

GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ALONG THE SITE. THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATIONS ON THE PLANS IS NOT TO BE CONSIDERED AS THE NON-EXISTENCE OF OR A DEFINITE LOCATION OF EXISTING UNDERGROUND UTILITIES.
2. THE CONTRACTOR WILL TAKE THE NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES, BUILDINGS, FENCES, AND ROADWAYS FROM DAMAGE DUE TO THIS OPERATION. ANY DAMAGE TO THE ABOVE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE, AND ANY SERVICE DISRUPTION WILL BE SETTLED BY THE CONTRACTOR.
3. BULK GRADING SHALL BE COMPLETED TO A SUBGRADE TOLERANCE OF PLUS OR MINUS 0.2'.
4. MAXIMUM CUT/FILL SLOPES SHALL NOT EXCEED 3:1, UNLESS OTHERWISE NOTED.
5. ALL BOTOM OF WALL (BW) CALLOUTS ARE FOR THE BOTTOM OF WALL AT GRADE. THEY DO NOT REPRESENT THE BOTTOM OF THE CONSTRUCTED WALL OR FOOTING, WHICH IS NOT SPECIFIED ON THESE PLANS.

NOTE: ALL EXISTING UNDERGROUND AND ABOVE GROUND UTILITY LOCATIONS, INVERTS AND SIZES ARE APPROXIMATE ONLY AND MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION. TIE IN POINTS SHALL BE POTHOLED AND LOCATIONS, INVERTS AND SIZES SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

SOIL TYPES

ONSITE SOILS ARE HYDROLOGIC GROUP "B", 27% KETTLE-ROCK OUTCROP COMPLEX (42) AND 73% PRING COARSE SANDY LOAM (71), PER NRCS WEB SOIL SURVEY MAP

BENCHMARKS

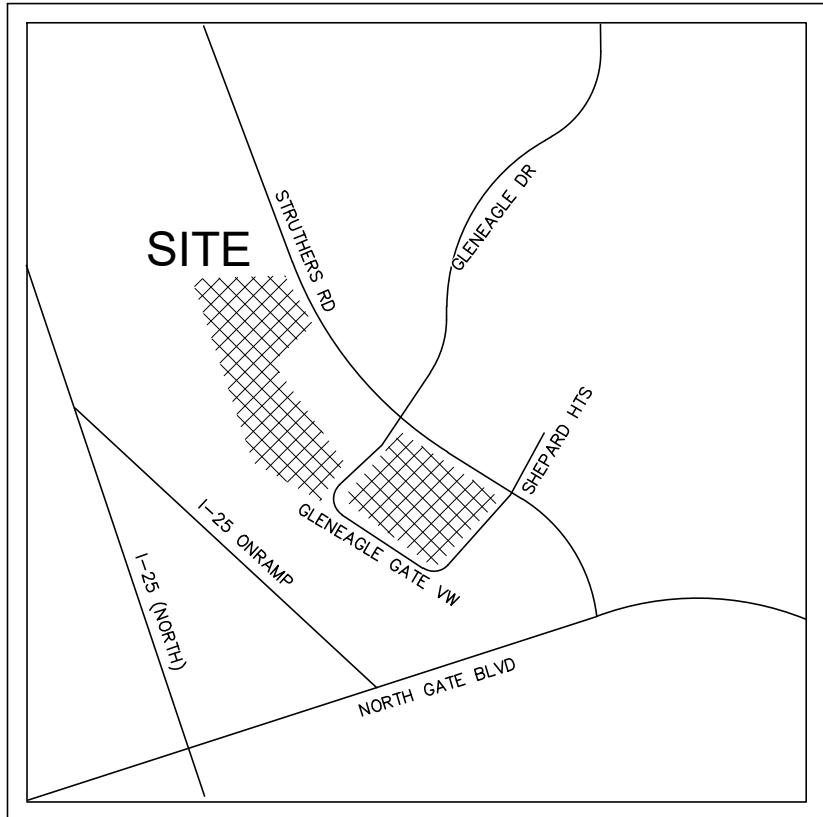
NGS CONTROL POINT Q 395 (PIDKK1309). ELEVATION = 6739.60 (NAVD 1988). BASIS OF BEARINGS IS THE EAST LINE OF THE PROPRETY, MONUMENTED AS SHOWN AND ASSUMED TO BEAR SOUTH 0 DEGREES 08 MINUTES 45 SECONDS WEST. LOCAL SITE BENCHMARK IS HEREON (SOUTHWEST CORNER OF TRACT E, 3-1/4" BRASS CAP IN CONCRETE, 0.3 ABOVE GROUND ELEV=6752.33, NAVD-1988).

EARTHWORK VOLUMES

ESTIMATED CUT = 27,068 CY, ESTIMATED FILL = 75,994 CY, NET = 48,926 CY <FILL>

EROSION CONTROL COST OPINION:

1.	2,590 LF-SILT FENCE @ \$4/LF	\$ 10,360
2.	1 EA-CONCRETE WASHOUT @ \$1,260/EA	\$ 1,260
3.	12 EA-INLET PROTECTION @ \$233/EA	\$ 2,796
4.	9.4 AC-SURFACE ROUGHENING @ \$289/AC	\$ 2,717
5.	2.5 AC-SEED AND MULCH @ \$2,169/AC	\$ 5,423
6.	2 EA-VEHICLE TRACKING CONTROL @ \$3,316/EA	\$ 6,632
7.	40% MAINTENANCE AND REPLACEMENT	\$ 11,675
TOTAL		\$ 40,863



VICINITY MAP
N.T.S.

SITE ADDRESS

208 AND 309 GLENEAGLE GATE VIEW, COLORADO SPRINGS, CO

TAX ID

6206306005 AND 7201402022

LEGAL DESCRIPTION

LOT 1-3 ACADEMY GATEWAY SUBDIVISION FILING NO. 2

CONSTRUCTION SCHEDULE

BEGIN GRADING: SPRING 2026, END GRADING: FALL 2027

CONTACT INFORMATION:

OWNER:	TKA PROPERTIES, LLP 17225 BURT STREET OMAHA, NE 68118 KEVIN QUINN (402) 964-4291 KQUINN@BAXTERAUTO.COM
DEVELOPER:	TKA PROPERTIES, LLP 17225 BURT STREET OMAHA, NE 68118 KEVIN QUINN (402) 964-4291 KQUINN@BAXTERAUTO.COM
CIVIL ENGINEER:	TERRA NOVA ENGINEERING, INC. 721 S. 23RD STREET COLORADO SPRINGS, COLORADO 80904 DANE FRANK, P.E., (719) 635-6422 DANE@TNESINC.COM
EL PASO COUNTY:	PLANNING AND COMMUNITY DEVELOPMENT 2880 INTERNATIONAL CIRCLE COLORADO SPRINGS, COLORADO 80910 ASHLYN MATHY, (719) 520-6300 ASHLYNMATHY2@ELPASOCO.COM
DONALA WATER & SANITATION DISTRICT:	15850 HOLBEIN DRIVE COLORADO SPRINGS, COLORADO 80921 CONNOR BURBA, MERRICK & CO (CONSULTANT), (303) 353-3539, CONNER.BURBA@MERRICK.COM

ENGINEER'S STATEMENT

THIS GRADING AND EROSION CONTROL PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. SAID PLAN HAS BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR GRADING AND EROSION CONTROL PLANS. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLAN.

DANE FRANK, P.E. #50207 DATE _____
FOR AND ON BEHALF OF TERRA NOVA ENGINEERING, INC.
NOTE: A RETAINING WALL DESIGN HAS BEEN ATTACHED TO THIS PLAN SET AS A REQUIREMENT BY THE COUNTY. IT IS BY OTHERS AND IS NOT COVERED BY THIS STAMP.

OWNER/DEVELOPER'S STATEMENT

I, THE OWNER/DEVELOPER, HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN.

OWNER NAME, TITLE _____ DATE _____

BUSINESS NAME _____

EL PASO COUNTY APPROVAL

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/ OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/ OR ACCURACY OF THIS DOCUMENT. FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL, AS AMENDED.

IN ACCORDANCE WITH EGM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTOR'S DISCRETION.

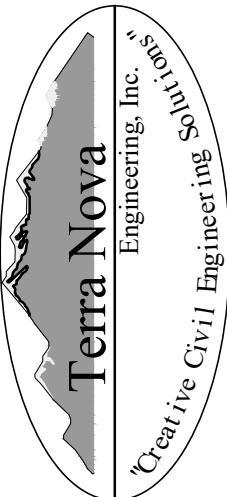
JOSHUA PALMER, P.E.
COUNTY ENGINEER / DIRECTOR

DATE _____



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NORTH GATE
SUBARU

PROJECT INFO
DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION
DRAWINGS

DATE: _____ BY: _____ DESCRIPTION: _____

SHEET TITLE: GRADING AND EROSION CONTROL PLAN
COVER SHEET

1 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

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STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS

- ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC).
- CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, INCLUDING THE FOLLOWING:
 - EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
 - CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
 - COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
 - CDOT M & S STANDARDS
- NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
- IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
- CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (PCD) –INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS–ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.
- CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND PCD. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
- ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY PCD.
- CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY PCD PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.
- ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
- SIGHT VISIBILITY TRIANGLES AS IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT ALL INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES ABOVE FLOWLINE ARE NOT ALLOWED WITHIN SIGHT TRIANGLES.
- SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA. [IF APPLICABLE, ADDITIONAL SIGNING AND STRIPING NOTES WILL BE PROVIDED.]
- CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
- THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.
- EL PASO COUNTY DOES NOT OWN AND IS NOT RESPONSIBLE FOR THE UNDERDRAINS OR GROUNDWATER DISCHARGE SYSTEMS SHOWN ON THESE PLANS AND ASSUMES NO LIABILITY FOR WATER RIGHTS ADMINISTRATION BY APPROVING THESE PLANS. MAINTENANCE AND WATER RIGHTS ARE THE RESPONSIBILITY OF THE DEVELOPER AND _____ [XX METROPOLITAN DISTRICT, OR YY PROPERTY OWNER'S ASSOCIATION]_____

EL PASO COUNTY SIGNING AND STRIPING NOTES

- ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
- ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT.
- ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
- STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
- ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
- ALL STREET NAME SIGNS SHALL HAVE "D" SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4"UPPER–LOWER CASE LETTERING ON 8"BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6"LETTERING, UPPER–LOWER CASE ON 12"BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 35 MPH OR HIGHER SHALL HAVE 8"UPPER–LOWER CASE LETTERING ON 12"BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS". SIGNAL POLE MOUNTED AND OVERHEAD STREET NAME SIGNS SHALL BE PER MUTCD SIZE STANDARDS.
- ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
- ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75"X 1.75" SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SLIPBASE DESIGN.
- ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100" MINIMUM THICKNESS.
- ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. STOP BARS SHALL BE 24"IN WIDTH. CROSSWALKS LINES SHALL BE 24" WIDE AND A MINIMUM OF 9' LONG.
- WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE.
- ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
- THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
- THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY.

STANDARD NOTES FOR EL PASO COUNTY GRADING AND EROSION CONTROL PLANS

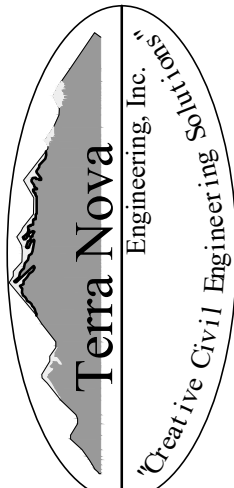
- NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE, AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY (EPC) STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE (LDC), THE ENGINEERING CRITERIA MANUAL (ECM), THE DRAINAGE CRITERIA MANUAL (DCM) VOLUME 1 AND 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
- A PRECONSTRUCTION MEETING BETWEEN THE PERMIT HOLDER(S) AND EL PASO COUNTY SHALL BE HELD PRIOR TO ANY CONSTRUCTION ACTIVITIES. IT IS THE RESPONSIBILITY OF THE PERMIT HOLDER(S) TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY STAFF. NO LAND DISTURBANCE OR CONSTRUCTION ACTIVITIES BEYOND THE INSTALLATION OF THE INITIAL CONSTRUCTION CONTROL MEASURES (CCMS), AS INDICATED ON THE APPROVED GEC PLAN OR CDS WITH GEC PLANS, MAY OCCUR PRIOR TO RECEIVING A NOTICE TO PROCEED (NTP) ISSUED BY THE ECM ADMINISTRATOR. FAILURE TO OBTAIN A NOTICE TO PROCEED PRIOR TO BEGINNING LAND DISTURBING ACTIVITIES MAY RESULT IN AN IMMEDIATE STOP WORK ORDER (SWO).
- CONSTRUCTION CONTROL MEASURES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF ACTIVITIES THAT COULD CONTRIBUTE POLLUTANTS TO STORMWATER. STORMWATER RUNOFF FROM ALL DISTURBED AREAS AND SOIL STORAGE AREAS MUST UTILIZE OR FLOW TO ONE OR MORE CCM(S) TO MINIMIZE EROSION OR SEDIMENT IN THE DISCHARGE. THE CCM(S) MUST CONTAIN OR FILTER FLOWS IN ORDER TO PREVENT THE BYPASS OF FLOWS WITHOUT TREATMENT AND MUST BE APPROPRIATE FOR STORMWATER RUNOFF FROM DISTURBED AREAS AND FOR THE EXPECTED FLOW RATE, DURATION, AND FLOW CONDITIONS (E.G., SHEET OR CONCENTRATED FLOW).
- ALL CCMs SHALL BE MAINTAINED AND REMAIN IN EFFECTIVE OPERATING CONDITION UNTIL FINAL STABILIZATION IS ACHIEVED. THE QUALIFIED STORMWATER MANAGER (QSM) SHALL ASSESS THE ADEQUACY OF CCMs AT THE SITE AND IDENTIFY IF CHANGES TO THOSE CCMs ARE NEEDED TO ENSURE THE CONTINUED EFFECTIVE PERFORMANCE OF THE CCMs.
- PRIOR TO CONSTRUCTION THE PERMIT HOLDER(S) SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
- MANAGEMENT OF THE STORMWATER MANAGEMENT PLAN (SWMP) DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE DESIGNATED QSM. THE SWMP SHALL BE LOCATED ON-SITE OR DIGITALLY ACCESSIBLE AT ALL TIMES DURING CONSTRUCTION ACTIVITIES AND MUST BE IMPLEMENTED AS WRITTEN FROM THE START OF CONSTRUCTION ACTIVITY UNTIL FINAL STABILIZATION IS ACHIEVED. THE QSM SHALL AMEND THE SWMP WHEN THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE OF THE SITE WHICH WOULD REQUIRE THE IMPLEMENTATION OF NEW OR REVISED CCMs OR IF THE SWMP PROVES TO BE INEFFECTIVE IN CONTROLLING POLLUTANTS IN STORMWATER RUNOFF ASSOCIATED WITH CONSTRUCTION ACTIVITY OR WHEN CCMs ARE NO LONGER NECESSARY AND ARE REMOVED. THE QSM SHALL MAINTAIN A RECORD OF AMENDMENTS MADE TO THE SWMP THAT INCLUDES THE DATE AND IDENTIFICATION OF THE CHANGES.
- EARTH DISTURBANCES SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY MINIMIZE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME. PRE-EXISTING VEGETATION SHALL BE PROTECTED AND MAINTAINED WITHIN 50 HORIZONTAL FEET OF A RECEIVING WATER UNLESS SHOWN TO BE INFEASIBLE AND SPECIFICALLY REQUESTED AND APPROVED. IN ADDITION TO MAINTAINING 50 HORIZONTAL FEET OF PRE-EXISTING VEGETATION UPGRADIENT OF A RECEIVING WATER (UNLESS INFEASIBLE AND APPROVED), THE PERMIT HOLDER(S) MUST INSTALL CCMs UPGRADIENT OF THE VEGETATIVE BUFFER.
- TEMPORARY STABILIZATION MEASURES SHALL BE IMPLEMENTED ON DISTURBED AREAS AND STOCKPILES WHERE GROUND DISTURBING CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED OR TEMPORARILY CEASED FOR LONGER THAN 14 DAYS.
- EROSION CONTROL BLANKET (ECB) OR OTHER APPROVED CONTROL MEASURE(S) SHALL BE USED ON SLOPES STEEPER THAN 3:1.
- VEHICLE TRACKING CONTROLS (VTC) MUST BE IMPLEMENTED TO MINIMIZE VEHICLE TRACKING OF SEDIMENT FROM DISTURBED AREAS. VTCs MUST INCLUDE A STRUCTURE CONTROL MEASURE (E.G., TRACKING PAD) AND MAY INCLUDE A NON-STRUCTURAL CONTROL MEASURE (E.G., SWEEPING). MATERIAL TRACKED OFF-SITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
- ANY TEMPORARY OR PERMANENT CONTROL MEASURE DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE A STABILIZED CONVEYANCE DESIGNED TO MINIMIZE EROSION AND THE DISCHARGE OF SEDIMENT OFF-SITE.
- NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE CURB AND GUTTER, PERMANENT CONTROL MEASURES (PCMS), OR DITCHES EXCEPT WITH APPROVED SEDIMENT CONTROL MEASURES.
- ALL PCMS SHALL BE INSTALLED AS DESIGNED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT AFFECT THE DESIGN OR FUNCTION OF PCMS MUST BE APPROVED BY THE ECM ADMINISTRATOR PRIOR TO IMPLEMENTATION.
- SOIL COMPACTION MUST BE MINIMIZED IN AREAS WHERE INFILTRATION PCMS WILL BE INSTALLED OR IN AREAS WHERE FINAL STABILIZATION WILL BE ACHIEVED BY VEGETATIVE COVER. AREAS DESIGNATED FOR INFILTRATION PCMS SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED. IF SOIL COMPACTION DOES OCCUR IN AREAS WHERE FINAL STABILIZATION WILL BE ACHIEVED BY VEGETATIVE COVER OR IN AREAS WHERE INFILTRATION PCMS WILL BE INSTALLED, DECOMPACTION OF THE SOIL MUST BE COMPLETED PRIOR TO PLANTING OR INSTALLATION OF THE PCM(S). AN INFILTRATION TEST MUST BE CONDUCTED FOR ALL INFILTRATION PCMS AND THE INFILTRATION TEST RESULTS SUBMITTED TO EL PASO COUNTY PRIOR TO PRELIMINARY ACCEPTANCE (PA).
- FINAL STABILIZATION MUST BE IMPLEMENTED AT ALL APPLICABLE CONSTRUCTION SITES. FINAL STABILIZATION IS ACHIEVED WHEN ALL GROUND DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED AND PERMANENT STABILIZATION METHODS ARE COMPLETE. WHEN USING VEGETATIVE COVER AS A PERMANENT STABILIZATION METHOD, THE VEGETATION SHALL BE EVENLY DISTRIBUTED PERENNIAL VEGETATION AND OF THE VARIETY AND SPECIES FOUND IN THE COUNTY-APPROVED SEED MIXES OR IN THE APPROVED GEC PLAN. VEGETATION COVERAGE SHALL BE, AT A MINIMUM, EQUAL TO 70% OF WHAT WOULD HAVE BEEN PROVIDED BY NATURE IN A LOCAL UNDISTURBED AREA OR ADEQUATE REFERENCE SITE. ALL TEMPORARY CCMs SHALL BE REMOVED UPON FINAL STABILIZATION AND PRIOR TO STORMWATER PERMIT TERMINATION.
- STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFF-SITE WATERS, INCLUDING WETLANDS.
- CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE SWMP. NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO BE DISCHARGED OFFSITE OR TO ENTER STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR CONTROL MEASURES. CONCRETE WASHOUT AREAS SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY, CREEK, OR STREAM.
- DURING CONSTRUCTION DEWATERING OPERATIONS, UNCONTAMINATED GROUNDWATER MAY BE DISCHARGED ON-SITE IN ACCORDANCE WITH THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENTS (CDPHE) LOW RISK DISCHARGE GUIDANCE POLICY FOR DISCHARGES OF UNCONTAMINATED GROUNDWATER TO LAND. IF CONSTRUCTION DEWATERING OPERATIONS ARE UNABLE TO MEET ALL CRITERIA, CONDITIONS, AND CONTROL MEASURE REQUIREMENTS OF THE LOW RISK DISCHARGE GUIDANCE POLICY, A COLORADO DISCHARGE PERMIT SYSTEM (CDPS) GENERAL PERMIT C0080000 WILL BE REQUIRED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTE FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES, OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
- THE PERMIT HOLDER(S) SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, SOIL, AND SAND THAT MAY ACCUMULATE IN ROADS, STORM DRAINS AND OTHER DRAINAGE CONVEYANCE SYSTEMS AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
- THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
- MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. APPROPRIATE CMS SHALL BE UTILIZED BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
- BULK STORAGE (I.E., INDIVIDUAL CONTAINERS OF 55 GALLONS OR GREATER) OF ALLOWED PETROLEUM PRODUCTS OR OTHER ALLOWED LIQUID SHALL REQUIRE ADEQUATE SECONDARY CONTAINMENT, OR EQUIVALENT PROTECTION, TO CONTAIN ALL SPILLS ON-SITE AND TO PREVENT ANY SPILLED MATERIALS FROM ENTERING STATE WATERS, ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM, OR OTHER FACILITIES.
- NO CHEMICAL(S) HAVING THE POTENTIAL TO BE RELEASED IN STORMWATER ARE TO BE STORED OR USED ON-SITE UNLESS PERMISSION FOR THE USE OF SUCH CHEMICAL(S) IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING APPROVAL FOR THE USE OF SUCH CHEMICAL(S), SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
- ON AREAS OF EXPOSED SOIL, MINIMIZE DUST THROUGH THE APPROPRIATE APPLICATION OF WATER OR OTHER DUST SUPPRESSION TECHNIQUES. WATER APPLICATION MUST BE CONDUCTED IN A MANNER TO PREVENT DISCHARGE OFFSITE UNLESS AUTHORIZED BY A CDPS OR NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT.
- ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE ONLY AT APPROVED CONSTRUCTION ACCESS POINTS.
- FOR SITES WHERE A SOILS REPORT IS REQUIRED, THE APPROVED SOILS REPORT FOR THIS SITE SHALL BE CONSIDERED A PART OF THESE PLANS.
- PERMIT HOLDER(S) AND THEIR AGENTS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT"(TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT"(33 USC 1344), IN ADDITION TO THE REQUIREMENTS OF THE LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL VOLUME 2, AND ENGINEERING CRITERIA MANUAL. ALL APPLICABLE LOCAL, STATE, AND FEDERAL PERMITS MUST BE OBTAINED PRIOR TO CONSTRUCTION. IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND OTHER LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, LOCAL, OR COUNTY AGENCIES, THE MOST RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
- AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB ONE (1) ACRE OR MORE OR LESS THAN 1 ACRE AND PART OF A LARGER COMMON PLAN OF DEVELOPMENT OR SALE THAT WOULD DISTURB 1 OR MORE ACRES, THE PERMIT HOLDER(S) SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE (COR400000 PERMIT) TO THE CDPHE WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A SWMP, OF WHICH THIS GEC PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
WATER QUALITY CONTROL DIVISION
WOOD –PERMITS
4300 CHERRY CREEK DRIVE SOUTH
DENVER, CO 80246-1530
ATTN: PERMITS UNIT



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NORTH GATE
SUBARU

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION
DRAWINGS

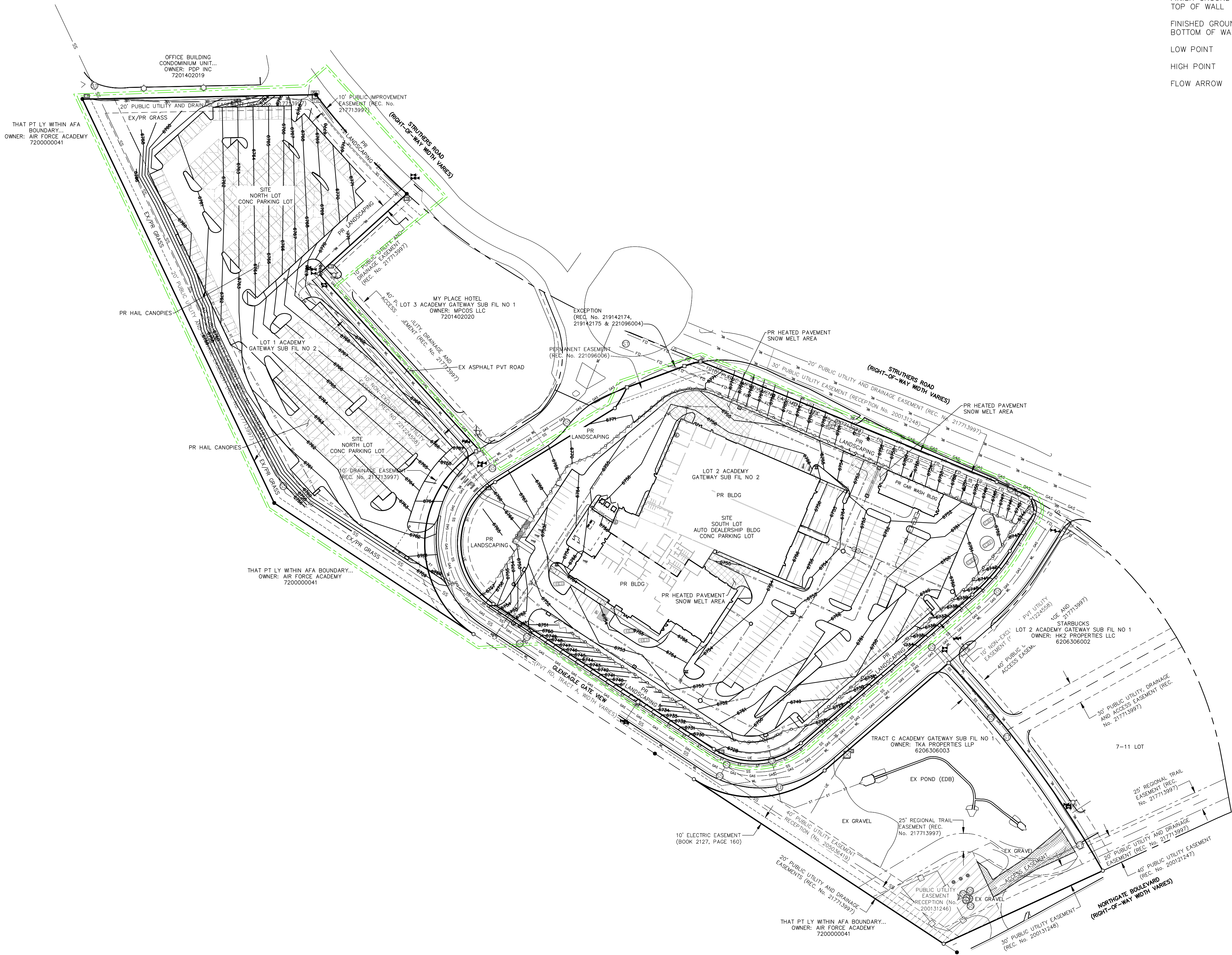
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GRADING AND EROSION CONTROL PLAN
STANDARD NOTES SHEET

2 OF 21

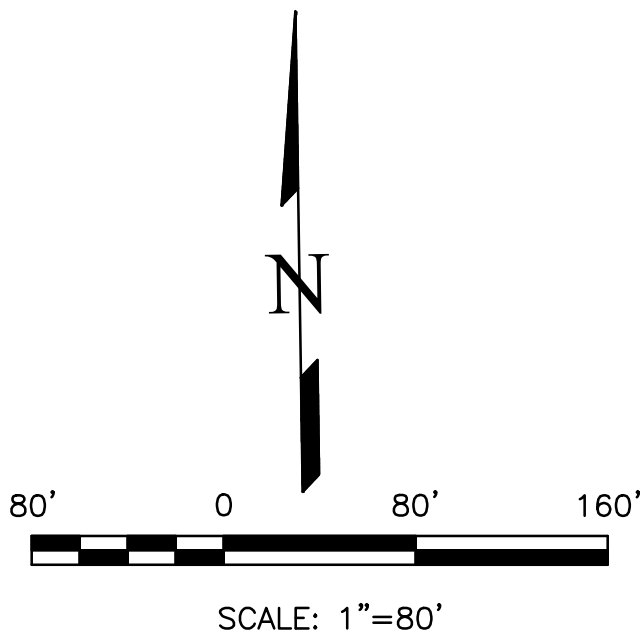
TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

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GRADING LEGEND

PROPOSED	PR	EXISTING CONTOURS - MINOR	---6231---
EXISTING	EX	EXISTING CONTOURS - MAJOR	---6230---
FINISHED SURFACE	FS	PROPOSED CONTOURS - 1'	---6231---
FINISHED GROUND	FG	EXISTING PROPERTY LINE	=====
TOP OF CURB	TC	PROPOSED RET WALL	~~~~~
FLOWLINE	FL	PROPOSED RIPRAP	~~~~~
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	---WL---
FINISHED GROUND AT BOTTOM OF WALL	BW	SANITARY SEWER LINE	---SS---
LOW POINT	LP	GAS LINE	---GAS---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---UE---
FLOW ARROW	←	TELEPHONE LINE	---UT---
		FIBER OPTIC LINE	---FO---
		STORM SEWER LINE	---ST---
		LIMIT OF CONSTRUCTION	---
		LIMIT OF SOIL DISTURBANCE	---
		PROPOSED FENCE	---
		FIRE HYDRANT	---



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NORTH GATE
SUBARU

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION
DRAWINGS

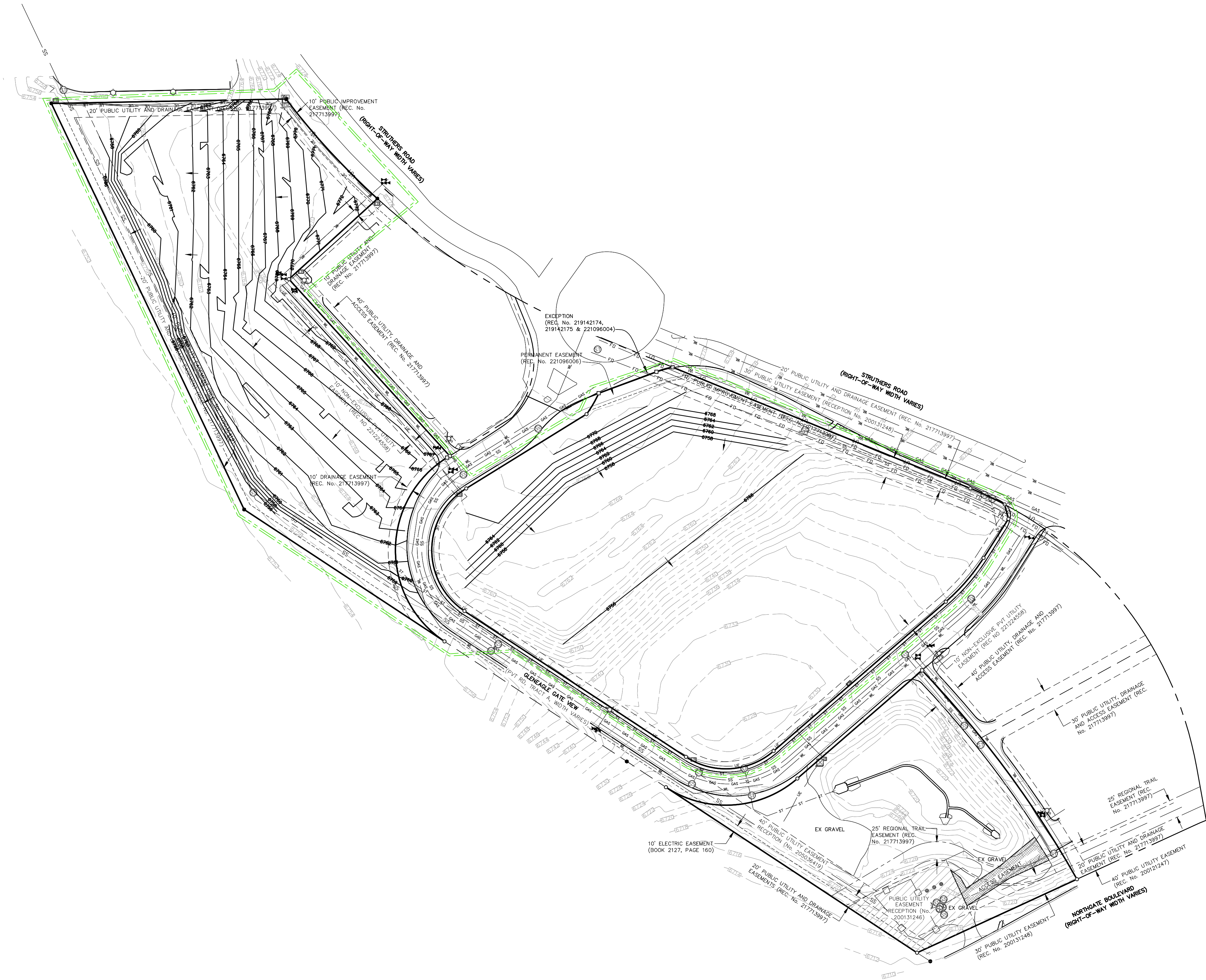
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GRADING AND EROSION CONTROL PLAN
OVERVIEW SHEET

3 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

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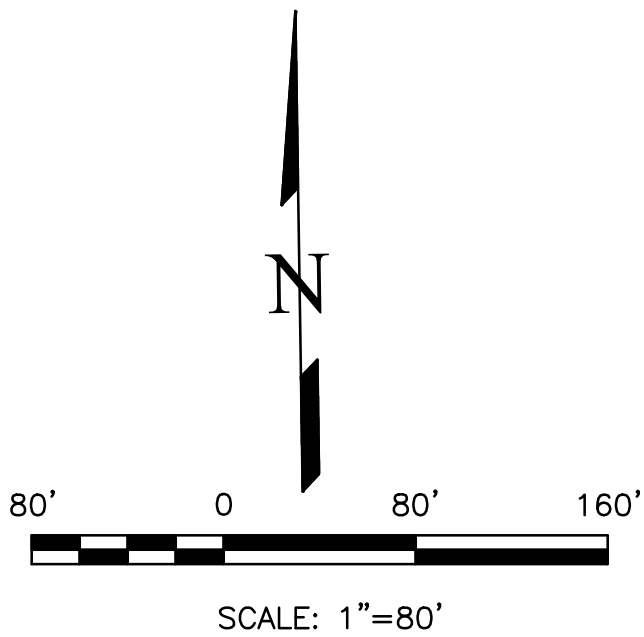


GRADING LEGEND

PROPOSED	PR	EXISTING CONTOURS - MINOR	---6231---
EXISTING	EX	EXISTING CONTOURS - MAJOR	---6230---
FINISHED SURFACE	FS	PROPOSED CONTOURS - 1'	---6231---
FINISHED GROUND	FG	EXISTING PROPERTY LINE	=====
TOP OF CURB	TC	PROPOSED RET WALL	~~~~~
FLOWLINE	FL	PROPOSED RIPRAP	~~~~~
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	---V---V---
FINISHED GROUND AT BOTTOM OF WALL	BW	SANITARY SEWER LINE	---SS---SS---
LOW POINT	LP	GAS LINE	---GAS---GAS---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---UE---UE---
FLOW ARROW	←	TELEPHONE LINE	---UT---
		FIBER OPTIC LINE	---FO---FO---
		STORM SEWER LINE	---ST---ST---
		LIMIT OF CONSTRUCTION	---
		LIMIT OF SOIL DISTURBANCE	---
		PROPOSED FENCE	---o---o---
		FIRE HYDRANT	o

NOTES

1. THE COUNTY HAS REQUIRED AN INITIAL GRADING PLAN. THIS INITIAL GRADING IS A POOR FIT FOR THE PROPOSED SITE DUE TO THE LARGE NUMBER OF TALL RETAINING WALLS PROPOSED. THE DESIGN ENGINEER DOES NOT CONSIDER MATCHING THE INITIAL GRADING PLAN TO BE CRITICAL AND RECOMMENDS THE CONTRACTOR PRIORITIZE CONSTRUCTION OF THE RETAINING WALLS AND THE FINAL GRADING PLAN.
2. THE SITE HAS PREVIOUSLY BEEN OVERLOT GRADED.
3. THE EXISTING VEGETATION ONSITE IS PRIMARILY PRAIRIE GRASSES. NO SIGNIFICANT TREES OR BUSHES HAVE BEEN OBSERVED.



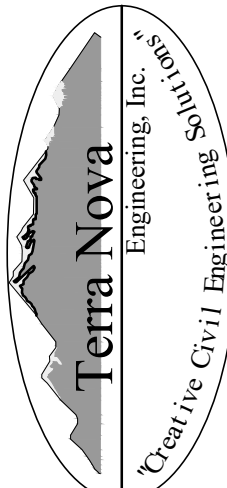
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NORTH GATE SUBARU

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION DRAWINGS

DATE: BY: DESCRIPTION:

GRADING AND EROSION CONTROL PLAN
INITIAL GRADING PLAN

4 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

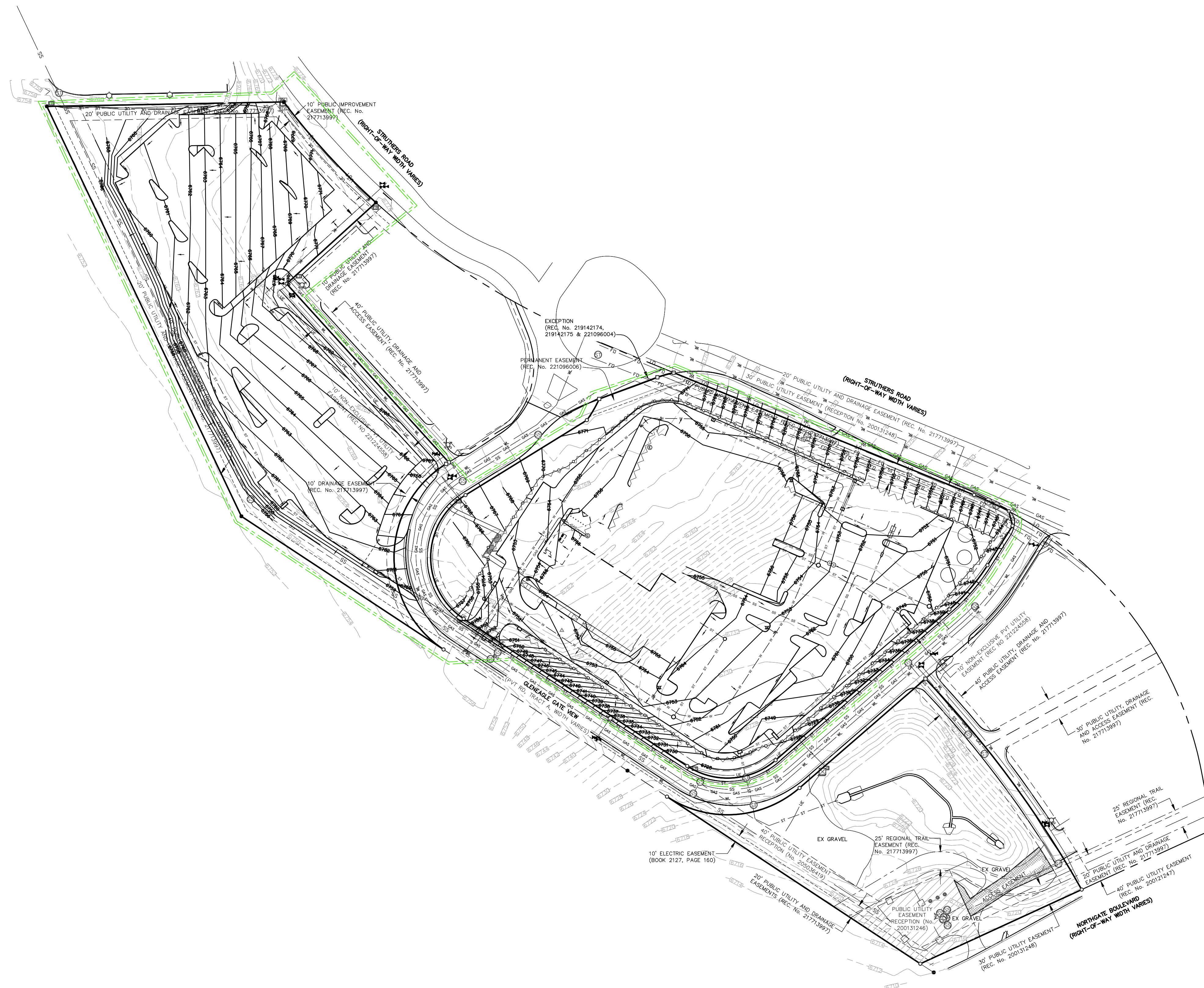
PROJECT INFO

DATE:	06/17/2014
PROJECT MGR:	K. JOHNSON
PREPARED BY:	TERRA NOVA ENGINEERING

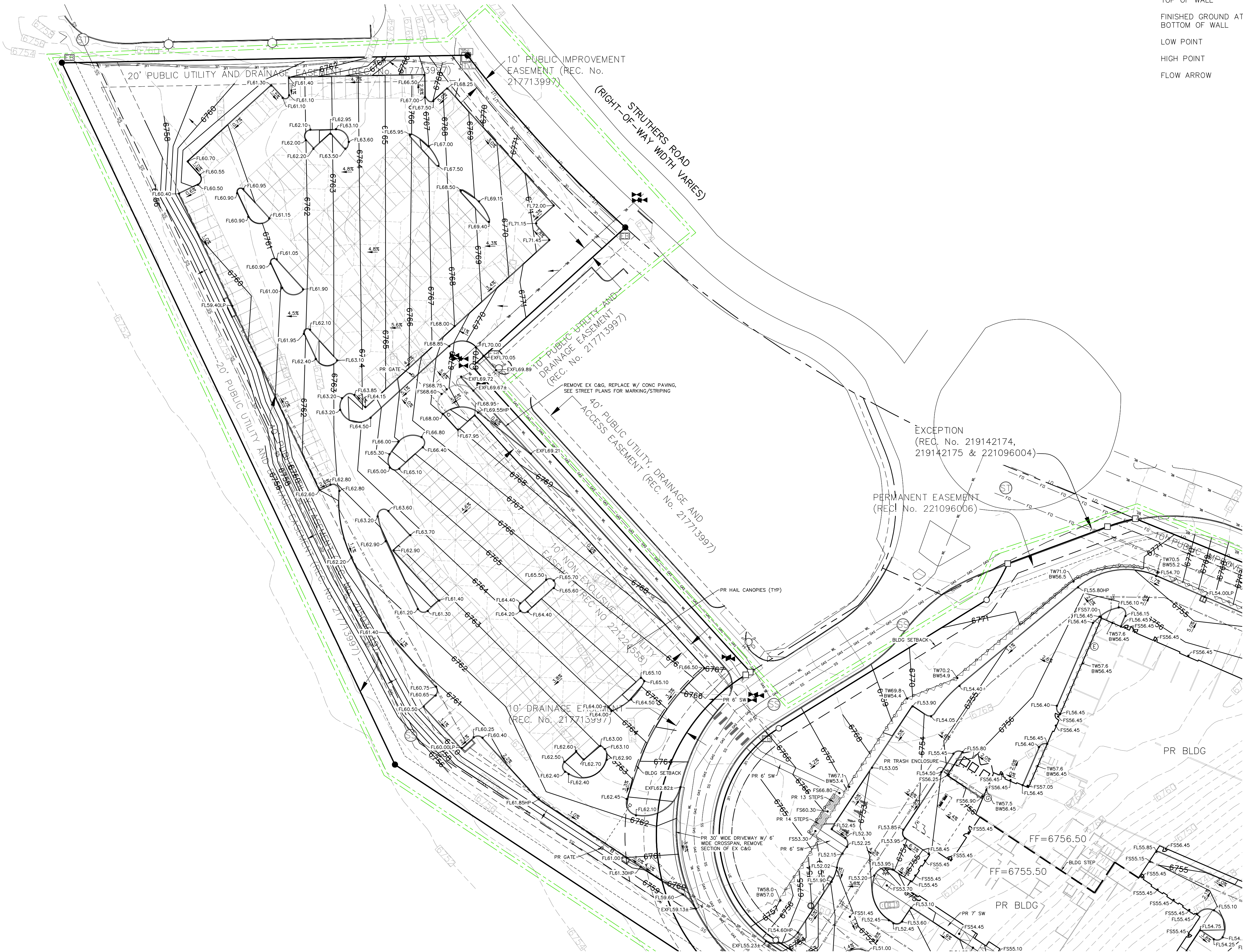
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TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

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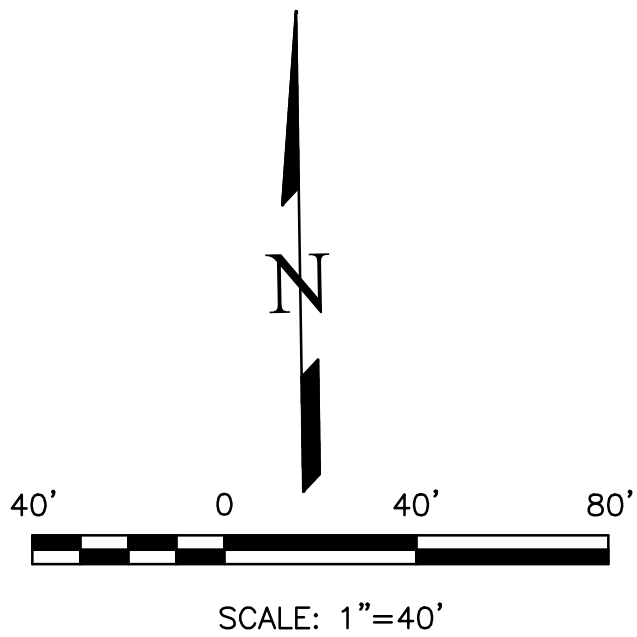


GRADING LEGEND

PROPOSED	PR	EXISTING CONTOURS - MINOR	
EXISTING	EX	EXISTING CONTOURS - MAJOR	
FINISHED SURFACE	FS	PROPOSED CONTOURS - 1'	
FINISHED GROUND	FG	EXISTING PROPERTY LINE	
TOP OF CURB	TC	PROPOSED RET WALL	
FLOWLINE	FL	PROPOSED RIPRAP	
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	
FINISHED GROUND AT BOTTOM OF WALL	BW	SANITARY SEWER LINE	
LOW POINT	LP	GAS LINE	
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	
FLOW ARROW	←	TELEPHONE LINE	
		FIBER OPTIC LINE	
		STORM SEWER LINE	
		LIMIT OF CONSTRUCTION	
		LIMIT OF SOIL DISTURBANCE	
		PROPOSED FENCE	
		FIRE HYDRANT	

NOTES

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2. THE EXISTING VEGETATION ONSITE IS PRIMARILY PRAIRIE GRASSES. NO SIGNIFICANT TREES OR BUSHES HAVE BEEN OBSERVED.
3. SOME CURB IS 8" TALL, MOST IS 6" TALL. SEE GRADING DETAILS SHEET.



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PLANNER / LANDSCAPE ARCHITECT

CIVIL ENGINEER

PROJECT INFO

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

STAMP

ISSUE INFO

DATE:	BY:	DESCRIPTION:

DESIGN / REVISION

SHEET TITLE

GRADING AND EROSION CONTROL PLAN
FINAL GRADING PLAN - NORTH

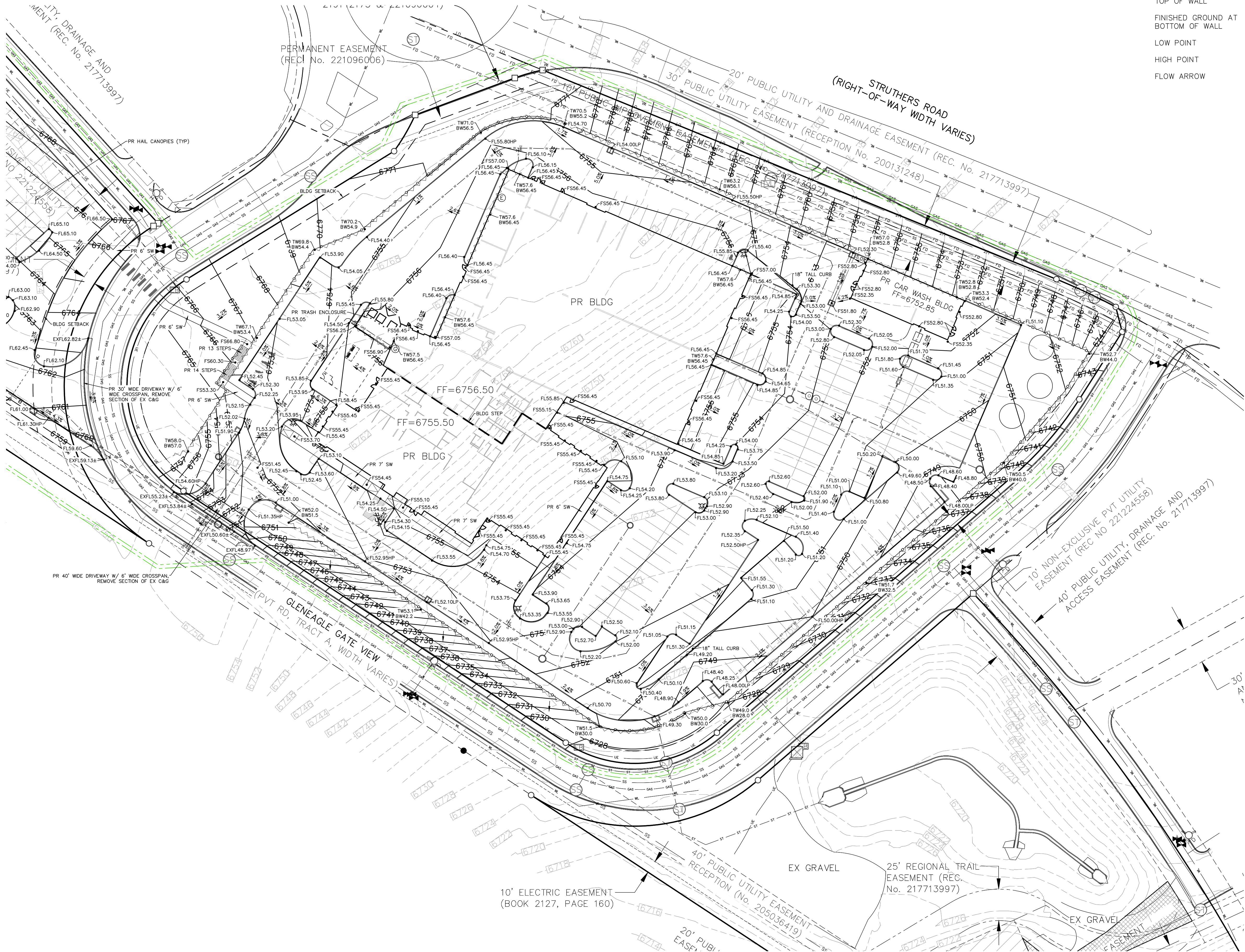
SHEET NUMBER

6 OF 21

PLANT FILE #

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

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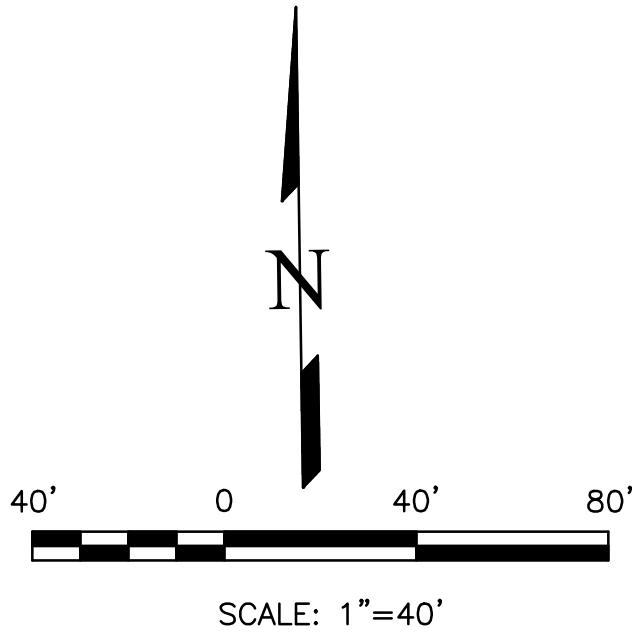


GRADING LEGEND

PROPOSED	PR	EXISTING CONTOURS - MINOR	---
EXISTING	EX	EXISTING CONTOURS - MAJOR	---
FINISHED SURFACE	FS	PROPOSED CONTOURS - 1'	---
FINISHED GROUND	FG	EXISTING PROPERTY LINE	---
TOP OF CURB	TC	PROPOSED RET WALL	---
FLOWLINE	FL	PROPOSED RIPRAP	---
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	---
FINISHED GROUND AT BOTTOM OF WALL	BW	SANITARY SEWER LINE	---
LOW POINT	LP	GAS LINE	---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---
FLOW ARROW	HP	TELEPHONE LINE	---
		FIBER OPTIC LINE	---
		STORM SEWER LINE	---
		LIMIT OF CONSTRUCTION	---
		LIMIT OF SOIL DISTURBANCE	---
		PROPOSED FENCE	---
		FIRE HYDRANT	---

NOTES

1. THE SITE HAS PREVIOUSLY BEEN OVERLOT GRADED.
2. THE EXISTING VEGETATION ONSITE IS PRIMARILY PRAIRIE GRASSES. NO SIGNIFICANT TREES OR BUSHES HAVE BEEN OBSERVED.
3. SOME CURB IS 8" TALL, MOST IS 6" TALL. SEE GRADING DETAILS SHEET.



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NORTH GATE SUBARU

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

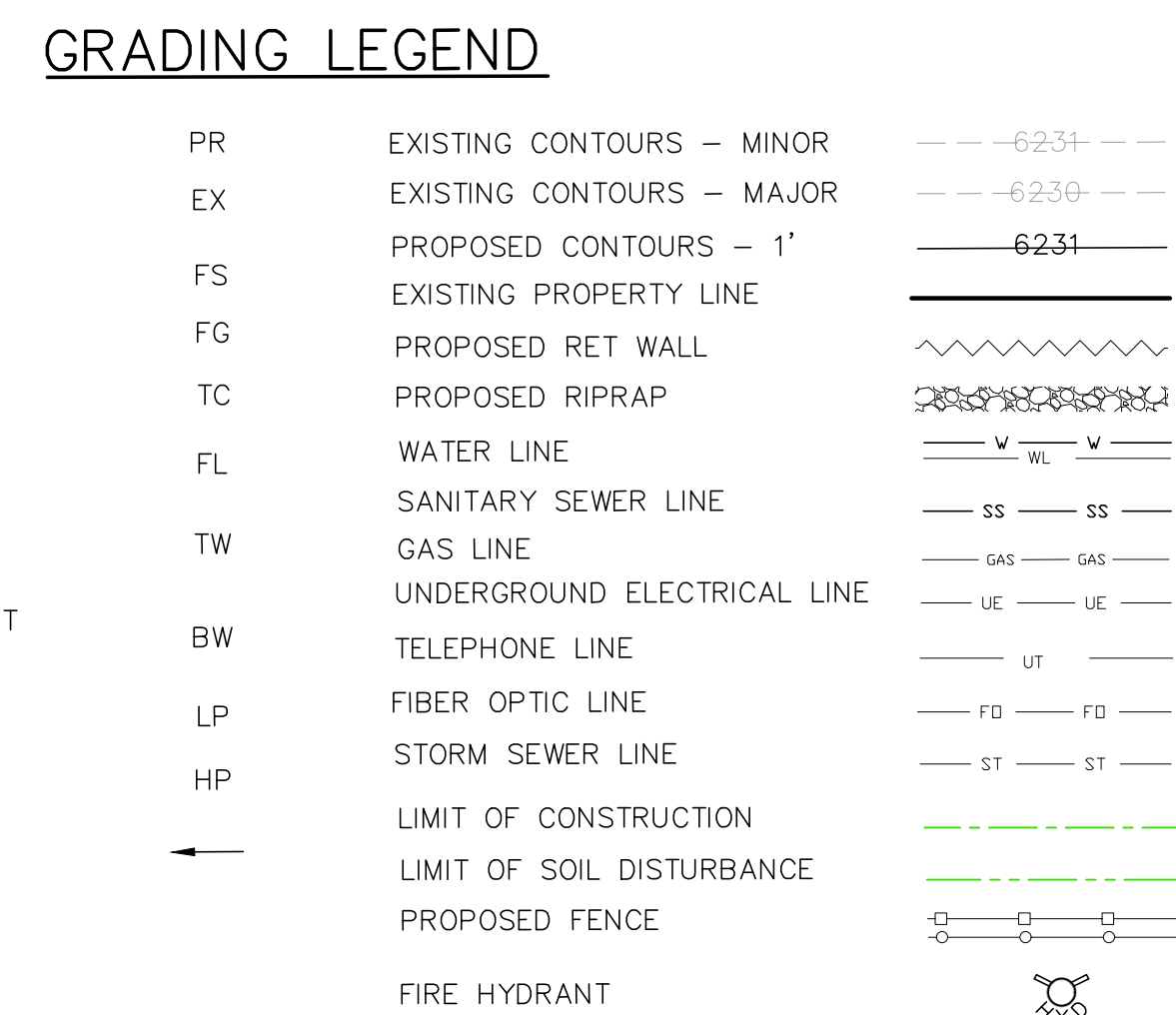
CONSTRUCTION DRAWINGS

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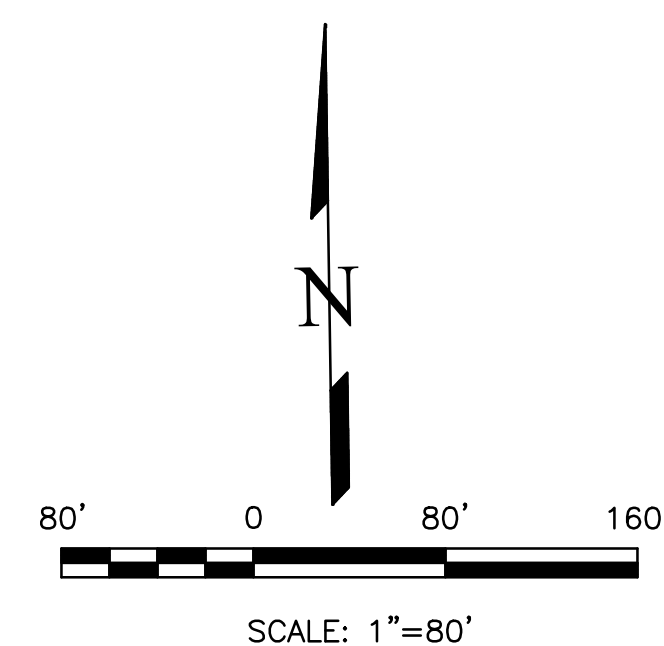
GRADING AND EROSION CONTROL PLAN
FINAL GRADING PLAN - SOUTH

7 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510



1. SOME CURB IS 8" TALL, MOST IS 6" TALL.

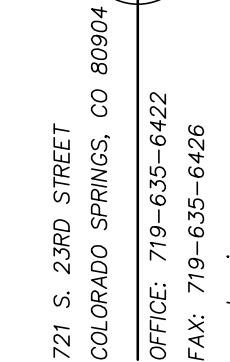


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PROJECT INFO

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PROJECT MGR:	K. JOHNSON
PREPARED BY:	TERRA NOVA ENGINEERING

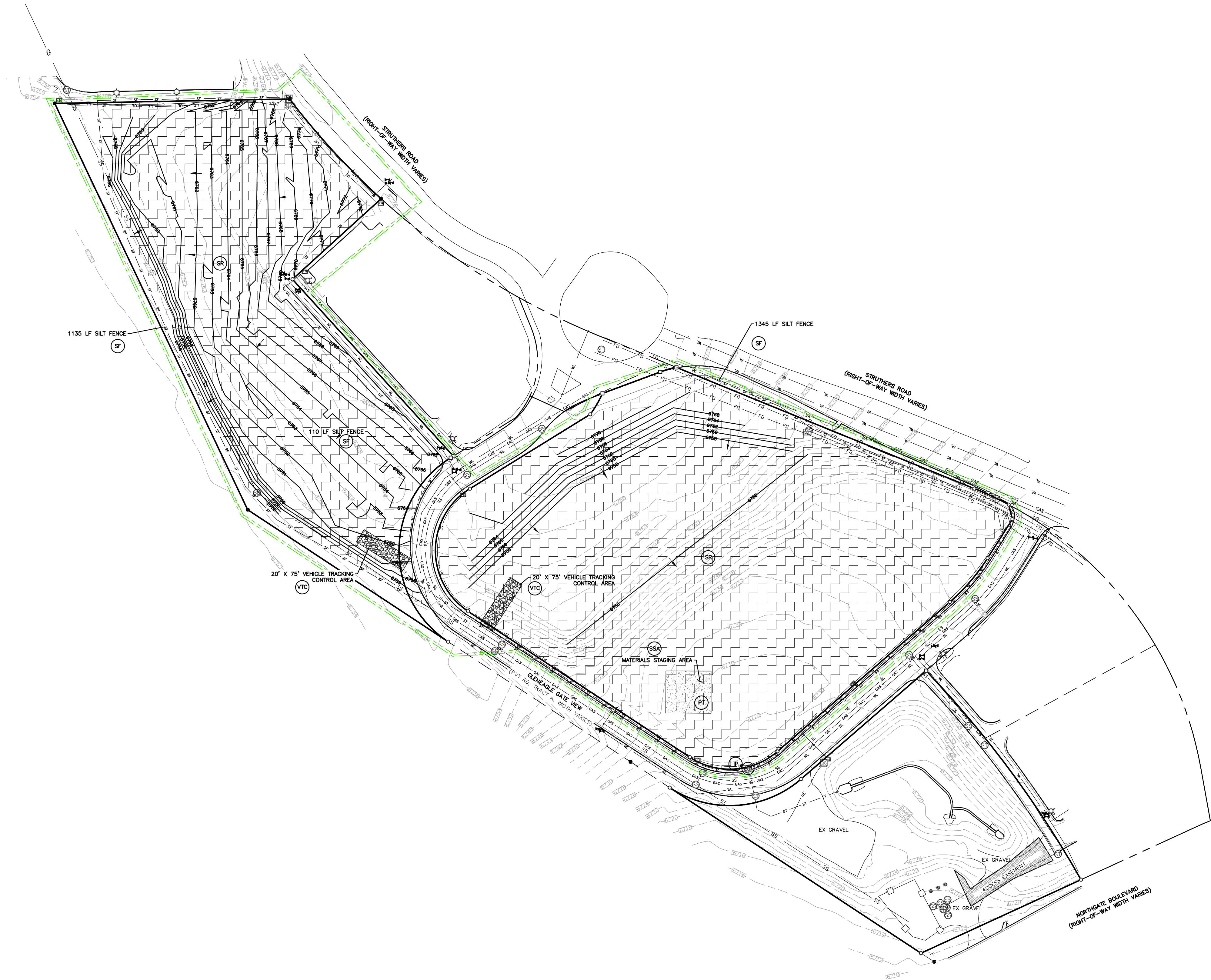
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TITLE GRADING AND EROSION CONTROL PLAN
GRADING DETAILS

8 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

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GRADING LEGEND

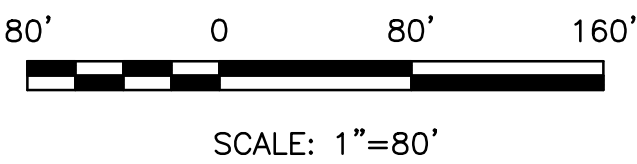
PROPOSED	PR	EXISTING CONTOURS - MINOR	---	-6231-	---
EXISTING	EX	EXISTING CONTOURS - MAJOR	---	-6230-	---
FINISHED SURFACE	FS	PROPOSED CONTOURS - 1'	---	6231	---
FINISHED GROUND	FG	EXISTING PROPERTY LINE	---		---
TOP OF CURB	TC	PROPOSED RET WALL	---		---
FLOWLINE	FL	PROPOSED RIPRAP	---		---
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	---	WL	---
FINISHED GROUND AT BOTTOM OF WALL	BW	SANITARY SEWER LINE	---	SS	---
LOW POINT	LP	GAS LINE	---	GAS	---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---	UE	---
FLOW ARROW	←	TELEPHONE LINE	---	UT	---
		FIBER OPTIC LINE	---	FO	---
		STORM SEWER LINE	---	ST	---
		LIMIT OF CONSTRUCTION	---		---
		LIMIT OF SOIL DISTURBANCE	---		---
		PROPOSED FENCE	---		---
		FIRE HYDRANT	---		---

EROSION CONTROL LEGEND

KEY	TITLE	SYMBOL	IMPLEMENTATION PHASE
SF	SILT FENCE	SF	INITIAL
SSA	STABILIZED STAGING AREA		INITIAL
VTC	VEHICLE TRACKING CONTROL		INITIAL
SP	STOCKPILE MANAGEMENT WITH PROTECTION		INITIAL
CWA	CONCRETE WASHOUT AREA		INITIAL
SR	SURFACE ROUGHENING		INITIAL
TSE	TEMPORARY SEDIMENT BASIN	NONE	INITIAL
PT	PORTABLE TOILET	NONE	INITIAL
IP	INLET PROTECTION		INTERIM
SM	PERMANENT SEEDING AND MULCHING PS - DRILL SEED, HAND SEED, OR HYDROSEED; SEED MIX PER COLORADO SPRINGS STORMWATER CONSTRUCTION MANUAL (DECEMBER 2020), TABLE S-2 MU - MECHANICALLY CRIMP MULCH OR HYDROMULCH		FINAL

NOTES

1. SEDIMENT CONTROL LOGS MAY BE SUBSTITUTED FOR SILT FENCE AND VICE VERSA.
2. SEED AND MULCH DISTURBED AREAS ONLY.
3. THE EXISTING VEGETATION ONSITE IS PRIMARILY PRAIRIE GRASSES. NO SIGNIFICANT TREES OR BUSHES HAVE BEEN OBSERVED.
4. NO ASPHALT OR CONCRETE BATCH PLANTS ARE PROPOSED.
5. NO TEMPORARY SEDIMENT BASINS ARE PROPOSED DUE TO THE DISTRIBUTED NATURE OF THE RUNOFF IN THE NORTH LOT AND THE LARGE RETAINING WALLS PROPOSED IN THE SOUTH LOT. ONCE THE PROPOSED STORM SEWER HAS BEEN INSTALLED, ONSITE RUNOFF WILL BE DIRECTED TO THE EXISTING STORMWATER POND.



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NORTH GATE SUBARU

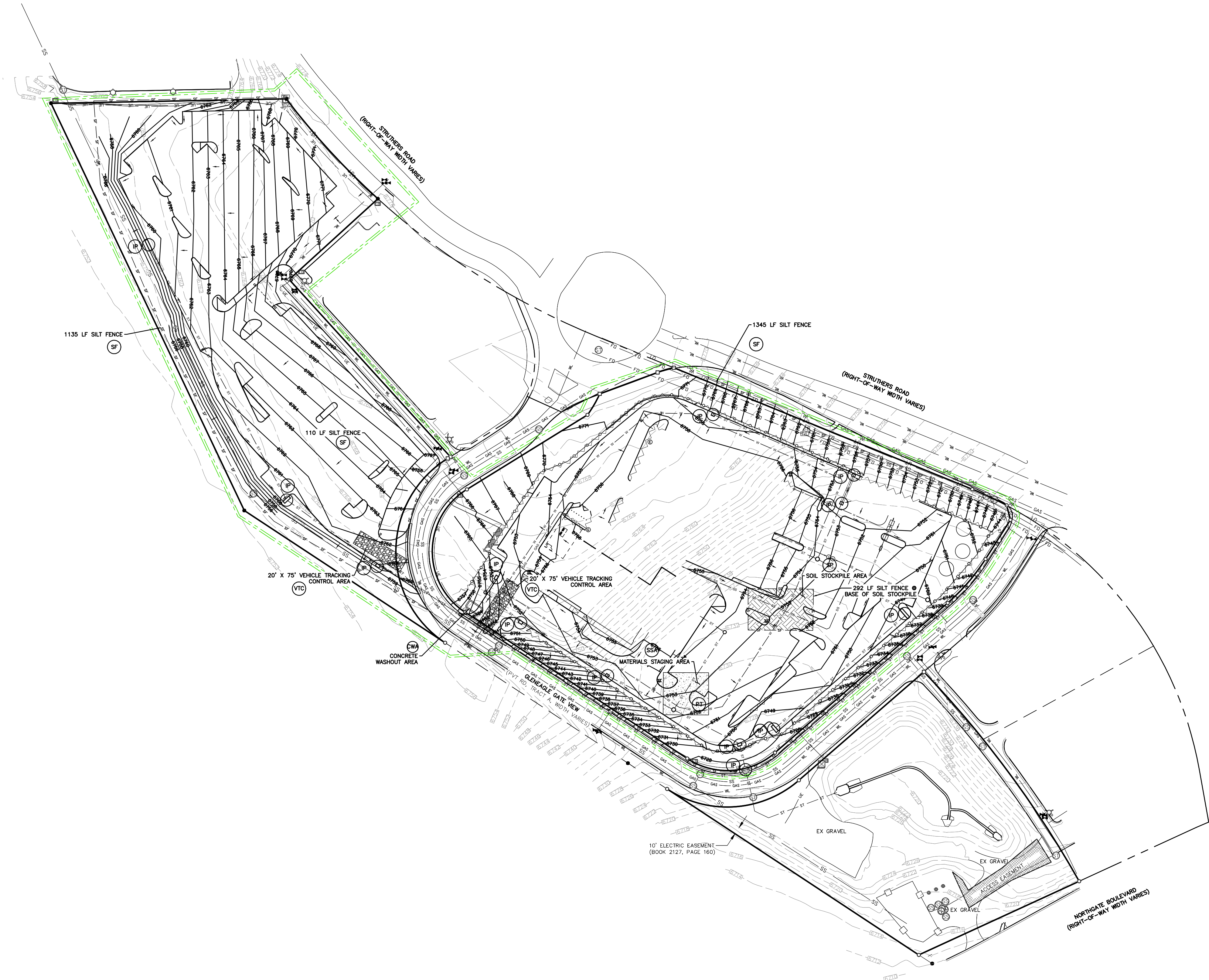
DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION DRAWINGS

DATE: BY: DESCRIPTION:

GRADING AND EROSION CONTROL PLAN
INITIAL EROSION CONTROL PLAN

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GRADING LEGEND

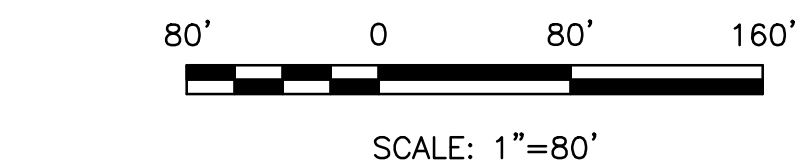
PROPOSED	PR	EXISTING CONTOURS - MINOR	---6231---
EXISTING	EX	EXISTING CONTOURS - MAJOR	---6230---
FINISHED SURFACE	FS	PROPOSED CONTOURS - 1'	---6231---
FINISHED GROUND	FG	EXISTING PROPERTY LINE	---
TOP OF CURB	TC	PROPOSED RET WALL	~ ~ ~ ~ ~
FLOWLINE	FL	PROPOSED RIPRAP	~ ~ ~ ~ ~
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	---WL---
FINISHED GROUND AT BOTTOM OF WALL	BW	SANITARY SEWER LINE	---SS---
LOW POINT	LP	GAS LINE	---GAS---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---UE---
FLOW ARROW		TELEPHONE LINE	---UT---
		FIBER OPTIC LINE	---FO---
		STORM SEWER LINE	---ST---
		LIMIT OF CONSTRUCTION	---
		LIMIT OF SOIL DISTURBANCE	---
		PROPOSED FENCE	---
		FIRE HYDRANT	---

EROSION CONTROL LEGEND

KEY	TITLE	SYMBOL	IMPLEMENTATION PHASE
(SF)	SILT FENCE	---SF---	INITIAL
(SSA)	STABILIZED STAGING AREA	---	INITIAL
(VTC)	VEHICLE TRACKING CONTROL	---	INITIAL
(SP)	STOCKPILE MANAGEMENT WITH PROTECTION	---	INITIAL
(CWA)	CONCRETE WASHOUT AREA	---	INITIAL
(SR)	SURFACE ROUGHENING	---	INITIAL
(TSB)	TEMPORARY SEDIMENT BASIN	NONE	INITIAL
(PT)	PORTABLE TOILET	NONE	INITIAL
(IP)	INLET PROTECTION	---	INTERIM
(SM)	PERMANENT SEEDING AND MULCHING PS - DRILL SEED, HAND SEED, OR HYDROSEED; SEED MIX PER COLORADO SPRINGS STORMWATER CONSTRUCTION MANUAL (DECEMBER 2020), TABLE 5-2 MU - MECHANICALLY CRIMP MULCH OR HYDROMULCH	---	FINAL

NOTES

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2. SEED AND MULCH DISTURBED AREAS ONLY.
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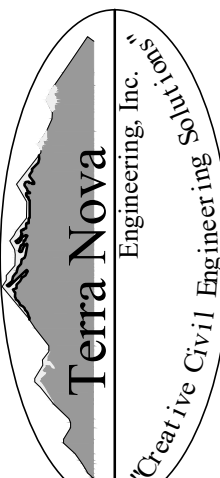
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NORTH GATE SUBARU

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION DRAWINGS

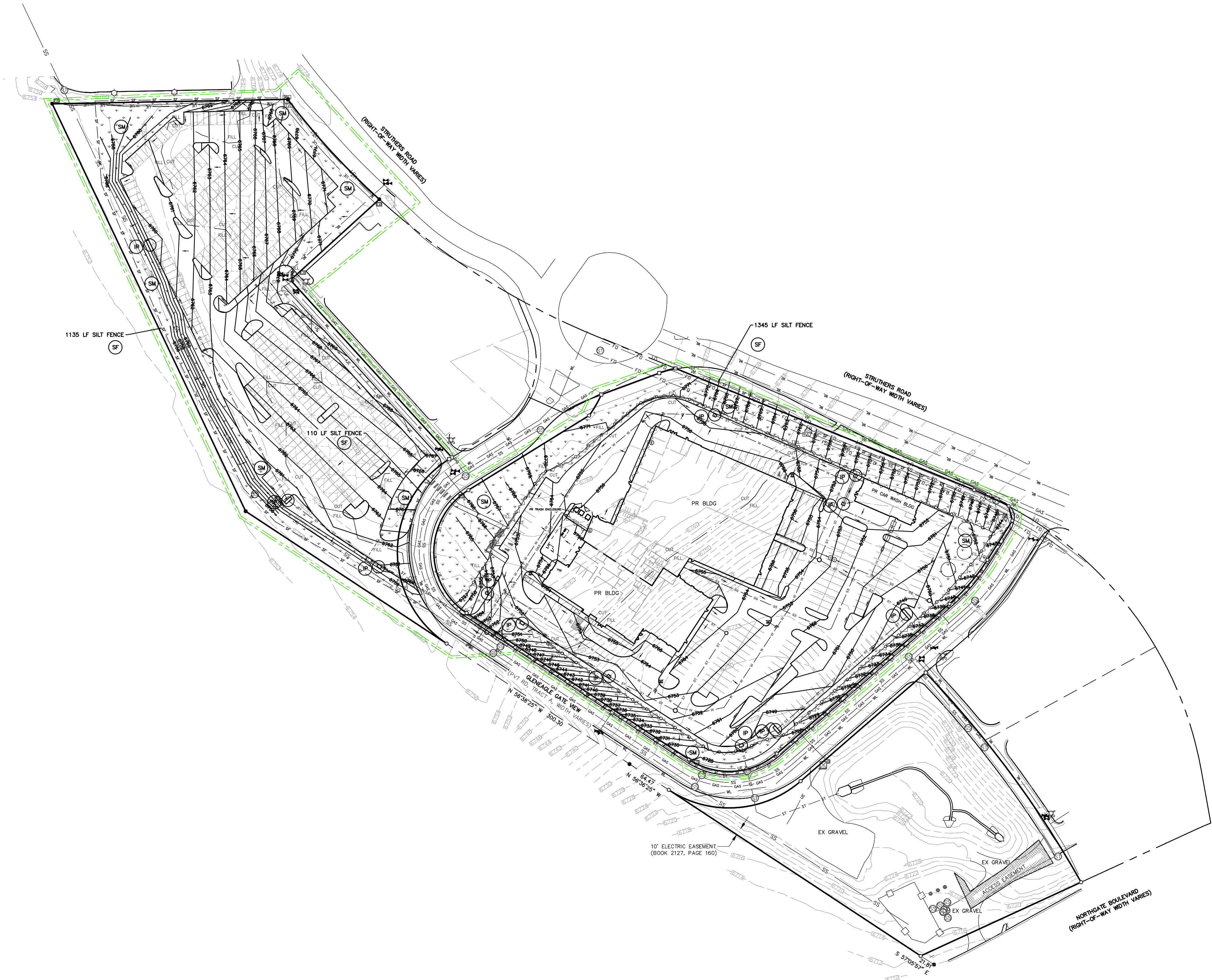
DATE: BY: DESCRIPTION:

GRADING AND EROSION CONTROL PLAN
INTERIM EROSION CONTROL PLAN

10 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

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GRADING LEGEND

PROPOSED	PR	EXISTING CONTOURS - MINOR	---	6231	---
EXISTING	EX	EXISTING CONTOURS - MAJOR	---	6230	---
FINISHED SURFACE	FS	PROPOSED CONTOURS - 1'	---	6231	---
FINISHED GROUND	FG	EXISTING PROPERTY LINE	---		---
TOP OF CURB	TC	PROPOSED RET WALL	---		---
FLOWLINE	FL	PROPOSED RIPRAP	---		---
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	---		---
FINISH GROUND AT BOTTOM OF WALL	BW	SANITARY SEWER LINE	---		---
LOW POINT	LP	GAS LINE	---		---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---		---
FLOW ARROW		TELEPHONE LINE	---		---
		FIBER OPTIC LINE	---		---
		STORM SEWER LINE	---		---
		LIMIT OF CONSTRUCTION	---		---
		LIMIT OF SOIL DISTURBANCE	---		---
		PROPOSED FENCE	---		---
		FIRE HYDRANT	---		---
		CUT FILL AREA BOUNDARY	---		---

EROSION CONTROL LEGEND

KEY	TITLE	SYMBOL	IMPLEMENTATION PHASE
SF	SILT FENCE	SF	INITIAL
SSA	STABILIZED STAGING AREA		INITIAL
VTC	VEHICLE TRACKING CONTROL		INITIAL
SP	STOCKPILE MANAGEMENT WITH PROTECTION		INITIAL
CWA	CONCRETE WASHOUT AREA		INITIAL
SR	SURFACE ROUGHENING		INITIAL
TBB	TEMPORARY SEDIMENT BASIN	NONE	INITIAL
PT	PORTABLE TOILET	NONE	INITIAL
IP	INLET PROTECTION		INTERIM
SM	PERMANENT SEEDING AND MULCHING PS - DRILL SEED, HAND SEED, OR HYDROSEED; SEED MIX PER COLORADO SPRINGS STORMWATER CONSTRUCTION MANUAL (DECEMBER 2020), TABLE S-2 MU - MECHANICALLY CRIMP MULCH OR HYDROMULCH		FINAL

NOTES

1. SEDIMENT CONTROL LOGS MAY BE SUBSTITUTED FOR SILT FENCE AND VICE VERSA.
2. SEED AND MULCH DISTURBED AREAS ONLY.
3. THE EXISTING VEGETATION ONSITE IS PRIMARILY PRAIRIE GRASSES. NO SIGNIFICANT TREES OR BUSHES HAVE BEEN OBSERVED.
4. NO ASPHALT OR CONCRETE BATCH PLANTS ARE PROPOSED.

THIS DESIGN WAS PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF TERRA NOVA ENGINEERING, INC.

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NORTH GATE SUBARU

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION DRAWINGS

DATE: BY: DESCRIPTION:

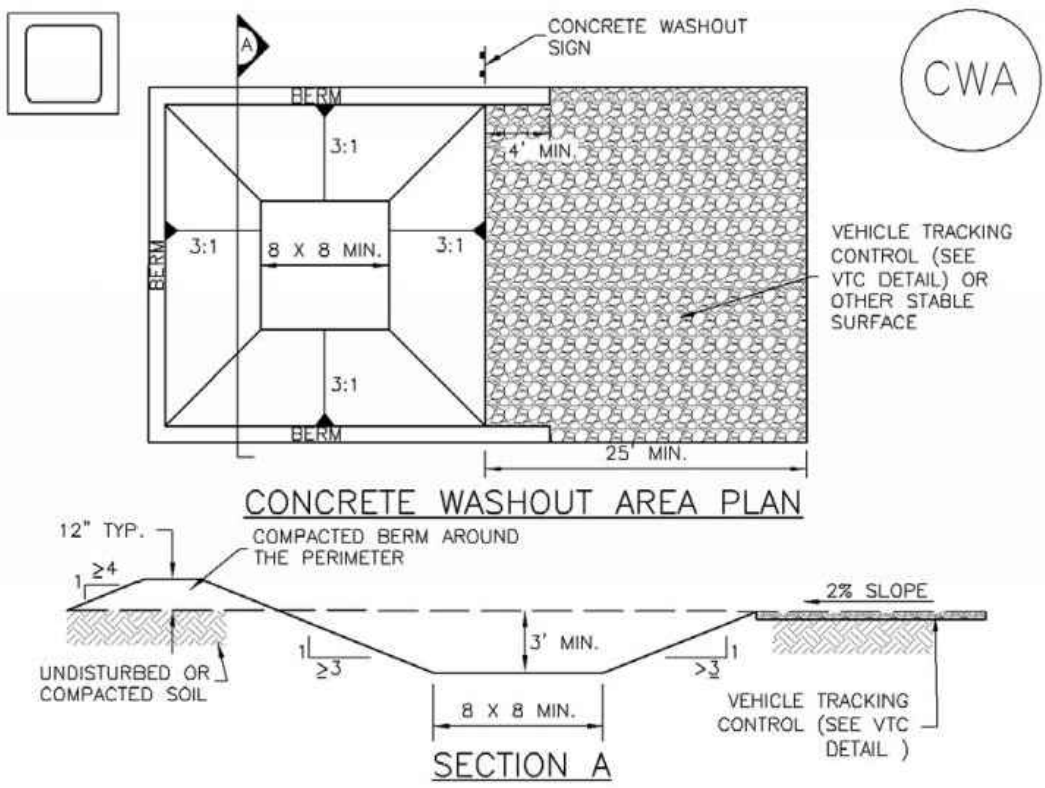
GRADING AND EROSION CONTROL PLAN
FINAL EROSION CONTROL PLAN

11 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

Concrete Washout Area (CWA)

MM-1



CWA-1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
-CWA INSTALLATION LOCATION.
2. DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.
3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
4. CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE PIT SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.
5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.
6. VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.
7. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
8. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

November 2010 Urban Drainage and Flood Control District CWA-3
Urban Storm Drainage Criteria Manual Volume 3

MM-1

Concrete Washout Area (CWA)

CWA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS, ACCUMULATED IN PIT, SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 2'.
5. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.
6. THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.
7. WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

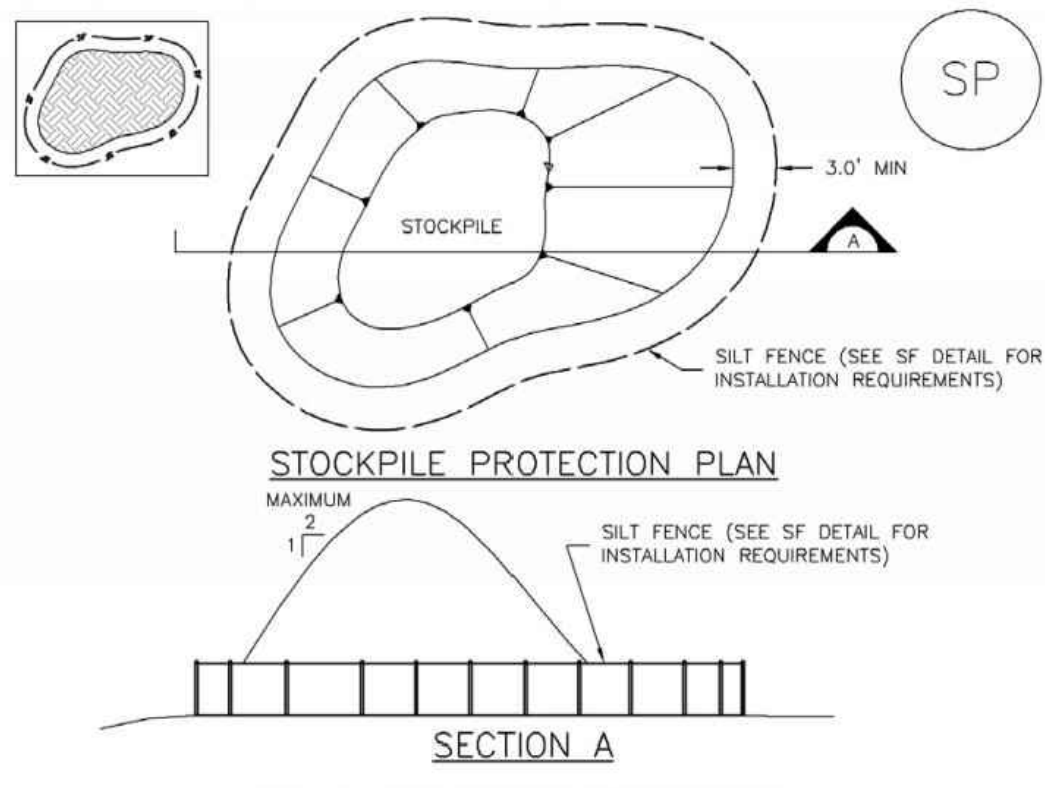
(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

CWA-4 Urban Drainage and Flood Control District November 2010
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Stockpile Management (SP)

MM-2



SP-1. STOCKPILE PROTECTION

STOCKPILE PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
-LOCATION OF STOCKPILES.
-TYPE OF STOCKPILE PROTECTION.
2. INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PERVIOUS OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SLUMPS AGAINST THE PERIMETER, AND OTHER FACTORS.
3. STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDED AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30-60 DAYS).
4. FOR TEMPORARY STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADE CONTROLS, INCLUDING PERIMETER CONTROL, ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

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MM-2

Stockpile Management (SM)

STOCKPILE PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.
5. STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE STOCKPILE HAS BEEN USED.

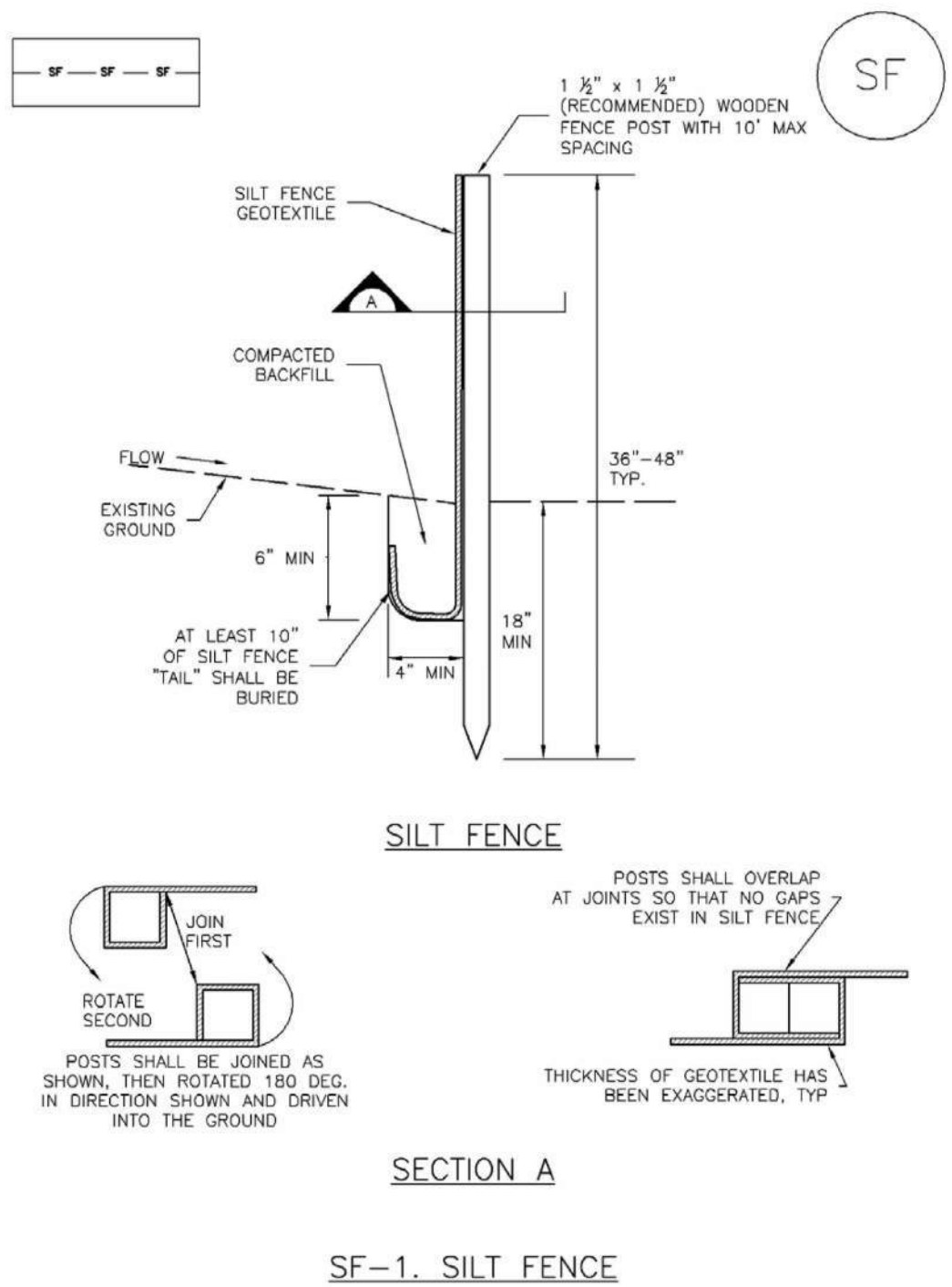
(DETAILS ADAPTED FROM PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

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Silt Fence (SF)

SC-1



SF-1. SILT FENCE

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SC-1

Silt Fence (SF)

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.
2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE, NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.
3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.
5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.
6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' - 20').
7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP. TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".
5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.
6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.
7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

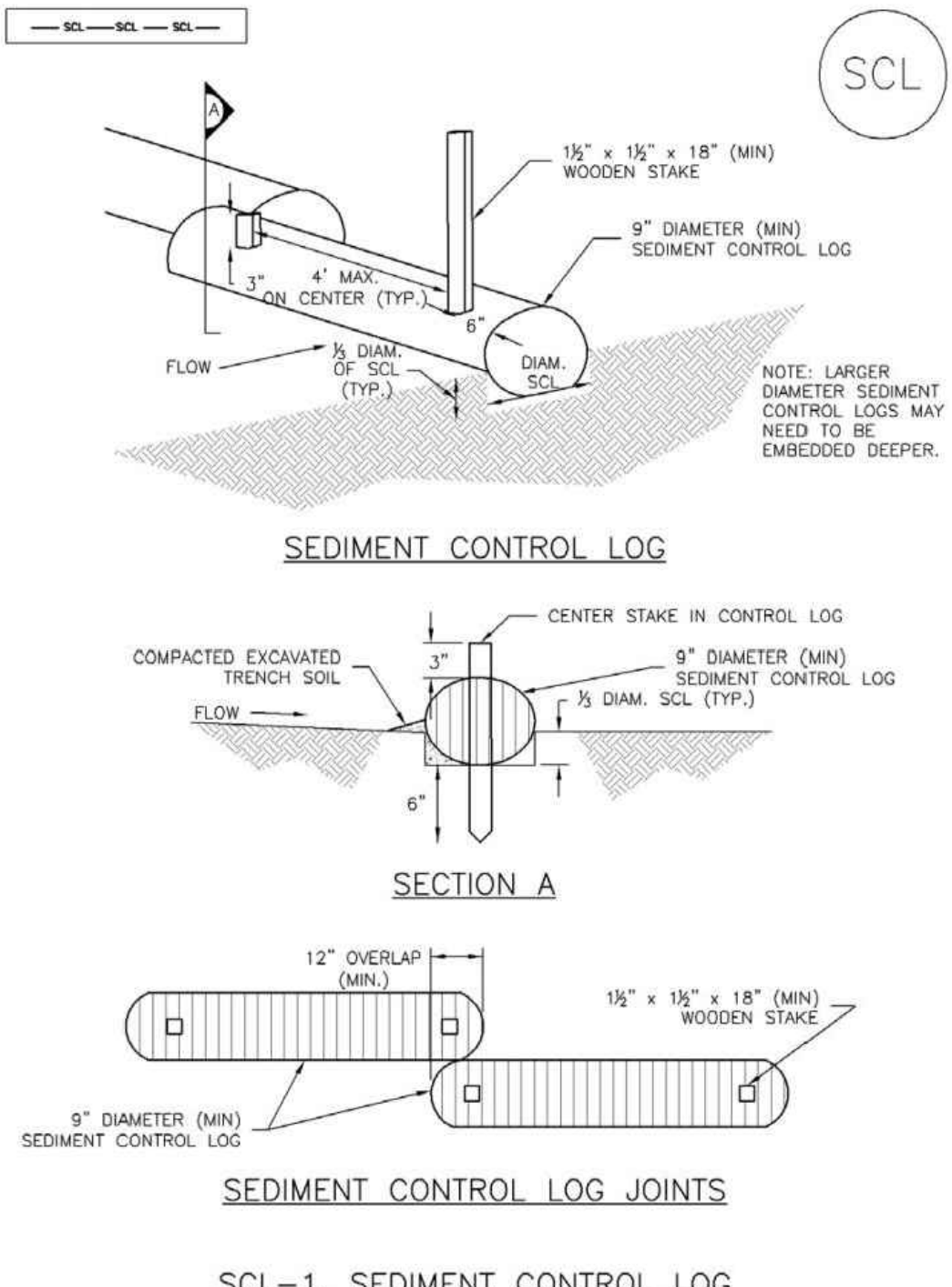
(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

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Sediment Control Log (SCL)

SC-2



SCL-1. SEDIMENT CONTROL LOG

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Urban Storm Drainage Criteria Manual Volume 3

Sediment Control Log (SCL)

SC-2

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.
2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADE/LAND-DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS OR HIGH VELOCITY DRAINAGE WAYS.
5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY 1/2 OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING.
6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER.
7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP. TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 1/2 OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION, IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

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NORTH GATE
SUBARU

PROJECT INFO
DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION
DRAWINGS

DATE: BY: DESCRIPTION:

REVISION

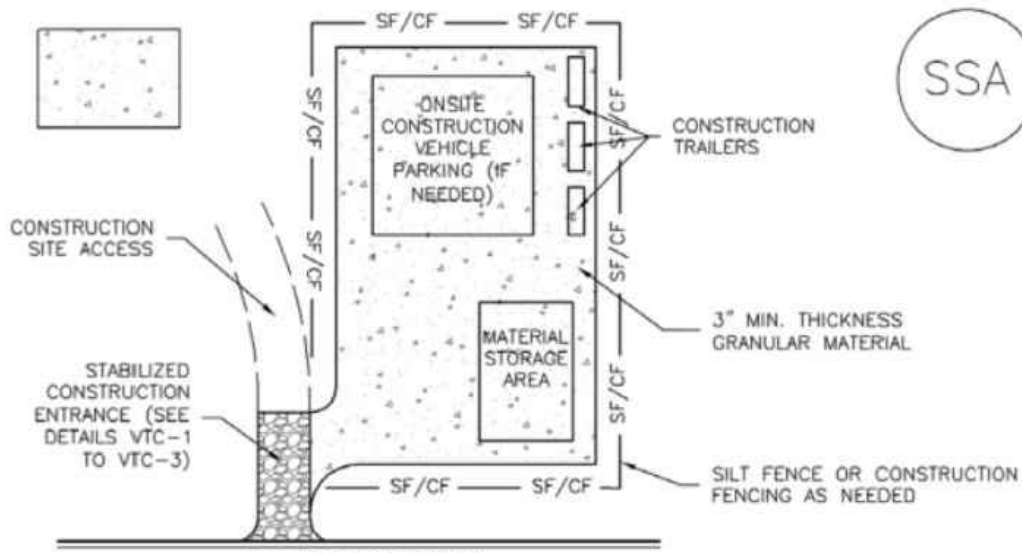
GRADING AND EROSION CONTROL PLAN
EROSION CONTROL DETAILS

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TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

Stabilized Staging Area (SSA)

SM-6



SSA-1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
-LOCATION OF STAGING AREA(S).
-CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.
3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.
4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.
5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.
6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

SM-6

Stabilized Staging Area (SSA)

STABILIZED STAGING AREA MAINTENANCE NOTES

5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDofCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

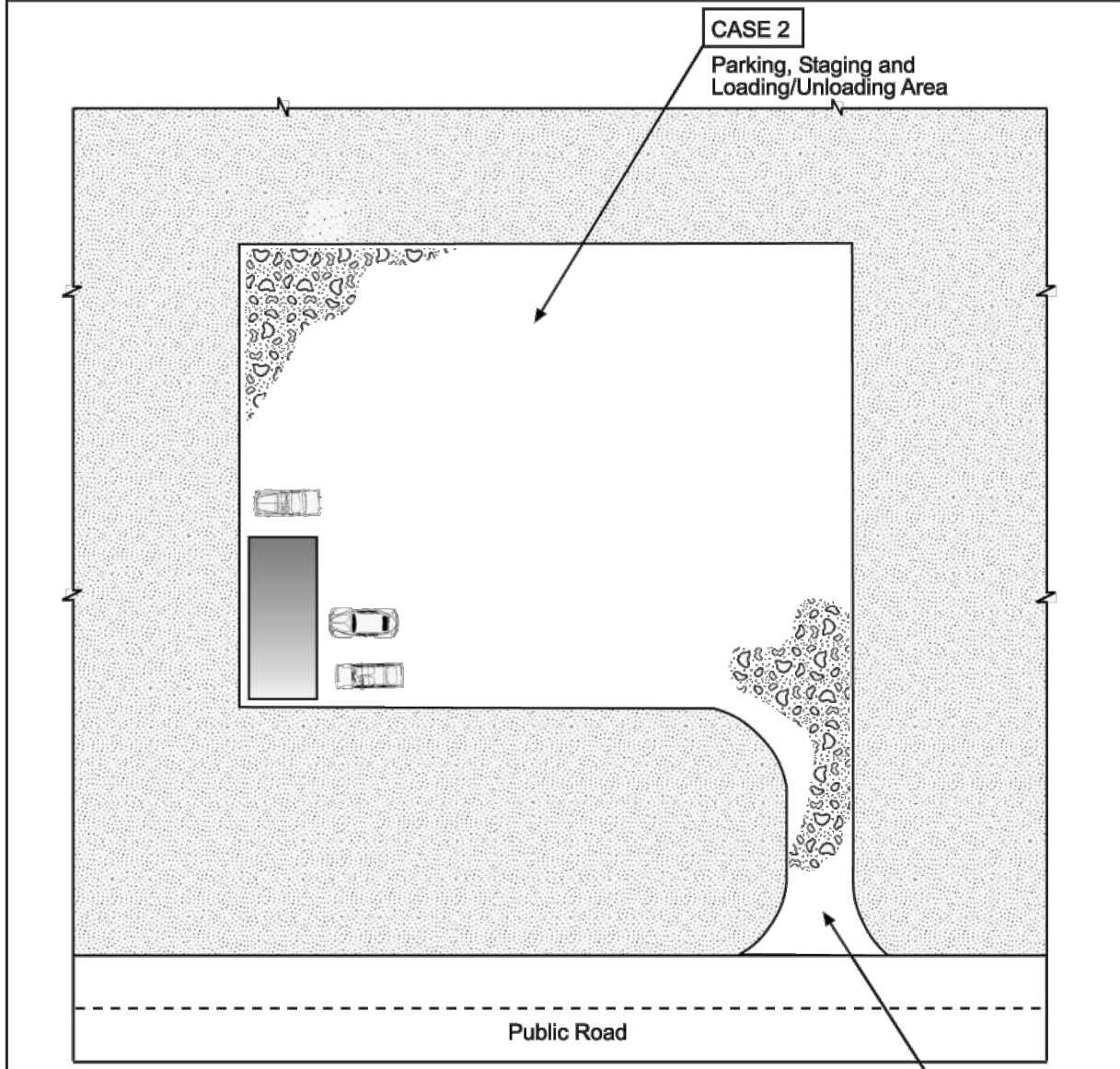


Table VT-1

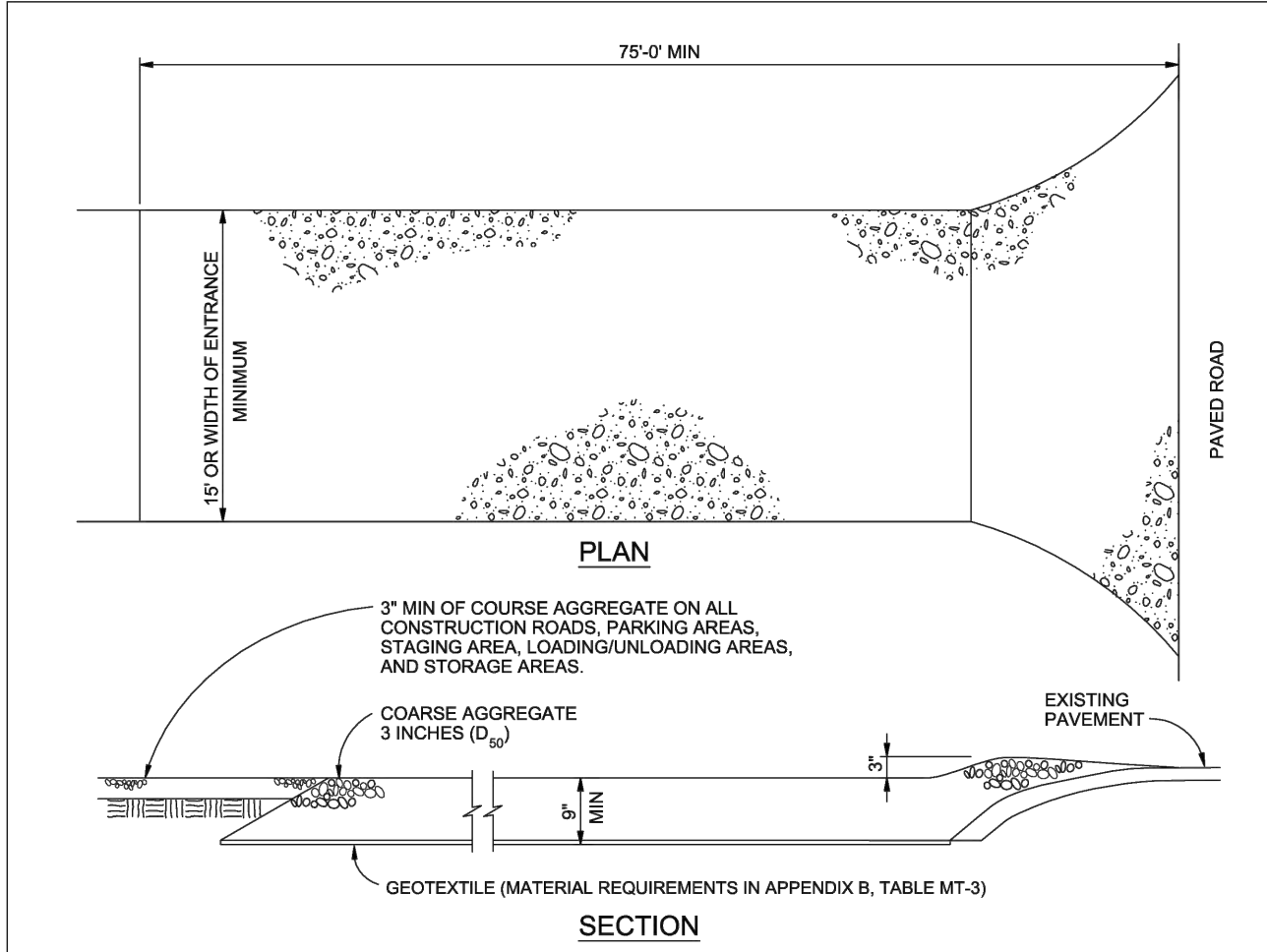
	Case 1	Case 2
Gravel Thickness	9"	3"
Filter Fabric	YES	NO

City of Colorado Springs
Storm Water Quality

Figure VT-1
Vehicle Tracking
Application Examples

DEM\153722.CB.CB\FigVT-1B-99

3-53



VEHICLE TRACKING NTS

VEHICLE TRACKING NOTES

INSTALLATION REQUIREMENTS

1. ALL ENTRANCES TO THE CONSTRUCTION SITE ARE TO BE STABILIZED PRIOR TO CONSTRUCTION BEGINNING.
2. CONSTRUCTION ENTRANCES ARE TO BE BUILT WITH AN APRON TO ALLOW FOR TURNING TRAFFIC, BUT SHOULD NOT BE BUILT OVER EXISTING PAVEMENT EXCEPT FOR A SLIGHT OVERLAP.
3. AREAS TO BE STABILIZED ARE TO BE PROPERLY GRADED AND COMPACTED PRIOR TO LAYING DOWN GEOTEXTILE AND STONE.
4. CONSTRUCTION ROADS, PARKING AREAS, LOADING/UNLOADING ZONES, STORAGE AREAS, AND STAGING AREAS ARE TO BE STABILIZED.
5. CONSTRUCTION ROADS ARE TO BE BUILT TO CONFORM TO SITE GRADES, BUT SHOULD NOT HAVE SIDE SLOPES OR ROAD GRADES THAT ARE EXCESSIVELY STEEP.

MAINTENANCE REQUIREMENTS

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL STABILIZED AREAS, ESPECIALLY AFTER STORM EVENTS.
2. STONES ARE TO BE REAPPLIED PERIODICALLY AND WHEN REPAIR IS NECESSARY.
3. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED DAILY BY SHOVELING OR SWEEPING. SEDIMENT IS NOT TO BE WASHED DOWN STORM SEWER DRAINS.
4. STORM SEWER INLET PROTECTION IS TO BE IN PLACE, INSPECTED, AND CLEANED IF NECESSARY.
5. OTHER ASSOCIATED SEDIMENT CONTROL MEASURES ARE TO BE INSPECTED TO ENSURE GOOD WORKING CONDITION.

City of Colorado Springs
Stormwater Quality

Figure VT-2
Vehicle Tracking
Application Examples

3-54

Temporary and Permanent Seeding (TS/PS)

EC-2

Description

Temporary seeding can be used to stabilize disturbed areas that will be inactive for an extended period. Permanent seeding should be used to stabilize areas at final grade that will not be otherwise stabilized. Effective seeding includes preparation of a seedbed, selection of an appropriate seed mixture, proper planting techniques, and protection of the seeded area with mulch, geotextiles, or other appropriate measures.

Appropriate Uses

When the soil surface is disturbed and will remain inactive for an extended period (typically 30 days or longer), proactive stabilization measures should be implemented. If the inactive period is short-lived (on the order of two weeks), techniques such as surface roughening may be appropriate. For longer periods of inactivity, temporary seeding and mulching can provide effective erosion control. Permanent seeding should be used on finished areas that have not been otherwise stabilized.

Typically, local governments have their own seed mixes and timelines for seeding. Check jurisdictional requirements for seeding and temporary stabilization.

Design and Installation

Effective seeding requires proper seedbed preparation, selection of an appropriate seed mixture, use of appropriate seeding equipment to ensure proper coverage and density, and protection with mulch or fabric until plants are established.

The USDCM Volume 2 *Revegetation* Chapter contains detailed seed mix, soil preparations, and seeding and mulching recommendations that may be referenced to supplement this Fact Sheet.

Drill seeding is the preferred seeding method. Hydroseeding is not recommended except in areas where steep slopes prevent use of drill seeding equipment, and even in these instances it is preferable to hand seed and mulch. Some jurisdictions do not allow hydroseeding or hydromulching.

Seedbed Preparation

Prior to seeding, ensure that areas to be revegetated have soil conditions capable of supporting vegetation. Overlot grading can result in loss of topsoil, resulting in poor quality subsoils at the ground surface that have low nutrient value, little organic matter content, few soil microorganisms, rooting restrictions, and conditions less conducive to infiltration of precipitation. As a result, it is typically necessary to provide stockpiled topsoil, compost, or other

Temporary and Permanent Seeding	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No



Photograph TS/PS-1. Equipment used to drill seed. Photo courtesy of Douglas County.

EC-2 Temporary and Permanent Seeding (TS/PS)

soil amendments and rototill them into the soil to a depth of 6 inches or more.

Topsoil should be salvaged during grading operations for use and spread on areas to be revegetated later. Topsoil should be viewed as an important resource to be utilized for vegetation establishment, due to its water-holding capacity, structure, texture, organic matter content, biological activity, and nutrient content. The rooting depth of most native grasses in the semi-arid Denver metropolitan area is 6 to 18 inches. At a minimum, the upper 6 inches of topsoil should be stripped, stockpiled, and ultimately respread across areas that will be revegetated.

Where topsoil is not available, subsoils should be amended to provide an appropriate plant-growth medium. Organic matter, such as well digested compost, can be added to improve soil characteristics conducive to plant growth. Other treatments can be used to adjust soil pH conditions when needed. Soil testing, which is typically inexpensive, should be completed to determine and optimize the types and amounts of amendments that are required.

If the disturbed ground surface is compacted, rip or rototill the surface prior to placing topsoil. If adding compost to the existing soil surface, rototilling is necessary. Surface roughening will assist in placement of a stable topsoil layer on steeper slopes, and allow infiltration and root penetration to greater depth.

Prior to seeding, the soil surface should be rough and the seedbed should be firm, but neither too loose nor compacted. The upper layer of soil should be in a condition suitable for seeding at the proper depth and conducive to plant growth. Seed-to-soil contact is the key to good germination.

Seed Mix for Temporary Vegetation

To provide temporary vegetative cover on disturbed areas which will not be paved, built upon, or fully landscaped or worked for an extended period (typically 30 days or more), plant an annual grass appropriate for the time of planting and mulch the planted areas. Annual grasses suitable for the Denver metropolitan area are listed in Table TS/PS-1. These are to be considered only as general recommendations when specific design guidance for a particular site is not available. Local governments typically specify seed mixes appropriate for their jurisdiction.

Seed Mix for Permanent Revegetation

To provide vegetative cover on disturbed areas that have reached final grade, a perennial grass mix should be established. Permanent seeding should be performed promptly (typically within 14 days) after reaching final grade. Each site will have different characteristics and a landscape professional or the local jurisdiction should be contacted to determine the most suitable seed mix for a specific site. In lieu of a specific recommendation, one of the perennial grass mixes appropriate for site conditions and growth season listed in Table TS/PS-2 can be used. The pure live seed (PLS) rates of application recommended in these tables are considered to be absolute minimum rates for seed applied using proper drill-seeding equipment.

If desired for wildlife habitat or landscape diversity, shrubs such as rubber rabbitbrush (*Chrysothamnus nauseosus*), fourwing saltbush (*Atriplex canescens*) and skunkbrush sumac (*Rhus trilobata*) could be added to the upland seedmixes at 0.25, 0.5 and 1 pound PLS/acre, respectively. In riparian zones, planting root stock of such species as American plum (*Prunus americana*), woods rose (*Rosa woodsii*), plains cottonwood (*Populus sargentii*), and willow (*Populus spp.*) may be considered. On non-topsoiled upland sites, a legume such as Ladak alfalfa at 1 pound PLS/acre can be included as a source of nitrogen for perennial grasses.

Mulching (MU)

EC-4

Description

Mulching consists of evenly applying straw, hay, shredded wood mulch, rock, bark or compost to disturbed soils and securing the mulch by crimping, tackifiers, netting or other measures. Mulching helps reduce erosion by protecting bare soil from rainfall impact, increasing infiltration, and reducing runoff. Although often applied in conjunction with temporary or permanent seeding, it can also be used for temporary stabilization of areas that cannot be reseeded due to seasonal constraints.

Mulch can be applied either using standard mechanical dry application methods or using hydromulching equipment that hydraulically applies a slurry of water, wood fiber mulch, and often a tackifier.

Appropriate Uses

Use mulch in conjunction with seeding to help protect the seedbed and stabilize the soil. Mulch can also be used as a temporary cover on low to mild slopes to help temporarily stabilize disturbed areas where growing season constraints prevent effective reseeded. Disturbed areas should be properly mulched and tacked, or seeded, mulched and tacked promptly after final grade is reached (typically within no longer than 14 days) on portions of the site not otherwise permanently stabilized.

Standard dry mulching is encouraged in most jurisdictions; however, hydromulching may not be allowed in certain jurisdictions or may not be allowed near waterways.

Do not apply mulch during windy conditions.

Design and Installation

Prior to mulching, surface-roughen areas by rolling with a crimping or punching type roller or by track walking. Track walking should only be used where other methods are impractical because track walking with heavy equipment typically compacts the soil.

A variety of mulches can be used effectively at construction sites. Consider the following:

Mulch	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	No



Photograph MU-1. An area that was recently seeded, mulched, and crimped.

EC-4

Mulching (MU)

- Clean, weed-free and seed-free cereal grain straw should be applied evenly at a rate of 2 tons per acre and must be tacked or fastened by a method suitable for the condition of the site. Straw mulch must be anchored (and not merely placed) on the surface. This can be accomplished mechanically by crimping or with the aid of tackifiers or nets. Anchoring with a crimping implement is preferred, and is the recommended method for areas flatter than 3:1. Mechanical crimpers must be capable of tucking the long mulch fibers into the soil to a depth of 3 inches without cutting them. An agricultural disk, while not an ideal substitute, may work if the disk blades are dull or blunted and set vertically; however, the frame may have to be weighted to afford proper soil penetration.
- Grass hay may be used in place of straw; however, because hay is comprised of the entire plant including seed, mulching with hay may seed the site with non-native grass species which might in turn out-compete the native seed. Alternatively, native species of grass hay may be purchased, but can be difficult to find and are more expensive than straw. Purchasing and utilizing a certified weed-free straw is an easier and less costly mulching method. When using grass hay, follow the same guidelines as for straw (provided above).
- On small areas sheltered from the wind and heavy runoff, spraying a tackifier on the mulch is satisfactory for holding it in place. For steep slopes and special situations where greater control is needed, erosion control blankets anchored with stakes should be used instead of mulch.
- Hydraulic mulching consists of wood cellulose fibers mixed with water and a tackifying agent and should be applied at a rate of no less than 1,500 pounds per acre (1,425 lbs of fibers mixed with at least 75 lbs of tackifier) with a hydraulic mulcher. For steeper slopes, up to 2000 pounds per acre may be required for effective hydroseeding. Hydromulch typically requires up to 24 hours to dry; therefore, it should not be applied immediately prior to inclement weather. Application to roads, waterways and existing vegetation should be avoided.
- Erosion control mats, blankets, or nets are recommended to help stabilize steep slopes (generally 3:1 and steeper) and waterways. Depending on the product, these may be used alone or in conjunction with grass or straw mulch. Normally, use of these products will be restricted to relatively small areas. Biodegradable mats made of straw and jute, straw-coconut, coconut fiber, or excelsior can be used instead of mulch. (See the ECM/TRM BMP for more information.)
- Some tackifiers or binders may be used to anchor mulch. Check with the local jurisdiction for allowed tackifiers. Manufacturer's recommendations should be followed at all times. (See the Soil Binder BMP for more information on general types of tackifiers.)
- Rock can also be used as mulch. It provides protection of exposed soils to wind and water erosion and allows infiltration of precipitation. An aggregate base course can be spread on disturbed areas for temporary or permanent stabilization. The rock mulch layer should be thick enough to provide full coverage of exposed soil on the area it is applied.

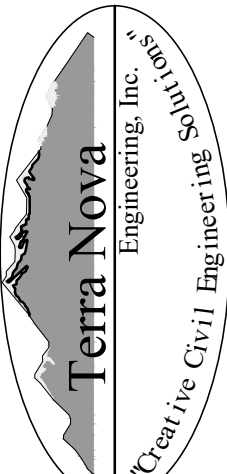
Maintenance and Removal

After mulching, the bare ground surface should not be more than 10 percent exposed. Reapply mulch, as needed, to cover bare areas.



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NORTH GATE
SUBARU

PROJECT INFO
DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION
DRAWINGS

DATE: BY: DESCRIPTION:

DESIGN/REVISION

SHEET TITLE: GRADING AND EROSION CONTROL PLAN
EROSION CONTROL DETAILS

Surface Roughening (SR)

EC-1

Description

Surface roughening is an erosion control practice that involves tracking, scarifying, imprinting, or tilling a disturbed area to provide temporary stabilization of disturbed areas. Surface roughening creates variations in the soil surface that help to minimize wind and water erosion. Depending on the technique used, surface roughening may also help establish conditions favorable to establishment of vegetation.



Photograph SR-1. Surface roughening via imprinting for temporary stabilization.

Appropriate Uses

Surface roughening can be used to provide temporary stabilization of disturbed areas, such as when revegetation cannot be immediately established due to seasonal planting limitations. Surface roughening is not a stand-alone BMP, and should be used in conjunction with other erosion and sediment controls.

Surface roughening is often implemented in conjunction with grading and is typically performed using heavy construction equipment to track the surface. Be aware that tracking with heavy equipment will also compact soils, which is not desirable in areas that will be revegetated. Scarifying, tilling, or ripping are better surface roughening techniques in locations where revegetation is planned. Roughening is not effective in very sandy soils and cannot be effectively performed in rocky soil.

Design and Installation

Typical design details for surfacing roughening on steep and mild slopes are provided in Details SR-1 and SR-2, respectively.

Surface roughening should be performed either after final grading or to temporarily stabilize an area during active construction that may be inactive for a short time period. Surface roughening should create depressions 2 to 6 inches deep and approximately 6 inches apart. The surface of exposed soil can be roughened by a number of techniques and equipment. Horizontal grooves (running parallel to the contours of the land) can be made using tracks from equipment treads, stair-step grading, ripping, or tilling.

Fill slopes can be constructed with a roughened surface. Cut slopes that have been smooth graded can be roughened as a subsequent operation. Roughening should follow along the contours of the slope. The tracks left by truck mounted equipment working perpendicular to the contour can leave acceptable horizontal depressions; however, the equipment will also compact the soil.

Surface Roughening	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 SR-1

EC-1

Surface Roughening (SR)

Maintenance and Removal

Care should be taken not to drive vehicles or equipment over areas that have been surface roughened. Tire tracks will smooth the roughened surface and may cause runoff to collect into rills and gullies.

Because surface roughening is only a temporary control, additional treatments may be necessary to maintain the soil surface in a roughened condition.

Areas should be inspected for signs of erosion. Surface roughening is a temporary measure, and will not provide long-term erosion control.

SR-2 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 November 2010

Surface Roughening (SR)

EC-1

Description

Surface roughening is an erosion control practice that involves tracking, scarifying, imprinting, or tilling a disturbed area to provide temporary stabilization of disturbed areas. Surface roughening creates variations in the soil surface that help to minimize wind and water erosion. Depending on the technique used, surface roughening may also help establish conditions favorable to establishment of vegetation.



Photograph SR-1. Surface roughening via imprinting for temporary stabilization.

Appropriate Uses

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Surface roughening is often implemented in conjunction with grading and is typically performed using heavy construction equipment to track the surface. Be aware that tracking with heavy equipment will also compact soils, which is not desirable in areas that will be revegetated. Scarifying, tilling, or ripping are better surface roughening techniques in locations where revegetation is planned. Roughening is not effective in very sandy soils and cannot be effectively performed in rocky soil.

Design and Installation

Typical design details for surfacing roughening on steep and mild slopes are provided in Details SR-1 and SR-2, respectively.

Surface roughening should be performed either after final grading or to temporarily stabilize an area during active construction that may be inactive for a short time period. Surface roughening should create depressions 2 to 6 inches deep and approximately 6 inches apart. The surface of exposed soil can be roughened by a number of techniques and equipment. Horizontal grooves (running parallel to the contours of the land) can be made using tracks from equipment treads, stair-step grading, ripping, or tilling.

Fill slopes can be constructed with a roughened surface. Cut slopes that have been smooth graded can be roughened as a subsequent operation. Roughening should follow along the contours of the slope. The tracks left by truck mounted equipment working perpendicular to the contour can leave acceptable horizontal depressions; however, the equipment will also compact the soil.

Surface Roughening	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 SR-1

Surface Roughening (SR)

EC-1

Description

Surface roughening is an erosion control practice that involves tracking, scarifying, imprinting, or tilling a disturbed area to provide temporary stabilization of disturbed areas. Surface roughening creates variations in the soil surface that help to minimize wind and water erosion. Depending on the technique used, surface roughening may also help establish conditions favorable to establishment of vegetation.



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Typical design details for surfacing roughening on steep and mild slopes are provided in Details SR-1 and SR-2, respectively.

Surface roughening should be performed either after final grading or to temporarily stabilize an area during active construction that may be inactive for a short time period. Surface roughening should create depressions 2 to 6 inches deep and approximately 6 inches apart. The surface of exposed soil can be roughened by a number of techniques and equipment. Horizontal grooves (running parallel to the contours of the land) can be made using tracks from equipment treads, stair-step grading, ripping, or tilling.

Fill slopes can be constructed with a roughened surface. Cut slopes that have been smooth graded can be roughened as a subsequent operation. Roughening should follow along the contours of the slope. The tracks left by truck mounted equipment working perpendicular to the contour can leave acceptable horizontal depressions; however, the equipment will also compact the soil.

Surface Roughening	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 SR-1

Chapter 5
Native Vegetation Requirements and Guidelines

Table 5-1. El Paso County Conservation District All-Purpose Mix for Upland, Transition and Permanent Control Measure Areas

Common Name	Scientific Name	Growth Season / Form	% of Mix	Pounds PLS		
				• Irrigated broadcast • Irrigated hydroseeded	• Non-irrigated broadcast • Non-irrigated hydroseeded • Irrigated drilled	• Non-irrigated drilled
				80 seeds/sq ft	40 seeds/sq ft	20 seeds/sq ft
Bluestem, big	<i>Andropogon gerardii</i>	Warm, sod	20	4.4	2.2	1.1
Gramma, blue	<i>Bouteloua gracilis</i>	Warm, bunch	10	0.5	0.25	0.13
Green needlegrass ²	<i>Nassella viridula</i>	Cool, bunch	10	2	1	0.5
Wheatgrass, western ²	<i>Pascopyrum smithii</i>	Cool, sod	20	6.4	3.2	1.6
Gramma, sideoats	<i>Bouteloua curtipendula</i>	Warm, bunch	10	2	1	0.5
Switchgrass ³	<i>Panicum virgatum</i>	Warm, bunch/sod	10	0.8	0.4	0.2
Prairie sandreed	<i>Calamovilfa longifolia</i>	Warm, sod	10	1.2	0.6	0.3
Yellow indiagrass ²	<i>Sorghastrum nutans</i>	Warm, sod	10	2	1	0.5
Seed rate (lbs PLS/acre)				19.3	9.7	4.8

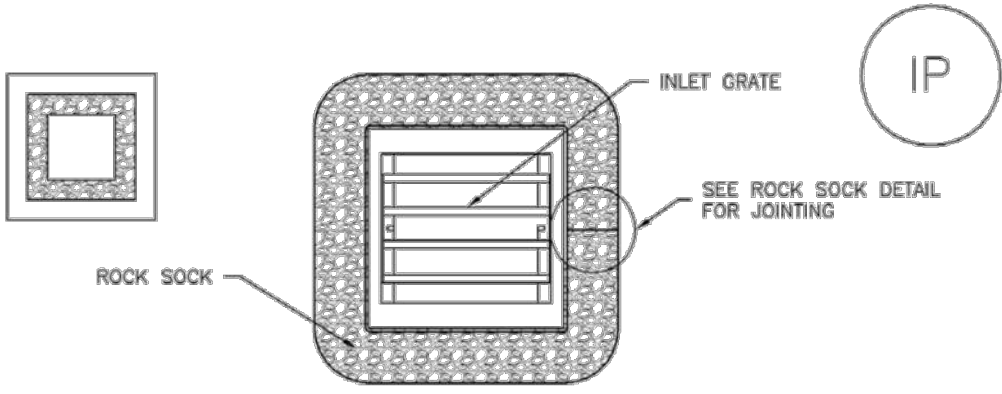
¹For portions of facilities located near or on the bottom or where wet soil conditions occur. Planting of potted nursery stock wetland plants 2-foot on-center is recommended for sites with wetland hydrology.

²Species that will do well in the bottom of pond areas.

City of Colorado Springs Stormwater Enterprise 5-11 Stormwater Construction Manual December 2020

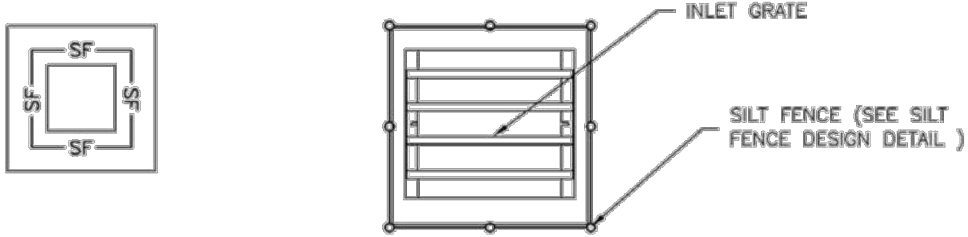
Inlet Protection (IP)

SC-6



IP-3. ROCK SOCK SUMP/AREA INLET PROTECTION

ROCK SOCK SUMP/AREA INLET PROTECTION INSTALLATION NOTES
1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
2. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



IP-4. SILT FENCE FOR SUMP INLET PROTECTION

SILT FENCE INLET PROTECTION INSTALLATION NOTES
1. SEE SILT FENCE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
2. POSTS SHALL BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.
3. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF SILT FENCE FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.

August 2013 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 IP-5

SC-6

Inlet Protection (IP)

GENERAL INLET PROTECTION INSTALLATION NOTES
1. SEE PLAN VIEW FOR:
-LOCATION OF INLET PROTECTION.
-TYPE OF INLET PROTECTION (IP-1, IP-2, IP-3, IP-4, IP-5, IP-6)
2. INLET PROTECTION SHALL BE INSTALLED PROMPTLY AFTER INLET CONSTRUCTION OR PAVING IS COMPLETE (TYPICALLY WITHIN 48 HOURS). IF A RAINFALL/RUNOFF EVENT IS FORECAST, INSTALL INLET PROTECTION PRIOR TO ONSET OF EVENT.
3. MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

INLET PROTECTION MAINTENANCE NOTES
1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED AS NECESSARY TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN STORAGE VOLUME REACHES 50% OF CAPACITY, A DEPTH OF 6" WHEN SILT FENCE IS USED, OR 1/4 OF THE HEIGHT FOR STRAW BALES.
5. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.
6. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF INLET PROTECTION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY PROPRIETARY INLET PROTECTION METHODS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY INLET PROTECTION. HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

NOTE: SOME MUNICIPALITIES DISCOURAGE OR PROHIBIT THE USE OF STRAW BALES FOR INLET PROTECTION. CHECK WITH LOCAL JURISDICTION TO DETERMINE IF STRAW BALE INLET PROTECTION IS ACCEPTABLE.

IP-8 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 August 2013

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NORTH GATE SUBARU

PROJECT INFO
DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

STAMP

CONSTRUCTION DRAWINGS

DATE: BY: DESCRIPTION:

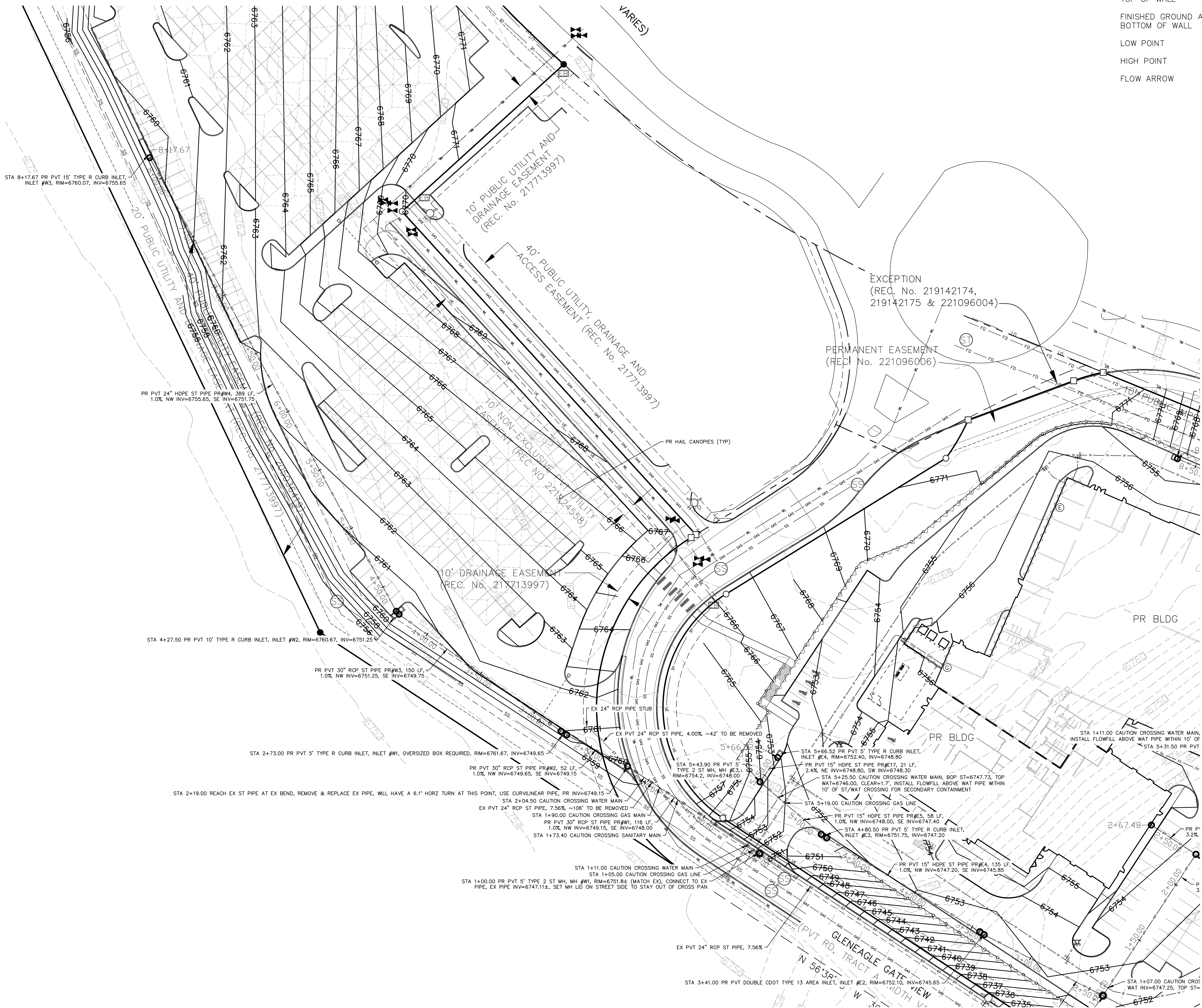
REVISION

SHEET TITLE: GRADING AND EROSION CONTROL PLAN EROSION CONTROL DETAILS

SHEET NUMBER: 14 OF 21

PLAN FILE # TNE JOB # 2326.00
COUNTRY FILE # PPR2514 & SF2510

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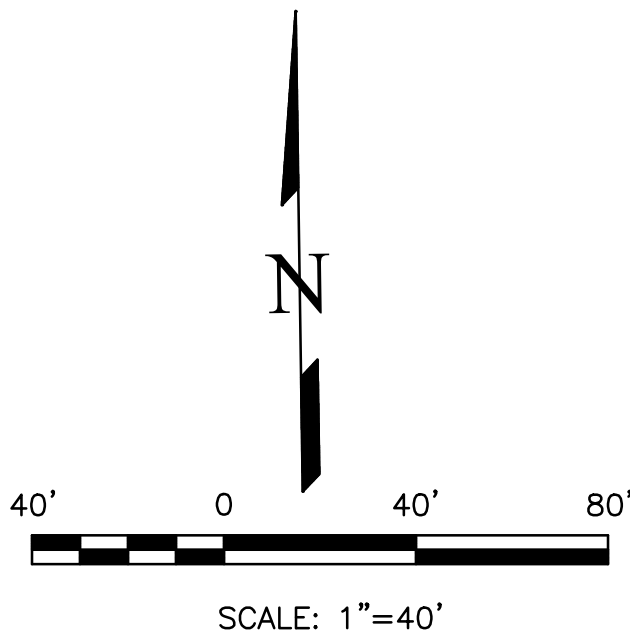


GRADING LEGEND

PROPOSED	PR	EXISTING CONTOURS - MINOR	---
EXISTING	EX	EXISTING CONTOURS - MAJOR	---
FINISHED SURFACE	FS	PROPOSED CONTOURS - 1'	---
FINISHED GROUND	FG	EXISTING PROPERTY LINE	---
TOP OF CURB	TC	PROPOSED RET WALL	---
FLOWLINE	FL	PROPOSED RIPRAP	---
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	---
FINISHED GROUND AT BOTTOM OF WALL	BP	SANITARY SEWER LINE	---
LOW POINT	LP	GAS LINE	---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---
FLOW ARROW	FA	TELEPHONE LINE	---
		FIBER OPTIC LINE	---
		STORM SEWER LINE	---
		LIMIT OF CONSTRUCTION	---
		LIMIT OF SOIL DISTURBANCE	---
		PROPOSED FENCE	---
		FIRE HYDRANT	---

NOTES

1. ALL HDPE STORM PIPE IS TO BE SMOOTH INTERIOR PIPE. ALL RCP MUST BE MINIMUM CLASS 3.
2. ALL PIPE CONNECTIONS TO PREFABRICATED INLETS OR BOXES MUST USE A REINFORCED CONCRETE COLLAR.
3. ALL PRESSURIZED PIPES MUST HAVE WATERTIGHT SEALS.



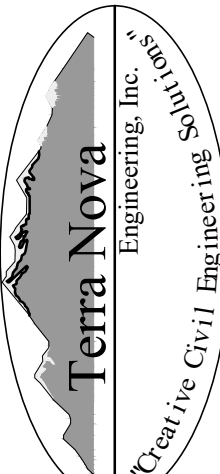
THIS DESIGN WAS PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF TERRA NOVA ENGINEERING, INC.

DANE FRANK
COLORADO P.E. # 50207



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NORTH GATE SUBARU

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION DRAWINGS

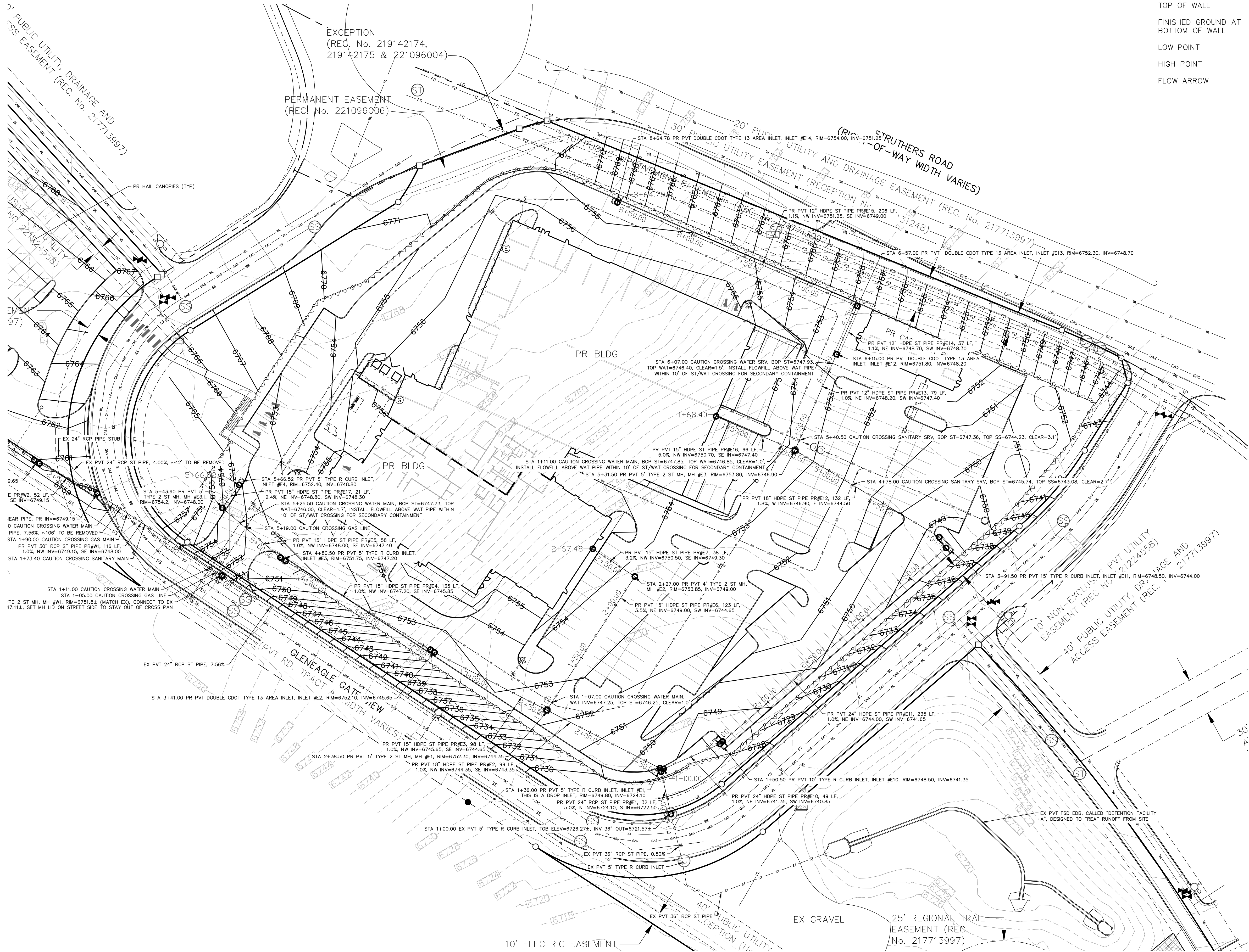
DATE: BY: DESCRIPTION:

STORM SEWER PLAN
NORTH LOT

15 OF 21

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COUNTY FILE # PPR2514 & SF2510

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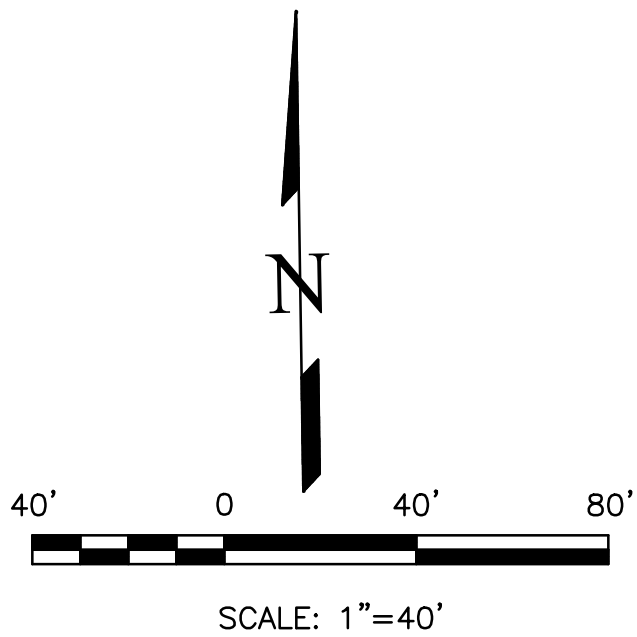


GRADING LEGEND

PROPOSED	PR	EXISTING CONTOURS - MINOR	---
EXISTING	EX	EXISTING CONTOURS - MAJOR	---
FINISHED SURFACE	FS	PROPOSED CONTOURS - 1'	---
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TOP OF CURB	TC	PROPOSED RET WALL	---
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LOW POINT	LP	GAS LINE	---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---
FLOW ARROW	←	TELEPHONE LINE	---
		FIBER OPTIC LINE	---
		STORM SEWER LINE	---
		LIMIT OF CONSTRUCTION	---
		LIMIT OF SOIL DISTURBANCE	---
		PROPOSED FENCE	---
		FIRE HYDRANT	---

NOTES

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3. ALL PRESSURIZED PIPES MUST HAVE WATERTIGHT SEALS.



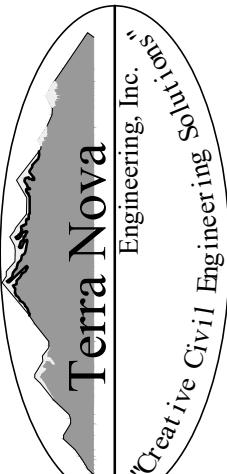
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COLORADO P.E. # 50207



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NORTH GATE SUBARU

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION DRAWINGS

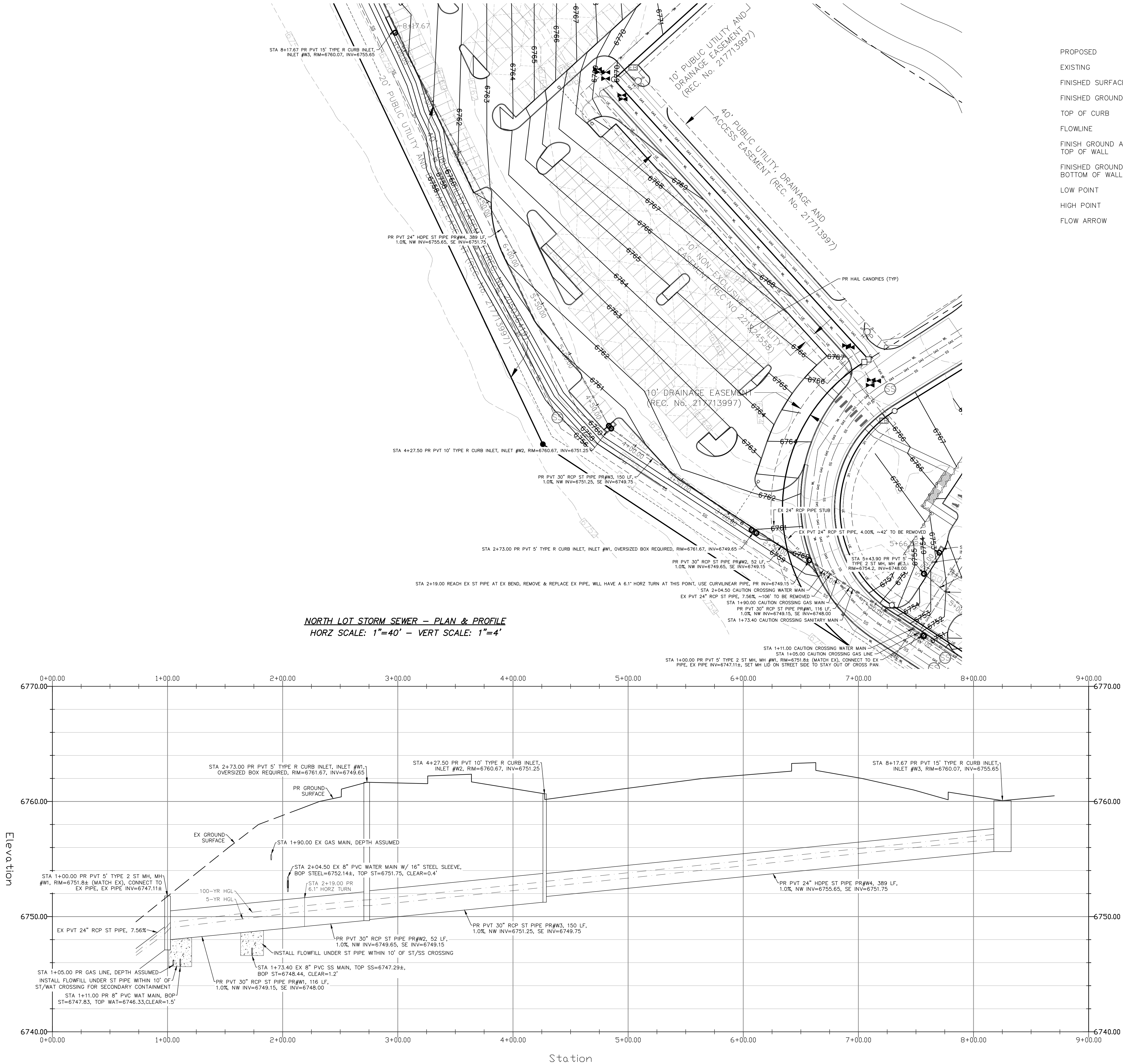
DATE: BY: DESCRIPTION:

STORM SEWER PLANS
SOUTH LOT

16 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

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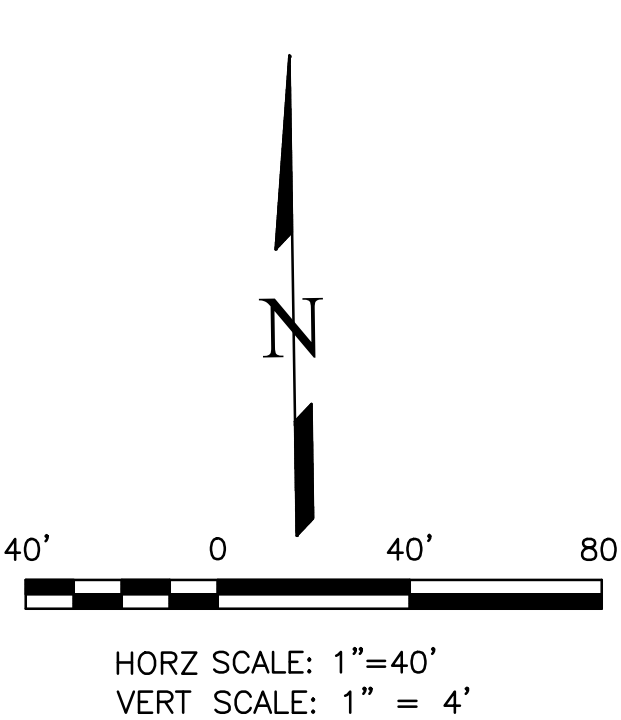


GRADING LEGEND

PROPOSED	PR	EXISTING CONTOURS – MINOR	---
EXISTING	EX	EXISTING CONTOURS – MAJOR	---
FINISHED SURFACE	FS	PROPOSED CONTOURS – 1'	---
FINISHED GROUND	FG	EXISTING PROPERTY LINE	---
TOP OF CURB	TC	PROPOSED RET WALL	---
FLOWLINE	FL	PROPOSED RIPRAP	---
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	---
FINISHED GROUND AT BOTTOM OF WALL	BW	SANITARY SEWER LINE	---
LOW POINT	LP	GAS LINE	---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---
FLOW ARROW	←	TELEPHONE LINE	---
		FIBER OPTIC LINE	---
		STORM SEWER LINE	---
		LIMIT OF CONSTRUCTION	---
		LIMIT OF SOIL DISTURBANCE	---
		PROPOSED FENCE	---
		FIRE HYDRANT	---

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3. ALL PRESSURIZED PIPES MUST HAVE WATERTIGHT SEALS.
4. IF THERE ARE ANY DISCREPANCIES BETWEEN THE PLAN VIEW AND PROFILE INFO, THE PLAN VIEW INFO DICTATES.



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PLANNER / LANDSCAPE ARCHITECT



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CIVIL ENGINEER

NORTH GATE SUBARU

PROJECT INFO

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

STAMP

CONSTRUCTION DRAWINGS

DATE: BY: DESCRIPTION:

ISSUE / REVISION

SHEET TITLE

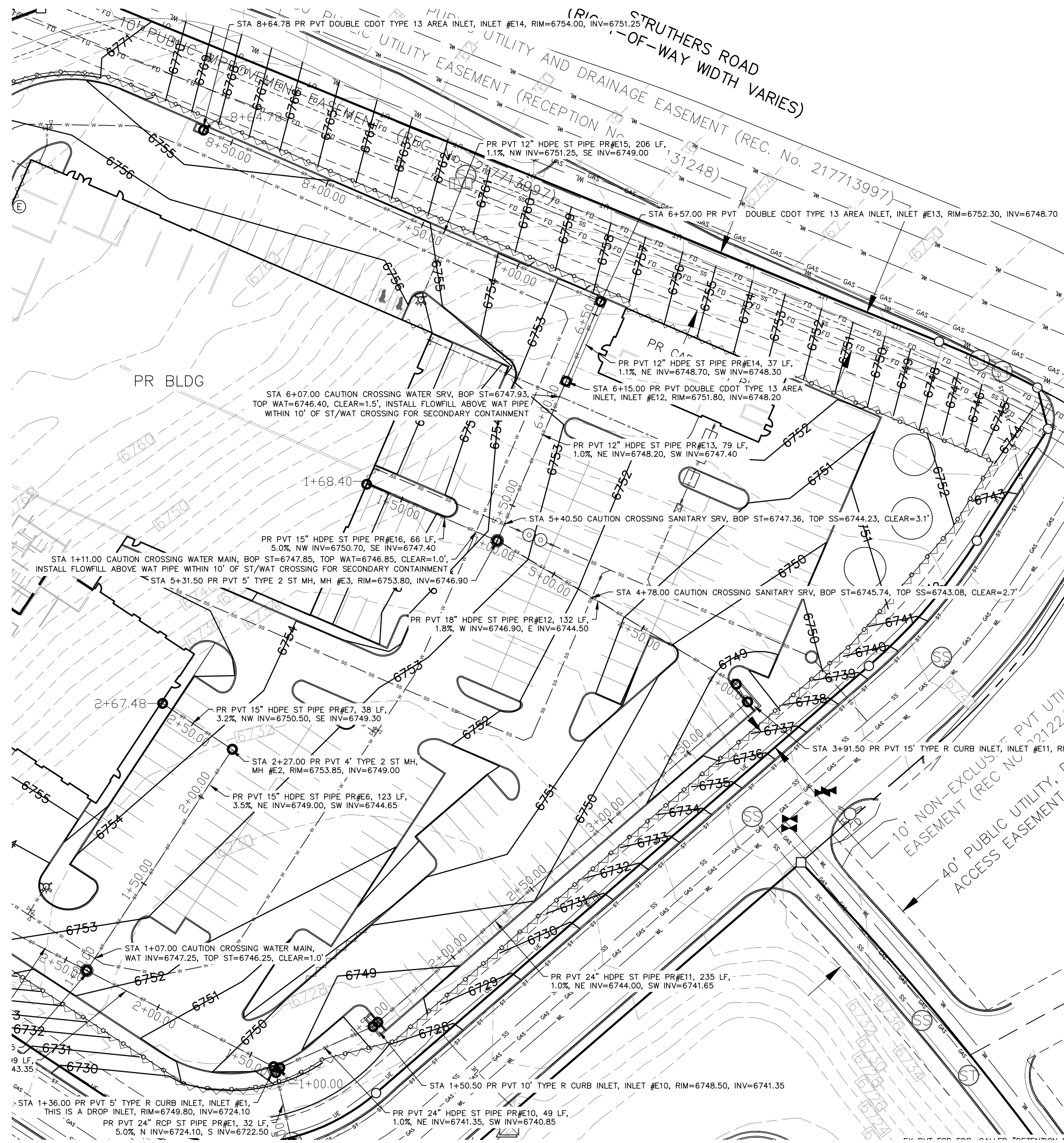
STORM SEWER PLAN
PLAN AND PROFILES – NORTH LOT

SHEET NUMBER

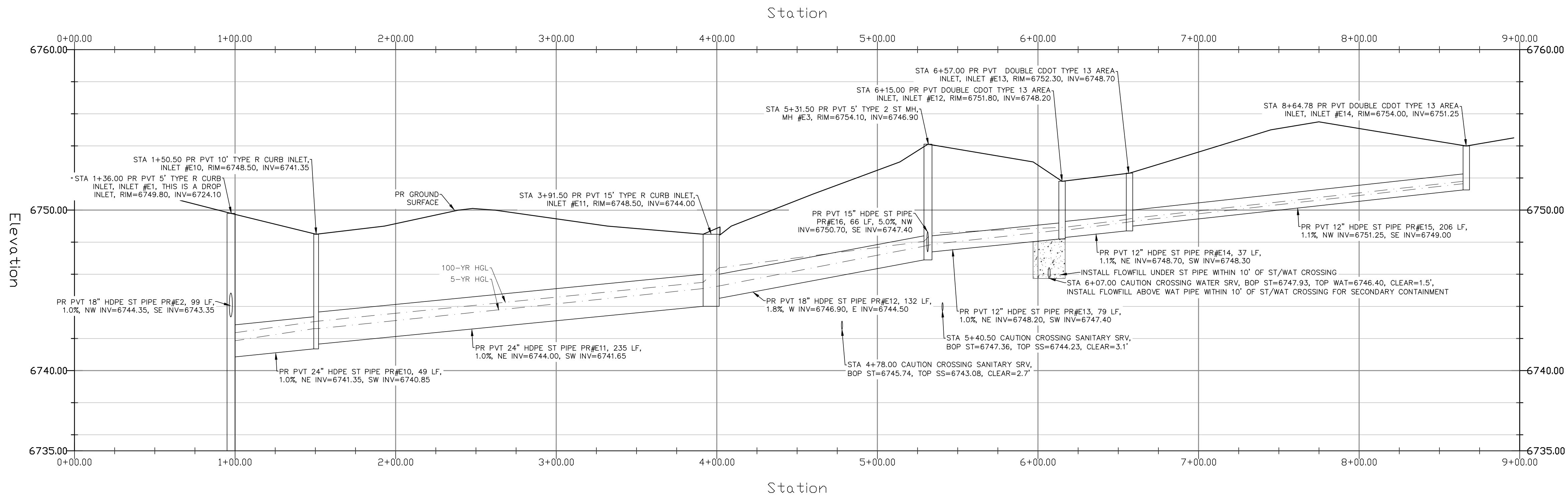
17 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

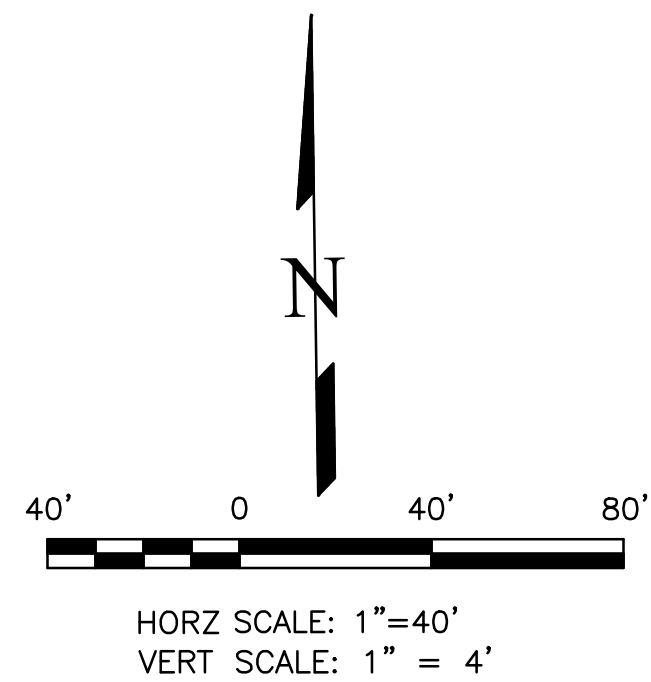
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SOUTH LOT – EAST RUN – PLAN & PROFILE
HORZ SCALE: 1"=40' – VERT SCALE: 1"=4'



Elevation



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DANE FRANK
COLORADO P.E. # 50207

GRADING LEGEND

PROPOSED	PR	EXISTING CONTOURS – MINOR	---
EXISTING	EX	EXISTING CONTOURS – MAJOR	---
FINISHED SURFACE	FS	PROPOSED CONTOURS – 1'	---
FINISHED GROUND	FG	EXISTING PROPERTY LINE	---
TOP OF CURB	TC	PROPOSED RET WALL	---
FLOWLINE	FL	PROPOSED RIPRAP	---
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	---
FINISH GROUND AT BOTTOM OF WALL	BP	SANITARY SEWER LINE	---
LOW POINT	LP	GAS LINE	---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---
FLOW ARROW	→	TELEPHONE LINE	---
		FIBER OPTIC LINE	---
		STORM SEWER LINE	---
		LIMIT OF CONSTRUCTION	---
		LIMIT OF SOIL DISTURBANCE	---
		PROPOSED FENCE	---
		FIRE HYDRANT	---

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NORTH GATE SUBARU

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION DRAWINGS

DATE: BY: DESCRIPTION:

STORM SEWER PLAN
PLAN AND PROFILES – SOUTH LOT –
EAST RUN

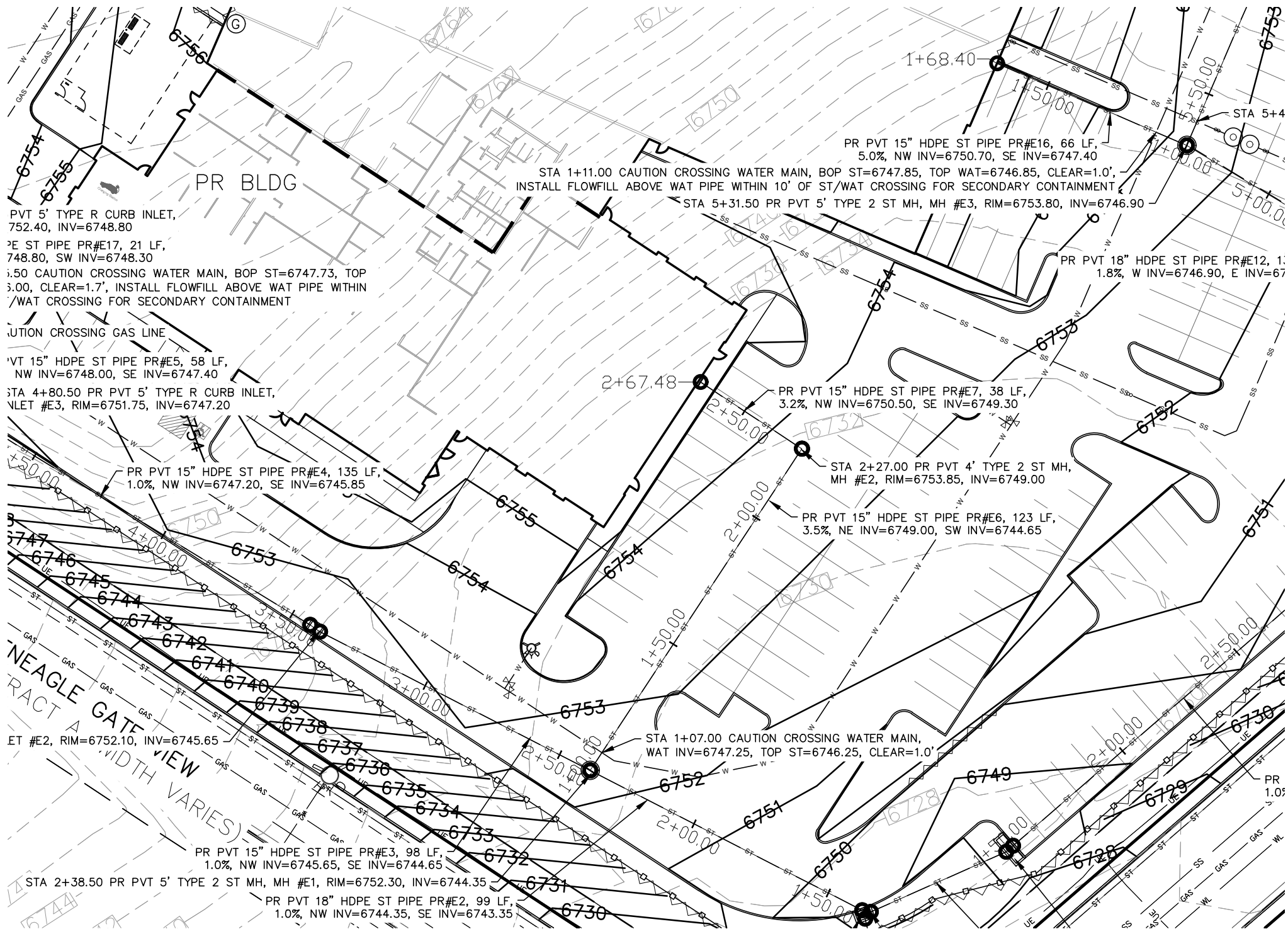
19 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

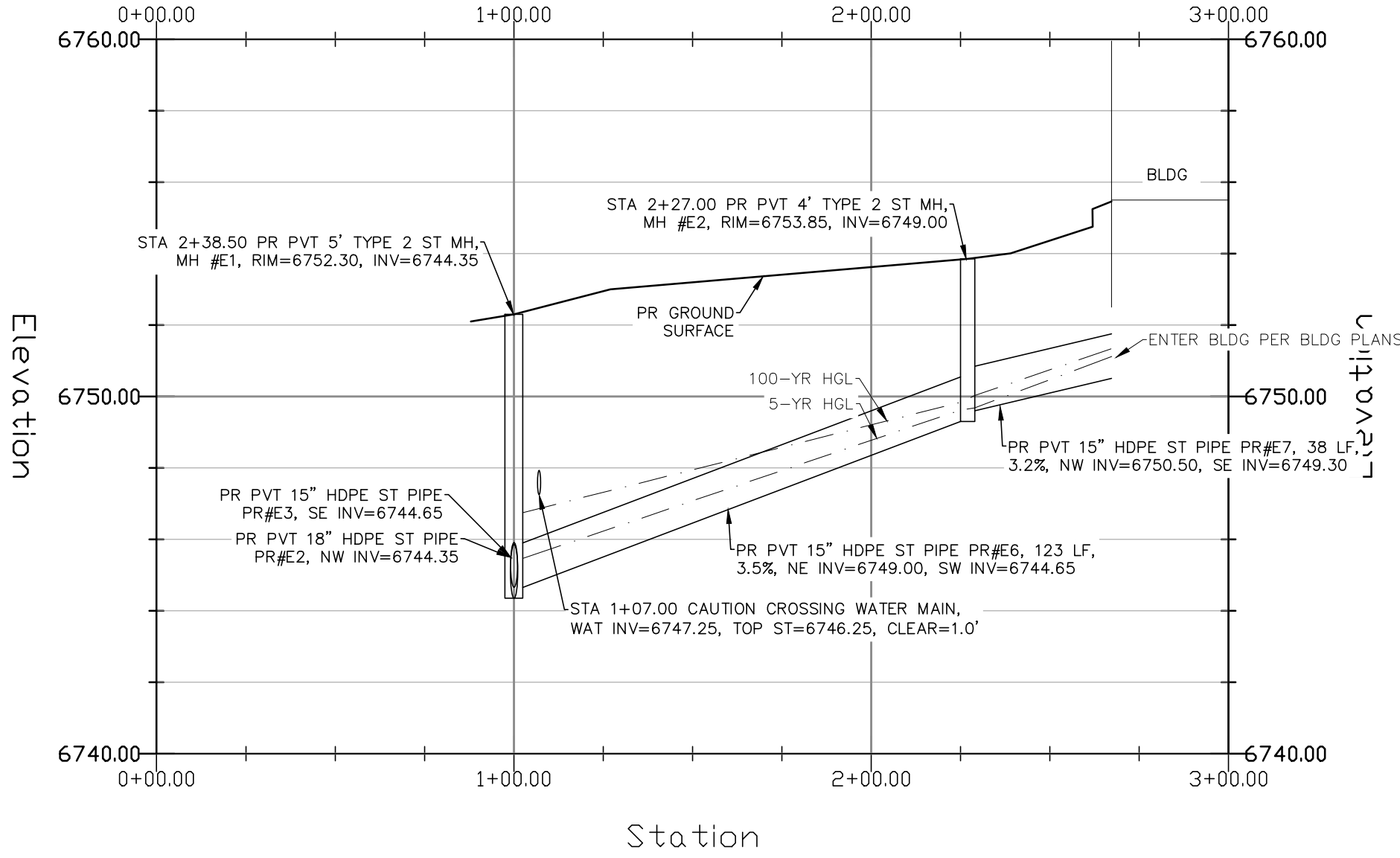
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GRADING LEGEND

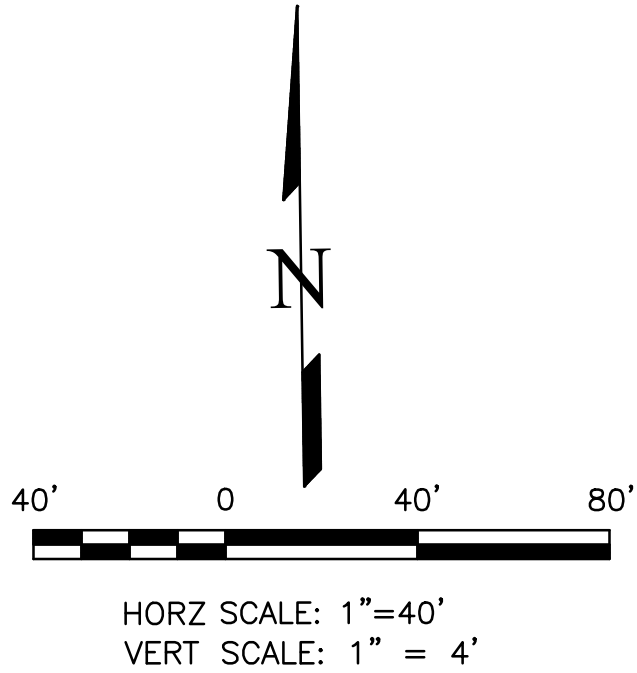
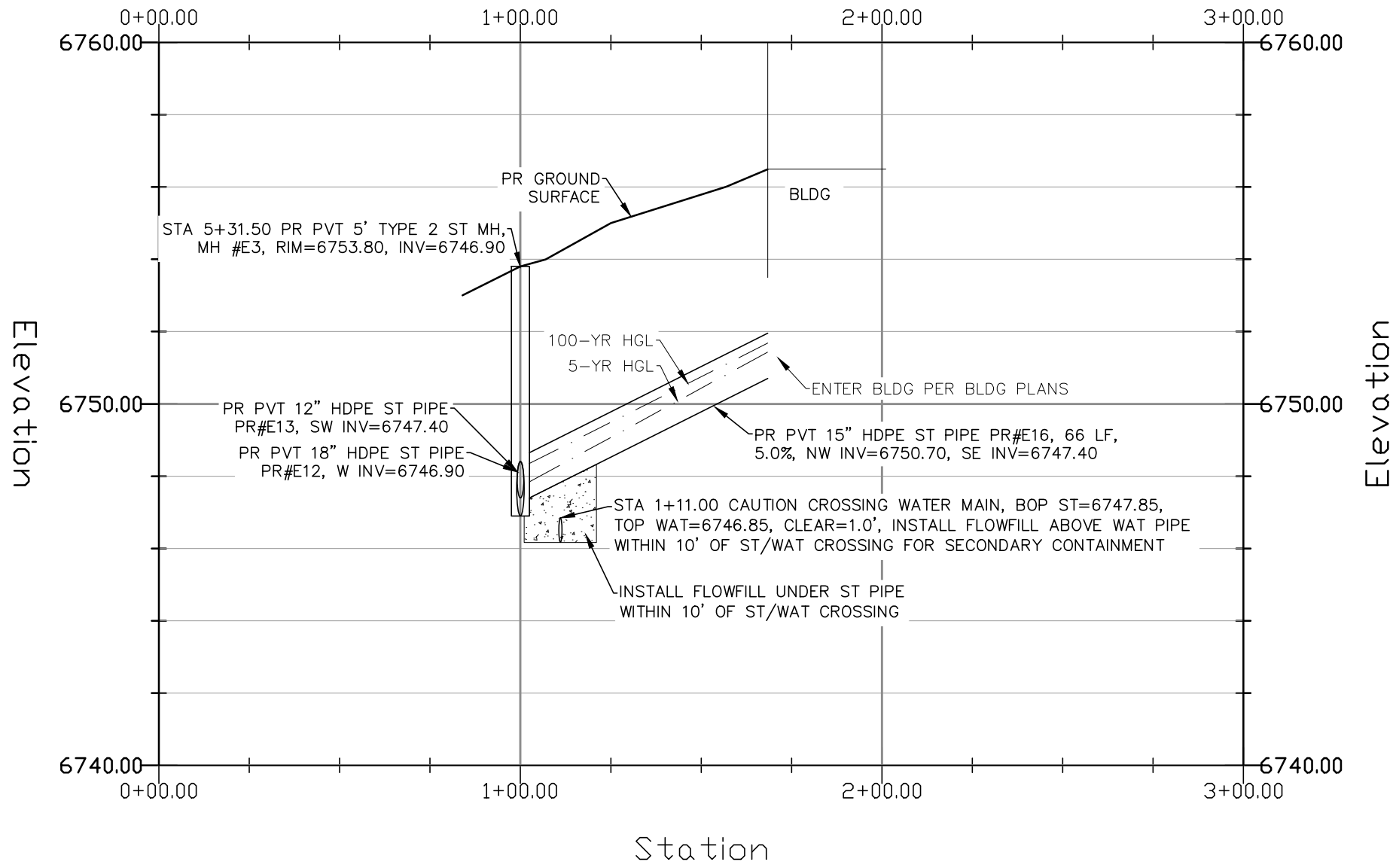
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EXISTING	EX	EXISTING CONTOURS - MAJOR	---	6236	---
FINISHED SURFACE	FS	PROPOSED CONTOURS - 1'	---	6231	---
FINISHED GROUND	FG	EXISTING PROPERTY LINE	---		---
TOP OF CURB	TC	PROPOSED RET WALL	---		---
FLOWLINE	FL	PROPOSED RIPRAP	---		---
FINISH GROUND AT TOP OF WALL	TW	WATER LINE	---	WL	---
FINISHED GROUND AT BOTTOM OF WALL	BW	SANITARY SEWER LINE	---	SS	---
LOW POINT	LP	GAS LINE	---	GAS	---
HIGH POINT	HP	UNDERGROUND ELECTRICAL LINE	---	UE	---
FLOW ARROW		TELEPHONE LINE	---	UT	---
		FIBER OPTIC LINE	---	FO	---
		STORM SEWER LINE	---	ST	---
		LIMIT OF CONSTRUCTION	---		---
		LIMIT OF SOIL DISTURBANCE	---		---
		PROPOSED FENCE	---		---
		FIRE HYDRANT	---		---



SOUTH LOT - NORTH RUN - PLAN & PROFILE
HORZ SCALE: 1"=40' - VERT SCALE: 1"=4'



SOUTH LOT - NORTHEAST RUN - PLAN & PROFILE
HORZ SCALE: 1"=40' - VERT SCALE: 1"=4'



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DANE FRANK
COLORADO P.E. # 50207



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NORTH GATE
SUBARU

DATE: 06/17/25
PROJECT MGR: K. JOHNSON
PREPARED BY: TERRA NOVA ENGINEERING

CONSTRUCTION
DRAWINGS

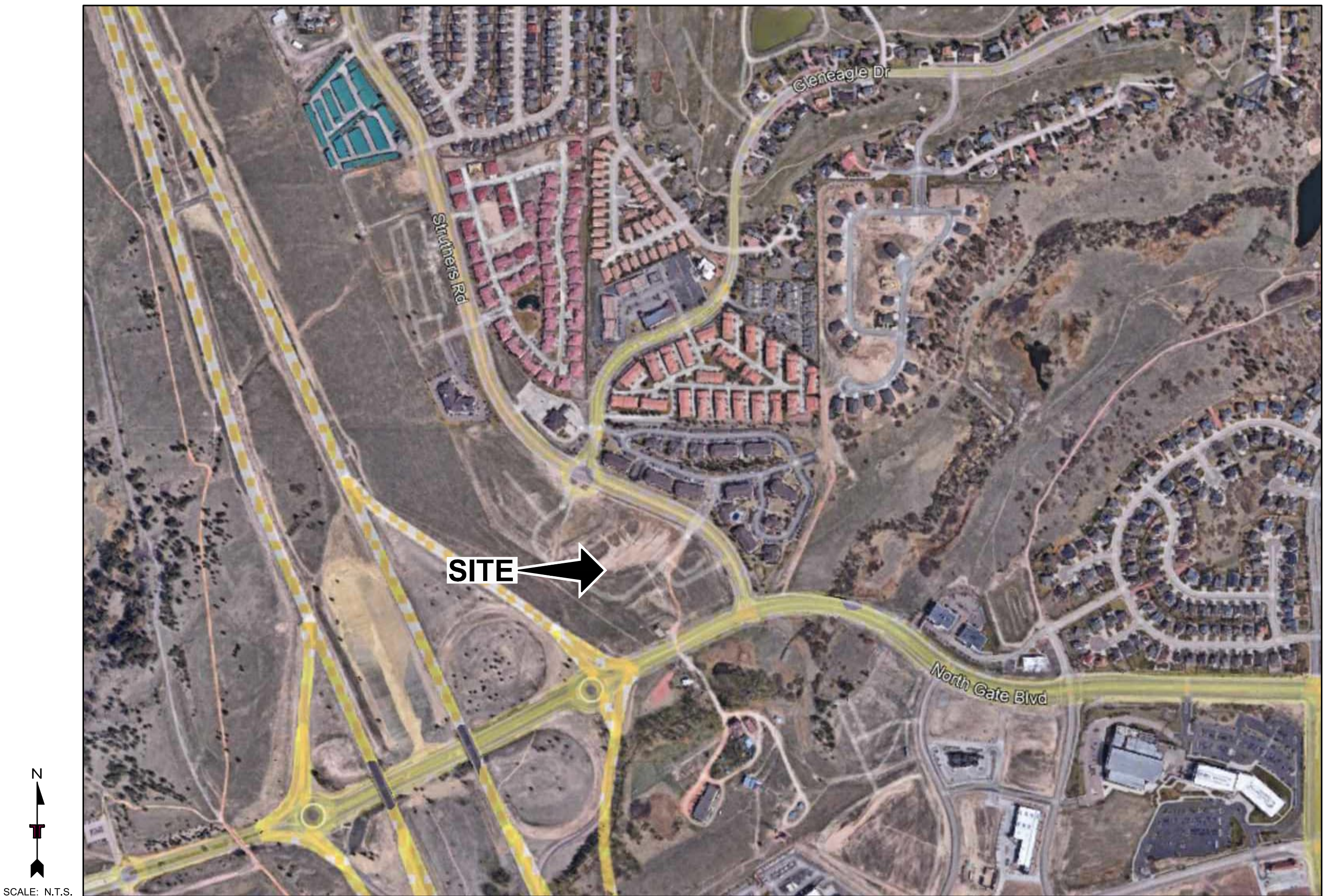
DATE: BY: DESCRIPTION:

STORM SEWER PLAN
PLAN AND PROFILES - SOUTH LOT -
NORTH RUN AND NORTHEAST RUN

20 OF 21

TNE JOB # 2326.00
COUNTY FILE # PPR2514 & SF2510

MECHANICALLY STABILIZED EARTH RETAINING WALLS
AND SOLDIER PILE AND LAGGING RETAINING WALL
FOR
NORTHGATE SUBARU
COLORADO SPRINGS, COLORADO



NOTE: SITE IMAGE PROVIDED BY GOOGLE EARTH, PRO, 2024.

VICINITY MAP

SHEET INDEX	
SHEET NUMBER	SHEET DESCRIPTION
RW-1	COVER SHEET
RW-2	TECHNICAL SCOPE OF WORK - MSE WALLS
RW-3	TECHNICAL SCOPE OF WORK - MSE WALLS
RW-4	TECHNICAL SCOPE OF WORK - SOLDIER PILE WALL
RW-5	TECHNICAL SCOPE OF WORK - SOLDIER PILE WALL
RW-6	RETAINING WALL SITE PLAN
RW-7	WALL A - PLAN & PROFILE
RW-8	WALL A - PLAN & PROFILE (CONTINUED)
RW-9	WALL A - PLAN & PROFILE (CONTINUED)
RW-10	WALLS A AND B - PLAN & PROFILE
RW-11	WALL C - PLAN & PROFILE
RW-12	WALL D - PLAN & PROFILE
RW-13	WALL D - PLAN & PROFILE (CONTINUED)
RW-D1	TYPICAL MSE WALL CROSS SECTION
RW-D2	TYPICAL MSE WALL CROSS SECTIONS
RW-D3	TYPICAL SOLDIER PILE WALL CROSS SECTIONS
RW-D4	TYPICAL MSE WALL CONSTRUCTION DETAILS
RW-D5	TYPICAL MSE WALL CONSTRUCTION DETAILS
RW-D6	SOLDIER PILE WALL CONSTRUCTION DETAILS
RW-D7	SOLDIER PILE WALL CONSTRUCTION DETAILS
RW-D8	SOLDIER PILE WALL CONSTRUCTION DETAILS

PREPARED FOR: TKA PROPERTIES, LLP



COVER SHEET

NORTHGATE SUBARU
208 GLENEAGLE GATE VIEW
COLORADO SPRINGS
COLORADO

Terracon
Explore with us

4685 SOUTH ASH AVE, SUITE H-4
PH: (480) 887-8200
TEMPE, AZ 85282
FAX: (480) 887-1133

RW-1

DESIGNED BY:	MWF
DRAWN BY:	MWF
APPVD. BY:	DRC
SCALE:	AS SHOWN
DATE:	2/28/25
JOB NO.:	23245149
SHEET NO.:	1 OF 21

3.11 **Site Drainage:**

- A. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall facing to rapidly direct runoff away from the wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.
- B. Finished grading at the top of the wall should provide positive drainage away from the retaining wall system to prevent infiltration of water into retained soils which may increase lateral pressures on the structure.

3.12 **Quality Assurance:**

- A. Quality Assurance and Special Inspection for the project, shall be conducted in accordance with the applicable portions of the Uniform Building Code, International Building Code and the Building Construction and Safety Code, NFPA 5000, or as required by the governing building department.
- B. All Special Inspectors shall be under the supervision of a registered engineer.
- C. Testing and inspection services shall be performed only by trained and experienced personnel and experienced technicians currently qualified for the work they are to perform.
- D. If Special Inspection is provided by anyone other than the Engineer of Record, the qualifications of all special inspectors shall be reviewed and approved by the Engineer of Record. All work requiring Special Inspection shall be made available and remain accessible and exposed until it is observed by the Special Inspector.
- E. Duties of the Special Inspector:
- The Special Inspector shall observe the work requiring special inspection for conformance with the approved design drawings and specifications.
 - The Special Inspector shall furnish inspection reports to be kept at the site for use by the Building Official, the Contractor and the Engineer of Record. If Special Inspection is provided by anyone other than the Engineer of Record, reports shall be submitted to the office of the Engineer of Record on a weekly basis. All discrepancies shall be brought to the attention of the Contractor for correction, then if uncorrected, to the design authority and the Building official.
 - Upon completion of the assigned work, the Special Inspector shall complete and sign a final report certifying that to the best of his knowledge, the work is in conformance with the approved plans and specifications, and the applicable workmanship provisions of the code.
- G. The following Special Inspection Schedule provides the types, extents and frequency of specific items requiring special inspections and structural tests as part of this project:

SPECIAL INSPECTION SCHEDULE			
Areas requiring special inspection:	Frequency		Comments:
	Continuous	Periodic	
SPECIAL CASES (1705.1)			
Segmental Block		X	Special Inspection shall be made of the type, location, orientation and plumbness of segmental block placement in each wall. Blocks shall be examined for defects.
Geogrid and Geotextile	X		Special Inspection shall be made of the type, location, orientation and extent of geogrid and geotextile placement in each wall.
Subdrain Installation		X	Special inspection shall be made of the placement and extent of the subdrain system within each wall.
SOILS (1705.6)			
Excavations		X	Verify excavations are extended to proper depth and have reached proper material.
Field Density		X	In accordance with ASTM D-6938 or ASTM D-1556. <ul style="list-style-type: none">Subgrade – One test every 500 to 1000 square feet of subgrade area.Base Leveling Pad – One test every 200 lineal feet of wall length.Reinforced Backfill – One test every 500 to 1000 square feet of backfill per lift.
Moisture-Density Relationships		X	In accordance with AASHTO or ASTM criteria as specified for subgrade, base leveling pad, and reinforced backfill.
Gradation Analysis & Atterberg Limits		X	In accordance with ASTM D-422. <ul style="list-style-type: none">Unit Fill – One test every 500 cubic yards of material.Wall Backfill – One test every 500 cubic yards of material.
Wall Backfill	X		Verify use of proper materials, densities and lift thickness during placement and compaction of reinforced backfill.
Direct Shear Testing		X	A minimum of no less than two (2) tests per soil type or change in soil borrow source. At the discretion of the Engineer, additional tests may be required if the source material or gradation of the MSE reinforced backfill changes during construction.

SECTION 4: DESIGN NOTES FOR RETAINING WALL SYSTEM

4.01 **Design Parameters:**

- A. Design of the reinforced soil structure is based on the following parameters:

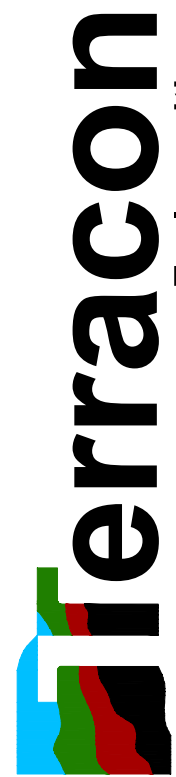
Wall Segment	Friction Angle	Cohesion	Unit Weight
Reinf. Backfill	34°	0 psf	125 pcf
Native Sand Soils – Foundation and Retained	32°	0 psf	120 pcf
Sand Fill Materials – Foundation and Retained	31°	0 psf	120 pcf

- B. Internal Stability of Walls
- Minimum Factor of Safety on Geogrid Strength 1.5
Minimum Factor of Safety on Geogrid Pullout 1.5
Minimum Factor of Safety on Connections (Peak Load Criterion) 1.5
Internal Compound Stability 1.3
Percent Coverage of Geogrid 100%
- C. External Stability
- Minimum Factor of Safety Against Base Sliding 1.5
Minimum Factor of Safety Against Overturning 2.0
Minimum Factor of Safety for Bearing Capacity 2.0
Minimum Factor of Safety (Global Stability) 1.5
Uniform Surcharge (Traffic) 250 psf
Uniform Surcharge (Pedestrian) 100 psf
- D. Hydrostatic Loading None
- E. Factor of Safety Seismic Conditions 0.75xStatic FS
- F. Seismic Acceleration Coefficient (A) 0.118g
Horizontal Seismic Coefficient (Kh) for Internal and External Stability 0.157
Horizontal Seismic Coefficient (Kh) for Global Stability 0.059

TECHNICAL SCOPE OF WORK - MSE WALLS

NORTHGATE SUBARU
208 GLENEAGLE GATE VIEW

COLORADO SPRINGS COLORADO



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RW-3

DESIGNED BY:	MWF
DRAWN BY:	MWF
APPVD. BY:	DRC
SCALE:	AS SHOWN
DATE:	2/28/25
JOB NO.	23245149
SHEET NO.:	3 OF 21

5.01 Description:

5.02 Work Included:

- ### 5.03 Reference Documents:

- 5.04 Special Provisions:**

- A. The designs presented herein are based on wall profiles, soil parameters, foundation conditions and loadings stated in documentation as outlined in Section 5.03, Items F through H, and Section 8.01.
- B. The Contractor shall be responsible for the cost of all means of subsoil improvement, cost of additional subsoil exploration; and for all labor tools, equipment and incidentals necessary to complete the work.
- C. The Contractor shall be responsible for complying with all federal, state and local requirements for execution of the work, including local building inspection and current OSHA excavation regulations.
- D. Prior to undertaking any grading or excavation of the site, the Contractor shall confirm the location of proposed soldier pile and lagging wall and all underground features, including utility locations within the area of construction.
- E. All work undertaken in the construction of the soldier pile retaining wall is subject to the quality control/assurance and special inspection provisions outlined in Section 7.09.
- F. Where there is potential for soldier pile wall/utility conflicts, Terracon should be afforded the opportunity to review the utility plans for review and modification of these plans as necessary.
- G. Terracon has completed engineering design of the proposed retaining wall, including internal stability and local external stability where applicable, based upon the information provided to us as outlined above. Any changes in planned grading, locations of structures or changes in wall profiles should be brought to the attention of Terracon for modification of the wall designs as necessary.
- H. The Contractor should verify all dimensions and grades prior to wall construction.

6.01 Definitions:

- ### 6.02 Drilled Shafts:

- ### 6.03 Portland Cement Concrete for Drilled Shafts:

- #### 6.04 Steel Pile:

- 6.05 Face Drain:**

- A. Drainage Geotextile for drain strip shall consist of AASHTO M288 Class 2 material meeting the following minimum Filtration/Hydraulic properties:
1. Permittivity ≥ 0.2 per second
 2. AOS $\geq \text{No. } 60 \text{ (25 mm)}$
- B. Face drain shall consist of prefabricated vertical geocomposite drainage strip such as Miradrain 6000, Amerdrain 500, Contech C-Drain 11K or approved equal.

- 6.06** Wall Facing:

- A. Shotcrete Facing
1. Aggregate for shotcrete shall meet the strength and durability requirements of AASHTO M6/M80 and the following gradation requirements:
- | <u>Sieve Size</u> | <u>Percent Passing</u> |
|-------------------|------------------------|
| 1/2 inch..... | 100 |
| 3/8 inch..... | 90-100 |
| No. 4..... | 70 – 85 |
| No. 8..... | 50 – 70 |
| No. 16..... | 35 – 55 |
| No. 30..... | 20 – 35 |
| No. 50..... | 8 – 20 |
| No. 100..... | 2 – 10 |
2. Cementitious materials used in shotcrete mixture shall consist of Type I, II, III or V Portland cement in accordance with ASTM C150.
3. Water shall be clean and potable in accordance with ASTM C94.
4. Chemical Admixtures
- a) Accelerators shall be fluid type meeting requirements of ASTM C1141.
- b) Air-Entraining Agents shall conform to ASTM C260.
- c) Water-reducer and Superplasticizer shall be Type A, C, D, E, F, or G and Retarders shall be Type B or D in accordance with ASTM C494.
5. Mineral Admixtures
- a) Fly Ash shall be cement Type F or C and meeting requirements of ASTM C618.

- B. Cast-In-Place Concrete Facing (Permanent Facing – If used in lieu of shotcrete)

2. Concrete shall attain a 28-day compressive strength of 4,000 psi. Concrete shall be sampled every 50 cubic yards or once per day if less than 50 cubic yards is placed.
3. Concrete slump shall be 5 to 7 inches.
4. Concrete mix design shall be prepared by an independent laboratory and reviewed and shall be approved by Terracon.
5. Cement shall conform to ASTM C-150 type I or II. Class C fly ash is acceptable.
6. Concrete aggregates shall conform to ASTM C-33 for normal weight concrete. Maximum aggregate size of 1-inch.
7. Maximum water/cement ratio of 0.45.
8. Reinforcing steel shall conform to ASTM A-615 Grade 60, except for reinforcing steel to be welded shall conform to ASTM A-706. All preheating and welding of reinforcing bars shall be done in accordance with AWS D1.4 latest edition and shall be continuously inspected by a qualified laboratory. Contractor shall furnish to the laboratory, rebar mill certificate.
9. Concrete forms shall be sufficiently tight to prevent leakage of concrete and shall be properly braced or tied together so as to maintain the desired position. Remove all debris from forms before casting any concrete. Reinforcing to be embedded in concrete shall be securely positioned before placing concrete.
10. The permanent facing shall have an architectural finish as required by the Owner.

- ### 6.07 Nelson Studs:

- A. The Nelson studs shall be standard mild steel studs in accordance with AWS D1.1.
- B. The Nelson studs shall be of the length, thickness, and spacing as shown on the construction drawings.
- C. The Nelson studs shall be new, straight, and undamaged.

- #### 6.08 Delivery, Storage and Handling:

- A. Cement, Aggregate and Liquid Admixtures
1. Contractor shall check to ensure that the proper materials have been received upon delivery.
 2. Contractor shall store cement to prevent moisture degradation and partial hydration. Cement that is caked or lumpy shall not be used.
 3. Cement shall be stored according to manufacturer's recommendations.
 4. Contractor shall store aggregates to prevent segregation and contamination from foreign materials. Contractor shall not use bottom 6 inches of aggregate pile when in contact with ground surface.
 5. Contractor shall store liquid admixtures to prevent evaporation and freezing.
- B. Steel Reinforcement
1. Contractor shall check the reinforcement upon delivery to ensure that proper materials have been received.
 2. Steel reinforcement shall be stored on supports to prevent steel from coming in contact with the ground. Contractor shall protect steel from dirt, rust, and other deleterious substances prior to installation.

- ## SECTION 7: EXECUTION

- 7.01 Construction:**
- A. The excavation shall be carried to the lines and grades shown on the construction drawings and to the extent necessary to place steel piles at the required elevations and embedment lengths. Contractor shall be careful not to disturb base or existing soils/fills beyond the lines shown except for that necessary to comply with applicable safety regulations.
- B. Excavations will be made in a manner that will not disturb the existing construction on the site. Contractor will provide protection or will construct the walls in such a manner to maintain the integrity of existing improvements. Excavations shall not exceed 5-foot vertical lifts. Where necessary for stability of the excavation face, the Contractor shall place a sealing layer (flashcoat) of unreinforced shotcrete or steel fiber reinforced shotcrete.
- C. In-situ materials excavated from the location of the cantilever walls shall be stockpiled on-site at locations designated by the Owner and in locations which will not interfere with the execution of the work.

- ## 7.02 Soldier Pile Wall Structure Excavation:

- A. The exposed unsupported final excavation face cut shall be made as required, or as directed by the Engineer.
- B. Complete excavation to final wall excavation line and application of shotcrete shall be completed during the same work shift unless otherwise approved by the Engineer. Shotcrete application can be delayed up to 24 hours if Contractor can show that the delay will not adversely affect the excavation face stability. Shotcrete shall have cured for at least 72 hours or attained at least the specified 3-day compressive strength before excavating the next underlying lift.
- C. Where the excavation and installation methods result in a discontinuous wall, the ends of the constructed wall section shall extend beyond the ends of the next lower excavation lift by at least 10 feet (3 meters). Slopes at the discontinuities and at the ends of phased wall sections shall be constructed to prevent sloughing or failure of the temporary slopes.
- D. All boulders, cobbles, rubble, or other subsurface obstructions encountered at the wall final excavation face that will protrude into the shotcrete facing shall be removed. The Contractor shall notify the Engineer 24 hours prior to removal of any face protrusions. Voids and/or over-excavation beyond the plan wall excavation line shall be backfilled with shotcrete or concrete, as approved by the Engineer.

- ### 7.03 Drilled Shaft/Steel Pile Installation:

- A. Drilled shaft excavations shall be performed by an appropriate drilling method. The auger holes shall be per the size as shown on the constructor drawings. The drill hole shall be clean of loose soil prior to installation of pile. Provide temporary steel casing as required to maintain clean shaft excavations.
- B. The Contractor shall ensure that the sidewalls of the drilled holes (i.e. shafts) do not collapse during drilling and prior to pile and concrete placement. Uncased shafts may be used where the sides and the bottom of the shaft are stable and may be visually inspected prior to placing the steel pile and concrete. Casing or drilling muds shall be used where the sides of the shaft require additional support. Loose material shall be removed from the bottom of the shaft. No more than 2 inches of standing water shall be left in the bottom of the shaft prior to beginning the steel pile and concrete installation.

- C. The steel pile shall be placed in the shaft without difficulty and aligned prior to general placement of concrete. The Contractor may place up to 2 feet of concrete at the bottom of the shaft to assist in aligning the pile. The pile shall be blocked or clamped in place at the ground surface, prior to placement of concrete. Piles shall be within 1 percent of plumb and the top of each pile shall be within 2 inches of the location shown on the construction drawings. Pile section shall be oriented as shown on the construction drawings.

- D. After loose material is removed and the pile is adequately braced, embed the pile with concrete as shown on the Drawings. Vibrate the concrete to ensure displacement of voids. Place drilled shaft concrete using procedures that minimize contact with the steel piling and to prevent segregation of the concrete.

- E. Splicing of steel piles shall not be permitted, unless approved in writing by the Engineer. All structural welding of steel shall be performed by certified welders qualified to perform the type of welding. All steel piles shall be cut off to a true plane at the elevations shown on the Contract Drawings. All cutoff lengths shall remain the property of the Contractor and shall be properly disposed of off of the site.

- F. For shafts constructed without casing or drilling muds, concrete may be placed by free-falling the concrete from the ground surface down the shaft and around the steel pile. If casing is used, the placement of concrete shall begin prior to casing removal. Remove the casing while the concrete remains workable. For shafts constructed using slurry, concrete shall be placed using the tremie method from the bottom of the shaft. The tremie pipe shall be withdrawn slowly as the level of the concrete rises in the shaft.

- #### 7.04 Wall Drainage Construction:

- A. Upon completion of excavation and prior to placement of shotcrete, a wall drainage network shall be constructed as shown on the Plans, specified herein, or as required by the Engineer to suit the site conditions. The drainage network shall consist of installing geocomposite drain strips and PVC connection pipes as shown on the Plans or as directed by the Engineer.
- B. Geocomposite drain strips shall be centered between the columns of nails as shown on the Plans. The drain strips shall be at least 12-inches wide and placed with the geotextile side against the ground. Secure the strips to the excavation face and prevent shotcrete from contaminating the ground side of the geotextile. Drain strips will be continuous and splices shall be made with a 12-inch minimum overlap such that the flow of water is not impeded.
- C. Connection pipes shall be as shown on the Plans. Connection pipes shall be solid PVC pipe installed to direct water from the geocomposite drain strips to the exposed face of the wall. Connect the connection pipes to the drain strips using prefabricated drain grates as shown on the Plans.
- D. Drain grates shall be installed per the manufacturer's recommendations. The joint between the drain grate and the drain strip and the discharge end of the connector pipe shall be sealed to prevent shotcrete intrusion.
- E. Weepholes shall be provided through the shotcrete facing to drain water from behind the facing. Install as shown on the Plans. Use PVC pipe to form the weephole through the shotcrete. All weep holes should be extended through the permanent facing. Cover the end of the pipe contacting the soil with a drainage geotextile. Prevent shotcrete intrusion into the discharge end of the pipe.

- 7.05 Temporary / Permanent Shotcrete Facing:**

- A. The Contractor shall ensure that the thickness of shotcrete satisfies the minimum requirements shown on the Plans using shooting wires, thickness control pins, or other devices acceptable to the Engineer. The thickness control devices shall be installed normal to the surface such that they protrude the required shotcrete thickness outside the surface and maintain a plane surface. The Contractor shall ensure that the alignment wires are tight, true to line, and placed to allow further tightening.
- B. The face of the excavation and other surfaces to be shotcreted shall be clean and free of loose materials, mud, rebound, overspray or other foreign matter that could prevent or reduce shotcrete bond. Adjacent surfaces shall be protected from overspray during shooting. Loosening, cracking, or shattering the ground during excavation and cleaning shall be avoided. Any surface material that is so loosened or damaged, shall be removed to a sufficient depth to provide a base that is suitable to receive the shotcrete. Any material that loosens as the shotcrete is applied shall be removed. Water flow and standing water shall be diverted or removed prior to shotcrete facing. Shotcrete shall not be placed on frozen surfaces.
- C. A clean, dry, oil-free supply of compressed air sufficient for maintaining adequate nozzle velocity and for simultaneous operation of a blow pipe for cleaning away rebound shall be maintained at all times. The shotcrete equipment shall be capable of delivering the premixed material accurately, uniformly, and continuously through the delivery hose. Application thickness, nozzle technique, air pressure, and rate of shotcrete placement to prevent sagging or sloughing of freshly-applied shotcrete shall be controlled at all times.
- D. Shotcrete shall be applied from the lower part of the area upwards to prevent accumulation of rebound. The nozzle shall be oriented at a distance and approximately perpendicular to the working face so that rebound will be minimal and compaction will be maximized. The front face of the reinforcement shall remain clean during shooting operations, so that shotcrete builds up from behind, to encase the reinforcement and prevent voids and sand pockets from forming. A blowpipe shall be used to remove rebound and overspray immediately ahead of the nozzle. Rebound shall not be worked back into the construction. Rebound that does not fall clear of the working area shall be removed. Hardened rebound and hardened overspray shall be removed prior to application of additional shotcrete, using abrasive blast cleaning, chipping hammers, high pressure water blasting or other suitable techniques.
- E. A clearly defined pattern of continuous horizontal or vertical ridges or depressions at the reinforcing elements after they are covered with shotcrete will be considered an indication of insufficient reinforcement cover or poor nozzle techniques and the application of shotcrete shall be immediately suspended and the Contractor shall implement corrective measures before resuming the shotcrete operations.
- F. When using multiple layer shotcrete construction, the surface of the receiving layer shall be prepared before application of a subsequent layer by either:

1. Brooming the stiffening layer with a stiff bristle broom to remove all loose material, rebound, overspray or glaze, prior to the shotcrete attaining initial set;
 2. If the shotcrete has set, surface preparation shall be delayed for at least 24 hours, at which time the surface shall be prepared by sandblasting or high pressure water blasting, to remove all loose material, rebound, hardened overspray, glaze, or other material that may prevent adequate bond.
- G. The Engineer shall have the authority to accept or reject the shotcrete work. Shotcrete that does not conform to the project specifications may be rejected either during the shotcrete application process, or completed work. Shotcrete surface defects shall be repaired as soon as possible after placement. Remove and replace shotcrete that exhibits segregation, honeycombing, lamination, voids, or sand pockets. In-place shotcrete determined not to meet the specified strength requirement will be subject to placement of additional shotcrete thickness, or removal and replacement as determined by the Engineer.
- H. Construction joints shall be tapered uniformly toward the excavation face over a minimum distance equal to the thickness of the shotcrete layer. Square joints are not permitted. The surface of the joints shall be rough, clean, and sound. A minimum reinforcement overlap shall be provided at reinforcement splice joints as shown on the Plans. Clean and wet the surface of a joint before adjacent shotcrete is applied.

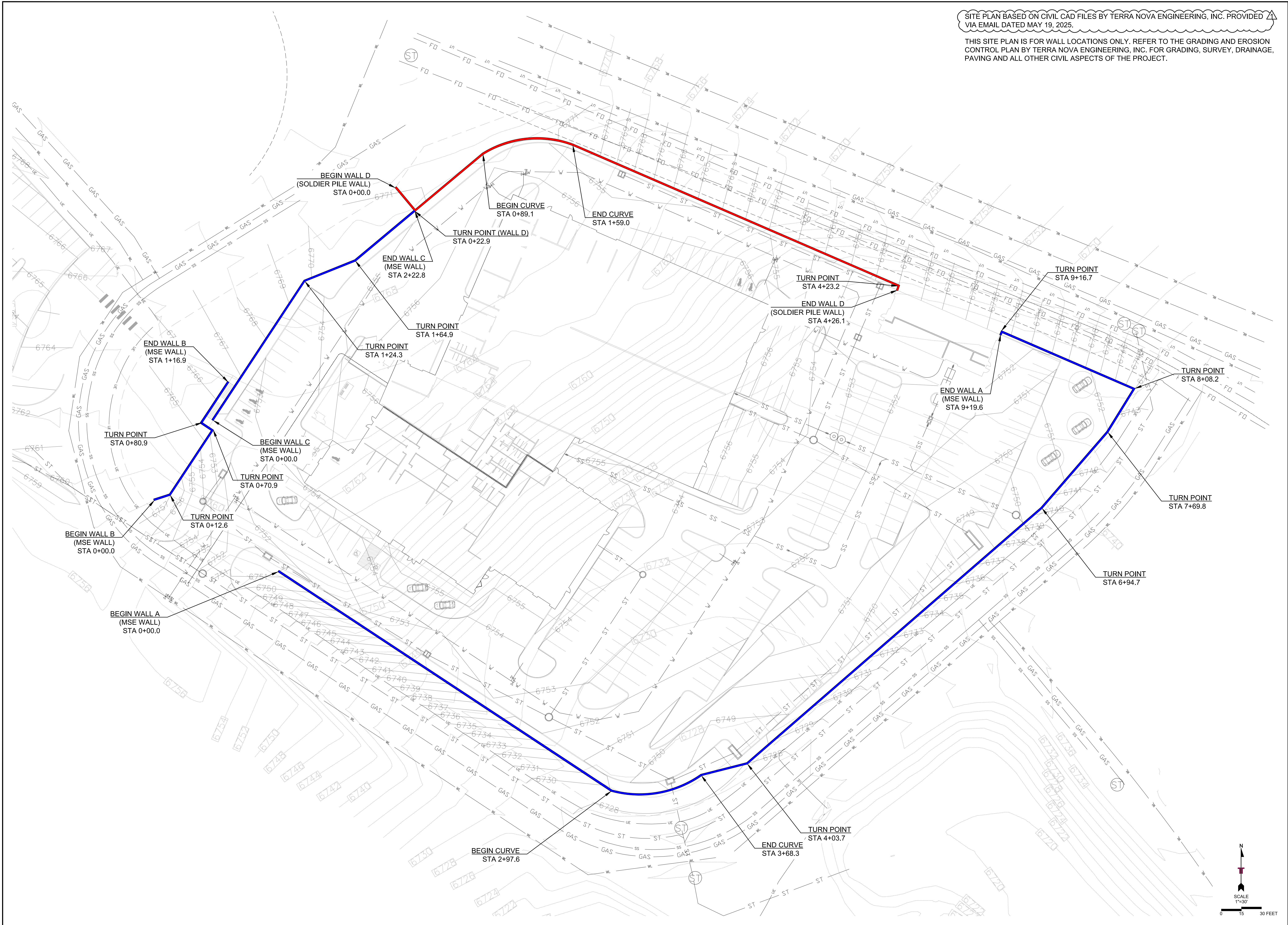
RW-4	
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APPVD. BY:	DRC
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DATE:	2/28/25
JOB NO.	23245149
SHEET NO.:	4 OF 21

- B. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

- The Contractor shall provide equipment for drilling and alignment of each shaft excavation. The dimensions and alignment shall be determined by the Contractor but shall be observed by the Special Inspector. The Special Inspector will check the alignment of the drilling equipment at the beginning of shaft construction and periodically thereafter. Final shaft depth shall be measured after final cleaning by the Contractor.

F.	Seismic Acceleration Coefficient (A).....	0.118g
	Horizontal Seismic Coefficient (Kh).....	0.059

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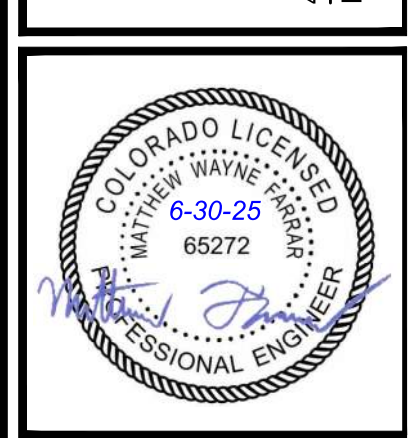
SITE PLAN BASED ON CIVIL CAD FILES BY TERRA NOVA ENGINEERING, INC. PROVIDED VIA EMAIL DATED MAY 19, 2025.

THIS SITE PLAN IS FOR WALL LOCATIONS ONLY. REFER TO THE GRADING AND EROSION CONTROL PLAN BY TERRA NOVA ENGINEERING, INC. FOR GRADING, SURVEY, DRAINAGE, PAVING AND ALL OTHER CIVIL ASPECTS OF THE PROJECT.

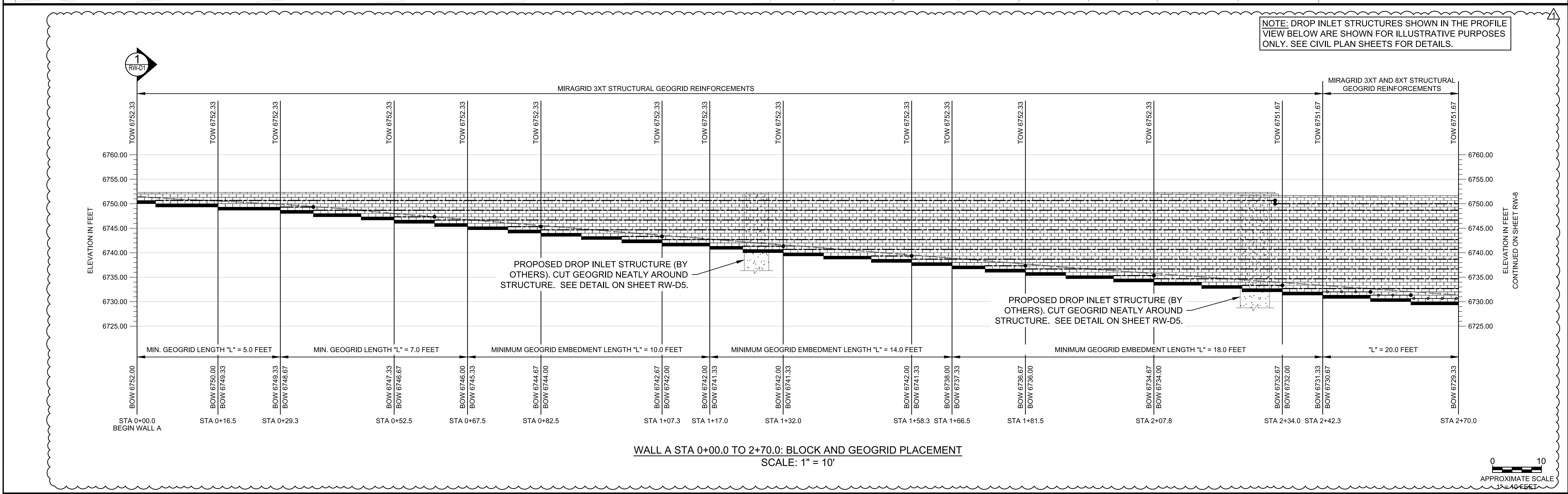
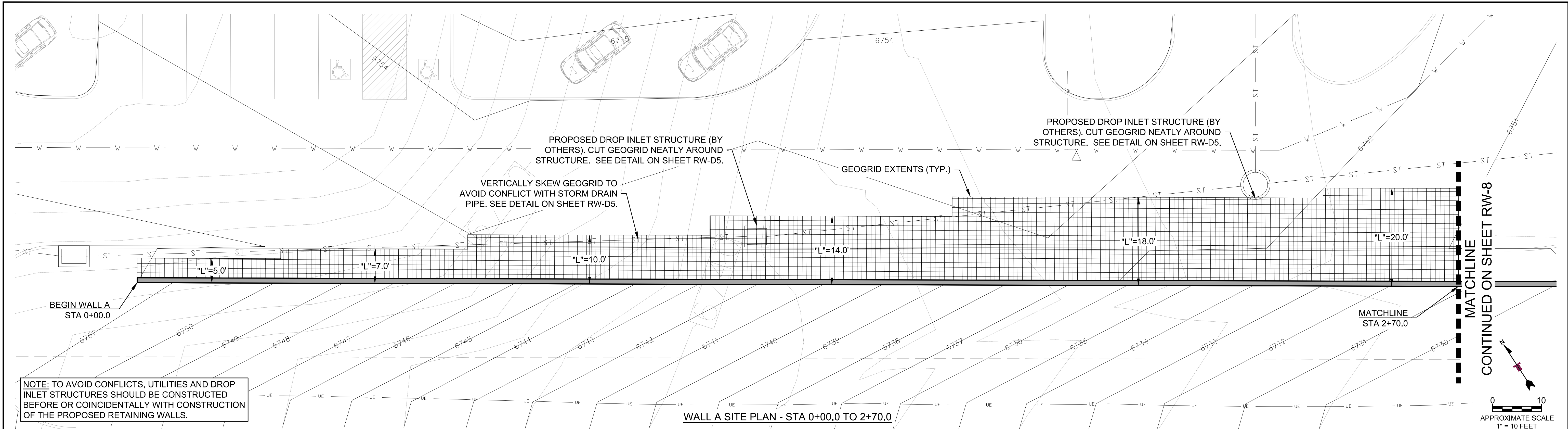
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1	6/30/25	MWF	UPDATED PER REVISED GRADING PLAN

RETAINING WALL SITE PLAN
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COLORADO SPRINGS
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DATE:	2/28/25
JOB NO.	23245149
SHEET NO.:	6 OF 21



LEGEND:

- KEYSTONE CAP UNITS
- KEYSTONE COMPAC III BLOCK UNITS
- 8-INCH LEVELING PAD
- MIRAGRID 3XT STRUCTURAL GEOGRID
- MIRAGRID 8XT STRUCTURAL GEOGRID
- FINISHED GRADE AT TOP OF WALL
- FINISHED GRADE AT BOTTOM OF WALL

STA STATION ALONG RETAINING WALL ALIGNMENT

"L" MINIMUM GEOGRID EMBEDMENT LENGTH

BOW ELEVATION AT BOTTOM OF BLOCK; TOP OF LEVELING PAD

TOW ELEVATION AT TOP OF CAP BLOCK

● INDICATES CHANGE IN GRID TYPE AND/OR CHANGE IN GRID ELEVATION

KEY PLAN

SCALE 1"=150'

0 75 150 FEET

REV. DATE BY DESCRIPTION

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WALL A - PLAN & PROFILE

NORTHGATE SUBARU

208 GLENEAGLE GATE VIEW

COLORADO SPRINGS

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COLORADO LICENSED PROFESSIONAL ENGINEER

6-30-25

65272

WILLIAM WAYNE HARRIS

RW-7

DESIGNED BY: MWF

DRAWN BY: MWF

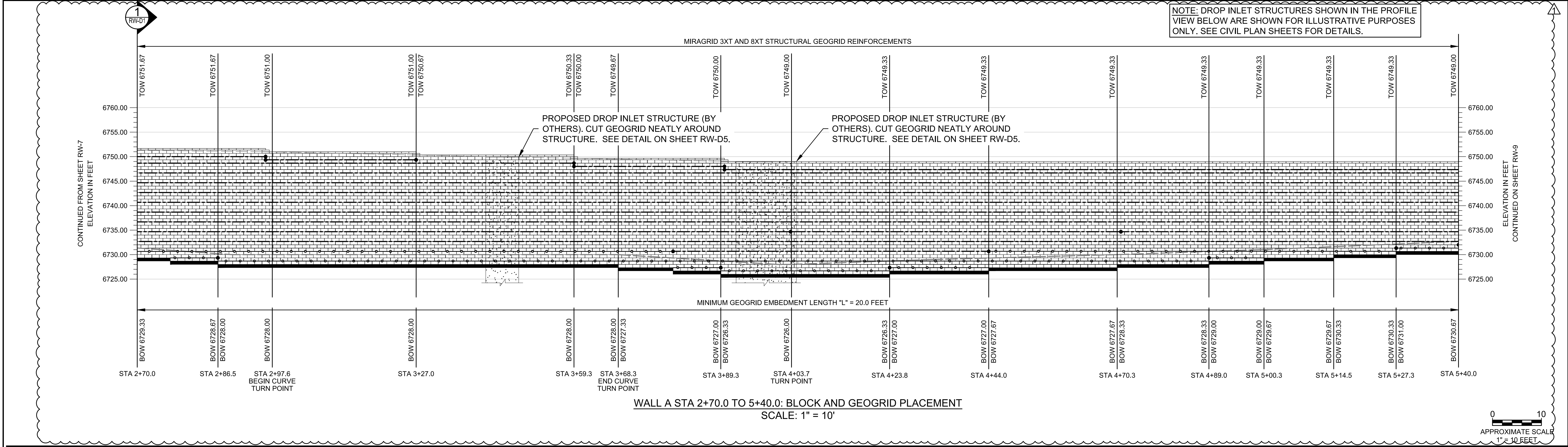
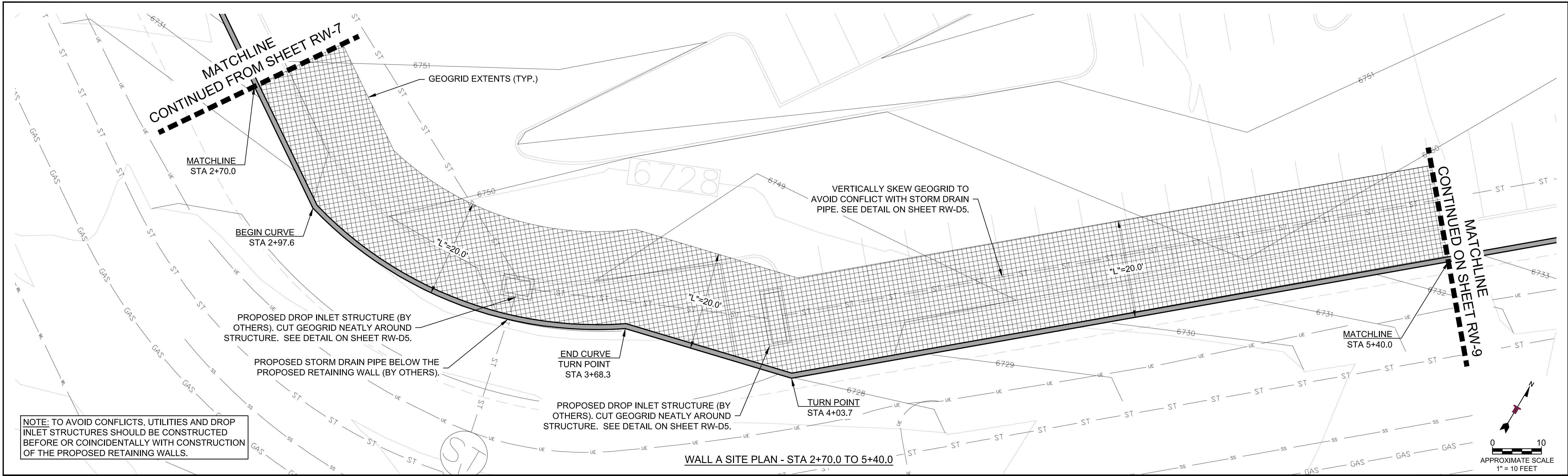
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SCALE: AS SHOWN

DATE: 2/28/25

JOB NO. 23245149

SHEET NO.: 7 OF 21



LEGEND:

- KEYSTONE CAP UNITS
- KEYSTONE COMPAC III BLOCK UNITS
- 8-INCH LEVELING PAD
- MIRAGRID 3XT STRUCTURAL GEOGRID
- MIRAGRID 8XT STRUCTURAL GEOGRID
- FINISHED GRADE AT TOP OF WALL
- FINISHED GRADE AT BOTTOM OF WALL

STA STATION ALONG RETAINING WALL ALIGNMENT

"L" MINIMUM GEOGRID EMBEDMENT LENGTH

BOW ELEVATION AT BOTTOM OF BLOCK; TOP OF LEVELING PAD

TOW ELEVATION AT TOP OF CAP BLOCK

● INDICATES CHANGE IN GRID TYPE AND/OR CHANGE IN GRID ELEVATION

KEY PLAN

REV. DATE BY DESCRIPTION

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WALL A - PLAN & PROFILE (CONTINUED)

NORTHGATE SUBARU

208 GLENEAGLE GATE VIEW

COLORADO SPRINGS

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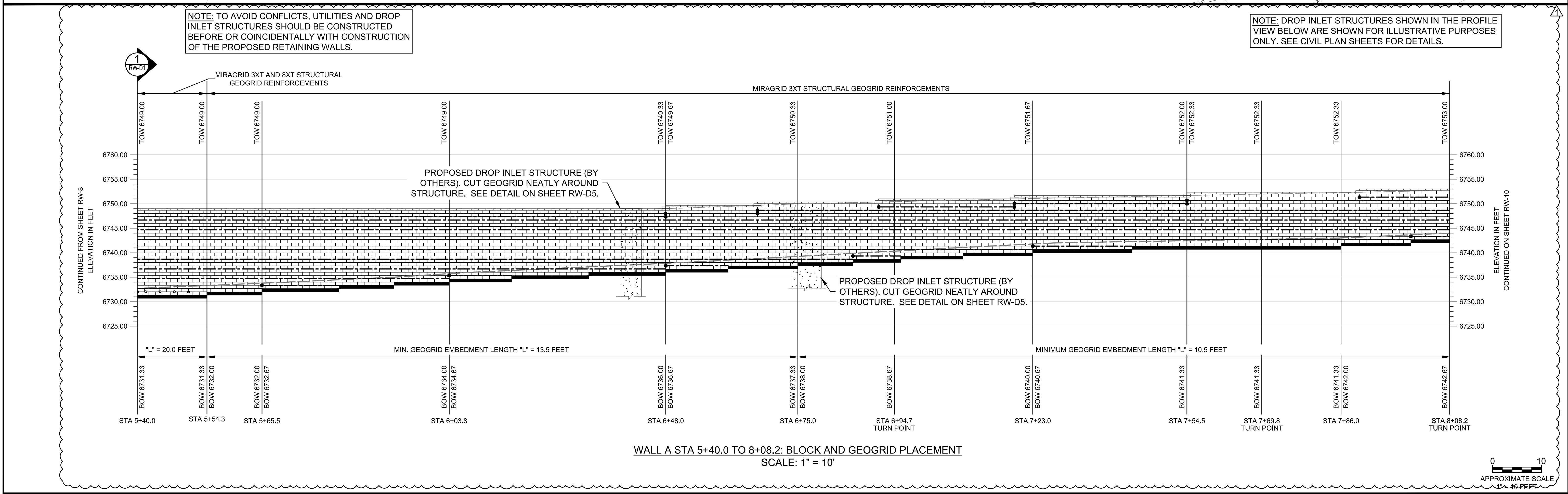
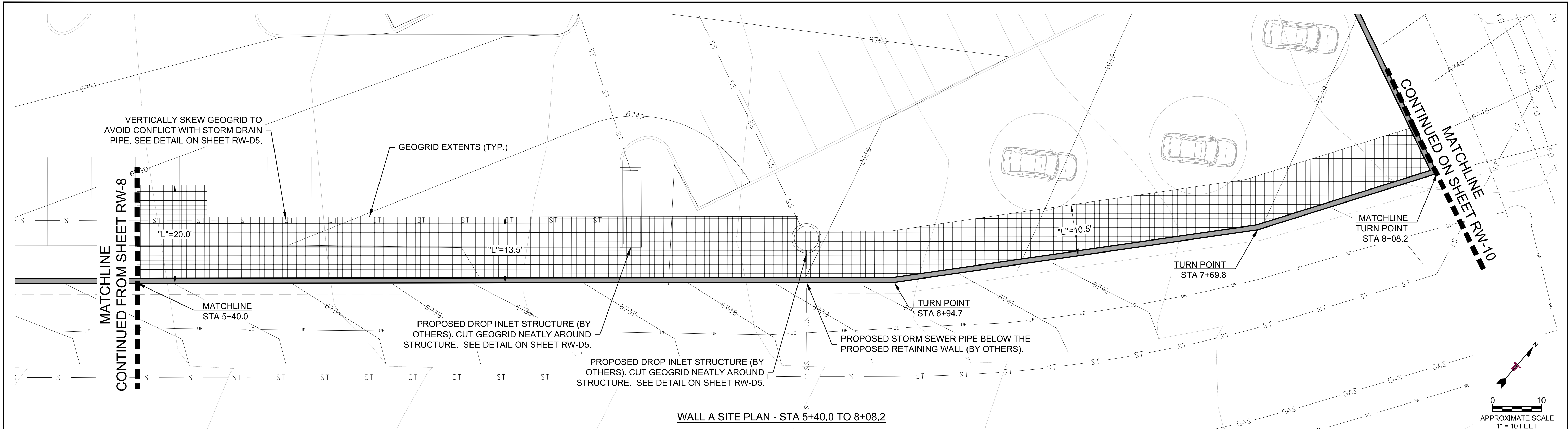
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RW-8

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DATE:	2/28/25
JOB NO.:	23245149
SHEET NO.:	8 OF 21



LEGEND:

- KEYSTONE CAP UNITS
- KEYSTONE COMPAC III BLOCK UNITS
- 8-INCH LEVELING PAD
- MIRAGRID 3XT STRUCTURAL GEOGRID
- MIRAGRID 8XT STRUCTURAL GEOGRID
- FINISHED GRADE AT TOP OF WALL
- FINISHED GRADE AT BOTTOM OF WALL

STA STATION ALONG RETAINING WALL ALIGNMENT

"L" MINIMUM GEOGRID EMBEDMENT LENGTH

BOW ELEVATION AT BOTTOM OF BLOCK; TOP OF LEVELING PAD

TOW ELEVATION AT TOP OF CAP BLOCK

● INDICATES CHANGE IN GRID TYPE AND/OR CHANGE IN GRID ELEVATION

KEY PLAN

WALL A - PLAN & PROFILE (CONTINUED)

NORTHGATE SUBARU

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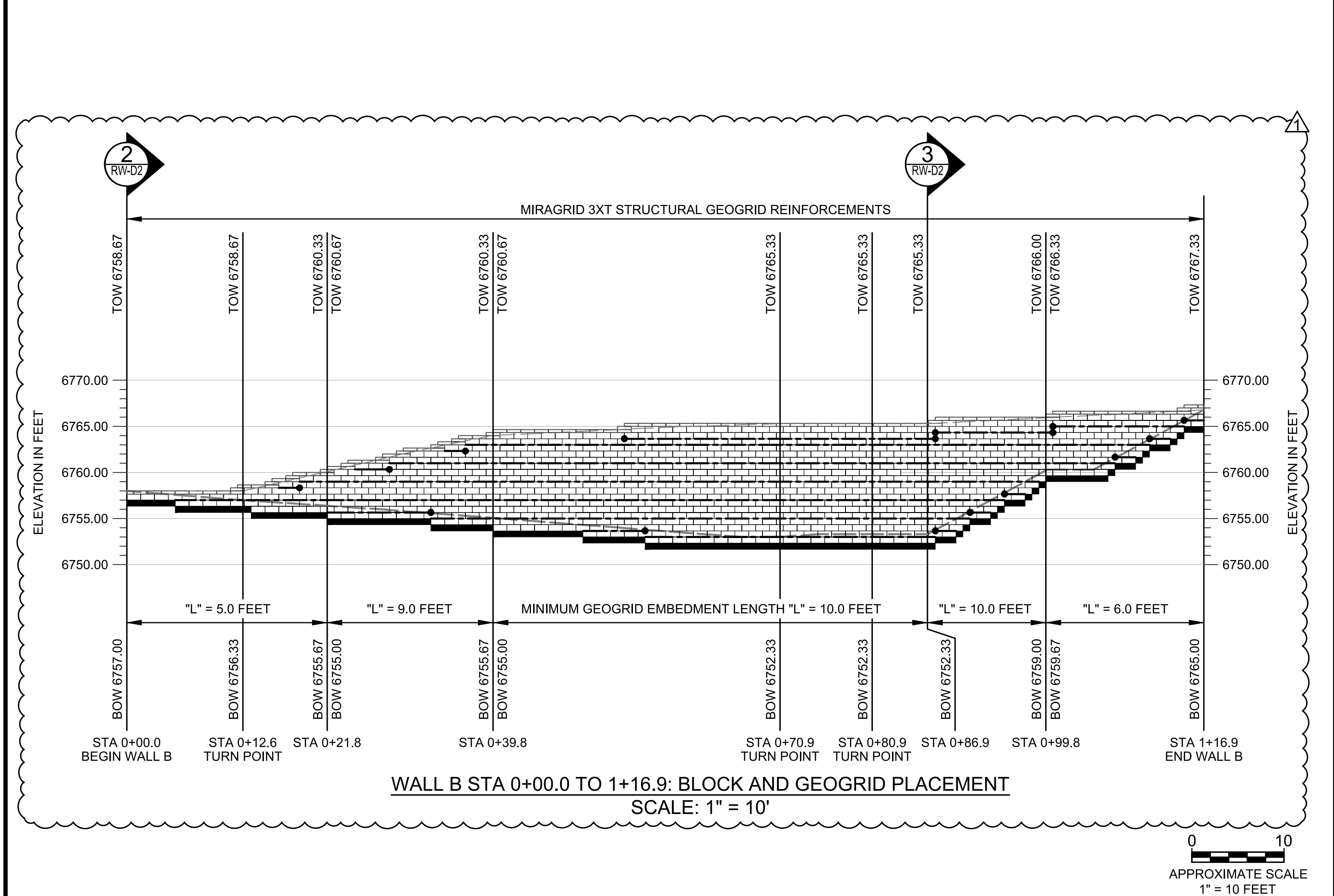
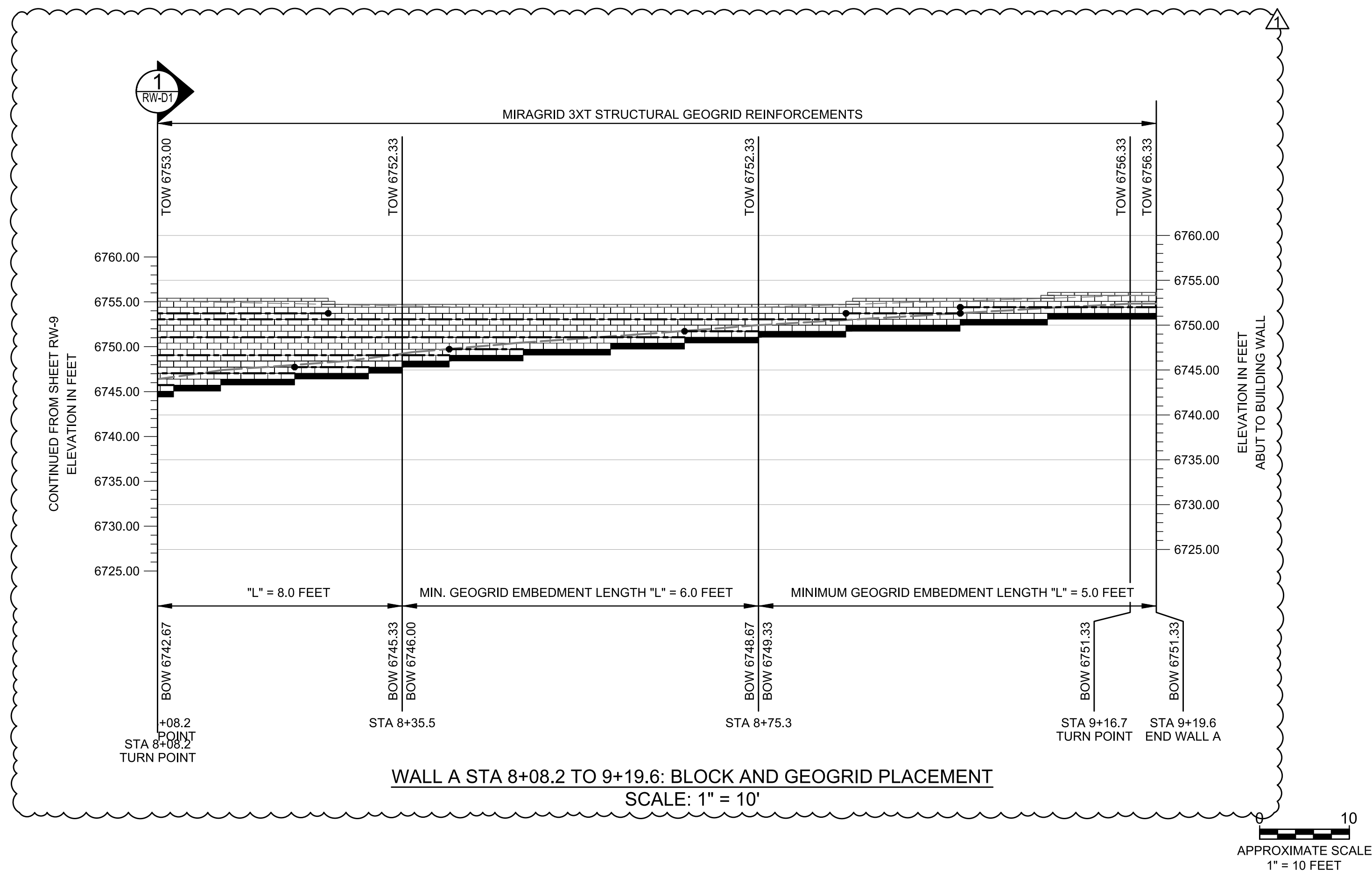
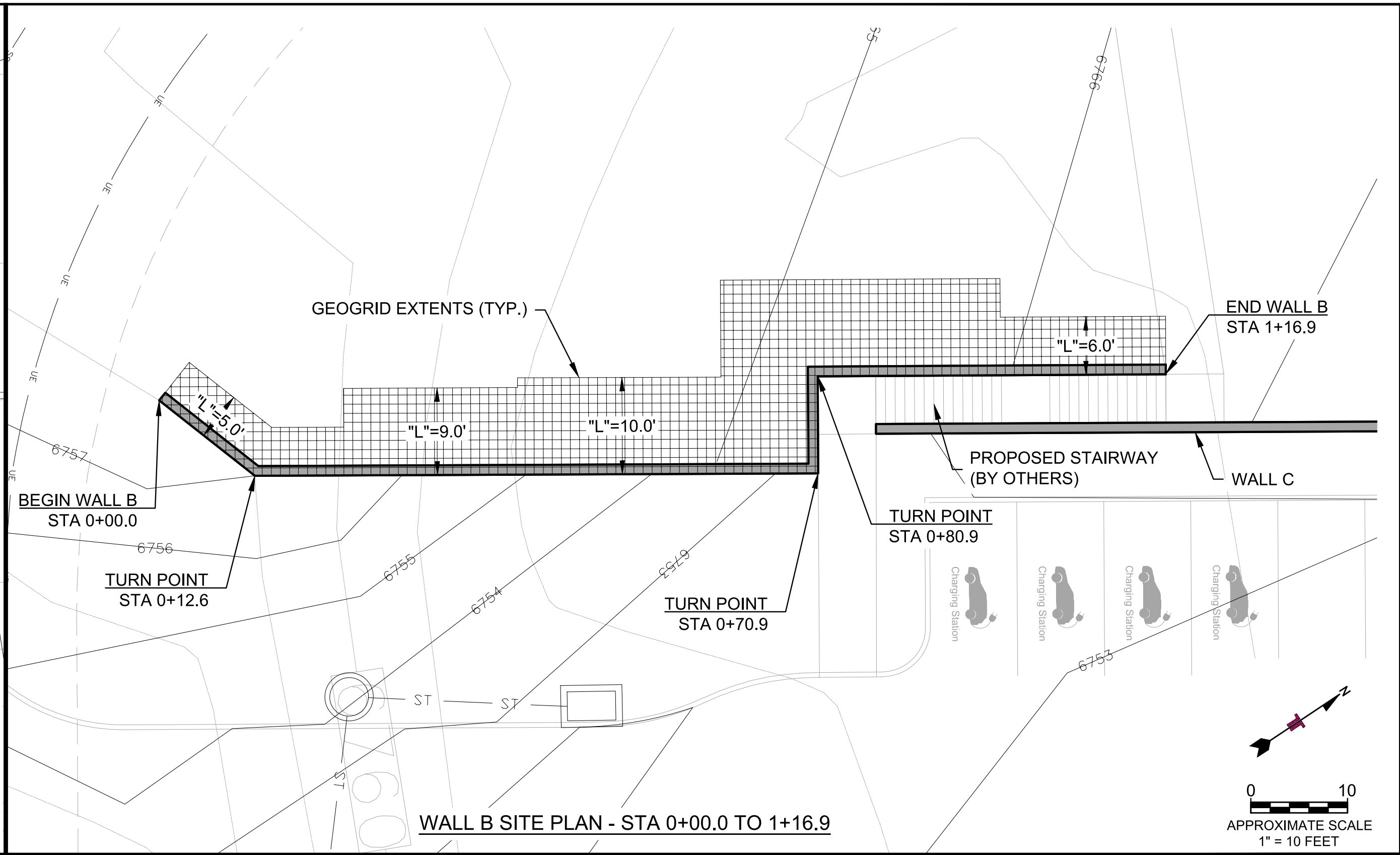
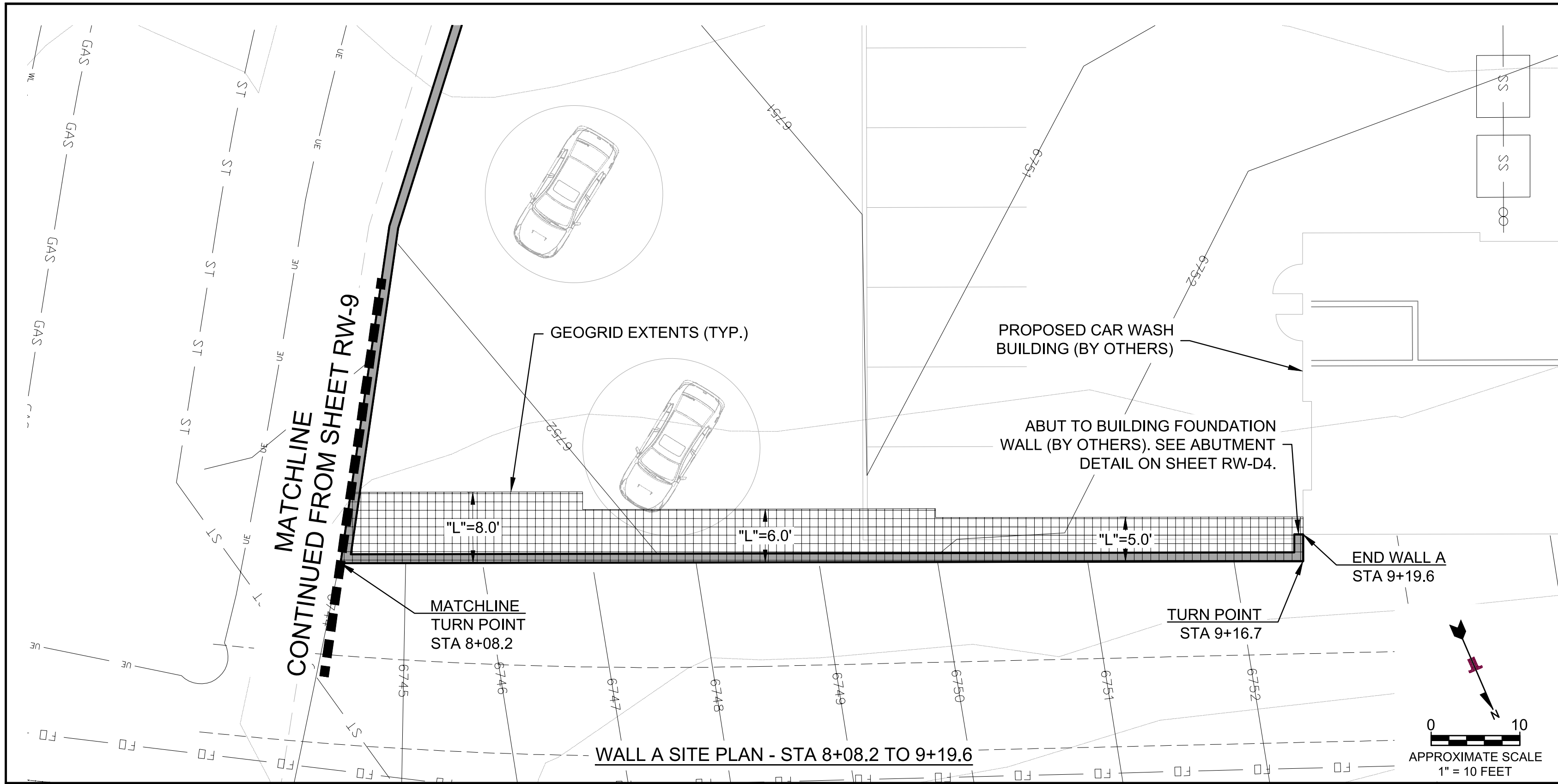
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RW-9

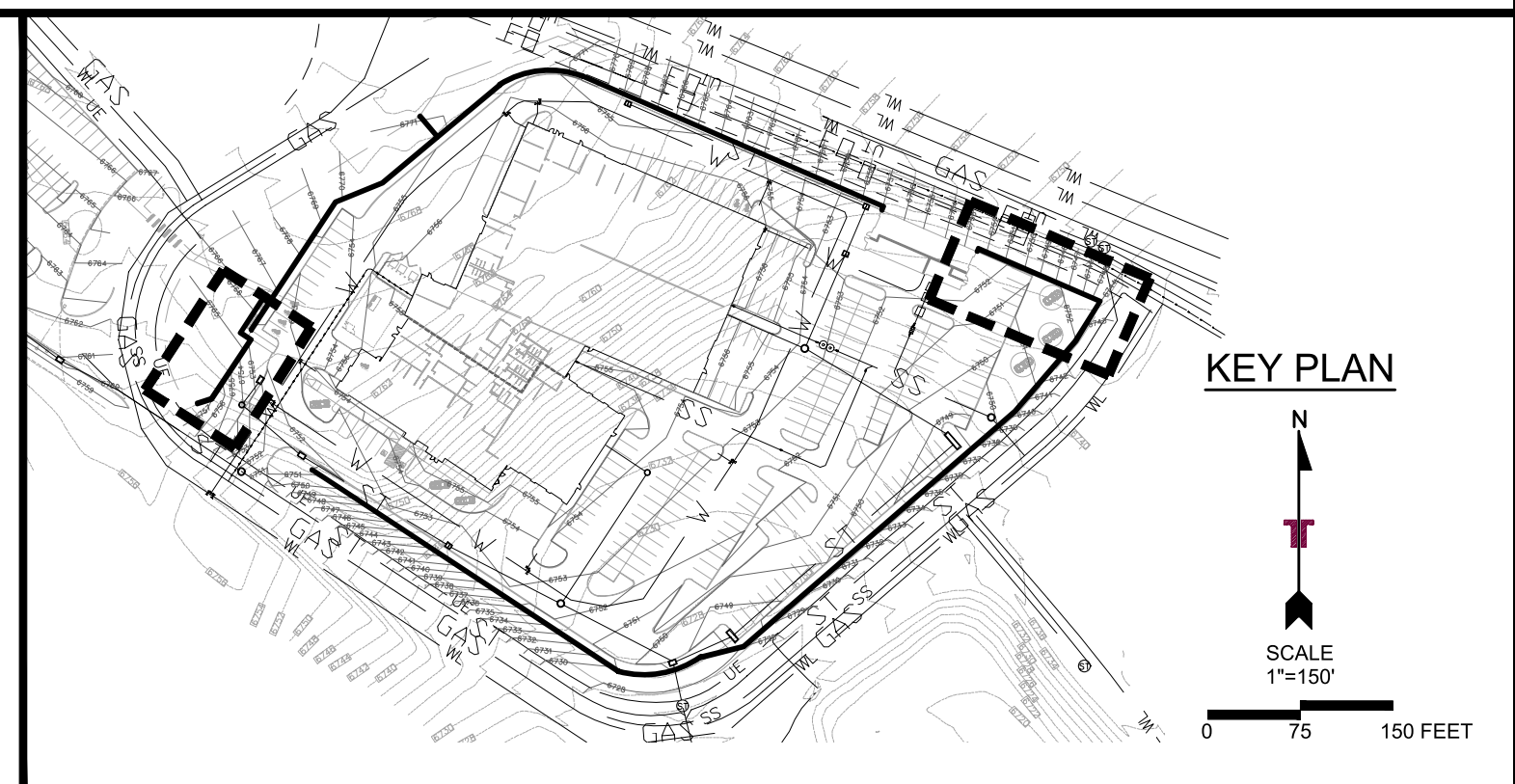
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JOB NO.:	23245149
SHEET NO.:	9 OF 21



LEGEND:

- KEystone CAP UNITS
- KEystone COMPAC III BLOCK UNITS
- 8-INCH LEVELING PAD
- MIRAGRID 3XT STRUCTURAL GEOGRID
- MIRAGRID 8XT STRUCTURAL GEOGRID
- FINISHED GRADE AT TOP OF WALL
- FINISHED GRADE AT BOTTOM OF WALL

- STA STATION ALONG RETAINING WALL ALIGNMENT
- "L" MINIMUM GEOGRID EMBEDMENT LENGTH
- BOW ELEVATION AT BOTTOM OF BLOCK; TOP OF LEVELING PAD
- TOW ELEVATION AT TOP OF CAP BLOCK
- INDICATES CHANGE IN GRID TYPE AND/OR CHANGE IN GRID ELEVATION



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WALLS A AND B - PLAN & PROFILE

NORTHGATE SUBARU

208 GLENEAGLE GATE VIEW

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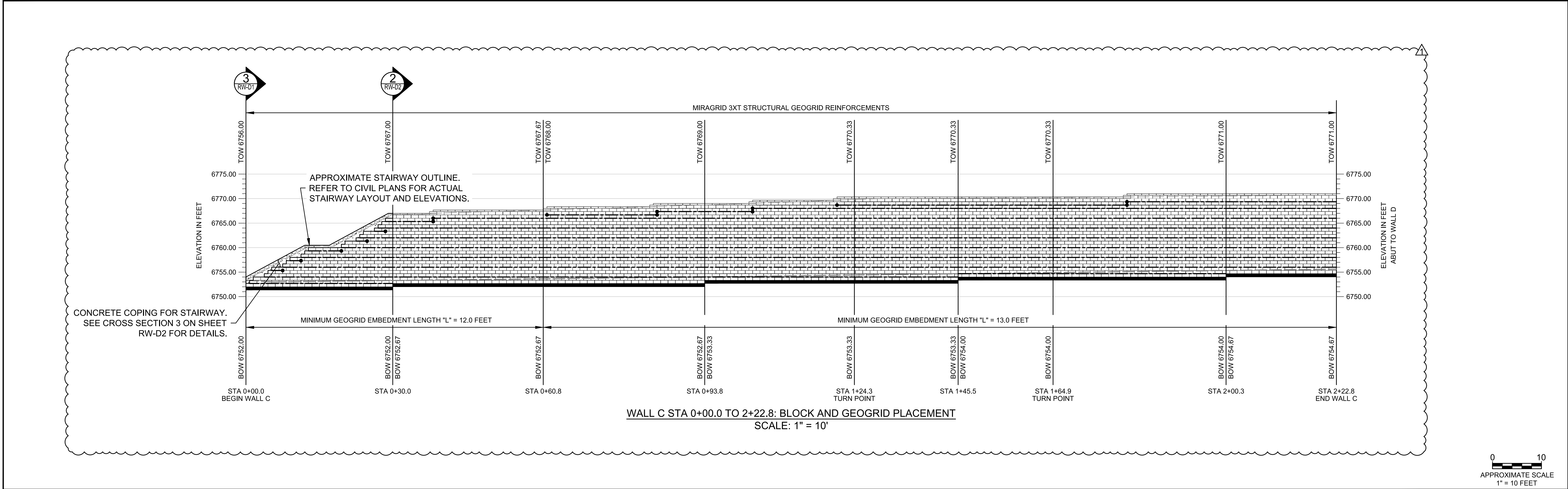
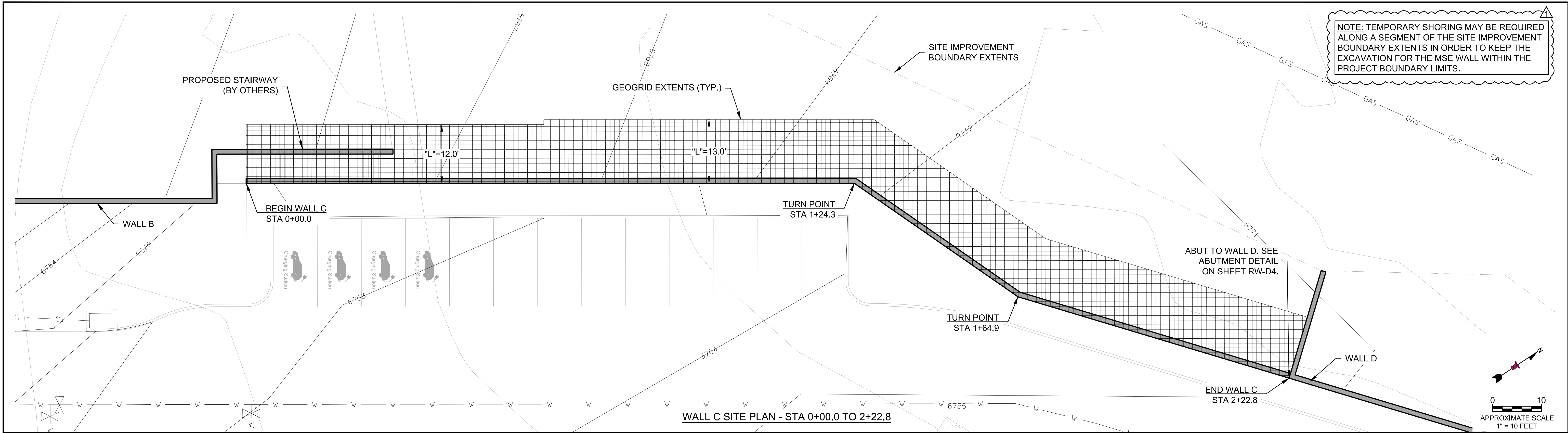
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RW-10

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JOB NO.: 23245149
SHEET NO.: 10 OF 21



LEGEND:

- KEYSTONE CAP UNITS
- KEYSTONE COMPAC III BLOCK UNITS
- 8-INCH LEVELING PAD
- MIRAGRID 3XT STRUCTURAL GEOGRID
- MIRAGRID 8XT STRUCTURAL GEOGRID
- FINISHED GRADE AT TOP OF WALL
- FINISHED GRADE AT BOTTOM OF WALL

STA STATION ALONG RETAINING WALL ALIGNMENT

"L" MINIMUM GEOGRID EMBEDMENT LENGTH

BOW ELEVATION AT BOTTOM OF BLOCK; TOP OF LEVELING PAD

TOW ELEVATION AT TOP OF CAP BLOCK

● INDICATES CHANGE IN GRID TYPE AND/OR CHANGE IN GRID ELEVATION

KEY PLAN

SCALE
1"=150'

0 75 150 FEET

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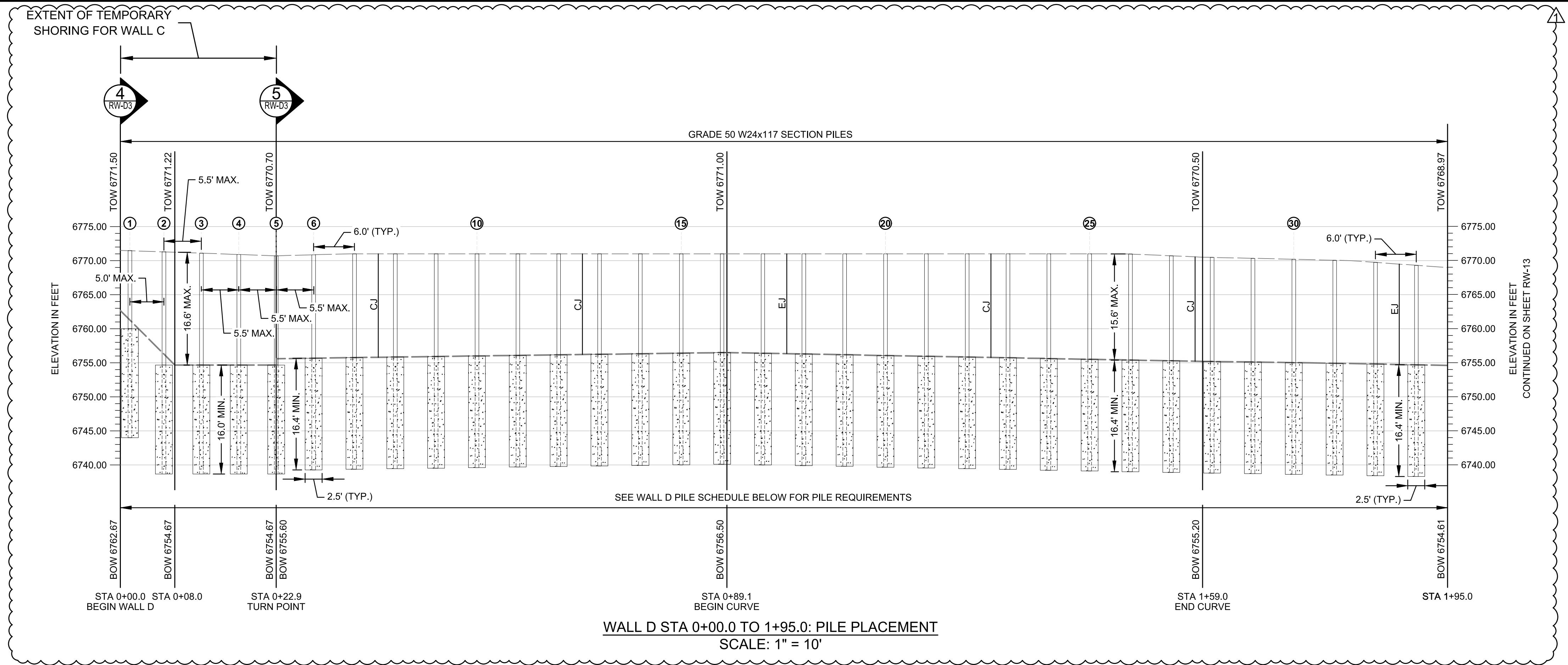
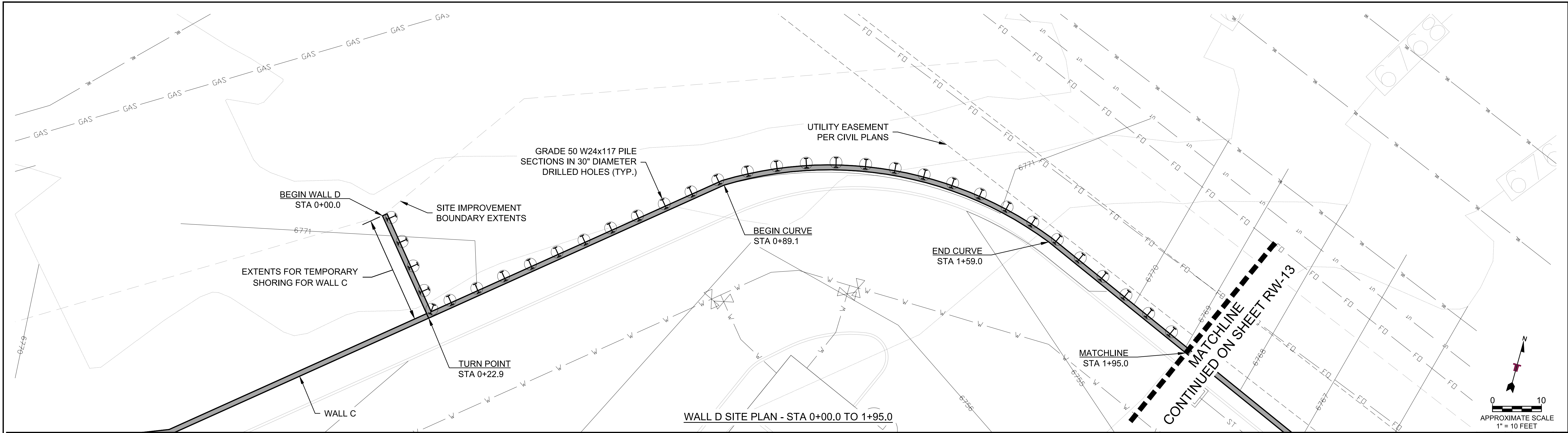
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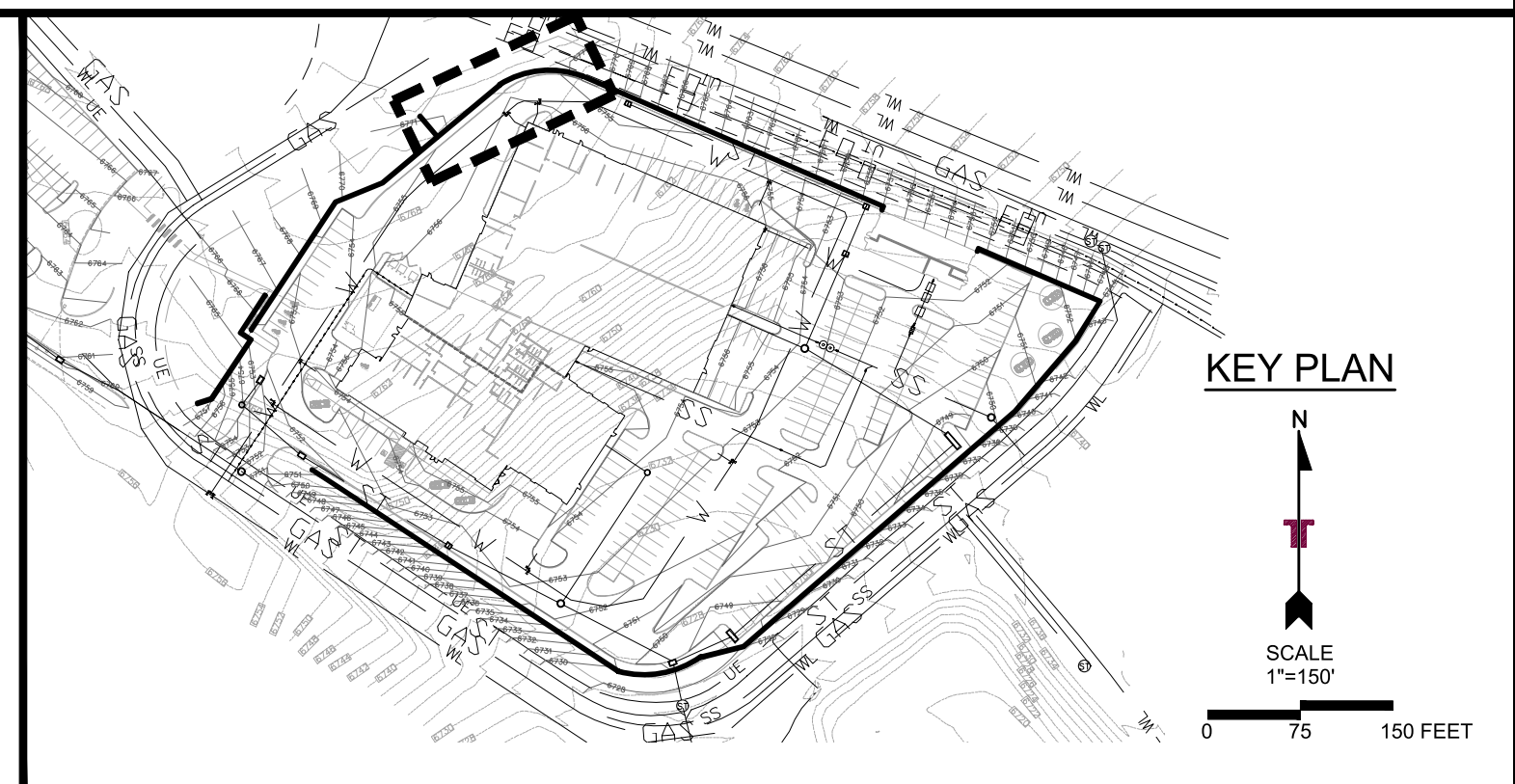


LEGEND:

- SOLDIER PILE LOCATION; GALVANIZED GRADE 50 W SECTION
- PILE NUMBER
- FINISHED GRADE AT TOP OF WALL
- FINISHED GRADE AT BOTTOM OF WALL

- STA STATION ALONG RETAINING WALL ALIGNMENT
- TOW ELEVATION AT TOP OF SOLDIER PILE WALL
- BOW ELEVATION AT BOTTOM OF SOLDIER PILE WALL
- CJ CONSTRUCTION JOINT
- EJ EXPANSION JOINT

WALL D: PILE SCHEDULE						
STATION	PILE NO.	MAX. EXPOSED WALL HEIGHT (FT)	MIN. PILE EMBEDMENT LENGTH (FT)	MAXIMUM HORIZONTAL SPACING (FT)	PILE SIZE	DRILLED SHAFT DIAMETER (IN)
0+00.0 TO 0+22.9	1 - 5	16.6	16.0	5.5	W24x117	30
0+22.9 TO 2+08.4	6 - 35	15.6	16.4	6.0	W24x117	30
2+08.4 TO 2+44.4	36 - 41	13.4	14.6	6.0	W24x117	30
2+44.4 TO 2+92.4	42 - 47	10.7	14.3	8.0	W18x76	24
2+92.4 TO 3+72.4	48 - 57	7.3	10.7	8.0	W18x76	24
3+72.4 TO 4+26.1	58 - 64	5.5	9.5	10.0	W18x76	24



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WALL D - PLAN & PROFILE

NORTHGATE SUBARU

208 GLENEAGLE GATE VIEW

COLORADO SPRINGS

COLORADO

Terracon

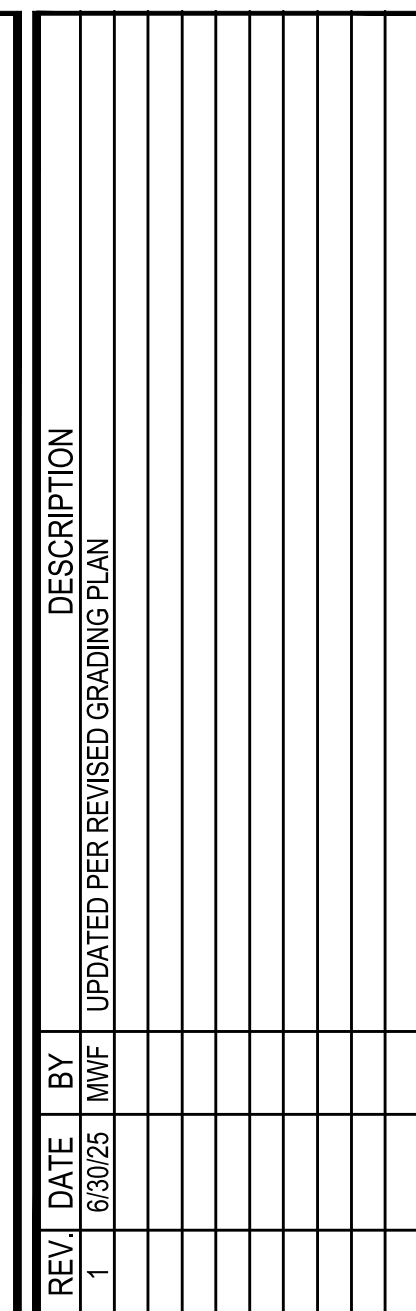
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SHEET NO.: 12 OF 21



COLORADO SPRINGS



KEY PLAN

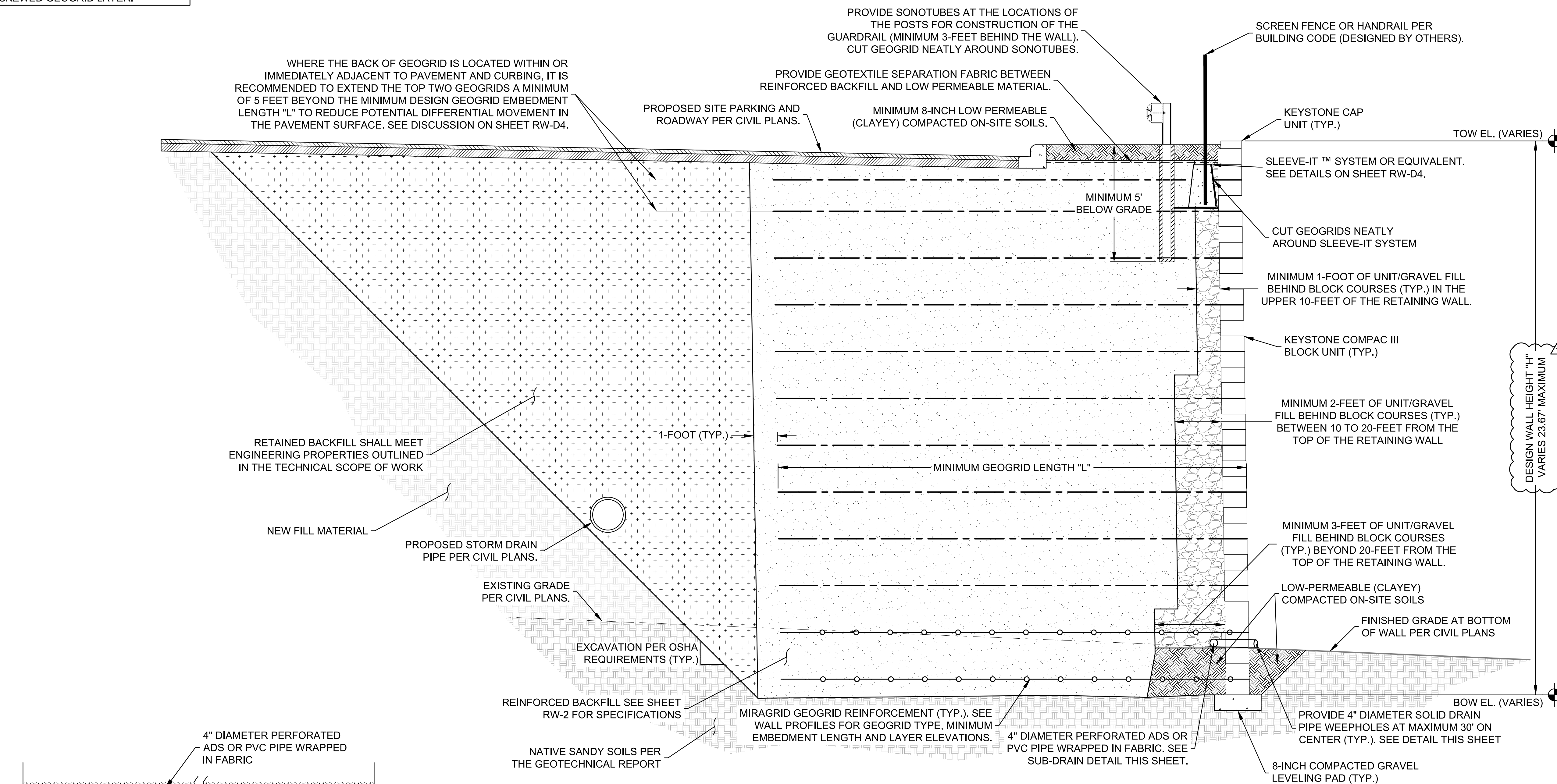
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SCALE
1"=150'

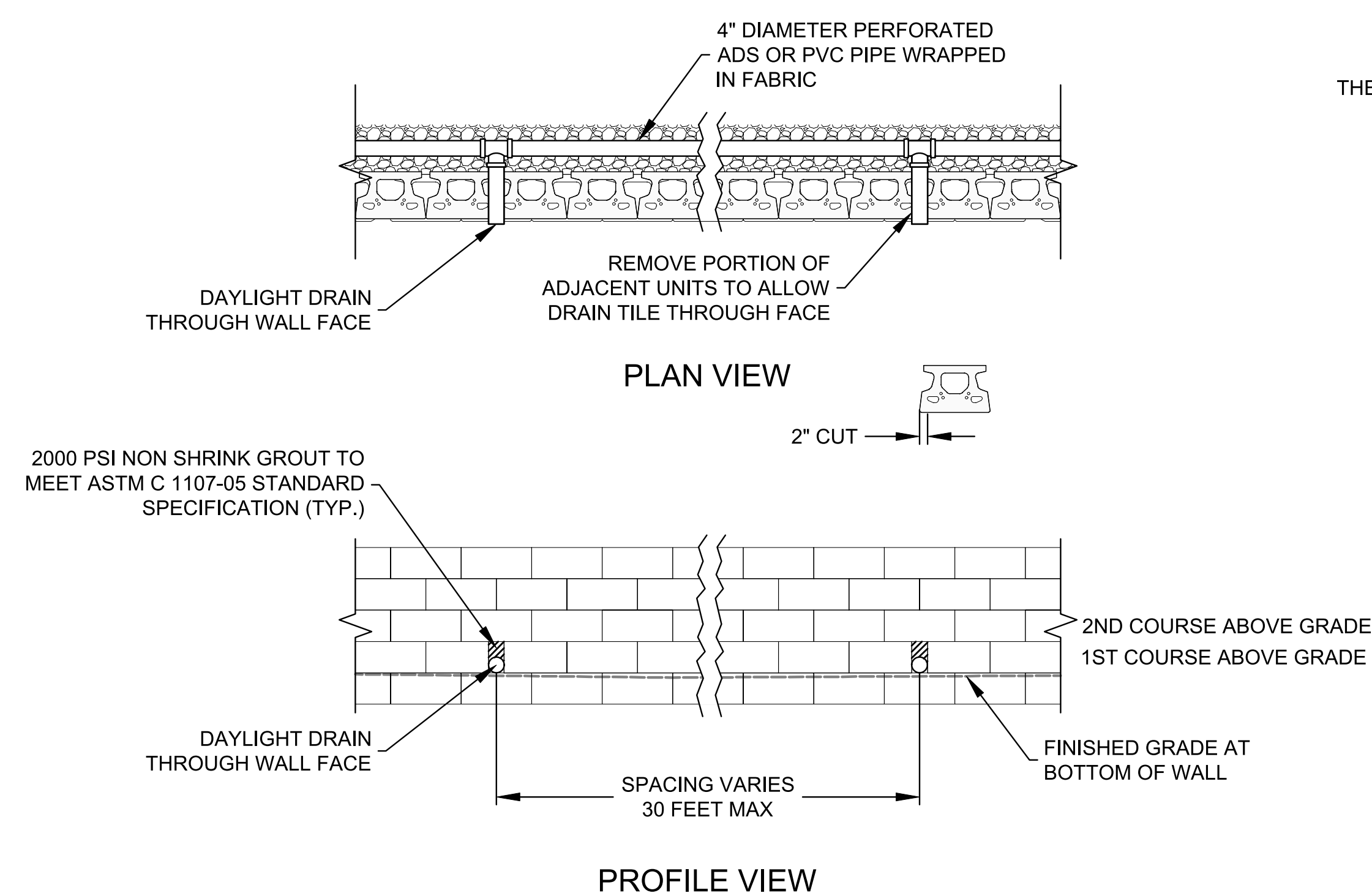
0 75 150 FEET

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JOB NO.	23245149
SHEET NO.:	13 OF 21

NOTE: AT LOCATIONS WHERE THE UPPER MOST GEOGRID LAYER IS 1.5 FEET OR LESS BELOW THE FINISHED GRADE AT THE TOP OF WALL, THE GEOGRID LAYER SHALL BE SKEWED A MAXIMUM OF 15° TO AVOID DAMAGE TO THE GEOGRID DURING PAVEMENT/CURB CONSTRUCTION. PROVIDE A MINIMUM OF 4" OF SOIL BETWEEN THE BOTTOM OF PAVEMENT AND THE TOP OF THE SKEWED GEOGRID LAYER.



1 TYPICAL MSE RETAINING WALL CROSS SECTION (N.T.S.)



SUB-DRAIN DETAIL FOR TYPICAL WALL SECTION (N.T.S.)

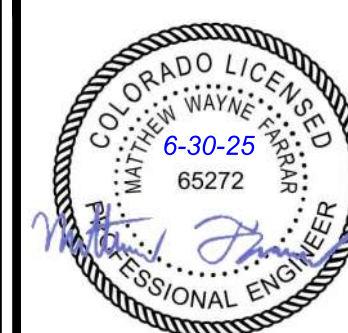
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TYPICAL MSE WALL CROSS SECTION

**NORTHGATE SUBARU
208 GLENEAGLE GATE VIEW**

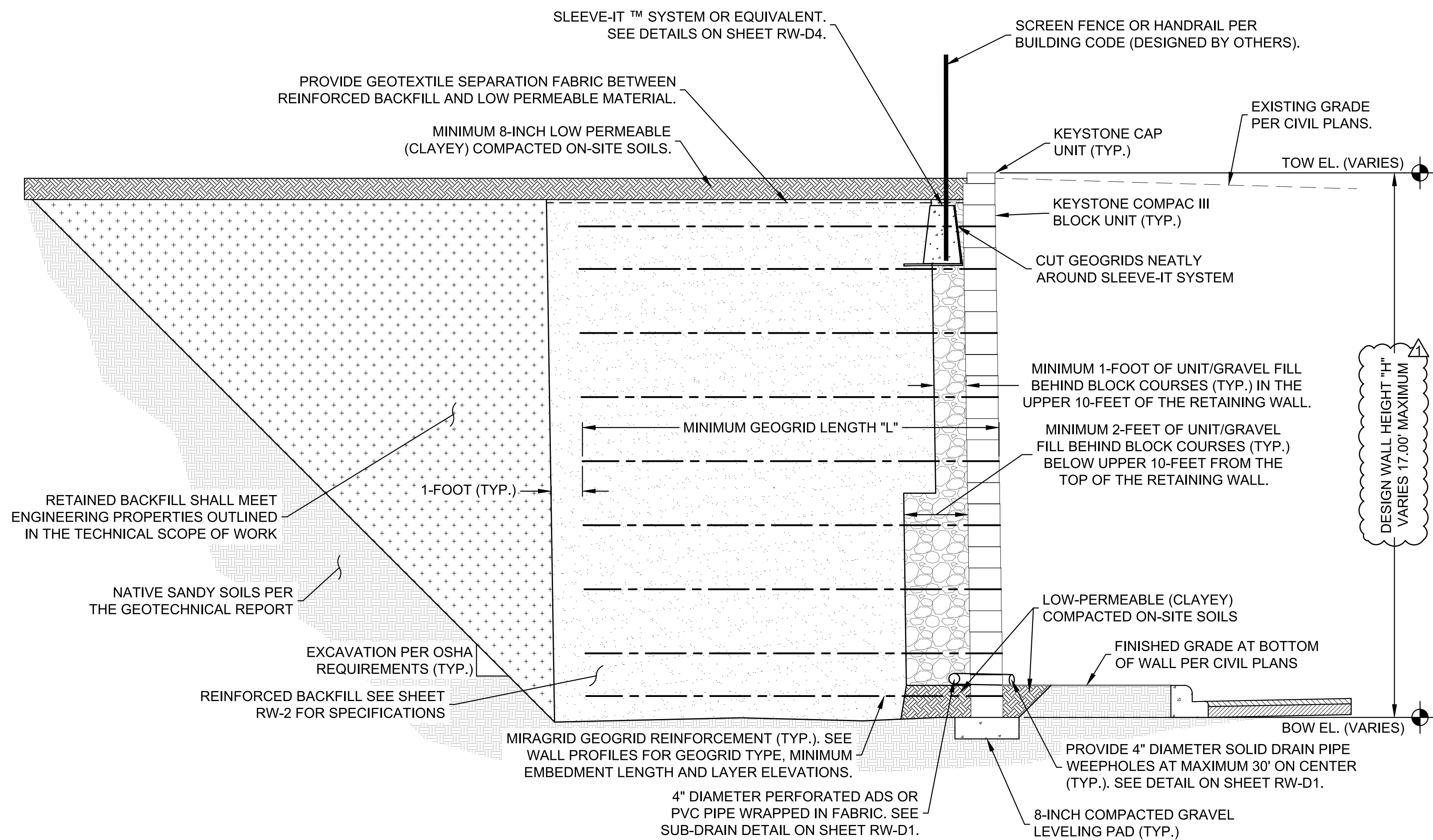
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COLORADO SPRINGS

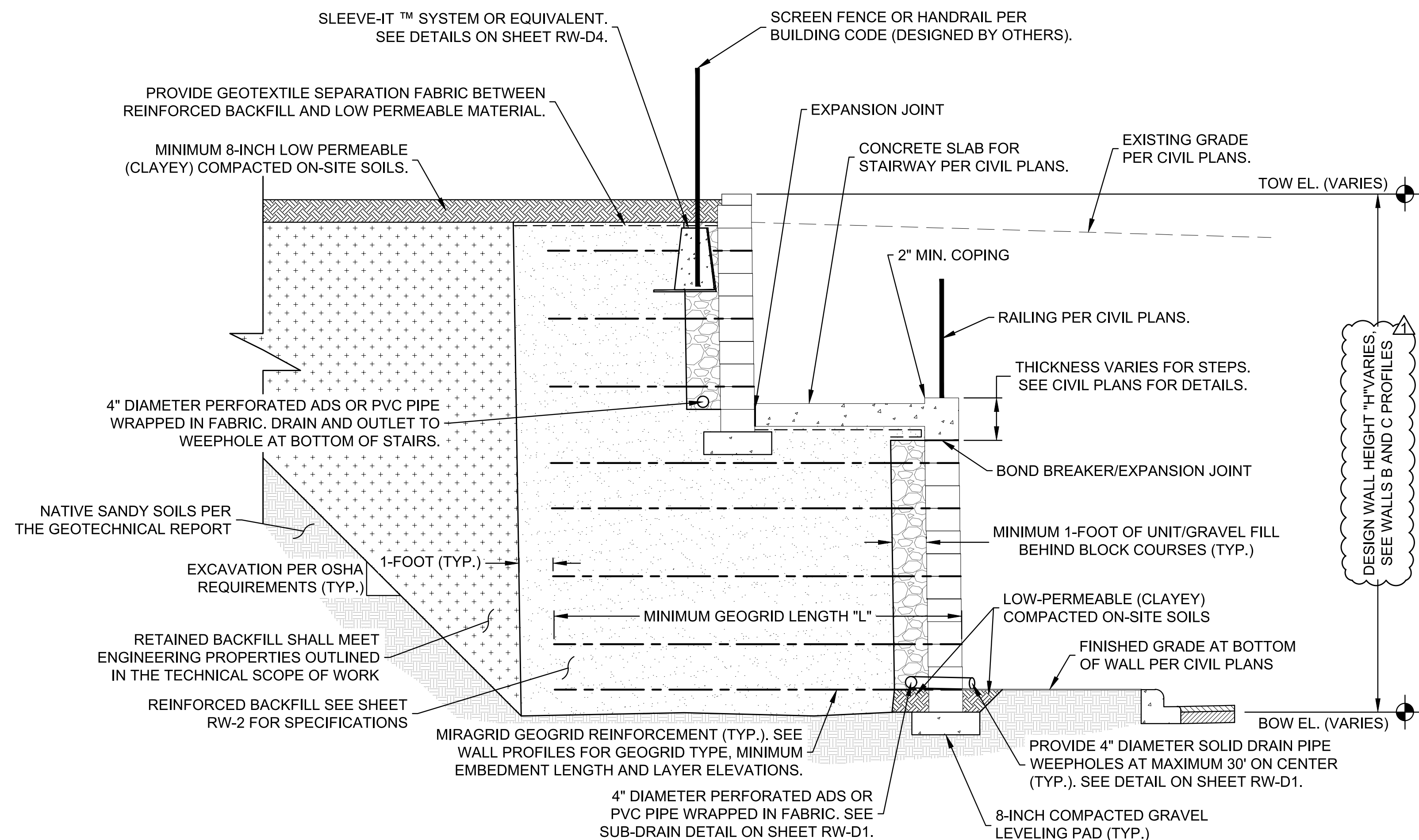


RW-D1

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2 TYPICAL MSE RETAINING WALL CROSS SECTION (N.T.S.)



3 TYPICAL MSE RETAINING WALL CROSS SECTION (N.T.S.)

REV.	DATE	BY	DESCRIPTION
1	6/30/25	MWF	UPDATED PER REVISED GRADING PLAN

TYPICAL MSE WALL CROSS SECTIONS

NORTHGATE SUBARU
208 GLENEAGLE GATE VIEW

COLORADO SPRINGS COLORADO

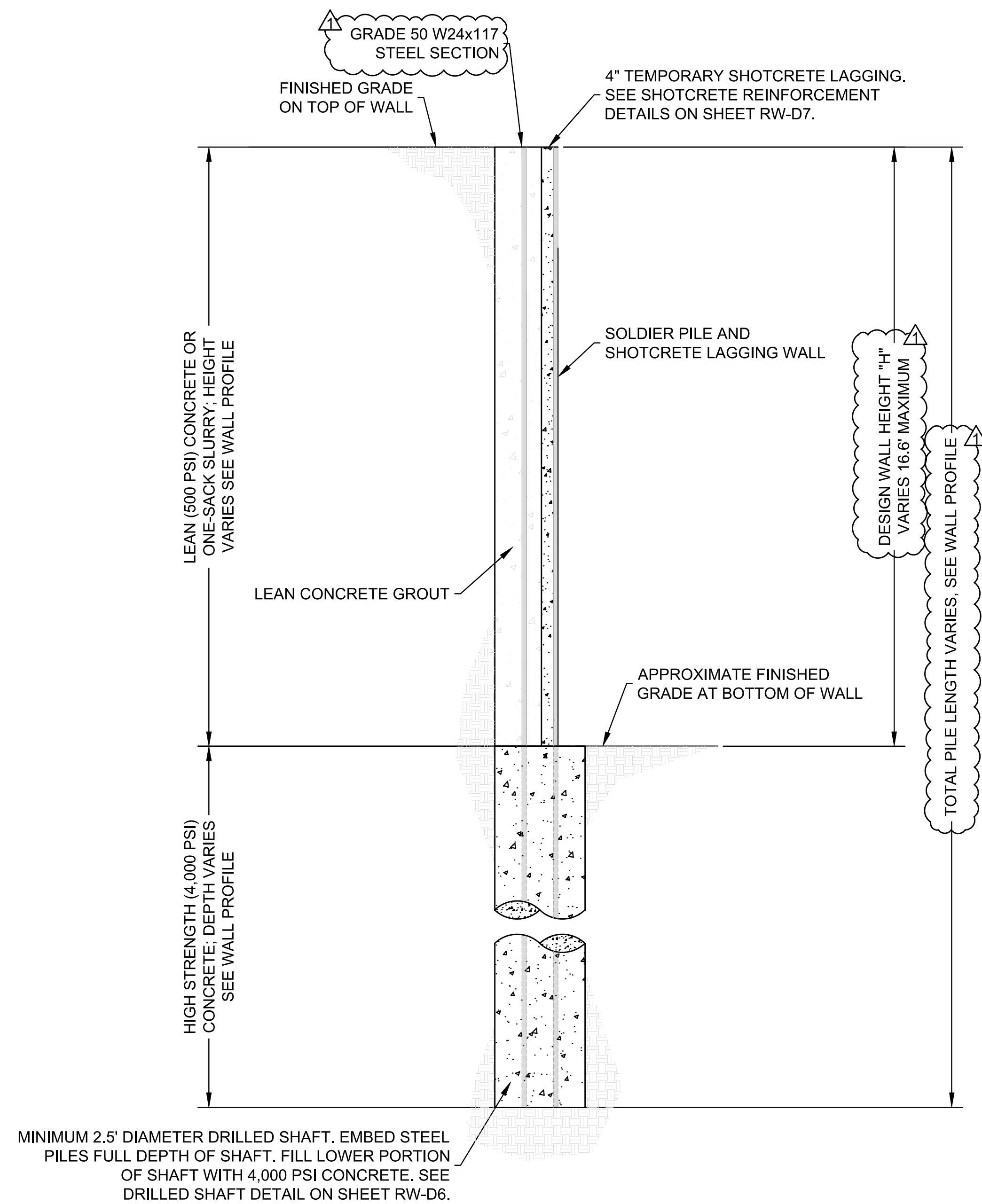


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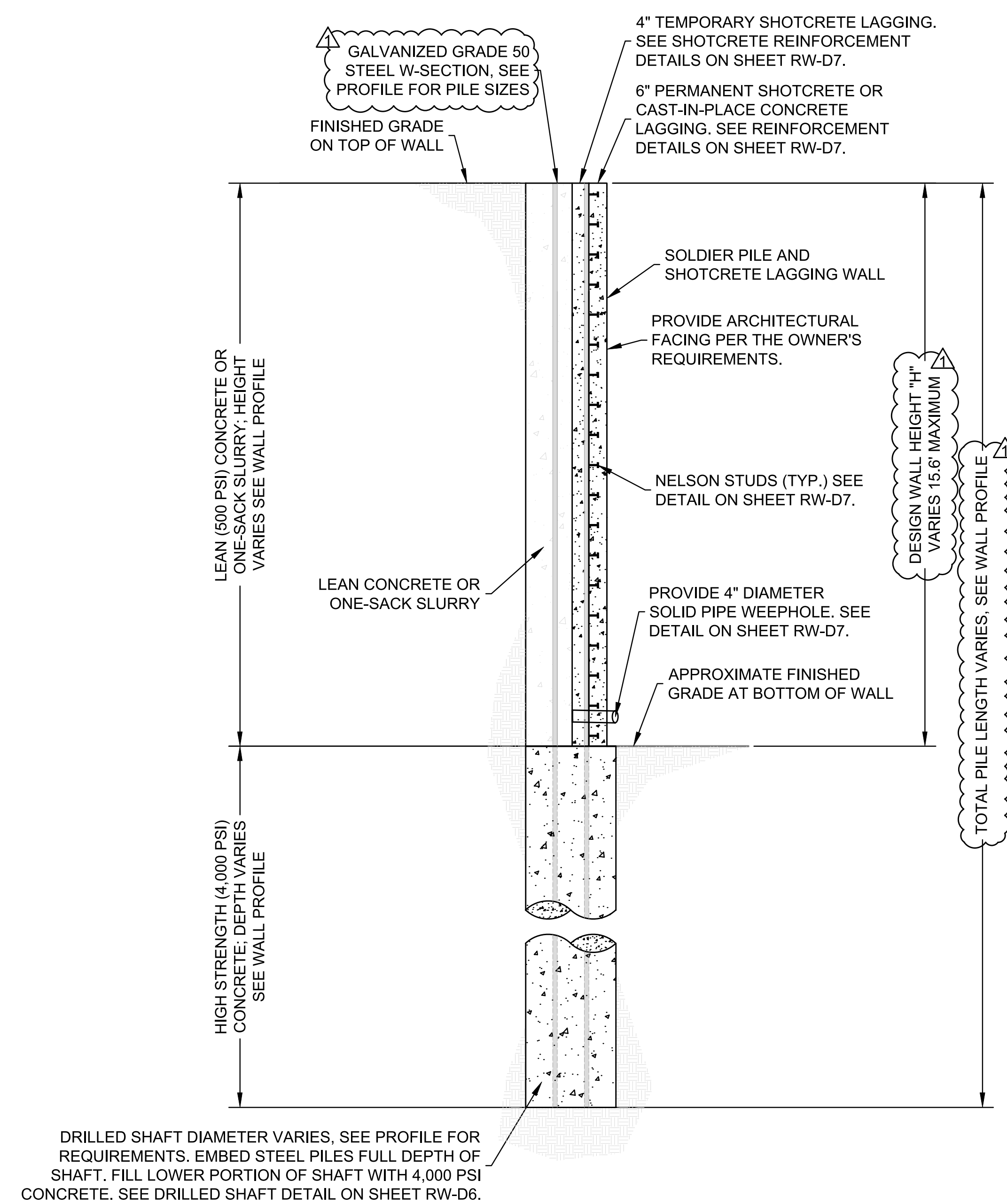


RW-D2

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JOB NO.	23245149
SHEET NO.:	15 OF 21



4 TYPICAL SOLDIER PILE (TEMPORARY SHORING) RETAINING WALL CROSS SECTION (N.T.S.)
WALL D - STA 0+00.0 TO 0+22.9



5 TYPICAL SOLDIER PILE (PERMANENT) RETAINING WALL CROSS SECTION (N.T.S.)
WALL D - STA 0+22.9 TO 4+26.1

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TYPICAL SOLDIER PILE WALL CROSS SECTIONS

NORTHGATE SUBARU
208 GLENEAGLE GATE VIEW

COLORADO SPRINGS COLORADO



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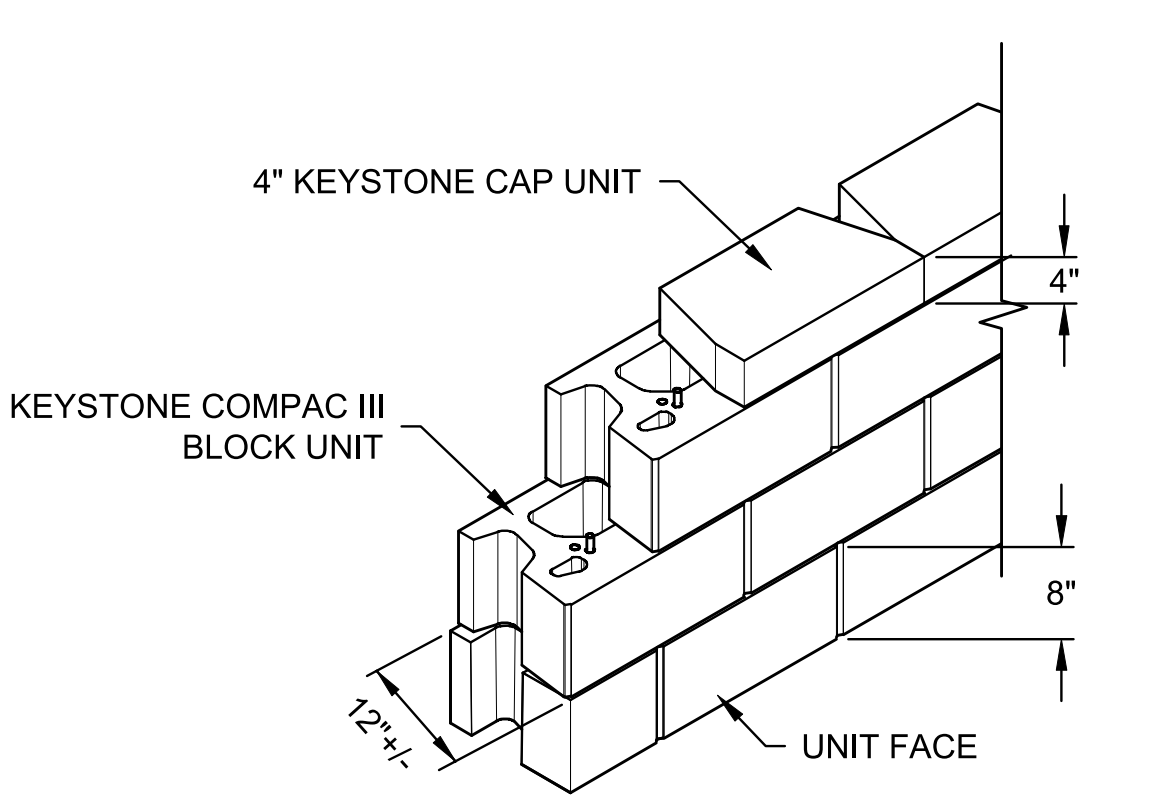
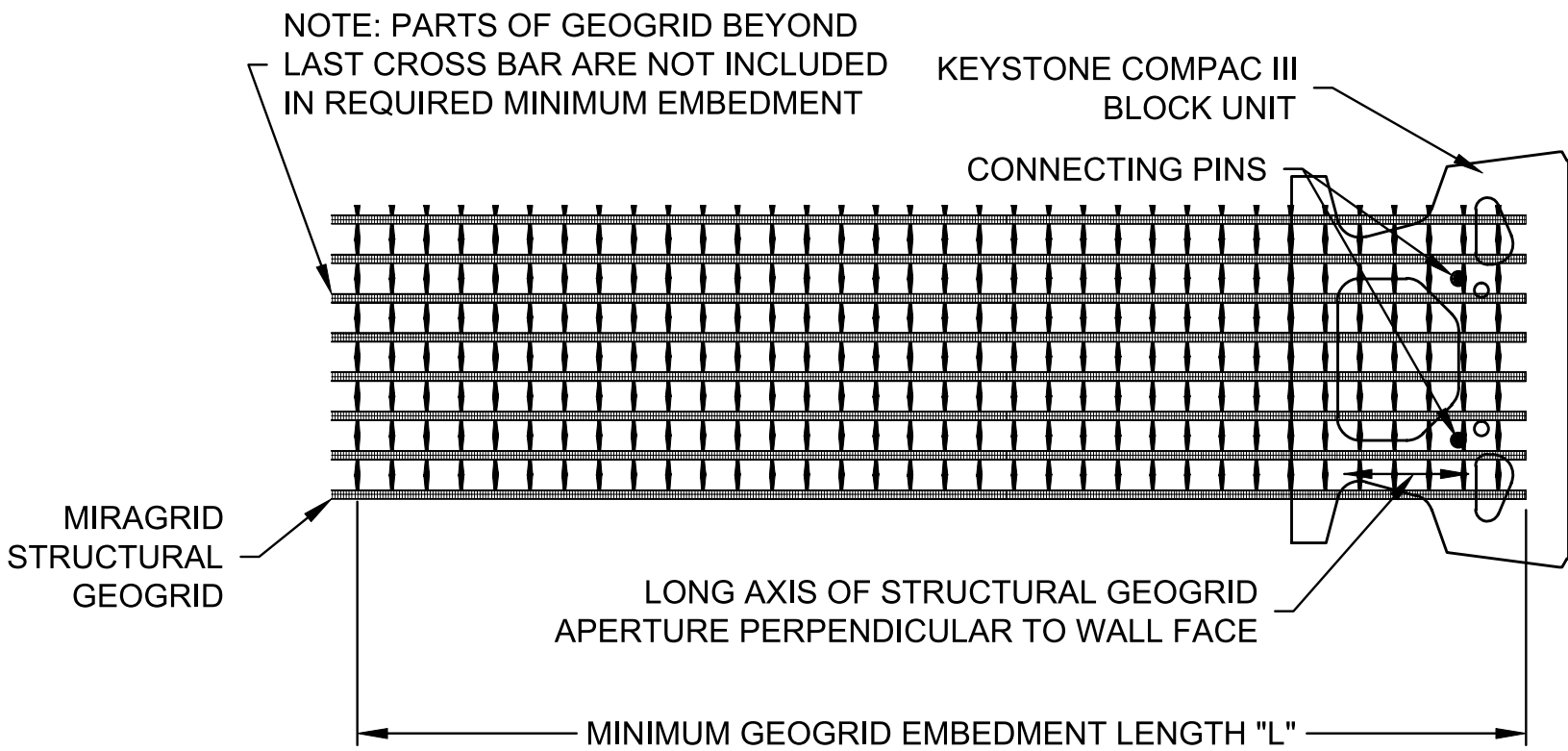
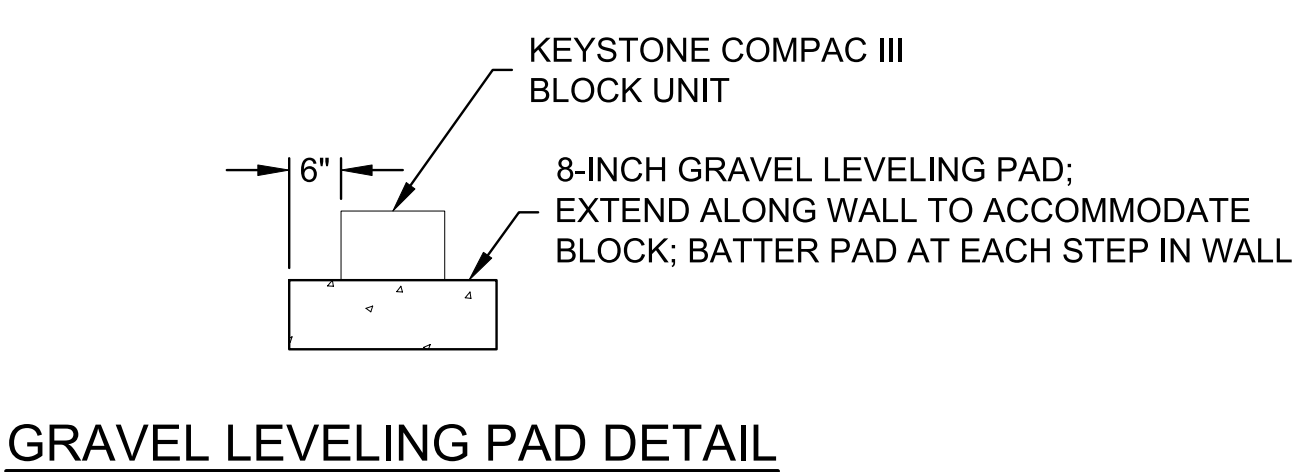


RW-D3

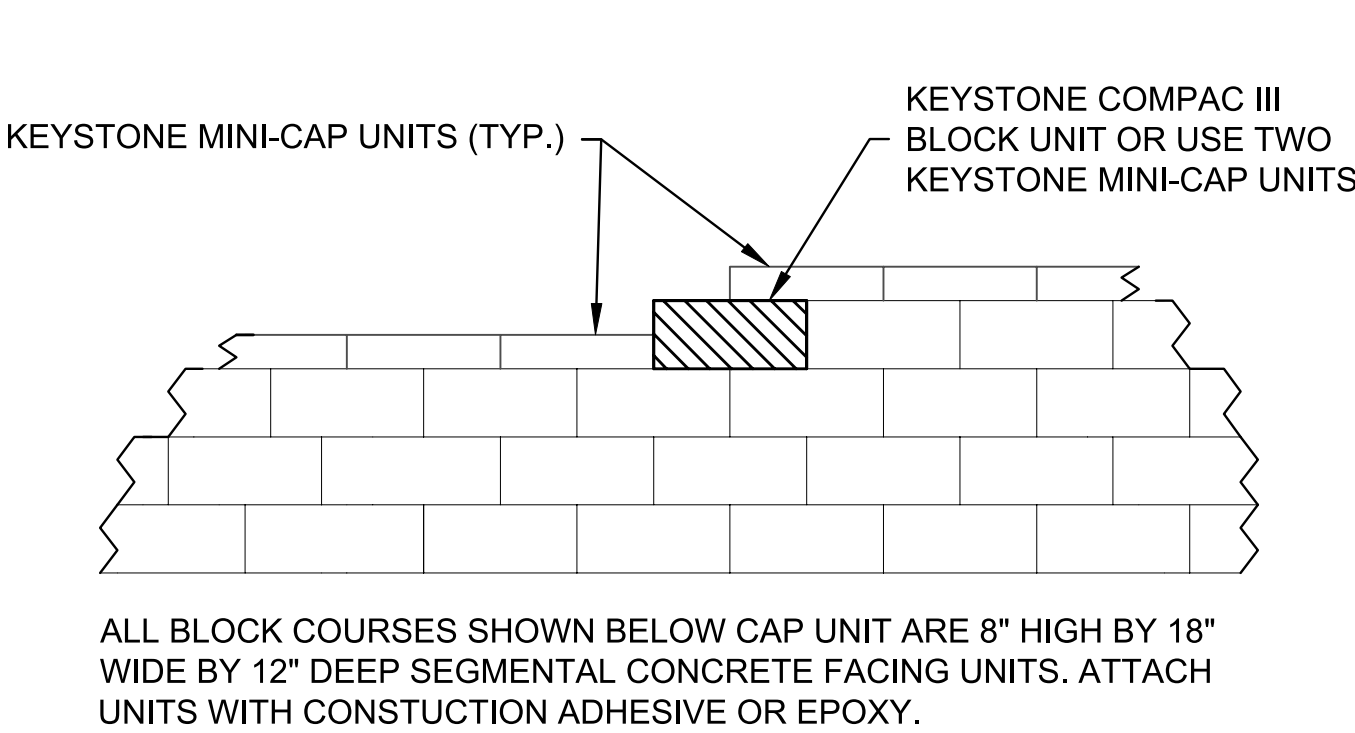
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DATE:	2/28/25
JOB NO.	23245149
SHEET NO.:	16 OF 21



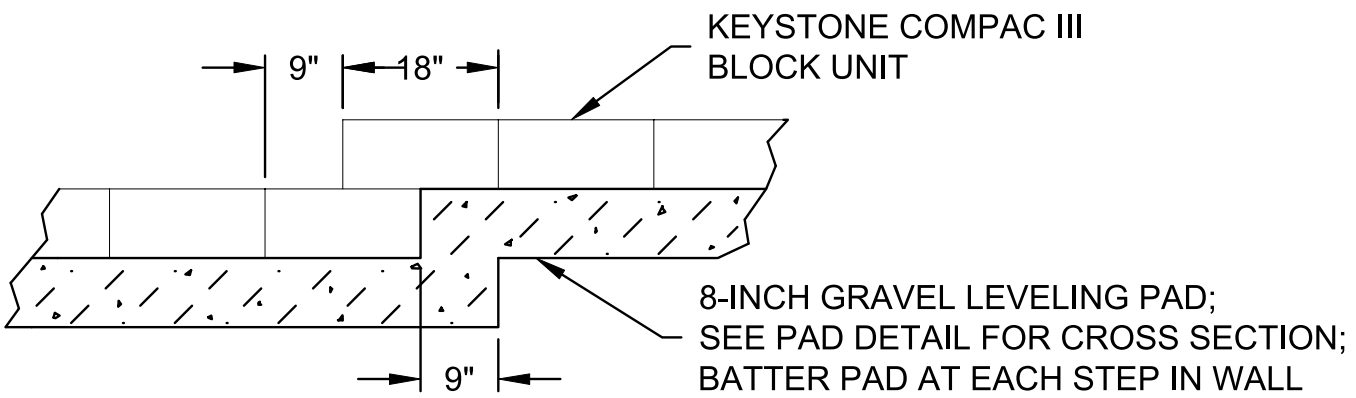
SLEEVE-IT™ SD1 COMPONENTS



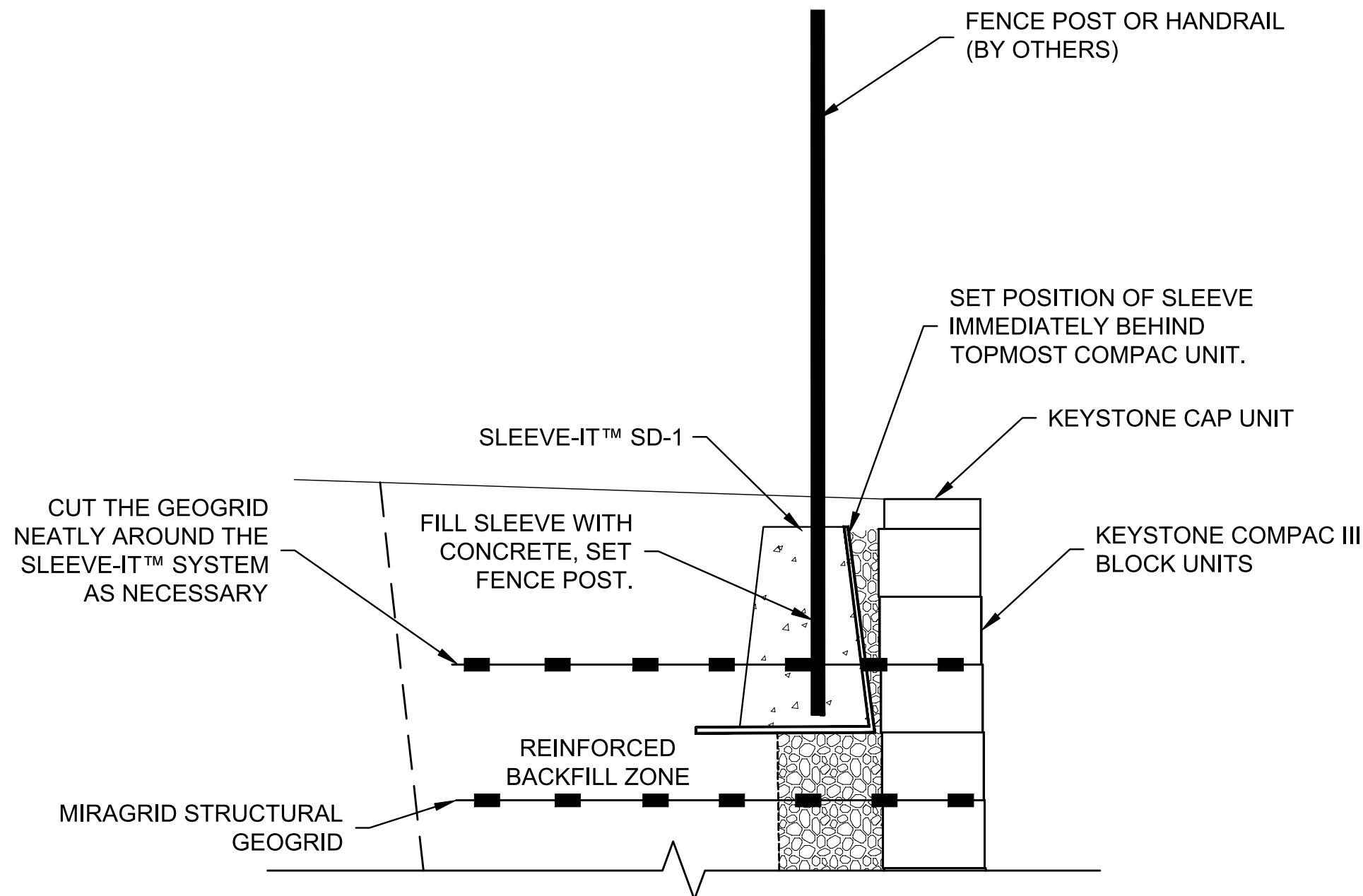
KEYSTONE COMPAC III BLOCK DETAIL



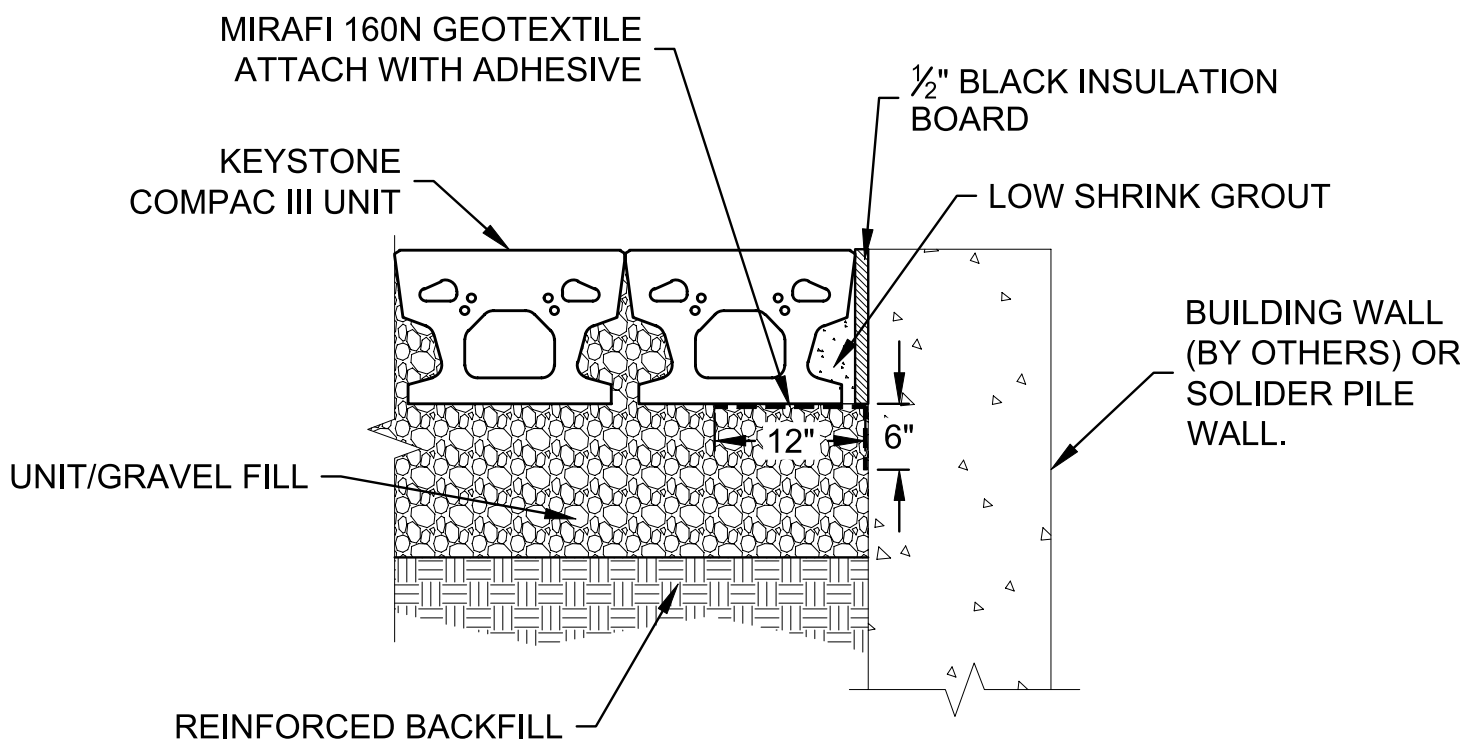
CAP STEP DETAIL



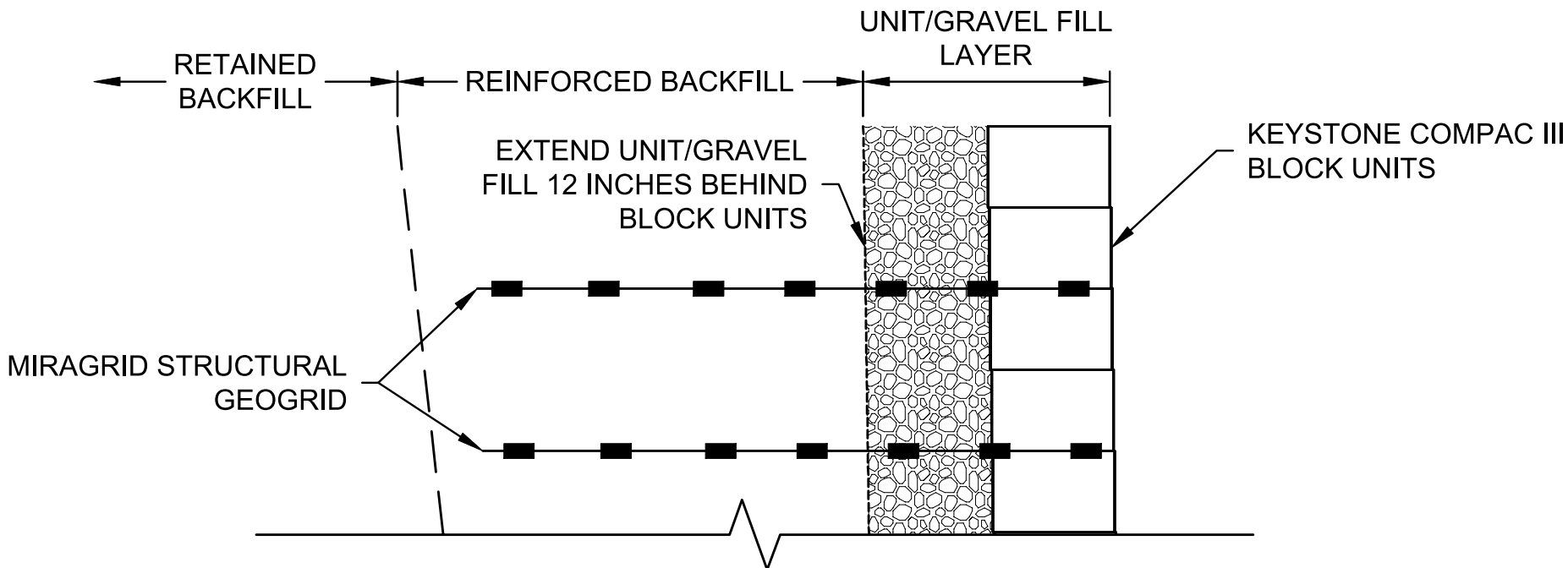
LEVELING PAD STEP DETAIL



FENCE POST INSTALLATION USING SLEEVE-IT™ SD-1



MODULAR BLOCK ABUTMENT DETAIL



LIMITS OF UNIT FILL AND REINFORCED BACKFILL

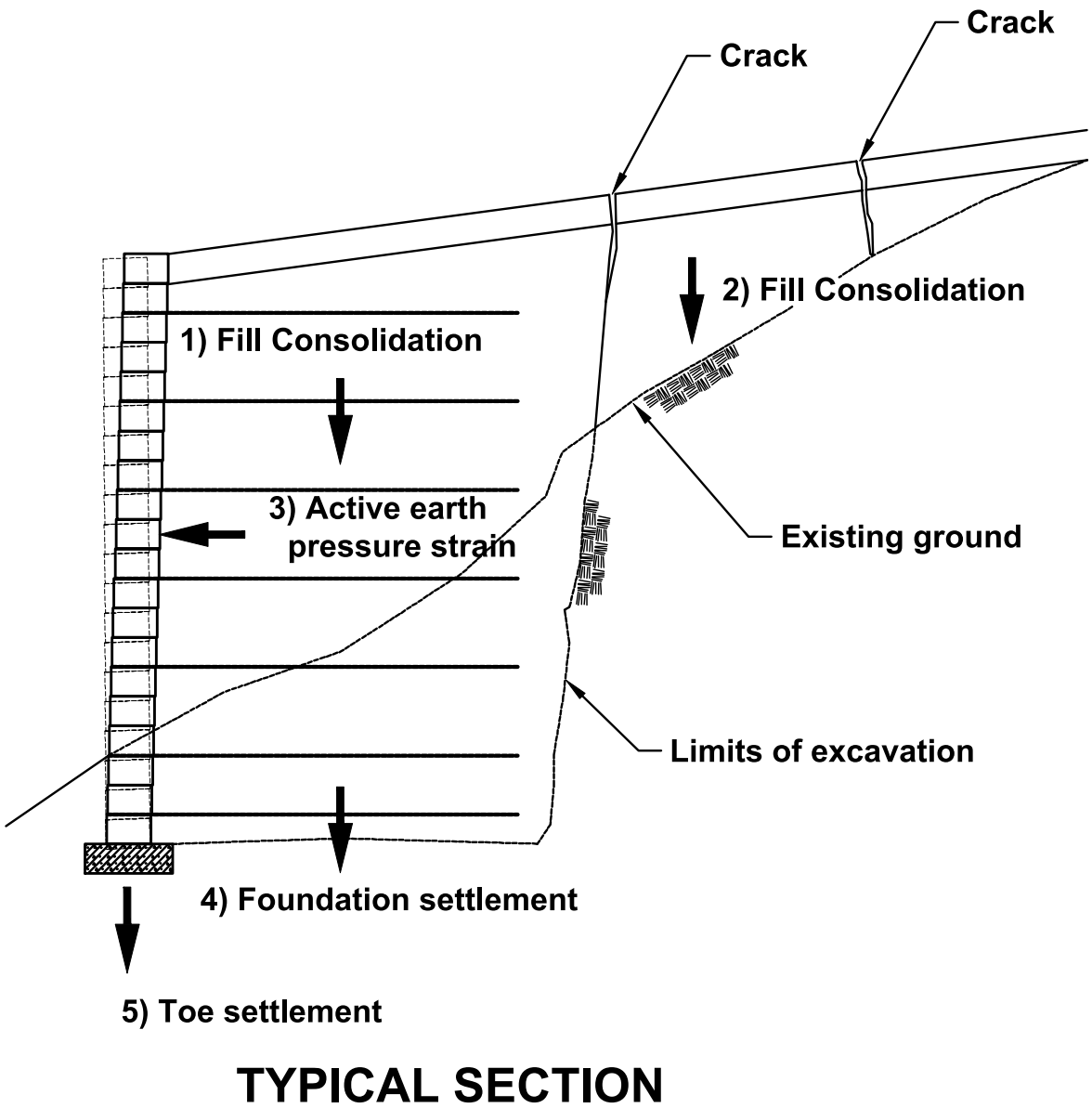
Backfill Movement and Soil Cracks

Mechanically Stabilized Earth (MSE) retaining walls are flexible reinforced soil masses, which interact with the foundation and retained backfill zones to provide a stable retaining structure. These soil zones have different stress/strain/consolidation properties which can result in differential movements and strain of the reinforced and retained soil matrix.

Relative movement of the soil masses is typically noted in taller wall or tiered structures with small soil cracks occurring behind the wall structure near the boundary of soil zones with different strain properties. Experience has shown that this type of soil cracking is most noticeable after very heavy rainstorms where the additional saturated soil weight and seepage pressure involved can cause slight differential movement of the masses. A wall schematic and possible causes are shown below:

Possible causes of soil cracking

- 1) Consolidation of reinforced zone backfill** - Any settlement of reinforced fill relative to adjacent soils may cause cracking at the end of reinforcement. If soils are placed and compacted in dry conditions, water can cause secondary consolidation of the reinforced fill and cracking at the end of the reinforced zone.
- 2) Consolidation of retained soil wedge** - Similar to Item 1 causing cracking at the back of fill wedge relative to existing soils.
- 3) Lateral wall movement due to active earth pressure state** - lesser quality backfill soils exhibit higher lateral movement to mobilize the active earth pressure state. If the reinforced wall mass strains laterally, the fill must settle accordingly and cracking can occur.
- 4) Foundation settlement** - The foundation soils of many wall structures have not experienced the loading from the new fill which can cause differential settlement between the wall volume and cut slope.
- 5) Toe Settlement** - The wall toe can experience more settlement than the wall heel due to the lack of overburden or confining pressure resulting in slight lateral wall movement in the upper wall section and tension cracking at the end of reinforcement.



Soil cracks can also be a sign of global instability or continuing settlement which requires evaluation by a geotechnical engineer. However, most minor soil cracking observed is structurally insignificant to the long term performance of the wall structure but can lead to reflective cracks in pavement sections and/or separation of curbs when of greater magnitude.

Significantly increasing the length of the upper reinforcement levels to help bridge the potential crack zones can be prudent precaution for projects with flexible pavements extending over all zones. High quality backfill, proper backfill placement and compaction, and firm foundations are the best precautions against soil cracking.

TYPICAL MSE WALL CONSTRUCTION DETAILS

NORTHGATE SUBARU 208 GLENEAGLE GATE VIEW

COLORADO

COLORADO SPRINGS

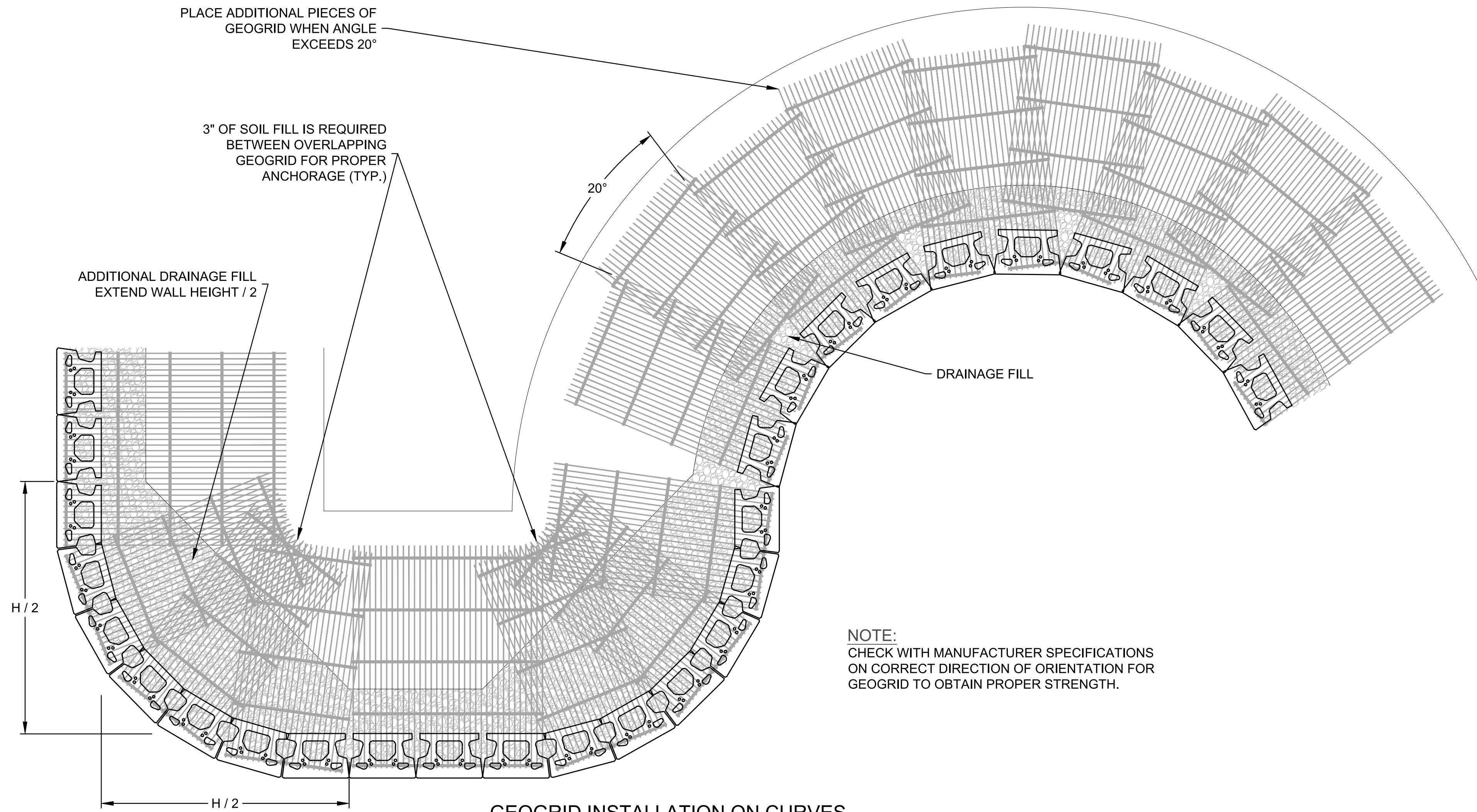


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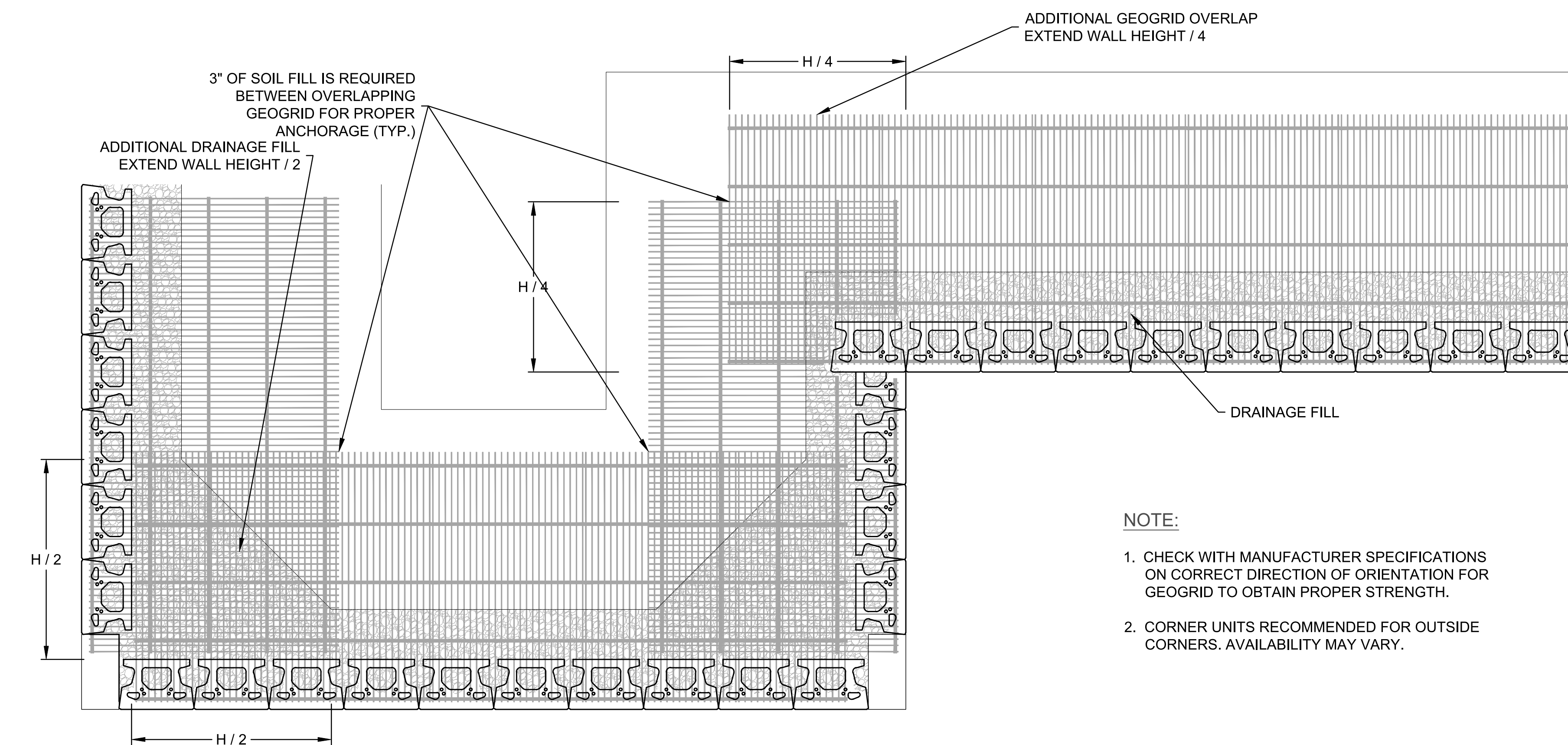


RW-D4

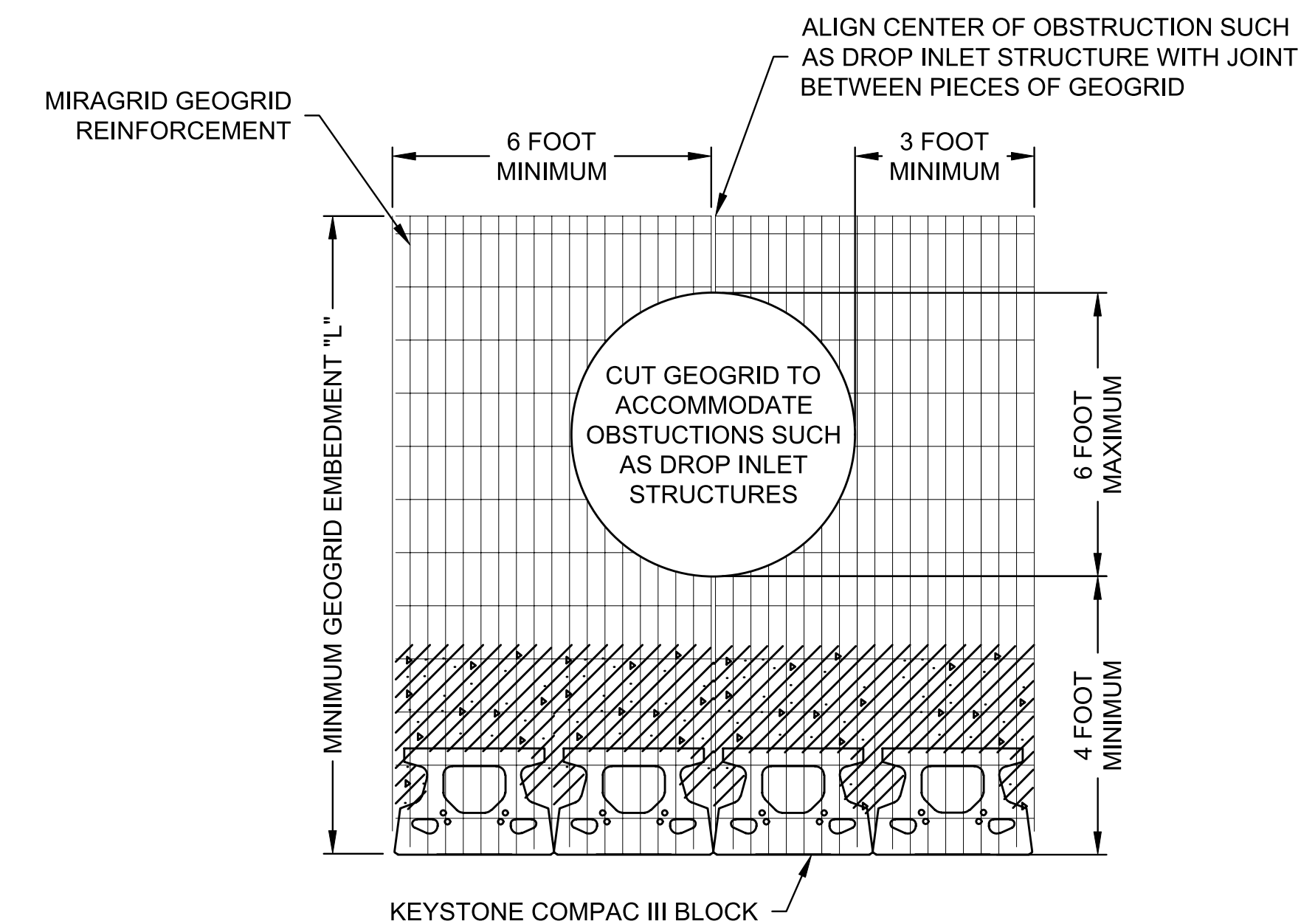
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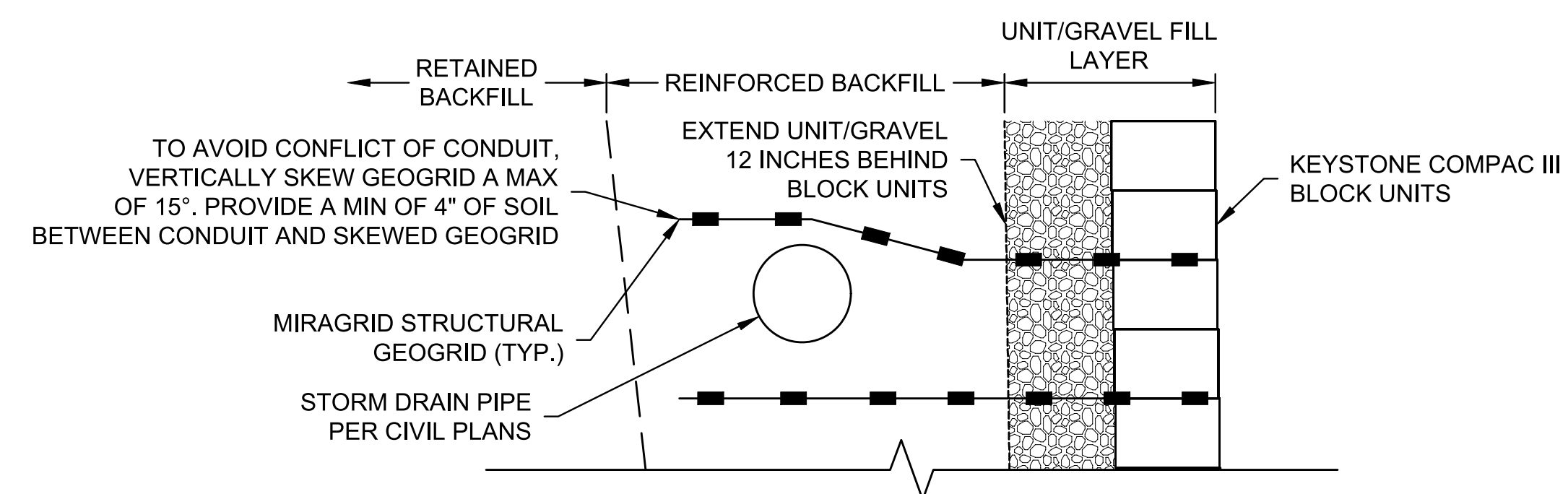
GEOGRID INSTALLATION ON CURVES



GEOGRID INSTALLATION AT CORNERS



GEOGRID DETAIL AT OBSTRUCTION LOCATIONS (N.T.S.)



SKEWED GEOGRID WHEN STORM DRAIN PIPE EXISTS

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TYPICAL MSE WALL CONSTRUCTION DETAILS

**NORTHGATE SUBARU
208 GLENEAGLE GATE VIEW**

COLORADO SPRINGS COLORADO

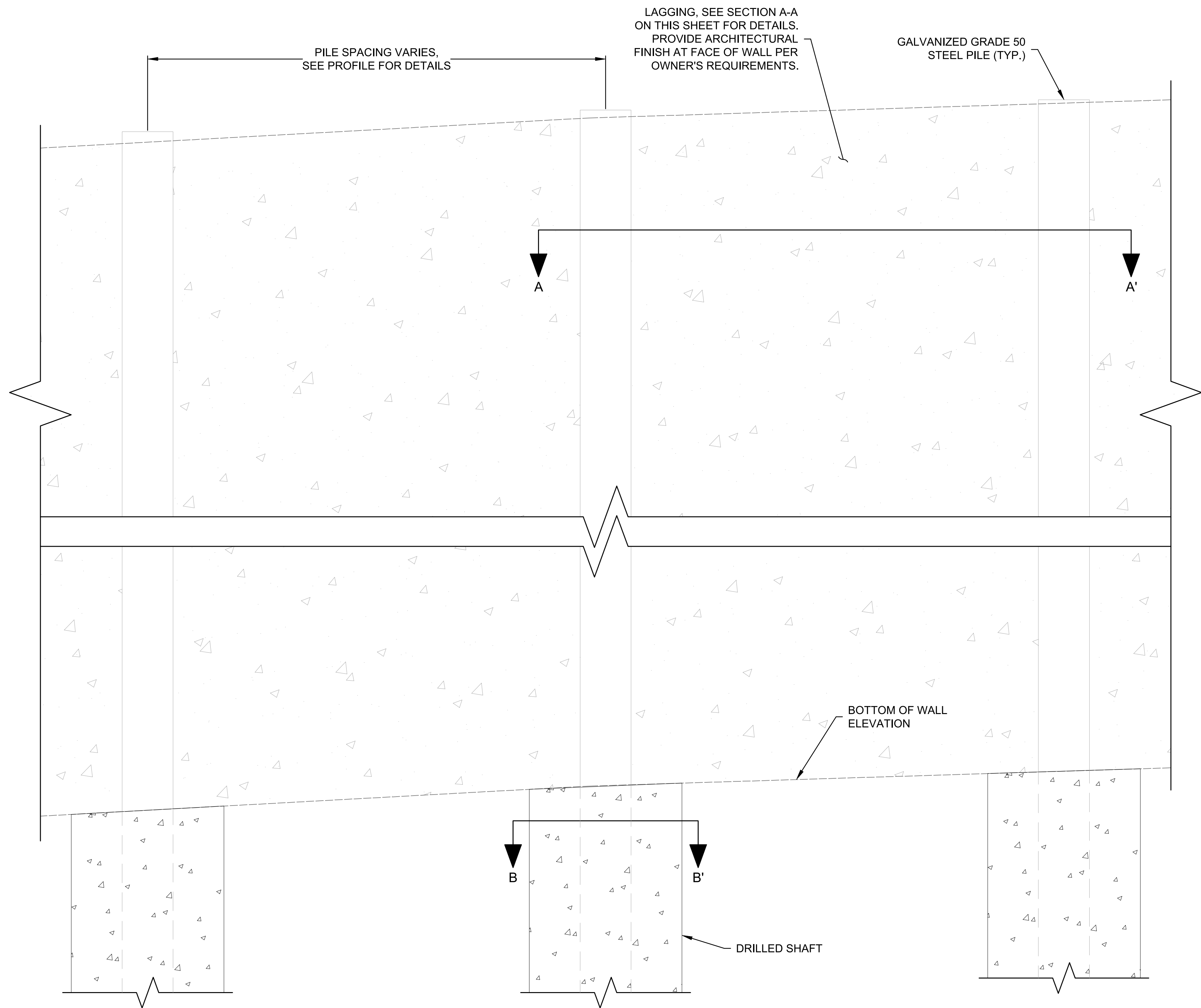


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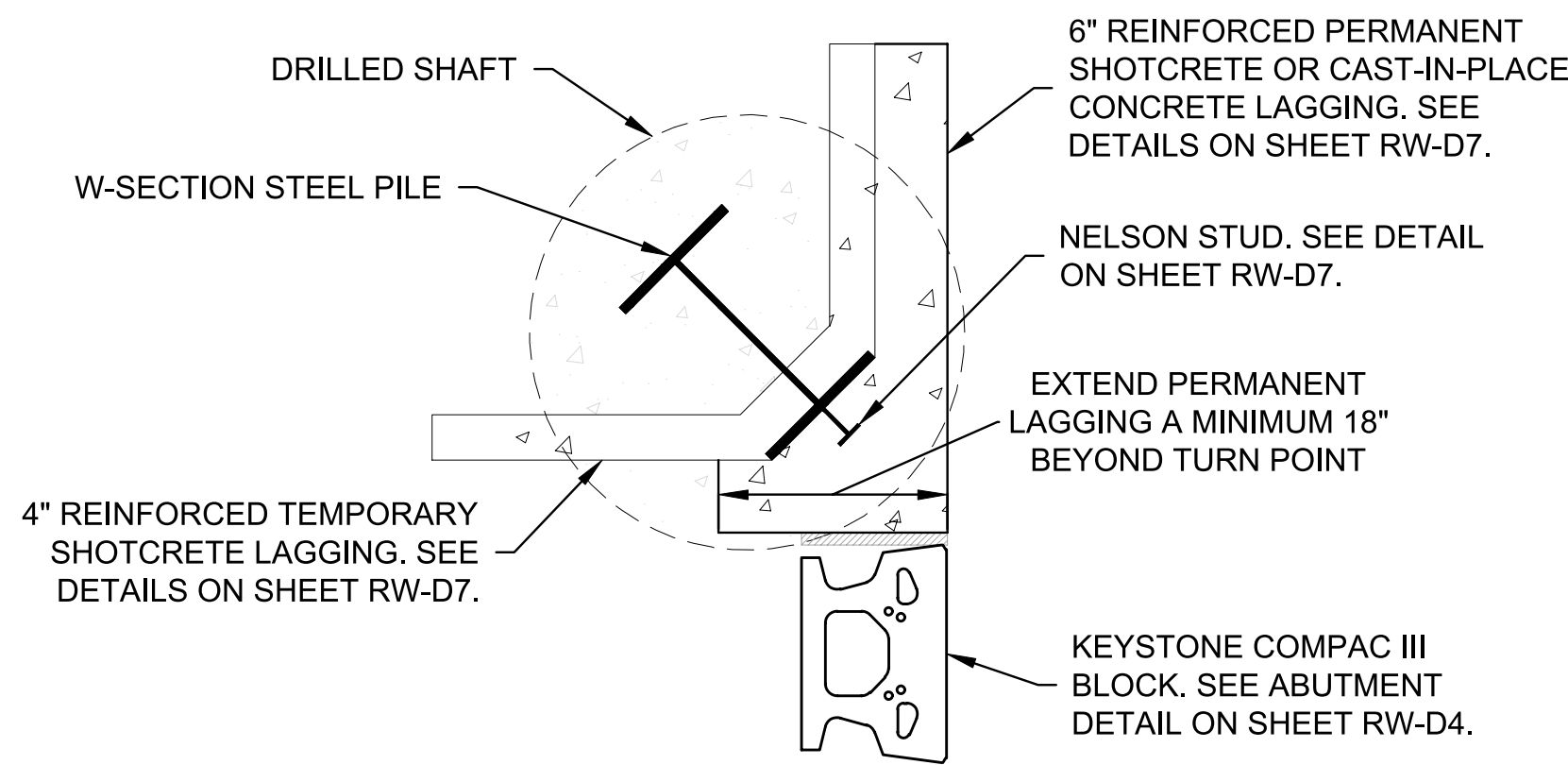
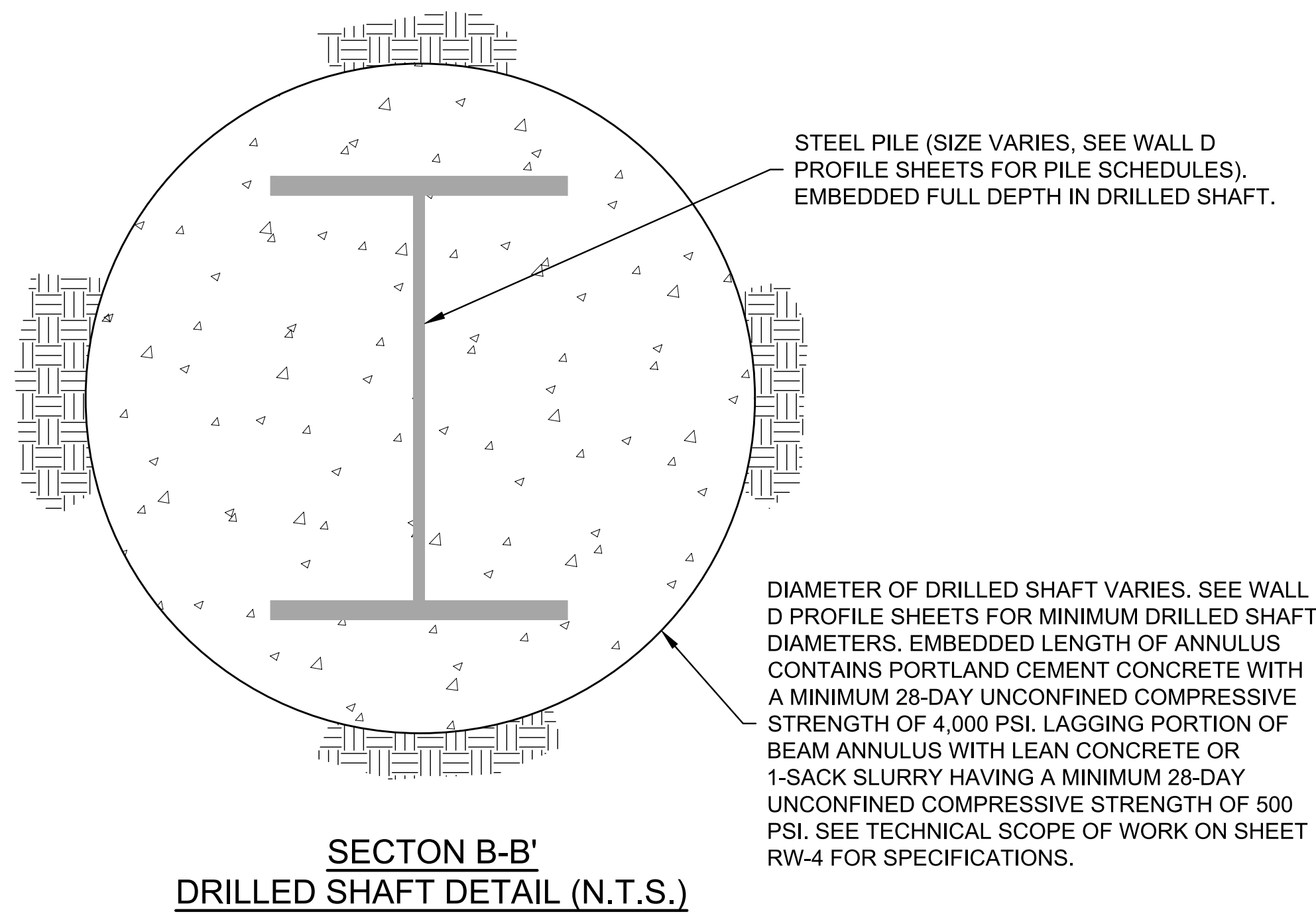
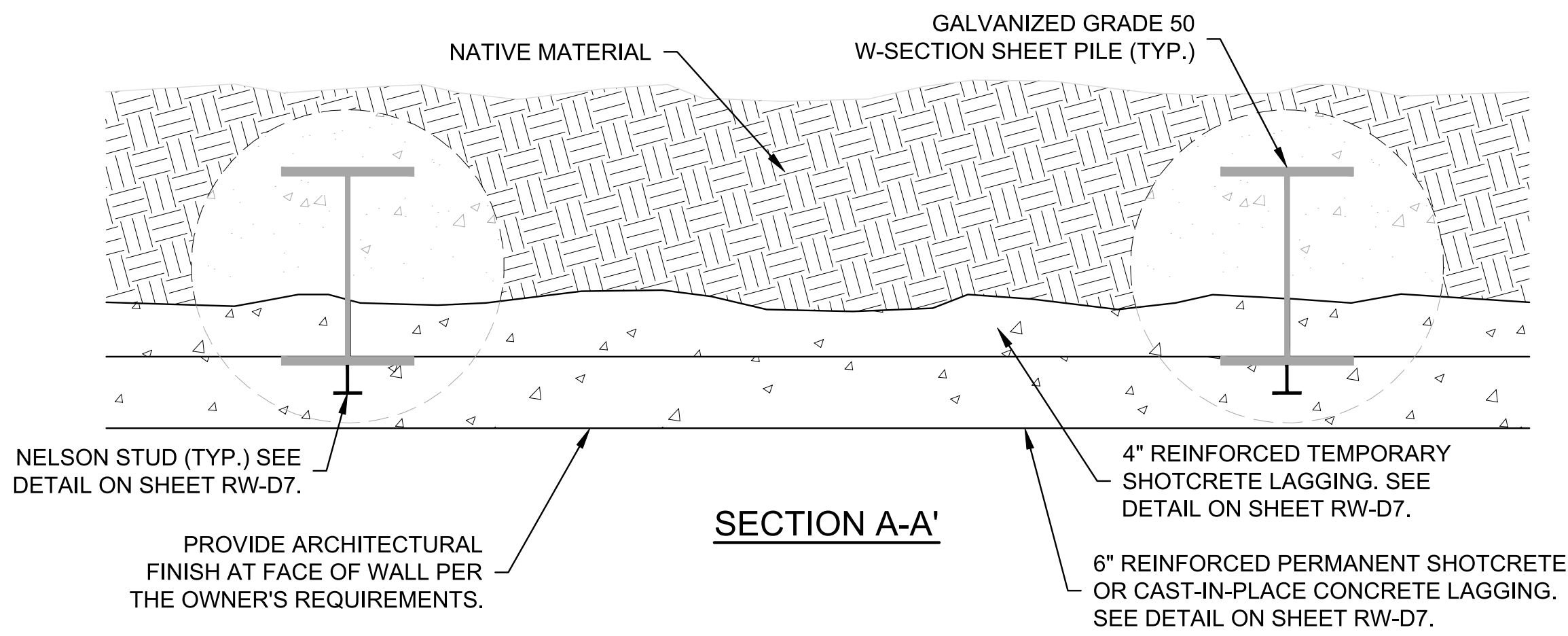


RW-D5

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SOLDIER PILE ELEVATION VIEW DETAIL



LAGGING PLACEMENT AT CORNER DETAIL
WALL D - STA 0+22.9

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SOLDIER PILE WALL CONSTRUCTION DETAILS

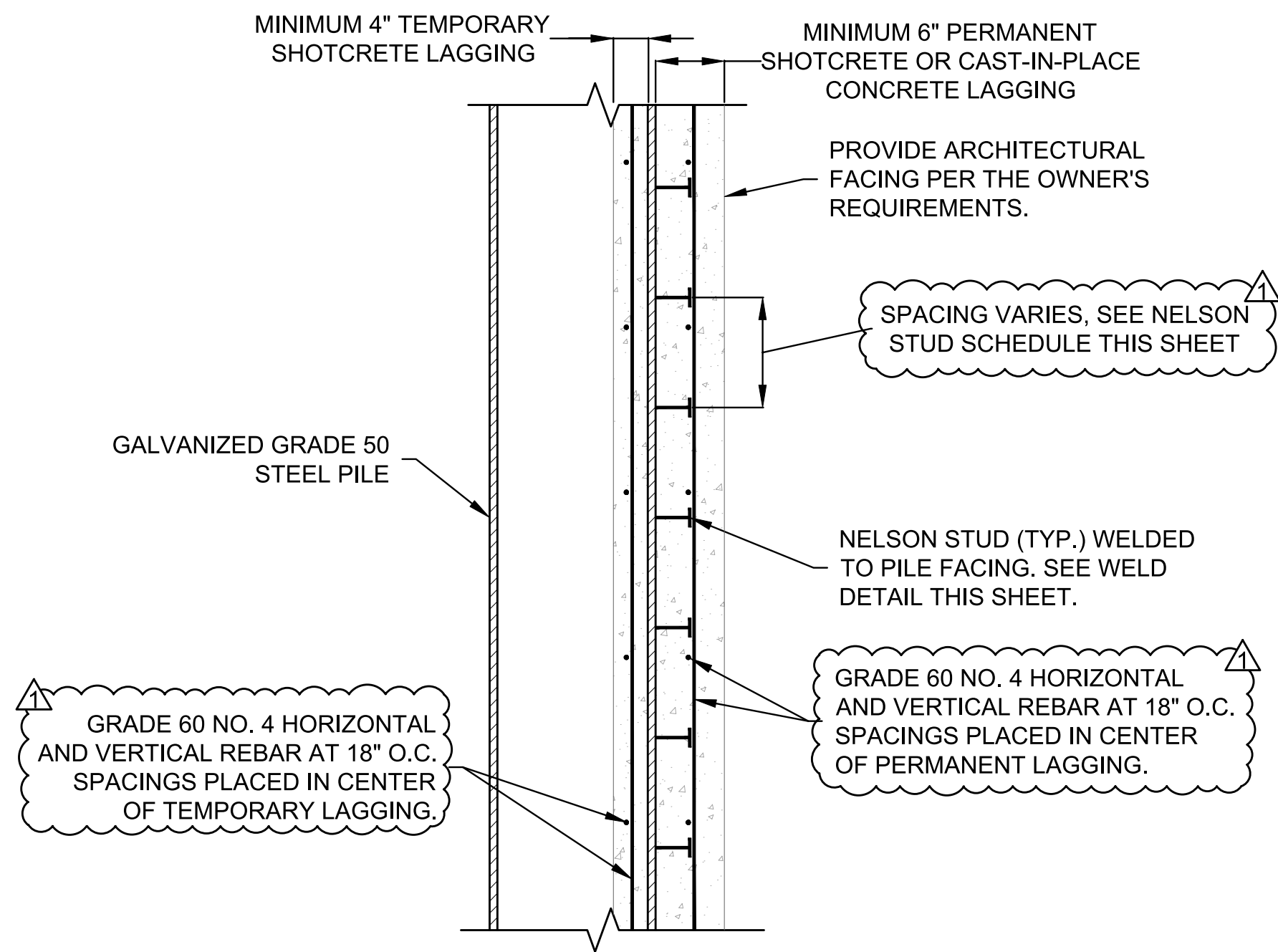
NORTHGATE SUBARU
208 GLENEAGLE GATE VIEW

COLORADO SPRINGS COLORADO

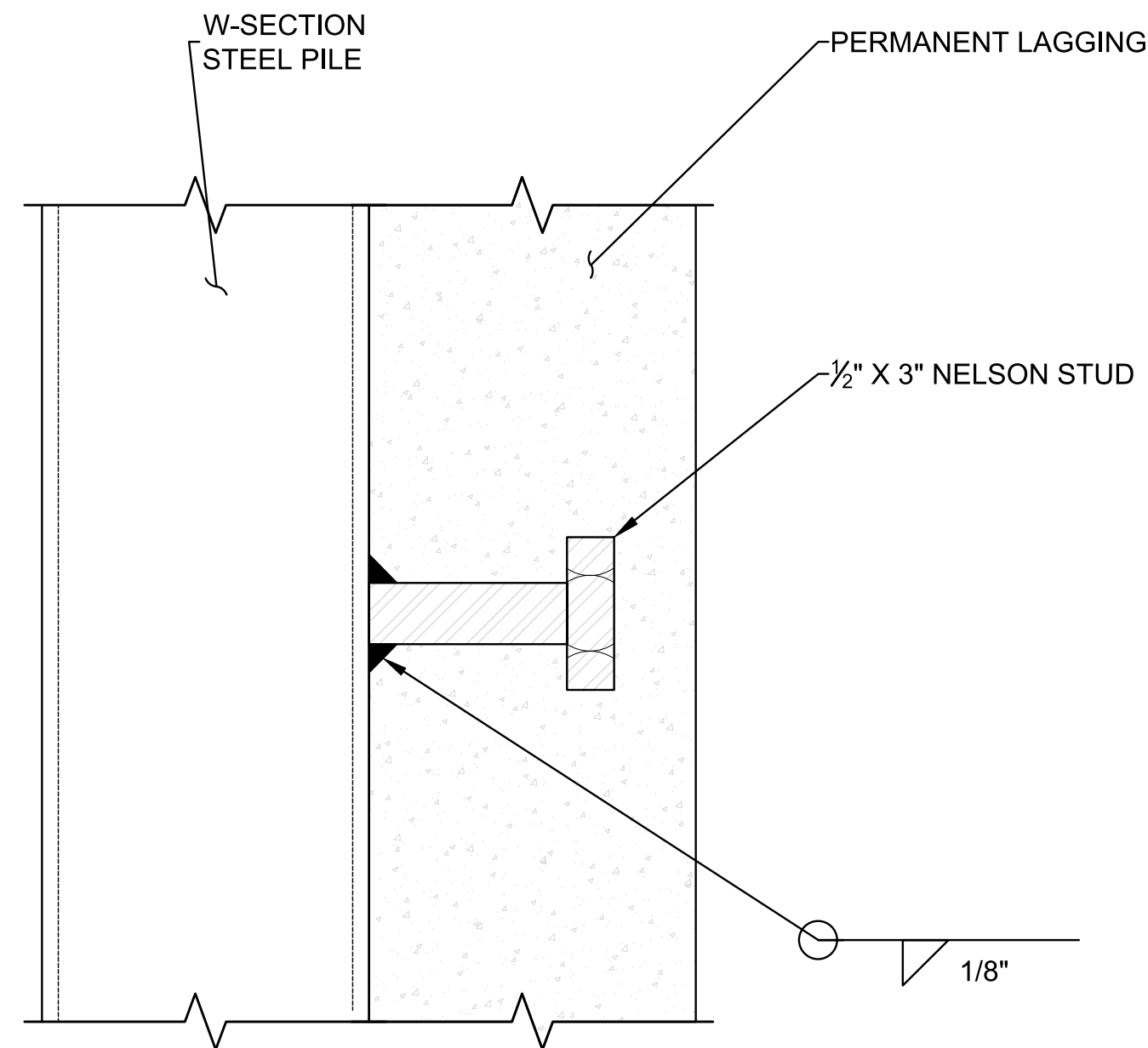
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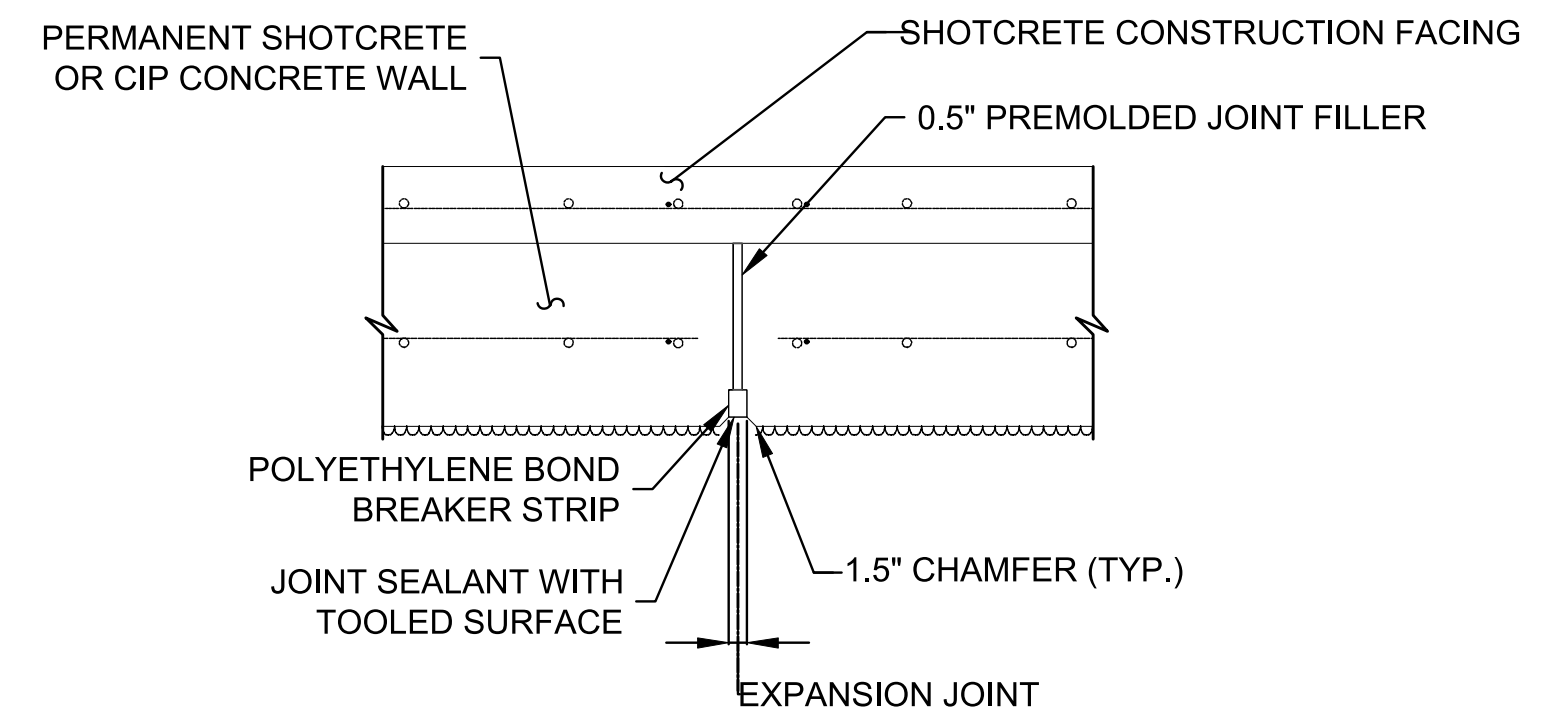
RW-D6	
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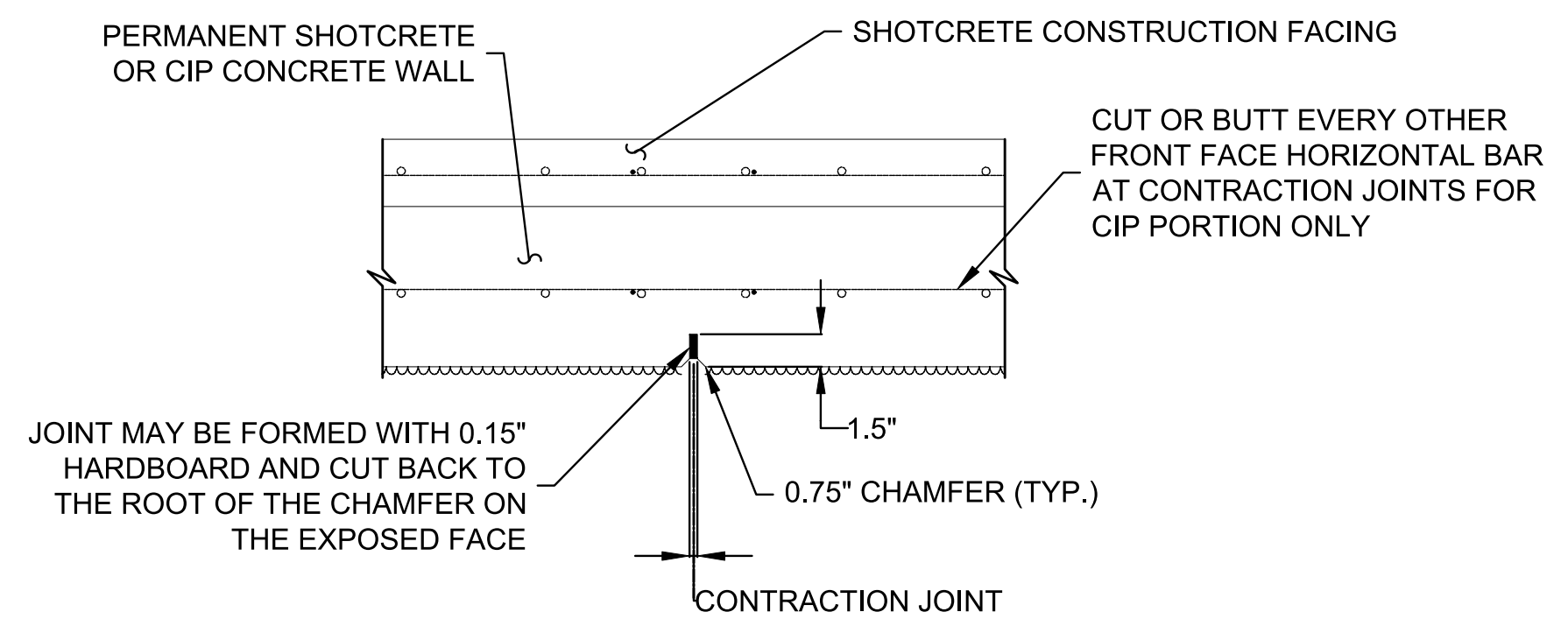
SOLDIER PILE LAGGING SECTION DETAIL (N.T.S.)



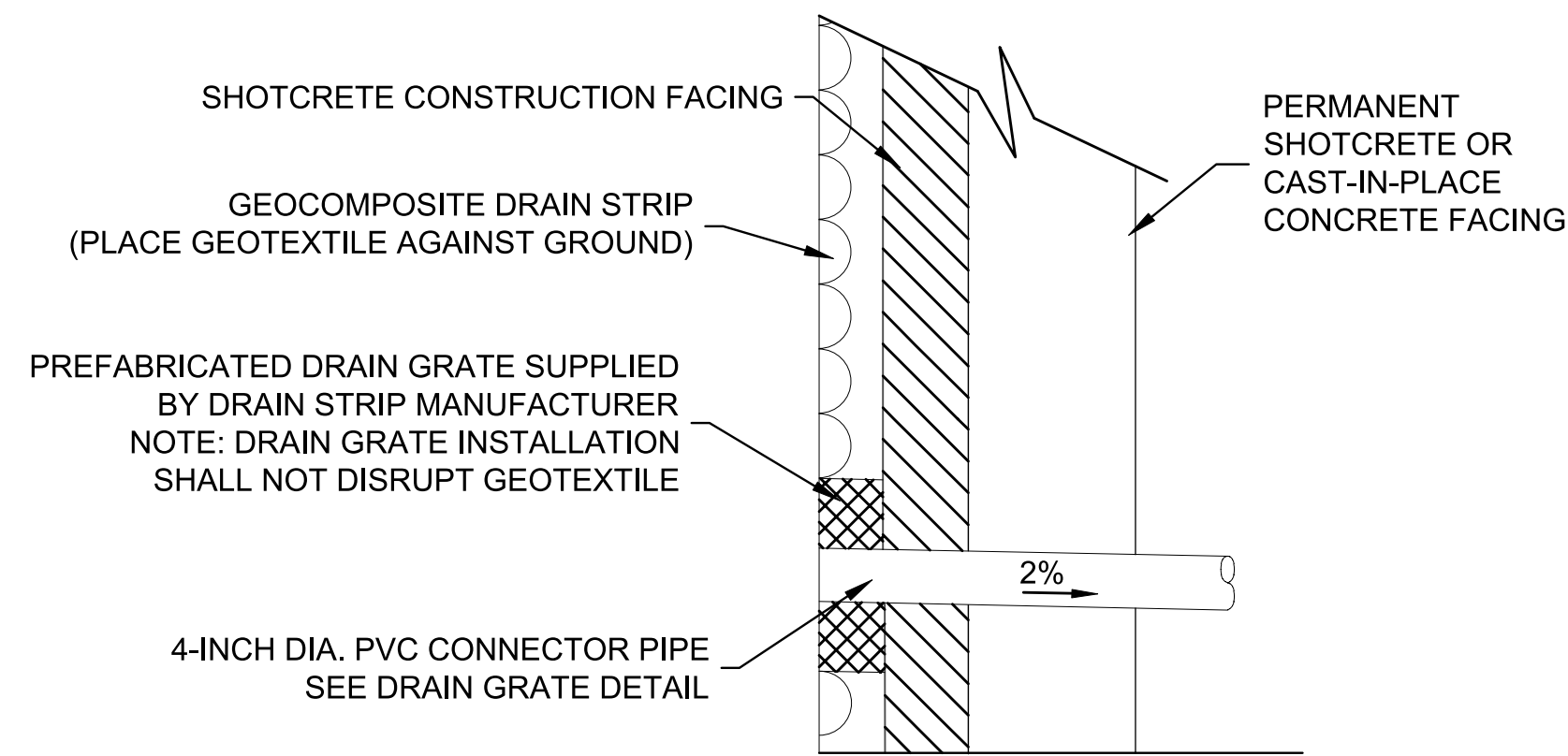
TYPICAL NELSON STUD CONNECTION DETAIL (N.T.S.)



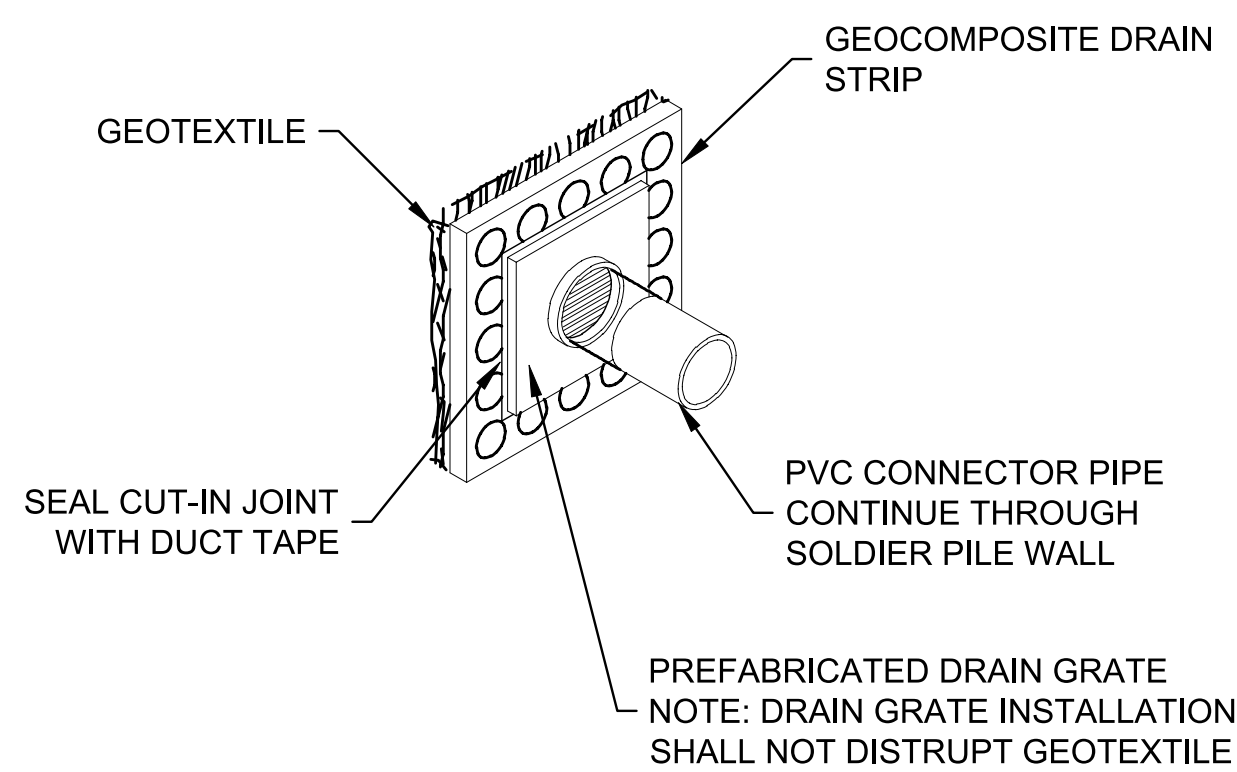
NOTE: CONTRACTION AND EXPANSION JOINTS SHALL BE PLACED AT LOCATIONS INDICATED ON THE PROFILE SHEETS, MAXIMUM SPACING 30 FEET O.C.



TYPICAL EXPANSION AND CONTRACTION JOINTS (N.T.S.)



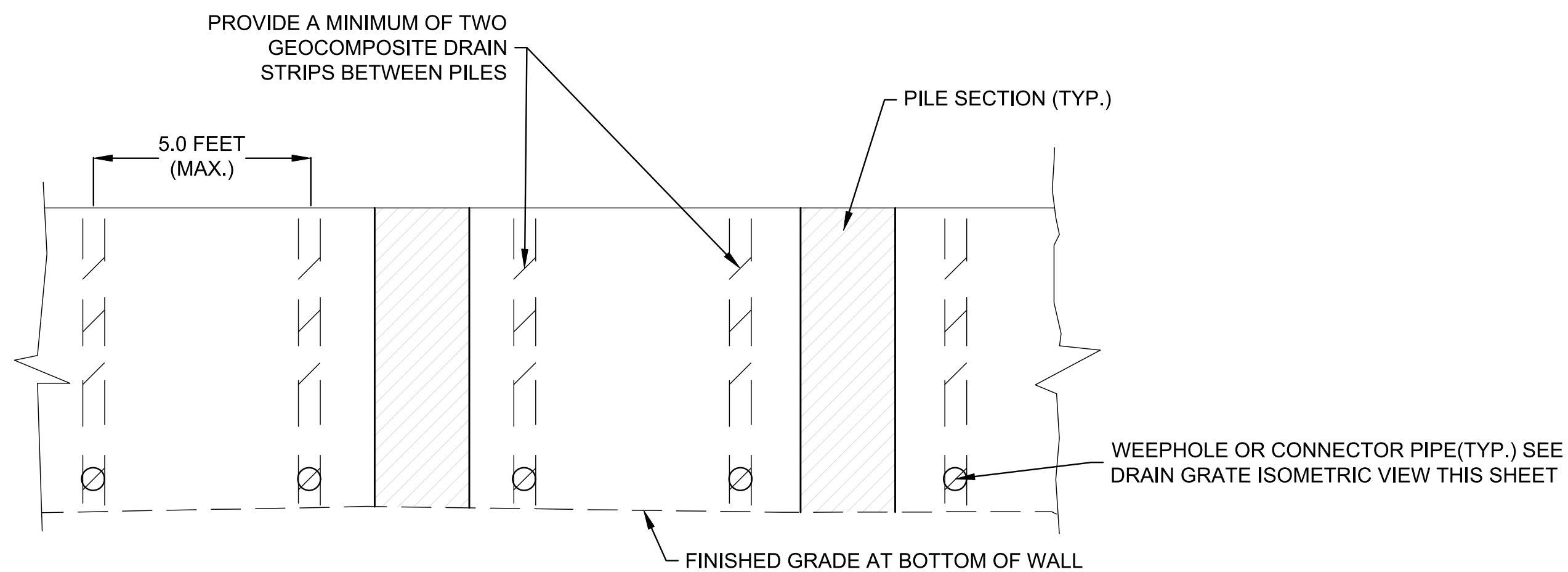
PVC CONNECTOR PIPE DETAIL (N.T.S.)



DRAIN GRATE ISOMETRIC VIEW (N.T.S.)

WALL D: NELSON STUD SCHEDULE					
STATION	PILE NO.	PERMANENT FACING NELSON STUD LENGTH (IN)	PERMANENT FACING NELSON STUD SPACING (IN)	TEMPORARY FACING NELSON STUD LENGTH (IN)	TEMPORARY FACING NELSON STUD SPACING (IN)
0+00.0 TO 3+72.4	1 - 57	3.0	9.0	N/A	N/A
3+72.4 TO 4+23.2	58 - 63	3.0	12.0	N/A	N/A
4+23.2 TO 4+26.1	64	7.0	12.0	3.0	12.0

NOTE: SEE END OF WALL D DETAIL ON SHEET RW-D8 FOR LAGGING AND NELSON STUD PLACEMENT AND DETAILS FOR PILE 64.



GEOCOMPOSITE DRAINAGE STRIP DETAIL (N.T.S.)

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SOLDIER PILE WALL CONSTRUCTION DETAILS

NORTHGATE SUBARU
208 GLENEAGLE GATE VIEW

COLORADO

COLORADO SPRINGS



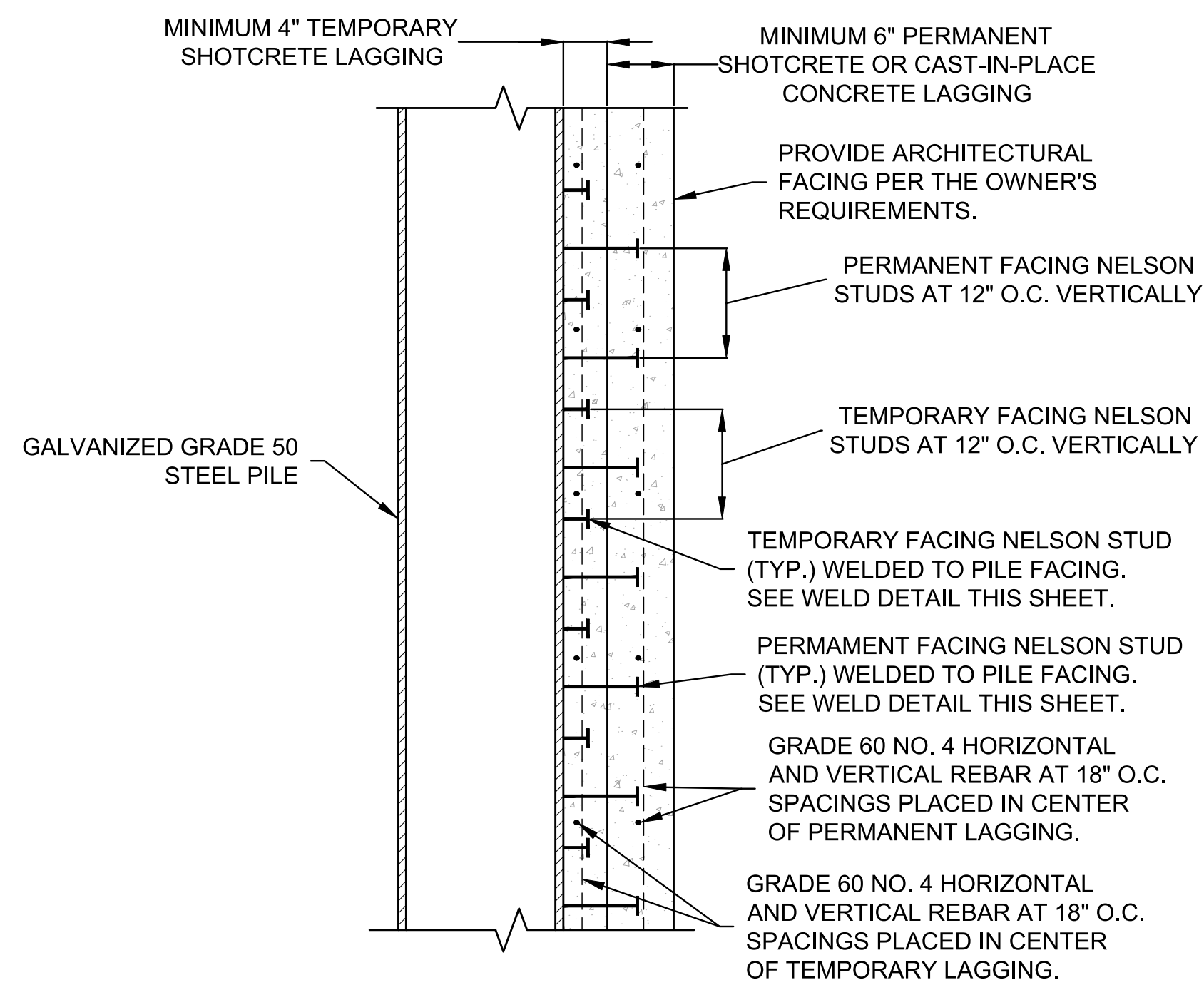
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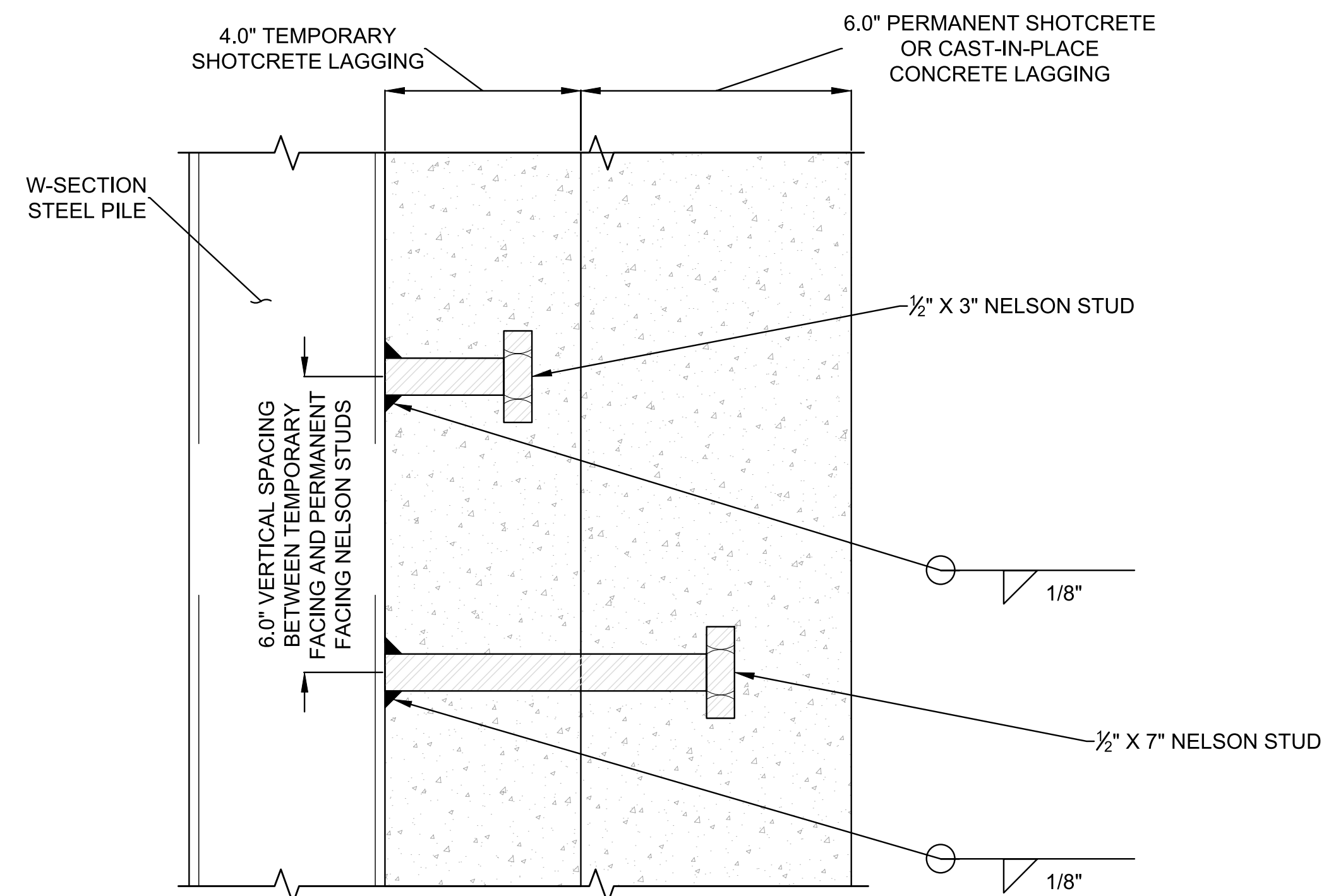
RW-D7

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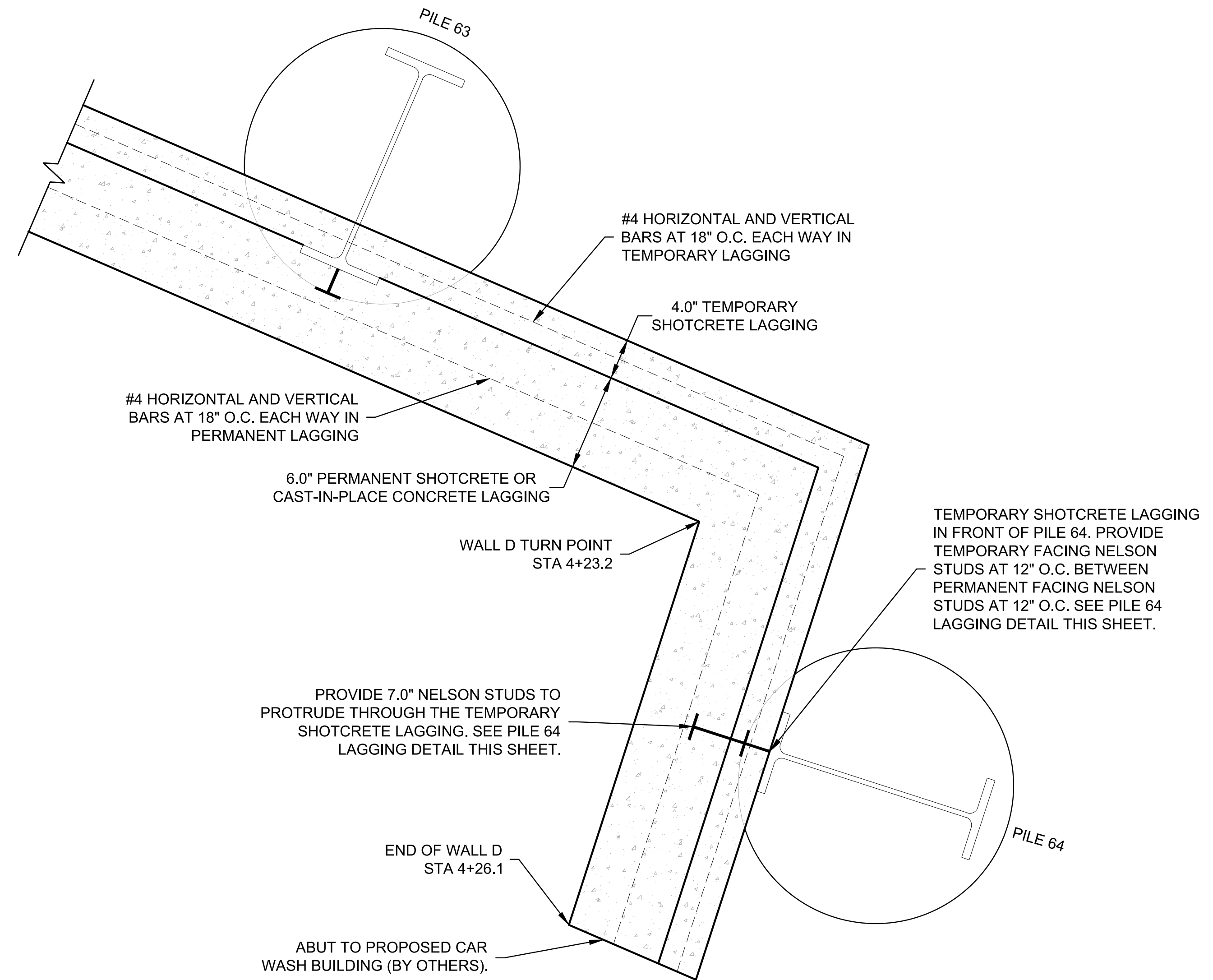
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PILE 64 LAGGING SECTION DETAIL (N.T.S.)



PILE 64 NELSON STUD CONNECTION DETAIL (N.T.S.)



END OF WALL D DETAIL (N.T.S.)

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SOLDIER PILE WALL CONSTRUCTION DETAILS

NORTHGATE SUBARU
208 GLENEAGLE GATE VIEW

COLORADO

COLORADO
SPRINGS



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RW-D8

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