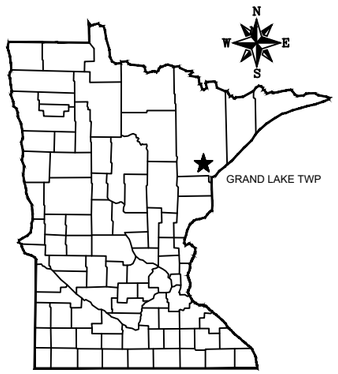
SUPERIOR AERO ESTATES

GRAND LAKE TOWNSHIP, MINNESOTA



REGIONAL LOCATION MAP
MINNESOTA

PROJECT LOCATION

LOCATION MAP
NOT TO SCALE

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G 2	PHASING PLAN
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GP- GRADING PLAN SHEETS

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GP2	GRADING KEY PLAN
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R - ROAD CONSTRUCTION PLANS

R 1-5	PLAN & PROFILE SHEETS

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TW - TAXIWAY CONSTRUCTION PLANS

TW 1	PLAN & PROFILE SHEET

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CS 17-35	RUNWAY CROSS SECTIONS
CS 36-38	TAXIWAY CROSS SECTIONS

SWP- SURFACE WATER PLAN

SWP 1	SURFACE WATER PLAN

ISSUED FOR CONSTRUCTION
ADJUST LOTS TO AVOID SEPTIC FIELD CONFLICTS & WETLAND DISTURBANCES.
1/31/2020

LEGEND

- EXISTING WATER MAIN
- EXISTING GATE VALVE & HYDRANT
- WATER SERVICE & CURB STOP
- PROPOSED WATERMAIN, VALVE, & HYDRANT
- PROPOSED WATER SERVICE & CURB STOP
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING FORCEMAIN
- EXISTING STORM SEWER & INLET
- PROPOSED STORM SEWER & INLET
- PROPOSED STORM SEWER & MANHOLE
- PROPOSED SANITARY SEWER & MANHOLE
- BURIED ELECTRIC
- BURIED GAS & VALVE
- BURIED CABLE TELEVISION
- BURIED TELEPHONE
- BURIED FIBER OPTICS
- OVERHEAD UTILITY
- RAILROAD TRACKS
- EXISTING CURB & GUTTER
- PROPOSED CURB & GUTTER
- EXISTING SIDEWALK
- PROPOSED SIDEWALK
- EXISTING CULVERT PIPE
- PROPOSED CULVERT PIPE
- FENCE LINE
- DRAINAGE ARROW
- SILT FENCE
- RIGHT-OF-WAY
- BASELINE
- PROPERTY LINE
- TREE LINE
- BENCHMARK
- IRON PIPE
- IRON ROD
- CONTROL POINT
- UTILITY POLE & GUY
- SOIL BORING
- LIGHT POLE
- PEDESTAL
- STREET SIGN
- MAILBOX
- FLAGPOLE
- TREE - DECIDUOUS
- TREE - CONIFEROUS
- TREE TO BE REMOVED

UTILITIES

GAS:
N/A

ELECTRIC:
LAKE COUNTRY POWER

TELEPHONE / FIBER / CATV:
PAUL BUNYAN COMMUNICATIONS

SEWER & WATER:
N/A

WARNING
LOCATION OF UNDERGROUND UTILITIES
TO BE VERIFIED BY CONTRACTOR
GOPHER STATE ONE CALL
CALL BEFORE DIGGING,
1-800-252-1166
REQUIRED BY LAW

NOTE:
UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO CONSTRUCTION.

			NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS		.	09/27/2019	SWPPP REVISIONS	AKB
	DESIGNED BY: AKB		.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
	CHECKED BY: EC		.	.	.	.

PLOT DATE: Friday, January 31, 2020 1:30:41 PM, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Title Sheet.dwg

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11/19/2019 Date
56425 License No.
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ANDREW K BARNEBEY

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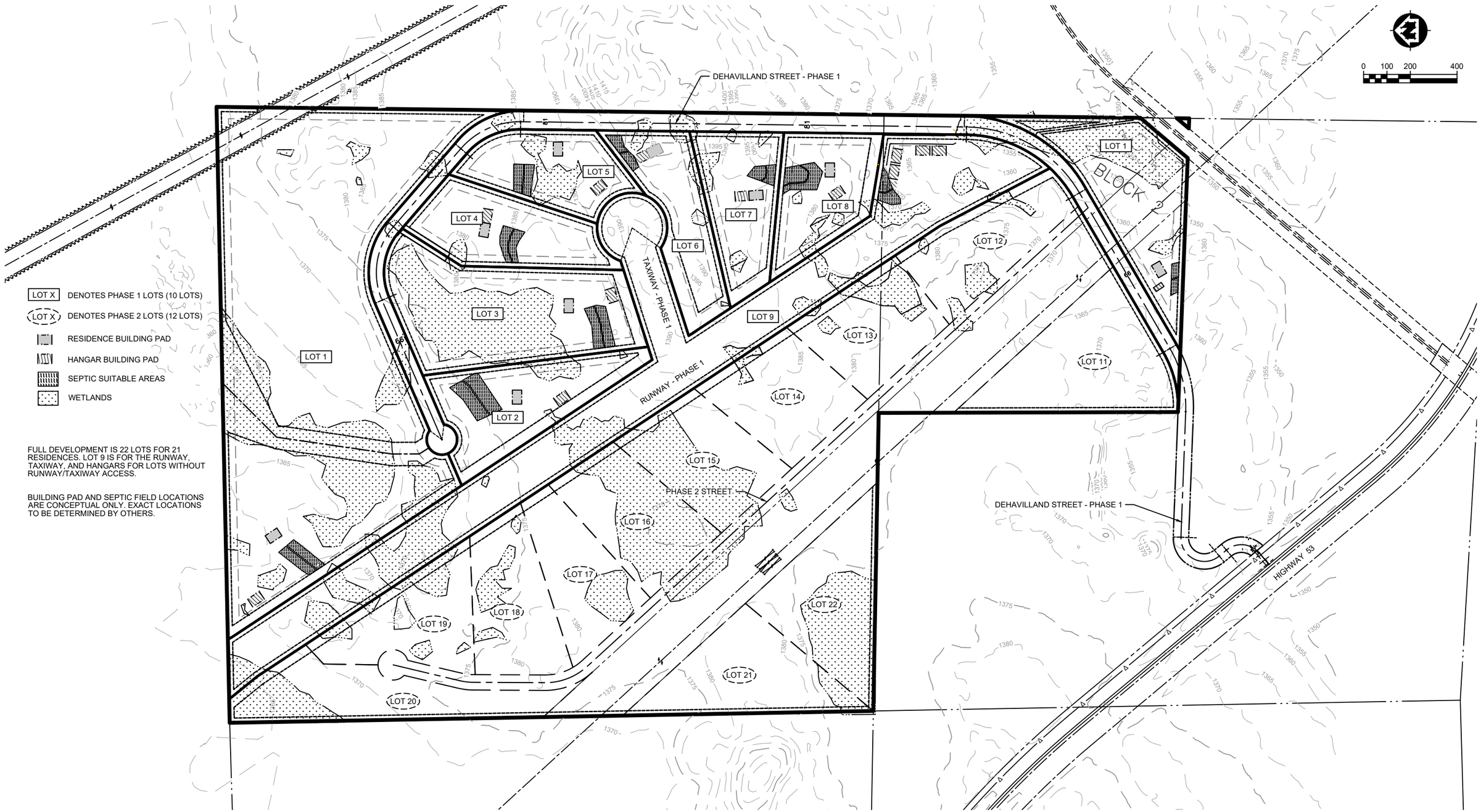
SUPERIOR AERO ESTATES
NICK CLATTENBURG
GRAND LAKE TOWNSHIP, MN

TITLE SHEET

PROJECT NO. 17764001
SHEET G1



PROJECT NO.:	17764001	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	JUNE 2019	DRAWN BY: JAS	.	09/27/2019	SWPPP REVISIONS	AKB
F.B. :	.	CHECKED BY: EC	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
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PLOT DATE: Thursday, April 4, 2019 10:10:08 AM, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Phasing Plan.dwg

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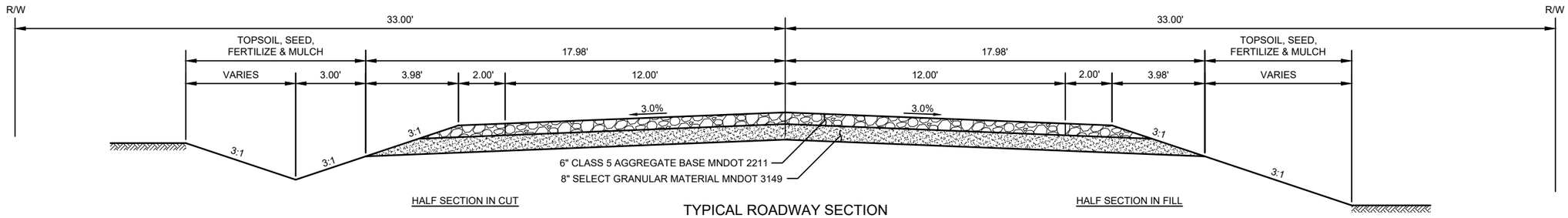
NICK CLATTENBURG
GRAND LAKE TOWNSHIP, MN

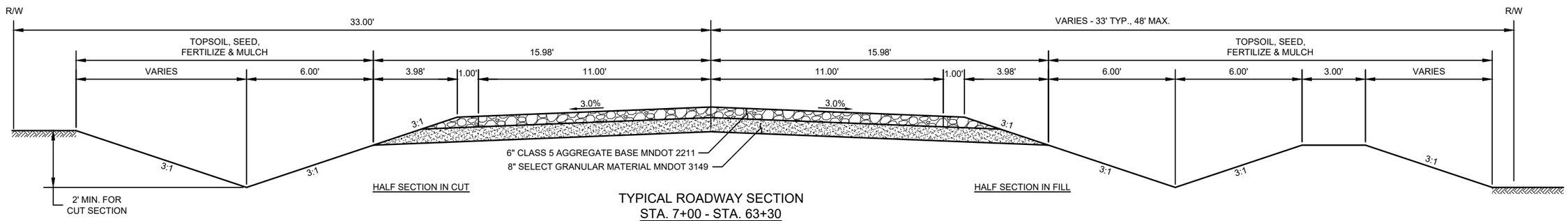
PHASING PLAN

FILE NO. 17764001

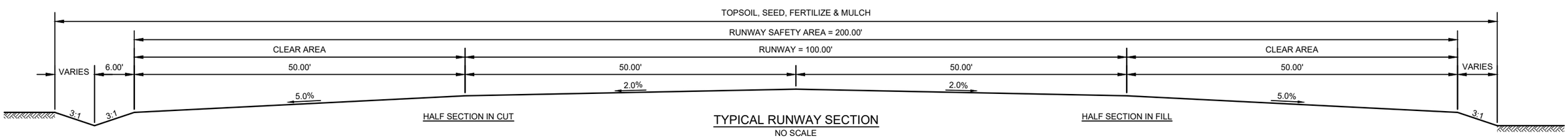
SHEET G2



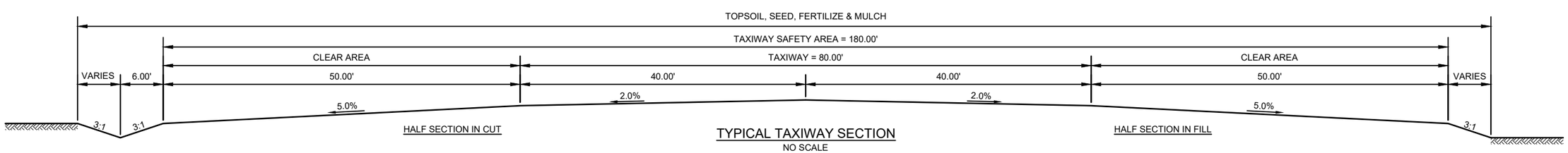
TYPICAL ROADWAY SECTION
STA. 1+00 - STA. 6+50
NO SCALE



TYPICAL ROADWAY SECTION
STA. 7+00 - STA. 63+30
NO SCALE



TYPICAL RUNWAY SECTION
NO SCALE



TYPICAL TAXIWAY SECTION
NO SCALE

ALL AIRPORT, RUNWAY AND TAXIWAY DESIGN BY OTHERS. THESE DRAWINGS HAVE BEEN BASED ON DESIGN GUIDANCE PROVIDED BY THE DEVELOPER. MSA PROFESSIONAL SERVICES ASSUMES NO RESPONSIBILITY FOR THE AIRPORT DESIGN.

PROJECT NO.:	17764001	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	JUNE 2019	DRAWN BY: JAS	.	09/27/2019	SWPPP REVISIONS	AKB
F.B. :	.	CHECKED BY: EC	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
.	.	.	.	.	.	.

PLOT DATE: 1/30/20, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Typical Section.dwg

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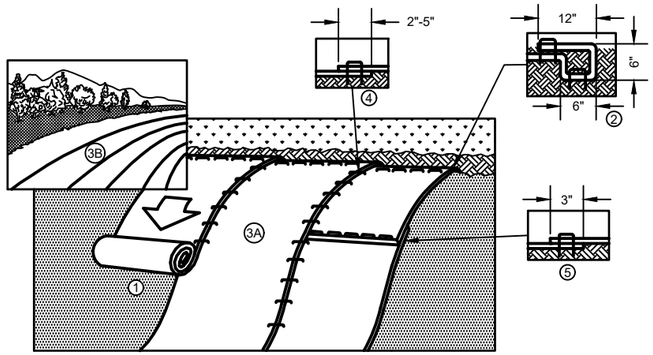
SUPERIOR AERO ESTATES
NICK CLATTENBURG
GRAND LAKE TOWNSHIP, MN

TYPICAL SECTIONS

FILE NO. 17764001

SHEET G3

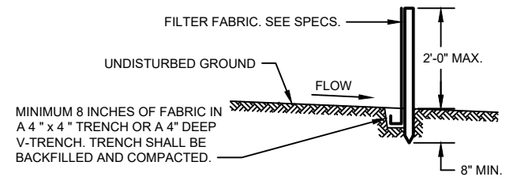


1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5 CM-12.5 CM) OVERLAP DEPENDING ON BLANKET TYPE.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE BLANKET WIDTH.

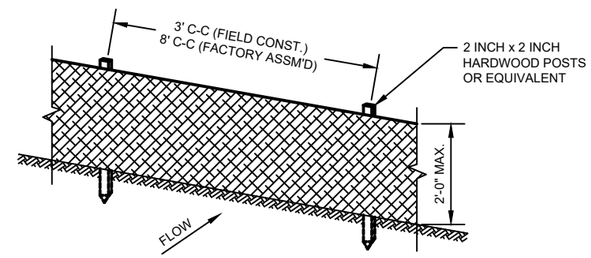
NOTE:

*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

EROSION CONTROL BLANKET SLOPE INSTALLATION
NO SCALE



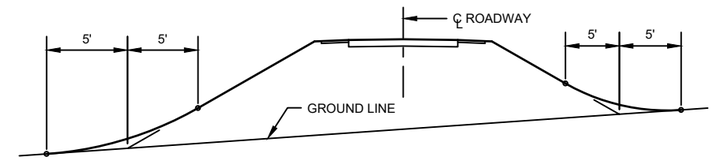
SECTION



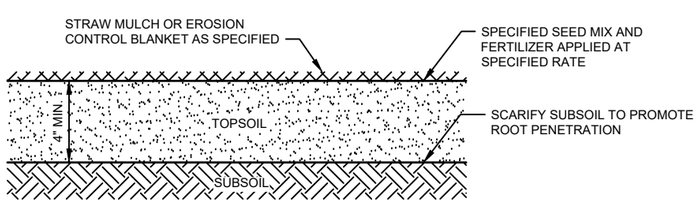
PERSPECTIVE VIEW

GENERAL NOTES:
1. ENDS OF FENCE SHALL BE TURNED UPSLOPE 1 TO 2 FEET IN ELEVATION TO PREVENT FLANKING.
2. STAPLE FABRIC WITH 1/2 INCH (MINIMUM) STAPLES TO THE UPSLOPE SIDE OF THE POSTS.
3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.

TYPICAL SILT FENCE INSTALLATION AT SITE PERIMETER DETAIL
NO SCALE

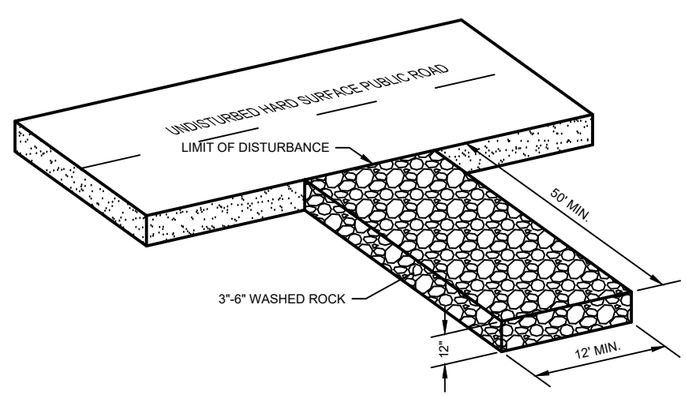


SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES
NO SCALE



NOTE: WHERE REQUIRED, PLANT HERBACEOUS PLUGS ACCORDING TO PLAN, OR AS DIRECTED BY ENGINEER.

TOPSOIL AND SEEDING DETAIL
NO SCALE



VEHICLE TRACKING PAD
NO SCALE

NOT USED

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	DESIGNED BY:	AKB	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
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SUPERIOR AERO ESTATES
NICK CLATTENBURG
GRAND LAKE TOWNSHIP, MN

DETAILS

PROJECT NO. 17764001
SHEET G4

SUPERELEVATION TABLE

Superelevation Region	Station	Description	Left Outside Shoulder	Left Outside Lane	Right Outside Shoulder	Right Outside Lane
1	0+71.61'	End Normal Shoulder	-3.00%	-3.00%	-3.00%	-3.00%
1	0+71.61'	End Normal Crown	-3.00%	-3.00%	-3.00%	-3.00%
1	1+20.36'	Level Crown	-3.00%	-3.00%	0.00%	0.00%
1	1+69.11'	Reverse Crown	-3.00%	-3.00%	3.00%	3.00%
1	1+85.36'	Begin Full Super	-4.00%	-4.00%	4.00%	4.00%
1	2+99.11'	End Full Super	-4.00%	-4.00%	4.00%	4.00%
2	3+82.06'	Begin Full Super	4.00%	4.00%	-4.00%	-4.00%
2	5+69.25'	End Full Super	4.00%	4.00%	-4.00%	-4.00%
2	5+85.50'	Reverse Crown	3.00%	3.00%	-3.00%	-3.00%
2	6+34.25'	Level Crown	0.00%	0.00%	-3.00%	-3.00%
2	6+83.00'	Begin Normal Crown	-3.00%	-3.00%	-3.00%	-3.00%
2	6+83.00'	Begin Normal Shoulder	-3.00%	-3.00%	-3.00%	-3.00%
3	10+32.71'	End Normal Shoulder	-3.00%	-3.00%	-3.00%	-3.00%
3	10+32.71'	End Normal Crown	-3.00%	-3.00%	-3.00%	-3.00%
3	10+87.42'	Level Crown	-3.00%	-3.00%	0.00%	0.00%
3	11+42.12'	Reverse Crown	-3.00%	-3.00%	3.00%	3.00%
3	11+49.42'	Begin Full Super	-3.40%	-3.40%	3.40%	3.40%
3	13+90.56'	End Full Super	-3.40%	-3.40%	3.40%	3.40%
3	13+97.86'	Reverse Crown	-3.00%	-3.00%	3.00%	3.00%
3	14+52.56'	Level Crown	-3.00%	-3.00%	0.00%	0.00%
3	15+07.27'	Begin Normal Crown	-3.00%	-3.00%	-3.00%	-3.00%
3	15+07.27'	Begin Normal Shoulder	-3.00%	-3.00%	-3.00%	-3.00%
4	20+85.95'	End Normal Shoulder	-3.00%	-3.00%	-3.00%	-3.00%
4	20+85.95'	End Normal Crown	-3.00%	-3.00%	-3.00%	-3.00%
4	21+40.65'	Level Crown	-3.00%	-3.00%	0.00%	0.00%
4	21+95.36'	Reverse Crown	-3.00%	-3.00%	3.00%	3.00%
4	22+02.65'	Begin Full Super	-3.40%	-3.40%	3.40%	3.40%
4	27+46.66'	End Full Super	-3.40%	-3.40%	3.40%	3.40%
4	27+53.96'	Reverse Crown	-3.00%	-3.00%	3.00%	3.00%
4	28+08.66'	Level Crown	-3.00%	-3.00%	0.00%	0.00%
4	28+63.37'	Begin Normal Crown	-3.00%	-3.00%	-3.00%	-3.00%
4	28+63.37'	Begin Normal Shoulder	-3.00%	-3.00%	-3.00%	-3.00%
5	45+71.93'	End Normal Shoulder	-3.00%	-3.00%	-3.00%	-3.00%
5	45+71.93'	End Normal Crown	-3.00%	-3.00%	-3.00%	-3.00%
5	46+26.68'	Level Crown	-3.00%	-3.00%	0.00%	0.00%
5	46+81.43'	Reverse Crown	-3.00%	-3.00%	3.00%	3.00%
5	46+99.68'	Begin Full Super	-4.00%	-4.00%	4.00%	4.00%
5	49+40.86'	End Full Super	-4.00%	-4.00%	4.00%	4.00%
5	49+59.11'	Reverse Crown	-3.00%	-3.00%	3.00%	3.00%
5	50+13.86'	Level Crown	-3.00%	-3.00%	0.00%	0.00%
5	50+68.61'	Begin Normal Crown	-3.00%	-3.00%	-3.00%	-3.00%
5	50+68.61'	Begin Normal Shoulder	-3.00%	-3.00%	-3.00%	-3.00%
6	53+03.55'	End Normal Shoulder	-3.00%	-3.00%	-3.00%	-3.00%
6	53+03.55'	End Normal Crown	-3.00%	-3.00%	-3.00%	-3.00%
6	53+58.30'	Level Crown	-3.00%	-3.00%	0.00%	0.00%
6	54+13.05'	Reverse Crown	-3.00%	-3.00%	3.00%	3.00%
6	54+31.30'	Begin Full Super	-4.00%	-4.00%	4.00%	4.00%
6	57+18.13'	End Full Super	-4.00%	-4.00%	4.00%	4.00%
6	57+36.38'	Reverse Crown	-3.00%	-3.00%	3.00%	3.00%
6	57+91.13'	Level Crown	-3.00%	-3.00%	0.00%	0.00%
6	58+45.88'	Begin Normal Crown	-3.00%	-3.00%	-3.00%	-3.00%
6	58+45.88'	Begin Normal Shoulder	-3.00%	-3.00%	-3.00%	-3.00%

NOT USED

NOT USED

NOT USED

NOT USED

		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	09/27/2019	SWPPP REVISIONS	AKB
	DESIGNED BY: AKB	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
	CHECKED BY: EC			.	.

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SUPERIOR AERO ESTATES
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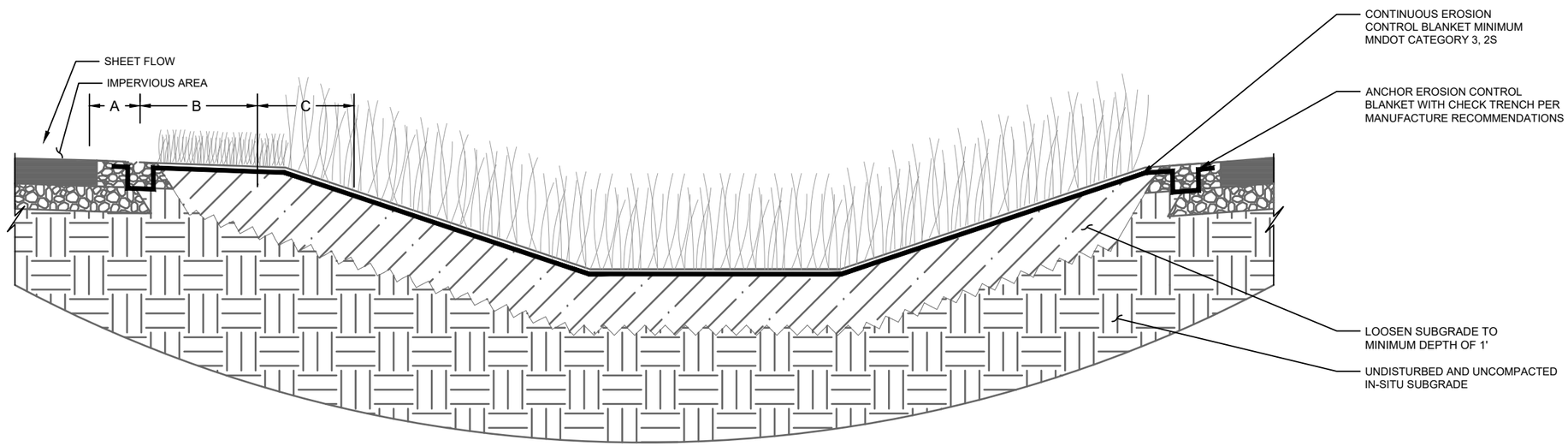
DETAILS

PROJECT NO. 17764001

SHEET G5



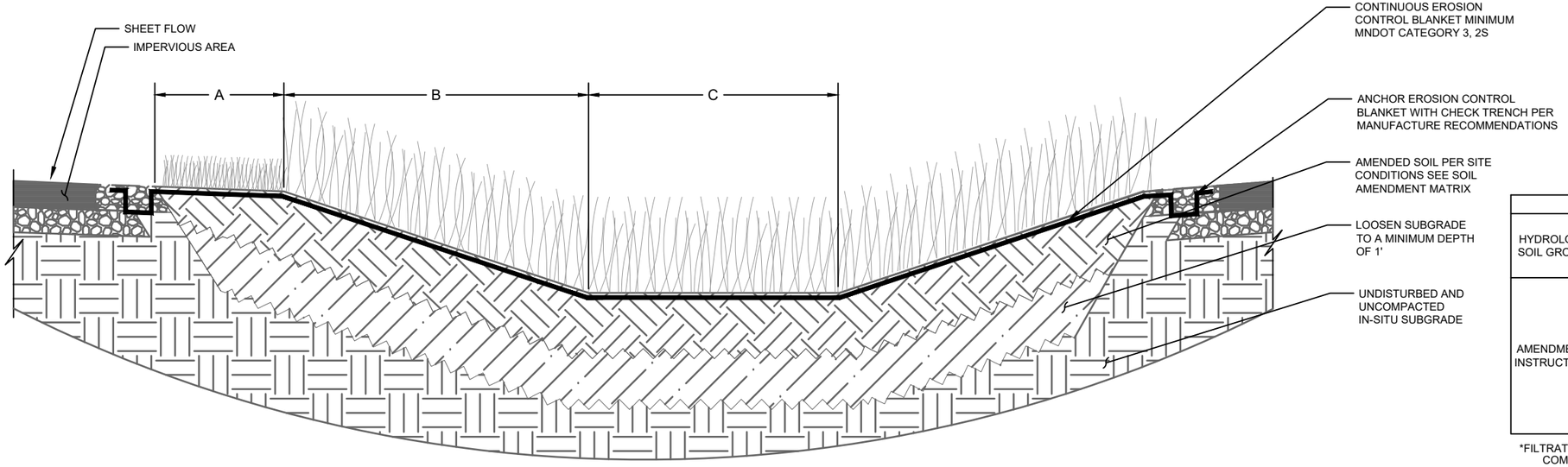
1 G6 TYPICAL GRASS CHANNEL SECTION WITH SOIL AMENDMENT

IN SITU SOILS: HYROLOGIC SOIL GROUP B
NO SCALE

TYPICAL GRASS CHANNEL NOTES:

- A FILTER STRIP OPTIONAL
- B SIDE SLOPE FLOWPATH LENGTH VARIES
- C CHANNEL WIDTH VAIRES

- SEED MIX SHALL BE SELECTED BASED ON SITE CONDITIONS INCLUDING SOIL TYPE, MOISTURE CONDITIONS, FLOW CONDITIONS, SUN VS. SHADE CONDITIONS, ASETHETICS, AND MAINTENACE REQUIREMENTS. MNDOT SPECIFICATION 3876 PROVIDES USEFUL CRITREA FOR SELECTING APPROPRIATE SEED MIXTURES.
- AVOID COMPACTION OF ALL IN-SITU SOILS AND IMPORTED SOILS UNLESS DIRECTED OTHERWISE. DO NOT LOOSEN SUBSOIL UNDER CHECK DAMS.
- IF POSSIBLE, RESTRICT FLOW OR DIVERT FLOW FROM SWALE UNTIL VEGETATION IS ESTALISHED



2 G6 TYPICAL GRASS CHANNEL SECTION WITH SOIL AMENDMENT

IN SITU SOILS: HYROLOGIC SOIL GROUP A, C, OR D
NO SCALE

TYPICAL GRASS CHANNEL WITH SOIL AMENDMENT NOTES:

- A FILTER STRIP OPTIONAL
- B SIDE SLOPE FLOWPATH LENGTH VARIES
- C CHANNEL WIDTH VAIRES

IN-SITU SOIL TYPE				
HYDROLGIC SOIL GROUP	A	B	C	D
AMENDMENT INSTRUCTION	PLACE 6" IMPORTED TOPSOIL**. MIX TOPSOIL INTO SUBSOIL BY LOOSENING SUBSOIL TO A MINIMUM DEPTH OF 12"	LOOSEN SUBSOIL TO A MINIMUM DEPTH OF 12"	PLACE 6" IMPORTED FILTRATION SOIL*. ON TOP OF SUBGRADE AND MIX INTO SUBSOIL BY LOOSENING SUBSOIL TO A MINIMUM DEPTH OF 12"	PLACE 6" IMPORTED FILTRATION SOIL*. ON TOP OF SUBGRADE AND MIX INTO SUBSOIL BY LOOSENING SUBSOIL TO A MINIMUM DEPTH OF 12"

*FILTRATION SOIL ID DEFINED AS 80% CLEAN SAND AND MIXED WITH 20% ORGANIC COMPOST BY VOLUME

**TOP SOIL SHALL BE SANDY LOAM, LOAMY SAND, OR LOAM TEXTURE PER USDA TEXTURAL TRIANGLE WITH LESS THAN 5% CLAY CONTENT

- DRAINTILE REQUIRED IF IN-SITU SOILS BELONG TO HYDROLOGIC SOIL GROUPS C OR D

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	DESIGNED BY:	AKB	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
	CHECKED BY:	EC	.	.	.	.

PLOT DATE: 1/30/2020 3:45 PM, P:\177700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Check Dam Details.dwg

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Andrew Barnebey
ANDREW K BARNEBEY

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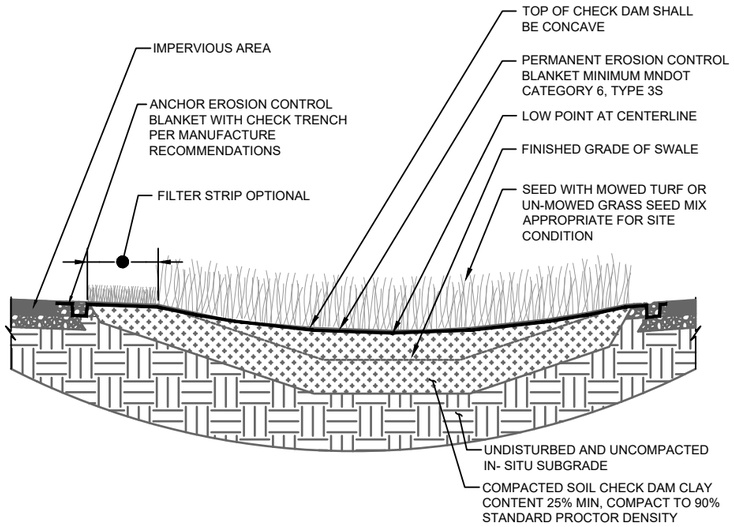
NICK CLATTENBURG
GRAND LAKE TOWNSHIP, MN

TYPICAL GRASS CHANNEL SECTIONS

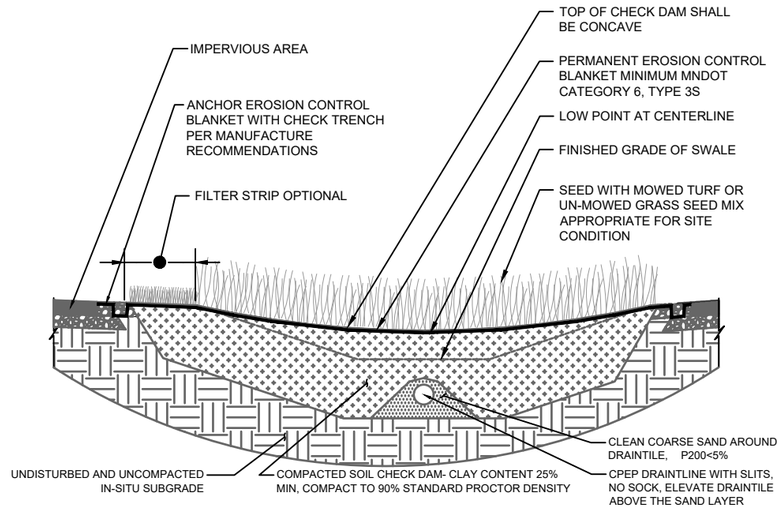
PROJECT NO. 17764001

SHEET G6



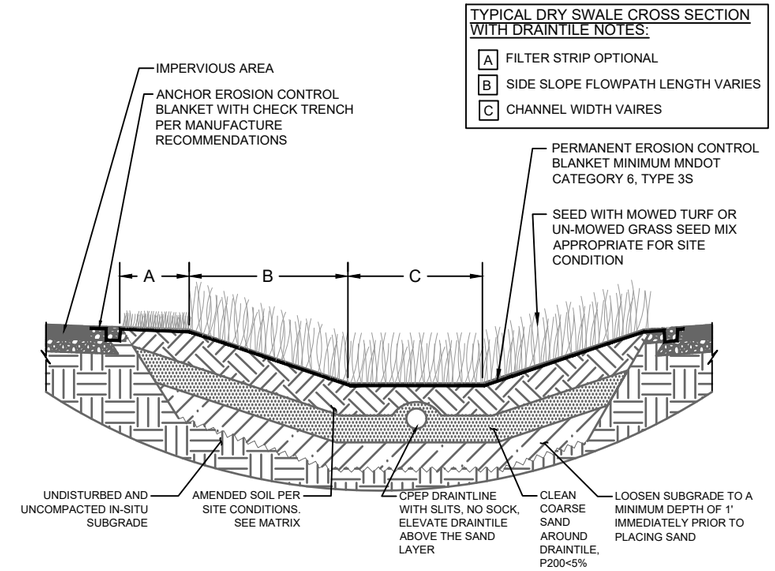
1 G7 TYPICAL DRY SWALE CHECK DAM CROSS SECTION

NO SCALE



2 G7 TYPICAL DRY SWALKE CHECK DAM CROSS SECTION WITH DRAINTILE

DRAINTILE REQUIRED IF IN-SITU SOILS BELONG TO HYDROLOGIC SOIL GROUPS C OR D.
NO SCALE



3 G7 TYPICAL DRY SWALE CROSS SECTION WITH DRAINTILE

DRAINTILE REQUIRED IF IN-SITU SOILS BELONG TO HYDROLOGIC SOIL GROUPS C OR D.
NO SCALE

NOT USED

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	DESIGNED BY:	AKB	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
	CHECKED BY:	EC	.	.	.	.

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11/19/2019 Date

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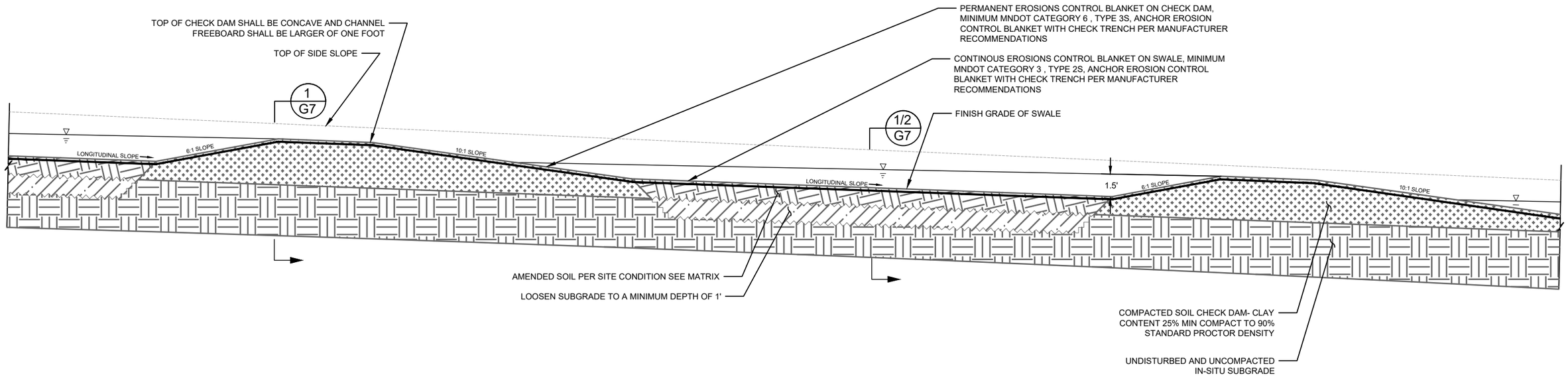
NICK CLATTENBURG
GRAND LAKE TOWNSHIP, MN

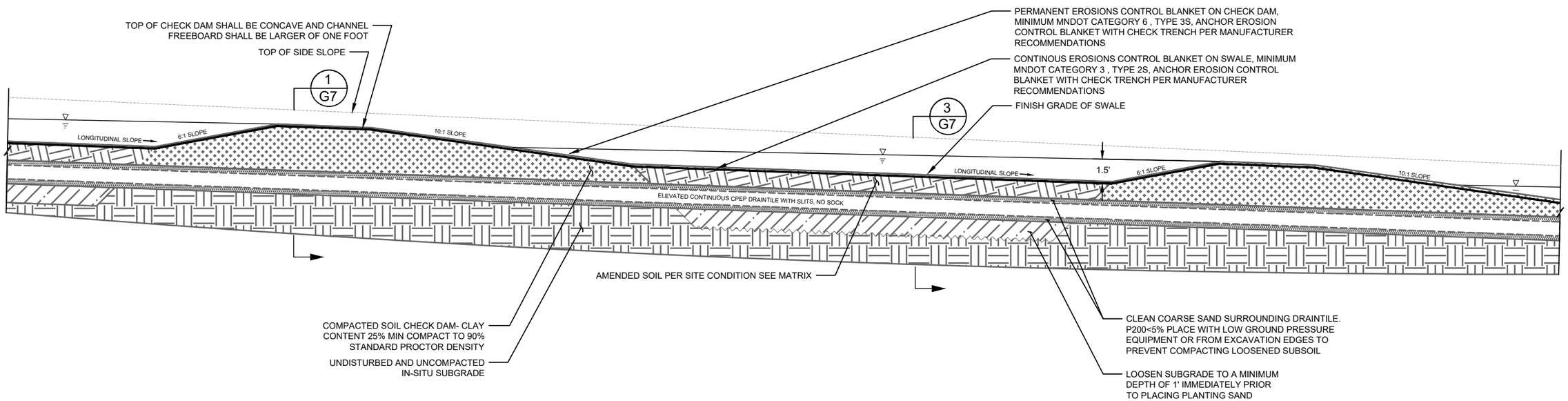
TYPICAL DRY SWALE

PROJECT NO. 17764001

SHEET G7



TYPICAL DRY SWALE PROFILE SECTION WITH CHECK DAMS
NO SCALE



TYPICAL DRY SWALE PROFILE SECTION WITH CHECK DAMS AND DRAINTILE
NO SCALE

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CHECK DAM PROFILES

PROJECT NO. 17764001

SHEET G8

NPDES STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CONSTRUCTION NOTES

THIS PROJECT INCLUDES THE DEVELOPMENT OF A 204.34 ACRE SITE IN GRAND LAKE TOWNSHIP, ST. LOUIS COUNTY, MINNESOTA, FOR USE AS A RESIDENTIAL AIR PARK SUBDIVISION. THE SITE CONTAINS WETLANDS IN SCATTERED LOCATIONS THROUGHOUT. SOME OF THE WETLANDS WILL BE INFILLED TO ALLOW FOR CONSTRUCTION OF THE ROAD, RUNWAY/ TAXIWAY AND DEVELOPMENT OF THE LOTS. THE MAJORITY OF THE WETLANDS WILL BE LEFT UNDISTURBED. SEE DRAWING SHEET G8 FOR MAPPING OF WETLANDS AND WETLANDS TO BE INFILLED.

THIS DEVELOPMENT WILL INCLUDE THE CONSTRUCTION OF A GRAVEL ROAD WITH ASSOCIATED DRAINAGE DITCHES AND CULVERTS, AND A TURF GRASS AIRPARK WITH RUNWAY AND TAXIWAY WITH ASSOCIATED DRAINAGE DITCHES AND CULVERT. INSTALLATION OF DRY UTILITIES (ELECTRIC AND TELECOMMUNICATION) WILL BE A PART OF THE PROJECT BUT ARE BEYOND THE SCOPE OF THIS DRAWING SET. WATER AND SEWER WILL BE IN THE FORM OF WELL AND SEPTIC TO BE PROVIDED BY THE HOMEOWNER/ BUILDER AS EACH LOT IS DEVELOPED.

IT IS ANTICIPATED THAT THIS PROJECT WILL RESULT IN AN OVERALL INCREASE OF IMPERVIOUS AREA OF 10.67 ACRES TOTAL. THIS INCLUDES INCREASE IN IMPERVIOUS DUE TO DEVELOPMENT OF INDIVIDUAL LOTS. THE SITE WILL MAINTAIN EXISTING DRAINAGE PATTERNS AND GENERALLY DRAINS TO TWO LOCATIONS ON THE SOUTH AND SOUTH EAST PORTION OF THE SITE IN ADDITION TO A LOCATION AT THE NORTH EAST CORNER OF THE SITE AND AN AREA AT THE NORTH CENTER PART OF THE SITE.

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AREA HYDROLOGIST:
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kim.boland@state.mn.us

PROJECT OWNER:
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NICK CLATTENBURG, OWNER
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nick.clattenburg@gmail.com

ST. LOUIS COUNTY SOIL AND WATER CONSERVATION DISTRICT:
215 N. 1ST AVE. E., #301
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info@southstlouisswcd.org

TIMING OF BMP INSTALLATION

THE EROSION AND SEDIMENTATION CONTROL BMPS SHALL BE INSTALLED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND CAPTURE SEDIMENT ON SITE, AND SHALL MEET THE NPDES PERMIT PART IV CONSTRUCTION ACTIVITY REQUIREMENTS.

1. TEMPORARY PERIMETER CONTROL BMPs WILL BE INSTALLED BEFORE ANY UP GRADIENT SOIL DISTURBANCE OCCURS.
2. PERMANENT AND TEMPORARY SEDIMENT TRAPS AND BASINS (IF APPLICABLE) WILL BE CONSTRUCTED BEFORE ANY CONVEYANCE OR DEWATERING OCCURS.
3. TOPSOIL AND TEMPORARY EROSION CONTROL BMPs SHALL BE PLACED WITHIN 3 DAYS OF COMPLETION OF EMBANKMENT.
4. PERMITTEES MUST STABILIZE THE NORMAL WETTED PERIMETER OF THE LAST 200 LINEAR FEET OF TEMPORARILY OR PERMANENT DRAINAGE DITCHES OR SWALES THAT DRAIN WATER FROM THE SITE WITHIN 24 HOURS AFTER CONNECTING TO A SURFACE WATER OR PROPERTY EDGE. PERMITTEES MUST COMPLETE STABILIZATION OF REMAINING PORTIONS OF TEMPORARY OR PERMANENT DITCHES OR SWALES WITHIN 14 CALENDAR DAYS AFTER CONNECTING TO A SURFACE WATER OR PROPERTY EDGE AND CONSTRUCTION IN THAT PORTION OF THE DITCH TEMPORARILY OR PERMANENTLY CEASES. [MINN. R. 7090]
5. PLACEMENT OF RIPRAP SHALL BE COMPLETED WITHIN 24 HOURS OF SHORELINE DISTURBANCE OR CULVERT PLACEMENTS AND DONE IN ONE CONTINUOUS OPERATION.
6. ONCE CONSTRUCTION ACTIVITY CEASES FOR 3 DAYS OR MORE IN AN AREA, THAT AREA WILL BE STABILIZED WITH TEMPORARY OR PERMANENT BMPs FOR EROSION.

CALCULATIONS

TOTAL DISTURBED AREA = 46.80 ACRES
ACRES POST CONSTRUCTION IMPERVIOUS AREA = 10.67 ACRES
EXISTING IMPERVIOUS AREA = 0.00 ACRES
IMPERVIOUS NET = 10.67 ACRES

1. CONSTRUCTION SHALL BE GOVERNED BY THE APPLICABLE DEMOLITION PERMITS AND MN/DOT SPECIFICATIONS (WHERE APPLICABLE).
2. THE CONTRACTOR SHALL KEEP WRITTEN INSPECTION AND MAINTENANCE LOGS (INCLUDING ALL CLEAN OUT AND CORRECTIVE ACTIONS) IN ACCORDANCE WITH THIS SWPPP AND ALL PERMITS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION AND MAINTENANCE OF THE EROSION AND SEDIMENT CONTROL BMPS BEFORE AND DURING CONSTRUCTION.
4. ALL MATERIAL SHALL BE MAINTAINED IN STOCKPILE AREAS, PROTECTED AS NOTED. NO ADDITIONAL IMPERVIOUS AREA SHALL BE CREATED THROUGH THE PROPOSED ACTION.

CONSTRUCTION PRACTICES TO MINIMIZE STORM WATER CONTAMINATION

TO PREVENT STORM WATER CONTAMINATION FROM OCCURRING, THE FOLLOWING BMPS WILL BE IMPLEMENTED:

1. ALL AREAS THAT ARE ROUGH GRADED MUST BE KEPT IN A SMOOTH CONDITION TO ALLOW SHEET FLOW OF STORM WATER WHEREVER PRACTICAL AND ALWAYS READY FOR SURFACE APPLICATION OF DEGRADABLE OR NON-DEGRADABLE BLANKETS, MULCH, OR OTHER PROTECTIVE COVERS.
2. A STABILIZED CONSTRUCTION ENTRANCE/EXIT WILL BE CONSTRUCTED TO REDUCE VEHICLE TRACKING OF SEDIMENTS OFF THE PROJECT SITE.
3. ALL SOLID WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER OR OTHER APPROVED CONTAINMENT METHOD AT THE END OF EACH DAY. ANY ALTERNATIVE TO A METAL DUMPSTER MUST BE SUBMITTED IN WRITING FOR APPROVAL BY THE PROJECT ENGINEER. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY TO FUNCTION AS INTENDED FOR DEBRIS COLLECTION. NO CONSTRUCTION MATERIALS WILL BE BURIED ON-SITE. THE CONTRACTOR'S EROSION CONTROL SUPERVISOR WILL INSTRUCT ALL PERSONNEL REGARDING THE CORRECT PROCEDURE FOR DISPOSAL.
4. RECYCLABLE MATERIALS MUST BE SEPARATED ON-SITE AND SEGREGATED IN DESIGNATED CONTAINERS.
5. A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR WILL COLLECT ALL SANITARY WASTE FROM THE PORTABLE UNITS AT A RATE NECESSARY TO MAINTAIN DESIGNED FUNCTION.
6. ALL VEHICLES ON SITE WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTATIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE.
7. FERTILIZERS WILL BE STORED IN A COVERED SHED AND PARTIALLY USED BAGS WILL BE TRANSFERRED TO A SEALABLE BIN TO REDUCE THE CHANCE OF SPILLAGE.
8. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS, WHICH ARE CLEARLY LABELED.
9. SPILL KITS WILL BE INCLUDED WITH ALL FUELING SOURCES AND MAINTENANCE ACTIVITIES. SECONDARY CONTAINMENT MEASURES WILL BE INSTALLED AND MAINTAINED BY THE CONTRACTOR.
10. ANY ASPHALT SUBSTANCES USED ON SITE WILL BE APPLIED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
11. ALL PAINT CONTAINERS AND CURING COMPOUNDS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM WATER SYSTEM BUT WILL BE PROPERLY DISPOSED OF ACCORDING TO MANUFACTURER'S INSTRUCTION.
12. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEAN-UP SHALL BE READILY AVAILABLE AND BE KEPT IN AN ENCLOSED TRAILER OR SHED ON SITE. EQUIPMENT WILL INCLUDE, BUT NOT LIMITED TO, BROOMS, MOPS, DUST PANS, RAGS, GLOVES, GOGGLES, ABSORBENT (KITTY LITTER, OIL ABSORBENT BOOMS AND DIAPERS) AND BUCKETS.
13. ALL SPILLS WILL BE CONTAINED AND CLEANED UP IMMEDIATELY UPON DISCOVERY. SPILLS LARGE ENOUGH TO REACH THE STORM WATER CONVEYANCE SYSTEM WILL BE REPORTED TO THE MPCA DUTY OFFICER AT 1-800-422-0798.
14. CONCRETE TRUCKS WILL NOT BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ON THE SITE UNLESS DONE IN AN ENGINEERED CONTAINMENT SYSTEM. THE ENGINEERED SYSTEM MUST INCLUDE SITE DRAWINGS FOR THE PROJECT FILE AND WRITTEN ASSURANCE THAT THE SYSTEM WILL WORK AS DESIGNED AND LEAVE NO DISCHARGE OF CONCRETE OR CONCRETE RESIDUE POTENTIAL TO ENTER WATERS OF THE STATE.
15. FORM RELEASE OIL USED FOR CONCRETE WORK MUST BE APPLIED OVER A PALLET CONTAINING ABSORBENT TO COLLECT EXCESS LIQUID. THE ABSORBENT MATERIAL WILL BE REPLACED AND PROPERLY DISPOSED OF WHEN SATURATED.
16. DISCHARGES FROM BASIN DEWATERING OPERATIONS THAT ARE TURBID OR SEDIMENT LADEN SHALL BE DISCHARGED TO TEMPORARY SEDIMENT BASINS CONSTRUCTED ON THE SITE TO PROVIDE TREATMENT PRIOR TO DISCHARGE TO A WATER OF THE STATE.
17. BMPS MUST BE ESTABLISHED ON ALL DOWNGRADIENT PERIMETERS OF THE SITE AND DOWNGRADIENT AREAS OF THE SITE THAT DRAIN TO ANY SURFACE WATER, INCLUDING CURB AND GUTTER SYSTEMS. PERMITTEES MUST LOCATE SEDIMENT CONTROL PRACTICES UPGRADIENT OF ANY BUFFER ZONES. PERMITTEES MUST INSTALL SEDIMENT CONTROL PRACTICES BEFORE ANY UPGRADIENT LAND-DISTURBING ACTIVITIES BEGIN AND MUST KEEP THE SEDIMENT CONTROL PRACTICES IN PLACE UNTIL THEY ESTABLISH PERMANENT COVER.

TMDL IMPLEMENTATION PLANS CONTAINING STORM WATER REQUIREMENTS

NO TMDL IMPLEMENTATION PLANS CURRENTLY EXIST FOR THE RECEIVING WATERS ON THIS PROJECT.

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	SILT FENCE	INLET PROTECTION
PROJECT SITE	10,005 LF	NA

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

DESCRIPTION	TITLE	LOCATION
SUMMARY OF PERVIOUS AND IMPERVIOUS	SWPPP NOTES	SHEET G6
DIRECTION OF FLOW/DRAINAGE AREA	NA	NA
RECEIVING SURFACE WATERS	SWPPP NOTES	SHEET G6
NO DISTURBANCE AREAS AND AREAS OF PHASED CONSTRUCTION	PHASING PLAN	G2
DRAINAGE STRUCTURES	PLAN & PROFILE	SHEETS R1-R5, RW1, RW2
DRAINAGE TABULATIONS	SWPPP NOTES	SHEET G6
EROSION CONTROL TABULATIONS	SWPPP NOTES	SHEET G6
EROSION CONTROL SHEETS	EROSION CONTROL PLAN	SHEETS ST1, ST2, ST3
EROSION CONTROL DETAILS	DETAILS	SHEETS G4 & G5
SEDIMENT CONTROL PRACTICES	SWPPP NOTES	SHEET G6
FINAL STABILIZATION	SWPPP NOTES	SHEET G6
SEDIMENT BASIN (POND) TABULATIONS	NA	NA
POND SHEETS (SEDIMENT BASINS)	NA	NA
LOCATIONS OF WETLANDS	WETLAND DISTURBANCE	SHEET G8

SWPPP IMPLEMENTATION CONTACTS

AGENCY	PERMIT	NAME	PHONE/E-MAIL
DEVELOPER/CONTRACOR, EROSION CONTROL SUPERVISORS & LONG TERM OPERATOR	NPDES	NICK CLATTENBERG	(913) 461-3007 nick.clattenberg@gmail.com
MPCA	NPDES	TBD	(218) 302-6632 james.dexter@state.mn.us
SOUTH ST. LOUIS COUNTY SOIL AND WATER CONSERVATION DISTRICT	N/A		(218)-723-4867
MnDNR WATERS AREA HYDROLOGIST	N/A	KIM BOLAND	(218) 735-3963 kim.boland@state.mn.us
CORPS OF ENGINEERS	N/A		651-290-5525
STATE DUTY OFFICER	N/A	MPCA	800-422-0798

EROSION CONTROL NOTES

1. MNDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION (2016 EDITION) SHALL APPLY.
   1.a. SUBMIT INITIAL EROSION CONTROL (EC) SCHEDULE AT OR BEFORE THE PRECONSTRUCTION CONFERENCE.
   1.b. SUBMIT EC SCHEDULE ALTERATIONS/ADJUSTMENTS WEEKLY THEREAFTER FOR ENGINEER'S APPROVAL.
2. THE CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL QUALITY CONTROL (WC) ON THIS PROJECT. CONTRACTOR SHALL PHASE/SEQUENCE THE PROJECT TO MINIMIZE EXPOSURE TO EROSION. CONTRACTOR SHALL PLACE OR OTHERWISE CONSTRUCT EROSION CONTROL AND SEDIMENT CONTAINMENT DEVICES TO MINIMIZE THE RUNOFF, TRACKING, AND SEDIMENT LOSS FROM DISTURBED AREAS OF THE PROJECT SITE.
3. DISTURBED SLOPES NOT ACTIVELY WORKED SHALL BE PROTECTED FROM SOIL EROSION WITH TEMPORARY OR PERMANENT COVER WITHIN 3 DAYS OF BEING WORKED. EROSION CONTROL BLANKET AND SOIL STAPLES SHALL BE USED.
4. AT MINIMUM, THE FOLLOWING CONTROLS WILL BE IMPLEMENTED AT THE CONSTRUCTION SITE:
   4.a. EROSION CONTROL BLANKETS SHALL BE USED AS INDICATED ON EROSION CONTROL DRAWINGS
   4.b. SILT FENCES SHALL BE USED IN CONJUNCTION WITH OTHER EROSION BMPS
   4.c. ROCK DITCH CHECKS OR APPROVED EQUAL ARE TO BE USED TO REDUCE DITCH VELOCITIES AND REDUCE EROSION
   4.d. STORM INLET AND OUTLET AREAS SHALL BE CONTINUOUSLY PROTECTED WITH MNDOT APPROVED DEVICES/METHODS
   4.e. STABILIZED CONSTRUCTION ENTRANCE, OR REUSABLE MUD MAT SHALL BE USED TO REDUCE SEDIMENT TRACKING
   4.f. PERMANENT VEGETATION WILL BE ESTABLISHED IMMEDIATELY AFTER TOPSOIL IS SPREAD
   4.g. CONTROL ALL SITE SOLID WASTE, DEBRIS, MATERIAL STORAGE AND CONCRETE WASHOUT ON SITE. NO MIGRATION OF SEDIMENT OFFSITE OR INTO DITCHES/STORM SYSTEMS PERMITTED
5. ALL SLOPES AND DITCHES SHALL BE STABILIZED PRIOR TO OPENING NEW CULVERTS INTO EXISTING DRAINAGE WAYS.
6. IF ANY STOCKPILE IS TO REMAIN IN PLACE FOR MORE THAN THREE DAYS.
7. WATER PUMPED OR OTHERWISE DISCHARGED FROM THE SITE DURING CONSTRUCTION DEWATERING SHALL BE IN ACCORDANCE WITH SPECIFICATIONS.
8. THE CONTRACTOR SHALL TAKE ALL POSSIBLE PRECAUTIONS TO PREVENT APPRECIABLE SOIL TRACKING ONTO ROADWAYS. APPRECIABLE SOIL, MUD, OR DEBRIS WASHED, TRACKED, OR DEPOSITED ONTO PAVED SURFACES SHALL BE REMOVED PRIOR TO THE END OF EACH WORK DAY.
9. STABILIZED CONSTRUCTION ENTRANCE(S) SHALL BE REMOVED AND AREA RESTORED AFTER GRADING IS COMPLETE.
10. THE CONTRACTOR QC PROGRAM SHALL ENSURE THAT A COMPETENT INDIVIDUAL SHALL INSPECT EROSION AND SEDIMENT CONTROL DEVICES WEEKLY AND AFTER EACH RAIN EVENT. ALL NONFUNCTIONAL DEVICES SHALL BE REPAIRED/REPLACED/CLEANED. MAINTAIN A WRITTEN LOG OF ALL WEEKLY INSPECTIONS AND RAIN EVENTS - INCLUDE THE CORRECTIVE ACTIONS THAT WERE TAKEN.
11. THE CONTRACTOR SHALL MAINTAIN THE CAPABILITY TO IMPLEMENT RAPID STABILIZATION METHOD 4 (MNDOT 2573.4) AT ALL TIMES. INCLUDES CAT III EROSION CONTROL BLANKET (ECB) [N. AMERICAN GREEN S150 OR APPROVED EQUAL] ALONG WITH SEED MIXTURE, FERTILIZER, AND SOIL STAPLES PER 2573-3. THE UPGRADIENT END OF EACH BLANKET STRIP SHALL BE BURIED AT LEAST 6 INCHES IN A VERTICAL CHECK SLOT. STAPLES SHALL BE PLACED AT SEAMS AND THROUGHOUT THE BLANKET AT A MAXIMUM SPACING IN ALL DIRECTIONS OF 2 FEET. PAYMENT ALLOWED SHALL BE PER CONTRACT BID PRICE OR IN ABSENCE OF CONTRACT BID PRICE IN ACCORDANCE WITH MNDOT SPECIFICATION 2575.5
12. COVER DEBRIS AND CRUSHING STOCKPILES. PROVIDE SILT FENCING AROUND PERIMETER OF STOCKPILE AREAS.
13. REPLACE TOPSOIL AND SEED ALL AREAS DISTURBED BY WORK.

TRAINING

TRAINING IS REQUIRED FOR ALL PERMITTED PROJECTS AFTER FEBRUARY 1, 2010. IT MUST BE PROVIDED BY ENTITIES W/ EXPERTISE IN EROSION PREVENTION, SEDIMENT CONTROL OR PERMANENT STORMWATER MANAGEMENT. TRAINING MUST BE FOCUSED ON THE INDIVIDUAL'S JOB DUTIES AS THEY RELATE TO PERMIT REQUIREMENTS (PART III.A.2).

INDIVIDUALS WHO MUST BE TRAINED INCLUDE:
A. INDIVIDUALS PREPARING THE SWPPP FOR THE PROJECT.

SWPPP DESIGNER:

NAME: ANDREW BARNEBEY, PE
TITLE: PROJECT ENGINEER
COMPANY: MSA PROFESSIONAL SERVICES, INC.
DATE OF TRAINING: APRIL 2019
TRAINING CERTIFICATION: DESIGN OF CONSTRUCTION SWPPP
EXPIRATION: 2022
TRAINING ENTITY: U. OF MINNESOTA, DEPT. OF BIOPRODUCTS AND BIOSYSTEMS ENGINEERING
INSTRUCTORS:JOHN CHAPMAN, TODD SMITH
PROFESSIONAL TRAINING HOURS: 12

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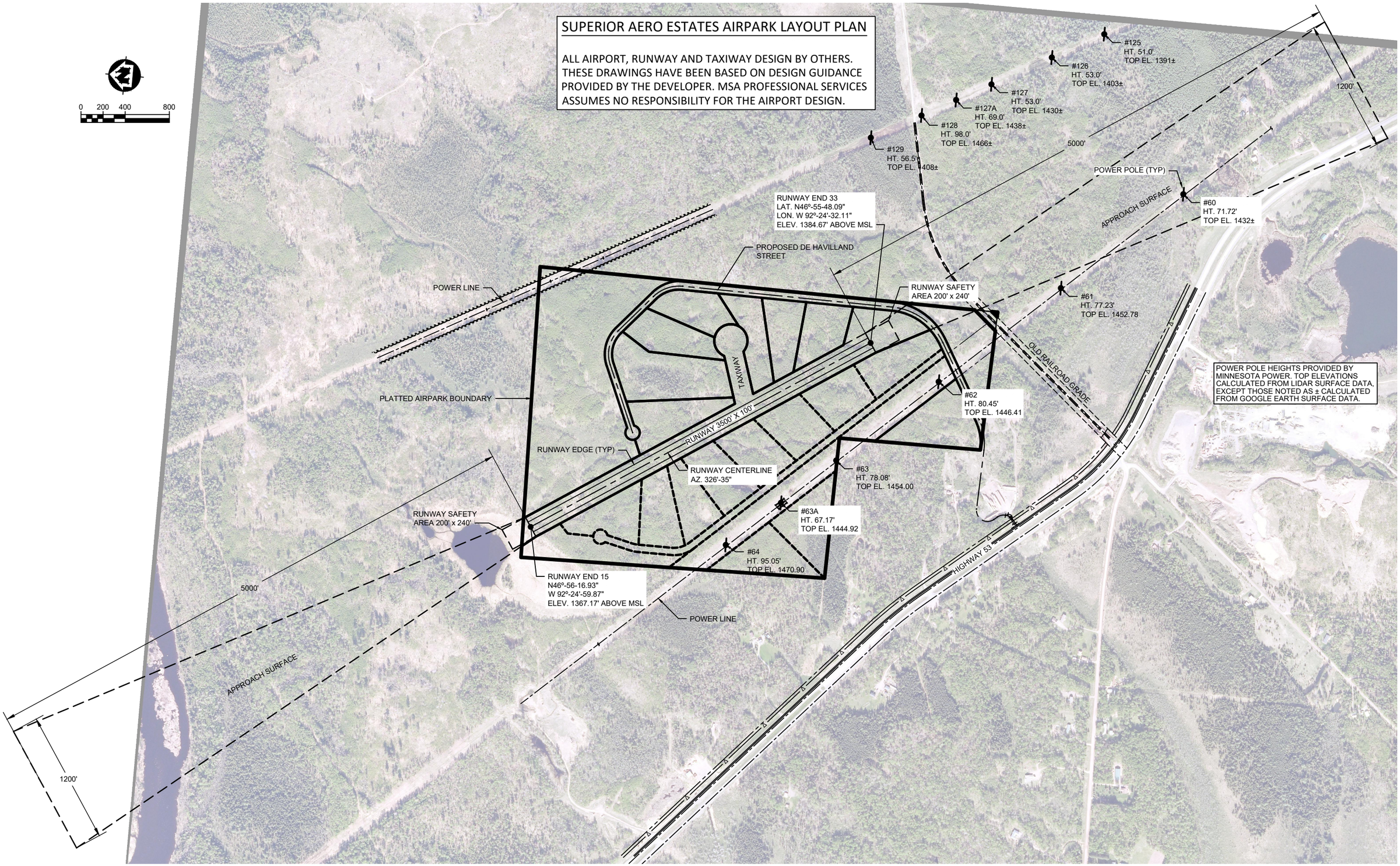
SWPPP NOTES

FILE NO. 17764001
SHEET G9



		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	-	09/27/2019	SWPPP REVISIONS	AKB
	DESIGNED BY: AKB	-	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
	CHECKED BY: EC	-			-

PLOT DATE: Thursday, January 30, 2020 3:47:28 PM, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Layout Plan.dwg

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11/19/2019 Date — 56425 License No.

Andrew Barnebey

ANDREW K BARNEBEY

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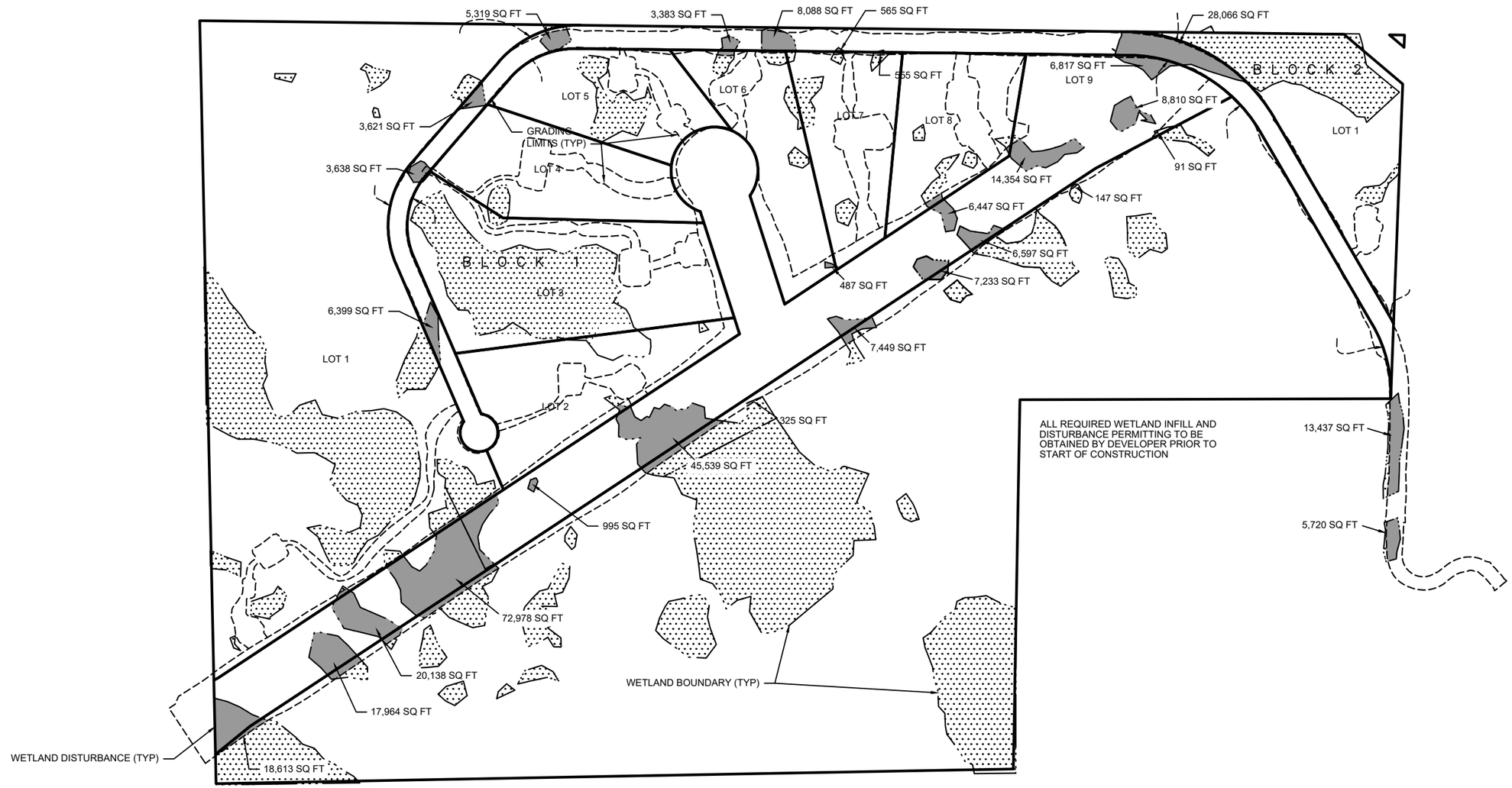
SUPERIOR AERO ESTATES
NICK CLATTENBURG
GRAND LAKE TOWNSHIP, MN

RUNWAY LAYOUT PLAN

PROJECT NO. 17764001

SHEET G10

WETLAND DISTURBANCE AREAS
ROAD: 78,791 SF (1.81 AC)
RUNWAY: 234,984 SF (5.39 AC)



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PROJECT DATE: JUNE 2019	DRAWN BY: JAS		.	09/27/2019	SWPPP REVISIONS	AKB
	DESIGNED BY: AKB		.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
	CHECKED BY: EC		.	.	.	.

PLOT DATE: Friday, January 31, 2020 1:30:56 PM, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Wetland Fill Areas.dwg

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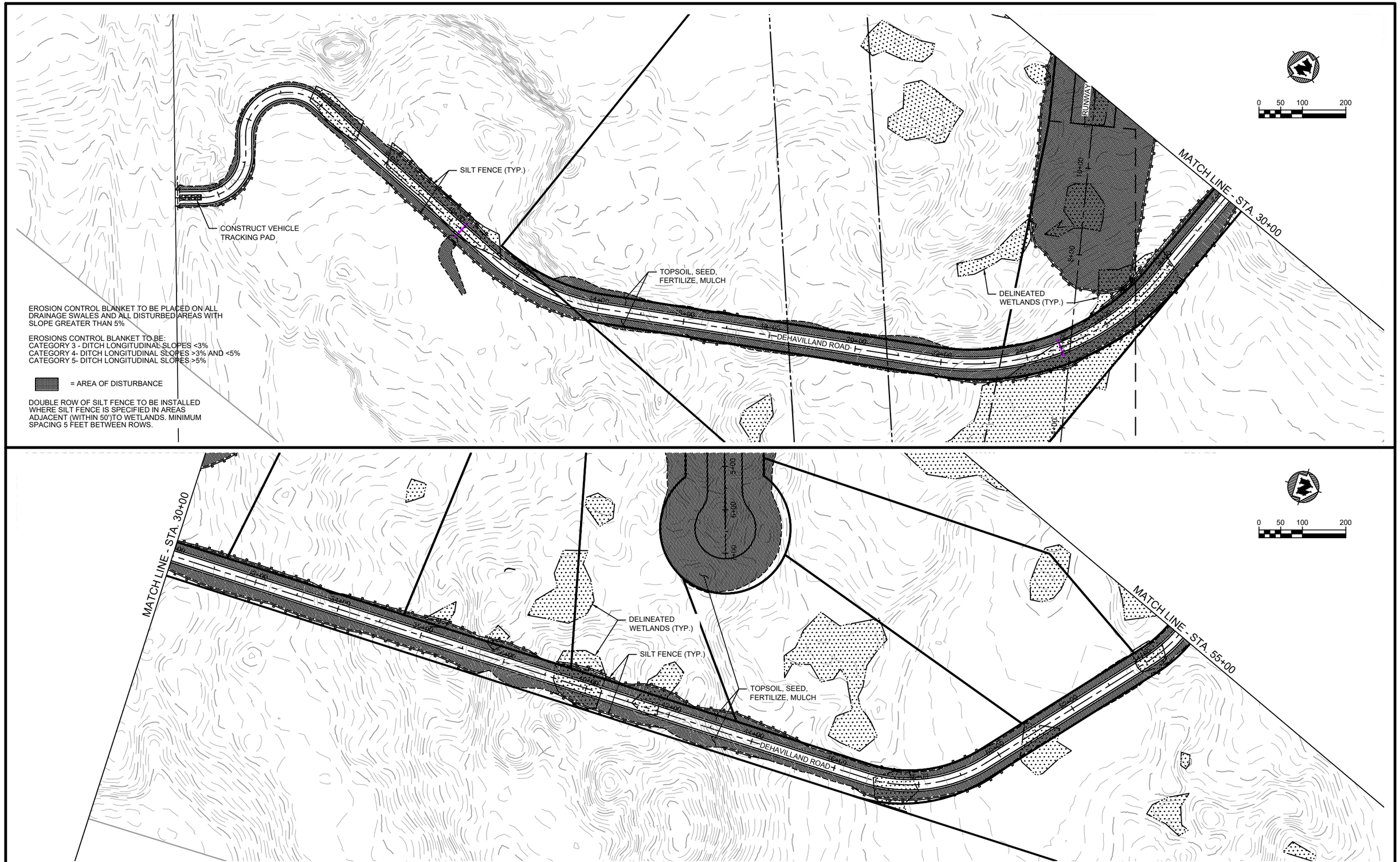
WETLAND DISTURBANCE

PROJECT NO. 17764001
SHEET G11



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PROJECT DATE: JUNE 2019	DRAWN BY:	JAS	.	09/27/2019	SWPPP REVISIONS	AKB
	DESIGNED BY:	AKB	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
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PLOT DATE: Thursday, January 30, 2020 4:20:53 PM, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Erosion Control Plan.dwg

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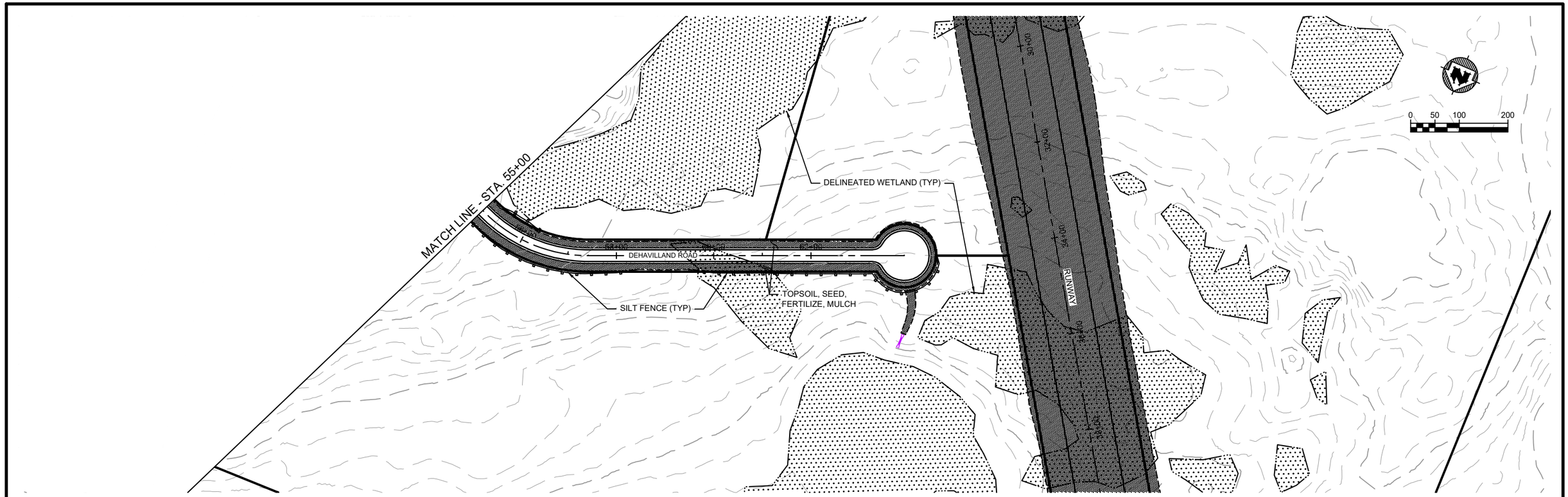
EROSION CONTROL PLAN

PROJECT NO. 17764001
SHEET ST1

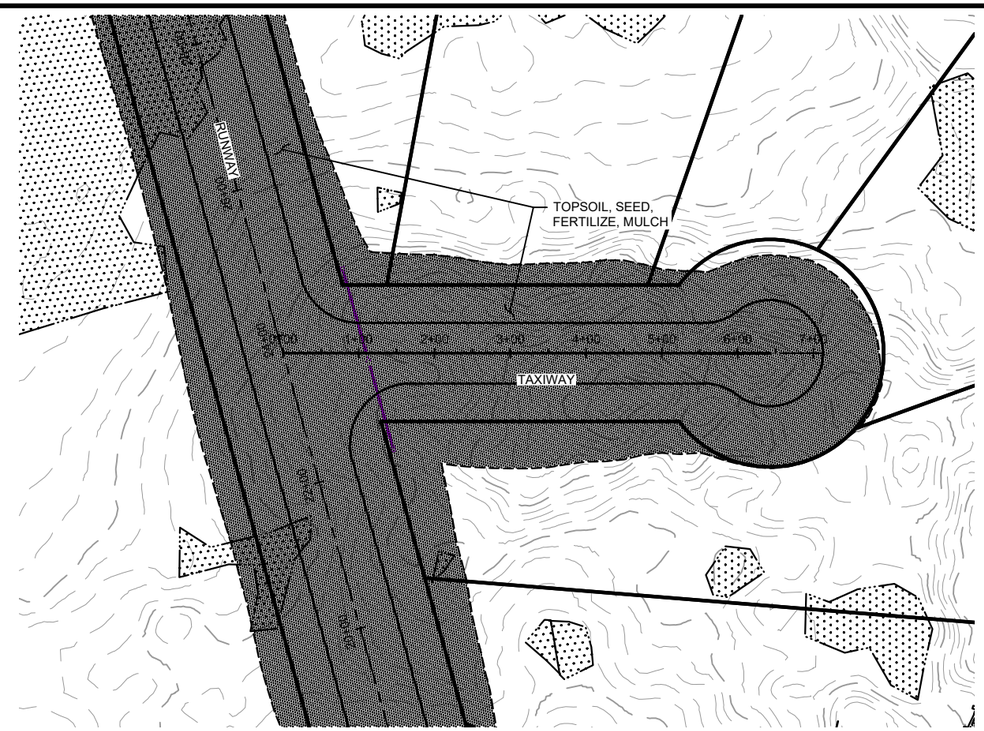


EROSION CONTROL BLANKET TO BE PLACED ON ALL DRAINAGE SWALES AND ALL DISTURBED AREAS WITH SLOPE GREATER THAN 5%

EROSIONS CONTROL BLANKET TO BE:
CATEGORY 3 - DITCH LONGITUDINAL SLOPES <3%
CATEGORY 4- DITCH LONGITUDINAL SLOPES >3% AND <5%
CATEGORY 5- DITCH LONGITUDINAL SLOPES >5%

= AREA OF DISTURBANCE

DOUBLE ROW OF SILT FENCE TO BE INSTALLED WHERE SILT FENCE IS SPECIFIED IN AREAS ADJACENT (WITHIN 50')TO WETLANDS. MINIMUM SPACING 5 FEET BETWEEN ROWS.



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PLOT DATE: Thursday, January 30, 2020 4:21:18 PM, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Erosion Control Plan.dwg

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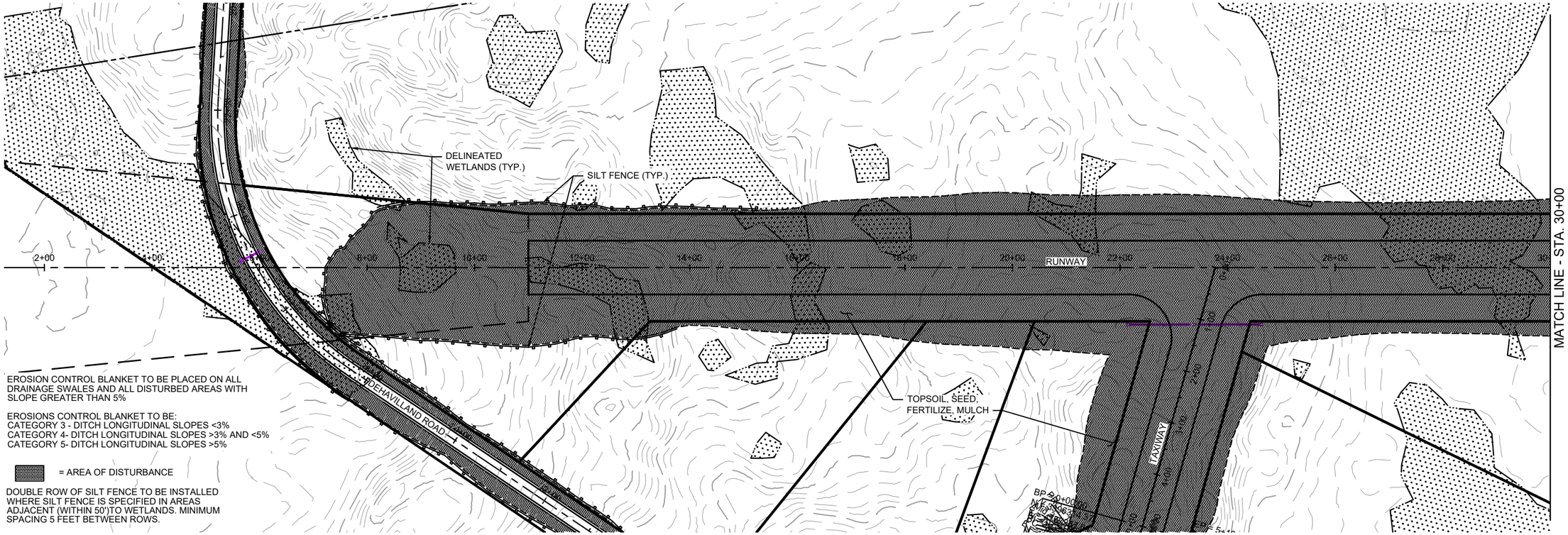
EROSION CONTROL PLAN

PROJECT NO. 17764001

SHEET ST2



EROSION CONTROL BLANKET TO BE PLACED ON ALL DRAINAGE SWALES AND ALL DISTURBED AREAS WITH SLOPE GREATER THAN 5%

EROSIONS CONTROL BLANKET TO BE:
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CATEGORY 4- DITCH LONGITUDINAL SLOPES >3% AND <5%
CATEGORY 5- DITCH LONGITUDINAL SLOPES >5%

= AREA OF DISTURBANCE

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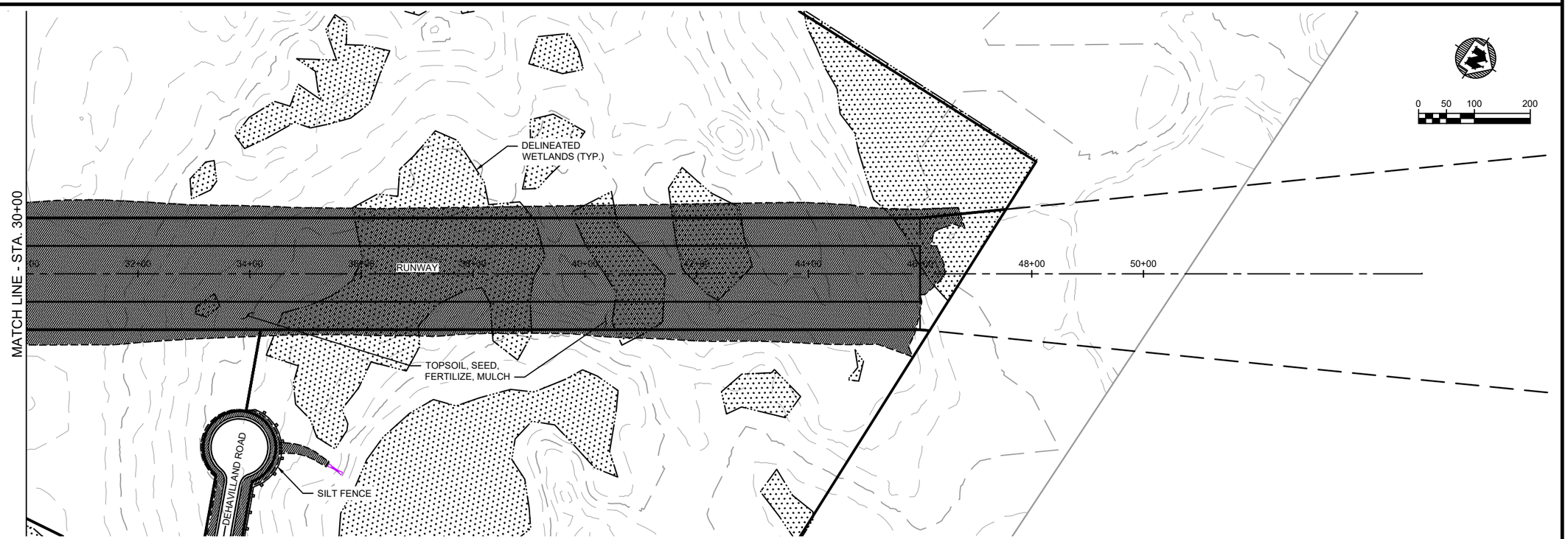

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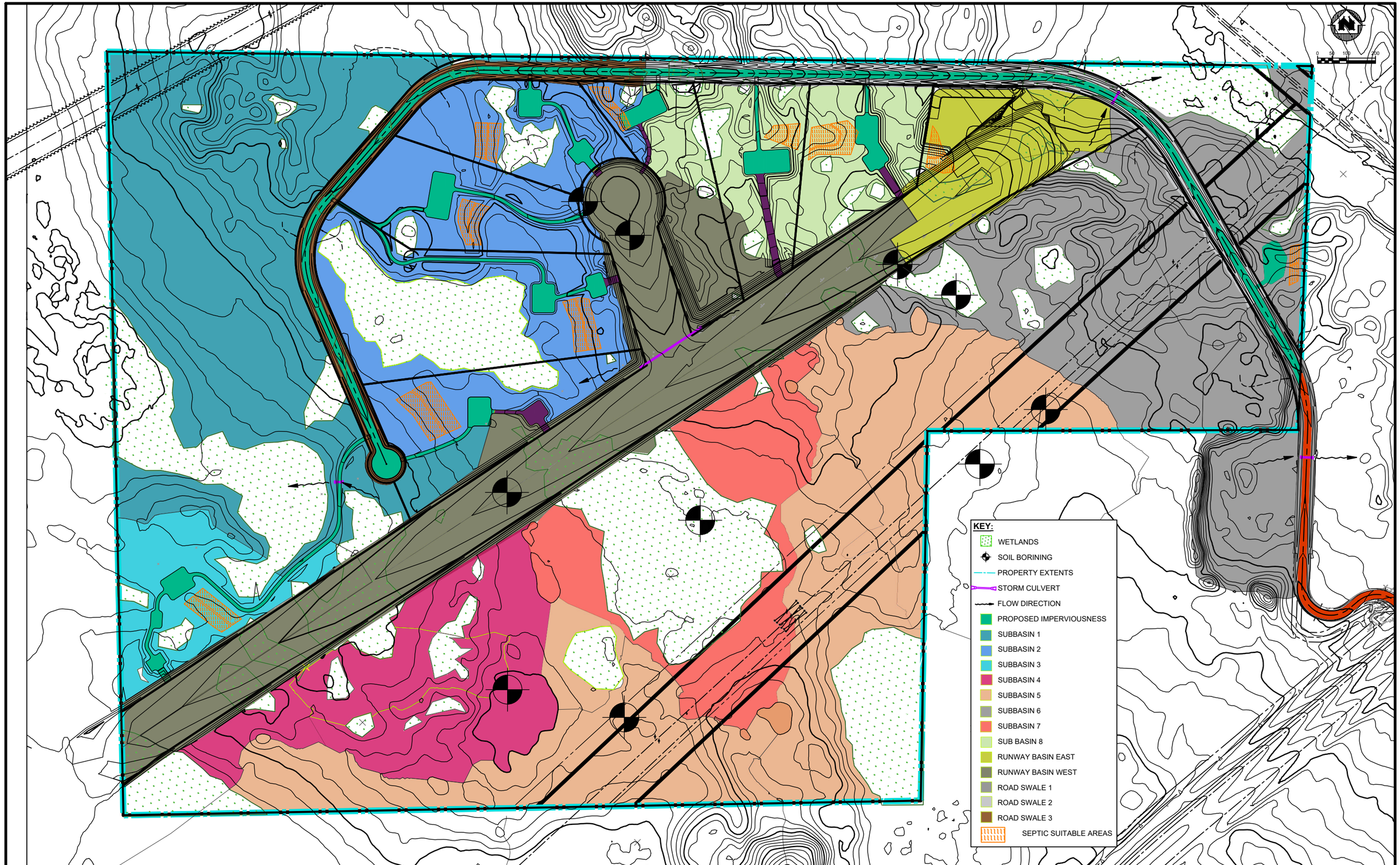
EROSION CONTROL PLAN

PROJECT NO. 17764001

SHEET ST3



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PLOT DATE: Thursday, January 30, 2020 7:35:51 PM, P:\17700s\17760s\17764\17764001\CADD\C3D\17764001 Overview drawing Drew_recover.dwg

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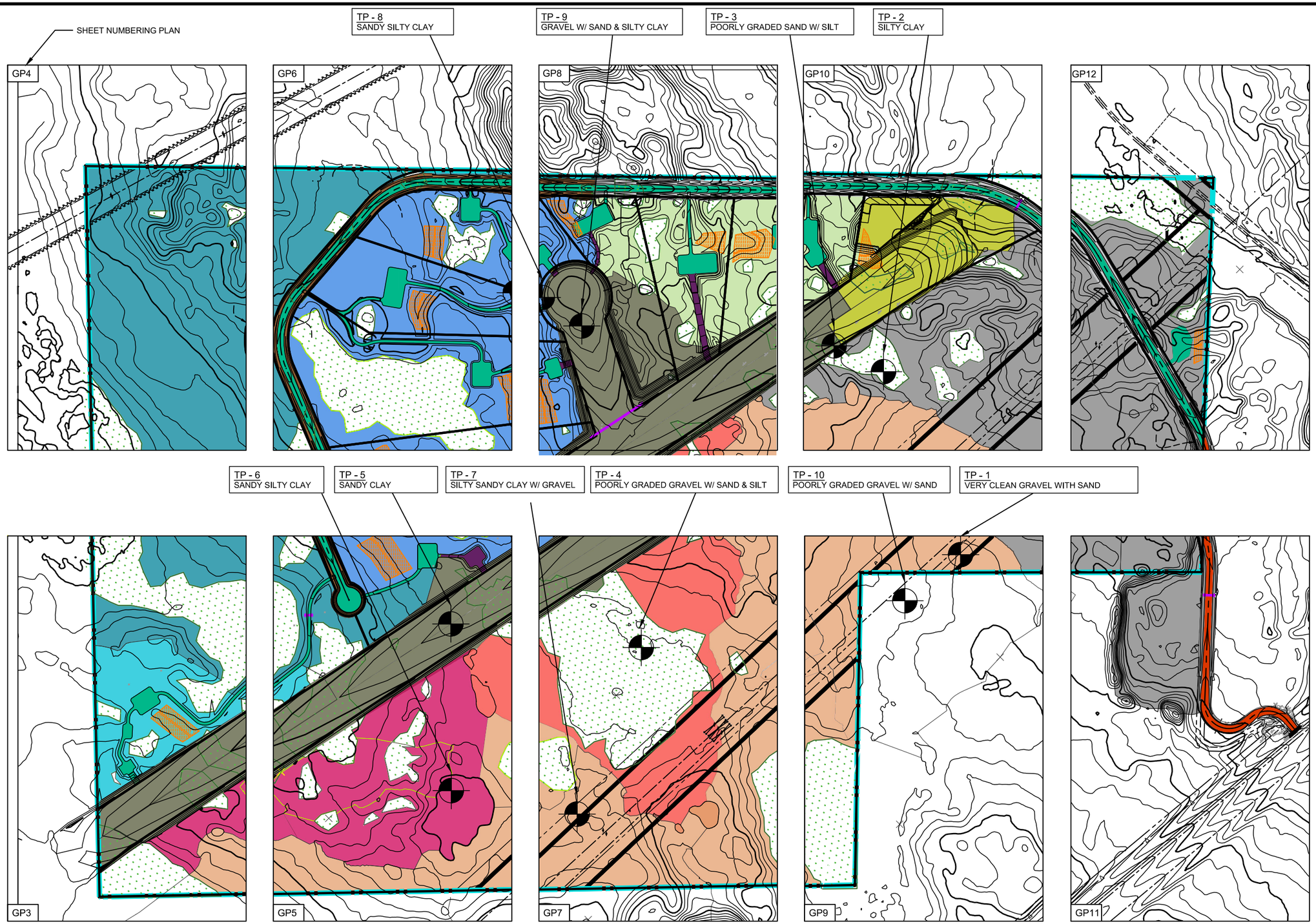
OVERALL GRADING PLAN

PROJECT NO. 17764001

SHEET GP1



KEY:

- WETLANDS
- SOIL BORINING
- PROPERTY EXTENTS
- STORM CULVERT
- FLOW DIRECTION
- PROPOSED IMPERVIOUSNESS
- SUBBASIN 1
- SUBBASIN 2
- SUBBASIN 3
- SUBBASIN 4
- SUBBASIN 5
- SUBBASIN 6
- SUBBASIN 7
- SUB BASIN 8
- RUNWAY BASIN EAST
- RUNWAY BASIN WEST
- ROAD SWALE 1
- ROAD SWALE 2
- ROAD SWALE 3
- SEPTIC SUITABLE AREAS

			NO.	DATE	REVISION	BY
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	DESIGNED BY:	AKB	-	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
	CHECKED BY:	EC	-	-	-	-

PLOT DATE: Thursday, January 30, 2020 7:36:24 PM, P:\17700s\17760s\17764\17764001\CADD\C3D\17764001 Overview drawing Drew_recover.dwg

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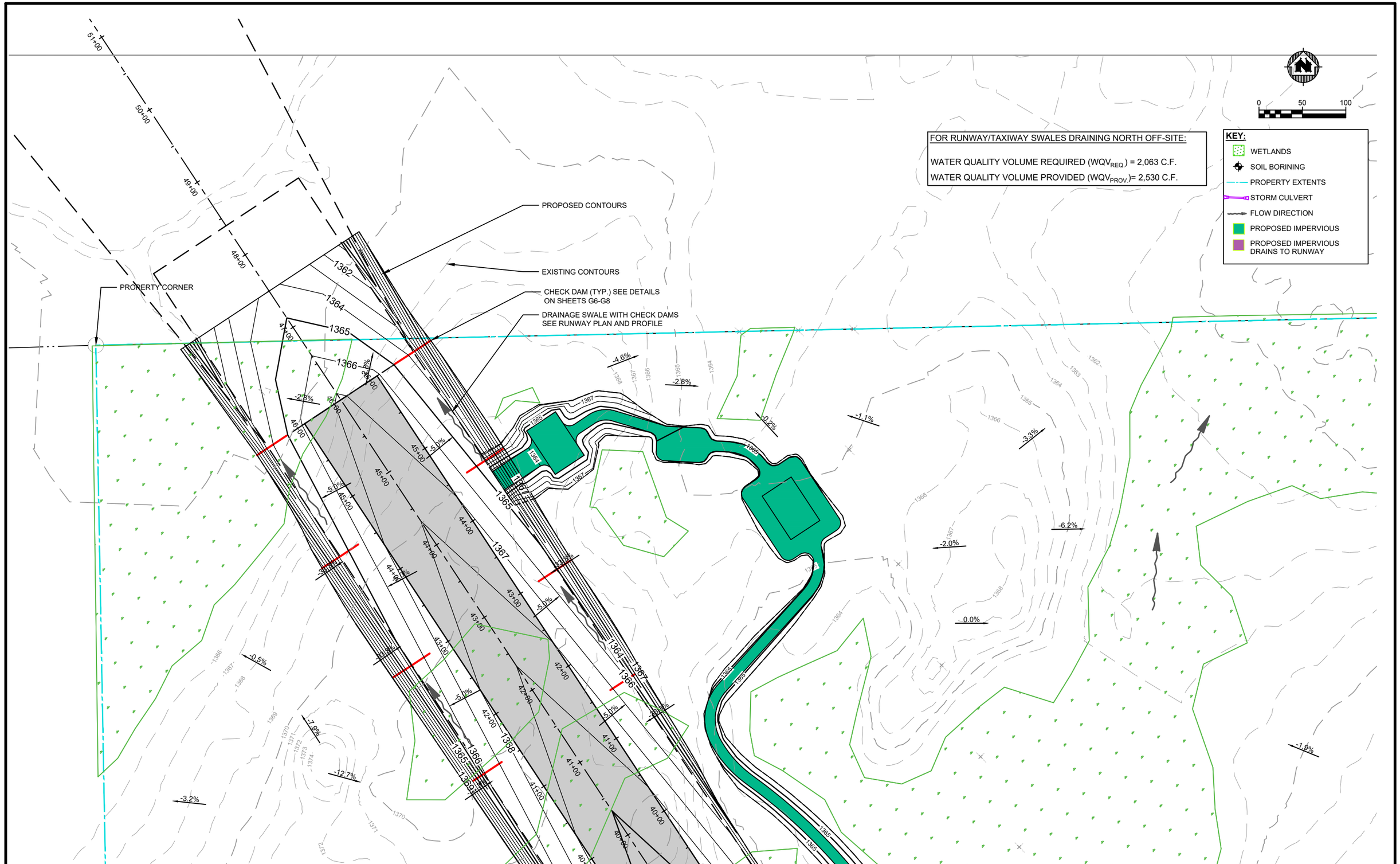
GRAND LAKE TOWNSHIP, MN

GRADING KEY PLAN

PROJECT NO. 17764001
SHEET GP2



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PLOT DATE: Thursday, January 30, 2020 7:36:42 PM, P:\17700s\17760s\17764\17764001\CADD\C3D\17764001 Grading and SWPPP DREW.dwg

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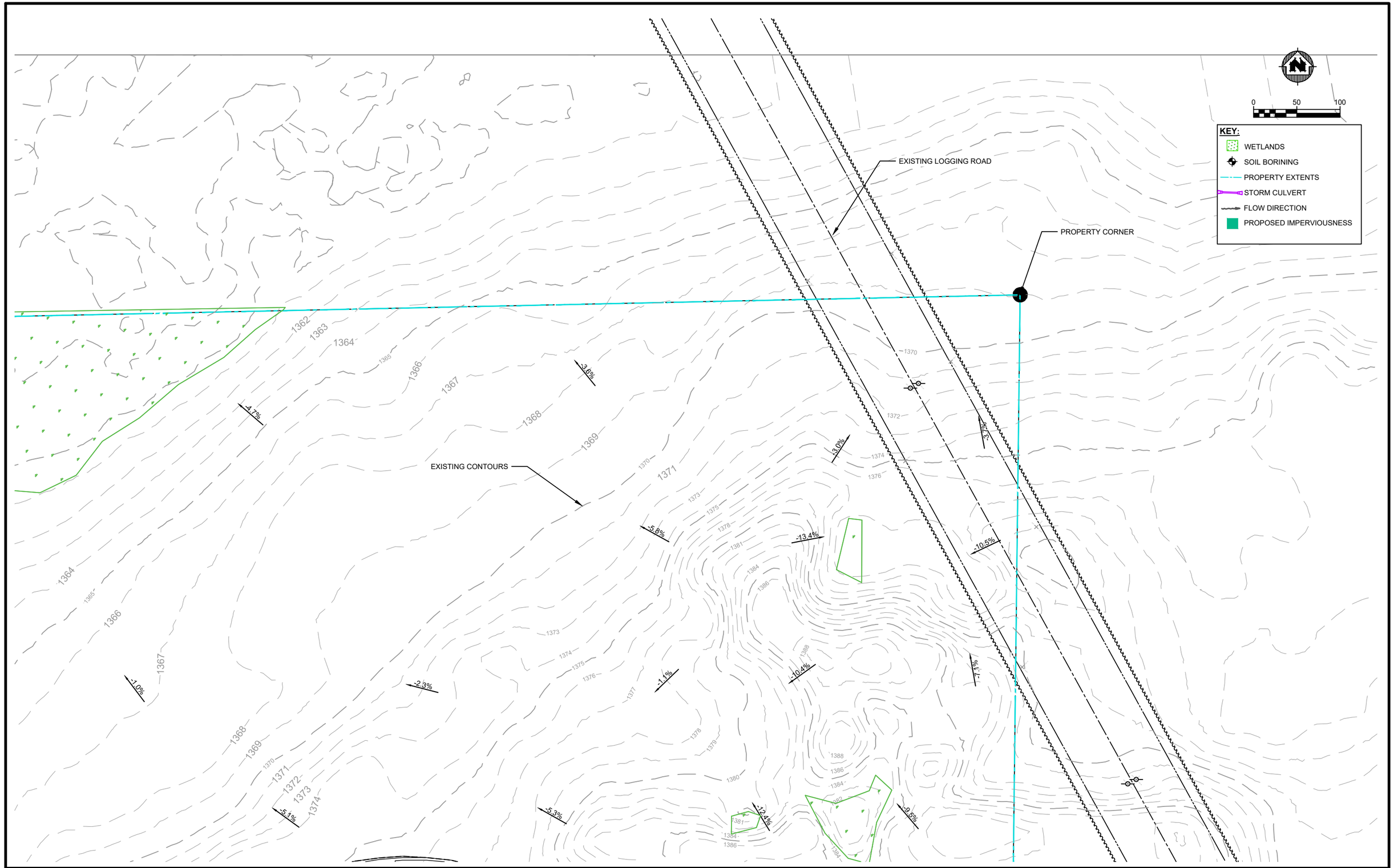
NICK CLATTENBURG
GRAND LAKE TOWNSHIP, MN

GRADING PLAN DETAIL

PROJECT NO. 17764001

SHEET GP3



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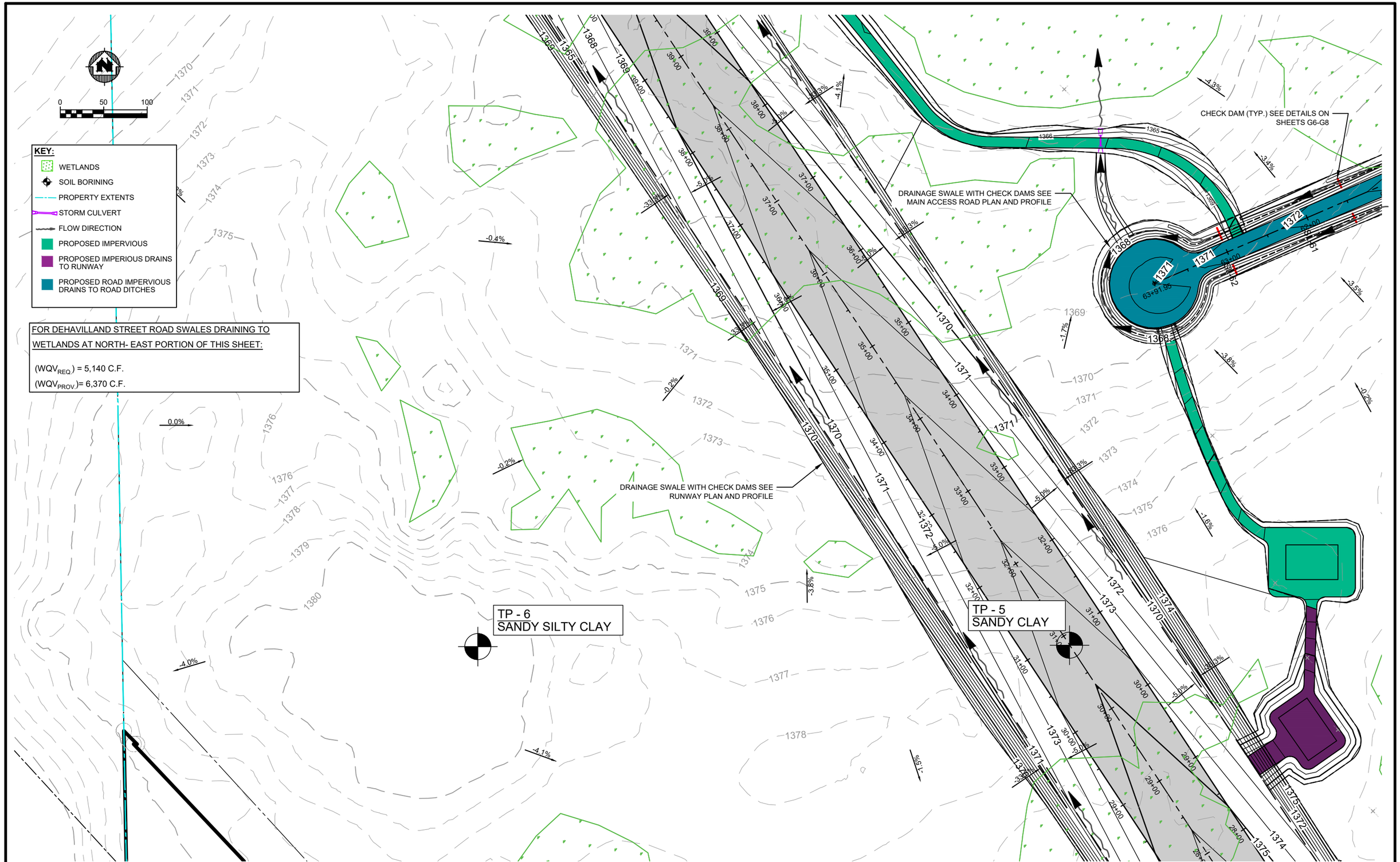
GRADING PLAN DETAIL

PROJECT NO.
17764001

SHEET
GP4



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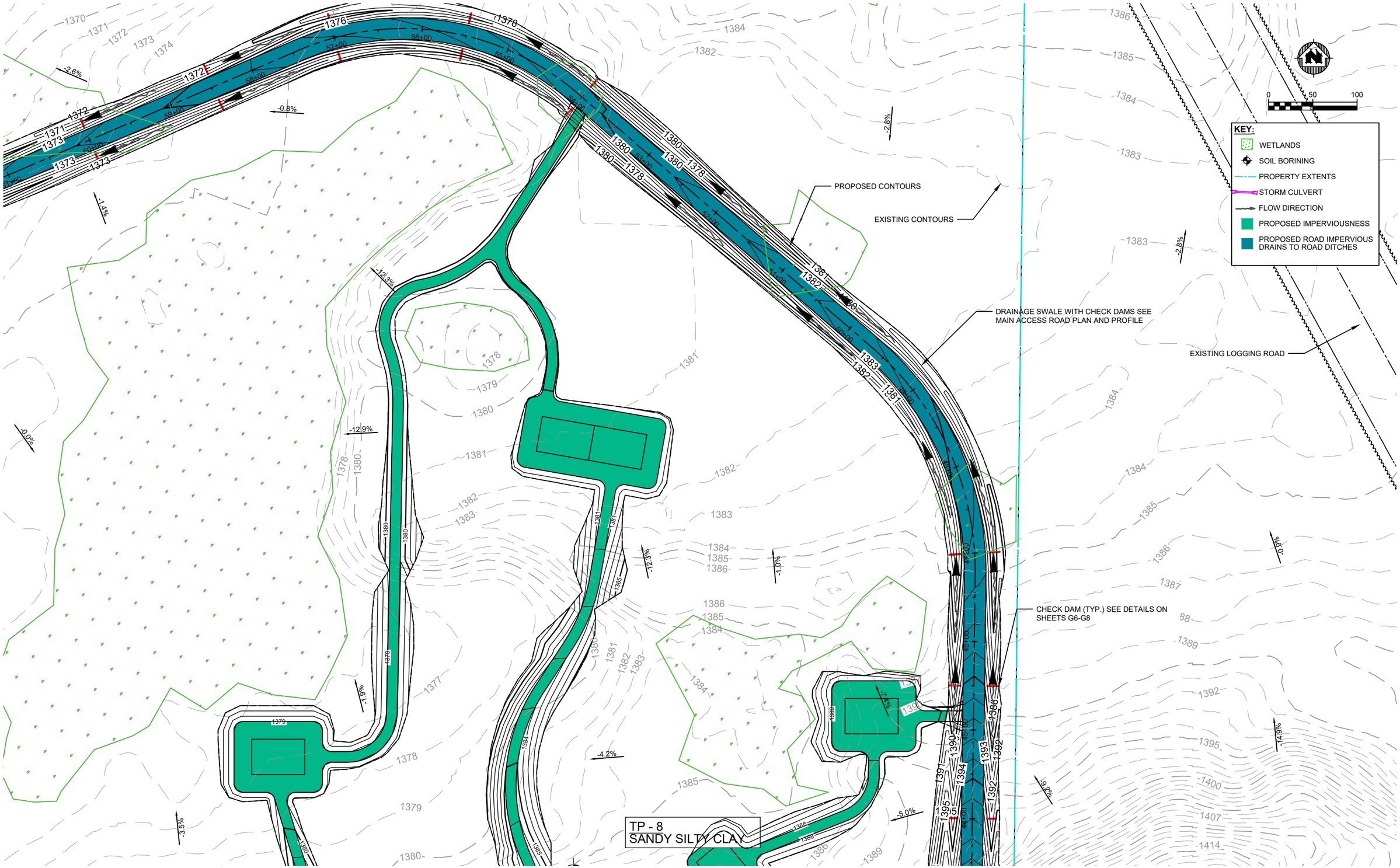
GRADING PLAN DETAIL

PROJECT NO. 17764001

SHEET GP5



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GRADING PLAN DETAIL

PROJECT NO. 17764001

SHEET GP6

TP - 7
SILTY SANDY CLAY W/ GRAVEL

TP - 4
POORLY GRADED
GRAVEL W/ SAND & SILT

KEY:
- WETLANDS
- SOIL BORINING
- PROPERTY EXTENTS
- STORM CULVERT
- FLOW DIRECTION

DRAINAGE SWALE WITH CHECK DAMS
SEE RUNWAY PLAN AND PROFILE

MN POWER TRANSMISSION CORRIDOR

0 50 100

			NO.	DATE	REVISION	BY
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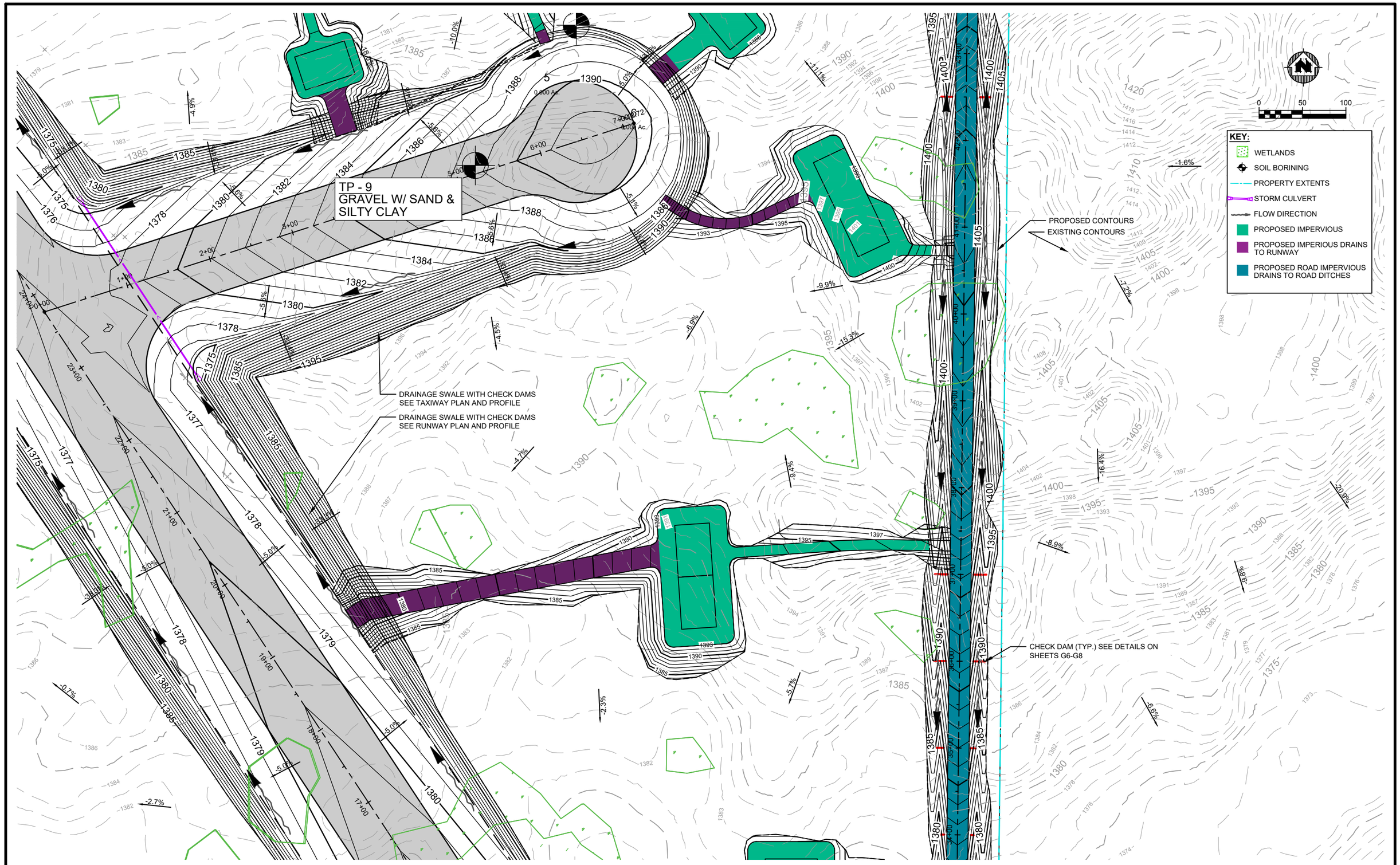
GRADING PLAN DETAIL

PROJECT NO. 17764001

SHEET GP7



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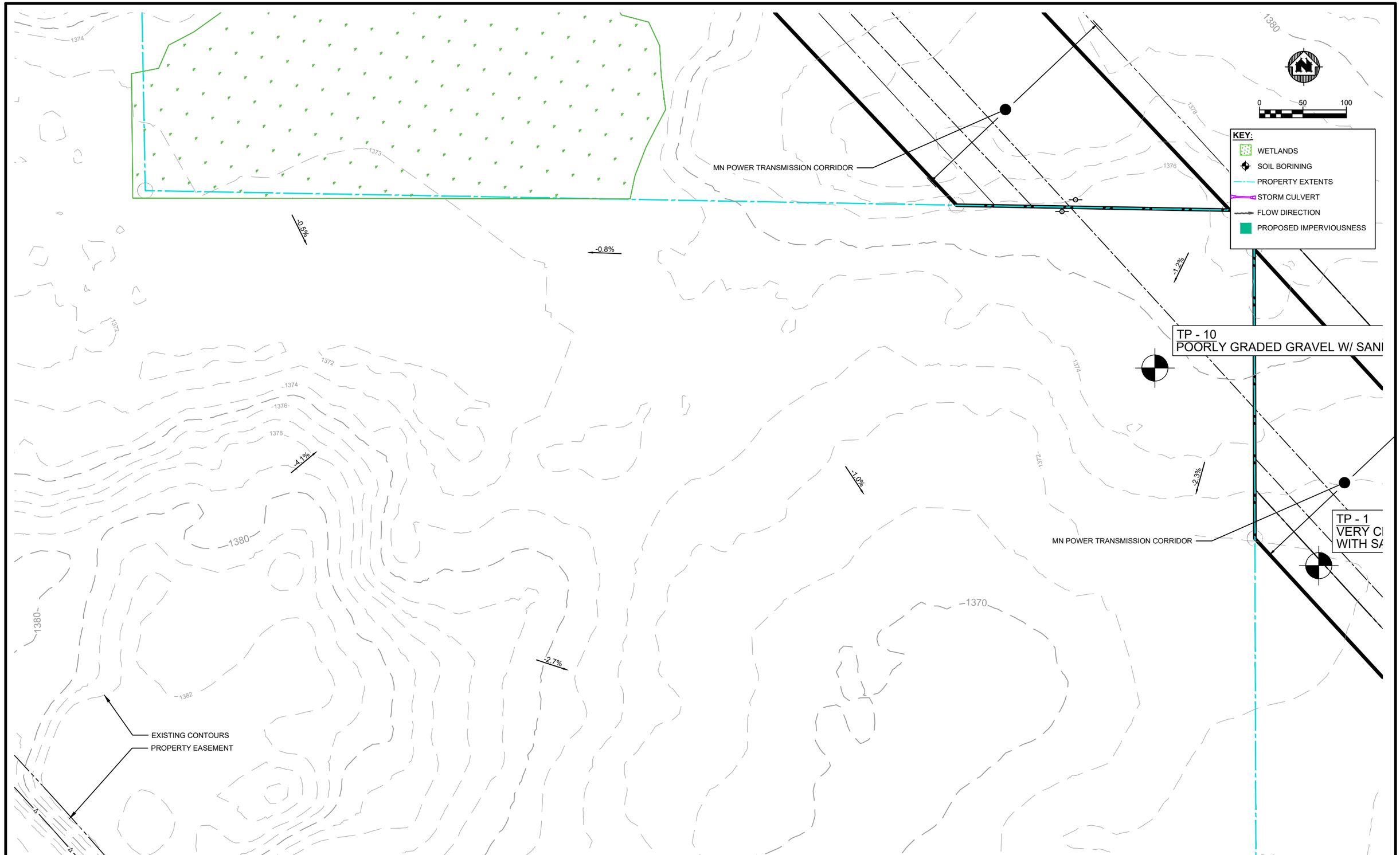
GRADING PLAN DETAIL

PROJECT NO. 17764001
SHEET GP8



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PLOT DATE: Thursday, January 30, 2020 7:38:05 PM, P:\17700s\17760s\17764\17764001\CADD\C3D\17764001 Grading and SWPPP DREW.dwg						

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GRADING PLAN DETAIL

PROJECT NO. 17764001

SHEET GP9

TP - 3
POORLY GRADED SAND W/ SILT

TP - 2
SILTY CLAY

FUTURE HANGAR AREA

DRAINAGE SWALE WITH CHECK DAMS SEE MAIN ACCESS ROAD PLAN AND PROFILE

PROPOSED CONTOURS

EXISTING CONTOURS

KEY:
- WETLANDS
- SOIL BORINING
- PROPERTY EXTENTS
- STORM CULVERT
- FLOW DIRECTION
- PROPOSED IMPERVIOUSNESS
- PROPOSED ROAD IMPERVIOUS DRAINS TO ROAD DITCHES

0 50 100

DRAINAGE SWALE WITH CHECK DAMS SEE RUNWAY PLAN AND PROFILE

CHECK DAM (TYP.) SEE DETAILS ON SHEETS G6-G8

LEAN GRAVEL
AND

FOR DEHAVILLAND STREET ROAD SWALES DRAINING TO OFF-SITE VIA DITCH AT SOUTH CENTER OF THIS SHEET:

$(WQV_{REQ.})$ = 5,050 C.F.

$(WQV_{PROV.})$= 5,610 C.F.

MN POWER TRANSMISSION CORRIDOR

NOTE:
FUTURE HANGAR AREA APPROX. 1.4 ACRES $WQV_{REQ.}$ FOR DEVELOPMENT OF THIS AREA IS NOT A PART OF THIS DESIGN

			NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY:	JAS	.	09/27/2019	SWPPP REVISIONS	AKB
	DESIGNED BY:	AKB	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
	CHECKED BY:	EC	.	.	.	.

PLOT DATE: Thursday, January 30, 2020 7:38:18 PM, P:\17700s\17760s\17764\17764001\CADD\C3D\17764001 Grading and SWPPP DREW.dwg

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11/19/2019 — Date
56425 — License No.
Andrew Barnebey
ANDREW K BARNEBEY

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SUPERIOR AERO ESTATES
NICK CLATTENBURG
GRAND LAKE TOWNSHIP, MN

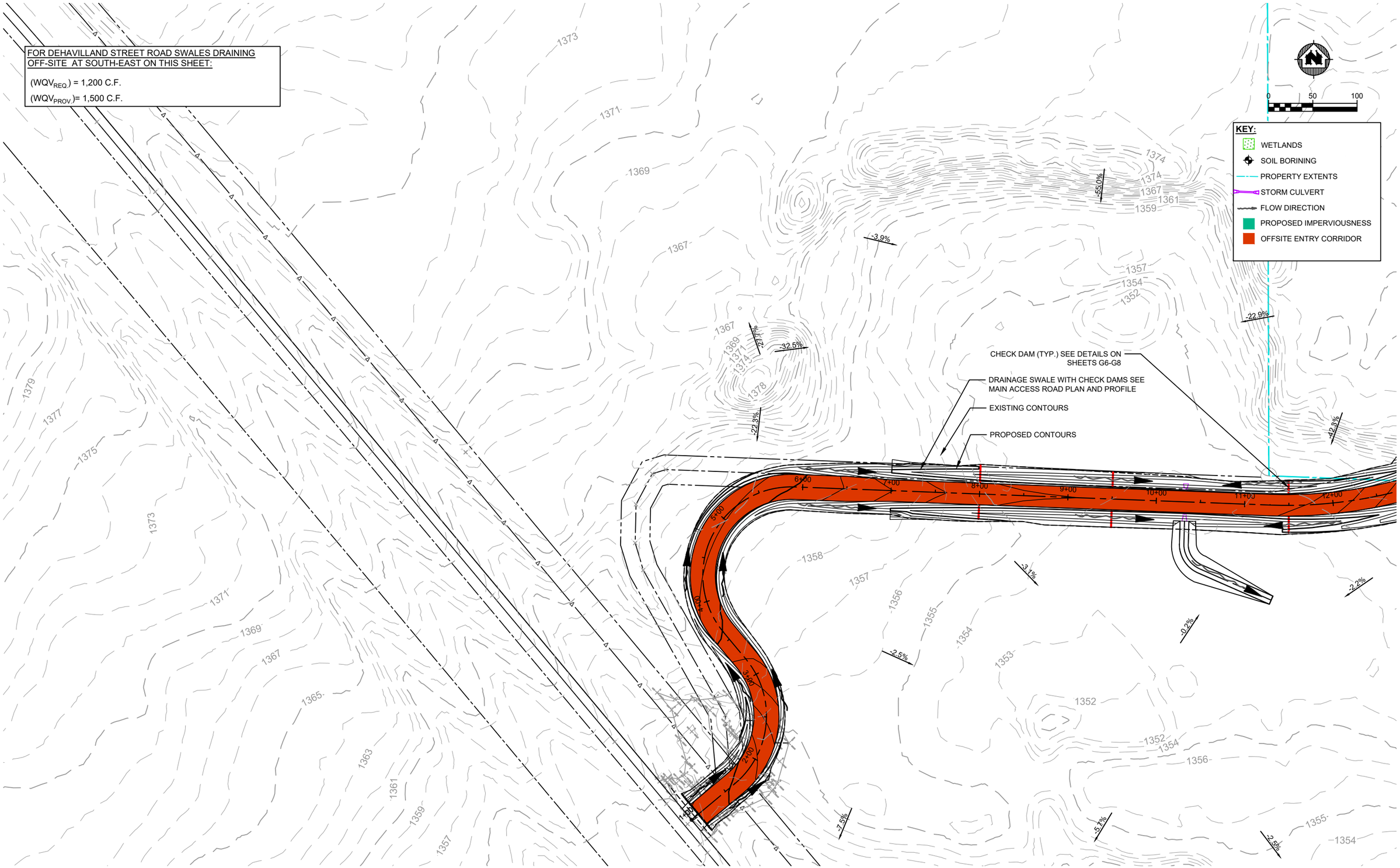
GRADING PLAN DETAIL

PROJECT NO. 17764001
SHEET GP10

FOR DEHAVILLAND STREET ROAD SWALES DRAINING OFF-SITE AT SOUTH-EAST ON THIS SHEET:

$(WQV_{REQ.})$ = 1,200 C.F.

$(WQV_{PROV.})$= 1,500 C.F.



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GRADING PLAN DETAIL

PROJECT NO. 17764001

SHEET GP11

MN POWER TRANSMISSION CORRIDOR

PROPOSED CONTOURS

EXISTING CONTOURS

CHECK DAM (TYP.) SEE DETAILS ON SHEETS G6-G8

DRAINAGE SWALE WITH CHECK DAMS SEE MAIN ACCESS ROAD PLAN AND PROFILE

EXISTING LOGGING ROAD

0 50 100

KEY:

- WETLANDS
- SOIL BORINING
- PROPERTY EXTENTS
- STORM CULVERT
- FLOW DIRECTION
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GRADING PLAN DETAIL

PROJECT NO. 17764001

SHEET GP12

FOR WORK WITHIN INDIVIDUAL LOTS:

1. NO WETLANDS CAN BE FILLED (OTHER THAN THOSE INDICATED AS APPROVED FOR INFILL AND AS SHOWN ON SHEET G8 IN THIS PLAN SET), WITHOUT OBTAINING ALL REQUIRED WETLAND FILL PERMITS AND APPROVALS FROM ALL RELEVANT STATE AND LOCAL AGENCIES. ALL PERMITTING TO BE BY HOMEOWNER, OR HIS REPRESENTATIVE.
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3. FOR ALL LOTS, DRIVEWAY CULVERTS TO BE MINIMUM 18" CMP C/W APRON END SECTIONS, PLACED AT SLOPE TO MATCH ROAD GRADE (0.5% MINIMUM SLOPE).
4. RUNWAY/ TAXIWAY ACCESS CULVERTS TO BE AS FOLLOWS:

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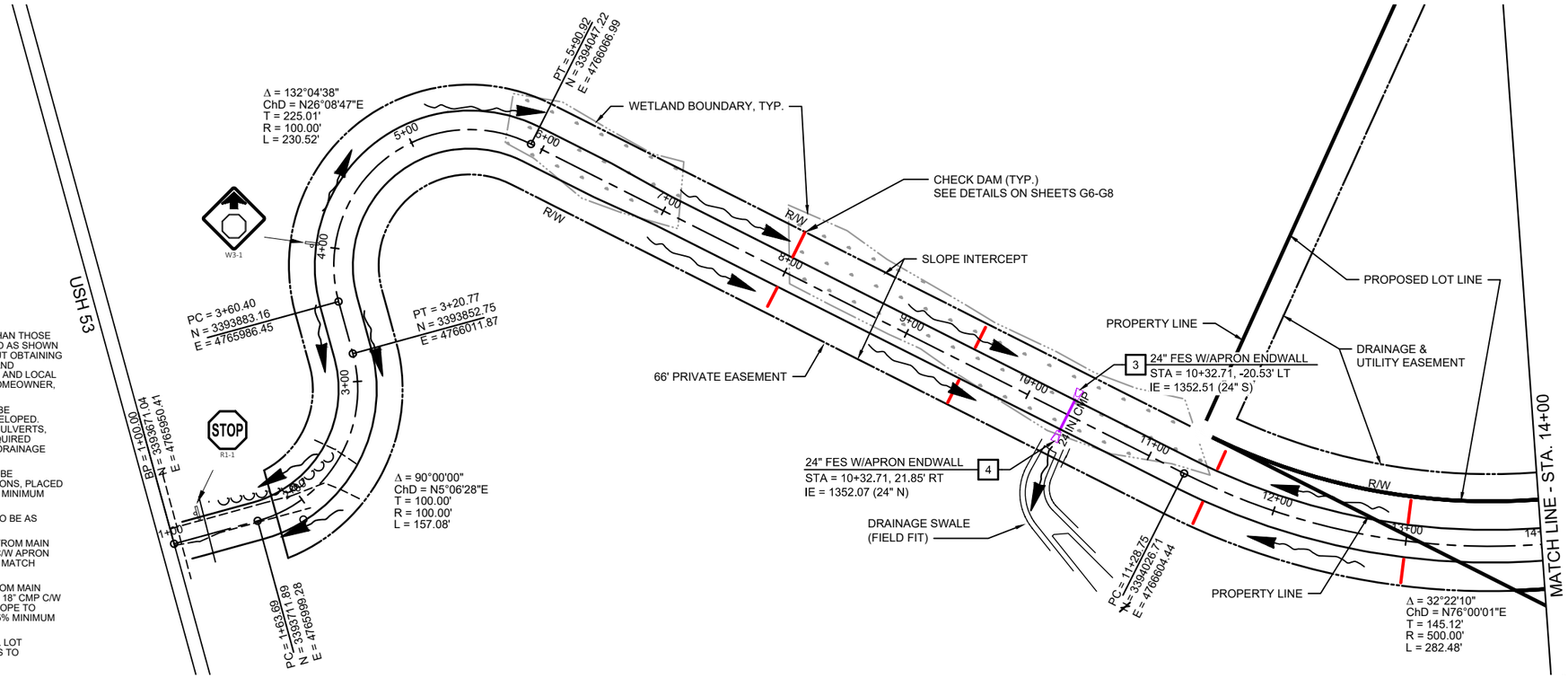
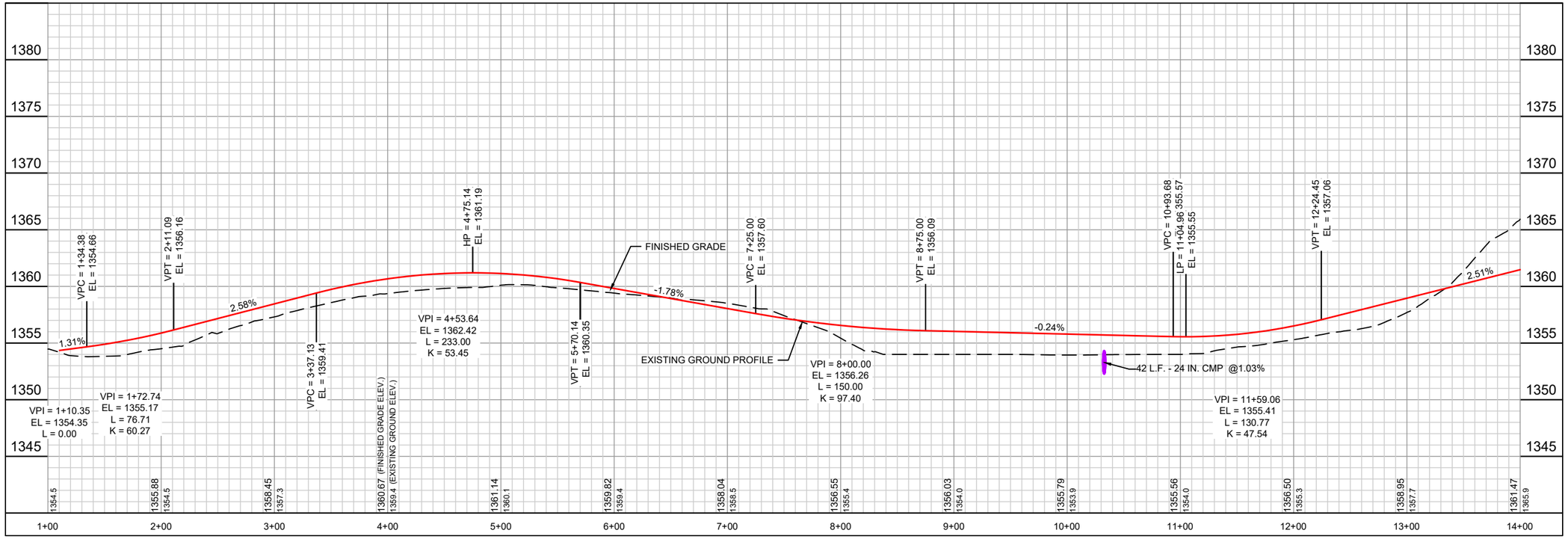
   LOTS 3-9 - CULVERTS FOR ACCESS FROM MAIN RUNWAY/ TAXIWAY TO HANGAR TO BE 18" CMP C/W APRON END SECTIONS, PLACED AT SLOPE TO MATCH RUNWAY/ TAXIWAY GRADE (0.5% MINIMUM SLOPE)

DEVELOPER TO COMMUNICATE AND BIND ALL LOT PURCHASERS, HOMEOWNERS, AND BUILDERS TO REQUIREMENTS 1 - 4 LISTED ABOVE.



DESIGN SUMMARY

RIGHT-OF WAY	66' MIN.	
ROAD WIDTH	24' MIN. (INCLUDING SHOULDERS)	
DESIGN SPEED	1+00 - 6+50 20 MPH	6+50 - 63+00 30 MPH
POSTED SPEED	1+00 - 6+50 15 MPH	6+50 - 63+00 30 MPH
CLEAR ZONE	7'	
HORIZONTAL ALIGN.	20 MPH eMAX = 4% MIN. RADIUS (DESIGN) = 86' (ACTUAL) = 100' 30 MPH eMAX = 4% MIN. RADIUS (DESIGN) = 250' (ACTUAL) = 300'	
VERTICAL ALIGN.	20 MPH MAX GRADE = 8% SSD MIN. = 115' K CREST MIN. = 7 K SAG MIN. = 17 30 MPH MAX GRADE = 7% SSD MIN. = 200' K CREST MIN. = 19 K SAG MIN. = 37	
VERT. CLEARANCE	WITHIN MINNESOTA POWER EASEMENT, FINISHED GRADE AT OR BELOW EXISTING GROUND.	



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F.B. : .	CHECKED BY: EC	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
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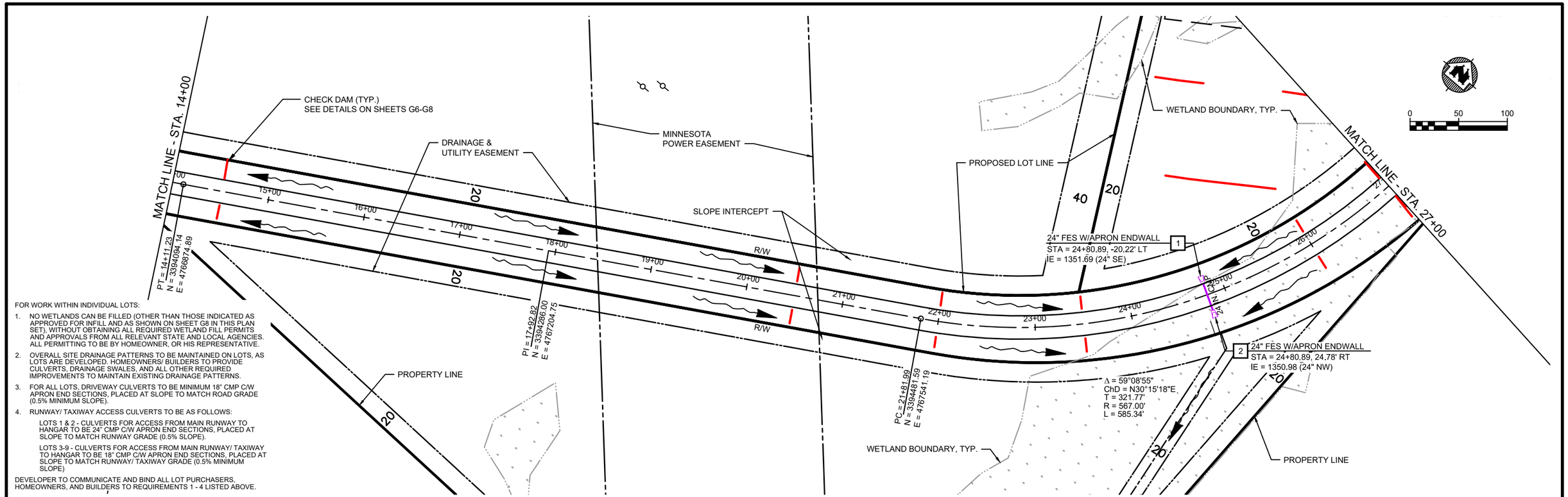
PLAN & PROFILE

FILE NO. 17764001

SHEET R1



FOR WORK WITHIN INDIVIDUAL LOTS:

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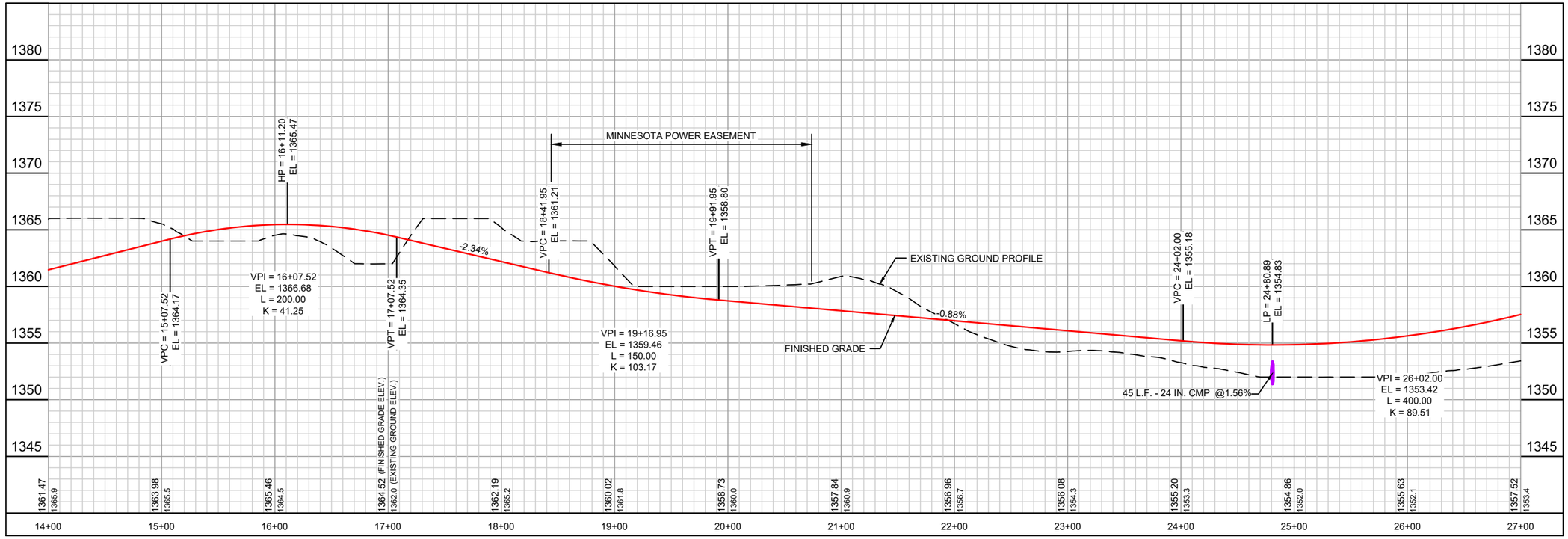

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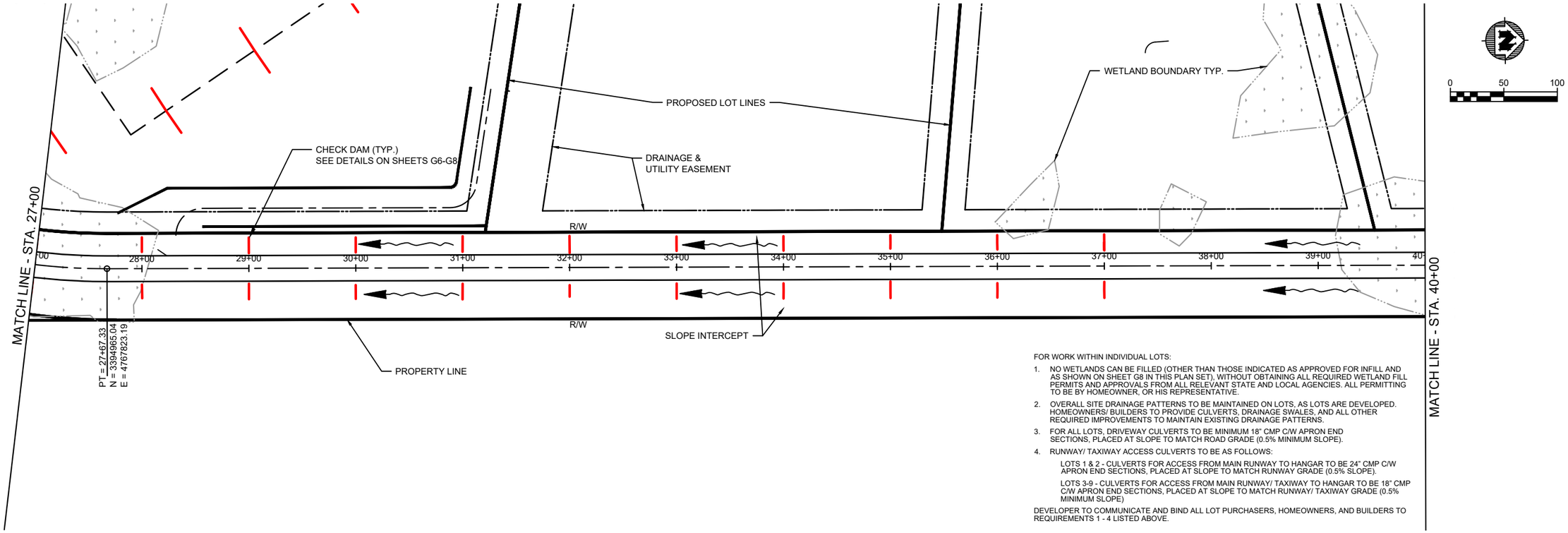
SHEET R2



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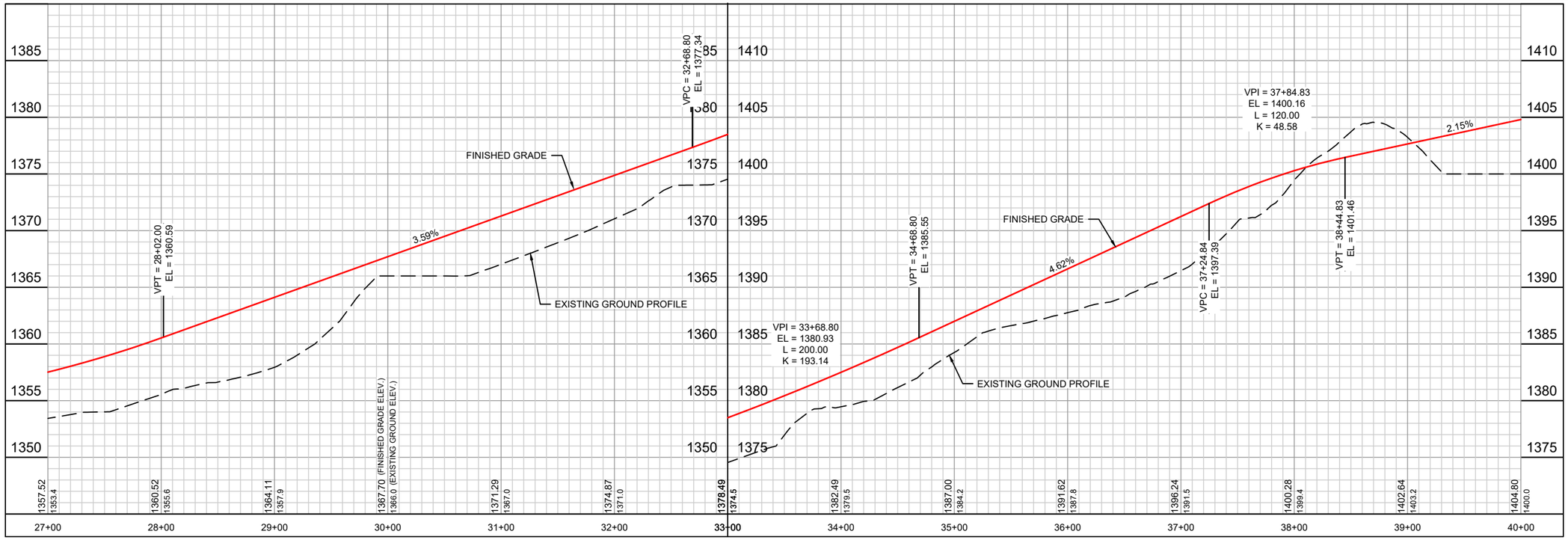

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PLAN & PROFILE

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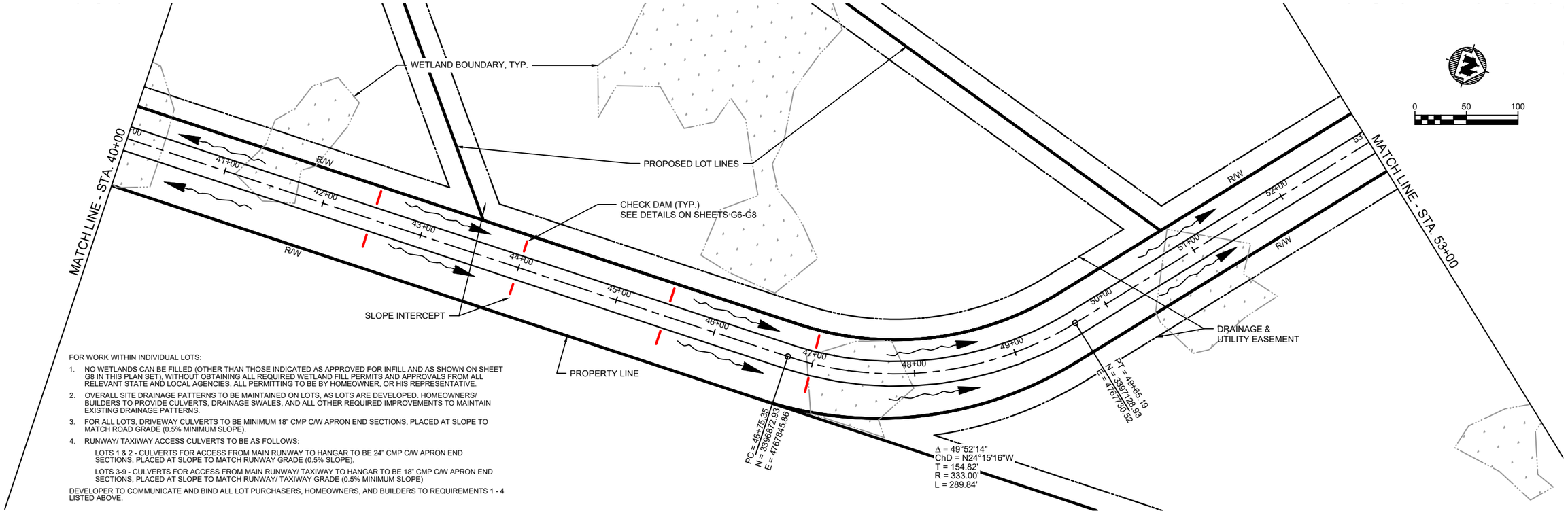
SHEET R3



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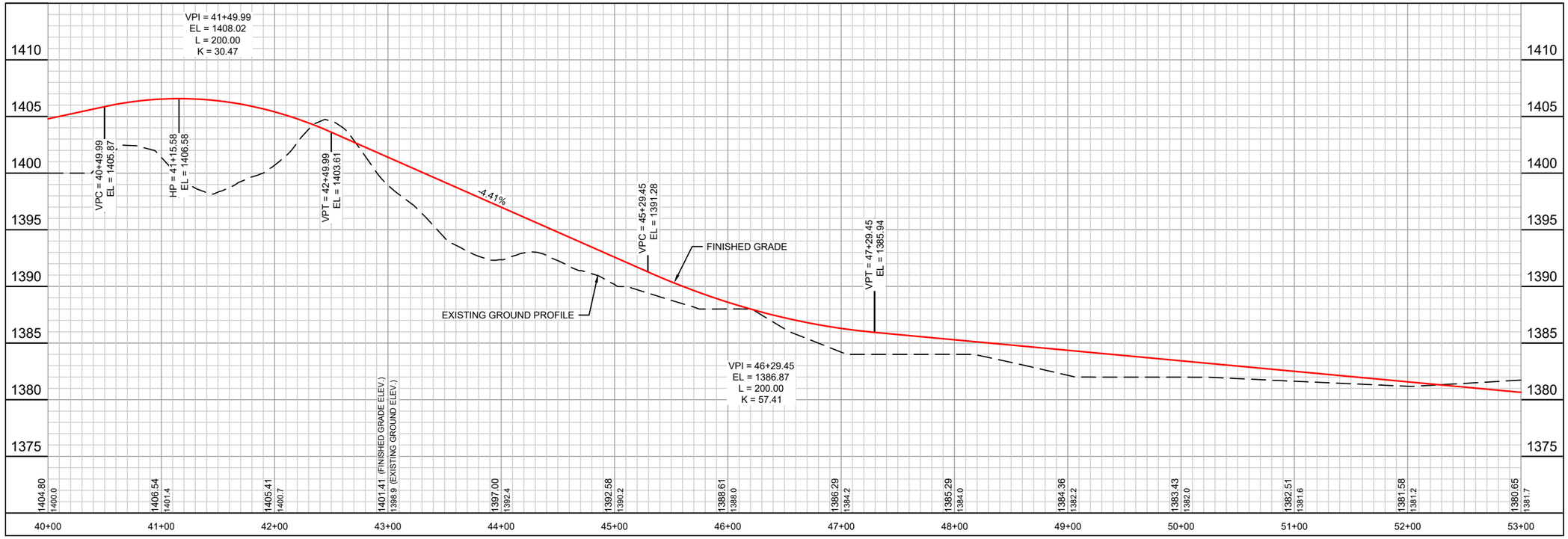

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SHEET R4

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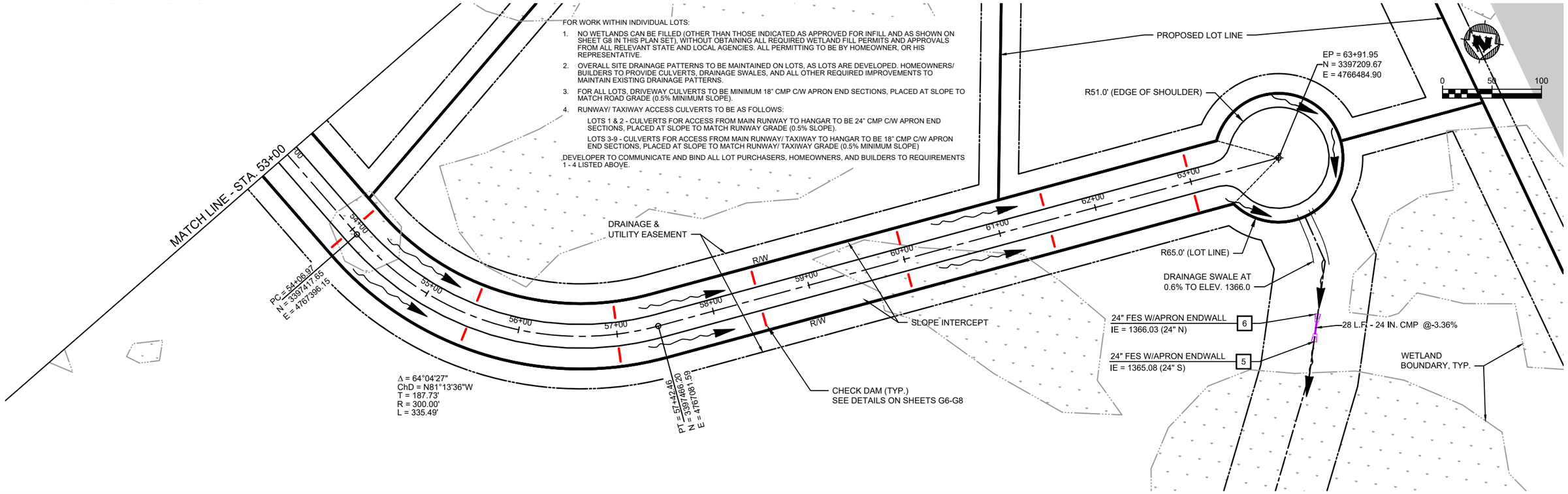

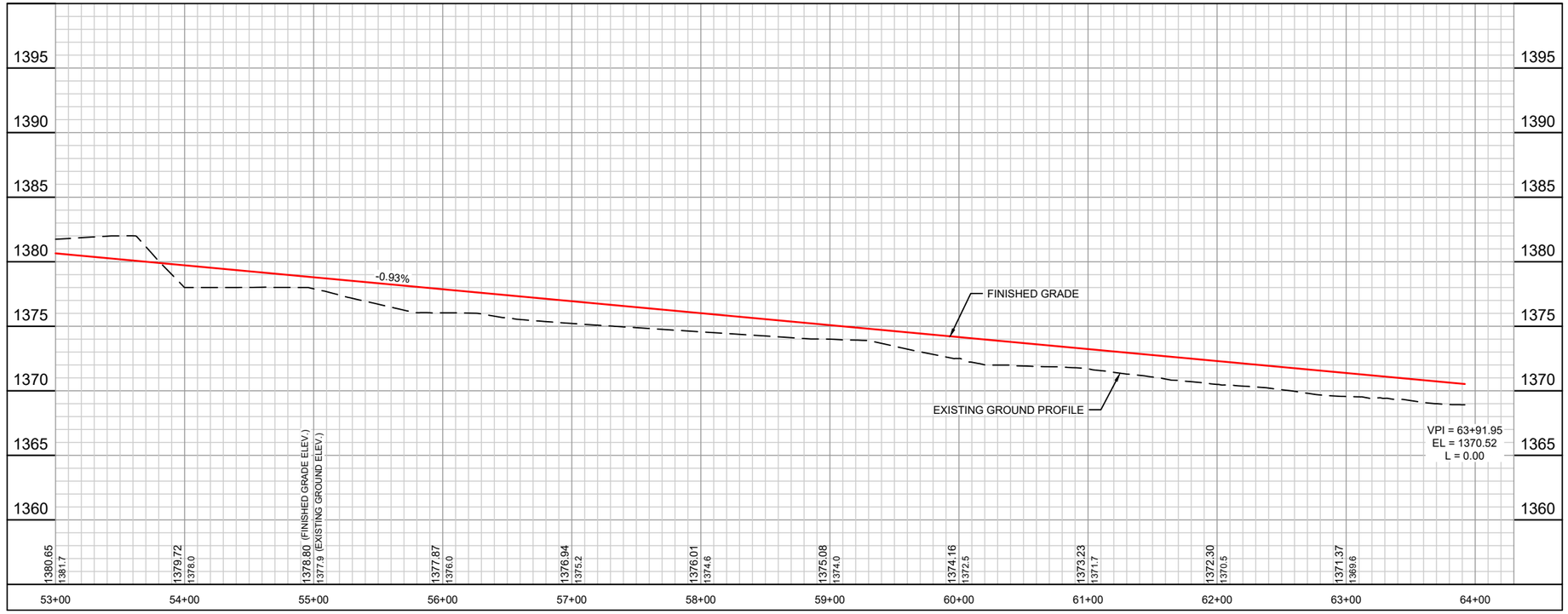

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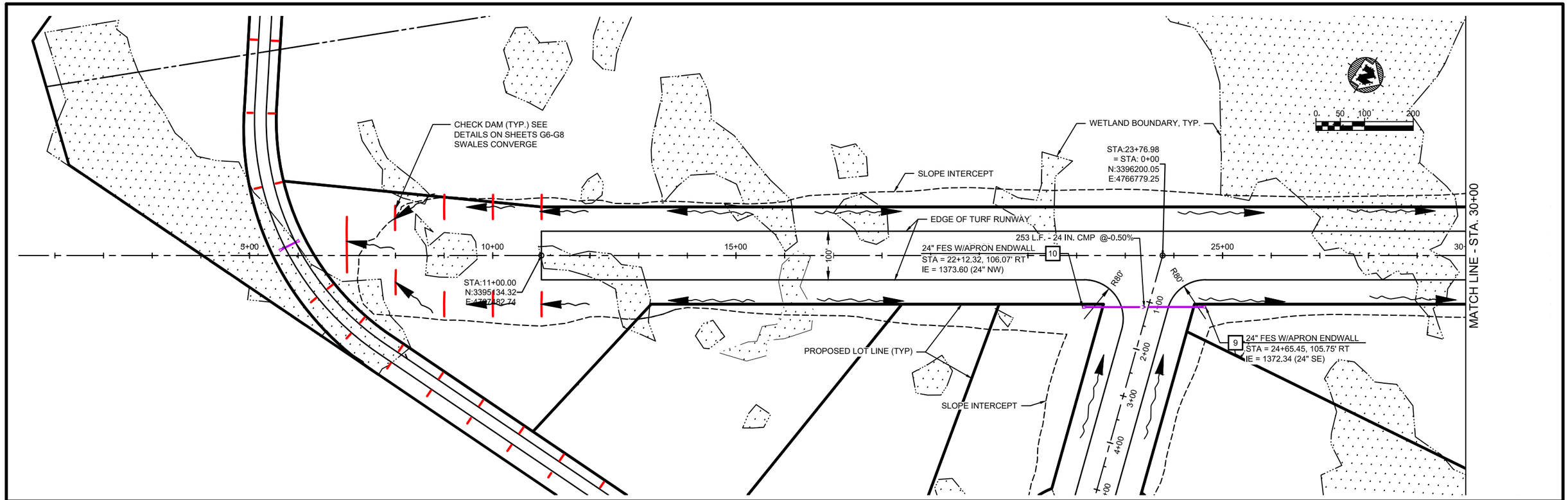
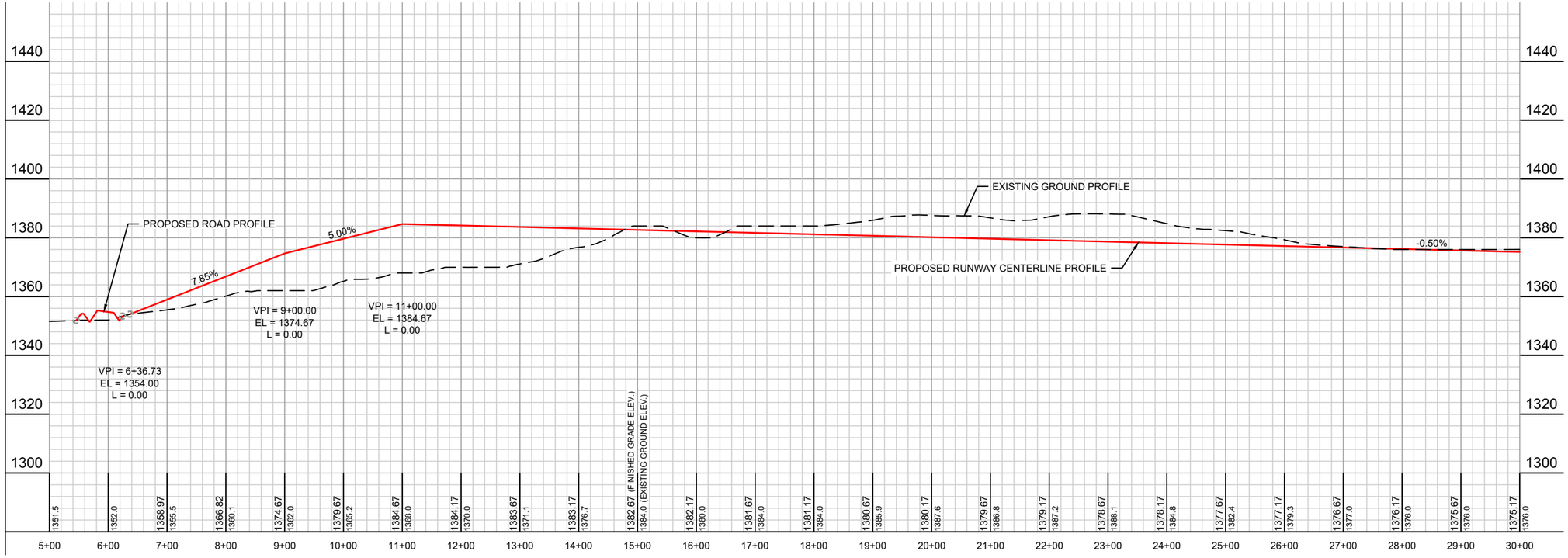
FILE NO. 17764001
SHEET R5





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	DESIGNED BY: AKB	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
	CHECKED BY: EC	.	.		.

PLOT DATE: Thursday, January 30, 2020 4:38:31 PM, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Plan & Profile.dwg

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11/19/2019 Date

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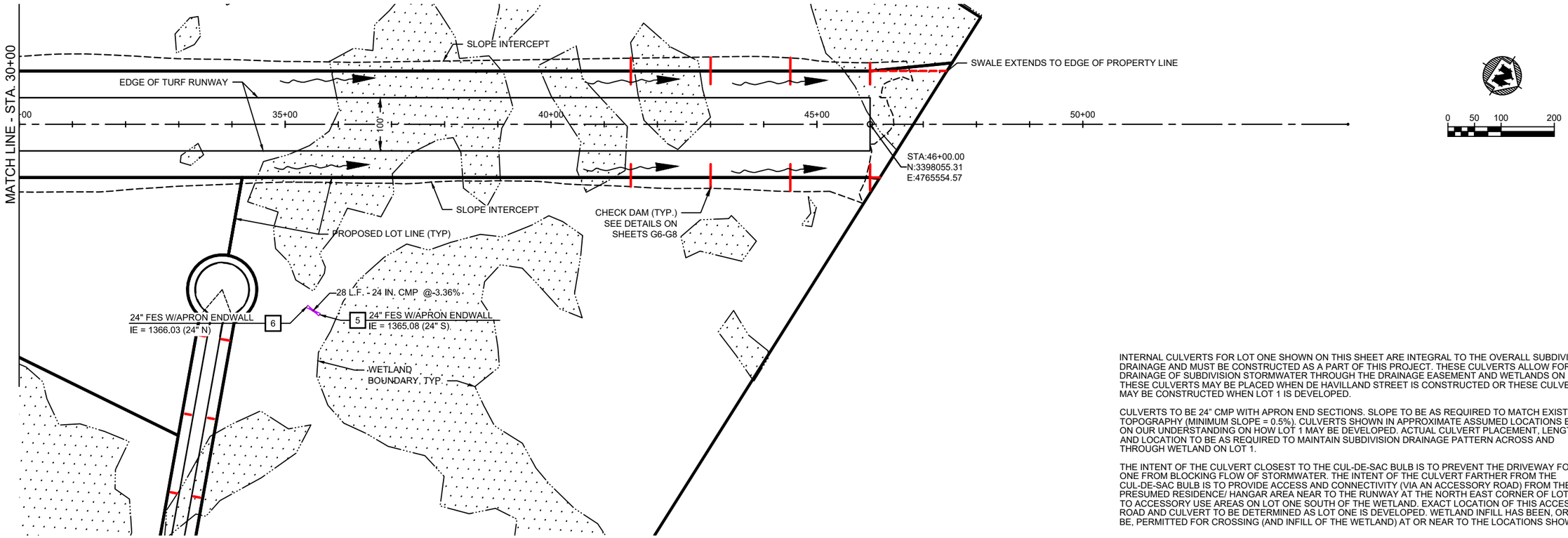
RUNWAY PLAN & PROFILE

PROJECT NO. 17764001

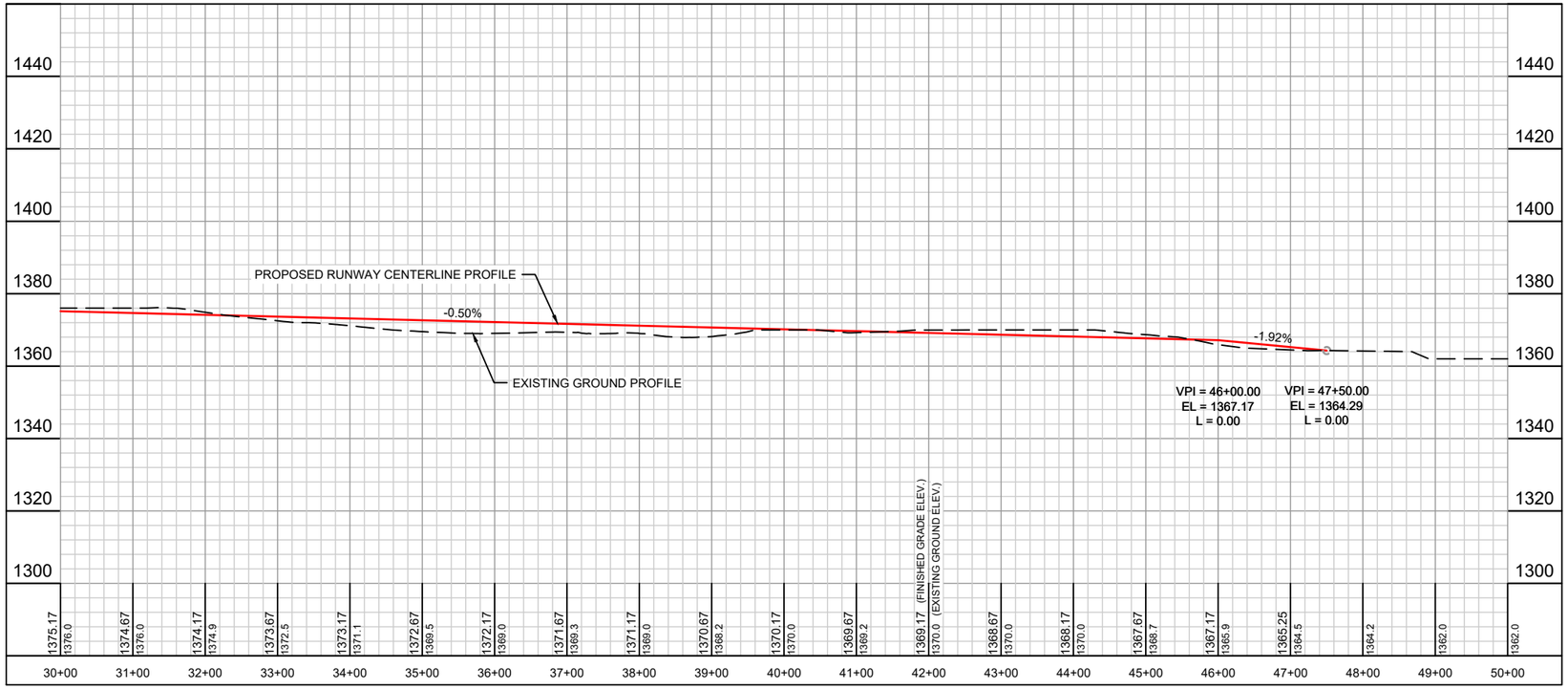
SHEET RW1



INTERNAL CULVERTS FOR LOT ONE SHOWN ON THIS SHEET ARE INTEGRAL TO THE OVERALL SUBDIVISION DRAINAGE AND MUST BE CONSTRUCTED AS A PART OF THIS PROJECT. THESE CULVERTS ALLOW FOR THE DRAINAGE OF SUBDIVISION STORMWATER THROUGH THE DRAINAGE EASEMENT AND WETLANDS ON LOT 1. THESE CULVERTS MAY BE PLACED WHEN DE HAVILLAND STREET IS CONSTRUCTED OR THESE CULVERTS MAY BE CONSTRUCTED WHEN LOT 1 IS DEVELOPED.

CULVERTS TO BE 24" CMP WITH APRON END SECTIONS. SLOPE TO BE AS REQUIRED TO MATCH EXISTING TOPOGRAPHY (MINIMUM SLOPE = 0.5%). CULVERTS SHOWN IN APPROXIMATE ASSUMED LOCATIONS BASED ON OUR UNDERSTANDING ON HOW LOT 1 MAY BE DEVELOPED. ACTUAL CULVERT PLACEMENT, LENGTH, AND LOCATION TO BE AS REQUIRED TO MAINTAIN SUBDIVISION DRAINAGE PATTERN ACROSS AND THROUGH WETLAND ON LOT 1.

THE INTENT OF THE CULVERT CLOSEST TO THE CUL-DE-SAC BULB IS TO PREVENT THE DRIVEWAY FOR LOT ONE FROM BLOCKING FLOW OF STORMWATER. THE INTENT OF THE CULVERT FARTHER FROM THE CUL-DE-SAC BULB IS TO PROVIDE ACCESS AND CONNECTIVITY (VIA AN ACCESSORY ROAD) FROM THE PRESUMED RESIDENCE/ HANGAR AREA NEAR TO THE RUNWAY AT THE NORTH EAST CORNER OF LOT ONE TO ACCESSORY USE AREAS ON LOT ONE SOUTH OF THE WETLAND. EXACT LOCATION OF THIS ACCESSORY ROAD AND CULVERT TO BE DETERMINED AS LOT ONE IS DEVELOPED. WETLAND INFILL HAS BEEN, OR WILL BE, PERMITTED FOR CROSSING (AND INFILL OF THE WETLAND) AT OR NEAR TO THE LOCATIONS SHOWN.



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PROJECT DATE: JUNE 2019	DRAWN BY:	JAS	.	09/27/2019	SWPPP REVISIONS	AKB
	DESIGNED BY:	AKB	.	1/31/2020	SEPTIC AND LOT GRADING REVISIONS	JAS
	CHECKED BY:	EC	.	.		.

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RUNWAY PLAN & PROFILE

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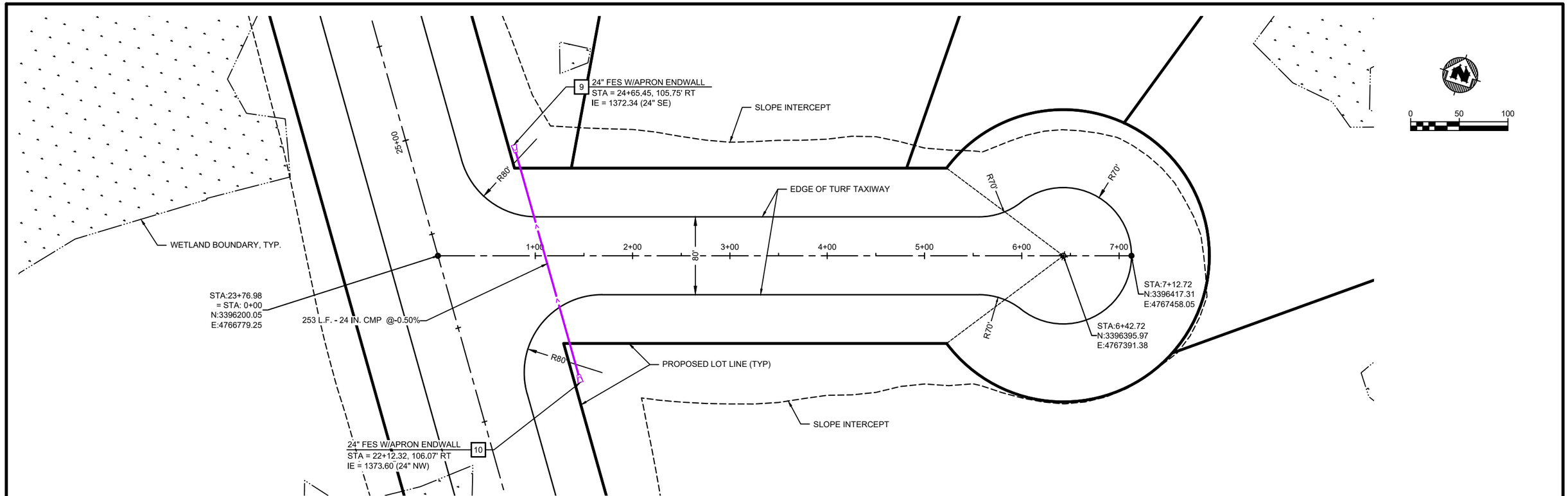
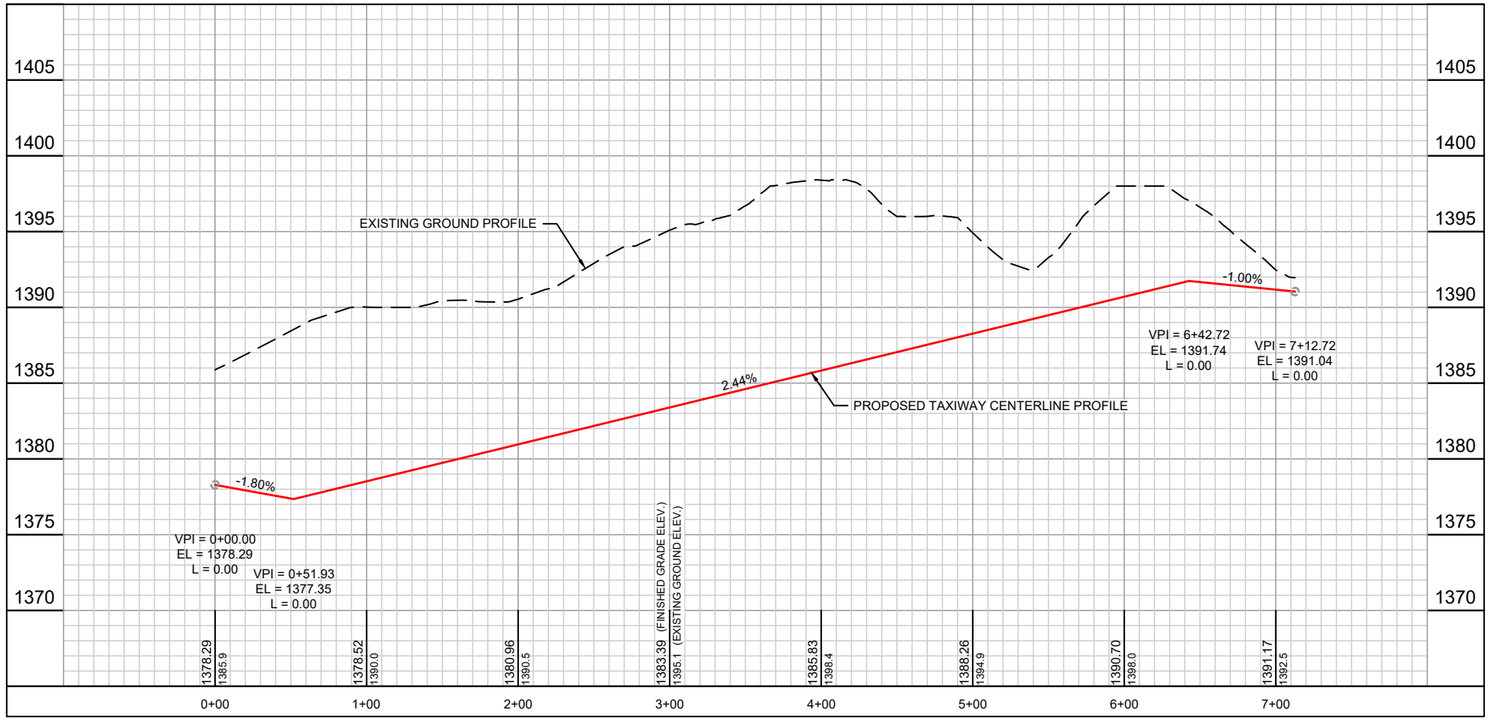
SHEET RW2





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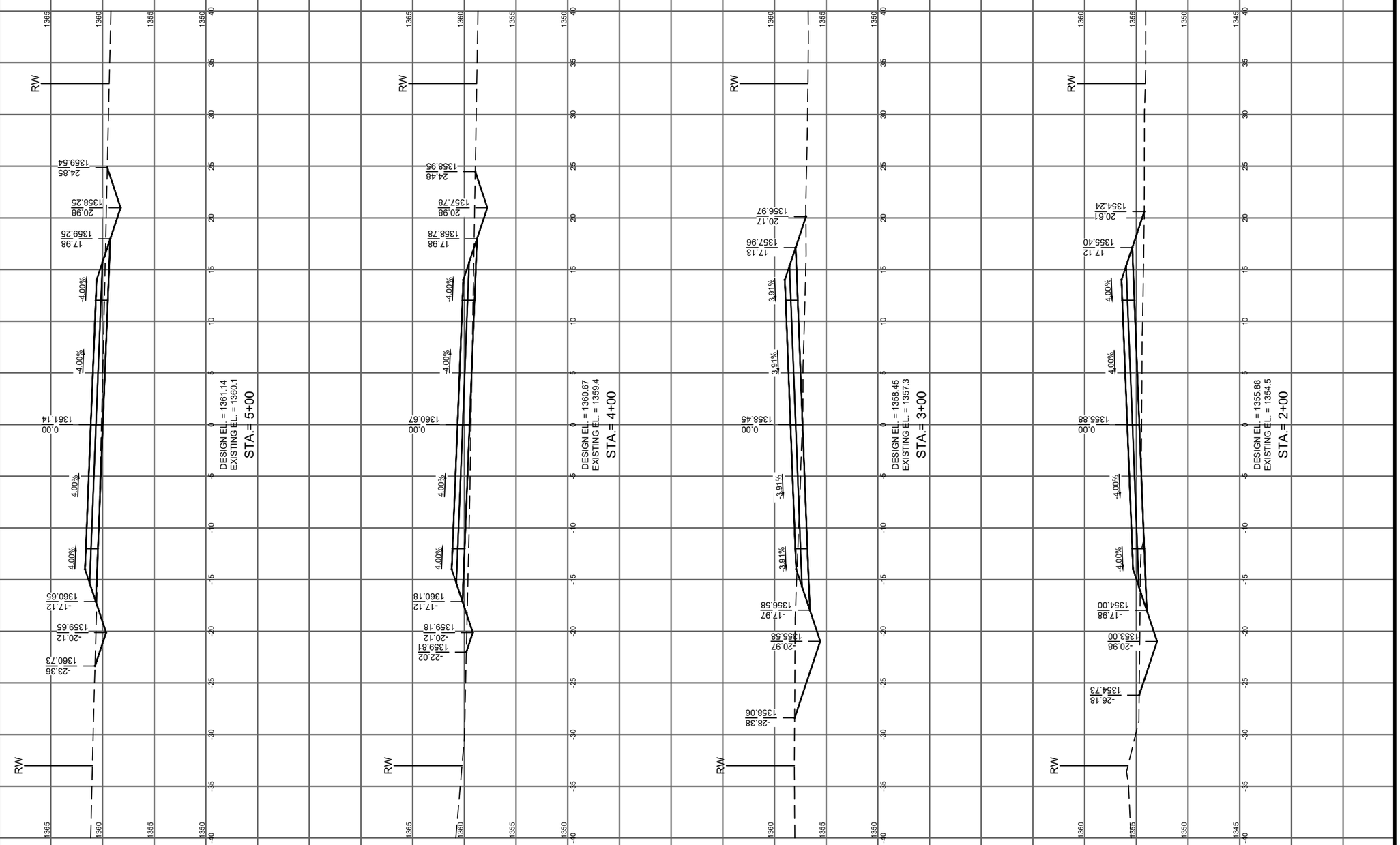
TAXIWAY PLAN & PROFILE

PROJECT NO. 17764001

SHEET TW1



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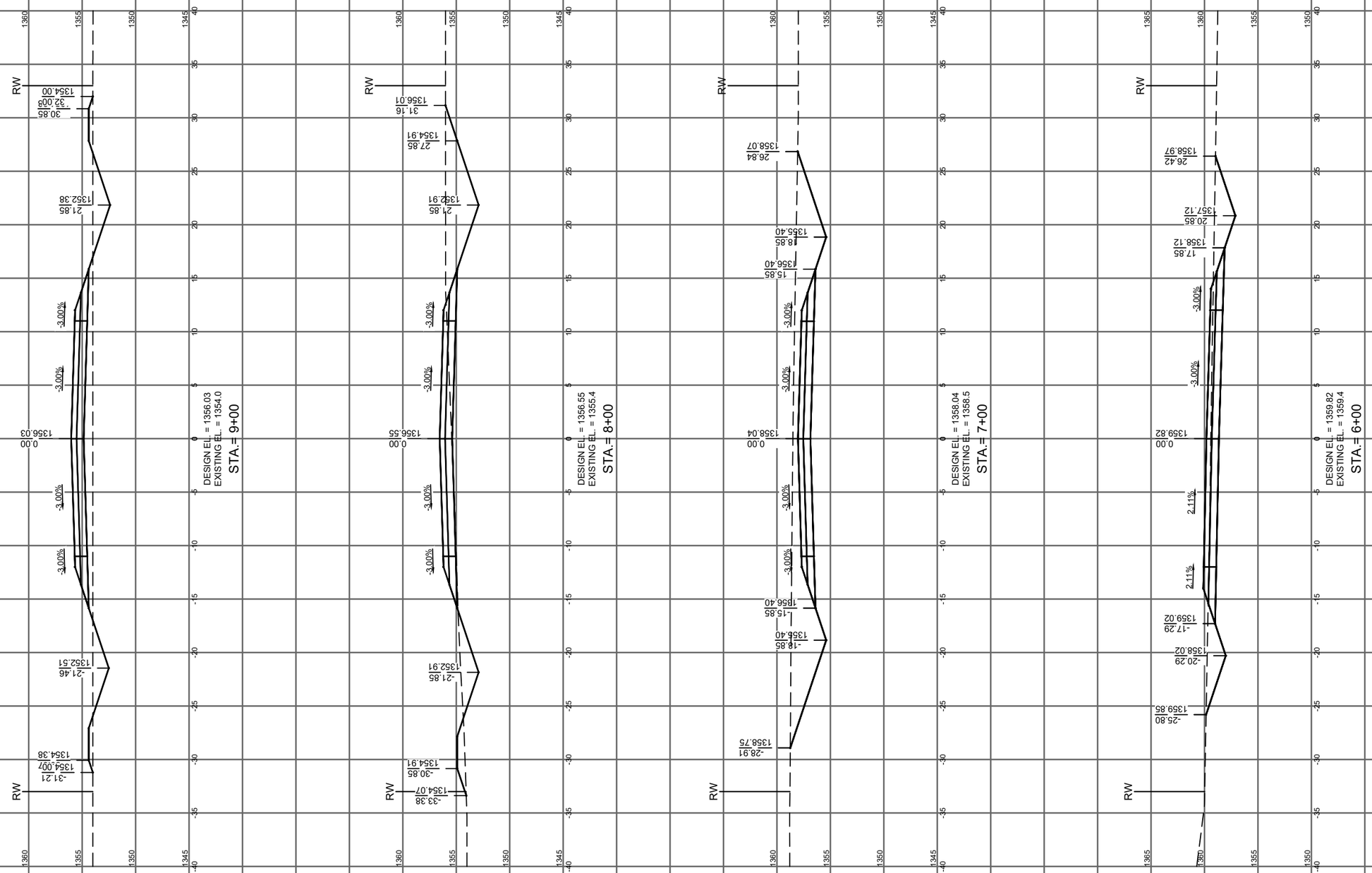
CROSS SECTIONS - (1)

PROJECT NO. 17764001

SHEET CS1



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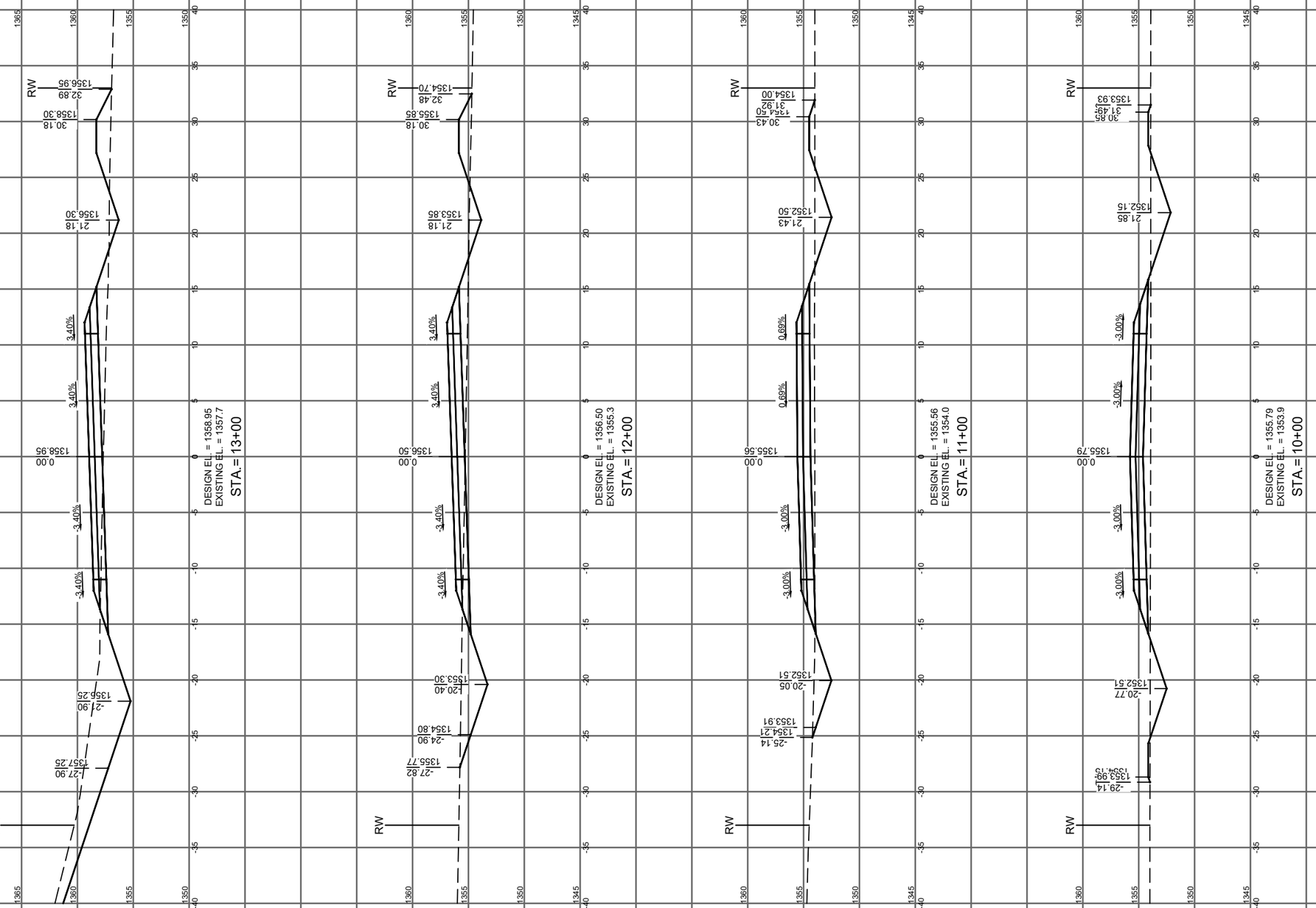
CROSS SECTIONS - (2)

PROJECT NO. 17764001

SHEET CS2



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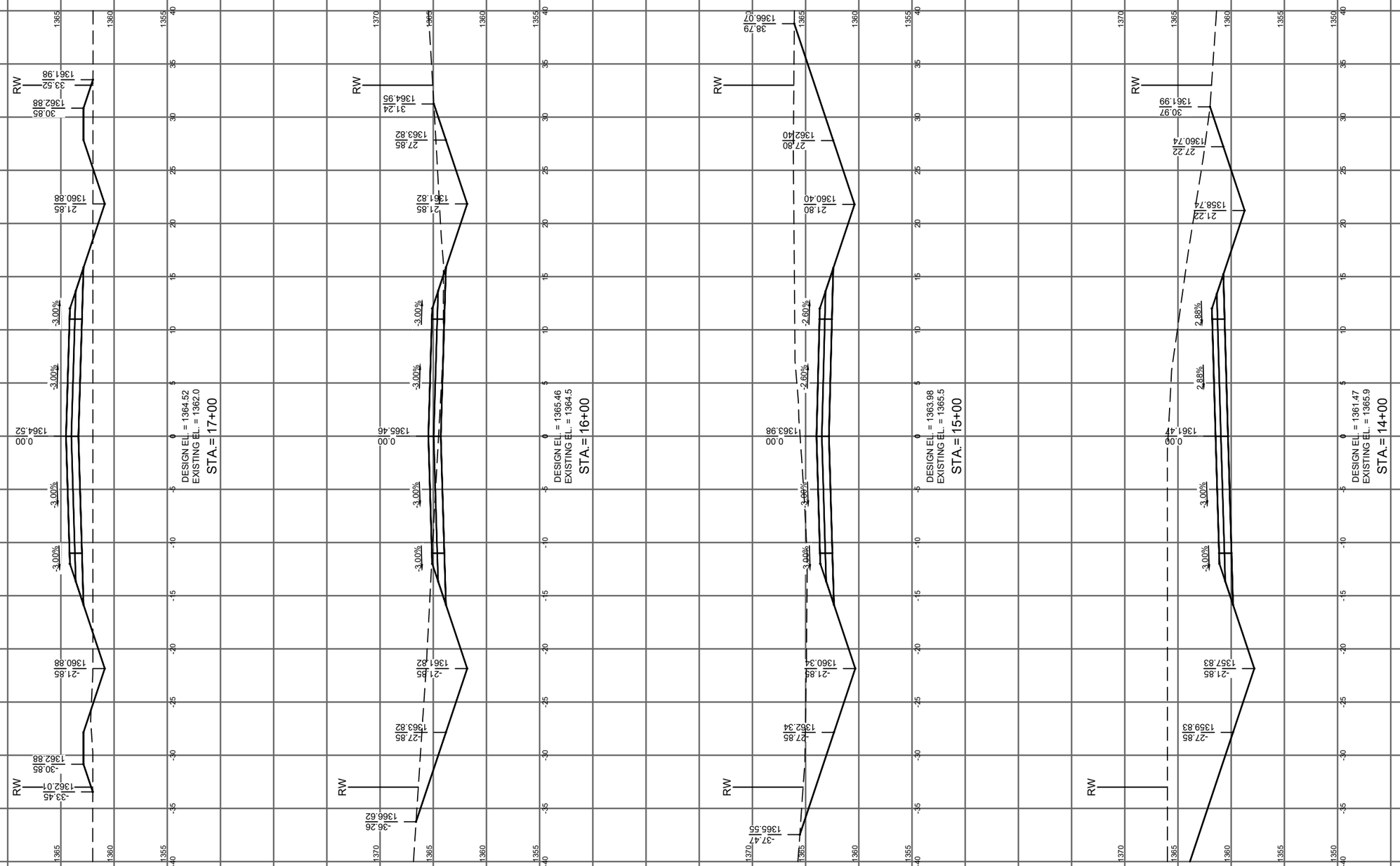
CROSS SECTIONS - (3)

PROJECT NO.
17764001

SHEET
CS3



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CROSS SECTIONS - (4)

PROJECT NO.
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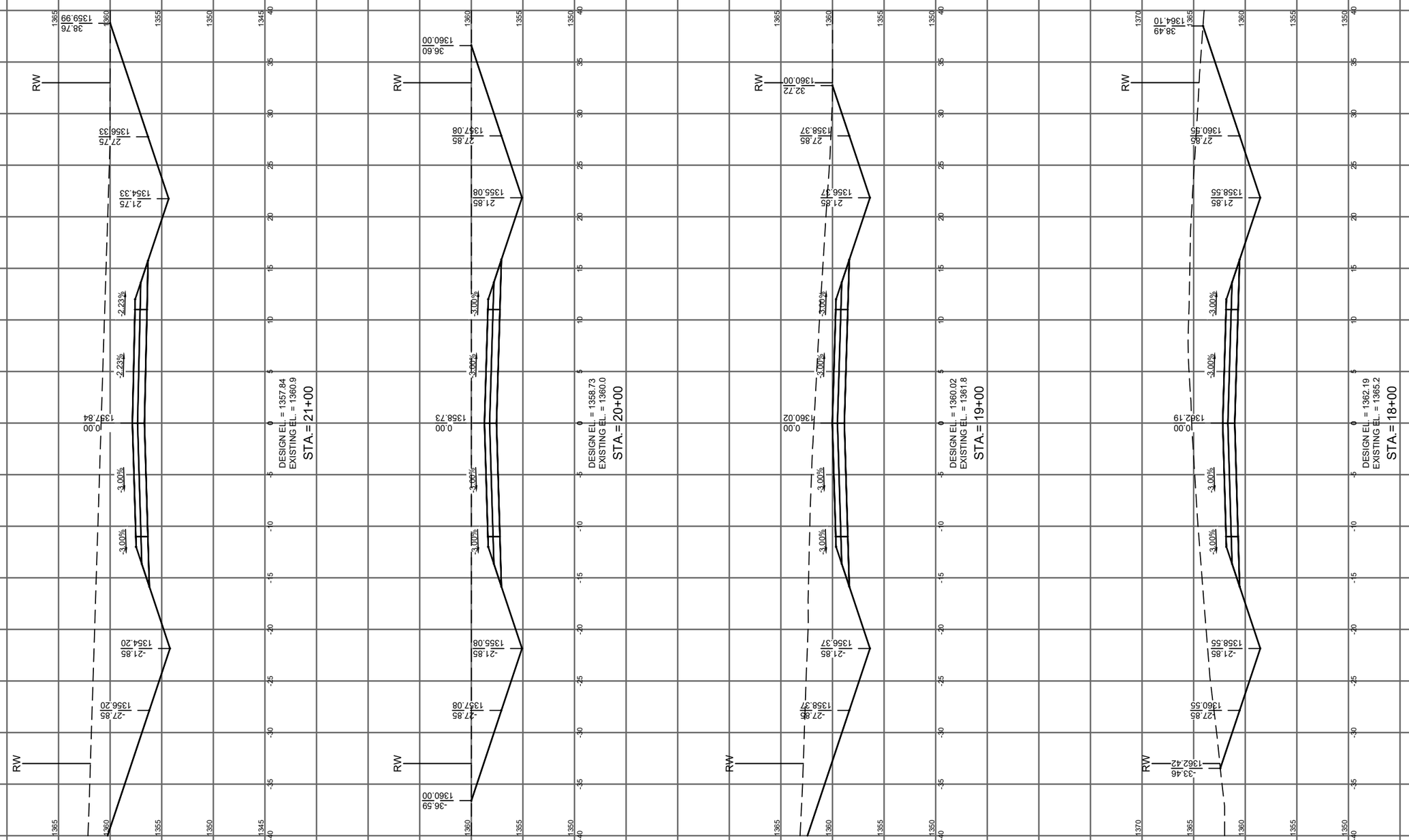
SHEET
CS4



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CROSS SECTIONS - (5)

PROJECT NO. 17764001

SHEET CS5

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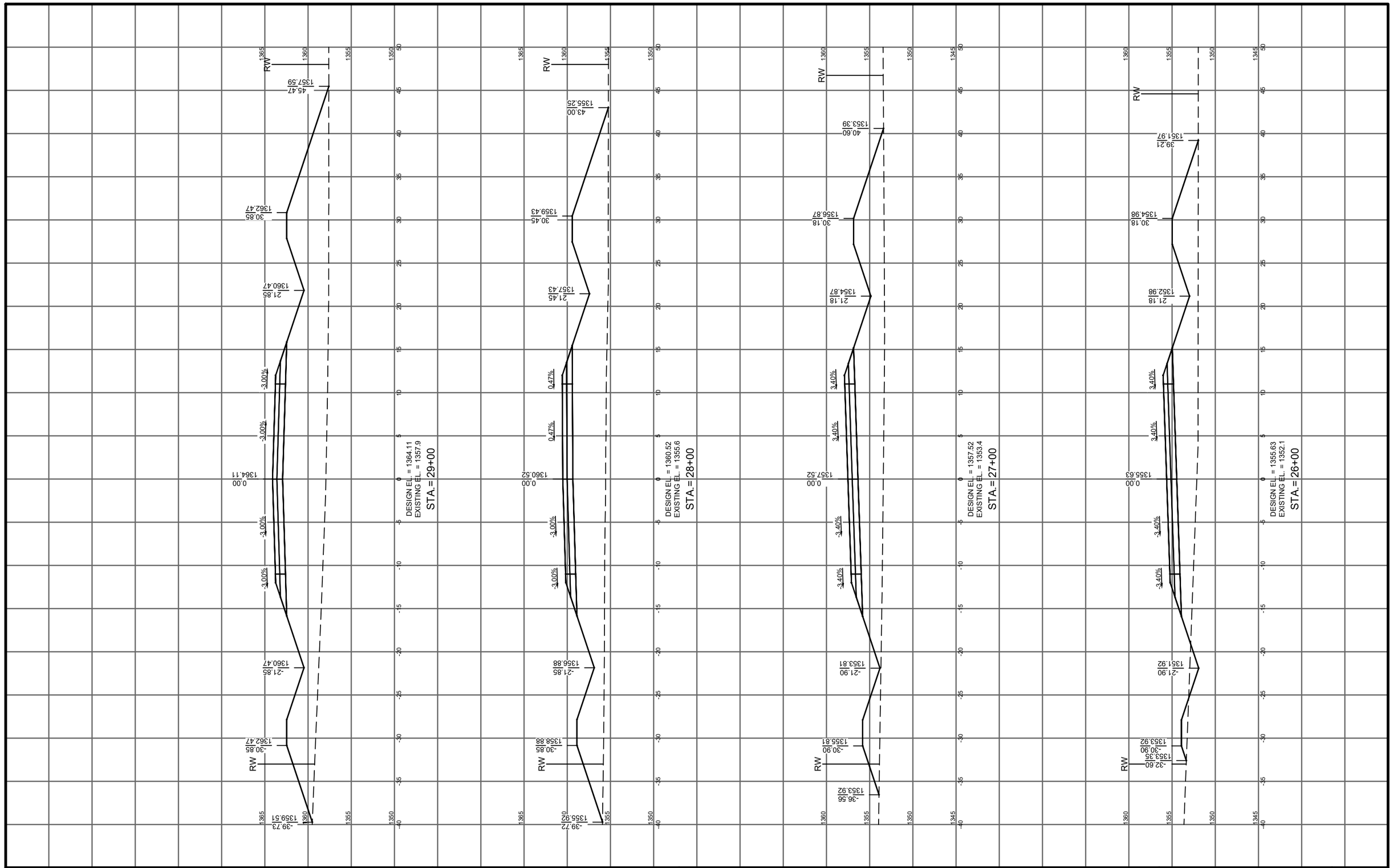
CROSS SECTIONS - (6)

PROJECT NO. 17764001

SHEET CS6



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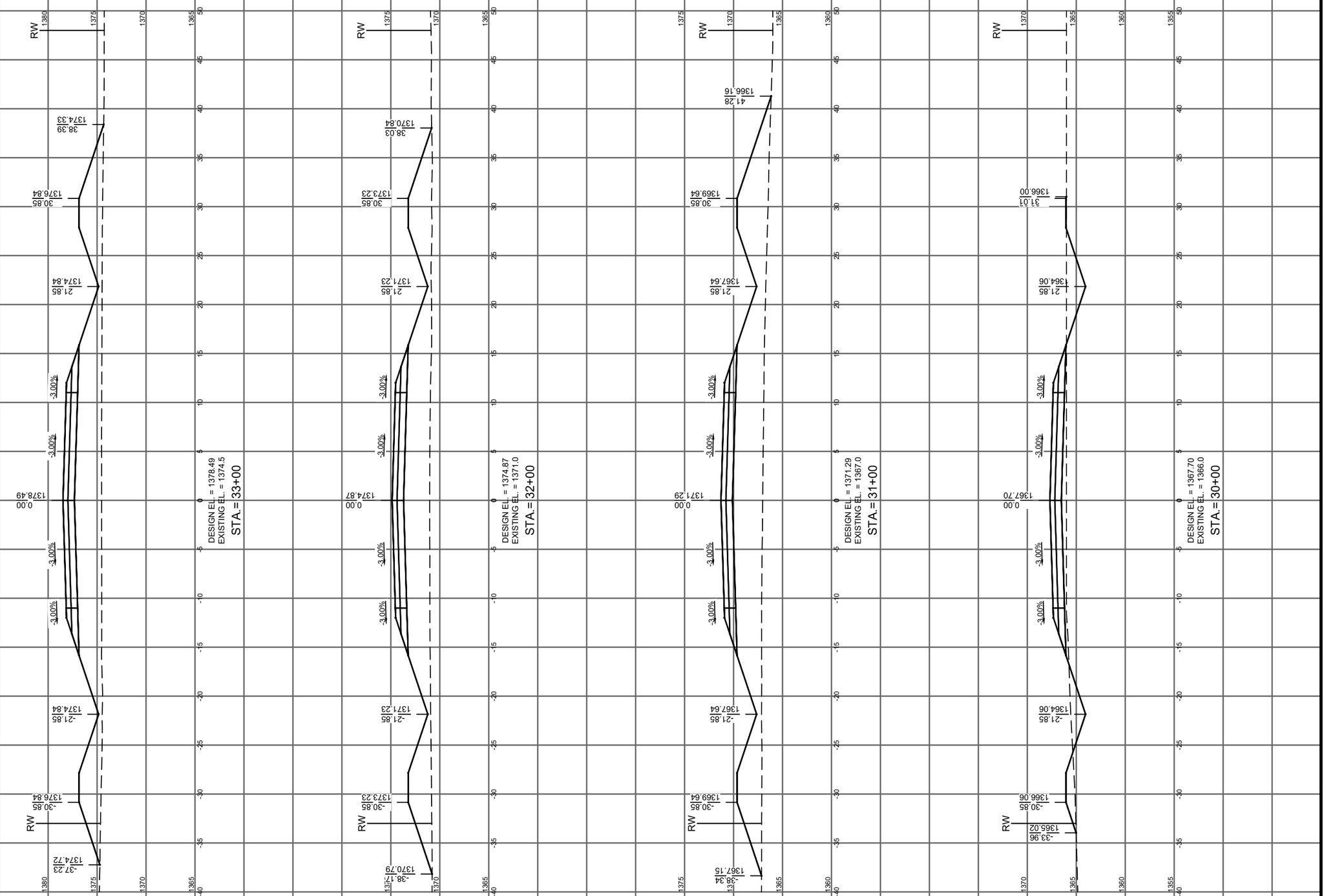
CROSS SECTIONS - (7)

PROJECT NO. 17764001

SHEET CS7



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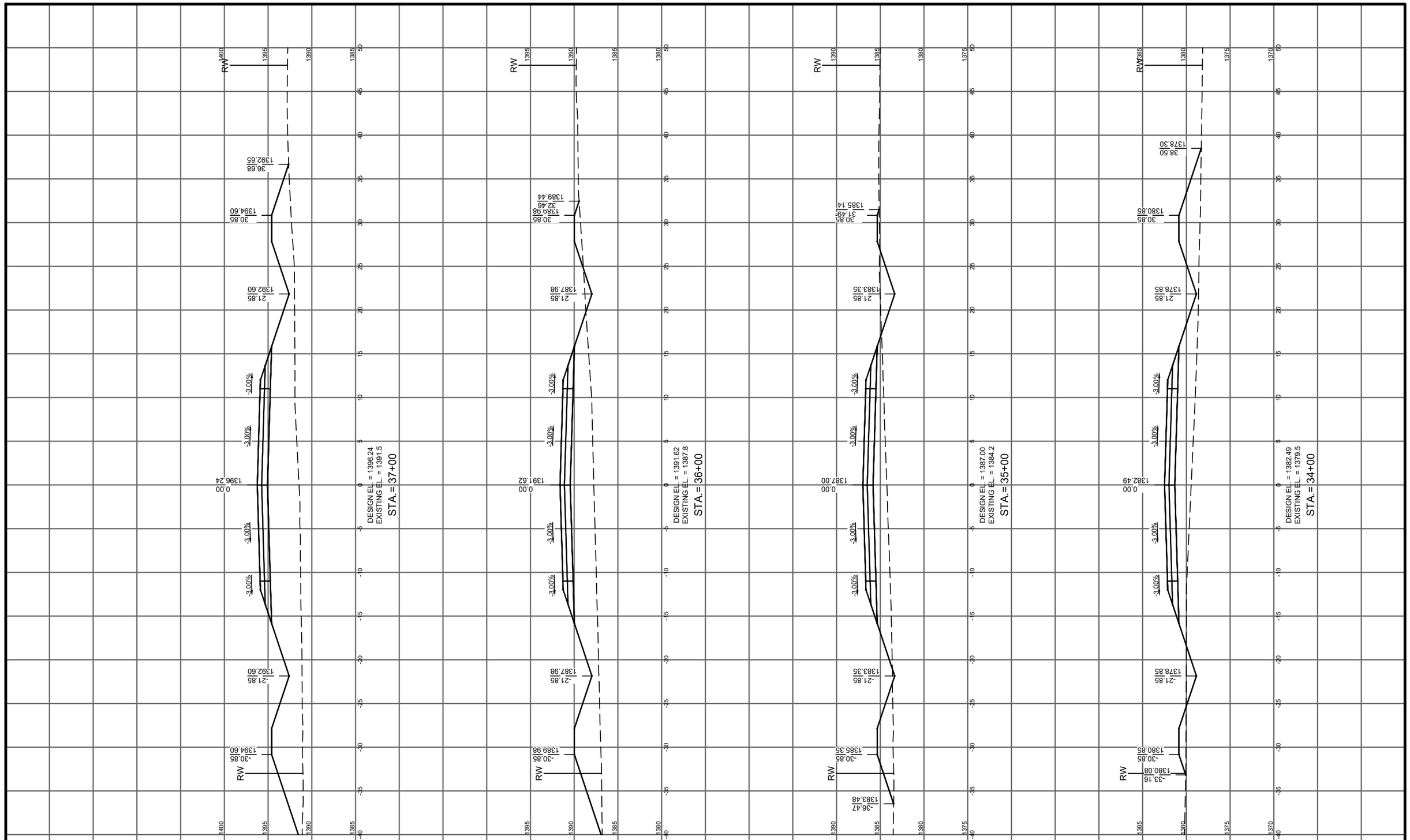
CROSS SECTIONS - (8)

PROJECT NO. 17764001

SHEET CS8



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CROSS SECTIONS - (9)

PROJECT NO. 17764001

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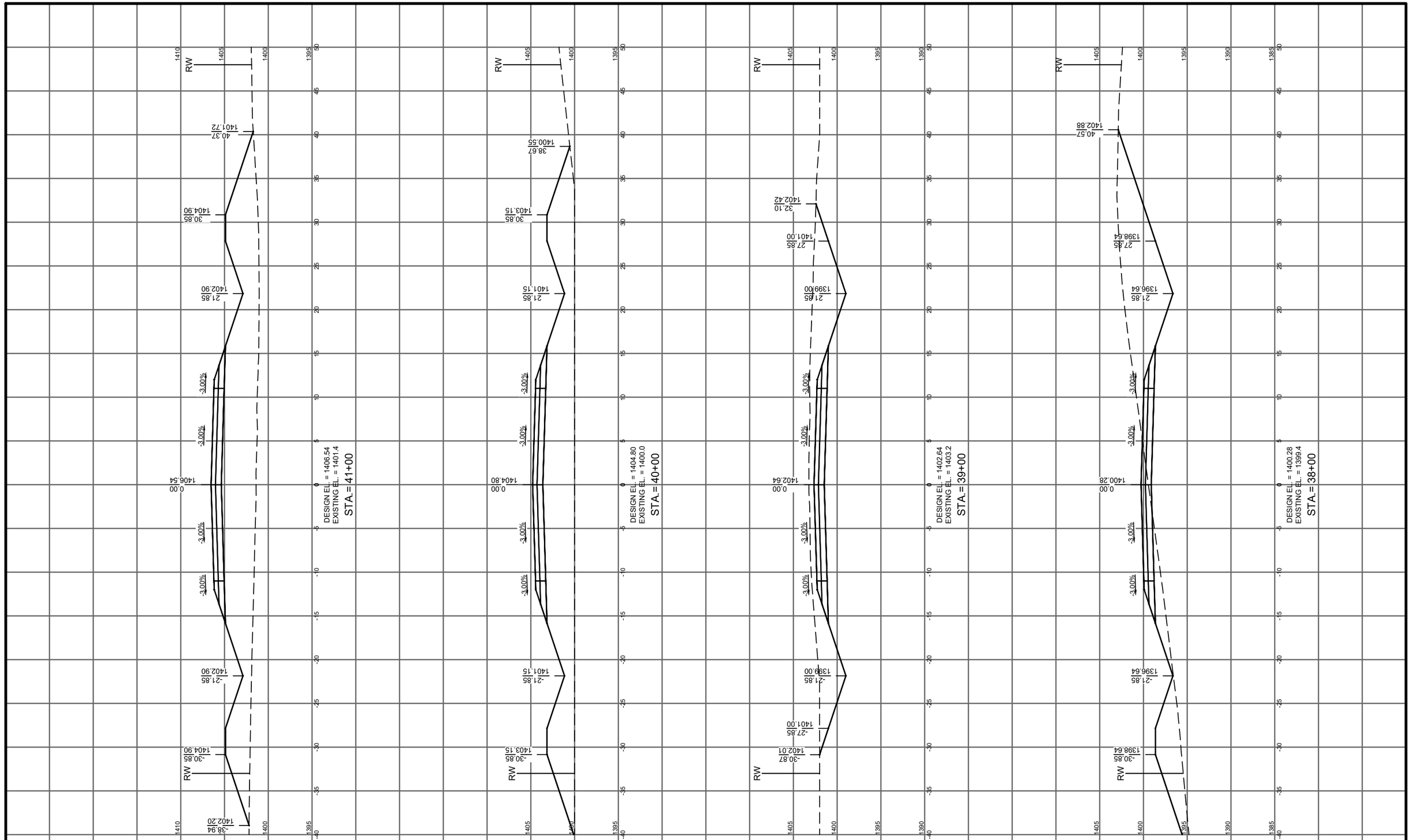

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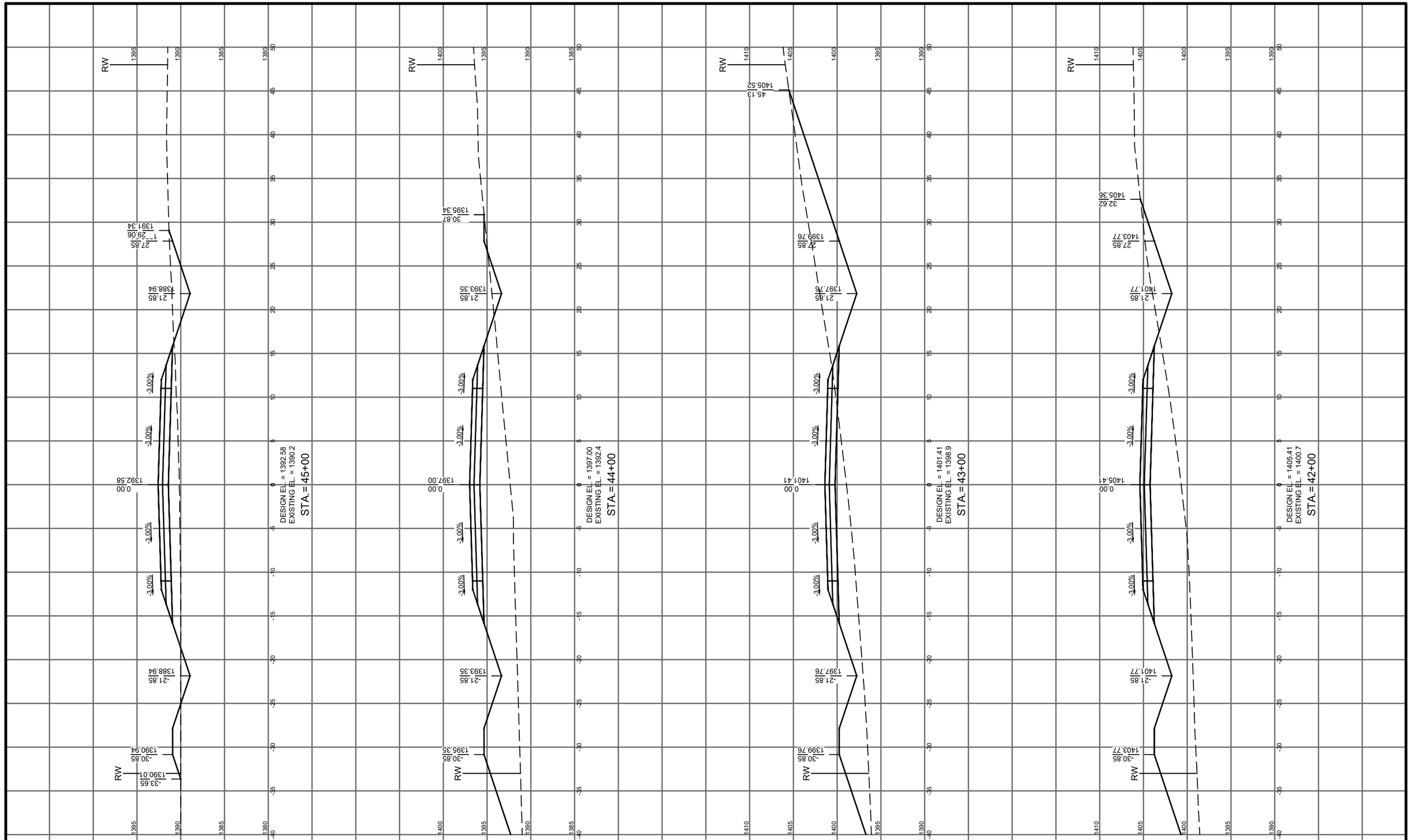
CROSS SECTIONS - (10)

PROJECT NO. 17764001

SHEET CS10



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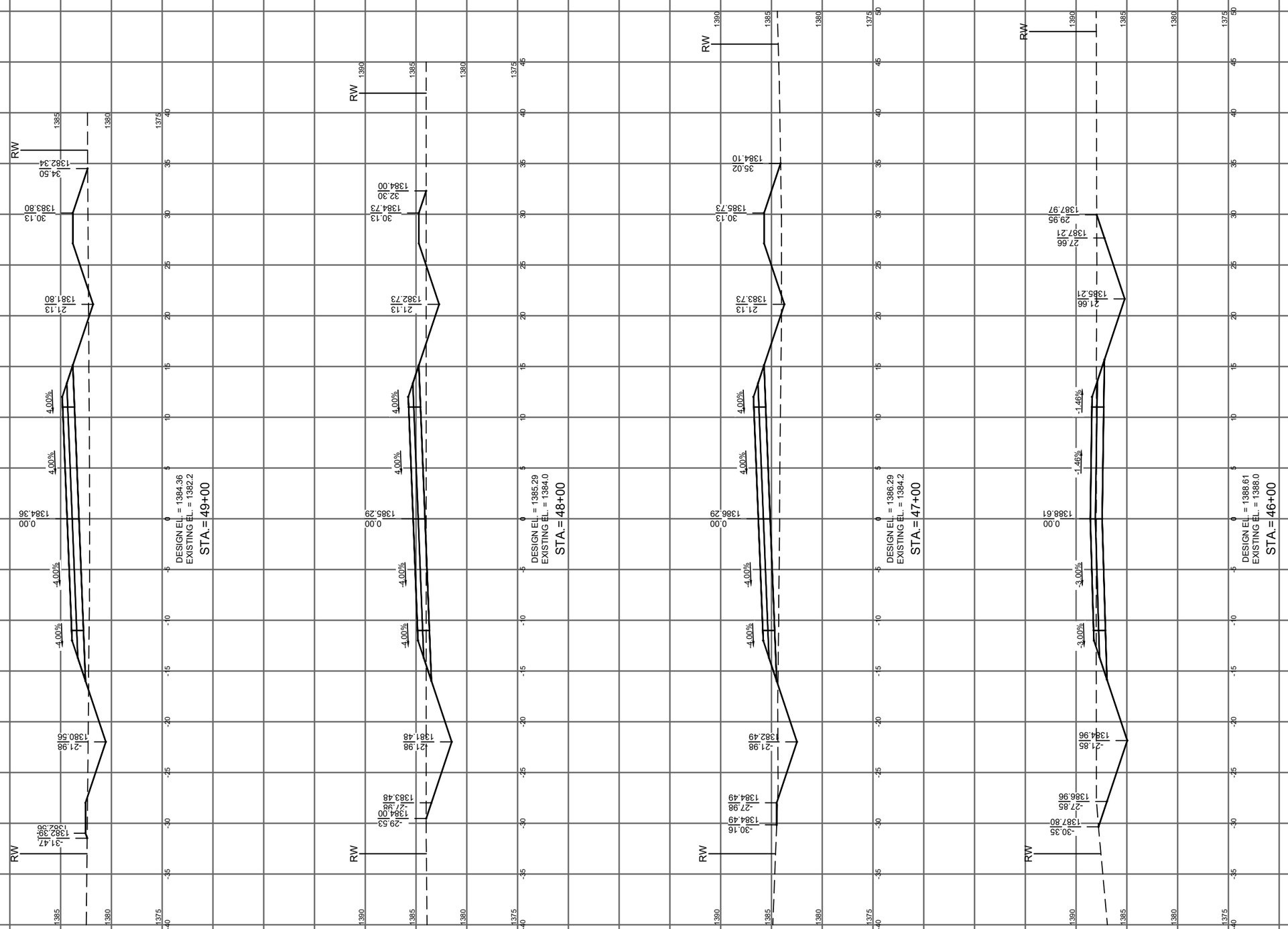
CROSS SECTIONS - (11)

PROJECT NO. 17764001

SHEET CS11



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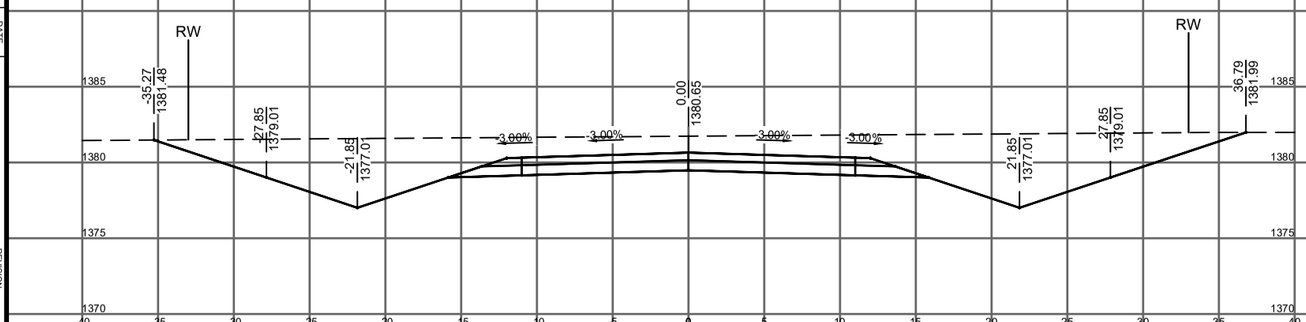
CROSS SECTIONS - (12)

PROJECT NO. 17764001

SHEET CS12



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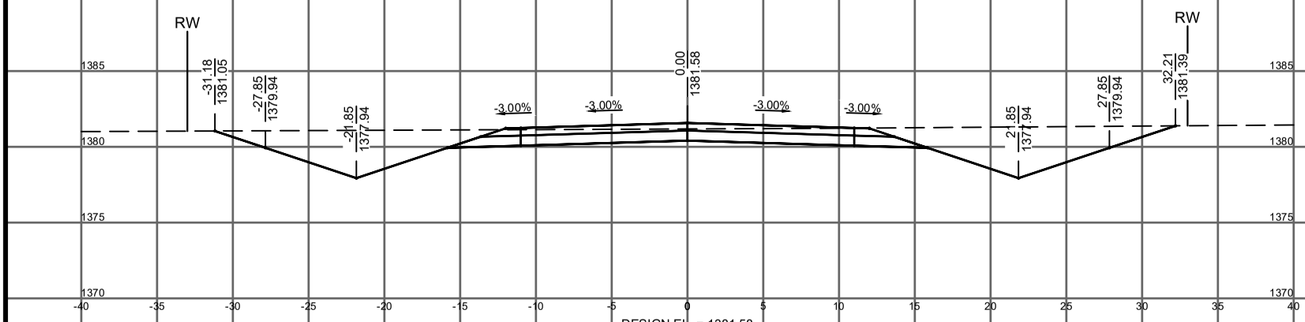
EXISTING EL. = 1381.7

STA.= 53+00



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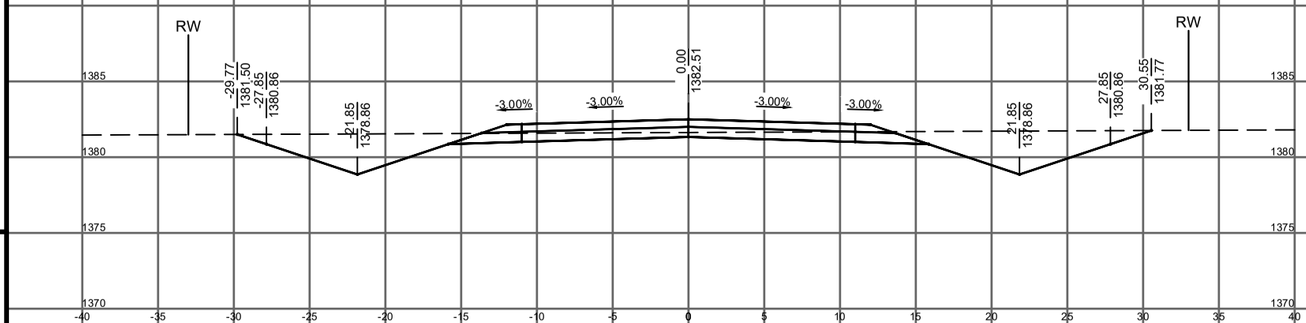
STA.= 52+00



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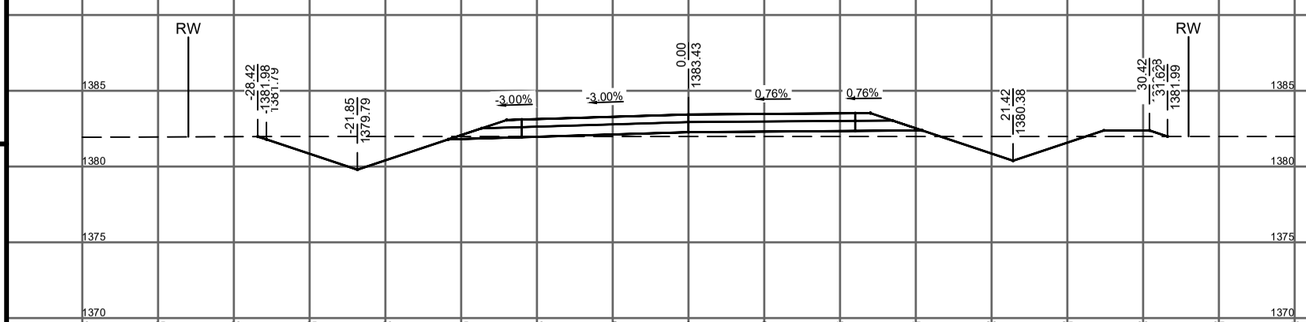
STA.= 51+00



DESIGN EL. = 1383.43
EXISTING EL. = 1382.0

STA.= 50+00

PROJECT DATE		DRAWN BY:	JAS	NO.	DATE	REVISION	BY
	JUNE 2019	DESIGNED BY:	AKB	-	-	-	-
		CHECKED BY:	EC	-	-	-	-

PLOT DATE: Thursday, June 20, 2019 11:22:30 AM, P:\17764\17764\17764\17764001\CADD\Construction Drawings\17764001 Detailed Rolls X-Section.dwg

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Date

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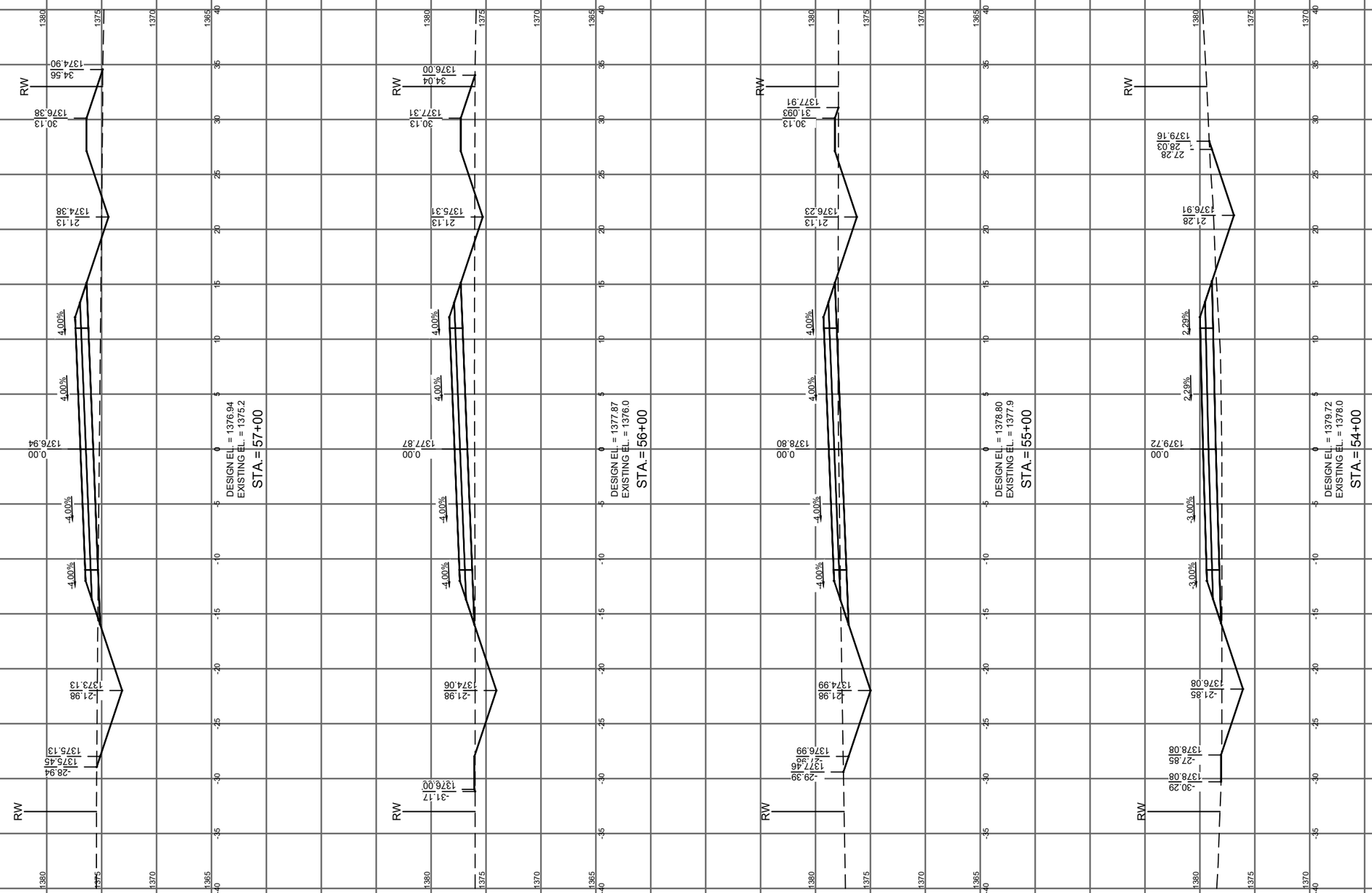
CROSS SECTIONS - (13)

PROJECT NO.
17764001

SHEET
CS13



			NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS		.	.	.	.
	DESIGNED BY: AKB		.	.	.	.
	CHECKED BY: EC		.	.	.	.

PLOT DATE: Thursday, June 20, 2019 11:23:41 AM, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Dehavilland Road X-Section.dwg

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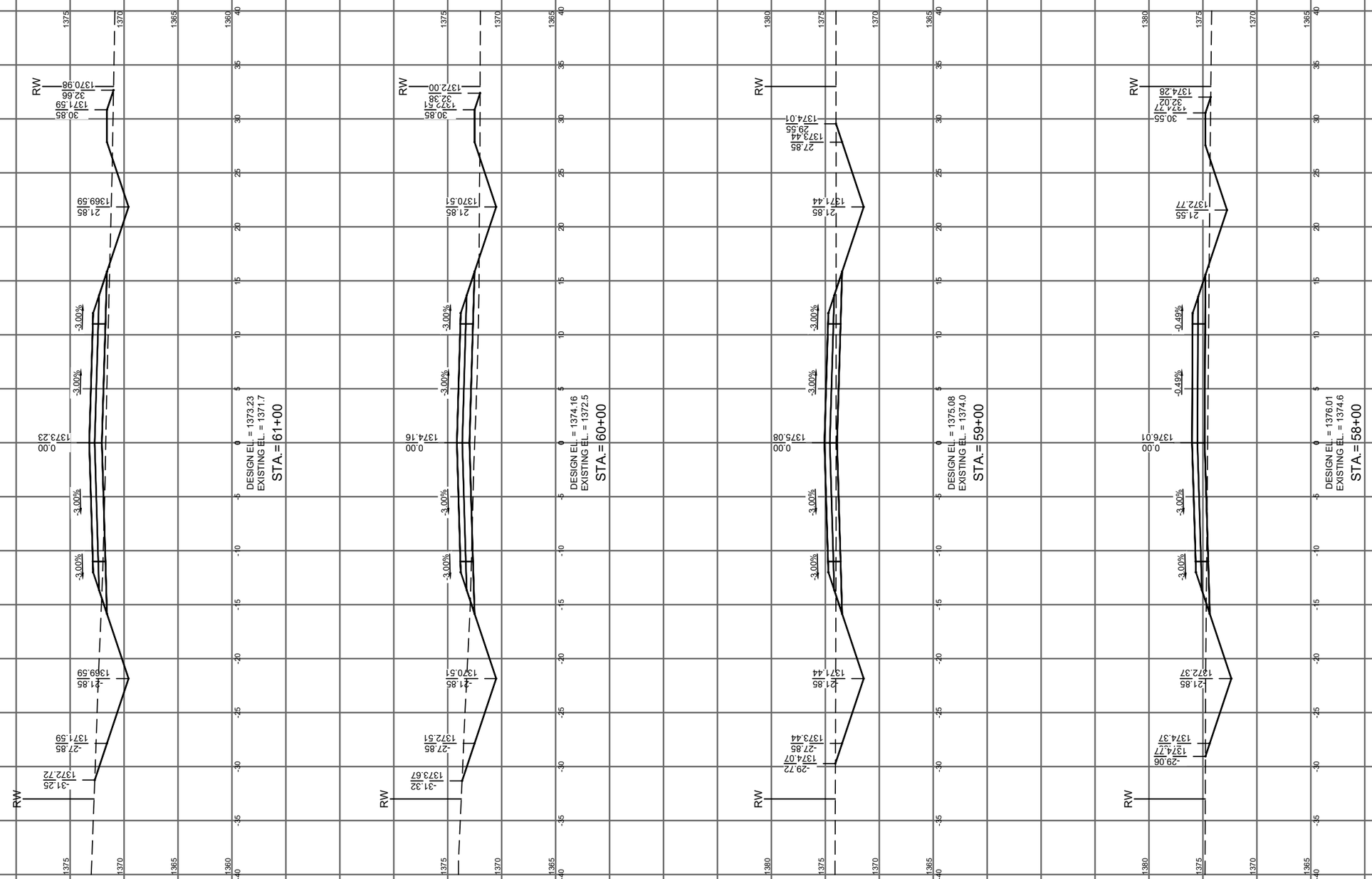
CROSS SECTIONS - (14)

PROJECT NO.
17764001

SHEET
CS14



			NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS		.	.	.	.
	DESIGNED BY: AKB		.	.	.	.
	CHECKED BY: EC		.	.	.	.

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CROSS SECTIONS - (15)

PROJECT NO. 17764001

SHEET CS15

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PROJECT DATE: JUNE 2019	DRAWN BY: JAS		.	.	.	.
	DESIGNED BY: AKB		.	.	.	.
	CHECKED BY: EC		.	.	.	.

PLOT DATE: Thursday, June 20, 2019 11:23:52 AM, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Dehavilland Road X-Section.dwg

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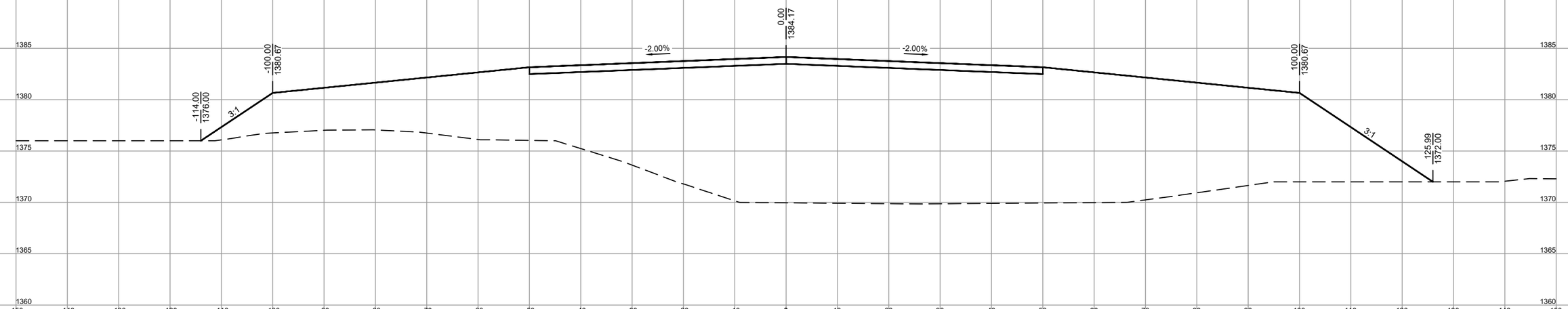
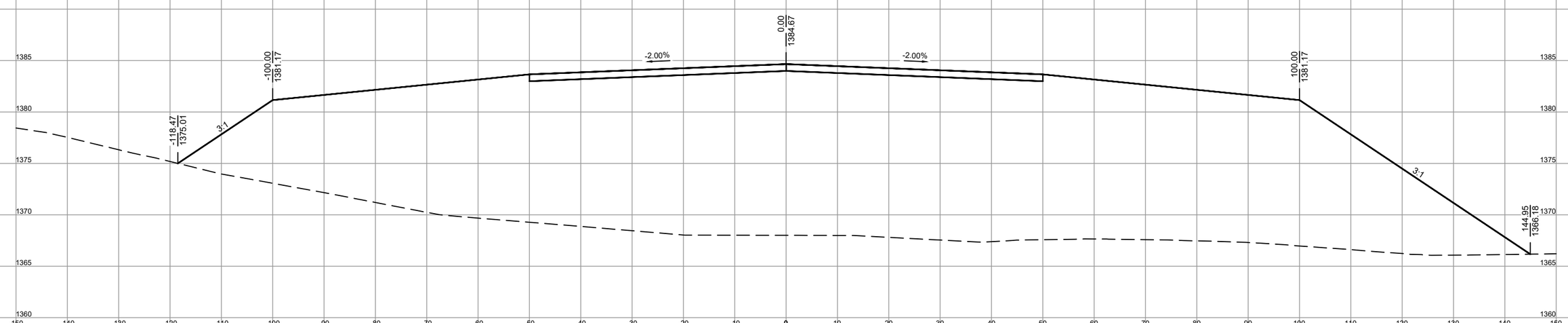
CROSS SECTIONS - (16)

PROJECT NO. 17764001

SHEET CS16



DESIGN EL. = 1384.17
EXISTING EL. = 1370.0
STA.= 12+00



DESIGN EL. = 1384.67
EXISTING EL. = 1368.0
STA.= 11+00

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PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

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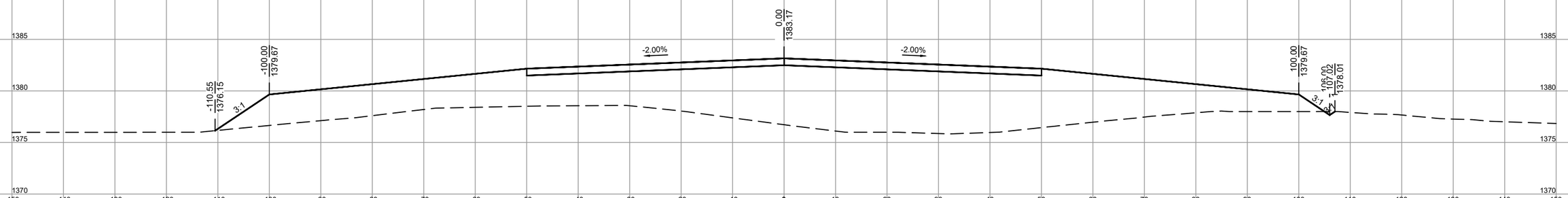
RUNWAY CROSS SECTIONS - (1)

PROJECT NO. 17764001

SHEET CS17



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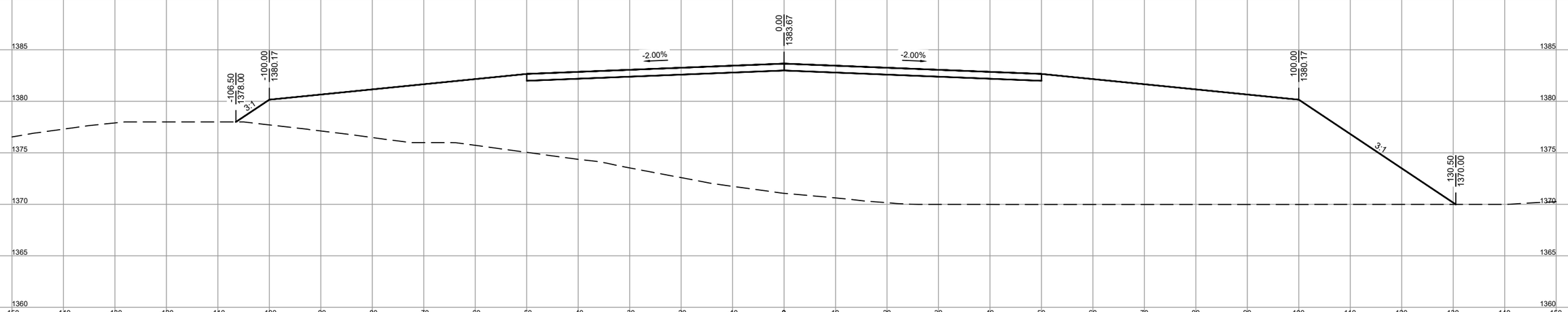

DESIGN EL. = 1383.67
EXISTING EL. = 1371.1
STA.= 13+00

		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

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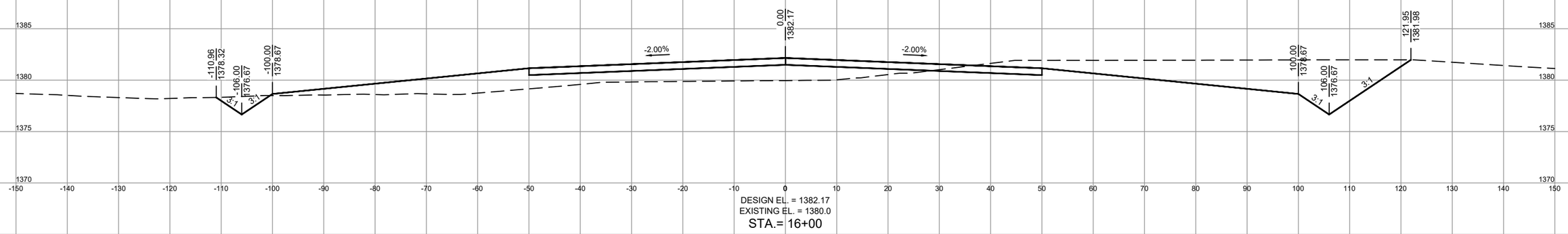
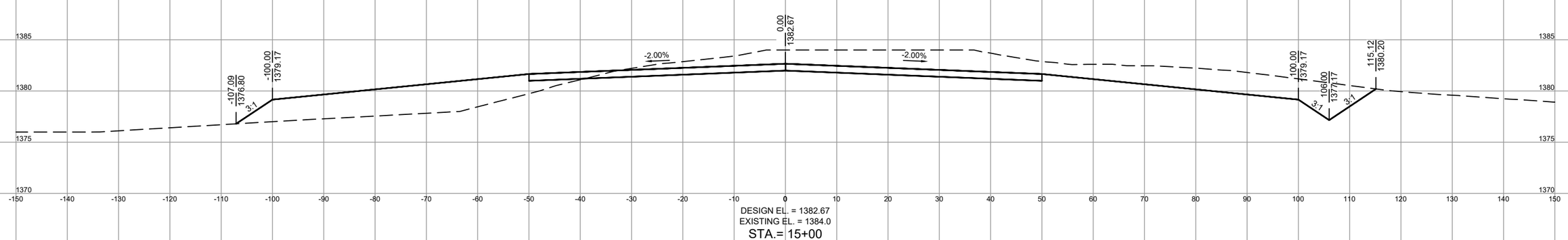
RUNWAY CROSS SECTIONS - (2)

PROJECT NO. 17764001

SHEET CS18





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PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

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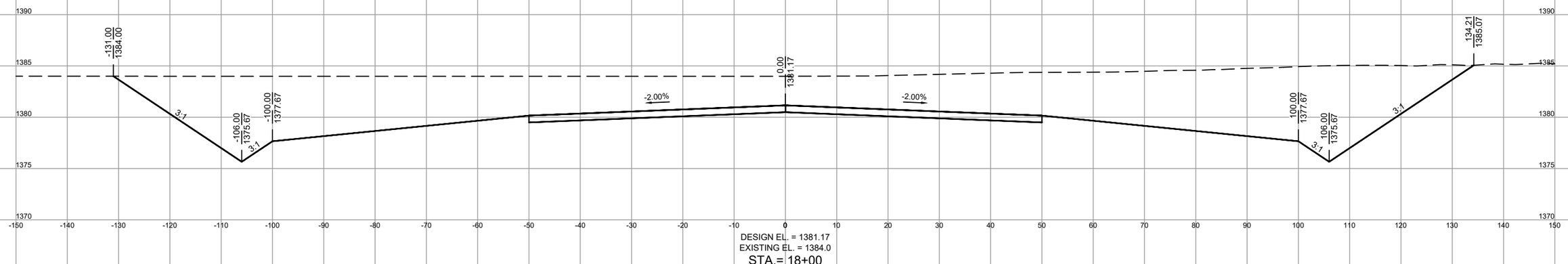
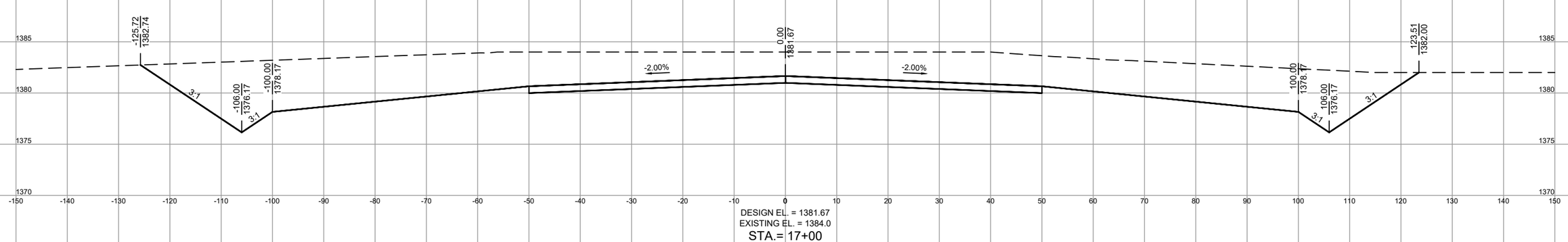
RUNWAY CROSS SECTIONS - (3)

PROJECT NO. 17764001

SHEET CS19





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PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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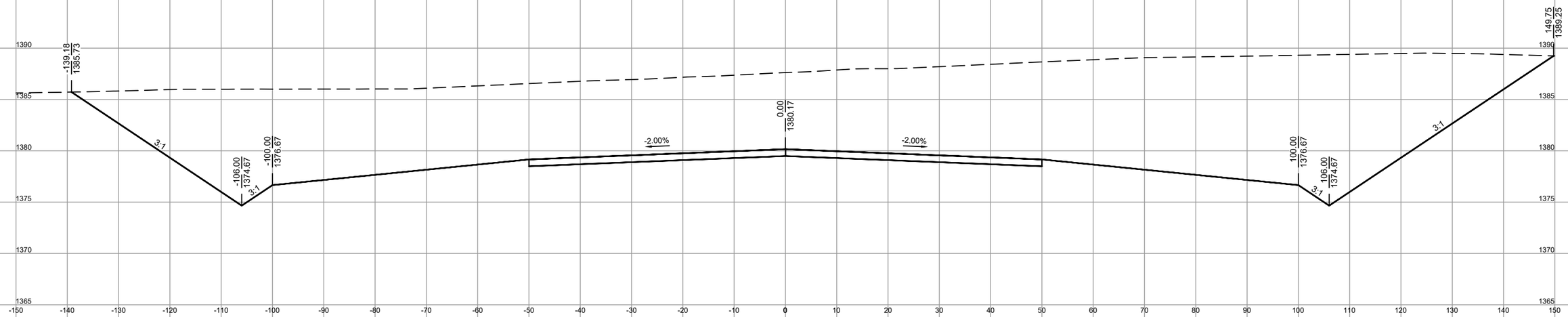
RUNWAY CROSS SECTIONS - (4)

PROJECT NO. 17764001

SHEET CS20



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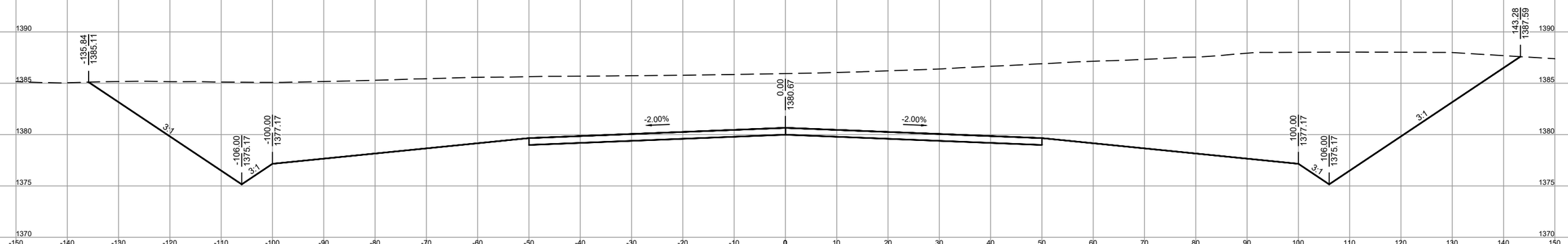
EXISTING EL. = 1387.6
STA.= 20+00



DESIGN EL. = 1380.67
EXISTING EL. = 1385.9
STA.= 19+00

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PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

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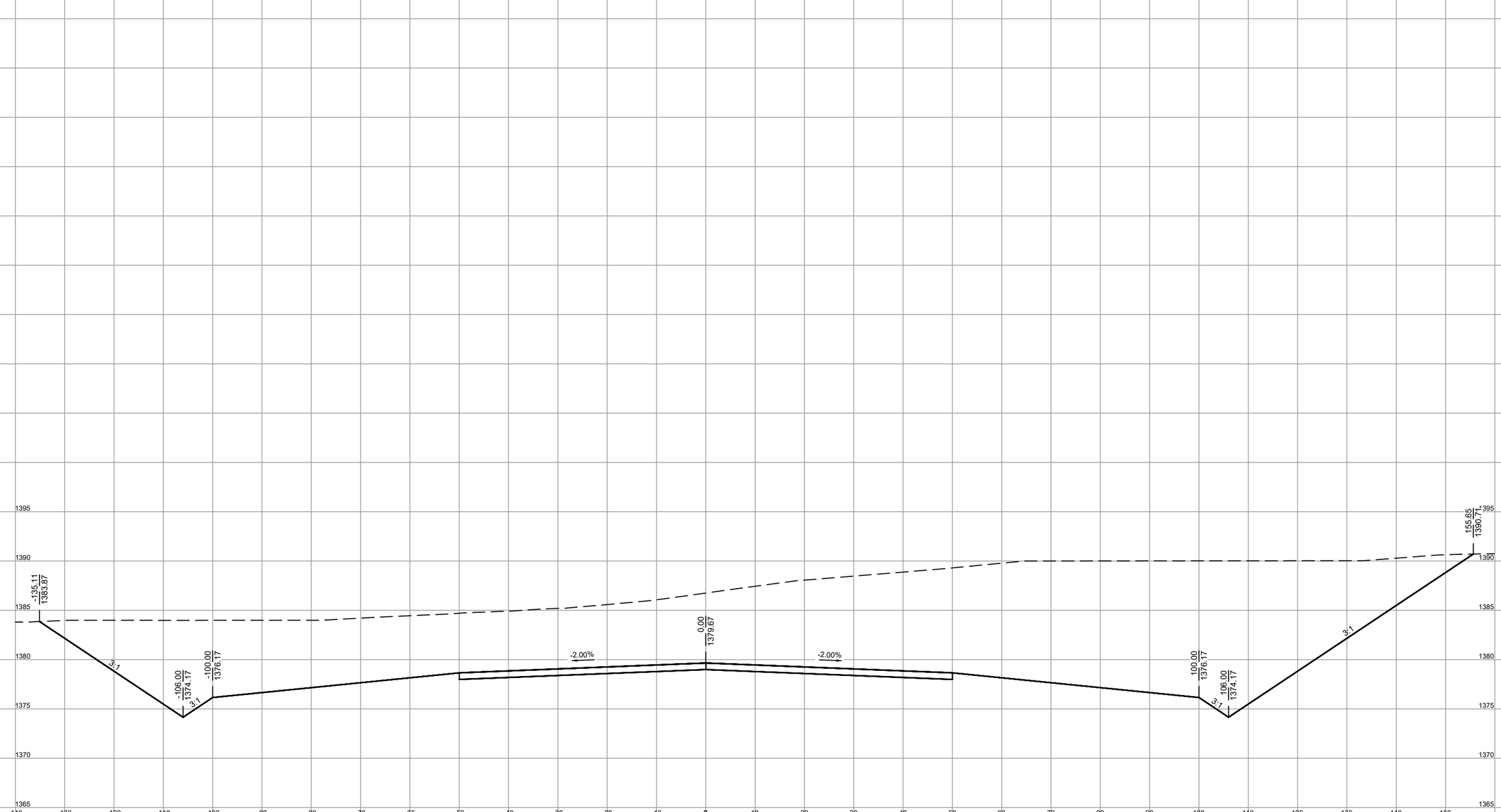
RUNWAY CROSS SECTIONS - (5)

PROJECT NO. 17764001

SHEET CS21



		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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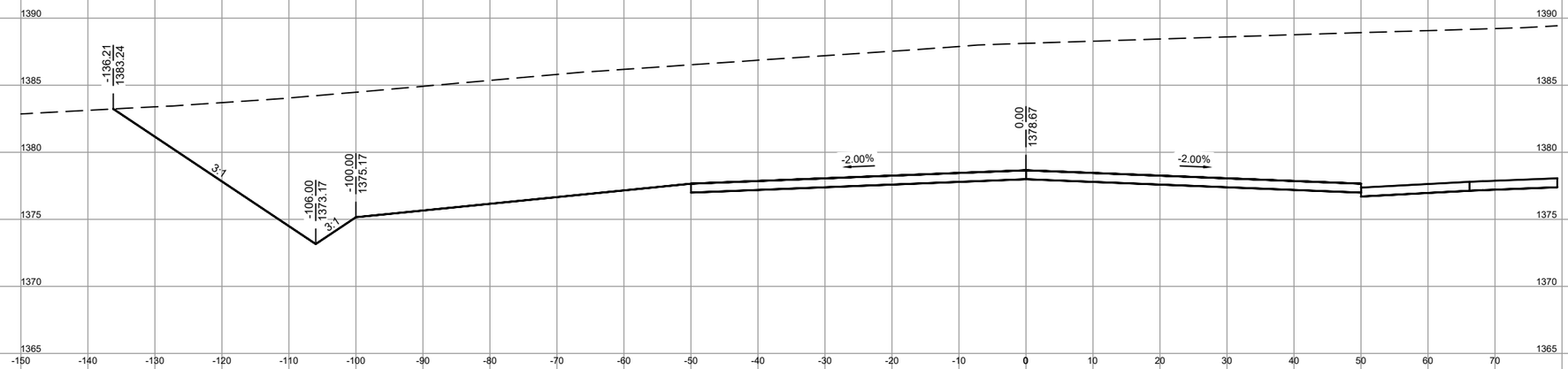
RUNWAY CROSS SECTIONS - (6)

PROJECT NO. 17764001

SHEET CS22



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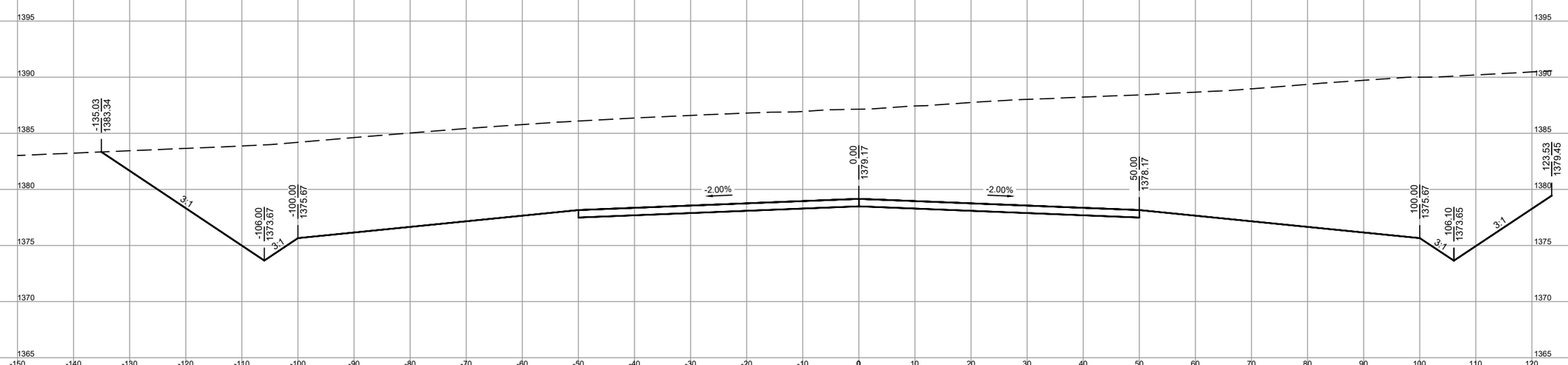
STA.= 23+00



DESIGN EL. = 1379.17
EXISTING EL. = 1387.2
STA.= 22+00

		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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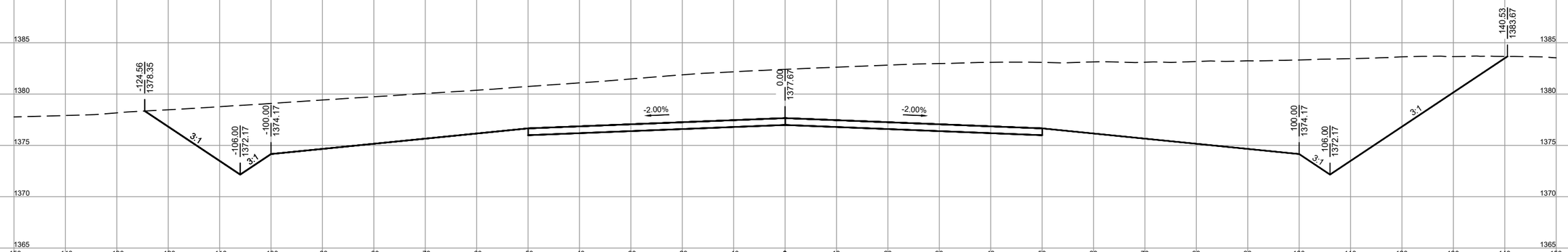
RUNWAY CROSS SECTIONS - (7)

PROJECT NO. 17764001

SHEET CS23



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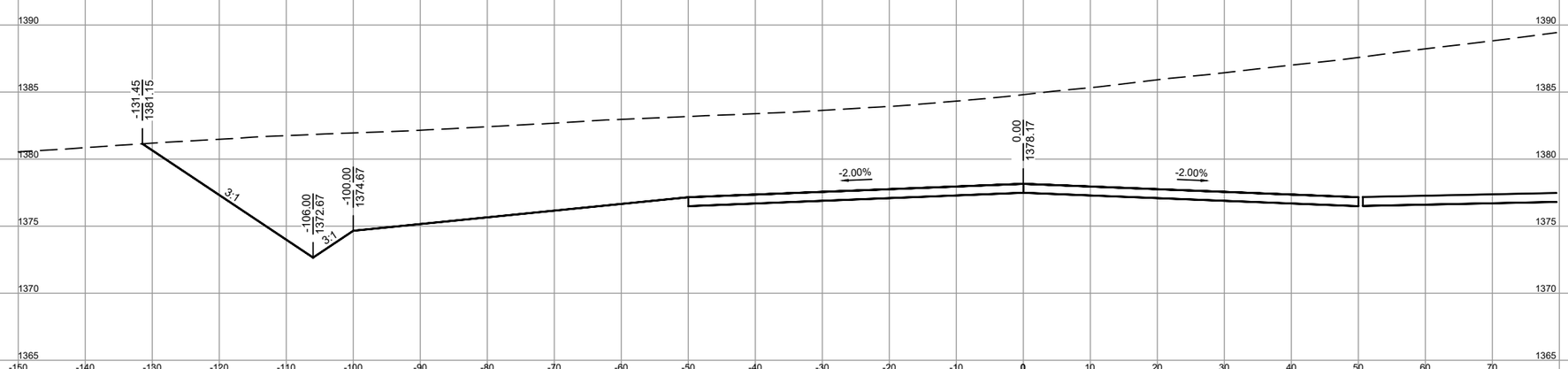
EXISTING EL. = 1382.4
STA.= 25+00



DESIGN EL. = 1378.17
EXISTING EL. = 1384.8
STA.= 24+00

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PROJECT DATE: JUNE 2019	DRAWN BY:	JAS	.	.	.	.
	DESIGNED BY:	AKB	.	.	.	.
	CHECKED BY:	EC	.	.	.	.

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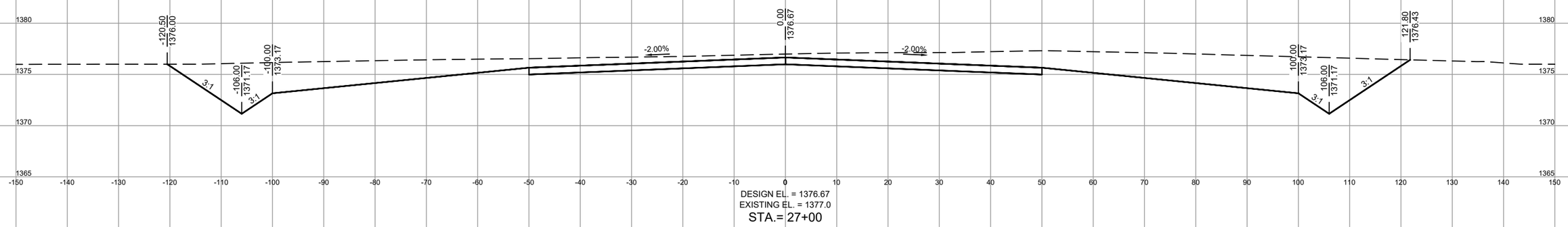
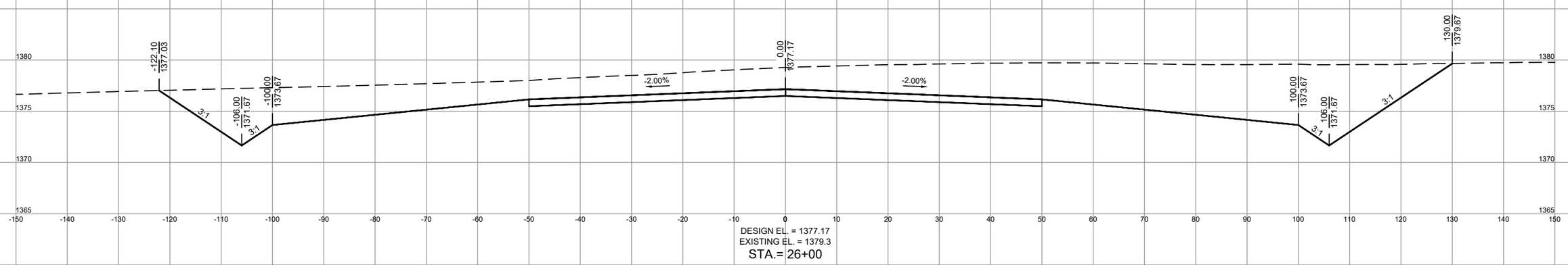
RUNWAY CROSS SECTIONS - (8)

PROJECT NO. 17764001
SHEET CS24





			NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY:	JAS	.	.	.	.
	DESIGNED BY:	AKB	.	.	.	.
	CHECKED BY:	EC	.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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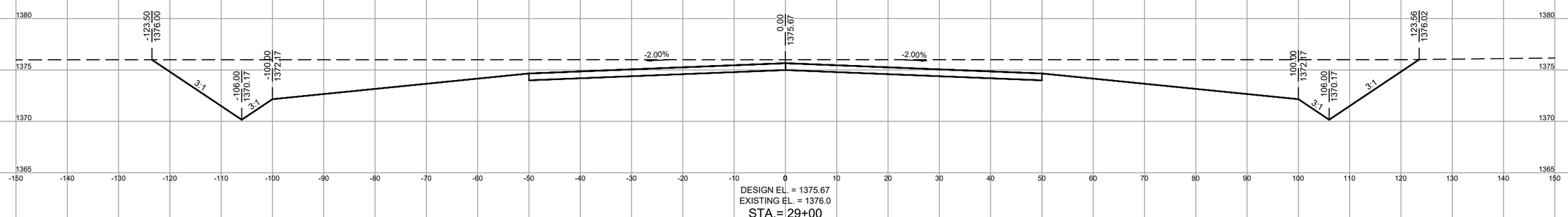
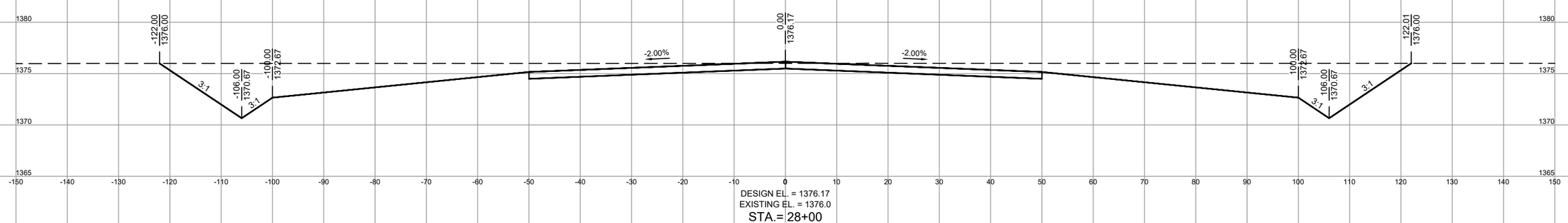
GRAND LAKE TOWNSHIP, MN

RUNWAY CROSS SECTIONS - (9)

PROJECT NO. 17764001

SHEET CS25





			NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS		.	.	.	.
	DESIGNED BY: AKB		.	.	.	.
	CHECKED BY: EC		.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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6-21-2019 Date

56425 License No.

Andrew Barnebey

ANDREW K BARNEBEY

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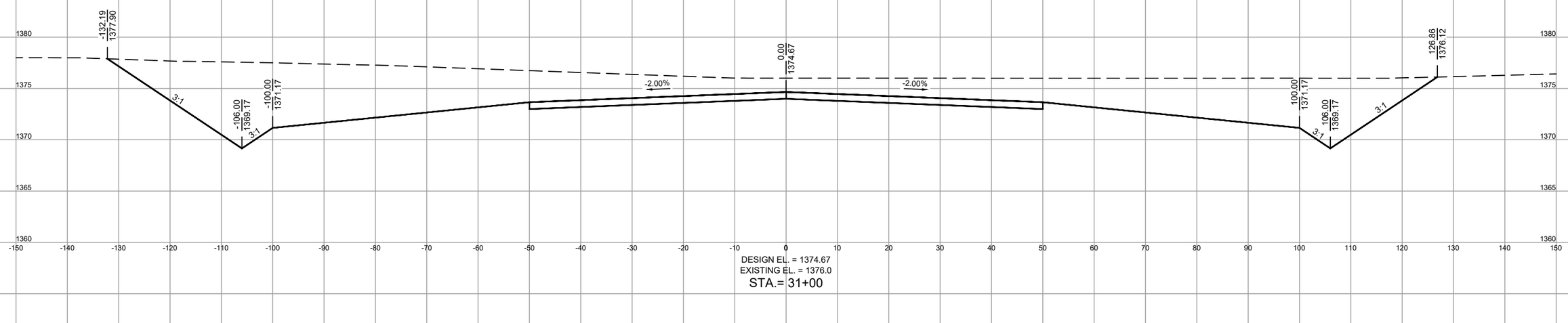
RUNWAY CROSS SECTIONS - (10)

PROJECT NO. 17764001

SHEET CS26



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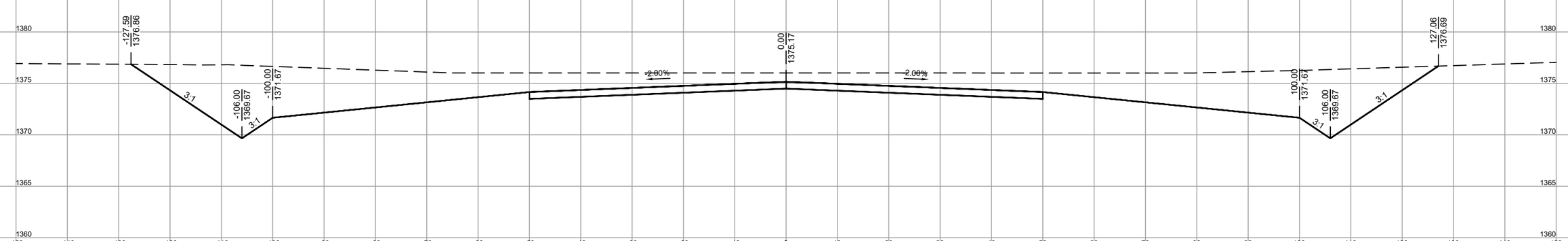
STA.= 31+00



DESIGN EL. = 1375.17
EXISTING EL. = 1376.0
STA.= 30+00

		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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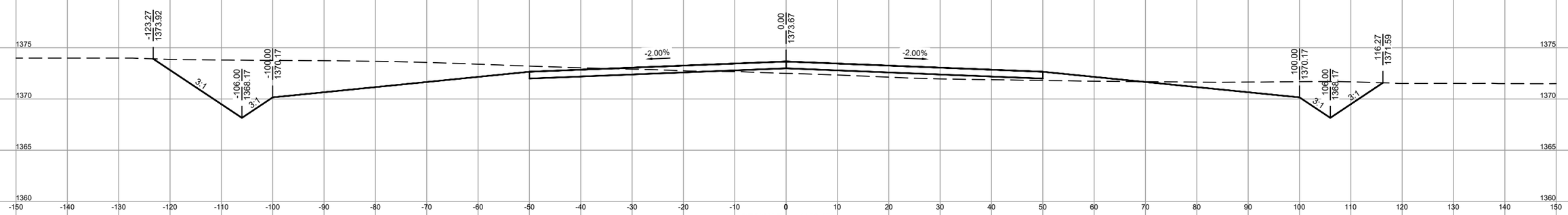
RUNWAY CROSS SECTIONS - (11)

PROJECT NO. 17764001

SHEET CS27



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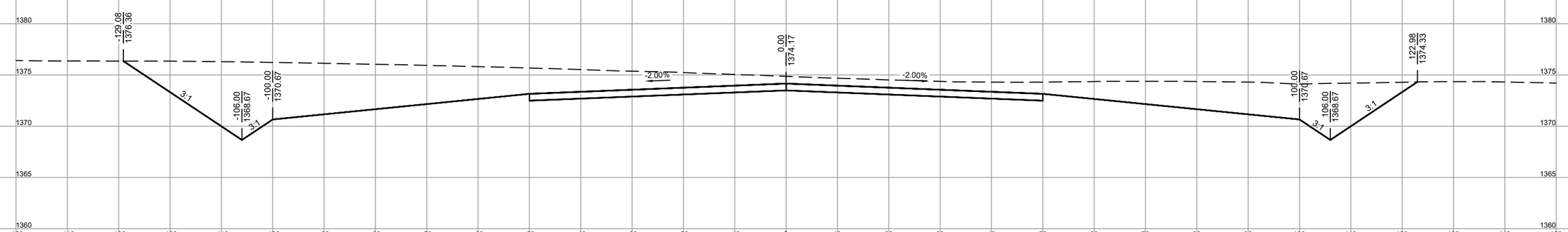

DESIGN EL. = 1374.17
EXISTING EL. = 1374.9
STA.= 32+00

		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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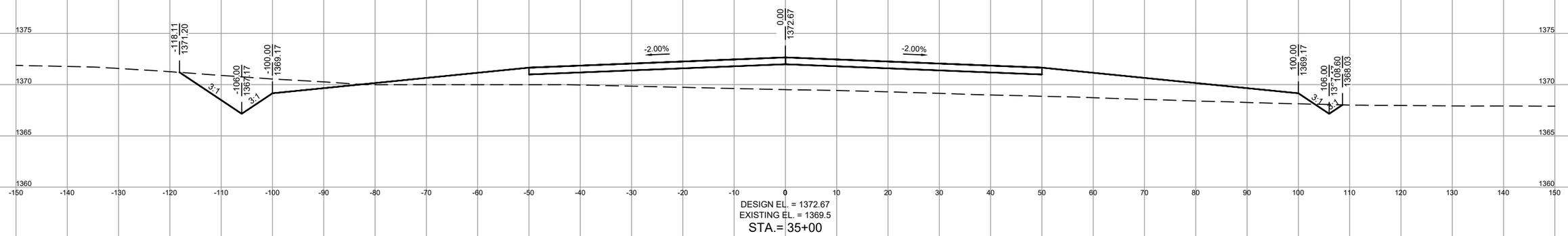
RUNWAY CROSS SECTIONS - (12)

PROJECT NO. 17764001

SHEET CS28



DESIGN EL. = 1372.67
EXISTING EL. = 1369.5
STA.= 35+00

DESIGN EL. = 1373.17
EXISTING EL. = 1371.1
STA.= 34+00

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PROJECT DATE: JUNE 2019	DRAWN BY: JAS		.	.	.	.
	DESIGNED BY: AKB		.	.	.	.
	CHECKED BY: EC		.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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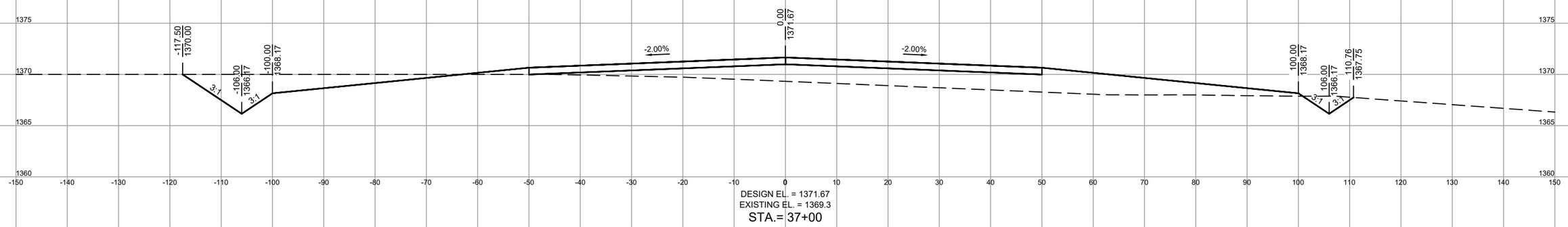
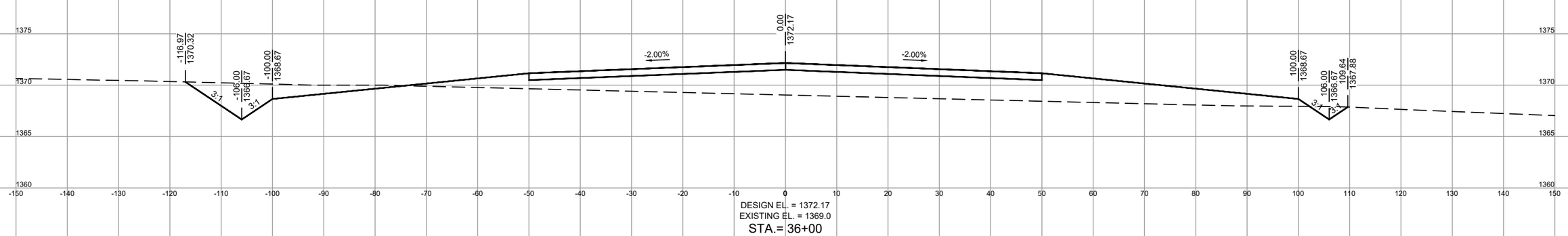
RUNWAY CROSS SECTIONS - (13)

PROJECT NO. 17764001

SHEET CS29





			NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY:	JAS	.	.	.	.
	DESIGNED BY:	AKB	.	.	.	.
	CHECKED BY:	EC	.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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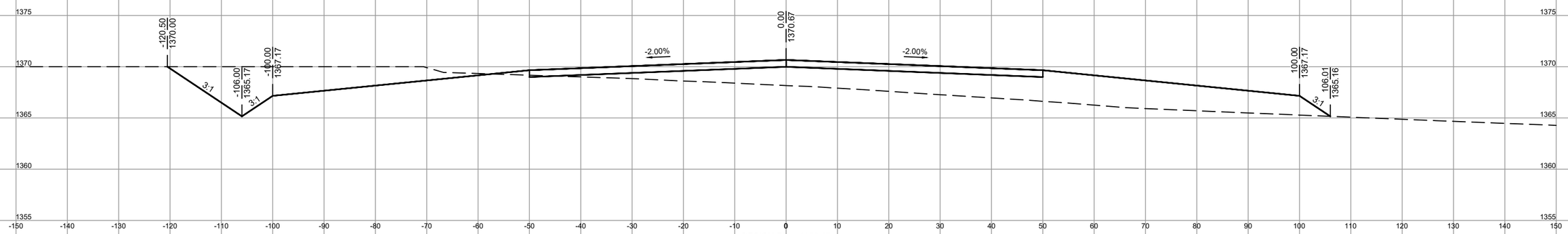
RUNWAY CROSS SECTIONS - (14)

PROJECT NO. 17764001

SHEET CS30



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EXISTING EL. = 1368.2
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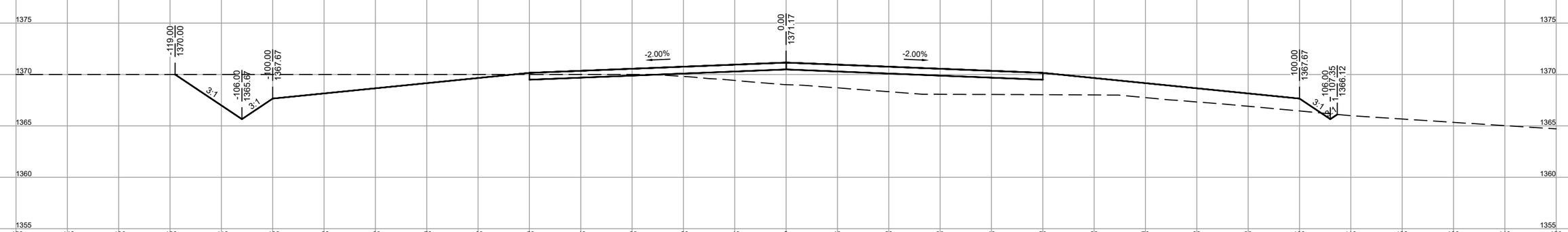

DESIGN EL. = 1371.17
EXISTING EL. = 1369.0
STA.= 38+00

		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

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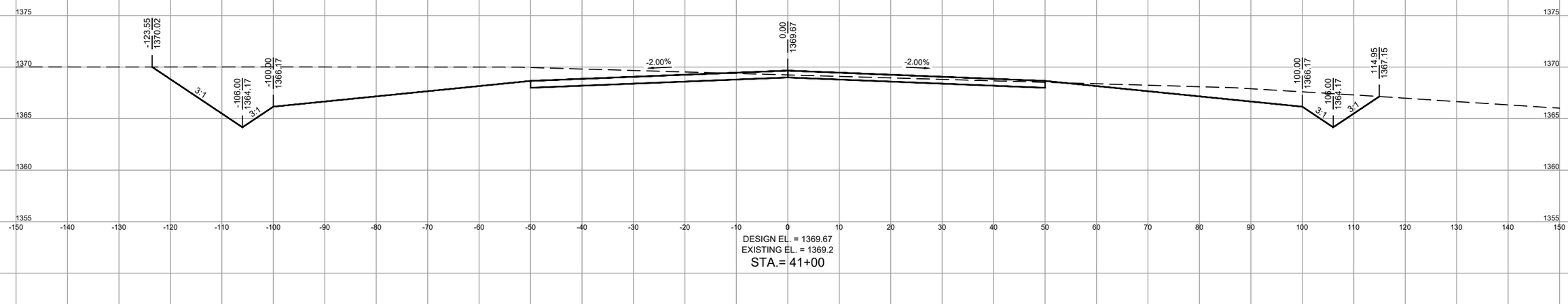
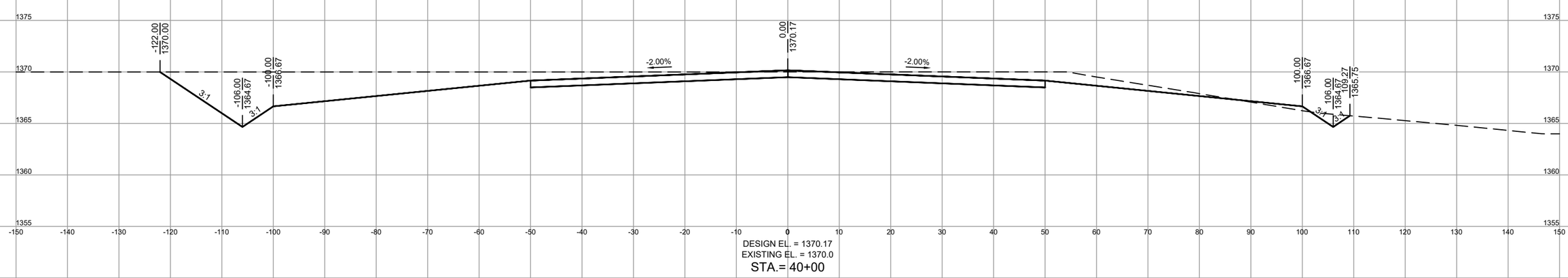
RUNWAY CROSS SECTIONS - (15)

PROJECT NO. 17764001

SHEET CS31





			NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS		.	.	.	.
	DESIGNED BY: AKB		.	.	.	.
	CHECKED BY: EC		.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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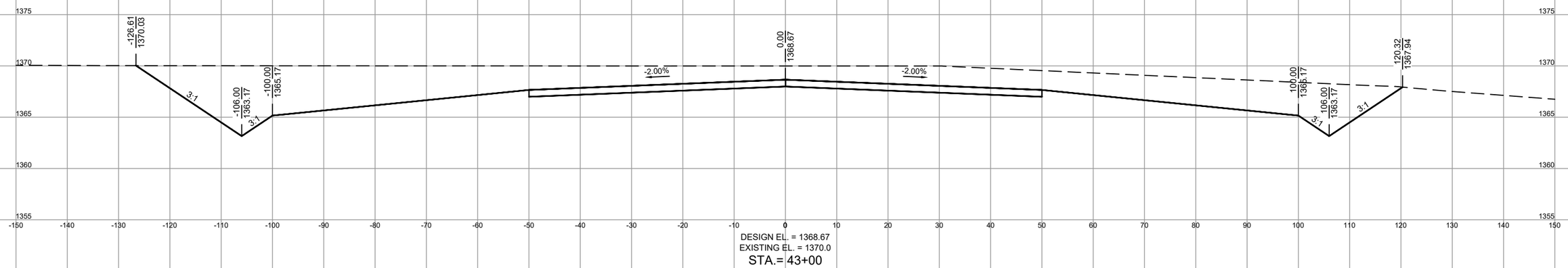
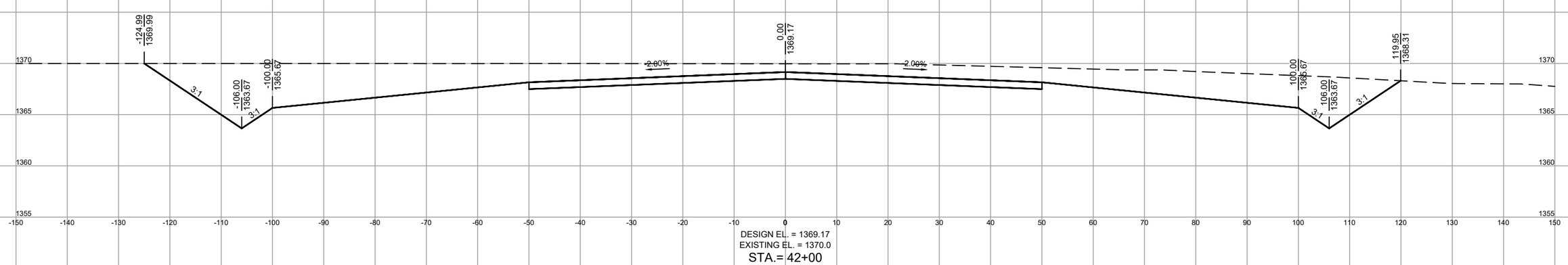
RUNWAY CROSS SECTIONS - (16)

PROJECT NO. 17764001

SHEET CS32





		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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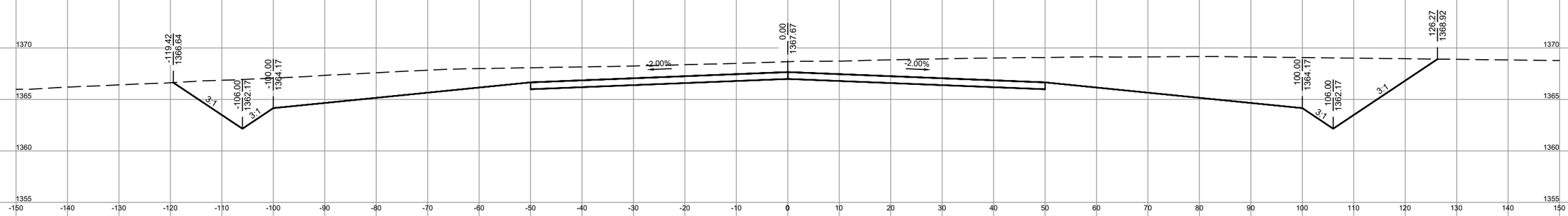
RUNWAY CROSS SECTIONS - (17)

PROJECT NO. 17764001

SHEET CS33



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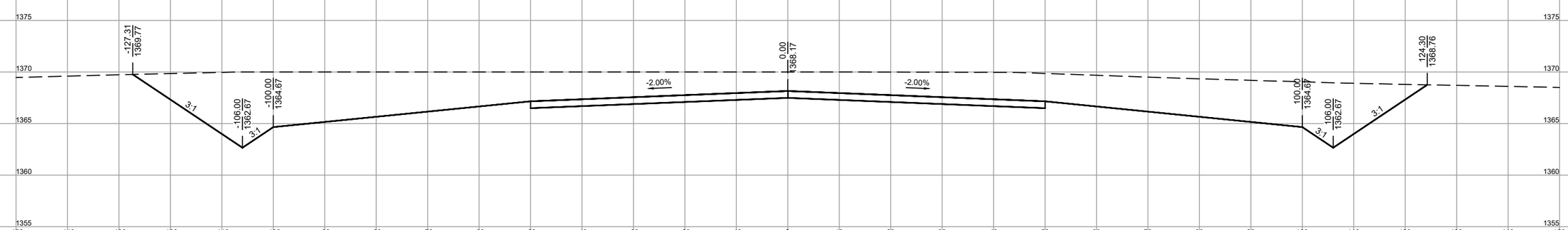

DESIGN EL. = 1368.17
EXISTING EL. = 1370.0
STA.= 44+00

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PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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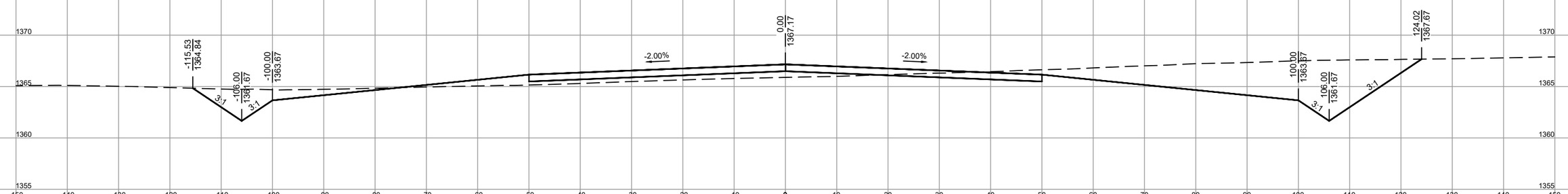
RUNWAY CROSS SECTIONS - (18)

PROJECT NO. 17764001

SHEET CS34



DESIGN EL. = 1367.17
EXISTING EL. = 1365.9
STA.= 46+00

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PROJECT DATE: JUNE 2019	DRAWN BY:	JAS	.	.	.	.
	DESIGNED BY:	AKB	.	.	.	.
	CHECKED BY:	EC	.	.	.	.

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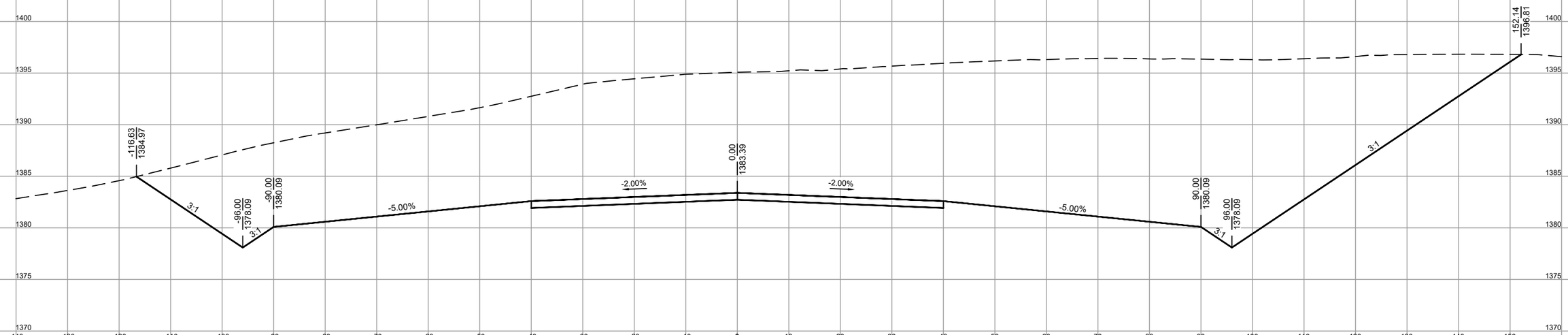
RUNWAY CROSS SECTIONS - (19)

PROJECT NO. 17764001

SHEET CS35



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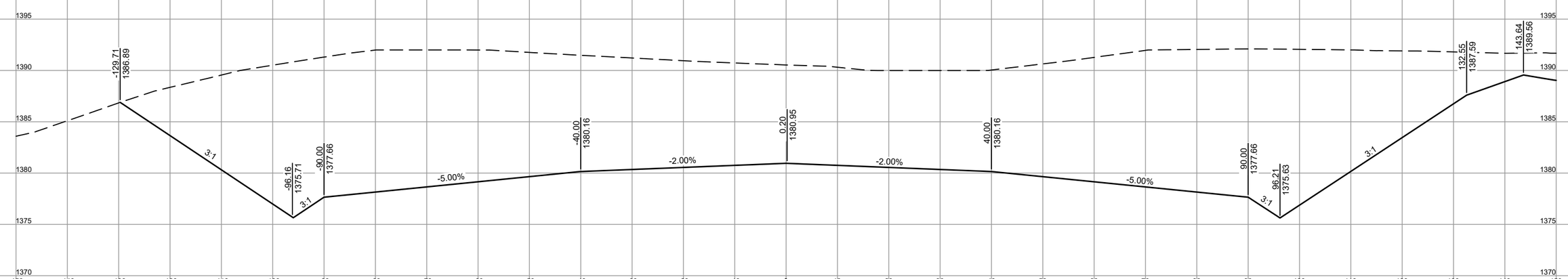

DESIGN EL. = 1380.96
EXISTING EL. = 1390.5
STA.= 2+00

		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

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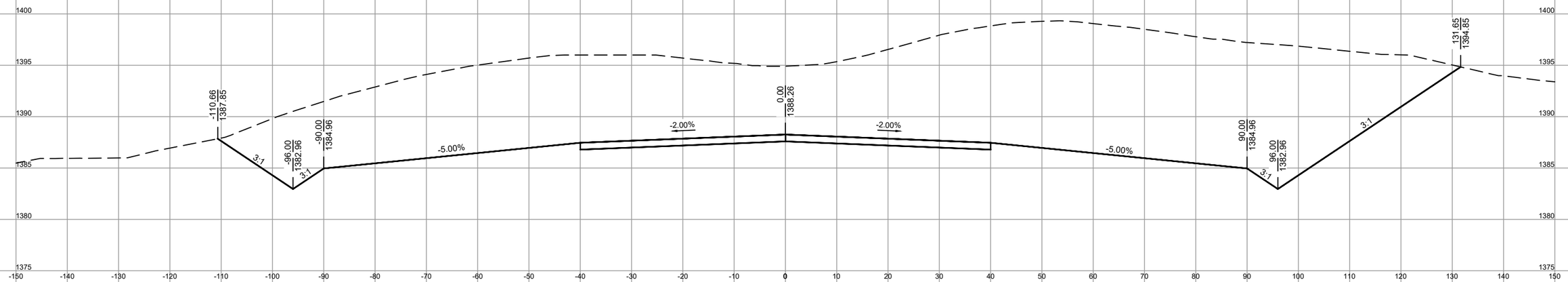
TAXIWAY CROSS SECTIONS - (1)

PROJECT NO. 17764001

SHEET CS36



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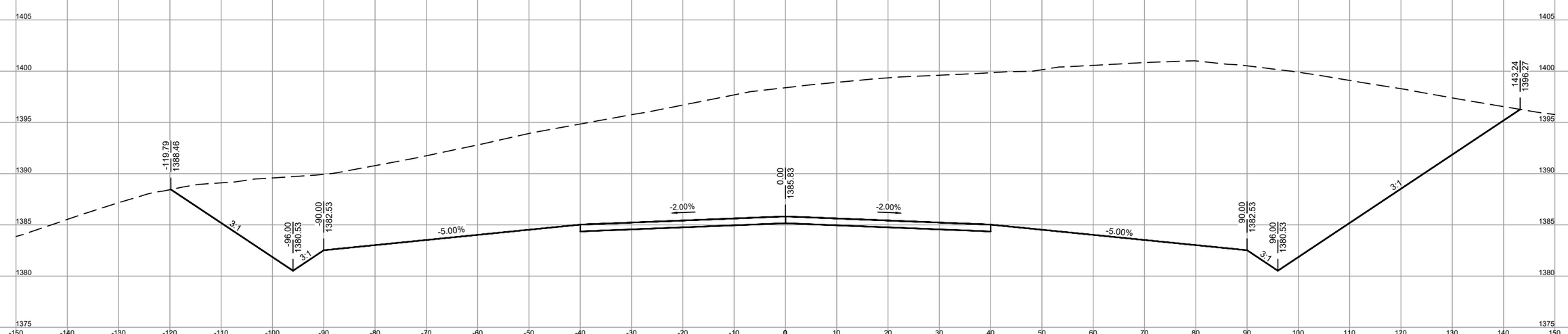
STA.= 5+00



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EXISTING EL. = 1398.4
STA.= 4+00

		NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS	.	.	.	.
	DESIGNED BY: AKB	.	.	.	.
	CHECKED BY: EC	.	.	.	.

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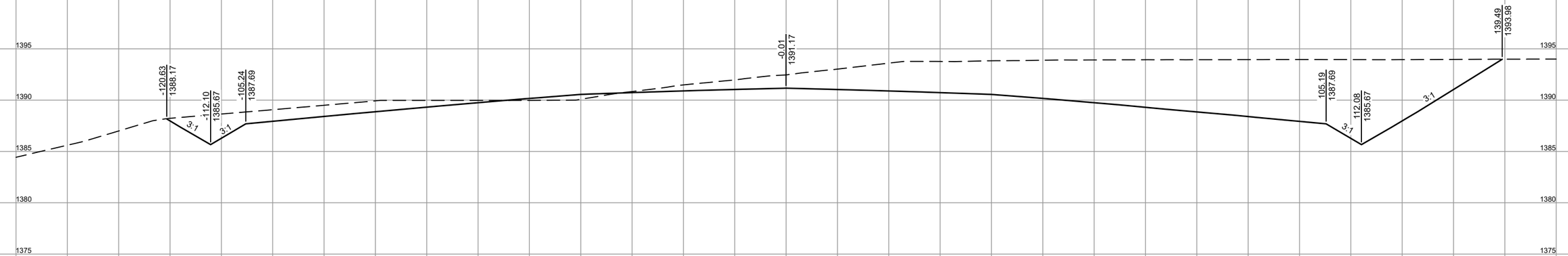
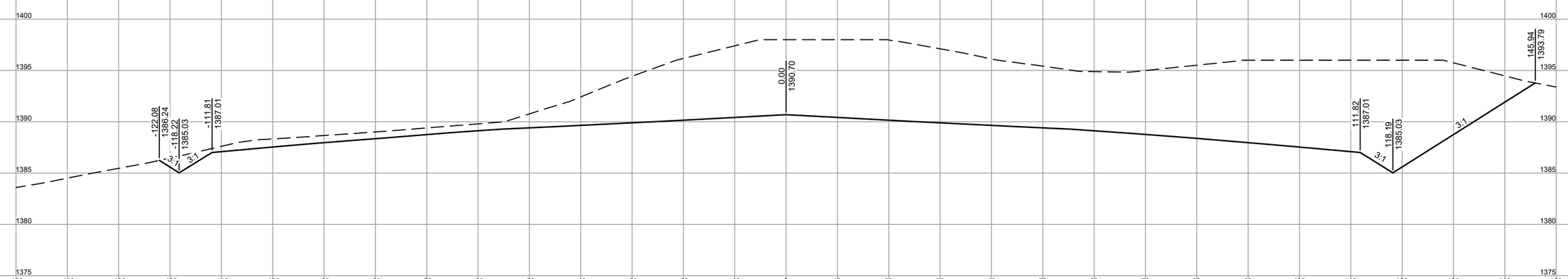
TAXIWAY CROSS SECTIONS - (2)

PROJECT NO. 17764001

SHEET CS37



DESIGN EL. = 1391.17
EXISTING EL. = 1392.5
STA.= 7+00



DESIGN EL. = 1390.70
EXISTING EL. = 1398.0
STA.= 6+00

			NO.	DATE	REVISION	BY
PROJECT DATE: JUNE 2019	DRAWN BY: JAS		.	.	.	.
	DESIGNED BY: AKB		.	.	.	.
	CHECKED BY: EC		.	.	.	.

PLOT DATE: 6/20/19, P:\17700s\17760s\17764\17764001\CADD\Construction Drawings\17764001 Runway Taxiway X-Section.dwg

I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

6-21-2019 Date

56425 License No.

Andrew Barnebey

ANDREW K BARNEBEY

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SUPERIOR AERO ESTATES
NICK CLATTENBURG
GRAND LAKE TOWNSHIP, MN

TAXIWAY CROSS SECTIONS - (3)

PROJECT NO. 17764001

SHEET CS38