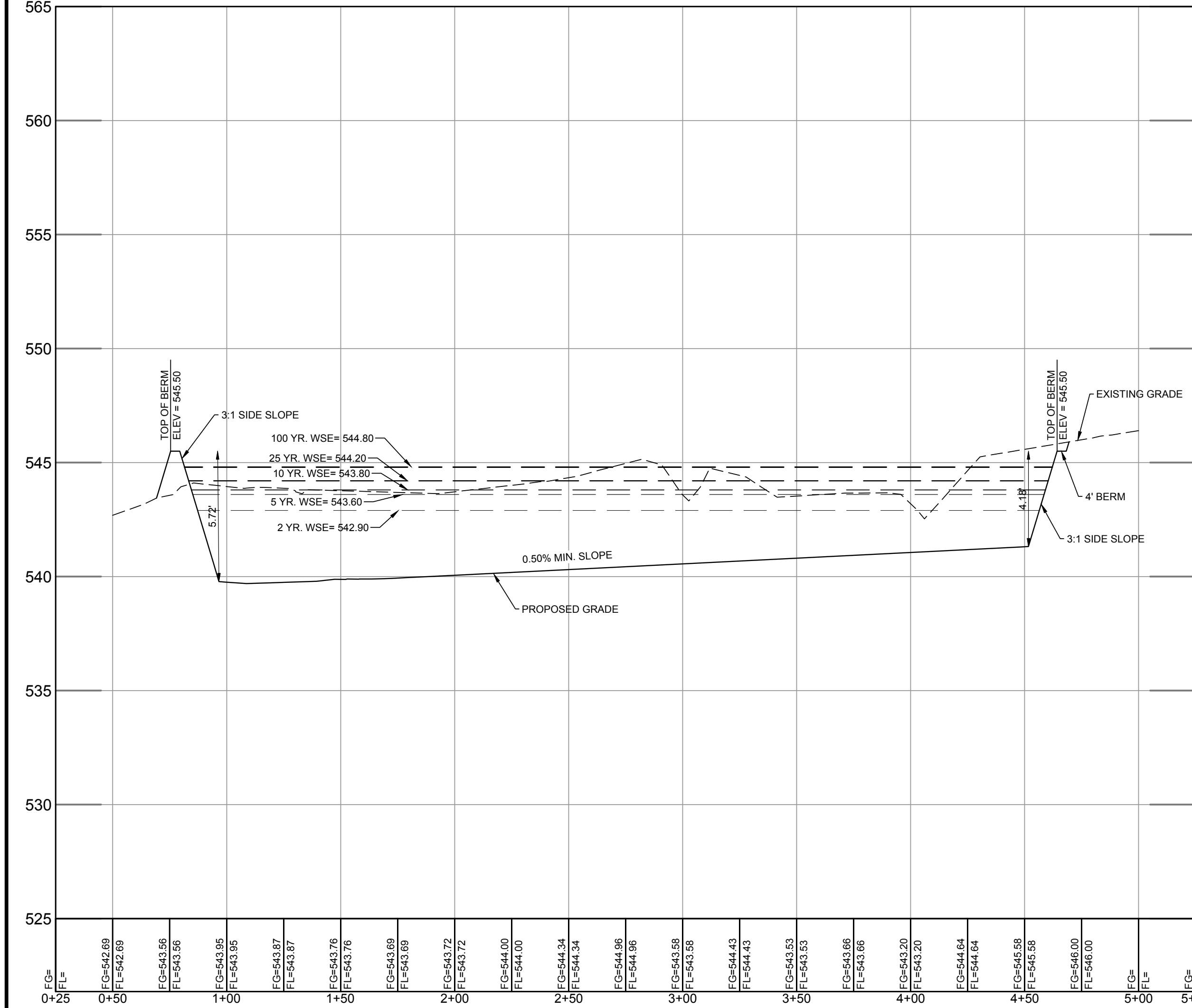


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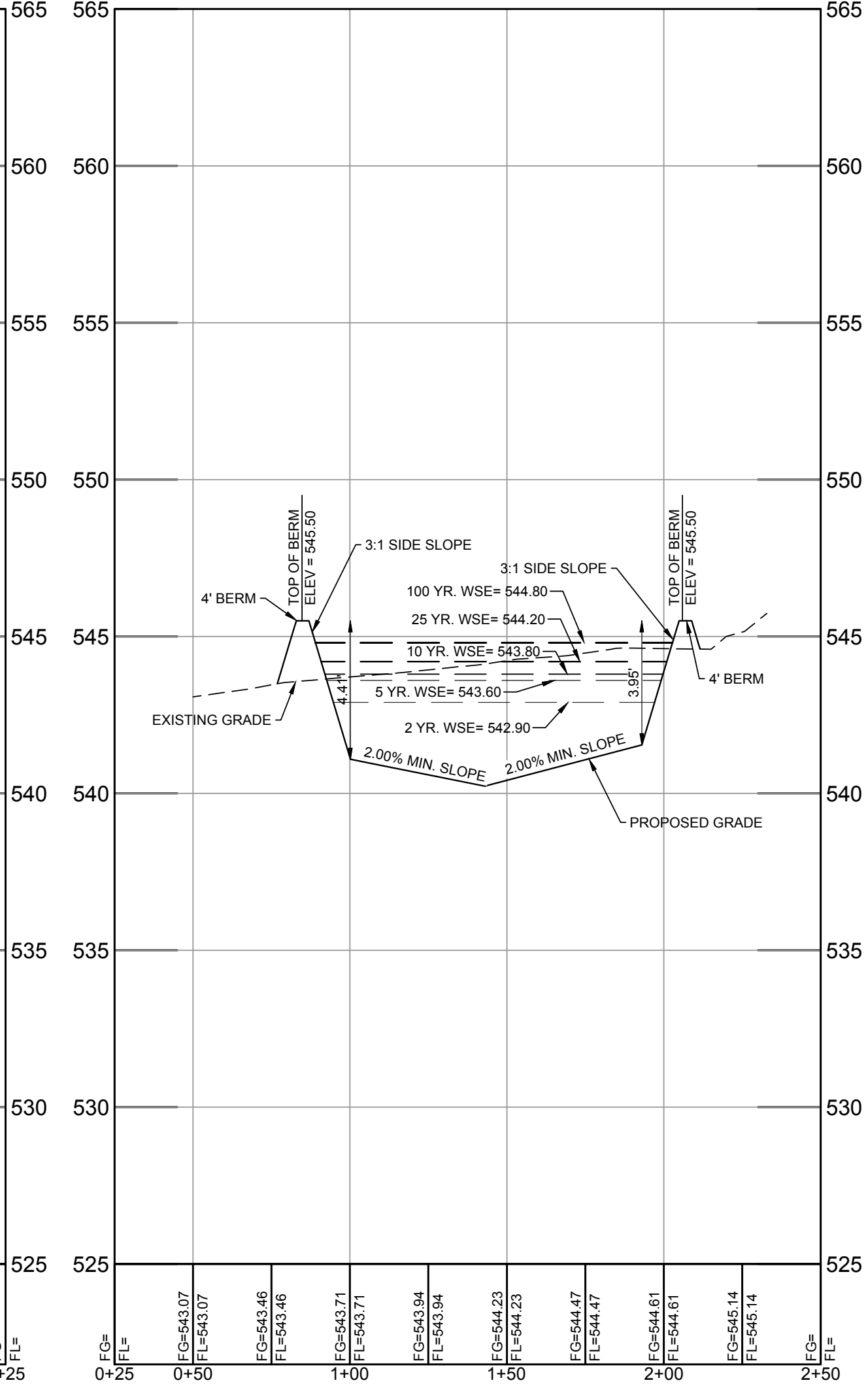
- PROPOSED R.O.W.
- PROPOSED LOT LINE
- SITE BOUNDARY
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE

- NOTES:
- ALL EARTHEN EMBANKMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH COA STANDARD SPECIFICATIONS
  - EARTHEN EMBANKMENTS SIDE SLOPES SHALL BE NO STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL.

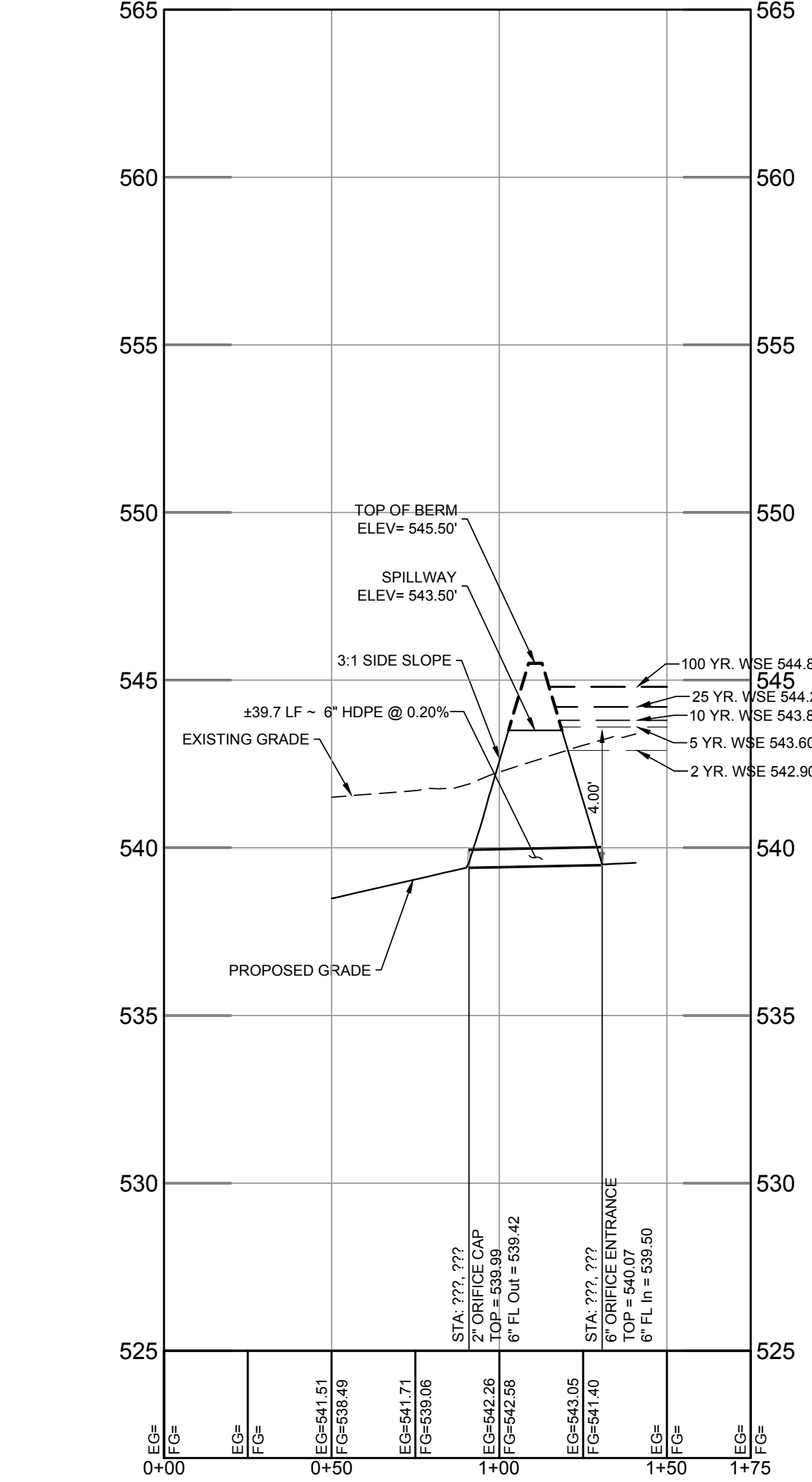
POND 1A SECTION A-A



POND 1A SECTION B-B



POND 1A OUTFALL



PROFILE SCALE 1:40



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| REVISIONS |             |
|-----------|-------------|
| REVISION  | DESCRIPTION |
|           |             |
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POND 1A

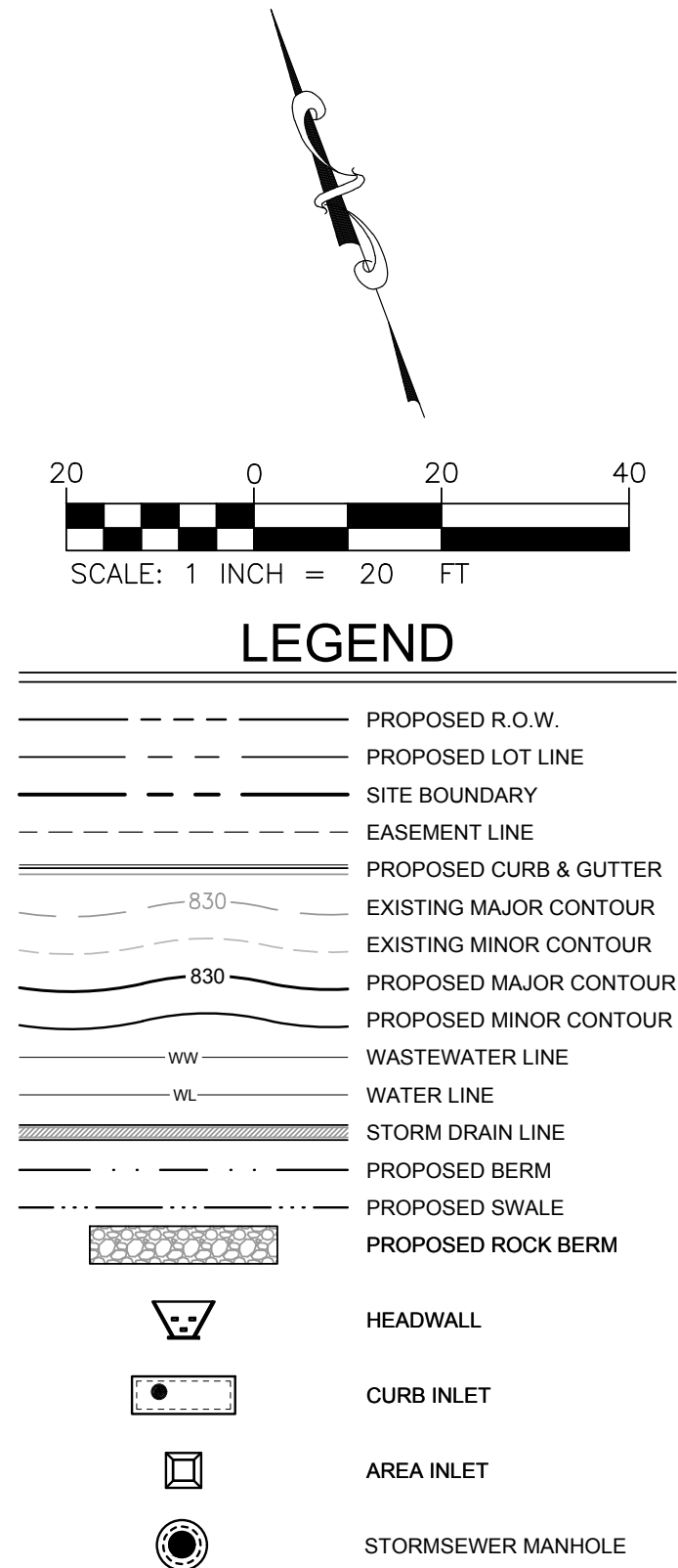
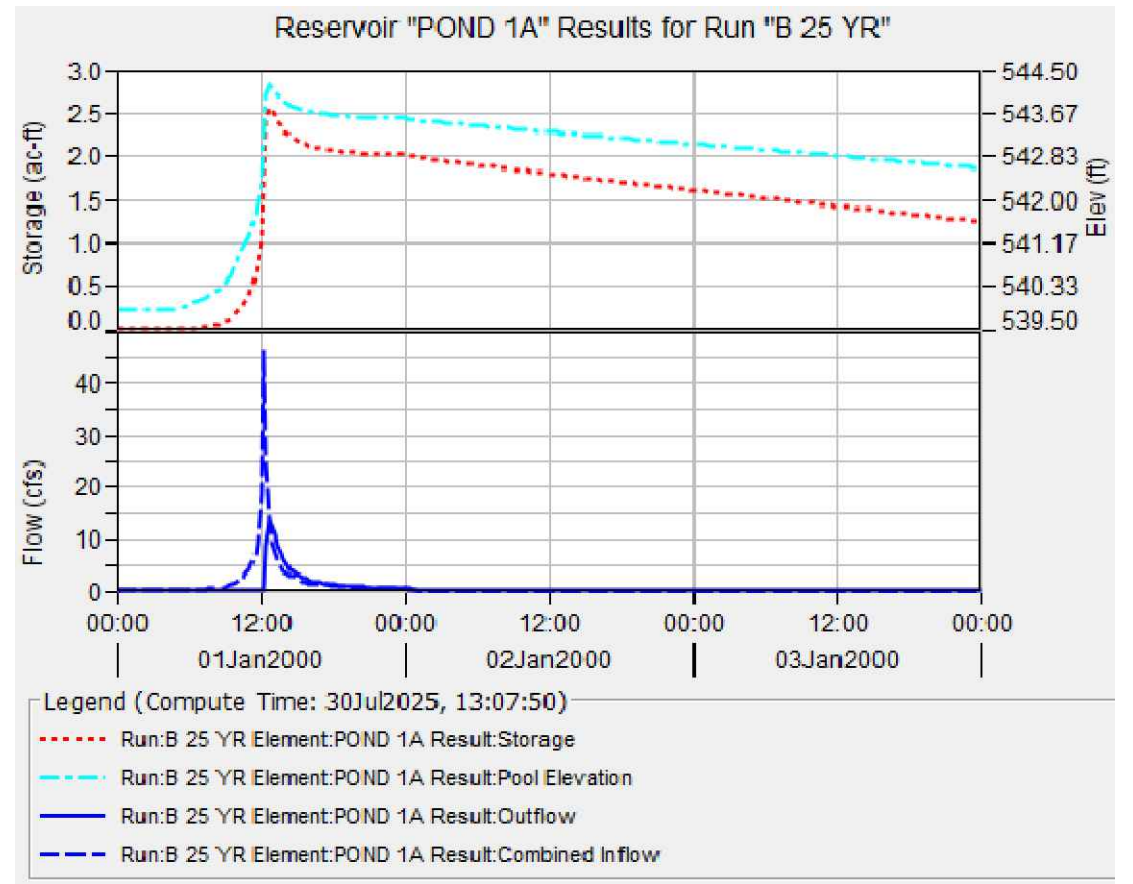
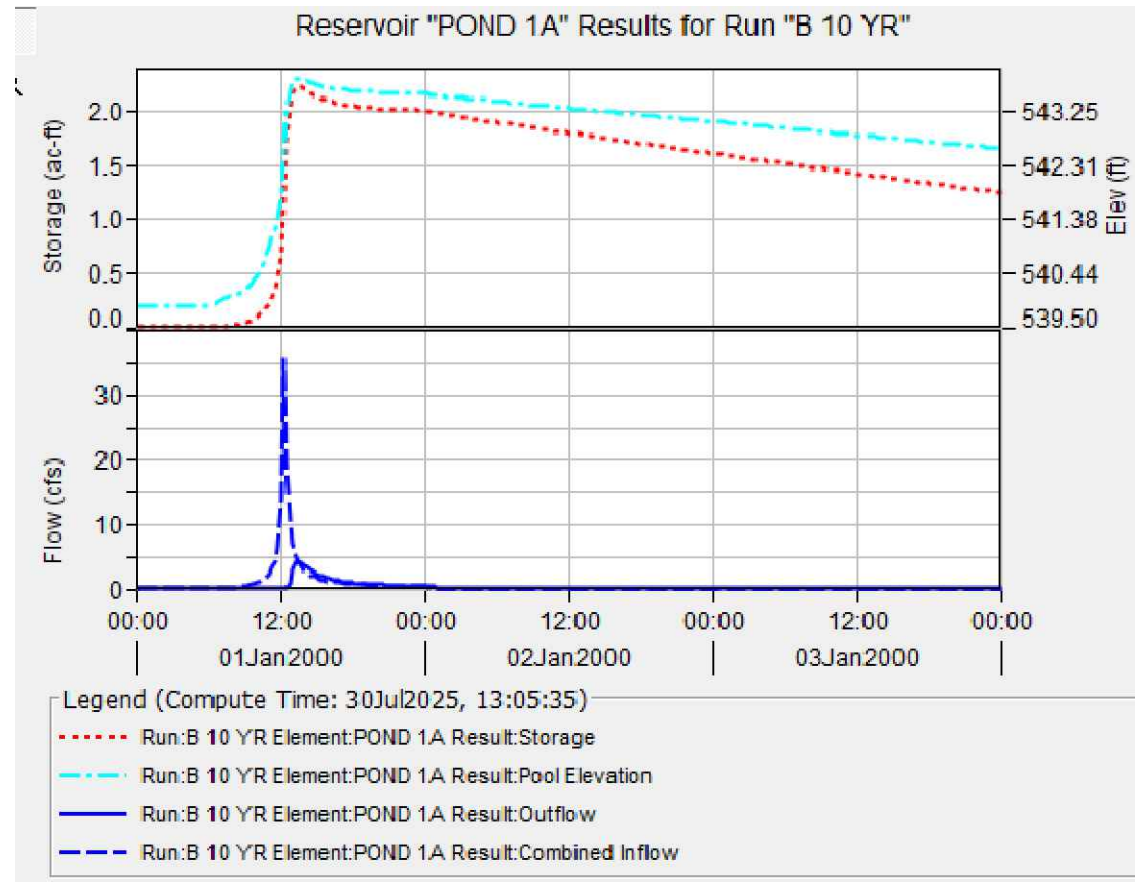
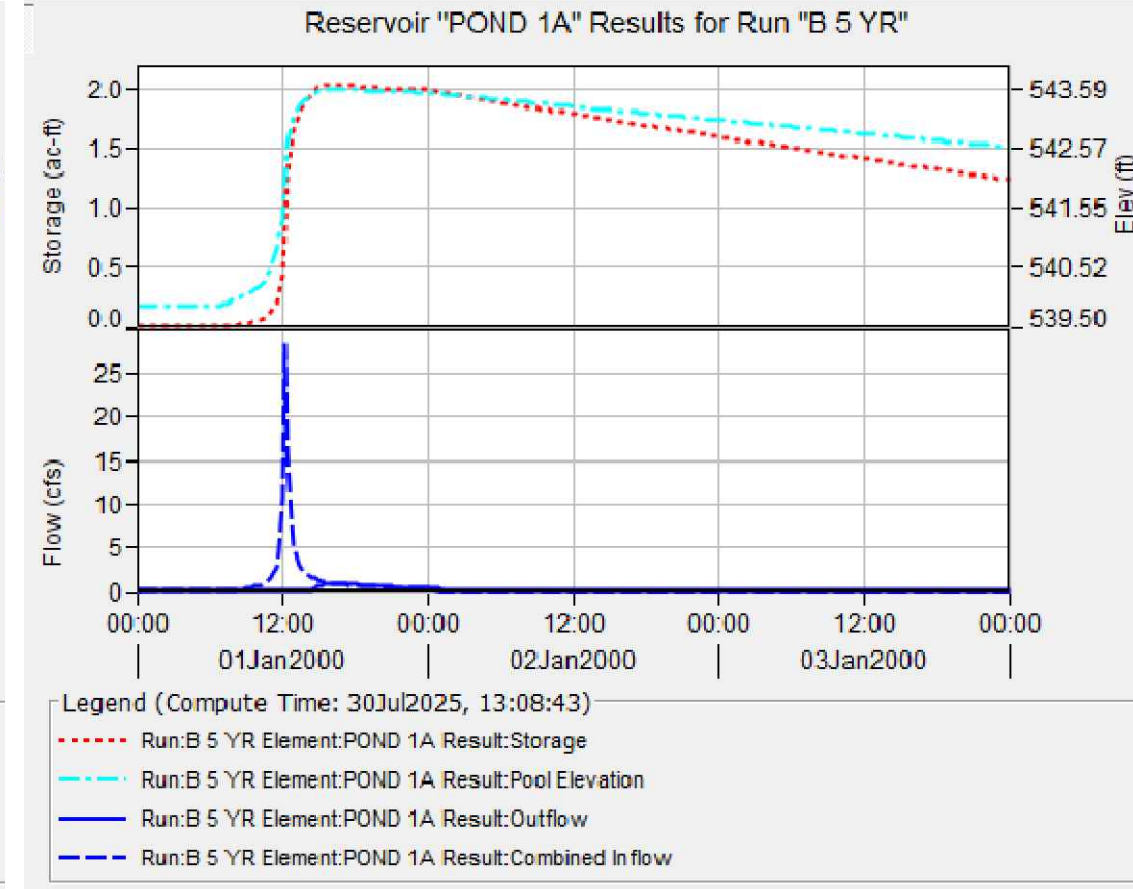
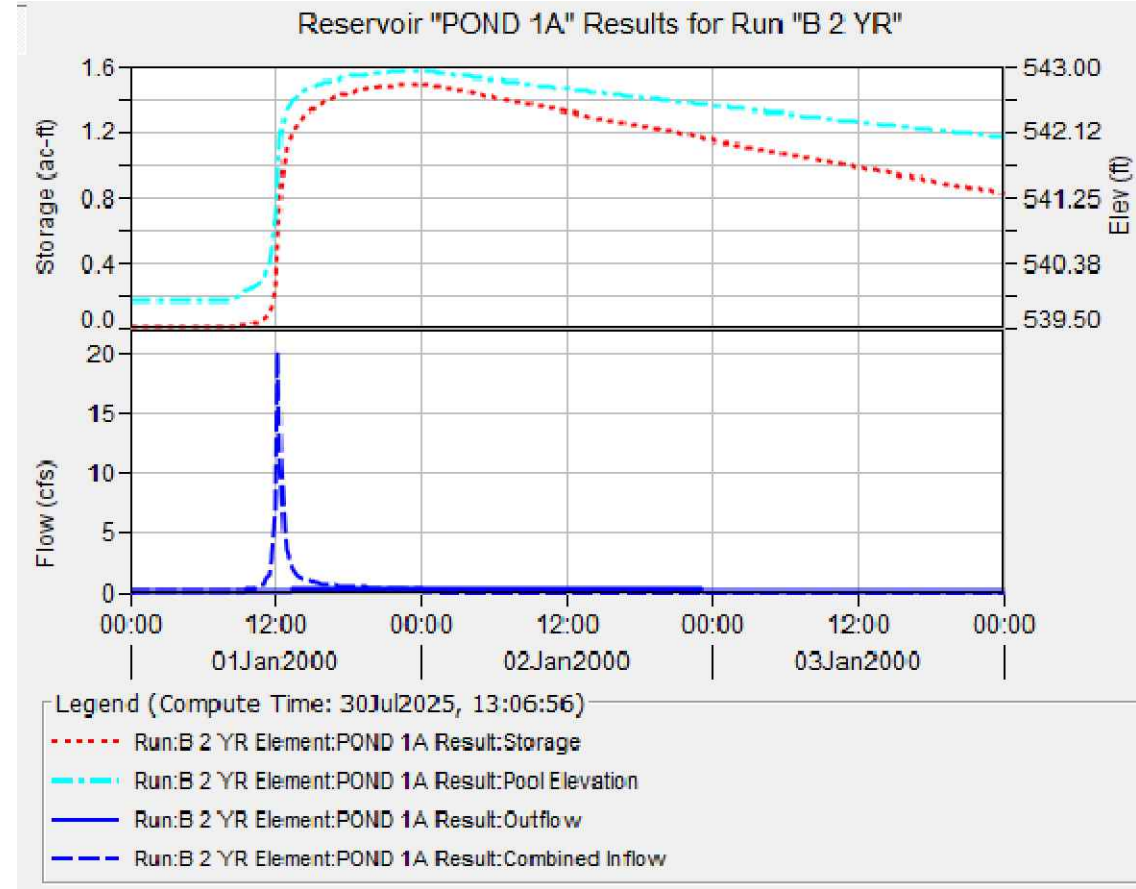
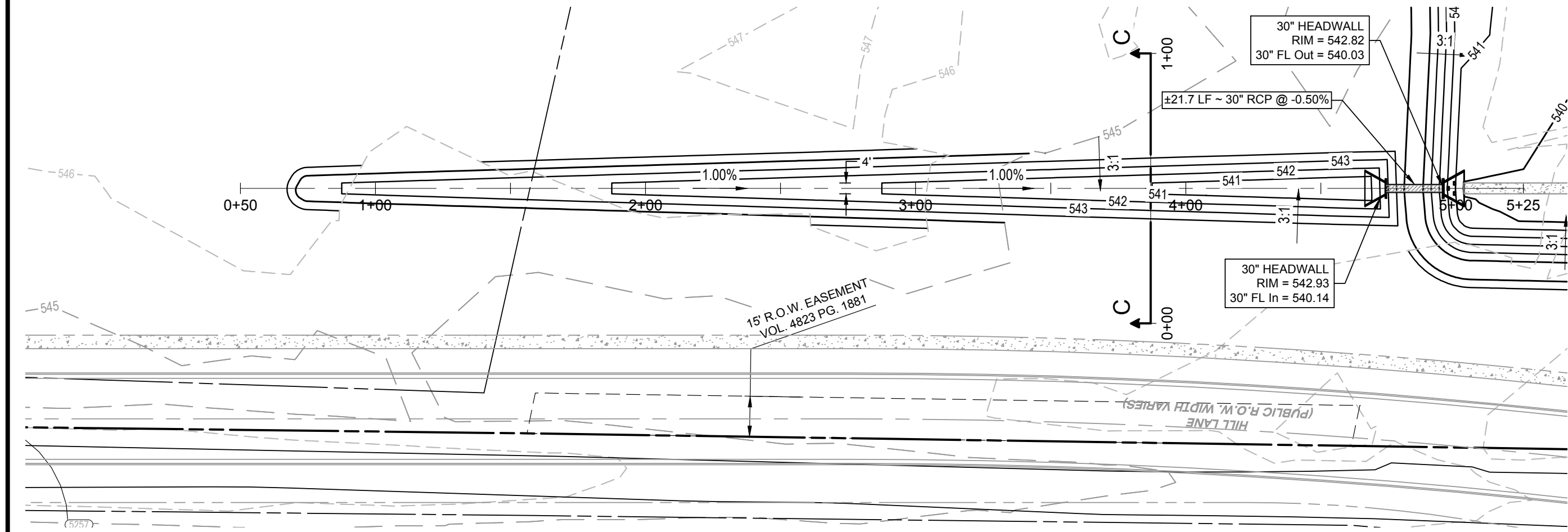
MANOR DOWNS INDUSTRIAL - SITE PLAN A  
8916 HILL LN  
MANOR, TEXAS, 78653

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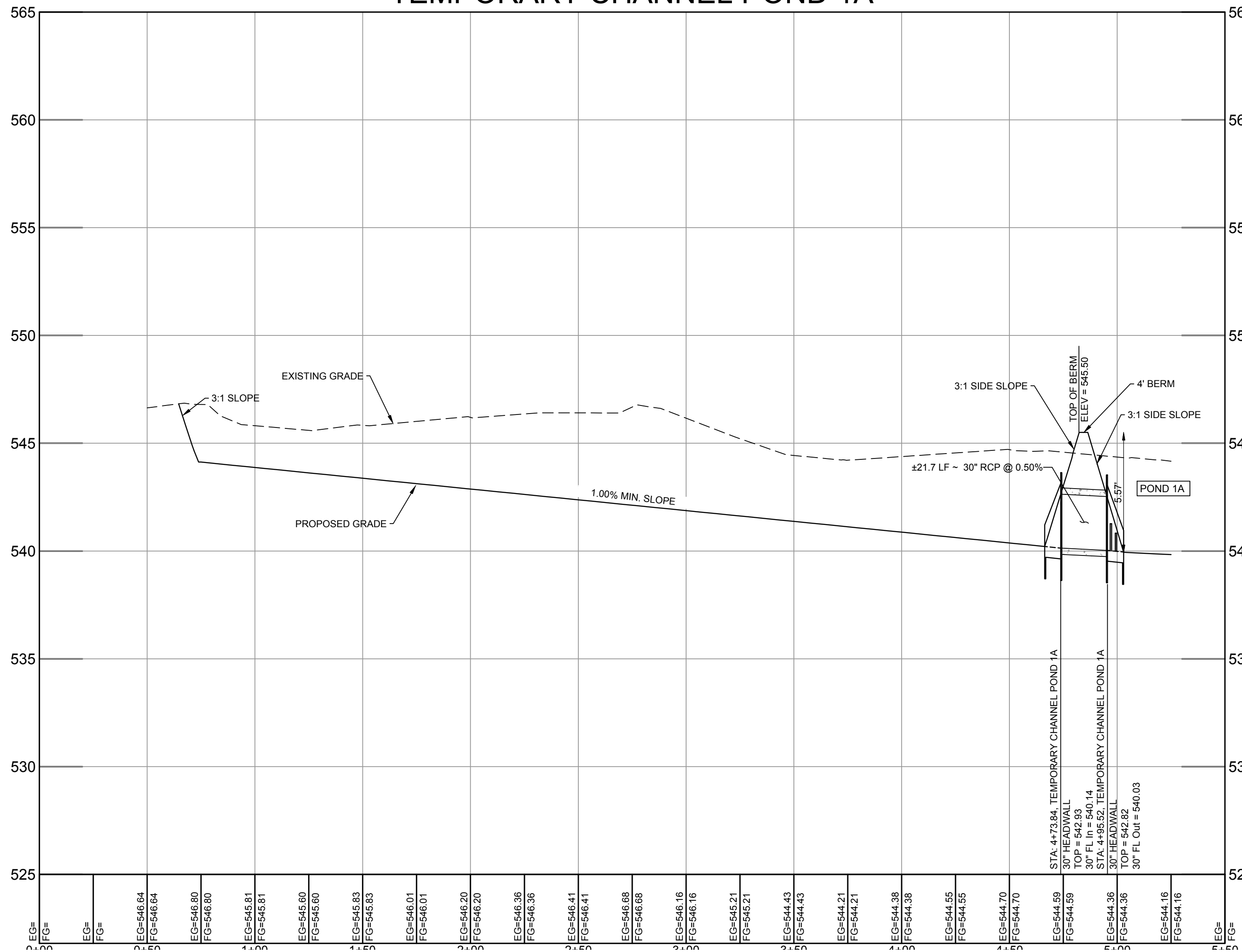
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|-----------------------|-------|------|
| DESIGN                | DRAWN | CHKD |
| MC                    | LB    | MK   |
| JOB No. 070422-01-002 |       |      |
| SHEET 55 OF 79        |       |      |



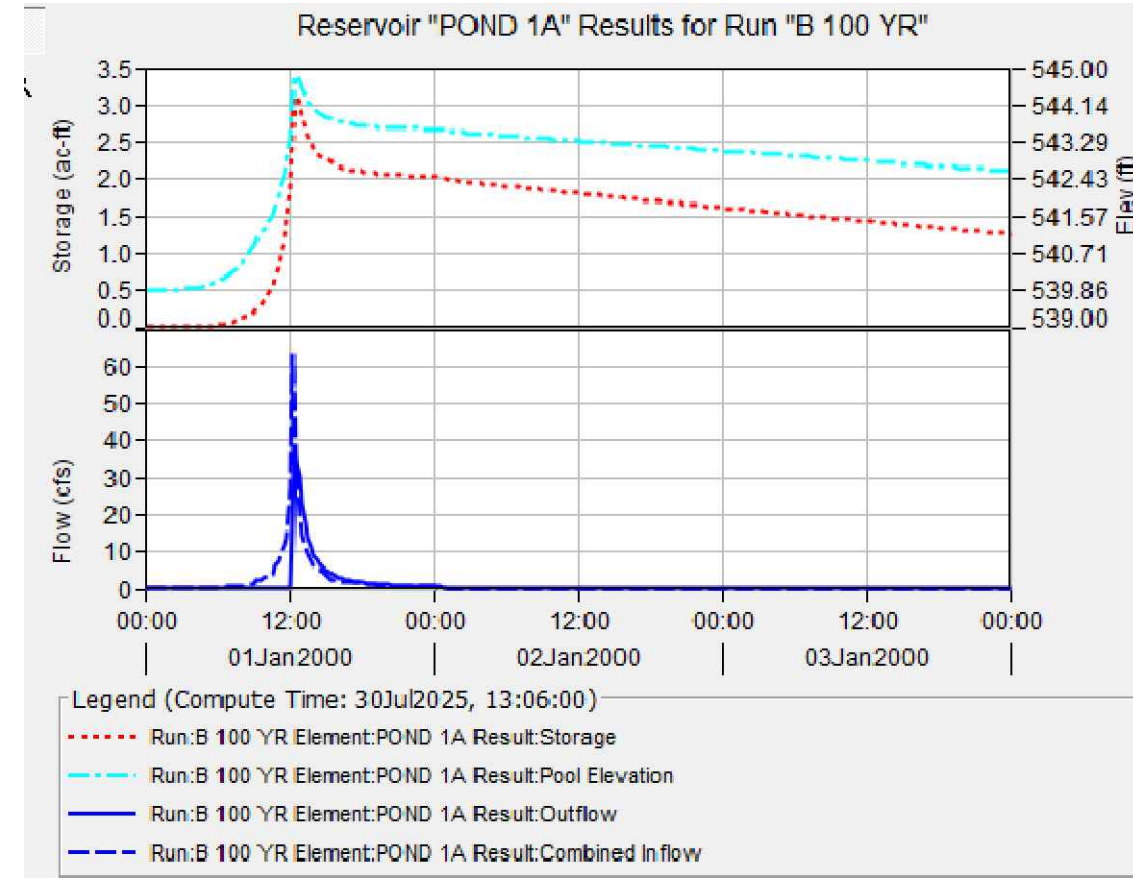
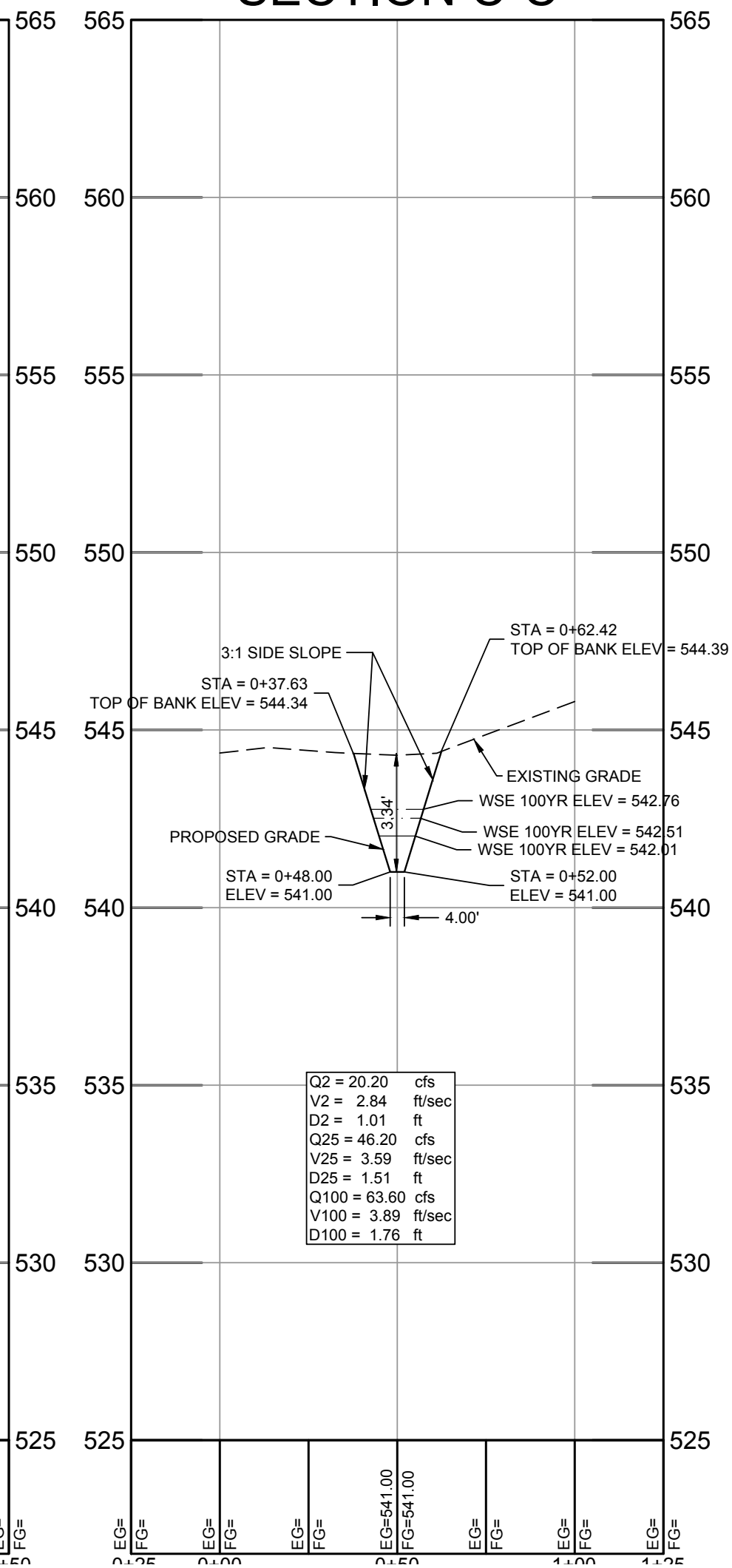
C:\Temp\AP\Bldg\_27768079422-01-009-SP-A\_POND 1A.dwg, POND 1A CHANNEL AND CALCULATIONS, August 01, 2025, 12:56 AM, acan0029



## TEMPORARY CHANNEL POND 1A

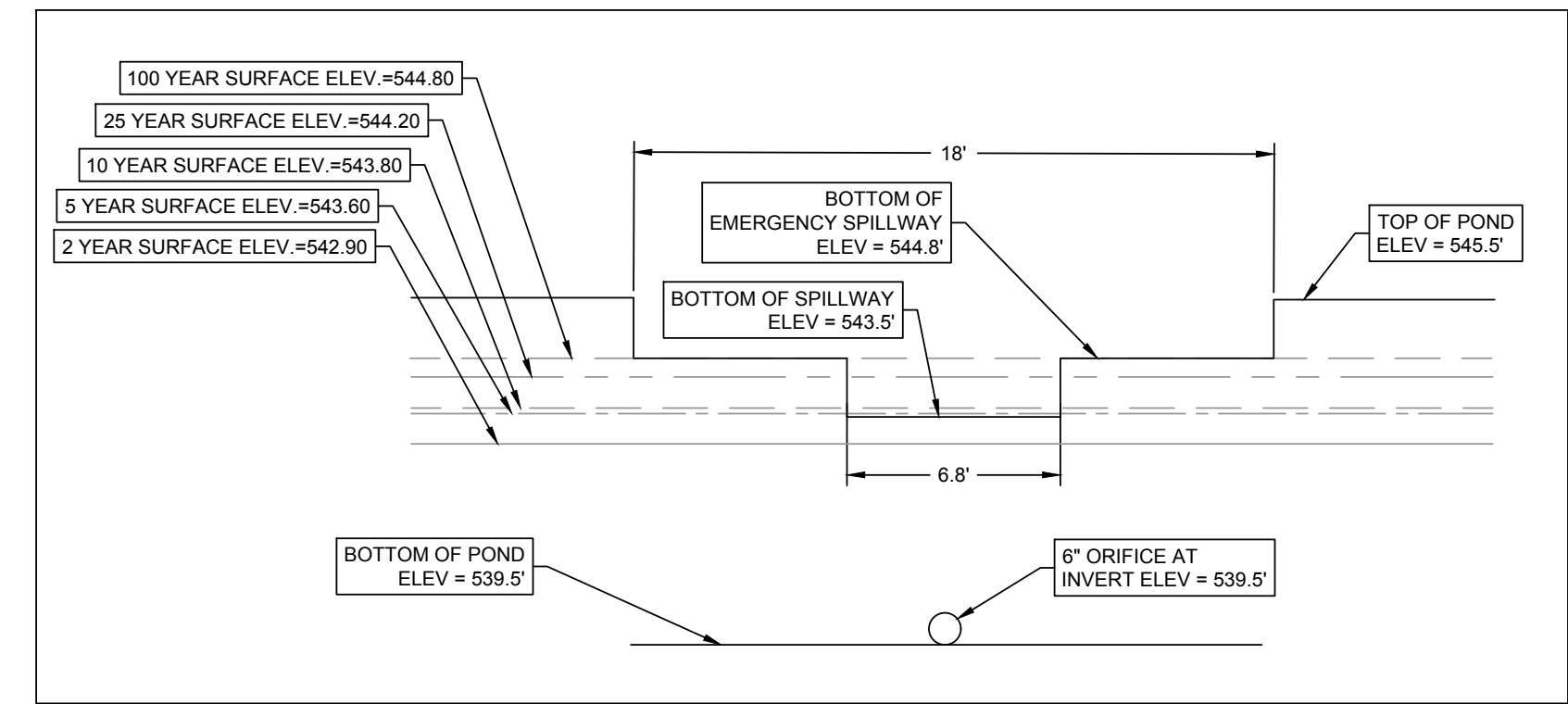


## SECTION C-C



| EVENT    | POND 1A SUMMARY TABLE |                  |                |           |                  |
|----------|-----------------------|------------------|----------------|-----------|------------------|
|          | INFLOW<br>(cfs)       | OUTFLOW<br>(cfs) | DELTA<br>(cfs) | WSE<br>Ft | STORAGE<br>Ac-ft |
| 2-year   | 20.20                 | 0.20             | 20.00          | 542.90    | 1.50             |
| 5-year   | 28.40                 | 0.80             | 27.60          | 543.60    | 2.00             |
| 10-year  | 35.80                 | 4.30             | 31.50          | 543.80    | 2.20             |
| 25-Year  | 46.20                 | 13.60            | 32.60          | 544.20    | 2.60             |
| 100-Year | 63.60                 | 34.80            | 28.80          | 544.80    | 3.10             |

| ELEV  | POND 1A STAGE-AREA-STORAGE TABLE |               |                                   |                                    |                                 |
|-------|----------------------------------|---------------|-----------------------------------|------------------------------------|---------------------------------|
|       | AREA<br>(sq. ft.)                | DEPTH<br>(ft) | AVG END<br>INC. VOL.<br>(cu. ft.) | AVG END<br>TOTAL VOL.<br>(cu. ft.) | CONIC<br>INC. VOL.<br>(cu. ft.) |
| 539.5 | 0                                | N/A           | N/A                               | 0                                  | N/A                             |
| 540.0 | 3595                             | 0.5           | 899                               | 899                                | 599                             |
| 541.0 | 17164                            | 1.0           | 10380                             | 11278                              | 10137                           |
| 542.0 | 31674                            | 1.0           | 24419                             | 35697                              | 24051                           |
| 543.0 | 34808                            | 1.0           | 33241                             | 68938                              | 33228                           |
| 544.0 | 37553                            | 1.0           | 36181                             | 105119                             | 36172                           |
| 545.0 | 40324                            | 1.0           | 38939                             | 144057                             | 38931                           |
| 545.5 | 41744                            | 0.5           | 20527                             | 164584                             | 20526                           |



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| REVISION | REVISIONS |             |
|----------|-----------|-------------|
|          | DATE      | DESCRIPTION |
|          |           |             |
|          |           |             |
|          |           |             |
|          |           |             |

## POND 1A CHANNEL AND CALCULATIONS

### MANOR DOWNS INDUSTRIAL - SITE PLAN A

8916 HILL LN  
MANOR, TEXAS, 78653

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ON AUGUST 1, 2025. IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

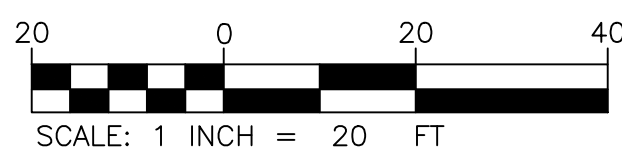
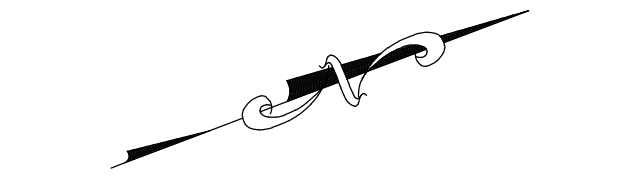
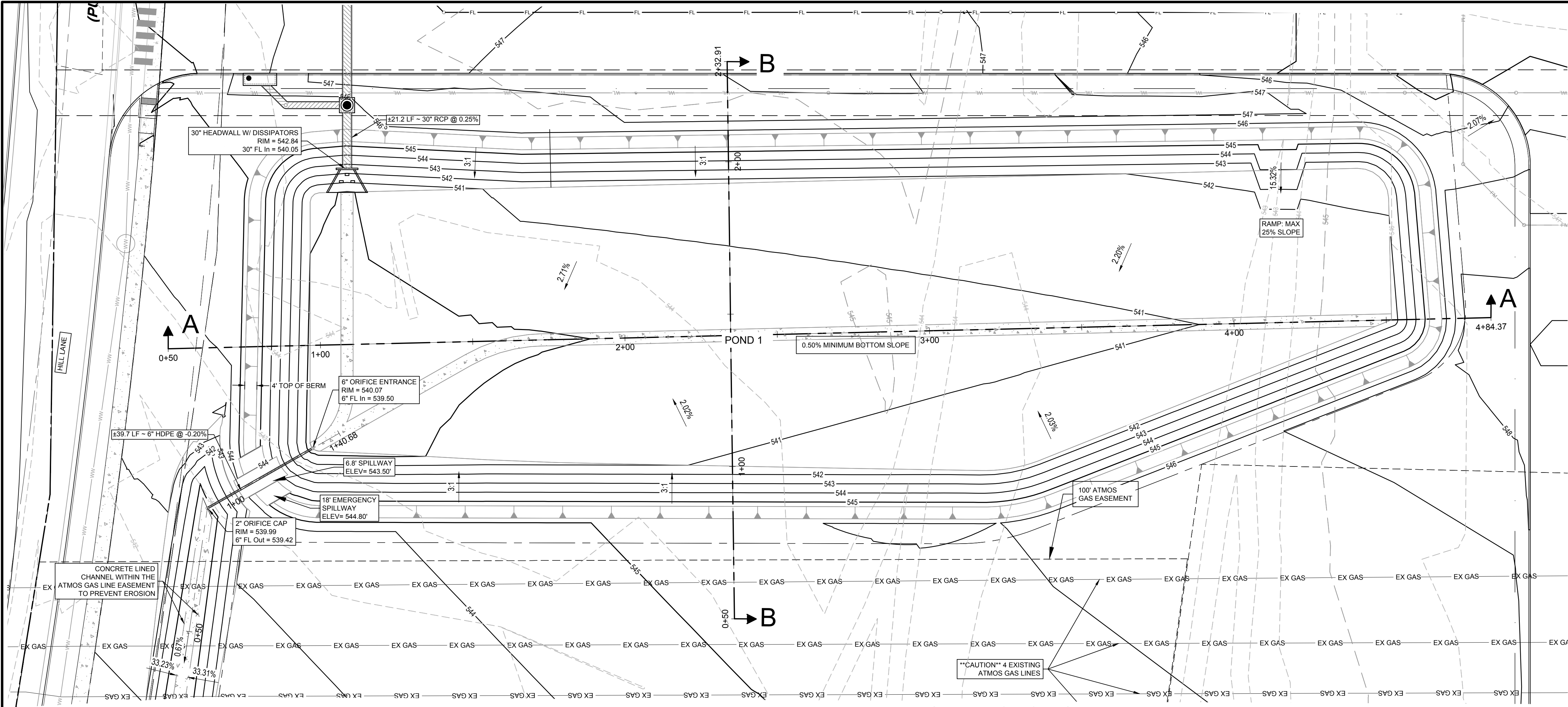
| DESIGN                | DRAWN | CHKD |
|-----------------------|-------|------|
| MC                    | LB    | MK   |
| JOB No. 070422-01-002 |       |      |
| SHEET 56 OF 79        |       |      |



## EXHIBIT 11 – DETENTION PONDS: ULTIMATE CONDITIONS



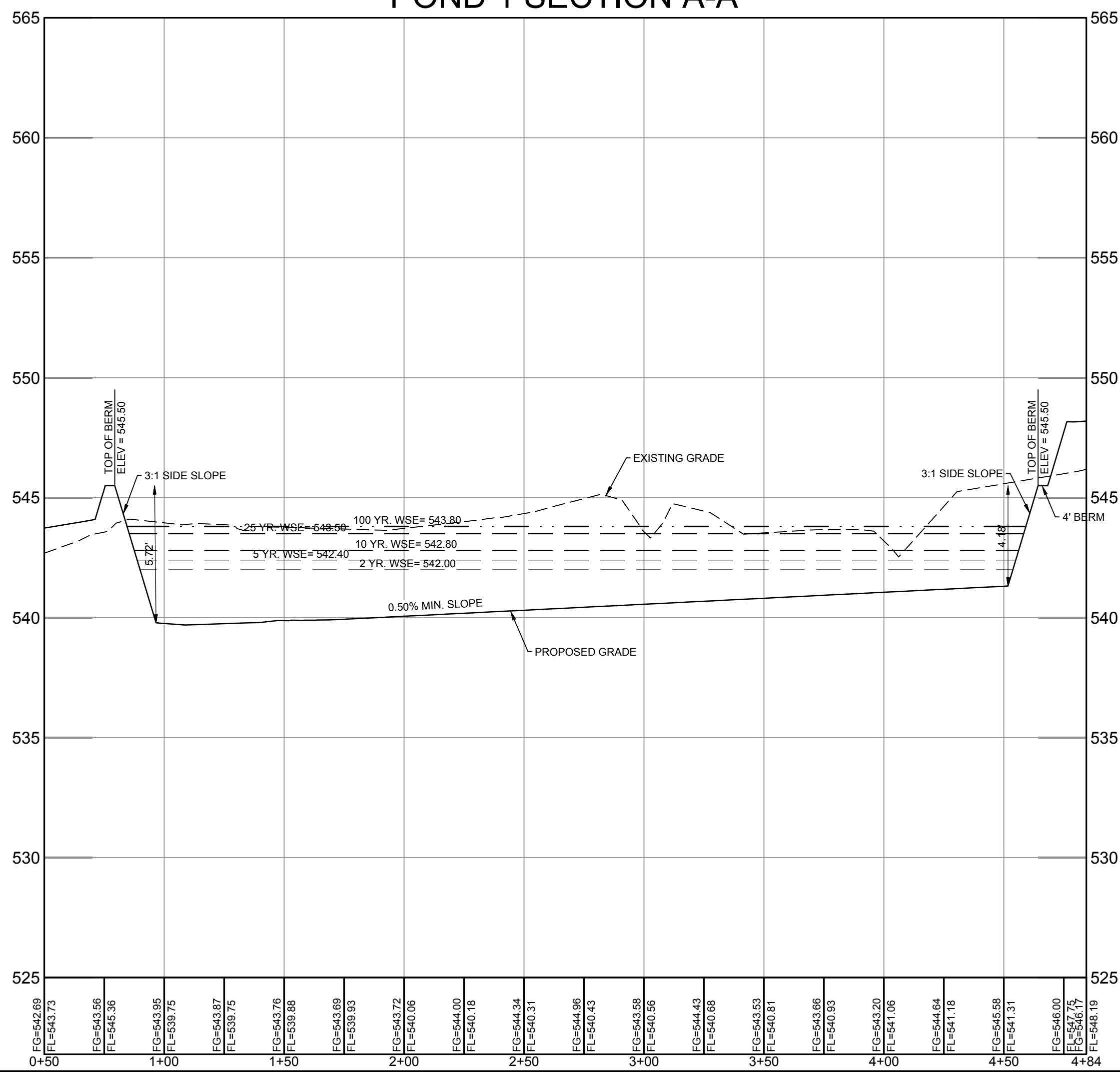
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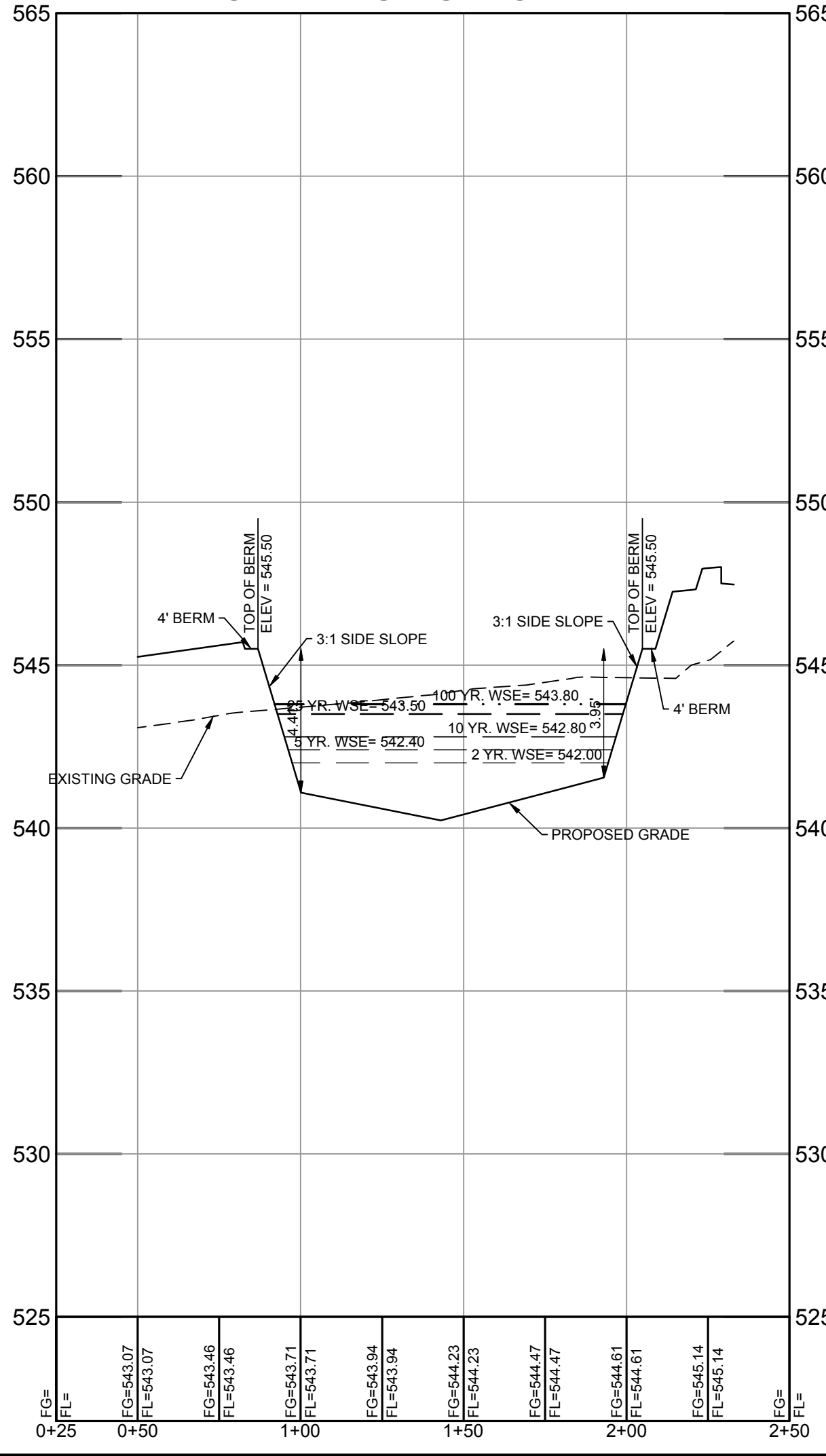
### LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE

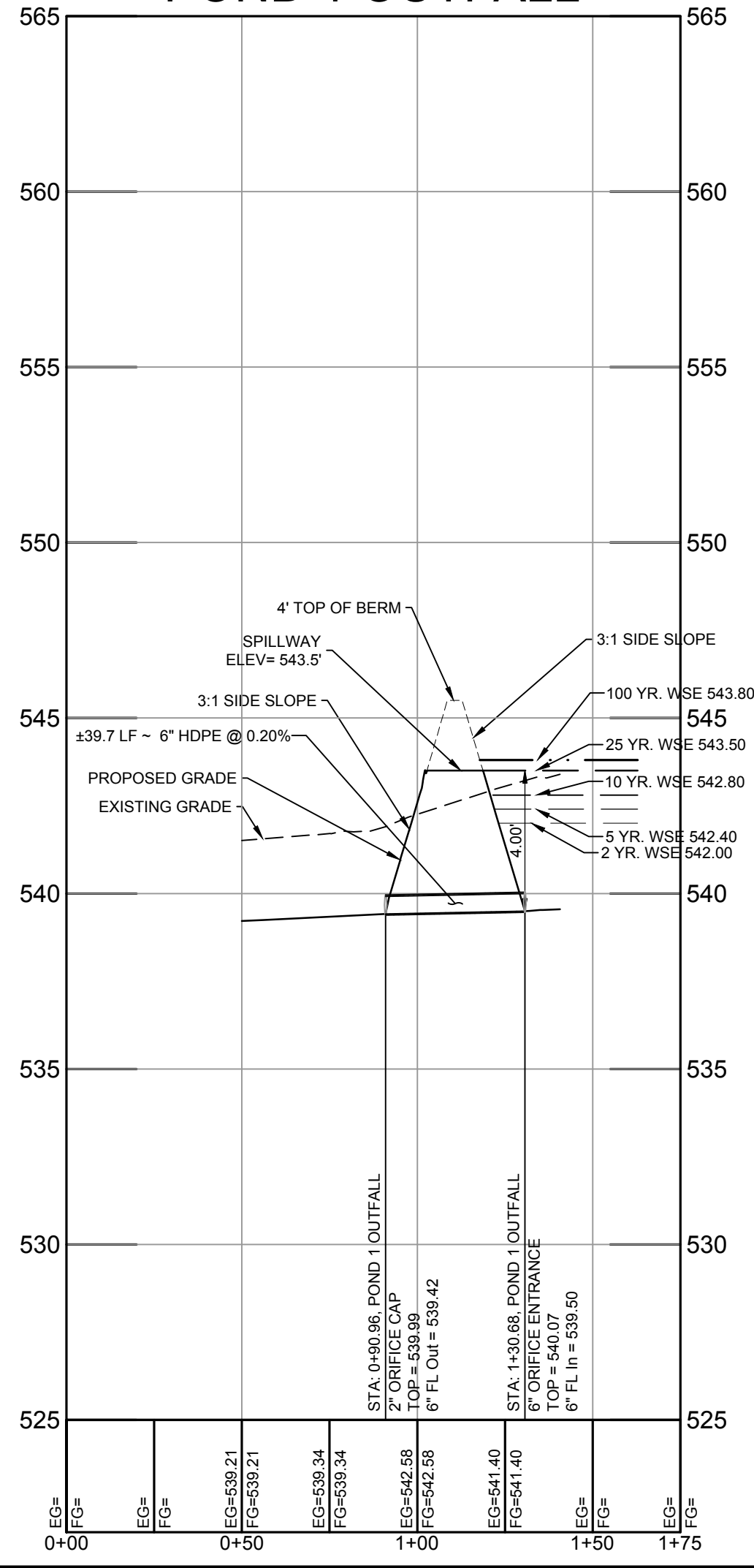
POND 1 SECTION A-A



POND 1 SECTION B-B



POND 1 OUTFALL



PROFILE SCALE 1:40



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8071 Las Comas Parkway  
Suite 350  
Austin, Texas 78746  
Phone: (512) 327-1800  
Fax: (512) 327-4062  
www.bowman.com

| REVISIONS | DATE | DESCRIPTION |
|-----------|------|-------------|
| REVISION  |      |             |

POND 1  
MANOR DOWNS INDUSTRIAL - SITE PLAN B  
8500 HILL LN  
MANOR, TEXAS, 78653

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| DESIGN  | DRAWN         | CHKD |
|---------|---------------|------|
| MC      | MG            | MK   |
| JOB No. | 070422-01-002 |      |
| SHEET   | 27 OF 43      |      |

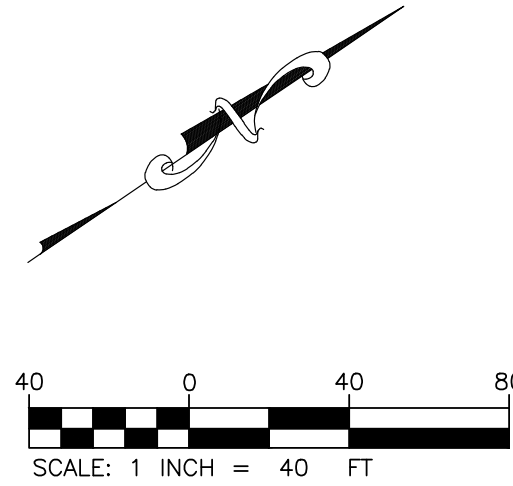
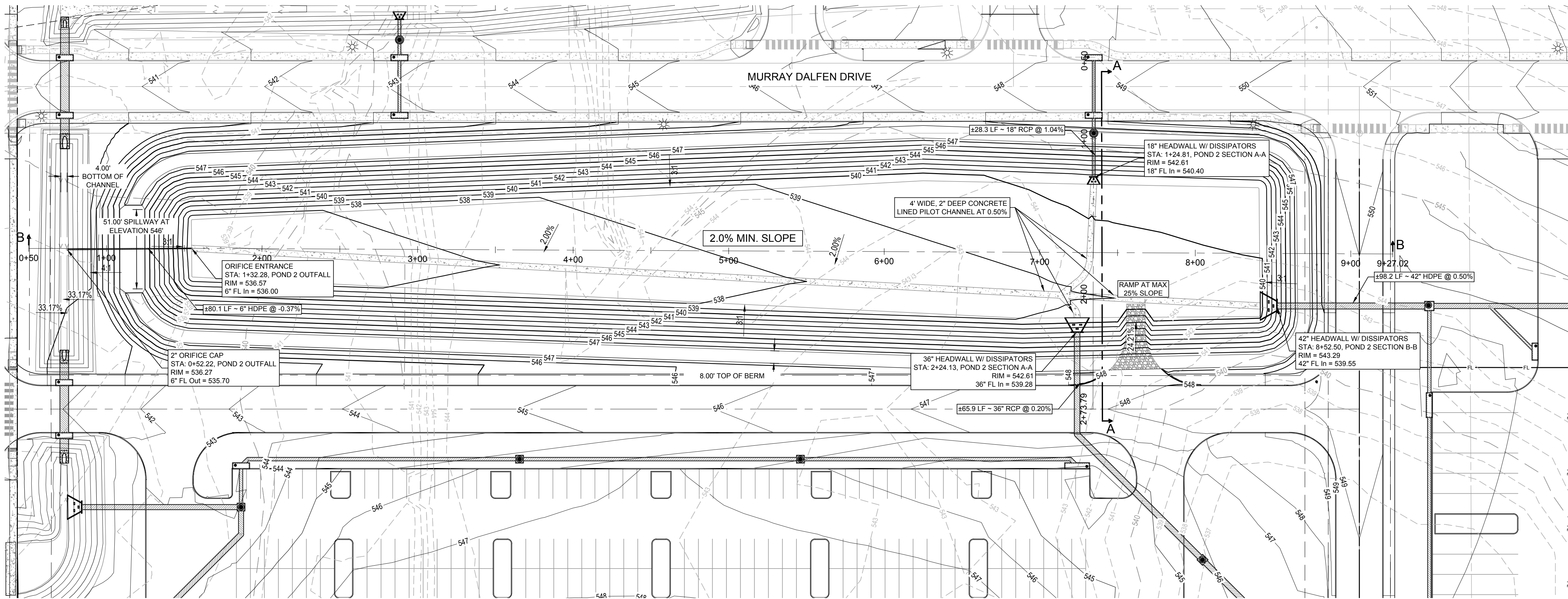
PRELIMINARY NOT FOR CONSTRUCTION







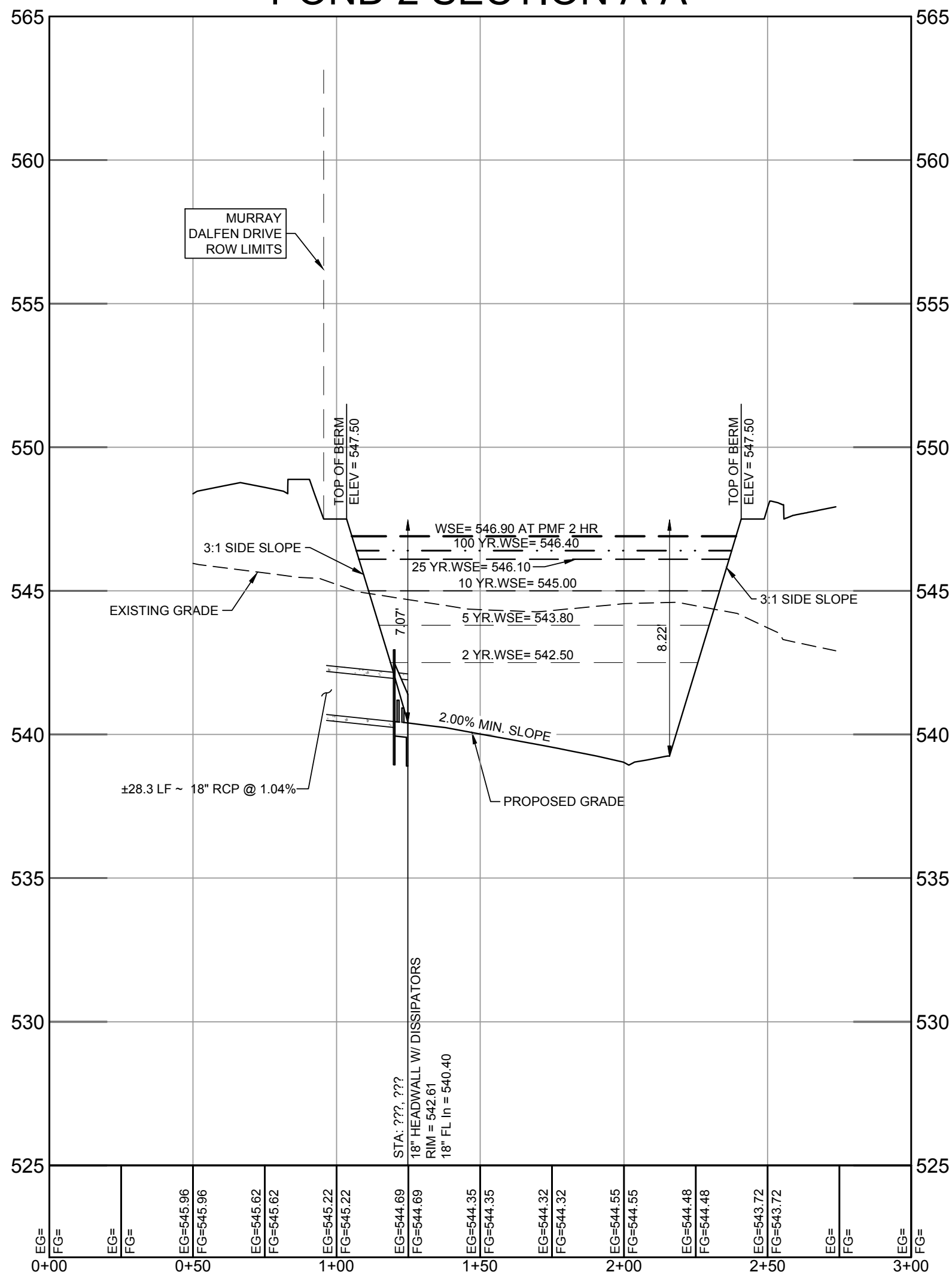
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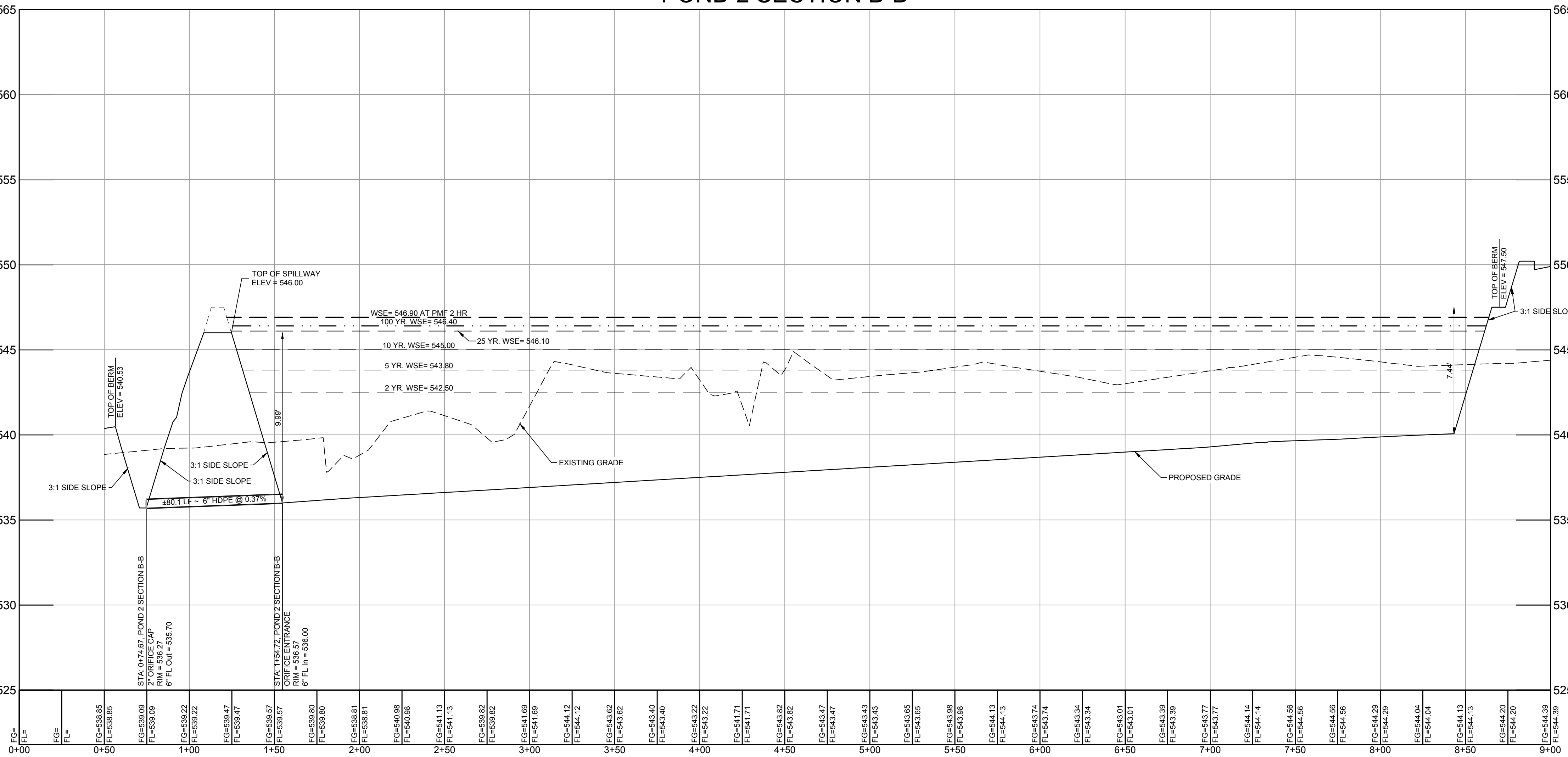
| LEGEND |                        |
|--------|------------------------|
|        | PROPOSED R.O.W.        |
|        | PROPOSED LOT LINE      |
|        | SITE BOUNDARY          |
|        | EASEMENT LINE          |
|        | PROPOSED CURB & GUTTER |
|        | EXISTING MAJOR CONTOUR |
|        | EXISTING MINOR CONTOUR |
|        | PROPOSED MAJOR CONTOUR |
|        | PROPOSED MINOR CONTOUR |
|        | WASTEWATER LINE        |
|        | WATER LINE             |
|        | STORM DRAIN LINE       |
|        | PROPOSED BERM          |
|        | PROPOSED SWALE         |
|        | PROPOSED ROCK BERM     |
|        | HEADWALL               |
|        | CURB INLET             |
|        | AREA INLET             |
|        | STORMSEWER MANHOLE     |

- NOTES:
- ALL EARTHEN EMBANKMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH COA STANDARD SPECIFICATIONS
  - EARTHEN EMBANKMENTS SIDE SLOPES SHALL BE NO STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL.

POND 2 SECTION A-A



POND 2 SECTION B-B



PROFILE SCALE 1:40



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| REVISION | DATE | DESCRIPTION |
|----------|------|-------------|
|          |      |             |
|          |      |             |
|          |      |             |
|          |      |             |
|          |      |             |

POND 2  
MANOR DOWNS INDUSTRIAL - SITE PLAN A  
8916 HILL LN  
MANOR, TEXAS, 78653

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|        |       |      |
|--------|-------|------|
| DESIGN | DRAWN | CHKD |
| MC     | LB    | MK   |

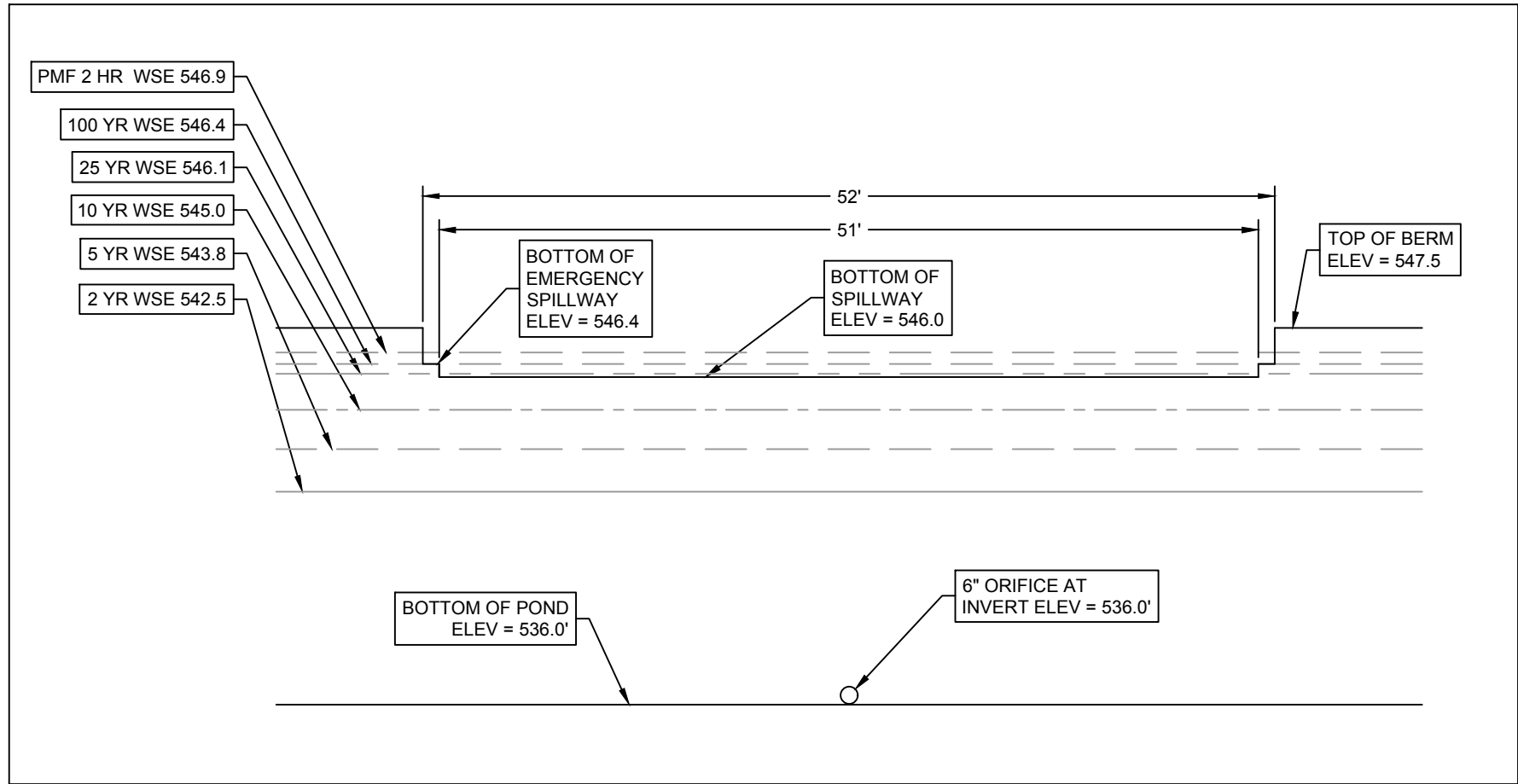
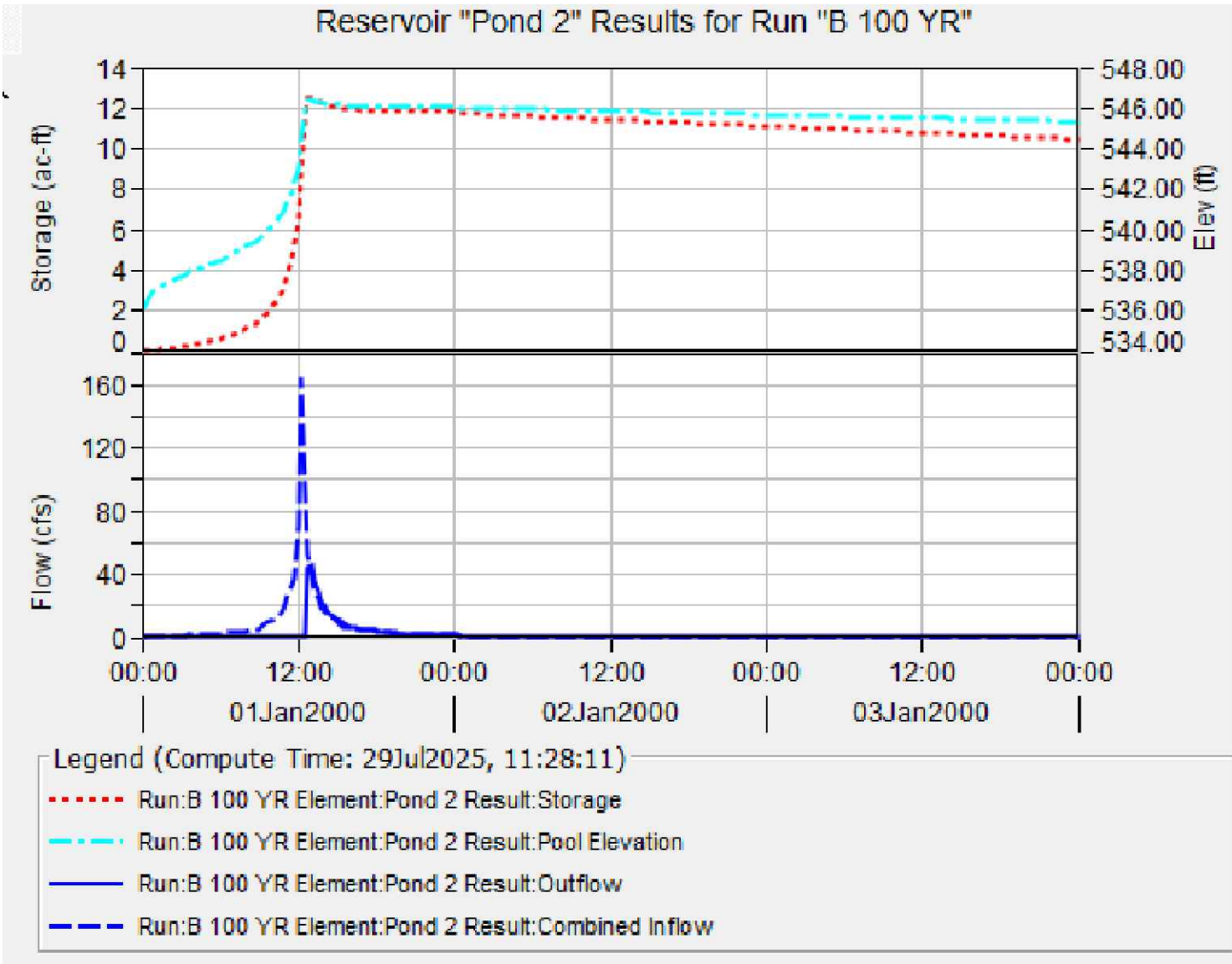
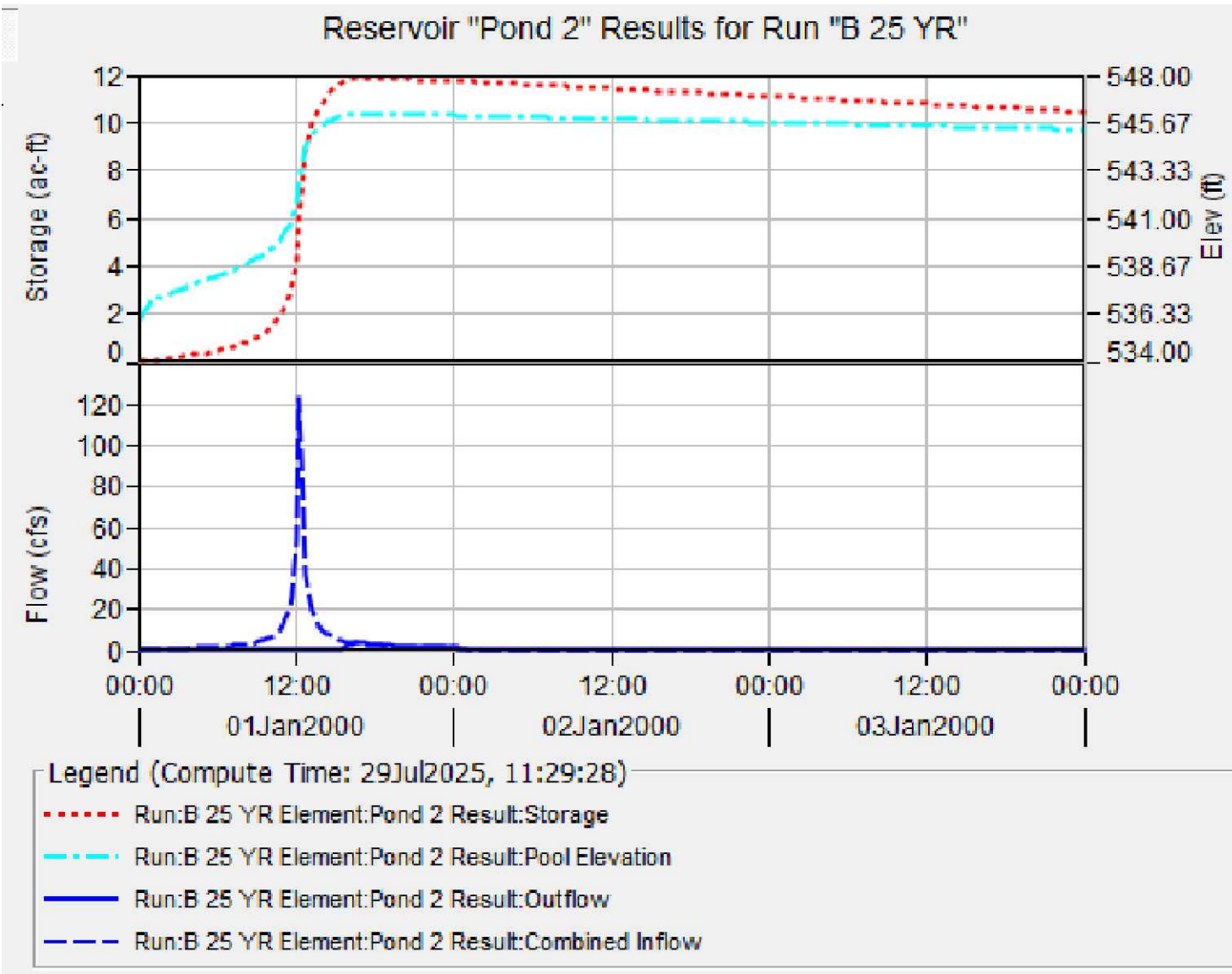
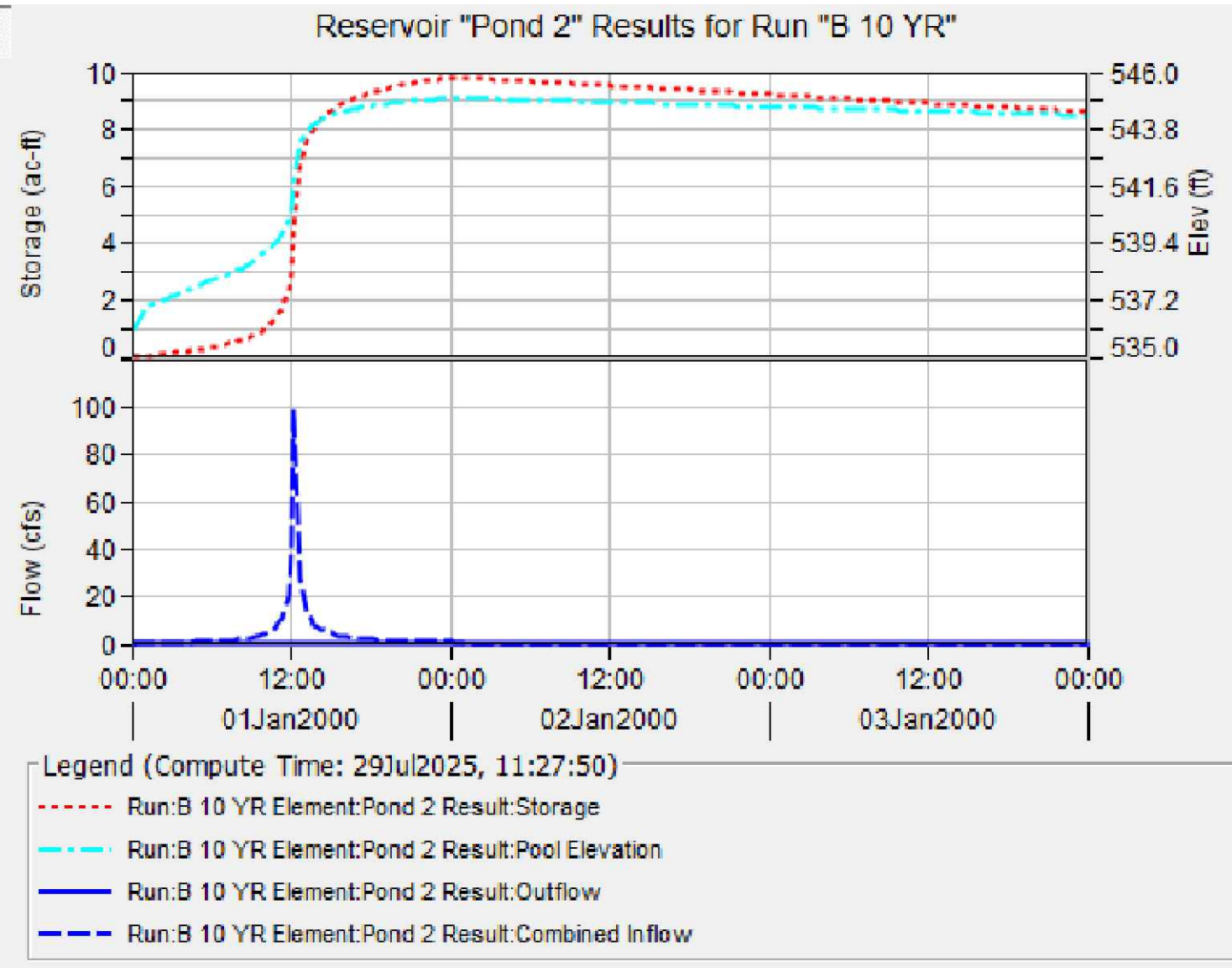
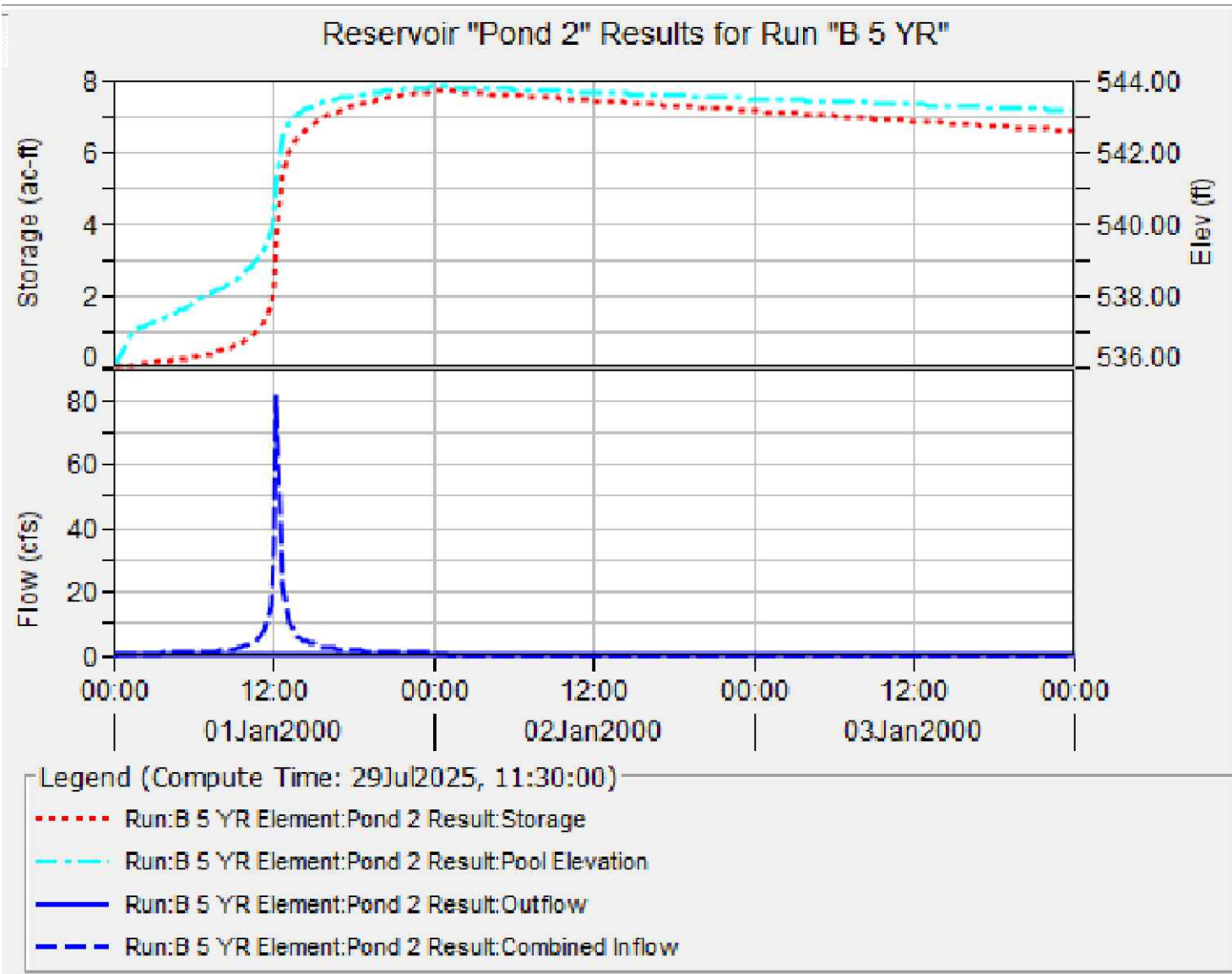
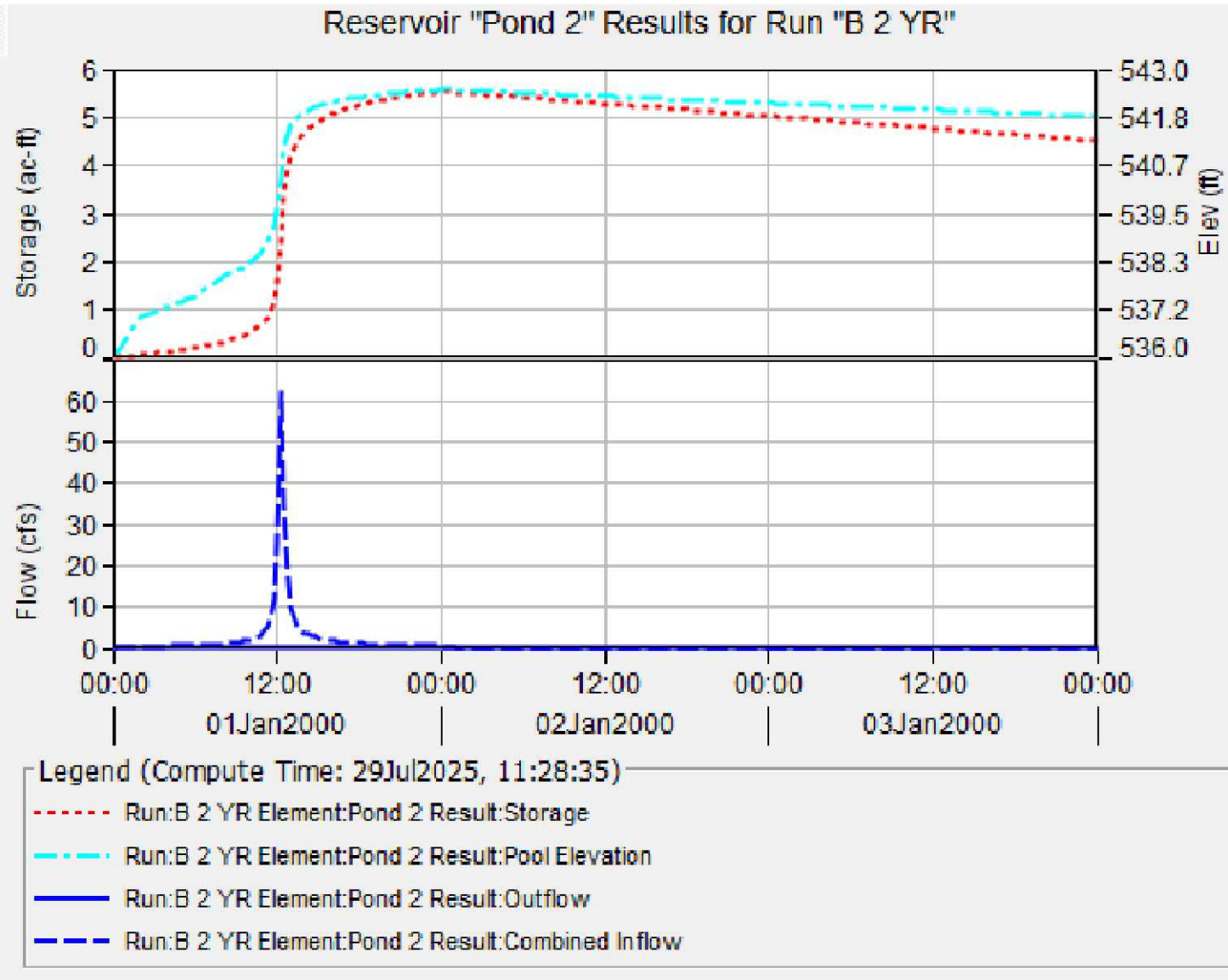
JOB No. 070422-01-002  
SHEET 57 OF 79



| POND 2 SUMMARY |                 |                  |                |           |                  |
|----------------|-----------------|------------------|----------------|-----------|------------------|
| EVENT          | INFLOW<br>(cfs) | OUTFLOW<br>(cfs) | DELTA<br>(cfs) | WSE<br>Ft | STORAGE<br>Ac-ft |
| 2-year         | 62.70           | 0.30             | 62.40          | 542.50    | 5.50             |
| 5-year         | 81.80           | 0.30             | 81.50          | 543.80    | 7.70             |
| 10-year        | 99.30           | 0.30             | 99.00          | 545.00    | 9.80             |
| 25-Year        | 124.00          | 3.50             | 120.50         | 546.10    | 11.90            |
| 100-Year       | 165.50          | 45.20            | 120.30         | 546.40    | 12.60            |

| STAGE STORAGE TABLE |                   |               |                                   |                                    |                                 |
|---------------------|-------------------|---------------|-----------------------------------|------------------------------------|---------------------------------|
| ELEV                | AREA<br>(sq. ft.) | DEPTH<br>(ft) | AVG END<br>INC. VOL.<br>(cu. ft.) | AVG END<br>TOTAL VOL.<br>(cu. ft.) | CONIC<br>INC. VOL.<br>(cu. ft.) |
| 536.000             | 0.00              | N/A           | N/A                               | 0.00                               | N/A                             |
| 537.000             | 6,912.30          | 1.000         | 3456.15                           | 2304.10                            | 2304.10                         |
| 538.000             | 19,183.10         | 1.000         | 13047.70                          | 16503.85                           | 12536.86                        |
| 539.000             | 35,373.29         | 1.000         | 27278.19                          | 43782.04                           | 26868.58                        |
| 540.000             | 52,304.75         | 1.000         | 43839.02                          | 87621.06                           | 43563.96                        |
| 541.000             | 61,714.68         | 1.000         | 57009.71                          | 144630.77                          | 56944.88                        |
| 542.000             | 66,445.97         | 1.000         | 64080.32                          | 208711.10                          | 64065.76                        |
| 543.000             | 71,231.30         | 1.000         | 68838.64                          | 277549.74                          | 68824.77                        |
| 544.000             | 76,071.00         | 1.000         | 73651.15                          | 351200.89                          | 73637.90                        |
| 545.000             | 80,965.89         | 1.000         | 78518.44                          | 429719.33                          | 78505.73                        |
| 546.000             | 85,917.06         | 1.000         | 83441.47                          | 513160.81                          | 83429.23                        |
| 547.000             | 90,854.45         | 1.000         | 88385.76                          | 601546.56                          | 88374.26                        |
| 547.500             | 93,386.85         | 0.500         | 46060.33                          | 647606.89                          | 46058.88                        |

| POND 2 PMF SUMMARY |            |                    |     |                  |                   |
|--------------------|------------|--------------------|-----|------------------|-------------------|
| PMP<br>FREQUENCY   | DEPTH (in) | MAX.<br>ELEV. (ft) | DAY | TIME<br>(hr:min) | PEAK<br>DISCHARGE |
| 1 hr               | 15.1       | 546.9              | 0   | 1:15             | 198.3             |
| 2 hr               | 19.9       | 546.9              | 0   | 1:30             | 213.1             |
| 3 hr               | 22.4       | 546.8              | 0   | 1:30             | 166.4             |
| 6 hr               | 26.6       | 546.8              | 0   | 2:00             | 168.0             |
| 12 hr              | 35.4       | 546.7              | 0   | 2:15             | 131.1             |
| 24 hr              | 42.5       | 546.6              | 0   | 7:45             | 90.1              |
| 48 hr              | 46.6       | 546.4              | 0   | 8:00             | 52.6              |
| 72 hr              | 46.6       | 546.3              | 0   | 20:30            | 35.1              |



SPILLWAY DETAIL (N.T.S.)

| REVISIONS |             | DATE | DESCRIPTION |
|-----------|-------------|------|-------------|
| REVISION  | DESCRIPTION | DATE |             |
|           |             |      |             |
|           |             |      |             |
|           |             |      |             |
|           |             |      |             |

POND 2 CALCULATIONS

MANOR DOWNS INDUSTRIAL - SITE PLAN A

8916 HILL LN

MANOR, TEXAS, 78653

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|        |       |      |
|--------|-------|------|
| DESIGN | DRAWN | CHKD |
| MC     | LB    | MK   |

JOB No. 070422-01-002

SHEET  
58 OF 79

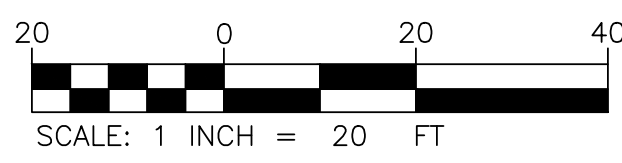
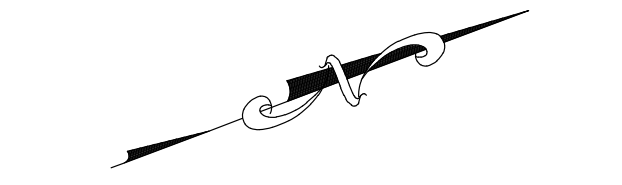
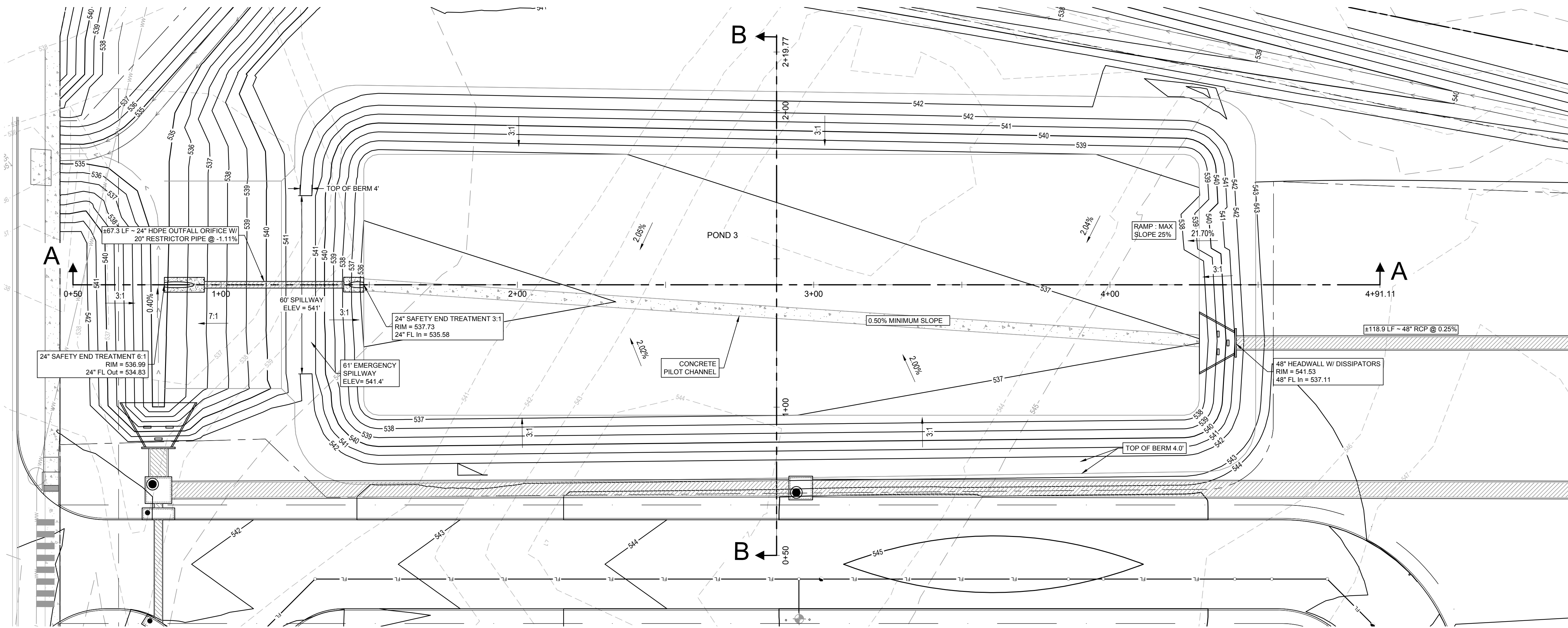


Know what's below.  
Call before you dig.

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.



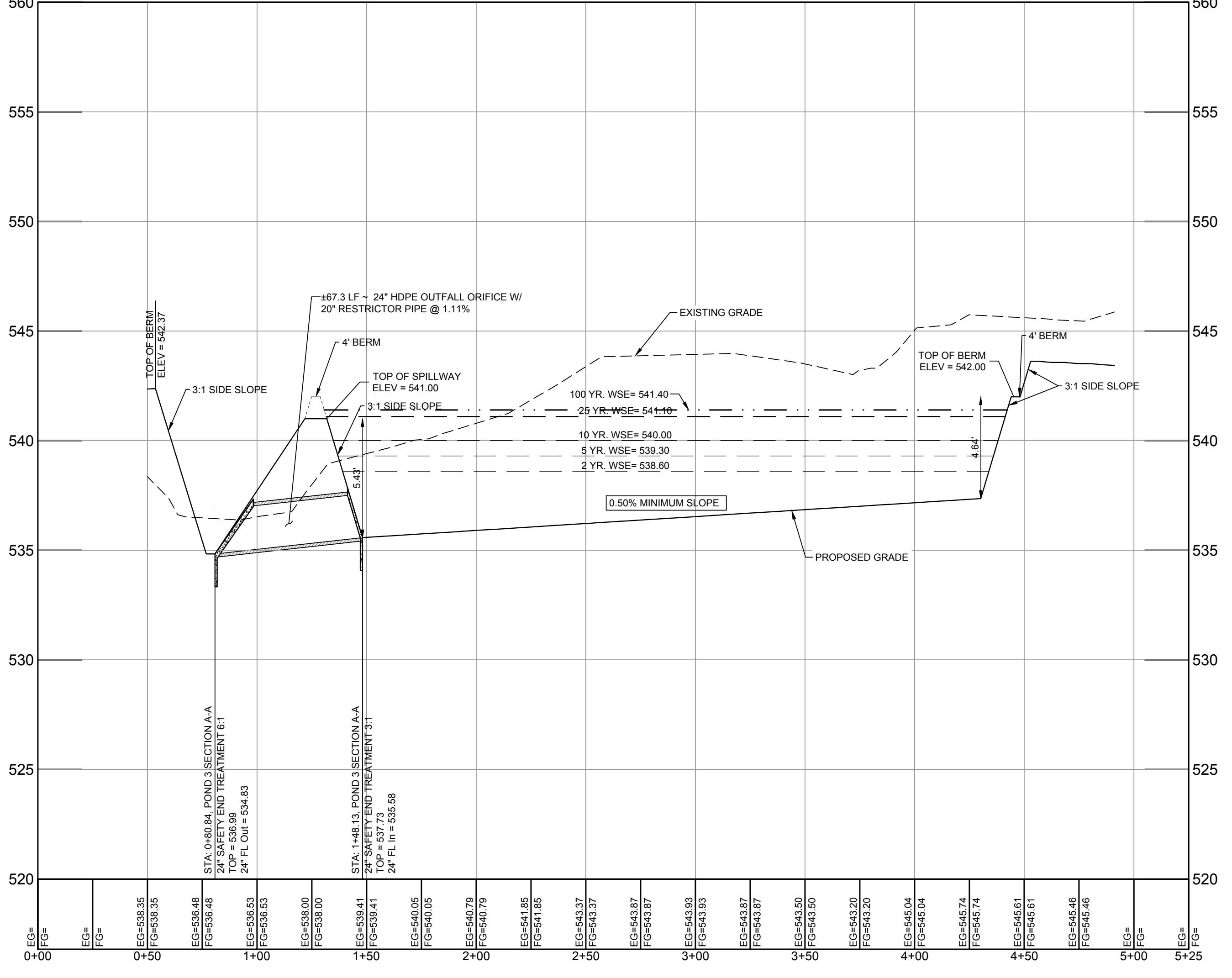
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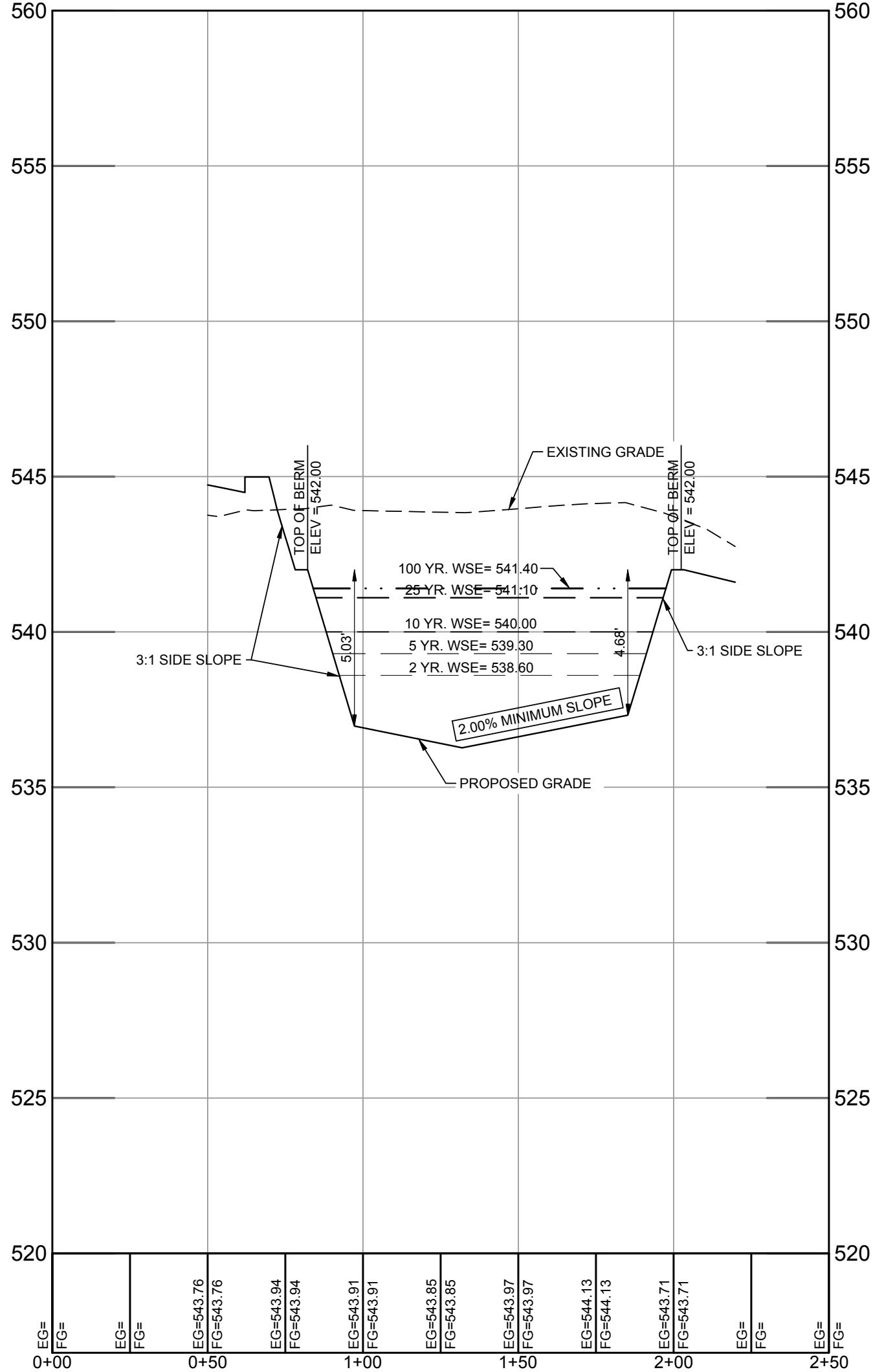
LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE

POND 3 SECTION A-A



POND 3 SECTION B-B



PROFILE SCALE 1:40



THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

| REVISION | REVISIONS |             |
|----------|-----------|-------------|
|          | DATE      | DESCRIPTION |
|          |           |             |
|          |           |             |
|          |           |             |
|          |           |             |
|          |           |             |
|          |           |             |
|          |           |             |
|          |           |             |
|          |           |             |

POND 3  
MANOR DOWNS INDUSTRIAL - SITE PLAN B  
8500 HILL LN  
MANOR, TEXAS, 78653

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| DESIGN | DRAWN | CHKD |
|--------|-------|------|
| MC     | MG    | MK   |



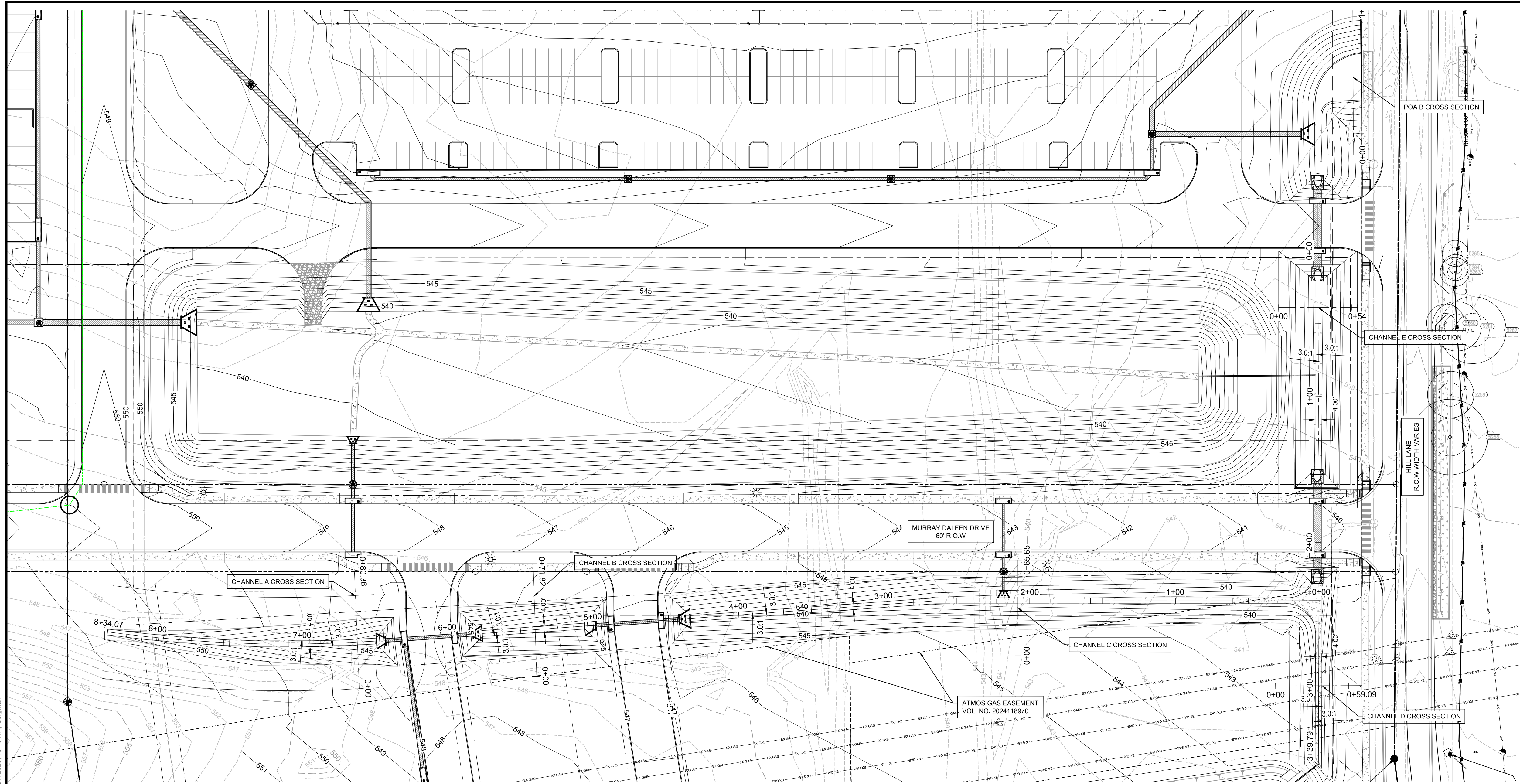




## EXHIBIT 12 – CHANNEL CROSS SECTIONS



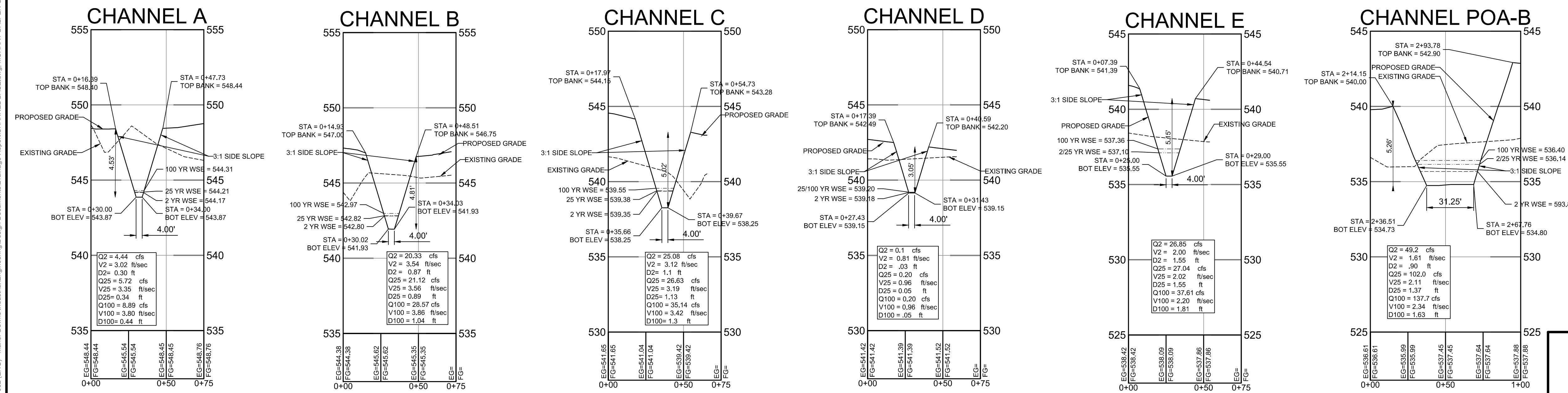
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| LEGEND |                        |
|--------|------------------------|
|        | PROPOSED R.O.W.        |
|        | PROPOSED LOT LINE      |
|        | EASEMENT LINE          |
|        | PROPOSED CURB & GUTTER |
|        | EXISTING MAJOR CONTOUR |
|        | EXISTING MINOR CONTOUR |
|        | PROPOSED MAJOR CONTOUR |
|        | PROPOSED MINOR CONTOUR |
|        | STORM DRAIN LINE       |
|        | HEADWALL               |
|        | CURB INLET             |
|        | AREA INLET             |
|        | STORMSEWER MANHOLE     |

| PROFILE LEGEND: |                             | PROFILE SCALE: |                                 |
|-----------------|-----------------------------|----------------|---------------------------------|
|                 | EXISTING GRADE CL           |                | 1"= 40' HORIZONTAL              |
|                 | PROPOSED GRADE CL           |                | 1"= 4' VERTICAL                 |
|                 | WSE - 100yr                 |                |                                 |
|                 | WSE - 25yr                  |                |                                 |
|                 | WSE - 2yr                   |                |                                 |
|                 | ELEVATION<br>EXISTING GRADE |                | ELEVATION<br>PROPOSED FLOW LINE |

NOTE:  
A MANNING'S N VALUE OF 0.040 WAS USED FOR CHANNEL A, B, C AND E  
A MANNING'S N VALUE OF 0.020 WAS USED FOR CHANNEL D



MANOR DOWNS INDUSTRIAL  
8916 HILL LANE  
MURRAY DALFEN DRIVE CHANNEL CROSS SECTIONS

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TBPE Firm Registration No. F-14309

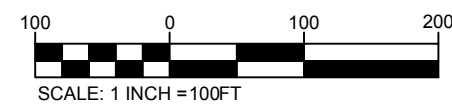
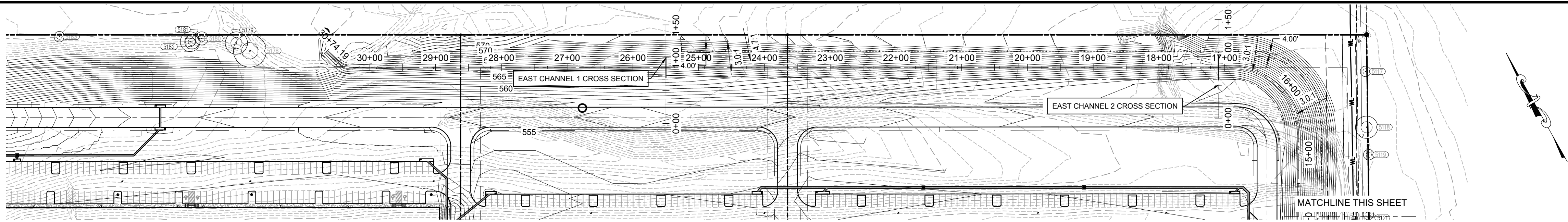
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August 1, 2025

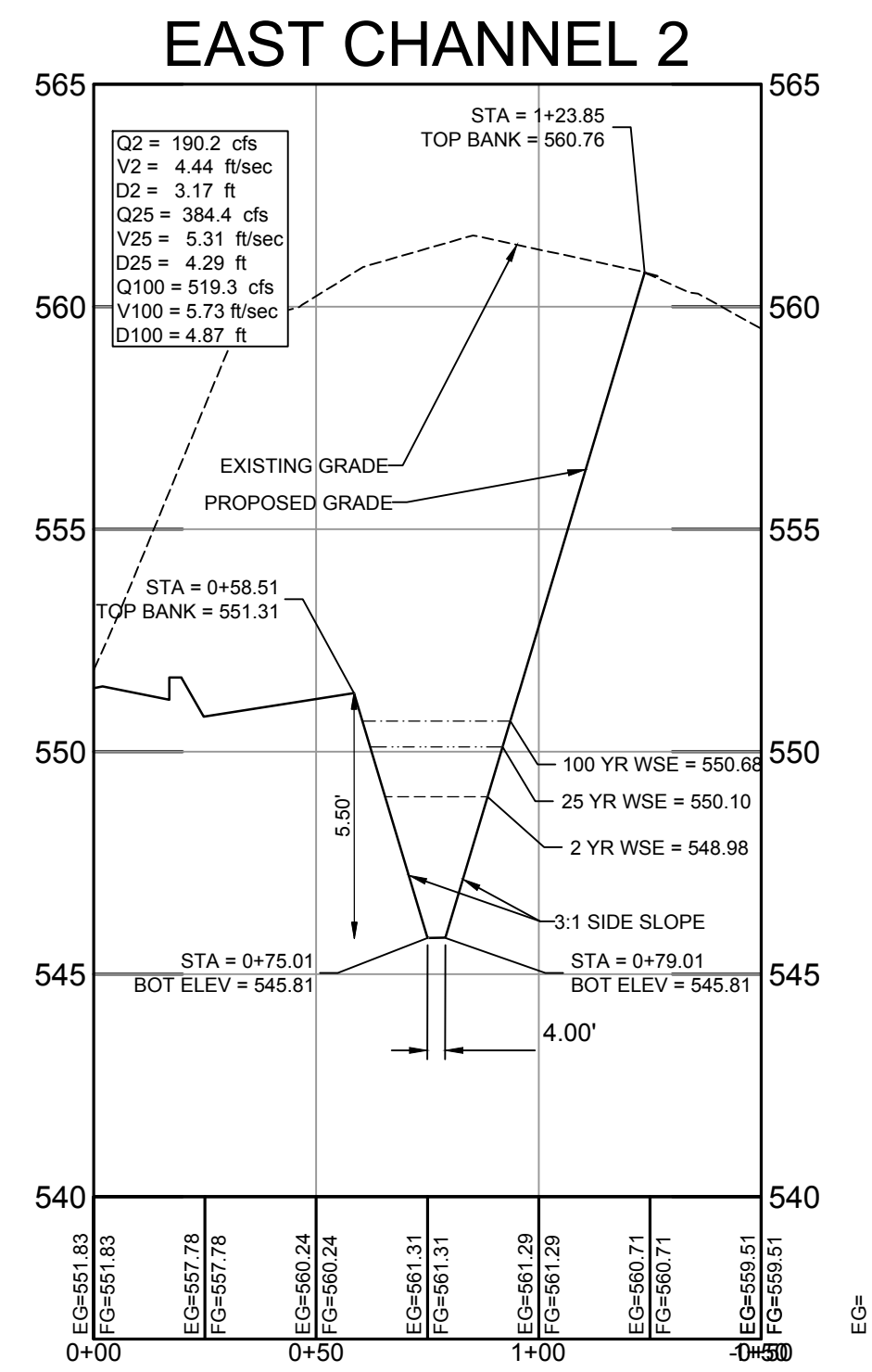
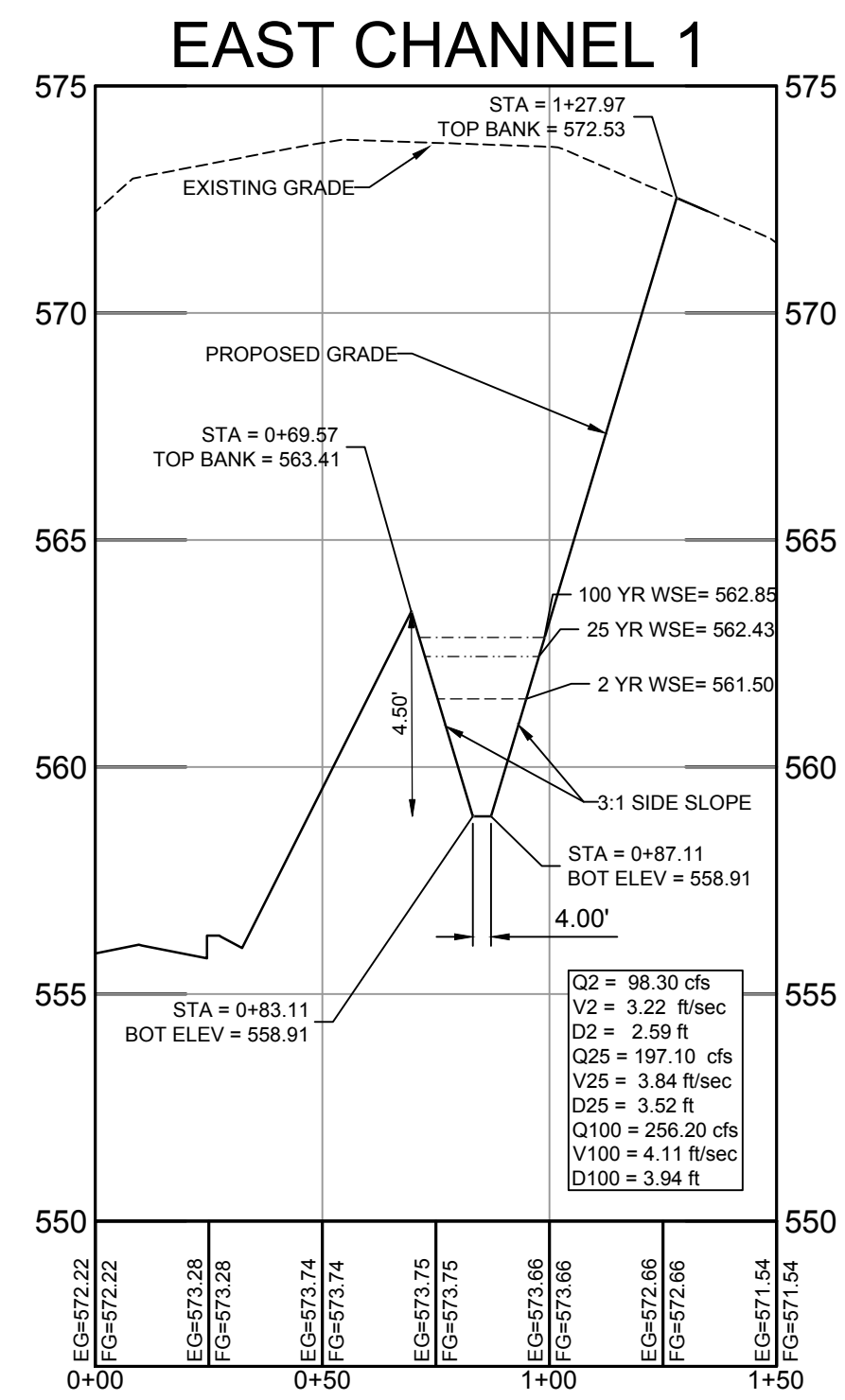
SHEET 1 OF 4

PRELIMINARY NOT FOR CONSTRUCTION



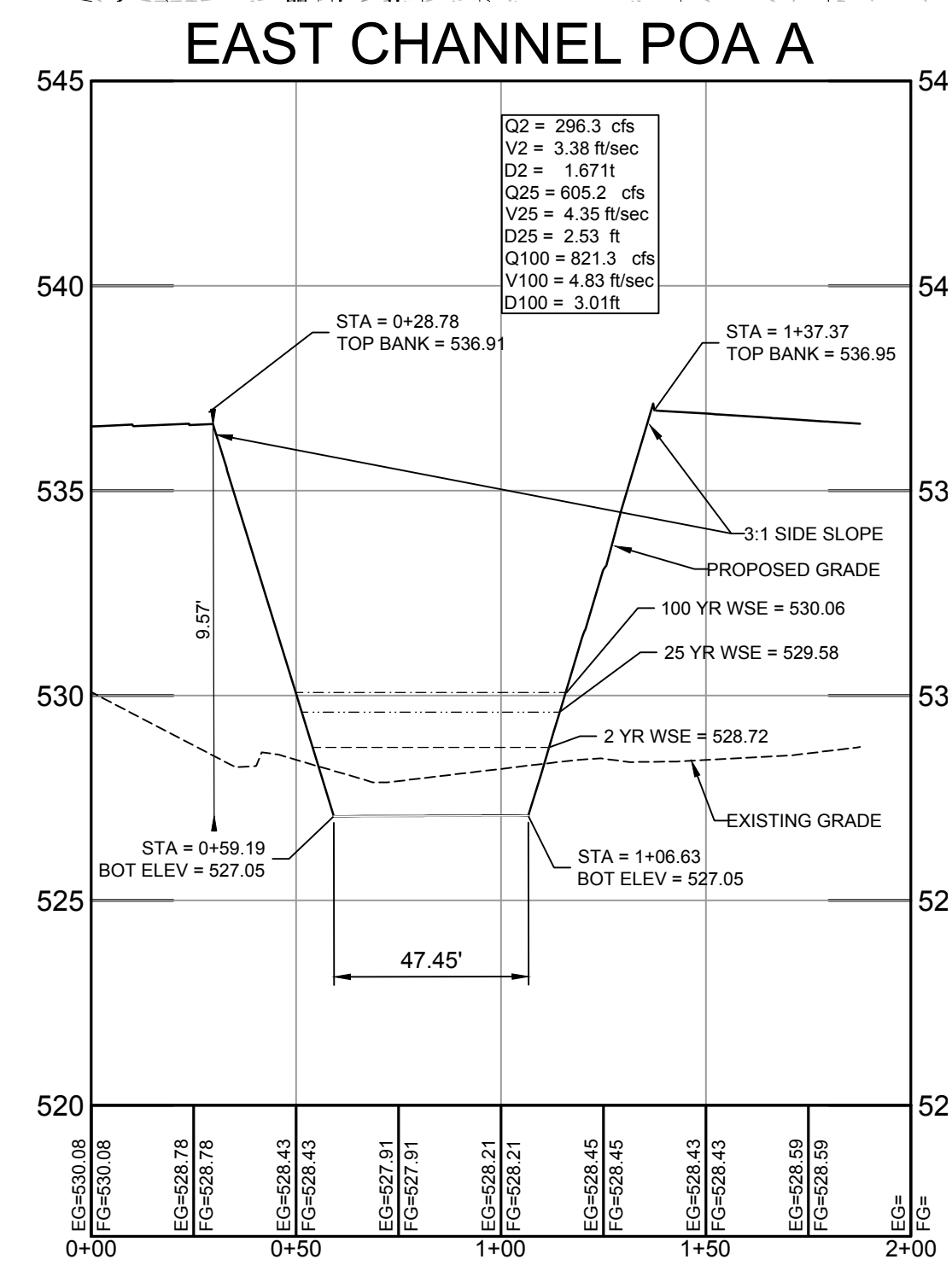
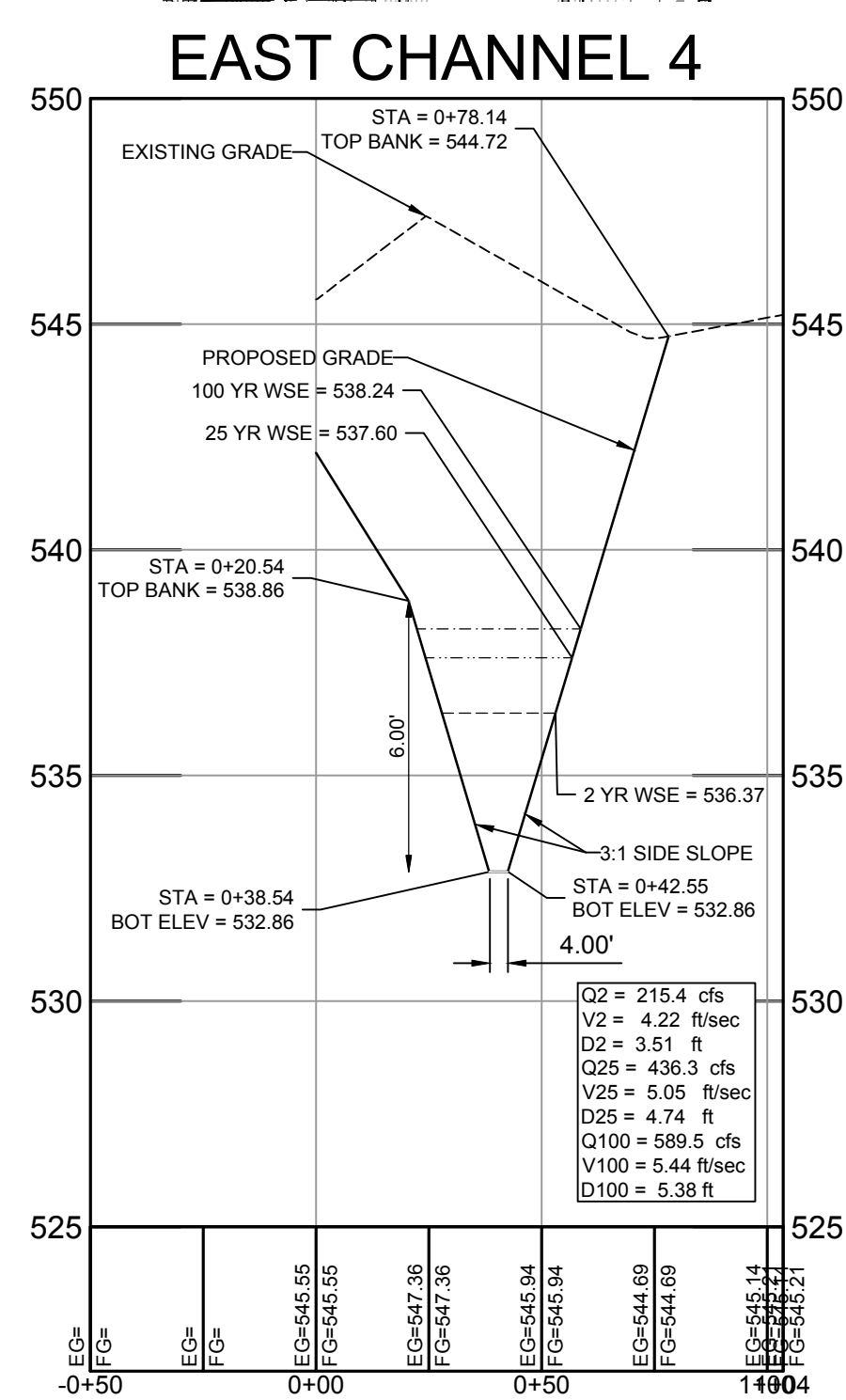
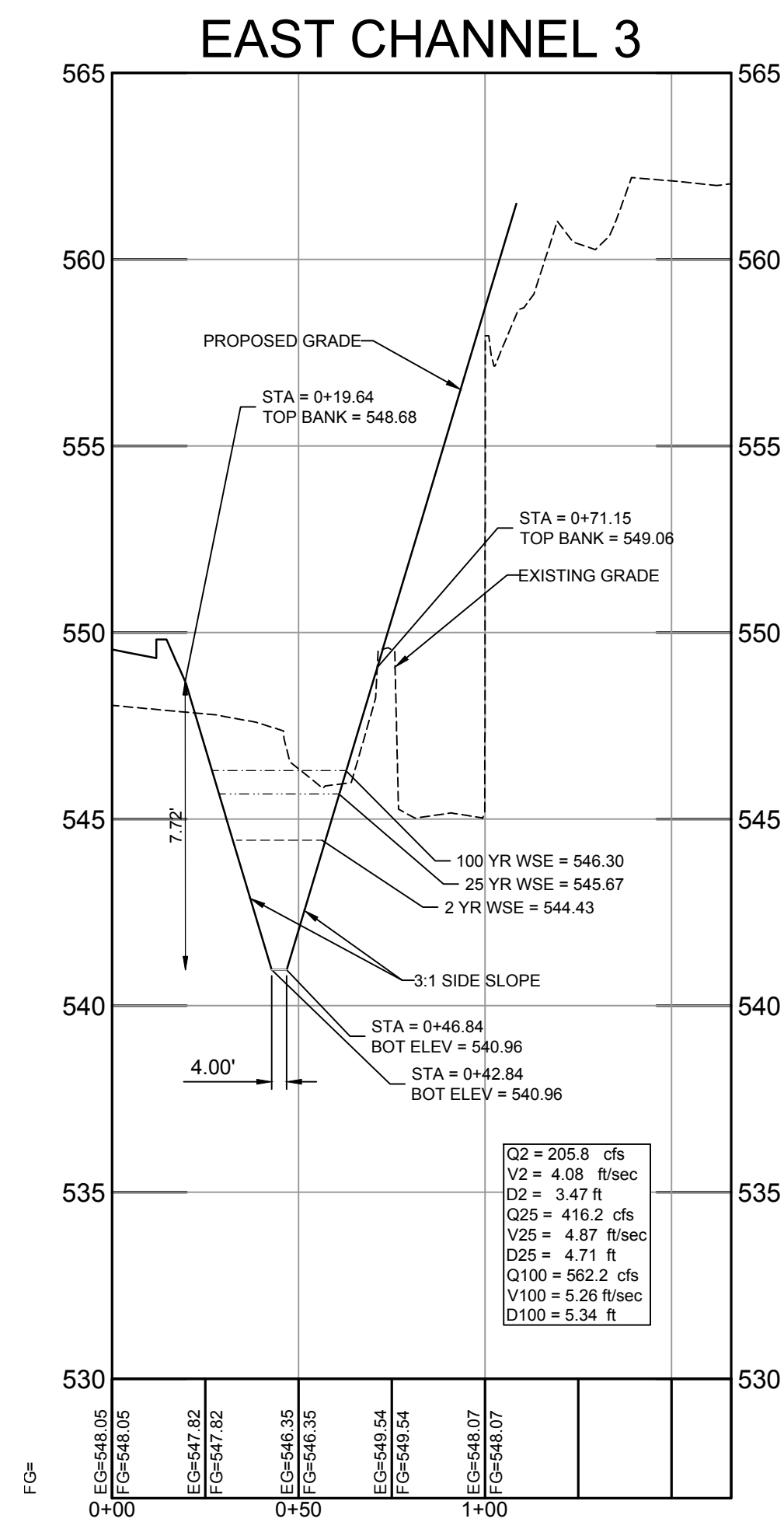
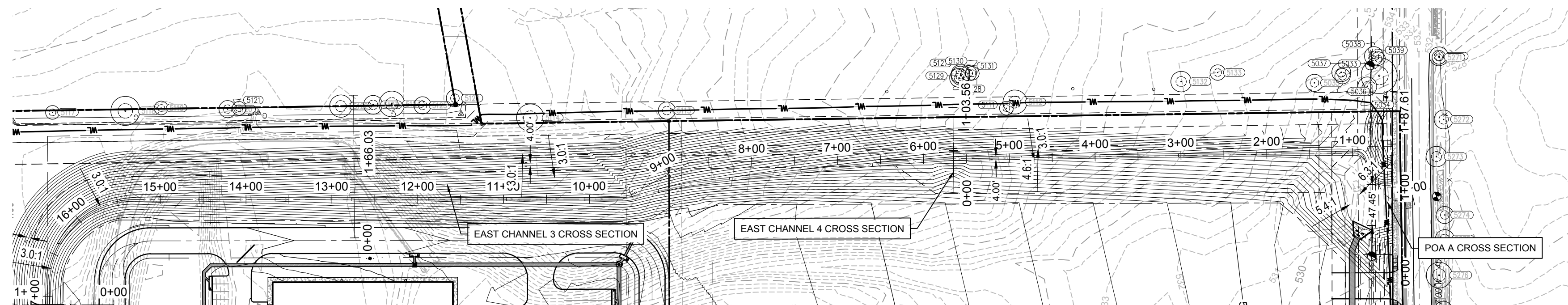


| LEGEND |                        |
|--------|------------------------|
|        | PROPOSED R.O.W.        |
|        | PROPOSED LOT LINE      |
|        | EASEMENT LINE          |
|        | PROPOSED CURB & GUTTER |
|        | EXISTING MAJOR CONTOUR |
|        | EXISTING MINOR CONTOUR |
|        | PROPOSED MAJOR CONTOUR |
|        | PROPOSED MINOR CONTOUR |
|        | STORM DRAIN LINE       |
|        | HEADWALL               |
|        | CURB INLET             |
|        | AREA INLET             |
|        | STORM SEWER MANHOLE    |



| PROFILE LEGEND:             |                         | PROFILE SCALE:                  |  |
|-----------------------------|-------------------------|---------------------------------|--|
| EXISTING GRADE CL           | -----                   | 1"= 40' HORIZONTAL              |  |
| PROPOSED GRADE CL           | -----                   | 1"= 4' VERTICAL                 |  |
| WSE - 100yr                 | -----                   |                                 |  |
| WSE - 25yr                  | -----                   |                                 |  |
| WSE - 2yr                   | -----                   |                                 |  |
| ELEVATION<br>EXISTING GRADE | EG=XXX.XX<br>FG=XXXX.XX | ELEVATION<br>PROPOSED FLOW LINE |  |

NOTE:  
A MANNINGS N VALUE OF 0.060 WAS USED FOR ALL CHANNELS INDICATING  
NATIVE GRASS AND VEGETATION NOT MOWED REGULARLY.



MANOR DOWNS INDUSTRIAL  
8916 HILL LANE  
EAST CHANNEL CROSS SECTIONS

**Bowman**

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SHEET 2 OF 4

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