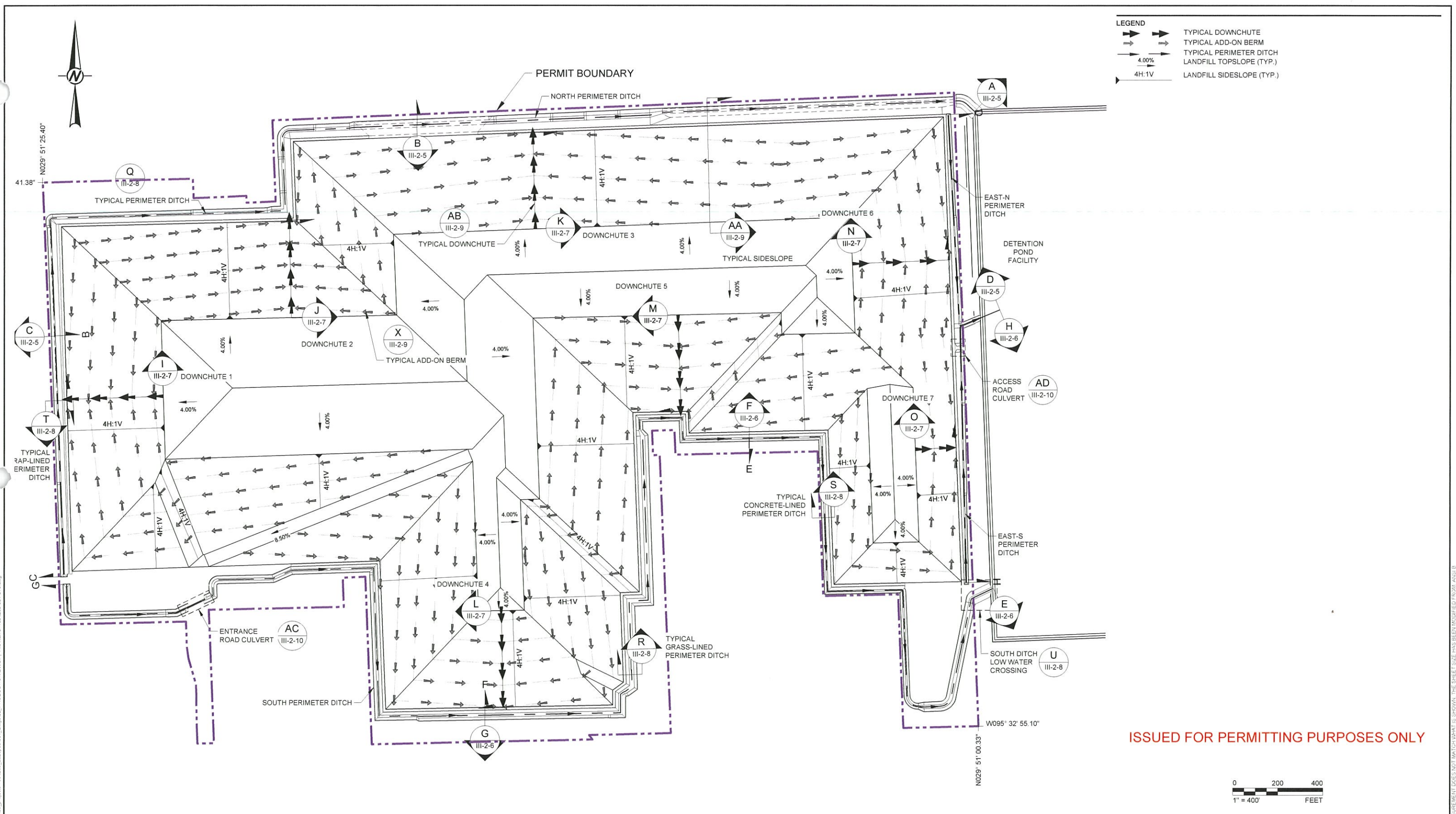


PART III, ATTACHMENT 2
FACILITY SURFACE WATER DRAINAGE REPORT
FIGURES

III-2-1	Facility Storm Water Management Plan
III-2-2	Pre-Development Overall Drainage Conditions
III-2-3	Post-Development Overall Drainage Conditions
III-2-4	Perimeter Ditch Plan
III-2-5	Flowline Profiles I – North and East-N Perimeter Ditches
III-2-6	Flowline Profiles II – South and East-S Perimeter Ditches
III-2-7	Flowline Profiles III - Downchutes
III-2-8	Drainage Control Details I – Perimeter Ditch Details & Schedule
III-2-9	Drainage Control Details II – Add-on Berm & Downchute Details
III-2-10	Drainage Control Details III – Culvert Details I
III-2-11	Drainage Control Details IV – Culvert Details II
III-2-12	Erosion and Sedimentation Control Details I
III-2-13	Erosion and Sedimentation Control Details II



LEGEND

	TYPICAL DOWNCHUTE
	TYPICAL ADD-ON BERM
	TYPICAL PERIMETER DITCH
	LANDFILL TOPSLOPE (TYP.)
	LANDFILL SIDESLOPE (TYP.)

ISSUED FOR PERMITTING PURPOSES ONLY



Path: \\msd\user\j\m\j\working\1894269_202102_PROD\1894269_202102_PROD\1894269_001_013.dwg | File Name: 1894269-001-013.dwg

0	2021-02	ISSUED FOR PERMITTING PURPOSES	EWT	EWT	CGD	CGD
REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED

SEAL

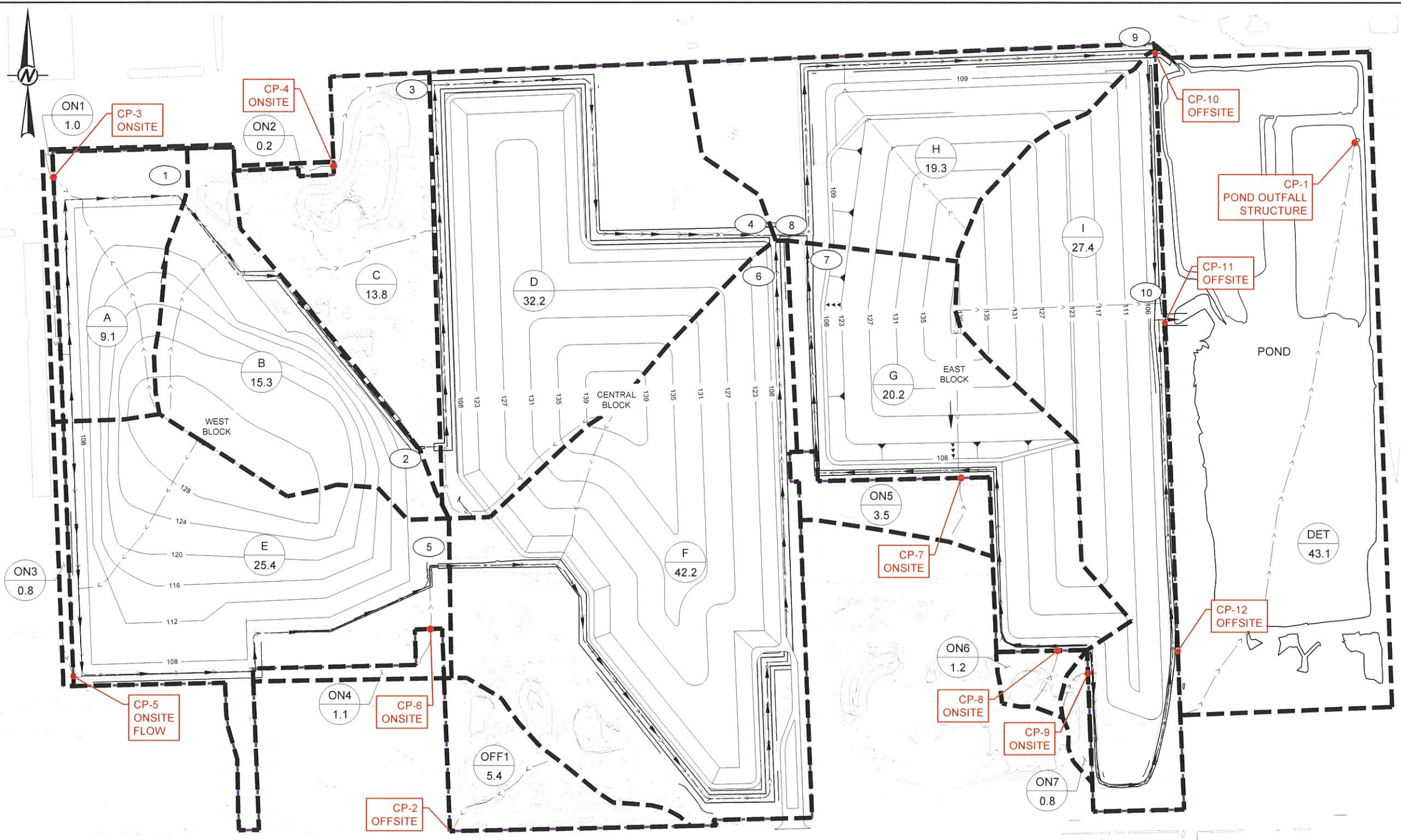
GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

CLIENT

CONSULTANT

HOUSTON NORTH OFFICE
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
(281) 821-6868
www.golder.com

PROJECT	HAWTHORN PARK RECYCLING & DISPOSAL FACILITY
PERMIT AMENDMENT APPLICATION	TCEQ PERMIT NO. MSW-2185A
TITLE	FACILITY STORM WATER MANAGEMENT PLAN
PROJECT NO.	1894269
APPLICATION SECTION	III Attachment 2
REV	0
1 of 13	FIGURE III-2-1



LEGEND

- PERMIT BOUNDARY
- OVERALL DRAINAGE AREA DELINEATION
- PERIMETER DITCH FLOW
- FLOW PATH
- CALCULATION POINT
- CONTROL POINT (RUNOFF DISCHARGE)
- DRAINAGE AREA NAME / ACREAGE

PRE-DEVELOPMENT PEAK DISCHARGES

DISCHARGE POINT	25-YEAR FLOW RATE (CFS)	100-YEAR FLOW RATE (CFS)
CP-1 OUTFALL	151.2	174.9
CP-2 OFFSITE	30.7	38.2
CP-3 ONSITE	1.8	2.3
CP-4 ONSITE	1.1	1.4
CP-5 ONSITE	1.8	2.3
CP-6 ONSITE	6.3	7.8
CP-7 ONSITE	8.6	10.7
CP-8 ONSITE	6.8	8.5
CP-9 ONSITE	4.5	5.7
CP-10 OFFSITE	402.6	514.1
CP-11 OFFSITE	60.1	74.3
CP-12 OFFSITE	0.0	0.0

NOTE(S)
 • RESULTS FROM HEC-HMS FOR 25-YEAR, 24 HOUR STORM AND 100-YEAR, 24 HOUR STORM. SEE APPENDIX III-2A.

ISSUED FOR PERMITTING PURPOSES ONLY



Path: h:\projects\1894269_2021\1894269_2021.dwg | File Name: 1894269_01.dwg
 Path: h:\projects\1894269_2021\1894269_2021.dwg | File Name: 1894269_01.dwg

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2021-02	ISSUED FOR PERMITTING PURPOSES	EWT	EWT	CGD	CGD

SEAL

 CHARLES G. DOMINGUEZ
 83247
 LICENSED PROFESSIONAL ENGINEER
 2/12/21

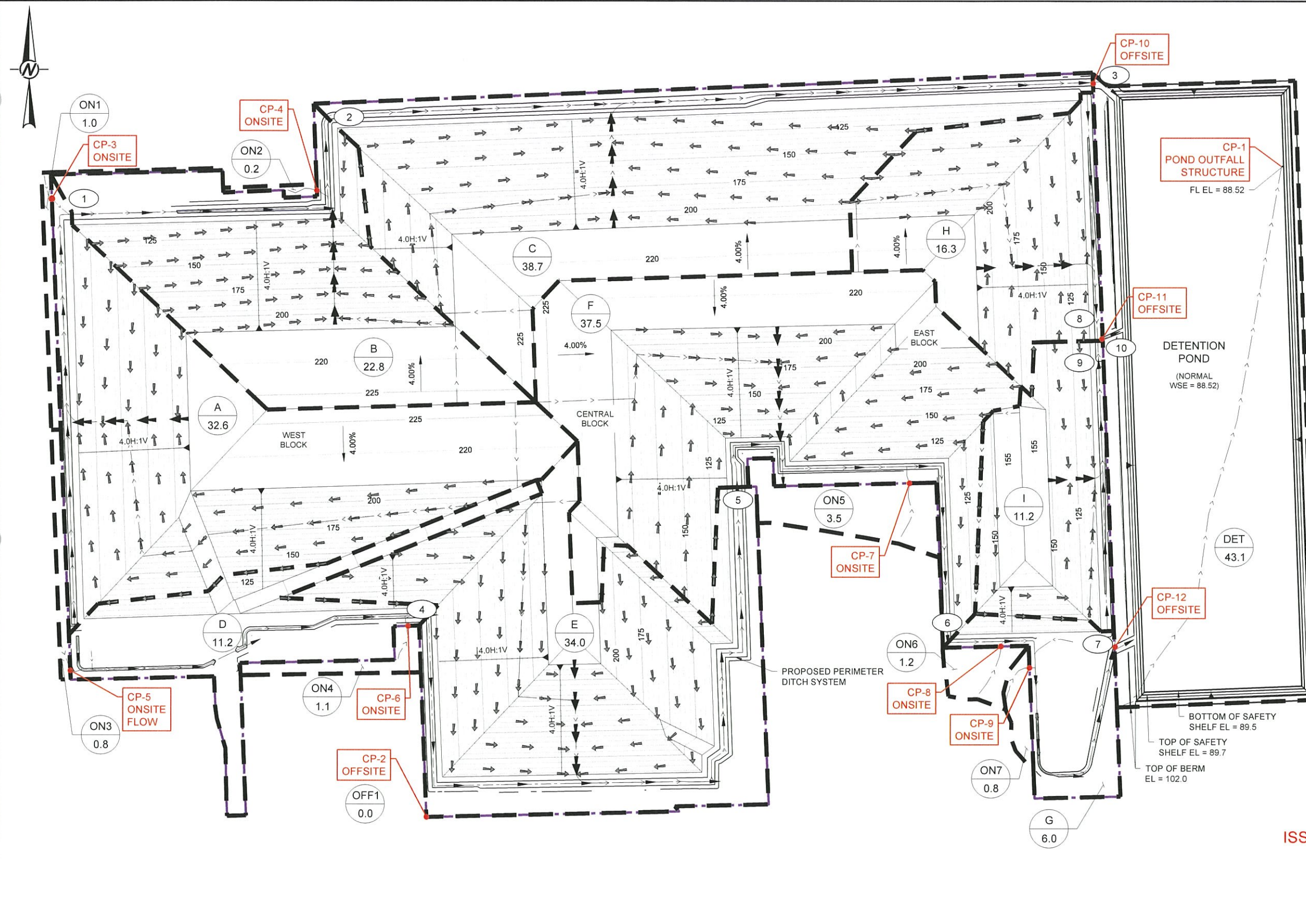
CLIENT

 CONSULTANT

 HOUSTON NORTH OFFICE
 14950 HEATHROW FOREST PKWY, STE 280
 HOUSTON, TEXAS 77032
 USA
 (281) 821-6868
 www.golder.com

PROJECT
 HAWTHORN PARK RECYCLING & DISPOSAL FACILITY
 PERMIT AMENDMENT APPLICATION
 TCEQ PERMIT NO. MSW-2185A
 TITLE
 PRE-DEVELOPMENT OVERALL DRAINAGE CONDITIONS
 PROJECT NO 1894269 APPLICATION SECTION III Attachment 2 REV 0 2 of 13 FIGURE III-2-2

1 in. IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN INCORPORATED FROM ANSIB



LEGEND

- PERMIT BOUNDARY
- OVERALL DRAINAGE AREA DELINEATION
- PERIMETER DITCH
- DOWNCHUTE
- ADD-ON BERM
- FLOW PATH
- CALCULATION POINT
- CONTROL POINT (RUNOFF DISCHARGE)
- DRAINAGE AREA NAME / ACREAGE

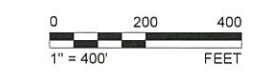
POST-DEVELOPMENT PEAK DISCHARGES

DISCHARGE POINT	25-YEAR FLOW RATE (CFS)	100-YEAR FLOW RATE (CFS)
CP-1 OUTFALL	141.8	169.8
CP-2 OFFSITE	0.0	0.0
CP-3 ONSITE	1.8	2.3
CP-4 ONSITE	1.1	1.4
CP-5 ONSITE	1.8	2.3
CP-6 ONSITE	6.3	7.8
CP-7 ONSITE	8.6	10.7
CP-8 ONSITE	6.8	8.5
CP-9 ONSITE	4.5	5.7
CP-10 OFFSITE	262.5	333.0
CP-11 OFFSITE	126.2	156.1
CP-12 OFFSITE	282.1	357.3

NOTE(S)

- RESULTS FROM HEC-HMS FOR 25-YEAR, 24 HOUR STORM AND 100-YEAR, 24 HOUR STORM. SEE APPENDIX III-2A.

ISSUED FOR PERMITTING PURPOSES ONLY



REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2021-02	ISSUED FOR PERMITTING PURPOSES				

SEAL

2/12/21

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

CLIENT

CONSULTANT

HOUSTON NORTH OFFICE
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
(281) 821-6868
www.golder.com

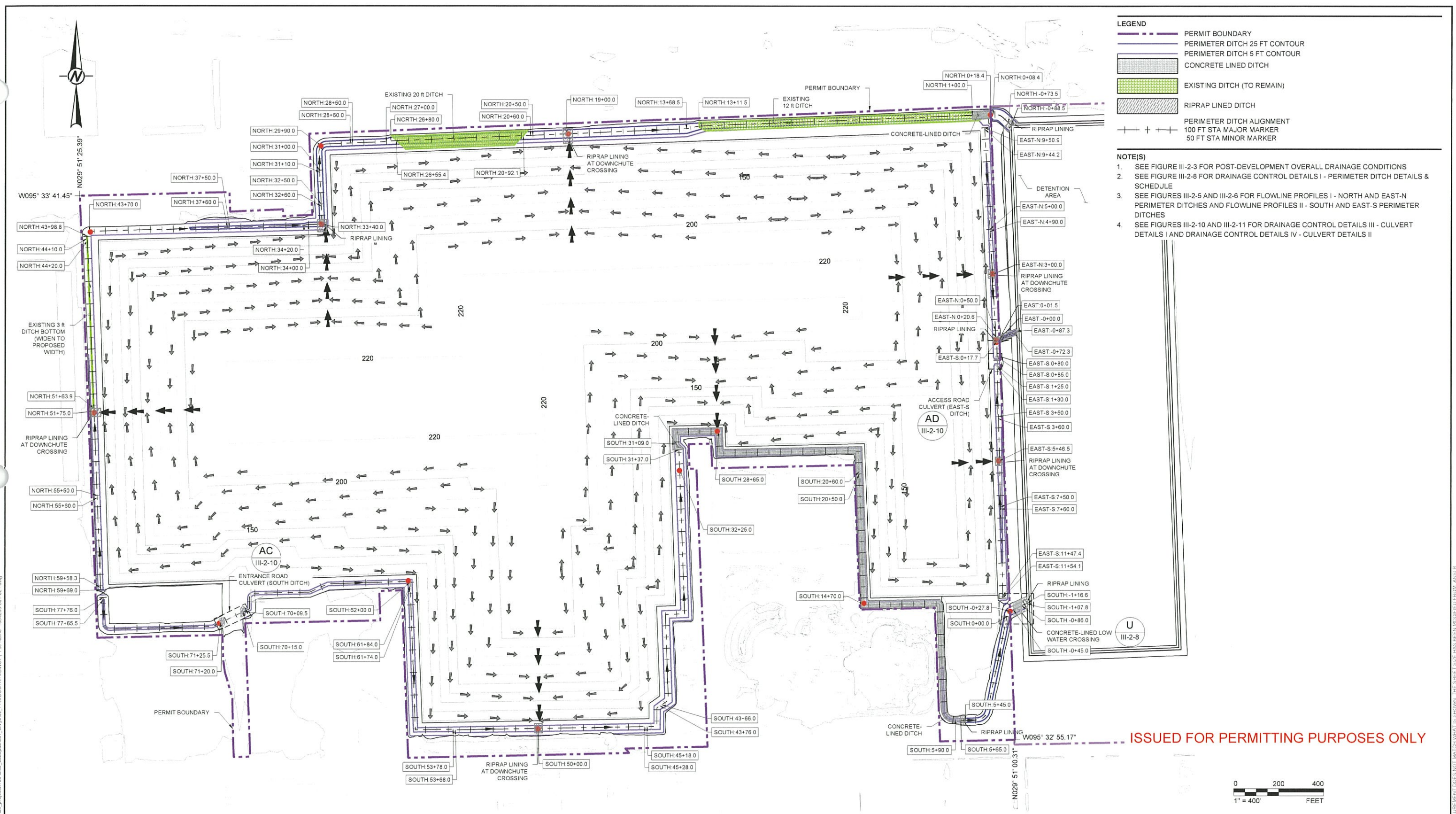
PROJECT
HAWTHORN PARK RECYCLING & DISPOSAL FACILITY
PERMIT AMENDMENT APPLICATION
TCEQ PERMIT NO. MSW-2185A

TITLE
POST-DEVELOPMENT OVERALL DRAINAGE CONDITIONS

PROJECT NO. 1894269 APPLICATION SECTION III Attachment 2 REV. 0 3 of 13 FIGURE III-2-3

Path: W:\projects\1894269_2021\02_2021\02_2021\1894269_001_017.dwg File Name: 1894269-001-017.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B.



LEGEND

	PERMIT BOUNDARY
	PERIMETER DITCH 25 FT CONTOUR
	PERIMETER DITCH 5 FT CONTOUR
	CONCRETE LINED DITCH
	EXISTING DITCH (TO REMAIN)
	RIPRAP LINED DITCH
	PERIMETER DITCH ALIGNMENT
	100 FT STA MAJOR MARKER
	50 FT STA MINOR MARKER

- NOTE(S)**
- SEE FIGURE III-2-3 FOR POST-DEVELOPMENT OVERALL DRAINAGE CONDITIONS
 - SEE FIGURE III-2-8 FOR DRAINAGE CONTROL DETAILS I - PERIMETER DITCH DETAILS & SCHEDULE
 - SEE FIGURES III-2-5 AND III-2-6 FOR FLOWLINE PROFILES I - NORTH AND EAST-N PERIMETER DITCHES AND FLOWLINE PROFILES II - SOUTH AND EAST-S PERIMETER DITCHES
 - SEE FIGURES III-2-10 AND III-2-11 FOR DRAINAGE CONTROL DETAILS III - CULVERT DETAILS I AND DRAINAGE CONTROL DETAILS IV - CULVERT DETAILS II

Path: \\rsd\user\jraff\proj\1894269_202102\02_PROD\PRODUCTION\DWG\1 File Name: 1894269-001-021.dwg

0	2021-02	ISSUED FOR PERMITTING PURPOSES	EWT	EWT	CGD	CGD
REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED

SEAL

CHARLES C. DOMINGUEZ
83247
LICENSED PROFESSIONAL ENGINEER
2/12/21

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

CLIENT

CONSULTANT

HOUSTON NORTH OFFICE
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
(281) 821-6868
www.golder.com

PROJECT

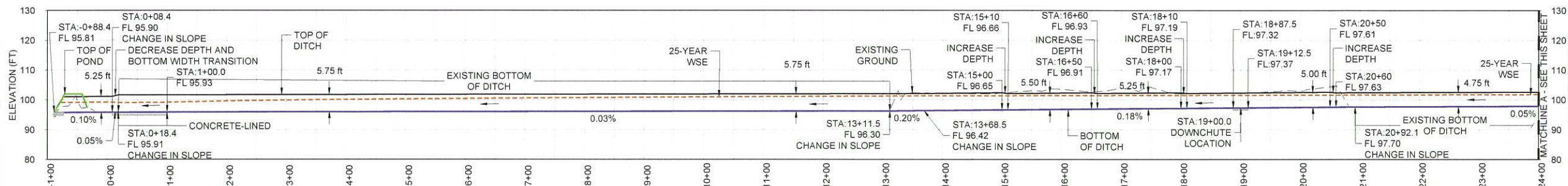
HAWTHORN PARK RECYCLING & DISPOSAL FACILITY
PERMIT AMENDMENT APPLICATION
TCEQ PERMIT NO. MSW-2185A

TITLE

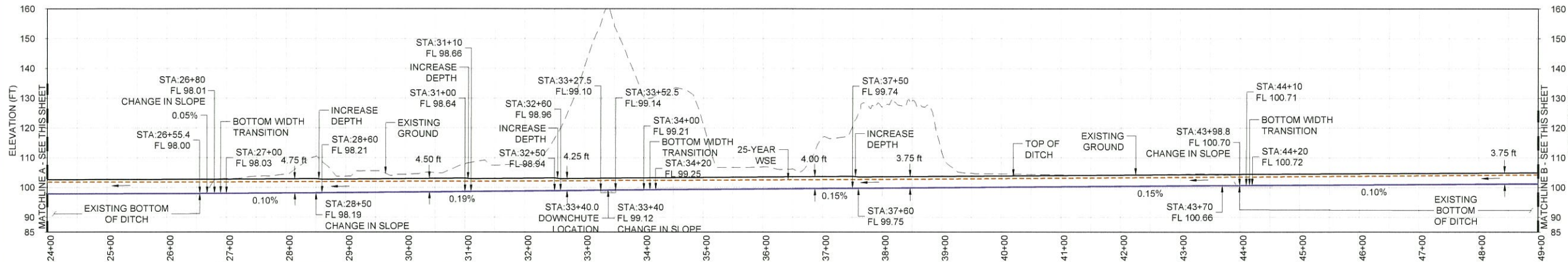
PERIMETER DITCH PLAN

PROJECT NO. 1894269 APPLICATION SECTION III Attachment 2 REV 0 4 of 13 FIGURE III-2-4

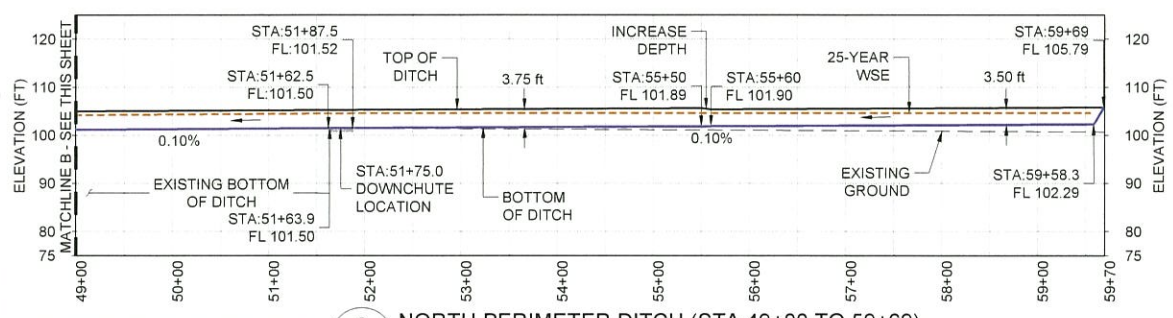
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



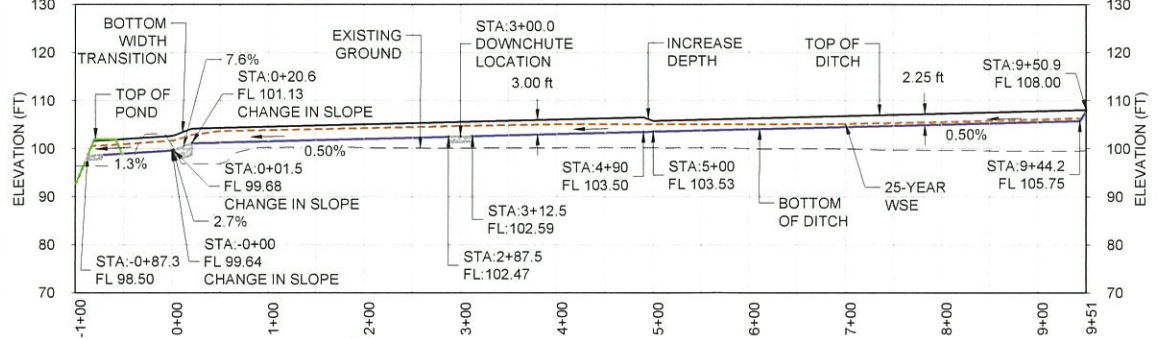
A NORTH PERIMETER DITCH (STA -0+88.4 TO 24+00)



B NORTH PERIMETER DITCH (STA 24+00 TO 49+00)



C NORTH PERIMETER DITCH (STA 49+00 TO 59+69)



D EAST-N PERIMETER DITCH

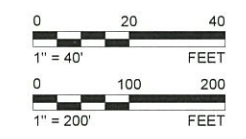
LEGEND

- TOP OF DITCH (MINIMUM)
- BOTTOM OF DITCH / DITCH FLOWLINE
- MAXIMUM WATER SURFACE ELEVATION (25-YEAR STORM)

NOTE(S)

- REFER TO PART III, ATTACHMENT 2 FIGURE III-2-8 FOR DRAINAGE CONTROL DETAILS I - PERIMETER DITCH DETAILS & SCHEDULE
- REFER TO PART III, ATTACHMENT 2 FIGURE III-2-4 FOR PERIMETER DITCH PLAN

ISSUED FOR PERMITTING PURPOSES ONLY



0	2021-02	ISSUED FOR PERMITTING PURPOSES	EWT	EWT	CGD	CGD
REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED

SEAL:

CLIENT: **WM**

CONSULTANT: **GOLDER**

HOUSTON NORTH OFFICE
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
(281) 821-6868
www.golder.com

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

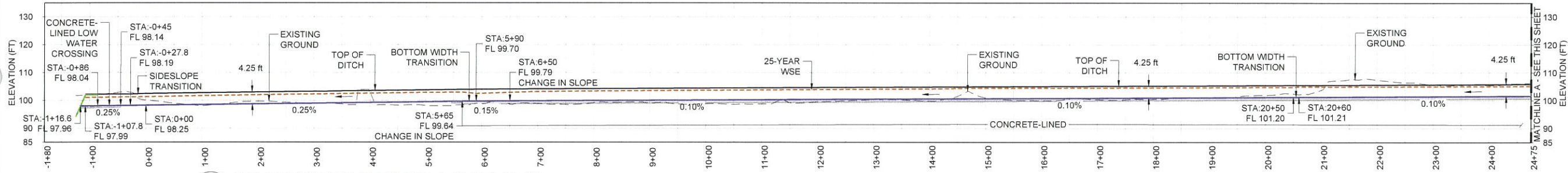
PROJECT: HAWTHORN PARK RECYCLING & DISPOSAL FACILITY
PERMIT AMENDMENT APPLICATION
TCEQ PERMIT NO. MSW-2185A

TITLE: **FLOWLINE PROFILES I - NORTH AND EAST-N PERIMETER DITCHES**

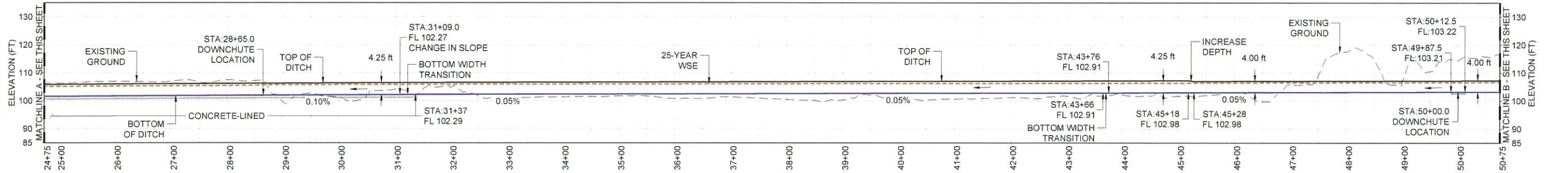
PROJECT NO: 1894269
APPLICATION SECTION: III Attachment 2
REV: 0
5 of 13
FIGURE: III-2-5

Path: \\redstone\trading\lason\... 1894269_20210201_018.dwg | File Name: 1894269-01-018.dwg

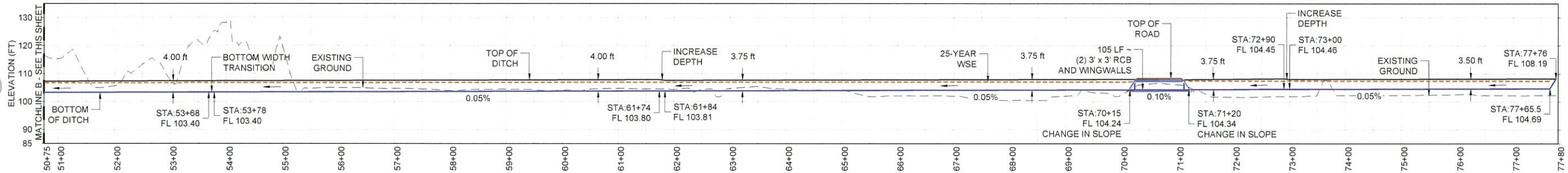
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



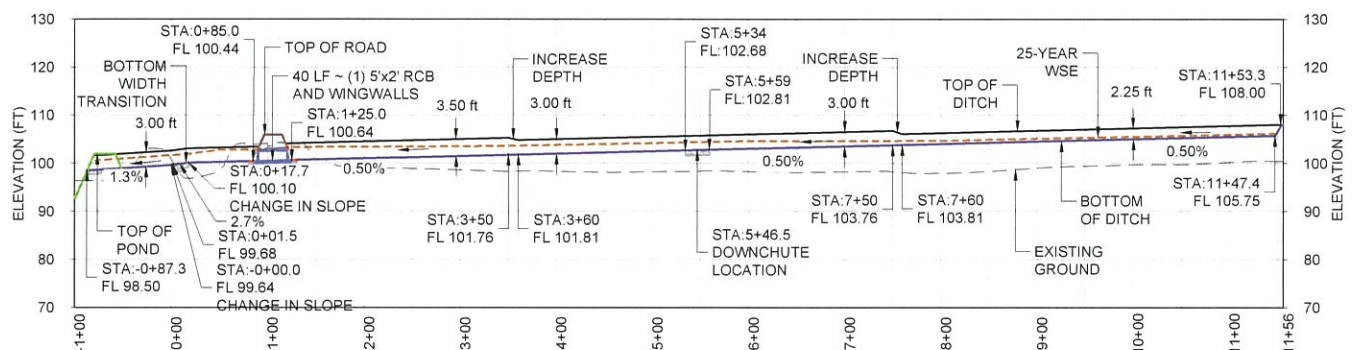
E SOUTH PERIMETER DITCH (STA -1+16.6 TO 24+75)
HOR. SCALE 1" = 200' | VERT. SCALE 1" = 40'



F SOUTH PERIMETER DITCH (STA 24+75 - 50+75)
HOR. SCALE 1" = 200' | VERT. SCALE 1" = 40'



G SOUTH PERIMETER DITCH (STA 50+75 - 77+76)
HOR. SCALE 1" = 200' | VERT. SCALE 1" = 40'



H EAST-S PERIMETER DITCH
HOR. SCALE 1" = 200' | VERT. SCALE 1" = 40'

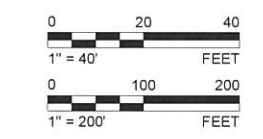
LEGEND

- TOP OF DITCH (MINIMUM)
- BOTTOM OF DITCH / DITCH FLOWLINE
- MAXIMUM WATER SURFACE ELEVATION (25-YEAR STORM)

NOTE(S)

- REFER TO PART III, ATTACHMENT 2 FIGURE III-2-8 FOR DRAINAGE CONTROL DETAILS I - PERIMETER DITCH DETAILS & SCHEDULE
- REFER TO PART III, ATTACHMENT 2 FIGURE III-2-4 FOR PERIMETER DITCH PLAN
- REFER TO PART III, ATTACHMENT 2 FIGURES III-2-10 AND III-2-11 FOR DRAINAGE CONTROL DETAILS III - CULVERT DETAILS I AND DRAINAGE CONTROL DETAILS IV - CULVERT DETAILS II

ISSUED FOR PERMITTING PURPOSES ONLY



REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2021-02	ISSUED FOR PERMITTING PURPOSES	EWT	EWT	CGD	CGD

SEAL

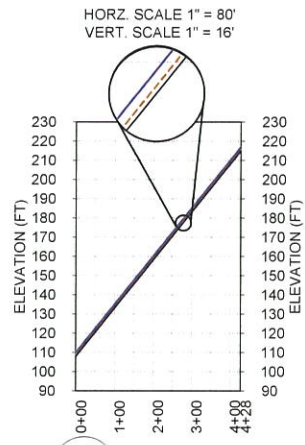
 2/12/21
 GOLDER ASSOCIATES INC.
 TEXAS REGISTRATION F-2578

CLIENT

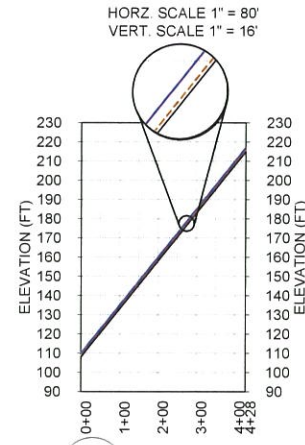
 CONSULTANT

 HOUSTON NORTH OFFICE
 14950 HEATHROW FOREST PKWY, STE 280
 HOUSTON, TEXAS 77032
 USA
 (281) 821-6868
 www.golder.com

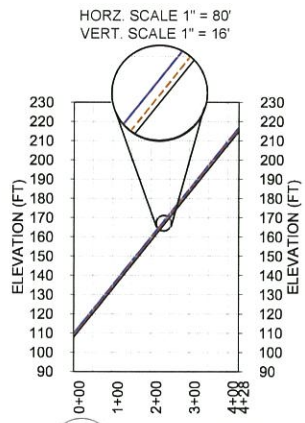
PROJECT
 HAWTHORN PARK RECYCLING & DISPOSAL FACILITY
 PERMIT AMENDMENT APPLICATION
 TCEQ PERMIT NO. MSW-2185A
 TITLE
 FLOWLINE PROFILES II - SOUTH AND EAST-S
 PERIMETER DITCHES
 PROJECT NO. 1894269 APPLICATION SECTION III Attachment 2 REV 0 of 13 FIGURE III-2-6



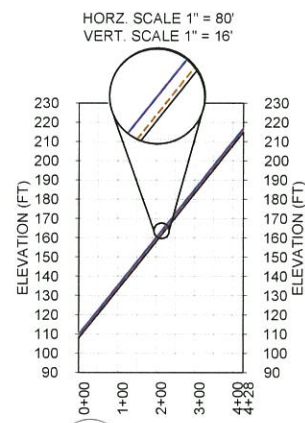
I DOWNCHUTE 1
 HORZ. SCALE 1" = 500'
 VERT. SCALE 1" = 100'



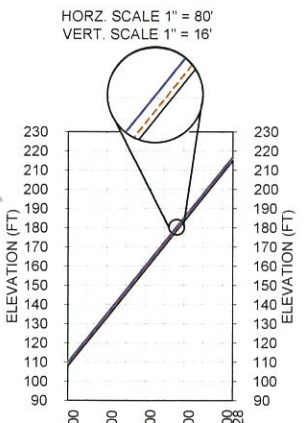
J DOWNCHUTE 2
 HORZ. SCALE 1" = 500'
 VERT. SCALE 1" = 100'



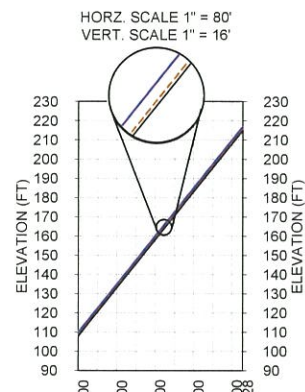
K DOWNCHUTE 3
 HORZ. SCALE 1" = 500'
 VERT. SCALE 1" = 100'



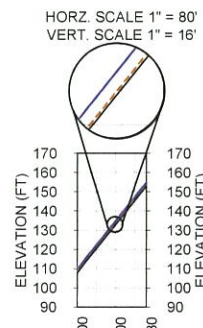
L DOWNCHUTE 4
 HORZ. SCALE 1" = 500'
 VERT. SCALE 1" = 100'



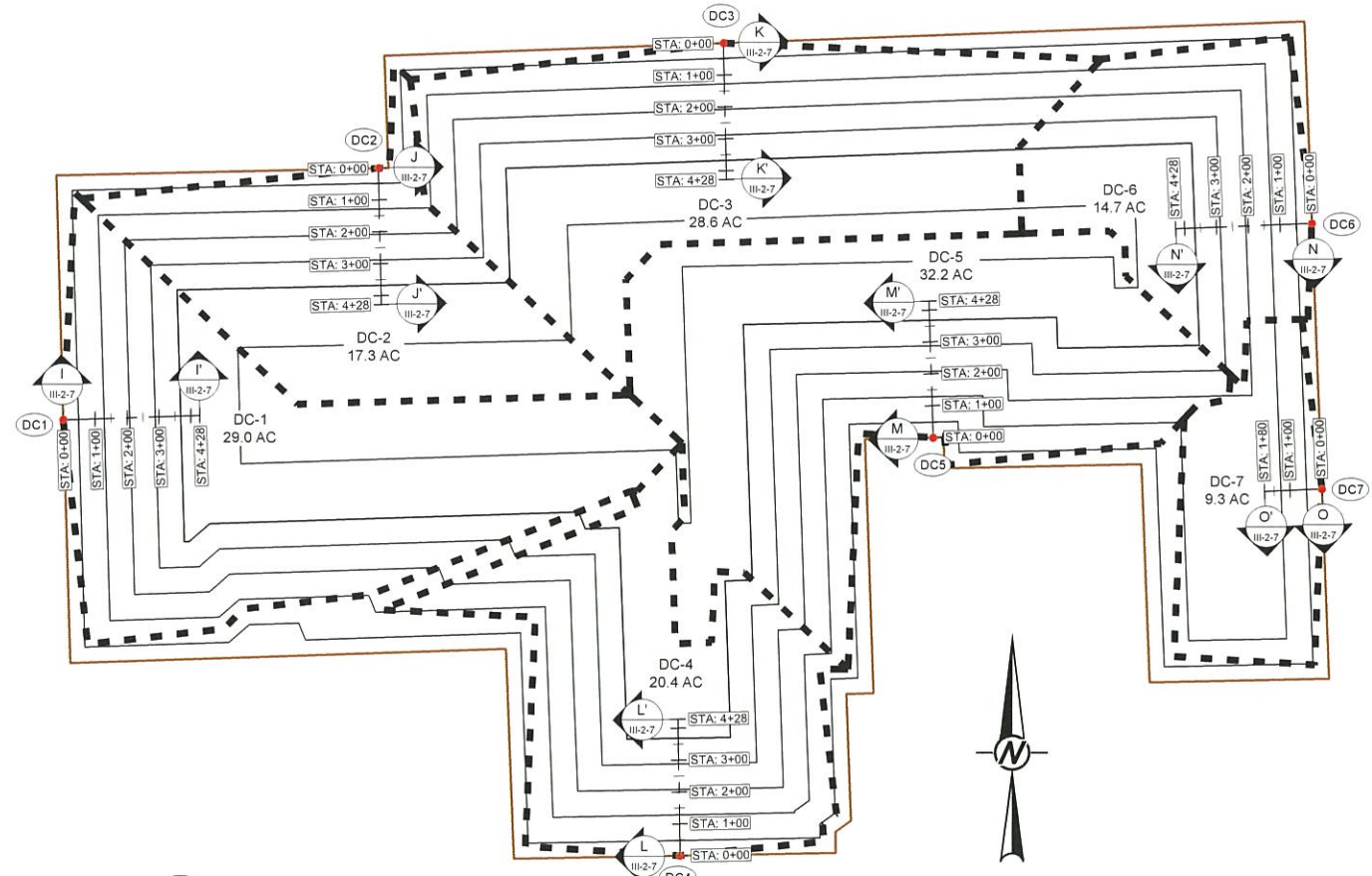
M DOWNCHUTE 5
 HORZ. SCALE 1" = 500'
 VERT. SCALE 1" = 100'



N DOWNCHUTE 6
 HORZ. SCALE 1" = 500'
 VERT. SCALE 1" = 100'



O DOWNCHUTE 7
 HORZ. SCALE 1" = 500'
 VERT. SCALE 1" = 100'



P DOWNCHUTE LAYOUT
 SCALE 1" = 800'

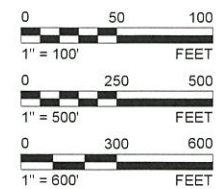
LEGEND

- TOP OF EMBANKMENT
- MAXIMUM WATER SURFACE ELEVATION (25-YEAR 24-HR STORM)
- FLOWLINE ELEVATION

NOTE(S)

- REFER TO PART III, ATTACHMENT 2 FIGURE III-2-5 FOR DOWNCHUTE DETAILS

ISSUED FOR PERMITTING PURPOSES ONLY



REV	DATE	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2021-02	ISSUED FOR PERMITTING PURPOSES	EWT	EWT	CGD	CGD

SEAL:

CLIENT: **WWM**

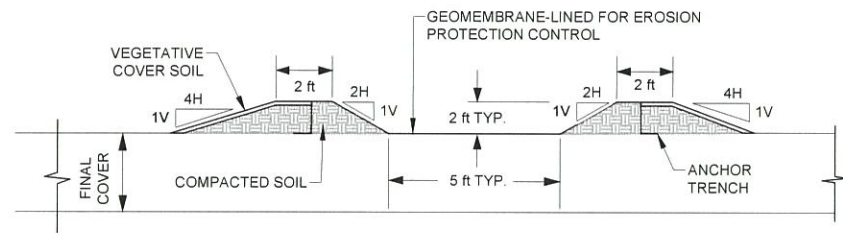
CONSULTANT: **GOLDER**

HOUSTON NORTH OFFICE
 14950 HEATHROW FOREST PKWY, STE 280
 HOUSTON, TEXAS 77032
 USA
 (281) 821-6868
 www.golder.com

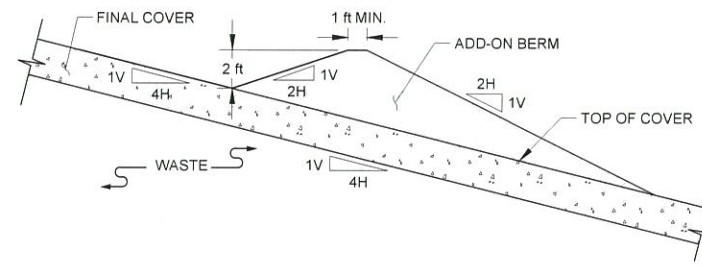
PROJECT	HAWTHORN PARK RECYCLING & DISPOSAL FACILITY		
	PERMIT AMENDMENT APPLICATION		
	TCEQ PERMIT NO. MSW-2185A		
TITLE	FLOWLINE PROFILES III - DOWNCHUTES		
PROJECT NO	APPLICATION SECTION	REV	7 of 13
1894269	III Attachment 2	0	FIGURE III-2-7

Path: \\msd\csm\staffing\wason\...
 Path: \\hwhorpark\eg_projects\1894269_2020\p01_Dwg\02_PROD\CTO\DWG\1 File Name: 1894269-01-C25.dwg

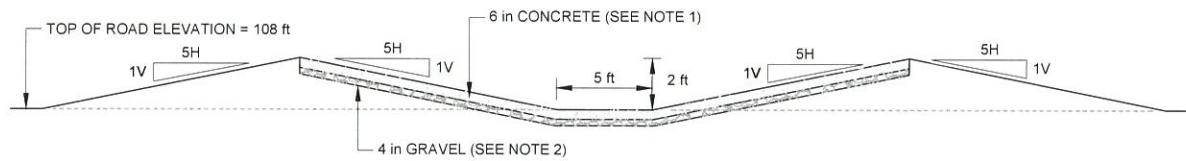
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



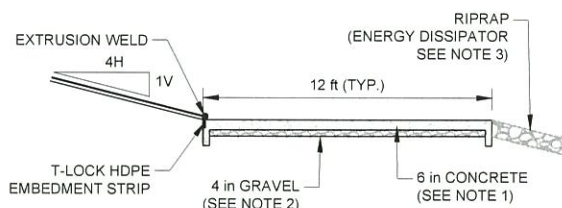
SCALE: NTS **W** TYPICAL STORM WATER DOWNCHUTE SECTION
III-2-9



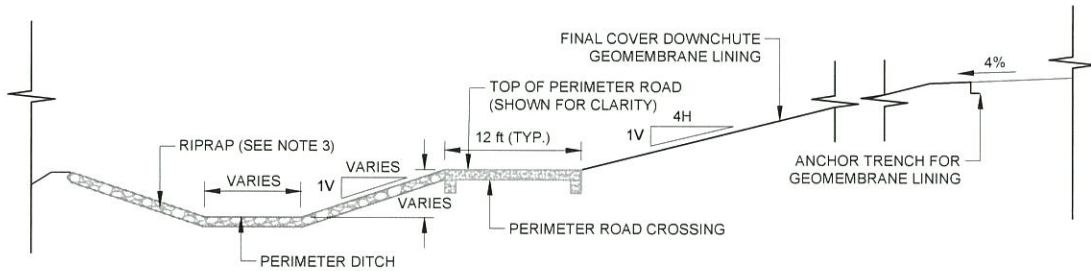
SCALE: NTS **X** TYPICAL ADD-ON BERM
III-2-9



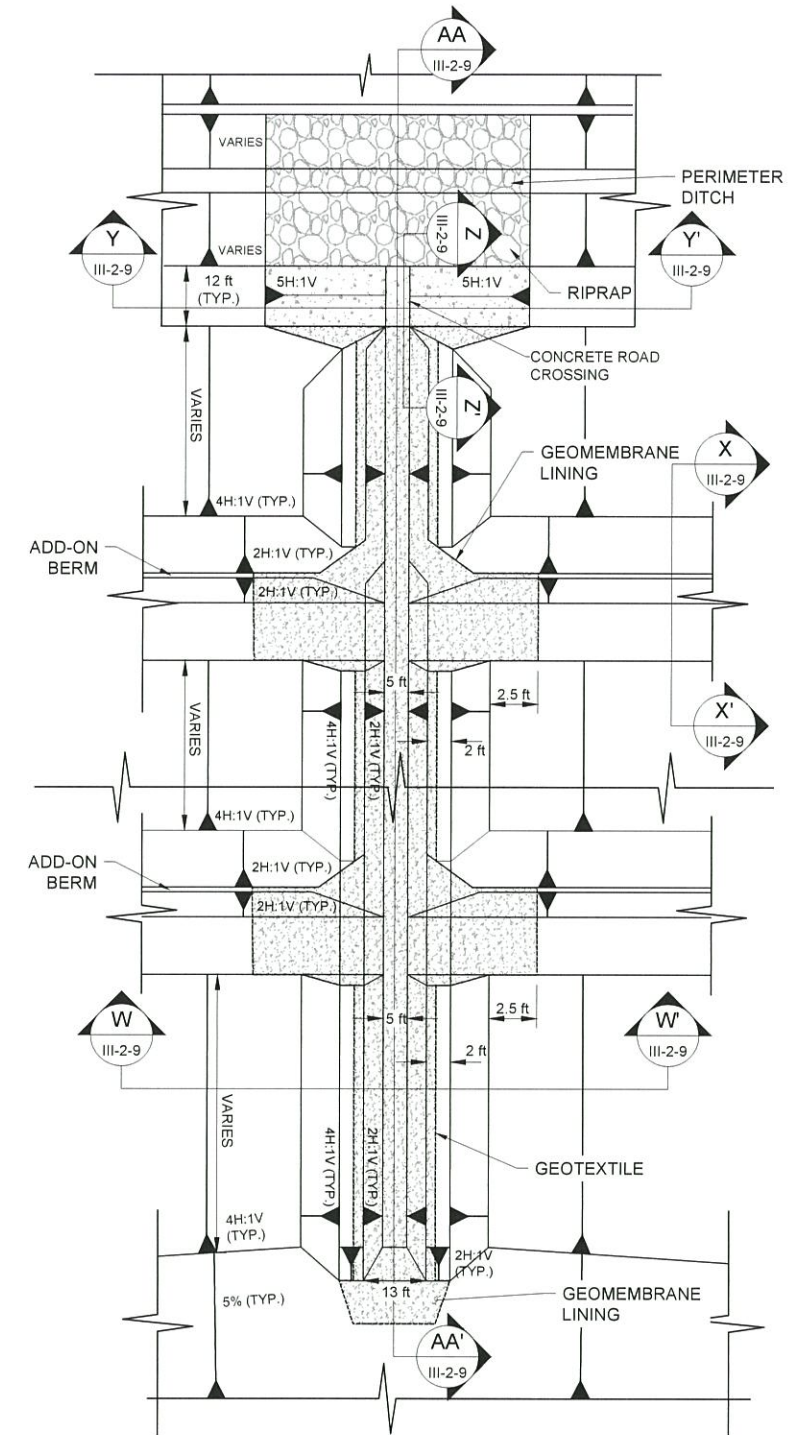
SCALE: NTS **Y** TYPICAL ROAD CROSSING SECTION
III-2-9



SCALE: NTS **Z** TYPICAL ROAD CROSSING
III-2-9



SCALE: NTS **AA** TYPICAL SIDESLOPE
III-2-9



SCALE: NTS **AB** TYPICAL STORM WATER DOWNCHUTE
III-2-9

NOTES

- CONCRETE: CONTROL JOINTS TO BE PLACED EVERY 20 FEET TO CONTROL SHRINKAGE CRACKING AND MAINTAIN AGGREGATE INTERLOCK BETWEEN ADJACENT REINFORCED CONCRETE SLABS. NO DOWEL BARS ARE REQUIRED. SIX INCH REINFORCED CONCRETE SHOULD HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI AND SHOULD BE REINFORCED WITH 12x12, W5xW5 WELDED WIRE FABRIC FOR TEMPERATURE CRACKING.
- GRAVEL: THE MATERIAL SHALL BE WELL GRADED AND SHALL MEET THE FOLLOWING REQUIREMENTS:

SIEVE	DESIGNATION	% RETAINED
US	SI	
1 3/4"	45 mm	0
7/8"	22.4 mm	10-35
3/8"	9.5 mm	30-50
#4	4.75 mm	45-65
#40	425 mm	70-85
- RIPRAP AT DOWNCHUTE CROSSING $D_{50} = 9.5"$ MIN THICKNESS = 18". A GEOTEXTILE FILTER FABRIC SHALL BE INSTALLED PRIOR TO PLACEMENT OF RIPRAP. RECYCLED CRUSHED CONCRETE MAY BE USED AS RIPRAP PROVIDED THAT IT MEETS THE GRADATION REQUIREMENTS AND DOES NOT CONTAIN REINFORCING STEEL.
- GEOSYNTHETICS SHOWN EXAGGERATED FOR CLARITY.

ISSUED FOR PERMITTING PURPOSES ONLY

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2021-02	ISSUED FOR PERMITTING PURPOSES	EWT	EWT	CGD	CGD

SEAL

CLIENT

CONSULTANT

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

PROJECT

HAWTHORN PARK RECYCLING & DISPOSAL FACILITY
PERMIT AMENDMENT APPLICATION
TCEQ PERMIT NO. MSW-2185A

TITLE

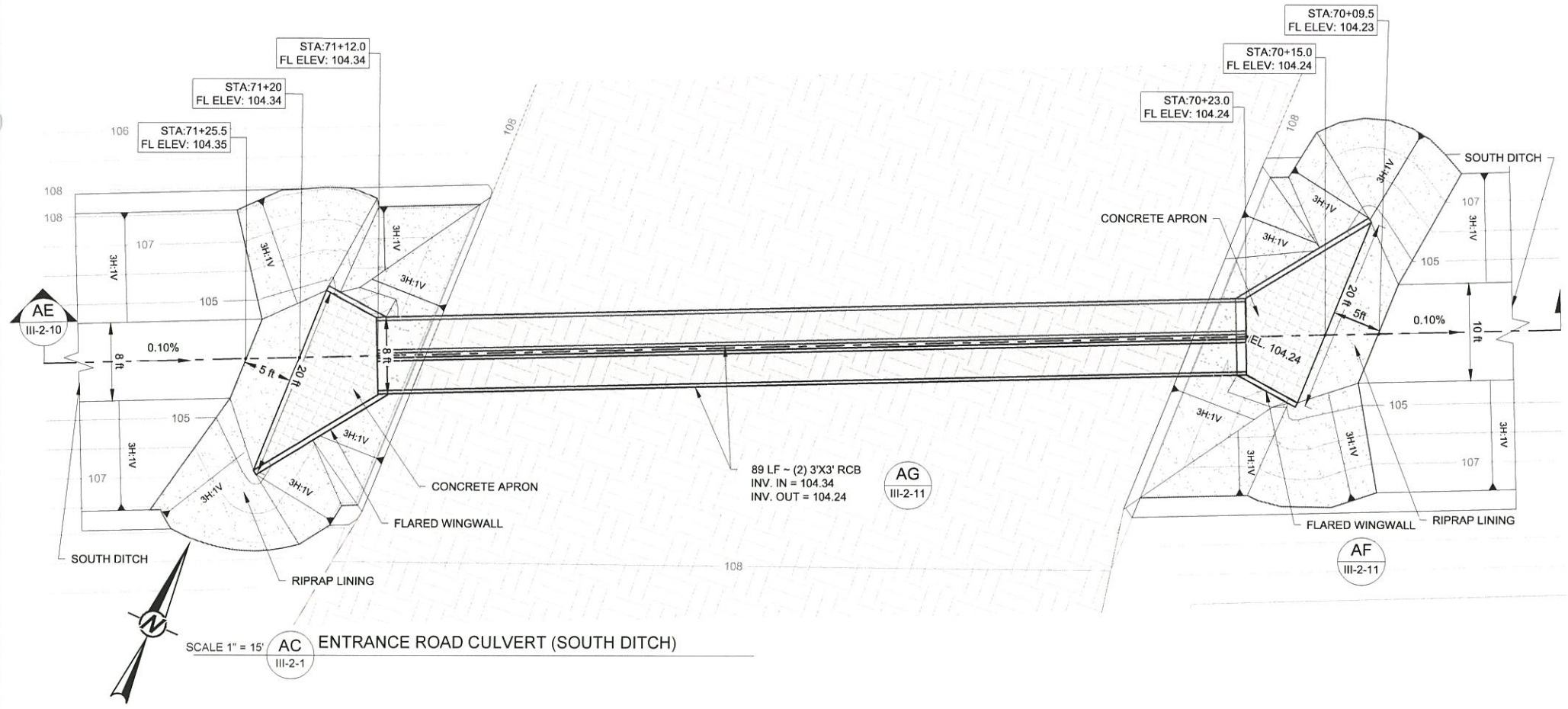
DRAINAGE CONTROL DETAILS II - ADD-ON BERM & DOWNCHUTE DETAILS

HOUSTON NORTH OFFICE
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
(281) 821-6868
www.golder.com

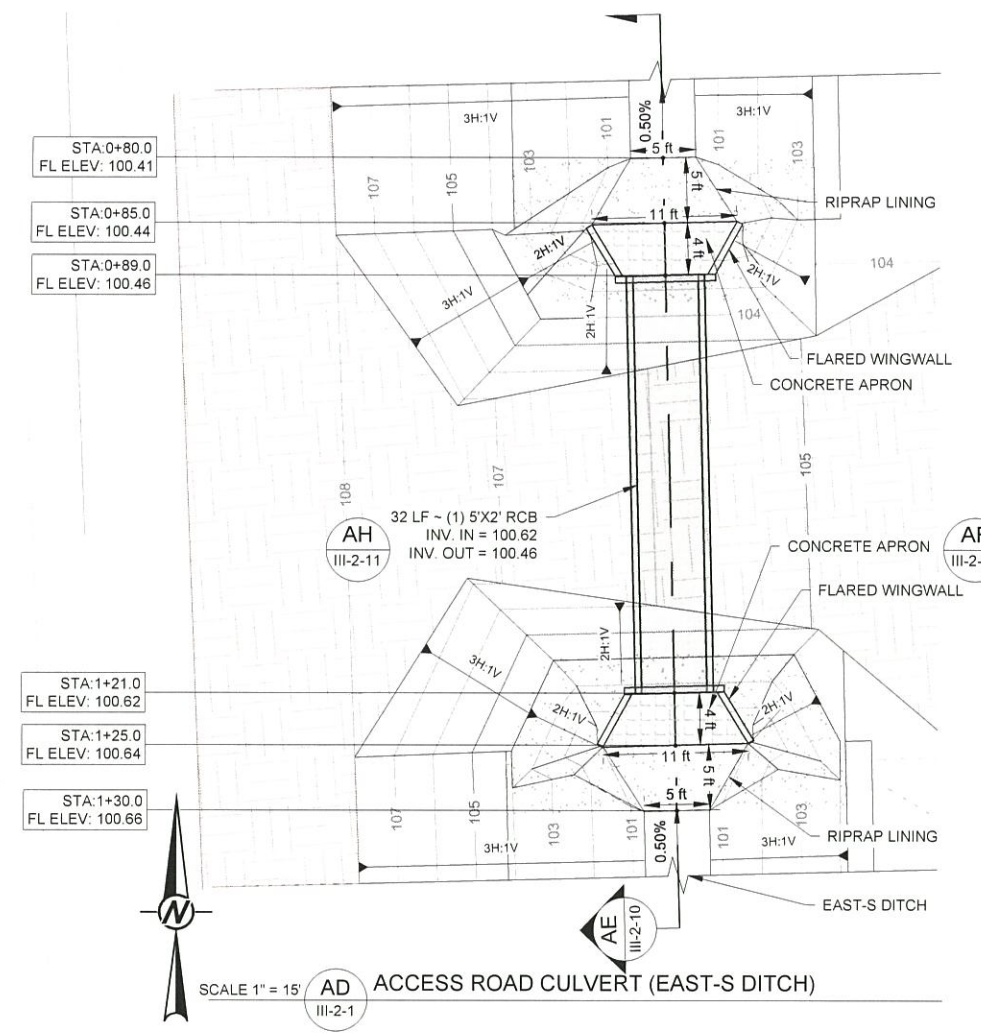
PROJECT NO	APPLICATION SECTION	REV	9 of 13	FIGURE
1894269	III Attachment 2	0		III-2-9

Path: \\msd\external\staffing\awson\1894269\1894269_2020\paw001_Dwg\102_PROD\CON\DWGS\1 File Name: 1894269-001-022.dwg

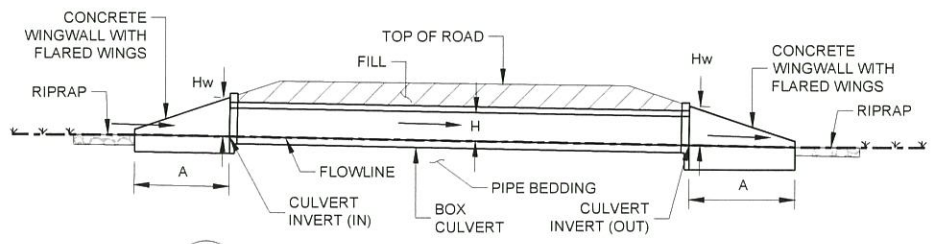
1 in. IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B.



SCALE 1" = 15' AC ENTRANCE ROAD CULVERT (SOUTH DITCH) III-2-1



SCALE 1" = 15' AD ACCESS ROAD CULVERT (EAST-S DITCH) III-2-1



SCALE: NTS AE TYPICAL CULVERT PROFILE III-2-10

	SOUTH CULVERT	EAST-S CULVERT
H	3 ft	2 ft
Hw	3.8 ft	2.75 ft
A	8 ft	4 ft

H = HEIGHT OF BOX CULVERT
 Hw = HEIGHT OF WINGWALL
 A = LENGTH OF APRON (CENTERLINE)

ISSUED FOR PERMITTING PURPOSES ONLY



REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2021-02	ISSUED FOR PERMITTING PURPOSES	EWT	EWT	CGD	CGD

SEAL

2/12/21

CLIENT

CONSULTANT

GOLDER ASSOCIATES INC.
 TEXAS REGISTRATION F-2578

HOUSTON NORTH OFFICE
 14950 HEATHROW FOREST PKWY, STE 280
 HOUSTON, TEXAS 77032
 USA
 (281) 821-6868
 www.golder.com

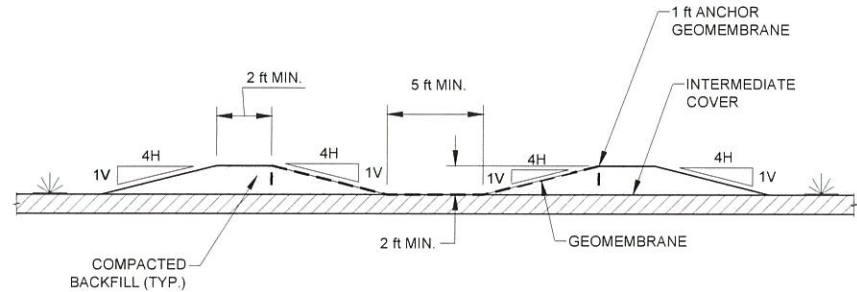
PROJECT
 HAWTHORN PARK RECYCLING & DISPOSAL FACILITY
 PERMIT AMENDMENT APPLICATION
 TCEQ PERMIT NO. MSW-2185A

TITLE
DRAINAGE CONTROL DETAILS III - CULVERT DETAILS I

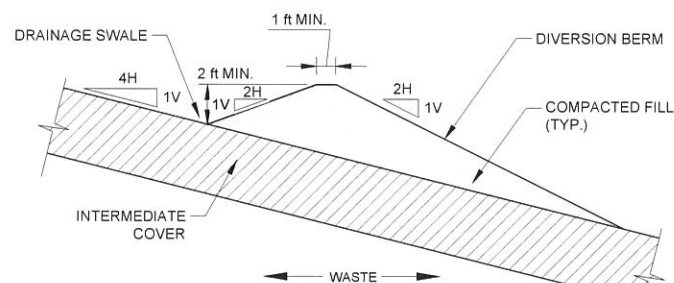
PROJECT NO 1894269 APPLICATION SECTION III Attachment 2 REV 0 10 of 13 FIGURE III-2-10

Path: \\vms01\p\drafting\workspace\1894269\projects\1894269_2020\paw001_Dwg\02_PROD\CON\DWG\03_1 File Name: 1894269-001_C38.dwg

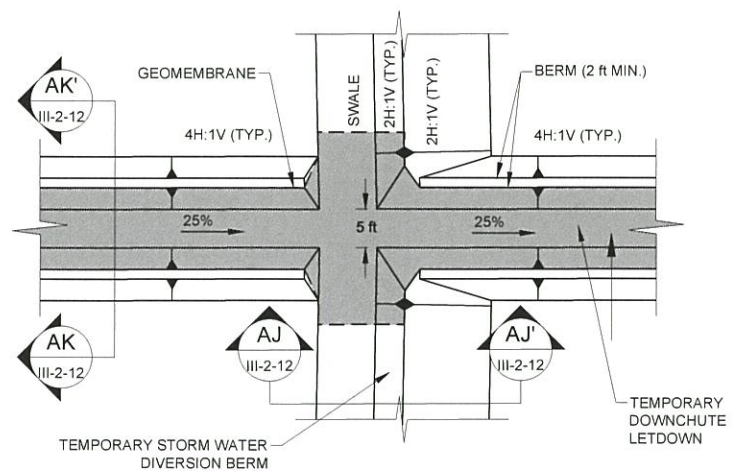
1 in. IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN RESIZED FROM ANSI B



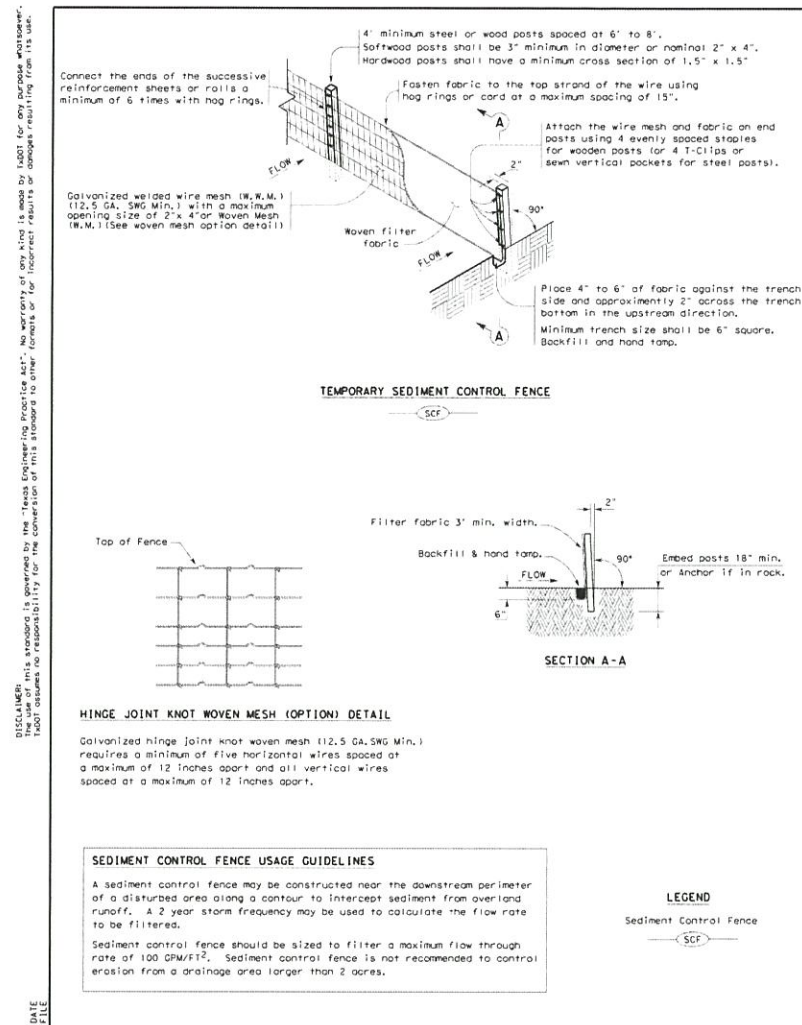
SCALE: NTS **AK** III-2-12 TEMPORARY STORM WATER FLUME



SCALE: NTS **AJ** III-2-12 TEMPORARY STORM WATER DIVERSION BERM



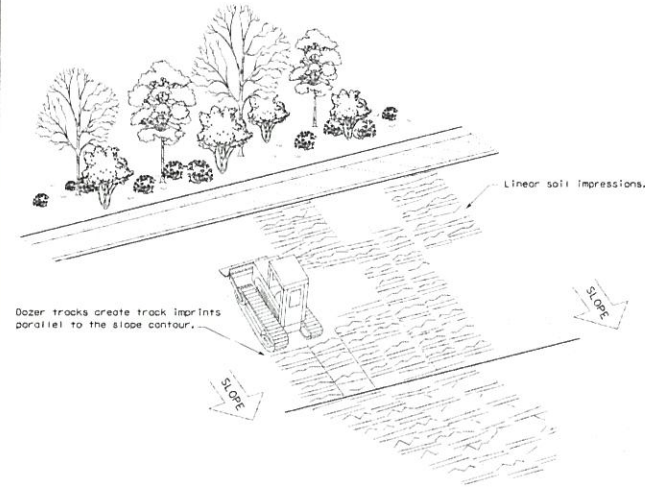
SCALE: NTS **AI** III-2-12 TEMPORARY DIVERSION BERM AND FLUME CONFLUENCE



DATE: FILE: 02/12/21

SCALE: NTS **AL** III-2-12 TxDOT SILT FENCE

- GENERAL NOTES**
1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
 2. Perform vertical tracking on slopes to temporarily stabilize soil.
 3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
 4. Do not exceed 12" between track impressions.
 5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



Vertical Tracking

Dozer tracks create track impressions parallel to the slope contour.

Texas Department of Transportation		Design
Standards		Division
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING		
EC(1)-16		
FILED	DATE	BY
02/12/21	JULY 15/21	AK
REVISION	DATE	BY

ISSUED FOR PERMITTING PURPOSES ONLY

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2021-02	ISSUED FOR PERMITTING PURPOSES	EWT	EWT	CGD	CGD

SEAL:

CLIENT:

CONSULTANT:

HOUSTON NORTH OFFICE
14950 HEATHROW FOREST PKWY, STE 280
HOUSTON, TEXAS 77032
USA
(281) 821-6868
www.golder.com

PROJECT:
HAWTHORN PARK RECYCLING & DISPOSAL FACILITY
PERMIT AMENDMENT APPLICATION
TCEQ PERMIT NO. MSW-2185A

TITLE:
EROSION AND SEDIMENTATION CONTROL DETAILS I

PROJECT NO. 1894269	APPLICATION SECTION III Attachment 2	REV. 0	12 of 13	FIGURE III-2-12
------------------------	---	-----------	----------	--------------------

Path: \\houston\houston\projects\1894269_2020\dwg\01_Design\02_EROSION\TCEQ\01_EC-16.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIB

DISCLAIMER: This sheet is intended to be used as a guide only. It is not intended to be used as a substitute for professional engineering services. The user of this sheet is advised to consult with a professional engineer before using this sheet. The user of this sheet is advised to consult with a professional engineer before using this sheet.

GENERAL NOTES

- If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream of drainage structures, and in roadway ditches and channels to collect sediment.
- Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
- The rock filter dam dimensions shall be as indicated on the SWP plans.
- Slope slopes should be 2:1 or flatter. Dams within the safety zone shall have side slopes of 6:1 or flatter.
- Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
- Filter dams should be embedded a minimum of 4" into existing ground.
- The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
- Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be forced at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
- Sack gabions should be staked down with 1/2" dia. rebar stakes, and a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/2".
- Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
- The guidelines shown herein are suggestions only and may be modified by the Engineer.

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 (SWFT) of gross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with wire mesh (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or seale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flow (approximately 8 ft/sec or more) in which aggregate wash out may occur. Sandbags may be used at the embankment foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh (1" to 6" aggregate): Type 2 may be used in ditches and at dike or seale outlets.

Type 3 (36" high with wire mesh (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 may be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

PLAN SHEET LEGEND

- Type 1 Rock Filter Dam - RFD1
- Type 2 Rock Filter Dam - RFD2
- Type 3 Rock Filter Dam - RFD3
- Type 4 Rock Filter Dam - RFD4

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
ROCK FILTER DAMS
EC(2)-16

SCALE NTS **AM** TxDOT ROCK BERM
III-2-13

DISCLAIMER: This sheet is intended to be used as a guide only. It is not intended to be used as a substitute for professional engineering services. The user of this sheet is advised to consult with a professional engineer before using this sheet. The user of this sheet is advised to consult with a professional engineer before using this sheet.

GENERAL NOTES (TYPE 1)

- The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
- The coarse aggregate should be open graded with a size of 4" to 8".
- The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
- The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materials approved by the Engineer.
- The construction exit shall be graded to allow drainage to a sediment trapping device.
- The guidelines shown herein are suggestions only and may be modified by the Engineer.
- Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

- The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
- The treated timber planks shall be attached to the railroad ties with 1/2" x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
- The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
- The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
- The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
- The construction exit should be graded to allow drainage to a sediment trapping device.
- The guidelines shown herein are suggestions only and may be modified by the Engineer.
- Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

- The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
- The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans, and should be free from large and loose knots.
- The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
- The guidelines shown herein are suggestions only and may be modified by the Engineer.

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
CONSTRUCTION EXITS
EC(3)-16

SCALE NTS **AN** TxDOT STABILIZED CONSTRUCTION ACCESS
III-2-13

Path: \\houston\p01\proj\1894269_3332\p01_2018\01_2018.dwg | File Name: 1894269-001-025.dwg

REV	DATE	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2021-02	ISSUED FOR PERMITTING PURPOSES	EWT	EWT	CGD	CGD

SEAL

 GOLDER ASSOCIATES INC
 TEXAS REGISTRATION F-2578

CLIENT

 CONSULTANT

 HOUSTON NORTH OFFICE
 14950 HEATHROW FOREST PKWY, STE 280
 HOUSTON, TEXAS 77032
 USA
 (281) 821-6868
 www.golder.com

PROJECT
 HAWTHORN PARK RECYCLING & DISPOSAL FACILITY
 PERMIT AMENDMENT APPLICATION
 TCEQ PERMIT NO. MSW-2185A
 TITLE
EROSION AND SEDIMENTATION CONTROL DETAILS II

PROJECT NO. 1894269 APPLICATION SECTION III Attachment 2 REV. 0 13 of 13 FIGURE III-2-13

ISSUED FOR PERMITTING PURPOSES ONLY

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSII